SPECIFICATIONS FOR VEHICLE EXHAUST GAS ANALYZER SYSTEMS FOR USE IN THE TEXAS VEHICLE EMISSIONS TESTING PROGRAM

Texas Natural Resource Conservation Commission
Technical Analysis Division

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SECTION I

I. GENERAL - ASM

1.1 Design Goals

This specification is provided for the implementation of the acceleration simulation mode (ASM-2) emission inspection system (EIS) and must be capable of performing uniform and consistent emissions tests for the Texas Vehicle Emissions Testing Program ("the Program"). Features of the EIS include, but not limited to:

- dynamometer,
- vehicle emissions measurements of hydrocarbons (HC), carbon monoxide (CO), carbon dioxide (CO2), oxides of nitrogen (NO), and oxygen (O_2),
- engine RPM measurements,
- exhaust dilution determinations,
- data entry,
- data retrieval tables,
- a printer for vehicle inspection reports, for diagnostics and general purpose printouts and an additional printer port,
- data recording on double sided high density 1.44 megabyte (MB) 3.5" floppy diskette, a 6.4Gb (or greater) hard drive,
- a modem for "on-line real time" data transmission,
- CRT information displays to the inspector,
- bar code (2D non contact) reader and printing capabilities,
- fully menu driven, interactive simple microprocessor controlled operation,
- the analyzer shall include a gas cap integrity tester which is a fully automated integral part of the analyzer system,
- an OBD II SAE Standardized Link, and,
- an Opacity meter for testing diesel vehicles.

Additional, automatic features required include:

- analyzer and dynamometer calibrations,
- zero and span checks,
- pressure calibrations,
- gas auditing procedure,
- leak checks,
- HC hang-up checks,
- audit menus,
- test sequencing, and
- low-flow checks.

The analyzer and dynamometer shall be designed and constructed to provide reliable and accurate service in the automotive environment. The software used in the analyzer shall consist of a process control

system as well as specific data files (look-up files). Security shall be provided to prevent unauthorized modifications to the software or test data and recording unauthorized entry (tampering) and locking out of the inspection process when detected.

The emissions analyzer software shall be designed for maximum operational simplicity. It shall also be capable of providing emissions reading characteristics, independent of the inspection function, which can be used for vehicle diagnostics.

1.2 Manuals

Each analyzer shall be delivered with a current hard copy version of the following manuals:

a. Reference Operating Instructions;

b. Operation Instruction Manual;

c. Maintenance Instruction Manual; and

d. Initial Start-up Instructions.

ASM-2 EIS manufacturers may consolidate manuals. The manuals shall be constructed of durable materials and shall not deteriorate as a result of normal use over the equipment's useful life. The analyzer housing shall provide convenient storage for each manual in a manner that will:

a. Allow easy use; and

b. Prevent accidental loss or destruction.

ASM-2 EIS manufacturers may install the manuals in the analyzer software. The analyzer shall have the ability to print complete manuals or portions of the manuals. If the manuals reside on system software, the manufacturer shall provide backup of the manuals in an electronic media (i.e., floppy disk, CD-ROM, etc.), and the procedures for loading the manuals onto the analyzer.

1.3 Software Certification Documentation

The analyzer software shall be fully documented. Six (6) copies of the documentation listed below shall be submitted to the Texas Natural Resource Conservation Commission (TNRCC) as part of the certification application, unless otherwise noted. Software documentation shall include at least the following:

a. Complete program listing(s). Program listings may be on diskette, and are not required to be submitted with the application for certification;

b. Functional specifications;

c. Functional flowcharts of the software;

d. Example inputs and outputs from all processes;

e. Detailed interface information on system components including the identification of protocol and output specifications; and

f. All DOS file layouts with file names, file types, file security, field names, field types, field sizes, and field editing criteria.

Documentation provided by the vendor to meet this requirement will be treated as proprietary information by the TNRCC/DPS if appropriately marked. This documentation must be marked "Confidential" if the vendor desires that the information be protected from distribution.

1.3.1 Confidential Information

If the manufacturer believes that the certification package, or parts of it, are confidential, it must specify that either all or part is excepted from release, and which exception(s) of the Texas Open Records Act (TORA) it believes applies, with specific and detailed reasons. Each page containing confidential information should be clearly marked accordingly. Vague and general claims to confidentiality are not acceptable. This is necessary so that the TNRCC/DPS will have sufficient information to provide to the Attorney General of Texas if his opinion is requested. All certification packages or parts of certification packages which are not marked as being confidential will automatically be considered public information.

The TNRCC/DPS assumes no responsibility for asserting legal arguments on behalf of the manufacturers. Manufacturers are advised to consult with their legal counsel concerning disclosure issues resulting from this certification process and take precautions to safeguard trade secrets and other proprietary information.

1.3.2 Escrow of Software

NOTE: THE MANUFACTURERS OF ASM-2 EMISSIONS INSPECTION SYSTEMS (EIS) WILL SUBMIT A LETTER OF CORPORATE AUTHORIZATION AGREEING TO PLACE SOFTWARE SOURCE CODES AND OTHER PERTINENT TECHNICAL INFORMATION IN "ESCROW." CERTIFICATION WILL NOT BE VALID UNTIL THIS CONDITION HAS BEEN MET. ESCROW INFORMATION MUST BE KEPT CURRENT, I.E., SOFTWARE VERSION IN USE MUST CORRESPOND WITH THE ESCROWED INFORMATION. ESCROW PLACEMENT WILL BE APPROVED BY THE TNRCC MOBILE SOURCE SECTION.

Manufacturer agrees to place the most recent update of, including, but not limited to: software, code, and related materials in use to meet this specification in the possession of a neutral third party of the manufacturer's choice. The manufacturer shall notify the TNRCC and provide the name and contact person of the selected third party. The software will be turned over to TNRCC in the event that the manufacturer defaults or cannot assure continued performance of the inspection analyzers.

In the event that the software is transferred, the TNRCC shall protect the source code from public dissemination and commercial usage. The software may be used, maintained and updated by the TNRCC or it's assignee to support the Program. At a minimum, the TNRCC shall:

a. limit access code to parties necessary to accomplish maintenance and updating of the ASM-2 EIS systems;

b. require all parties to sign a non-disclosure agreement before obtaining access to the code; and

c. grant no license to any entity permitting that entity to use any part of the code for any commercial purpose other than to update/operate the ASM-2 EIS systems.

The purpose of the requirement for the source code is to provide the TNRCC/DPS with a mechanism to assure continued performance of inspection analyzers in the event that a manufacturer should default. The TNRCC/DPS is not interested in any disclosure of proprietary information, nor in the detailed inner workings of vendor code. However, it is essential that all of the necessary working codes, schematics, drawings, be available in case of such demise. The escrow agreement must be approved by the TNRCC.

1.3.3 Performance Bond

As a prerequisite to certification, the Manufacturer shall furnish a performance bond to the TNRCC. This bond shall be in a form approved by the TNRCC and shall be executed as surety by a bonding company authorized to do business in the State of Texas and signed by a Licensed Resident Agent. The performance bond shall be for the amount of $2,000,000 and must remain valid for the entire time period which the manufacturer participates in the Program. This performance bond will cover all systems (i.e., ASM/TSI/OBDII, TSI/OBD, and OBD-only) that are certified to conduct inspections in the Program.

The performance bond may be utilized by TNRCC at any time if the Manufacturer is in material default of the requirements of these specifications, including but not limited to the following "Events of Default":

a. The Manufacturer fails to remedy a breach of covenant, representation, or warranty required by these specifications within thirty (30) days after written notice of such breach has been given to the Manufacturer by the TNRCC;

b. The Manufacturer makes a general assignment for the benefit of creditors, admits in writing its inability to pay debts as they mature, institutes proceedings to be adjudicated upon voluntary bankruptcy, consents to the filing of a bankruptcy proceeding against it, files a petition or answer or consent seeking reorganization, readjustment, arrangement, composition, or similar relief under the federal bankruptcy laws or any other similar applicable law, consents to the filing of any such petition, consents to the appointment of a receiver, liquidator, trustee, or assignee in bankruptcy or insolvency of the Manufacturer or of a substantial part of its property, or takes action in furtherance of any of these purposes; or

c. A decree or order by a court of competent jurisdiction is entered adjudging the Manufacturer as bankrupt or insolvent, or approving as properly filed a petition seeking reorganization, readjustment, arrangement, composition, or similar relief for the Manufacturer under the federal bankruptcy laws or any other similar applicable law, and such decree or order continues undischarged or unstayed for a period of sixty (60) days; or a decree or order of a court of competent jurisdiction for the appointment of a receiver, liquidator, trustee or assignee in bankruptcy or insolvency of the Manufacturer or of a substantial part of its

property, or for the winding up or liquidation of its affairs, is entered, and such decree or order remains in force undischarged or unstayed for a period of sixty (60) days; or any substantial part of the property of the Manufacturer is sequestered or attached and is not returned to the possession of the Manufacturer or released from such attachment within sixty (60) days thereafter.

To require performance by the surety under the performance bond, the TNRCC shall give written notice of the event of default to the Manufacturer, specifying the date upon which surety performance shall begin.

The performance bond shall be released upon determination by the Executive Director or "Designee"of the TNRCC that the manufacturer has satisfactorily completed its obligations in accordance with the terms of this specification, or at an earlier date, if it is determined by the Executive Director to be in the best interest of the State to do so.

1.4 Warranty Coverage / Mandatory Service Contract

A written warranty coverage agreement, signed by an authorized representative of the equipment manufacturer and the vehicle inspection station owner, which provides a complete description of coverage for all systems and components and all manufacturer provided services listed in Section 1.5, must accompany the sale or lease of each ASM-2 EIS.

An extended service contract must be available upon the expiration of the manufacturer's original warranty period. **ORIGINAL MANUFACTURER'S WARRANTY SHALL BE A MINIMUM OF ONE YEAR FROM THE DATE OF PURCHASE.** Renewals shall be offered at the inspection station owner's request and governed by "good business" practices between the parties involved. Service contract agreements must be available by the manufacturer. The inspection station owner is responsible for maintaining the manner of service for the EIS. Cost disclosures and detailed descriptions of coverages must be available in printed form and distributed to all ASM-2 EIS users. Cost disclosure shall also be made for "consumable" inventory items 1.5b. This information would most appropriately be presented with the original manufacturer's warranty.

1.5 Manufacturer Provided Services

The manufacturer shall agree to provide the following services to the inspection station as part of the manufacturer's original warranty and thereafter as a portion of the service contract agreement. The cost of a service agreement is to be listed at least annually. Future charges cannot exceed the amount published.

a. Delivery, installation, calibration, and verification of the proper operating condition of an ASM-2 EIS.

b. Quarterly (90 days) examination, calibration, and routine maintenance of the dynamometer, analyzer, and sampling systems. Annual examination shall be required on OBD only analyzers. Full systems support and repair, including temporary provision of units of equal quality and specification. Upon initial sale, lease, or loan, provide sample filter(s) (2), and

"extra" printer medium (1 ea.), or a certificate redeemable for a printer cartridge for laser printers. Maintain the availability of "extra" consumable inventory upon examination. **CONSUMABLES AND THE COST(S) THEREOF MUST BE DISCLOSED IN THE SERVICE AGREEMENT.**

c. Instruct all certified inspectors employed by the inspection station at the time of installation in the proper use, maintenance, and operation of the EIS. The Emission Inspection System shall contain a feature that will allow an inspector to go through the complete inspection procedure without generating an official inspection record. The feature will be able to be performed with or without a car and shall produce a vehicle marked "invalid". This function will be used for evaluating inspector performance, by DPS program officials, or by the manufacturer for demonstration purposes. The "training mode" shall not require the use of an inspector's access code or allow access to secured areas of hardware or software. The display shall show a message throughout the inspection that this is not an official inspection. During the "training mode," vehicle inspection reports shall indicate to the satisfaction of the DPS that they are for training only. No official vehicle inspection report will be generated during the training exercise.

d. On-site service response by a qualified repair technician within (2) business days, (48 hours) excluding Sundays, national holidays (New Years Day, Martin Luther King, Jr. Day, President's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving, Christmas, and other days when the purchaser's business might be closed), of a request from the inspection station. The names, toll-free telephone numbers, and service facility addresses of all manufacturer representatives responsible for equipment service shall be provided to the inspection station. A service representative shall be available at all times during normal working hours. Sundays, national holidays, and other days when the purchaser's business might be closed, are not included. All system repairs, component replacements, and/or analyzer adjustments, including reset of quality control lockout systems, shall be accomplished on-site within 48 hours after a service request has been initiated. If the completion of this work is not possible within this time period, an ASM-2 EIS unit of equal quality and specifications shall be provided until the malfunctioning unit is properly repaired and returned to service. Service representatives shall have a software driven menu option or other acceptable method that records the transfer of inspection station, inspector information, and other applicable data files from one EIS to another without manual inputs and without transfer of previous test files.

e. Updates of operational software, i.e., file based information, will be on a basis specified by the TNRCC. The update of software should be designed to utilize modem technology for future software updates. The TNRCC will require the manufacturer to provide software updates in the first year of the Program to ensure the Program meets all designated criteria provided herein. The "first year of the Program" will be mutually agreed upon by the TNRCC and each manufacturer. The manufacturer shall provide up to two (2) software updates to the State in the first year, and thereafter, updates will be limited to once per year. Future software updates must be ready for beta testing within 120 days of notification to prospective EIS analyzer contractors by the State (TNRCC). The software updates shall not exceed a combined total one thousand (1,000) programming hours and be at no cost to the State or

analyzer owners. If the manufacturer anticipates that an update shall exceed the one thousand (1,000) programming hours limit, a cost quotation shall be prepared by the manufacturer. The cost quotation shall be submitted to the TNRCC prior to commencing work on the update and prior written approval from the TNRCC shall be required.

The manufacturer shall submit a formal certificate to the TNRCC that states that any analyzer model sold or leased by the manufacturer or its authorized representatives or any analyzer currently in use in the Program will satisfy all design and performance criteria described in these specifications. The manufacturer shall also provide sufficient documentation to demonstrate conformance with these criteria including a complete description of all hardware components, the results of appropriate performance testing, and a point-by-point response to specific requirements.

All equipment shall be tested by an independent test laboratory. The independent laboratory shall have previous experience certifying exhaust gas analyzers and dynamometers (prior BAR 97 certification experience.) The manufacturer shall seek prior written approval from the TNRCC of the certification laboratory. At least 15 days in advance of commencing the certification process, the manufacturer shall notify the TNRCC. The notification will include the laboratory name, address, telephone number, and the name of a contact person. The TNRCC reserves the right to be present during the evaluation of all equipment. The test laboratory shall issue a test report detailing the objectives, test methods, and test results of the subject equipment. The test report shall then be submitted to the TNRCC Mobile Source Section for an evaluation of acceptance. Previous certification by the TNRCC may be considered in this process but will not be sufficient to satisfy all necessary documentation requirements. The cost of the certification shall be adsorbed by the manufacturer.

In addition, a full description of the company's service procedures and policies, as well as sample contracts, warranties, and extended service agreements, shall be provided as part of the certification application to ensure proper maintenance of all analyzers throughout their useful life. One fully-functional analyzer shall be presented for TNRCC evaluation.

Software updates provided during the warranty period, *at no charge***,** by the supplier of the inspection equipment or software programs, shall consist of at least the following:

- The inclusion of data pertaining to additional vehicles not previously included in the inspection program;

- The inclusion of data pertaining to new model-year vehicles released since the most recent update;

- Amendments made to the "cut points" as directed by the Administrator of the program; or

- Software updates that rectify errors subsequent to release of original software. Any software updates shall be warrantied for a period of one year from the date the software becomes operational in the analyzer EIS.

The supplier of the software shall be entitled to a reasonable reimbursement based on the costs accrued in the production, release and installation of the software update in the following instances:

- Changes in the vehicle inspection procedure that differ from the original procedure as outlined in the specifications used to certify the equipment and/or software at the program inception. Examples would be the addition of pressure/purge tests or visual inspection of components;

- Changes in the software structure as the result of the administrative changes within a state organization. Examples would be changes made to software fields to permit entry of Inspectors Social Security Numbers as opposed to drivers license numbers as required in the original specifications used to certify the equipment and/or software at the program inception;

- Changes in the software structure as the result of a decision to change/include extra functions or procedures not included in the original specifications used to certify the equipment/software at the program inception. Example would be changes or additions to Electronic Transmission; or

- Changes mandated by the State as a result of a state error or revision in specifications or procedures found in a previous update.

f. The EIS software shall allow DPS program officials to insert a floppy disk, prepared by the manufacturer, into the State access drive, and update the existing software version. Look-up tables and message screens shall be designed independent from the main operations software to eliminate interference with the operations of the EIS.

   The TNRCC/DPS will require the manufacturer to render updates as necessary in the first year of the Program to ensure the program meets all design criteria. Since modem software updating will be utilized, there are no costs to the EIS owner. A software version number, consisting of a four-character alpha-numeric code made up of the last two digits of the year followed by a two-character version number, shall be recorded in the EIS and included on each vehicle test record. The EIS manufacturer shall not modify any existing software version without obtaining prior written approval from the designated representative of TNRCC/DPS.

g. The TNRCC/DPS may require the manufacturers to conduct on-site or laboratory testing of EIS equipment in order to document continued compliance. When a part of a EIS is removed from the field, for repair or testing, manufacturers shall supply the inspection station from which it was removed, a temporary replacement unit meeting all Program requirements. Manufacturers shall pay for all associated shipping and transfer costs for the replacement of the EIS selected for compliance testing. Manufactures shall also be responsible for any costs incurred for required testing performed by their personnel or by an independent contractor.

h. The manufacturer/s shall be responsible for the provision of training to state officials

responsible for oversight of the Program (e.g., TNRCC, DPS). The training shall include, but not be limited to**:** instruction on all operational, maintenance, and quality control features of the analyzer, sampling system, and dynamometer, including full access to and use of inspection menus, audit menus, and calibration menus, as well as optional programs offered to inspectors. Such training shall be conducted at the manufacturer's expense as a condition of certification; and thereafter at intervals (minimum of once per year in each I/M program area and after each major software revision) upon written request by the TNRCC/DPS.

The manufacturers shall provide a training plan to TNRCC/DPS. The training plan will be used by state oversight officials to conduct certification training of potential inspectors on the use of the analyzers for Program implementation. The manufacturers shall provide a minimum of six (6) hours training to the owners and operators of the EIS for each EIS unit purchased, leased, or upgraded.

1.6 Certification Requirements

The manufacturer shall submit a formal certificate to the TNRCC that states that any EIS unit sold or leased by the manufacturer or its authorized representatives for use in the Program will satisfy all design and performance criteria described in this specification. The manufacturer shall also provide sufficient documentation to demonstrate conformance with these criteria including a complete description of all hardware components, the results of appropriate performance testing, and a response to specific requirements.

All equipment shall be tested by an independent test laboratory. The independent laboratory shall have previous experience in the certification of exhaust gas analyzers and dynamometers. The manufacturer shall seek prior written approval of the certification laboratory by the TNRCC. The manufacturer shall notify the TNRCC at least fifteen (15) days in advance of the certification process. The notification will include the laboratory name, address, telephone number, and the contact person. The TNRCC reserves the right to be present during the evaluation of all equipment. The test laboratory shall issue a test report detailing the objectives, test methods, and test results of the subject equipment. The test report shall then be submitted to the TNRCC for evaluation and acceptance. Previous certification by the TNRCC may be considered in this process but will not be sufficient to satisfy all necessary documentation requirements. The manufacturer shall be responsible for all costs associated with equipment certification.

In addition, a full description of the EIS contractor's service procedures and policies, as well as sample contracts, warranties, and extended service agreements, shall be provided as part of the certification application, to ensure proper maintenance of all analyzers, sampling systems, and dynamometers throughout their useful life. One fully-functional EIS shall be presented for evaluation by the TNRCC.

1.7 Electronic Transmission

1.7.1 Texas Information Management System (TIMS) Overview

A required component of the enhanced program is the electronic transmission of data/information about a specific vehicle under test and test results. Texas Information Management System (TIMS) is the name that TNRCC has given to the electronic network that enables the ASM-2 EIS to automatically connect to the TNRCC's centralized Vehicle Information Database (VID) via modem and dial-up connection. The

software protocol is provided in greater detail in Section 3 of this Specification. The communications protocol shall be provided by the TNRCC contractor and provided to the EIS manufacturers. The manufacturers shall be responsible for submitting a written request to the TNRCC for the communications protocol. Communication between the Texas Information Management System Host, and the ASM-2 EIS shall be a condition of certification. The ASM-2 EIS shall demonstrate the ability to receive from the Texas Information Management System Host all applicable data (i.e., EPA Vehicle Look-up Table (VLT) data, inspection records, vehicle information, etc.) needed to conduct the inspections. The ASM-2 EIS shall also demonstrate the ability to transmit the applicable data (i.e., results of inspections, audit file, etc.) to the TIMS. The TIMS Host shall be able to transmit the emissions standards table via modem. The analyzer shall be capable of automatically installing and using the new files containing the aforementioned items. The emissions standards table shall be stored under the file name: ESC.DAT.

a) Mandatory TIMS Service:
In order to comply with the TIMS mandate, each inspection station shall obtain and maintain TIMS services through TNRCC's designated TIMS contractor. The following criteria shall be met before an (EIS) is used for I/M test certification: (1) the EIS shall be connected to, and shall be fully functional with the TIMS service and (2) the EIS shall possess, and be operational with the current software and/or hardware update.

b) TIMS Service Description:
At the beginning of the test, following the technician's entry of the Vehicle License Plate Number and VIN into the EIS, the ET software (via the modem and dial-up connection) initiates an automated call (initial call) to the VID. Vehicle-specific information (VLT), previous test results, vehicle description, waiver or extension data, emissions recall information, technical service bulletins are electronically returned from the VID. Information that the technician previously filled in manually will be automatically entered into the EIS and the technician will be responsible for verifying that the information is correct.

At the conclusion of the inspection, test results, repair results (when required), and certificate number for passed tests are transmitted electronically to the VID (end-of-test call). The Vehicle Inspection Report (VIR) serves as the customer's receipt.

Using the TIMS system, the TNRCC is also able to send electronic messages to technicians and inspection station owners. When an announcement or bulletin has been received from the host, the software will automatically display a message or other indicator, indicating that an announcement or bulletin has been received from the TNRCC/DPS. At a minimum, the indicator shall be visible to the inspector between inspections and from the main menu. The display shall not stop an inspection from being conducted. Announcements shall be transmitted during initial contact with the TIMS during an emissions test, or during a communications refresh. The announcement(s) or bulletin(s) shall be stored on the EIS in the Announcement file for 180 days from the date of initial receipt from the host or until another announcement is saved over it.

c) Optional Diagnostic and Repair Information (ALLDATA):
The TIMS service provides immediate electronic access to diagnostic and repair information

for a fee.

d) Charges for TIMS Services:
Inspection stations must maintain TIMS service in accordance with the terms specified by the TNRCC's TIMS contractor.

l.7.2 Form, Manner and Frequency of Data Transmittals for TIMS

a) Form: For each inspection, the data transmittal shall consist of the vehicle's test record, VLT data, and when required, repair record (and other records) as described in Appendix I.

b) Manner: The manner of the data transmittal shall be using the ASM-2 EIS modem via a dial-up connection. The ASM-2 EIS must be maintained to ensure proper operation and shall be connected to a fully operational and dial-up connection during all times of operation.

c) Frequency: The data shall be transmitted for inspection and repair (when required) and shall include two (2) transmissions per inspection, one for the initial call and another for the end-of-test call.

1.8 Tamper Resistance

Controlled access design shall be the responsibility of the manufacturer. All security measures shall be submitted to the TNRCC for approval. Analyzer operators, State field representatives and manufacturer's representatives shall be prevented, to the TNRCC/DPS's satisfaction, from creating or changing any test results, TNRCC/DPS programs or TNRCC/DPS data files contained in the EIS as called for in this specification. Manufacturers shall utilize special BIOS, partitions (or equivalent approved by the TNRCC), as well as other appropriate software and hardware provisions to protect the I/M files and programs. File and program protection may consist of mechanical systems in combination with electronic/software systems. The protection features shall prevent access to the secured disk drives and portions of the hard disk containing I/M programs and test data. The "control" key, or its functional equivalent giving access to the operating system (OS), shall not be activated except through the use of a password on the STATE MENU. The password shall be chosen by the TNRCC's Mobile Source Section at the time of certification testing. Other security or protection alternatives, such as more sophisticated BIOS limitations and LPT port key, may be proposed by the manufacturer for approval by the TNRCC.

In addition, the emission analyzer and the sampling system shall be made tamper-resistant to the TNRCC's satisfaction. As a minimum, the manufacturer shall develop tamper-resistant features to prevent unauthorized access through the cabinet. Micro switches, keyed locks, software-controlled locks, and software algorithms requiring the use of an access code shall all be utilized where appropriate. Access codes shall be changed on a monthly based on an algorithm provided by the TNRCC. Service access codes shall be changed monthly, at a minimum based on a unique algorithm provided by the manufacturer. Both algorithms may be changed as part of any software update.

Manufacturers may utilize keyed lock on the doors securing the disk drives as long as the locks are built-in, good quality and can be easily changed by authorized personnel if a security problem is identified. The following examples illustrate ineffective, and therefore unacceptable, security measures:

- A mercury switch would not be effective if the analyzer can be tipped over to one side to trigger the switch.

- A keyed lock would not be effective if it is placed in a position that allows the analyzer cabinet to be flexed slightly to bypass the lock.

- If there is a dynamometer control cabinet separate from the secured area of the analyzer cabinet, it shall be secured in a manner approved by the TNRCC/DPS.

The inspection technician shall have access to the compact disc (CD) drive. However, access security to the BIOS, I/M related programs, and data must be secured from this drive when accessed by a technician. The manufacturer shall provide security for the CD drive to prevent unauthorized read/writes (to memory, ROM, hard drive, etc.). This security shall guard against unauthorized executables that are executed from the CD. The manufacturer shall submit their method for providing this security to TNRCC for approval.

A software-controlled solenoid lock may be used on the secured drive door of all ASM-2 EIS units submitted for certification. This solenoid lock may be used instead of, or in addition to, any key or combination lock that may be provided. The solenoid lock shall be controlled by the EIS software, unlatching the doors in response to authorized requests from the STATE MENU, always maintaining the appropriate levels of security. All ASM-2 EIS units shall have sensors, such as Micro switches, to detect the open/closed state of the doors, as well as other secured areas of the EIS. The EIS shall monitor these sensors and shall define an inappropriate state as a tamper.

Manufacturers may offer analyzers with additional disk drives that can run optional software application programs. However, the optional disk drives shall be secured from the BIOS, operating system and all other I/M related programs and test data (or equivalent acceptable to the TNRCC). If tampering occurs, a software lockout algorithm shall be activated which aborts any existing test sequence and prevents further I/M testing until the lockout is cleared by a state field representative (or other representatives authorized by TNRCC/DPS). Manufacturers shall develop a system to allow service technicians to only clear “tamper” lockouts during authorized service calls.

The use of Micro switches to detect unauthorized entry is acceptable. However, unauthorized access to the secured areas of the analyzer shall be detected even when the power is off. The analyzer shall record the type and location of each tamper (excluding the underhood tamper flag). The tamper attempts shall be recorded in a tamper file which includes the date of the tamper-caused lockout, the type and location of the lockout, the date the lockout was cleared and who it was cleared by (State or manufacturer's service representative). The specific tamper type and location shall only be accessible through the STATE MENU - LOCKOUT EIS function.

The lockout system shall be designed so that it can be activated by a state field representative from the STATE MENU. Only State field representatives (or other representatives authorized by TNRCC/DPS) may remove lockouts put in place from the STATE MENU. Manufacturers shall develop a system by which their service technicians shall be prevented, by some method approved by the TNRCC, from clearing TNRCC/DPS installed lockouts. In particular, the following policies shall apply to the

manufacturers' field representatives:

1) They shall not be capable of:
   i. clearing a State-installed lockout, or
   ii. clearing a lockout due to a requirement for a three-day gas calibration/leak check.

2) They shall not add, delete or modify Station or Inspector license number.

3) They shall not be capable of altering the calibration gas values.

The tamper resistance features shall be designed so that software programs, especially those which deal with repair and diagnostics of vehicles, can be added at a later date.

Optional software packages supplied by the manufacturer shall not interfere with the normal operation of the I/M inspection and testing software, and shall not compromise the tamper-resistance of the analyzer.

Access to and from all required and mandatory-option programs shall be "seamless." These programs shall be accessed from the Main Menu or a submenu, and, when exited, shall return directly to the menu or submenu from which they were accessed, without requiring the EIS to reboot.

SECTION 2

2.0 HARDWARE SPECIFICATIONS

2.1 Overview

The ASM-2 EIS hardware specification pertains to the following: an IBM-compatible personal computer (PC) with a printer, a modem, software to perform both two-speed idle and loaded-mode testing; a five-gas analyzer and sample conditioning system; zero and calibration gases; a dynamometer; a dyno control interface; an engine cooling fan; a bar code reader, OBDII fault code retrieval, a fuel cap tester; a tachometer, the capability for an opacity measurement system at a future date, and a cabinet.

The hardware specification for "**Specifications for ASM-2 Loaded Mode Vehicle Emission Inspection System for use in the Texas Vehicle Emissions Testing Program"** dated November 1,2000 shall meet or exceed specifications as published in **"BAR-97 EMISSIONS INSPECTION SYSTEM SPECIFICATIONS"** (BAR-97), dated **"May 1996"**, and, <u>including all amendments made to BAR-97 hardware specifications to present date.</u>

All ASM-2 EIS hardware shall have the ability to perform a transient test (i.e. BAR-31, IM240 trace) consistent with the design of the dynamometer as delivered. The only modifications to the ASM-2 EIS, if required to perform a loaded transient vehicle emissions test shall be:

1. Proper dynamometer calibration, and

2. Software modification.

Any ASM-2 EIS will be unacceptable if unable to comply with the loaded transient test requirements listed above.

2.1.1 Computer/Peripheral Compatibility

Computers shall be IBM-PC-compatible. They shall be able to reliably read and write IBM formatted 1.44Mb 3.5" diskettes.

Systems must be capable of producing graphic output on CRT displays and printers. The computer and printer shall be capable of printing graphics and text displayed on CRT.

Systems must be capable of communicating with computers using modems and a dial-up connection. The Emission Inspection System shall operate without manual intervention to automatically answer, verify passwords, and upload and download files with the contacted computer. The autoanswer feature is not required to be active during an emissions test. The power supply must have the potential to handle at least 300 watts of additional TNRCC/DPS upgrade devices.

2.2 General Requirements

2.2.1 Availability of Circuitry

All components including circuit board and integrated circuits used in the EIS shall be types and brands that are presently in common usage. Custom ROM programs developed by the manufacturer for building the analyzer are allowed.

2.2.2 Clock/Calendar

The EIS shall have a real time clock/calendar which shall make available the current date and time. Both time and date shall be in standard IBM PC format and used to set the computer's date and time on power up.

Resetting the clock shall require controlled access available only to the State Representatives and the manufacturer's service technician. The access mechanism or procedures shall be approved by the TNRCC. The software shall require the clock to be set each time contact is made with the VID (except for end-of-test contact). The EIS shall also check the EIS clock against the VID clock prior to clearing any lockout.

The analyzer clock/calendar shall be equipped with a battery backup feature that has a battery with at least a five-year expected life. The calendar shall handle the year rollover from 1999 to 2000. All software updates shall be activated by the clock/calendar as directed by the TNRCC.

2.2.3 Data and File Transfer

All calibration, vehicle test records, and other EIS files shall be capable of being transferred from the EIS in two ways:

a. Via an IBM PC compatible modem (located inside the cabinet) and connection to a telephone line, electronically receiving and/or transmitting data from the VID whenever the EIS connects to the VID.

b. By use of the standard 3.5" IBM 1.44Mb compatible floppy disk on which data is stored.

2.2.4 Capability To Access OBD II Fault Codes

EIS manufacturers shall have a port to connect to the OBD II SAE Standardized Link. The link shall enable the EIS to access engine RPM and fault codes for all OBD II equipped vehicles.

2.2.5 Mobility

The analyzer cabinet unit shall be designed for easy and safe movement over rough surfaces and/or graded surfaces (15° inclines). The center of gravity and wheel design shall be such that the analyzer can negotiate a vertical grade separation of one-half inch (½") without overturning when being moved in a prescribed manner. Industrial grade, swivel casters shall be used to permit 360°-rotations of the unit. The caster wheels shall be equipped with oil resistant tires and foot operated brakes capable of preventing movement on a 15°-incline.

Analyzer peripheral equipment, such as bar code readers, OBDII scanners, and keyboards, may utilized wireless communication to interact with the EIS analyzer.

2.3 Computers & Peripheral Requirements

The EIS functions shall be controlled by an IBM PC-compatible computer. Each EIS must include the hardware and software needed to perform all functions required by this specification. The computer shall be capable of at least the following tasks:

a. Collect, operate on, and record second-by-second readings for HC, CO, CO_2, O_2, NO, dynamometer speed and load, and engine RPM.

b. Monitor and control dynamometer functions.

c. Transmit test, audit, and calibration records to the VID via the TIMS.

d. Read and interpret bar code labels read by the bar code reader.

e. Read data from compact discs (CD) or other storage media approved by TNRCC.

f. Provide storage for archived test and graphic files.

g. Allow access to readiness and fault codes and engine RPM on OBD II equipped vehicles and interface with OBD II scan tools.

h. Provide VIR reprint capability from information stored on the hard drive or information received from the VID or equivelant storage media approved by TNRCC.

I. Interface with an optional partial-flow opacity-measuring device, display and record to the test record.

j. Optionally provide multimedia functionality, with audio/video (AVI) capability for video presentations and teleconferencing, and internal hardware for graphic frame capture.

The TNRCC/DPS reserves the right to add additional programs and functional performance requirements, up to the technical limits of the hardware, to improve the state of Texas I/M program.

Manufacturers may offer analyzers with additional disk drives that can run optional software hardware application programs; however, the computer shall not be bootable from any additional drive, nor shall any program run from one of these drives have access to the computer's operating system. Programs run from an additional drive shall not be capable of interfering with, modifying, corrupting or interrupting any inspection-related program, procedure, or file. Additional drives shall be located in a limited-access secured area within the ASM-2 EIS cabinet.

2.3.1 Minimum Required Microcomputer Configuration

NOTE: OBD only systems that do not use a standard microcomputer configuration will need to demonstrate their functional equivalency with this section to obtain approval from the TNRCC.

a) Operating System

Each unit may be supplied with an IBM PC-compatible, multi-tasking, operating system, which provides TCP/IP capability such as OS/2 or a MS 95/98/2000 Windows, Linux, or equivalent. The operating system must be DOS version 6.0 or most current with safeguards to limit access to DOS. The software program will neither exit to DOS, neither provide a “shell to DOS,” nor be bootable from any unsecured floppy disk drive. OBD only units **must** be supplied with an IBM PC-compatible, multi-tasking operating system, which provides TCP/IP capabilities.

b) Processor

The processor shall be IBM PC-compatible. Processing speed shall be equivalent to Pentium class, slot 1 type processor, or a TNRCC approved equivalent. The motherboard shall allow for processor upgrades.

c) RAM Memory

The system must contain at least 16Mb of user-available RAM and must be expandable to 512Mb.

d) BIOS

The system must include a BIOS (basic input/output system) that provides a self diagnostic routine to

check the performance of critical PC components (including, as a minimum, the processor, firmware, ROM hard disk, keyboard, clock, set-up RAM and memory) upon power and which enables full use of the operating system. This BIOS must fully support all supplied components.

e) Bus

When equipped with all TNRCC specified options, each unit must provide at least 1 free EISA (16 bit), one free USB slot, and 2 PCI slots for future expansion. The PCI expansion slots must be fully PCI-compliant ("plug-and-play") and be capable of mapping IRQ 14 & 15. TNRCC may waive the requirement for the spare EISA slot if the EIS has manufacturer-designated slots for upgraded options which would address potential future expansion.

f) Monitors: Display Screen & Drive Trace

The active screen area must be in color, of .28 dot pitch or less, and measure at least 15" diagonally. The monitor shall be interchangeable, “off-the-shelf”, and must be capable of noninterlaced resolution up to 1024 X 768. The display must interface with a color graphics adapter fully compatible with the IBM SVGA color graphics adapter. This interface must be capable of operating in noninterlaced modes up to a resolution of 1024 X 768 while emulating 64K colors or more. The video adapter must be equipped with a 64-bit accelerator chip (or better) to increase its video processing speed and must be PCI or AGP bus-compliant. The video adapter must be equipped with 1Mb and easily replaceable. A screen saver shall be provided for the monitor.

g) Floppy Disk

Each unit must come with an IBM compatible floppy disk drive which will permit full usage of double-sided, high-density 1.44Mb 3.5" removable media. The drive must be located in a secured area accessible only to TNRCC/DPS Program officials and authorized service representatives. The secured drive must also include an approved method to limit logical access. The TNRCC/DPS will test the system for drive security and it shall not provide access to the secured floppy except through the approved security procedure. The floppy drives must have an external door protecting them from contamination (dust). The analyzer's cooling fan (if equipped) shall not create a negative pressure in the case unless the floppy drive is sealed to prevent this negative pressure from drawing dust into the drive. The secured floppy disk shall be designated the "A" drive.

h) Compact Disc (CD) (Optional)

Each analyzer may be equipped with one CD ROM drive, or equivalent drive approved by TNRCC that is capable of reading CD ROM disks (i.e., DVD drive). The disk drive must be protected from contamination in the shop environment. The CD ROM drive shall be capable of reading CD ROMs that are formatted per ISO 9660. The CD drive shall be designated the "H" drive. The minimum acceptable sustained transfer rate is 600 kilobytes per second with a minimum acceptable average random access time of 225ms and must be multimedia and photo CD compatible as a minimum. A means for providing security to prevent unauthorized access to lower level system functions shall be submitted by the manufacturer for TNRCC approval.

i) Hard Disk

Each unit must come with at least 1.0 gigabytes of usable formatted uncompressed hard disk storage. The vendor must leave at least 2.5 gigabytes of usable storage for the TNRCC/DPS and 1.0 gigabyte of graphic/audio and text storage allotted to the technician. Second-by-second data, emission inspection data (including graphics) and vehicle data will be stored in the TNRCC/DPS storage area. The system shall warn the technician with a screen prompt when the hard disk is within 10% of being full in any of the allotted storage areas. The hard disk is to be self-parking, shock mounted, and able to operate reliably in the expected hostile garage environment. The hard disk must also include a TNRCC approved method of limiting logical access to data and programs. The hard disk containing the TNRCC/DPS programs and files shall be designated the "C: " drive. The hard drive's minimum acceptable burst transfer (external transfer) shall be 33Mb per second. The hard drive's minimum acceptable sustained transfer (internal transfer) shall be 5Mb per second. The minimum acceptable average random access time shall be 12ms. No software cache can be used when measuring transfer rate or access times.

j) Hard Disk Interface

The hard disk interface must be PCI bus-compliant and use enhanced IDE Mode 4 (or better) or Fast SCSI-2 (or better) or alternative approved by the TNRCC. The hard disk must be capable of maintaining a minimum transfer rate of 16,600 kilobytes per second with all peripherals installed (including options).

k) I/O Ports

The unit must include at least two DOS/IBM compatible parallel printer ports. The printer may be connected to one of these ports. The parallel port for TNRCC/DPS's use must be enhanced bidirectional. One of the ports must be free and easily accessible for TNRCC/DPS data transfer or future expansion upon approval by the TNRCC/DPS. Software providing this port transfer capability shall be provided by the manufacturer. This software must provide the capability for state representatives to transfer files to their laptops. Access to the data transfer capability shall be available only to manufacturer and State representatives.

The unit must include at least one free (TNRCC-reserved) male DB25 (25-pin) baudrate-programmable (300 to 115.2K or more) IBM PC RS232C-compatible serial port with full hardware support. This port must be unpopulated, easily accessible, for future expansion if authorized by the TNRCC.

Three baud rate programmable (300 to 115.2K or more) I/O serial ports using CPC female connectors with the following pinouts must be provided for future expansion or for use by the manufacturer upon approval by TNRCC.

All TNRCC-reserved serial ports shall use 16550 UART chips or better. All I/O ports shall be clearly labeled and easily accessible and may be shared. All CPC pinouts shall be as follows:

ANALYZER CPC SHELL REVERSE CONNECTOR
This connector must be shielded and must be compatible with an ANT 208721-1.

PINS	SIGNAL

1	GND	
2	+12v	
3	TXD	TRANSMIT DATA
4	RCV	RECEIVE DATA
5	RTS	RESET (request to send)
SHELL		SHIELD-GND

The CPC ports will supply software switchable 12V DC to equipment attached. The +12V pin must provide circuit protection of shorts or overload. The circuit protection can be in the form of a fuse, circuit breaker, etc. The circuit protection must be easily accessible to the operating technician for fuse replacement and or circuit breaker reset (unless automatic reset). The circuit must be capable of handling at least 6 watts.

2.3.2 Keyboard

The EIS keyboard must be fully interfaced with the microcomputer and have all of the necessary normal, numeric, cursor, control, shift, alternate, and function keys needed to operate a standard IBM PC, MS Windows compatible computer. A full-sized keyboard with at least 101 keys, and a Microsoft PS-2 or equivalent mouse (pointing device)should be provided. The keyboard shall be removable and replaceable without requiring access to a secured area within the EIS cabinet. The keyboard must accept a standard or PS-2 keyboard connector. The analyzer's keyboard shall be interchangeable with a locally purchased, off-the-shelf, IBM PC compatible keyboard.

2.3.3 Modem

The modem hardware must support the following protocols:

Modulation: ITU (International Telecommunications Union, formerly the CCITT) V.22, V.22bis, V.32, V.32bis, V.34.

Error control: ITU V.42, MNP (Microcom Network Protocol) 2, 3 and 4. Compression: ITU V.42bis, MNP 5.

Connect Time: The modem must be capable of achieving a link with the VID in less than 10 seconds at 14.4K baud or higher. The link time will be measured from the point the line is picked up to the point of connect.

The modems must support at least the following baud rates: 36.6k to 56k asynchronous operation.

The modem must support the industry-standard AT command set. If the modem is not using a common expansion bus slot, then a means of disabling the modem and an expansion slot or another high speed I/O port must be provided with the intent of supporting an upgraded modem if needed for future expansion. The analyzer shall have a standard female modular telephone connector located on the back of the analyzer. The telephone cord shall not be attached to the power cord. The telephone line shall be enclosed in a protective cable meeting UL approval.

2.3.4 Printer

A laser printer shall be supplied with each EIS purchased, leased, or upgraded. The printer shall be dedicated to the task of printing vehicle inspection reports, diagnostic reports, or printing other designated information on a vehicle diagnostic form, or other repair type information. Standard printer paper will be used. The printer shall print information on the vehicle inspection report using a minimum of 12 characters per inch and 80 characters per line. The EIS' printer shall be interchangeable with a locally purchased, off-the-shelf, IBM-PC compatible printer.

2.3.5 Running Changes and Other Hardware Modifications

Any changes to design characteristics, component specifications and any modifications to the hardware must be approved by TNRCC. It will be the instrument manufacturer's responsibility to confirm that such changes have no detrimental effect on EIS performance.

a) Only TNRCC-approved hardware configurations and options may be used in ASM-2 EIS.

b) All proposed hardware modifications and options must be thoroughly tested by a third party before being submitted to TNRCC.

c) All proposed hardware modifications shall be accompanied by a cover letter containing the following information:

    1) A description of all of the proposed modifications to be performed (including manufacturer initiated modifications), a parts list, and the installation instructions for the field service representative. Any modifications to the bench or sample system shall also be accompanied with test data and an engineering evaluation regarding the effects of the proposed modifications on the performance and reliability of the analyzer.

    2) A time line showing when the modifications are expected to be performed (start to finish), and how many existing units will be updated.

    3) If any special procedures are needed to perform the hardware modifications, describe the procedures for performing the update.

    4) If the proposed hardware modifications require changes or additions to the software, documentation for the software update shall be submitted as indicated above.

    5) Depending on the type and number of modifications proposed, the TNRCC may require testing at TNRCC-approved beta test sites prior to release of the software. The software modifications shall be reviewed by a third party prior to release for beta-site testing.

2.4 Exhaust Gas Analysis Equipment for the ASM-2 EIS

This section defines the requirements for the equipment needed to determine the concentrations of the exhaust gases of interest during the loaded-mode and two-speed idle tests. It covers the

analyzers/sensors and sampling systems, including sampling probes, hoses and filters.

2.4.1 General

The analyzer shall be compatible with all types of automotive service operating environments. The analyzer shall operate under the conditions and performance requirements listed below.

2.4.2 Measured Gases

Gases to be measured are hydrocarbon (HC), parts per million as hexane (ppmh); carbon monoxide (CO), percent; carbon dioxide (CO_2), percent; oxygen (O_2), percent; oxide of nitrogen (NO), ppm. The analyzer shall have a digital display for exhaust concentrations of HC, CO, NO, and CO_2 and for vehicle engine speed. The analyzer shall have the capability to measure opacity of diesel exhaust at a future date.

2.4.3 Emission Accuracy

The system shall ensure that the analytical system provides an accurate accounting of the actual exhaust emissions produced during the test, taking into consideration the individual channel accuracies, repeat abilities, interference effects, sample transport times, and analyzer response times.

2.4.4 Sample Rate

The analyzer shall be capable of measuring exhaust concentrations of HC, CO, CO_2, NO, and O_2 at a minimum rate of twice per second.

2.4.5 Types of Analyzers

HC, CO, and CO_2 shall be measured by means of nondispersive infrared (NDIR) analysis. Methods for the measurement of NO and O_2 shall be approved by the TNRCC.

2.4.6 Analyzer Requirements

2.4.6.1 Gas Calibration

a) General: The analyzer shall automatically require and successfully pass a leak check and a gas calibration for HC, CO, CO_2, O_2 and NO by a method that is approved by TNRCC at least every 72 hours, as activated by the internal clock, or the analyzer shall lock itself out from further I/M tests. The gas calibration shall ensure that accuracy specifications are satisfied. The analyzer shall not allow an error of more than 1% of reading using the high-range span gas described in Table 1, 2.4.6.1 or the analyzer shall be automatically prohibited from performing any portion of the I/M test. The gas calibration procedure shall correct the readings to the center of the allowable tolerance range. When a gas calibration is initiated, the analyzer channels shall actually be adjusted.

b) Gas Calibration Procedure: The analyzer shall, to the extent possible, maintain accuracy between gas calibrations taking into account all errors, including noise, repeatability, drift, linearity, temperature, and barometric pressure.

1) Two-Point Gas Calibration and Low-Range Audit

i. Analyzers shall automatically require a zero gas calibration and a high-range gas calibration for HC, CO, NO, and CO_2. The system shall also use a low-range gas to check the calibration in the range of vehicle emission standards. Analyzers shall be calibrated at least every 72 hours. If the system does not calibrate or is not calibrated, the analyzer shall lock out from testing until corrective action is taken.

ii. Gas Calibration and Check Procedure. Gas calibration shall be accomplished per manufacturers recommendation, or, by the following method: introducing calibration gases that meet the requirements of Table 1 into the calibration port. The pressure in the sample cell shall be the same with the calibration gas flowing as with the sample flowing during testing. The analyzer channels shall be adjusted to the center of the allowable tolerance range as a result of the calibration. The system shall record the gas reading data prior to the adjustment and other data pertinent to control charting analyzer performance.

ii Zero the analyzer and perform a leak check.

b) Calibrate the analyzer using the high-range calibration gas specified in Table 1.

ii Introduce the low-range check gas specified in Table 1. If the low-range check gas readings differ from the label value by more than +/- 2%, the analyzer shall be locked out from testing.

Table 1. The following gases shall be used for the 2-point calibration and low-range audit.

(A) Zero Gas

O_2	=	20.7%
HC	<	1 ppm THC
CO	<	1 ppm
CO_2	<	400 ppm
NO	<	1 ppm
N2	=	Balance 99.99% pure

(B) Low-Range Audit Gas

HC	=	200 ppm propane
CO	=	0.5%
CO_2	=	6.0%
NO	=	300 ppm
N2	=	Balance 99.99% pure

(C) High-Range Calibration Gas

HC	=	3200 ppm propane
CO	=	8.0%
CO_2	=	12.0%
NO	=	3000 ppm

N2	=	Balance 99.99% pure

iii. Traceability. The audit and span gases used for the gas calibration shall be traceable to National Institute of Standards and Technology (NIST) standards +/- 1%. Gases shall have a 5% blend tolerance.

2) Five-Point Calibration Audit

i. Gas Audit Procedure. Calibration auditing shall be accomplished by introducing audit gas through the probe. The pressure in the sample cell shall be the same with the audit gas flowing as with the sample flowing during testing. The gas audit shall be accomplished per manufacturers recommendation, or, by the following method.

(A) Zero the analyzer and perform a leak check.

(B) Flow the low range audit gas specified in Table 2, through the sample probe, ensuring that the tip is equal to ambient barometric pressure +/- 0.1 inches Hg (a balloon teed into the gas flow line is an acceptable pressure indicator; the balloon should stand slightly erect).

(C) When the HC, CO, NO, and CO_2 gases have been flowing for 60 seconds record the readings as well as the Propane equivalency factor value for HC at each audit blend.

(D) Repeat steps B and C for each audit gas specified in Table 2..

(E) Compare the readings with the audit gas values. Divide the HC reading by its PEF using the following relationship:

$$\text{Tolerance \%} = 100 * \frac{\text{(Reading - Cylinder Value)}}{\text{Cylinder Value}}$$

(F) If the analyzer response when reading any of the Audit Gases exceeds +/- 6.0% for CO, CO_2, and HC/PEF, or +/- 6.0% for NO, then the analyzer shall fail the gas audit and shall be locked out from testing until it passes.

Table 2. The following gases shall be used for the five-point calibration audit.

(A) Zero Audit Gas

O_2	=	20.7%
HC	<	0.1 ppm THC
CO	<	0.5 ppm
CO_2	<	1 ppm
NO	<	0.1 ppm
NO2	=	Balance 99.99% pure

(B) Low Range Audit Gas

HC	=	200 ppm propane
CO	=	0.5%
CO_2	=	6.0%
NO	=	300 ppm
N2	=	Balance 99.99% pure

(C) Low-Middle Range Audit Gas

HC	=	960 ppm propane
CO	=	2.4%
CO_2	=	3.6%
NO	=	900 ppm
N2	=	Balance 99.99% pure

(D) High-Middle Range Audit Gas

HC	=	1920 ppm propane
CO	=	4.8%
CO_2	=	7.2%
NO	=	1800 ppm
N2	=	Balance 99.99% pure

(E) High Range Audit Gas

HC	=	3200 ppm propane
CO	=	8.0%
CO_2	=	12.0%
NO	=	3000 ppm
N2	=	Balance 99.99% pure

ii. Traceability. The gases used for the audit shall be traceable to NIST standards +/- 1%. Gases shall have a 5% blend tolerance.

2.4.6.2 Dilution

The flow rate on the analyzer shall not cause more than 10% dilution during sampling of exhaust of a 1.6 liter engine at normal idle. Ten percent dilution is defined as a sample of 90% exhaust and 10% ambient air.

2.4.6.3 Other Requirements

The analyzer shall provide adequate prompts on the display to guide the inspector through the calibration procedure in a manner that minimizes the amount of gas used. The analyzer shall be designed to keep the loss of calibration gas to an absolute minimum (less than 0.5 liter in 24 hours) should the operator forget to shut off the valve.

2.4.6.4 Propane Equivalency Factor

The nominal PEF range shall be between 0.490 and 0.540. For each audit/calibration point, the nominal

PEF shall be conveniently displayed for the quality assurance inspectors and other authorized personnel, in a manner acceptable to the TNRCC. If an optical bench must be replaced in the field, the manufacturer's Field Service Representative (FSR) shall change any external labels to correspond to the nominal PEF of the new bench. The analyzer shall incorporate an algorithm relating PEF to HC concentration. Corrections shall be made automatically. The corrected PEF value may cover the range of 0.470 to 0.560.

2.4.6.5 System Response Time requirements

The response time from the probe to the display for HC, CO, and CO_2 analyzers shall not exceed 8 seconds for 90% of a step change in input, nor shall it exceed 12 seconds to 95% of a step change in input. The response time for a step change in O_2 from 20.9% O_2 to 0.1% O_2 shall be no longer than 40 seconds. For NO analyzers, the response time shall not exceed 12 seconds for 90% of a step change in input. The response time for a step change in NO from a stabilized reading to 10% of that reading shall be no longer than 12 seconds.

2.4.6.6 NDIR Beam Strength

The beam strength from the source to the detector for all channels shall be monitored such that when the beam degrades beyond the adjustment range of the analyzer, the analyzer shall be locked out from operation. The manufacturer shall specify at what point degradation occurs whereby the signal cannot be corrected. A software prompt shall appear on the analyzer screen indicating that degradation has occurred and, thus, the lockout.

2.4.6.7 Date of Last Gas Calibration

The date of the last gas calibration shall be kept in non-volatile memory (or on the hard disk). When the system check is adjusted, if the date/time change, positive or negative, is greater than 48 hours, three-day gas calibration/leak check shall be required.

2.4.6.8 Detection Methods, Instrument Ranges, Accuracy, and Repeatability

a) Hydrocarbon Analysis. Hydrocarbon analysis shall be determined by non-dispersive infrared (NDIR) analyzer. The analyzer shall cover at least the range of 0 ppm to 9999 ppm HC, where ppm HC is parts per million of hydrocarbon volume as hexane. The accuracy of the instrument from 0-2000 ppm HC shall be +/- 3% of point or 4 ppm C6, whichever is greater. The accuracy of the instrument between 2001 ppm HC and 5000 ppm HC shall be at least +/- 5% of point. The accuracy of the instrument between 5001 ppm HC and 9999 ppm HC shall be at least +/- 10% of point. The instrument shall comply with the quality control specifications within this document.

b) Carbon Monoxide Analysis. Carbon monoxide analysis shall be determined by NDIR analyzer. The analyzer shall cover at least the range of 0.00% CO to 14.00% CO, where % CO is % volume CO_2 The accuracy of the instrument between 0.01% and 10.00% CO shall be +/- 3% of point or 0.02% CO, whichever is greater. The accuracy of the instrument between 10.01% and 14.00% shall be at least +/-5% of point. The instrument shall comply

with the quality control specifications within this document.

c) Carbon Dioxide Analysis. Carbon dioxide analysis shall be determined by NDIR analyzer. The analyzer shall cover at least the range of 0.0% CO_2 to 18.0% CO_2. The accuracy of the instrument between 0.01% and 16.00% CO_2 shall be +/- 3% of point or 0.3% CO_2, whichever is greater. The accuracy of the instrument between 16.01% and 18.00% CO_2 shall be at least +/- 5% of point. The instrument shall comply with the quality control specifications within this document.

d) Nitric Oxide Analysis. The analyzer shall cover at least the range of 0 ppm NO to 5000 ppm NO, where ppm NO is parts per million nitric oxide. The accuracy of the instrument between 0 and 4000 ppm shall be at least +/- 4% of point or 25 ppm NO, whichever is greater. The accuracy of the instrument between 4001 and 5000 ppm shall be at least +/- 8% of point. The instrument shall comply with the quality control specifications within this document.

e) Oxygen Analysis. If an oxygen analyzer is included, the analyzer shall cover at least the range of 0.0% O_2 to 25.0% O_2. The accuracy of the instrument over this range shall be at least 5% of point or +/- 0.1% O_2, whichever is greater. The instrument shall comply with the quality control specifications within this document.

1. Repeatability. The repeatability for the HC analyzer in the range of 0-1400 ppm HC shall be 2% of point or 3 ppm HC absolute, whichever is greater. In the range of 1400-2000 ppm HC, the repeatability shall be 3% of point. The repeatability for the CO analyzer in the range of 0-7.00% CO shall be 2% of point or 0.02% CO absolute, whichever is greater. In the range of 7.00% to 10.00% CO, the repeatability shall be 3% of point. The repeatability for the CO_2 analyzer in the range of 0-10.00% CO_2 shall be 2% of point or 0.1% CO_2 absolute, whichever is greater. In the range of 10.00% to 16.00% CO_2, the repeatability shall be 3% of point. The repeatability of the NO analyzer shall be 3% of point or 20 ppm NO, whichever is greater. The repeatability of the O_2 analyzer shall be 3% of point or 0.1% O_2, whichever is greater.

g) Rounding Rule. Rounding beyond the decimal places shown in 2.4.6.7 shall follow the standard mathematical practice of going to the next higher number for any numerical value of five or more. This shall also hold true for pass/fail decisions. For example, if 2.00% CO passes and 2.01% CO fails, and the reading is 2.0049%, the value shall be rounded down and decision shall be a pass. If the reading is 2.0050, the value shall be rounded up and the decision shall be a fail. The value displayed and printed on the test report shall be consistent with the value used for the pass/fail decision.

2.4.6.9 Minimum Analyzer Display Resolution

The analyzer electronics shall have sufficient resolution to achieve the following:

HC	1	ppm HC as hexane
NO	1	ppm NO
CO	0.01	% CO

CO_2	0.1	% CO_2		
O_2	0.1	% O_2 (optional)		
RPM	10	RPM		
Speed	0.1	mph		
Load	0.1	hp		
Relative Humidity			1	%RH
Dry Bulb Temperature		1	°F	
Barometric Pressure			1	mm Hg

2.4.6.10 Interference Effects

The interference effects from non-interest gases shall not exceed +/- 4 ppm for HC, +/- 0.02% for CO, +/- 0.20% for CO_2, and +/- 20 ppm for NO. Corrections for collision-broadening effects of combined high CO and CO_2 concentrations shall be taken into account in developing the factory calibration curves, and are included in the accuracy specifications.

2.4.6.11 Warm-up Time

The analyzer shall reach stability within 30 minutes at 35°F from startup. If an analyzer does not achieve stability within the allotted time frame, it shall be locked out from I/M testing and a message shall be displayed instructing the operator to call for service.

2.4.6.12 System Lockout During Warm-up

Functional operation of the gas sampling unit shall remain disabled through a system lockout until the instrument meets stability and warm-up requirements. The instrument shall be considered "warmed-up" when internal analyzer verifications are complete and the zero and span readings for HC, CO, CO_2, and NO have stabilized, within the allowable accuracy values, for five minutes without adjustment.

2.4.6.13 Electromagnetic Isolation and Interference

Electromagnetic signals found in an automotive service environment shall not cause malfunctions or changes in the accuracy in the electronics of the analyzer system. The instrument design shall ensure that readings do not vary as a result of electromagnetic radiation and induction devices normally found in the automotive service environment, including high energy vehicle ignition systems, radio frequency transmission radiation sources, and building electrical systems. In addition, the manufacturer shall ensure that the analyzer processor and memory components are sufficiently protected to prevent the loss of programs and test records.

2.4.6.14 Vibration and Shock Protection

System operation shall be unaffected by the vibration and shock encountered under the normal operating conditions encountered in an automotive service environment.

2.4.6.15 Engine Speed Detection

The analyzer shall utilize a tachometer capable of detecting engine speed in revolutions per minute (rpm) with a 0.5 second response time and an accuracy of +/- 3% of the true rpm. On vehicles equipped with onboard diagnostic (OBD II) systems, the engine speed may be taken by connecting to the SAE standardized OBD II link on 1996 and newer vehicles. RPM readings shall be recorded on a second-by-second basis for the 10 second period upon which the pass/fail basis is based.

2.4.6.16 OBD II Fault Code Retrieval

The system shall include the hardware and software necessary to access the onboard computer systems on 1996 and newer vehicles, determine OBD II readiness, and recover stored fault codes using the SAE standardized link.

2.4.6.17 Automated Test Process Software and Displays

a) Software. The testing process, data collection, and quality control features of the analyzer system shall be automated to the greatest degree possible. The software shall automatically select the emission standards and set the vehicle load based on an EPA-provided or approved VLT. Vehicle identification information shall be derived from a database accessed over a real-time data system to a host computer system. Entry of license plate and all or part of the VIN shall be sufficient to access the vehicle record. Provision shall be made for manual entry of data for vehicles not in the host computer system.
b) Test and mode timers. The analyzer shall be capable of simultaneously determining the amount of time elapsed in a test (overall test time), and in a mode within that test (mode time).
c) Clocks and timers. The clock used to check the coast-down time shall be accurate to within 0.1% of reading between 0.5 and 100 seconds, with a resolution of 0.001 seconds. The test mode timers used shall be accurate to within 0.1% of reading between 10 and 1000 seconds with a resolution of 0.1 seconds.

2.4.7 Sampling System Components

a) General. Sampling systems shall extract exhaust gas from the vehicle under test, shall remove particulate matter and aerosols from the sampled gas, shall drain the condensed water from the sample if necessary, and shall deliver the resultant gas sample to the analyzers/sensors for analysis. The sampling system shall, at a minimum, consist of a tailpipe probe, flexible sample line, a continuously-draining water removal system, particulate trap, sample pump and flow control components. The sample system and its components shall be designed to conduct loaded mode testing. Provisions shall be made for the introduction of zero air and calibration gases, as discussed below. The sampling system shall be designed to insure durable, leak free operation and be easily maintained. Materials that are in contact with the gases sampled shall not contaminate or change the character of the gases to be analyzed, including gases from vehicles not fueled by gasoline (except diesels). The system shall be designed to be corrosion-resistant and be able to withstand typical vehicle exhaust . The sampling system shall be designed to be corrosion-resistant for at least five years. The useful life of the analyzer shall be a minimum of five years, however this does not imply that the Program will be in effect for five years or that the analyzer

specifications will not change within five years.

b) Sample Hose. The sample hose shall be 25 ft +/- 0. 5 ft in length, when measured from the front of the EIS cabinet. The hose shall be of such design and weight that it can easily be handled by the inspector. The hose shall be of non-kinking construction and fabricated of materials that will not be affected by or react with the exhaust gases. Molecular HC hang-up shall be minimized. The hose connection to the analyzer shall be reinforced at the point of maximum bending.

c) Sample Hose and Probe. The sample hose and probe shall withstand exhaust gas temperatures at the probe tip of up to 1,100°F for ten (10) minutes.

Sample Probe. The analyzer manufacturer shall equip the analyzer with a sampling probe which meets the following criteria:

1. Retention.
The probe shall incorporate a positive means of retention to prevent it from slipping out of the tailpipe when in use.

2) Hand Grip.
A thermally-insulated, securely-attached hand grip shall be provided on the probe in such a manner that easy probe insertion using one hand is insured.

3) Flexibility.
Manufacturers shall supply a probe with each analyzer sold. The probe shall meet the following criteria:

i. the probe shall be designed so that the tip extends 16 inches into the tailpipe and at least 10 inches into the vehicle's exhaust;

ii. the-probe should be designed so the average garage operator can easily remove and reinstall them without special tools;

iii. a handle, made of thermally insulating materials, shall be attached to a rigid, reasonably non-crushable portion of tubing made of stainless steel or something equivalent, which can be easily removed from the sample line and reinstalled by the operator; and

iv. the probe tip shall be shielded so that debris is not scooped up by the probe when it is inserted into the tailpipe. Use of a tailpipe extension is permitted as long as the extension does not change the exhaust back pressure by more than +/- 1.0 inch of water pressure.

v. In addition, the probe tip supplied with the analyzer shall be of the traditional style meeting and the flexible portion shall be constructed so that it is sealed to prevent any sample dilution.

vi. Manufacturers shall also supply the analyzer with an essentially straight probe tip (no more than a 15 degree bend) meeting the following specifications:

(a) made of either stainless steel, 3/16 inch outside diameter (O.D.) solid-wall tubing, which is readily available; and

(b) designed so that the connector between the removable probe tip and the rigid portion of tubing is up inside the tailpipe at least three inches to reduce the effects of any leak that might occur.

4) Serviceability. For the purposes of economical replacement, the flexible portion of the probe assembly shall be designed so it can be replaced. The probes supplied shall be readily available.

5) Materials. The probe shall be made of materials that will withstand exhaust temperatures up to 1100°F for 10 minutes. Use of dissimilar metals with thermal expansion factors of more than five percent shall not be used in either the construction of probes or connectors. All materials in contact with exhaust prior to and throughout the measurement portion of the system shall be unaffected by and shall not affect the sample (i.e., the materials shall not react with the sample, and they shall not taint the sample).

6) Probe Cap. A probe tip cap suitable for performing a system leak check shall be provided if the vacuum decay method of leak check is utilized. Otherwise, whatever hoses and connectors are necessary shall be provided to allow the operator to perform the leak check.

d) Dual Exhaust

The sample system shall provide for the testing of dual exhaust equipped vehicles. When testing a vehicle with functional dual exhaust pipes, a dual sample probe of a design certified by the analyzer manufacturer to provide equal flow in each leg shall be used. The equal flow requirement is considered to be met if the flow rate in each leg of the probe has been measured under two sample pump flow rates (the normal rate and a rate equal to the onset of low flow), and if the flow rates in each of the legs are found to be equal to each other (within 15% of the flow rate in the leg having lower flow).

e) Particulate Filter and Water Trap

1) The particulate filter shall be capable of trapping 97% of all particulates and aerosols 5 microns or larger.

2) The filter element shall not absorb or adsorb hydrocarbons.

3) The filter housing shall be transparent or translucent to allow the operator to observe the filter element's condition without removing the housing. The filter element shall be

easily replaceable and shall provide for reliable sealing after filter element changes.

4) The water trap shall be sized to remove exhaust sample water from vehicles fueled with or a combination of gasoline, gasohol, propane, compressed natural gas (CNG), reformulated gasoline, as well as with alternative and oxygenated fuels, such as methanol (M85), ethanol (E85), and reformulated gasolines with MTBE as the oxygenate. The filter element, bowl, and housing shall be inert to these fuels as well as to the exhaust gases from vehicles burning these fuels. The condensed water shall be continuously drained from the water trap's bowl. Sufficient water shall be trapped, regardless of fuel, to prevent condensation in the sample system or in the optical bench's sample cell.

f) Low Flow Indication

The analyzer shall lock out official testing when the sample flow is below the acceptable level. The sampling system shall be equipped with a flow meter (or equivalent) that shall indicate sample flow degradation when measurement error exceeds 3% of the gas value used for checking, or causes the system response time to exceed 13 seconds to 90 percent of a step change in input (excluding NO), whichever is less. Alternatively, the sample vacuum may be continuously monitored to detect a low flow condition.

2.4.8 Temperature Operating Range

The analyzer, including all of the software/hardware enclosed in the cabinet, shall operate within the performance specifications described herein in ambient air temperatures ranging from 35 to 110°F. Analyzers shall be designed so that adequate air flow is provided around critical components to prevent overheating (and automatic shutdown) and to prevent the condensation of water vapor which could reduce the reliability and durability of the analyzer. The analyzer system shall otherwise include necessary features to keep the sampling system within the specified range.

2.4.9 Humidity Operating Range

The analyzer, including all of the software/hardware enclosed in the cabinet, shall operate within the performance specifications, described herein at a minimum of 95% relative humidity throughout the required temperature range.

2.4.10 Humidity

Relative humidity shall be measured prior to the start of every inspection in order to calculate Kh, the nitric oxide humidity correction factor. Wet bulb thermometers shall not be used. The humidity measuring device shall have the following minimum characteristics:

Range: 5% - 95% Relative Humidity
Accuracy: +/- 3% of full scale or better
Operating Temperature Range: 35°F - 110°F

The relative humidity reading shall be recorded in Field Relative_Humidity of the test record.

2.4.11 Ambient Temperature Measurement

Ambient (dry-bulb) temperature shall be measured prior to the start of every inspection, and shall be recorded in Field AMB_BULB_TEMP (Ambient Temperature) of the test record. The temperature measuring device shall have the following minimum characteristics:

Range: 0 - 140°F
Accuracy: +/- 3°F

2.4.12 Barometric Pressure Compensation

Barometric pressure shall be measured prior to the start of every inspection, and shall be recorded in Field BARO_PRESSURE (Barometric Pressure) of the test record. The barometric measuring device shall have the following minimum characteristics:

Range: 24 - 32 in. Hg absolute (610 - 810 mm Hg absolute)
Accuracy: +/- 3% of point or better
Operating Temperature Range: 35°F - 110°F

2.4.13 Acceptance Testing

a) Analyzer accuracy. This test confirms the ability of the candidate instruments to read various concentrations of gases within the tolerances required by this specification. The test compares the response of the candidate instrument with that of standard instruments, and also estimates the uncertainty of the readings.

   The analyzer shall be zeroed and gas calibrated using the high-range calibration gas. The instrument shall be tested using propane, carbon monoxide, carbon dioxide, and nitric oxide in nitrogen, with a certified accuracy of +/- 1%, in the following concentrations: 0%, 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90% of full scale for the analyzers. Full scale is defined as at least 9999 ppm HC as hexane, 14.00% CO, 18.0% CO_2, 5000 ppm NO, and 25.0% O_2.

   1) Introduce the gases in ascending order of concentrations beginning with the zero gas. Record the readings of the standard and candidate instruments to each concentration value.

   2) After the highest concentration has been introduced and recorded, introduce the same gases to the standard and candidate analyzers in descending order, including the zero gas. Record the reading of analyzers to each gas, including negatives (if any.)

   3) Repeat steps 1 and 2 for the candidate only, four more times (total of five times).

   4) Calculations:

      i. Calculate the average value of each concentration for the readings of the standard instruments.

ii. Calculate the mean and standard deviation of each candidate's readings for each concentration. Include both upscale and downscale readings for the same gas concentration. (All calculations may not be possible for zero concentrations.)

iii. For each concentration, calculate the difference between the candidate mean and the standard average.

iv. For each concentration, compute the following:

1. $Y_1 = x + K_{sd}$
2. $Y_2 = x - K_{sd}$

Where:

K_{sd} = standard deviation * 3.5 for zero and the highest concentration value
K_{sd} = standard deviation * 2.5 for all other concentration values
x = mean (arithmetic average) of the set of candidate readings

v. Compute the uncertainty (U) of the calibration curve for each concentration as follows:

(a) U_1 = concentration value - Y_1
(b) U_2 = concentration value - Y_2

vi. Acceptance Criteria

(a) For each concentration, the differences calculated in Step iii shall be no greater than the accuracy tolerances specified in 2.4.6.7 for each instrument.
(b) For each concentration, the uncertainties, (U1 and U2) shall be no greater than the accuracy tolerances required in 2.4.6.7.

b) Analyzer System Repeatability. This test characterizes the ability of the instrument to give consistent readings when repeatedly sampling the same gas concentration.

1) Using high range span gas, introduce the gas through the calibration port. Record the readings.

2) Purge with ambient air for at least 30 seconds but no more than 60 seconds.

3) Repeat steps a and b above four more times.

4) Repeat steps a, b, and c, introducing the gas through the sample probe.

5) Acceptance Criteria: The differences between the highest and lowest readings from both ports shall not exceed the values specified in 2.4.6.7(f).

c) Analyzer System Response Time. This test determines the speed of response of the candidate instrument when a sample is introduced at the sample probe.

1) Gas calibrate the instrument per the manufacturer's instructions.

2) Using a solenoid valve or equivalent selector system, remotely introduce a high range span gas to the sample cell inlet or inlet port. The gas pressure at the entrance to the port shall be equal to room ambient.

3) Measure the elapsed time required for the instrument display to read 90% and 95% of the final stabilized reading for HC, CO, CO_2, and NO. Alternatively the bench outputs may be recorded against a time base to determine response time. Record all times in seconds.

4) Switch the solenoid valve to purge with zero air for at least 40 seconds but no more than 60 seconds.

5) measure the elapsed time required for the NO instrument display to read 10% of the stabilized reading in step 3.

6) Repeat steps 1, 2, and 3 two more times for a total of three times.

7) The response times (drop time for O_2 and NO; rise time for HC, CO, CO_2, and NO) from the port to the display for HC, CO, and CO_2 analyzers shall not exceed 8 seconds for 90% of a step change in input, nor shall it exceed 12 seconds to 95% of a step change in input. The response time for a step change in O_2 from 20.9% to 0.1% $_{O2}$ shall be no longer than 40 seconds. For NO analyzers, the response time shall not exceed 12 seconds for 90% of a step change in input. The response time for a step change in NO from a stabilized reading to 10% of that reading shall be no longer than 12 seconds.

d) Analyzer Interference Effects. The following acceptance test procedure shall be performed at 45°F, 75°F, and 105°F.

1) Zero and span the instrument.

2) Sample the following gases for at least one minute. Record the response of each channel to the presence of these gases.

i. 16% Carbon Dioxide in Nitrogen

ii.1600 ppm Hexane in Nitrogen

iii. 10% Carbon Monoxide in Nitrogen

iv. 3000 ppm Nitric Oxide in Nitrogen

v.75 ppm Sulfur Dioxide (SO_2) in Nitrogen

vi. 75 ppm Hydrogen Sulfide (H_2S) in Nitrogen

3) Acceptance Criteria. The interference effects shall not exceed the limits specified in 2.4.6.7.

e) Water-Saturated Hot Air. Water-saturated hot air shall be drawn through the probe from the top of a sealed vessel partially filled with water through which ambient air will be bubbled. The water shall be maintained at a temperature of 122°F +/- 9°F. This test shall be performed at only the 75°F and 105°F conditions.

Acceptance Criteria. The interference effects shall not exceed the limits specified in 2.4.6.7.

f) Electromagnetic Isolation and Interference. This test shall measure the ability of the candidate instrument to withstand electromagnetic fields which could exist in vehicle testing and repair facilities. For all tests described below, sample "Low-Middle Range Audit Gas" specified in Table 2, 2.4.6.1, at atmospheric pressure, through the sample probe. Record analyzer reading during test periods.

1) Radio Frequency Interference Test.

i. Use a test vehicle with an engine having a high energy ignition system (or equivalent), a solid core coil wire and a 3/8" air gap. Leave engine off.

ii. Locate the candidate instrument within 5 feet of the ignition coil. Gas calibrate the candidate instrument.

iii. Sample gas specified above. Wait 20 seconds, and record analyzer readings.

iv. Start engine. With the hood open and gas flowing to the analyzer, cycle the engine from idle through 25 mph on the dynamometer at ASM-2 loads and record the analyzer readings.

v. Relocate the instrument to within 6 inches of one side of the vehicle near the engine compartment. Follow procedure described in step (iv) and record analyzer readings.

vi. Relocate the instrument to within 6 inches of the other side of the vehicle near the engine compartment. Follow procedure described in step (iv) and record analyzer readings.

vii. Acceptance Criteria. The analyzer readings shall deviate no more than 0.5% full scale.

2) Induction Field Test. Use a variable speed (commutator type) hand drill having a plastic housing and rated at 3 amps or more. While the analyzer is sampling the gas, vary the drill speed from zero to maximum while moving from the front to the sides of the instrument at various heights.

Acceptance Criteria. The analyzer readings shall deviate no more than 0.5% full scale.

3) Line Interference Test. Plug the drill used in part 2 above into one outlet of a #16-3 wire extension cord approximately 20 feet long. Connect the instrument into the other outlet of the extension cord. Repeat part 2 above.

Acceptance Criteria. The analyzer readings shall deviate no more than 0.5% full scale.

4) VHF Band Frequency Interference Test. Locate both a citizens ban radio (CB), with output equivalent to FCC legal maximum, and a highway patrol transmitter (or equivalent) within 50 feet of the instrument. While the analyzer is sampling the gas, press and release transmit button of both radios several times.

   Acceptance Criteria. The analyzer readings shall deviate no more than 0.5% full scale.

5) Ambient Conditions Instruments. Upon installation and every six months thereafter, the performance of the ambient conditions instruments shall be cross checked against a master weather station.

   Acceptance Criteria. The individual instruments shall be within the tolerance specified in 2.4.10, 2.4.11, and 2.4.12.

g) Dilution.

1) Set vehicle with 1.6L maximum engine displacement at factory - recommended idle speed, OEM configuration exhaust system, transmission in neutral, hood up (a fan to cool the engine may be used if needed). Set idle speed not to exceed 920 RPM. (Set for 900 RPM with a tolerance of +/- 20 RPM.)

2) With a laboratory grade analyzer system, sample the exhaust at 40 centimeters depth with a flow sample rate below 320 liters per hour. Allow sufficient time for this test. Record all HC, CO, NO, CO_2, and O_2 readings. A chart recorder or electronically stored data may be used to detect the point of stable readings.

3) While operating the candidate analyzer system in a mode which has the same flow rate as the official test mode, record the levels of HC, CO, NO, CO_2, and O_2. Ensure that the probe is installed correctly.

4) Repeat step 2.

5) If the difference of the readings between 2 and 4 exceed 5% of the average of 2 and 4, repeat 2, 3, and 4; otherwise average 2 and 4 and compare with 3. If 3 is within 10% of the average of 2 and 4, then the equipment meets the dilution specification.

2.4.14 Service, Repair, and Modification

a) Each time an analyzer's emissions measurement system (i.e., analyzer bench) are repaired or replaced, a 5-point calibration audit (as described in this specification) shall be performed, at a minimum, prior to returning the unit to service.

b) Each time the sample line integrity is broken, a leak check shall be performed prior to testing.

2.5 ASM-2 EIS Dynamometer (Dyno) & Auxiliary Equipment Specifications

All dynamometers manufactured for use in form of vehicle emissions testing in the State of Texas shall be fully capable of performing a loaded transient test (i.e. BAR-31, IM240 trace) as delivered. The only modifications to the dynamometer, if required to perform a loaded transient vehicle emissions test shall be:

a) Proper dynamometer calibration,

b) Software modification, and

c) Minor hardware modification.

Any ASM-2 EIS dynamometer shall be unacceptable if unable to comply with the loaded transient test requirements listed above.

2.5.1 Dynamometer Identification

All dynamometers shall have an identification plate permanently affixed showing as a minimum Dynamometer Manufacturer's Name, the System Provider's Name (i.e., the provider who obtained the TNRCC certification and who markets the system using the dyno), Production Date, Model Number, Serial-Number, Dynamometer Type, Maximum Axle Weight, Maximum HP Absorbed, Roll Diameter, Roll Width, Base Inertia Weight, Electrical Requirements.

2.5.2 Two-Wheel Drive Vehicle Dynamometer

The dynamometer structure (e.g., bearings, rollers, pit plates, etc.) shall accommodate all light-duty vehicles and light-duty trucks up to 8500 pounds GVWR (unloaded), (except for those vehicles equipped with antilock braking systems (ABS) or traction control (TC) which require a 2-speed idle test.

2.5.3 ASM-2 Load Horsepower

Dynamometer ASM-2 load horsepower (HP5015 or HP2525) shall be automatically selected based on the vehicle parameters in the test record or EPA supplied lookup table.

2.5.4 Power Absorption

2.5.4.1 Acceptable Configurations

Power absorption methods shall be described in the manufacturer's certification Submital package. All configurations are subject to TNRCC approval.

2.5.4.2 Power Absorber Range

The range of the power absorber shall be sufficient to simulate the load required to perform an ASM5015 test and an ASM2525 test on any vehicle in its weight range on all light-duty vehicles and light-duty

trucks up to 8500 pounds GVWR. For the ASM5015, the vehicle loading is 50% of the maximum loading required for that vehicle during the FTP test; for the ASM2525, the vehicle loading is 25% of the maximum loading required for that vehicle during the FTP test. All dynamometers shall be capable of performing these tests for any vehicle in its weight range. The power absorber shall be able to absorb, at 14 mph and above, a minimum of 25 horsepower continuously for a steady state test lasting at least five minutes, with three minutes between tests, for ten (10) consecutive tests.

2.5.4.3 Power Absorber Accuracy

The power absorber shall be adjustable in 0.1 hp increments at both 15 mph and 25 mph and the accuracy of the system (PAU + Parasitic Losses) shall be +/- 0.25 horsepower or +/- 2.0% of required power loading for dyno certification, whichever is greater, in either direction of rotation. For field auditing the accuracy shall be +/- 0.5 horsepower.

2.5.4.4 Vehicle Loading

The vehicle loading used during the ASM-2 driving cycles shall follow the equation below at 15 and 25 mph. Unless otherwise noted, any horsepower displayed during testing shall be expressed as HP.

$$IHP = TRLHP - PLHP - GTRL$$

Where:

IHP	=	The dynamometer indicated, or set, horsepower.
TRLHP	=	The track, or total, horsepower for a particular vehicle.
PLHP	=	The dynamometer parasitic loss horsepower.
GTRL	=	Generic Tire/Rollloss of a vehicle on the dynamometer.

TRLHP, PLHP, GTRL, and therefore IHP, are all expressed as three term polynomials of the type.

$$HP = A*Obmph + B*Obmph^2 + C*Obmph^3$$

Where:

HP	=	individual expressions relating IHP, TRLHP, PLHP, or GTRL as a function of velocity.
A, B or C	=	horsepower coefficients for the individual expressions relating IHP, TRLHP, or GTRL as a function of velocity.
Obmph	=	the velocity in miles per hour.

2.5.5 Inertia

2.5.5.1 Base Inertia

The dynamometer shall be equipped with a mechanical flywheel(s), or with full inertia simulation providing a total base inertia weight of 2000 lbs +/- 40 lbs. Any deviation from the 2000 pounds base inertia shall be quantified and the coast-down time shall be corrected accordingly. Any deviation from the stated inertia shall be quantified and the inertia simulation shall be corrected accordingly. The actual inertia weight shall be marked on the dynamometer ID plate or on the flywheel.

2.5.5.2 Inertia/Inertia Simulation

The dynamometer, as delivered, shall be capable of conducting, as a minimum, diagnostic level transient inertia simulations with an acceleration rate between 0 to 3.3 mph/sec with a minimum load (power) of 25 hp at 14 mph over the inertia weight range of 2,000 to 6,000 lbs. For the diagnostic level inertia simulation, the 25 hp criterion is a requirement on acceleration only, while for the full inertia simulation option, the requirement is for both acceleration and deceleration. Mechanical inertia simulation shall be provided in 500 lb. minimum increments; electric inertia simulation shall be provided in one (1) lb. increments. Any deviation from the stated inertia shall be quantified and the inertia simulation shall be corrected accordingly. Mechanical or electrical inertia simulation, or a combination of both, may be used, subject to review and approval by the TNRCC.

Diagnostic Level Simulation

a) System Response - The torque response to a step change shall be at least 90% of the command value within 300 milliseconds after a step change is commanded by the dynamometer control system, and shall be within 2% of the commanded torque by 300 milliseconds after the command is issued. Any overshoot to the commanded torque value shall not exceed 25% of the torque value.

b) Inertia Simulation Error - An inertia simulation error (ISE) shall be continuously calculated any time the actual dynamometer speed is between 10 and 60 mph. The ISE shall be calculated using the equation below and shall be within 3% of the inertia weight selected (IW_S) for the vehicle under diagnostics testing when driving a predetermined drive trace.

$$ISE = [(IW_s - I_t)/(IW_s)] * 100$$

$$I_t = I_m + (1/V)\int_0^t (F_m - F_{rl})dt$$

Where:

ISE	=	Inertia Simulation Error in percent
IW_S	=	Inertia Weight Selected
I_t	=	Total inertia being simulated by the dynamometer (kg)
I_t (lb force)	=	I_t (kg) * 2.2046
I_m	=	Base mechanical inertia of the dynamometer (kg)
V	=	Measured roll speed (m/s)
F_m	=	Force measured by the load cell (translated to the roll surface) (N)
F_{rl}	=	Road load force (N) required by IHP at the measured roll speed

t = Time

c) Maximum Vehicle-Speed - The dynamometer shall be designed to accommodate a vehicle speed of up to 60 mph.

2.5.6 Rolls

a) Main Rolls: The dynamometer shall be equipped with twin rolls. The rolls shall be electrically or mechanically coupled side-to-side and front-to-rear. The dynamometer roll diameter shall be between 8.5 and 21.0 inches. The spacing between roll centers shall be determined by the following equation. The actual spacing shall be within +0.5 and -0.25 inches of the calculated value.

   Roll Spacing = (24.375 + D) * Sin 31.5
   Where D = Dynamometer Roll Diameter
   Roll spacing and roll diameter are expressed in inches.

b) Roll Speed. Roll speed and roll counts shall be checked at least once per week by an independent means, such as a photo tachometer. Deviations greater than +/- 0.2 mph or a comparable tolerance in roll counts shall require corrective action. Alternatively, a redundant roll speed transducer independent of the primary transducer may be used in lieu of the weekly comparison. Accuracy of redundant systems shall be checked bimonthly.

c) Track Width: Fixed dynamometer rolls shall have an inside track width of no more than 30 inches and an outside track width of at least 100 inches. Other configurations may be offered but shall be subject to TNRCC verification and approval. Manufacturers shall ensure that inner track tire damage does not occur if narrower widths are used.

d) Roll Characteristics: The roll size, surface finish, and hardness shall be such that tire slippage is minimized under all weather conditions, that water removal is maximized, that the specified accuracy of distance and speed measurements are maintained, and that tire wear and noise are minimized.

2.5.7 Dynamometer Calibration

The dynamometer shall be automatically calibrated. The manufacturer's Calibration procedures shall be submitted to and approved by TNRCC.

2.5.7.1 Accuracy Over Operating Ambient Temperature Range

The dynamometer's accuracy, when warmed up, shall not deviate by more than +/- 0.5 horsepower over any temperature variation within the full ambient operating temperature range of 35° F to 110°F. This may be accomplished by intrinsic design or by software correction techniques. At any constant temperature, the dynamometer shall have an accuracy of +/- 0.5 horsepower within 15 seconds of the start of the test, and shall have an accuracy of +/- 0.25 hp within 30 seconds of the start of the test.

The dyno manufacturer shall demonstrate that its dyno horsepower deviation between cold and warmed-up operation is less than 0.25 hp within an ambient temperature range of 35°F - 110°F. For

temperatures outside the specified range, the dyno shall provide correction or proceed with a manufacturer recommended warm-up sequence until full warm-up condition has been reached. If the dynamometer is temperature compensating, the warm-up is not required. (No Cal in data Record).

2.5.7.2 Coast-Down Check

Each dynamometer's calibration shall be checked every 72 hours by means of an automated dynamometer coast-down check procedure approved by TNRCC. An integral motor, while recommended, is not required. The coast-down performance check shall be conducted between the speeds of 30-20 mph and 20-10 mph. All rotating dynamometer components shall be included in the coast-down check. The coast-down procedure shall use a vehicle off-dynamometer type method or equivalent. Using a vehicle to bring the dynamometer up to speed and removing the vehicle before the coast-down shall not be permitted. If either the measured 30-20 mph coast-down time or 20-10 mph coast-down time is outside the window bounded by Calculated Coast-Down Time (CCDT) (seconds) +/- 7%, then it shall be locked out for official inspection purposes until recalibration allows a passing value. The base dynamometer inertia (2000 pounds) shall be checked at two random horsepower settings for each speed range. The two random horsepower settings shall be between 8.0 and 18.0 horsepower. A shunt resistor for a load cell performance check shall not be used.

a) Randomly select an IHP2525 value between 8.0 hp and 18.0 hp and set dynamometer PAU to this value. Coast down the dynamometer from 30 to 20 mph.

$$CCDT_{@25mph} = \frac{[(0.5 * DIW)/32.2] * (V_{30}^2 - V_{20}^2)}{550 * (IHP_{2525} + PLHP_{25})}$$

Where:

DIW = Dynamometer Inertia Weight (total inertia weight of all rotating components in the dynamometer)

V_{30} = Velocity in feet/sec at 30 mph

V_{20} = Velocity in feet/sec at 20 mph

IHP_{2525} = ASM_{2525} indicated horsepower, randomly selected during each coast-down check

$PLHP_{25}$= Parasitic horsepower for specific dynamometer at 25 mph.

b) Randomly select an IHP5015 value between 8.0 hp and 18.0 hp and set dynamometer PAU to this value. Coast down the dynamometer from 20 - 10 mph.

$$CCDT_{@15\ mph} = \frac{[(0.5 * DIW)/32.2] * (V_{20}^2 - V_{10}^2)}{550 * (IHP_{5015} + PLHP_{15})}$$

Where:

DIW = Dynamometer inertia weight (total inertia weight of all rotating components in the dynamometer)

V_{20} = Velocity in feet/sec at 20 mph

V_{10} = Velocity in feet/sec at 10 mph

IHP_{5015} = Randomly selected ASM5015 indicated horsepower

$PLHP_{15}$ = Parasitic horsepower for specific dyno at 15 mph.

2.5.7.3 Parasitic Losses

Whenever a coast-down check is performed, the dynamometer's parasitic loss horsepower (PLHP) shall also be determined at 25 and 15 mph. Calculate the PLHP of the dynamometer at 25 and 15 mph by coasting the dynamometer down with IHP set to zero from 30 - 20 mph and 20 - 10 mph, using the equation below.

a) Parasitic losses at 25 mph for a dynamometer with specified diameter rollers.

$$PLHP_{25} = \frac{[(0.5 * DIW)/32.2] * (V_{30}^2 - V_{20}^2)}{550 * (ACDT)}$$

Where:

PLHP = Parasitic loss horsepower
DIW = Dynamometer Inertia Weight. Total inertia weight of all rotating components in dynamometer in pounds.
V_{30} = Velocity in feet per second at 30 mph.
V_{20} = Velocity in feet per second at 20 mph.
ACDT = Actual coast-down time required for dynamometer to coast from 30 - 20 mph.

b) Parasitic losses at 15 mph for a dynamometer with specified diameter rollers.

$$PLHP_{15} = \frac{[(0.5 * DIW)/32.2] * (V_{20}^2 - V_{10}^2)}{550 * (ACDT)}$$

Where:

PLHP = Parasitic loss horsepower
DIW = Dynamometer Inertia Weight. Total inertia weight of all rotating components in dynamometer in pounds.
V_{20} = Velocity in feet per second at 20 mph.
V_{10} = Velocity in feet per second at 10 mph.

ACDT = Actual coast-down time required for dynamometer to coast from 20 - 10 mph.

2.5.8 Other Requirements

2.5.8.1 Vehicle Restraint

The EIS shall be equipped with a means or device for restraining front-wheel-drive vehicles under test. Its primary function shall be to limit the vehicle's side-to-side movement on the dyno rolls. This means or device shall be engaged when the test is ready to be performed and shall be disengaged after the test has been completed. The restraint system shall be designed to minimize vertical and horizontal force on the drive wheels so that emission levels are not significantly affected. The restraint system shall allow unobstructed vehicle ingress and egress and shall be capable of safely restraining the vehicle under all reasonable operating conditions without damaging the suspension system. The EIS shall not allow a test to be initiated unless the restraint system is in place. Restraints may also be provided for rearwheel-drive vehicles, but if not, rear-wheel-drive vehicles shall have their front wheels securely chocked.

2.5.8.2 Installation

Vehicles shall be approximately level (not to exceed +/-5 degrees) while being tested on the dynamometer. Dynamometers may be installed in-floor or above-ground, as long as this requirement is met.

2.5.8.3 Load Measuring Device

If the dynamometer fails a coast-down check or requires a recalibration for any other reason, the system shall conduct the parasitic loss check, and conduct a second coast-down check. If the dynamometer fails the second coast-down, the analyzer shall prompt the inspector to call for service, and prevent all emissions related testing. The load measuring device shall have the ability to be checked using a dead-weight method, and shall cover at least three points over the range of loads used for vehicle testing. Dead weights shall be traceable to NIST, and shall be accurate to within +/- 0.1%. The dynamometer shall provide automatic load measuring device calibration/verification feature.

2.5.8.4 Automatic Lift

Dynamometers shall have an automatic lift between the rolls to allow smooth vehicle transition onto and off the rolls. Alternative methods of effecting this transition may be submitted to TNRCC for its approval.

2.5.8.5 Driver's Aid

The EIS shall be equipped with a driver's aid that shall be clearly visible to the driver during the loaded-mode test. The aid-shall continuously display the required speed, the number of seconds into the test mode, driver's actual speed/time performance (a display showing deviation between set-point and actual drive trace), engine rpm, the use of augmented braking, and necessary prompts and alerts. The driver's aid shall also be capable of displaying test and equipment status and other messages as required. Dynamic information being displayed shall be refreshed at a minimum rate of twice per second.

Emissions values shall not be displayed during official testing.

2.5.8.6 Driver's Remote Control Device

Each EIS shall be equipped with a means of allowing the driver to start the test, perform an emergency stop, and perform other necessary and convenient functions related to the test, while inside the vehicle.

2.5.8.7 Fan

A fan shall be provided for cooling the engine of the vehicle under test. It shall be mobile or positionable in front of the vehicle, and adjustable in such a manner that the catalyst is not cooled abnormally. The fan shall have a maximum outer diameter of 30 inches. The fan must provide at least 3000 cfm or at least 10 mph air velocity averaged over the cross section of the fan, whichever is greater. The fan shall have an on/off switch. The test shall be conducted with the hood open. The vehicle inspector shall receive a visual prompt indicating that the hood of the vehicle should be opened and that the fan should be turned on prior to the test. In addition, an optional remote control shall be offered which allows the technician to activate the fan from the driver's seat. The remote control may use software and/or hardware to activate the fan. The fan shall always be used when the ambient temperature is above 72F, and may be used below that temperature.

2.5.8.8 Augmented Braking

Dynamometers shall be capable of applying augmented braking on major decelerations over 2 mph per second as required by the chosen drive cycle. The dynamometer software shall provide a signal output to inform the operator when augmented braking is activated.

2.5.8.9 Safety Provisions

The dynamometer shall provide a means of facilitating the removal of the vehicle in case of system failure or power outage.

2.5.8.10 Dynamometer Interface and Controller

The dynamometer (or controller if applicable) shall use a connector. The connector (or a separate connector) shall reserve one wire at the dynamometer (or controller if applicable) that shall provide software switchable (on/off) +12V with 0.5 AMP circuit protection to each +12V line. The necessary hardware and software connectivity details shall be sufficient to allow a seamless interface to the system that meets all of the requirements of the specification. The dynamometer controller may be a separate unit or included in the analyzer cabinet. Regardless, the dynamometer controller and its inputs, outputs, and functionality shall not vary over the operating temperature range, and shall be unaffected by AC voltage variations of +10% or less, ENI/RFI, and shall be resistant to shock and vibration.

2.5.9 Certification Testing

a) Load Cell Verification (if equipped). This test confirms the proper operation of the dynamometer

load cell and associated systems. Weights in the proper range shall be supplied by the system supplier. Weights shall be NIST traceable to 0.1% of point.

1) Calibrate the load cell according to the manufacturer's direction.

2) Using a dead weight method, load the test cell to 20%, 40%, 60%, and 80% (in ascending order) of the range used for ASM-2 testing. Record the readings for each weight. Remove the weights in the same steps (descending order) and record the results.
3) Perform steps 1 through 2 two more times (total of three). Calculate the average value for each weight. Multiply each average weight by the length of the torque arm.

4) Acceptance Criteria. The difference for each reading from the weight shall not exceed 1% of full scale.

b) Speedometer Verification. This test confirms the accuracy of the dynamometer's speedometer.

1) Set dynamometer speed to 15 mph. Independently measure and record dynamometer speed. Repeat at 25 mph.

2) Acceptance Criteria. The difference for each reading from set dynamometer speed shall not exceed 0.2 mph.

c) Parasitics Verification. Parasitic losses shall be calculated using the following equations at 25 and 15 mph. The indicated horsepower (IHP) shall be set to zero for these tests. Using time versus speed data from the system, calculate PLHP for 25 mph and 15 mph.

1) Parasitic losses at 25 mph for a dynamometer with specified diameter rollers.

$$PLHP_{25} = \frac{[(0.5 * DIW)/32.2] * (V_{30}^2 - V_{20}^2)}{550 * CDT}$$

Where:

PLHP	=	Parasitic loss horsepower
DIW	=	Dynamometer Inertia Weight. Total "inertia" weight of all rotating components in dynamometer.
V_{30}	=	Velocity in feet/sec at 30 mph
V_{20}	=	Velocity in feet/sec at 20 mph
CDT	=	Coast-down time required for dynamometer to coast from 30 to 20 mph

2) Parasitic losses at 15 mph for a dynamometer with specified diameter rollers.

$$PLHP15 = \frac{[(0.5 * DIW)/32.2] * (V_{20}^2 - V_{10}^2)}{550 * CDT}$$

Where:

PLHP	=	Parasitic loss horsepower
DIW	=	Dynamometer Inertia Weight. Total "inertia" weight of all rotating components in dynamometer.
V_{20}	=	Velocity in feet/sec at 20 mph
V_{10}	=	Velocity in feet/sec at 10 mph
CDT	=	Coast-down time required for dynamometer to coast from 20 to 10 mph

d) Verify Coast-Down

1) Randomly select an IHP2525 value that is between 8.0 hp and 18.0 hp and set dynamometer PAU to this value.

Coast-down dynamometer from 30-20 mph.

$$CCDT_{@25\ mph} = \frac{[(0.5 * DIW)/32.2] * (V_{30}^2 - V_{20}^2)}{550 * (IHP_{2525yy} + PLHP_{25yy})}$$

Where:

CCDT	=	Calculated coast-down time
DIW	=	Dynamometer Inertia Weight. Total "inertia" weight of all rotating components in dynamometer.
V_{30}	=	Velocity in feet/sec at 30 mph
V_{20}	=	Velocity in feet/sec at 20 mph
IHP_{2525}	=	Randomly selected ASM2525 indicated horsepower
$PLHP_{25yy}$	=	Parasitic Horsepower for specific dynamometer at 25 mph Placeholder for dynamometer roll diameter

2) Randomly select an IHP5015 value that is between 8.0 hp and 18.0 hp and set dynamometer PAU to this value.
Coast-down dynamometer from 20-10 mph.

$$CCDT_{@15\ mph} = \frac{[(0.5 * DIW)/32.2] * (V_{20}^2 - V_{10}^2)}{550 * (IHP5015_{yy} + PLHP15_{yy})}$$

Where:

CCDT	Calculated coast-down time
DIW	Dynamometer Inertia Weight. Total "inertia" weight of all rotating components in dynamometer.
V_{20}	Velocity in feet/sec at 20 mph
V_{10}	Velocity in feet/sec at 10 mph
IHP_{5015}	Randomly selected ASM5015 indicated horsepower
$PLHP_{15yy}$	Parasitic Horsepower for specific dynamometer at 15 mph

3) Acceptance Criteria. The measured 30-20 mph coast-down time and the 20-10 mph coast-down

time must be inside the window bounded by CCDT (seconds) +/- 7%.

2.6 Cabinet & Peripheral Requirements

2.6.1 Power/Telephone Cord

The modem shall be designed to connect to the EIS by means of a modular telephone connector with a standard wiring configuration. The connector shall be located on the back of the analyzer cabinet. Alternatives to this requirement to improve the durability of the connection interface and the telephone line are encouraged and may be proposed by the manufacturer for evaluation by the TNRCC. The telephone cord shall not be attached to the power cord. The telephone line shall be enclosed in a protective cable meeting UL approval. Alternative methods to protect the telephone line may be submitted to the TNRCC for approval.

The manufacturer shall include provisions to ensure that the power necessary to activate the modem at the appropriate time is available. The analyzer shall be supplied with a 25-foot UL-approved power cord. The manufacturer shall design the cabinet so that convenient storage is provided for the excess cord not needed to reach the nearest power outlet.

2.6.2 Power Requirements

The EIS shall operate only on alternating current (AC). No direct current (DC) models will be acceptable. The EIS shall not be powered by a portable AC generating unit. Input power shall be 115 VAC, 60 hertz. All instruments shall meet the specified requirements over an input voltage variation of at least +/- 12 volts. Maximum allowable performance change due to line voltage variations shall not exceed one-third of the accuracy requirements.

2.6.3 Instrument Construction

The instrument shall be designed and constructed to provide reliable and accurate service in the automotive repair environment. The analyzer shall be supplied with a cabinet which is equipped with a storage area large enough to secure all accessories and operating manuals.

a) Materials
The materials used in instrument construction shall be resistant to corrosive type substances found in the automotive repair environment and be designed to last for at least the period of the warranty.

b) Finish
The exterior and interior finish of the entire cabinet and console shall be sufficiently durable to withstand the chemicals and environmental conditions normally encountered in the automotive repair environment for the period of the warranty.

c) Mobility
The analyzer may be permanently mounted or mobile with wheels. Wheels shall be at least five inches in diameter and have a locking mechanism capable of preventing movement on a 15 degree incline.

If mobile, the analyzer shall be designed so that movement over rough surfaces (three-inch deep holes) and on 15 degree inclines, will not cause it to tip over. Analyzers shall not tip over when placed at the center of an inclined plane that makes an angle of 10 degrees with the horizontal and rotated 360 degrees stopping in the position where it is most likely to tip over. In addition, the analyzer shall not become unstable or tip over when rolled straight off the edge of a two-inch high platform or when one wheel is rolled over a drain, two inches below the surface, inside an 18-inch diameter depression.

d) Identification

The analyzer serial number, name and address of manufacturer, the model description, the date of production, the EIS number, and the PEF shall be conveniently displayed. The first two characters of the EIS number shall be alphas denoting the manufacturer's initials, and shall not be changeable from the keyboard even in the manufacturer's service mode. The initials chosen are subject to approval by the TNRCC to prevent duplication between manufacturers. The remaining six characters shall be numeric. The numbers shall be right justified. Zeroes shall be used to fill any blank spaces between the initials and the numerics. For example, the EIS number for analyzer #23 from Hobo Electronics would be "HE000023." The manufacturer shall affix a stick-on type label to the analyzer which contains a toll-free telephone number for customer service. This number can also be included in a service software message.

e) Electrical Design

Provisions shall be made for storing the power cord in a manner satisfactory to the TNRCC. Fuses or circuit breakers shall be used to protect individual electrical circuits and emission analyzers. Main circuit breakers and fuses shall be readily accessible from the exterior of the cabinet. Analyzer operation shall be unaffected by electrical line noise and voltage surges. The analyzer shall be sufficiently protected from voltage surges to prevent damage to the analyzer from the simultaneous start up of a 220-volt compressor, an arc welder, hydraulic controls and other equipment commonly found in the typical automotive test and/or repair environment.

2.7 Bar Code Scanner

The purchase of a bar code scanner for reading Vehicle Identification Numbers is required. The analyzer shall be configured to allow for installation of the bar code scanner. The bar code scanner must be able to read a 2D bar code, and 1D bar code through a windshield, even if the bar code is 6 to 8 inches from the windshield. The bar code scanner shall not be able to read UPC 1D bar codes. The bar code scanner shall use visible laser diode technology, be able to withstand multiple drops to concrete covering a distance of at least 4 feet, and be environmentally sealed to withstand the normal operating conditions of an automotive service environment.

2.8 Fuel Cap Tester

2.8.1 Equipment Specifications

a) The tester shall identify gas caps which leak more than 60 cc/min at 30 inches of water pressure.

b) The flow standard shall be a squared edged circular orifice sized to produce a leak rate of 60

cc/min of air at 30 inches of water pressure.

c) The supply pressure may be obtained using ambient air and any convenient low pressure source. The tester shall control the supply pressure and prevent over pressurization.

d) The tester shall provide a visual or digital signal that the required air supply pressure is within the acceptable range and the flow comparison test is ready to be conducted.

e) The system shall be tamper-resistant.

f) A reference passing fuel cap of nominal 52-56 cc/min, and a reference failing fuel cap of nominal 64-68 cc/min shall be supplied with the tester for daily test verification.

2.8.2. Fuel Cap Adapters

a) Adapters shall be available for at least 95 percent of the fuel caps that are used on U.S. light duty vehicles and trucks for the most recent 24 model years.

b) Varying internal volumes of the fuel caps and adapter assemblies shall not affect the accuracy of the test results.

c) Adapters shall be made available on the first day of each year of the introduction of new model year vehicles.

2.8.3 Pre-inspection and Preparation

a) Fuel Cap Missing: If the fuel cap is missing, the vehicle shall fail the fuel cap flow test (rejection shall be recorded as a failure in the data base).

b) Fuel Cap Available: The fuel cap shall be removed and taken to the test device. If the fuel cap is tethered, the cap tester shall be brought to the vehicle.

c) Fuel Cap Untestable: The fuel cap is untestable, if it is present on the vehicle and the tester does not have an attachment to fit the fuel cap. (The untestable feature shall be recorded on the analyzer as untestable.)

2.8.4 Fuel Cap Integrity Test Sequence

a) The adapter appropriate for the fuel cap shall be fitted to the flow test device.

b) The fuel cap shall be installed on the adapter and the test device shall be pressurized to approximately 30 inches of water.

c) The fuel cap leak rate shall be compared to an orifice with a flow rate of 60 cc/min of air at 30 inches of water.

d) If the leak rate exceeds 60 cc/min at 30 inches of water, the cap fails the flow test.

The analyzer shall prompt the inspector to indicate whether or not the gas cap is testable. Then, the analyzer shall prompt the inspector to remove the gas cap from the vehicle, attach it to the tester, and press continue when ready. The tester shall automatically pressurize the cap, and indicate when the test has commenced and when it has ended. The tester shall indicate whether or not the gas cap passes or fails. The inspector shall then enter the result into the analyzer, or the tester may do so automatically. The gas cap connector shall be long enough to reach gas caps that are attached to vehicles.

2.8.5 Data Transmission (for External Cap Tester Only)

The tester shall be equipped with a serial data port to transmit pass/fail and calibration information to the EIS data base via the data link.

a) Communication from the unit shall be provided by one cable (if the unit is external). A CPC serial port as shown below, shall be used for communication and to provide the power needed to operate the fuel cap tester.

b) The connector on the EIS and pin outs shall be as follows:

ANALYZER CPC SHELL REVERSE CONNECTOR: This connector must be shielded and must be compatible with an AMP 208721-1. The circuit shall be protected for power surges over 0.5 AMPS. The circuit protection shall be easily accessible to the technician unless it is an automatic reset system. The pin-out shall be as follows:

PINS	SIGNAL	
1	GND	
2	+12v	
3	TXD	TRANSMIT DATA
4	RCV	RECEIVE DATA
5	RTS	RESET (request to send)
SHELL	SHIELD-GND	

The power for the tester may be provided via the CPC connector (or equivalent) as referenced above.

2.9 Engine RPM Detection

A digital display tachometer shall be CRT displayed for the purpose of measuring engine speed. The tachometer operation shall be by three means; (1) a radio frequency “RF” type transmitter/receiver that requires no direct vehicle connection and can detect engine RPM on vehicles utilizing “DIS” systems, or (2) a cable type connection capable of detecting engine RPM of current Original Equipment Manufacturer (O.E.M). ignition technology, or (3) a cable type connection capable of detecting engine RPM via the OBDII port. Beginning with 1996 model year vehicles, the EIS analyzer shall prompted the inspector to detect engine RPM via the OBDII port. However, if the OBDII port is unable to detect Engine RPM, the technician may use the previously listed methods. Tachometer performance shall be no

less than RPM with a 0.5 second response time and an accuracy of ±3.0% of actual RPM. The cable type connection shall be at least twenty-five (25') feet in length measured from the front of the analyzer. During an official inspection process, the software shall prompt the inspector to shut the engine off while connecting the RPM probe (only if a cable connection is being made). A software "HELP" screen shall be available to assist the inspector in locating an RPM signal. This information may be supplied or reviewed by the TNRCC/DPS. Based on the vehicle identification information available to the inspector, the analyzer shall prompt the inspector as to which vehicles require a specific type or method of connection of the tachometer pick-up. Analyzers shall be provided with all the software and hardware that are necessary to make them capable of reading engine RPM from O.E.M. ignition technologies in use at the time of certification. Possible updates may be required to enable future ignition systems to be monitored for engine RPM. If the RPM can not be obtained, the system will allow the inspector to bypass the RPM. The RPM bypass function shall be made available, when the analyzer displays live engine RPM for the first time. To activate the RPM bypass, inspector must strike at least two keys simultaneously. Once the emission test has begun, the bypass function shall no longer be available. The option to bypass may not be available to all makes and models. For analyzer certification, analyzers shall be capable of reading engine RPM on all spark ignition vehicles.

2.10 Accessing OBD II Fault Codes

Analyzer manufacturers shall incorporate provisions for reading fault codes from vehicles with on-board computers using the SAE Standardized Link. The SAE Standardized Link shall connect to the vehicle's on-board diagnostics port to automatically interrogate and retrieve fault codes. The EIS shall decode, interpret and display the fault codes on the screen and print them with their interpretation on the VIR.

2.11 Testing Heavy-Duty Gasoline-Powered Vehicles

Manufacturers shall supply the analyzer with the hardware and software necessary to test heavy-duty gasoline-powered vehicles. At a minimum, accessories shall allow for 40-foot motor homes to be tested without degrading the emission analyzer response time and provide the technician with an accurate indication of the engine speed. Vehicles with >8,500 GVWR or dedicated four-wheel drive shall be tested using the two-speed idle mode.

3.0 DISPLAY PROMPTS AND PROGRAMMING CRITERIA REQUIREMENTS

This section describes the display prompts and programming criteria for the Emissions Inspection/Test Sequence. These items shall be standardized to facilitate training of licensed inspectors. Manufacturers may propose alternative methodologies for the presentation of information and for data entry as long as the substance and the priority of the sequence is not significantly modified. Alternative methodologies shall be presented to the TNRCC for approval. The ASM-2 EIS manufacturers shall utilize one or more of the following options to make the analyzer more user friendly:

a) Direct cursor addressing a first letter selection versus a scrolling display;

b) Displaying data entry error messages; and

c) Help screens to assist inspectors with data entry and data verification.

Other options may be proposed for approval by the TNRCC. Data entry from one item to another shall not proceed until a valid entry has been made. During reinspection entry from the Main Menu, the analyzer shall display the appropriate fail records with no tampering information displayed. Where editing is allowed, the inspector shall have the ability to return to a previous display prompt. At that point, the inspector shall see the prior information and be permitted to insert and delete characters without having to retype the whole field.

d) Vehicle Look-Up Table (VLT)

1. The Vehicle Lookup Table is the EPA/Sierra supplied Lookup Table (ESLT). The VLT.DAT provides basic vehicle descriptions as well as ASM-2 testing parameters, including single-axle dynamometer compatibility data. The VLT includes emission cutpoints exception information for some vehicles along with the following items that differ from the ESLT: vehicle information for model-years 1966-1972 and some medium-/heavy-duty trucks. The VLT will be resident on the VID and accessible via the Texas Information Management System Host (TIMS). Wherever possible, at the beginning of each test, all pertinent data from the VLT.DAT file shall be automatically entered into the EIS ' vehicle test field parameters. If the test field parameter is unavailable or incomplete via the VLT.DAT, the technician shall be prompted to enter the parameter manually.

2) The table will be periodically revised on a "by-record" basis. The EIS shall send the version date and the number of records in its VLT file to the VID during any "Begin-Test" or "Data-Refresh" communications session.

3) When a "VLT Update" file is received from the VID, the EIS shall store the file to the hard drive until a period of relative inactivity (e.g. between inspections).

1. The VLT Update file may appear to be corrupted if either of the following conditions exist:

    1. The version date sent by the EIS does not match any dates stored in the "VLT Update History" table in the VID (second consecutive occurrence).
    2. The number of records in the EIS's VLT.DAT does not match the appropriate number of records for that version date (determined at the VID).

If possible corruption is detected by the VID, the VID will send a lockout to the EIS. The EIS, upon receiving the response bit, shall display the following prompt:

DISPLAY PROMPT:

THE VLT DATABASE IS CORRUPT. CALL SERVICE.

If the VLT is corrupt, a lockout shall be set. This lockout can only be cleared by the VID upon replacing the file and the VID has verified that the VLT data has been replaced.

Inspection Sequence

The microcomputer software shall control the inspection sequence and equipment process. This software shall, at a minimum, require the inspector to proceed in the following sequence when performing a vehicle inspection:

A. Enter the inspector access code number.

B. Enter vehicle identification information.

C. Enter license plate number.

D. Select and conduct the EPA approved preconditioned 2-speed idle test or 2-mode ASM test.

E. Enter the emissions repair data, if applicable.

F. Update data files, send data to Host/print vehicles inspection reports.

Aborting Inspections

If 'ABORT' is selected on an initial test, the vehicle information will be stored in the RECALL.DAT file for later recall by the inspector via main menu option ‘10.’ Main menu option ‘10’ is described in Section 3.10.

If 'ABORT' is selected, the system shall prompt the inspector to ENTER THE CODE THAT BEST DESCRIBES THE REASON THE TEST WAS ABORTED. SELECT AND ENTER THE APPROPRIATE ESCAPE CODE FROM THE LIST BELOW:

If the inspector selects one of the following abort codes, the analyzer shall:

1) fail the vehicle, and
2) allow the inspector to edit the fee entries, because the fee is due.

01 OIL SYSTEM WARNING LIGHT IS ON

02 COOLANT SYSTEM WARNING LIGHT IS ON

03 FUEL SYSTEM LEAK

04 EXCESSIVE ENGINE NOISE

08 OTHER SAFETY PROBLEM

If the inspector selects one of the following abort codes, the analyzer shall:

1) not fail the vehicle,
2) set the EMISS _INSP_COST field to $0.00, because no fee is due
3) mark the test as an aborted inspection, and not count the inspection as an initial inspection or reinspection,
4) prompt the inspector to indicate if safety related repairs were conducted. If no, set the SAFE_INSP_COST field to $0.00. Otherwise, allow the inspector to enter a value using the Safety Test Fee Prompt as shown in Section 3.1.22,
5) prompt the inspector to indicate if emissions-related repairs were conducted. If no, set the REP_CST_YIS fields to $0.00. Otherwise, allow the inspector to enter a value using the Emissions Reinspection Repairs Prompt in Section 3.4.6, and
6) include all entered safety and emissions related repair costs on the VIR.

05 VEHICLE DOES NOT REQUIRE INSPECTION

06 BMW, PEUGEOT, VOLVO, JAGUAR AUTOMATIC TRANSMISSION

07 ANALYZER PROBLEM

09 LOW FLOW RATE

99 OTHER (INDICATE REASON ON THE VEHICLE INSPECTION REPORT)

A maximum of two characters has been provided for this entry. The analyzer shall accept one two character abort code which shall be inputted by the inspector and saved to the test record. All of the inspection and test data collected up to the time abort is initiated, shall be recorded in the VEHICLE.DAT and REINSPEC.DAT files, and on the vehicle inspection report. After the abort code confirmation has been made, the analyzer shall allow the inspector to enter or edit the applicable fees, (i.e. safety fee, emissions fee, or both).

If the emissions test must be aborted after the sampling period has started, the latest five-second average (or the average of whatever portion of the first five seconds of the sampling period has elapsed) shall be treated as the "final value." Emissions readings shall be taken during all test modes and the "final" reading shall be recorded on the VEHICLE.DAT and REINSPEC.DAT files and on the vehicle inspection report. The analyzer shall be designed so that the inspector can initiate the 'ESCAPE' or 'ABORT' sequence by depressing a maximum of one key. Leading zeros shall be entered by the analyzer software.

The analyzer shall be designed so that the inspector is required to confirm the initial abort command after entering the applicable abort code. The inspector shall be allowed to edit the abort codes up until the confirmation is made. If the inspector wants to return to the test, and not continue with the abort sequence, the inspector shall be allowed to do so prior to the confirmation. The inspector shall be returned to the same place in the test sequence they are at when the abort was initiated. However, if the abort was initiated during the emissions test, the inspector shall be returned to the beginning of the emissions test sequence. Unconfirmed aborts shall not be recorded on the test record. The abort code selected must be recorded to the VEHICLE.DAT file. The analyzer must then return to the main menu.

Data Entry Errors

Data entry errors will be displayed as the following message(s):

NO VALUE HAS BEEN ENTERED - TRY AGAIN

INVALID ABORT CODE - TRY AGAIN

Menus

The following list contains the menus manufacturers are required to provide. Manufacturers may break the menus down further to increase user friendliness or expedite certain operations. Manufacturers may provide additional menus. The TNRCC/DPS reserves the right to require modification if any menu does not meet minimum requirements.

Upon successful completion of the start-up diagnostics, the system shall display the main menu containing the following options:

1. Safety and Emissions Inspection
2. Safety Only Inspection
3. Emissions Only Inspection
4. Reinspection
5. Reprint Vehicle Inspection Report
6. Vehicle Diagnosis
7. Training Mode
8. Analyzer Maintenance
9. Audit Menu
10. Recall Aborted Inspection.
11. Gas Cap Integrity Test
12. Missing, or Voided Certificates
13. Certificate Correction/Replacement
14. Technical Bulletins/Announcements

15. Communications Refresh

16. Communication Diagnostics (Loopback)

17. Alldata Communications

18. Inspection Log (VI-8B)

19. VI-30A Only

The inspector shall initiate an official emissions inspection by entering the number "1," the training mode by entering the number "7," and so forth.

Upon power-up of the analyzer, a full system check of all hardware components will be conducted. The system will verify that leak check has been performed during the past 24 hours. If not, the system will display the message "YOU MUST PERFORM A LEAK CHECK ON THE ANALYZER BEFORE YOU CAN PROCEED WITH ANY EMISSIONS TEST OPTION."

After selecting Main Menu Option 1, 3, 4, or 10, the system will verify that a leak check has been performed during the past 24-hours. If not, the system will display the message "YOU MUST PERFORM A LEAK CHECK ON THE ANALYZER BEFORE YOU CAN PROCEED WITH ANY EMISSIONS TEST OPTION."

If it fails the leak check, the analyzer will prevent the inspector from proceeding with the emissions test options. The analyzer shall then check for station lockout flags in the LOCKOUT.DAT file. The analyzer shall check for a '1' or 'Y' in the STAT_CERT_SUSP, STAT_CERT_EXP, or STAT_CERT_REVOK fields of the LOCKOUT.DAT file.

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If station lockout field equals "Y" or any power-up test fails, the analyzer shall disable all emissions test functions and display a message **"CALL SERVICE FOR REPAIRS OR YOUR LOCAL DPS OFFICE FOR STATION OR INSPECTOR LOCKOUT**."

Programming Criteria:	**VEHICLE.DAT**	**TEST_TYPE**
		EMISS_TEST_TYPE
		EMISS_INIT_TEST
	REINSPEC.DAT	**TEST_TYPE**
		EMISS_TEST_TYPE
		EMISS_INIT_TEST
	RECALL.DAT	**TEST_TYPE**
		EMISS_TEST_TYPE
		EMISS_INIT_TEST

The analyzer will set the EMISS_TEST_TYPE field to '1' if the inspector conducts an OBDII

emissions test, ‘2’ if the inspector conducts a two-speed idle emissions test, and a ‘3’ if the inspector conducts an ASM emissions test.

If the inspector selects one of the following choices from the main menu:

1 - Safety & Emission Inspection
2 - Safety Only
3 - Emissions Only
5 - Reprint

The system will set test_type field to the following:

1 - ‘A’ 5 - ‘K’
2 - ‘H’

If 3 - Emissions Only is selected, prompt the inspector to indicated if the test is a:

1 - required emission only test (decal)
2 - voluntary test
3 - test on resale (not displayed or used)
4 - remote sensing request

The system will set test_type field to the following:

1 - ‘O’ 3 - ‘C’
2 - ‘I’ 4 - ‘B’

NOTE: The tests and their corresponding letters are cross-referenced below:

A)	Emission & Safety Test	H)	Safety Only Test
B)	Remote Sensing Request	I)	Voluntary Emissions Test
C)	Test on Resale	J)	Waiver - Individual Vehicles
D)	Accelerated Vehicle Retirement Test	K)	Reprint
E)	Dispute Test	L)	Waiver - Low Income Time Extension
F)	Waiver - Minimum Expenditure	M)	Parts Availability Time Extension
G)	Federal Test	N)	Other (Special Test)
		O)	Required Emissions Only Test (Decal)
		P)	Waiver - Low Mileage

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1.0.a GENERAL - Two-Speed Idle (i.e., El Paso Analyzers)

1.1.a <u>Design Goals</u>

The specifications that have been developed are designed utilizing a personal computer system. The TX96 analyzer (“the analyzer”) system must be capable of performing uniform and consistent emissions tests for the Texas Vehicle Emissions Testing Program (“the Program”). Features of the analyzer include, but not are limited to: vehicle emissions measurements of hydrocarbons (HC), carbon monoxide (CO), carbon dioxide (CO_2) and oxygen (O_2); engine revolutions per minute (RPM) measurements, exhaust dilution determinations, pressure test system for EVAP; data entry; data retrieval tables; a printer (for vehicle inspection reports, for diagnostics and general purpose printouts and an additional

printer port; data recording on double sided high density 1.44 megabyte (Mb) 3.5" floppy diskette and a 500 Mb (or greater) hard drive; a modem for “on-line real time” data transmission; CRT information displays to the inspector; bar code (1D or 2D) reader and printing capabilities; and fully menu driven, interactive simple microprocessor controlled operation. The analyzer should have the flexibility of adding vehicle emissions measurements of Oxides of Nitrogen (NO_x) as Nitrogen Oxide (NO). The analyzer shall include a gas cap integrity tester. The gas cap integrity tester shall be a fully automated integral part of the analyzer system.

Additional automatic features required include: gas calibrations, zero and span checks, pressure calibrations, gas auditing procedure, leak checks, HC hang-up checks, audit menus (i.e., data read system), test sequencing, and low-flow checks. The analyzer shall be designed and constructed to provide reliable and accurate service in the automotive environment. The software used in the analyzer shall consist of a process control system as well as data look-up files. Security shall be provided to prevent unauthorized modifications to the software or test data and recording unauthorized entry (tampering) and locking out of the inspection process when detected.

The emissions analyzer software shall be designed for maximum operational simplicity. It shall also be capable of providing emissions reading characteristics, independent of the inspection function, which can be used for vehicle diagnostics.

This document contains the minimum requirements for analyzers performing emissions tests in the Program. Analyzers built to these specifications may not be easily upgraded to conduct loaded mode emissions tests or emissions tests involving a dynamometer (i.e., ASM, RG240). Manufacturers may offer analyzers that meet the minimum requirements contained in this specification, and can be easily upgraded to conduct loaded mode emissions tests.

1.2.a Useful Life

The useful life of the analyzer shall be a minimum of five years, however, this does not imply that the Program will be in effect for five years or that the analyzer specifications will not change within five years.

1.3.a Nameplate Data

A nameplate including the following information shall be permanently affixed to the housing of the analyzer:

Name and Address of Manufacturer
Model Description
Serial Number
Date of Assembly

The manufacturer shall affix a stick-on type label to the analyzer which contains a toll-free telephone number for customer service. This number can also be included in a service software message.

1.4.a <u>Manuals</u>

Each analyzer shall be delivered with a current hard copy version of the following manuals:

A. Reference Operating Instructions

B. Operation Instruction Manual

C. Maintenance Instruction Manual (limited)

D. Initial Start-up Instructions

TX96 analyzer manufacturers may consolidate manuals. The manuals shall be constructed of durable materials and shall not deteriorate as a result of normal use over a five-year period. The analyzer housing shall provide convenient storage for each manual in a manner that will:

E. Allow easy use.

F. Prevent accidental loss or destruction.

TX96 analyzer manufacturers may install the manuals in the analyzer software. The analyzer will have the ability to print complete manuals or portions of the manuals. If the manuals reside on the analyzer in the software, the manufacturer shall provide backup of the manuals in an electronic media (i.e., floppy disk, CD-ROM, etc.), and the procedures for loading the manuals onto the analyzer.

1.5.a <u>Certification Documentation</u>

The analyzer software shall be fully documented. Six copies of the documentation listed below shall be submitted to the Texas Natural Resource Conservation Commission (TNRCC) as part of the certification application. Software documentation shall include the following:

A. Complete program listing. Program listings may be on diskette. <u>They are not required to be submitted with the application for certification;</u>

B. Functional specifications;

C. Functional flowcharts of the software;

D. Example inputs and outputs from all processes;

E. Detailed interface information on system components including the identification of

protocol and output specifications; and

F. All DOS file layouts with file names, file types, file security, field names, field types, field sizes, and field editing criteria.

Documentation provided by the vendor to meet this requirement will be treated as proprietary information by the TNRCC. This documentation must be marked "Confidential" if the vendor desires that the information be protected from distribution.

Confidential Information

If the manufacturer believes that the certification package, or parts of it, are confidential, it must specify that either all or part is excepted from release, and which exception(s) of the Texas Open Records Act (TORA) it believes applies, with specific and detailed reasons. Each page containing confidential information should be clearly marked accordingly. Vague and general claims to confidentiality are not acceptable. This is necessary so that the TNRCC will have sufficient information to provide to the Attorney General of Texas if his opinion is requested. All certification packages or parts of certification packages which are not marked as being confidential will automatically be considered public information.

The TNRCC assumes no responsibility for asserting legal arguments on behalf of the manufacturers. Manufacturers are advised to consult with their legal counsel concerning disclosure issues resulting from this certification process and take precautions to safeguard trade secrets and other proprietary information.

THE MANUFACTURERS OF TX96 EMISSIONS ANALYZERS WILL SUBMIT A LETTER OF CORPORATE AUTHORIZATION AGREEING TO PLACE SOFTWARE SOURCE CODES AND OTHER PERTINENT TECHNICAL INFORMATION IN "ESCROW." CERTIFICATION WILL NOT BE VALID UNTIL THIS CONDITION HAS BEEN MET. ESCROW INFORMATION MUST BE KEPT CURRENT, I.E., SOFTWARE VERSION IN USE MUST CORRESPOND WITH THE ESCROWED INFORMATION. ESCROW PLACEMENT WILL BE APPROVED BY THE TNRCC MOBILE SOURCE DIVISION.

Escrow of Software

The Manufacturer agrees to place the most recent update of all application software in use to meet this specification in the possession of a neutral third party of the manufacturer's choice. The manufacturer shall notify the TNRCC and provide the name and contact person of the selected third party. The software will be turned over to TNRCC in the event that Manufacturer goes out of business or cannot assure continued performance of the inspection analyzers.

In the event that the software is transferred, the TNRCC shall protect the source code from public dissemination and commercial usage. At a minimum, the TNRCC shall:

a. limit access to the code to parties necessary to accomplish maintenance and updating of the TX96 analyzers;

b. require all parties to sign a nondisclosure agreement before obtaining access to the code; and

c. grant no license to any entity permitting that entity to use any part of the code for any commercial purpose other than to update/operate the TX96 analyzers.

The purpose of the requirement for the source code is to provide the TNRCC with a mechanism to assure continued performance of inspection analyzers in the event that a manufacturer should fail. The TNRCC is not interested in any disclosure of proprietary information, nor in the detailed inner workings of vendor code. However, it is essential that all of the necessary working codes, schematics, drawings, and so forth be available in case of such demise.

Performance Bond

As a prerequisite to certification, the Manufacturer shall furnish a performance bond to the TNRCC. This bond shall be in a form approved by the TNRCC and shall be executed as surety by a bonding company authorized to do business in the State of Texas and signed by a Licensed Resident Agent. The performance bond shall be for the amount of $2,000,000. This performance bond will cover all systems (i.e., ASM/TSI/OBDII, TSI/OBD, and OBD-only) that are certified to conduct inspections in the Program.

The performance bond may be utilized by TNRCC at any time if the Manufacturer is in material default of the requirements of these specifications, including but not limited to the following "Events of Default":

(a) The Manufacturer fails to remedy a breach of covenant, representation, or warranty required by these specifications within thirty (30) days after written notice of such breach has been given to the Manufacturer by the TNRCC;

(b) The Manufacturer makes a general assignment for the benefit of creditors, admits in writing its inability to pay debts as they mature, institutes proceedings to be adjudicated a voluntary bankrupt, consents to the filing of a bankruptcy proceeding against it, files a petition or answer or consent seeking reorganization, readjustment, arrangement, composition, or similar relief under the federal bankruptcy laws or any other similar applicable law, consents to the filing of any such petition, consents to the appointment of a receiver, liquidator, trustee, or assignee in bankruptcy or insolvency of the Manufacturer or of a substantial part of its property, or takes action in furtherance of any of these purposes; or

(c) A decree or order by a court of competent jurisdiction is entered adjudging the Manufacturer a bankrupt or insolvent, or approving as properly filed, a petition seeking reorganization, readjustment, arrangement, composition, or similar relief for the

Manufacturer under the federal bankruptcy laws or any other similar applicable law, and such decree or order continues undischarged or unstayed for a period of sixty (60) days; or a decree or order of a court of competent jurisdiction for the appointment of a receiver, liquidator, trustee or assignee in bankruptcy or insolvency of the Manufacturer or of a substantial part of its property, or for the winding up or liquidation of its affairs, is entered, and such decree or order remains in force undischarged or unstayed for a period of sixty (60) days; or any substantial part of the property of the Manufacturer is sequestered or attached and is not returned to the possession of the Manufacturer or released from such attachment within sixty (60) days thereafter.

To require performance by the surety under the performance bond, the TNRCC shall give written notice of the event of default to the Manufacturer, specifying the date upon which surety performance shall begin.

The performance bond shall be released upon determination by the Executive Director of the TNRCC that the manufacturer has satisfactorily completed its obligations in accordance with the terms of this specification, or at an earlier date, if it is determined by the Executive Director to be in the best interest of the State to do so.

1.6.a <u>Warranty Coverage/Mandatory Service Contract</u>

A written warranty coverage agreement, signed by an authorized representative of the equipment manufacturer and the vehicle inspection station owner, which provides a complete description of coverage for all systems and components and all manufacturer provided services listed in Section 1.8a, must accompany the sale or lease of each TX96 emissions analyzer.

An extended service contract must be available upon the expiration of the manufacturer's original warranty period. **ORIGINAL MANUFACTURER'S WARRANTY SHALL BE A MINIMUM OF ONE YEAR FROM THE DATE OF PURCHASE.** Renewals shall be offered at the inspection station owner's request and governed by "good business" practices between the parties involved. Service contract agreements must be available by the manufacturer. The inspection station owner is responsible for maintaining the manner of service for the analyzer. Cost disclosures and detailed descriptions of coverages must be available in printed form and distributed to all TX96 emissions analyzer users. Cost disclosure shall also be made for "consumable" inventory items 1.8B. This information would most appropriately be presented with the original manufacturer's warranty.

1.7.a <u>Tampering Resistance</u>

Controlled access design shall be the responsibility of the manufacturer. All security measures shall be submitted to the TNRCC for approval. Analyzer operators, State field representatives and manufacturer's representatives shall be prevented, to the TNRCC/DPS's satisfaction, from creating or changing any test results, TNRCC/DPS programs or TNRCC/DPS data files contained in the TX96 analyzer as called for in this specification. Manufacturers shall utilize special BIOS, partitions as well as other appropriate software and hardware provisions (or

equivalent approved by the TNRCC), to protect the I/M files and programs. File and program protection may consist of mechanical systems in combination with electronic/software systems. The protection features shall prevent access to the secured disk drives and portions of the hard disk containing I/M programs and test data. The "control" key, or its functional equivalent giving access to the operating system (OS), shall not be activated except through the use of a password on the audit menu. The password shall be chosen by the TNRCC's Mobile Source Section at the time of certification testing. Other security or protection alternatives, such as more sophisticated BIOS limitations and LPT port key, may be proposed by the manufacturer for approval by the TNRCC.

In addition, the emission analyzer and the sampling system shall be made tamper-resistant to the TNRCC's satisfaction. As a minimum, the manufacturer shall develop tamper-resistant features to prevent unauthorized access through the cabinet. Micro switches, keyed locks, software-controlled locks, and software algorithms requiring the use of an access code shall all be utilized where appropriate and would be acceptable provided the physical or logical design effectively prevents unauthorized access. Access codes shall be changed on a monthly basis on an algorithm provided by the TNRCC. Service access codes shall be changed monthly based on a unique algorithm provided by the manufacturer. Both algorithms may be changed as part of any software update.

Manufacturers may utilize keyed locks on the doors securing the disk drives as long as the locks are built-in, good quality and can be easily changed by authorized personnel if a security problem is identified. The following examples illustrate ineffective, and therefore unacceptable, security measures:

- A mercury switch would not be effective if the analyzer can be tipped over to one side to trigger the switch.

- A keyed lock would not be effective if it is placed in a position that allows the analyzer cabinet to be flexed slightly to bypass the lock.

- If there is a dynamometer control cabinet separate from the secured area of the analyzer cabinet, it shall be secured in a manner approved by the TNRCC/DPS.

The inspection technician shall have access to the optional compact disc (CD) drive. However, access security to the BIOS, I/M related programs, and data must be secured from this drive when accessed by a technician. The manufacturer shall provide security for the CD drive to prevent unauthorized read/writes (to memory, ROM, hard drive, etc.). This security shall guard against unauthorized executables that are executed from the CD. The manufacturer shall submit their method for providing this security to TNRCC for approval.

A software-controlled solenoid lock may be used on the secured drive door of all TX96 analyzer units submitted for certification. This solenoid lock may be used instead of, or in addition to, any key or combination lock that may be provided. The solenoid lock shall be controlled by the TX96 analyzer software, unlatching the doors in response to authorized requests from the audit menu, always maintaining the appropriate levels of security. All TX96

analyzer units shall have sensors, such as Micro switches, to detect the open/closed state of the doors, as well as other secured areas of the TX96 analyzer. The TX96 analyzer shall monitor these sensors and shall define an inappropriate state as a tamper.

Manufacturers may offer analyzers with additional disk drives that can run optional software application programs. However, the optional disk drives shall be secured from the BIOS, operating system and all other I/M related programs and test data (or equivalent acceptable to the TNRCC). If tampering occurs, a software lockout algorithm shall be activated which aborts any existing test sequence and prevents further I/M testing until the lockout is cleared by a DPS program official (or other representatives authorized by TNRCC/DPS). Manufacturers shall develop a system to allow service technicians to only clear “tamper” lockouts during authorized service calls.

The use of Micro switches to detect unauthorized entry is acceptable. However, unauthorized access to the secured areas of the analyzer shall be detected even when the power is off. The analyzer shall record the type and location of each tamper (excluding the underhood tamper flag). The tamper attempts shall be recorded in a tamper file which includes the date of the tamper-caused lockout, the type and location of the lockout, the date the lockout was cleared and who it was cleared by (State or manufacturer's service representative). The specific tamper type and location shall only be accessible through the audit menu.

The lockout system shall be designed so that it can be activated by a DPS program official from the audit menu. Only State field representatives (or other representatives authorized by TNRCC/DPS) may remove lockouts put in place from the audit menu. Manufacturers shall develop a system by which their service technicians shall be prevented, by some method approved by the TNRCC, from clearing TNRCC/DPS installed lockouts. In particular, the following policies shall apply to the manufacturers' field representatives:

1) They shall not be capable of:
   i. clearing a State-installed lockout, or
   ii. clearing a lockout due to a requirement for a three-day gas calibration/leak check.

2) They shall not add, delete or modify Station or Inspector license number.

3) They shall not be capable of altering the calibration gas values.

The tamper resistance features shall be designed so that software programs, especially those which deal with repair and diagnostics of vehicles, can be added at a later date.

Optional software packages supplied by the manufacturer shall not interfere with the normal operation of the I/M inspection and testing software, and shall not compromise the tamper-resistance of the analyzer.

Access to and from all required and mandatory-option programs shall be "seamless." These programs shall be accessed from the Main Menu or a submenu, and, when exited, shall return

directly to the menu or submenu from which they were accessed, without requiring the TX96 analyzer to reboot.

1.8.a <u>Manufacturer Provided Services</u>

The manufacturer shall agree to provide the following services to the inspection station as part of the manufacturer's original warranty and thereafter as a portion of the service contract agreement. The cost of a service agreement is to be listed at least annually. Future charges cannot exceed the amount published.

A. Delivery, installation, calibration, and verification of the proper operating condition of a TX96 emissions analyzer.

B. Quarterly (90 days) examination, calibration, and routine maintenance of the analyzer and sampling systems. Annual examination shall be required on OBD only analyzers. Full systems support and repair including loaner units. Upon initial sale, lease, or loan, provide sample filter(s) (2), and "extra" printer medium (1 ea.), or a certificate redeemable for a printer cartridge for laser printers. Maintain the availability of "extra" consumable inventory upon examination. **CONSUMABLES AND THE COST(S) THEREOF MUST BE DISCLOSED IN THE SERVICE AGREEMENT.**

C. Instruct all certified inspectors employed by the inspection station at the time of installation in the proper use, maintenance, and operation of the analyzer. The analyzer shall contain a feature that will allow an inspector to go through the complete inspection procedure without generating an official inspection record. The feature will be able to be performed with or without a car and shall produce a vehicle inspection report. This function will be used for evaluating inspector performance, by DPS program officials, or by the manufacturer for demonstration purposes. The "training mode" shall not require the use of an inspector's access code or allow access to secured areas of hardware or software. The display shall show a message throughout the inspection that this is not an official inspection. During the "training mode," vehicle inspection reports shall indicate to the satisfaction of the DPS that they are for training only. No official vehicle inspection report will be generated during the training exercise.

D. On-site service response by a qualified repair technician within (2) business days, (48 hours) excluding Sundays, national holidays (New Years, Martin Luther King, Jr. Day, President's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving, Christmas, and other days when the purchaser's business might be closed), of a request from the inspection station. The names, toll-free telephone numbers, and service facility addresses of all manufacturer representatives responsible for equipment service shall be provided to the inspection station. A service representative shall be available at all times during normal working hours. Sundays, national holidays, and other days when the purchaser's business might be closed, are not included. All system repairs, component replacements, and/or analyzer adjustments, including reset of quality control lockout systems, shall be accomplished on-site within 48 hours after a service request has been initiated. If the completion of this work is not

possible within this time period, a TX96 loaner unit shall be provided until the malfunctioning unit is properly repaired and returned to service. Service representatives shall have a software driven menu option or other acceptable method that records the transfer of inspection station, inspector information, and other applicable data files from one analyzer to another without manual inputs and without transfer of previous test files.

E. Updates of the "Functional" software will be limited to a total of 1,000 programming hours.

Updates of operational software, i.e., file based information, will be on an "as required" basis. Software updating should be designed to utilize modem technology for the updating process. The TNRCC will require the manufacturer to render updates as necessary in the first year of the Program to ensure the Program meets all design criteria. The manufacturer shall provide up to two file/software updates to the State in the first year, and thereafter, updates will be limited to once per year. The 'first year' shall be defined as one calendar year measured from the program start date. The file/software updates shall not exceed a combined total 1,000 programming hours at no cost to the State or analyzer owners. If the manufacturer anticipates that an update shall exceed the 1,000 programming hours limit, a cost quotation shall be prepared by the manufacturer. The cost quotation shall be submitted to the TNRCC prior to commencing work on the update. Then, the TNRCC will approve or not approve in writing that the work be undertaken.

Software updates, provided during the warranty period, **at no charge,** by the supplier of the inspection equipment or software programs shall consist of no more than the following:

- The inclusion of data pertaining to additional vehicles newly included in inspection program;
- The inclusion of data pertaining to new model year vehicles released since the last update;
- Changes to the "cut points" as directed by the Administrator of the program; or
- Software updates that rectify errors found at a later date where the original software was found to be not in compliance with the State specification published at the inception of the program. Software updates shall be warrantied for a period of one year from the date the software becomes operational in the analyzer.

Software updates that involve any of the following revisions shall not be provided by the supplier of the equipment or software programs on a "no charge" basis, but instead the supplier of the inspection equipment or software programs shall be entitled to charge a reasonable fee, based on the resources used by that supplier in producing, releasing, and installing the software update.

- Changes in the vehicle inspection procedure that differ from the original procedure as outlined in the specifications used to certify the equipment and/or software at the program inception. Examples would be the addition of pressure/purge tests or visual inspection of components;

- Changes in the software structure as the result of the administrative changes within a state organization. Examples would be changes made to software fields to permit entry of Inspectors Social Security Numbers as opposed to drivers license numbers as required in the original specifications used to certify the equipment and/or software at the program inception;

- Changes in the software structure as the result of a decision to change/include extra functions or procedures that were not part of the original specifications used to certify the equipment/software at the program inception. Example would be changes or additions to Electronic Transmission; or

- Changes mandated by the State as a result of a state error in specifications or procedures found in a previous update.

F. The analyzer software shall be designed so that DPS program officials can insert a floppy disk (or equivalent storage media), prepared by the manufacturer, into the Program system host, and update the existing software version via modem. If the analyzer update is not accomplished via modem, a system of loading updates by program officials utilizing the auditor's menu shall also be available. Look-up tables and message screens shall be designed sufficiently separate from the main operations software so that it is not possible to interfere in any way with the operations of the analyzer.

The TNRCC will require the manufacturer to render updates as necessary in the first year of the Program to ensure the Program meets all design criteria. Since modem software updating will be utilized, there are no costs to the analyzer owner. A software version number, consisting of a four-character alpha-numeric code made up of the last two digits of the year followed by a two-character version number, shall be recorded in the analyzer and included on each vehicle test record. The analyzer manufacturer shall not modify any existing software version without obtaining prior written approval from the TNRCC.

G. The TNRCC may require the manufacturers to conduct on-site or laboratory testing of in-use analyzers in order to document continued compliance. When an analyzer is removed from the field, for repair or testing, manufacturers shall supply to the inspection station from which it was removed, a temporary replacement unit meeting all Program requirements. Manufacturers shall pay for all necessary shipping and transfer costs for the replacement of the analyzer selected for compliance testing. Manufactures shall also pay for any required testing performed by their personnel or by an independent company.

H. The manufacturers shall provide training to state officials responsible for oversight of the

Program (e.g., TNRCC, DPS). The training will include, but not be limited to, instruction on all operational, maintenance, and quality control features of the analyzers, including full access to and use of inspection menus, audit menus, and calibration menus, as well as optional programs offered to inspectors. Such training shall be conducted at the manufacturer's expense as a condition of certification and thereafter at reasonable intervals (minimum of once per year in each I/M program area and after each major "cost" software revision) upon written request by the TNRCC/DPS.

The manufacturers shall provide a training plan to TNRCC. The training plan will be used by state oversight officials to conduct certification training of potential inspectors on the use of the analyzers for implementation of the Program. The manufacturers shall provide a minimum of four (4) hours training to the potential owners and operators of the analyzer for each analyzer purchased, leased, or upgraded.

1.9.a <u>Certification Requirements</u>

The manufacturer shall submit a formal certificate to the TNRCC that states that any analyzer sold or leased by the manufacturer or its authorized representatives for use in the Program will satisfy all design and performance criteria described in these specifications. The manufacturer shall also provide sufficient documentation to demonstrate conformance with these criteria including a complete description of all hardware components, the results of appropriate performance testing, and a point-by-point response to specific requirements.

All equipment shall be tested by an independent test laboratory. The independent laboratory shall have previous experience certifying exhaust gas analyzers (prior BAR 90 certification experience.) The manufacturer shall seek prior written approval from the TNRCC of the certification laboratory. At least 15 days in advance of commencing the certification process, the manufacturer shall notify the TNRCC. The notification will include the laboratory name, address, telephone number, and the name of a contact person. The TNRCC reserves the right to be present during the evaluation of all equipment. The test laboratory shall issue a test report detailing the objectives, test methods, and test results of the subject equipment. The test report shall then be submitted to the TNRCC, Mobile Source Section for an evaluation of acceptance. Previous certification by the TNRCC may be considered in this process but will not be sufficient to satisfy all necessary documentation requirements. The cost of the certification shall be adsorbed by the manufacturer.

In addition, a full description of the company's service procedures and policies, as well as sample contracts, warranties, and extended service agreements, shall be provided as part of the certification application to ensure proper maintenance of all analyzers throughout their useful life. One fully-functional analyzer shall be presented for TNRCC evaluation.

To facilitate the need for educating the motoring public and vehicle emissions inspection station owners/inspectors, manufacturers may phase-in hardware and software requirements. Beginning July 1, 1996, all current models of vehicle emissions analyzers in Dallas and Tarrant Counties must be able to connect to the Texas Information Management System via modem through the electronic transmission contractor. Additionally, during this phase-in period, each

manufacturer must develop software to reflect the emissions standards in Appendix A. Beginning October 1, 1996, all equipment must be upgraded with hardware and software to meet or exceed the TX96 gas analyzer requirements.

2.0.a CONSTRUCTION DESIGN

2.1.a Materials

All materials used in the fabrication of the analyzer and the appropriate housing assembly shall be new and of industrial quality and durability. Only materials that are not susceptible to deterioration when in contact with automobile exhaust gases shall be used. Contact between nonferrous and ferrous metals shall be avoided where possible. Suitable protective coatings shall be applied where galvanic action is likely. All mechanical fasteners shall have appropriate locking features. The locks on the analyzer shall be keyed locks. Use of self-tapping screws shall be limited. All parts subject to adjustment or removal and reinstallation shall not be permanently deformed by the adjustment or removal/reinstallation process and this process shall not cause deformations to adjoining parts.

2.2.a Construction

The analyzer shall be complete and all necessary parts and equipment required for satisfactory operation shall be furnished. A suitable means of storing the probes and sample hose shall be provided. A means of storing the "spares" inventory shall be included. All parts shall be manufactured and assembled to permit the replacement and/or adjustment of components and parts without requiring the modification of any parts or the basic equipment design. Where practical, components and/or subassemblies shall be modularized. The analyzer cabinet shall have a durable finish (i.e., baked enamel, powder paint, etc.). The cabinet shall be constructed to allow access to the following analyzer periphery connections without setting off a tamper lockout: the keyboard, the printer, the monitor, and the bar code reader. The analyzer's keyboard, printer, and monitor shall be interchangeable with locally purchased, off-the-shelf, IBM PC compatible keyboards, printers, and monitors.

2.3.a Mobility

The analyzer unit shall be designed for easy and safe movement over rough surfaces and/or graded surfaces (15° inclines). The center of gravity and wheel design shall be such that the analyzer can negotiate a vertical grade separation of one-half inch (½") without overturning when being moved in a prescribed manner. Industrial grade, swivel casters shall be used to permit 360°-rotations of the unit. The caster wheels shall be equipped with oil resistant tires and foot operated brakes capable of preventing movement on a 15°-incline.

Analyzer peripheral equipment, such as bar code readers, OBDII scanners, and keyboards, may utilize wireless communication to interact with the TX96 analyzer.

2.4.a Electrical Materials/Construction

Unless otherwise specified, all electrical components and wiring shall conform to standards established by the Underwriters Laboratories, Standard for Electrical and Electronic Measuring and Testing Equipment (U.L.-1244).

The analyzer shall operate from a 115 VAC, 60 hertz (Hz) supply. An input voltage variation of ± 12 volts shall not change analyzer performance more than one percent of full scale. The analyzer must operate on a 15 AMP breaker. The power cable shall be equipped with a standard three-prong connector at the inlet, and shall have a National Electrical Code rating of SO, SJO, or better with an overall length not to exceed 25 feet. Each emissions analyzer shall incorporate safety devices to prevent conditions hazardous to personnel or detrimental to equipment. The system shall be grounded to prevent electrical shock, and adequate circuit overload protection shall be provided. The analyzer shall be sufficiently protected from voltage surges to prevent damage to the analyzer from the simultaneous start up of a 220 volt compressor, an arc welder, hydraulic controls, and other equipment commonly found in the typical automotive repair environment.

2.5.a <u>Sampling System</u>

The sampling system consists of two subsystems: (1) external sampling system; and (2) internal sampling system. The external system shall include a sample probe, a sample hose at least 25 feet in length, a water trap, and a filtration system. The internal subsystem shall include but not necessarily be limited to, a sample pump and bypass pump or an equivalent system approved by the TNRCC.

<u>Sample Probe</u>

The sample probe shall incorporate a positive means of retention to prevent it from slipping out of the tailpipe when in use. A thermally insulated, securely attached hand grip shall be provided on the probe in such a manner that easy probe insertion using one hand is ensured.

The probe shall also have a smooth surface near the probe tip before the flexible portion of the probe to be used for sealing of the span gas adaptor necessary for field or on-board leak checking (vacuum or gas) or response time checking equipment. For standardization, it is recommended that the sealing surface be one-half inch (½") in outside diameter and one-half to one inch (½" to 1") long. Two probe tip caps shall be provided for the sample system leak check. A probe tip adapter or assembly shall be included for use with spark arrester type tailpipes.

<u>Sample Hose</u>

The interconnecting hose shall be of such design and weight that it can easily be handled by the inspector. The hose shall be of non-kinking construction and fabricated of materials that will not be affected by or react with the exhaust gases. Molecular HC hang-up shall be minimized. The hose connection to the analyzer shall be reinforced at the point of maximum bending.

Water Trap

The system shall be designed with a water trap in the sample stream. The water trap shall be continually self-draining. The trap bowl shall be constructed of a durable transparent material. The water trap should be located as low as possible on the analyzer so that condensed water in the sample hose will drain into them. However, the trap must be placed in a position readily visible to the inspector. The sample for the analyzer shall be obtained from the top of the water trap.

Filtration System

The sampling system shall be equipped with a suitable particulate filter upstream of the optical bench. There may be a secondary filter located in the sample hose, serviceable by the inspector. This filter must have sufficient capacity to filter the samples obtained during the routine testing of vehicles in the inspection station. A prompt shall be provided to the inspector indicating when the filter should be changed based on an indication of low flow (automatic lockout) or the other criteria approved by the TNRCC.

Pumps

The pumps shall contain corrosion-resistant internal surfaces. The pumps shall have a minimum operational life of 2,000 hours without failure.

The sample pump system may be either a single pump, multiple pumps, or a multiple stage pump or an equivalent system approved by the TNRCC. The sample pump shall have integral motor overload protection and be permanently lubricated. The bypass system shall be connected in the sample system so that any water condensed in the water trap is removed and dumped outside the system.

2.6.a Storage Temperature

While in storage, the analyzer and all components thereof shall be undamaged from ambient air temperatures ranging from 0° F to 130° F.

The analyzer, including all of the software/hardware enclosed in the cabinet, shall operate within the performance specifications described herein in ambient air temperatures ranging from 35 to 110°F. Analyzers shall be designed so that adequate air flow is provided around critical components to prevent overheating (and automatic shutdown) and to prevent the condensation of water vapor which could reduce the reliability and durability of the analyzer. The analyzer system shall otherwise include necessary features to keep the sampling system within the specified range.

2.7.a Operating Temperature

The analyzer and all components shall operate within calibration limits in ambient air

temperatures ranging from 41° F to 110° F.

2.8.a <u>Humidity Conditions</u>

The analyzer shall be designed for use inside a building that is vented or open to outside ambient humidity. The printer and analyzer, including all components of the analytical, sampling, and computer systems, shall operate within the required performance specifications at ambient conditions of up to 100 percent noncondensing relative humidity throughout the required temperature range, assuming the components are reasonably protected by the inspector from direct contact with water or other condensing moisture. Failure of any component due to exposure to temperature and humidity extremes within the limits specified during actual use shall be corrected at the manufacturer's expense.

2.8.1.a <u>Temperature Control</u>

Analyzer components which affect sensitivity and calibration shall have their internal temperatures controlled to maintain design temperature, when exposed to prevailing ambient conditions. These include the conditions noted in the sections titled "Operation Temperature" and "Humidity Conditions" above.

2.9.a <u>Barometric Pressure Compensation</u>

Barometric pressure compensation shall be provided. Compensation shall be made for elevations up to 6,000 feet (mean sea level). At any given altitude and temperature, errors due to barometric pressure changes of ± two inches (2") of mercury shall not exceed the accuracy limits contained in this specification. Manufacturers shall describe in writing how compensation will be accomplished. The method used shall be acceptable only if approved in writing by the TNRCC.

2.10.a <u>Operational Design</u>

A. Analytical System

These analyzers shall utilize nondispersive infrared systems for measuring HCs, CO, and CO_2. O_2 shall also be measured and ambient air will be used for calibration purposes.

B. Readout Display/CRT Screen

The screen shall contain numerical HC (as hexane), CO, CO_2 and O_2 displays and a pass/fail indication at the completion of the inspection process. If available, the gas cap leak check - flow method shall be a pass/fail indication, with results recorded to file.

The numerical display shall be of a digital format. The resolution of the emissions display shall be as follows:

HC:	XXXX ppm (as hexane)
CO:	XX.XX%
CO_2:	XX.X%
O_2:	XX.X%

The minimum display increments shall be 1 ppm HC, 0.01 percent CO, 0.1 percent CO_2, and 0.1 percent O_2. The displays shall be capable of full scale readings of 2,000 ppm HC (as hexane), 9.99 percent CO, 16.0 percent CO_2, and 25.0 percent O_2.

CRT display is to be employed for an exhaust sample validity (sample dilution). This indication will signal excess dilution in the exhaust system based upon measurement of CO + CO_2 emissions.

The analyzer shall be capable of selecting the pass/fail values (limits) based on vehicle model year, vehicle type, or other criteria. The system shall be designed in such a manner that the standards and vehicle groups may be readily revised by a modem software update.

SPECIFIC EMISSIONS LIMITS AND VEHICLE MODEL YEAR GROUPINGS ARE AVAILABLE IN APPENDIX A.

See Appendix A for Cutpoints.

2.11.a <u>Automatic Calibrations</u>

The analyzer shall be designed to require an automatic two-point gas calibration for HC, CO, and CO_2, and an automatic electrical zero and span check. (O_2 shall be measured by ambient air.) The automatic gas calibration shall be conducted every 24 or 72 hours, activated by the internal clock. The option of 24 hour calibration will be software selectable, with the default at 72 hours. Electrical zero and span check (automatic) shall be required prior to each test sequence. User friendly prompts shall be provided to the inspector to indicate every step needed to properly perform the required gas calibration including when it is necessary to turn the gas cylinder valve on and off.

If the system is not calibrated, or the system fails the calibration or the zero and span check, an error message or fault indication shall be displayed and the analyzer shall be locked out to prevent the performance of an emissions inspection. Lockout will remain until the system is properly calibrated and passes a calibration/leak check, and zero and span check.

The calibration record will contain before and after calibration readings and provide date and time of each reading. The gas calibration shall ensure that accuracy specifications are satisfied and that linearity is correct at the required span points. The gas calibration and leak check procedures shall require no more than five (5) minutes to complete. The analyzer shall provide adequate prompts on the display to guide the inspector through the calibration procedure in a manner that minimizes the amount of calibration gas used.

The system shall have the capability of printing historical calibration data for specified date ranges by the program auditor (audit menu, calibration history). The system shall be capable of maintaining up to 12 months of historical calibration and up to six months of test data.

For HC, CO, and CO_2, analyzer manufacturers shall limit gas usage during the gas calibration procedure to two liters per point. The analyzer shall also be designed to keep the loss of calibration gas to an absolute minimum (less than 0.5 liters in 24 hours) if the calibration gas valve(s) is/are not shut off. Manufacturers shall provide an evaluation of this capability with their certification application materials and shall demonstrate this feature during certification.

The analyzer shall be equipped with a gas calibration port for the purpose of performing a probe to calibration port comparison for audit purposes and leak check procedures. Gas auditing shall be accomplished by introducing standard gases into the analyzer either through the calibration port or through the probe. Span gases utilized for calibrations shall have a two percent (2%) analytical accuracy and a zero percent (0%) blend tolerance of the following points: Ambient air may be used to calibrate the O_2 sensor.

(HC)	300	ppm propane
	1.0	percent CO
	6.0	percent CO_2
	Bal.	Nitrogen (N_2)
(HC)	1200 ppm propane	
	4.0	percent CO
	12.0	percent CO_2
	Bal.	Nitrogen (N_2)

The standard gases used to calibrate and audit the analyzers shall satisfy the criteria included in the Federal Clean Air Act, Section 207(b) and described in Subpart W of Part 85 of Chapter I, Title 40 of the Code of Federal Regulations. In order to ensure that the quality of the standard gases used in the Program meet these specifications, all standard gases purchased by the inspection facility for use in the analyzer must conform to the requirements established in 1990 by the California Bureau of Automotive Repair for Test Analyzer System Calibration Gases and National Institute of Standards and Technology (NIST). These requirements include the testing and certification of the concentration, accuracy, precision, and purity of the standard gases to within the referenced limits and the labeling of individual gas canisters describing these and other specified parameters.

A. <u>Automatic Leak Check</u>

An automatic leak checking system shall be provided that will allow the vacuum side of the system to be checked for leakage. Appropriate valves lines, and switches shall be installed to permit this operation. Minimal activity by the inspector, such as setting the probe in a holder or capping the probe, is permitted, provided errors resulting form improper inspector action would be identified by the computer and would require corrective actions. Improper action would cause the system to fail a leak check, and automatically lock-out. User friendly prompts shall be provided to the inspector to indicate every step needed to properly perform the required leak check (including when it is necessary to turn the gas cylinder valve on and off).

A system leak check shall be accomplished every four or 24 hours in addition to the gas calibration performed every 24 or 72 hours, activated by the internal clock. The four hour option shall be software selectable with the 24 hours as the default value. Four hour leak checks are required only for those facilities performing more than 5,000 inspections per year. The analyzer shall not allow an error of more than ±3 percent of reading using mid-range TX96 certified span gas to perform the leak check. A maximum of two liters of calibration gas may be used to perform the leak check. If the system is not leak checked, or the system fails a leak check, an error message or fault indication shall be displayed, and the analyzer will be locked out to prevent the performance of an emissions inspection, until system is properly leak checked and passes.

B. Automatic HC Hang-Up Check

The analyzer shall be designed for using ambient air induced through the sample probe, prior to each test sequence. The analyzer shall have a CRT prompt/indicator. "Hang-up" activation shall cause the analyzer to automatically sample ambient air through the sample line and probe. The system shall continue to sample room air for a maximum of 150 seconds or until the HC response is below 20 ppm propane, (or 40 ppm hexane).

If the HC hang-up does not drop below 20 ppm within 150 seconds, a message shall be displayed indicating possible dirty filters or sample line. If HC levels are not below specified values after 150 seconds, the test shall be discontinued until HC hang-up is corrected. When the level stabilizes below this value, an indication that testing may begin shall be displayed. The analyzer shall be locked out from operating until the HC level is met.

C. Vehicle Diagnostics

During analyzer warm-up, emissions diagnostics and other gas reading functions shall be prohibited. After a successful warm-up and for the purpose of vehicle diagnosis or repairs, the analyzer shall have a menu selection, that will allow the analyzer to continuously monitor the vehicle exhaust.

The automatic data collection system shall be prevented from operating anytime the analyzer is not being used in the official emissions inspection mode.

D. Dilution

The analyzer manufacturer shall document, to the satisfaction of the TNRCC, that the flow rate on the analyzer shall not cause more than 10 percent dilution during sampling of the exhaust at normal idle (10 percent dilution is defined as a sample of 90 percent exhaust and 10 percent ambient air). Manufacturers shall utilize the procedures specified by the BAR for demonstrating this dilution criterion (Section 8.2.9 of the Bar-90 Test Analyzer System Specifications, California Bureau of Automotive Repair, October 1991).

The analyzer shall be equipped with a feature to identify vehicle exhaust system leaks and sample dilution. The preferred method for identifying leaks is monitoring the CO & CO_2 levels in the exhaust. Other additional techniques that can demonstrate improved sensitivity to leaks may also be used.

DILUTION VALUES:

All light-duty vehicles:6 percent
All heavy-duty vehicles: 5 percent

The microcomputer will prevent testing if the CO + CO_2 value is outside of the specified limit. If the CO + CO_2 reading is less than the limit, the inspector shall be prompted to check the exhaust system for leaks and to make sure that the sample probe is all the way into the tailpipe. If the excessive dilution is detected after the initiation of the test sequence, the analyzer output shall display "SAMPLE DILUTION." The analyzer shall prompt the inspector to check the probe insertion, visually reinspect the analyzer hoses, check the exhaust system for leaks, and continue with the test. If the dilution continues, the inspector shall have the option of aborting the test. If the inspector aborts the test after initiating the test sequence, the vehicle shall fail the emissions portion of the inspection, and the analyzer shall write a test record, indicating an aborted test. If the test "times out" due to dilution condition, the vehicle shall fail the emissions portion of the inspection, and the analyzer shall write the appropriate test record.

E. Engine Tachometer

A digital display tachometer shall be CRT displayed for the purpose of measuring engine speed. The tachometer operation shall be by three means; (1) a radio frequency "RF" type transmitter/receiver that requires no direct vehicle connection and can detect engine RPM on vehicles utilizing "DIS" systems, (2) a cable type connection capable of detecting engine RPM of current Original Equipment Manufacturer (OEM) ignition technology, or (3) a cable type connection capable of detecting engine RPM via the OBDII port. Beginning with 1996 model year vehicles, the TX96 analyzer shall prompted the inspector to detect engine RPM via the OBDII port. However, if the OBDII port is unable to detect Engine RPM, the technician may use the previously listed

methods. Tachometer performance shall be no less than RPM with a 0.5 second response time and an accuracy of ±3.0 percent of actual RPM. The cable type connection shall be at least twenty-five (25') feet in length measured from the front of the analyzer. During an official inspection process, the software shall prompt the inspector to shut the engine off while connecting the RPM probe (only if a cable connection is being made). A software "HELP" screen shall be available to assist the inspector in locating an RPM signal. This information may be supplied or reviewed by the TNRCC/DPS. Based on the vehicle identification information available to the inspector, the analyzer shall prompt the inspector as to which vehicles require a specific type or method of connection of the tachometer pick-up. Analyzers shall be provided with all the software and hardware that are necessary to make them capable of reading engine RPM from OEM ignition technologies in use at the time of certification. Possible updates may be required to enable future ignition systems to be monitored for engine RPM. If the RPM cannot be obtained, the system will allow the inspector to bypass the RPM. The RPM bypass function shall be made available, when the analyzer displays live engine RPM for the first time. To activate the RPM bypass, the inspector must strike at least two keys simultaneously. Once the emission test has begun, the bypass function shall no longer be available. The option to bypass may not be available to all makes and models.

F. Analytical Bench Accuracy

Each analyzer shall meet the following analytical accuracy requirements:

Channel	Range	Accuracy
HC ppm	0 - 400	± 12 ppm
	401 - 1000	± 30 ppm
	1001 - 2000	± 80 ppm
CO percent	0 - 2.00	± 0.06 percent
	2.01 - 5.00	± 0.15 percent
	5.01 - 9.99	± 0.40 percent
CO_2 percent	0 - 4.0	± 0.6 percent
	4.1 - 14.0	± 0.5 percent
	14.1 - 16.0	± 0.6 percent
O_2 percent	0 - 10.0	± 0.5 percent
	10.1 - 25.0	± 1.3 percent

The analyzer display resolution electronics shall have sufficient resolution and accuracy to achieve the following:

HC	1	PPM HC
CO	0.01	percent CO

CO_2	0.1	percent CO_2
O_2	0.1	percent O_2

G. Drift

If zero and/or span drift cause the infrared signal levels to move beyond the adjustment range of the analyzer, the inspector shall be locked out from testing and instructed to call for service.

H. Warm-up

The analyzer shall reach stabilized operation in an inspection station environment within 15 minutes at an ambient air temperature of 41 degrees Fahrenheit from "power-on." The instrument shall be considered "warmed-up" when the zero and span readings for HC, CO, and CO_2 have stabilized, within ±3 percent of full range of low scale, for five minutes without adjustment.

Functional operation of the gas sampling unit shall remain disabled through a system lockout until the instrument meets stability and warm-up requirements. If the analyzer does not achieve stability within 15 minutes, from "power-on," it shall be locked out from I/M testing and a message shall be displayed instructing the inspector to call for service.

During the warm-up, the Main Menu shall be displayed unless an optional functional menu or menus are offered. The analyzer system shall lock out all bench related functions during warm-up. During warm-up, a message under the main menu shall be prominently displayed as follows: "WARM-UP IN PROGRESS-CHECKING FOR STABILITY." When stability is achieved and the warm-up requirements are satisfied, access to gas bench functions shall be permitted.

I. System Response Time Requirements

The response time from the probe to the display shall not exceed eight (8) seconds to 90 percent of a step change in input, nor will it exceed 12 seconds to 95 percent of a step change in input. For the O_2 sensor, the response time shall be no more than fifteen (15) seconds to 90 percent of full scale.

J. Optical Correction Factors

The hexane/propane equivalency factor (PEF) shall be limited to values between 0.49 and 0.54. If an optical bench is used that can demonstrate accuracy of propane/hexane identification within specification, using a range greater or less than indicated, it may be approved by the TNRCC/DPS. Factor confirmation shall be made on each analyzer assembly by measuring both N-hexane and propane on assembly line quality checks. The PEF shall be permanently stored in nonvolatile memory. The PEF shall be displayed on the monitor on request by inquiry through the menu system. The optical bench shall

be marked with a permanent "stamped" type tag identifying its PEF.

The signal strength from the source to the detector for all channels shall be monitored such that when the signal degrades beyond the adjustment range of the analyzer, the analyzer shall be locked out from operation, i.e., fail calibration.

K. Interference Effects

The effect of extraneous gas interference on the HC, CO, and CO_2 analyzers shall not exceed ±10 ppm HC, ±0.05 percent CO, ±0.20 percent for CO_2.

The instrument design shall ensure that readings do not vary as a result of electromagnetic radiation and induction devices normally found in the inspection environment (including high energy vehicle ignition systems, RF transmission radiation sources, and building electrical systems). In addition, the manufacturer shall ensure that the analyzer processor and memory components are sufficiently protected to prevent any loss of programs and test records.

L. Gas Cap Integrity Test

A. Equipment Specifications

1. The tester shall identify gas caps which leak more than 60 cc/min at 30 inches of water pressure.

2. The flow standard shall be a squared edged circular orifice sized to produce a leak rate of 60 cc/min of air at 30 inches of water pressure.

3. The supply pressure may be obtained using ambient air and any convenient low pressure source. The tester shall control the supply pressure and prevent over pressurization.

4. The tester shall provide a visual or digital signal that the required air supply pressure is within the acceptable range and the flow comparison test is ready to be conducted.

5. If the tester is battery powered, it must be equipped with an automatic shutoff and a low-battery indicator.

6. The system shall be tamper-resistant.

7. A reference passing fuel cap of nominal 52-56 cc/min and a reference failing fuel cap of nominal 64-68 cc/min shall be supplied with the tester for daily test verification.

B. Fuel Cap Adapters

1. Adapters shall be available for at least 95 percent of the fuel caps that are used on U.S. light-duty vehicles and trucks for the most recent 25 model years.

2. Varying internal volumes of the fuel caps and adapter assemblies shall not affect the accuracy of the test results.

3. Adapters shall be made available within two years of the introduction of new model year vehicles.

C. Pre-inspection and Preparation

1. Fuel Cap Missing: If the fuel cap is missing, the vehicle shall fail the fuel cap flow test (rejection shall be recorded as a failure in the data base).

2. Fuel Cap Available: The fuel cap shall be removed and taken to the test device. If the fuel cap is tethered, the cap tester shall be brought to the vehicle.

3. Fuel Cap Untestable: The fuel cap is untestable if it is present on the vehicle and the tester does not have an attachment to fit the fuel cap. (The untestable feature shall be recorded on the analyzer as untestable.)

D. Fuel Cap Integrity Test Sequence

1. The adapter appropriate for the fuel cap shall be fitted to the flow test device.

2. The fuel cap shall be installed on the adapter and the test device shall be pressurized to approximately 30 inches of water.

3. The fuel cap leak rate shall be compared to an orifice with a flow rate of 60 cc/min of air at 30 inches of water.

4. If the leak rate exceeds 60 cc/min at 30 inches of water, the cap fails the flow test.

The analyzer shall prompt the inspector to indicate whether or not the gas cap is testable. Then, the analyzer shall prompt the inspector to remove the gas cap from the vehicle, attach it to the tester, and press continue when ready. The tester shall automatically pressurize the cap, and indicate when the test has commenced and when it has ended. The tester shall indicate whether or not the gas cap passes or fails. The tester shall automatically enter the result into the analyzer. The gas cap connector shall be long enough to reach gas caps that are attached to vehicles.

E. Operating Range

1. All test elevations.

2. A temperature range of 20°F to 120°F.

F. Accuracy

Leak rate measurements shall be accurate to within ±3 percent cc/min.

G. Output

1. The test device shall provide a visual or digital signal to indicate pass or fail status.

2. The leak test shall not last longer than 45 seconds.

H. Quality Control

1. The flow standard orifice shall be calibrated before initial usage and thereafter on an annual basis unless quality control data suggests other intervals are appropriate. The flow calibration method shall be traceable to the NIST.

2. The flow tester shall be verified daily by testing the two reference fuel caps and correctly identifying the passing and failing fuel caps. Failure to pass this verification shall result in immediate cessation of usage of the tester and its repair or recalibration.

3. Flow calibrations of the reference fuel caps shall be conducted before initial usage and thereafter as required by examining quality control data.

4. The filter shall be maintained in accordance with the leak test manufacturer's recommendations.

H. Data Transmission (for External Fuel Cap Integrity Testers Only)

The tester shall be equipped with a serial data port for future capabilities to transmit pass/fail and calibration information to the central data base via the Texas Information Management System.

1) Texas Information Management System. The fuel cap tester shall have the capability to communicate with the TX96 analyzer to record information such as pass/fail results, calibration reading, etc. Communication from the unit shall be provided by one cable (if the unit is external). A CPC serial port as shown below, shall be used for communication and to provide the power

needed to operate the fuel cap tester.

2) The connector on the TX96 analyzer and pin outs shall be as follows:

ANALYZER CPC SHELL REVERSE CONNECTOR: This connector must be shielded and must be compatible with an AMP 208721-1. The circuit shall be protected for power surges over 0.5 AMPS. The circuit protection shall be easily accessible to the technician unless it is an automatic reset system. The pin-out shall be as follows:

PINS	SIGNAL	
1	GND	
2	+12v	
3	TXD	TRANSMIT DATA
4	RCV	RECEIVE DATA
5	RTS	RESET (request to send)
SHELL	SHIELD-GND	

The power for the tester may be provided via the CPC connector as referenced above.

2.12.a **<u>Gas Calibration File</u>**

At the conclusion of each gas calibration, leak check, or gas cap tester calibration, the required data shall be placed in the CAL.DAT file.

2.13.a **<u>Microcomputer Specifications</u>**

A. A standard microcomputer must be included in the analyzer and is to be used to control all analyzer functions. Each vendor is to develop disk operating system programs or executable programs for each required function. The development of Windows 95 compatibility is optional. These programs shall:

1. control each of the analyzer functions and time of function;

2. examine and obtain values from all of the analyzer sensors;

3. read and write information to a diskette in standard DOS, or equivalent, format;

4. copy the analyzer inspection station identification information from the hard disk, or equivalent, onto each new floppy diskette, or other storage media, when formatted;

5. allow access to all TNRCC/DPS functions and be capable of performing these functions via modem such as:

- auditing functions;
- tampering, lockout checks;
- responses to queries;
- report downloading; etc;

6. transmit vehicle test records, calibration records, and audit records and other analyzer files to the central database via the Texas Information Management System, to a standard 3.5" IBM 1.44Mb compatible floppy disk, or by means of a standard IBM PC fully compatible DB25 enhanced bidirectional parallel port;

7. read and interpret bar code labels read by the bar code reader;

8. read data from compact discs (CD) or other storage media approved by TNRCC;

9. provide storage for archived test and graphic files;

10. access engine RPM on OBD II equipped vehicles and interface with OBD and OBD II scan tools;

11. reprint vehicle inspection reports (VIRs) from information stored on the hard drive, or equivalent storage media, or via information received from the Texas Information Management System

The TNRCC reserves the right to add additional programs and functional performance requirements, up to the technical limits of the hardware, to improve the I/M program.

Sufficient flexibility shall be provided in the design of the microcomputer system to allow expansion of the analyzer to include, but not be limited to, the following additional capabilities:

1. connect and recover data from vehicle on-board diagnostic (OBD) systems meeting EPA/SAE specifications when they become available;

2. monitor vehicle recall data; identify, record, and process data as required when an official EPA/SAE format is identified;

3. accommodate additional input channels in both analog and digital form; two free slots, 16 bit capability;

4. accommodate additional data of vehicle information and test results;

5. inclusion of record-keeping for safety inspection parameters;

6. inclusion of OBD information as part of the inspection process;

7. future revision(s) for emissions repair monitoring and reporting; and

8. inclusion of diesel emissions opacity.

The manufacturer may offer additional features which utilize the microcomputer as a stand-alone personal computer by providing optional software to perform various non-I/M functions. Such offerings must not interfere with the inspection requirements, nor in any manner affect or allow the inspector to tamper with the inspection-related computer programming or data files.

The analyzer shall be equipped with an internal clock which operates independently from the power source and will provide accurate and automatic date and time information for the following functions:

a. each test performed;

b. automatic gas calibration and pressure test check (72 hours or 24 hour optional);

c. automatic leak check (4 or 24 hours and every 24 or 72 hours for automatic gas calibration and leak check combination); and

d. audit sequence.

All equipment and software submitted for TX 96 certification must be the full and current configuration proposed for sale. PARTIAL, DATED, OR INCOMPLETE MODELS ARE NOT ACCEPTABLE.

Acceptance of the microcomputer portion of the TX96 analyzer system will be dependent upon the satisfactory performance of the full proposed configuration meeting all the requirements of this specification.

The proposed hardware configuration must be fully supported by all software and/or operating systems listed in the acceptance requirements or elsewhere in these specifications. Performance tests to prove compatibility will be conducted. The vendor will bear all shipping and equipment preparation charges for the certification testing.

2.14.a **Standard Hardware**: Minimum Required Configuration

NOTE: OBD only systems that do not use a standard microcomputer configuration will need to demonstrate their functional equivalency with this section to obtain approval from the TNRCC.

1. Operating System

Each unit may be supplied with an IBM PC-compatible, multi-tasking operating system, which provides TCP/IP capabilities, such as OS/2, Windows, Linux or equivalent operating system (OS) approved by TNRCC. The software program will neither exit to the OS, neither provide a “shell” to the operating system (i.e., “shell to the DOS”), nor

be bootable from any unsecured floppy disk drive, or equivalent storage media drive. The manufacturer shall disable the option to boot from any unsecured floppy disk drive, or equivalent storage media drive. OBD only units **must** be supplied with an IBM PC-compatible, multi-tasking operating system, which provides TCP/IP capabilities.

2. Processor

The microprocessor must be fully compatible with the Intel 80486 microprocessor, or equivalent approved by TNRCC. The motherboard shall allow for processor upgrades.

3. RAM Memory

The system must contain at least 16 MB of user available RAM. (expandable to 64 MB) Alternative memory configurations may be approved by TNRCC.

4. POWER UP SEQUENCE

The system must include a power up sequence which provides a self-diagnostic routine to check the on-line presence of critical PC components or equivalent components (including, at a minimum, the processor, firmware ROM, hard disk controller, keyboard, clock, modem, printers, bar code reader I/O ports, set RAM and memory). This power up sequence must support all supplied components.

4a. Cache Memory

The system must contain at least 256K of external cache memory. If more than one processor is used for the central processing, then for each additional processor, 256K more cache memory must be added.

4b. Bus

When equipped with all TNRCC specified options, each unit must provide at least 1 free EISA (16 bit), one free USB slot, and 2 PCI slots for future expansion. The PCI expansion slots must be fully PCI-compliant ("plug-and-play") and be capable of mapping IRQ 14 & 15. TNRCC may waive the requirement for the spare EISA slot if the TX96 analyzer has manufacturer-designated slots for upgraded options which would address potential future expansion.

5. VIDEO

The CRT display must be at least 15" in diagonal measure, of .28 dot pitch or less, and must be in color. The analyzer’s monitor shall be interchangeable with a locally purchased, off-the-shelf, IBM PC compatible monitor. The monitor must be capable of non interlaced resolution up to 1024 X 768. The display must interface with a color graphics adapter fully compatible with the IBM SVGA color graphics adapter. This interface must be capable of operating in noninterlaced modes up to a resolution of 1024

X 768 while emulating 64K colors or more. The video adapter must be equipped with a 64-bit accelerator chip (or better) to increase its video processing speed and must be PCI or AGP bus-compliant. The video adapter must be equipped with 8Mb and easily replaceable.

The software shall automatically blank the screen, leave the screen in a blank condition with a bouncing prompt, dim the screen, or use a screen saver mode, if no keyboard entry is made for 10 minutes. The display shall return when the inspector strikes any key. Alternative proposals may be approved by the TNRCC in writing.

6. Floppy Disk (or equivalent)

Each unit must come with an IBM compatible floppy disk drive which will permit full usage of 2sHD 1.44 Mb 3.5" removable media. The drive must be located in a secured area accessible only to TNRCC/DPS program officials and authorized service representatives. That secured drive must also include an approved method to limit logical access. The TNRCC will test the system for drive security and it shall not provide access to the secured floppy except through the approved security procedure. The floppy drives must have an external door protecting them from contamination (dust). The analyzer's cooling fan (if equipped) shall not create a negative pressure in the case unless the floppy drive is sealed to prevent this negative pressure from drawing dust into the drive. The secured floppy drive shall be designated the “A” drive.

6a. Compact Disc (CD) (Optional)

Each analyzer may be equipped with one CD ROM drive. The disk drive must be protected from contamination in the shop environment. The drives must accept disk caddies or other methods acceptable by TNRCC such as a multi-disk changer. The CD ROM drive shall be capable of reading CD ROMs that are formatted per ISO 9660. The CD drive shall be designated the "H" drive. The minimum acceptable sustained transfer rate is 600 kilobytes per second with a minimum acceptable average random access time of 225ms and must be multimedia and photo CD compatible as a minimum. A means for providing security to prevent unauthorized access to lower level system functions shall be submitted by the manufacturer for TNRCC approval.

7. Hard Disk

Each unit must come with at least 6.4 gigabytes of usable formatted uncompressed hard disk storage. The vendor must leave at least 2.5 gigabytes of usable storage for the TNRCC/DPS and 1.0 gigabyte of graphic/audio and text storage allotted to the technician. Second-by-second data, emission inspection data (including graphics) and vehicle data will be stored in the TNRCC/DPS storage area. The system shall warn the technician with a screen prompt when the hard disk is within 10% of being full in any of the allotted storage areas. The hard disk is to be self-parking, shock mounted, and able to operate reliably in the expected hostile garage environment. The hard disk must also include a TNRCC approved method of limiting logical access to data and programs.

The hard disk containing the TNRCC/DPS programs and files shall be designated the "C: " drive. The hard drive's minimum acceptable burst transfer (external transfer) shall be 33Mb per second. The hard drive's minimum acceptable sustained transfer (internal transfer) shall be 5Mb per second. The minimum acceptable average random access time shall be 12ms. No software cache can be used when measuring transfer rate or access times.

7a. Hard Disk Interface

The hard disk interface must be PCI bus-compliant and use enhanced IDE Mode 4 (or better) or Fast SCSI-2 (or better) or alternative approved by the TNRCC. The hard disk must be capable of maintaining a minimum transfer rate of 16,600 kilobytes per second with all peripherals installed (including options).

8. I/O Ports

The unit must include sufficient I/O ports of proper configuration to allow the connection of all required options and the capability to add additional I/O boards. The unit must include at least one MS-DOS/IBM PC standard compatible parallel printer port and one baud rate programmable (300 to 19.2K) IMB PC compatible serial port with a male connector (9 pin or 25 pin (DB025)). The parallel port can be connected to the printers, but the serial port must be available. Serial port only must be clearly labeled and easily accessible by only TNRCC/DPS program officials or authorized representatives.

Three baud rate programmable (300 to 115.2K or more) I/O serial ports using CPC female connectors with the following pinouts must be provided for future expansion or for use by the manufacturer upon approval by TNRCC.

All TNRCC-reserved serial ports shall use 16550 UART chips or better. All I/O ports shall be clearly labeled and easily accessible and may be shared. All CPC pinouts shall be as follows:

ANALYZER CPC METAL SHELL REVERSE CONNECTOR
This connector must be metal, shielded and must be compatible with an ANT 208721-1.

PINS	SIGNAL
1	GND
2	+12v
3	TXD TRANSMIT DATA
4	RCV RECEIVE DATA
5	RTS RESET (request to send)
SHELL	SHIELD-GND

The CPC ports will supply software switchable 12V DC to equipment attached. The +12V pin must provide circuit protection of shorts or overload. The circuit protection can be in the form of a fuse, circuit breaker, etc. The circuit protection must be easily accessible to the operating technician for fuse replacement and or circuit breaker reset (unless automatic reset). The circuit must be capable of handling at least 6 watts.

9. Keyboard

The TX96 analyzer keyboard must be fully interfaced with the microcomputer and have all of the necessary normal, numeric, cursor, control, shift, alternate, and function keys needed to operate a standard IBM PC compatible microcomputer, preferably a full 101 keys should be provided. A 101-key keyboard shall be able to interface and fully operate the analyzer. The analyzer's keyboard shall be interchangeable with a locally purchased, off-the-shelf, IBM PC compatible keyboard.

10. Bar Code Scanner

The purchase of a bar code scanner for reading Vehicle Identification Numbers (VINs) is required. Configuration of the analyzer should allow for installation of the bar code scanner. The bar code scanner must be able to read a 2D bar code, and 1D bar code through a windshield, even if the bar code is six to eight inches from the windshield. The bar code scanner shall not be able to read UPC 1D bar codes. The bar code scanner shall use visible laser diode technology, be able to withstand multiple drops to concrete covering a distance of at least four feet, and be environmentally sealed to withstand the normal operating conditions of an automotive technician environment.

11. Hard Disk Expansion

Each system must include a hard disk interface which will fully support a second internal disk drive of the same type as the original type drive or a functional equivalent approved by the TNRCC. Tamper-resistance shall not be compromised by the use of the second disk drive and/or the hard disk interface.

12. Additional Storage

3.5" 1.44 Mb Floppy Disk Drive, IBM Optical disk drive, CD ROM reader etc., -These options would be for manufacturer offered look up tables, service information, or other options requiring additional storage capability.

13. Communications

The modem hardware must support the following protocols:

Modulation: ITU (International Telecommunications Union, formerly the CCITT) V.22, V.22bis, V.32, V.32bis, V.34.

Error control: ITU V.42, MNP (Microcom Network Protocol) 2, 3 and 4. Compression: ITU V.42bis, MNP 5.

Connect Time: The modem must be capable of achieving a link with the VID in less than 10 seconds at 14.4K baud or higher. The link time will be measured from the point the line is picked up to the point of connect.

The modems must support at least the following baud rates: 36.6k to 56k asynchronous operation.

The modem must support the industry-standard AT command set. If the modem is not using a common expansion bus slot, then a means of disabling the modem and an expansion slot or another high speed I/O port must be provided with the intent of supporting an upgraded modem if needed for future expansion. The analyzer shall have a standard female modular telephone connector located on the back of the analyzer. The telephone cord shall not be attached to the power cord. The telephone line shall be enclosed in a protective cable meeting UL approval.

The analyzer shall be programmed to automatically lockout if a software program update does not load properly via the modem or diskette.

2.15.a Required Printer

Vehicle Inspection Report Printer:

An impact printer shall be supplied with each analyzer purchased, leased, or upgraded. The printer shall be dedicated to the task of printing vehicle inspection reports, diagnostic reports, or printing other designated information on a vehicle diagnostic form, or other repair type information. Continuous, fanfold, printer paper will be used. The printer shall print information on the vehicle inspection report using 12 characters per inch and 80 characters per line. The analyzer's printer shall be interchangeable with a locally purchased, off-the-shelf, IBM PC compatible printer.

2.15.b Running Changes and Other Hardware Modifications

Any changes to design characteristics, component specifications and any modifications to the hardware must be approved by TNRCC. It will be the instrument manufacturer's responsibility to confirm that such changes have no detrimental effect on the TX96 analyzer performance.

a) Only TNRCC-approved hardware configurations and options may be used in the TX96 analyzer.

b) All proposed hardware modifications and options must be thoroughly tested by a third party before being submitted to TNRCC.

c) All proposed hardware modifications shall be accompanied by a cover letter containing the following information:

1) A description of all of the proposed modifications to be performed (including manufacturer initiated modifications), a parts list, and the installation instructions for the field service representative. Any modifications to the bench or sample system shall also be accompanied with test data and an engineering evaluation regarding the effects of the proposed modifications on the performance and reliability of the analyzer.

2) A time line showing when the modifications are expected to be performed (start to finish), and how many existing units will be updated.

3) If any special procedures are needed to perform the hardware modifications, describe the procedures for performing the update.

4) If the proposed hardware modifications require changes or additions to the software, documentation for the software update shall be submitted as indicated above.

5) Depending on the type and number of modifications proposed, the TNRCC may require testing at TNRCC-approved beta test sites prior to release of the software. The software modifications shall be reviewed by a third party prior to release for beta-site testing.

2.16.a <u>Clock/Calendar</u>

The analyzer unit shall have a real time clock/calendar which shall make available the current date and time. Dates will be in month, day, year format, and time will be in a 24-hour format. Both time and date shall be updated by the program system host computer during each transfer of data via the system modem.

The date/time, along with the time the test started and when it ended, is to be included on the test record. The start time is when the inspector's access code is entered and the end time is when the analyzer data is written to the test file.

If the clock/calendar fails or becomes unstable (as referenced to the program host system during modem data transfer), the analyzer unit shall be locked out from I/M testing and a message shall be displayed indicating that service is required.

The TX96 analyzer clock shall be checked against the VID clock at the beginning of each test. If the difference between the analyzer clock and the VID clock varies by more than 10 minutes for more than three times within one month, the analyzer shall be locked out from I/M testing and a message shall be displayed indicating that service is required or tampering has occurred.

Resetting of the clock, independent of the host updating, shall require controlled access. The controlled access shall be available only to the State Representatives and the manufacturer's service technician. The access mechanism or procedures shall be approved by the TNRCC. The software shall require the clock to be set each time contact is made with the VID (except for end-of-test contact). The TX96 analyzer shall also check the its' clock against the VID clock prior to clearing any lockout.

The analyzer clock/calendar shall be equipped with a battery backup feature that has a battery with at least a five-year expected life. The calendar shall handle the year rollover from 1999 to 2000. The analyzer shall be able to activate a software update by the clock/calendar as directed by the TNRCC.

2.17.a Lockout Notification

The analyzer shall alert the inspector of any lockout situation by prominently displaying a message on the CRT. Any lockout condition will be stored to file.

2.18.a Vehicle Diagnosis

The analyzer shall be capable of menu selection that will allow the analyzer to be used as an ordinary garage type emissions analyzer for general automotive repair work and diagnostics. Diagnostic capabilities are optional.

2.19.a Software Loading

The inspector shall not have to load the microcomputer's operating or applications software to operate the analyzer. On each POWER-ON of the analyzer, the analyzer shall automatically do all microcomputer component self-diagnostics, memory checking, and loading of all necessary operating software without inspector intervention. Upon satisfactory computer component check out, the applications software shall present a menu of available analyzer operations. All offered features are to be menu-driven. For each feature, a context sensitive, on-line help facility is to be provided which can be accessed, preferably with a single key stroke.

2.20.a Communications with Texas Information Management System(ET)

A required component of the vehicle emissions testing program is the electronic transmission of data/information about the specific vehicle under inspection and the inspection results. The Texas Information Management System (TIMS) is the name that TNRCC has given to the electronic network that enables the TX96 analyzer to automatically connect to the TNRCC's centralized Vehicle Information Database (VID) via modem and dial-up connection. The software protocol is provided in greater detail in Section 3 of this Specification.

The communications protocol shall be developed by the TNRCC contractor and provided to the analyzer manufacturers. The manufacturers shall be responsible for submitting a written request to the TNRCC for the communications protocol. Communication between the Texas

Information Management System Host, and the TX96 analyzer shall be a condition of certification. The TX96 analyzer shall demonstrate the ability to receive from the Texas Information Management System Host all applicable data (i.e., inspection records, vehicle information, etc.) needed to conduct the inspections. The TX96 analyzer shall also demonstrate the ability to transmit the applicable data (i.e., results of inspections, audit file, etc.) to the Texas Information Management System. The Texas Information Management System Host shall be able to transmit the emissions standards table via modem. The analyzer shall be capable of automatically installing and using the new files containing the aforementioned items. The emissions standards table shall be stored under the file name: ESC.DAT.

When an announcement or bulletin has been received from the host, the software will automatically display a message or other indicator, indicating that an announcement or bulletin has been received from the TNRCC/DPS. At a minimum, the indicator shall be visible to the inspector between inspections and from the main menu. The display shall not stop an inspection from being conducted. Announcements shall be transmitted during initial contact with the Texas Information Management System during an emissions test or during a communications refresh. The analyzer may have a “bulletin display” function and display any announcements or bulletins forwarded from the Texas Information Management System Host system via modem transfer in the past 72 hours. The announcement(s) or bulletin(s) shall be stored on the analyzer in the Announcement file for 180 days from the date of initial receipt from the host or until another announcement is saved over it. The analyzer shall allow an inspector to view and/or print any message contained in the Announcement file.

a) Mandatory TIMS Service:

In order to comply with the TIMS mandate, each inspection station shall obtain and maintain TIMS services through TNRCC's designated TIMS contractor. The following criteria shall be met before a TX96 analyzer is used for I/M testing: (1) the TX96 analyzer shall be connected to, and shall be fully functional with the TIMS service, and (2) the TX96 analyzer shall possess, and be operational with the current software and/or hardware update which includes the TIMS communications protocol.

b) TIMS Service Description:

At the beginning of the test, following the technician's entry of the Vehicle License Plate Number and VIN into the TX96 analyzer, the communications software (via the modem and dial-up connection) initiates an automated call (initial call) to the VID. Vehicle-specific information (VLT), previous test results, vehicle description, waiver or extension data, emissions recall information, technical service bulletins, and announcements are electronically returned from the VID. Information that the technician previously filled in manually will be automatically entered into the TX96 analyzer and the technician will be responsible for verifying that the information is correct.

At the conclusion of the inspection, test results, repair results (when required), and certificate number for passed tests are transmitted electronically to the VID (end-of-test call). The

Vehicle Inspection Report (VIR) serves as the customer's receipt.

Using the TIMS system, the TNRCC is also able to send electronic messages to technicians and inspection station owners. When an announcement or bulletin has been received from the host, the software will automatically display a message or other indicator, indicating that an announcement or bulletin has been received from the TNRCC/DPS. At a minimum, the indicator shall be visible to the inspector between inspections and from the main menu. The display shall not stop an inspection from being conducted. Announcements shall be transmitted during initial contact with the TIMS during an emissions test, or during a communications refresh. The announcement(s) or bulletin(s) shall be stored on the EIS in the Announcement file for 180 days from the date of initial receipt from the host or until another announcement is saved over it.

c) Optional Diagnostic and Repair Information (ALLDATA):

The TIMS service provides immediate electronic access to diagnostic and repair information for a fee.

d) Charges for TIMS Services:

Inspection stations must maintain TIMS service in accordance with the terms specified by the TNRCC's TIMS contractor.

2.20.b Form, Manner and Frequency of Data Transmittals for TIMS

a) Form: For each inspection, the data transmittal shall consist of the vehicle's test record, VLT data, and when required, repair record (and other records) as described in Appendix I.

b) Manner: The manner of the data transmittal shall be using the ASM-2 EIS modem via a dial-up connection. The ASM-2 EIS must be maintained to ensure proper operation and shall be connected to a fully operational and dial-up connection during all times of operation.

c) Frequency: The data shall be transmitted for inspection and repair (when required) and shall include two (2) transmissions per inspection, one for the initial call and another for the end-of-test call.

3.0.a DISPLAY PROMPTS AND PROGRAMMING CRITERIA REQUIREMENTS

This section describes the display prompts and programming criteria for the Emissions Inspection/Test Sequence. These items shall be standardized to facilitate training of licensed inspectors. Manufacturers may propose alternative methodologies for the presentation of information and for data entry as long as the substance and the priority of the sequence is not significantly modified. Alternative methodologies shall be presented to the TNRCC for approval. The TX96 analyzer manufacturers shall utilize one or more of the following options to make the

analyzer more user friendly:

A. Direct cursor addressing a first letter selection versus a scrolling display;

B. Displaying data entry error messages; and

C. Help screens to assist inspectors with data entry and data verification.

Other options may be proposed for approval by the TNRCC. Data entry from one item to another shall not proceed until a valid entry has been made. During reinspection entry from the Main Menu, the analyzer shall display the appropriate fail records with no tampering information displayed. Where editing is allowed, the inspector shall have the ability to return to a previous display prompt. At that point, the inspector shall see the prior information and be permitted to insert and delete characters without having to retype the whole field.

Inspection Sequence

The microcomputer software shall control the inspection sequence and equipment process. This software shall, at a minimum, require the inspector to proceed in the following sequence when performing a vehicle inspection:

A. Enter the inspector access code number.

B. Enter VIN.

C. Enter license plate number.

D. Conduct the EPA approved preconditioned 2-speed idle test.

E. Enter the emissions repair data, if applicable.

F. Update data files, send data to Host/print vehicles inspection reports.

Aborting Inspections

If 'ABORT' is selected on an initial test, the vehicle information will be stored in the RECALL.DAT file for later recall by the inspector via main menu option ‘10.’ Main menu option ‘10’ is described in Section 3.10.

If 'ABORT' is selected, the system shall prompt the inspector to ENTER THE CODE THAT BEST DESCRIBES THE REASON THE TEST WAS ABORTED. SELECT AND ENTER THE APPROPRIATE ESCAPE CODE FROM THE LIST BELOW:

If the inspector selects one of the following abort codes, the analyzer shall:

1) fail the vehicle; and

2) allow the inspector to edit the fee entries, because the fee is due.

01 OIL SYSTEM WARNING LIGHT IS ON

02 COOLANT SYSTEM WARNING LIGHT IS ON

03 FUEL SYSTEM LEAK

04 EXCESSIVE ENGINE NOISE

08 OTHER SAFETY PROBLEM

If the inspector selects one of the following abort codes, the analyzer shall:

1) not fail the vehicle;
2) set the EMISS _INSP_COST field to $0.00, because no fee is due;
3) mark the test as an aborted inspection, and not count the inspection as an initial inspection or reinspection;
4) prompt the inspector to indicate if safety related repairs were conducted. If no, set the SAFE_INSP_COST field to $0.00. Otherwise, allow the inspector to enter a value using the Safety Test Fee Prompt as shown in Section 3.1.22;
5) prompt the inspector to indicate if emissions-related repairs were conducted. If no, set the REP_CST_YIS fields to $0.00. Otherwise, allow the inspector to enter a value using the Emissions Reinspection Repairs Prompt in Section 3.4.6; and
6) include all entered safety and emissions related repair costs on the VIR.

05 VEHICLE DOES NOT REQUIRE INSPECTION

06 BMW, PEUGEOT, VOLVO, JAGUAR AUTOMATIC TRANSMISSION

07 ANALYZER PROBLEM

09 LOW FLOW RATE

99 OTHER (INDICATE REASON ON THE VEHICLE INSPECTION REPORT)

A maximum of two characters has been provided for this entry. The analyzer shall accept one two character abort code which shall be inputted by the inspector and saved to the test record. All of the inspection and test data collected up to the time abort is initiated, shall be recorded in the VEHICLE.DAT and REINSPEC.DAT files, and on the vehicle inspection report. After the abort code confirmation has been made, the analyzer shall allow the inspector to enter or edit the applicable fees, (i.e., safety fee, emissions fee, or both).

If the emissions test must be aborted after the sampling period has started, the latest five-second average (or the average of whatever portion of the first five seconds of the sampling period has elapsed) shall be treated as the "final value." Emissions readings shall be taken during all test modes

and the "final" reading shall be recorded on the VEHICLE.DAT and REINSPEC.DAT files and on the vehicle inspection report. The analyzer shall be designed so that the inspector can initiate the 'ESCAPE' or 'ABORT' sequence by depressing a maximum of one key. Leading zeros shall be entered by the analyzer software.

The analyzer shall be designed so that the inspector is required to confirm the initial abort command after entering the applicable abort code. The inspector shall be allowed to edit the abort codes up until the confirmation is made. If the inspector wants to return to the test, and not continue with the abort sequence, the inspector shall be allowed to do so prior to the confirmation. The inspector shall be returned to the same place in the test sequence they are at when the abort was initiated. However, if the abort was initiated during the emissions test, the inspector shall be returned to the beginning of the emissions test sequence. Unconfirmed aborts shall not be recorded on the test record. The abort code selected must be recorded to the VEHICLE.DAT file. The analyzer must then return to the main menu.

Data Entry Errors

Data entry errors will be displayed as the following message(s):

NO VALUE HAS BEEN ENTERED - TRY AGAIN

INVALID ABORT CODE - TRY AGAIN

Menus

The following list contains the menus manufacturers are required to provide. Manufacturers may break the menus down further to increase user friendliness or expedite certain operations. Manufacturers may provide additional menus. The TNRCC/DPS reserves the right to require modification if any menu does not meet minimum requirements.

Upon successful completion of the start-up diagnostics, the system shall display the main menu containing the following options:

1. Safety and Emissions Inspection
2. Safety Only Inspection
3. Emissions Only Inspection
4. Reinspection
5. Reprint Vehicle Inspection Report
6. Vehicle Diagnosis
7. Training Mode

8. Analyzer Maintenance

9. Audit Menu

10. Recall Aborted Inspection

11. Gas Cap Integrity Test

12. Missing, or Voided Certificates

13. Certificate Correction/Replacement

14. Technical Bulletins/Announcements

15. Communications Refresh

16. Communication Diagnostics (Loopback)

17. All data Communications

18. Inspection Log (VI-8B)

19. VI-30A Only

20. Test on Resale (shall be displayed immediately before ‘Reinspection’)

The inspector shall initiate an official emissions inspection by entering the number "1," the training mode by entering the number "7," and so forth.

Upon power-up of the analyzer, a full system check of all hardware components will be conducted. The system will verify that leak check has been performed during the past 24 hours. If not, the system will display the message "YOU MUST PERFORM A LEAK CHECK ON THE ANALYZER BEFORE YOU CAN PROCEED WITH ANY EMISSIONS TEST OPTION.”

After selecting Main Menu Option 1, 3, 4, or 10, the system will verify that a leak check has been performed during the past 24-hours. If not, the system will display the message "YOU MUST PERFORM A LEAK CHECK ON THE ANALYZER BEFORE YOU CAN PROCEED WITH ANY EMISSIONS TEST OPTION.”

If the leak check passes, the inspector can proceed with emissions test options of the analyzer. If it fails the leak check, the analyzer will prevent the inspector from proceeding with the emissions test options. The analyzer shall then check for station lockout flags in the LOCKOUT.DAT file. The analyzer shall check for a ‘1’ or ‘Y’ in the STAT_CERT_SUSP, STAT_CERT_EXP, or STAT_CERT_REVOK fields of the LOCKOUT.DAT file.

If a station lockout field equals "Y" or any power-up test fails, the analyzer shall disable all emissions test functions and display a message **"CALL SERVICE FOR REPAIRS OR YOUR LOCAL DPS OFFICE FOR STATION OR INSPECTOR LOCKOUT**."

Programming Criteria:	**VEHICLE.DAT**	**TEST_TYPE**
		EMISS_TEST_TYPE
		EMISS_INIT_TEST
		SPECIAL_TEST
	REINSPECT.DAT	**TEST_TYPE**
		EMISS_TEST_TYPE
		EMISS_INIT_TEST
		SPECIAL_TEST
	RECALL.DAT	**TEST_TYPE**
		EMISS_TEST_TYPE
		EMISS_INIT_TEST
		SPECIAL_TEST

The analyzer will set the EMISS_TEST_TYPE field to '1' if the inspector conducts an OBDII emissions test, '2' if the inspector conducts a two-speed idle emissions test, and a '3' if the inspector conducts an ASM emissions test.

If the inspector selects one of the following choices from the main menu:

1 - Safety & Emission Inspection
2 - Safety Only
3 - Emissions Only
5 - Reprint

The system will set test_type field to the following:

1 - 'A' 5 - 'K'
2 - 'H'

If 3 - Emissions Only is selected, prompt the inspector to indicated if the test is a:

1 - required emission only test (decal)
2 - voluntary test
3 - test on resale (not displayed or used)
4 - remote sensing request

The system will set test_type field to the following:

1 - 'O' 3 -'C'
2 - 'I' 4 - 'B'

Choice 'F' is reserved for 'minimum expenditure waiver tests,' and choice 'G' is reserved for 'federal tests'. Choice 'D' and choice 'E' are reserved for scrappage tests, and arbitration/dispute tests, respectively. The system will default/highlight selection number 1 in all of the scenarios.

NOTE: The tests and their corresponding letters are cross-referenced below:

A) Emission & Safety Test
B) Remote Sensing Request
H) Safety Only Test
I) Voluntary Emissions Test

C)	Test on Resale	J)	Waiver - Individual Vehicles
D)	Accelerated Vehicle Retirement Test	K)	Reprint
E)	Dispute Test	L)	Waiver - Low Income Time Extension
F)	Waiver - Minimum Expenditure	M)	Parts Availability Time Extension
G)	Federal Test	N)	Other (Special Test)
		O)	Required Emissions Only Test (Decal)
		P)	Waiver - Low Mileage

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3.1 Main Menu Selection '1' "Safety and Emissions Inspection"

3.1.1 Access Code Prompt: ENTER YOUR INSPECTOR'S ACCESS CODE

Programming Criteria:

The TX96 analyzer shall be designed to require the entry of the access code via the 2-D bar code reader. The inspector shall be required to enter his access code using the bar code reader for every inspection.

The TX96 analyzer shall be designed to require the entry of a special access code by the certified inspector before an official emissions inspection can begin. The access code shall neither be displayed nor printed on the Inspection Vehicle Inspection Report. This access code will be verified and linked to existing I/M Inspector number contained in the **INSPECTR.DAT** file. The analyzer shall not accept duplicate access code for different inspectors. Each inspector's access code shall be unique. The analyzer shall allow three attempts to enter a valid access code. Following each of the first two attempts, Error Message 1 shall be displayed. Error Message 2 shall be displayed for 5 minutes following the third attempt or until the inspector presses "enter/continue". The system shall then return to the main menu.

Error Messages:

1. **"YOUR ACCESS CODE IS NOT VALID--TRY AGAIN"**

2. **"THE ACCESS CODE ENTERED IS NOT VALID. VERIFY YOUR ACCESS CODE NUMBER WITH YOUR LOCAL DPS OFFICE."**

Associated System File: **INSPECTR.DAT** **ACCESS_CODE**

- -

3.1.1a PIN Number Prompt: ENTER YOUR INSPECTOR'S PIN NUMBER

Programming Criteria:

The TX96 analyzer shall be designed to require the entry of a special PIN by the

certified inspector before an official emissions inspection can begin. The PIN shall neither be displayed nor printed on the Inspection Vehicle Inspection Report. This access code will be verified and linked to existing I/M Inspector number contained in the **INSPECTR.DAT** file. The analyzer shall not accept duplicate PINs for different inspectors. Each inspector's access code shall be unique. The PIN will be encrypted on the analyzer and is unreadable to anyone. Also, any other files that contain the PIN (i.e. INSPECTR.REC) must be unreadable to anyone. The analyzer may encrypt or delete these files. The analyzer shall allow three attempts to enter a valid access code. Following each of the first two attempts, Error Message 1 shall be displayed. Error Message 2 shall be displayed for 5 minutes following the third attempt or until the inspector presses "enter/continue". The system shall then return to the main menu.

Error Messages:

1. **"YOUR PIN IS NOT VALID--TRY AGAIN"**

2. **"THE PIN ENTERED IS NOT VALID. CONTACT YOUR LOCAL DPS OFFICE TO RESET YOUR PIN."**

Associated System File: **INSPECTR.DAT** **PIN_NO**

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3.1.2 Date Expiration Prompt: **YOUR STATION/INSPECTOR CERTIFICATION EXPIRATION DATE IS MM DD YY**

Programming Criteria: The analyzer will then check the license expiration date and lockout flag for the inspector in the inspector file. The station license renewal date and lockout flag will then be checked in the station file. If either the station or the inspector license expiration date is within 60 days of today, then the analyzer will display Message 1 indicating the expiration date. If the inspector or station dates have passed, Message 2 will be displayed. The analyzer shall countdown the final five days prior to the expiration date of the inspector or the station certification. The analyzer shall display Message 3 in addition to Message 1 or 2 during the five-day countdown. If it is 30 days past the inspector or station expiration date, the system will set the station lockout flag in the station file or the inspector lockout flag in the inspector file to "Y" to indicate lockout has occurred.

If either the station or the inspector lockout flag is set, the analyzer will display a message that indicates lockout has occurred and returns to the main menu.

Error Messages:

1. **YOUR (STATION/INSPECTOR) CERTIFICATION EXPIRES MM/DD/YY.**

2. **YOUR STATION /OR INSPECTOR CERTIFICATION EXPIRED (date). YOU ARE NOT AUTHORIZED TO PERFORM ANY EMISSIONS INSPECTION AT THIS TIME. PLEASE CONTACT YOUR LOCAL DPS OFFICE.**

3. **YOUR (STATION/INSPECTOR) CERTIFICATION WILL EXPIRE IN X (5, 4, 3, 2, 1) DAY(S).**

Associated System File:	**INSPECTR.DAT**	**INSP_EXP_DATE**
	STATION.DAT	**STAT_EXP_DATE**
	LOCKOUT.DAT	**INSP_LOCKOUT_FLAG**
		STATE_LOCKOUT

- -

3.1.3 Insurance Prompt: **ENTER THE INSURANCE EXPIRATION DATE.**

Programming Criteria: Enter the insurance expiration date in the following format: MM/DD/YY. The analyzer system shall verify that the entry for the month is between 1 - 12, the entry for the day is between 1 - 31, and that the entry for the year begins with 19 or 20 (i.e., 1985, 2001). If the inspector enters a date that has passed, the analyzer shall provide a warning to the inspector. The warning shall indicate that the insurance has expired. The system will accept '000000' as a valid entry. The system will print '000000' on any applicable form, and write the vehicle record to VEHICLE.DAT.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **INSUR_EXP_DT**

- -

3.1.4 Fuel Type Prompt: **ENTER THE VEHICLE FUEL TYPE. SELECT THE APPROPRIATE FUEL TYPE CODE FROM THE LIST BELOW.**

Code	Description
"G"	**Gasoline**
"B"	**Bi-Fueled (Dual-Fueled)**
"D"	**Diesel (Not applicable -End Test Now)**

Programming Criteria: Entry of one of the above types is required. The analyzer software shall be designed so that only a "G," a "B,"or a "D" can be entered by the inspector for this field. The system software shall default to gasoline for this entry. If the inspector selects "B", the system shall display a message stating that **"YOU HAVE INDICATED THAT THIS VEHICLE IS DUAL FUELED. PLEASE CONFIRM THAT THE VEHICLE IS OPERATING ON GASOLINE FOR THE TEST WITH A "Y."**" After confirming the result, the system shall go to the model year prompt, 3.1.5. If the inspector presses something other than "Y", the system shall return to the initial fuel type prompt. If the inspector selects "D", the system shall display a message stating **"YOU HAVE INDICATED THAT THIS VEHICLE IS DIESEL FUELED. PLEASE CONFIRM THIS ENTRY BY PRESSING "Y". IF YOU CONFIRM THAT THE VEHICLE IS DIESEL FUELED, THE TEST WILL END. DIESEL FUELED VEHICLES ARE NOT REQUIRED TO BE TESTED."** If the inspector confirms the entry, the system shall return to the main menu. If the inspector presses something other than "Y", the system shall return to the initial fuel type prompt.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN.**

INVALID ENTRY--TRY AGAIN.

Associated System File: **VEHICLE.DAT** **FUEL_TYPE**

- -

3.1.5 Model Year Prompt: **ENTER THE LAST TWO DIGITS OF THE VEHICLE MODEL YEAR.**

Programming Criteria:

If no value is entered, the analyzer will display Message 1, and prompt the inspector to reenter the last two digits of the vehicle model year. If the vehicle model year is strictly less than the current year minus 24 years, or strictly greater than the current year minus two years, then display message 2, or a message on applicable model years, without writing any data to the disk file. The system will display a message asking the inspector if he/she desires to continue. If the inspector wishes to discontinue, then the system will abort the test and return to the main menu. The system will continue with the test if the inspector indicates that he/she wishes to continue. The system will display Message 3 in the event that the model year is beyond (i.e., strictly greater than) the current year +2, and prompt the inspector to reenter the last two digits of the vehicle model year or the entire model year. The system shall display message 4 in the event that the entered vehicle model year is greater than or equal to (>=) 1990 and

strictly less than the value contained in the OBDII_MODEL_YR field of the SYSTEM.DAT file (i.e., is not eligible to receive an OBDII emissions test). The analyzer shall require the inspector to confirm any model year entry that is less than 1950.

Error Message:

1. **NO VALUE HAS BEEN ENTERED TRY AGAIN.**
2. **NOT REQUIRED TO TEST VEHICLES OLDER THAN YEAR (CURRENT YEAR - 24) AND/OR VEHICLES LESS THAN 2 YEARS OLD. THIS IS AN OPTIONAL TEST.**
3. **INVALID MODEL YEAR -- TRY AGAIN.**
4. **THIS VEHICLE IS NOT ELIGIBLE FOR AN OBDII ONLY EMISSIONS TEST**

Associated System File: **VEHICLE.DAT** **MODEL_YEAR**

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3.1.5a Bar Code Entry of License Plate Type, Number, and VIN Prompt:

SCAN THE BAR CODE THAT CONTAINS THE LICENSE PLATE TYPE, LICENSE PLATE NUMBER, AND TXDOT NUMBER FROM THE VEHICLE INSPECTION REPORT.

OR

PRESS "ENTER/CONTINUE" TO CONTINUE IF THE VEHICLE INSPECTION REPORT IS NOT AVAILABLE.

Programming Criteria:

The analyzer prompt the inspector to scan the bar code which contains license plate type, number, and TXDOT number. After the first bar code is successfully scanned, the analyzer shall place a 'B' in the BARCODED_LIC_PLT, and BARCODED_TXDOT_NO fields, of the test record, and proceed to Section 3.1.8, VIN Number Prompt. If the inspector presses "enter/continue," the analyzer shall place a 'K' in the BARCODED_LIC_PLT, and BARCODED_TXDOT_NO fields of the test record, and allow the inspector to enter this information using the keyboard by proceeding to Section 3.1.6, License Type Prompt.

Error Message: **DID NOT SCAN PROPERLY–PLEASE TRY AGAIN**

Associated System File: **VEHICLE.DAT**

LICENSE_TYPE	**BARCODED_LIC_PLT**
LICENSE_NUM	**BARCODE_TXDOT**

TXDOT_NUM

- -

3.1.6 <u>License Type Prompt:</u> **"ENTER THE TYPE OF LICENSE PLATE OF THE VEHICLE."**

1.	**Texas Plate**	5.	**Exempt (Federal)**
2.	**No Plate**	6.	**Dealer Plate**
3.	**Out of State**	7.	**Temporary Buyer Tag**
4.	**Exempt (State)**	8.	**Other**

<u>Programming Criteria:</u> The inspector will be prompted to enter the license type of the vehicle. If the inspector selects license type ‘2,’or ‘8,’ the system will assign the License_Num field in the VEHICLE.DAT a value of "V" followed by the last seven digits of the VIN number, and skip the license prompt, number 3.1.7 . The entry in the License_Num field shall be a “V” and the seven rightmost characters of the VIN. If the entered VIN has less than seven characters, the entry should be a “V” followed immediately by the entered VIN without filler spaces between the “V” and the entered VIN. The system will default to license type ‘1.’

<u>Error Message:</u> **THIS FIELD MUST BE ENTERED TO CONTINUE WITH THE TEST.**

<u>Associated System File:</u> **VEHICLE.DAT** **LICENSE_TYPE**

- -

3.1.7 <u>License Prompt:</u> **"ENTER THE LICENSE NUMBER OF THE VEHICLE."**

<u>Programming Criteria:</u> The inspector will be prompted to enter the license number of the vehicle. Upon confirming the license plate entry, the vehicle information is eligible to be stored in the RECALL.DAT file. After the inspector enters the license plate number, the analyzer shall place a ‘K’ in the BARCODED_LIC_PLT field of the test record.

<u>Error Message:</u> **THIS FIELD MUST BE ENTERED TO CONTINUE WITH THE TEST.**

<u>Associated System File:</u> **VEHICLE.DAT** **LICENSE_NUM**
BARCODED_LIC_PLT

- -

3.1.7a **<u>Texas Department of Transportation (TxDOT) Number Prompt:</u>**
ENTER THE NUMBER FROM THE TxDOT REGISTRATION CERTIFICATE AFFIXED TO THE VEHICLE.

<u>Programming Criteria:</u> The system shall only give this prompt if the inspector selected 'Texas Plate' (i.e., License_Type is '1') as the license type of the vehicle in Section 3.1.6. The system will prompt for the TxDOT number as it appears on the vehicle.

Where available, the inspector will enter the TxDOT number by using the bar code reader to scan the bar coded TxDOT number that is on the windshield of the vehicle. The bar code of the windshield sticker will utilize the Code 39 symbology. The only information contained in the bar code are the start and stop characters, and the TxDOT number. After the first bar code is successfully scanned, the analyzer shall place a 'B' in the BARCODED_TXDOT_NO field of the test record. If a bar-code reader is not available, the inspector will be capable of entering the TxDOT number from the keyboard. After the inspector enters the TxDOT number, the analyzer shall place a 'K' in the BARCODED_TXDOT_NO field of the test record.

The system shall allow the inspector to see and edit the TxDOT number as it is being entered. When all characters of the TxDOT number have been entered, the system shall prompt the inspector to press "continue" or "enter". The inspector shall hit "continue" or "enter", the screen will blank the TxDOT number and ask the operator to reenter the TxDOT number under the same conditions as the previous entry. The two attempts must match. If the two attempts do not match, the analyzer will display Message 3 and prompt the inspector to enter the TxDOT number a third time. A minimum 10 characters are required for this field. If the entry is not within these parameters then the system will display Message 2. The format of the TxDOT number shall consist of eight numeric digits followed by two alpha characters. For example, 06691576WZ is a valid TxDOT number. If the entry is does not fit this format, then the system will display Message 4. If no value is entered, the analyzer will display Message 1.

<u>Error Message:</u>

1. **THIS FIELD MUST BE ENTERED TO CONTINUE WITH THE TEST.**
2. **A MINIMUM OF 10 CHARACTERS ARE NEEDED FOR THIS ENTRY--TRY AGAIN.**
3. **ENTRIES DO NOT MATCH -- TRY AGAIN.**
4. **THIS ENTRY MUST BE EIGHT NUMBERS FOLLOWED BY TWO LETTERS-- TRY AGAIN.**

<u>Associated System File:</u> **VEHICLE.DAT** **TXDOT_NUM**
BARCODED_TXDOT_NO

- -

3.1.8 <u>VIN Number Prompt:</u> **ENTER VIN NUMBER.**

<u>Programming Criteria:</u> The system will prompt for the VIN number as it appears on the vehicle. Where available, the inspector will enter the VIN number by using the bar code reader to scan the bar coded VIN on the vehicle. If a bar code reader is not available, the inspector will be capable of entering the VIN number from the keyboard. The analyzer will place a 'B' in the BARCODED_VIN field of the test record, if the VIN is entered using the bar code reader. Otherwise, the analyzer will place a 'K' in the BARCODED_VIN field of the test record.

The system shall allow the inspector to see and edit the VIN as it is being entered. When all characters of the VIN have been entered, the system shall prompt the inspector to press "continue" or "enter". The inspector shall hit "continue" or "enter", the screen will blank the VIN and ask the operator to reenter the VIN under the same conditions as the previous entry. The two attempts must match. If the two attempts do not match, the analyzer will display Message 3 and prompt the inspector to enter the VIN number a third time. A minimum of three and maximum of 17 characters are required for this field. If the entry is not within these parameters, then the system will display Message 2. If no value is entered, the analyzer will display Message 1. The VIN verification algorithm shall be applied here. The algorithm shall be supplied under separate cover by the TNRCC. The VIN verification shall only be applied to vehicles with model years 1981 and newer. The analyzer will not allow the inspector to enter the letters 'I,' 'O,' or 'Q' for vehicle with model years 1981 and newer. The software should suggest possible substitute letters when the DPS algorithm indicates that the VIN is bad. For example, the software could ask if the entered '8' could be a 'B.'

<u>Error Message:</u>

1. **THIS FIELD MUST BE ENTERED TO CONTINUE WITH THE TEST.**
2. **A MINIMUM OF 3 OR MAXIMUM OF 17 CHARACTERS ARE NEEDED FOR THIS ENTRY--TRY AGAIN.**
3. **ENTRIES DO NOT MATCH -- TRY AGAIN.**

<u>Associated System File:</u> **VEHICLE.DAT** **VIN_ID_NUM**
VIN_FLAG
BARCODED_VIN

- -

3.1.8a <u>Texas Information Management System Contact:</u>

The analyzer shall contact the Texas Information Management System Host, retrieve all applicable vehicle information, and enter the information into the appropriate fields.

An inspection shall be stopped, and the analyzer shall return to the main menu, if the following response bits are set in the RESPONSE.DAT file:

56 - Inspector License expired
57 - Inspector license suspended/revoked
58 - Inspector not authorized to test at this station
60 - TAS is locked out for at least one of the reasons included within "Lockout Status Record" data file

The analyzer shall obtain the test record from the Texas Information Management System Host and search the local system files for a VIN match. The analyzer shall conduct the local search, even if a test record is received from the Texas Information Management System Host. The local search shall only consist of the records for the last 17 days. This may cause the analyzer to end up with two different records (i.e., the record from the Texas Information Management System Host and the record from the local system files).

If the records are identical, then analyzer shall use either record to set the EMISS_INIT_TEST, and SAFE_INIT_TEST fields, determine eligibility status for the current inspection, and the test sequence for reinspections, if applicable.

If the records are different, then the analyzer shall set the flags as follows. The EMISS_INIT_TEST field shall be set based on the value of the EMISS_PF_FLAG in the most recent test record from the Texas Information Management System Host or the local system files. The SAFE_INIT_TEST field shall be set based on the value of the SAFE_INIT_TEST field in the test record for the most recent inspection conducted at the station in the last 17 days (i.e., the test record that contains the most recent date and is less than 17 days old, and a station number that matches the number of the station conducting the current inspection). The test record used to set the SAFE_INIT_TEST field will also be used to determine the eligibility status for the vehicle and the test sequence for reinspections. The EMISS_INIT_TEST and SAFE_INIT_TEST fields may potentially be set based on criteria from two different records (i.e., in a single test, EMISS_INIT_TEST could be set based on the record from the data link, while SAFE_INIT_TEST is set from the local record, and vice versa).

If a test record is available from either the Texas Information Management System Host or the system files, the analyzer shall confirm that the vehicle is eligible for an initial inspection by using the test record that was used to set the SAFE_INIT_TEST field.

If the vehicle has not had an initial inspection at this station within the last 16 days, the vehicle is eligible for an initial inspection. The vehicle is eligible for an initial inspection if:

1. the SAFE_INIT_TEST field in the test record is set to 'R,' or

2. the station number of the previous inspection station does not match the number of the station conducting the current inspection, or

3. the date of this inspection is not within 16 days of the inspection date contained in the

previous test record.

If the vehicle is not eligible for an initial inspection, the analyzer shall:

1. display a message indicating why the vehicle is not eligible for an 'initial inspection' (i.e., an initial inspection has already been conducted on this vehicle), and prompt the inspector to inform the customer that they will not be charged for this inspection;

2. save the vehicle information, possibly in the Recall.Dat file for use in the reinspection mode;

3. either transfer operation to the reinspection mode, Section 3.4, or continue in the initial inspection mode if the inspector is prompted to enter repair information about this vehicle; and

4. input the necessary vehicle information from the test record of the previous inspection once the analyzer is in the reinspection mode.

If the vehicle is eligible for an initial inspection because the station numbers do not match and the EMISS_PF_FLAG is set to 'F' in the test record of the previous inspection, the analyzer shall prompt the inspector for the repair data prior to conducting the preconditioned two-speed idle test.

Upon completion of this contact, the analyzer shall display all Technical Service Bulletins, Recall Information, and Announcements transmitted by the Texas Information Management System. The analyzer shall automatically print a copy of any announcement. The analyzer shall provide the option of printing additional copies prior to continuing with the test, deleting the announcement, or saving the announcement to a predetermined file. The analyzer shall be able to save three messages for later review. Any new announcement saved shall overwrite the oldest announcement in the system.

- -

3.1.9 <u>Vehicle Type Prompt:</u>

SELECT THE VEHICLE TYPE
'P' - PASSENGER CAR/STATION WAGON
'T' - TRUCK/VAN/SPORTS UTILITY VEHICLE
'M' - MOTOR HOME
'B' - BUS

<u>Programming Criteria:</u>

The inspector should select the vehicle type from the above list. The inspector shall be able to use the arrow keys to highlight the appropriate choice and press "continue" to select it. The default choice on this screen shall be the "passenger car/station wagon" selection.

If the inspector selects ‘M’ or ‘B’, the analyzer shall skip the Vehicle Body Type Prompt in Section 3.1.9a and use the Vehicle_Stnds_Type of ‘T’ if it receives an ASM inspection. If the inspector enters a gross vehicle weight for a bus or motor home that is less than 8501 pounds, the analyzer shall set the BODY_STYLE field to 6.

Error Message: **NO VALUES HAVE BEEN ENTERED--TRY AGAIN**

INVALID ENTRY--TRY AGAIN

Associated System File: **VEHICLE.DAT** **VEHICLE _TYPE**

- -

3.1.9a **Vehicle Body Type Prompt:** **ENTER THE VEHICLE TYPE.**

SELECT THE APPROPRIATE VEHICLE BODY TYPE FROM THE LIST BELOW:

CODE	VEHICLE BODY TYPE
1	SEDAN
2	STATION WAGON
3	PICKUP
4	SPORT/UTILITY VEHICLE
5	MINIVAN
6	FULL-SIZE VAN

Programming Criteria:

If the inspector selected ‘p’ as the vehicle type, the analyzer shall only display choices, 1 and 2. The default choice on this screen shall be the “passenger car/station wagon” selection. If the inspector selected ‘t’ as the vehicle type, the analyzer shall only display choice 3 through 6. In this case, the default choice on this screen shall be the “pickup” selection. The inspector shall be able to use the arrow keys to highlight the appropriate choice and press “continue” to select it. In either case, the analyzer may use the TXVRT.DAT to display the list of vehicle makes and models. This prompt may be combined with the vehicle type prompt in section 3.1.9 as long as the logic is correct.

If the inspector selected ‘M’ or ‘B’ as the vehicle type, the analyzer shall use the NCIC list to display the list of makes and models.

If the model year, make and model entered describe a unique vehicle (i.e., a single VRT Row number), the body type may be taken directly from the VRT record and the inspector does not need to be prompted to enter the body type.

The Vehicle Body Type will be used to determine the vehicle test standards group (Passenger car or Truck), which will be used for determining the appropriate test

standards to be used. Vehicle body type codes 1 and 2 will be tested as passenger cars, while body type codes 3-6 will be tested as trucks.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **BODY_STYLE**
VEHICLE_STNDS_TYPE

TXVRT.DAT **VEHICLE_BODY_TYPE**

- - - -

entry. The analyzer shall present the option of 'other' as a model definition for use when there is no applicable definition for the vehicle under inspection. The analyzer shall:

1) put a message on the screen that instructs the inspector to enter the full model name in the space provided and that the maximum entry length is 20 characters, and,
2) store the selected make name in the MAKE field, the inspector's entry in the MODEL field, and 'OTH' in the MODEL_CODE field.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN.**

Associated System File: **VEHICLE.DAT** **MODEL**
MODEL_CODE

- -

3.1.12 **Odometer Prompt:** **ENTER THE VEHICLE ODOMETER READING. A MINIMUM OF ONE NUMERIC ENTRY IS REQUIRED. DO NOT ENTER THE TENTH'S DIGIT.**

Programming Criteria: Enter the vehicle odometer. Do not include tenth's. The system shall only accept numerical entries in this field. If the analyzer is conducting this sequence as a "Test on Resale" inspection, and the entered values for model year and odometer indicate the vehicle is exempt from this requirement (i.e., model year >= 1995 or odometer >= 50,001), the system will display error message number 2, at any point between this prompt and the Safety Items Inspection Prompt.

Error Message:

1. **NO VALUE HAS BEEN ENTERED--TRY AGAIN**.

2. **THIS VEHICLE IS EXEMPT FROM TEST-ON-RESALE BECAUSE THE MODEL YEAR IS 1996 OR NEWER AND THE ODOMETER READING IS LESS THAN 50,000 MILES. PRESS "ENTER/CONTINUE" TO RETURN TO THE MAIN MENU.**

Associated System File: **VEHICLE.DAT** **ODOMETER**

- -

3.1.13 **Injection/Carburetion Prompt:**

SELECT THE INJECTION/CARBURETION

F - FUEL INJECTION

C - CARBURETION
O - OTHER

Programming Criteria: The inspector should select the appropriate injection/carburetion from the above list.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**

INVALID ENTRY--TRY AGAIN

Associated System File: **VEHICLE.DAT** **INJECT_CARB**

- -

3.1.16 **Cylinder Prompt:** **ENTER THE NUMBER OF CYLINDERS.**
FOR ROTARY ENGINES, ENTER AN "R."

Programming Criteria:

The analyzer shall display the choice(s) for the expected number of cylinders based on the previously entered engine size. The default for the number of cylinders to be entered shall be the value contained in the CYLINDERS field in the TXVRT.DAT file. The minimum number of cylinders is "1" and the maximum is "16". Any entries out of the "1-16" range will be rejected by the system.

For rotary engines, the inspector shall be prompted to enter an "R."

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN.**

NUMBER OF CYLINDERS IS NOT VALID--TRY AGAIN.

Associated System File: **VEHICLE.DAT** **CYLINDERS**

- -

3.1.16a **Engine Units Prompt:** **ENTER THE UNITS OF THE ENGINE SIZE**

Letter	Units
L	**Liters**
I	**Cubic Inches**
C	**Cubic Centimeters**

Programming Criteria: This prompt may be combined with the Engine Size Prompt to facilitate ease of entry for the lane inspector. The intent is to allow the inspector to select the correct engine size and unit of measure. Combination entries, such as 3.0 Liter, and 350 Cubic

inches, are preferable here. The analyzer shall prompt the inspector to enter the measurement unit for the engine size, and allow the inspector to use the arrow keys to highlight the appropriate selection, and press “continue” to select the correct choice. The analyzer software shall be designed so that an "I,” "L,” or "C" can also be entered for the units. The default for this screen shall be liters.

Error Message: **1. NO VALUE HAS BEEN ENTERED--TRY AGAIN**

2. INVALID ENTRY--TRY AGAIN

- -

3.1.16b **Engine Size Prompt:** **ENTER THE ENGINE SIZE**

Unit: **“Display selection from previous prompt here” (i.e., Liters, Cubic Inches, Cubic Centimeters)**

Size: **_____**

Programming Criteria: The analyzer shall display the unit of measure that was selected on the previous prompt, and allow the inspector to enter the engine size. When storing this information to the test record, the analyzer shall store the use the first four characters of the ENGINE SIZE field to hold the size entered at this prompt. The last character shall be the engine unit size. The engine unit size shall be "L" for liters, "I" for cubic inches, and "C" for cubic centimeters. The analyzer software shall be designed so that only an "I,” "L,” or "C" can be entered for the units. Liter size entry format shall be a numeric, decimal point, and numeric (i.e., “3.8”, “5.0”).

The internal storage on the TX96 analyzer record is to be automatically converted to cubic centimeters. The display shall remain in the original units entered. To convert from cubic inches to cubic centimeters, multiply by 16.387. To convert from liters to cubic centimeters, multiply by 1,000. Products shall be rounded to the nearest cubic centimeter.

An error message shall be displayed if the inspector enters an equivalent engine size greater than 9,999 cc or smaller than 655 cc. The inspector shall be instructed to correct the entry or abort the test. Vehicles powered by less than a 40 cubic inch engine (655 cc) shall display Error Message 3. If the test is aborted, no updates will be made to any disk file.

Error Message: 1. **NO VALUE HAS BEEN ENTERED--TRY AGAIN**

2. **INVALID ENTRY--TRY AGAIN**

3. **40 CID OR 655 CC OR SMALLER ARE EXEMPT FROM THE EMISSIONS INSPECTION PROGRAM.**

Associated System File: **VEHICLE.DAT** **ENGINE_SIZE**

- -

3.1.16c **GVW Prompt:** **ENTER THE GVW OF THE VEHICLE.**

Programming Criteria:

The system will prompt the inspector to enter GVW. The analyzer shall display the choice for the expected gross vehicle weight rating based on the previously entered engine size. The default for the GVW to be entered shall be the value contained in the GVWR field in the TXVRT.DAT file. If there is no value in the TXVRT.DAT file or there is not listing of the vehicle in the TXVRT.DAT file, the default shall be the value contained in the GVW_ACTUAL field of a previous test record. If the previous weight cannot be determined, no default entry shall be displayed. The inspector shall be allowed to disregard the default and enter his choice.

If the entered GVW is less than or equal to 8,500, set GVW_TYPE field in the vehicle file to 1 (light). If GVW is greater than or equal to 8,501, set GVW_TYPE field in the vehicle file to 2 (heavy).

If the inspector presses “continue/enter” and no entry has been made, the analyzer shall display message 1, and prompt the inspector to reenter the GVW. If the inspector enters a GVW greater than 85,000 pounds, the analyzer shall display message 2, and prompt the inspector to reenter the GVW. If the inspector enters a GVW strictly less than 2500 pounds, the analyzer shall display message 3, and prompt the inspector to reenter the GVW.

If the inspector selected ‘M’ or ‘B’ in the Vehicle Body Type Prompt and enters a gross vehicle weight that is less than 8501 pounds, the analyzer shall set the BODY_STYLE field to 6 and perform ASM test sequence, where applicable, and using the truck standards to determine pass/fail. If the vehicle is not eligible for ASM (traction control, AWD, etc.,) or the analyzer is not equipped to conduct ASM inspections, the TSI test shall be conducted.

For analyzers not equipped to conduct ASM inspections, the system will set the GVW_TYPE field as described above, and conduct the appropriate emissions test as described in the next two paragraphs.

If the entered vehicle model year is less than the value contained in the OBDII_MODEL_YR field of the SYSTEM.DAT file (i.e., is not eligible to receive an OBDII emissions test), the analyzer shall conduct a two-speed idle (TSI) emissions test on this vehicle.

If the entered vehicle model year is greater or equal to the value contained in the OBDII_MODEL_YR field of the SYSTEM.DAT file (i.e., is eligible to receive an OBDII emissions test), the analyzer shall conduct an OBDII emissions test on this vehicle.

For analyzers equipped to conduct ASM inspections, the system will set the GVW_TYPE field as described above only if the vehicle receives a TSI emissions test. Also, the system will conduct the appropriate emissions test as described in the next four paragraphs.

If the entered GVWR is strictly greater than 8500 (i.e., GVWR > 8500 lbs.), and the entered vehicle model year is less than the value contained in the OBDII_MODEL_YR field of the SYSTEM.DAT file (i.e., is not eligible to receive an OBDII emissions test), the analyzer shall conduct a two-speed idle (TSI) emissions test on this vehicle.

If the entered GVWR is less than or equal to 8500 (i.e., GVWR > 8500 lbs.), and the entered vehicle model year is less than the value contained in the OBDII_MODEL_YR field of the SYSTEM.DAT file (i.e., is not eligible to receive an OBDII emissions test), the analyzer shall conduct an ASM-2 emissions test on this vehicle. If the vehicle is not eligible to receive the ASM-2 test (GVWR > 8500, all wheel drive, etc.,), the system will conduct a two-speed idle (TSI) emissions test on this vehicle.

If the entered GVWR is strictly greater than 8500 (i.e., GVWR > 8500 lbs.), and the entered vehicle model year is greater or equal to the value contained in the OBDII_MODEL_YR field of the SYSTEM.DAT file (i.e., is eligible to receive an OBDII emissions test), the analyzer shall conduct an OBDII emissions test on this vehicle.

If the entered GVWR is less than or equal to 8500 (i.e., GVWR > 8500 lbs.), and the entered vehicle model year is greater or equal to the value contained in the OBDII_MODEL_YR field of the SYSTEM.DAT file (i.e., is eligible to receive an OBDII emissions test), the analyzer shall conduct an OBDII emissions test on this vehicle.

<u>Error Message:</u>

1. **NO VALUE HAS BEEN ENTERED--TRY AGAIN.**
2. **MAXIMUM GVW ENTRY IS 85,000 LBS--TRY AGAIN.**
3. **WEIGHT RATING MUST BE AT LEAST 2500 LBS.--TRY AGAIN**

<u>Associated System File:</u> **VEHICLE.DAT** **GVW_TYPE**
GVW_ACTUAL

- -

3.1.17 **Transmission Prompt:** **INDICATE THE TYPE OF TRANSMISSION.**
ENTER AN "M" IF IT IS MANUAL.
ENTER AN "A" IF IT IS AUTOMATIC

Programming Criteria: This information will be used to determine emissions control system requirements in the future. Only 'A' or 'M' entries are allowed.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN.**

Associated System File: **VEHICLE.DAT** **TRANSMISSION**

- -

3.1.18 **Ignition Prompt:** **ENTER IGNITION TYPE.**
SELECT THE APPROPRIATE IGNITION TYPE CODE FROM THE LIST BELOW:

Code	Ignition Type
"C"	**Conventional**
"D"	**Distributorless**
"Q"	**Quad 4/Wireless**

Programming Criteria: Entry of one of the above types is required. The analyzer software shall be designed so that only “C” Conventional, "D" Distributorless or, "Q" Quad 4/Wireless can be entered by the inspector for this field.

Error Message: **NO VALUES HAVE BEEN ENTERED--TRY AGAIN.**
INVALID ENTRY--TRY AGAIN.

Associated System File: **VEHICLE.DAT** **IGNITION**

- -

3.1.19 **Exhaust Prompt:** **DOES THE VEHICLE HAVE DUAL EXHAUST?**

"Y" = YES "N" = NO

Programming Criteria: The software shall ask the inspector to indicate if the vehicle is equipped with dual exhaust. If the inspector selects "Y" YES, then the analyzer shall display instructions to the inspector to attach the additional probe to the analyzer for testing. After the additional hose is connected to the analyzer, the inspector shall be required to hit “enter/continue” to proceed to the next prompt.

The analyzer shall read exhaust concentration from both exhaust pipes simultaneously. The analyzer averaging method of tailpipe reading is not acceptable. If the inspector selects "N" NO, the analyzer shall automatically proceed to the next item. The analyzer software shall be designed so that only a "Y" or an "N" can be entered by the inspector for this field.

Error Message: **INVALID ENTRY--TRY AGAIN.**

Associated System File: **VEHICLE.DAT** **DUAL_EXHAUST**

- -

3.1.19a **Vehicle 80" Width Prompt:** **IS THE VEHICLE 80 INCHES WIDE? (CHOOSE THE CORRECT SENTENCE)**

1. **NO, THE VEHICLE IS LESS THAN 80 INCHES WIDE.**

2. **YES, THE VEHICLE IS AT LEAST 80 INCHES WIDE.**

Programming Criteria:

The analyzer shall only display this prompt if the previously enter vehicle type is ‘T - Truck/Van/Sports Utility Vehicle’ or ‘M - Motorhome.’ The analyzer shall display these choices and allow the inspector to use the arrow keys, the number keys, or the letters ‘Y,’ and ‘N’ to highlight the appropriate choice and press enter to select.

If the previously entered vehicle type is ‘M - Motorhome,’ then the default is to phrase 2.

If the previously entered vehicle type is ‘T-Truck/Van/Sports Utility Vehicle,’ then the default is to phrase 1.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **80_INCHES**

- -

3.1.19.b **Drive Axle Prompt:** **IS THE VEHICLE EQUIPPED WITH AWD OR FULL-TIME 4 WHEEL DRIVE OR NON-DISENGAGEABLE TRACTION CONTROL. PLEASE CONFIRM BY PRESSING “Y” OR “N”**

Programming Criteria: The analyzer shall only display this prompt if the entered vehicle model year is less than the value contained in the

OBDII_MODEL_YR field of the SYSTEM.DAT file (i.e., is not eligible to receive an OBDII emissions test). If YES, and, according to the data stored in the station information (i.e., OBDII_ONLY set to 'N'), the emissions inspection system is not equipped with an AWD dynamometer, then display prompt:

PERFORM A TWO-SPEED IDLE EMISSIONS TEST

NOTE: Two speed idle emissions test procedure is included in Appendix K.

If NO, the EIS shall perform an ASM-2 emissions test.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN.**

INVALID ENTRY--TRY AGAIN.

Associated System File: **VEHICLE.DAT** **AXLE_TYPE**
OBDII_ONLY

- -

3.1.20 **Test Type Prompt:** **ENTER THE TYPE OF INSPECTION**

A-1 YEAR WINDSHIELD (SAFETY & EMISSIONS) **G-FMCSR (TRUCK)**

Programming Criteria:

The system shall only accept entries for alphabets 'a,' and 'g.' Thus, the default for this screen shall be 'a.'

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **SAFE_TEST_TYPE**

- -

3.1.20a **Confirm Vehicle Info Display:**

The analyzer shall display the vehicle information to the inspector and allow the inspector to edit the information as appropriate. If the vehicle information was populated by the Texas Information Management System, the inspector shall be allowed to edit all vehicle information except the VIN, the license plate type, and the license plate number. The inspector shall be required to press "continue/enter" to continue.

Upon confirming the vehicle, the vehicle information is no longer eligible to be stored in the RECALL.DAT file.

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3.1.21 Safety Inspection Items:

Programming Criteria:

The Texas Department of Public Safety wants to enhance the entry of the safety items of inspection to collect reasons for failing or repaired items, and to prescribe the order of appearance of the safety items based on the type of inspection selected. Appendix R contains nine lists of safety items in their prescribed order.

The analyzer must display the appropriate list choices based on entries made by the inspector. The analyzer will require the inspector to enter the status of the safety item in the order it appears in the list. The acceptable entries are 'P,' for pass, 'F,' for fail, 'R' for repaired. 'N' for N/A is not an acceptable entry. A value of 'N' in the safety item field may occur in a test record that is received from the VID (i.e., for reprinting purposes). That is why the 'N' is contained in the test record. It is a carry over from the previous version of software where this was an allowable entry. If the inspector select 'F' or 'R' for any safety item in the list, a subset list of failure reasons shall be displayed and the inspector shall highlight and select the failure reason or the entry that allows the inspector to return to the previous screen entry of 'F' or 'R' to edit this selection. The default for this display shall be to the 'return to previous screen' selection. The analyzer shall automatically enter the appropriate alpha character based on the selections made by the inspector.

If the vehicle type = 'P,' and the safe_test_type = 'A - 1 year windshield', then the analyzer shall display safety item sequence #1.

If the vehicle type = 'P,' and the safe_test_type = 'G - FMCSR (truck)', then the analyzer shall display safety item sequence #8.

If the vehicle type = 'B,' and the safe_test_type = 'A - 1 year windshield', then the analyzer shall display safety item sequence #3.

If the vehicle type = 'B,' and the safe_test_type = 'G - FMCSR (truck)', then the analyzer shall display the titles of safety item sequence #7, and safety item sequence #8, allow the inspector to use the arrow keys to highlight and select the appropriate safety item sequence by pressing 'continue/enter.'

If the vehicle type = 'T,' the safe_test_type = 'A - 1 year windshield,' and the 80_inches = 'N' (i.e., the truck is less than 80 inches wide), then the analyzer shall display the safety item sequence #1.

If the vehicle type = 'T,' the safe_test_type = 'A - 1 year windshield,' and the 80_inches = 'Y'

(i.e., the truck is at least 80 inches wide), then the analyzer shall display the safety item sequence #4.

If the vehicle type = ‘T,’ and the safe_test_type = ‘G - FMSCR (Truck),’ (Note: the 80 inches wide entry is not used here to determine the appropriate safety item sequence), then the analyzer shall display the titles of safety item sequence #8, and safety item sequence #5, and allow the inspector to use the arrow keys to highlight and select appropriate safety item sequence by pressing ‘continue/enter.’

If the vehicle type = ‘M,’ the safe_test_type = ‘A - 1 year windshield,’ and the 80_inches = ‘N’ (i.e., the truck is less than 80 inches wide), then the analyzer shall display the safety item sequence #1.

If the vehicle type = ‘M,’ the safe_test_type = ‘A - 1 year windshield,’ and the 80_inches = ‘Y’ (i.e., the truck is at least 80 inches wide), then the analyzer shall display the safety item sequence #4.

If the vehicle type = ‘M,’ and the safe_test_type = ‘G - FMSCR (Truck),’ (Note: the 80 inches wide entry is not used here to determine the appropriate safety item sequence), then the analyzer shall display safety item sequence #8.

The inspector shall be required to press “enter/continue” after each item. These fields are required and must contain a valid entry. The system does not have to display the screen heading during the test sequence. The system shall enter the date and the inspector’s drivers license number. The inspector should be able to access an item’s associated help screen by placing the cursor in the parentheses and pressing the ‘F1’ key. The help screens are in Appendix D for each type of Safety Inspection test. If any safety item is entered as failing (i.e, stored value of ‘A,’ ‘C,’ ‘E,’ ‘H,’ ‘J,’ ‘L,’ ‘O,’ ‘S,’ ‘U,’ ‘W,’ or ‘Y’), then set the SAFETY_PF_FLAG to 'F'. Otherwise, set the SAFETY_PF_FLAG to 'P' for pass (i.e, all safety items entered as passing or repaired.).

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT**

SAFE_1	**SAFE_2**
SAFE_3	**SAFE_4**
SAFE_5	**SAFE_6A**
SAFE_6B	**SAFE_7**
SAFE_7A	**SAFE_7B**
SAFE_8	**SAFE_9**
SAFE_10A	**SAFE_10B**
SAFE_10C	**SAFE_10D**
SAFE_10E	**SAFE_10F**
SAFE_11	**SAFE_12**
SAFE_13	**SAFE_14**
SAFE_15	**SAFE_16**
SAFE_17	**SAFE_18**

SAFE_19	**SAFE_20**
SAFE_21	**SAFE_22A**
SAFE_22B	**SAFE_22C**
SAFE_22D	**SAFE_23**
SAFE_24	**SAFE_25**
SAFE_26	**SAFE_27**
SAFE_28	**SAFE_29**
SAFE_30	

SAFETY_PF_FLAG
DPS_SAFE_SEQ

- - - -

unusually large, please confirm the amount entered or reenter the fee.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **SAFE_INSP_COST**

- -

3.1.23 **Pre-Tune Prompt:** **DID INSPECTOR/FACILITY PERFORM ANY EMISSIONS-RELATED REPAIRS OR ADJUSTMENTS PERFORMED ON THE VEHICLE PRIOR TO THIS TEST?**

"Y" - YES **"N" - NO**

Programming Criteria: The analyzer will ask the inspector if pre-tuning was performed on this vehicle prior to testing. The analyzer software shall be designed so that only a "Y" or an "N" can be entered by the inspector for this field.

Error Message: **NO VALUES HAVE BEEN ENTERED--TRY AGAIN.**

Associated System File: **VEHICLE.DAT** **PRE_TUNE**

- -

3.1.23a **Update Test Record:**

Programming Criteria:

Once the inspector has inserted the probe into the tailpipe and pressed ‘continue’, the analyzer shall update the test record and store a ‘J’ in the ABORT field. If the test sequence is not exited properly (i.e., unit is powered down), the analyzer shall be able to send the test record for the affected inspection to the VID during the next communications session. This test record shall contain a ‘J’ in the ABORT field. If the inspection is aborted properly after ‘J’ has been stored, the analyzer shall replace the ‘J’in the ABORT field with an ‘A’ and include the entered abort code.

If the emissions phase of the inspection is not aborted after ‘J’ has been stored, the system shall replace the ‘J’ in the ABORT field with a blank/space.

- -

3.1.23b **OBD II Hookup:**

The analyzer will prompt the inspector to conduct an OBD II check on all passenger

vehicles and light-duty trucks whose model year is equal to or newer than the vehicle model year contained in the OBDII_Model_Year field of the SYSTEM table. The analyzer should automatically search for vehicle-specific test parameters in the TXVRT.DAT file when an OBD II check is conducted. If these test parameters are not located in the TXVRT.DAT file, the analyzer shall use the default parameters in the SYSTEM.DAT file. Unless otherwise stated, the analyzer shall compare vehicle make, model, and model year in matching records with the vehicle being inspected.

The analyzer must be equipped with a standard SAE J1978 OBD connecter and communications link to allow an RPM signal, readiness codes, fault codes, and Malfunction Indicator Light (MIL) status to be downloaded from the on-board computer for applicable vehicles.

The equipment design and operation must meet all Federal requirements (contained in 40 CFR 85.2207-2231) and recommended SAE practices (J1962, J1978 and J1979) for OBDII system inspections.

The OBDII interrogation process shall be fully integrated into the TX96 analyzer system. It must be automated and require no inspector intervention to collect and record the OBD data retrieved via the OBD diagnostic link. An RPM signal, OBDII readiness codes, failure codes, and MIL status shall be automatically retrieved through a standard interface and vehicle connector. No hand-held unit or separate interface may be used.

If the OBDII Port has previously been connected for the RPM signal, proceed to the OBDII Readiness Evaluation Section. If not, proceed to the following prompt.

- -

3.1.23c **<u>OBD II Connector Prompt:</u>**

TURN THE CAR OFF (I.E., PUT KEY IN “OFF/LOCK” POSITION)

LOCATE THE VEHICLE’S OBD DIAGNOSTIC LINK CONNECTOR.

ATTACH THE OBDII PORT TO THE VEHICLE CONNECTOR.

LEAVE CAR OFF FOR 12 SECONDS WITH CONNECTOR ATTACHED.

PRESS CONTINUE.

<u>Programming Criteria:</u>

The analyzer will prompt the inspector for an OBD II diagnostic link connection for all passenger vehicles and light-duty trucks whose model year is equal to or newer than the vehicle model year contained in the OBDII_Model_Year field of the SYSTEM table.

The analyzer will be designed to provide assistance to the inspector with OBD II connector locations using an OBD II connector look-up table.

- -

3.1.23d **<u>OBD II (Key On, Engine Off) Prompt:</u>**

TURN THE IGNITION KEY TO THE 'ON' POSITION, BUT DON'T START THE ENGINE. LOCATE THE MIL (MALFUNCTION INDICATOR LIGHT) ON THE DASHBOARD.

DID THE MIL TURN ON? Note: MIL may stay on continuously or go out after only a few seconds. (CHOOSE THE CORRECT SENTENCE)

YES, the MIL did come on.

NO, the MIL did <u>NOT</u> come on at all.

The malfunction indicator light (mil) will either display "service engine soon," "check engine," the word "check" along with the international engine symbol, or some combination of these depending on the vehicle make.

<u>Programming Criteria:</u> The analyzer will ask the inspector to perform a key-on/engine-off check to see if the Malfunction Indicator Light/Check Engine Light (MIL) properly illuminates. The analyzer shall prompt the inspector to enter a No if the MIL does not properly illuminate. The analyzer software shall be designed so that the inspector can use the arrow keys to highlight his choice and press "continue" to select the appropriate sentence. The analyzer software shall not have a default entry for this screen. The inspector must be required press the arrow key at least once, followed by the "continue".

The help message for this screen shall contain the following text: "The Malfunction Indicator Light (MIL) is the official term for the warning light that is illuminated by the vehicle's OBD system when a malfunction occurs. Depending on the vehicle make, the MIL will either display "service Engine Soon," "Check Engine," the word "Check" along with the international engine symbol, or some combination of these . The MIL must come on when the ignition key is turned to the "key on, engine off" position. This is to allow inspectors to check that the MIL is capable of illuminating if a malfunction were to occur. On most vehicles, the MIL will stay illuminated as long as the key is in the position. However, on some vehicles, the MIL will illuminate very briefly when the key is turned to the "key on, engine off" position and then go out."

<u>Error Message:</u> **1. NO VALUES HAVE BEEN ENTERED--TRY AGAIN.**

<u>Associated System File:</u> **VEHICLE.DAT** **OBD2_MIL_CHECK**

- -

3.1.23e **<u>OBD II Engine Running Prompt:</u>**

START THE ENGINE AND ALLOW IT TO IDLE FOR AT LEAST 20 SECONDS. (I.E., PUT KEY IN "RUN" POSITION)

PRESS CONTINUE.

<u>Programming Criteria:</u>

The analyzer shall require the inspector to confirm that the vehicle is started and idling, by pressing the "enter/continue" key. The analyzer may attempt to establish communications while displaying this prompt and accepting the response from the inspector.

- -

3.1.23f **<u>OBD II Key On, Engine Running (KOER) Prompt:</u>**

DID THE MIL TURN OFF? (CHOOSE THE CORRECT SENTENCE)

Yes, the MIL turned off.

No, the MIL stayed on.

<u>Programming Criteria:</u>

The analyzer will ask the inspector to see if the Malfunction Indicator Light/Check Engine Light (MIL) illuminates while the engine is running. The analyzer shall store a No, if the inspector indicates that the MIL does not illuminate while the engine is on. The analyzer software shall be designed so that the inspector can use the arrow keys to highlight his choice and press "continue" to select the appropriate sentence. The analyzer software shall not have a default entry for this screen. The inspector must be required press the arrow key at least once, followed by the "continue" key. The analyzer may attempt to establish communications while displaying this prompt and accepting the response from the inspector.

If the previously entered GVWR is greater than 8500 pounds (i.e., >8500 lbs.), the analyzer shall only collect the data from the vehicle OBD system and not use the data in the pass/fail determination.

<u>Error Message:</u> **1. NO VALUES HAVE BEEN ENTERED--TRY AGAIN.**

Associated System File: **VEHICLE.DAT** **OBD2_MIL_ON_RUN**

- -

3.1.23g **OBD II Connection Prompt:**

COMMUNICATION IN PROGRESS, PLEASE WAIT.

Programming Criteria:

The analyzer system shall display this message while attempting to establish communications with the vehicle's OBD computer.

If the inspector has pressed continue and connection cannot be confirmed, the analyzer will proceed to the OBD II Connection Non Confirmed Prompt in Section 3.1.23h. If the inspector has pressed continue and connection is confirmed, the analyzer will proceed to the OBD II Malfunction Indicator Light (MIL) Status Check in Section 3.1.23j.

- -

3.1.23h **OBD II Connection Not Confirmed Prompt:**

THE OBD II CONNECTION CANNOT BE CONFIRMED –CHOOSE THE NEXT ACTION

1. TRY AGAIN

2. DO NOT TRY AGAIN - - (I.E., FAIL THE CAR)

Programming Criteria:

The analyzer shall display these choices and allow the inspector to use the arrow keys or number keys to highlight the appropriate choice and press enter to select. The default is to phrase 1.

If the inspector selects phrase number 1, the analyzer will attempt to gain a confirmed OBDII connection. The analyzer must allow the inspector unlimited attempts to gain a confirmed OBDII connection.

If the inspector selects phrase number 2, then the analyzer shall proceed to the OBDII No Connection Reason Prompt in Section 3.1.23i.

- -

3.1.23i **OBD II No Connection Reason Prompt:**

THE OBD II CONNECTION CANNOT BE CONFIRMED –CHOOSE THE NEXT ACTION

1. BACK TO PREVIOUS SCREEN

2. CONNECTOR CANNOT BE LOCATED

3. CONNECTOR IS MISSING, DAMAGED, OR TAMPERED.

4. CONNECTOR IS OBSTRUCTED OR INACCESSIBLE AND CONNECTION IS NOT POSSIBLE.

5. COMMUNICATION FAILED, AND OBD II PORT IS ATTACHED TO CONNECTOR.

Programming Criteria:

The analyzer shall display all five choices and allow the inspector to use the arrow keys or number keys to highlight the appropriate choice and press enter to select. The default is to phrase 1.

If the inspector selects phrase number 1, the analyzer will return to the OBDII Connection Not Confirmed Prompt in Section 3.1.24g.

If the inspector selects phrase number 2, then the analyzer shall:

1. store a 'L' in the OBD2_DLC_RES field indicating the connector cannot be located, and,
2. proceed directly to the OBD Test Evaluation and Messages Prompt in Section 3.1.23 m.

If the inspector selects phrase number 3, then the analyzer shall:

1. store a 'D' in the OBD2_DLC_RES field indicating the connector is missing, damaged, or tampered, and,
2. proceed directly to the OBD Test Evaluation and Messages Prompt in Section 3.1.23 m.

If the inspector selects phrase number 4, then the analyzer shall:

1. store a 'I' in the OBD2_DLC_RES field indicating an inaccessible connector, and,
2. proceed directly the OBD Test Evaluation and Messages Prompt in Section 3.1.23 m.

If the inspector selects phrase number 5, then the analyzer shall:

1. store a 'N' in the OBD2_DLC_RES field indicating failed to establish communication with vehicle, and,
2. proceed directly to the OBD Test Evaluation and Messages Prompt in

Section 3.1.23 m.

If the test date is less than the date contained in the OBD2_FAIL_ST_DT field in the SYSTEM.DAT file, the analyzer shall:

1. Place a 'L,' 'D,' 'I,' or 'N,' in the OBD2_DLC_RES field in VEHICLE.DAT,
2. Place a blank in the OBD2_PF_FLAG field in VEHICLE.DAT,
3. Print 'FAIL' in the OBD section of the VIR,
4. A second page will be printed for the VIR indicating that the OBD failure is **"Advisory Only"**, and that the vehicle's on-board diagnostic system could not be checked due to: unsuccessful communications if the OBD2_DLC_RES is set to 'N,' or a missing, damaged, or tampered connector if the OBD2_DLC_RES is set to 'D', or an unlocated connector if the OBD2_DLC_RES is set to 'L', or an inaccessible connector if the OBD2_DLC_RES is set to 'I,'and,
5. Proceed directly to the Preconditioned Two-Speed Idle Test Procedure Prompt in Section 3.1.24.

The failure of the OBD portion of the test WILL NOT result in an overall test failure.

If the test date is equal to or greater than the date in the OBD2_FAIL_ST_DT field in the SYSTEM.DAT file, the analyzer will:

1. Place a 'L,' 'D,' 'I,' or 'N' to the OBD2_DLC_RES field in VEHICLE.DAT,
2. Place an 'F' in the OBD2_PF_FLAG field (and later to the OVERALL_RESULTS field) in VEHICLE.DAT,
3. Print 'FAIL' in the OBD portion and the OVERALL TEST RESULT section of the VIR,
4. A second page will be printed for the VIR indicating that the vehicle's on-board diagnostic system could not be checked due to: unsuccessful communications if the OBD2_DLC_RES is set to 'N,' or a missing, damaged, or tampered connector if the OBD2_DLC_RES is set to 'D', or an unlocated connector if the OBD2_DLC_RES is set to 'L', or an inaccessible connector if the OBD2_DLC_RES is set to 'I,'and,
5. Proceed to the OBD Test Evaluation and Messages Prompt in Section 3.1.23 m, and no tailpipe emissions inspection will be conducted.

The failure of the OBD portion of the test WILL result in an overall test failure.

Associated System File:	**VEHICLE.DAT**	**OBD2_DLC_RES**
		OBD2_PF_FLAG
		OVERALL_RESULTS

- -

3.1.23j OBD II Malfunction Indicator Light (MIL) Status Check:

Programming Criteria:

The analyzer will evaluate the MIL status based on the data returned via the OBD link from the vehicle's on-board diagnostic system. The Yes/No (Y/N) status of whether the MIL has been commanded to be illuminated will be recorded in the OBD2_MIL_STATUS field of the test record.

If the MIL status returned is NOT COMMANDED ON with the engine running (i.e., RPM is greater than zero), the analyzer shall:

1. store a "P" in the OBD2_MIL_STATUS field, and
2. proceed to the OBD Readiness Evaluation section.

If the MIL status returned is COMMANDED ON with the engine running (i.e., RPM is greater than zero), the analyzer shall:

2. store an "F" in the OBD2_MIL_STATUS field, and
3. proceed to the OBD Readiness Evaluation section.

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(7) Secondary air system (once/trip)
(8) Air conditioning system (once/trip)
(9) Oxygen sensor (once/trip)
(10) Oxygen sensor heater (once/trip)
(11) EGR system (once/trip)

iv. Continuous monitors are those in which the applicable system/condition is checked continuously during vehicle operation; once/trip monitors are only checked when the vehicle is driven in a certain manner (i.e., over a predefined driving cycle expected to occur in customer service). According to Federal regulation (40 CFR 86.099-17), a vehicle manufacturer is not required to store a readiness code for the continuous operating monitors; however, some may choose to do so.

v. Possible readiness code responses include: completed/ready, not completed/not ready, and 'not supported/not enabled.' A response that a monitor is not supported or enabled means that, for this particular vehicle, that monitor is not applicable. Hence, when a 'not supported/not enabled' response is given, the analyzer will not fail the vehicle for that code.

vi. All readiness code values will be written to the appropriate test record fields in the VEHICLE.DAT file for each inspection using the following format:
   i. Not supported/enabled = 0,
   ii. Completed = 1, and
   iii. Not completed = 2.

vii. If the value specified in the SYSTEM table for a particular readiness monitor is "Y", that code shall be used for the overall readiness determination. If the value specified for a readiness monitor in the SYSTEM table is "N", that code shall be ignored by the analyzer and not used for the overall readiness determination. Each readiness monitor field that contains a value of "Y" is an applicable readiness monitor.

For information on how to set the OBD2_READY_RES field, refer to part (a) of the OBD II Test Evaluation and Messages Prompt below.

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3.1.23l <u>OBD II Diagnostic Trouble Code (DTC) Check:</u>

<u>Programming Criteria:</u>

i. The analyzer shall send a request (i.e., Mode $03) to the on-board computer to determine the stored emissions-related powertrain trouble codes. The analyzer will repeat this cycle until the number of codes reported equals the number expected based on the previous Mode $01 response. Any codes listed in the DTC table shall be recorded on the test record and the text fault code description shall be printed on the second page of the VIR.

ii. If there are no DTCs:
   i. A 'P' will be written to both the OBD2_FAULT_CD_RES and OBD2_PF_FLAG

fields in VEHICLE.DAT,

ii. Two zeros ('00') will be stored in the DTC_STORED field of the VEHICLE. DAT file,

iii. A PASS will be printed in the OBD section of the VIR, and

iv. The analyzer will proceed to the OBD Test Evaluation and Messages Prompt in Section 3.1.23 m, no tailpipe emissions inspection will be conducted.

iii. If one or more DTC is found, which cause the MIL to be commanded to be illuminated;

i. The analyzer will check the OBD2_FAIL_DT field in the SYSTEM table;

ii. If the test date is less than the date in the OBD2_FAIL_DT field and the MIL has been commanded to be illuminated:

i. An 'F' will be written to both the OBD2_FAULT_CD_RES and OBD2_PF_FLAG fields in VEHICLE.DAT.

ii. The first ten DTC(s), which cause the MIL to be illuminated, that was found will be written to the FAULT_CODES(DTCS) field in the VEHICLE.DAT table.

iv. The analyzer shall store the total number of stored DTCs (not pending DTCs) causing the MIL to illuminate in the DTC_STORED field of the VEHICLE.DAT file. The analyzer shall also proceed to the OBD Evaluation Prompt.

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This number is found in the field called MAX_NUM_NOT_READY in the SYSTEM.DAT file and is the number of non-continuous monitors allowed not ready and still PASS the OBD test. This number changes as the vehicle model year changes. The applicable model years are contained in the MAX_NT_RDY_BGN_YR and MAX_NT_RDY_END_YR fields of the SYSTEM.DAT file. If the vehicle is deemed "not ready," the analyzer shall abort the inspection if the date of inspection is greater than the date contained in the OBDII_FAIL_ST_DT field of the SYSTEM.DAT. If the vehicle is deemed "not ready," the analyzer shall will default to a TSI inspection if the date of inspection is less than the date contained in the OBDII_FAIL_ST_DT field of the SYSTEM.DAT file. If any continuous monitors indicate "not ready", the vehicle shall NOT PASS the OBD test.

- If a continuous monitor returns a not-ready status the OBD2_READY_RES shall remain an "F", or

- If there are fewer than the maximum non-continuous monitors not ready (less than or equal to MAX_NUM_NOT_READY), then a "P" shall be stored in the OBD2_READY_RES field of the VEHICLE.DAT record, or

- If too many non-continuous monitors are not ready (greater than MAX_NUM_ NOT_READY) then the OBD2_READY_RES_RESULT shall remain "F."

(b) The following fields of the VEHICLE.DAT must contain a "P" in order to pass the OBD test sequence: OBD2_MIL_CHECK, OBD2_MIL_ON_RUN, OBD2_DLC_RES, OBD2_MIL_STATUS, and OBD2_READY_RES.

1. If all the above fields contain a "P" then the program will store a "P" in the OBD2_PF_FLAG field of the VEHICLE.DAT file and print a PASS in the OBD Test Result section on the VIR,

2. If any of the above fields contain a character other than a "P" then

   (i) If the OBD2_DLC_RES field has a "D," "I," or an "N" stored in it then the analyzer shall write a "F" to OBD2_PF_FLAG of the VEHICLE.DAT and a "FAULT" should be written on the ADVISORY VIR:

   (ii) If theOBD2_DLC_RES field does not have a "L" then the analyzer shall write a "F" to the OBD2_READY_RES field of the VEHICLE.DAT file and an "N/A" shall be printed on the ADVISORY OBD VIR.

(c) If the MY of the vehicle under test is equal to or greater than the value contained in the OBDII_MODEL_YR field of the SYSTEM.DAT file and the test date is prior to the PASS/FAIL (P/F) start date of OBD testing as defined in the SYSTEM.DAT file, OBD failures will not cause the vehicle to have an OVERALL TEST FAILURE. Motorist information messages shall be printed on an Advisory OBD VIR to be given to the motorist informing them of problems with their vehicle's OBD system. The analyzer shall proceed to perform a TSI emission test on failed OBD or aborted OBD tests during the advisory period.

NOTE: The Texas OBD advisory period starts when the OBD software is loaded on an analyzer and ends when the OBD mandatory P/F date flag is set in the SYSTEM.DAT file. Currently the start date of P/F OBD is May 1, 2002.

NOTE: The failing or aborted OBD ADVISORY VIR shall be printed prior to the tailpipe VIR.

1. If the value in the following fields is other than blank or "P" then the following message(s) shall be printed on the Advisory OBD VIR to inform the motorist of possible problems with their vehicle.

(i) If there is an "F" in the MIL KOEO or MIL KOER field the following shall be printed:
Based on the information received during the test, there may be a problem with your On-Board Diagnostic Computer Malfunction Indicator Light. Repairing any problems that exist will likely improve performance, fuel economy, and reduce pollution. This vehicle must have the On-Board Computer functioning properly to pass the vehicle inspection to register this vehicle next year. (Text subject to change)

OBD PRINT MESSAGE (2)

(ii) If there is a "D" or an "N" in the OBD2_DLC_RES field the following message shall be printed on the Advisory OBD VIR indicating that the vehicle's on-board diagnostic system could not be checked due to a missing, inaccessible, damaged, or tampered connector.
Based on the information gathered during an attempt to perform an On- Board Diagnostic test your vehicle has a missing, tampered, or broken Diagnostic Connector. This vehicle must have the On-Board Computer functioning properly to pass the vehicle inspection to register this vehicle next year. (Text subject to change)

OBD PRINT MESSAGE (3)

(iii) If there is an "I" in the OBD2_DLC_RES field the following message shall be printed on the ADVISORY OBD VIR indicating that the vehicle's on-board diagnostic system could not be checked due to inaccessible connector,
Based on the information gathered during an attempt to perform an On-Board Diagnostic test your vehicle has an inaccessible Diagnostic Connector. This vehicle must have the Diagnostic Connector accessible to allow the check of the On Board Diagnostic computer system on the vehicle next year. (Text subject to change)

OBD PRINT MESSAGE (4)

(iv) If there is an "F" in the OBD2_READY_RES field of the VEHICLE.DAT the vehicle will be failed and the following message shall be printed on the Advisory OBD VIR:
Based on the information obtained from the On-Board Computer in the vehicle, the system is not ready to make a determination regrading the pollution control

system on the vehicle. This situation must be corrected before the OBD system can be evaluated and the reinspection made next year. See your owner's manual for information on "OBD/Readiness driving procedures" or contact your vehicle service advisor. (Text subject to change)

OBD PRINT MESSAGE (5)

(v). If the OBD2_MIL_STATUS field has an "F" stored in it the following message shall be printed.

Based on the results of the On-Board Diagnostic test, your vehicle indicates there is a failure that is causing higher than allowed pollution levels to be emitted into the atmosphere. The problem(s) causing the failure, when fixed, will increase performance, fuel economy, and reduce pollution. Repair of the failure(s) will be required to pass the OBD test next year. (Text subject to change)

OBD PRINT MESSAGE (6)

(d) If the model year of the vehicle being tested is equal to or greater than the value contained in the OBDII_MODEL_YR field of the SYSTEM.DAT file and the test date is after the mandatory P/F start date as defined in the SYSTEM.DAT file, OBD test results will be used to evaluate the Overall PASS/FAIL result of the vehicle being tested. The vehicle will receive a PASS of the OBD system if the OBD2_PF_FLAG field contains a "P", or

1. If the OBD2_PF_FLAG is not "P" and

(i) if the result in the OBD2_DLC_RES is an "L" (abort code 80) the following message shall be printed on the P/F VIR:

Based on the information gathered during an attempt to perform an On Board Diagnostic test your vehicle has a missing Diagnostic Connector, or a Diagnostic Connector that cannot be located by the inspector. This vehicle must have the On-Board Computer Diagnostic connector available to the inspector and functioning properly to pass the vehicle inspection. If you have questions regarding this test, ask the inspector who performed this test. (Text subject to change)

OBD PRINT MESSAGE (10)

(ii) if the result in the OBD2_DLC_RES is an "D," "I," or an "N" the following message shall be printed on the P/F VIR:

Based on the information gathered during an attempt to perform an On Board Diagnostic test your vehicle has a damaged or inaccessible Diagnostic Connector. This vehicle must have the On-Board Computer Diagnostic connector available to the inspector and functioning properly to pass the vehicle inspection. If you have questions regarding this test, ask the inspector who performed this test. (Text subject to change)

OBD PRINT MESSAGE (11)

(iii) the result n the OBD2_READY_RES field is an "F" the following message shall be printed on the VIR: a "FAIL" shall be printed in the OBD2_PF_FLAG section of the P/F VIR. A failed OBD vehicle shall receive a FUEL CAP TEST.

Based on information obtained from the On-Board Computer in the vehicle, the system is not ready to make a determination regarding the pollution control system on the vehicle. This situation must be corrected before the OBD system can be evaluated and the reinspection made which will allow this vehicle to be registered. See your owner's manual for information on "OBD/Readiness driving procedures" or contact your vehicle service advisor. (Text subject to change)

OBD PRINT MESSAGE (12)

2. If the value in the following fields is other than blank or "P" then the following message shall be printed on the P/F VIR to inform the motorist of possible problems with their vehicle.

(i) If there is an "F" in the OBD2_MIL_CHECK or the OBD2_MIL_ON_RUN field the following shall be printed on the P/F VIR:

Based on the information received during the test, there may be a problem with your On-Board Diagnostic Computer Malfunction Indicator Light. This vehicle must have the On-Board Computer system functioning properly to pass the vehicle inspection. (Text subject to change)

OBD PRINT MESSAGE (13)

(iv) If the OBD2_MIL_STATUS field has an "F" stored in it the following message shall be printed on the P/F VIR:

Based on information obtained from the On-Board Computer in the vehicle, the system has made a determination that there is a problem regarding the pollution control system on the vehicle. This situation must be corrected before the OBD system can be reinspected. See your owner's manual for information on "OBD/Readiness driving procedures" or contact your vehicle service advisor. (Text subject to change)

OBD PRINT MESSAGE (14)

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proceed to the Gas Cap Missing Prompt in Section 3.1.25.

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3.1.23o ASM-2 (Loaded Mode) Emission Test Sequence

Programming Criteria

Once the analyzer has established which inspector that will be conducting the inspection, the system will check the ASM_ESP, ASM_SNAP, ASM_WW, and ASM_SPX fields to determine if the inspector is certified to conduct ASM inspections using this system. The field will contain a 'Y,' if the inspector is certified to conduct the ASM inspections. An 'N' in these fields indicates that the inspector is not certified to conduct ASM inspections on this system. If the vehicle under inspection is to receive an ASM inspection and the associated "ASM_" field contains an 'N,' then the analyzer shall display an error message indicating that the inspector is not 'certified' to conduct ASM inspections on this type of analyzer system and return to the Main Menu. The associations shall be defined by the first two letters of the analyzer system (i.e., ASM_ESP to "ES" analyzers, ASM_SNAP to "JB," and "SE" analyzers, ASM_WW to "WW" analyzers, ASM_SPX to all remaining analyzer systems).

Note: ASM-2 Test Standards and Calculations (EPA) is located in Appendix S.

Note: ASM-2 Emission Test Procedure (EPA) also located in Appendix U.

1. RPM Signal

The software shall prompt the technician to select the RPM pick-up type to be used while performing the emissions test.

SELECT RPM PICK-UP DEVICE

1. CONTACT
2. NON-CONTACT
3. OBD II PORT
4. OTHER

Programming Criteria:

a. Beginning with the 1996 model year vehicles, the EIS shall be prompted to detect engine RPM via the OBDII port after 1/4/99.

b. The technician shall be given the opportunity to select another RPM pick-up device and continue with the current inspection (without causing the test to abort), if the RPM is not detected.

- RPM shall be displayed during the emissions test. Instability shall be immediately detected and displayed on the screen.

UNSTABLE RPM SIGNAL - - CHECK OR CHANGE PICK-UP

Programming Criteria:

1. A stable RPM signal is required to complete the emissions test. Manufacturers may propose an error tolerance factor to be used when testing vehicles with unstable RPM signals.

2. For "OTHER" RPM pick-up devices, the EIS manufacturer may develop a unique engine RPM pick-up. If the EIS manufacturer provides this option, a written explanation/procedure regarding this option must be submitted to TNRCC for approval.

2. General Procedure for ASM - 2 Mode Preconditioning

1. Safety Checks: The software shall prompt the technician to perform any equipment manufacturer-required safety checks.

2. Vehicle Alignment:

Programming Criteria:

Prompt the inspector to drive the vehicle onto the dynamometer and laterally stabilize, restrain, and chock the vehicle.

3. Vehicle Equivalent Test Weight (ETW) Selection: Select a test weight based upon the following criteria:

<u>Programming Criteria:</u>

The prompt shall only be displayed if the vehicle is eligible to receive the ASM-2 test (MY < 1995, no all wheel drive, etc.,) and the vehicle's test weight cannot be determined from the value in the VEHICLE_TEST_WT field of the TXVRT.DAT file or data received from the VID (i.e., the TEST_WEIGHT field in a previous test record). The test weight shall be selected from the VRT row number chosen in the vehicle information entry process. The analyzer shall use the model year, make, model, engine size, cylinders, and gross vehicle weight entries to determine test weight (i.e., MODEL_YR, VEHICLE_MAKE, MODEL, VEHICLE_BODY_TYPE, NUMBER_CYLINDERS, ENGINE_SIZE, GVWR). The analyzer shall use these fields in the following order to identify the specific VRT row: model year, vehicle make, model, body type/style, number of cylinders, engine size, then gross vehicle weight rating. If a specific VRT row cannot be matched, the default VRT test horsepower and test weight values based on the vehicle year, type, number of cylinders, etc., shall be used.

The ETW shall be recorded in the TEST_WEIGHT field of the test record and printed on the VIR.

4. Restrain the Vehicle:

Display Prompt:

IS THE VEHICLE A FRONT-WHEEL DRIVE? (YES/NO)

<u>Programming Criteria:</u>

1) If Yes (the vehicle is a front-wheel drive vehicle), the software shall:

Prompt the driver to laterally stabilize, restrain and chock the vehicle on the dynamometer if it has not already been done.

Display Prompt:

FRONT-WHEEL DRIVE VEHICLE: LATERALLY STABILIZE, RESTRAIN AND CHOCK.

Verify that the restraints are engaged (by a positive answer to a prompt) prior to preceding to the next step.

Note: Provisions must be made to ensure that restraints which control side-to-side movement are used on all front-wheel drive vehicles and that the vehicles are not just tied to some fixed object. If the restraint system does not control forward to backward movement, the TNRCC EIS must prompt the technician to place wheel chocks or equivalent.

2) If No (the vehicle is a rear-wheel drive vehicle), prompt the driver to restrain the vehicle.

Display Prompt:

REAR-WHEEL DRIVE VEHICLE: RESTRAIN AND CHOCK.

5. **Horsepower Applied During the ASM-2 Cycle**: During the ASM-2 test, the torque will remain constant during each mode of the test. The torque to apply will be derived from the dynamometer-applied horsepower for both the 5015 and the 2525 portions of the test using the following equation:

Torque = 5252 × [applied hp @ 25 mph] / [roll RPM]

Torque = 5252 × [applied hp @ 15 mph] / [roll RPM]

Dynamometer-applied horsepower for each mode of the ASM-2 loaded-mode test must be calculated using the appropriate weights located in the TXVRT.DAT file, or if unavailable, shall default to EPA supplied horsepower settings determined by engine cylinder as contained in the DFLTHP.DAT file. The default horsepower contains the following cylinder numbers: 3, 4, 5, 6, 8, and 9. Cylinder numbers 3, 4, 5, 6, and 8 are exact engine cylinder counts. Cylinder number 9 should be used for all engines that have more than 8 cylinders. Cylinder number 4 should be used for all rotary engines.

6. **Cooling Fan**: The analyzer shall prompt the technician to turn on the fan and to place it in position if the ambient temperature is above 72ºF. (The TNRCC EIS may provide the option of automatically turning on the fan from a remote location.)

7. **Probe and Tachometer Hookups**: The software shall prompt the technician to insert the sample probe into the tailpipe and attach the selected RPM pick up device.

8. **Gear Selection**: The technician shall be prompted, as appropriate, on transmission type:

1. Automatic Transmissions

Display Prompt:

PLACE THE TRANSMISSION IN DRIVE. IF THE ENGINE RPM EXCEEDS _____, PLACE THE TRANSMISSION IN OVERDRIVE.

<u>Programming Criteria:</u>

The software shall prompt the technician to place the transmission in drive. Engine RPM during the test mode shall not exceed the following:

a. Engine size less than or equal to 3.0L: RPM may not exceed 3000 RPM.

b. Engine size greater than 3.0L: RPM may not exceed 2500 RPM.

2. Manual Transmissions

Display Prompt:

PLACE THE TRANSMISSION IN SECOND GEAR.

KEEP ENGINE RPM BETWEEN ____ AND ____RPM.

<u>Programming Criteria:</u>

The software shall prompt the technician to test the vehicle in second gear unless the following criteria cannot be met, then select a gear that will maintain the following engine speeds.

a. Engine size less than or equal to 3.0L: Greater than or equal to 1500

RPM, less than or equal to 3000 RPM.

b. Engine size larger than 3.0L: Greater than or equal to 1250 RPM, less than or equal to 2500 RPM.

9. **Tire Drying:** If the test vehicle tires must be dried before the emission testing, the analyzer shall prompt the technician as follows:

Display Prompt:

DO THE TIRES NEED DRYING? (YES/NO)

Programming Criteria:

1. If YES, the analyzer shall require the technician to run the vehicle at any speed below 30 mph after selection of the transmission gear (engine speed may not exceed 3000 RPM) for a period from 15 to 30 seconds. When the roll speed exceeds 1 mph, the screen shall display the following delay message which shall include the seconds that must be waited until the test mode can begin.

Display Prompt:

ONCE THE TIRES ARE DRY, YOU MUST WAIT AT IDLE FOR ____ SECONDS PRIOR TO BEGINNING THE PRECONDITIONING MODE.

The software shall increment the above second timer one second at a time, not to exceed 30 seconds, until the rolls are brought to a stop (speed reaches 1 mph or less). If the vehicle speed exceeds 30 mph or the engine exceeds 3000 RPM during tire drying, the timer shall increment twice a second until the speed is brought below 30 mph or the engine speed below 3000 RPM. When the rolls come to a stop, the above timer shall decrement once every second until the time reads zero before the TNRCC EIS allows the driver to start the 50/15 mode. At the same time, display the following prompt:

Display Prompt:

DO THE TIRES NEED MORE DRYING? (Y)es OR (N)o

2. If NO (to either the 1st or 2nd question), the analyzer shall proceed to the next step (after any required waiting time) in the testing procedure.

10. ASM-2 Pre Emissions Test Conditions

The following conditions must be present before the TNRCC EIS begins the test sequence:

Programming Criteria:

a. Zero air, electronic span, ambient air, and hang up checks have been performed.

b. The TNRCC EIS does not detect a "low-flow" condition.

c. The engine idle speed is between 400 and 1250 RPM.

d. The dynamometer rolls are not turning (speed <1 mph). If the roll speed exceeds this limit, or the engine speed exceeds 1250 RPM, display the following delay message and increment the displayed seconds by two times the number of seconds the roll or engine speed are outside limits (not to exceed 30 seconds).

Display Prompt:

DELAY TESTING, YOU MUST WAIT ____ SECONDS.

e. Once the roll and engine speed are within the limits, decrement the time by one second at a time until the number of seconds reaches zero. The TNRCC EIS shall not start the test sequence until the dynamometer remains stopped for twice the time that the rolls were turning or 30 seconds whichever is less.

f. The analyzer does not detect a “sample dilution” condition.

11. Preconditioning

Once the conditions in (10) are met, the inspector shall be prompted to begin the

preconditioning sequence.

Programming Criteria:

The dynamometer shall smoothly apply the load once the vehicle speed exceeds 10 mph. The preconditioning shall be accomplished by driving the vehicle on the dynamometer using the 50/15 mode as specified in Appendix U A2(d). The vehicle will continue to be operated for 30 seconds at this speed within the speed and wheel force tolerance specified below. The duration of the preconditioning cycle may be adjusted by TNRCC if it is determined through the use of statistical process control methods that a shorter time is adequate to ensure that vehicles are fully warmed up prior to testing. The adjustment to the preconditioning cycle will be done via software updates until a more efficient method is developed.

If the speed or wheel force fall above or below the tolerance of ± 0.5 HP or ± 4% HP (which ever is greater) and ± 5 mph, the preconditioning timer will reset to zero. Preconditioning time shall not be included in the overall maximum test time.

Display Prompt:

PRECONDITIONING CAN BEGIN. ACCELERATE GRADUALLY TO 15 MPH

If, at any time during the preconditioning mode, the above speed and RPM criteria or the gear selection criteria fall outside the acceptable ranges, the software shall display one of the following appropriate messages to prompt the driver to correct the problem. The "dyno loading error" should be displayed if the ASM 50/15 load tolerances are exceeded, even if they are within the preconditioning tolerances above. A dyno loading error requires correction only if it is outside preconditioning tolerances.

Display Prompt:

OUTSIDE PRECONDITIONING SPEED LIMIT

OUTSIDE ENGINE RPM RANGE

DYNO LOADING ERROR

OUTSIDE DILUTION SPECIFICATION

ANALYZER LOW FLOW ERROR

12. ASM-2 (Loaded Mode) Emissions Testing Sequence

When the preconditioning sequence at ASM 50/15 speed and load has been successfully completed, the inspector shall be prompted that the ASM 50/15 test has begun. The ASM-2 mode timer shall start (mt=0) when the vehicle speed, engine rpm, dyno loading and dilution are within the test limits for five (5) continuous seconds.

If the test is restarted at any time during the test sequence, the previously stored second-by-second record shall be deleted. The second-by-second data shall be written to the second-by-second data record. The emission levels, without the DCF adjustment, shall be recorded in the second-by-second data record.

The emissions data (HC, CO, CO_2, and NO second-by-second readings) for both the ASM 5015 and ASM 2525 modes shall be time-aligned with the vehicle speed readings to account for the delay caused by the transport time needed to get the exhaust gas from the vehicle's tailpipe to the analyzers/sensors. This transport time may be different from the probe to the optical bench and from the probe to the NO sensor, and shall be accounted for. Time-alignment shall be done before any corrections (e.g., DCF) are applied.

a. **50/15 Test Mode (ASM Test Mode 1)**

At the conclusion of the preconditioning mode, the software shall prompt the driver to maintain the vehicle at 15 mph ±1 mph. The software shall display the 50/15 test speed with applicable speed limits (or drive trace graphical display), test time, engine RPM and other appropriate test mode information. The dynamometer shall meet the 50/15 test mode tolerances throughout the 50/15 test mode. The 50/15 mode shall begin (mt=0) when the roll speed (and corresponding power) is stabilized at 15 ± 1 mph for five consecutive seconds (which may include the last 5 seconds of the preconditioning mode if the 50/15 tolerances have been met for those 5 seconds).

The maximum duration for the 50/15 test mode is 90 seconds. The emissions averaging portion of the test shall not begin unless:

- Engine speed (manual transmission only) is within required engine RPM range.
- Load and dilution (CO + CO_2) fall within specifications. (If dyne horsepower loading remains out of specification for two or more consecutive seconds or dilution occurs, restart test according to the restart procedures listed later.)

If the vehicle has not stabilized in accordance with the above criteria within 25 seconds, the analyzer shall prompt the technician to restart the test according to the restart procedures listed later.

If the instantaneous dynamometer loading, as measured by the dynamometer load cell, differs from the command load by more than ±0.25 hp or ±2% whichever is greater for more than two consecutive seconds during the emissions averaging portion of the ASM 50/15 test, the analyzer shall set a dynamometer loading error. This shall cause the test mode to restart according to the restart procedures.

The pass/fail analysis using the fast pass criteria (i.e., reading are simultaneously below 50% of the normal cutpoints for HC, CO, and NOx) shall begin after an elapsed time of 15 seconds from mt=0, provided that the speed, load and acceleration readings are within specifications. Pass/fail analysis using the normal cutpoints shall occur between an elapsed time of 25 seconds (mt=25) and 90 seconds (mt=90), provided that the speed, load, and acceleration readings are with specifications. The vehicle shall pass the ASM 50/15 mode and the mode shall be immediately terminated if, at any point between an elapsed time of 15 seconds and 90 seconds, the 10 second running average measured values for each pollutant are simultaneously less than or equal to the applicable test standards (i.e., fast pass criteria between mt=15 and mt=24, standard cutpoints between mt=25, and mt=90).

If, at any time during the emissions-averaging portion of the test mode, the above criteria fall outside the acceptable ranges, the software shall display one of the following appropriate messages to prompt the driver to correct the problem.

Display Prompt:

OUTSIDE TEST SPEED LIMIT

OUTSIDE ENGINE RPM RANGE

DYNO LOADING ERROR

OUTSIDE DILUTION SPECIFICATION

ANALYZER LOW FLOW ERROR

As soon as the emission averaging portion of the test mode has begun, start monitoring the vehicle's acceleration every 0.5 seconds. If at any time the acceleration exceeds the limits , the software shall display the following message to prompt the driver that the acceleration is out of range:

Display Prompt:

OUTSIDE THE MAXIMUM ACCELERATION LIMIT

<u>Programming Criteria:</u>

Emissions resulting from transient throttle (i.e., outside the acceleration limit) shall not be included in the ten-second averaging data. In addition, if an acceleration violation occurs, that time-aligned data must not be used for emissions averaging. Instead, the emissions averaging will continue beginning five seconds after the time aligned acceleration violation ceased. (Time alignment is determined by subtracting TNRCC EIS response time and transport time.) If this event occurs near the end of the test (meaning another 10-second average cannot be completed), the last full 10-second average without acceleration violations will be the ending result for the mode.

When ten seconds have passed since the emissions-averaging portion of the test mode began, the software shall keep track of the number of acceleration excursions. The data shall be recorded in the ACCEL_VIOLAT_5015 field, of the test record, as appropriate. If the number of acceleration excursions exceeds five or the cumulative time exceeds five seconds, then the analyzer shall prompt the technician to restart the test according to the restart procedures listed later.

During the 10-second period used for the pass decision, the dynamometer speed must not fall more than 1.0 mph absolute drop, not cumulative. That is, if the speed at the end of the 10-second period is more than1.0 mph less than the speed at the start of the 10-second period, testing shall continue until the speed meets this criterion.

If, at any time during the emissions averaging portion of the test mode, the vehicle speed deviates by more than one mph from the target speed for more than two consecutive seconds at any time, the mode shall restart.

A vehicle shall pass the 50/15 test mode when the 10-second average readings for HC, CO and NO are all equal to or below the applicable standards for the vehicle. Once passing readings have been achieved for all three gases, the 50/15 mode shall terminate and the analyzer shall proceed to the next phase of the test.

The emissions readings used to make the pass/fail decision shall be recorded in the test record of SECXSEC.DAT. This data shall be purged from the analyzer when the data is transmitted to the TIMS.

b. **25/25 Test Mode (ASM Test Mode 2)**

The 25/25 test mode procedures are the same as those for the 50/15 test mode, except for the following:

Upon termination of the ASM5015 mode, the vehicle shall immediately begin accelerating to the speed required for the ASM2525 mode. The dynamometer torque shall smoothly transition during the acceleration period and shall automatically reset to the load required for the 25/25 mode once the speed reaches 25 mph.

The 25/25 mode shall begin (mt=0) when the roll speed (and corresponding power) is stabilized at 25 mph ±1 mph for five consecutive seconds.

The pass/fail analysis using the fast pass criteria (i.e., reading are simultaneously below 50% of the normal cutpoints for HC, CO, and NOx) shall begin after an elapsed time of 15 seconds from mt=0, provided that the speed, load and acceleration readings are within specifications. Pass/fail analysis using the normal cutpoints shall occur between an elapsed time of 25 seconds (mt=25) and 90 seconds (mt=90), provided that the speed, load, and acceleration readings are with specifications. The vehicle shall pass the ASM 25/25 mode and the mode shall be immediately terminated if, at any point between an elapsed time of 15 seconds and 90 seconds, the 10 second running average measured values for each pollutant are simultaneously less than or equal to the applicable test standards (i.e., fast pass criteria between mt=15 and mt=24, standard cutpoints between mt=25, and mt=90).

The number of acceleration excursions shall be recorded in the ACCEL_VIOLAT_2525 field of the test record.

A vehicle shall pass the 25/25 test mode if, after mt=25 seconds, the 10-second average readings for HC, CO and NO are all equal to or below the applicable standards for the vehicle. Once readings have been achieved for all three gases, the 25/25 mode shall terminate and the analyzer shall proceed, if applicable, to the second chance phase of the test.

The emissions readings used to make the pass/fail decision shall be recorded in the test record. If the vehicle failed either the 50/15 mode (ASM Test Mode 1) or the 25/25 mode (ASM Test Mode 2) with scores for any pollutant over 150% of the applicable standard, the vehicle shall fail the ASM-2 test. The ASM-2 test shall be terminated and both Mode 1 and Mode 2 test results shall be recorded on the VIR.

13. Second Chance Tests.

If all emissions results (HC, CO, and NO) for both ASM Modes are within 150% of the applicable standards, the vehicle is entitled to a second chance test (i.e., the HC, CO,

and NO readings for any valid ten-second average taken during the test mode are within 150% of the applicable standard). If all emissions results (HC, CO, and NO) for both ASM Modes are not within 150% of the applicable standards, the test will end and the vehicle will not received a second chance test. If an ASM mode is authorized for a second chance test, only the results of the second chance test for that mode shall be written to the VIR. However, all first chance test results shall be recorded on the test record as well as the second chance test results.

(a) If the vehicle fails the first-chance test, the test timer shall reset to zero (mt=0) and a second-chance test shall be performed, except as noted below.

(b) If the vehicle failed only the first mode (ASM 50/15) (within 150% of all standards) of the first chance test, then that mode shall be repeated upon completion of the second mode (ASM2525). The test will terminate when the mode ends or when the vehicle passes, whichever occurs first.

(c) The dynamometer torque shall smoothly transition during the deceleration period and shall automatically reset to the load required for the 50/15 mode once the speed reaches 15 mph. The second chance ASM 50/15 test shall proceed as in Section (12)(a) above. The analyzer shall display the following message:

Display Prompt:

SECOND CHANCE 50/15 TEST AUTHORIZED. PLEASE GRADUALLY DECELERATE TO 15 MPH AND REPEAT THE ASM 5015 MODE.

(d) If the vehicle is failing only the second mode (ASM25/25) (within 150% of all standards) of the first chance test, then the second mode shall not end at 90 seconds but shall continue for up to 180 seconds. Mode timers shall not reset but rather continue up to 180 seconds. The pass/fail analysis shall continue up to 180 seconds or until the vehicle passes, whichever comes first. If a restart occurs, then this second chance ASM 25/25 mode (i.e., pass/fail analysis, restart conditions, tolerances, etc.,) shall occur as described in Section 12(b) above.

(e) The dynamometer torque shall maintain the load required for the 2525 mode. The second chance ASM 2525 test shall proceed as in Section (12)(b). The analyzer shall display the following message:

Display Prompt:

SECOND CHANCE 25/25 TEST AUTHORIZED. PLEASE CONTINUE SPEED AT 25 MPH.

(f) If the vehicle failed both modes (ASM5015 and ASM 2525) (within 150% of all standards) of the first chance test, then the vehicle shall receive a second-chance test for the ASM5015.

(g) If the vehicle fails both modes (ASM 50/15 and ASM 25/25) of the first chance test, within 150% of all standards, the analyzer shall display the following message:

Display Prompt:

SECOND CHANCE 50/15 TEST AUTHORIZED. PLEASE DECELERATE GRADUALLY TO 15 MPH AND REPEAT THE ASM 5015 MODE.

The second chance ASM 50/15 test shall proceed as in Section (13)(b)&(c) above. The emissions readings used to make the pass/fail decision shall be recorded in the test record and on the VIR.

(h) If the vehicle fails the second-chance ASM 50/15, then the vehicle shall fail the ASM-2 test. Otherwise, the vehicle shall also receive a second-chance ASM 25/25. If the vehicle fails the ASM 25/25 second chance test, the vehicle shall fail the ASM-2 test. If the vehicle passes the second chance 25/25 mode, the vehicle shall pass the ASM-2 test.

The ASM-2 test shall terminate and the emissions readings used to make the pass/fail decision shall be recorded in the test record and on the VIR.

If the vehicle passes, the printed and recorded values shall be the passing readings. In addition to storing these readings, the analyzer shall also store the start time of the readings (i.e., the start time of the first chance 50/15 mode, and the end time of the final mode). If the vehicle fails, calculate the scores in the same manner and enter the values for the HC , CO, and NO into the record from the last valid ten-second average (i.e, test parameters within tolerances and no restart conditions occurred during the last ten-second average). Proceed to the second chance test and report only the scores obtained from it.

14. Augmented Braking

Augmented braking shall be operational during the ASM-2 test. Augmented braking for the ASM-2 test consists of applying the maximum safe load with the dynamometer to bring the rolls to a complete stop. Augmented braking shall automatically occur when any of the following conditions are met:

a. The conclusion of the final test mode (including second chance tests)

b. The test mode meets conditions for restart

c. The test mode meets conditions for abort

15. Restart Procedures

Bring the rollers to a full stop. Record the time that had elapsed since the beginning of the current mode. The software shall prohibit the restart of the test until the vehicle has idled (speed <1250) until twice the original elapsed time from the start of the current mode or one minute (whichever is less). The dynamometer load shall be applied when the speed reaches 10 mph and shall smoothly transition until the speed reaches 15 mph or 25 mph as applicable. The mode timer shall reset to zero when the speed and dynamometer load reach 15 or 25 mph ±1 mph (as applicable) for 5 continuous seconds. Upon restart, the previously captured second-by-second data for that test mode shall be deleted and data collection shall begin anew.

Display Prompt:

TEST MODE MUST BE RESTARTED BECAUSE:

a. Conditions Causing Test Mode Restart (all modes):

i. Vehicle and/or equipment unable to stabilize with required stabilization time.

ii. Acceleration violation according to the requirements stated in the test sequence.

iii. Dynamometer load outside of specification for two or more consecutive seconds.

iv. Sample dilution.

v. Engine speed below 100 RPM for two or more consecutive seconds.(i.e., RPM violation).

vi. Inadequate number of valid ten-second average readings.

vii. Analyzer “low flow” condition for two or more consecutive seconds.

viii. Vehicle speed outside test limit for two or more consecutive seconds.

ix. Engine speed outside of range for five or more seconds during one excursion. The engine speed ranges are: 1500 - 3000 RPM, for engine sizes less than or equal to 3.0 L; and 1250 - 2500 RPM, for engine sizes larger than 3.0L.

The software shall count the number of restarts during the test procedure. The count shall be written to the *ASM Restart Counter* field of the test record. The maximum number of restarts for the entire ASM test sequence is two, otherwise the test will be aborted. ASM-2 tests with no restarts will record zero in the appropriate fields; (two-speed idle tests will leave the field blank).

b. Conditions Causing ASM-2 Test Abort (both modes):

i. Safety-related issues

ii. Equipment failure

iii. Power loss

iv. Any of the restart conditions listed above, occurring more than twice

16. End of ASM-2 Emissions Test Mode

At the completion or termination of the ASM two-mode inspection, the analyzer shall display the following message:

Display Prompt:

END OF ASM-2 EMISSIONS TEST
REMOVE RESTRAINING SYSTEM FROM VEHICLE.
REMOVE COOLING FAN, TACHOMETER LEAD AND SAMPLE PROBE.
DRIVE THE VEHICLE OFF OF THE DYNO.

Upon completion of an emissions test, the analyzer must:

1. Set the EMISS_TEST_TYPE to “1" for ASM-2 test. If there is no previous inspection for this vehicle, or the EMISS_PF_FLAG for this vehicle’s previous inspection is ‘P,’set the EMISS_INIT_TEST to ‘I’ for initial test. If the EMISS_PF_FLAG for this vehicle’s previous inspection is ‘F,’ set the EMISS_INIT_TEST to ‘R’. If there is no previous inspection for this vehicle, the previous inspection was a reinspection, or the previous inspection was more than sixteen days prior to this inspection, set the SAFE_INIT_TEST to ‘I.’ If the previous inspection was less than sixteen days prior to this inspection, set the SAFE_INIT_TEST to ‘R.’

2. Set the HC_PF_FLAG, CO_PF_FLAG, NO_PF_FLAG, and EMISS_PF_FLAG to one of the following codes:

   (a) P - Pass; or
   (b) F - Fail;

3. Display the test results just prior to printing the rejection receipt or VIR, and write the vehicle test record to **VEHICLE.DAT**, if the entry for EMISS_FP_FLAG is a “P”.

4. Display the test results just prior to printing the rejection receipt or VIR, and write the vehicle test record to **VEHICLE.DAT** and **REINSPECT.DAT** if the entry for EMISS_PF_FLAG is an “F”.

5. If the inspector opted to ‘bypass’ the RPM, set the RPM_BYPASS to 'B'.

6. If the excessive dilution causes the test sequence to end, set the DILUTION_PF_FLAG to 'F'. Otherwise, set the DILUTION_PF_FLAG to 'P'.

7. If the emissions test ends due to a “time out” condition, set the TIMEOUT_FLAG to ‘Y.’ Otherwise, set the TIMEOUT_FLAG to ‘N.’

8. The system will automatically enter the following fields: VERSION, TEST_DATE, TEST_START_TIME, TEST_END_TIME, STATION_NUM, ANALYZER_NUMBER, INSPECTOR_NUM, COUNTY_CODE, DILUTION (Dilution Amount in percent, $CO + CO_2$).

9. Based on the vehicle information entered, the microcomputer shall choose all of the proper Emissions Standards Category (ESC) (see Appendix S - Test Standards

and Calculations, and Appendix T - Concentration Tables) for the vehicle being tested. The software shall provide for emissions standards which would be selected on the basis of vehicle year, vehicle type and weight. Updates to these tables shall come from the TIMS.

10. The emissions readings used to make the pass/fail decision shall be recorded in the test record of SECXSEC.DAT. This data shall be purged from the EIS when the data is transmitted to the TIMS.

11. The final results of the inspection go in the PRI fields. If second chance tests are conducted, the first chance test results are stored in the ALT fields and the second chance test results will be place in the PRI fields.

Associated System File:	**VEHICLE.DAT**	**PRI_AVG_5015_CO**
	REINSPECT.DAT	**PRI_AVG_5015_HC**
		PRI_AVG_5015_CO_2
		PRI_AVG_5015_NO
		PRI_AVG_5015_O_2
		PRI_AVG_2525_CO
		PRI_AVG_2525_HC
		PRI_AVG_2525_NO
		PRI_AVG_2525_CO_2
		PRI_AVG_2525_O_2
		ALT_AVG_5015_CO
		ALT_AVG_5015_HC
		ALT_AVG_5015_NO
		ALT_AVG_5015_CO_2
		ALT_AVG_5015_O_2
		ALT_AVG_2525_CO
		ALT_AVG_2525_HC
		ALT_AVG_2525_NO
		ALT_AVG_2525_CO_2
		ALT_AVG_2525_O_2
		PRI_AVG_2525_RPM
		PRI_AVG_5015_RPM
		ALT_AVG_2525_RPM
		ALT_AVG_5015_RPM
		RPM_PF_FLAG

DILUTION_5015
DILUTION_2525
DILUTION_PF_FLAG

HUMIDITY_CORR_5015
HUMIDITY_CORR_2525
HUMIDITY_PF_FLAG

HC_PF_FLAG
CO_PF_FLAG
NO_PF_FLAG
EMISS_PF_FLAG
ASM_RESTART_COUNT
TEST_TYPE
EMISS_INIT_TEST
TEST_WEIGHT

TEST_DATE
TEST_START_TIME
TEST_END_TIME
STATION_NAME
INSPECTOR_LNAME
INSPECTOR_FNAME

- - - -

temperature (based on a temperature gauge reading or a touch test on the radiator hose, and visual observation for overheating). The inspector shall insert the sample probe into the tailpipe and the test sequence shall begin. The test timer governing the overall test sequence shall begin at the start of sampling. A separate mode timer shall govern the modes within the test sequence and shall start when the specified conditions are met. The anti-dilution criterion shall be a minimum combined CO and CO_2 concentration of six percent (for all light-duty vehicles and light-duty trucks, five percent for all heavy-duty trucks).

B. **Initial Test**

The initial test shall have an overall maximum test time of 290 seconds. If after 290 seconds a valid test condition has not been obtained, the analyzer shall prompt the inspector to restart the emissions test or fail this portion of the test and continue to the next phase of the inspection. If the inspector elects to continue on to the next phase of the inspection, the test shall end and be reported as a **FAILED** test in the test record and on the vehicle inspection report. If the inspector elects to restart the emissions test, the analyzer shall restart the emissions test from the beginning, reset the time out flag, and write the emissions readings from the invalid test condition in the test record in the bytes that begin 'ALT_', and the next set of emissions readings in the test record in the bytes that begin 'PRI_.' If after 290 seconds a valid test condition has not been obtained after the restart, the test shall end and be reported as a **FAILED** test in the test record and on the vehicle inspection report. The procedure will not proceed to the second chance section. This condition could be caused by invalid RPM or Dilution.

C. **High-Speed Mode**

The mode timer shall start when engine speed is between 2200 and 2800 RPM and exhaust CO + CO_2 is at least six percent (for all light-duty vehicles and light-duty trucks, five percent for all heavy-duty trucks). The mode shall last 90 seconds. If engine speed falls below 2200 RPM or exceeds 2800 RPM for more than two seconds in one excursion, or more than six seconds over all excursions, within 30 seconds of final readings, the readings shall be invalid and the mode shall continue. If CO + CO_2 falls below six percent (for all light-duty vehicles and light-duty trucks, five percent for all heavy-duty trucks) at any time, the analyzer shall display a warning message indicating the dilution condition, prompt the inspector to check the probe for proper insertion, visually reinspect the analyzer hoses, check the vehicle's exhaust system for leaks, return to the beginning of the mode (i.e., reset the mode timer), and resume sampling once a valid testing condition is achieved.

The pass/fail analysis shall begin after an initial time delay of 10 seconds. The emissions level for HC and CO shall be analyzed at a minimum sampling rate of 2 Hz. A reading is

a simple average of the emissions levels over the last five seconds. Readings shall be taken as running averages.

The pass/fail determination is made based on a comparison of the HC and CO readings to the high-speed emissions standard selected for the particular vehicle. If the HC and CO readings show passing values for both HC and CO, then the vehicle has passed. If all readings fail for either HC, CO, or both, then the vehicle has failed the high-speed mode.

If the vehicle passes, the printed and recorded values shall be the passing readings, for which HC + (151*CO) is a minimum among all passing readings. In addition to storing these readings, the analyzer shall also store the start time of the readings (i.e., the start of the five second averaging period). If the vehicle fails, calculate the scores in the same manner and enter the values for the HC and CO into the record from the lowest score. Proceed to the second chance test and report only the scores obtained from it.

D. **Idle-Mode**

This mode shall be performed immediately following the high-speed mode. The mode timer shall start when the engine speed is between 350 and 1200 RPM and the concentration of CO + CO_2 is at least six percent. This mode shall last a minimum of 30 seconds as engine speed is between 350 and 1200 RPM, CO + CO_2 level is above six percent, idle mode time is less than 90 seconds, and passing readings have not been obtained. If engine rpm exceeds 1200 RPM or falls below 350 RPM, the mode timer shall reset to zero and resume timing. If the engine stalls, the test shall abort resulting in a **FAILED** test. If CO + CO_2 falls below six percent (for all light-duty vehicles and light-duty trucks, five percent for all heavy-duty trucks) at any time, the analyzer shall display a warning message indicating the dilution condition, prompt the inspector to check the probe for proper insertion, visually reinspect the analyzer hoses, check the vehicle's exhaust system for leaks, return to the beginning of the mode (i.e., reset the mode timer), and resume sampling once a valid testing condition is achieved.

The pass/fail analysis shall begin after an initial time delay of 10 seconds. The emissions level for HC and CO shall be analyzed at a minimum sampling rate of 2 Hz. A reading is a simple average of the emission levels over the last five seconds. Readings shall be taken as running averages. If readings less than or equal to 100 ppm HC and 0.5 percent CO are obtained before the 30-second point, the vehicle shall pass and the mode shall end immediately. Otherwise, the mode shall continue for at least 30 seconds and not more than 90 seconds, stopping between these two limits whenever local program cutpoints are met.

The pass/fail determination is made based on a comparison of the HC and CO readings to idle emissions standard selected for the particular vehicle. If the HC and CO readings show passing values for both HC and CO, then the vehicle has passed. If all readings fail for either HC, CO, or both, then the vehicle has failed the idle mode.

If the vehicle passes, the printed and recorded values shall be the passing readings, for which HC + (151*CO) is a minimum among all passing readings. In addition to storing these readings, the analyzer shall also store the start time of the readings (i.e., the start of the five second averaging period). If the vehicle fails, calculate the scores in the same manner and enter the values for the HC and CO into the record from the lowest score. Proceed to the second chance test and report only the scores obtained from it.

E. **Second-Chance Test**

If the vehicle fails either mode, the test timer shall restart and a second-chance test shall be performed. The second-chance test shall be performed for only the mode(s) that failed.

If the vehicle failed only the initial high-speed mode, the second-chance test shall consist of the high-speed test mode only. The overall test time limit for this sequence is 280 seconds. If the vehicle failed only the idle mode, the second-chance high-speed mode is for preconditioning only. If both modes were failed initially, a complete test is conducted. The second-chance idle test mode shall be performed if a vehicle has failed both its initial and second-chance high-speed tests. If the vehicle failed only the idle mode, the second-chance test shall consist of the preconditioning mode followed by the idle mode. The overall test time limit for these sequences shall be 425 seconds.

F. **Second-Chance High-Speed Mode Without Subsequent Idle Mode**

The engine shall be shut off and be restarted for 1981-1987 Ford Motor Company products and 1984-1985 Honda Preludes, but no other vehicles. A **prompt shall notify the inspector of this requirement**. If necessary to reduce analyzer fouling, remove the probe from the tailpipe or turn off the sample pump during the restart procedure.

The mode timer shall start when engine speed is between 2200 and 2800 RPM and exhaust CO + CO_2 is at least six percent (for all light-duty vehicles and light-duty trucks, five percent for all heavy-duty trucks). The mode shall last a minimum of 15 seconds and a maximum of 180 seconds. If engine speed falls below 2200 RPM or exceeds 2800 RPM for more than two seconds in one excursion, or for more than six seconds over all excursions within 30 seconds of the current final readings, the readings shall be invalid

and the mode shall continue. If CO + CO_2 falls below six percent (for all light-duty vehicles and light-duty trucks, five percent for all heavy-duty trucks) at any time, the analyzer shall display a warning message indicating the dilution condition, prompt the inspector to check the probe for proper insertion, visually reinspect the analyzer hoses, check the vehicle's exhaust system for leaks, return to the beginning of the mode (i.e., reset the mode timer), and resume sampling once a valid testing condition is achieved.

The pass/fail analysis shall begin after an initial time delay of 10 seconds. The emissions level for HC and CO shall be analyzed at a minimum sampling rate of 2 Hz. A reading is a simple average of the emission levels over the last five seconds. Readings shall be taken as running averages. If readings less than or equal to 100 ppm HC and 0.5 percent CO are obtained before the 30-second point, the vehicle shall pass and the mode shall end immediately. Otherwise, the mode shall continue for at least 30 seconds and not more than 180 seconds, stopping between these two limits whenever local program cutpoints are met.

The pass/fail determination is made based on a comparison of the HC and CO readings to high-speed emissions standard selected for the particular vehicle. If the HC and CO readings show passing values for both HC and CO, then the vehicle has passed. If all readings fail for either HC, CO, or both, then the vehicle has failed the test.

If the vehicle fails, the printed and recorded values shall be the readings for which HC + (151*CO) is a minimum. If the vehicle passes, the reported scores shall be the passing readings for which HC + (151*CO) is a minimum among all passing readings. In addition to storing these readings, the analyzer shall also store the start time of the readings (i.e., the start of the five second averaging period).

G. **Second-Chance Preconditioning Mode With Subsequent Idle Mode**

The mode timer shall initiate when engine speed is between 2200 and 2800 RPM. The mode shall continue for 180 seconds. If engine speed falls below 2200 RPM, or exceeds 2800 RPM for more than five seconds in any one excursion, or 15 seconds over all excursions, the mode timer shall reset to zero and resume timing.

H. **Second-Chance Idle Mode**

The second-chance idle mode shall be performed immediately following the second-chance preconditioning mode. The engine shall be shut off and restarted for 1981-1987 Ford Motor Company products and 1984-1985 Honda Preludes, but no other vehicles. A **prompt will notify the inspector of this requirement**. If necessary to reduce

analyzer fouling, remove the probe from the tailpipe or turn off the sample pump during the restart procedure.

The mode shall initiate when the engine speed is between 350 and 1200 RPM, and the concentration of $CO + CO_2$ is at least six percent (for all light-duty vehicles and light-duty trucks, five percent for all heavy-duty trucks and alternate fuel vehicles). The mode shall last a minimum of 30 seconds and a maximum of 90 seconds. The idle mode shall continue as long as engine speed is between 350 and 1200 RPM, $CO + CO_2$ level is above six percent (for all light-duty vehicles and light-duty trucks, five percent for all heavy-duty trucks and alternate fuel vehicles), idle mode time is less than 90 seconds and passing readings have not been obtained. If engine rpm exceeds 1200 RPM or falls below 350 RPM, the mode timer shall reset to zero and resume timing. If the engine stalls, the test shall abort. If $CO + CO_2$ falls below six percent (for all light-duty vehicles and light-duty trucks, five percent for all heavy-duty trucks) at any time, the analyzer shall display a warning message indicating the dilution condition, prompt the inspector to check the probe for proper insertion, visually reinspect the analyzer hoses, check the vehicle's exhaust system for leaks, return to the beginning of the mode (i.e., reset the mode timer), and resume sampling once a valid testing condition is achieved.

The pass/fail analysis shall begin after an initial time delay of 10 seconds. The emissions level for HC and CO shall be analyzed at a minimum sampling rate of 2 Hz. A reading is a simple average of the emission levels over the last five seconds. Readings shall be taken as running averages. If readings less than or equal to 100 ppm HC and 0.5 percent CO are obtained before the 30-second point, the vehicle shall pass and the mode shall end immediately. Otherwise, the mode shall continue for at least 30 seconds and not more than 90 seconds, stopping between these two limits whenever local program cut points are met.

The pass/fail determination is made based on a comparison of the HC and CO readings to idle emissions standard selected for the particular vehicle. If the HC and CO readings show passing scores for both HC and CO, then the vehicle has passed. If all readings fail for either HC, CO, or both, then the vehicle has failed the test.

If the vehicle fails, the printed and recorded values shall be the readings for which HC + (151*CO) is a minimum. If the vehicle passes, the reported scores shall be the passing readings for which HC + (151*CO) is a minimum among all passing readings. In addition to storing these readings, the analyzer shall also store the start time of the readings (i.e., the start of the five second averaging period).

I. **Graphic Illustration of Preconditioned Two-Speed Idle Test**

(Reserved)

J. **Test Sequence for BMW/Peugeot/Volvo/Jaguar**

The test sequence shall follow the procedure described in 40 CFR Part 51, Subpart S, Appendix B, (I) Idle Test (see Appendix K) with the following modifications.

Given the problems with the ZF automatic transmission, the TNRCC/DPS prefers that the affected vehicles be tested at their dealerships. Accordingly, if the inspector enters an "A" (for automatic) for the transmission type, and if the vehicle make, model and model year match BMW/Peugeot/Volvo/Jaguar criteria, the TX96 analyzer shall display the following message:

BECAUSE OF THE POSSIBILITY OF TRANSMISSION DAMAGE TO THIS VEHICLE, THE TNRCC/DPS PREFERS THAT IT BE INSPECTED AT ITS DEALERSHIP. IF YOU STILL WISH TO PERFORM THE INSPECTION, YOU MAY DO SO AT YOUR OWN RISK. PRESS "ENTER" TO CONTINUE. IF NOT, PRESS "ESC" TO ABORT THE TEST. (ENTER ABORT CODE 6.)

If the inspector chooses to continue testing this vehicle, display the following message before beginning the test sequence.

BEFORE BEGINNING THE EMISSIONS TEST, MAKE SURE THE ENGINE IS A NORMAL OPERATING TEMPERATURE. IF NOT, THE VEHICLE SHOULD BE DRIVEN UNTIL IT IS. <u>DO NOT</u> WARM THE ENGINE BY RAISING THE RPM ABOVE IDLE WHILE THE TRANSMISSION IS IN PARK OR NEUTRAL.

AFTER THE ENGINE REACHES NORMAL OPERATING TEMPERATURE, PUT THE TRANSMISSION IN PARK AND TURN THE ENGINE OFF FOR 30 SECONDS. RESTART THE ENGINE. AFTER THE ENGINE IS STARTED, <u>DO NOT</u> MOVE THE GEAR SHIFT SELECTOR THROUGH THE FORWARD OR REVERSE GEARS BEFORE OR DURING THE TEST SEQUENCE. <u>DO NOT EXCEED 2000 RPM.</u>

Testing period: 90 seconds, no second stage (second chance).

Test Stage: Idle RPM (see standards for maximum).

Units of test results: Concentration measurements: HC PPM, CO percent, CO_2 percent, O_2 percent.

All 1984-87 BMW's with automatic transmission, 1983-88 Volvo 740s with automatic transmission, 1984-89 Jaguar XjS's, and the 1986-92 Peugeot 505s with automatic transmission shall be tested using this test sequence or the latest test sequence supplied by the TNRCC.

K. Preconditioning Modes for BMW/Peugeot/Volvo/Jaguar

In addition to the preconditioning modes described for Ford Motor Company and Honda vehicles in Appendix B, the emissions test shall include the following preconditioning modes or the latest preconditioning modes supplied by the TNRCC. There are no preconditioning modes for vehicles that match the BMW/Peugeot/Volvo/Jaguar criteria (i.e., vehicle make, model and model year, and transmission).

L. Initial Test Completion

Upon completion of a preconditioned 2-speed idle test, the TX96 analyzer must:

1. Set the EMISS_TEST_TYPE to '2' for 2-speed idle test. If there is no previous inspection for this vehicle, or the EMISS_PF_FLAG for this vehicle's previous inspection is 'P,'set the EMISS_INIT_TEST to 'I' for initial test. If the EMISS_PF_FLAG for this vehicle's previous inspection is 'F,' set the EMISS_INIT_TEST to 'R'. If there is no previous inspection for this vehicle, the previous inspection was a reinspection, or the previous inspection was more than 16 days prior to this inspection, set the SAFE_INIT_TEST to 'I.' If the previous inspection was less than or equal to 16 days prior to this inspection, set the SAFE_INIT_TEST to 'R.'

2. Set the HC_PF_FLAG, CO_PF_FLAG, and EMISS_PF_FLAG to one of the following codes:

   (a) P - Pass; or

(b) F - Fail;

3. Display the test results just prior to printing the rejection receipt or VIR, update the test record, replace the ‘J’ in the ABORT field with a space or blank, and write the vehicle test record to **VEHICLE.DAT**, if the entry for EMISS_FP_FLAG is a “P”.

4. Display the test results just prior to printing the rejection receipt or VIR, update the test record, replace the ‘J’ in the ABORT field with a space or blank, and write the vehicle test record to **VEHICLE.DAT** and **REINSPECT.DAT** if the entry for EMISS_PF_FLAG is an “F”.

5. If the inspector opted to ‘bypass’ the RPM, set the RPM_BYPASS to 'B'.

6. If the excessive dilution causes the test sequence to end, set the DILUTION_PF_FLAG to 'F'. Otherwise, set the DILUTION_PF_FLAG to 'P'.

7. If the emissions test ends due to a “time out” condition, set the TIMEOUT_FLAG to ‘Y.’ Otherwise, set the TIMEOUT_FLAG to ‘N.’

8. The system will automatically enter the following fields: VERSION, TEST_DATE, TEST_START_TIME, TEST_END_TIME, STATION_NUM, ANALYZER_NUMBER, INSPECTOR_NUM, COUNTY_CODE, DILUTION (Dilution Amount in percent, $CO + CO_2$).

Associated System File:	**VEHICLE.DAT**	**PRI_CURB_IDLE_CO**
	REINSPECT.DAT	**PRI_CURB_IDLE_HC**
		PRI_CURB_IDLE_CO_2
		PRI_CURB_IDLE_O_2
		PRI_HIGH_SPEED_CO
		PRI_HIGH_SPEED_HC
		PRI_HIGH_SPEED_CO_2
		PRI_HIGH_SPEED_O_2
		ALT_CURB_IDLE_CO
		ALT_CURB_IDLE_HC

ALT_CURB_IDLE_CO_2
ALT_CURB_IDLE_O_2
ALT_HIGH_SPEED_CO
ALT_HIGH_SPEED_HC
ALT_HIGH_SPEED_CO_2
ALT_HIGH_SPEED_O_2

PRI_HIGH_SPEED_RPM
PRI_CURB_IDLE_RPM
ALT_HIGH_SPEED_RPM
ALT_CURB_IDLE_RPM

DILUTION
DILUTION_PF_FLAG
RPM_BYPASS

HC_PF_FLAG
CO_PF_FLAG
EMISS_PF_FLAG
TEST_TYPE
EMISS_INIT_TEST

STATION_NAME
INSPECTOR_LNAME
INSPECTOR_FNAME

- -

3.1.25 <u>Gas Cap Missing Prompt:</u>

IS THE GAS CAP MISSING? ('Y' OR 'N')

Programming Criteria: The system shall only accept a ‘Y’ or ‘N’ entry. If inspector indicates the gas cap is missing, the system shall set the GAS_CAP_MISS to ‘Y’, set the GAS_CAP_PF_FLAG_1 to 'F' - fail, (i.e., the vehicle shall fail the gas cap integrity test), and continue with the end of phase logic in Section 3.1.28b. If the inspector selects ‘N’, continue with the next screen prompt.

Error Message: **ONLY ‘Y’ OR ‘N’ WILL BE ACCEPTED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **GAS_CAP_MISS**
GAS_CAP_PF_FLAG_1

- -

3.1.26 Gas Cap Testable Prompt:

IS THE GAS CAP TESTABLE? ('Y' OR 'N')

Programming Criteria: The system shall only accept a ‘Y’ or ‘N’ entry. If the inspector indicates the gas cap not testable (‘untestable’), (i.e., selects ‘N’), the system shall set the GAS_CAP_PF_FLAG_1 to 'P' - pass, set the GAS_CAP_TESTABLE to ‘N’, and continue with the end of phase logic in Section 3.1.28b. If the inspector selects ‘Y’, continue with the next screen prompt.

Error Message: **ONLY ‘Y’ OR ‘N’ WILL BE ACCEPTED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **GAS_CAP_TESTABLE**
GAS_CAP_PF_FLAG_1

- -

3.1.27 Gas Cap Connect Prompt:

REMOVE THE GAS CAP FROM THE VEHICLE AND CONNECT IT TO THE GAS CAP TESTER. REFER TO THE OPERATOR’S MANUAL, IF REQUIRED.

Programming Criteria: If the gas cap tester is an integral part of the analyzer or fully automatic, the system will prompt the inspector to press "continue/enter" to conduct the test.

Error Message: **ONLY 'CONTINUE/ENTER' WILL BE ACCEPTED--TRY AGAIN**

- -

3.1.28 Gas Cap Results Prompt:

ENTER THE RESULTS OF THE GAS CAP INTEGRITY TEST. ('P' OR 'F')

Programming Criteria: If the gas cap tester is an integral part of the analyzer or fully automatic, the system shall not display this prompt, and shall enter the results of the test in GAS_CAP_PF_FLAG_1. The result shall either be 'P' for pass, or 'F' for fail.

Error Message: **ONLY 'P' OR 'F' WILL BE ACCEPTED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **GAS_CAP_PF_FLAG_1**

- -

3.1.28a Second Gas Cap Prompt:

IS THERE A SECOND FUEL CAP TO BE TESTED? ('Y' OR 'N')

Programming Criteria: This prompt shall not be displayed if the inspector has indicated that the gas cap is missing, or untestable. The default for this screen shall be to 'N.' The analyzer shall only accept an entry of 'Y' or 'N.' The error message shall be displayed, if the inspector enters something other than 'Y' or 'N.' If the inspector indicates that there is a second gas cap to be tested, the analyzer shall proceed to the Second Gas Cap Missing Prompt, in Section 3.1.28c.

Error Message: **ONLY 'Y' OR 'Y' WILL BE ACCEPTED--TRY AGAIN**.

- -

3.1.28b End of Phase Logic:

Programming Criteria:

Since the second gas cap will not be tested, the analyzer shall set the flags as follows. If the GAS_CAP_PF_FLAG_1 is set to "P" - pass, then set the GAS_CAP_PF_FLAG to "P." If the GAS_CAP_PF_FLAG_1 is set to "F" - fail, then set the GAS_CAP_PF_FLAG to "F."

For an ASM or TSI inspection, if the EMISS_PF_FLAG, the SAFETY_PF_FLAG, and the GAS_CAP_PF_FLAG are all set to "P" - pass, then set the OVERALL_RESULTS field to "P" for pass. If the EMISS_PF_FLAG, the SAFETY_PF_FLAG, and the GAS_CAP_PF_FLAG are not all set to "P" - pass, then set the OVERALL_RESULTS to "F" for fail.

For an OBD2 inspection, if the OBD2_PF_FLAG, the SAFETY_PF_FLAG, and the GAS_CAP_PF_FLAG are all set to "P" - pass, then set the OVERALL_RESULTS field to "P" for pass. If the OBD2_PF_FLAG, the SAFETY_PF_FLAG, and the GAS_CAP_PF_FLAG are not all set to "P" - pass, then set the OVERALL_RESULTS to "F" for fail.

Then, the system shall then proceed to the Emissions Test Fee Prompt, Section 3.1.29.

Associated System File:	**VEHICLE.DAT**	**EMISS_PF_FLAG**
		OBD2_PF_FLAG
		SAFETY_PF_FLAG
		GAS_CAP_PF_FLAG
		GAS_CAP_PF_FLAG_1
		OVERALL_RESULTS

3.1.28c Second Gas Cap Missing Prompt:

IS THE SECOND GAS CAP MISSING? ('Y' OR 'N')

Programming Criteria: The system shall only accept a 'Y' or 'N' entry. If inspector indicates the gas cap is missing, the system shall set the 2ND_GAS_CAP_MISS to 'Y', set the GAS_CAP_PF_FLAG_2 to 'F' - fail, (i.e., the vehicle shall fail the gas cap integrity test), and continue with the end of phase logic in Section 3.1.28g. If the inspector selects 'N', continue with the next screen prompt.

Error Message: **ONLY 'Y' OR 'N' WILL BE ACCEPTED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **2ND_GAS_CAP_MISS**
GAS_CAP_PF_FLAG_2

- -

3.1.28d **Second Gas Cap Testable Prompt:**

IS THE SECOND GAS CAP TESTABLE? ('Y' OR 'N')

Programming Criteria: The system shall only accept a 'Y' or 'N' entry. If the inspector indicates the gas cap not testable ('untestable'), (i.e., selects 'N'), the system shall set the GAS_CAP_PF_FLAG_2 to 'P' - pass, set the 2ND_GAS_CAP_TEST to 'N', and continue with the end of phase logic in Section 3.1.28g. If the inspector selects 'Y', continue with the next screen prompt.

Error Message: **ONLY 'Y' OR 'N' WILL BE ACCEPTED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **2ND_GAS_CAP_TEST**
GAS_CAP_PF_FLAG_2

- -

3.1.28e **Second Gas Cap Connect Prompt:**

REMOVE THE SECOND GAS CAP FROM THE VEHICLE AND CONNECT IT TO THE GAS CAP TESTER. REFER TO

THE OPERATOR'S MANUAL, IF REQUIRED.

Programming Criteria: If the gas cap tester is an integral part of the analyzer or fully automatic, the system will prompt the inspector to press "continue/enter" to conduct the test.

Error Message: **ONLY 'CONTINUE/ENTER' WILL BE ACCEPTED--TRY AGAIN**

- - - -

For an ASM or TSI inspection, if the EMISS_PF_FLAG, the SAFETY_PF_FLAG, and the GAS_CAP_PF_FLAG are all set to “P” - pass, then set the OVERALL_RESULTS field to “P” for pass. If the EMISS_PF_FLAG, the SAFETY_PF_FLAG, and the GAS_CAP_PF_FLAG are not all set to “P” - pass, then set the OVERALL_RESULTS to “F” for fail.

For an OBD2 inspection, if the OBD2_PF_FLAG, the SAFETY_PF_FLAG, and the GAS_CAP_PF_FLAG are all set to “P” - pass, then set the OVERALL_RESULTS field to “P” for pass. If the OBD2_PF_FLAG, the SAFETY_PF_FLAG, and the GAS_CAP_PF_FLAG are not all set to “P” - pass, then set the OVERALL_RESULTS to “F” for fail.

Then, the system shall then proceed to the Emissions Test Fee Prompt, Section 3.1.29.

Associated System File:	**VEHICLE.DAT**	**OBD2_PF_FLAG**
	GAS_CAP_PF_FLAG	**SAFETY_PF_FLAG**
	GAS_CAP_PF_FLAG_1	**EMISS_PF_FLAG**
	GAS_CAP_PF_FLAG_2	**OVERALL_RESULTS**

- -

3.1.29 Emissions Test Fee Prompt:

ENTER THE COST FOR THE EMISSIONS INSPECTION, INCLUDING CENTS.

Programming Criteria: The inspector shall enter the cost for the emissions inspection, exclusive of repair costs. The system shall sum the EMISS_INSP_COST, the SAFE_INSP_COST, if applicable, and the applicable repair costs, (i.e., REP_CST_YIS) to obtain the OVERALL_COST. The analyzer shall not accept a value greater than $99.99 for this entry.

Error Messages: **NO VALUE HAS BEEN ENTERED--TRY AGAIN.**

MAXIMUM ENTRY $99.99 -- TRY AGAIN.

Associated System File: **VEHICLE.DAT** **EMISS_INSP_COST**
OVERALL_COST

- -

3.1.30 **Certificate Number Prompt:** **ENTER THE INSPECTION CERTIFICATE NUMBER**.

Programming Criteria: If the OVERALL_RESULTS flag is "F", then the system will not give the inspector this prompt and proceed to 3.1.34. If the OVERALL_RESULTS flag is "P", then the system will prompt the inspector to input the safety inspection sticker number. A minimum of six (6) and maximum of nine (9) characters are required for this field. When the certificate number entered is not a sequential number to the last certificate issued, a warning should be displayed, "Certificate number not in sequential order. Notify DPS if a certificate is missing." The enter key should allow the inspector to continue.

The safety certificate number consists of an alpha character, followed by up to eight digits. The alpha character usually does **not** correspond to the alpha character contained in the SAFE_TEST_TYPE field. They are however, separated or indexed by the different types of safety inspections. Thus, the sticker numbers should be in sequential order for all one year windshield inspections (type "A" tests), two year windshield inspections (type "B" tests), Trailer/motorcycle inspections (type "C" tests), and so forth. The warning should appear each time the inspector changes books for the same type of inspection. For example, a book of one year windshield inspections (type "A" tests) may end with F00000050, and the next book of one year windshield inspection certificates purchased by the shop owner may begin with F00001000. The books contain 50 sequential certificates.

The system should take the entered certificate number, compare it to the previous certificate issued under the same safety inspection type, and determine if the entered certificate number is next in sequence for that safety inspection type. If the entered number is not next in sequence, the correction prompt should appear.

If the inspector enters fewer than 9 characters, the analyzer shall automatically load leading zeros to the numerical entry and show the analyzer number after the entry is confirmed. For example, an entry of an 'A', followed by a '123' shall be converted to 'A00000123' and displayed for the inspector to confirm the entry. The conversion will

always end in a nine-character certificate number entry. This nine-character value shall be used during comparison testing to facilitate sequential issuance of certificates. The first character of a certificate number shall be an alphabetic character. The analyzer shall be able to enter the certificate number using the bar code reader. The only acceptable alpha character is 'V' for decals.

The analyzer shall restrict the alpha character to a list of acceptable alpha characters for a particular type of certificate or decal being issued. For example, during a safety and emission inspection reinspection, if the inspector selects the '1-year windshield (safety & emissions)' certificate on the type of inspection prompt in Section 3.1.20 and the vehicle passes the inspection, the inspector may only enter an 'A,' 'B,' 'C,' 'D,' 'E,' or 'F,' as the alpha character in the certificate number entry prompt. For Emission only Decals, the only acceptable alpha character is 'V.' For '1 Year Windshield (Safety Only)' certificate types, the acceptable alpha characters are 'G,' 'H,' 'I,' 'J,' 'K,' 'L,' 'M,' and 'P.' For '2 Year Windshield' certificate types, the acceptable alpha characters are 'N,' 'W,' and 'Q.' For 'Trailer/Motorcycle' certificate types, the acceptable alpha characters are 'X,' 'Y,' and 'Z.' For 'FMCSR (Truck)' certificate types, the acceptable alpha characters are 'T,' and 'U.' For 'FMCSR (Trailer)' certificate types, the acceptable alpha characters are 'R,' and 'S.'

Associated System File: **VEHICLE.DAT** **CERT_NUM**

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3.1.31 Certificate Number Correction Prompt:

INDICATE THE CONDITION OF THE PREVIOUS CERTIFICATE

U - UNACCOUNTED FOR

C - ENTERED CERTIFICATE IS CORRECT

R - RE-ENTER CERTIFICATE NUMBER

Programming Criteria:

The system shall only accept 'U,' 'C,' or 'R,' as valid entries. The system shall display the entered certificate number, the safety certificate inspection type ('A' or 'G' certificate) and the 'previously' issued certificate number. This prompt shall only appear if the entered certificate is out of sequence with the previously issue certificate number of the same safety certificate inspection type. If 'R' is entered, the system shall return to the previous screen prompt and allow the inspector to re-enter the current certificate. If

‘C,’ or ‘U’ is selected, the system will 1) store the entry of either ‘C,’ or ‘U,’ in the CERT_COND field of the test record, and 2) use the entered certificate number as the new ‘previous’ certificate number for the next comparison. If the inspector selects ‘U,’ the analyzer shall not allow any further official emissions inspections to be conducted until the inspector has ‘accounted for’ the certificates by completing the entries required in Section 3.12, Missing, or Voided Certificates.

The analyzer may either:

1. a. complete the inspection as prescribed in Sections 3.1, by proceeding with Section 3.1.32, VI 30A Selection Prompt, and then,

   b. complete the screen prompts in Section 3.12. A manufacturer selected lockout shall be used to prevent any subsequent official emissions inspections until the certificates are accounted for by answering the prompts in Section 3.12,

2. a. Or, interrupt the current inspection, then,

   b. account for the previous certificates by answering the prompts in Section 3.12, beginning with 3.12.2a and continuing through to 3.12.5, or 3.12.6, and then,

   c. complete the inspection, by proceeding with Section 3.1.32, VI 30A Selection Prompt, write the test record, and transmit the results to the Texas Information Management System, thus, satisfying the requirement of accounting for the previous certificates prior to conducting any subsequent official emissions inspections.

If a manufacturer lockout is used, the inspector shall be able to easily identify the reason the analyzer is preventing subsequent official inspections. The inspector shall be able to easily identify which type of certificate must be accounted for. In any case, the analyzer shall not conduct any subsequent official emissions inspections until the inspector accounts for the previous certificates by answering the questions in Section 3.12.

The analyzer will store the information in the VEHICLE.DAT file and print it on the weekly inspection log report (VI-8B). The system shall store the entry of ‘C’ in the CERT_COND field, if ‘C’ is selected, and store the entry of the ‘U’ in the CERT_COND field, if ‘U’ is selected in the test record. The default for this screen shall be ‘R’ for reenter certificate number.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**

INVALID ENTRY--TRY AGAIN

Associated System File: **VEHICLE.DAT** **CERT_COND**

- - - -

3.1.34 <u>Rejection Receipt:</u> EXPLAIN THE REJECTION FULLY.

VEHICLE INSPECTION REJECTION RECEIPT

Date_____ Vehicle Make_____ Model year_____
Vehicle License # _____ Inspection Station# _____
Inspection Station Name_____

REJECTED FOR DEFECTIVE

Turn Signals - Mounting, operation, and approved type

Window Tinting and Sunscreening - Tint or Coating out of Specifications

Turn Signal Switch and Indicator Lamp - Switch accessible & locks in position

Emissions System - Excessive Emissions (see VIR)

Gas Cap Test - Fails Pressure Test

EXPLAIN REJECTION FULLY: (Inspector's explanation goes here)
_____
_____
_____
_____
_____
_____

Certified Inspector Making Inspection: _____

If defects indicated above are corrected and the vehicle is returned to the original inspection station within 15 days, (excluding the date of rejection) the vehicle will be reinspected once with no additional fee. THIS IS NOT A PERMIT TO DRIVE A DEFECTIVE VEHICLE OR TO DRIVE A VEHICLE WITHOUT A CURRENT VALID INSPECTION CERTIFICATE.

Fee Paid $_____

VI-7(rev. 2000) Texas Department of Public Safety

Programming Criteria:

The system shall prompt the inspector to explain the rejection fully, enter the fee paid on the rejection receipt and print the rejection receipt shown above. The fee paid shall be the overall cost for the complete inspection (i.e., the amount in the OVERALL_COST field). The system shall allow the inspector to type the explanation from the keyboard prior to printing the rejection receipt. If the inspector opts to type the explanation, the explanation shall appear on the printed rejection report. The system shall allow the inspector to print additional copies of the rejection receipt, after the initial report has been printed. The maximum number of entries that can be displayed on the rejection receipt is five (5). If the emissions test (ASM, TSI, or OBD) or the gas cap integrity test of the inspection is failed, then the entry for this item must be displayed. If both the emissions test and the gas cap integrity test are failed, then both entries must be displayed on the rejection receipt. The preferred order of appearance is the emissions test entry, the gas cap integrity test entry, followed by the remaining safety item entries. In either case, the rejection receipt shall not display more than the maximum of five items. Then, the system should continue to the Print Vehicle Repair Form, Section number 3.1.34a, followed by the Print Vehicle Inspection Report Prompt, number 3.1.35.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **OVERALL_COST**

3.1.34a Print Vehicle Repair Form (VRF):

Programming Criteria: If the EMISS_PF_FLAG flag is “F”, then the analyzer shall print a VRF. The analyzer shall print the following vehicle information on the VRF: make, model, model year, the vehicle identification number (VIN), license plate number, and odometer reading (mileage). A draft VRF format is provided in Appendix O.

- -

3.1.34b **<u>Print Public Awareness Statement</u>:**

The public awareness statement shall be printed only once, and the VIR shall be printed twice based on the outcome of the emissions phase of the inspection. If the vehicle passes the emissions phase of the inspection, the analyzer shall print the 'passing' public awareness statement, and the 'failing' public awareness statement, if the vehicle fails the emissions phase of the inspection.

- -

3.1.35 **<u>Print Vehicle Inspection Report:</u>**

After the system has stored the test record, the following prompt shall be displayed.
"READY TO PRINT VEHICLE INSPECTION REPORT? ENTER "Y" FOR YES OR "N" FOR NO."

Depending upon the pass/fail status of the emissions phase of the inspection, the printer will provide additional information to the customer as outlined in Appendix B. The custom report shall include, but not be limited to, the following information: Test Type (Initial or Reinspection), Test (2-Speed Idle), Test Date, Test Time, Test Cost (differentiated by Emission and Safety), Overall Cost, Inspector Name, Station Name, Vehicle License Number, VIN, Vehicle Make, Vehicle Model Year, Vehicle Type, Engine Size, Cylinders, Transmission, Odometer, Gross Vehicle Weight, Ignition, Two Letter Special Test Designation where applicable, Emissions Standard (by pollutant), Vehicle Actual Emissions Amounts (by pollutant), Emissions Result (by pollutant), all final RPM values for the Test, Dilution Amount (in percent, $CO + CO_2$), Dilution Results (Pass or Fail), the Results of the Gas Cap Integrity Test, and the Overall Result of the Inspection. The vehicle's ignition type shall be place on the same line as the number of cylinders separated by at least two spaces or a slash. The subtitle of the report shall indicate that the test was a Safety and Emissions Inspection, Safety Only Inspection, Required Emission Only Decal Inspection or Emission Only Inspection, and whether or not the test was conducted as a Special Test. If the test was conducted as a Special Test, the Two Letter Designation (i.e., LI, ME, IV, AD, ST, PA, or OT) shall be placed on the same line as the Test Type separated by at least two spaces, or a slash, and the words 'Special Test' shall be in the subtitle. The system shall allow the inspector to print additional copies of the vehicle inspection report, after the initial report has been printed. If the test ends because of a time out condition or because of dilution, the emission standards, amounts, and results shall **not** be printed on the report. The report shall indicate that the vehicle has failed. The report shall indicate that the vehicle failed because of excessive dilution, where applicable. If the test should 'time out', then the report shall indicate that the vehicle failed because the test was not completed in the time allowed for

completion of the test. After the inspection has been completed, the analyzer shall contact the Texas Information Management System Host, and transmit all applicable vehicle information.

If the test ends in an aborted condition, the vehicle inspection report (VIR) shall print the station information, the vehicle information, indicate that the test was aborted in the overall result block, and display the reason for the abort. If the inspector selectes other, then the analyzer shall print the reason typed in by the inspector, or provide space for a handwritten answer if the inspector does not type in the reason.

If the vehicle aborts the emissions phase or completes the emissions phase of the inspection with a timeout condition, the system shall print dashes on the VIR where the analyzer would have ordinarily placed readings. The dashes shall follow the expected format of the corresponding gas (i.e., CO = '--.--', HC = '----', CO_2 = '--.-'). Dashes are preferable, however, an alternative symbol may be used. The system shall also place dashes in place of the pass/fail indicator on the VIR. The system shall print the RPM value, the dilution standard, the dilution reading and result, and the standards for HC, CO, CO_2, and O_2, where applicable.

The analyzer shall print two barcodes on the VIR which contain the VIN, license plate number of the vehicle, and the license type, of the vehicle under inspection. The bar code shall be code 39 format and contain only the previously mentioned information and the start and stop characters.

The bar codes shall be printed on the VIR in the following format: 2 code 3 of 9 bar codes will be utilized, since there is too much information to use a single bar code. One bar code shall be formatted as follows:

Name	Length	Start	Format
Identifier	1	1	'$'
License Plate Type	1	2	'1', '2', '3', '4', '5', '6', '7', or '8'
License Plate Number	8	3	Alphanumeric
TxDOT Number	10	11	Alphanumeric

The other shall be formatted as follows:

Name	Length	Start	Format
Identifier	1	1	'I'

VIN	17	2	Alphanumeric

Each bar code must be clearly labeled, so that the inspectors can easily tell which bar code is which. The location of the bar codes on the VIR shall be determined by the manufacturers. The State only requires that they be present and labeled.

Error Message: **NO VALUES ENTERED -- TRY AGAIN**

Associated System File: **VEHICLE.DAT** **EMISS_INSP_COST**
CERT_NUM
OVERALL_RESULTS

- -

3.1.36 Texas Information Management System Contact:

The analyzer shall contact the Texas Information Management System Host, and transmit the completed test record for this inspection and any other test records from previous inspections that have not been sent to the Texas Information Management System Host. Upon completion of this contact, the analyzer shall return to the Main Menu.

The analyzer shall increment the 'number of tests without VID contact' counter (No contact counter) by one, if the following bits are not set in the RESPONSE.DAT file during the communication sessions:

48 - Command completed successfully (status specific to "transmit VIN/License Plate data" command)

80 - Command completed successfully (status specific to "Transmit test record(s)" command)

The no contact counter shall only increment by one for each inspection completed with either response bit 48 or response bit 80 not being set.

The following bits may also be set when response bits 48 and 80 are not set. These bits provide probable explanations to why response bits 48 and 80 were not set.

8 - Invalid password (token file error) 17 - Communication port error

9 - Invalid LOCKOUT.DAT file
10 - Invalid TAS telephone number
11 - Invalid station number
12 - Invalid TAS number
13 - Invalid software version number
14 - Invalid VID phone number
15 - Invalid communications port base address
16 - Invalid communications port interrupt
18 - Dialing error
19 - No dial tone
20 - Phone line busy
21 - No answer
22 - Voice answered
23 - Security lagon (to VID) failure

The no contact counter shall not be incremented for any aborted inspections.

- - - -

2. **"THE ACCESS CODE ENTERED IS NOT VALID. VERIFY YOUR ACCESS CODE NUMBER WITH YOUR LOCAL DPS OFFICE."**

Associated System File: **INSPECTR.DAT** **ACCESS_CODE**

- - - -

Programming Criteria: The analyzer will then check the license expiration date and lockout flag for the inspector in the inspector file. The station license renewal date and lockout flag will then be checked in the station file. If either the station or the inspector license expiration date is within 60 days of today then the analyzer will display Message 1 indicating the expiration date. If the inspector or station dates have passed, Message 2 will be displayed. The analyzer shall countdown the final five days prior to the expiration date of the inspector or the station certification. The analyzer shall display Message 3 in addition to Message 1 or 2 during the five-day countdown. If it is 30 days past the inspector or station expiration date, the system will set the station lockout flag in the station file or the inspector lockout flag in the inspector file to "Y" to indicate lockout has occurred.

If either the station or the inspector lockout flag is set, the analyzer will display a message that indicates lockout has occurred and returns to the main menu.

Error Messages:

1. **YOUR (STATION/INSPECTOR) CERTIFICATION EXPIRES MM/DD/YY.**

2. **YOUR STATION /OR INSPECTOR CERTIFICATION EXPIRED (date). YOU ARE NOT AUTHORIZED TO PERFORM ANY EMISSIONS INSPECTION AT THIS TIME. PLEASE CONTACT YOUR LOCAL DPS OFFICE.**

3. **YOUR (STATION/INSPECTOR) CERTIFICATION WILL EXPIRE IN X (5, 4, 3, 2, 1) DAY(S).**

Associated System File:

INSPECTR.DAT	**INSP_EXP_DATE**
STATION.DAT	**STAT_EXP_DATE**
LOCKOUT.DAT	**INSP_LOCKOUT_FLAG**
	STATE_LOCKOUT

- - - -

3.2.3 <u>Insurance Prompt:</u> ENTER THE INSURANCE EXPIRATION DATE.

<u>Programming Criteria:</u> Enter the insurance expiration date in the following format: MM/DD/YY. The analyzer system shall verify that the entry for the month is between 1 - 12, the entry for the day is between 1 - 31, and that the entry for the year begins with 19 or 20 (i.e., 1985, 2001). If the inspector enters a date that has passed, the analyzer shall provide a warning to the inspector. The warning shall indicate that the insurance has expired. The system will accept '000000' as a valid entry. The system will print '000000' on any applicable form, and write the vehicle record to VEHICLE.DAT.

<u>Error Message:</u> **NO VALUE HAS BEEN ENTERED--TRY AGAIN**.

<u>Associated System File:</u> **VEHICLE.DAT** **INSUR_EXP_DT**

- - - -

VEHICLE."

1.	**Texas Plate**	5.	**Exempt (Federal)**
2.	**No Plate**	6.	**Dealer Plate**
3.	**Out of State**	7.	**Temporary Buyer Tag**
4.	**Exempt (State)**	8.	**Other**

Programming Criteria: The inspector will be prompted to enter the license type of the vehicle. If the inspector selects license type '2,'or '8,' the system will assign the License_Num field in the VEHICLE.DAT a value of "V" followed by the last seven digits of the VIN number, and skip the license prompt, number 3.2.6 . The entry in the License_Num field shall be a "V" and the 7 rightmost characters of the VIN. If the entered VIN has less than 7 characters, the entry should be a "V" followed immediately by the entered VIN without filler spaces between the "V" and the entered VIN. The system will default to license type '1.'

Error Message: **THIS FIELD MUST BE ENTERED TO CONTINUE WITH THE TEST.**

Associated System File: **VEHICLE.DAT** **LICENSE_TYPE**

- -

3.2.6 License Prompt: **"ENTER THE LICENSE NUMBER OF THE VEHICLE."**

Programming Criteria: The inspector will be prompted to enter the license number of the vehicle. Upon confirming the license plate entry, the vehicle information is eligible to be stored in the RECALL.DAT file.

Error Message: **THIS FIELD MUST BE ENTERED TO CONTINUE WITH THE TEST.**

Associated System File: **VEHICLE.DAT** **LICENSE_NUM**

- -

3.2.6a **<u>TxDOT Number Prompt:</u>** **ENTER THE NUMBER FROM THE TxDOT REGISTRATION CERTIFICATE AFFIXED TO THE VEHICLE.**

<u>Programming Criteria:</u> The system shall only give this prompt if the inspector selected 'Texas Plate' (i.e., License_Type is '1') as the license type of the vehicle in Section 3.2.5. The system will prompt for the TxDOT number as it appears on the vehicle.

Where available, the inspector will enter the TxDOT number by using the bar-code reader to scan the bar coded TxDOT number that is on the windshield of the vehicle. If a bar-code reader is not available, the inspector will be capable of entering the TxDOT number from the keyboard. The bar code should utilize the Code 39 symbology. The only information contained in the bar code are the start and stop characters, and the TxDOT number.

The system shall allow the inspector to see and edit the TxDOT number as it is being entered. When all characters of the TxDOT number have been entered, the system shall prompt the inspector to press "continue" or "enter". The inspector shall hit "continue" or "enter", the screen will blank the TxDOT number and ask the operator to reenter the TxDOT number under the same conditions as the previous entry. The two attempts must match. If the two attempts do not match, the analyzer will display Message 3 and prompt the inspector to enter the TxDOT number a third time. A minimum10 characters are required for this field. If the entry is not within these parameters then the system will display Message 2. The format of the TxDOT number shall consist of eight numeric digits followed by two alpha characters. For example, 06691576WZ is a valid TxDOT number. If the entry is does not fit this format, then the system will display Message 4. If no value is entered, the analyzer will display Message 1.

<u>Error Message:</u> **1. THIS FIELD MUST BE ENTERED TO CONTINUE WITH THE TEST.**

2. A MINIMUM OF 10 CHARACTERS ARE NEEDED FOR THIS ENTRY--TRY AGAIN.

3. ENTRIES DO NOT MATCH -- TRY AGAIN.

4. THIS ENTRY MUST BE EIGHT NUMBERS FOLLOWED BY TWO LETTERS-- TRY AGAIN.

Associated System File: **VEHICLE.DAT** **TXDOT_NUM**

- -

3.2.7 VIN Number Prompt: **ENTER VIN NUMBER.**

Programming Criteria: The system will prompt for the VIN number as it appears on the vehicle. Where available, the inspector will enter the VIN number by using the bar-code reader to scan the bar-coded VIN on the vehicle. If a bar-code reader is not available, the inspector will be capable of entering the VIN number from the keyboard. The analyzer will place a 'B' in the BARCODED_VIN field of the test record, if the VIN is entered using the bar code reader. Otherwise, the analyzer will place a 'K' in the BARCODED_VIN field of the test record.

The system shall allow the inspector to see and edit the VIN as it is being entered. When all characters of the VIN have been entered, the system shall prompt the inspector to press "continue" or "enter". The inspector shall hit "continue" or "enter", the screen will blank the VIN and ask the operator to reenter the VIN under the same conditions as the previous entry. The two attempts must match. If the two attempts do not match, the analyzer will display Message 3 and prompt the inspector to enter the VIN number a third time. A minimum of three and maximum of 17 characters are required for this field. If the entry is not within these parameters, the system will display Message 2. If no value is entered, the analyzer will display Message 1. The VIN verification algorithm shall be applied here. The algorithm shall be supplied under separate cover by the TNRCC. The VIN verification shall only be applied to vehicles with model years 1981 and newer. The analyzer will not allow the inspector to enter the letters 'I,' 'O,' or 'Q' for vehicle with model years 1981 and newer. The software should suggest possible substitute letters when the DPS algorithm indicates that the VIN is bad. For example, the software could ask if the entered '8' could be a 'B.'

Error Message: **1. THIS FIELD MUST BE ENTERED TO CONTINUE WITH THE TEST.**

2. A MINIMUM OF 3 OR MAXIMUM OF 17 CHARACTERS ARE NEEDED FOR THIS ENTRY--TRY AGAIN.

3. ENTRIES DO NOT MATCH -- TRY AGAIN.

Associated System File: **VEHICLE.DAT** **VIN_ID_NUM**

VIN_FLAG

BARCODED_VIN

- -

3.2.7a **<u>Fuel Type Prompt:</u>** **ENTER THE VEHICLE FUEL TYPE. SELECT THE APPROPRIATE FUEL TYPE CODE FROM THE LIST BELOW.**

Code	Description
"G"	**Gasoline**
"B"	**Bi-Fueled (Dual-Fueled)**
"D"	**Diesel**
"N"	**None (i.e., Trailers, Electric & Electric Hybrids)**

<u>Programming Criteria:</u>

Entry of one of the above types is required. The analyzer software shall be designed so that only a "G," a "B," a "D," or an "N" can be entered by the inspector for this field. The system software shall default to gasoline for this entry.

<u>Error Message:</u> **NO VALUE HAS BEEN ENTERED--TRY AGAIN.**

INVALID ENTRY--TRY AGAIN.

<u>Associated System File:</u> **VEHICLE.DAT** **FUEL_TYPE**

- -

3.2.7b **<u>Vehicle Type Prompt:</u>**

SELECT THE VEHICLE TYPE

'P' - PASSENGER CAR/STATION WAGON

'T' - TRUCK/VAN/BUS/SPORTS UTILITY VEHICLE

'M' - MOTOR HOME

'B' - BUS

'C' - MOTORCYCLE

'L' - TRAILER

Programming Criteria:

The inspector should select the vehicle type from the above list. The inspector shall be able to use the arrow keys to highlight the appropriate choice and press "continue" to select it. The default choice on this screen shall be the "passenger car/station wagon" selection.

If the inspector selects 'M,' 'B,' 'L,' or 'C,' the analyzer shall skip the Vehicle Body Type Prompt in Section 3.2.7c. If the inspector enters a gross vehicle weight for a bus or motor home that is less than 8501 pounds, the analyzer shall set the BODY_STYLE field to 6.

Error Message: **NO VALUES HAVE BEEN ENTERED--TRY AGAIN**

INVALID ENTRY--TRY AGAIN

Associated System File: **VEHICLE.DAT** **VEHICLE _TYPE**

- -

3.2.7c **Vehicle Body Type Prompt:** **ENTER THE VEHICLE TYPE.**

SELECT THE APPROPRIATE VEHICLE BODY TYPE FROM THE LIST BELOW:

CODE	VEHICLE BODY TYPE
1	SEDAN
2	STATION WAGON
3	PICKUP
4	SPORT/UTILITY VEHICLE

5 **MINIVAN**

6 **FULL-SIZE VAN**

Programming Criteria:

If the inspector selected 'p' as the vehicle type, the analyzer shall only display choices, 1 and 2. The default choice on this screen shall be the "passenger car/station wagon" selection. If the inspector selected 't' as the vehicle type, the analyzer shall only display choice 3 through 6. In this case, the default choice on this screen shall be the "pickup" selection. The inspector shall be able to use the arrow keys to highlight the appropriate choice and press "continue" to select it. In either case, the analyzer may use the TXVRT.DAT to display the list of vehicle makes and models. This prompt may be combined with the vehicle type prompt in section 3.2.7b as long as the logic is correct.

If the inspector selected 'M,' 'B,' 'L,' or 'C,' as the vehicle type, the analyzer shall use the NCIC list to display the list of makes and models.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **BODY_STYLE**

- - - -

The analyzer shall present the option of ‘other’ as a make definition for use when there is no applicable definition for the vehicle under inspection. The ‘other’ option shall instruct the inspector to enter the full make name and at least the first five characters of the model name. The analyzer shall allow the inspector to enter up to 20 characters. The entry of ‘OTHR’ shall be stored in the MODEL field, and the characters ‘OTH’ shall be placed in the MODEL_CODE field in the applicable test record. The NCIC make/model list may supplied by the TNRCC.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN.**

Associated System File: **VEHICLE.DAT** **MAKE**

- -

3.2.9 Model Prompt: **SELECT THE VEHICLE MODEL.**

Programming Criteria: The system will then display the appropriate vehicle models based on the vehicle make entry. The analyzer shall present the option of ‘other’ as a model definition for use when there is no applicable definition for the vehicle under inspection. The ‘other’ option shall instruct the inspector to enter the model name and allow the inspector to enter up to 20 characters. An ‘OTH’ shall be placed in the MODEL_CODE field of the test record whenever the ‘other’ option is selected by the inspector.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN.**

Associated System File: **VEHICLE.DAT** **MODEL**
MODEL_CODE

- -

3.2.10 Odometer Prompt: **ENTER THE VEHICLE ODOMETER READING.**
A MINIMUM OF ONE NUMERIC ENTRY IS REQUIRED. DO NOT ENTER THE TENTH'S DIGIT.

Programming Criteria: Enter the vehicle odometer. Do not include tenth's. The system shall only accept numerical entries in this field.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **ODOMETER**

- -

3.2.10a **Vehicle 80" Width Prompt:** **IS THE VEHICLE 80 INCHES WIDE? (CHOOSE THE CORRECT SENTENCE)**

1. **NO, THE VEHICLE IS LESS THAN 80 INCHES WIDE.**

2. **YES, THE VEHICLE IS AT LEAST 80 INCHES WIDE.**

Programming Criteria:

The analyzer shall only display this prompt if the previously enter vehicle type is ‘T - Truck/Van/Sports Utility Vehicle’ or ‘M - Motorhome.’ The analyzer shall display these choices and allow the inspector to use the arrow keys, the number keys, or the letters ‘Y,’ and ‘N’ to highlight the appropriate choice and press enter to select.

If the previously entered vehicle type is ‘M - Motorhome,’ then the default is to phrase 2.

If the previously entered vehicle type is ‘T-Truck/Van/Sports Utility Vehicle,’ then the default is to phrase 1.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **80_INCHES**

- -

3.2.10b **Confirm Vehicle Info Display:**

The analyzer shall display the vehicle information to the inspector and allow the inspector to edit the information as appropriate. If the vehicle information was populated by the analyzer using a previous test record, the inspector shall be allowed to edit all vehicle information except the VIN, the license plate type, and the license plate number. Upon confirming the vehicle, the vehicle information is no longer eligible to be stored in the RECALL.DAT file.

- -

3.2.11 **Test Type Prompt:** **ENTER THE TYPE OF INSPECTION**

J-1 YEAR WINDSHIELD (SAFETY ONLY)

C-TRAILER/MOTORCYCLE

B-2 YEAR WINDSHIELD

G-FMCSR (TRUCK)

K-FMCSR (TRAILER)

Programming Criteria:

The system shall only accept entries for alphabets ‘j,’ ‘b,’ ‘c,’ and ‘g.’ The analyzer shall only display one FMCSR selection. For the FMCSR selection, the analyzer shall display only choice ‘g’ if the vehicle type is a truck, and only choice ‘k’ if the vehicle type is a trailer. The default for this screen shall be the first choice for all the cases listed below (i.e., ‘j,’ ‘c,’).

If the inspector selected ‘P’ for the vehicle type, then the analyzer shall display the following certificate choices:

‘J - 1 year windshield,’

‘B - 2 year windshield’, and

‘G - FMCSR (TRUCK).’

If the inspector selected ‘B’ for the vehicle type, then the analyzer shall display the following certificate choices:

‘J - 1 year windshield,’ and

‘G - FMCSR (truck).’

If the inspector selected ‘T’ for the vehicle type, then the analyzer shall display the following certificate choices:

‘J - 1 year windshield,’

‘B - 2 year windshield’, and

‘G - FMCSR (TRUCK).’

If the inspector selected ‘M’ for the vehicle type, then the analyzer shall display the following certificate choices:

‘J - 1 year windshield,’

‘B - 2 year windshield’, and

‘G - FMCSR (TRUCK)’.

If the inspector selected ‘C’ for the vehicle type, then the analyzer shall display the following certificate choice:

‘C - Trailer/Motorcycle.’

If the inspector selected ‘L’ for the vehicle type, then the analyzer shall display the following certificate choices:

‘C - Trailer/Motorcycle,’ and

‘K - FMSCR(Trailer).’

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **SAFE_TEST_TYPE**

- -

3.2.12 Safety Inspection Items:

Programming Criteria:

The Texas Department of Public Safety wants to enhance the entry of the safety items of

inspection to collect reasons for failing or repaired items, and to prescribe the order of appearance of the safety items based on the type of inspection selected. Appendix R contains nine lists of safety items in their prescribed order.

The analyzer must display the appropriate list choices based on entries made by the inspector. The analyzer will require the inspector to enter the status of the safety item in the order it appears in the list. The acceptable entries are 'P,' for pass, 'F,' for fail, 'R' for repaired. 'N' for N/A is not an acceptable entry. A value of 'N' in the safety item field may occur in a test record that is received from the VID (i.e., for reprinting purposes). That is why the 'N' is contained in the test record. It is a carry over from the previous version of software where this was an allowable entry. If the inspector select 'F' or 'R' for any safety item in the list, a subset list of failure reasons shall be displayed and the inspector shall highlight and select the failure reason or the entry that allows the inspector to return to the previous screen entry of 'F' or 'R' to edit this selection. The default for this display shall be to the 'return to previous screen' selection. The analyzer shall automatically enter the appropriate alpha character based on the selections made by the inspector.

If the vehicle type = 'P,' and the safe_test_type = 'J - 1 year windshield', then the analyzer shall display safety item sequence #1.

If the vehicle type = 'P,' and the safe_test_type = 'B - 2 year windshield', then the analyzer shall display safety item sequence #1.

If the vehicle type = 'P,' and the safe_test_type = 'G - FMCSR (truck)', then the analyzer shall display safety item sequence #8.

If the vehicle type = 'B,' and the safe_test_type = 'J - 1 year windshield', then the analyzer shall display safety item sequence #3.

If the vehicle type = 'B,' and the safe_test_type = 'G - FMCSR (truck)', then the analyzer shall display the titles of safety item sequence #7, and safety item sequence #8, allow the inspector to use the arrow keys to highlight and select the appropriate safety item sequence by pressing 'continue/enter.'

If the vehicle type = 'T,' the safe_test_type = 'J - 1 year windshield,' and the 80_inches = 'N' (i.e., the truck is less than 80 inches wide), then the analyzer shall display safety item sequence #1.

If the vehicle type = 'T,' the safe_test_type = 'J - 1 year windshield,' and the 80_inches = 'Y'

(i.e., the truck is at least 80 inches wide), then the analyzer shall display the titles of safety item sequence #4, and safety item sequence #5, and allow the inspector to use the arrow keys to highlight and select the appropriate safety item sequence by pressing 'continue/enter.'

If the vehicle type = 'T,' the safe_test_type = 'B - 2 year windshield,' and the 80_inches = 'N' (i.e., the truck is less than 80 inches wide), then the analyzer shall display safety item sequence #1.

If the vehicle type = 'T,' the safe_test_type = 'B - 2 year windshield,' and the 80_inches = 'Y' (i.e., the truck is at least 80 inches wide), then the analyzer shall display safety item sequence #4.

If the vehicle type = 'T,' and the safe_test_type = 'G - FMSCR (Truck),' (Note: the 80 inches wide entry is not used here to determine the appropriate safety item sequence), then the analyzer shall display the titles of safety item sequence #8, and safety item sequence #5, and allow the inspector to use the arrow keys to highlight and select the appropriate safety item sequence by pressing 'continue/enter.'

If the vehicle type = 'M,' the safe_test_type = 'J - 1 year windshield,' and the 80_inches = 'N' (i.e., the truck is less than 80 inches wide), then the analyzer shall display safety item sequence #1.

If the vehicle type = 'M,' the safe_test_type = 'J - 1 year windshield,' and the 80_inches = 'Y' (i.e., the truck is at least 80 inches wide), then the analyzer shall display the safety item sequence #4.

If the vehicle type = 'M,' the safe_test_type = 'B - 2 year windshield,' and the 80_inches = 'N' (i.e., the truck is less than 80 inches wide), then the analyzer shall display safety item sequence #1.

If the vehicle type = 'M,' the safe_test_type = 'B - 2 year windshield,' and the 80_inches = 'Y' (i.e., the truck is at least 80 inches wide), then the analyzer shall display safety item sequence #4.

If the vehicle type = 'M,' and the safe_test_type = 'G - FMSCR (Truck),' (Note: the 80 inches wide entry is not used here to determine the appropriate safety item sequence), then the analyzer shall display safety item sequence #8.

If the vehicle type = ‘C,’ and the safe_test_type = ‘C - Trailer/Motorcycle,’ then the analyzer shall display safety item sequence #2.

If the vehicle type = ‘L,’ and the safe_test_type = ‘C - Trailer/Motorcycle,’ then the analyzer shall display safety item sequence #6.

If the vehicle type = ‘L,’ and the safe_test_type = ‘K - FMSCR(Trailer),’ then the analyzer shall display safety item sequence #9.

The inspector shall be required to press “enter/continue” after each item. These fields are required and must contain a valid entry. The system does not have to display the screen heading during the test sequence. The system shall enter the date and the inspector’s drivers license number. The inspector should be able to access an item’s associated help screen by placing the cursor in the parentheses and pressing the ‘F1’ key. The help screens are in Appendix D for each type of Safety Inspection test. If any safety item is entered as failing (i.e, stored value of ‘A,’ ‘C,’ ‘E,’ ‘H,’ ‘J,’ ‘L,’ ‘O,’ ‘S,’ ‘U,’ ‘W,’ or ‘Y’), then set the SAFETY_PF_FLAG to 'F'. Otherwise, set the SAFETY_PF_FLAG to 'P' for pass (i.e, all safety items entered as passing or repaired.).

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT**

SAFE_1	**SAFE_2**
SAFE_3	**SAFE_4**
SAFE_5	**SAFE_6A**
SAFE_6B	**SAFE_7**
SAFE_7A	**SAFE_7B**
SAFE_8	**SAFE_9**
SAFE_10A	**SAFE_10B**
SAFE_10C	**SAFE_10D**
SAFE_10E	**SAFE_10F**
SAFE_11	**SAFE_12**
SAFE_13	**SAFE_14**
SAFE_15	**SAFE_16**
SAFE_17	**SAFE_18**
SAFE_19	**SAFE_20**
SAFE_21	**SAFE_22A**

SAFE_22B	**SAFE_22C**
SAFE_22D	**SAFE_23**
SAFE_24	**SAFE_25**
SAFE_26	**SAFE_27**
SAFE_28	**SAFE_29**
SAFE_30	

SAFETY_PF_FLAG

DPS_SAFE_SEQ

- - - -

IS THE GAS CAP MISSING? ('Y' OR 'N')

Programming Criteria: Gas Cap Testing is not required on Trailers, Motorcycles, Diesel-Powered Vehicles, and Gasoline-powered vehicles 25 years old and older.

If the inspector selected "D" or "N" in the Fuel Type prompt , the system shall not display this prompt and proceed to the End of Phase Logic Prompt in Section 3.2.12l. The system shall only accept a 'Y' or 'N' entry. If inspector indicates the gas cap is missing, the system shall set the GAS_CAP_MISS to 'Y', set the GAS_CAP_PF_FLAG_1 to 'F' - fail, (i.e., the vehicle shall fail the gas cap integrity test), and continue with the end of phase logic in Section 3.2.12g. If the inspector selects 'N', continue with the next screen prompt.

Error Message: **ONLY 'Y' OR 'N' WILL BE ACCEPTED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **GAS_CAP_MISS**
GAS_CAP_PF_FLAG_1

- -

3.2.12c **Gas Cap Testable Prompt:**

IS THE GAS CAP TESTABLE? ('Y' OR 'N')

Programming Criteria: The system shall only accept a 'Y' or 'N' entry. If the inspector indicates the gas cap not testable ('untestable'), (i.e., selects 'N'), the system shall set the GAS_CAP_PF_FLAG_1 to 'P' - pass, set the GAS_CAP_TESTABLE to 'N', and continue with the end of phase logic in Section 3.2.12g. If the inspector selects 'Y', continue with the next screen prompt.

Error Message: **ONLY 'Y' OR 'N' WILL BE ACCEPTED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **GAS_CAP_TESTABLE**
GAS_CAP_PF_FLAG_1

- -

3.2.12d **Gas Cap Connect Prompt:**

REMOVE THE GAS CAP FROM THE VEHICLE AND CONNECT IT TO THE GAS CAP TESTER. REFER TO THE OPERATOR'S MANUAL, IF REQUIRED.

Programming Criteria: If the gas cap tester is an integral part of the analyzer or fully automatic, the system will prompt the inspector to press "continue/enter" to conduct the test.

Error Message: **ONLY 'CONTINUE/ENTER' WILL BE ACCEPTED--TRY AGAIN**

- -

3.2.12e **Gas Cap Results Prompt:**

ENTER THE RESULTS OF THE GAS CAP INTEGRITY TEST. ('P' OR 'F')

Programming Criteria: If the gas cap tester is an integral part of the analyzer or fully automatic, the system shall not display this prompt, and shall enter the results of the test in GAS_CAP_PF_FLAG_1. The result shall either be 'P' for pass, or 'F' for fail.

Error Message: **ONLY 'P' OR 'F' WILL BE ACCEPTED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **GAS_CAP_PF_FLAG_1**

- -

3.2.12f **Second Gas Cap Prompt:**

IS THERE A SECOND FUEL CAP TO BE TESTED? ('Y' OR 'N')

Programming Criteria: This prompt shall not be displayed if the inspector has indicated that the gas cap is missing, or untestable. The default for this screen shall be to 'N.' The analyzer shall only accept an entry of 'Y' or 'N.' The error message shall be displayed, if the inspector enters something other than 'Y' or 'N.' If the inspector indicates that there is a second gas cap to be tested, the analyzer shall proceed to the Second Gas Cap Missing Prompt, in Section 3.2.12h.

Error Message: **ONLY 'Y' OR 'Y' WILL BE ACCEPTED--TRY AGAIN**.

- -

3.2.12g End of Phase Logic:

Programming Criteria:

Since the second gas cap will not be tested, the analyzer shall set the flags as follows. If the GAS_CAP_PF_FLAG_1 is set to "P" - pass, then set the GAS_CAP_PF_FLAG to "P." If the GAS_CAP_PF_FLAG_1 is set to "F" - fail, then set the GAS_CAP_PF_FLAG to "F." If the SAFETY_PF_FLAG, and the GAS_CAP_PF_FLAG are all set to "P" - pass, then set the OVERALL_RESULTS field to "P" for pass. If the SAFETY_PF_FLAG, and the GAS_CAP_PF_FLAG are not all set to "P" - pass, then set the OVERALL_RESULTS to "F" for fail. Then, the system shall then proceed to the end of test logic in Section 3.2.12m.

Associated System File: **VEHICLE.DAT** **EMISS_PF_FLAG**
SAFETY_PF_FLAG
GAS_CAP_PF_FLAG
GAS_CAP_PF_FLAG_1
OVERALL_RESULTS

3.2.12h Second Gas Cap Missing Prompt:

IS THE SECOND GAS CAP MISSING? ('Y' OR 'N')

Programming Criteria: The system shall only accept a 'Y' or 'N' entry. If inspector

indicates the gas cap is missing, the system shall set the 2ND_GAS_CAP_MISS to ‘Y’, set the GAS_CAP_PF_FLAG_2 to 'F' - fail, (i.e., the vehicle shall fail the gas cap integrity test), and continue with the end of phase logic in Section 3.2.12l. If the inspector selects ‘N’, continue with the next screen prompt.

Error Message: **ONLY ‘Y’ OR ‘N’ WILL BE ACCEPTED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **2ND_GAS_CAP_MISS**
GAS_CAP_PF_FLAG_2

- -

3.2.12i **Second Gas Cap Testable Prompt:**

IS THE SECOND GAS CAP TESTABLE? ('Y' OR 'N')

Programming Criteria: The system shall only accept a ‘Y’ or ‘N’ entry. If the inspector indicates the gas cap not testable (‘untestable’), (i.e., selects ‘N’), the system shall set the GAS_CAP_PF_FLAG_2 to 'P' - pass, set the 2ND_GAS_CAP_TEST to ‘N’, and continue with the end of phase logic in Section 3.2.12l. If the inspector selects ‘Y’, continue with the next screen prompt.

Error Message: **ONLY ‘Y’ OR ‘N’ WILL BE ACCEPTED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **2ND_GAS_CAP_TEST**
GAS_CAP_PF_FLAG_2

- -

3.2.12j **Second Gas Cap Connect Prompt:**

REMOVE THE SECOND GAS CAP FROM THE VEHICLE AND CONNECT IT TO THE GAS CAP TESTER. REFER TO THE OPERATOR’S MANUAL, IF REQUIRED.

Programming Criteria: If the gas cap tester is an integral part of the analyzer or fully

automatic, the system will prompt the inspector to press "continue/enter" to conduct the test.

Error Message: **ONLY 'CONTINUE/ENTER' WILL BE ACCEPTED--TRY AGAIN**

- -

3.2.12k **Second Gas Cap Results Prompt:**

ENTER THE RESULTS OF THE SECOND GAS CAP INTEGRITY TEST. ('P' OR 'F')

Programming Criteria: If the gas cap tester is an integral part of the analzyer or fully automatic, the system shall not display this prompt, and shall enter the results of the test in GAS_CAP_PF_FLAG_2. The result shall either be 'P' for pass, or 'F' for fail.

Error Message: **ONLY 'P' OR 'F' WILL BE ACCEPTED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **GAS_CAP_PF_FLAG**
GAS_CAP_PF_FLAG_1
GAS_CAP_PF_FLAG_2

- -

3.2.12l **End of Phase Logic:**

Programming Criteria: If the GAS_CAP_PF_FLAG_2 and the GAS_CAP_PF_FLAG_1 are set to "P" - pass, then set the GAS_CAP_PF_FLAG to "P." If either the GAS_CAP_PF_FLAG_2 or the GAS_CAP_PF_FLAG_1 is set to "F" - fail, then set the GAS_CAP_PF_FLAG to "F." If the SAFETY_PF_FLAG, and the GAS_CAP_PF_FLAG are all set to "P" - pass, then set the OVERALL_RESULTS field to "P" for pass. If the SAFETY_PF_FLAG, and the GAS_CAP_PF_FLAG are not all set to "P" - pass, then set the OVERALL_RESULTS to "F" for

fail. Then, the system shall then proceed to the end of test logic in Section 3.2.12m.

Associated System File: **VEHICLE.DAT**

GAS_CAP_PF_FLAG	**SAFETY_PF_FLAG**
GAS_CAP_PF_FLAG_1	**EMISS_PF_FLAG**
GAS_CAP_PF_FLAG_2	**OVERALL_RESULTS**

- - - -

unusually large, please confirm the amount entered or reenter the fee.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **SAFE_INSP_COST**

- - - -

_____

Certified Inspector Making Inspection: _____

If defects indicated above are corrected and the vehicle is returned to the original inspection station within 15 days, (excluding the date of rejection) the vehicle will be reinspected once with no additional fee. THIS IS NOT A PERMIT TO DRIVE A DEFECTIVE VEHICLE OR TO DRIVE A VEHICLE WITHOUT A CURRENT VALID INSPECTION CERTIFICATE.

Fee Paid $_____

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Programming Criteria:

The system shall prompt the inspector to explain the rejection fully, enter the fee paid on the rejection receipt and print the rejection receipt shown above. The fee paid shall be the overall cost for the complete inspection (i.e., the amount in the OVERALL_COST field). The system shall allow the inspector to type the explanation from the keyboard prior to printing the rejection receipt. If the inspector opts to type the explanation, the explanation shall appear on the printed rejection report. The system shall allow the inspector to print additional copies of the rejection receipt, after the initial report has been printed. The maximum number of entries that can be displayed on the rejection receipt is five (5). If the gas cap integrity test of the inspection is failed, then the entry for this item must be displayed. The preferred order of appearance is the gas cap integrity test entry, followed by the remaining safety item entries. In either case, the rejection receipt shall not display more than the maximum of five items. Then, the system will continue to the Print Vehicle Inspection Report Prompt in Section 3.2.19.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **SAFE_INSP_COST**

- - - -

NUMBER.

Programming Criteria: If the Safety_PF_Flag is set to "F", then the system will not give the inspector this prompt and proceed to the Main Menu. If the Safety_PF_Flag is set to "P", then the system will prompt the inspector to input the safety inspection sticker number. A minimum of six (6) and maximum of nine (9) characters are required for this field. When the certificate number entered is not a sequential number to the last certificate issued, a warning should be displayed, "Certificate number not in sequential order. Notify DPS if a certificate is missing." The enter key should allow the inspector to continue.

The safety certificate number consists of an alpha character, followed by up to eight digits. The alpha character usually does **not** correspond to the alpha character contained in the SAFE_TEST_TYPE field. They are, however, separated or indexed by the different types of safety inspections. Thus, the sticker numbers should be in sequential order for all one year windshield inspections (type "A" tests), two year windshield inspections (type "B" tests), trailer/motorcycle inspections (type "C" tests), and so forth. The warning should appear each time the inspector changes books for the same type of inspection. For example, a book of one year windshield inspections (type "A" tests) may end with F00000050, and the next book of one year windshield inspection certificates purchased by the shop owner may begin with F00001000. The books contain 50 sequential certificates.

The system should take the entered certificate number, compare it to the previous certificate issued under the same safety inspection type, and determine if the entered certificate number is next in sequence for that safety inspection type. If the entered number is not next in sequence, the correction prompt should appear.

If the inspector enters fewer than 9 characters, the analyzer shall automatically load leading zeros to the numerical entry and show the analyzer number after the entry is confirmed. For example, an entry of an 'A' followed by a '123' shall be converted to 'A00000123' and displayed for the inspector to confirm the entry. The conversion will always end in a nine-character certificate number entry. This nine-character value shall be used during comparison testing to facilitate sequential issuance of certificates. The first character of a certificate number shall be an alphabetic character. The analyzer shall be able to enter the certificate number using the bar code reader. The only acceptable alpha character is 'V' for decals.

The analyzer shall restrict the alpha character to a list of acceptable alpha characters for a particular type of certificate or decal being issued. For example, during a safety and

emission inspection reinspection, if the inspector selects the '1-year windshield (safety & emissions)' certificate on the type of inspection prompt in Section 3.1.20 and the vehicle passes the inspection, the inspector may only enter an 'A,' 'B,' 'C,' 'D,' 'E,' or 'F,' as the alpha character in the certificate number entry prompt. For Emission only Decals, the only acceptable alpha character is 'V.' For '1 Year Windshield (Safety Only)' certificate types, the acceptable alpha characters are 'G,' 'H,' 'I,' 'J,' 'K,' 'L,' 'M,' and 'P.' For '2 Year Windshield' certificate types, the acceptable alpha characters are 'N,' 'W,' and 'Q.' For 'Trailer/Motorcycle' certificate types, the acceptable alpha characters are 'X,' 'Y,' and 'Z.' For 'FMCSR (Truck)' certificate types, the acceptable alpha characters are 'T,' and 'U.' For 'FMCSR (Trailer)' certificate types, the acceptable alpha characters are 'R,' and 'S.'

Associated System File: **VEHICLE.DAT** **CERT_NUM**

- -

3.2.16 Certificate Number Correction Prompt:

INDICATE THE CONDITION OF THE PREVIOUS CERTIFICATE

U - UNACCOUNTED FOR

C - ENTERED CERTIFICATE IS CORRECT

R - RE-ENTER CERTIFICATE NUMBER

Programming Criteria:

The system shall only accept 'U,' 'C,' or 'R,' as valid entries. The system shall display the entered certificate number, the safety certificate inspection type ('J,' 'C,' 'B,' 'K,' or 'G' certificate), and the 'previously' issued certificate number. This prompt shall only appear if the entered certificate is out of sequence. If 'R' is entered, the system shall allow the inspector to return to the previous screen prompt to re-enter the current certificate. If 'C' or 'U' is selected, the system will use the entered certificate number as the new 'previous' certificate number for the next comparison. If 'U' is selected, the system shall complete the test, write the test record, transmit the results to the Texas Information Management System during the next emission-related inspection, and continue with the Certificate Type Prompt, number 3.12.2a. If the inspector selects 'U,' the analyzer shall not allow any further official inspections to be conducted until the inspector has completed the entries required in Section 3.12, Missing, or Voided Certificates.

The analyzer may either:

1. a. complete the inspection as prescribed in Sections 3.2, by proceeding with Section 3.2.17, VI 30A Selection Prompt and;

   b. complete the screen prompts in Section 3.12. A manufacturer selected lockout shall be used to prevent any subsequent official inspections until the certificates are accounted for by answering the prompts in Section 3.12; or

2. a. interrupt the current inspection; and

   b. account for the previous certificates by answering the prompts in Section 3.12, beginning with 3.12.2a and continuing through to 3.12.5, or 3.12.6; and

   c. complete the inspection, by proceeding with Section 3.2.17, VI 30A Selection Prompt, write the test record, and transmit the results to the Texas Information Management System during the next emissions-related inspection, thus, satisfying the requirement of accounting for the previous certificates prior to conducting any subsequent official inspections.

If a manufacturer lockout is used, the inspector shall be able to easily identify the reason the analyzer is preventing subsequent official inspections. The inspector shall be able to easily identify which type of certificate or decal must be accounted for. In any case, the analyzer shall not conduct any subsequent official inspections until the inspector accounts for the previous certificates by answering the questions in Section 3.12.

The analyzer will store the information in the VEHICLE.DAT file and print it on the weekly inspection log report (VI-8B). The void indicator shall show 'VOID' if 'V' is in the CERT_COND field or 'MISS' if 'M' is in the CERT_COND field of the record created using the Missing or Voided Certificates function. The system shall store the entry of 'C' in the CERT_COND field, if 'C' is selected, and store the entry of the 'U' in the CERT_COND field, if 'U' is selected in the test record. The default for this screen shall be 'R' for reenter certificate number.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**

INVALID ENTRY--TRY AGAIN

Associated System File: **VEHICLE.DAT** **CERT_COND**

- -

3.2.17 VI 30A Selection Prompt:

DO YOU WISH TO ISSUE AN OUT OF STATE VERIFICATION FORM (VI-30A)? ('Y' OR 'N')

Programming Criteria: The system shall give this prompt if the Safety_PF_Flag is "P." The system shall only accept a 'Y' or 'N' entry. If the inspector selects 'N', the system shall skip the next screen prompt and continue to the Print Vehicle Inspection Report Prompt in Section 3.2.19.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **VI30A_FLAG**

- -

3.2.18 VI 30A Number Prompt: ENTER THE VI 30A #.

Programming Criteria: The inspector will enter the VI 30A #. A minimum of one (1) character and a maximum of seven (7) characters are required for this field. If no entry is made, the analyzer shall return to the VI 30A Selection prompt, number 3.2.17. Then, the system shall continue to the Print Vehicle Inspection Report Prompt in Section 3.2.19.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **VI30A_NUM**

- -

3.2.19 Print Vehicle Inspection Report:

After the system has stored the test record, the following prompt shall be displayed. **"READY TO PRINT VEHICLE INSPECTION REPORT? ENTER "Y" FOR YES OR "N" FOR NO."**

Depending upon the pass/fail status of the emissions phase of the inspection, the printer will provide additional information to the customer as outlined in Appendix B. The custom report shall include, but not be limited to, the following information: Test Type (Initial or Reinspection), Test (Safety), Test Date, Test Time, Test Cost (differentiated by Inspection Fee and Repair), Overall Cost, Inspector Name, Station Name, Vehicle License Number, VIN, Vehicle Make, Vehicle Model Year, Vehicle Type, Engine Size, Cylinders, Transmission, Odometer, Gross Vehicle Weight, Two Letter Special Test Designation where applicable, the Results of the Gas Cap Integrity Test, and the Overall Result of the Inspection. The vehicle's ignition type shall be place on the same line as the number of cylinders separated by at least two spaces or a slash. The subtitle of the report shall indicate that the test was a Safety and Emissions Inspection, Safety Only Inspection, Required Emission Only Decal Inspection or Emission Only Inspection, and whether or not the test was conducted as a Special Test. If the test was conducted as a Special Test, the Two Letter Designation (i.e., LI, ME, IV, AD, ST, PA, or OT) shall be placed on the same line as the Test Type separated by at least two spaces, or a slash, and the words 'Special Test' shall be in the subtitle. The system shall allow the inspector to print additional copies of the vehicle inspection report, after the initial report has been printed. Prior to returning to the main menu, the analyzer shall store the results of the safely only inspection in the appropriate file structure. When the analyzer conducts and completes the next emissions test, the information for the safety only inspection(s) shall be transmitted to the Texas Information Management System Host.

The analyzer shall print two barcodes on the VIR which contain the VIN, license plate number of the vehicle, and the license type, of the vehicle under inspection. The bar code shall be code 39 format and contain only the previously mentioned information and the start and stop characters.

The bar codes shall be printed on the VIR in the following format: 2 code 3 of 9 bar codes will be utilized, since there is too much information to use a single bar code. One bar code shall be formatted as follows:

Name	Length	Start	Format
Identifier	1	1	'$'
License Plate Type	1	2	'1', '2', '3', '4', '5', '6', '7', or '8'
License Plate Number	8	3	Alphanumeric
TxDOT Number	10	11	Alphanumeric

The other shall be formatted as follows:

Name	Length	Start	Format
Identifier	1	1	'I'
VIN	17	2	Alphanumeric

Each bar code must be clearly labeled, so that the inspectors can easily tell which bar code is which. The location of the bar codes on the VIR shall be determined by the manufacturers. The State only requires that they be present and labeled.

Error Message: **NO VALUES ENTERED -- TRY AGAIN**

Associated System File: **VEHICLE.DAT** **SAFE_INSP_COST**
OVERALL_COST
CERT_NUM
OVERALL_RESULTS

- -

3.3 Main Menu Selection '3' "Emissions Only Inspection"

3.3.1 Access Code Prompt: ENTER YOUR INSPECTOR'S ACCESS CODE

Programming Criteria:

The TX96 analyzer shall be designed to require the entry of the access code via the 2-D bar code reader. The inspector shall be required to enter his access code using the bar code reader for every inspection.

The TX96 analyzer shall be designed to require the entry of a special access code by the certified inspector before an official emissions inspection can begin. The access code shall neither be displayed nor printed on the Inspection Vehicle Inspection Report. This access code will be verified and linked to existing I/M Inspector number contained in the **INSPECTR.DAT** file. The analyzer shall not accept duplicate access code for different inspectors. Each inspector's access code shall be unique. The analyzer shall allow three

attempts to enter a valid access code. Following each of the first two attempts, Error Message 1 shall be displayed. Error Message 2 shall be displayed for 5 minutes following the third attempt or until the inspector presses “enter/continue”. The system shall then return to the main menu.

Error Messages:

1. **"YOUR ACCESS CODE IS NOT VALID--TRY AGAIN"**

2. **"THE ACCESS CODE ENTERED IS NOT VALID. VERIFY YOUR ACCESS CODE NUMBER WITH YOUR LOCAL DPS OFFICE."**

Associated System File: **INSPECTR.DAT** **ACCESS_CODE**

- -

3.3.1a **PIN Number Prompt:** **ENTER YOUR INSPECTOR'S PIN NUMBER**

Programming Criteria:

The TX96 analyzer shall be designed to require the entry of a special PIN by the certified inspector before an official emissions inspection can begin. The PIN shall neither be displayed nor printed on the Inspection Vehicle Inspection Report. This access code will be verified and linked to existing I/M Inspector number contained in the **INSPECTR.DAT** file. The analyzer shall not accept duplicate PINs for different inspectors. Each inspector’s access code shall be unique. The PIN will be encrypted on the analyzer and is unreadable to anyone. Also, any other files that contain the PIN (i.e. INSPECTR.REC) must be unreadable to anyone. The analyzer may encrypt or delete these files. . The analyzer shall allow three attempts to enter a valid access code. Following each of the first two attempts, Error Message 1 shall be displayed. Error Message 2 shall be displayed for 5 minutes following the third attempt or until the inspector presses “enter/continue”. The system shall then return to the main menu.

Error Messages:

1. **"YOUR PIN IS NOT VALID--TRY AGAIN"**

2. **"THE PIN ENTERED IS NOT VALID. CONTACT YOUR LOCAL DPS OFFICE TO RESET YOUR PIN."**

Associated System File: **INSPECTR.DAT** **PIN_NO**

- -

3.3.2 Date Expiration Prompt: **YOUR STATION/INSPECTOR CERTIFICATION EXPIRATION DATE IS MM DD YY**

Programming Criteria: The analyzer will then check the license expiration date and lockout flag for the inspector in the inspector file. The station license renewal date and lockout flag will then be checked in the station file. If either the station or the inspector license expiration date is within 60 days of today then the analyzer will display Message 1 indicating the expiration date. If the inspector or station dates have passed, Message 2 will be displayed. The analyzer shall countdown the final five days prior to the expiration date of the inspector or the station certification. The analyzer shall display Message 3 in addition to Message 1 or 2 during the five-day countdown. If it is 30 days past the inspector or station expiration date, the system will set the station lockout flag in the station file or the inspector lockout flag in the inspector file to "Y" to indicate lockout has occurred.

If either the station or the inspector lockout flag is set, the analyzer will display a message that indicates lockout has occurred and returns to the main menu.

Error Messages:

1. **YOUR (STATION/INSPECTOR) CERTIFICATION EXPIRES MM/DD/YY.**

2. **YOUR STATION /OR INSPECTOR CERTIFICATION EXPIRED (date). YOU ARE NOT AUTHORIZED TO PERFORM ANY EMISSIONS INSPECTION AT THIS TIME. PLEASE CONTACT YOUR LOCAL DPS OFFICE.**

3. **YOUR (STATION/INSPECTOR) CERTIFICATION WILL EXPIRE IN X (5, 4, 3, 2, 1) DAY(S).**

Associated System File: **INSPECTR.DAT** **INSP_EXP_DATE**

STATION.DAT **STAT_EXP_DATE**

LOCKOUT.DAT **INSP_LOCKOUT_FLAG**

STATE_LOCKOUT

- -

3.3.2a **<u>Inspection Type Prompt:</u> ENTER THE INSPECTION TYPE**

1 - Required Emissions Only Test (Decal)

2 - Voluntary Test

3 - Test on Resale (Do Not Display or Use)

4 - Remote Sensing Request

<u>Programming Criteria:</u> The analyzer shall display the type of test selected by the inspector so that the inspector can confirm the selection. The default for this screen shall be the required emission only test. The system shall set test_type field as follows:

1 - 'O'	3 - 'C'
2 - 'I'	4 - 'B'

<u>Associated System File:</u> **VEHICLE.DAT** **TEST_TYPE**

- -

3.3.3 <u>Fuel Type Prompt:</u> ENTER THE VEHICLE FUEL TYPE. SELECT THE APPROPRIATE FUEL TYPE CODE FROM THE LIST BELOW.

<u>Code</u>	<u>Description</u>
"G"	**Gasoline**
"B"	**Bi-Fueled (Dual-Fueled)**
"D"	**Diesel (Not applicable -End Test Now)**

Programming Criteria:

Entry of one of the above types is required. The analyzer software shall be designed so that only a "G" a "B"or a "D" can be entered by the inspector for this field. The system software shall default to gasoline for this entry. If the inspector selects "B", the system shall display a message stating that **"YOU HAVE INDICATED THAT THIS VEHICLE IS DUAL-FUELED. PLEASE CONFIRM THAT THE VEHICLE IS OPERATING ON GASOLINE FOR THE TEST WITH A "Y."**" After confirming the result, the system shall go to the model year prompt, 3.3.4. If the inspector presses something other than "Y", the system shall return to the initial fuel type prompt. If the inspector selects "D", the system shall display a message stating **"YOU HAVE INDICATED THAT THIS VEHICLE IS DIESEL FUELED. PLEASE CONFIRM THIS ENTRY BY PRESSING "Y". IF YOU CONFIRM THAT THE VEHICLE IS DIESEL FUELED, THE TEST WILL END. DIESEL FUELED VEHICLES ARE NOT REQUIRED TO BE TESTED."** If the inspector confirms the entry, the system shall return to the main menu. If the inspector presses something other than "Y", the system shall return to the initial fuel type prompt.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN.**

INVALID ENTRY--TRY AGAIN.

Associated System File: **VEHICLE.DAT** **FUEL_TYPE**

- -

3.3.4 Model Year Prompt: **ENTER THE LAST TWO DIGITS OF THE VEHICLE MODEL YEAR.**

Programming Criteria:

If no value is entered, the analyzer will display Message 1, and prompt the inspector to reenter the last two digits of the vehicle model year. If the vehicle model year is strictly less than the current year minus 24 years, or strictly greater than the current year minus two years, then display message 2, or a message on applicable model years, without writing any data to the disk file. The system will display a message asking the inspector if he/she desires to continue. If the inspector wishes to discontinue, then the system will abort the test and return to the main menu. The system will continue with the test if the inspector indicates that he/she wishes to continue. The system will display Message 3 in the event that the model year is beyond (i.e., strictly greater than) the current year +2, and prompt the inspector to reenter the last two digits of the vehicle model year or the entire model year. The system shall display message 4

in the event that the entered vehicle model year is greater than or equal to (>=) 1990 and strictly less than the value contained in the OBDII_MODEL_YR field of the SYSTEM.DAT file (i.e., is not eligible to receive an OBDII emissions test). The analyzer shall require the inspector to confirm any model year entry that is less than 1950.

Error Message:

1. **NO VALUE HAS BEEN ENTERED TRY AGAIN.**

2. **NOT REQUIRED TO TEST VEHICLES OLDER THAN YEAR (CURRENT YEAR - 24) AND/OR VEHICLES LESS THAN 2 YEARS OLD. THIS IS AN OPTIONAL TEST.**

3. **INVALID MODEL YEAR -- TRY AGAIN.**

4. **THIS VEHICLE IS NOT ELIGIBLE FOR AN OBDII ONLY EMISSIONS TEST**

Associated System File: **VEHICLE.DAT** **MODEL_YEAR**

- -

3.3.4a Bar Code Entry of License Plate Type, Number, and VIN Prompt:

SCAN THE BAR CODE THAT CONTAINS THE LICENSE PLATE TYPE, LICENSE PLATE NUMBER, AND TXDOT NUMBER FROM THE VEHICLE INSPECTION REPORT.

OR

PRESS "ENTER/CONTINUE" TO CONTINUE IF THE VEHICLE INSPECTION REPORT IS NOT AVAILABLE.

Programming Criteria:

The analyzer prompt the inspector to scan the bar code which contains license plate type, number, and TXDOT number. After the first bar code is successfully scanned, the analyzer shall place a 'B' in the BARCODED_LIC_PLT, and

BARCODED_TXDOT_NO fields, of the test record, and proceed to Section 3.1.8, VIN Number Prompt. If the inspector presses “enter/continue,” the analyzer shall place a ‘K’ in the BARCODED_LIC_PLT, and BARCODED_TXDOT_NO fields of the test record, and allow the inspector to enter this information using the keyboard by proceeding to Section 3.3.5 , License Type Prompt.

Error Message: **DID NOT SCAN PROPERLY–PLEASE TRY AGAIN**

Associated System File: **VEHICLE.DAT**

LICENSE_TYPE	**BARCODED_LIC_PLT**
LICENSE_NUM	**BARCODE_TXDOT**
TXDOT_NUM	

- -

3.3.5 License Type Prompt: **"ENTER THE TYPE OF LICENSE PLATE OF THE VEHICLE."**

1.	**Texas Plate**	5.	**Exempt (Federal)**
2.	**No Plate**	6.	**Dealer Plate**
3.	**Out of State**	7.	**Temporary Buyer Tag**
4.	**Exempt (State)**	8.	**Other**

Programming Criteria: The inspector will be prompted to enter the license type of the vehicle. If the inspector selects license type ‘2’ or ‘8’ the system will assign the License_Num field in the VEHICLE.DAT a value of "V" followed by the last seven digits of the VIN number, and skip the license prompt, number 3.3.6 . The entry in the License_Num field shall be a “V” and the 7 rightmost characters of the VIN. If the entered VIN has less than 7 characters, the entry should be a “V” followed immediately by the entered VIN without filler spaces between the “V” and the entered VIN. The system will default to license type ‘1.’

Error Message: **THIS FIELD MUST BE ENTERED TO CONTINUE WITH THE TEST.**

Associated System File: **VEHICLE.DAT** **LICENSE_TYPE**

- -

3.3.6 <u>License Prompt:</u> **"ENTER THE LICENSE NUMBER OF THE VEHICLE."**

<u>Programming Criteria:</u> The inspector will be prompted to enter the license number of the vehicle. Upon confirming the license plate entry, the vehicle information is eligible to be stored in the RECALL.DAT file.

<u>Error Message:</u> **THIS FIELD MUST BE ENTERED TO CONTINUE WITH THE TEST.**

<u>Associated System File:</u> **VEHICLE.DAT** **LICENSE_NUM**

- -

3.3.6a <u>TxDOT Number Prompt:</u> **ENTER THE NUMBER FROM THE TxDOT REGISTRATION CERTIFICATE AFFIXED TO THE VEHICLE.**

<u>Programming Criteria:</u> The system shall only give this prompt if the inspector selected 'Texas Plate' (i.e., License_Type is '1') as the license type of the vehicle in Section 3.3.5. The system will prompt for the TxDOT number as it appears on the vehicle.

Where available, the inspector will enter the TxDOT number by using the bar-code reader to scan the bar coded TxDOT number that is on the windshield of the vehicle. If a barcode reader is not available, the inspector will be capable of entering the TxDOT number from the keyboard. The bar code should utilize the Code 39 symbology. The only information contained in the bar code are the start and stop characters, and the TxDOT number.

The system shall allow the inspector to see and edit the TxDOT number as it is being entered. When all characters of the TxDOT number have been entered, the system shall prompt the inspector to press "continue" or "enter". The inspector shall hit "continue" or "enter", the screen will blank the TxDOT number and ask the operator to reenter the TxDOT number under the same conditions as the previous entry. The two attempts must match. If the two attempts do not match, the analyzer will display Message 3 and prompt the inspector to enter the TxDOT number a third time. A minimum10 characters are required for this field. If the entry is not within these parameters then the system will display Message 2. The format of the TxDOT number shall consist of eight numeric digits followed by two alpha characters. For example, 06691576WZ is a valid

TxDOT number. If the entry does not fit this format, then the system will display Message 4. If no value is entered, the analyzer will display Message 1.

Error Message: **1. THIS FIELD MUST BE ENTERED TO CONTINUE WITH THE TEST.**

2. A MINIMUM OF 10 CHARACTERS ARE NEEDED FOR THIS ENTRY--TRY AGAIN.

3. ENTRIES DO NOT MATCH -- TRY AGAIN.

4. THIS ENTRY MUST BE EIGHT NUMBERS FOLLOWED BY TWO LETTERS-- TRY AGAIN.

Associated System File: **VEHICLE.DAT** **TXDOT_NUM**

- -

3.3.7 VIN Number Prompt: **ENTER VIN NUMBER.**

Programming Criteria: The system will prompt for the VIN number as it appears on the vehicle. Where available, the inspector will enter the VIN number by using the barcode reader to scan the barcoded VIN on the vehicle. If a barcode reader is not available, the inspector will be capable of entering the VIN number from the keyboard. The analyzer will place a 'B' in the BARCODED_VIN field of the test record, if the VIN is entered using the bar code reader. Otherwise, the analyzer will place a 'K' in the BARCODED_VIN field of the test record.

The system shall allow the inspector to see and edit the VIN as it is being entered. When all characters of the VIN have been entered, the system shall prompt the inspector to press "continue" or "enter". The inspector shall hit "continue" or "enter", the screen will blank the VIN and ask the operator to reenter the VIN under the same conditions as the previous entry. The two attempts must match. If the two attempts do not match, the analyzer will display Message 3 and prompt the inspector to enter the VIN number a third time. A minimum of three and maximum of 17 characters are required for this field. If the entry is not within these parameters then the system will display Message 2. If no value is entered, the analyzer will display Message 1. The VIN verification algorithm shall be applied here. The algorithm shall be supplied under separate cover by

the TNRCC. The VIN verification shall only be applied to vehicles with model years 1981 and newer. The analyzer will not allow the inspector to enter the letters 'I,' 'O,' or 'Q' for vehicle with model years 1981 and newer. The software should suggest possible substitute letters when the DPS algorithm indicates that the VIN is bad. For example, the software could ask if the entered '8' could be a 'B.'

Error Message: **1. THIS FIELD MUST BE ENTERED TO CONTINUE WITH THE TEST.**

2. A MINIMUM OF 3 OR MAXIMUM OF 17 CHARACTERS ARE NEEDED FOR THIS ENTRY--TRY AGAIN.

3. ENTRIES DO NOT MATCH -- TRY AGAIN.

Associated System File:	**VEHICLE.DAT**	**VIN_ID_NUM**
		VIN_FLAG
		BARCODED_VIN

- -

3.3.7a Texas Information Management System Contact:

The analyzer shall contact the Texas Information Management System Host, retrieve all applicable vehicle information, and enter the information into the appropriate fields.

An inspection shall be stopped and the analyzer shall return to the main menu, if the following response bits are set in the RESPONSE.DAT file:

56 - Inspector License expired

57 - Inspector license suspended/revoked

58 - Inspector not authorized to test at this station

60 - TAS is locked out for at least one of the reasons included within "Lockout Status Record" data file

If the most recent test record is available from either the Texas Information Management System Host or the system files, the analyzer shall confirm that the vehicle is eligible for an initial inspection.

If the vehicle has not had an initial inspection at this station within the last sixteen days, the vehicle is eligible for an initial inspection. The vehicle is eligible for an initial inspection if:

1. the SAFE_INIT_TEST field in the test record is set to ‘R’; or

2. the station number of the previous inspection station does not match the number of the station conducting the current inspection; or

3. the date of this inspection is not within 16 days of the inspection date contained in the previous test record.

If the vehicle is not eligible for an initial inspection, the analyzer shall:

1. display a message indicating why the vehicle is not eligible for an ‘initial inspection’ (i.e., an initial inspection has already been conducted on this vehicle) and prompt the inspector to inform the customer that they will not be charged for this inspection;

2. save the vehicle information, possibly in the Recall.Dat file for use in the reinspection mode;

3. either transfer operation to the reinspection mode, Section 3.4 or continue in the initial inspection mode if the inspector is prompted to enter repair information about this vehicle; and

4. input the necessary vehicle information from the test record of the previous inspection once the analyzer is in the reinspection mode.

If the vehicle is eligible for an initial inspection because the station numbers do not match and the EMISS_PF_FLAG is set to ‘F’ in the test record of the previous inspection, the analyzer shall prompt the inspector for the repair data prior to conducting the preconditioned two-speed idle test.

Upon completion of this contact, the analyzer shall display all Technical Service Bulletins, Recall Information, and Announcements transmitted by the Texas Information Management System. The analyzer shall automatically print one copy of any announcement. The analyzer shall provide the option of printing additional copies prior to continuing with the test, deleting the announcement, or saving the announcement to a predetermined file. The analyzer shall be

able to save three messages for later review. Any new announcement saved shall overwrite the oldest announcement in the system.

- -

3.3.8 <u>Vehicle Type Prompt:</u>

SELECT THE VEHICLE TYPE

'P' - PASSENGER CAR/STATION WAGON

'T' - TRUCK/VAN/BUS/SPORTS UTILITY VEHICLE

'M' - MOTOR HOME

'B' - BUS

<u>Programming Criteria:</u>

The inspector should select the vehicle type from the above list. The inspector shall be able to use the arrow keys to highlight the appropriate choice and press "continue" to select it. The default choice on this screen shall be the "passenger car/station wagon" selection.

If the inspector selects 'M' or 'B', the analyzer shall skip the Vehicle Body Type Prompt in Section 3.1.9a and use the Vehicle_Stnds_Type of 'T' if it receives an ASM inspection. If the inspector enters a gross vehicle weight for a bus or motor home that is less than 8501 pounds, the analyzer shall set the BODY_STYLE field to 6.

<u>Error Message:</u> **NO VALUES HAVE BEEN ENTERED--TRY AGAIN**

INVALID ENTRY--TRY AGAIN

<u>Associated System File:</u> **VEHICLE.DAT** **VEHICLE_TYPE**

- -

3.3.8a <u>Vehicle Body Type Prompt:</u> ENTER THE VEHICLE TYPE.

SELECT THE APPROPRIATE VEHICLE BODY TYPE FROM THE LIST BELOW:

CODE	VEHICLE BODY TYPE
1	SEDAN
2	STATION WAGON
3	PICKUP
4	SPORT/UTILITY VEHICLE
5	MINIVAN
6	FULL-SIZE VAN

Programming Criteria:

If the inspector selected 'P' as the vehicle type, the analyzer shall only display choices, 1 and 2. The default choice on this screen shall be the "passenger car/station wagon" selection. If the inspector selected 'T' as the vehicle type, the analyzer shall only display choice 3 through 6. In this case, the default choice on this screen shall be the "pickup" selection. The inspector shall be able to use the arrow keys to highlight the appropriate choice and press "continue" to select it. In either case, the analyzer may use the TXVRT.DAT to display the list of vehicle makes and models. This prompt may be combined with the Vehicle Type Prompt in Section 3.3.8 as long as the logic is correct.

If the inspector selected 'M' or 'B' as the vehicle type, the analyzer shall use the NCIC list to display the list of makes and models.

If the model year, make and model entered describe a unique vehicle (i.e., a single VRT Row number), the body type may be taken directly from the VRT record and the inspector does not need to be prompted to enter the body type.

The Vehicle Body Type will be used to determine the vehicle test standards group (Passenger car or Truck), which will be used for determining the appropriate test standards to be used. Vehicle body type codes 1 and 2 will be tested as passenger cars, while body type codes 3-6 will be tested as trucks.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **BODY_STYLE**

TXVRT.DAT **VEHICLE_BODY_TYPE**

- -

3.3.9 <u>Vehicle Make Prompt:</u> **ENTER THE VEHICLE MAKE.**

<u>Programming Criteria:</u> The analyzer will then display a list of vehicle makes that the inspector will use to select the make of the vehicle currently under inspection. The analyzer will store the selected make name using the NCIC make definitions. The analyzer may display subsets of the make list that specifically identify all of the manufacturers of passenger vehicles, trucks, motor homes, motorcycles, trailers, or buses. The system shall use the makes contained in the TXVRT.DAT file for passenger cars and trucks. The system shall use the makes in the NCIC listings for Buses and Motor homes.

The analyzer shall present the option of 'other' as a make definition for use when there is no applicable definition for the vehicle under inspection. The 'other' option shall instruct the inspector to enter the full make name and at least the first five characters of the model name. The analyzer shall allow the inspector to enter up to 20 characters. The entry of 'OTHR' shall be stored in the MODEL field, and the characters 'OTH' shall be placed in the MODEL_CODE field in the applicable test record. The NCIC make/model list may be supplied by the TNRCC.

<u>Error Message:</u> **NO VALUE HAS BEEN ENTERED--TRY AGAIN.**

<u>Associated System File:</u> **VEHICLE.DAT** **MAKE**

- -

3.3.10 <u>Model Prompt:</u> **SELECT THE VEHICLE MODEL.**

<u>Programming Criteria:</u> The system will then display the appropriate vehicle models based on the vehicle make entry. The analyzer shall present the option of 'other' as a model definition for use when there is no applicable definition for the vehicle under inspection. The 'other' option shall instruct the inspector to enter the model name and allow the inspector to enter up to 20 characters. An 'OTH' shall be placed in the MODEL_CODE field of the test record

whenever the ‘other’ option is selected by the inspector.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN.**

Associated System File: **VEHICLE.DAT** **MODEL**
MODEL_CODE

- -

3.3.11 **Odometer Prompt:** **ENTER THE VEHICLE ODOMETER READING. A MINIMUM OF ONE NUMERIC ENTRY IS REQUIRED. DO NOT ENTER THE TENTH'S DIGIT.**

Programming Criteria: Enter the vehicle odometer. Do not include tenth's. The system shall only accept numerical entries in this field. If the analyzer is conducting this sequence as a “Test on Resale” inspection, and the entered values for model year and odometer indicate the vehicle is exempt from this requirement (i.e., model year >= 1995 or odometer >= 50,001), the system will display error message number 2, at any point between this prompt and the Safety Items Inspection Prompt.

Error Message:

1. **NO VALUE HAS BEEN ENTERED--TRY AGAIN**.

2. **THIS VEHICLE IS EXEMPT FROM TEST-ON-RESALE BECAUSE THE MODEL YEAR IS 1996 OR NEWER AND THE ODOMETER READING IS LESS THAN 50,000 MILES. PRESS “ENTER/CONTINUE” TO RETURN TO THE MAIN MENU.**

Associated System File: **VEHICLE.DAT** **ODOMETER**

- -

3.3.12 **Injection/Carburetion Prompt:**

SELECT THE INJECTION/CARBURETION

F - FUEL INJECTION

C - CARBURETION

O - OTHER

Programming Criteria: The inspector should select the appropriate injection/carburetion from the above list.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**

INVALID ENTRY--TRY AGAIN

Associated System File: **VEHICLE.DAT** **INJECT_CARB**

- -

3.3.15 **Cylinder Prompt:** **ENTER THE NUMBER OF CYLINDERS.**
FOR ROTARY ENGINES, ENTER AN "R."

Programming Criteria:

The analyzer shall display the choice(s) for the expected number of cylinders based on the previously entered engine size. The default for the number of cylinders to be entered shall be the value contained in the CYLINDERS field in the TXVRT.DAT file. The minimum number of cylinders is "1" and the maximum is "16". Any entries out of the "1-16" range will be rejected by the system.

For rotary engines, the inspector shall be prompted to enter an "R."

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN.**

NUMBER OF CYLINDERS IS NOT VALID--TRY AGAIN.

Associated System File: **VEHICLE.DAT** **CYLINDERS**

- -

3.3.15a **<u>Engine Units Prompt:</u>** **ENTER THE UNITS OF THE ENGINE SIZE**

Letter	Units
L	**Liters**
I	**Cubic Inches**
C	**Cubic Centimeters**

<u>Programming Criteria:</u> This prompt may be combined with the Engine Size Prompt to facilitate ease of entry for the lane inspector. The intent is to allow the inspector to select the correct engine size and unit of measure. Combination entries, such as 3.0 Liter, and 350 Cubic inches, are preferable here. The analyzer shall prompt the inspector to enter the measurement unit for the engine size, and allow the inspector to use the arrow keys to highlight the appropriate selection, and press “continue” to select the correct choice. The analyzer software shall be designed so that an "I," "L,” or "C" can also be entered for the units. The default for this screen shall be liters.

<u>Error Message:</u>

1. **NO VALUE HAS BEEN ENTERED--TRY AGAIN**

2. **INVALID ENTRY--TRY AGAIN**

- -

3.3.15b **<u>Engine Size Prompt:</u>** **ENTER THE ENGINE SIZE**

Unit: **“Display selection from previous prompt here” (i.e., Liters, Cubic Inches, Cubic Centimeters)**

Size: **_____**

<u>Programming Criteria:</u> The analyzer shall display the unit of measure that was selected

on the previous prompt, and allow the inspector to enter the engine size. When storing this information to the test record, the analyzer shall store the use the first four characters of the ENGINE SIZE field to hold the size entered at this prompt. The last character shall be the engine unit size. The engine unit size shall be "L" for liters, "I" for cubic inches, and "C" for cubic centimeters. The analyzer software shall be designed so that only an "I," "L," or "C" can be entered for the units. Liter size entry format shall be a numeric, decimal point, and numeric (i.e., “3.8”, “5.0”).

The internal storage on the TX96 analyzer record is to be automatically converted to cubic centimeters. The display shall remain in the original units entered. To convert from cubic inches to cubic centimeters, multiply by 16.387. To convert from liters to cubic centimeters, multiply by 1,000. Products shall be rounded to the nearest cubic centimeter.

An error message shall be displayed if the inspector enters an equivalent engine size greater than 9,999 cc or smaller than 655 cc. The inspector shall be instructed to correct the entry or abort the test. Vehicles powered by less than a 40 cubic inch engine (655 cc) shall display Error Message 3. If the test is aborted, no updates will be made to any disk file.

Error Message:

1. **NO VALUE HAS BEEN ENTERED--TRY AGAIN**
2. **INVALID ENTRY--TRY AGAIN**
3. **40 CID OR 655 CC OR SMALLER ARE EXEMPT FROM THE EMISSIONS INSPECTION PROGRAM.**

Associated System File: **VEHICLE.DAT** **ENGINE_SIZE**

- -

3.3.15c **GVW Prompt:** **ENTER THE GVW OF THE VEHICLE.**

Programming Criteria:

The system will prompt the inspector to enter GVW. The analyzer shall display the choice for the expected gross vehicle weight rating based on the previously entered engine size. The default for the GVW to be entered shall be the value contained in the GVWR field in the TXVRT.DAT file. If there is no value in the TXVRT.DAT file or there is not listing of the vehicle in the TXVRT.DAT file, the default shall be the value contained in the GVW_ACTUAL field of a previous test record. If the previous weight cannot be determined, no default entry shall be displayed. The inspector shall be allowed to disregard the default and enter his choice.

If the entered GVW is less than or equal to 8,500, set GVW_TYPE field in the vehicle file to 1 (light). If GVW is greater than or equal to 8,501, set GVW_TYPE field in the vehicle file to 2 (heavy).

If the inspector presses "continue/enter" and no entry has been made, the analyzer shall display message 1, and prompt the inspector to reenter the GVW. If the inspector enters a GVW greater than 85,000 pounds, the analyzer shall display message 2, and prompt the inspector to reenter the GVW. If the inspector enters a GVW strictly less than 2500 pounds, the analyzer shall display message 3, and prompt the inspector to reenter the GVW.

If the inspector selected 'M' or 'B' in the Vehicle Body Type Prompt and enters a gross vehicle weight that is less than 8501 pounds, the analyzer shall set the BODY_STYLE field to 6 and perform ASM test sequence, where applicable, and using the truck standards to determine pass/fail. If the vehicle is not eligible for ASM (traction control, AWD, etc.,) or the analyzer is not equipped to conduct ASM inspections, the TSI test shall be conducted.

For analyzers <u>not</u> equipped to conduct ASM inspections, the system will set the GVW_TYPE field as described above, and conduct the appropriate emissions test as described in the next two paragraphs.

If the entered vehicle model year is less than the value contained in the OBDII_MODEL_YR field of the SYSTEM.DAT file (i.e., is not eligible to receive an OBDII emissions test), the analyzer shall conduct a two-speed idle (TSI) emissions test on this vehicle.

If the entered vehicle model year is greater or equal to the value contained in the OBDII_MODEL_YR field of the SYSTEM.DAT file (i.e., is eligible to receive an OBDII emissions test), the analyzer shall conduct an OBDII emissions test on this vehicle.

For analyzers equipped to conduct ASM inspections, the system will set the GVW_TYPE field as described above only if the vehicle receives a TSI emissions test. Also, the system will conduct the appropriate emissions test as described in the next four paragraphs.

If the entered GVWR is strictly greater than 8500 (i.e., GVWR > 8500 lbs.), and the entered vehicle model year is less than the value contained in the OBDII_MODEL_YR field of the SYSTEM.DAT file (i.e., is not eligible to receive an OBDII emissions test), the analyzer shall conduct a two-speed idle (TSI) emissions test on this vehicle.

If the entered GVWR is less than or equal to 8500 (i.e., GVWR > 8500 lbs.), and the entered vehicle model year is less than the value contained in the OBDII_MODEL_YR field of the SYSTEM.DAT file (i.e., is not eligible to receive an OBDII emissions test), the analyzer shall conduct an ASM-2 emissions test on this vehicle. If the vehicle is not eligible to receive the ASM-2 test (GVWR > 8500, all wheel drive, etc.,), the system will conduct a two-speed idle (TSI) emissions test on this vehicle.

If the entered GVWR is strictly greater than 8500 (i.e., GVWR > 8500 lbs.), and the entered vehicle model year is greater or equal to the value contained in the OBDII_MODEL_YR field of the SYSTEM.DAT file (i.e., is eligible to receive an OBDII emissions test), the analyzer shall conduct an OBDII emissions test on this vehicle.

If the entered GVWR is less than or equal to 8500 (i.e., GVWR > 8500 lbs.), and the entered vehicle model year is greater or equal to the value contained in the OBDII_MODEL_YR field of the SYSTEM.DAT file (i.e., is eligible to receive an OBDII emissions test), the analyzer shall conduct an OBDII emissions test on this vehicle.

Error Message:

1. **NO VALUE HAS BEEN ENTERED--TRY AGAIN.**
2. **MAXIMUM GVW ENTRY IS 85,000 LBS--TRY AGAIN.**
3. **WEIGHT RATING MUST BE AT LEAST 2500 LBS.--TRY AGAIN**

Associated System File: **VEHICLE.DAT** **GVW_TYPE**
GVW_ACTUAL

- - - -

3.3.16 **Transmission Prompt:** **INDICATE THE TYPE OF TRANSMISSION.**

ENTER AN "M" IF IT IS MANUAL.

ENTER AN "A" IF IT IS AUTOMATIC

Programming Criteria: This information will be used to determine emissions control system requirements in the future. Only 'A' or 'M' entries are allowed.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN.**

Associated System File: **VEHICLE.DAT** **TRANSMISSION**

- -

3.3.17 **Ignition Prompt:** **ENTER IGNITION TYPE.**

SELECT THE APPROPRIATE IGNITION TYPE CODE FROM THE LIST BELOW:

Code	Ignition Type
"C"	**Conventional**
"D"	**Distributorless**
"Q"	**Quad 4/Wireless**

Programming Criteria: Entry of one of the above types is required. The analyzer software shall be designed so that only “C” Conventional, "D" Distributorless or, "Q" Quad 4/Wireless can be entered by the inspector for this field.

Error Message: **NO VALUES HAVE BEEN ENTERED--TRY AGAIN.**

INVALID ENTRY--TRY AGAIN.

Associated System File: **VEHICLE.DAT** **IGNITION**

- -

3.3.18 **Exhaust Prompt:** **DOES THE VEHICLE HAVE DUAL EXHAUST?**

"Y" = YES "N" = NO

Programming Criteria: The software shall ask the inspector to indicate if the vehicle is equipped with dual exhaust. If the inspector selects "Y" (YES), then the analyzer shall display instructions to the inspector to attach the additional probe to the analyzer for testing. After the additional hose is connected to the analyzer, the inspector shall be required to hit "enter/continue" to proceed to the next prompt. The analyzer shall read exhaust concentration from both exhaust pipes simultaneously. The analyzer averaging method of tailpipe reading is not acceptable. If the inspector selects "N" (NO), the analyzer shall automatically proceed to the next item. The analyzer software shall be designed so that only a "Y" or an "N" can be entered by the inspector for this field.

Error Message: **INVALID ENTRY--TRY AGAIN.**

Associated System File: **VEHICLE.DAT** **DUAL_EXHAUST**

- -

3.3.18.a **Drive Axle Prompt:** **IS THE VEHICLE EQUIPPED WITH AWD OR FULL-TIME 4 WHEEL DRIVE OR NON-DISENGAGEABLE TRACTION CONTROL. PLEASE CONFIRM BY PRESSING "Y" OR "N"**

Programming Criteria: The analyzer shall only display this prompt if the entered vehicle model year is less than the value contained in the OBDII_MODEL_YR field of the SYSTEM.DAT file (i.e., is not eligible to receive an OBDII emissions test). If YES, and, according to the data stored in the station information (i.e., OBDII_ONLY set to 'N'), the emissions inspection system is not equipped with an AWD dynamometer, then display prompt:

PERFORM A TWO-SPEED IDLE EMISSIONS TEST

NOTE: Two speed idle emissions test procedure is included in Appendix K.

If NO, the EIS shall perform an ASM-2 emissions test.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN.**

INVALID ENTRY--TRY AGAIN.

Associated System File: **VEHICLE.DAT** **AXLE_TYPE**
OBDII_ONLY

- -

3.3.19 **Pre-Tune Prompt:** **DID INSPECTOR/FACILITY PERFORM ANY EMISSIONS-RELATED REPAIRS OR ADJUSTMENTS PERFORMED ON THE VEHICLE PRIOR TO THIS TEST?**

"Y" = YES **"N" = NO**

Programming Criteria: The analyzer will ask the inspector if pre-tuning was performed on this vehicle prior to testing. The analyzer software shall be designed so that only a "Y" or an "N" can be entered by the inspector for this field.

Error Message: **NO VALUES HAVE BEEN ENTERED--TRY AGAIN.**

Associated System File: **VEHICLE.DAT** **PRE_TUNE**

- -

3.3.19a **Confirm Vehicle Info Display:**

The analyzer shall display the vehicle information to the inspector and allow the inspector to edit the information as appropriate. If the vehicle information was populated by the Texas Information Management System, the inspector shall be allowed

to edit all vehicle information except the VIN, the license plate type, and the license plate number. The inspector shall be required to press "continue/enter" to continue. Upon confirming the vehicle, the vehicle information is no longer eligible to stored in the RECALL.DAT file.

- -

3.3.19b **Update Test Record:**

Programming Criteria:

Once the inspector has inserted the probe into the tailpipe and pressed 'continue', the analyzer shall update the test record and store a 'J' in the ABORT field. If the test sequence is not exited properly (i.e., unit is powered down), the analyzer shall be able to send the test record for the affected inspection to the VID during the next communications session. This test record shall contain a 'J' in the ABORT field. If the inspection is aborted properly after 'J' has been stored, the analyzer shall replace the 'J'in the ABORT field with an 'A' and include the entered abort code.

If the emissions phase of the inspection is not aborted after 'J' has been stored, the system shall replace the 'J' in the ABORT field with a blank/space.

- -

3.3.19c **OBD II Hookup:**

The analyzer must be equipped with a standard SAE J1978 OBD connecter and communications link to allow an RPM signal, readiness codes, fault codes, and Malfunction Indicator Light (MIL) status to be downloaded from the on-board computer for applicable vehicles.

The equipment design and operation must meet all Federal requirements (contained in 40 CFR 85.2207-2231) and recommended SAE practices (J1962, J1978 and J1979) for OBDII system inspections.

The OBDII interrogation process shall be fully integrated into the TX96 analyzer system. It must be automated and require no inspector intervention to collect and

record the OBD data retrieved via the OBD diagnostic link. An RPM signal, OBDII readiness codes, failure codes, and MIL status shall be automatically retrieved through a standard interface and vehicle connector. No hand-held unit or separate interface may be used.

If the OBDII Port has previously been connected for the RPM signal, proceed to the OBDII Readiness Evaluation Section. If not, proceed to the following prompt.

- -

3.3.19d **<u>OBD II Connector Prompt:</u>**

TURN THE CAR OFF (I.E., PUT KEY IN "OFF/LOCK" POSITION)

LOCATE THE VEHICLE'S OBD DIAGNOSTIC LINK CONNECTOR.

ATTACH THE OBDII PORT TO THE VEHICLE CONNECTOR.

LEAVE CAR OFF FOR 12 SECONDS WITH CONNECTOR ATTACHED.

PRESS CONTINUE.

<u>Programming Criteria:</u>

The analyzer will prompt the inspector for an OBD II diagnostic link connection for all passenger vehicles and light-duty trucks whose model year is equal to or newer than the vehicle model year contained in the OBDII_Model_Year field of the SYSTEM table, and whose entered gross vehicle weight is strictly less than 8501 pounds (i.e., < 8501 lbs.).

The analyzer will be designed to provide assistance to the inspector with OBD II connector locations using an OBD II connector look-up table.

- -

3.3.19e **<u>OBD II (Key On, Engine Off) Prompt:</u>**

TURN THE IGNITION KEY TO THE 'ON' POSITION, BUT DON'T START THE ENGINE. LOCATE THE MIL (MALFUNCTION INDICATOR LIGHT) ON THE DASHBOARD.

DID THE MIL TURN ON? Note: MIL may stay on continuously or go out after only a few seconds. (CHOOSE THE CORRECT SENTENCE)

YES, the MIL did come on.

NO, the MIL did <u>NOT</u> come on at all.

The malfunction indicator light (mil) will either display "service engine soon," "check engine," the word "check" along with the international engine symbol, or some combination of these depending on the vehicle make.

<u>Programming Criteria:</u> The analyzer will ask the inspector to perform a key-on/engine-off check to see if the Malfunction Indicator Light/Check Engine Light (MIL) properly illuminates. The analyzer shall prompt the inspector to enter a No if the MIL does not properly illuminate. The analyzer software shall be designed so that the inspector can use the arrow keys to highlight his choice and press "continue" to select the appropriate sentence. The analyzer software shall not have a default entry for this screen. The inspector must be required press the arrow key at least once, followed by the "continue" key.

The help message for this screen shall contain the following text: "The Malfunction Indicator Light (MIL) is the official term for the warning light that is illuminated by the vehicle's OBD system when a malfunction occurs. Depending on the vehicle make, the MIL will either display "service Engine Soon," "Check Engine," the word "Check" along with the international engine symbol, or some combination of these . The MIL must come on when the ignition key is turned to the "key on, engine off" position. This is to allow inspectors to check that the MIL is capable of illuminating if a malfunction were to occur. On most vehicles, the MIL will stay illuminated as long as the key is in the position. However, on some vehicles, the MIL will illuminate very briefly when the key is turned to the "key on, engine off" position and then go out."

<u>Error Message:</u> **1. NO VALUES HAVE BEEN ENTERED--TRY AGAIN.**

<u>Associated System File:</u> **VEHICLE.DAT** **OBD2_MIL_CHECK**

- -

3.3.19f **<u>OBD II Engine Running Prompt:</u>**

START THE ENGINE AND ALLOW IT TO IDLE FOR AT LEAST 20 SECONDS. (I.E., PUT KEY IN "RUN" POSITION)

PRESS CONTINUE.

<u>Programming Criteria:</u>

The analyzer shall require the inspector to confirm that the vehicle is started and idling, by pressing the "enter/continue" key. The analyzer may attempt to establish communications while displaying this prompt and accepting the response from the inspector.

- -

3.3.19g **<u>OBD II Key On, Engine Running (KOER) Prompt:</u>**

DID THE MIL TURN OFF? (CHOOSE THE CORRECT SENTENCE)

Yes, the MIL turned off.

No, the MIL stayed on.

<u>Programming Criteria:</u>

The analyzer will ask the inspector to see if the Malfunction Indicator Light/Check Engine Light (MIL) illuminates while the engine is running. The analyzer shall store a

No, if the inspector indicates that the MIL does not illuminate while the engine is on. The analyzer software shall be designed so that the inspector can use the arrow keys to highlight his choice and press "continue" to select the appropriate sentence. The analyzer software shall not have a default entry for this screen. The inspector must be required press the arrow key at least once, followed by the "continue" key. The analyzer may attempt to establish communications while displaying this prompt and accepting the response from the inspector.

If the previously entered GVWR is greater than 8500 pounds (i.e., >8500 lbs.), the analyzer shall only collect the data from the vehicle OBD system and not use the data in the pass/fail determination.

Error Message: **1. NO VALUES HAVE BEEN ENTERED--TRY AGAIN.**

Associated System File: **VEHICLE.DAT** **OBD2_MIL_ON_RUN**

- - - -

THE OBD II CONNECTION CANNOT BE CONFIRMED –CHOOSE THE NEXT ACTION

1. TRY AGAIN

2. DO NOT TRY AGAIN - - (I.E., FAIL THE CAR)

Programming Criteria:

The analyzer shall display these choices and allow the inspector to use the arrow keys or number keys to highlight the appropriate choice and press enter to select. The default is to phrase 1.

If the inspector selects phrase number 1, the analyzer will attempt to gain a confirmed OBDII connection. The analyzer must allow the inspector unlimited attempts to gain a confirmed OBDII connection.

If the inspector selects phrase number 2, then the analyzer shall proceed to the OBDII No Connection Reason Prompt in Section 3.3.19j.

- -

3.3.19j **OBD II No Connection Reason Prompt:**

THE OBD II CONNECTION CANNOT BE CONFIRMED –CHOOSE THE NEXT ACTION

1. BACK TO PREVIOUS SCREEN

2. CONNECTOR CANNOT BE LOCATED

3. CONNECTOR IS MISSING, DAMAGED, OR TAMPERED.

4. CONNECTOR IS OBSTRUCTED OR INACCESSIBLE AND CONNECTION IS NOT POSSIBLE.

5. COMMUNICATION FAILED, AND OBD II PORT IS ATTACHED TO CONNECTOR.

Programming Criteria:

The analyzer shall display all five choices and allow the inspector to use the arrow keys or number keys to highlight the appropriate choice and press enter to select. The default is to phrase 1.

If the inspector selects phrase number 1, the analyzer will return to the OBDII Connection Not Confirmed Prompt in Section 3.3.19i.

If the inspector selects phrase number 2, then the analyzer shall:

1. store a 'L' in the OBD2_DLC_RES field indicating the connector cannot be located, and,
2. proceed directly to the OBD II Test Evaluation and Messages Prompt in Section 3.3.19n.

If the inspector selects phrase number 3, then the analyzer shall:

1. store a 'D' in the OBD2_DLC_RES field indicating the connector is missing, damaged, or tampered, and,
2. proceed directly to the the OBD II Test Evaluation and Messages Prompt in Section 3.3.19n.

If the inspector selects phrase number 4, then the analyzer shall:

1. store a 'I' in the OBD2_DLC_RES field indicating an inaccessible connector, and,
2. proceed directly to the the OBD II Test Evaluation and Messages Prompt in Section 3.3.19n.

If the inspector selects phrase number 5, then the analyzer shall:

1. store a 'N' in the OBD2_DLC_RES field indicating failed to establish communication with vehicle, and,
2. proceed directly to the the OBD II Test Evaluation and Messages Prompt in Section 3.3.19n.

If the test date is less than the date contained in the OBD2_FAIL_ST_DT field in the SYSTEM.DAT file, the analyzer shall:

1. Place a 'L,' 'D,' 'I,' or 'N,' in the OBD2_DLC_RES field in VEHICLE.DAT,
2. Place a blank in the OBD2_PF_FLAG field in VEHICLE.DAT,
3. Print 'FAIL' in the OBD section of the VIR,
4. A second page will be printed for the VIR indicating that the OBD failure is **"Advisory Only"**, and that the vehicle's on-board diagnostic system could not be checked due to: unsuccessful communications if the OBD2_DLC_RES is set to 'N,' or a missing, damaged, or tampered connector if the OBD2_DLC_RES is set to 'D', or an unlocated connector if the OBD2_DLC_RES is set to 'L', or an inaccessible connector if the OBD2_DLC_RES is set to 'I,'and,
5. Proceed directly to the Preconditioned Two-Speed Idle Test Procedure Prompt in Section 3.3.20.

The failure of the OBD portion of the test WILL NOT result in an overall test failure.

If the test date is equal to or greater than the date in the OBD2_FAIL_ST_DT field in the SYSTEM.DAT file, the analyzer will:

1. Place a 'L,' 'D,' 'I,' or 'N' to the OBD2_DLC_RES field in VEHICLE.DAT,
2. Place an 'F' in the OBD2_PF_FLAG field (and later to the OVERALL_RESULTS field) in VEHICLE.DAT,
3. Print 'FAIL' in the OBD portion and the OVERALL TEST RESULT section of the VIR,
4. A second page will be printed for the VIR indicating that the vehicle's on-board diagnostic system could not be checked due to: unsuccessful communications if the OBD2_DLC_RES is set to 'N,' or a missing, damaged, or tampered connector if the OBD2_DLC_RES is set to 'D', or an unlocated connector if the OBD2_DLC_RES is set to 'L', or an inaccessible connector if the OBD2_DLC_RES is set to 'I,'and,
5. Proceed to the the OBD II Test Evaluation and Messages Prompt in Section 3.3.19n, and no tailpipe emissions inspection will be conducted.

The failure of the OBD portion of the test WILL result in an overall test failure.

Associated System File:	**VEHICLE.DAT**	**OBD2_DLC_RES**
		OBD2_PF_FLAG

OVERALL_RESULTS

- -

3.3.19k **<u>OBD II Malfunction Indicator Light (MIL) Status Check:</u>**

<u>Programming Criteria:</u>

The analyzer will evaluate the MIL status based on the data returned via the OBD link from the vehicle's on-board diagnostic system. The Yes/No (Y/N) status of whether the MIL has been commanded to be illuminated will be recorded in the OBD2_MIL_STATUS field of the test record.

If the MIL status returned is NOT COMMANDED ON with the engine running (i.e., RPM is greater than zero), the analyzer shall:

1. store a "P" in the OBD2_MIL_STATUS field, and
2. proceed to the OBD Readiness Evaluation section.

If the MIL status returned is COMMANDED ON with the engine running (i.e., RPM is greater than zero), the analyzer shall:

1. store an "F" in the OBD2_MIL_STATUS field, and
2. proceed to the OBD Readiness Evaluation section.

- -

3.3.19l **<u>OBD II Readiness Evaluation:</u>**

The analyzer shall communicate with the OBD system of the vehicle under inspection to determine if the OBD system has enough readiness monitors completed to allow an evaluation of the OBD system. In accordance with EPA guidance, the readiness of the OBD system for evaluation is dependant on the year of the vehicle, and in some instances, on the model as well. This step is to store the status of the READINESS MONITORS in the OBD system with the engine running to allow the program to evaluate the stored results. If the vehicle has multiple ECMs, the analyzer shall provide

the summary of results all the readiness monitors received from the vehicle as the status of the readiness monitors.

Programming Criteria:

i. A request (in accordance with SAE J1979, e.g., Mode $01, PID $01) shall be transmitted to the on-board computer to determine the evaluation status of the OBD system, the number of emission-related trouble codes stored in memory, and the Malfunction Indicator Light (MIL) status.

ii. Based on the returned data, the analyzer shall determine which on-board monitors are supported by the OBD system and the readiness code status of the applicable monitors.

iii. Possible monitors include the following:

(1) Misfire (continuous)

(2) Fuel system (continuous)

(3) Comprehensive component (continuous)

(4) Catalyst (once/trip)

(5) Heated catalyst (once/trip)

(6) Evaporative system (once/trip)

(7) Secondary air system (once/trip)

(8) Air conditioning system (once/trip)

(9) Oxygen sensor (once/trip)

(10) Oxygen sensor heater (once/trip)

(11) EGR system (once/trip)

iv. Continuous monitors are those in which the applicable system/condition is checked continuously during vehicle operation; once/trip monitors are only checked when the vehicle is driven in a certain manner (i.e., over a predefined driving cycle expected to occur in customer service). According to Federal regulation (40 CFR 86.099-17), a vehicle manufacturer is not required to store a readiness code for the continuous operating monitors; however, some may choose to do so.

v. Possible readiness code responses include: completed/ready, not completed/not ready, and 'not supported/not enabled.' A response that a monitor is not supported or enabled means that, for this particular vehicle, that monitor is not applicable. Hence, when a 'not supported/not enabled' response is given, the analyzer will not fail the vehicle for that code.

vi. All readiness code values will be written to the appropriate test record fields in the VEHICLE.DAT file for each inspection using the following format:

i. Not supported/enabled = 0,

ii. Completed = 1, and

iii. Not completed = 2.

vii. If the value specified in the SYSTEM table for a particular readiness monitor is "Y", that code shall be used for the overall readiness determination. If the value specified for a readiness monitor in the SYSTEM table is "N", that code shall be ignored by the analyzer and not used for the overall readiness determination. Each readiness monitor field that contains a value of "Y" is an applicable readiness monitor.

For information on how to set the OBD2_READY_RES field, refer to part (a) of the OBD II Test Evaluation and Messages Prompt below.

- -

3.3.19m <u>OBD II Diagnostic Trouble Code (DTC) Check:</u>

<u>Programming Criteria:</u>

i. The analyzer shall send a request (i.e., Mode $03) to the on-board computer to determine the stored emissions-related powertrain trouble codes. The analyzer will repeat this cycle until the number of codes reported equals the number expected based on the previous Mode $01 response. Any codes listed in the DTC table shall be recorded on the test record and the text fault code description shall be printed on the second page of the VIR.

ii. If there are no DTCs:

i. A 'P' will be written to both the OBD2_FAULT_CD_RES and OBD2_PF_FLAG fields in VEHICLE.DAT,

ii. Two zeros ('00') will be stored in the DTC_STORED field of the VEHICLE. DAT file,

iii. A PASS will be printed in the OBD section of the VIR, and

iv. The analyzer will proceed to the OBD II Test Evaluation and Messages Prompt in Section 3.3.19n, no tailpipe emissions inspection will be conducted.

iii. If one or more DTC is found, which cause the MIL to be commanded to be illuminated;

i. The analyzer will check the OBD2_FAIL_DT field in the SYSTEM table;

ii. If the test date is less than the date in the OBD2_FAIL_DT field and the MIL has been commanded to be illuminated:

i. An 'F' will be written to both the OBD2_FAULT_CD_RES and OBD2_PF_FLAG fields in VEHICLE.DAT.

ii. The first ten DTC(s), which cause the MIL to be illuminated, that was found will be written to the FAULT_CODES(DTCS) field in the VEHICLE.DAT table.

iv. The analyzer shall store the total number of stored DTCs (not pending DTCs) causing the MIL to illuminate in the DTC_STORED field of the VEHICLE.DAT file. The analyzer shall also proceed to the OBD Evaluation Prompt.

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value = 2 for 1996 to 2000 model year vehicles, and 1 for 2001 and newer model year vehicles). This number is found in the field called MAX_NUM_NOT_READY in the SYSTEM.DAT file and is the number of non-continuous monitors allowed not ready and still PASS the OBD test. This number changes as the vehicle model year changes. The applicable model years are contained in the MAX_NT_RDY_BGN_YR and MAX_NT_RDY_END_YR fields of the SYSTEM.DAT file. If the vehicle is deemed "not ready," the analyzer shall abort the inspection if the date of inspection is greater than the date contained in the OBDII_FAIL_ST_DT field of the SYSTEM.DAT. If the vehicle is deemed "not ready," the analyzer shall will default to a TSI inspection if the date of inspection is less than the date contained in the OBDII_FAIL_ST_DT field of the SYSTEM.DAT file. If any continuous monitors indicate "not ready", the vehicle shall NOT PASS the OBD test.

- If a continuous monitor returns a not-ready status the OBD2_READY_RES shall remain an "F", or

- If there are fewer than the maximum non-continuous monitors not ready (less than or equal to MAX_NUM_NOT_READY), then a "P" shall be stored in the OBD2_READY_RES field of the VEHICLE.DAT record, or

- If too many non-continuous monitors are not ready (greater than MAX_NUM_ NOT_READY) then the OBD2_READY_RES RESULT shall remain "F."

(b) The following fields of the VEHICLE.DAT must contain a "P" in order to pass the OBD test sequence: OBD2_MIL_CHECK, OBD2_MIL_ON_RUN, OBD2_DLC_RES, OBD2_MIL_STATUS, and OBD2_READY_RES.

1. If all the above fields contain a "P" then the program will store a "P" in the OBD2_PF_FLAG field of the VEHICLE.DAT file and print a PASS in the OBD Test Result section on the VIR,

2. If any of the above fields contain a character other than a "P" then

(i) If the OBD2_DLC_RES field has a "D," "I," or an "N" stored in it then the analyzer shall write a "F" to OBD2_PF_FLAG of the VEHICLE.DAT and a "FAULT" should be written on the ADVISORY VIR:

(ii) If theOBD2_DLC_RES field does not have a "L" then the analyzer shall write a "F" to the OBD2_READY_RES field of the VEHICLE.DAT file and an "N/A" shall be printed on the ADVISORY OBD VIR.

(c) If the MY of the vehicle under test is equal to or greater than the value contained in the OBDII_MODEL_YR field of the SYSTEM.DAT file and the test date is prior to the PASS/FAIL (P/F) start date of OBD testing as defined in the SYSTEM.DAT file, OBD failures will not cause the vehicle to have an OVERALL TEST FAILURE.. Motorist information messages shall be printed on an Advisory OBD VIR to be given to the motorist informing them of problems with their vehicle's OBD system. The analyzer shall proceed to perform a TSI emission test on failed OBD or aborted OBD tests during the advisory period.

NOTE: The Texas OBD advisory period starts when the OBD software is loaded on an analyzer and ends when the OBD mandatory P/F date flag is set in the SYSTEM.DAT file. Currently the start date of P/F OBD is May 1, 2002.

NOTE: The failing or aborted OBD ADVISORY VIR shall be printed prior to the tailpipe VIR.

1. If the value in the following fields is other than blank or "P" then the following message(s) shall be printed on the Advisory OBD VIR to inform the motorist of possible problems with their vehicle.

(i) If there is an "F" in the MIL KOEO or MIL KOER field the following shall be printed:

Based on the information received during the test, there may be a problem with your On-Board Diagnostic Computer Malfunction Indicator Light. Repairing any problems that exist will likely improve performance, fuel economy, and reduce pollution. This vehicle must have the On-Board Computer functioning properly to pass the vehicle inspection to register this vehicle next year. (Text subject to change)

OBD PRINT MESSAGE (2)

(ii) If there is a "D" or an "N" in the OBD2_DLC_RES field the following message shall be printed on the Advisory OBD VIR indicating that the vehicle's on-board diagnostic system could not be checked due to a missing, inaccessible, damaged, or tampered connector.

Based on the information gathered during an attempt to perform an On- Board Diagnostic test your vehicle has a missing, tampered, or broken Diagnostic Connector. This vehicle must have the On-Board Computer functioning properly to pass the vehicle inspection to register this vehicle next year. (Text subject to change)

OBD PRINT MESSAGE (3)

(iii) If there is an "I" in the OBD2_DLC_RES field the following message shall be printed on the ADVISORY OBD VIR indicating that the vehicle's on-board diagnostic system could not be checked due to inaccessible connector,

Based on the information gathered during an attempt to perform an On-Board Diagnostic test your vehicle has an inaccessible Diagnostic Connector. This vehicle must have the Diagnostic Connector accessible to allow the check of the On Board Diagnostic computer system on the vehicle next year. (Text subject to change)

OBD PRINT MESSAGE (4)

(iv) If there is an "F" in the OBD2_READY_RES field of the VEHICLE.DAT the vehicle will be failed and the following message shall be printed on the Advisory OBD VIR:

Based on the information obtained from the On-Board Computer in the vehicle, the system is not ready to make a determination regrading the pollution control system on the vehicle. This situation must be corrected before the OBD system can be evaluated and the reinspection made next year. See your owner's manual for information on "OBD/Readiness driving procedures" or contact your vehicle service advisor. (Text subject to change)

OBD PRINT MESSAGE (5)

(v). If the OBD2_MIL_STATUS field has an "F" stored in it the following message shall be printed.

Based on the results of the On-Board Diagnostic test, your vehicle indicates there is a failure that is causing higher than allowed pollution levels to be emitted into the atmosphere. The problem(s) causing the failure, when fixed, will increase performance, fuel economy, and reduce pollution. Repair of the failure(s) will be required to pass the OBD test next year. (Text subject to change)

OBD PRINT MESSAGE (6)

(d) If the model year of the vehicle being tested is equal to or greater than the value contained in the OBDII_MODEL_YR field of the SYSTEM.DAT file and the test date is after the mandatory P/F start date as defined in the SYSTEM.DAT file, OBD test results will be used to evaluate the Overall PASS/FAIL result of the vehicle being tested. The vehicle will receive a PASS of the OBD system if the OBD2_PF_FLAG field contains a "P", or

1. If the OBD2_PF_FLAG is not "P" and

   (i) if the result in the OBD2_DLC_RES is an "L" (abort code 80) the following message shall be printed on the P/F VIR:

   Based on the information gathered during an attempt to perform an On Board Diagnostic test your vehicle has a missing Diagnostic Connector, or a

Diagnostic Connector that cannot be located by the inspector. This vehicle must have the On-Board Computer Diagnostic connector available to the inspector and functioning properly to pass the vehicle inspection. If you have questions regarding this test, ask the inspector who performed this test. (Text subject to change)

OBD PRINT MESSAGE (10)

(ii) if the result in the OBD2_DLC_RES is an "D," "I," or an "N" the following message shall be printed on the P/F VIR:

Based on the information gathered during an attempt to perform an On Board Diagnostic test your vehicle has a damaged or inaccessible Diagnostic Connector. This vehicle must have the On-Board Computer Diagnostic connector available to the inspector and functioning properly to pass the vehicle inspection. If you have questions regarding this test, ask the inspector who performed this test. (Text subject to change)

OBD PRINT MESSAGE (11)

(iii) the result n the OBD2_READY_RES field is an "F" the following message shall be printed on the VIR: a "FAIL" shall be printed in the OBD2_PF_FLAG section of the P/F VIR. A failed OBD vehicle shall receive a FUEL CAP TEST.

Based on information obtained from the On-Board Computer in the vehicle, the system is not ready to make a determination regarding the pollution control system on the vehicle. This situation must be corrected before the OBD system can be evaluated and the reinspection made which will allow this vehicle to be registered. See your owner's manual for information on "OBD/Readiness driving procedures" or contact your vehicle service advisor. (Text subject to change)

OBD PRINT MESSAGE (12)

2. If the value in the following fields is other than blank or "P" then the following message shall be printed on the P/F VIR to inform the motorist of possible problems with their vehicle.

(i) If there is an "F" in the OBD2_MIL_CHECK or the OBD2_MIL_ON_RUN field the following shall be printed on the P/F VIR:

Based on the information received during the test, there may be a problem with your On-Board Diagnostic Computer Malfunction Indicator Light. This vehicle must have the On-Board Computer system functioning properly to pass the vehicle inspection. (Text subject to change)

OBD PRINT MESSAGE (13)

(iv) If the OBD2_MIL_STATUS field has an "F" stored in it the following message shall be printed on the P/F VIR:

Based on information obtained from the On-Board Computer in the vehicle, the system has made a determination that there is a problem regarding the pollution control system on the vehicle. This situation must be corrected before the OBD system can be reinspected. See your owner's manual for information on "OBD/Readiness driving procedures" or contact your vehicle service advisor. (Text subject to change)

OBD PRINT MESSAGE (14)

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3.3.19o OBD II Engine Stop Prompt:

SHUT OFF THE ENGINE

Programming Criteria: The analyzer will prompt the inspector to turn off the engine, and proceed to the Gas Cap Missing Prompt in Section 3.3.21.

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3.3.19p ASM-2 (Loaded Mode) Emission Test Sequence

Programming Criteria

Once the analyzer has established which inspector that will be conducting the inspection, the system will check the ASM_ESP, ASM_SNAP, ASM_WW, and ASM_SPX fields to determine if the inspector is certified to conduct ASM inspections using this system. The field will contain a 'Y,' if the inspector is certified to conduct the ASM inspections. An 'N' in these fields indicates that the inspector is not certified to conduct ASM inspections on this system. If the vehicle under inspection is to receive an ASM inspection and the associated "ASM_" field contains an 'N,' then the analyzer shall display an error message indicating that the inspector is not 'certified' to conduct ASM inspections on this type of analyzer system and return to the Main Menu. The associations shall be defined by the first two letters of the analyzer system (i.e., ASM_ESP to "ES" analyzers, ASM_SNAP to "JB," and "SE" analyzers, ASM_WW to "WW" analyzers, ASM_SPX to all remaining analyzer systems).

Note: ASM-2 Test Standards and Calculations (EPA) is located in Appendix S.

Note: ASM-2 Emission Test Procedure (EPA) also located in Appendix U.

1. RPM Signal

The software shall prompt the technician to select the RPM pick-up type to be used while performing the emissions test.

SELECT RPM PICK-UP DEVICE

1. CONTACT
2. NON-CONTACT
3. OBD II PORT
4. OTHER

Programming Criteria:

a. Beginning with the 1996 model year vehicles, the EIS shall be prompted to detect engine RPM via the OBDII port after 1/4/99.

b. The technician shall be given the opportunity to select another RPM pick-up device and continue with the current inspection (without causing the test to abort), if the RPM is not detected.

- RPM shall be displayed during the emissions test. Instability shall be immediately detected and displayed on the screen.

UNSTABLE RPM SIGNAL - - CHECK OR CHANGE PICK-UP

Programming Criteria:

1. A stable RPM signal is required to complete the emissions test. Manufacturers may propose an error tolerance factor to be used when testing vehicles with unstable RPM signals.

2. For “OTHER” RPM pick-up devices, the EIS manufacturer may develop a unique engine RPM pick-up. If the EIS manufacturer provides this option, a written explanation/procedure regarding this option must be submitted to TNRCC for approval.

2. General Procedure for ASM - 2 Mode Preconditioning

1. Safety Checks: The software shall prompt the technician to perform any equipment manufacturer-required safety checks.

2. Vehicle Alignment:

Programming Criteria:

Prompt the inspector to drive the vehicle onto the dynamometer and laterally stabilize, restrain, and chock the vehicle.

3. Vehicle Equivalent Test Weight (ETW) Selection: Select a test weight based upon the following criteria:

Programming Criteria:

The prompt shall only be displayed if the vehicle is eligible to receive the ASM-2 test (MY < 1995, no all wheel drive, etc.,) and the vehicle's test weight cannot be determined from the value in the VEHICLE_TEST_WT field of the TXVRT.DAT file or data received from the VID (i.e., the TEST_WEIGHT field in a previous test record). The test weight shall be selected from the VRT row number chosen in the vehicle information entry process. The analyzer shall use the model year, make, model, engine size, cylinders, and gross vehicle weight entries to determine test weight (i.e., MODEL_YR, VEHICLE_MAKE, MODEL, VEHICLE_BODY_TYPE, NUMBER_CYLINDERS, ENGINE_SIZE, GVWR). The analyzer shall use these fields in the following order to identify the specific VRT row: model year, vehicle make, model, body type/style, number of cylinders, engine size, then gross vehicle weight rating. If a specific VRT row cannot be matched, the default VRT test horsepower and test weight values based on the vehicle year, type, number of cylinders, etc., shall be used.

The ETW shall be recorded in the TEST_WEIGHT field of the test record and printed on the VIR.

4. Restrain the Vehicle:

Display Prompt:

IS THE VEHICLE A FRONT-WHEEL DRIVE? (YES/NO)

<u>Programming Criteria:</u>

1) If Yes (the vehicle is a front-wheel drive vehicle), the software shall:

Prompt the driver to laterally stabilize, restrain and chock the vehicle on the dynamometer if it has not already been done.

Display Prompt:

FRONT-WHEEL DRIVE VEHICLE: LATERALLY STABILIZE, RESTRAIN AND CHOCK.

Verify that the restraints are engaged (by a positive answer to a prompt) prior to preceding to the next step.

Note: Provisions must be made to ensure that restraints which control side-to-side movement are used on all front-wheel drive vehicles and that the vehicles are not just tied to some fixed object. If the restraint system does not control forward to backward movement, the TNRCC EIS must prompt the technician to place wheel chocks or equivalent.

2) If No (the vehicle is a rear-wheel drive vehicle), prompt the driver to restrain the vehicle.

Display Prompt:

REAR-WHEEL DRIVE VEHICLE: RESTRAIN AND CHOCK.

5. Horsepower Applied During the ASM-2 Cycle: During the ASM-2 test, the torque will remain constant during each mode of the test. The torque to apply will be derived from the dynamometer-applied horsepower for both the 5015 and the 2525 portions of the test using the following equation:

Torque = 5252 × [applied hp @ 25 mph] / [roll RPM]

Torque = 5252 × [applied hp @ 15 mph] / [roll RPM]

Dynamometer-applied horsepower for each mode of the ASM-2 loaded-mode test must be calculated using the appropriate weights located in the TXVRT.DAT file, or if unavailable, shall default to EPA supplied horsepower settings determined by engine cylinder as contained in the DFLTHP.DAT file. The default horsepower contains the following cylinder numbers: 3, 4, 5, 6, 8, and 9. Cylinder numbers 3, 4, 5, 6, and 8 are exact engine cylinder counts. Cylinder number 9 should be used for all engines that have more than 8 cylinders. Cylinder number 4 should be used for all rotary engines.

6. **Cooling Fan**: The analyzer shall prompt the technician to turn on the fan and to place it in position if the ambient temperature is above 72°F. (The TNRCC EIS may provide the option of automatically turning on the fan from a remote location.)

7. **Probe and Tachometer Hookups**: The software shall prompt the technician to insert the sample probe into the tailpipe and attach the selected RPM pick up device.

8. **Gear Selection**: The technician shall be prompted, as appropriate, on transmission type:

1. Automatic Transmissions

Display Prompt:

PLACE THE TRANSMISSION IN DRIVE. IF THE ENGINE RPM EXCEEDS _____, PLACE THE TRANSMISSION IN OVERDRIVE.

<u>Programming Criteria:</u>

The software shall prompt the technician to place the transmission in drive. Engine RPM during the test mode shall not exceed the following:

a. Engine size less than or equal to 3.0L: RPM may not exceed 3000 RPM.

b. Engine size greater than 3.0L: RPM may not exceed 2500 RPM.

2. Manual Transmissions

Display Prompt:

PLACE THE TRANSMISSION IN SECOND GEAR.

KEEP ENGINE RPM BETWEEN ____ AND ____RPM.

<u>Programming Criteria:</u>

The software shall prompt the technician to test the vehicle in second gear unless the following criteria cannot be met, then select a gear that will maintain the following engine speeds.

a. Engine size less than or equal to 3.0L: Greater than or equal to 1500 RPM, less than or equal to 3000 RPM.

b. Engine size larger than 3.0L: Greater than or equal to 1250 RPM, less than or equal to 2500 RPM.

9. **Tire Drying:** If the test vehicle tires must be dried before the emission testing, the analyzer shall prompt the technician as follows:

Display Prompt:

DO THE TIRES NEED DRYING? (YES/NO)

<u>Programming Criteria:</u>

1. If YES, the analyzer shall require the technician to run the vehicle at any speed below 30 mph after selection of the transmission gear (engine speed may not exceed 3000 RPM) for a period from 15 to 30 seconds. When the roll speed exceeds 1 mph, the screen shall display the following delay message which shall include the seconds that must be waited until the test mode can begin.

Display Prompt:

ONCE THE TIRES ARE DRY, YOU MUST WAIT AT IDLE FOR ____ SECONDS PRIOR TO BEGINNING THE PRECONDITIONING

MODE.

The software shall increment the above second timer one second at a time, not to exceed 30 seconds, until the rolls are brought to a stop (speed reaches 1 mph or less). If the vehicle speed exceeds 30 mph or the engine exceeds 3000 RPM during tire drying, the timer shall increment twice a second until the speed is brought below 30 mph or the engine speed below 3000 RPM. When the rolls come to a stop, the above timer shall decrement once every second until the time reads zero before the TNRCC EIS allows the driver to start the 50/15 mode. At the same time, display the following prompt:

Display Prompt:

DO THE TIRES NEED MORE DRYING? (Y)es OR (N)o

2. If NO (to either the 1st or 2nd question), the analyzer shall proceed to the next step (after any required waiting time) in the testing procedure.

10. ASM-2 Pre Emissions Test Conditions

The following conditions must be present before the TNRCC EIS begins the test sequence:

Programming Criteria:

a. Zero air, electronic span, ambient air, and hang up checks have been performed.

b. The TNRCC EIS does not detect a "low-flow" condition.

c. The engine idle speed is between 400 and 1250 RPM.

d. The dynamometer rolls are not turning (speed <1 mph). If the roll speed exceeds this limit, or the engine speed exceeds 1250 RPM, display the following delay message and increment the displayed seconds by two times the number of seconds the roll or engine speed are outside limits (not to exceed 30 seconds).

Display Prompt:

DELAY TESTING, YOU MUST WAIT ____ SECONDS.

e. Once the roll and engine speed are within the limits, decrement the time by one second at a time until the number of seconds reaches zero. The TNRCC EIS shall not start the test sequence until the dynamometer remains stopped for twice the time that the rolls were turning or 30 seconds whichever is less.

f. The analyzer does not detect a "sample dilution" condition.

11. Preconditioning

Once the conditions in (10) are met, the inspector shall be prompted to begin the preconditioning sequence.

Programming Criteria:

The dynamometer shall smoothly apply the load once the vehicle speed exceeds 10 mph. The preconditioning shall be accomplished by driving the vehicle on the dynamometer using the 50/15 mode as specified in Appendix U A2(d). The vehicle will continue to be operated for 30 seconds at this speed within the speed and wheel force tolerance specified below. The duration of the preconditioning cycle may be adjusted by TNRCC if it is determined through the use of statistical process control methods that a shorter time is adequate to ensure that vehicles are fully warmed up prior to testing. The adjustment to the preconditioning cycle will be done via software updates until a more efficient method is developed.

If the speed or wheel force fall above or below the tolerance of ± 0.5 HP or ± 4% HP (which ever is greater) and ± 5 mph, the preconditioning timer will reset to zero. Preconditioning time shall not be included in the overall maximum test time.

Display Prompt:

PRECONDITIONING CAN BEGIN. ACCELERATE GRADUALLY TO 15 MPH

If, at any time during the preconditioning mode, the above speed and RPM criteria or the gear selection criteria fall outside the acceptable ranges, the software shall display

one of the following appropriate messages to prompt the driver to correct the problem. The "dyno loading error" should be displayed if the ASM 50/15 load tolerances are exceeded, even if they are within the preconditioning tolerances above. A dyno loading error requires correction only if it is outside preconditioning tolerances.

Display Prompt:

OUTSIDE PRECONDITIONING SPEED LIMIT

OUTSIDE ENGINE RPM RANGE

DYNO LOADING ERROR

OUTSIDE DILUTION SPECIFICATION

ANALYZER LOW FLOW ERROR

12. ASM-2 (Loaded Mode) Emissions Testing Sequence

When the preconditioning sequence at ASM 50/15 speed and load has been successfully completed, the inspector shall be prompted that the ASM 50/15 test has begun. The ASM-2 mode timer shall start (mt=0) when the vehicle speed, engine rpm, dyno loading and dilution are within the test limits for five (5) continuous seconds.

If the test is restarted at any time during the test sequence, the previously stored second-by-second record shall be deleted. The second-by-second data shall be written to the second-by-second data record. The emission levels, without the DCF adjustment, shall be recorded in the second-by-second data record.

The emissions data (HC, CO, CO_2, and NO second-by-second readings) for both the ASM 5015 and ASM 2525 modes shall be time-aligned with the vehicle speed readings to account for the delay caused by the transport time needed to get the exhaust gas from the vehicle's tailpipe to the analyzers/sensors. This transport time may be different from the probe to the optical bench and from the probe to the NO sensor, and shall be accounted for. Time-alignment shall be done before any corrections (e.g., DCF) are applied.

a. 50/15 Test Mode (ASM Test Mode 1)

At the conclusion of the preconditioning mode, the software shall prompt the driver to maintain the vehicle at 15 mph ±1 mph. The software shall display the 50/15 test speed with applicable speed limits (or drive trace graphical display), test time, engine RPM and other appropriate test mode information. The dynamometer shall meet the 50/15 test

mode tolerances throughout the 50/15 test mode. The 50/15 mode shall begin (mt=0) when the roll speed (and corresponding power) is stabilized at 15 ± 1 mph for five consecutive seconds (which may include the last 5 seconds of the preconditioning mode if the 50/15 tolerances have been met for those 5 seconds).

The maximum duration for the 50/15 test mode is 90 seconds. The emissions averaging portion of the test shall not begin unless:

- Engine speed (manual transmission only) is within required engine RPM range.
- Load and dilution ($CO + CO_2$) fall within specifications. (If dyne horsepower loading remains out of specification for two or more consecutive seconds or dilution occurs, restart test according to the restart procedures listed later.)

If the vehicle has not stabilized in accordance with the above criteria within 25 seconds, the analyzer shall prompt the technician to restart the test according to the restart procedures listed later.

If the instantaneous dynamometer loading, as measured by the dynamometer load cell, differs from the command load by more than ±0.25 hp or ±2% whichever is greater for more than two consecutive seconds during the emissions averaging portion of the ASM 50/15 test, the analyzer shall set a dynamometer loading error. This shall cause the test mode to restart according to the restart procedures.

The pass/fail analysis using the fast pass criteria (i.e., reading are simultaneously below 50% of the normal cutpoints for HC, CO, and NOx) shall begin after an elapsed time of 15 seconds from mt=0, provided that the speed, load and acceleration readings are within specifications. Pass/fail analysis using the normal cutpoints shall occur between an elapsed time of 25 seconds (mt=25) and 90 seconds (mt=90), provided that the speed, load, and acceleration readings are with specifications. The vehicle shall pass the ASM 50/15 mode and the mode shall be immediately terminated if, at any point between an elapsed time of 15 seconds and 90 seconds, the 10 second running average measured values for each pollutant are simultaneously less than or equal to the applicable test standards (i.e., fast pass criteria between mt=15 and mt=24, standard cutpoints between mt=25, and mt=90).

If, at any time during the emissions-averaging portion of the test mode, the above criteria fall outside the acceptable ranges, the software shall display one of the following appropriate messages to prompt the driver to correct the problem.

Display Prompt:

OUTSIDE TEST SPEED LIMIT

OUTSIDE ENGINE RPM RANGE

DYNO LOADING ERROR

OUTSIDE DILUTION SPECIFICATION

ANALYZER LOW FLOW ERROR

As soon as the emission averaging portion of the test mode has begun, start monitoring the vehicle's acceleration every 0.5 seconds. If at any time the acceleration exceeds the limits , the software shall display the following message to prompt the driver that the acceleration is out of range:

Display Prompt:

OUTSIDE THE MAXIMUM ACCELERATION LIMIT

Programming Criteria:

Emissions resulting from transient throttle (i.e., outside the acceleration limit) shall not be included in the ten-second averaging data. In addition, if an acceleration violation occurs, that time-aligned data must not be used for emissions averaging. Instead, the emissions averaging will continue beginning five seconds after the time aligned acceleration violation ceased. (Time alignment is determined by subtracting TNRCC EIS response time and transport time.) If this event occurs near the end of the test (meaning another 10-second average cannot be completed), the last full 10-second average without acceleration violations will be the ending result for the mode.

When ten seconds have passed since the emissions-averaging portion of the test mode began, the software shall keep track of the number of acceleration excursions. The data shall be recorded in the ACCEL_VIOLAT_5015 field, of the test record, as appropriate. If the number of acceleration excursions exceeds five or the cumulative time exceeds five seconds, then the analyzer shall prompt the technician to restart the test according to the restart procedures listed later.

During the 10-second period used for the pass decision, the dynamometer speed must not fall more than 1.0 mph absolute drop, not cumulative. That is, if the speed at the end of the 10-second period is more than1.0 mph less than the speed at the start of the 10-second period, testing shall continue until the speed meets this criterion.

If, at any time during the emissions averaging portion of the test mode, the vehicle speed

deviates by more than one mph from the target speed for more than two consecutive seconds at any time, the mode shall restart.

A vehicle shall pass the 50/15 test mode when the 10-second average readings for HC, CO and NO are all equal to or below the applicable standards for the vehicle. Once passing readings have been achieved for all three gases, the 50/15 mode shall terminate and the analyzer shall proceed to the next phase of the test.

The emissions readings used to make the pass/fail decision shall be recorded in the test record of SECXSEC.DAT. This data shall be purged from the analyzer when the data is transmitted to the TIMS.

b. **25/25 Test Mode (ASM Test Mode 2)**

The 25/25 test mode procedures are the same as those for the 50/15 test mode, except for the following:

Upon termination of the ASM5015 mode, the vehicle shall immediately begin accelerating to the speed required for the ASM2525 mode. The dynamometer torque shall smoothly transition during the acceleration period and shall automatically reset to the load required for the 25/25 mode once the speed reaches 25 mph.

The 25/25 mode shall begin (mt=0) when the roll speed (and corresponding power) is stabilized at 25 mph ±1 mph for five consecutive seconds.

The pass/fail analysis using the fast pass criteria (i.e., reading are simultaneously below 50% of the normal cutpoints for HC, CO, and NOx) shall begin after an elapsed time of 15 seconds from mt=0, provided that the speed, load and acceleration readings are within specifications. Pass/fail analysis using the normal cutpoints shall occur between an elapsed time of 25 seconds (mt=25) and 90 seconds (mt=90), provided that the speed, load, and acceleration readings are with specifications. The vehicle shall pass the ASM 25/25 mode and the mode shall be immediately terminated if, at any point between an elapsed time of 15 seconds and 90 seconds, the 10 second running average measured values for each pollutant are simultaneously less than or equal to the applicable test standards (i.e., fast pass criteria between mt=15 and mt=24, standard cutpoints between mt=25, and mt=90).

The number of acceleration excursions shall be recorded in the ACCEL_VIOLAT_2525

field of the test record.

A vehicle shall pass the 25/25 test mode if, after mt=25 seconds, the 10-second average readings for HC, CO and NO are all equal to or below the applicable standards for the vehicle. Once readings have been achieved for all three gases, the 25/25 mode shall terminate and the analyzer shall proceed, if applicable, to the second chance phase of the test.

The emissions readings used to make the pass/fail decision shall be recorded in the test record. If the vehicle failed either the 50/15 mode (ASM Test Mode 1) or the 25/25 mode (ASM Test Mode 2) with scores for any pollutant over 150% of the applicable standard, the vehicle shall fail the ASM-2 test. The ASM-2 test shall be terminated and both Mode 1 and Mode 2 test results shall be recorded on the VIR.

13. Second Chance Tests.

If all emissions results (HC, CO, and NO) for both ASM Modes are within 150% of the applicable standards, the vehicle is entitled to a second chance test (i.e., the HC, CO, and NO readings for any valid ten-second average taken during the test mode are within 150% of the applicable standard). If all emissions results (HC, CO, and NO) for both ASM Modes are not within 150% of the applicable standards, the test will end and the vehicle will not received a second chance test. If an ASM mode is authorized for a second chance test, only the results of the second chance test for that mode shall be written to the VIR. However, all first chance test results shall be recorded on the test record as well as the second chance test results.

(a) If the vehicle fails the first-chance test, the test timer shall reset to zero (mt=0) and a second-chance test shall be performed, except as noted below.

(b) If the vehicle failed only the first mode (ASM 50/15) (within 150% of all standards) of the first chance test, then that mode shall be repeated upon completion of the second mode (ASM2525). The test will terminate when the mode ends or when the vehicle passes, whichever occurs first.

(c) The dynamometer torque shall smoothly transition during the deceleration period and shall automatically reset to the load required for the 50/15 mode once the speed reaches 15 mph. The second chance ASM 50/15 test shall proceed as in Section (12)(a) above. The analyzer shall display the following message:

Display Prompt:

SECOND CHANCE 50/15 TEST AUTHORIZED. PLEASE GRADUALLY DECELERATE TO 15 MPH AND REPEAT THE ASM 5015 MODE.

(d) If the vehicle is failing only the second mode (ASM25/25) (within 150% of all standards) of the first chance test, then the second mode shall not end at 90 seconds but shall continue for up to 180 seconds. Mode timers shall not reset but rather continue up to 180 seconds. The pass/fail analysis shall continue up to 180 seconds or until the vehicle passes, whichever comes first. If a restart occurs, then this second chance ASM 25/25 mode (i.e., pass/fail analysis, restart conditions, tolerances, etc.,) shall occur as described in Section 12(b) above.

(e) The dynamometer torque shall maintain the load required for the 2525 mode. The second chance ASM 2525 test shall proceed as in Section (12)(b). The analyzer shall display the following message:

Display Prompt:

SECOND CHANCE 25/25 TEST AUTHORIZED. PLEASE CONTINUE SPEED AT 25 MPH.

(f) If the vehicle failed both modes (ASM5015 and ASM 2525) (within 150% of all standards) of the first chance test, then the vehicle shall receive a second-chance test for the ASM5015.

(g) If the vehicle fails both modes (ASM 50/15 and ASM 25/25) of the first chance test, within 150% of all standards, the analyzer shall display the following message:

Display Prompt:

SECOND CHANCE 50/15 TEST AUTHORIZED. PLEASE DECELERATE GRADUALLY TO 15 MPH AND REPEAT THE ASM 5015 MODE.

The second chance ASM 50/15 test shall proceed as in Section (13)(b)&(c) above. The emissions readings used to make the pass/fail decision shall be recorded in the

test record and on the VIR.

(h) If the vehicle fails the second-chance ASM 50/15, then the vehicle shall fail the ASM-2 test. Otherwise, the vehicle shall also receive a second-chance ASM 25/25. If the vehicle fails the ASM 25/25 second chance test, the vehicle shall fail the ASM-2 test. If the vehicle passes the second chance 25/25 mode, the vehicle shall pass the ASM-2 test.

The ASM-2 test shall terminate and the emissions readings used to make the pass/fail decision shall be recorded in the test record and on the VIR.

If the vehicle passes, the printed and recorded values shall be the passing readings. In addition to storing these readings, the analyzer shall also store the start time of the readings (i.e., the start time of the first chance 50/15 mode, and the end time of the final mode). If the vehicle fails, calculate the scores in the same manner and enter the values for the HC , CO, and NO into the record from the last valid ten-second average (i.e, test parameters within tolerances and no restart conditions occurred during the last ten-second average). Proceed to the second chance test and report only the scores obtained from it.

14. Augmented Braking

Augmented braking shall be operational during the ASM-2 test. Augmented braking for the ASM-2 test consists of applying the maximum safe load with the dynamometer to bring the rolls to a complete stop. Augmented braking shall automatically occur when any of the following conditions are met:

a. The conclusion of the final test mode (including second chance tests)

b. The test mode meets conditions for restart

c. The test mode meets conditions for abort

15. Restart Procedures

Bring the rollers to a full stop. Record the time that had elapsed since the beginning of the current mode. The software shall prohibit the restart of the test until the vehicle has idled (speed <1250) until twice the original elapsed time from the start of the current mode or one minute (whichever is less). The dynamometer load shall be applied when the speed reaches 10 mph and shall smoothly transition until the speed reaches 15 mph or 25 mph as applicable. The mode timer shall reset to zero when the speed and

dynamometer load reach 15 or 25 mph ±1 mph (as applicable) for 5 continuous seconds. Upon restart, the previously captured second-by-second data for that test mode shall be deleted and data collection shall begin anew.

Display Prompt:

TEST MODE MUST BE RESTARTED BECAUSE:

a. Conditions Causing Test Mode Restart (all modes):

i. Vehicle and/or equipment unable to stabilize with required stabilization time.

ii. Acceleration violation according to the requirements stated in the test sequence.

iii. Dynamometer load outside of specification for two or more consecutive seconds.

iv. Sample dilution.

v. Engine speed below 100 RPM for two or more consecutive seconds.(i.e., RPM violation).

vi. Inadequate number of valid ten-second average readings.

vii. Analyzer "low flow" condition for two or more consecutive seconds.

viii. Vehicle speed outside test limit for two or more consecutive seconds.

ix. Engine speed outside of range for five or more seconds during one excursion. The engine speed ranges are: 1500 - 3000 RPM, for engine sizes less than or equal to 3.0 L; and 1250 - 2500 RPM, for engine sizes larger than 3.0L.

The software shall count the number of restarts during the test procedure. The count shall be written to the *ASM Restart Counter* field of the test record. The maximum number of restarts for the entire ASM test sequence is two, otherwise the test will be aborted. ASM-2 tests with no restarts will record zero in the appropriate fields; (two-speed idle tests will leave the field blank).

b. Conditions Causing ASM-2 Test Abort (both modes):

i. Safety-related issues

ii. Equipment failure

iii. Power loss

iv. Any of the restart conditions listed above, occurring more than twice

16. End of ASM-2 Emissions Test Mode

At the completion or termination of the ASM two-mode inspection, the analyzer shall display the following message:

Display Prompt:

END OF ASM-2 EMISSIONS TEST
REMOVE RESTRAINING SYSTEM FROM VEHICLE.
REMOVE COOLING FAN, TACHOMETER LEAD AND SAMPLE PROBE.
DRIVE THE VEHICLE OFF OF THE DYNO.

Upon completion of an emissions test, the IS analyzer must:

1. Set the EMISS_TEST_TYPE to “1" for ASM-2 test. If there is no previous inspection for this vehicle, or the EMISS_PF_FLAG for this vehicle’s previous inspection is ‘P,’set the EMISS_INIT_TEST to ‘I’ for initial test. If the EMISS_PF_FLAG for this vehicle’s previous inspection is ‘F,’ set the EMISS_INIT_TEST to ‘R’. If there is no previous inspection for this vehicle, the previous inspection was a reinspection, or the previous inspection was more than sixteen days prior to this inspection, set the SAFE_INIT_TEST to ‘I.’ If the previous inspection was less than sixteen days prior to this inspection, set the SAFE_INIT_TEST to ‘R.’

2. Set the HC_PF_FLAG, CO_PF_FLAG, NO_PF_FLAG, and EMISS_PF_FLAG to one of the following codes:

   (a) P - Pass; or
   (b) F - Fail;

3. Display the test results just prior to printing the rejection receipt or VIR, and write the vehicle test record to **VEHICLE.DAT**, if the entry for EMISS_FP_FLAG is a

"P".

4. Display the test results just prior to printing the rejection receipt or VIR, and write the vehicle test record to **VEHICLE.DAT** and **REINSPECT.DAT** if the entry for EMISS_PF_FLAG is an "F".

5. If the inspector opted to 'bypass' the RPM, set the RPM_BYPASS to 'B'.

6. If the excessive dilution causes the test sequence to end, set the DILUTION_PF_FLAG to 'F'. Otherwise, set the DILUTION_PF_FLAG to 'P'.

7. If the emissions test ends due to a "time out" condition, set the TIMEOUT_FLAG to 'Y.' Otherwise, set the TIMEOUT_FLAG to 'N.'

8. The system will automatically enter the following fields: VERSION, TEST_DATE, TEST_START_TIME, TEST_END_TIME, STATION_NUM, ANALYZER_NUMBER, INSPECTOR_NUM, COUNTY_CODE, DILUTION (Dilution Amount in percent, $CO + CO_2$).

9. Based on the vehicle information entered, the microcomputer shall choose all of the proper Emissions Standards Category (ESC) (see Appendix S - Test Standards and Calculations, and Appendix T - Concentration Tables) for the vehicle being tested. The software shall provide for emissions standards which would be selected on the basis of vehicle year, vehicle type and weight. Updates to these tables shall come from the TIMS.

10. The emissions readings used to make the pass/fail decision shall be recorded in the test record of SECXSEC.DAT. This data shall be purged from the EIS when the data is transmitted to the TIMS.

11. The final results of the inspection go in the PRI fields. If second chance tests are conducted, the first chance test results are stored in the ALT fields and the second chance test results will be place in the PRI fields.

Associated System File:	**VEHICLE.DAT**	**PRI_AVG_5015_CO**
	REINSPECT.DAT	**PRI_AVG_5015_HC**
		PRI_AVG_5015_CO_2

PRI_AVG_5015_NO

PRI_AVG_5015_O_2

PRI_AVG_2525_CO

PRI_AVG_2525_HC

PRI_AVG_2525_NO

PRI_AVG_2525_CO_2

PRI_AVG_2525_O_2

ALT_AVG_5015_CO

ALT_AVG_5015_HC

ALT_AVG_5015_NO

ALT_AVG_5015_CO_2

ALT_AVG_5015_O_2

ALT_AVG_2525_CO

ALT_AVG_2525_HC

ALT_AVG_2525_NO

ALT_AVG_2525_CO_2

ALT_AVG_2525_O_2

PRI_AVG_2525_RPM

PRI_AVG_5015_RPM

ALT_AVG_2525_RPM

ALT_AVG_5015_RPM

RPM_PF_FLAG

DILUTION_5015

DILUTION_2525

DILUTION_PF_FLAG

HUMIDITY_CORR_5015

HUMIDITY_CORR_2525

HUMIDITY_PF_FLAG

HC_PF_FLAG

CO_PF_FLAG

NO_PF_FLAG

EMISS_PF_FLAG

ASM_RESTART_COUNT

TEST_TYPE

EMISS_INIT_TEST

TEST_WEIGHT

TEST_DATE

TEST_START_TIME

TEST_END_TIME

STATION_NAME

INSPECTOR_LNAME

INSPECTOR_FNAME

- - - -

The anti-dilution criterion shall be a minimum combined CO and CO_2 concentration of six percent for all light-duty vehicles and light-duty trucks and five percent for all heavy-duty trucks.

B. **Initial Test**

The initial test shall have an overall maximum test time of 290 seconds. If after 290 seconds a valid test condition has not been obtained, the analyzer shall prompt the inspector to restart the emissions test or fail this portion of the test and continue to the next phase of the inspection. If the inspector elects to continue on to the next phase of the inspection, the test shall end and be reported as a **FAILED** test in the test record and on the vehicle inspection report. If the inspector elects to restart the emissions test, the analyzer shall restart the emission test from the beginning, reset the time out flag, and write the emissions readings from the invalid test condition in the test record in the bytes that begin 'ALT_', and the next set of emissions readings in the test record in the bytes that begin 'PRI_.' If after 290 seconds a valid test condition has not been obtained after the restart, the test shall end and be reported as a **FAILED** test in the test record and on the vehicle inspection report. The procedure will not proceed to the second chance section. This condition could be caused by invalid RPM or Dilution.

C. **High-Speed Mode**

The mode timer shall start when engine speed is between 2200 and 2800 RPM and exhaust CO + CO_2 is at least six percent for all light-duty vehicles and light- duty trucks and five percent for all heavy-duty trucks. The mode shall last 90 seconds. If engine speed falls below 2200 RPM or exceeds 2800 RPM for more than two seconds in one excursion or more than six seconds over all excursions, within 30 seconds of final readings, the readings shall be invalid and the mode shall continue. If CO + CO_2 falls below six percent for all light-duty vehicles and light-duty trucks and five percent for all heavy-duty trucks at any time, the analyzer shall display a warning message indicating the dilution condition, prompt the inspector to check the probe for proper insertion, visually reinspect the analyzer hoses, check the vehicle's exhaust system for leaks, return to the beginning of the mode (i.e., reset the mode timer), and resume sampling once a valid testing condition is achieved.

The pass/fail analysis shall begin after an initial time delay of 10 seconds. The emissions level for HC and CO shall be analyzed at a minimum sampling rate of 2 Hz. A reading is a simple average of the emissions levels over the last five seconds. Readings shall be taken as running averages.

The pass/fail determination is made based on a comparison of the HC and CO readings

to the high speed emissions standard selected for the particular vehicle. If the HC and CO readings show passing values for both HC and CO then the vehicle has passed. If all readings fail for either HC, CO, or both, then the vehicle has failed the high speed mode.

If the vehicle passes, the printed and recorded values shall be the passing readings, for which HC + (151*CO) is a minimum among all passing readings. In addition to storing these readings, the analyzer shall also store the start time of the readings (i.e., the start of the five second averaging period). If the vehicle fails, calculate the scores in the same manner and enter the values for the HC and CO into the record from the lowest score. Proceed to the second chance test and report only the scores obtained from it.

D. **Idle Mode**

This mode shall be performed immediately following the high speed mode. The mode timer shall start when the engine speed is between 350 and 1200 RPM and the concentration of CO + CO_2 is at least six percent. This mode shall last a minimum of 30 seconds as engine speed is between 350 and 1200 RPM, CO + CO_2 level is above six percent, idle mode time is less than 90 seconds, and passing readings have not been obtained. If engine RPM exceeds 1200 RPM or falls below 350 RPM, the mode timer shall reset to zero and resume timing. If the engine stalls, the test shall abort resulting in a **FAILED** test. If CO + CO_2 falls below six percent (for all light-duty vehicles and light-duty trucks, five percent for all heavy-duty trucks) at any time, the analyzer shall display a warning message indicating the dilution condition, prompt the inspector to check the probe for proper insertion, visually reinspect the analyzer hoses, check the vehicle's exhaust system for leaks, return to the beginning of the mode (i.e., reset the mode timer), and resume sampling once a valid testing condition is achieved.

The pass/fail analysis shall begin after an initial time delay of 10 seconds. The emissions level for HC and CO shall be analyzed at a minimum sampling rate of 2 Hz. A reading is a simple average of the emission levels over the last five seconds. Readings shall be taken as running averages. If readings less than or equal to 100 ppm HC and 0.5 percent CO are obtained before the 30-second point, the vehicle shall pass and the mode shall end immediately. Otherwise, the mode shall continue for at least 30 seconds and not more than 90 seconds, stopping between these two limits whenever local program cutpoints are met.

The pass/fail determination is made based on a comparison of the HC and CO readings to idle emissions standard selected for the particular vehicle. If the HC and CO readings show passing values for both HC and CO then the vehicle has passed. If all readings fail for either HC, CO, or both, then the vehicle has failed the idle mode.

If the vehicle passes, the printed and recorded values shall be the passing readings, for which HC + (151*CO) is a minimum among all passing readings. In addition to storing these readings, the analyzer shall also store the start time of the readings (i.e., the start of the five second averaging period). If the vehicle fails, calculate the scores in the same manner and enter the values for the HC and CO into the record from the lowest score. Proceed to the second-chance test and report only the scores obtained from it.

E. **Second-Chance Test**

If the vehicle fails either mode, the test timer shall restart and a second-chance test shall be performed. The second chance test shall be performed for only the mode(s) that failed.

If the vehicle failed only the initial high speed mode, the second chance test shall consist of the high speed test mode only. The overall test time limit for this sequence is 280 seconds. If the vehicle failed only the idle mode, the second-chance high speed mode is for preconditioning only. If both modes were failed initially, a complete test is conducted. The second-chance idle test mode shall be performed if a vehicle has failed both its initial and second-chance high speed tests. If the vehicle failed only the idle mode, the second-chance test shall consist of the preconditioning mode followed by the idle mode. The overall test time limit for these sequences shall be 425 seconds.

F. **Second-Chance High Speed Mode Without Subsequent Idle Mode**

The engine shall be shut off and be restarted for 1981-1987 Ford Motor Company products and 1984-1985 Honda Preludes, but no other vehicles. A **prompt shall notify the inspector of this requirement**. If necessary to reduce analyzer fouling, remove the probe from the tailpipe or turn off the sample pump during the restart procedure.

The mode timer shall start when engine speed is between 2200 and 2800 RPM and exhaust CO + CO_2 is at least six percent (for all light-duty vehicles and light- duty trucks, five percent for all heavy-duty trucks). The mode shall last a minimum of 15 and a maximum of 180 seconds. If engine speed falls below 2200 RPM or exceeds 2800 RPM for more than two seconds in one excursion or for more than six seconds over all excursions within 30 seconds of the current final readings, the readings shall be invalid and the mode shall continue. If CO + CO_2 falls below six percent (for all light-duty vehicles and light-duty trucks, five percent for all heavy-duty trucks) at any time, the analyzer shall display a warning message indicating the dilution condition, prompt the inspector to check the probe for proper insertion, visually reinspect the analyzer hoses, check the vehicle's exhaust system for leaks, return to the beginning of the mode (i.e., reset the mode timer), and resume sampling once a valid testing condition is achieved.

The pass/fail analysis shall begin after an initial time delay of 10 seconds. The emissions level for HC and CO shall be analyzed at a minimum sampling rate of 2 Hz. A reading is a simple average of the emission levels over the last five seconds. Readings shall be taken as running averages. If readings less than or equal to 100 ppm HC and 0.5 percent CO are obtained before the 30-second point, the vehicle shall pass and the mode shall end immediately. Otherwise, the mode shall continue for at least 30 seconds and not more than 180 seconds, stopping between these two limits whenever local program cut points are met.

The pass/fail determination is made based on a comparison of the HC and CO readings to high speed emissions standard selected for the particular vehicle. If the HC and CO readings show passing values for both HC and CO, then the vehicle has passed. If all readings fail for either HC, CO, or both, then the vehicle has failed the test.

If the vehicle fails, the printed and recorded values shall be the readings for which HC + (151*CO) is a minimum. If the vehicle passes, the reported scores shall be the passing readings for which HC + (151*CO) is a minimum among all passing readings. In addition to storing these readings, the analyzer shall also store the start time of the readings (i.e., the start of the five second averaging period).

G. **Second-Chance Preconditioning Mode With Subsequent Idle Mode**

The mode timer shall initiate when engine speed is between 2200 and 2800 RPM. The mode shall continue for 180 seconds. If engine speed falls below 2200 RPM, or exceeds 2800 RPM for more than five seconds in any one excursion, or 15 seconds over all excursions, the mode timer shall reset to zero and resume timing.

H. **Second-Chance Idle Mode**

The second-chance idle mode shall be performed immediately following the second-chance preconditioning mode. The engine shall be shut off and restarted for 1981-1987 Ford Motor Company products and 1984-1985 Honda Preludes, but no other vehicles. A **prompt will notify the inspector of this requirement**. If necessary to reduce analyzer fouling, remove the probe from the tailpipe or turn off the sample pump during the restart procedure.

The mode shall initiate when the engine speed is between 350 and 1200 RPM, and the concentration of CO + CO_2 is at least six percent (for all light-duty vehicles and light-duty trucks, five percent for all heavy-duty trucks and alternate fuel vehicles). The mode shall last a minimum of 30 seconds and a maximum of 90 seconds. The idle mode

shall continue as long as engine speed is between 350 and 1200 RPM, CO + CO_2 level is above six percent (for all light-duty vehicles and light-duty trucks, five percent for all heavy-duty trucks and alternate fuel vehicles), idle mode time is less than 90 seconds and passing readings have not been obtained. If engine RPM exceeds 1200 RPM or falls below 350 RPM the mode timer shall reset to zero and resume timing. If the engine stalls, the test shall abort. If CO + CO_2 falls below six percent (for all light-duty vehicles and light-duty trucks, five percent for all heavy-duty trucks) at any time, the analyzer shall display a warning message indicating the condition, prompt the inspector to check the probe for proper insertion, visually reinspect the analyzer hoses, check the vehicle's exhaust system for leaks, return to the beginning of the mode (i.e., reset the mode timer), and resume sampling once a valid testing condition is achieved.

The pass/fail analysis shall begin after an initial time delay of 10 seconds. The emissions level for HC and CO shall be analyzed at a minimum sampling rate of 2 Hz. A reading is a simple average of the emission levels over the last five seconds. Readings shall be taken as running averages. If readings less than or equal to 100 ppm HC and 0.5 percent CO are obtained before the 30-second point, the vehicle shall pass and the mode shall end immediately. Otherwise, the mode shall continue for at least 30 seconds and not more than 90 seconds, stopping between these two limits whenever local program cutpoints are met.

The pass/fail determination is made based on a comparison of the HC and CO readings to idle emissions standard selected for the particular vehicle. If the HC and CO readings show passing scores for both HC and CO, then the vehicle has passed. If all readings fail for either HC, CO, or both, then the vehicle has failed the test.

If the vehicle fails, the printed and recorded values shall be the readings for which HC + (151*CO) is a minimum. If the vehicle passes, the reported scores shall be the passing readings for which HC + (151*CO) is a minimum among all passing readings. In addition to storing these readings, the analyzer shall also store the start time of the readings (i.e., the start of the five second averaging period).

I. **Graphic Illustration of Preconditioned Two Speed Idle Test**

(Reserved)

J. **Test Sequence for BMW/Peugeot/Volvo**

The test sequence shall follow the procedure described in 40 CFR Part 51, Subpart S, Appendix B (I) Idle Test (see Appendix K) with the following modifications.

Given the problems with the ZF automatic transmission, the TNRCC/DPS prefers that the affected vehicles be tested at their dealerships. Accordingly, if the inspector enters an "A" (for automatic) for the transmission type, and if the vehicle make, model and model year match BMW/Peugeot/Volvo/Jaguar criteria, the TX96 Analyzer shall display the following message:

BECAUSE OF THE POSSIBILITY OF TRANSMISSION DAMAGE TO THIS VEHICLE, THE TNRCC/DPS PREFERS THAT IT BE INSPECTED AT ITS DEALERSHIP. IF YOU STILL WISH TO PERFORM THE INSPECTION, YOU MAY DO SO AT YOUR OWN RISK. PRESS "ENTER" TO CONTINUE. IF NOT, PRESS "ESC" TO ABORT THE TEST. (ENTER ABORT CODE 6.)

If the inspector chooses to continue testing this vehicle, display the following message before beginning the test sequence.

BEFORE BEGINNING THE EMISSIONS TEST, MAKE SURE THE ENGINE IS A NORMAL OPERATING TEMPERATURE. IF NOT, THE VEHICLE SHOULD BE DRIVEN UNTIL IT IS. <u>DO NOT</u> WARM THE ENGINE BY RAISING THE RPM ABOVE IDLE WHILE THE TRANSMISSION IS IN PARK OR NEUTRAL.

AFTER THE ENGINE REACHES NORMAL OPERATING TEMPERATURE, PUT THE TRANSMISSION IN PARK AND TURN THE ENGINE OFF FOR 30 SECONDS. RESTART THE ENGINE. AFTER THE ENGINE IS STARTED, <u>DO NOT</u> MOVE THE GEAR SHIFT SELECTOR THROUGH THE FORWARD OR REVERSE GEARS BEFORE OR DURING THE TEST SEQUENCE. <u>DO NOT EXCEED 2000 RPM.</u>

Testing period:	90 seconds, No second stage (second chance)
Test Stage:	Idle RPM (see standards for maximum)
Units of test results:	Concentration measurements: HC PPM, CO percent, CO_2 percent, O_2 percent.

All 1984-87 BMW's with automatic transmission, 1983-88 Volvo 740s with automatic transmission, 1984-89 Jaguar XjS's, and the 1986-92 Peugeot 505s with automatic

transmission shall be tested using this test sequence or the latest test sequence supplied by the TNRCC.

K. **Preconditioning Modes for BMW/Peugeot/Volvo/Jaguar**

In addition to the preconditioning modes described for Ford Motor Company and Honda vehicles in Appendix B, the emissions test shall include the following preconditioning modes or the latest preconditioning modes supplied by the TNRCC. There are no preconditioning modes for vehicles that match the BMW/Peugeot/Volvo/Jaguar criteria (i.e., vehicle make, model and model year, transmission).

L. Initial Test Completion

Upon completion of a preconditioned 2-speed idle test, the TX96 Analyzer must:

1. Set the EMISS_TEST_TYPE to '2' for 2-speed idle test. If there is no previous inspection for this vehicle, or the EMISS_PF_FLAG for this vehicle's previous inspection is 'P,'set the EMISS_INIT_TEST to 'I' for initial test. If the EMISS_PF_FLAG for this vehicle's previous inspection is 'F,' set the EMISS_INIT_TEST to 'R'. If there is no previous inspection for this vehicle, the previous inspection was a reinspection, or the previous inspection was more than 16 days prior to this inspection, set the SAFE_INIT_TEST to 'I.' If the previous inspection was less than or equal to 16 days prior to this inspection, set the SAFE_INIT_TEST to 'R.'

2. Set the HC_PF_FLAG, CO_PF_FLAG, and EMISS_PF_FLAG to one of the following codes:

   (a) P - Pass; or

   (b) F - Fail;

3. Display the test results just prior to printing the rejection receipt or VIR, update the test record, replace the 'J' in the ABORT field with a space or blank, and write the vehicle test record to **VEHICLE.DAT**, if the entry for EMISS_FP_FLAG is a "P".

4. Display the test results just prior to printing the rejection receipt or VIR, update

the test record, replace the ‘J’ in the ABORT field with a space or blank, and write the vehicle test record to **VEHICLE.DAT** and **REINSPECT.DAT** if the entry for EMISS_PF_FLAG is an “F”.

5. Set the RPM_BYPASS to 'B', if the inspector opted to ‘bypass’ the RPM.

6. If the excessive dilution causes the test sequence to end, set the DILUTION_PF_FLAG to 'F'. Otherwise, set the DILUTION_PF_FLAG to 'P'.

7. If the emissions test ends due to a “time out” condition, set the TIMEOUT_FLAG to ‘Y.’ Otherwise, set the TIMEOUT_FLAG to ‘N.’

8. The system will automatically enter the following fields: VERSION, TEST_DATE, TEST_START_TIME, TEST_END_TIME, STATION_NUM, ANALYZER_NUMBER, INSPECTOR_NUM, COUNTY_CODE, DILUTION (Dilution Amount in percent, $CO + CO_2$).

Associated System File:	**VEHICLE.DAT**	**PRI_CURB_IDLE_CO**
	REINSPECT.DAT	**PRI_CURB_IDLE_HC**
		PRI_CURB_IDLE_CO_2
		PRI_CURB_IDLE_O_2
		PRI_HIGH_SPEED_CO
		PRI_HIGH_SPEED_HC
		PRI_HIGH_SPEED_CO_2
		PRI_HIGH_SPEED_O_2
		ALT_CURB_IDLE_CO
		ALT_CURB_IDLE_HC
		ALT_CURB_IDLE_CO_2
		ALT_CURB_IDLE_O_2
		ALT_HIGH_SPEED_CO
		ALT_HIGH_SPEED_HC
		ALT_HIGH_SPEED_CO_2
		ALT_HIGH_SPEED_O_2

PRI_HIGH_SPEED_RPM
PRI_CURB_IDLE_RPM
ALT_HIGH_SPEED_RPM
ALT_CURB_IDLE_RPM

DILUTION
DILUTION_PF_FLAG
RPM_BYPASS

HC_PF_FLAG
CO_PF_FLAG
EMISS_PF_FLAG
TEST_TYPE
EMISS_INIT_TEST

STATION_NAME
INSPECTOR_LNAME
INSPECTOR_FNAME

- -

3.3.21 Gas Cap Missing Prompt:

IS THE GAS CAP MISSING? ('Y' OR 'N')

Programming Criteria: The system shall only accept a ‘Y’ or ‘N’ entry. If inspector indicates the gas cap is missing, the system shall set the GAS_CAP_MISS to ‘Y’, set the GAS_CAP_PF_FLAG_1 to 'F' - fail, (i.e., the vehicle shall fail the gas cap integrity test), and continue with the end of phase logic in Section 3.3.24b. If the inspector selects ‘N’, continue with the next screen prompt.

Error Message: **ONLY ‘Y’ OR ‘N’ WILL BE ACCEPTED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **GAS_CAP_MISS**
GAS_CAP_PF_FLAG_1

- -

3.3.22 Gas Cap Testable Prompt:

IS THE GAS CAP TESTABLE? ('Y' OR 'N')

Programming Criteria: The system shall only accept a 'Y' or 'N' entry. If the inspector indicates the gas cap not testable ('untestable'), (i.e., selects 'N'), the system shall set the GAS_CAP_PF_FLAG_1 to 'P' - pass, set the GAS_CAP_TESTABLE to 'N', and continue with the end of phase logic in Section 3.3.24b. If the inspector selects 'Y', continue with the next screen prompt.

Error Message: **ONLY 'Y' OR 'N' WILL BE ACCEPTED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **GAS_CAP_TESTABLE**
GAS_CAP_PF_FLAG_1

- -

3.3.23 Gas Cap Connect Prompt:

REMOVE THE GAS CAP FROM THE VEHICLE AND CONNECT IT TO THE GAS CAP TESTER. REFER TO THE OPERATOR'S MANUAL, IF REQUIRED.

Programming Criteria: If the gas cap tester is an integral part of the analyzer or fully automatic, the system will prompt the inspector to press "continue/enter" to conduct the test.

Error Message: **ONLY 'CONTINUE/ENTER' WILL BE ACCEPTED--TRY AGAIN**

- -

3.3.24 Gas Cap Results Prompt:

ENTER THE RESULTS OF THE GAS CAP INTEGRITY TEST. ('P' OR 'F')

Programming Criteria: If the gas cap tester is an integral part of the analyzer or fully automatic, the system shall not display this prompt, and shall enter the results of the test in GAS_CAP_PF_FLAG_1. The result shall either be 'P' for pass, or 'F' for fail.

Error Message: **ONLY 'P' OR 'F' WILL BE ACCEPTED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **GAS_CAP_PF_FLAG_1**

- - - -

Since the second gas cap will not be tested, the analyzer shall set the flags as follows. If the GAS_CAP_PF_FLAG_1 is set to “P” - pass, then set the GAS_CAP_PF_FLAG to “P.” If the GAS_CAP_PF_FLAG_1 is set to “F” - fail, then set the GAS_CAP_PF_FLAG to “F.” If the EMISS_PF_FLAG, and the GAS_CAP_PF_FLAG are all set to “P” - pass, then set the OVERALL_RESULTS field to “P” for pass. If the EMISS_PF_FLAG, and the GAS_CAP_PF_FLAG are not all set to “P” - pass, then set the OVERALL_RESULTS to “F” for fail. Then, the system shall then proceed to the Emissions Test Fee Prompt, Section 3.3.25.

Associated System File: **VEHICLE.DAT** **EMISS_PF_FLAG**
GAS_CAP_PF_FLAG
GAS_CAP_PF_FLAG_1
OVERALL_RESULTS

3.3.24c **Second Gas Cap Missing Prompt:**

IS THE SECOND GAS CAP MISSING? ('Y' OR 'N')

Programming Criteria: The system shall only accept a ‘Y’ or ‘N’ entry. If inspector indicates the gas cap is missing, the system shall set the 2ND_GAS_CAP_MISS to ‘Y’, set the GAS_CAP_PF_FLAG_2 to 'F' - fail, (i.e., the vehicle shall fail the gas cap integrity test), and continue with the end of phase logic in Section 3.3.24g. If the inspector selects ‘N’, continue with the next screen prompt.

Error Message: **ONLY ‘Y’ OR ‘N’ WILL BE ACCEPTED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **2ND_GAS_CAP_MISS**
GAS_CAP_PF_FLAG_2

- -

3.3.24d **Second Gas Cap Testable Prompt:**

IS THE SECOND GAS CAP TESTABLE? ('Y' OR 'N')

Programming Criteria: The system shall only accept a ‘Y’ or ‘N’ entry. If the inspector

indicates the gas cap not testable (‘untestable’), (i.e., selects ‘N’), the system shall set the GAS_CAP_PF_FLAG_2 to 'P' - pass, set the 2ND_GAS_CAP_TEST to ‘N’, and continue with the end of phase logic in Section 3.3.24g. If the inspector selects ‘Y’, continue with the next screen prompt.

Error Message: **ONLY ‘Y’ OR ‘N’ WILL BE ACCEPTED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **2ND_GAS_CAP_TEST**
GAS_CAP_PF_FLAG_2

- -

3.3.24e **Second Gas Cap Connect Prompt:**

REMOVE THE SECOND GAS CAP FROM THE VEHICLE AND CONNECT IT TO THE GAS CAP TESTER. REFER TO THE OPERATOR’S MANUAL, IF REQUIRED.

Programming Criteria: If the gas cap tester is an integral part of the analyzer or fully automatic, the system will prompt the inspector to press “continue/enter” to conduct the test.

Error Message: **ONLY ‘CONTINUE/ENTER’ WILL BE ACCEPTED--TRY AGAIN**

- -

3.3.24f **Second Gas Cap Results Prompt:**

ENTER THE RESULTS OF THE SECOND GAS CAP INTEGRITY TEST. ('P' OR 'F')

Programming Criteria: If the gas cap tester is an integral part of the analyzer or fully automatic, the system shall not display this prompt, and shall enter the results of the test in GAS_CAP_PF_FLAG_2. The result shall either be ‘P’ for pass, or ‘F’ for fail.

Error Message: **ONLY 'P' OR 'F' WILL BE ACCEPTED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **GAS_CAP_PF_FLAG**
GAS_CAP_PF_FLAG_1
GAS_CAP_PF_FLAG_2

- -

3.3.24g End of Phase Logic:

Programming Criteria: If the GAS_CAP_PF_FLAG_2 and the GAS_CAP_PF_FLAG_1 are set to "P" - pass, then set the GAS_CAP_PF_FLAG to "P." If either the GAS_CAP_PF_FLAG_2 or the GAS_CAP_PF_FLAG_1 is set to "F" - fail, then set the GAS_CAP_PF_FLAG to "F." If the EMISS_PF_FLAG, and the GAS_CAP_PF_FLAG are set to "P" - pass, then set the OVERALL_RESULTS field to "P" for pass. If the EMISS_PF_FLAG, and the GAS_CAP_PF_FLAG are not set to "P" - pass, then set the OVERALL_RESULTS to "F" for fail. Then, the system shall then proceed to the Emissions Test Fee Prompt, Section 3.3.25.

Associated System File: **VEHICLE.DAT**
GAS_CAP_PF_FLAG
GAS_CAP_PF_FLAG_1 **EMISS_PF_FLAG**
GAS_CAP_PF_FLAG_2 **OVERALL_RESULTS**

- -

3.3.25 Emissions Test Fee Prompt:

ENTER THE COST FOR THE EMISSIONS INSPECTION, INCLUDING CENTS.

Programming Criteria: The inspector shall enter the cost for the emissions inspection,

exclusive of repair costs. The system shall sum the EMISS_INSP_COST, and the applicable repair costs, (i.e., REP_CST_YIS) to obtain the OVERALL_COST. The analyzer shall not accept a value greater than $99.99 for this entry.

Error Messages: **NO VALUE HAS BEEN ENTERED--TRY AGAIN.**

MAXIMUM ENTRY $99.99 -- TRY AGAIN.

Associated System File: **VEHICLE.DAT** **EMISS_INSP_COST**
OVERALL_COST

- -

3.3.25a **Decal Number Prompt:** **ENTER THE INSPECTION DECAL NUMBER**.

Programming Criteria: This prompt shall only be displayed if the vehicle passes the inspection and the inspection is a required emissions only test (decal), or a remote sensing request. If the inspection is a required emission only test, set the SAFE_TEST_TYPE to 'H.' Otherwise, leave the SAFE_TEST_TYPE blank. If the OVERALL_RESULTS flag is "F", then the system will not give the inspector this prompt and proceed to 3.3.26. If the OVERALL_RESULTS flag is "P", then the system will prompt the inspector to input the safety inspection decal number, and proceed to 3.3.27. A minimum of six (6) and maximum of nine (9) characters are required for this field. When the decal number entered is not a sequential number to the last decal issued, a warning shall be displayed, "Decal number not in sequential order. Notify DPS if a decal is missing." The enter key should allow the inspector to continue.

The safety decal number consists of an alpha character, followed by up to eight digits. The alpha character usually does **not** correspond to the alpha character contained in the SAFE_TEST_TYPE field. The decal numbers should be in sequential order. The warning should appear each time the inspector changes strips for the 'emissions only test (decal)' inspection. For example, a strip of decals (type "H" tests) may end with V00000050, and the next strip of decals purchased by the shop owner may begin with V00001000. The strips contain 10 sequential emissions decals.

The system should take the entered decal number, auto populate the entry with leading zeroes, compare it to the previous decal issued, and determine if the entered decal number is next in sequence. If the entered number is not next in sequence, the correction prompt should appear.

If the inspector enters fewer than 9 characters, the analyzer shall automatically load leading zeros to the numerical entry and show the analyzer number after the entry is confirmed. For example, an entry of an 'A', followed by a '123' shall be converted to 'A00000123' and displayed for the inspector to confirm the entry. The conversion will always end in a nine-character decal number entry. This nine-character value shall be used during comparison testing to facilitate sequential issuance of decals. The first character of a decal number shall be an alphabetic character. The only acceptable alpha character is 'V' for decals.

The analyzer shall restrict the alpha character to a list of acceptable alpha characters for a particular type of decal being issued. For example, during a safety and emission inspection reinspection, if the inspector selects the '1-year windshield (safety & emissions)' certificate on the type of inspection prompt in Section 3.1.20 and the vehicle passes the inspection, the inspector may only enter an 'A,' 'B,' 'C,' 'D,' 'E,' or 'F,' as the alpha character in the certificate number entry prompt. For Emission only Decals, the only acceptable alpha character is 'V.' For '1 Year Windshield (Safety Only)' certificate types, the acceptable alpha characters are 'G,' 'H,' 'I,' 'J,' 'K,' 'L,' 'M,' and 'P.' For '2 Year Windshield' certificate types, the acceptable alpha characters are 'N,' 'W,' and 'Q.' For 'Trailer/Motorcycle' certificate types, the acceptable alpha characters are 'X,' 'Y,' and 'Z.' For 'FMCSR (Truck)' certificate types, the acceptable alpha characters are 'T,' and 'U.' For 'FMCSR (Trailer)' certificate types, the acceptable alpha characters are 'R,' and 'S.'

<u>Associated System File:</u> **VEHICLE.DAT**

DECAL_NUM

SAFE_TEST_TYPE

- - - -

R - RE-ENTER DECAL NUMBER

Programming Criteria:

The system shall only accept 'U,' 'C,' or 'R,' as valid entries. The system shall display the entered decal number, the safety inspection type (decal) and the 'previous' decal number. This prompt shall only appear if the entered decal is out of sequence. If 'R' is entered, the system shall allow the inspector to return to the previous screen prompt to re-enter the current decal. If 'C,' or 'U' is selected, the system will use the entered decal number as the new 'previous' decal number for the next comparison. If 'U,' is selected, the system shall complete the test, write the test record, transmit the results to the Texas Information Management System, and continue with the Certificate Type Prompt, number 3.12.2a. If the inspector selects 'U,' the analyzer shall not allow any further official inspections to be conducted until the inspector has completed the entries required in Section 3.12, Missing, or Voided Certificates/Decals.

The analyzer may either:

1. a. complete the inspection as prescribed in Section 3.3 by proceeding with Section 3.3.26, Rejection Receipt, and then,

   b. complete the screen prompts in Section 3.12. A manufacturer selected lockout shall be used to prevent any subsequent official inspections until the decals are accounted for by answering the prompts in Section 3.12,

2. a. Or, interrupt the current inspection, then,

   b. account for the previous decals by answering the prompts in Section 3.12, beginning with 3.12.2a and continuing through to 3.12.5, or 3.12.6, and then,

   c. complete the inspection by proceeding with Section 3.3.26, Rejection Receipt, write the test record, and transmit the results to the Texas Information Management System, thus, satisfying the requirement of accounting for the previous decals prior to conducting any subsequent official inspections.

If a manufacturer lockout is used, the inspector shall be able to easily identify the reason the analyzer is preventing subsequent official inspections. The inspector shall be able to easily identify which decal must be accounted for. In any case, the analyzer shall not conduct any subsequent official inspections until the inspector accounts for the previous decals by answering the questions in Section 3.12.

The analyzer will store the information in the VEHICLE.DAT file and print it on the weekly inspection log report (VI-8B). The void indicator shall show 'VOID', if 'V' is in the DECAL_COND field, or 'MISS', if 'M' is in the DECAL_COND field of the record created using the Missing or Voided Certificates/Decals function. The system shall store the entry of 'C' in the DECAL_COND field, if 'C' is selected, and store the entry of the 'U' in the DECAL_COND field, if 'U' is selected in the test record. The default for this screen shall be 'R' for reenter decal number.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**

INVALID ENTRY--TRY AGAIN

Associated System File: **VEHICLE.DAT** **DECAL_COND**

3.3.26 **Rejection Receipt:** **EXPLAIN THE REJECTION FULLY.**

VEHICLE INSPECTION REJECTION RECEIPT

Date_____ Vehicle Make_____ Model year_____
Vehicle License # _____ Inspection Station# _____
Inspection Station Name_____

REJECTED FOR DEFECTIVE

Turn Signals - Mounting, operation, and approved type

Window Tinting and Sunscreening - Tint or Coating out of Specifications

Turn Signal Switch and Indicator Lamp - Switch accessible & locks in position

Emissions System - Excessive Emissions (see VIR)

Gas Cap Test - Fails Pressure Test

EXPLAIN REJECTION FULLY: (Inspector's explanation goes here)

Certified Inspector Making Inspection: _____

If defects indicated above are corrected and the vehicle is returned to the original inspection station within 15 days, (excluding the date of rejection) the vehicle will be reinspected once with no additional fee. THIS IS NOT A PERMIT TO DRIVE A DEFECTIVE VEHICLE OR TO DRIVE A VEHICLE WITHOUT A CURRENT VALID INSPECTION CERTIFICATE.

Fee Paid $_____

VI-7(rev. 2000) Texas Department of Public Safety

Programming Criteria:

The system shall prompt the inspector to explain the rejection fully, enter the fee paid on the rejection receipt and print the rejection receipt shown above. The fee paid shall be the overall cost for the complete inspection (i.e., the amount in the OVERALL_COST field). The system shall allow the inspector to type the explanation from the keyboard prior to printing the rejection receipt. If the inspector opts to type the explanation, the explanation shall appear on the printed rejection report. The system shall allow the inspector to print additional copies of the rejection receipt, after the initial report has been printed. The maximum number of entries that can be displayed on the rejection receipt is five (5). If the emissions test (ASM, TSI, or OBD) or the gas cap integrity test of the inspection is failed, then the entry for this item must be displayed. If both the emissions test and the gas cap integrity test are failed, then both entries must be displayed on the rejection receipt. The preferred order of appearance is the emissions test entry, the gas cap integrity test entry, followed by the remaining safety item entries. In either case, the rejection receipt shall not display more than the maximum of five items. Then, the system should continue to the Print Vehicle Repair Form, Section number 3.3.26a, followed by the Print Vehicle

Inspection Report Prompt, number 3.3.27.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **OVERALL_COST**

- -

3.3.26a **Print Vehicle Repair Form (VRF):**

Programming Criteria: If the EMISS_PF_FLAG flag is "F", then the analyzer shall print a VRF. The analyzer shall print the following vehicle information on the VRF: make, model, model year, the vehicle identification number (VIN), license plate number, and odometer reading (mileage). A draft VRF format is provided in Appendix O.

- -

3.3.26b **Print Public Awareness Statement:**

The public awareness statement shall be printed only once, and the VIR shall be printed twice based on the outcome of the emissions phase of the inspection. If the vehicle passes the emissions phase of the inspection, the analyzer shall print the 'passing' public awareness statement, and the 'failing' public awareness statement, if the vehicle fails the emissions phase of the inspection.

- -

3.3.27 **Print Vehicle Inspection Report:**

After the system has stored the test record, the following prompt shall be displayed.
"READY TO PRINT VEHICLE INSPECTION REPORT? ENTER "Y" FOR YES OR "N" FOR NO."

Depending upon the pass/fail status of the emissions phase of the inspection, the printer will provide additional information to the customer as outlined in Appendix B. The custom report

shall include, but not be limited to, the following information: Test Type (Initial or Reinspection), Test (2-Speed Idle), Test Date, Test Time, Test Cost (differentiated by Emission and Safety), Overall Cost, Inspector Name, Station Name, Vehicle License Number, VIN, Vehicle Make, Vehicle Model Year, Vehicle Type, Engine Size, Cylinders, Transmission, Odometer, Gross Vehicle Weight, Ignition, Two Letter Special Test Designation where applicable, Emissions Standard (by pollutant), Vehicle Actual Emissions Amounts (by pollutant), Emissions Result (by pollutant), all final RPM values for the Test, Dilution Amount (in percent, CO + CO_2), Dilution Results (Pass or Fail), the Results of the Gas Cap Integrity Test, and the Overall Result of the Inspection. The vehicle's ignition type shall be place on the same line as the number of cylinders separated by at least two spaces or a slash. The subtitle of the report shall indicate that the test was a Safety and Emissions Inspection, Safety Only Inspection, Required Emission Only Decal Inspection or Emission Only Inspection, and whether or not the test was conducted as a Special Test. If the test was conducted as a Special Test, the Two Letter Designation (i.e., LI, ME, IV, AD, ST, PA, or OT) shall be placed on the same line as the Test Type separated by at least two spaces, or a slash, and the words 'Special Test' shall be in the subtitle. The system shall allow the inspector to print additional copies of the vehicle inspection report, after the initial report has been printed. If the test ends because of a time out condition or because of dilution, the emission standards, amounts, and results shall **not** be printed on the report. The report shall indicate that the vehicle has failed. The report shall indicate that the vehicle failed because of excessive dilution, where applicable. If the test should 'time out', then the report shall indicate that the vehicle failed because the test was not completed in the time allowed for completion of the test. After the inspection has been completed, the analyzer shall contact the Texas Information Management System Host, and transmit all applicable vehicle information.

If the test ends in an aborted condition, the vehicle inspection report (VIR) shall print the station information, the vehicle information, indicate that the test was aborted in the overall result block, and display the reason for the abort. If the inspector selects other, then the analyzer shall print the reason typed in by the inspector, or provide space for a handwritten answer if the inspector does not type in the reason.

If the vehicle aborts the emissions phase or completes the emissions phase of the inspection with a timeout condition, the system shall print dashes on the VIR where the analyzer would have ordinarily placed readings. The dashes shall follow the expected format of the corresponding gas (i.e., CO = '--.--', HC = '----', CO_2 = '--.-'). Dashes are preferable, however, an alternative symbol may be used. The system shall also place dashes in place of the pass/fail indicator on the VIR. The system shall print the RPM value, the dilution standard, the dilution reading and result, and the standards for HC, CO, CO_2, and O_2, where applicable.

The analyzer shall print two barcodes on the VIR which contain the VIN, license plate number of the vehicle, and the license type, of the vehicle under inspection. The bar code shall be code 39 format and contain only the previously mentioned information and the start and stop

characters.

The bar codes shall be printed on the VIR in the following format: 2 code 3 of 9 bar codes will be utilized, since there is too much information to use a single bar code. One bar code shall be formatted as follows:

Name	Length	Start	Format
Identifier	1	1	‘$’
License Plate Type	1	2	‘1’, ‘2’, ‘3’, ‘4’, ‘5’, ‘6’, ‘7’, or ‘8’
License Plate Number	8	3	Alphanumeric
TxDOT Number	10	11	Alphanumeric

The other shall be formatted as follows:

Name	Length	Start	Format
Identifier	1	1	‘I’
VIN	17	2	Alphanumeric

Each bar code must be clearly labeled, so that the inspectors can easily tell which bar code is which. The location of the bar codes on the VIR shall be determined by the manufacturers. The State only requires that they be present and labeled.

Error Message: **NO VALUES ENTERED -- TRY AGAIN**

Associated System File: **VEHICLE.DAT** **EMISS_INSP_COST**
OVERALL_RESULTS

- -

3.3.28 Texas Information Management System Contact:

The analyzer shall contact the Texas Information Management System Host, and transmit the completed test record for this inspection and any other test records from previous inspections that have not been sent to the Texas Information Management System Host. Upon completion of this contact, the analyzer shall return to the Main Menu.

The analyzer shall increment the ‘number of tests without VID contact’ counter (No contact counter) by one, if the following bits are not set in the RESPONSE.DAT file during the communication sessions:

48 - Command completed successfully (status specific to “transmit VIN/License Plate data” command)

80 - Command completed successfully (status specific to “Transmit test record(s)” command)

The no contact counter shall only increment by one for each inspection completed with either response bit 48 or response bit 80 not being set.

The following bits may also be set when response bits 48 and 80 are not set. These bits provide probable explanations to why response bits 48 and 80 were not set.

8 - Invalid password (token file error)
9 - Invalid LOCKOUT.DAT file
10 - Invalid TAS telephone number
11 - Invalid station number
12 - Invalid TAS number
13 - Invalid software version number
14 - Invalid VID phone number
15 - Invalid communications port base address
16 - Invalid communications port interrupt
17 - Communication port error
18 - Dialing error
19 - No dial tone
20 - Phone line busy
21 - No answer
22 - Voice answered
23 - Security lagon (to VID) failure

The no contact counter shall not be incremented for any aborted inspections.

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3.4 Main Menu Selection '4' "Re-inspection"

3.4.1 Access Code Prompt: ENTER YOUR INSPECTOR'S ACCESS CODE

Programming Criteria:

The TX96 analyzer shall be designed to require the entry of the access code via the 2-D bar code reader. The inspector shall be required to enter his access code using the bar code reader for every inspection.

The TX96 analyzer shall be designed to require the entry of a special access code by the certified inspector before an official emissions inspection can begin. The access code shall neither be displayed nor printed on the Inspection Vehicle Inspection Report. This access code will be verified and linked to existing I/M Inspector number contained in the **INSPECTR.DAT** file. The analyzer shall not accept duplicate access code for different inspectors. Each inspector's access code shall be unique. The analyzer shall allow three attempts to enter a valid access code. Following each of the first two attempts, Error Message 1 shall be displayed. Error Message 2 shall be displayed for 5 minutes following the third attempt or until the inspector presses "enter/continue". The system shall then return to the main menu.

Error Messages:

1. **"YOUR ACCESS CODE IS NOT VALID--TRY AGAIN"**

2. **"THE ACCESS CODE ENTERED IS NOT VALID. VERIFY YOUR ACCESS CODE NUMBER WITH YOUR LOCAL DPS OFFICE."**

Associated System File **INSPECTR.DAT** **ACCESS_CODE**

- - - -

Following each of the first two attempts, Error Message 1 shall be displayed. Error Message 2 shall be displayed for 5 minutes following the third attempt or until the inspector presses “enter/continue”. The system shall then return to the main menu.

Error Messages:

1. **"YOUR PIN IS NOT VALID--TRY AGAIN"**

2. **"THE PIN ENTERED IS NOT VALID. CONTACT YOUR LOCAL DPS OFFICE TO RESET YOUR PIN."**

Associated System File: **INSPECTR.DAT** **PIN_NO**

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3.4.2 Date Expiration Prompt: **YOUR STATION/INSPECTOR CERTIFICATION EXPIRATION DATE IS MM DD YY**

Programming Criteria: The analyzer will then check the license expiration date and lockout flag for the Inspector in the inspector file. The station license renewal date and lockout flag will then be checked in the station file. If either the station or the inspector license expiration date is within 60 days of today, then the analyzer will display Message 1 indicating the expiration date. If the inspector or station dates have passed, Message 2 will be displayed. The analyzer shall countdown the final five days prior to the expiration date of the inspector or station certification. The analyzer shall display Message 3 in addition to Message 1 or 2 during the five-day countdown. If it is 30 days past the inspector or station expiration date, the system will set the station lockout flag in the station file or the inspector lockout flag in the inspector file to "Y" to indicate lockout has occurred.

If either the station or the inspector lockout flag is set, then the analyzer will display a message that indicates lockout has occurred and returns to the main menu.

Error Messages:

1. **YOUR (STATION/INSPECTOR) CERTIFICATION EXPIRES MM/DD/YY.**

2. **YOUR STATION /OR INSPECTOR**

CERTIFICATION EXPIRED (date). YOU ARE NOT AUTHORIZED TO PERFORM ANY EMISSIONS INSPECTION AT THIS TIME. PLEASE CONTACT YOUR LOCAL DPS OFFICE.

3. YOUR (STATION/INSPECTOR) CERTIFICATION WILL EXPIRE IN X (5, 4, 3, 2, 1) DAY(S).

Associated System File:	**STATION.DAT**	**STAT_EXP_DATE**
	INSPECTR.DAT	**INSP_EXP_DATE**
	LOCKOUT.DAT	
		INSP_LOCKOUT_FLAG
		STATE_LOCKOUT

- - - -

An inspection shall be stopped, and the analyzer shall return to the main menu, if the following response bits are set in the RESPONSE.DAT file:

56 - Inspector License expired

57 - Inspector license suspended/revoked

58 - Inspector not authorized to test at this station

60 - TAS is locked out for at least one of the reasons included within "Lockout Status Record" data file

If the most recent test record is available from either the Texas Information Management System Host or the system files, the analyzer shall confirm that the vehicle is eligible for a reinspection.

Upon completion of this contact, the analyzer shall display all Technical Service Bulletins, Recall Information, and Announcements transmitted by the Texas Information Management System. The analyzer shall automatically print a one copy of any announcement. The analyzer shall provide the option of printing additional copies prior to continuing with the test, deleting the announcement, or saving the announcement to a predetermined file. The analyzer shall be able to save three messages for later review. Any new announcement saved shall overwrite the oldest announcement in the system.

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inspector enters a "Y" indicating that the vehicle record selected is correct, the following prompt shall be displayed, **"IS THIS VEHICLE INFORMATION CORRECT? ENTER "Y" FOR YES OR "N" FOR NO."** If any of the displayed information is incorrect (e.g., model year, GVW, etc.), the software shall display a prompt instructing the inspector to correct the vehicle information and press "continue" when ready. The analyzer shall not allow the inspector to edit the VIN or license plate number. The analyzer must display a prompt directing the inspector to update odometer reading. Upon confirming the vehicle, the vehicle information is no longer eligible to stored in the RECALL.DAT file. The analyzer will then begin the Texas 96 emissions test as described in 3.1.23b and continue until the completion of the preconditioned 2-speed idle test and gas cap integrity test.

If the search of the system files does not provide a match, or the REINSPECT.DAT file does not contain a record of the vehicle, the inspector must be prompted to enter all information concerning the vehicle. Upon confirming the vehicle, the vehicle information is no longer eligible to be stored in the RECALL.DAT file.

If the analyzer can not obtain a previous test record from either contacting the Texas Information Management System or searching the files contained on the analyzer, the analyzer shall:

1. Prompt the inspector to enter the type of reinspection (i.e., Safety and Emissions, Safety Only, or Emissions Only),
2. Prompt the inspector to enter the applicable vehicle information,
3. Upon test completion, set the SAFE_INIT_TEST to 'I,' and if an emissions test is conducted, set the EMISS_INIT_TEST to 'R.'

After the inspector has selected the proper record, confirmed the correct vehicle, and updated the odometer reading, the system shall give the vehicle the same test it was issued initially. The system shall verify that the EMISS_TEST_TYPE field contains a value of '2' (2-speed idle test). The TEST_TYPE field can be used to determine the previous test type.

If the TEST_TYPE field contains an 'H' - 'Safety Only Inspection,' the system shall conduct a 'Safety Only Inspection' using the screen prompts from Section 3.2. The

analyzer will determine if the vehicle is eligible for a reinspection by using the value contained in the SAFE_INIT_TEST field of the target record. The target record is the test record of the most recent previous inspection of this type (i.e., Safety Only Inspection). If the target record was created from conducting an initial inspection, an 'I' will be stored in the SAFE_INIT_TEST field. If the target record was created from conducting a reinspection, an 'R' will be stored in the SAFE_INIT_TEST field.

If the vehicle has had an initial inspection at this station within the last 16 days (i.e., the SAFE_INIT_TEST is set to 'I' in the previous inspection, the station number of the previous inspection station matches the number of the station conducting the current inspection, and the date of this inspection is within the last 16 days of the inspection date contained in the previous test record), then, the vehicle is eligible for a reinspection.

If the vehicle is not eligible for a reinspection, the analyzer shall:

1) display a message indicating why the vehicle is not eligible for a 'reinspection' (i.e., a reinspection has already been conducted on this vehicle), and prompt the inspector to inform the customer that they will be charged for this inspection;

2) save the vehicle information, possibly in the Recall.Dat file for use in the initial inspection mode;

3) either transfer operation to the initial inspection mode for 'Safety Only Inspection', Section 3.2, or cease the reinspection operation, prompt the inspector that this inspection must be conducted in the initial inspection mode; and

4) input the necessary vehicle information from the test record of the previous inspection once the analyzer is in the initial inspection mode.

If the re-inspection is conducted on the same day (Day 1) or before the sixteenth day following the day of the initial inspection (Day 17), the analyzer shall:

1. Only allow the inspector to enter values in the fields that failed during the previous inspection;

2. Administer the gas cap integrity test if the gas_cap_pf_flag was set to 'F' (fail) during the previous inspection. (i.e., use the gas_cap_pf_flag field); and

3. Display the safety test fee prompt only if an ‘R’(repaired) is entered in an available field; and

4. Display the safety test fee prompt if the station number is different from the station number of the previous inspection, if applicable.

If the reinspection is conducted on the seventeenth day (Day 17), the analyzer shall:

1. Conduct a complete safety only inspection requiring new entries in all fields; and

2. Administer the gas cap integrity test if the gas_cap_pf_flag was set to ‘F’ (fail) during the previous inspection. (i.e., use the gas_cap_pf_flag field); and

3. Display the safety test fee prompt.

In each case, the inspection will be stored as a new record in the Vehicle.dat file.

If the TEST_TYPE field contains a ‘C’ (Test on Resale), ‘I’ (Voluntary Emissions Test), ‘O’ (Required Emissions Only Test (Decal), or ‘B’ (Remote Sensing Request), the analyzer shall conduct an “Emissions Only Inspection” test using the screen prompts in Section 3.3. The analyzer will determine if the vehicle is eligible for a reinspection by using the value contained in the SAFE_INIT_TEST field of the target record. The target record is the test record of the most recent previous inspection of this type (i.e., Safety Only Inspection). If the target record was created from conducting an initial inspection, an ‘I’ will be stored in the SAFE_INIT_TEST field. If the target record was created from conducting a reinspection, an ‘R’ will be stored in the SAFE_INIT_TEST field.

If the vehicle has had an initial inspection at this station within the last 16 days (i.e., the SAFE_INIT_TEST is set to ‘I’ in the previous inspection, the station number of the previous inspection station matches the number of the station conducting the current inspection, and the date of this inspection is within the last 16 days of the inspection date contained in the previous test record), then, the vehicle is eligible for a reinspection.

If the vehicle is not eligible for a reinspection, the analyzer shall:

1) display a message indicating why the vehicle is not eligible for a 'reinspection' (i.e., a reinspection has already been conducted on this vehicle), and prompt the inspector to inform the customer that they will be charged for this inspection;

2) save the vehicle information, possibly in the Recall.Dat file for use in the initial inspection mode;

3) either transfer operation to the initial inspection mode for 'Emissions Only Inspection', Section 3.3, or continue in the reinspection mode if the inspector is prompted to enter repair information about this vehicle; and

4) input the necessary vehicle information from the test record of the previous inspection once the analyzer is in the initial inspection mode.

If the reinspection is conducted on the same day (Day 1) or before the sixteenth day following the day of the initial inspection (Day 17), the analyzer shall:

1. Administer the appropriate emissions test (ASM, TSI, OBDII) if the emiss_pf_flag was set to 'F' (fail), 'T' (time out failure), or 'D' (dilution failure) during the previous inspection;

2. Administer the gas cap integrity test if the gas_cap_pf_flag was set to 'F' (fail) during the previous inspection. (i.e., use the emiss_pf_flag, and gas_cap_pf_flag fields);

3. Obtain the repair information requested in 3.4.6 immediately prior to conducting the appropriate emissions test (ASM, TSI, OBDII) if the EMISS_PF_FLAG is set to 'F' in the target record, if applicable; and

4. Display the emissions test fee prompt only if the station number is different from the station number of the previous inspection, if applicable.

If the re-inspection is conducted on the seventeenth day (Day 17), the analyzer shall:

1. Conduct the complete 'Emissions Only Inspection' test sequence;

2. Obtain the repair information requested in 3.4.6 immediately prior to

conducting the appropriate emissions test (ASM, TSI, OBDII) if the EMISS_PF_FLAG is set to 'F' in the target record, if applicable; and

3. Display the emission test fee prompt.

If the TEST_TYPE field contains an 'A,' the analyzer shall conduct an "Safety and Emissions Inspection" using the screen prompts in Section 3.1. The analyzer will determine if the vehicle is eligible for a reinspection by using the value contained in the SAFE_INIT_TEST field of the target record. The target record is the test record of the most recent previous inspection of this type (i.e., Safety Only Inspection). If the target record was created from conducting an initial inspection, an 'I' will be stored in the SAFE_INIT_TEST field. If the target record was created from conducting a reinspection, an 'R' will be stored in the SAFE_INIT_TEST field.

If the vehicle has had an initial inspection at this station within the last 16 days (i.e., the SAFE_INIT_TEST is set to 'I' in the previous inspection, the station number of the previous inspection station matches the number of the station conducting the current inspection, and the date of this inspection is within the last 16 days of the inspection date contained in the previous test record), then, the vehicle is eligible for a reinspection.

If the vehicle is not eligible for a reinspection, the analyzer shall:

1) display a message indicating why the vehicle is not eligible for a 'reinspection' (i.e., a reinspection has already been conducted on this vehicle), and prompt the inspector to inform the customer that they will be charged for this inspection;

2) save the vehicle information, possibly in the Recall.Dat file for use in the initial inspection mode;

3) either transfer operation to the initial inspection mode for 'Safety and Emissions Inspection', Section 3.1, or continue in the reinspection mode if the inspector is prompted to enter repair information about this vehicle; and

4) input the necessary vehicle information from the test record of the previous inspection once the analyzer is in the initial inspection mode.

If the reinspection is conducted on the same day (Day 1) or before the sixteenth day following the day of the initial inspection (Day 17), the analyzer shall:

1. Only allow the inspector to enter values in the fields that failed during the previous inspection, if applicable (i.e., the safety_pf_flag was set to ‘F’ (fail) during the previous inspection);

2. Display the safety test fee prompt only if an ‘R’ (repaired) is entered in an available field during the reinspection, if applicable;

3. Obtain the repair information requested in 3.4.6 immediately prior to conducting the appropriate emissions test (ASM, TSI, OBDII) if the EMISS_PF_FLAG is set to ‘F’ in the target record, if applicable; and

4. Administer the appropriate emissions test (ASM, TSI, OBDII) if the emiss_pf_flag was set to ‘F’ (fail), ‘T’ (time out failure), or ‘D’ (dilution failure) during the previous inspection;

5. Administer the gas cap integrity test if the gas_cap_pf_flag was set to ‘F’ (fail) during the previous inspection. (i.e., use the emiss_pf_flag, and gas_cap_pf_flag fields); and

6. Display the emission test fee prompt and the safety test fee prompt only if the station number is different from the station number of the previous inspection, if applicable.

If the reinspection is conducted on the seventeenth day (Day 17), the analyzer shall:

1. Conduct the complete “Safety and Emission Inspection” test sequence as described in Section 3.1;

2. Display the safety test fee prompt;

3. Obtain the repair information requested in 3.4.6 immediately prior to conducting the appropriate emissions test (ASM, TSI, OBDII) if the EMISS_PF_FLAG is set to ‘F’ in the target record, if applicable; and

4. Display the emissions test fee prompt.

In all the aforementioned cases, the system shall purge the record from the

Reinspect.Dat file if the vehicle passes and is issued a certificate.

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3.4.4 Safety Inspection Items:

Programming Criteria:

The Texas Department of Public Safety wants to enhance the entry of the safety items of inspection to collect reasons for failing or repaired items, and to prescribe the order of appearance of the safety items based on the type of inspection selected. Appendix R contains nine lists of safety items in their prescribed order.

The analyzer must display the appropriate list choices based on entries made by the inspector. The analyzer will require the inspector to enter the status of the safety item in the order it appears in the list. The acceptable entries are 'P,' for pass, 'F,' for fail, 'R' for repaired. 'N' for N/A is not an acceptable entry. A value of 'N' in the safety item field may occur in a test record that is received from the VID (i.e., for reprinting purposes). That is why the 'N' is contained in the test record. It is a carry over from the previous version of software where this was an allowable entry. If the inspector select 'F' or 'R' for any safety item in the list, a subset list of failure reasons shall be displayed and the inspector shall highlight and select the failure reason or the entry that allows the inspector to return to the previous screen entry of 'F' or 'R' to edit this selection. The default for this display shall be to the 'return to previous screen' selection. The analyzer shall automatically enter the appropriate alpha character based on the selections made by the inspector.

If the vehicle type = 'P,' and the safe_test_type = 'A - 1 year windshield', then the analyzer shall display safety item sequence #1.

If the vehicle type = 'P,' and the safe_test_type = 'G - FMCSR (truck)', then the analyzer shall display safety item sequence #8.

If the vehicle type = 'P,' and the safe_test_type = 'J - 1 year windshield', then the analyzer shall display safety item sequence #1.

If the vehicle type = 'P,' and the safe_test_type = 'B - 2 year windshield', then the analyzer shall display safety item sequence #1.

If the vehicle type = ‘B,’ and the safe_test_type = ‘A - 1 year windshield’, then the analyzer shall display safety item sequence #3.

If the vehicle type = ‘B,’ and the safe_test_type = ‘G - FMCSR (truck)’, then the analyzer shall display the titles of safety item sequence #7, and safety item sequence #8, allow the inspector to use the arrow keys to highlight and select the appropriate safety item sequence by pressing ‘continue/enter.’

If the vehicle type = ‘B,’ and the safe_test_type = ‘J - 1 year windshield’, then the analyzer shall display safety item sequence #3

If the vehicle type = ‘T,’ the safe_test_type = ‘A - 1 year windshield,’ and the 80_inches = ‘N’ (i.e., the truck is less than 80 inches wide), then the analyzer shall display safety item sequence #1.

If the vehicle type = ‘T,’ the safe_test_type = ‘A - 1 year windshield,’ and the 80_inches = ‘Y’ (i.e., the truck is at least 80 inches wide), then the analyzer shall display safety item sequence #4.

If the vehicle type = ‘T,’ and the safe_test_type = ‘G - FMSCR (Truck),’ (Note: the 80 inches wide entry is not used here to determine the appropriate safety item sequence), then the analyzer shall display the titles of safety item sequence #8, and safety item sequence #5, and allow the inspector to use the arrow keys to highlight and select this safety item sequence by pressing ‘continue/enter.’

If the vehicle type = ‘T,’ the safe_test_type = ‘J - 1 year windshield,’ and the 80_inches = ‘N’ (i.e., the truck is less than 80 inches wide), then the analyzer shall display safety item sequence #1.

If the vehicle type = ‘T,’ the safe_test_type = ‘J - 1 year windshield,’ and the 80_inches = ‘Y’ (i.e., the truck is at least 80 inches wide), then the analyzer shall display the titles of safety item sequence #4, and safety item sequence #5, and allow the inspector to use the arrow keys to highlight and select the appropriate safety item sequence by pressing ‘continue/enter.’

If the vehicle type = ‘T,’ the safe_test_type = ‘B - 2 year windshield,’ and the 80_inches = ‘N’ (i.e., the truck is less than 80 inches wide), then the analyzer shall display safety item sequence #1.

If the vehicle type = ‘T,’ the safe_test_type = ‘B - 2 year windshield,’ and the 80_inches = ‘Y’ (i.e., the truck is at least 80 inches wide), then the analyzer shall display safety item sequence #4.

If the vehicle type = ‘M,’ the safe_test_type = ‘A - 1 year windshield,’ and the 80_inches = ‘N’ (i.e., the truck is less than 80 inches wide), then the analyzer shall display safety item sequence #1.

If the vehicle type = ‘M,’ the safe_test_type = ‘A - 1 year windshield,’ and the 80_inches = ‘Y’ (i.e., the truck is at least 80 inches wide), then the analyzer shall display safety item sequence #4.

If the vehicle type = ‘M,’ and the safe_test_type = ‘G - FMSCR (Truck),’ (Note: the 80 inches wide entry is not used here to determine the appropriate safety item sequence), then the analyzer shall display safety item sequence #8.

If the vehicle type = ‘M,’ the safe_test_type = ‘J - 1 year windshield,’ and the 80_inches = ‘N’ (i.e., the truck is less than 80 inches wide), then the analyzer shall display safety item sequence #1.

If the vehicle type = ‘M,’ the safe_test_type = ‘J - 1 year windshield,’ and the 80_inches = ‘Y’ (i.e., the truck is at least 80 inches wide), then the analyzer shall display the safety item sequence #4.

If the vehicle type = ‘M,’ the safe_test_type = ‘B - 2 year windshield,’ and the 80_inches = ‘N’ (i.e., the truck is less than 80 inches wide), then the analyzer shall display safety item sequence #1.

If the vehicle type = ‘M,’ the safe_test_type = ‘B - 2 year windshield,’ and the 80_inches = ‘Y’ (i.e., the truck is at least 80 inches wide), then the analyzer shall display safety item sequence #4.

If the vehicle type = ‘C,’ and the safe_test_type = ‘C - Trailer/Motorcycle,’ then the analyzer shall display safety item sequence #2.

If the vehicle type = ‘L,’ and the safe_test_type = ‘C - Trailer/Motorcycle,’ then the analyzer shall display safety item sequence #6.

If the vehicle type = ‘L,’ and the safe_test_type = ‘K - FMSCR(Trailer),’ then the analyzer shall display safety item sequence #9.

The inspector shall be required to press “enter/continue” after each item. These fields are required and must contain a valid entry. The system does not have to display the screen heading during the test sequence. The system shall enter the date and the inspector’s drivers license number. The inspector should be able to access an item’s associated help screen by placing the cursor in the parentheses and pressing the ‘F1’ key. The help screens are in Appendix D for each type of Safety Inspection test. If any safety item is entered as failing (i.e, stored value of ‘A,’ ‘C,’ ‘E,’ ‘H,’ ‘J,’ ‘L,’ ‘O,’ ‘S,’ ‘U,’ ‘W,’ or ‘Y’), then set the SAFETY_PF_FLAG to 'F'. Otherwise, set the SAFETY_PF_FLAG to 'P' for pass (i.e, all safety items entered as passing or repaired.).

This prompt shall not appear if the reinspection is being conducted on the same day as the initial inspection (Day1) or before the sixteenth day following the day of the initial inspection (Day 17), and the SAFETY_PF_FLAG was set to ‘P’ (pass) during the initial inspection.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT**

SAFE_1	**SAFE_2**
SAFE_3	**SAFE_4**
SAFE_5	**SAFE_6A**
SAFE_6B	**SAFE_7**
SAFE_7A	**SAFE_7B**
SAFE_8	**SAFE_9**
SAFE_10A	**SAFE_10B**
SAFE_10C	**SAFE_10D**
SAFE_10E	**SAFE_10F**
SAFE_11	**SAFE_12**
SAFE_13	**SAFE_14**
SAFE_15	**SAFE_16**
SAFE_17	**SAFE_18**
SAFE_19	**SAFE_20**
SAFE_21	**SAFE_22A**
SAFE_22B	**SAFE_22C**
SAFE_22D	**SAFE_23**

SAFE_24	**SAFE_25**
SAFE_26	**SAFE_27**
SAFE_28	**SAFE_29**
SAFE_30	

SAFETY_PF_FLAG

DPS_SAFE_SEQ

- - - -

Programming Criteria:

This prompt shall only appear if one of the following scenarios occurs:

1. a. if the reinspection is being conducted on the same day as the initial inspection (Day1) or before the sixteenth day following the day of the initial inspection (Day 17), and

   b. an 'R' (repaired) has been entered in any field for the current inspection, or

2 a. if the reinspection is being conducted on or after the sixteenth day following the day of the initial inspection (Day 17)

If the EMISS_PF_FLAG was set to 'P' during the initial inspection, add the value entered to the SAFE_INSP_COST field to the OVERALL_COST field. If the vehicle passes the safety reinspection (i.e., SAFETY_PF_FLAG is set to 'P' - pass) for this inspection, then the inspector shall enter the overall cost for the inspection, inclusive of repair costs. If an inspector enters a fee greater than $150 dollars, the inspector shall be required to confirm the entry before proceeding to the next screen prompt. The analyzer shall display a warning message stating that "The fee seems unusually large. Please confirm the amount entered or reenter the fee."

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **SAFE_INSP_COST**

- - - -

b. the EMISS_PF_FLAG was set to ‘F,’ ‘T,’ or ‘D’ during the initial inspection, or

2 a. if the reinspection is being conducted on or after the sixteenth day following the day of the initial inspection (Day 17)

On an emissions reinspection, the system will prompt the inspector to provide repair information prior to conducting the retest. However, the inspector shall not be able to completely bypass the screen prompts requesting repair information.

Provided below is the complete list of specific repair items, organized according to engine/emissions system, each with a 1-digit (0-9) or 2-digit (10-99) numeric code assigned to it. The analyzer will provide the inspector with the ability to print out the Numeric Repair Chart for reference purposes (such as posting next to the monitor).

A. Fuel Supply

B. Evaporative (EVAP) Emissions Control System

C. Fuel Metering (Carbureted / Fuel Injected)

D. Idle Speed (Carbureted / Fuel Injected)

E. Air Supply

F. Ignition System

G. Electrical / Electronic

H. Emissions Systems

I. Engine Mechanical

J. Engine Exhaust

K. Engine Cooling

L. Vehicle Fluids

M. Transmission / Final Drive

N. Miscellaneous

The inspector will highlight and select the category(s) for any repairs done to the vehicle. Upon selection of a repair category, the system will display the associated sub-menu detailing the actual items. The following is a list of the repair categories and associated sub-menus:

REPAIR ANALYSIS

A. Fuel Supply

1. Pump
2. Tank
3. Lines / Hoses / Filters
4. Fuel Pressure Control
5. Fuel Distribution (if applicable)

B. Evaporative (EVAP) Emissions Control System

6. Canister
7. Vent Lines / Hoses / Purge Hoses
8. Fuel Cap
9. Purge Valves / Solenoids / etc.
10. Mechanical Control System (includes vacuum)
11. Electronic Control System

C. Fuel Metering (Carbureted / Fuel Injected)

12. Mechanical Control System (includes vacuum)
13. Electronic Control System
14. Injector(s)
15. Throttle Body
16. Carburetor - Internal
17. Carburetor - External
18. Idle Mixture Control
19. Cold Start System / Choke
20. Metering Device (if applicable)

21. Oxygen Sensor (O2S), Heated Oxygen Sensor (HO2S)
22. Engine Coolant Temperature (ECT) Sensor
23. Air Flow Sensor(s) (all)
24. Inlet Air Temperature (IAT) Sensor
25. Throttle Position Sensor (TPS)
26. Manifold Absolute Pressure (MAP) Sensor, Manifold Differential Pressure Sensor, Manifold Vacuum Zone Sensor, or Barometric Pressure (BARO) Sensor
27. Crankshaft Position (CP) Sensor
28. Camshaft Position (CMP) Sensor
29. Knock Sensor (KS)
30. Vehicle Speed Sensor (VSS)
31. Other Sensor(s)

D. Idle Speed (Carbureted / Fuel Injected)

32. Idle Speed Adjustment
33. Idle Air Control (IAC) / Idle Speed Control (ISC)

E. Air Supply

34. Air Filter
35. Hot/Cold Intake-Air System and Control / Thermostatic Air Cleaner (TAC)
36. Intake Manifold / Gaskets
37. Other Vacuum / False Air Leaks
38. Turbo / SuperCharger System

F. Ignition System

39. Ignition Control Module (ICM)
40. Primary / Reference (Circuit & Components)
41. Coil(s) / Secondary
42. Spark Plug Wires
43. Spark Plugs
44. Spark Timing

G. Electrical / Electronic

45. Powertrain Control Module (PCM)
    Engine Control Module (ECM)
    Program Read-Only Memory (PROM) Computer Chip
46. Clear Diagnostic Trouble Codes (DTC)
47. Actuators (other)

a) Wiring (all systems)
    48. Open Circuit
    49. High Resistance (power / ground)
    50. Shorted Circuit
    51. Battery
    52. Charging System

H. Emissions Systems

a) Catalytic Converter
    53. Empty / Melted / Damaged
    54. Low Efficiency
    55. Secondary Air Injection Reaction (AIR) tube

b) Exhaust Gas Recirculation (EGR)

56. Flow Passages
57. Mechanical Control System (includes vacuum)
58. Electronic Control System
59. Valve / Actuator Assembly(ies)

c) Secondary Air Injection System (AIS)

60. Belt(s)
61. Pump(s)
62. Bypass / Diverter / Switch Valve(s)
63. Mechanical Control System (includes vacuum)
64. Electronic Control System
65. Reed, Check, and Other Valves
66. Plumbing

d) Positive Crankcase Ventilation (PCV)

67. Valve
68. Other

I. Engine Mechanical

69. Internal Short-Block
70. Cylinder Head Structure / Head Gasket
71. Camshaft(s)
72. Cam Timing / Belt / Chain
73. Valves (Mechanical)
74. Valves (Oil Seals)
75. Other (including valve adjustment)
76. Other Seals / Gaskets

J. Engine Exhaust

77. Exhaust Manifold / Gaskets
78. Back pressure

K. Engine Cooling

79. Fan
80. Thermostat
81. Radiator, Coolers, and Caps
82. Mechanical Control System (includes vacuum)
83. Electronic Control System

L. Vehicle Fluids

84. Engine Coolant
85. Engine Crankcase Oil
86. Fuel

M. Transmission / Final Drive

87. Internal (hydraulic / mechanical)
88. Electronic Control System
89. External Control (vacuum, cables)
90. Final Drive Ratio
91. Tire Size

N. Miscellaneous

92-98. Reserved for future use
99. All other types of repairs

- - - -

! Complete repair data must be entered BEFORE an emissions retest can be performed on a vehicle.

! When reporting repair information, use one or more of the following items:

- your Inspection Station's own records;
- receipts from other repair facilities;
- parts receipts provided by the motorist; and/or
- questions asked of the motorist.

! If repairs were done in more than one category (i.e., Fuel System, and Ignition/Electrical System), select the category whose cost is the largest percentage of the total repair cost. The category that would have cost the most if the repairs were done separately. However, enter the total cost of the repairs (since the last inspection) in question #2.

! Depending on where emissions repairs were performed on the vehicle, please enter the appropriate information in one the following categories:

1. Recognized Emissions Repair Technician (completed repairs);
2. Other Repair Technician (Non-Recognized); or
3. Motorist (Self-Performed).

! If two or more non-recognized repair facilities performed repairs on the vehicle, just select the Other Repair Technician (Non-Recognized) category and enter the total of the repair costs in the question #2.

! If two or more Recognized Emissions Repair Technicians performed repairs on this vehicle, just enter the total of the repair costs in the question #2, and select the Recognized Emissions Repair Technician category.

! Please provide as much of the requested repair information as possible. Please note that an

abnormally high amount of incomplete repair information entries may result in an audit of your Inspection Station.

Press Enter or type "C" to Continue

- - - -

Question #3:

Please indicate who performed the emissions repairs on this vehicle:

1. Recognized Emissions Repair Technician
2. Other Repair Technician (Non-Recognized)
3. Motorist (Self-Repair)

Response Format:

Provide the list and allow the inspector to highlight a choice using the arrow keys or by pressing "1," "2," or "3," and select it by pressing continue. The system shall store the inspector's selection in the PERF_REPAIRS field of the test record. If the inspector selects "3,", skip question #4. Display entries of the three questions, and prompt the inspector to confirm the entries by pressing continue. The total repair cost entered in question 2 will be stored in the REP_OVERALL_COST field. The same value will be stored in the REP_CST_RRF field, the REP_CST_NRF field, or the REP_CST_MSP field, when the inspector selects "1," "2," or "3," respectively.

Question #4:

Choose the appropriate sentence:

1. Yes, repairs were done at this station. Repair costs will be added to the overall inspection costs and displayed on the VIR.
2. No, repairs were not done at this station. Repair costs will not be added to the overall inspection costs nor displayed on VIR.

Response Format:

Provide the list and allow the inspector to highlight a choice using the arrow keys or by pressing "1," or "2," and select it by pressing continue. If the inspector select "1," then the analyzer shall:

1. Store the value entered in question 2 in the REP_CST_YIS field and the REP_OVERALL_COST field,
2. Calculate the sum of the values stored in the REP_OVERALL_COST field, the EMISS_INSP_COST, and the SAFE_INSP_COST field, where applicable, to arrive at the total inspection cost and store the sum in the OVERALL_COST field,
3. Print the repair costs, the emissions costs, and the safety costs, where applicable, on the VIR.

If the inspector selects "2," then the analyzer shall:

1. Store the value entered in question 2 in the REP_OVERALL_COST field,
2. Calculate the sum of the values stored in the the EMISS_INSP_COST, and the

SAFE_INSP_COST field, where applicable, to arrive at the total inspection cost and store the sum in the OVERALL_COST field (store the repair costs, but do not use them to calculate the total inspection cost),

3. Print the repair cost on the VIR as ‘0.00’, and print the emissions costs, and the safety costs, where applicable, on the VIR. print the repair cost on the VIR as ‘0.00’, and do not add these costs when computing the total inspection cost.

After the inspector makes the selection, display the entries of the four questions, then, prompt the inspector to confirm the entries by pressing continue.

Go to OBD II test or Tailpipe test.

- - - -

REP_CST_CRF	**REP_CST_NRF**
REP_CST_MSP	**REP_ITM_YIS**
REP_ITM_CRF_AFR	**REP_ITM_CRF_ADL**
REP_ITM_CRF_REC	**REP_ITM_NRF**
REP_ITM_MSP	**CERF_ID_NUM**
CERT_ID_NUM	**VH_AF_BR**
VH_AF_AR	**VH_OB_SR**
REP_OVERALL_COST	

VEHICLE.DAT	**EMISS_INSP_COST**
	SAFE_INSP_COST
	OVERALL_COST

- -

3.4.6a <u>OBD II Hookup:</u>

The analyzer must be equipped with a standard SAE J1978 OBD connecter and communications link to allow an RPM signal, readiness codes, fault codes, and Malfunction Indicator Light (MIL) status to be downloaded from the on-board computer for applicable vehicles.

The equipment design and operation must meet all Federal requirements (contained in 40 CFR 85.2207-2231) and recommended SAE practices (J1962, J1978 and J1979) for OBDII system inspections.

The OBDII interrogation process shall be fully integrated into the TX96 analyzer system. It must be automated and require no inspector intervention to collect and record the OBD data retrieved via the OBD diagnostic link. An RPM signal, OBDII readiness codes, failure codes, and MIL status shall be automatically retrieved through a standard interface and vehicle connector. No hand-held unit or separate interface may be used.

If the OBDII Port has previously been connected for the RPM signal, proceed to the OBDII Readiness Evaluation Section. If not, proceed to the following prompt.

- - - -

DID THE MIL TURN ON? Note: MIL may stay on continuously or go out after only a few seconds. (CHOOSE THE CORRECT SENTENCE)

YES, the MIL did come on.

NO, the MIL did <u>NOT</u> come on at all.

The malfunction indicator light (mil) will either display "service engine soon," "check engine," the word "check" along with the international engine symbol, or some combination of these depending on the vehicle make.

<u>Programming Criteria:</u> The analyzer will ask the inspector to perform a key-on/engine-off check to see if the Malfunction Indicator Light/Check Engine Light (MIL) properly illuminates. The analyzer shall prompt the inspector to enter a No if the MIL does not properly illuminate. The analyzer software shall be designed so that the inspector can use the arrow keys to highlight his choice and press "continue" to select the appropriate sentence. The analyzer software shall not have a default entry for this screen. The inspector must be required press the arrow key at least once, followed by the "continue" key.

The help message for this screen shall contain the following text: "The Malfunction Indicator Light (MIL) is the official term for the warning light that is illuminated by the vehicle's OBD system when a malfunction occurs. Depending on the vehicle make, the MIL will either display "service Engine Soon," "Check Engine," the word "Check" along with the international engine symbol, or some combination of these . The MIL must come on when the ignition key is turned to the "key on, engine off" position. This is to allow inspectors to check that the MIL is capable of illuminating if a malfunction were to occur. On most vehicles, the MIL will stay illuminated as long as the key is in the position. However, on some vehicles, the MIL will illuminate very briefly when the key is turned to the "key on, engine off" position and then go out."

<u>Error Message:</u> **1. NO VALUES HAVE BEEN ENTERED--TRY AGAIN.**

<u>Associated System File:</u> **VEHICLE.DAT** **OBD2_MIL_CHECK**

- - - -

3.4.6d **<u>OBD II Engine Running Prompt:</u>**

START THE ENGINE AND ALLOW IT TO IDLE FOR AT LEAST 20 SECONDS. (I.E., PUT KEY IN "RUN" POSITION)

PRESS CONTINUE.

<u>Programming Criteria:</u>

The analyzer shall require the inspector to confirm that the vehicle is started and idling, by pressing the "enter/continue" key. The analyzer may attempt to establish communications while displaying this prompt and accepting the response from the inspector.

- -

3.4.6e **<u>OBD II Engine Running Prompt:</u>**

DID THE MIL TURN OFF? (CHOOSE THE CORRECT SENTENCE)

Yes, the MIL turned off.

No, the MIL stayed on.

<u>Programming Criteria:</u>

The analyzer will ask the inspector to see if the Malfunction Indicator Light/Check Engine Light (MIL) illuminates while the engine is running. The analyzer shall store a No, if the inspector indicates that the MIL does not illuminate while the engine is on. The analyzer software shall be designed so that the inspector can use the arrow keys to highlight his choice and press "continue" to select the appropriate sentence. The analyzer software shall not have a default entry for this screen. The inspector must be required press the arrow key at least once, followed by the "continue" key. The analyzer may attempt to establish communications while displaying this prompt and accepting the response from the inspector.

If the previously entered GVWR is greater than 8500 pounds (i.e., >8500 lbs.), the analyzer shall only collect the data from the vehicle OBD system and not use the data in the pass/fail determination.

Error Message: **1. NO VALUES HAVE BEEN ENTERED--TRY AGAIN.**

Associated System File: **VEHICLE.DAT** **OBD2_MIL_ON_RUN**

- - - -

Programming Criteria:

The analyzer shall display these choices and allow the inspector to use the arrow keys or number keys to highlight the appropriate choice and press enter to select. The default is to phrase 1.

If the inspector selects phrase number 1, the analyzer will attempt to gain a confirmed OBDII connection. The analyzer must allow the inspector unlimited attempts to gain a confirmed OBDII connection.

If the inspector selects phrase number 2, then the analyzer shall proceed to the OBDII No Connection Reason Prompt in Section 3.4.6h.

- -

3.4.6h OBD II No Connection Reason Prompt:

THE OBD II CONNECTION CANNOT BE CONFIRMED –CHOOSE THE NEXT ACTION

1. BACK TO PREVIOUS SCREEN

2. CONNECTOR CANNOT BE LOCATED

3. CONNECTOR IS MISSING, DAMAGED, OR TAMPERED.

4. CONNECTOR IS OBSTRUCTED OR INACCESSIBLE AND CONNECTION IS NOT POSSIBLE.

5. COMMUNICATION FAILED, AND OBD II PORT IS ATTACHED TO CONNECTOR.

Programming Criteria:

The analyzer shall display all five choices and allow the inspector to use the arrow keys

or number keys to highlight the appropriate choice and press enter to select. The default is to phrase 1.

If the inspector selects phrase number 1, the analyzer will return to the OBDII Connection Not Confirmed Prompt in Section 3.4.6g.

If the inspector selects phrase number 2, then the analyzer shall:

1. store a 'L' in the OBD2_DLC_RES field indicating the connector cannot be located, and,
2. proceed directly to the OBD Test Evaluation and Messages Prompt in Section 3.4.6l.

If the inspector selects phrase number 3, then the analyzer shall:

1. store a 'D' in the OBD2_DLC_RES field indicating the connector is missing, damaged, or tampered, and,
2. proceed directly to the OBD Test Evaluation and Messages Prompt in Section 3.4.6l.

If the inspector selects phrase number 4, then the analyzer shall:

1. store a 'I' in the OBD2_DLC_RES field indicating an inaccessible connector, and,
2. proceed directly to the OBD Test Evaluation and Messages Prompt in Section 3.4.6l.

If the inspector selects phrase number 5, then the analyzer shall:

1. store a 'N' in the OBD2_DLC_RES field indicating failed to establish communication with vehicle, and,
2. proceed directly to the OBD Test Evaluation and Messages Prompt in Section 3.4.6l.

If the test date is less than the date contained in the OBD2_FAIL_ST_DT field in the SYSTEM.DAT file, the analyzer shall:

1. Place a 'L,' 'D,' 'I,' or 'N,' in the OBD2_DLC_RES field in VEHICLE.DAT,
2. Place a blank in the OBD2_PF_FLAG field in VEHICLE.DAT,
3. Print 'FAIL' in the OBD section of the VIR,

4. A second page will be printed for the VIR indicating that the OBD failure is **"Advisory Only"**, and that the vehicle's on-board diagnostic system could not be checked due to: unsuccessful communications if the OBD2_DLC_RES is set to 'N,' or a missing, damaged, or tampered connector if the OBD2_DLC_RES is set to 'D', or an unlocated connector if the OBD2_DLC_RES is set to 'L', or an inaccessible connector if the OBD2_DLC_RES is set to 'I,'and,
5. Proceed directly to the OBD Test Evaluation and Messages Prompt in Section 3.4.6l.

The failure of the OBD portion of the test WILL NOT result in an overall test failure.

If the test date is equal to or greater than the date in the OBD2_FAIL_ST_DT field in the SYSTEM.DAT file, the analyzer will:

1. Place a 'L,' 'D,' 'I,' or 'N' to the OBD2_DLC_RES field in VEHICLE.DAT,
2. Place an 'F' in the OBD2_PF_FLAG field (and later to the OVERALL_RESULTS field) in VEHICLE.DAT,
3. Print 'FAIL' in the OBD portion and the OVERALL TEST RESULT section of the VIR,
4. A second page will be printed for the VIR indicating that the vehicle's on-board diagnostic system could not be checked due to: unsuccessful communications if the OBD2_DLC_RES is set to 'N,' or a missing, damaged, or tampered connector if the OBD2_DLC_RES is set to 'D', or an unlocated connector if the OBD2_DLC_RES is set to 'L', or an inaccessible connector if the OBD2_DLC_RES is set to 'I,'and,
5. Proceed to the OBD Test Evaluation and Messages Prompt in Section 3.4.6l, and no tailpipe emissions inspection will be conducted.

The failure of the OBD portion of the test WILL result in an overall test failure.

Associated System File:	**VEHICLE.DAT**	**OBD2_DLC_RES**
		OBD2_PF_FLAG
		OVERALL_RESULTS

- -

3.4.6i OBD II Malfunction Indicator Light (MIL) Status Check:

Programming Criteria:

The analyzer will evaluate the MIL status based on the data returned via the OBD link from the vehicle's on-board diagnostic system. The Yes/No (Y/N) status of whether the MIL has been commanded to be illuminated will be recorded in the OBD2_MIL_STATUS field of the test record.

If the MIL status returned is NOT COMMANDED ON with the engine running (i.e., RPM is greater than zero), the analyzer shall:

1. store a "P" in the OBD2_MIL_STATUS field, and
2. proceed to the OBD Readiness Evaluation section.

If the MIL status returned is COMMANDED ON with the engine running (i.e., RPM is greater than zero), the analyzer shall:

1. store an "F" in the OBD2_MIL_STATUS field, and
2. proceed to the OBD Readiness Evaluation section.

- - - -

system, the number of emission-related trouble codes stored in memory, and the Malfunction Indicator Light (MIL) status.

ii. Based on the returned data, the analyzer shall determine which on-board monitors are supported by the OBD system and the readiness code status of the applicable monitors.

iii. Possible monitors include the following:

(1) Misfire (continuous)

(2) Fuel system (continuous)

(3) Comprehensive component (continuous)

(4) Catalyst (once/trip)

(5) Heated catalyst (once/trip)

(6) Evaporative system (once/trip)

(7) Secondary air system (once/trip)

(8) Air conditioning system (once/trip)

(9) Oxygen sensor (once/trip)

(10) Oxygen sensor heater (once/trip)

(11) EGR system (once/trip)

iv. Continuous monitors are those in which the applicable system/condition is checked continuously during vehicle operation; once/trip monitors are only checked when the vehicle is driven in a certain manner (i.e., over a predefined driving cycle expected to occur in customer service). According to Federal regulation (40 CFR 86.099-17), a vehicle manufacturer is not required to store a readiness code for the continuous operating monitors; however, some may choose to do so.

v. Possible readiness code responses include: completed/ready, not completed/not ready, and 'not supported/not enabled.' A response that a monitor is not supported or enabled means that, for this particular vehicle, that monitor is not applicable. Hence, when a 'not supported/not enabled' response is given, the analyzer will not fail the vehicle for that code.

vi. All readiness code values will be written to the appropriate test record fields in the VEHICLE.DAT file for each inspection using the following format:

i. Not supported/enabled = 0,

ii. Completed = 1, and

iii. Not completed = 2.

vii. If the value specified in the SYSTEM table for a particular readiness monitor is "Y", that code shall be used for the overall readiness determination. If the value specified for a readiness monitor in the SYSTEM table is "N", that code shall be ignored by the analyzer and not used for the overall readiness determination. Each readiness monitor

field that contains a value of “Y” is an applicable readiness monitor.

For information on how to set the OBD2_READY_RES field, refer to part (a) of the OBD II Test Evaluation and Messages Prompt below.

- -

3.4.6k <u>OBD II Diagnostic Trouble Code (DTC) Check:</u>

<u>Programming Criteria:</u>

i. The analyzer shall send a request (i.e., Mode $03) to the on-board computer to determine the stored emissions-related powertrain trouble codes. The analyzer will repeat this cycle until the number of codes reported equals the number expected based on the previous Mode $01 response. Any codes listed in the DTC table shall be recorded on the test record and the text fault code description shall be printed on the second page of the VIR.

ii. If there are no DTCs:

   i. A ‘P’ will be written to both the OBD2_FAULT_CD_RES and OBD2_PF_FLAG fields in VEHICLE.DAT,

   ii. Two zeros (‘00’) will be stored in the DTC_STORED field of the VEHICLE. DAT file,

   iii. A PASS will be printed in the OBD section of the VIR, and

   iv. The analyzer will proceed to the OBD Test Evaluation and Messages Prompt in Section 3.4.6l, no tailpipe emissions inspection will be conducted.

iii. If one or more DTC is found, which cause the MIL to be commanded to be illuminated;

   i. The analyzer will check the OBD2_FAIL_DT field in the SYSTEM table;

   ii. If the test date is less than the date in the OBD2_FAIL_DT field and the MIL has been commanded to be illuminated:

      i. An ‘F’ will be written to both the OBD2_FAULT_CD_RES and OBD2_PF_FLAG fields in VEHICLE.DAT.

      ii. The first ten DTC(s), which cause the MIL to be illuminated, that was found will be written to the FAULT_CODES(DTCS) field in the VEHICLE.DAT table.

iv. The analyzer shall store the total number of stored DTCs (not pending DTCs) causing the MIL to illuminate in the DTC_STORED field of the VEHICLE.DAT file. The analyzer shall also proceed to the OBD Evaluation Prompt.

- -

3.4.6l **OBD II Test Evaluation and Messages:**

Programming Criteria:

The result of the OBD section of the test will be determined as follows:

- OBD2_MIL_CHECK is a manual entry
- OBD2_MIL_ON_RUN is a manual entry
- OBD2_DLC_RES is an automatic entry unless there is no communication between the vehicle and the analyzer
- OBD2_MIL_STATUS is an automatic entry
- OBD2_READY_RES is a field populated automatically.
- OBD2_FAULT_CD_RES depends if there are any stored DTCs causing the MIL to illuminate.

Note: If the previously entered GVWR is greater than 8500 pounds (i.e., >8500 lbs.), the analyzer shall only collect the data from the vehicle OBD system and not use the data in the pass/fail determination. The following fields of the VEHICLE.DAT must contain a "P" in order to pass the OBD test sequence: OBD2_MIL_CHECK, OBD2_MIL_ON_RUN.

(a) The OBD2_READY_RES field is determined by the following criteria: The Pass outcome requires that not more than a certain number of monitors return a value of not ready (example: value = 2 for 1996 to 2000 model year vehicles, and 1 for 2001 and newer model year vehicles). This number is found in the field called MAX_NUM_NOT_READY in the SYSTEM.DAT file and is the number of non-continuous monitors allowed not ready and still PASS the OBD test. This number changes as the vehicle model year changes. The applicable model years are contained in the MAX_NT_RDY_BGN_YR and MAX_NT_RDY_END_YR fields of the SYSTEM.DAT file. If the vehicle is deemed "not ready," the analyzer shall abort the inspection if the date of inspection is greater than the date contained in the OBDII_FAIL_ST_DT field of the SYSTEM.DAT. If the vehicle is deemed "not ready," the analyzer shall will default to a TSI inspection if the date of

inspection is less than the date contained in the OBDII_FAIL_ST_DT field of the SYSTEM.DAT file. If any continuous monitors indicate "not ready", the vehicle shall NOT PASS the OBD test.

- If a continuous monitor returns a not-ready status the OBD2_READY_RES shall remain an "F", or

- If there are fewer than the maximum non-continuous monitors not ready (less than or equal to MAX_NUM_NOT_READY), then a "P" shall be stored in the OBD2_READY_RES field of the VEHICLE.DAT record, or

- If too many non-continuous monitors are not ready (greater than MAX_NUM_ NOT_READY) then the OBD2_READY_RES RESULT shall remain "F."

(b) The following fields of the VEHICLE.DAT must contain a "P" in order to pass the OBD test sequence: OBD2_MIL_CHECK, OBD2_MIL_ON_RUN, OBD2_DLC_RES, OBD2_MIL_STATUS, and OBD2_READY_RES.

1. If all the above fields contain a "P" then the program will store a "P" in the OBD2_PF_FLAG field of the VEHICLE.DAT file and print a PASS in the OBD Test Result section on the VIR,

2. If any of the above fields contain a character other than a "P" then

(i) If the OBD2_DLC_RES field has a "D," "I," or an "N" stored in it then the analyzer shall write a "F" to OBD2_PF_FLAG of the VEHICLE.DAT and a "FAULT" should be written on the ADVISORY VIR:

(ii) If theOBD2_DLC_RES field does not have a "L" then the analyzer shall write a "F" to the OBD2_READY_RES field of the VEHICLE.DAT file and an "N/A" shall be printed on the ADVISORY OBD VIR.

(c) If the MY of the vehicle under test is equal to or greater than the value contained in the OBDII_MODEL_YR field of the SYSTEM.DAT file and the test date is prior to the PASS/FAIL (P/F) start date of OBD testing as defined in the SYSTEM.DAT file, OBD failures will not cause the vehicle to have an OVERALL TEST FAILURE.. Motorist information messages shall be printed on an Advisory OBD VIR to be given to the motorist informing them of problems with their vehicle's OBD system. The analyzer shall proceed to perform a TSI emission test on failed OBD or aborted OBD tests during the advisory period.

NOTE: The Texas OBD advisory period starts when the OBD software is loaded on an analyzer and ends when the OBD mandatory P/F date flag is set in the SYSTEM.DAT file. Currently the start date of P/F OBD is May 1, 2002.

NOTE: The failing or aborted OBD ADVISORY VIR shall be printed prior to the tailpipe VIR.

1. If the value in the following fields is other than blank or "P" then the following message(s) shall be printed on the Advisory OBD VIR to inform the motorist of possible problems with their vehicle.

(i) If there is an "F" in the MIL KOEO or MIL KOER field the following shall be printed:

Based on the information received during the test, there may be a problem with your On-Board Diagnostic Computer Malfunction Indicator Light. Repairing any problems that exist will likely improve performance, fuel economy, and reduce pollution. This vehicle must have the On-Board Computer functioning properly to pass the vehicle inspection to register this vehicle next year. (Text subject to change)

OBD PRINT MESSAGE (2)

(ii) If there is a "D" or an "N" in the OBD2_DLC_RES field the following message shall be printed on the Advisory OBD VIR indicating that the vehicle's on-board diagnostic system could not be checked due to a missing, inaccessible, damaged, or tampered connector.

Based on the information gathered during an attempt to perform an On- Board Diagnostic test your vehicle has a missing, tampered, or broken Diagnostic Connector. This vehicle must have the On-Board Computer functioning properly to pass the vehicle inspection to register this vehicle next year. (Text subject to change)

OBD PRINT MESSAGE (3)

(iii) If there is an "I" in the OBD2_DLC_RES field the following message shall be printed on the ADVISORY OBD VIR indicating that the vehicle's on-board diagnostic system could not be checked due to inaccessible connector,

Based on the information gathered during an attempt to perform an On-Board Diagnostic test your vehicle has an inaccessible Diagnostic Connector. This vehicle must have the Diagnostic Connector accessible to allow the check of the On Board Diagnostic computer system on the vehicle next year. (Text subject to change)

OBD PRINT MESSAGE (4)

(iv) If there is an "F" in the OBD2_READY_RES field of the VEHICLE.DAT the vehicle will be failed and the following message shall be printed on the Advisory OBD VIR:

Based on the information obtained from the On-Board Computer in the vehicle, the system is not ready to make a determination regrading the pollution control system on the vehicle. This situation must be corrected before the OBD system can be evaluated and the reinspection made next year. See your owner's manual for information on "OBD/Readiness driving procedures" or contact your vehicle service advisor. (Text subject to change)

OBD PRINT MESSAGE (5)

(v). If the OBD2_MIL_STATUS field has an "F" stored in it the following message shall be printed.

Based on the results of the On-Board Diagnostic test, your vehicle indicates there is a failure that is causing higher than allowed pollution levels to be emitted into the atmosphere. The problem(s) causing the failure, when fixed, will increase performance, fuel economy, and reduce pollution. Repair of the failure(s) will be required to pass the OBD test next year. (Text subject to change)

OBD PRINT MESSAGE (6)

(d) If the model year of the vehicle being tested is equal to or greater than the value contained in the OBDII_MODEL_YR field of the SYSTEM.DAT file and the test date is after the mandatory P/F start date as defined in the SYSTEM.DAT file, OBD test results will be used to evaluate the Overall PASS/FAIL result of the vehicle being tested. The vehicle will receive a PASS of the OBD system if the OBD2_PF_FLAG field contains a "P", or

1. If the OBD2_PF_FLAG is not "P" and

(i) if the result in the OBD2_DLC_RES is an "L" (abort code 80) the following message shall be printed on the P/F VIR:

Based on the information gathered during an attempt to perform an On Board Diagnostic test your vehicle has a missing Diagnostic Connector, or a Diagnostic Connector that cannot be located by the inspector. This vehicle must have the On-Board Computer Diagnostic connector available to the inspector and functioning properly to pass the vehicle inspection. If you have questions regarding this test, ask the inspector who performed this test. (Text subject to change)

OBD PRINT MESSAGE (10)

(ii) if the result in the OBD2_DLC_RES is an "D," "I," or an "N" the following message shall be printed on the P/F VIR:

Based on the information gathered during an attempt to perform an On Board Diagnostic test your vehicle has a damaged or inaccessible Diagnostic Connector. This vehicle must have the On-Board Computer Diagnostic connector available to the inspector and functioning properly to pass the vehicle inspection. If you have questions regarding this test, ask the inspector who performed this test. (Text subject to change)

OBD PRINT MESSAGE (11)

(iii) the result n the OBD2_READY_RES field is an "F" the following message shall be printed on the VIR: a "FAIL" shall be printed in the OBD2_PF_FLAG section of the P/F VIR. A failed OBD vehicle shall receive a FUEL CAP TEST.

Based on information obtained from the On-Board Computer in the vehicle, the system is not ready to make a determination regarding the pollution control system on the vehicle. This situation must be corrected before the OBD system can be evaluated and the reinspection made which will allow this vehicle to be registered. See your owner's manual for information on "OBD/Readiness driving procedures" or contact your vehicle service advisor. (Text subject to change)

OBD PRINT MESSAGE (12)

2. If the value in the following fields is other than blank or "P" then the following message shall be printed on the P/F VIR to inform the motorist of possible problems with their vehicle.

(i) If there is an "F" in the OBD2_MIL_CHECK or the OBD2_MIL_ON_RUN field the following shall be printed on the P/F VIR:

Based on the information received during the test, there may be a problem with your On-Board Diagnostic Computer Malfunction Indicator Light. This vehicle must have the On-Board Computer system functioning properly to pass the vehicle inspection. (Text subject to change)

OBD PRINT MESSAGE (13)

(iv) If the OBD2_MIL_STATUS field has an "F" stored in it the following message shall be printed on the P/F VIR:

Based on information obtained from the On-Board Computer in the vehicle, the system has made a determination that there is a problem regarding the pollution control system on the vehicle. This situation must be corrected before the OBD system can be reinspected. See your owner's manual for information on "OBD/Readiness driving procedures" or contact your vehicle service advisor. (Text subject to change)

- -

3.4.6m **<u>OBD II Engine Stop Prompt:</u>**

SHUT OFF THE ENGINE

<u>Programming Criteria:</u> The analyzer will prompt the inspector to turn off the engine, and proceed to the Gas Cap Missing Prompt in Section 3.4.8.

- -

3.4.7 <u>Reinspection Test Completion</u>

<u>Programming Criteria:</u> The appropriate emissions test (ASM, TSI) shall not be conducted if the reinspection is being conducted on the same day (Day 1) as the initial inspection or before the sixteenth day following the day of the initial inspection (Day 17), and the EMISS_PF_FLAG was set to ‘P’ (pass) during the initial inspection.

The appropriate emissions test (ASM,TSI) shall be conducted only if one of the following scenarios occurs:

1. a. if the reinspection is being conducted on the same day as the initial inspection (Day1) or before the sixteenth day following the day of the initial inspection (Day 17), and

   b. the EMISS_PF_FLAG was set to ‘F’ (fail), ‘T’ (time out failure), or ‘D’ (dilution failure) during the initial inspection, or

2 a. if the reinspection is being conducted on or after the sixteenth day following the day of the initial inspection (Day 17)

Upon completion of the appropriate emissions test, the TX96 Analyzer must:

1. Set the EMISS_TEST_TYPE to ‘2’ for 2-speed idle test, or ‘3’ for the ASM test.

If there is no previous inspection for this vehicle, or the EMISS_PF_FLAG for this vehicle's previous inspection is 'P,'set the EMISS_INIT_TEST to 'I' for initial test. If the EMISS_PF_FLAG for this vehicle's previous inspection is 'F,' set the EMISS_INIT_TEST to 'R'. If there is no previous inspection for this vehicle, the previous inspection was a reinspection, or the previous inspection was more than 16 days prior to this inspection, set the SAFE_INIT_TEST to 'I.' If the previous inspection was less than or equal to 16 days prior to this inspection, set the SAFE_INIT_TEST to 'R.' Set the flag in the system indicating that the free reinspection has been completed, if applicable (i.e., the station number matches the station number of the previous reinspection).

2. Set the HC_PF_FLAG, CO_PF_FLAG, and EMISS_PF_FLAG to one of the following codes:

   (a) P - Pass; or

   (b) F - fail;

3. Display the test results just prior to printing the rejection receipt or VIR, and write the vehicle test record to VEHICLE.DAT, if the EMISS_PF_FLAG is a 'P.'

4. Display the test results just prior to printing the rejection receipt or VIR, and write the vehicle test record to VEHICLE.DAT and REINSPECT.DAT if the EMISS_PF_FLAG is a 'F.'

5. Set the RPM_BYPASS to 'B', if the inspector opted to 'bypass' the RPM.

6. If the excessive dilution causes the test sequence to end, set the DILUTION_PF_FLAG to 'F'. Otherwise, set the DILUTION_PF_FLAG to 'P'.

7. If the emissions test ends due to a "time out" condition, set the TIMEOUT_FLAG to 'Y.' Otherwise, set the TIMEOUT_FLAG to 'N.'

8. The system will automatically enter the following fields: VERSION, TEST_DATE, TEST_START_TIME, TEST_END_TIME, STATION_NUM, ANALYZER_NUMBER, INSPECTOR_NUM, COUNTY_CODE, DILUTION (Dilution Amount in percent, $CO + CO_2$).

- - - -

3.4.8 Gas Cap Missing Prompt:

IS THE GAS CAP MISSING? ('Y' OR 'N')

Programming Criteria: The system shall only accept a 'Y' or 'N' entry. If inspector indicates the gas cap is missing, the system shall set the GAS_CAP_MISS to 'Y', set the GAS_CAP_PF_FLAG_1 to 'F' - fail, (i.e., the vehicle shall fail the gas cap integrity test), and continue with the end of phase logic in Section 3.4.11b. If the inspector selects 'N', continue with the next screen prompt.

Error Message: **ONLY 'Y' OR 'N' WILL BE ACCEPTED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **GAS_CAP_MISS**
GAS_CAP_PF_FLAG_1

- -

3.4.9 Gas Cap Testable Prompt:

IS THE GAS CAP TESTABLE? ('Y' OR 'N')

Programming Criteria: The system shall only accept a 'Y' or 'N' entry. If the inspector indicates the gas cap not testable ('untestable'), (i.e., selects 'N'), the system shall set the GAS_CAP_PF_FLAG_1 to 'P' - pass, set the GAS_CAP_TESTABLE to 'N', and continue with the end of phase logic in Section 3.4.11b. If the inspector selects 'Y', continue with the next screen prompt.

Error Message: **ONLY 'Y' OR 'N' WILL BE ACCEPTED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **GAS_CAP_TESTABLE**
GAS_CAP_PF_FLAG_1

- -

3.4.10 Gas Cap Connect Prompt:

REMOVE THE GAS CAP FROM THE VEHICLE AND CONNECT IT TO THE GAS CAP TESTER. REFER TO THE OPERATOR'S MANUAL, IF REQUIRED.

Programming Criteria: If the gas cap tester is an integral part of the analyzer or fully automatic, the system will prompt the inspector to press "continue/enter" to conduct the test.

Error Message: **ONLY 'CONTINUE/ENTER' WILL BE ACCEPTED--TRY AGAIN**

- - - -

'Y' or 'N.' The error message shall be displayed, if the inspector enters something other than 'Y' or 'N.' If the inspector indicates that there is a second gas cap to be tested, the analyzer shall proceed to the Second Gas Cap Missing Prompt, in Section 3.4.11c.

Error Message: **ONLY 'Y' OR 'Y' WILL BE ACCEPTED--TRY AGAIN**.

- -

3.4.11b End of Phase Logic:

Programming Criteria:

Since the second gas cap will not be tested, the analyzer shall set the flags as follows. If the GAS_CAP_PF_FLAG_1 is set to "P" - pass, then set the GAS_CAP_PF_FLAG to "P." If the GAS_CAP_PF_FLAG_1 is set to "F" - fail, then set the GAS_CAP_PF_FLAG to "F." If the EMISS_PF_FLAG, the SAFETY_PF_FLAG, and the GAS_CAP_PF_FLAG are all set to "P" - pass, then set the OVERALL_RESULTS field to "P" for pass. If the EMISS_PF_FLAG, the SAFETY_PF_FLAG, and the GAS_CAP_PF_FLAG are not all set to "P" - pass, then set the OVERALL_RESULTS to "F" for fail. Then, the system shall then proceed to the Emissions Test Fee Prompt, Section 3.4.12.

Associated System File: **VEHICLE.DAT**

EMISS_PF_FLAG
SAFETY_PF_FLAG
GAS_CAP_PF_FLAG
GAS_CAP_PF_FLAG_1
OVERALL_RESULTS

3.4.11c Second Gas Cap Missing Prompt:

IS THE SECOND GAS CAP MISSING? ('Y' OR 'N')

Programming Criteria: The system shall only accept a 'Y' or 'N' entry. If inspector indicates the gas cap is missing, the system shall set the 2ND_GAS_CAP_MISS to 'Y', set the GAS_CAP_PF_FLAG_2

to 'F' - fail, (i.e., the vehicle shall fail the gas cap integrity test), and continue with the end of phase logic in Section 3.4.11g. If the inspector selects 'N', continue with the next screen prompt.

Error Message: **ONLY 'Y' OR 'N' WILL BE ACCEPTED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **2ND_GAS_CAP_MISS**
GAS_CAP_PF_FLAG_2

- -

3.4.11d **Second Gas Cap Testable Prompt:**

IS THE SECOND GAS CAP TESTABLE? ('Y' OR 'N')

Programming Criteria: The system shall only accept a 'Y' or 'N' entry. If the inspector indicates the gas cap not testable ('untestable'), (i.e., selects 'N'), the system shall set the GAS_CAP_PF_FLAG_2 to 'P' - pass, set the 2ND_GAS_CAP_TEST to 'N', and continue with the end of phase logic in Section 3.4.11g. If the inspector selects 'Y', continue with the next screen prompt.

Error Message: **ONLY 'Y' OR 'N' WILL BE ACCEPTED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **2ND_GAS_CAP_TEST**
GAS_CAP_PF_FLAG_2

- -

3.4.11e **Second Gas Cap Connect Prompt:**

REMOVE THE SECOND GAS CAP FROM THE VEHICLE AND CONNECT IT TO THE GAS CAP TESTER. REFER TO THE OPERATOR'S MANUAL, IF REQUIRED.

Programming Criteria: If the gas cap tester is an integral part of the analyzer or fully automatic, the system will prompt the inspector to press "continue/enter" to conduct the test.

Error Message: **ONLY 'CONTINUE/ENTER' WILL BE ACCEPTED--TRY AGAIN**

- -

3.4.11f Second Gas Cap Results Prompt:

ENTER THE RESULTS OF THE SECOND GAS CAP INTEGRITY TEST. ('P' OR 'F')

Programming Criteria: If the gas cap tester is an integral part of the analyzer or fully automatic, the system shall not display this prompt, and shall enter the results of the test in GAS_CAP_PF_FLAG_2. The result shall either be 'P' for pass, or 'F' for fail.

Error Message: **ONLY 'P' OR 'F' WILL BE ACCEPTED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **GAS_CAP_PF_FLAG**
GAS_CAP_PF_FLAG_1
GAS_CAP_PF_FLAG_2

- -

3.4.11g End of Phase Logic:

Programming Criteria: If the GAS_CAP_PF_FLAG_2 and the GAS_CAP_PF_FLAG_1 are set to "P" - pass, then set the GAS_CAP_PF_FLAG to "P." If either the GAS_CAP_PF_FLAG_2 or the GAS_CAP_PF_FLAG_1 is set to "F" - fail, then set the GAS_CAP_PF_FLAG to "F." If the EMISS_PF_FLAG, the SAFETY_PF_FLAG, and the GAS_CAP_PF_FLAG are all set to "P" - pass, then set the OVERALL_RESULTS field to "P" for pass. If the EMISS_PF_FLAG, the SAFETY_PF_FLAG, and the GAS_CAP_PF_FLAG are not all set to "P" - pass, then set the OVERALL_RESULTS to "F" for fail. Then, the system shall then proceed to the Emissions Test Fee Prompt, Section 3.4.12.

Associated System File: **VEHICLE.DAT**

GAS_CAP_PF_FLAG	**SAFETY_PF_FLAG**
GAS_CAP_PF_FLAG_1	**EMISS_PF_FLAG**
GAS_CAP_PF_FLAG_2	**OVERALL_RESULTS**

- -

3.4.12 Emissions Test Fee Prompt:

ENTER THE COST FOR THE EMISSIONS INSPECTION, INCLUDING CENTS.

Programming Criteria: This prompt shall appear if the reinspection is being conducted on the sixteenth day (Day 17) after the initial inspection. This prompt shall appear if the reinspection is being conducted before the sixteenth day (Day 17) after the initial inspection, and the EMISS_PF_FLAG was set to 'F' (fail) during the initial inspection. The inspector shall enter the cost for the emissions inspection, exclusive of repair costs. The system shall sum the EMISS_INSP_COST, the SAFE_INSP_COST, if applicable, and the applicable repair costs, (i.e., REP_CST_YIS) to obtain the OVERALL_COST. The analyzer shall not accept a value greater than $99.99 for this entry.

Error Messages: **NO VALUE HAS BEEN ENTERED--TRY AGAIN.**

MAXIMUM ENTRY $99.99 -- TRY AGAIN.

Associated System File: **VEHICLE.DAT** **EMISS_INSP_COST**
OVERALL_COST

- -

3.4.13 Certificate Number Prompt: **ENTER THE INSPECTION CERTIFICATE NUMBER**.

Programming Criteria: If the reinspection conducts an "Emissions Only Inspection"

retest (i.e., the TEST TYPE field is set to ‘C,’ ‘I,’ or ‘B’), the system will not give this prompt and continue with the Print Vehicle Inspection Report Prompt, number 3.4.18.

If the reinspection conducts a “Required Emissions Only Test (Decal)” retest (i.e., the TEST TYPE field is set to ‘O’), the system will prompt the inspector to ‘ENTER THE INSPECTION DECAL NUMBER’, and continue with the Print Vehicle Inspection Report Prompt, number 3.4.18. Set the SAFE_TEST_TYPE to ‘H,’ if the inspection is a required emission only test. Otherwise, leave the SAFE_TEST_TYPE blank. If the OVERALL_RESULTS flag is “F”, then the system will not give the inspector this prompt and proceed to the Main Menu. If the OVERALL_RESULTS flag is “P”, then the system will prompt the inspector to input the safety inspection sticker number. A minimum of six (6) and maximum of nine (9) characters are required for this field. When the certificate number entered is not a sequential number to the last certificate issued, a warning should be displayed, “Certificate number not in sequential order. Notify DPS if a certificate is missing.” This warning should be sent to the historical file by date and time. The enter key should allow the inspector to continue.

The safety certificate number consists of an alpha character, followed by up to eight digits. The alpha character usually does **not** correspond to the alpha character contained in the SAFE_TEST_TYPE field. They are however separated or indexed by the different types of safety inspections. Thus, the sticker numbers should be in sequential order for all one year windshield inspections (type “A” tests), two year windshield inspections (type “B” tests), trailer/motorcycle inspections (type “C” tests), and so forth. The warning should appear each time the inspector changes books for the same type of inspection. For example, a book of one year windshield inspections (type “A” tests) may end with F00000050, and the next book of one year windshield inspection certificates purchased by the shop owner may begin with F00001000. The books contain 50 sequential certificates.

The system should take the entered certificate number, compare it to the previous certificate issued under the same safety inspection type, and determine if the entered certificate number is next in sequence for that safety inspection type. If the entered number is not next in sequence, the correction prompt should appear.

If the inspector enters fewer than 9 characters, the analyzer shall automatically load leading zeros to the numerical entry and show the analyzer number after the entry is confirmed. For example, an entry of an ‘A’, followed by a ‘123’ shall be converted to ‘A00000123’ and displayed for the inspector to confirm the entry. The conversion will always end in a nine-character certificate number entry. This nine-character value shall be used during comparison testing to facilitate sequential issuance of certificates. The first character of a certificate number shall be an alphabetic character. The analyzer shall be able to enter the certificate number using the bar code reader. The only acceptable

alpha character is ‘V’ for decals.

The analyzer shall restrict the alpha character to a list of acceptable alpha characters for a particular type of certificate or decal being issued. For example, during a safety and emission inspection reinspection, if the inspector selects the ‘1-year windshield (safety & emissions)’ certificate on the type of inspection prompt in Section 3.1.20 and the vehicle passes the inspection, the inspector may only enter an ‘A,’ ‘B,’ ‘C,’ ‘D,’ ‘E,’ or ‘F,’ as the alpha character in the certificate number entry prompt. For Emission only Decals, the only acceptable alpha character is ‘V.’ For ‘1 Year Windshield (Safety Only)’ certificate types, the acceptable alpha characters are ‘G,’ ‘H,’ ‘I,’ ‘J,’ ‘K,’ ‘L,’ ‘M,’ and ‘P.’ For ‘2 Year Windshield’ certificate types, the acceptable alpha characters are ‘N,’ ‘W,’ and ‘Q.’ For ‘Trailer/Motorcycle’ certificate types, the acceptable alpha characters are ‘X,’ ‘Y,’ and ‘Z.’ For ‘FMCSR (Truck)’ certificate types, the acceptable alpha characters are ‘T,’ and ‘U.’ For ‘FMCSR (Trailer)’ certificate types, the acceptable alpha characters are ‘R,’ and ‘S.’

Associated System File: **VEHICLE.DAT** **CERT_NUM**
DECAL_NUM

- -

3.4.14 Certificate Number Correction Prompt:

INDICATE THE CONDITION OF THE PREVIOUS CERTIFICATE

U - UNACCOUNTED FOR
C - ENTERED CERTIFICATE IS CORRECT
R - RE-ENTER CERTIFICATE NUMBER

Programming Criteria:

If the reinspection conducts a “Required Emissions Only Test (Decal)” retest (i.e., the TEST TYPE field is set to ‘O’), the system shall proceed to Section 3.4.15, the VI-30A Selection Prompt. The system shall only accept ‘U,’ ‘C,’ or ‘R,’ as valid entries. The system shall display the entered certificate number, the safety certificate inspection type (‘A,’ ‘J,’ ‘C,’ ‘B,’ ‘K,’ ‘G’ certificate) and the ‘previously’ issued certificate number.

This prompt shall only appear if the entered certificate is out of sequence. If 'R' is entered, the system shall allow the inspector to return to the previous screen prompt to re-enter the current certificate. If 'C,' or 'U' is selected, the system will use the entered certificate number as the new 'previous' certificate number for the next comparison. If 'U,' is selected, the system shall complete the test, write the test record, transmit the results to the Texas Information Management System, and continue with the Certificate Type Prompt, number 3.12.2a. If the inspector selects 'U,' the analyzer shall not allow any further official inspections to be conducted until the inspector has completed the entries required in Section 3.12, Missing, or Voided Certificates.

The analyzer may either:

1. a. complete the inspection as prescribed in Sections 3.4, by proceeding with Section 3.4.15, VI 30A Selection Prompt, and then,

   b. complete the screen prompts in Section 3.12. A manufacturer selected lockout shall be used to prevent any subsequent official inspections until the certificates are accounted for by answering the prompts in Section 3.12,

2. a. Or, interrupt the current inspection, then,

   b. account for the previous certificates by answering the prompts in Section 3.12, beginning with 3.12.2a and continuing through to 3.12.5, or 3.12.6, and then,

   c. complete the inspection, by proceeding with Section 3.4.15, VI 30A Selection Prompt, write the test record, and transmit the results to the Texas Information Management System, thus, satisfying the requirement of accounting for the previous certificates prior to conducting any subsequent official inspections.

If a manufacturer lockout is used, the inspector shall be able to easily identify the reason the analyzer is preventing subsequent official inspections. The inspector shall be able to easily identify which type of certificate or decal must be accounted for. If the inspector indicates that the previous certificates are unaccounted for while conducting a Safety Only reinspection, then the analyzer shall transmit the results via the Texas Information Management System during the next emissions-related inspection. In any case, the analyzer shall not conduct any subsequent official inspections until the inspector accounts for the previous certificates by answering the questions in Section 3.12.

The analyzer will store the information in the VEHICLE.DAT file and print it on the weekly inspection log report (VI-8B). The void indicator shall show 'VOID', if 'V' is in the CERT_COND field, or 'MISS', if 'M' is in the CERT_COND field of the record

created using the Missing or Voided Certificates function. The system shall store the entry of ‘C’ in the CERT_COND field, if ‘C’ is selected, and store the entry of the ‘U’ in the CERT_COND field, if ‘U’ is selected in the test record. The default for this screen shall be ‘R’ for reenter certificate number.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**

INVALID ENTRY--TRY AGAIN

Associated System File: **VEHICLE.DAT** **CERT_COND**

- -

3.4.15 VI 30A Selection Prompt:

DO YOU WISH TO ISSUE AN OUT OF STATE VERIFICATION FORM (VI-30A)? ('Y' OR 'N')

Programming Criteria: The system shall give this prompt if the Safety_PF_Flag is “P.” The system shall only accept a ‘Y’ or ‘N’ entry. If the inspector selects ‘N’, skip the next screen prompt.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **VI30A_FLAG**

- -

3.4.16 VI 30A Number Prompt: ENTER THE VI 30A #.

Programming Criteria: The inspector will enter the VI 30A #. A minimum of one (1) character and a maximum of seven (7) characters are required for this field. If no entry is made, the analyzer shall return to the VI 30A Selection prompt, number 3.4.15.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **VI30A_NUM**

- -

3.4.17 **Rejection Receipt:** **EXPLAIN THE REJECTION FULLY.**

VEHICLE INSPECTION REJECTION RECEIPT

Date_____ Vehicle Make_____ Model year_____
Vehicle License # _____ Inspection Station# _____
Inspection Station Name_____

REJECTED FOR DEFECTIVE

Turn Signals - Mounting, operation, and approved type

Window Tinting and Sunscreening - Tint or Coating out of Specifications

Turn Signal Switch and Indicator Lamp - Switch accessible & locks in position

Emissions System - Excessive Emissions (see VIR)

Gas Cap Test - Fails Pressure Test

EXPLAIN REJECTION FULLY: (Inspector's explanation goes here)_____
_____
_____
_____
_____
_____
_____

Certified Inspector Making Inspection: _____

If defects indicated above are corrected and the vehicle is returned to the original inspection station within 15 days, (excluding the date of rejection) the vehicle

will be reinspected once with no additional fee. THIS IS NOT A PERMIT TO DRIVE A DEFECTIVE VEHICLE OR TO DRIVE A VEHICLE WITHOUT A CURRENT VALID INSPECTION CERTIFICATE.

Fee Paid $_____

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Programming Criteria:

The system shall prompt the inspector to explain the rejection fully, enter the fee paid on the rejection receipt and print the rejection receipt shown above. The fee paid shall be the overall cost for the complete inspection (i.e., the amount in the OVERALL_COST field). The system shall allow the inspector to type the explanation from the keyboard prior to printing the rejection receipt. If the inspector opts to type the explanation, the explanation shall appear on the printed rejection report. The system shall allow the inspector to print additional copies of the rejection receipt, after the initial report has been printed. The maximum number of entries that can be displayed on the rejection receipt is five (5). If the emissions test (ASM, TSI, or OBD) or the gas cap integrity test of the inspection is failed, then the entry for this item must be displayed. If both the emissions test and the gas cap integrity test are failed, then both entries must be displayed on the rejection receipt. The preferred order of appearance is the emissions test entry, the gas cap integrity test entry, followed by the remaining safety item entries. In either case, the rejection receipt shall not display more than the maximum of five items. Then, the system should continue to the Print Vehicle Repair Form, Section number 3.4.17a, followed by the Print Vehicle Inspection Report Prompt, number 3.4.18.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **OVERALL_COST**

3.4.17a **Print Vehicle Repair Form (VRF):**

Programming Criteria: If the EMISS_PF_FLAG flag is "F", then the analyzer shall print a VRF. The analyzer shall print the following vehicle information on the VRF: make, model, model year, the vehicle identification number (VIN), license plate number, and odometer reading (mileage). A draft VRF format is provided in Appendix O.

- -

3.4.17b Print Public Awareness Statement:

The public awareness statement shall be printed only once, and the VIR shall be printed twice based on the outcome of the emissions phase of the inspection. If the vehicle passes the emissions phase of the inspection, the analyzer shall print the 'passing' public awareness statement, and the 'failing' public awareness statement, if the vehicle fails the emissions phase of the inspection.

- -

3.4.18 Print Vehicle Inspection Report:

After the system has stored the test record, the following prompt shall be displayed.
"READY TO PRINT VEHICLE INSPECTION REPORT? ENTER "Y" FOR YES OR "N" FOR NO."

Depending upon the pass/fail status of the emissions phase of the inspection, the printer will provide additional information to the customer as outlined in Appendix B. The custom report shall include, but not be limited to, the following information: Test Type (Initial or Reinspection), Test (2-Speed Idle), Test Date, Test Time, Test Cost (differentiated by Emission and Safety), Overall Cost, Inspector Name, Station Name, Vehicle License Number, VIN, Vehicle Make, Vehicle Model Year, Vehicle Type, Engine Size, Cylinders, Transmission, Odometer, Gross Vehicle Weight, Ignition, Two Letter Special Test Designation where applicable, Emissions Standard (by pollutant), Vehicle Actual Emissions Amounts (by pollutant), Emissions Result (by pollutant), all final RPM values for the Test, Dilution Amount (in percent, $CO + CO_2$), Dilution Results (Pass or Fail), the Results of the Gas Cap Integrity Test, and the Overall Result of the Inspection. The vehicle's ignition type shall be place on the same line as the number of cylinders separated by at least two spaces or a slash. The subtitle of the report shall indicate that the test was a Safety and Emissions Inspection, Safety Only Inspection, Required Emission Only Decal Inspection or Emission Only Inspection, and whether or not the test was conducted as a Special Test. If the test was conducted as a Special Test, the Two Letter Designation (i.e., LI, ME, IV, AD, ST, PA, or OT) shall be placed on the same line as the Test Type separated by at least two spaces, or a

slash, and the words 'Special Test' shall be in the subtitle. The system shall allow the inspector to print additional copies of the vehicle inspection report, after the initial report has been printed. If the test ends because of a time out condition or because of dilution, the emission standards, amounts, and results shall **not** be printed on the report. The report shall indicate that the vehicle has failed. The report shall indicate that the vehicle failed because of excessive dilution, where applicable. If the test should 'time out', then the report shall indicate that the vehicle failed because the test was not completed in the time allowed for completion of the test. After the inspection has been completed, the analyzer shall contact the Texas Information Management System Host, and transmit all applicable vehicle information.

If the test ends in an aborted condition, the vehicle inspection report (VIR) shall print the station information, the vehicle information, indicate that the test was aborted in the overall result block, and display the reason for the abort. If the inspector selects other, then the analyzer shall print the reason typed in by the inspector, or provide space for a handwritten answer if the inspector does not type in the reason.

If the vehicle aborts the emissions phase or completes the emissions phase of the inspection with a timeout condition, the system shall print dashes on the VIR where the analyzer would have ordinarily placed readings. The dashes shall follow the expected format of the corresponding gas (i.e., CO = '--.--', HC = '----', CO_2 = '--.-'). Dashes are preferable, however, an alternative symbol may be used. The system shall also place dashes in place of the pass/fail indicator on the VIR. The system shall print the RPM value, the dilution standard, the dilution reading and result, and the standards for HC, CO, CO_2, and O_2, where applicable.

The analyzer shall print two barcodes on the VIR which contain the VIN, license plate number of the vehicle, and the license type, of the vehicle under inspection. The bar code shall be code 39 format and contain only the previously mentioned information and the start and stop characters.

The bar codes shall be printed on the VIR in the following format: 2 code 3 of 9 bar codes will be utilized, since there is too much information to use a single bar code. One bar code shall be formatted as follows:

Name	Length	Start	Format
Identifier	1	1	'$'
License Plate Type	1	2	'1', '2', '3', '4', '5', '6', '7', or '8'
License Plate Number	8	3	Alphanumeric
TxDOT Number	10	11	Alphanumeric

The other shall be formatted as follows:

Name	Length	Start	Format
Identifier	1	1	'I'
VIN	17	2	Alphanumeric

Each bar code must be clearly labeled, so that the inspectors can easily tell which bar code is which. The location of the bar codes on the VIR shall be determined by the manufacturers. The State only requires that they be present and labeled.

Error Message: **NO VALUES ENTERED -- TRY AGAIN**

Associated System File: **VEHICLE.DAT** **EMISS_INSP_COST**
OVERALL_RESULTS

- -

3.5 Main Menu Selection '5' "Re-Print Vehicle Inspection Report" / "VIR"

There are no requirements to write a test record for reprinting a VIR. An analyzer that writes a test record for reprints shall not be deemed unacceptable.

3.5.1 Access Code Prompt: ENTER YOUR INSPECTOR'S ACCESS CODE

Programming Criteria:

The TX96 analyzer shall be designed to require the entry of the access code via the 2-D bar code reader. The inspector shall be required to enter his access code using the bar code reader for every inspection.

The TX96 analyzer shall be designed to require the entry of a special access code by the certified inspector before an official emissions inspection can begin. The access code shall neither be displayed nor printed on the Inspection Vehicle Inspection Report. This access code will be verified and linked to existing I/M Inspector number contained in the **INSPECTR.DAT** file. The analyzer shall not accept duplicate access code for different

inspectors. Each inspector's access code shall be unique. The analyzer shall allow three attempts to enter a valid access code. Following each of the first two attempts, Error Message 1 shall be displayed. Error Message 2 shall be displayed for 5 minutes following the third attempt or until the inspector presses "enter/continue". The system shall then return to the main menu.

Error Messages:

1. **"YOUR ACCESS CODE IS NOT VALID--TRY AGAIN"**

2. **"THE ACCESS CODE ENTERED IS NOT VALID. VERIFY YOUR ACCESS CODE NUMBER WITH YOUR LOCAL DPS OFFICE."**

Associated System File **INSPECTR.DAT** **ACCESS_CODE**

- -

3.5.1a **PIN Number Prompt:** **ENTER YOUR INSPECTOR'S PIN NUMBER**

Programming Criteria:

The TX96 analyzer shall be designed to require the entry of a special PIN by the certified inspector before an official emissions inspection can begin. The PIN shall neither be displayed nor printed on the Inspection Vehicle Inspection Report. This access code will be verified and linked to existing I/M Inspector number contained in the **INSPECTR.DAT** file. The analyzer shall not accept duplicate PINs for different inspectors. Each inspector's access code shall be unique. The PIN will be encrypted on the analyzer and is unreadable to anyone. Also, any other files that contain the PIN (i.e. INSPECTR.REC) must be unreadable to anyone. The analyzer may encrypt or delete these files. The analyzer shall allow three attempts to enter a valid access code. Following each of the first two attempts, Error Message 1 shall be displayed. Error Message 2 shall be displayed for 5 minutes following the third attempt or until the inspector presses "enter/continue". The system shall then return to the main menu.

Error Messages:

1. **"YOUR PIN IS NOT VALID--TRY AGAIN"**

2. **"THE PIN ENTERED IS NOT VALID. CONTACT YOUR LOCAL DPS OFFICE TO RESET YOUR**

PIN."

<u>Associated System File:</u> **INSPECTR.DAT** **PIN_NO**

- -

3.5.2 <u>Date Expiration Prompt:</u> **YOUR STATION/INSPECTOR CERTIFICATION EXPIRATION DATE IS MM DD YY**

<u>Programming Criteria:</u> The analyzer will then check the license expiration date and lockout flag for the inspector in the inspector file. The station license renewal date and lockout flag will then be checked in the station file. If either the station or the inspector license expiration date is within 60 days of that date, then the analyzer will display Message 1 indicating the expiration date. If the inspector or station dates have expired, message 2 will be displayed. The analyzer shall display Message 3 in addition to Message 1 or 2 during the five-day countdown. If it is 30 days past the inspector or station expiration date, the system will set the station lockout flag in the station file or the inspector lockout flag in the inspector file to "Y" to indicate lockout has occurred. The analyzer shall countdown the final 30 days after the expiration date of the inspector or the station certification.

If either the station or the inspector lockout flag is set, then analyzer will display message 2 or a message that indicates lockout has occurred. The system will then return to the main menu.

<u>Error Messages:</u>

1. **YOUR (STATION/INSPECTOR) CERTIFICATION EXPIRES MM/DD/YY.**

2. **YOUR STATION /OR INSPECTOR CERTIFICATION EXPIRED (date). YOU ARE NOT AUTHORIZED TO PERFORM ANY EMISSIONS INSPECTION AT THIS TIME. PLEASE CONTACT YOUR LOCAL DPS OFFICE.**

3. **YOUR (STATION/INSPECTOR) CERTIFICATION**

WILL EXPIRE IN X (5, 4, 3, 2, 1) DAY(S).

Associated System File:	**INSPECTR.DAT**	**INSP_EXP_DATE**
	STATION.DAT	**STAT_EXP_DATE**
	LOCKOUT.DAT	**INSP_LOCKOUT_FLAG**
		STAT_LOCKOUT_FLAT

- - - -

record, if the VIN is entered using the bar code reader. Otherwise, the analyzer will place a 'K' in the BARCODED_VIN field of the test record.

The system shall allow the inspector to see and edit the VIN as it is being entered. When all characters of the VIN have been entered, the system shall prompt the inspector to press "continue" or "enter". The inspector shall hit "continue" or "enter", the screen will blank the VIN and ask the operator to reenter the VIN under the same conditions as the previous entry. The two attempts must match. If the two attempts do not match, the analyzer will display Message 3 and prompt the inspector to enter the VIN number a third time. A minimum of three and maximum of 17 characters are required for this field. If the entry is not within these parameters, then the system will display Message 2. If no value is entered, the analyzer will display Message 1. The VIN verification algorithm shall be applied here. The algorithm shall be supplied under separate cover by the TNRCC. The VIN verification shall only be applied to vehicles with model years 1981 and newer. The analyzer will not allow the inspector to enter the letters 'I,' 'O,' or 'Q' for vehicle with model years 1981 and newer. The software should suggest possible substitute letters when the DPS algorithm indicates that the VIN is bad. For example, the software could ask if the entered '8' could be a 'B.'

Error Message:

1. **THIS FIELD MUST BE ENTERED TO CONTINUE.**
2. **A MINIMUM OF 3 OR MAXIMUM OF 17 CHARACTERS ARE NEEDED FOR THIS ENTRY--TRY AGAIN.**
3. **ENTRIES DO NOT MATCH -- TRY AGAIN.**

Associated System File: **VEHICLE.DAT** **VIN_ID_NUM**
VIN_FLAG
BARCODED_VIN

- - - -

Error Message: **THIS FIELD MUST BE ENTERED TO CONTINUE.**

Associated System File: **VEHICLE.DAT** **LICENSE_NUM**

- - - -

The system will print the original date of the initial test on the reprint vehicle inspection report. The system will print the VIR based on the data contained in the test record received from the Texas Information Management System (VID). The system shall print 'TIMS Reprint' on the line for station address. The system shall print 'N/A' on the lines for station city and station zip code.

Depending upon the pass/fail status of the emissions phase of the inspection, the printer will provide additional information to the customer as outlined in Appendix B. The custom report shall include, but not be limited to, the following information: Test Type (Initial or Reinspection), Test (2-Speed Idle), Test Date, Test Time, Test Cost (differentiated by Emission and Safety), Overall Cost, Inspector Name, Station Name, Vehicle License Number, VIN, Vehicle Make, Vehicle Model Year, Vehicle Type, Engine Size, Cylinders, Transmission, Odometer, Gross Vehicle Weight, Ignition, Two Letter Special Test Designation where applicable, Emissions Standard (by pollutant), Vehicle Actual Emissions Amounts (by pollutant), Emissions Result (by pollutant), all final RPM values for the Test, Dilution Amount (in percent, $CO + CO_2$), Dilution Results (Pass or Fail), the Results of the Gas Cap Integrity Test, and the Overall Result of the Inspection. The vehicle's ignition type shall be placed on the same line as the number of cylinders separated by at least two spaces or a slash. The subtitle of the report shall indicate that the test was a Safety and Emissions Inspection, Safety Only Inspection, Required Emission Only Decal Inspection or Emission Only Inspection, and whether or not the test was conducted as a Special Test. If the test was conducted as a Special Test, the Two Letter Designation (i.e., LI, ME, IV, AD, ST, PA, or OT) shall be placed on the same line as the Test Type separated by at least two spaces, or a slash, and the words 'Special Test' shall be in the subtitle. The system shall allow the inspector to reprint additional copies of the vehicle inspection report, after the initial reprinted report has been printed. If the test ends because of a time out condition or because of dilution, the emission standards, amounts, and results shall **not** be printed on the report. The report shall indicate that the vehicle has failed. The report shall indicate that the vehicle failed because of excessive dilution, where applicable. If the test should 'time out', then the report shall indicate that the vehicle failed because the test was not completed in the time allowed for completion of the test. Since there is no place to store the safety related repair costs in the test record, the reprinted VIR will be deemed acceptable if the safety related repair cost amount is not printed. However, the other costs (i.e., overall cost, emissions fee, safety fee, and emissions repair cost) shall be printed as received in the test record. This may mean that the VIR math will be incorrect for inspections where safety related repair costs were entered. Manufacturers **may** leave blanks for this amount or **may** print the amount if they perform the math to deduce this value (i.e., overall cost - (safety fee + emissions fee + emission repair costs)).

If the test ended in an aborted condition, the vehicle inspection report (VIR) shall print the station information, the vehicle information, indicate that the test was aborted in the overall result block, and display the reason for the abort.

If the test ended in an abort or timeout condition, the system shall print dashes on the VIR where the analyzer would have ordinarily placed readings. The dashes shall follow the expected format of the corresponding gas (i.e., CO = '--.--', HC = '----', CO_2 = '--.-'). Dashes are preferable, however, an alternative symbol may be used. The system shall also place dashes in place of the pass/fail indicator on the VIR. The system shall print the RPM value, the dilution standard, the dilution reading and result, and the standards for HC, CO, CO_2, and O_2, where applicable.

The analyzer shall print two barcodes on the VIR which contain the VIN, license plate number of the vehicle, and the license type, of the vehicle under inspection. The bar code shall be code 39 format and contain only the previously mentioned information and the start and stop characters.

The bar codes shall be printed on the VIR in the following format: 2 code 3 of 9 bar codes will be utilized, since there is too much information to use a single bar code. One bar code shall be formatted as follows:

Name	Length	Start	Format
Identifier	1	1	'$'
License Plate Type	1	2	'1', '2', '3', '4', '5', '6', '7', or '8'
License Plate Number	8	3	Alphanumeric
TxDOT Number	10	11	Alphanumeric

The other shall be formatted as follows:

Name	Length	Start	Format
Identifier	1	1	'I'
VIN	17	2	Alphanumeric

Each bar code must be clearly labeled, so that the inspectors can easily tell which bar code is which. The location of the bar codes on the VIR shall be determined by the manufacturers. The State only requires that they be present and labeled.

When the analyzer has completed printing the reprinted VIR, and the inspector chooses not to print additional copies, the analyzer shall return to the Main Menu.

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3.5.3h Display/Select Pass Records

Programming Criteria: The system shall prompt the inspector to enter the license number and VIN of the vehicle. The system shall either prompt the inspector to enter the license number, pass/fail status (optional), and VIN, and/or certificate number, as search criteria, or the sysytem will display the license number and VIN and test date of all records currently contained in the VEHICLE.DAT and prompt the inspector to select the desired record. The system will search and display the appropriate record for the inspector.

The system will then display vehicle information for verification by the inspector.

The system will print the original date of the initial test on the reprint vehicle inspection report.

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3.5.4 Reprint Prompt: "DO YOU WANT TO REPRINT THIS VIR?" (Y OR N)

Programming Criteria: The system shall only accept an entry of 'Y' or 'N.' If the inspector selects 'N', the system shall return to the Main Menu.

Error Message: **INVALID ENTRY--TRY AGAIN**

- -

3.5.5 Print Vehicle Inspection Report:

After the system has displayed the vehicle information and the inspector has confirmed that the vehicle information is correct, the following prompt shall be displayed. **"READY TO REPRINT VEHICLE INSPECTION REPORT? ENTER "Y" FOR YES OR "N" FOR NO."**

The system will print the original date of the initial test on the reprint vehicle inspection report. The system will print the VIR based on the data contained in the test record received from the Texas Information Management System (VID). The system shall print 'Local Reprint' on the line for station address. The system shall print 'N/A' on the lines for station

city and station zip code.

Depending upon the pass/fail status of the emissions phase of the inspection, the printer will provide additional information to the customer as outlined in Appendix B. The custom report shall include, but not be limited to, the following information: Test Type (Initial or Reinspection), Test (2-Speed Idle), Test Date, Test Time, Test Cost (differentiated by Emission and Safety), Overall Cost, Inspector Name, Station Name, Vehicle License Number, VIN, Vehicle Make, Vehicle Model Year, Vehicle Type, Engine Size, Cylinders, Transmission, Odometer, Gross Vehicle Weight, Ignition, Two Letter Special Test Designation where applicable, Emissions Standard (by pollutant), Vehicle Actual Emissions Amounts (by pollutant), Emissions Result (by pollutant), all final RPM values for the Test, Dilution Amount (in percent, CO + CO_2), Dilution Results (Pass or Fail), the Results of the Gas Cap Integrity Test, and the Overall Result of the Inspection. The vehicle's ignition type shall be placed on the same line as the number of cylinders separated by at least two spaces or a slash. The subtitle of the report shall indicate that the test was a Safety and Emissions Inspection, Safety Only Inspection, Required Emission Only Decal Inspection or Emission Only Inspection, and whether or not the test was conducted as a Special Test. If the test was conducted as a Special Test, the Two Letter Designation (i.e., LI, ME, IV, AD, ST, PA, or OT) shall be placed on the same line as the Test Type separated by at least two spaces, or a slash, and the words 'Special Test' shall be in the subtitle. The system shall allow the inspector to reprint additional copies of the vehicle inspection report, after the initial reprinted report has been printed. If the test ends because of a time out condition or because of dilution, the emission standards, amounts, and results shall **not** be printed on the report. The report shall indicate that the vehicle has failed. The report shall indicate that the vehicle failed because of excessive dilution, where applicable. If the test should 'time out', then the report shall indicate that the vehicle failed because the test was not completed in the time allowed for completion of the test.

If the test ended in an aborted condition, the vehicle inspection report (VIR) shall print the station information, the vehicle information, indicate that the test was aborted in the overall result block, and display the reason for the abort.

If the test ended in an abort or timeout condition, the system shall print dashes on the VIR where the analyzer would have ordinarily placed readings. The dashes shall follow the expected format of the corresponding gas (i.e., CO = '--.--', HC = '----', CO_2 = '--.-'). Dashes are preferable, however, an alternative symbol may be used. The system shall also place dashes in place of the pass/fail indicator on the VIR. The system shall print the RPM value, the dilution standard, the dilution reading and result, and the standards for HC, CO, CO_2, and O_2, where applicable.

The analyzer shall print two barcodes on the VIR which contain the VIN, license plate number of the vehicle, and the license type, of the vehicle under inspection. The bar code shall be code 39 format and contain only the previously mentioned information and the start and stop

characters.

The bar codes shall be printed on the VIR in the following format: 2 code 3 of 9 bar codes will be utilized, since there is too much information to use a single bar code. One bar code shall be formatted as follows:

Name	Length	Start	Format
Identifier	1	1	‘$’
License Plate Type	1	2	‘1’, ‘2’, ‘3’, ‘4’, ‘5’, ‘6’, ‘7’, or ‘8’
License Plate Number	8	3	Alphanumeric
TxDOT Number	10	11	Alphanumeric

The other shall be formatted as follows:

Name	Length	Start	Format
Identifier	1	1	‘I’
VIN	17	2	Alphanumeric

Each bar code must be clearly labeled, so that the inspectors can easily tell which bar code is which. The location of the bar codes on the VIR shall be determined by the manufacturers. The State only requires that they be present and labeled.

When the analyzer has completed printing the reprinted VIR, and the inspector chooses not to print additional copies, the analyzer shall return to the Main Menu.

3.6 Main Menu Selection '6' "Vehicle Diagnosis"

As soon as the analyzer meets the warm-up criteria, selection of the vehicle diagnosis mode from the main menu shall cause the analyzer to conduct an automated electronic zero and span and then begin taking emissions readings. The emissions readings shall be displayed in large, easily read characters by a person with 20/20 vision from a distance of eight feet, in the following format.

Emission Reading

HC	XXXX
CO	XX.XX
CO_2	XX.X
O_2	XX.X

3.7 Main Menu Selection '7' "Training Mode"

The analyzer shall contain a feature that will allow an inspector or student to go through the complete inspection procedure without generating an official emissions inspection vehicle inspection report. This capability will be used by the auditors for evaluating inspector performances, by the manufacturers for training purchasers of analyzers, or by analyzer owners to train new employees. The training mode selection shall not require the users access code or allow access to secured areas of hardware or software. The display shall show a message throughout the inspection that this is a training exercise and not an official inspection. Vehicle inspection reports shall indicate to the satisfaction of the TNRCC that they are for training only.

3.8 Main Menu Selection '8' "Analyzer Maintenance"

Upon selection of this menu, the analyzer shall display the following list for the inspector:

1. Three day gas calibration and leak check

2. Gas Calibration

3. Leak Check

4. Status Screen

5. Gas Cap Integrity Tester Calibration

99. Return to Main Menu

3.8.1 Three-day Gas Calibration and Leak Check

When the Inspector has selected 1, the analyzer shall initiate a three (3)-day gas calibration and leak check sequence.

1. A three (3)-day gas calibration and leak check is required. Selection of this item shall bring up a set of both gas calibration and leak check procedures. The procedures shall be user friendly and shall indicate every step needed to properly perform the required gas calibration and leak check (including when it is necessary to turn the gas cylinder valve on and off). TNRCC/DPS reserves the right to approve the procedures. Results of the leak check and the gas calibration shall be displayed to the screen and recorded on the **CAL.DAT** file. The three-day calibration and leak check record will contain before and after calibration readings in **CAL.DAT**. The system shall preclude official emissions-related inspections after seventy-two (72) hours if a gas calibration and leak check are not performed and passed. If the analyzer fails the three (3)-day gas calibration and leak check, a message shall be displayed indicating that it failed, official emissions-related inspections shall be precluded, and instructions shall be provided to the inspector to call for repairs. (The message will include the toll free telephone number during the warranty period.)

2. When the three (3)-day gas calibration and leak check is completed, the analyzer shall return to the Main Menu.

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3.8.2 <u>Gas Calibration</u>

When the inspector has selected two (2) at the display prompt, the analyzer shall initiate a gas calibration sequence.

1. Selection of this item shall bring up a set of gas calibration procedures. The procedures shall be user friendly and shall indicate every step needed to properly perform the gas calibration (including when it is necessary to turn the gas cylinder valve on and off). TNRCC/DPS reserves the right to approve the procedures. Results of the gas calibration shall be displayed to the screen and recorded on the CAL.DAT. If the analyzer fails the gas calibration, a message shall be displayed indicating that it failed and instructing the inspector to call for repairs.

2. When the gas calibration is completed, the analyzer shall return to the Main Menu.

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3.8.3 <u>Leak Check</u>

When the inspector has selected three (3) the analyzer shall initiate a leak check sequence.

1. Selection of this item shall bring up a set of leak check procedures. The procedures shall be user friendly and shall indicate every step needed to properly perform the leak check (including when it is necessary to turn the gas cylinder valve on and off). TNRCC/DPS reserves the right to approve the procedures. Results of the leak check shall be displayed to the screen and recorded on the CAL.DAT. If the analyzer fails the leak check, a message shall be displayed indicating that it failed and instructing the inspector to call for repairs.

2. When the leak check is completed, the analyzer shall return to the Main Menu.

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3.8.4 <u>Status Screen</u>

When the Auditor has selected 4, the analyzer shall display the Status Screen. The analyzer shall use information stored in the CAL.DAT file and other sources to generate the Status Screen.

Station Number

Analyzer Number

Propane Equivalency Factor (PEF) Number

Span Gas Cylinder Valves

Date/time of last gas calibration & leak check

Remaining space will store approximately ___ test records (the analyzer should fill in the blank with a number.)

Date analyzer was last serviced

Current date and time

Software Version Number

The system shall post a recurring warning when sufficient space remains to store 200 records.

3.8.5 <u>Gas Cap Integrity Tester Calibration</u>

When the inspector has selected five (5), the analyzer shall initiate a gas cap tester calibration sequence.

1. Selection of this item shall bring up a set of gas cap tester calibration procedures. The procedures shall be user friendly and shall indicate every step needed to properly

perform the gas cap tester calibration (including when it is necessary to identify which the reference cap is being attached, and when to switch reference caps). TNRCC/DPS reserves the right to approve the procedures. Results of the gas cap tester calibration shall be displayed to the screen and recorded on the CAL.DAT. The affected fields are CAL_DATE, CAL_TIME, and GAS_CAP_CHECK_RSLT. The results shall be automatically written to CAL.DAT file. If the analyzer fails the gas cap tester calibration, a message shall be displayed indicating that it failed and instructing the inspector to call for repairs.

2. When the gas cap calibration is completed, the analyzer shall return to the Main Menu.

3.9 Main Menu Selection '9' "Audit Menu"

The information (e.g., test data files) from the analyzer in the station should be accessible to an auditor from a host computer for the purposes of conducting an audit. The auditor shall be able to conduct audit functions from the host as if he/she were in the station, with the exceptions of gas calibrations and leak checks. If an audit is conducted on-site, the auditor should encounter the following prompts.

If the Audit Menu (9) is selected from the Main Menu:

TNRCC/DPS Access Code Prompt: ENTER TNRCC/DPS ACCESS CODE

Programming Criteria: The system will prompt the auditor to enter the TNRCC/DPS Access Code. The ACCESS CODE shall be changed by algorithm provided by the TNRCC/DPS on the first day of every month.

If an invalid Access Code is entered, the system will write a record to the AUDITLOG.DAT file containing the date, time and "U" for unauthorized login attempt. The record should be written when the 'enter/continue' key is pressed after the access code is entered. The system shall then return to Main Menu.

If the Access Code is valid, the system will write a record to the AUDITLOG.DAT file containing the date, time and "A" for the authorized login attempt. The record should be written when the 'enter/continue' key is pressed after the access code is entered. If the Auditor selects the inspection log search under Section 3.9.13, the record for the successful log on shall be appended with a 'Y' in the SEARCH field, and the time of the search in the TIME field when the Auditor presses 'continue/enter.' Otherwise, leave

these fields blank.

Upon successful validation of the TNRCC/DPS access Code, the auditor shall be prompted to enter his 6-digit employee identification number. This is a required entry. The 6-digit employee identification number enter by the auditor must be compared to the DPS_ID field of the AUDITOR.DAT file. If the 6-digit employee identification number does not match a value in the AUDITOR.DAT file, the system shall place a 'U' in the BAD_DPS_ID field of the AUDITLOG.DAT file. If the 6-digit employee identification number does match a value in the auditor.dat file, the system shall place an 'A' in the BAD_DPS_ID field of the AUDITLOG.DAT file and display the Audit Menu. The system shall report this number to complete the Inspection log (VI-8B). Then, the Audit Menu will be displayed as follows:

1. Station Evaluation Report
2. Station Performance Report
3. Inspector Evaluation Report
4. Analyzer Maintenance
5. Gas Audit
6. Update Station and Inspector Information
7. Install New Data Disk
8. Reset Date, Time and Telephone Numbers
9. Analyzer Lockout/Station Lockout
10. Software Updates
11. Practical Test
12. Auditor's Notes
13. Search and Retrieve Test Records
14. Analyzer Tampering/Access Report
15. History Report
16. System Settings
17. Reprint VIR
18. Communications Refresh
19. Copy/Download Test Records
20. Missing, or Voided Certificates Function
21. Certificate Correction/Replacement Function
22. Status Page

99. Return to Main Menu

The analyzer shall store the entry and exit time of each time a selection is made from the the Audit Main Menu. These entries shall be stored in the AUDTMENU.DAT file and transmitted to the VID via the Texas Information Management System. Submenu selections will not be collected.

An example of the acceptable audit Menu display is contained in Appendix T. The auditor shall have the option of printing all reports and items displayed on the Audit Menu Options to the printer. The system will make provisions for the date and signature of the station manager and the I/M auditor at the end of every report. Upon exiting the State Menu, the analyzer shall store the changes made by the Auditor in the appropriate file structure. When the analyzer conducts and completes an emissions test, the state information and auditor changes shall be transmitted to the Texas Information Management System Host along with the vehicle inspection information.

3.9.1 Audit Menu Selection '1' "Station Evaluation Report"

When the auditor selects Audit Menu Option (1), the station evaluation report shall be initiated.

The Station evaluation report shall be generated by the analyzer from the information stored in the hard disk. The auditor shall have the ability to select the time interval over which the analyzer will calculate for the evaluations. The time interval for calculation will be 30 days, 60 days, and 90 days. Upon the request of the auditor, the system shall be designed to display all three time interval calculations for comparison. In addition, the auditor will be able to request an "ad hoc" report starting on a specific date and ending on a specific date. The analyzer shall complete the following fields automatically: station number, today's date, and the time the report was activated.

When the auditor selects this Audit Menu Option (1), the system shall display a screen which lists the Station Evaluation Report Menu as the Header and lists the following choices: Comparison Report, Multi-day Report, 30 Day Report, 60 Day Report, 90 Day Report. The inspector shall be able to use the arrow keys to highlight the appropriate choice and press "continue/enter" to select the desired report.

The Multi-day Report shall have a date entry screen that allows the auditor to enter the specific starting and ending dates. The date entry screen shall require the auditor to only enter number characters. The blank date entry shall look like:

Starting Date: _ _/_ _/_ _ _ _

Ending Date: _ _/_ _/_ _ _ _

The auditor shall not be required to enter the separation slashes. The format of the date shall be MMDDYYYY. If the auditor elects to print the report, the system shall print the reports as shown below. The header shall contain a title which indicates the type of report (i.e., 30 day, 60 day, Multi-day, etc.) on the first line. The header shall also contain the date and time of the report, the station name, station number, and analyzer number. The column headings, at a minimum, shall be underlined. A border is not required.

Station Evaluation Report Sample:

60 DAY REPORT STATION NAME & NUMBER DATE/TIME ANALYZER NUMBER			
DESCRIPTION	71 TO 80	81 & NEWER	TOTAL INSPECTIONS
Total Inspections Initial Pass Emissions Initial Pass Gas Cap Initial Pass Safety Fail Emission Fail Gas Cap Fail Safety % Fail Emission % Fail Gas Cap % Fail Safety Abort Sequence Bypass RPM Time out condition occurred			
Total Re-inspection Reinspect Emission Reinspect Gas Cap Reinspect Safety Reinspect Emissions Failed Reinspect Gas Cap Failed Reinspect Safety Failed Pre-tune Total % of Total Inspection Pre-tuned Abort Sequence Bypass RPM Time out condition occurred			

3.9.2 <u>Audit Menu Selection '2' "Station Performance Report"</u>

Audit Menu Selection "2," "STATION PERFORMANCE REPORT." The Station Performance Report sequence shall be initiated by the selection of "2" from the Audit Menu. The analyzer shall display the following four choices, and allow the auditor to use the arrow keys to highlight the appropriate choice and press “continue/enter” to select the type of station contact:

1. Compliance Audit
2. Administrative Contact
3. Investigation
4. Certification Contact

The analyzer shall display the Station Performance Report to the screen. The type of station contact shall appear as a subheading or hyphenated heading when the Station Performance Report is displayed to the screen. The analyzer shall complete the following fields automatically: Station Name, Station Number, Analyzer Number, today's date, the date of the last report, the date of the last three-day calibration and leak check and the most recent gas audit report. The analyzer shall display the most recent auditor’s notes entry, and allow the auditor to review and edit previous entries and create a new entry in the Auditor’s notes window. The analyzer shall allow for auditor entry of "P" (pass) or "F" (fail) for each item on the station equipment checklist. The analyzer shall allow for auditor entry of "Y" (yes) or "N" (no) for each item on the Audit Procedures Checklist. The analyzer shall allow for free-form auditor's notes to be entered and reviewed.

The analyzer shall allow the free-form entry of at least 5 violation codes, corrective action codes, and ticket numbers, if issued. At the completion of the entries for the Audit Procedures Checklist, the analyzer shall display the following prompt: Do you wish to enter any Defieciency Information? (Yes or No). The default for this prompt shall be No. If no is selected, the analyzer shall display the report to the screen to allow the auditor to confirm that the entries are correct. The auditor shall be required to press the “continue/enter” to confirm the entries are correct. The analyzer shall prompt the auditor to highlight and select the number of copies to be printed “1,” “2,” or “3.” If yes is selected, the analyzer shall prompt the auditor to enter the Violation Code.

If no code has been entered and the auditor pressed continue, the analyzer shall display a prompt asking the auditor to select one of the following actions: 1) Return to the Violation Code Entry Screen, 2) Violation Code Entry Completed, 3) Skip the Deficiency Information - Go to Confirmation Screen. The second action can only be displayed, when at least one deficiency code has been properly entered. The analyzer will go to the Action Code Entry Prompt. The analyzer will go back to the Violation Code Entry screen, if the auditor selects the first action. The analyzer shall go to the confirm screen if the last action is selected by the auditor.

If the entered code does not match a code contained in the DefLK.dat file, the analyzer shall display an error message indicating that the code is not acceptable and to try again. The analyzer shall display the list of codes in numerical order when the auditor presses the "F5" function key, display the list of codes in alphabetical order when the auditor presses the "F6" function key, or display the list of codes contained in the DefLK.dat file. No matter what list is displayed, the analyzer shall allow the inspector to use the arrow keys to highlight the different choices, and use the "continue/enter" key to select the appropriate code.

Once the code is selected, the analyzer shall return to the prompt requesting the Auditor to enter the Violation Code. The 40 most used violation codes will be contained in the DEFLK.DAT file, which will be received by the analyzer via the Texas Information Management System. The format of the violation codes is alphanumeric of length 5.

The analyzer shall prompt the inspector to enter the Action Codes. The analyzer shall allow the inspector to highlight and select from the following list of action codes:

ENTER THE ACTION CODES: _ _

'C' - Citation Issued,

'W'- Warning Issued,

'S' - Suspension Recommended, and

'R' - Revocation Recommended.

The analyzer shall allow the auditor to enter the action codes by pressing the letters on the keyboard that correspond to the action codes listed above. If the inspector uses the arrow keys, and presses 'continue/enter' to select, the corresponding letter shall appear in the space provided. At least one entry must be made. If the auditor presses 'continue/enter' after the first successful entry is made, the analyzer shall display a confirmation screen which lists the entered action codes, as well as two action choices: 1) continue, 2) go back to make changes. The default shall be to continue. When the auditor selects 'continue,' the analyzer shall proceed to the Ticket Number prompt. Action codes are alphanumeric of length 2, and have expected values of 'C' - for Citation Issued, 'W' for Warning Issued, 'S' for Suspension Recommended, and 'R' for Revocation Recommended.

The analyzer shall prompt the auditor to enter the Ticket Number.

ENTER THE TICKER NUMBER: _ _ _ _ _ _ _ _ _ _ _ _ _ _

Press ‘continue/enter’ when done entering the ticket number.

The analyzer shall allow the free form entry of fourteen alphanumeric characters. The analyzer shall require the auditor to press ‘continue/enter’ when the entry of the ticket number is complete. When the auditor presses ‘continue/enter’ the analyzer shall display the entered number and two action choices: 1) continue, 2) go back to make changes. The default shall be to continue. When the auditor selects ‘continue,’ the analyzer shall display the completed report and prepare to print the necessary number of copies. The format of the ticket numbers is alphanumeric of length 14.

The report generated from this selection will be stored in the PERFORM.DAT. This is both a hard disk and floppy-based file accessed through the audit screen.

The Station Performance Report shall contain the following items:

A. Station Name
B. Station Number
C. Analyzer Number
D. Today's Date
E. Date of the last Station Performance Report
F. The date of the last three-day calibration and leak check
G. The most recent gas audit
H. The Station Equipment Checklist
I. The Audit Procedures Checklist
J. The Auditor's Notes

Station Equipment: Entry of "P" or "F" required.

1. Station Sign
2. Certificate of Appointment
3. Display Board
4. Flex Probes
5. Approved Bar 90 Gases
6. Rules and Regulations Manual
7. Brake Test Area
8. Required Equipment (Laundry Marking Pen, Scraping Device, Tread Depth Gauge, Measuring Devices, ¼" Round-Hole Punch)
9. Tachometer Lead
10. Gas Cap Tester
11. Inspector on Duty

12. Inspection Bay
13. Approved Window Tint meter
14. Analyzer, Printer & Supplies
15. Overall Result

Audit Procedures: Entry of "Y" or "N" required

1. New data disk
2. Reset tamper
3. Software updates
4. Station lockout
5. Inspector lockout
6. Letter delivered
7. Technical Bulletins

Deficiencies: No entries required

1. Violation Code
2. Action Taken
3. Ticket #

For: TSI analyzers

Station Performance Report - Compliance Audit Station Name (e.g., FRIDAYS AUTOMOTIVE) Today's Date (e.g., 01/12/2000)	
Station Number	1P10753
Analyzer Number	TX123654
Today's Date	12/21/1999
Last Station Performance Report	09/21/1999
Last Three-Day Gas Calibration	12/19/1999
Last Leak Check	12/20/1999

Last Gas Audit Report						
09/21/1999 11:30				HC HangUp: ppm		
Gas	Low Label	Low Reading	P/F	Mid Label	Mid Reading	P/F
CO HC (ppm) CO2 NO_X						

Station Equipment	Pass	Fail	Audit Procedures	Pass	Fail

1. Station Sign 2. Certificate of Appointment 3. Display Board 4. Flex Probes 5. Approved Bar 90 Gases 6. Rules and Regulations Manual 7. Brake Test Area 8. Required Equipment (Laundry Marking Pen, Scraping Device, Tread Depth Gauge, Measuring Devices, ¼" Round-Hole Punch) 9. Tachometer Lead 10. Fuel Cap Tester 11. Inspector on Duty 12. Inspection Bay 13. Approved Window Tint meter 14. Analyzer, Printer & Supplies 15. Overall Result			1. New data disk 2. Reset tamper 3. Software updates 4. Station lockout 5. Inspector lockout 6. Letter delivered 7. Technical Bulletins		

Auditor Notes	
01/12/2000	CA Cksheet - OK, Tint Meter - OK, Gas Cap Tester - OK, Analyzer Audit - Pass 1/2

Deficiencies						
Violation Code (5 Digits)					Action Taken	Ticket #

Station Manager: _____ Date: _____

DPS Auditor: _____ Date: _____

For: ASM analyzers

Station Performance Report - Compliance Audit Station Name (e.g., FRIDAYS AUTOMOTIVE) Today's Date (e.g., 01/12/2000)	
Station Number, Analyzer Number Last Station Performance Report / Last Three-Day Gas Calibration Last Leak Check	1P10753, TX123654 09/21/1999, 12/19/1999 12/20/1999

Last Gas Audit Report						
09/21/1999 11:30				HC HangUp: ppm		
Gas	Low Label	Low Reading	P/F	High Label	High Reading	P/F
CO HC (ppm) CO2 NO_X						
Gas	Mid-1 Label	Mid-1 Reading	P/F	Mid-2 Label	Mid-2 Reading	P/F
CO HC (ppm) CO2 NO_X						
Gas	Zero Label	Zero Reading	P/F			
CO HC (ppm) CO2 NO_X O2						

Station Equipment	Pass	Fail	Audit Procedures	Pass	Fail

1. Station Sign 2. Certificate of Appointment 3. Display Board 4. Flex Probes 5. Approved Bar 90 Gases 6. Rules and Regulations Manual 7. Brake Test Area 8. Required Equipment (Laundry Marking Pen, Scraping Device, Tread Depth Gauge, Measuring Devices, ¼" Round-Hole Punch) 9. Tachometer Lead 10. Fuel Cap Tester 11. Inspector on Duty 12. Inspection Bay 13. Approved Window Tint meter 14. Analyzer, Printer & Supplies 15. Overall Result			1. New data disk 2. Reset tamper 3. Software updates 4. Station lockout 5. Inspector lockout 6. Letter delivered 7. Technical Bulletins		

Auditor Notes	
01/12/2000	CA Cksheet - OK, Tint Meter - OK, Gas Cap Tester - OK, Analyzer Audit - Pass 1/2

Deficiencies						
Violation Code (5 Digits)					Action Taken	Ticket #

Station Manager: _____ Date: _____

DPS Auditor: _____ Date: _____

3.9.3 <u>Audit Menu Selection ‘3’ “Inspector Evaluation Report”</u>

When the auditor selects "3" from the Audit Menu, the analyzer will display:

1. Inspector Evaluation Report
2. Multiple Repairs
3. Fast Testing
4. Emissions Reductions
5. After Hours Test
6. Consecutive Test Comparison

The system will display inspector number and name.

The analyzer shall complete the following fields automatically: today's date, the time the report was activated.

Inspector Evaluation Report Sample:

60 DAY REPORT INSPECTOR NAME & NUMBER DATE TIME			
DESCRIPTION	71 TO 80	81 & NEWER	TOTAL INSPECTIONS

Total Inspections Initial Pass Emissions Initial Pass Gas Cap Initial Pass Safety Fail Emission Fail Gas Cap Fail Safety % Fail Emission % Fail Gas Cap % Fail Safety Abort Sequence Bypass RPM Time out condition occurred			
Total Re-inspection Reinspect Emission Reinspect Gas Cap Reinspect Safety Reinspect Emissions Failed Reinspect Gas Cap Failed Reinspect Safety Failed Pre-tune Total % of Total Inspection Pre-tuned Abort Sequence Bypass RPM Time out condition occurred			

Selection Option 2 displays a prompt which asks if the auditor wants to see all the inspectors/repair technicians, or an individual inspector/repair technician. After the auditor makes this selection a screen showing the number of vehicles with retests and the number and percent of those which have more than one retest.

If the auditor selects all, the statistics are displayed for the station as a whole and for each individual inspector.

The vehicles retested by an inspector can be called from this screen and vehicle data on repairs, emissions levels and time of test can be compared.

(The purpose of this exercise is to detect repair technicians who are not repairing to manufacturers specifications, but are just tweaking carburetors.)

Selecting Option 3 "Fast Testing" asks if all or individual statistics are desired. The screen then displays the "median" time between tests; the average time for a complete test, the percent of tests started within 5 minutes of the end of the previous test. (All displays should have effective graphics.) Do not include OBD data for “Fast Testing” criteria.

Selecting Option 4 "Emissions Reductions" will ask if the auditor wants all or individual inspectors. Three categories of repair effectiveness will be evaluated, "super clean repairs" and "possible cutpoint repairs" and "indeterminate repairs."

Super clean repairs are for catalyst equipped vehicles model year 75-80 CO less than .40 percent and HC less than 100 ppm; 81 to 84 CO .30 percent and HC 75 ppm; 85 and newer CO less than .20 percent and HC less than 50 ppm.

Possible cutpoint repairs are those in which the CO or the HC is within 25 percent of the cutpoint.

Indeterminate repairs are those which are not in either of the other categories.

A repair is defined as any vehicle that has a passing and a failing record stored in the TX96 Analyzer.

The screen should display the percent of repairs that were made on catalyst vehicles and the percent of those that were made to super clean conditions. The screen should display the total number of repairs and the percent that are possible cutpoint and the percent that are indeterminate. Also average emissions reductions for all repairs and for catalyst and non-catalyst vehicles should be displayed.

An option should allow the auditor to use all repairs, or just those repaired at the station.

Selection Option 5 "After Hours Test" displays any tests that have been conducted outside of normal business hours. The auditor will be prompted to enter these hours.

Selecting Option 6 "Consecutive Test Comparison" asks for all or individual statistics. This screen will display, for a given time period, the consecutive CO, HC, and model year values. This can be done for 81 and newer vehicles for 71-80 vehicles or for all vehicles. The auditor may select all inspection, re-inspection, or all passing re-inspections. CO and HC levels should be reported in percent of actual values for the applicable model year standard. (This process is designed to detect and discourage the use of a single vehicle for all tests.) If CO or HC is greater than 110 percent of the standard then the system will display values as 110 percent.

3.9.4 Audit Menu Selection '4' "Analyzer Maintenance"

The Analyzer Maintenance Menu shall be activated by an entry of four (4) from the Audit Menu. This will present a set of maintenance functions that may be performed by the auditor. Upon selection of the Analyzer Maintenance the analyzer will display the following options:

1) Three Day Gas Calibration and Leak Check
2) Gas Calibration
3) Leak Check
4) Gas Cap Integrity Tester Calibration
99) Return to Audit Menu

A. When the auditor has selected one (1), the analyzer shall initiate a three (3)-day gas calibration and leak check sequence.

1. A three (3)-day gas calibration and leak check is required. Selection of this item shall bring up a set of both gas calibration and leak check procedures. The procedures shall be user friendly and shall indicate every step needed to properly perform the required gas calibration and leak check (including when it is necessary to turn the gas cylinder valve on and off). TNRCC/DPS reserves the right to approve the procedures. Results of the leak check and the gas calibration shall be displayed to the screen and recorded on **CAL.DAT**. The three-day calibration and leak check record will contain before and after calibration readings in **CAL.DAT**. The system shall preclude official emissions inspections (Main Menu options 1, 2, 3, and 4) after seventy-two (72) hours if a gas calibration and leak check are not performed and passed. If the analyzer fails the three (3)-day gas calibration and leak check, a message shall be displayed indicating that it failed, Main Menu 1, 2, 3, and 4 shall be precluded, and instructions shall be provided to the inspector to call for repairs.

2. When the three (3)-day gas calibration and leak check is completed, the analyzer shall return to the Audit Menu.

B. When the auditor has selected two (2) at the display prompt, the analyzer shall initiate a gas calibration sequence.

1. Selection of this item shall bring up a set of gas calibration procedures. The procedures shall be user friendly and shall indicate every step needed to properly perform the gas calibration (including when it is necessary to turn the gas cylinder valve on and off). TNRCC/DPS reserves the right to approve the procedures. Results of the gas calibration shall be displayed to the screen and recorded on the CAL.DAT. If the analyzer fails the gas calibration, a message shall be displayed indicating that it failed and instructing the inspector to call for repairs.

2. When the gas calibration is completed, the analyzer shall return to the Audit Menu.

C. When the auditor has selected three (3) the analyzer shall initiate a leak check sequence.

1. Selection of this item shall bring up a set of leak check procedures. The procedures shall be user friendly and shall indicate every step needed to properly perform the leak check (including when it is necessary to turn the gas cylinder valve on and off). TNRCC/DPS reserves the right to approve the procedures. Results of the leak check shall be displayed to the screen and recorded on the CAL.DAT. If the analyzer fails the leak check, a message shall be displayed indicating that it failed and instructing the inspector to call for repairs.

2. When the leak check is completed, the analyzer shall return to the Audit Menu.

D. When the inspector has selected five (4), the analyzer shall initiate a gas cap tester calibration sequence.

1. Selection of this item shall bring up a set of gas cap tester calibration procedures. The procedures shall be user friendly and shall indicate every step needed to properly perform the gas cap tester calibration (including when it is necessary to identify which the reference cap is being attached, and when to switch reference caps). TNRCC/DPS reserves the right to approve the procedures. Results of the gas cap tester calibration shall be displayed to the screen and recorded on the CAL.DAT. The affected fields are CAL_DATE, CAL_TIME, and GAS_CAP_CHECK_RSLT. The results shall be automatically written to

CAL.DAT file. If the analyzer fails the gas cap tester calibration, a message shall be displayed indicating that it failed and instructing the inspector to call for repairs.

2. When the gas cap calibration is completed, the analyzer shall return to the Audit Menu.

3.9.5 Audit Menu Selection '5' "Gas Audit"

The gas audit sequence shall be initiated when "5" is selected from the Audit Menu:

A. The analyzer shall display the current audit gas values, low range and mid range, and shall prompt the auditor "Do you want to change the Audit Gas Values?" If no, proceed with the Gas Audit. If yes, the analyzer shall allow entry of the new low range and mid range audit gas values, and then prompt: "Are the Audit Gas Values correct?" If no, the analyzer shall allow for reentry of the gas values. If yes, the new values shall be written to the AUDITGAS.DAT file and the analyzer shall proceed with the gas audit.

B. The analyzer shall conduct a sixty-second sample system purge followed by an automated electronic zero. The analyzer shall prompt the auditor to select whether the audit gas will be entered through the probe, or through the calibration port. The analyzer shall default to the entry through the probe. If the auditor selects entry of the audit gas through the calibration port, the analyzer will place a ‘C’ in the CAL_PORT field, and leave the HC_HANGUP field blank in the AUDITGAS.DAT file. If the auditor indicates that the gas shall be entered through the probe, the analyzer shall then measure the HC hang-up for ten-seconds and record the average.

C. The analyzer shall display the Audit Gas Values, the average HC hang-up and the sample readings (HC sample readings shall be displayed minus the average HC hang-up).

PEF .XXX Average HC HANG-UP XX PPM

Low Audit Gas Values		Sample Readings		Result
HC	XXXX	HC	XXXX	(P/F)
CO	XX.XX	CO	XX.XX	(P/F)
CO_2	XX.X	CO_2	XX.X	(P/F)
O_2	XX.X	O_2	XX.X	(N/A)

When the gas readings stabilize, press the "Enter" key.

Mid Audit Gas Values		Sample Readings		Result
HC	XXXX	HC	XXXX	(P/F)
CO	XX.XX	CO	XX.XX	(P/F)
CO_2	XX.X	CO_2	XX.X	(P/F)
O_2	XX.X	O_2	XX.X	(N/A)

When the gas readings stabilize, press the "Enter" key.

The analyzer shall compare the HC, CO and CO_2 readings to the Audit Gas Values and determine pass/fail status based on accuracy of plus 5 percent or minus 5 percent for the three gases. If any fail, the analyzer shall require a three-day calibration and leak check prior to performing any emissions test. If the analyzer fails after the introduction of the first gas, the analyzer shall continue and complete the audit and accept the introduction of the second gas. The analyzer shall display pass or fail status at the completion of the gas audit.

After the Gas audit has been completed, the analyzer shall prompt the auditor to enter the results of the gas cap tester calibration. The only choices shall be ‘P’ for pass, ‘F’ for fail, or ‘N’ for not done. The results of the gas cap calibration shall be saved in the GAS_CAP_CHECK_RSLT field of the AUDITGAS.DAT file..

Results of the gas audit shall be recorded in AUDITGAS.DAT on the hard disk and floppy.

When the gas audit is complete, the analyzer shall return to the Audit Menu.

3.9.6 <u>Audit Menu Selection '6' "Update Station and Inspector Information"</u>

The update Station and Inspector Information sequences shall be initiated when six (6) is selected from the Audit Menu.

A. The analyzer shall display the contents of the inspector file. The INSPECTR.DAT file shall contain the information for up to 100 inspectors.

B. Access codes shall be displayed as Xs. The access codes may be displayed only while holding down a key specified by the manufacturer. Changing the access codes shall be

accomplished by receiving inspector information during a successful communications refresh.

C. Entries which are to be removed from the file will be done via successful communications refresh.

D. Hold down the (specified key) key to display the access codes.

STATION.DAT
Station Number: ____char(7)
Station Name: _____char(25)
Station Street Address: _____char(20)
City: _____char(13) Zip: _____num(10)
Analyzer Number: ____num(7) -___ (extension, where applicable)
Station Exp Date _____num(6)(display format: MM/DD/YY)
Station Lockout _____char(1)
Hours of Operation (M-F): Open___num(4) Close: ___num(4)
Hours of Operation (Sat.): Open___num(4) Close: ___num(4)
Hours of Operation (Sun.): Open___num(4) Close: ___num(4)
(display format for Hours is HH:MM)
Mailing Street Address:_____char(20)
City: _____ char(13) Zip:_____num(10)
Email address:_____ char(50)

INSPECTR.DAT Inspector Last Name	Inspector First Name	Access Code	Inspector Number	Expiration Date	Lockout Flag
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

D. The changes entered by the auditor shall be recorded to STATION.DAT file.

E. System setting shall include the screen prompts that allow the TNRCC/DPS Representative to enter or edit all the information in the STATION.DAT file.

F. If the auditor chooses to lockout an inspector, the analyzer shall allow the auditor to select the affected inspector from the displayed list, enter the lockout status (‘Y’ or ‘N’).

G. The analyzer system shall a method of encryption so that the stored PIN number cannot be read as text or printed. The encryption method will be left to manufacturers' discretion and must be demonstrated during certification.

3.9.7 Audit Menu Selection '7' "Install New Data Disk"

The Install New Data Disk sequence shall be initiated when seven (7) is selected from the Audit Menu.

A. The analyzer shall display instructions, on a single screen, for changing the floppy diskette. This procedure shall properly format the new diskette. The instructions must be approved by the TNRCC.

B. When the change is complete and the analyzer security devices (doors, etc.) are secure, the analyzer shall return to the Audit Menu.

3.9.8 Audit Menu Selection '8' "Reset Date, and Time"

The reset date, and time sequence shall be initiated when eight (8) is selected from the Audit Menu.

The analyzer shall display the date, and time update screen. The time, and date can be updated by the I/M auditors when required. The analyzer shall automatically switch to daylight savings time and back to central standard time, when applicable. The analyzer date and time shall be updated when the analyzer contacts the Texas Information Management System. Upon a successful update, the analyzer shall return to the Audit Menu.

3.9.9 Audit Menu Selection '9' "Analyzer/Station Lockout"

The lockout sequence shall be initiated when "9" is selected from the Audit Menu. The analyzer manufacturer shall devise a method to allow the inspection operation (Main Menu option 1, 2, 3, and 4) to be disabled and still allow all other options to work normally. Software shall allow the auditor to set the analyzer/station lockouts listed below in items 1, 6, and 7, and clear the lockouts in items 1, 2, 3, 5, 6, 7, 8, or 9 with the understanding that these lockout could be reset during a communications session with the Texas Information Management System. Software shall allow the Texas Information Management System to set the lockouts in items 1, 4, 6, 7, 8, and 9 and clear the lockouts in items 1, 4-9. Software shall allow the manufacturer's service technician to clear items 2, or 3. The analyzer may display

the station name, station number and the analyzer number on this screen.

Lockout Status Screen

1.	State Lockout	5.	Station Certification Expired
2.	Cabinet Tamper	6.	Station Certification Suspended
3.	Floppy Tamper	7.	Station Certification Revoked
4.	Communications Failure to Pay	8.	Maximum Tests w/o Comm.

9. Maximum OBDII Tests (LOW_VOL_STATION)

No Contact Limit: XXX

Number of Test w/o Communications: XXX

The analyzer shall also display an appropriate error messages in the event of an error or a failure of the following components: Floppy Disk Failure, Gas Analyzer Tamper, Gas Calibration Failure, Hard Disk Failure, Gas Analyzer Failure, Leak Check Failure, Internal Clock Failure, and Warm-Up Failure.

3.9.10 Audit Menu Selection '10' "Software Update"

The analyzer shall perform a software update when "10" is selected from the Audit Menu.

A. When emergency software updates are required between annual software updates, the manufacturer is responsible for developing the update and provide the update to the TNRCC/DPS on a three and one-half inch (3-1/2") floppy diskette, or equivalent storage media (i.e., CD, etc.,). The TNRCC/DPS may install the update, but reserves the right to have it done by the manufacturer. If the TNRCC/DPS performs the update, multiple copies may be required.

B. The update shall be made as simple as possible for the auditor by using display driven instructions, batch files, etc.

C. Software Updates will cause the software version number to change.

D. When the update is complete, the analyzer will automatically reboot and return to Main Menu.

3.9.11 Audit Menu Selection '11' "Practical Test"

This item is optional, if the Training Mode can be operated from the Main Menu.

This function allows the auditor to have an I/M inspector perform an inspection without generating an actual vehicle inspection report.

This sequence is very similar to the Training Mode (Main Menu Option).

3.9.12 Audit Menu Selection '12' "Auditor's Notes"

This menu entry allows the auditor to make entries and comments after the monthly audit. This should allow for free form notes to be entered and reviewed.

Associated System File:	**AUDIT.NOT**	**DATE MMDDYY**
		TIME HHMM
		NOTES

3.9.13 Audit Menu Selection '13' "Search and Retrieve Test Records"

The Search and Retrieve Test Records Menu shall be activated by an entry of thirteen (13) from the Audit Menu. If the Auditor selects the inspection log search this menu, the AUDITLOG.DAT record for the successful log on shall be appended with a 'Y' in the SEARCH field, and the time of the search in the TIME field when the Auditor presses ‘continue/enter.’ The analyzer shall search the VEHICLE.DAT file for test records. The search shall locate, display, and print out test records based on the knowledge of the vehicle license number, VIN, or date/time. When a match is found for the search condition, the auditor shall be able to review the previous chronological test records as well as those which follow the target record. The auditor shall be given the option of continuing the search for the next matching test record. After the analyzer has located the test record, the auditor shall be given the option of printing the test record on the printer. After printing the analyzer will then go to the Audit Menu. The analyzer shall be able to print reprints of the VI-8b that are identical to the reprinted VI-8b’s of the station manager. The data entry screens shall be identical to screens used by the station manager. The analyzer shall be deemed acceptable if

the system allows the Auditor to enter the station manager menu by using the State Access Code. (Note: The purpose is to get a short cut to the screens that allow the station manager to reprint the VI-8b.)

The auditor shall be able to conduct an Inspection Log review on the analyzer. The analyzer shall provide the following prompt:

SELECT THE SEARCH METHOD: 1 - INSPECTION LOG
2 - TEST TYPE

If the auditor selects 1, the analyzer shall search the VEHICLE.DAT file for test records based on the knowledge of the inspector's identification number, the vehicle license number, VIN, date/time, approximate week ending or certificate number issued to the vehicle. The analyzer shall be able to locate, display, and print out the test record(s). The information shall be displayed in the format outlined in Appendix G for the Inspection Log (VI-8B), inclusive of the 'audited by' line, where applicable. The auditor shall be given the option of printing the results of the search on the printer. The auditor shall press a key designated by the manufacturer to return to the Audit Menu.

If the auditor selects 2, the analyzer shall provide the following prompt:

ENTER THE SAFETY INSPECTION TYPE

A-1 YEAR WINDSHIELD (SAFETY & EMISSIONS)	**J-1 YEAR WINDSHIELD (SAFETY ONLY)**
B-2 YEAR WINDSHIELD	**E-LOADED-2 YEAR**
C-TRAILER/MOTORCYCLE	**G-FMCSR (TRUCK)**
D-TEST & REPAIR	**H-EMISSIONS DECAL**
	K-FMCSR (TRAILER)

Once the auditor has selected, the analyzer shall prompt the auditor for the search one or more of the following search criteria: Vehicle license number, VIN, Inspector Identification Number, date/time, or certificate number. The analyzer shall search the VEHICLE.DAT file for test records that match the search criteria. The items shall be displayed in the format displayed in Appendix G, inclusive of the 'audited by' line, where applicable. The items shall be listed in sequential order according to certificate numbers. The analyzer shall place an

indicator or flag (i.e. an asterisk, question mark, etc.) beside any item whose certificate number is not next in sequence to the previous item. The auditor shall be given the option of printing the results of the search on the printer. The auditor shall press a key designated by the manufacturer to return to the Audit Menu.

3.9.14 Audit Menu Selection '14' "Analyzer Tampering/Access Report"

The system will purge this information after 12 months. This menu selection allows the auditor to review the following sample items:

1. Analyzer Tampering Lockout - the analyzer will display the tampering lockout number and give a description of the location of the tamper.

2. Clear Analyzer Tampering Lockout

3. Analyzer Service

4. Date

5. Time

3.9.15 Audit Menu Selection '15' "History Report"

This menu selection allows the auditor to review all gas calibration records, tamper history, leak check records, gas cap tester calibration history, if applicable, and gas audit records stored in the hard disk for at least the past 180 days.

3.9.16 Audit Menu Selection '16' "System Settings"

When the auditor selects "16" from the Audit Menu, the analyzer will display:

Type Station: _____

County Setting: _____

Station Volume: _____

Settings Prompt: **ENTER THE SETTING YOU WISH TO CHANGE.**

1 - Type Station

2 - County Code Setting

3 - Station Volume

4 - Special Testing (i.e. waiver tests, arbitration tests, etc.)

5 - Return to Audit Main Menu

The analyzer shall complete the display from the information contained in the STATION.DAT file. The Type Station shall display 'Public,' 'Government,' or 'Fleet.' The County Setting shall display the name of the county in which the station is to be used. The Station Volume shall display 'Low,' or 'High.' The auditor shall be able to access the type station selection by selecting '1', the county selection by entering '2', the station volume setting by entering '3,' and the special testing selection by entering '4.' The auditor shall be returned to the Audit Main Menu by entering '5', the <Esc> key, or a key designated by the manufacturer.

Type Station

The Type Station selection should access the following selections:

'P' - Public	(Lockout until print VI-8B log weekly)
'F' - Fleet	(Lockout until print VI-8B log weekly)
'G' - Government	(Lockout until print VI-8B log weekly)

After the Auditor has selected the Type Station, the analyzer shall automatically return to the System Settings Display Screen/Menu.

County Code Setting

The County Code Setting selection shall give the following prompt and access the selections:

County Code Prompt: **ENTER SELECT THE COUNTY WHERE THE ANALYZER WILL BE USED.**

Dallas - 057 **Denton - 061**

El Paso - 071	**Fort Bend - 079**
Harris - 101	**Galveston - 084**
Collin - 043	**Brazoria - 020**
Liberty - 146	**Chambers - 036**
Tarrant - 220	**Montgomery - 170**
Waller - 237	**Out of State or Federal - 000**
Other - 999	

The analyzer shall provide the list of counties shown above, excluding the codes. The auditor shall be able to select the appropriate county by using the arrows keys. The auditor shall highlight the appropriate county, and press the 'enter/continue' key to confirm his selection. The analyzer shall convert the selection to the corresponding three digit code shown above and store the code in the COUNTY_CODE field in the STATION.DAT file. The analyzer shall be designed to have the county code set by the Texas Information Management System. The county selection shall correspond to the county in which the analyzer is to be used. After the auditor has selected the County Code, the analyzer shall automatically return to the System Settings Display Screen/Menu.

Station Volume Setting

The Station Volume Setting selection shall give the following prompt:

Station Volume Setting: ENTER THE STATION VOLUME DESIGNATION

1 - HIGH VOLUME

2 - LOW VOLUME

The analyzer shall allow the auditor to select the station designation as a High Volume station, or a Low Volume station. The analyzer shall be designed to default to the low volume setting. The Station Volume Setting shall control the defaults for the minimum frequency for gas calibrations and leak checks. A Low Volume designation shall require that the gas calibrations will be conducted at least every 72 hours, and a leak check is conducted every 24 hours. A High Volume designation shall require that the gas calibrations will be conducted at least every 24 hours, and a leak check is conducted every 4 hours. The system shall preclude official emissions inspections (Main Menu options 1, 2, 3, and 4) after seventy-two (72) hours if a gas calibration and leak check are not performed and passed. If the analyzer fails the three (3)-day gas calibration and leak check, a message shall be displayed indicating that it failed, Main Menu 1, 2, 3, and 4 shall be precluded, and instructions shall be provided to the

inspector to call for repairs. After the auditor has selected the Station Volume, the analyzer shall automatically return to the System Settings Display Screen/Menu.

Special Testing

When the auditor selects "4" from the Setting Prompt, the analyzer will display:

Special Testing Prompt: **SELECT THE TYPE OF TEST TO BE CONDUCTED FROM THE LIST BELOW.**

1.	**LOW INCOME TIME EXTENSION**	**(LI)**
2.	**WAIVER - LOW MILEAGE**	**(LM)**
3.	**WAIVER - INDIVIDUAL VEHICLE**	**(IV)**
4.	**ARBITRATION/DISPUTE TEST**	**(AD)**
5.	**ACCELERATED VEHICLE RETIREMENT TEST**	**(ST)**
6.	**PARTS AVAILABILITY TIME EXTENSION**	**(PA)**
7.	**OTHER**	**(OT)**

The analyzer shall provide the list of tests shown above. The auditor shall be able to select the appropriate test by using the arrows keys or by entering the number associated with each test. The auditor shall highlight the appropriate test and press the ‘enter/continue’ key to confirm his selection. If the auditor selects 1, the analyzer shall set the SPECIAL_TEST field to ‘L.’ If the auditor selects 2, the analyzer shall set the SPECIAL_TEST field to ‘P.’ If the auditor selects 3, the analyzer shall set the SPECIAL_TEST field to ‘J’ for the next emissions test. If the auditor selects 4, the analyzer shall set the SPECIAL_TEST field to ‘E’ for the next emissions test. If the auditor selects 5, the analyzer shall set the SPECIAL_TEST field to ‘D’ for the next emissions test. If the auditor selects 6, the analyzer shall set the SPECIAL_TEST field to ‘M’ for the next emissions test. If the auditor selects 7, the analyzer shall set the SPECIAL_TEST field to ‘N’ for the next emissions test.

The analyzer shall record the results of the test and allow the inspector to enter the certificate number issued to the vehicle, regardless of the actual pass or fail result. The auditor shall be able to return to the Audit Main Menu by pressing the <Esc> key or a key determined by the manufacturer.

After the auditor has selected confirmed his selection, the analyzer shall prompt the Auditor:

THE __(TEST NAME)__ HAS BEEN SELECTED. PRESS 'ENTER/CONTINUE' TO CONFIRM. PRESS ANY OTHER KEY TO CHANGE YOUR SELECTION.

If the auditor does not press 'enter/continue', the analyzer shall return to the Special Testing Prompt/Screen. If the auditor presses 'enter/continue', the analyzer shall return to a **special menu** to allow the inspector to conduct the applicable emissions **reinspection** test.

The **special menu** shall consist of the following two selections:

1) Safety and Emissions Inspection (Main Menu selection 1), or

2) Emissions Only Inspection (Main Menu selection 3).

If the customer is in the rotation for a free reinspection (i.e., paid for the previous inspection), the analyzer shall recognize this situation and use the menu selections from Section 3.4 Reinspection (Main Menu selection 4). The analyzer shall look for the information needed to make the determination from two sources:

1) data transmitted by the Texas Information Management System, or

2) data contained in the analyzer.

Only one **reinspection** test can be administered when a special test type is selected from this menu. After the reinspection is conducted and a complete test record is written, the analyzer shall return to standard operation.

The analyzer shall not print a rejection receipt for any of the special tests regardless of the actual outcome of the inspection. The analyzer shall print a vehicle inspection report (VIR) for all special tests regardless of the actual outcome of the inspection. The analyzer shall place a two digit code next to the test type to indicate the type of special test being conducted. The two digit codes are in parenthesis next to the list of special tests.

For **all** special tests, the analyzer shall provide the inspector with the option of entering a safety certificate/decal number regardless of the actual outcome of the inspection. When the vehicle fails the test, and the inspector is prompted to enter the safety certificate/decal number, a warning message shall be displayed instructing the inspector to leave this screen blank if a safety certificate or decal will not be issued to the vehicle. If a safety certificate or decal is issued, the analyzer shall then, prompt the auditor to enter the waiver number for all special tests, except the arbitration/dispute test, selection number 4. The waiver number is an alphanumeric entry of length seven (7). The analyzer shall make the auditor enter a minimum of 4 characters, press enter, and reconfirm the entry before proceeding to the next screen (VI-30 A Prompt).

3.9.17 Audit Menu Selection '17' "Reprint VIR"

The analyzer shall conduct a reprint the a VIR from a test record. The screen prompts shall be identical to Section 3.5, beginning with the Display Records prompts, Section 3.5.3. The search shall not be limited to passing records. The analyzer shall search for all records that match the criteria whether the vehicle passed or failed.

3.9.18 Audit Menu Selection '18' "Communications Refresh"

The analyzer shall conduct a Communications Refresh as described in Main Menu Selection, in Section 3.15. The communications refresh shall not require the entry of an access code.

3.9.19 Audit Menu Selection '19' "Copy/Download Test Records"

The analyzer shall provide a State menu item that allows an auditor to copy the VEHICLE.DAT, VEHICLE.HST, AUDITLOG.DAT, and AUDITLOG.HST from the hard disk to an auditor installed floppy disk (target disk). The analyzer shall copy the AUDITLOG.DAT file on to the target disk. The system shall prompt the auditor to enter the download date. The analyzer shall copy the test records from the hard drive to the floppy disk. The date of the test records shall begin with the download date, and copy backward from the download date (i.e., records prior to the download date). The analyzer shall copy records to the disk until there are no more records on the hard drive or the disk is full. If the disk fills up prior to the copying all the records on the hard drive, the analyzer shall display the date of the last record, and the number of records copied on to the disk. The last record date shall be displayed until the auditor presses ‘continue/enter’. The analyzer shall allow the inspector to run the download procedures again. If the analyzer determines that all of the test records will fit on the floppy, the analyzer may copy the AUDITLOG.DAT file, the test records, and display one of the following:

1) the date of the oldest test record on the hard drive,
2) the 180 maximum default date,
3) or a message stating all test records have been copied.

The analyzer may prompt the auditor to format the target disk prior to copying the records. The analyzer may erase or write over any preexisting information on the target disk. If it is necessary to remove the state data disk prior to copying the files, the analyzer shall provide instructions for the auditor to follow to remove the data disk and reinstall the data disk after the copy procedure is complete.

3.9.20 Audit Menu Selection '20' "Missing, or Voided Certificates"

3.9.20a **Access Code Entry:** **ENTER YOUR INSPECTOR'S ACCESS CODE**

Programming Criteria: The TX96 Analyzer shall be designed to automatically place the Auditor's 6-digit employee identification number in the INSPECTOR_NUM field of the test record when this function is successfully completed.

Associated System File: **VEHICLE.DAT** **REPL_ID_NUM**

- -

3.9.20b **Certificate Type Prompt:** **INDICATE THE TYPE OF INSPECTION CERTIFICATE(S).**

A-1 YEAR WINDSHIELD (SAFETY & EMISSIONS)	**J-1 YEAR WINDSHIELD (SAFETY ONLY)**
B-2 YEAR WINDSHIELD	**E-LOADED-2 YEAR**
C-TRAILER/MOTORCYCLE	**G-FMCSR (TRUCK)**
D-TEST & REPAIR	**H-EMISSIONS TEST ONLY DECAL**
K-FMCSR (TRAILER)	

Programming Criteria: The system shall only accept the following entries: 'A,' 'B,' 'C,' 'D,' 'E,' 'G,' 'H,' 'J,' or 'K.' Each entry shall be followed by hitting the "enter/continue" key. The system shall display the two previous numeric entries, and the type of certificate or decal that needs to be accounted for. The system shall display the previous two entries, and the type of certificate or decal that caused the lockout or prevention of subsequent official inspections.

Associated System File: **VEHICLE.DAT** **SAFE_TEST_TYPE**

- -

3.9.20c **Certificate Condition Prompt:**

INDICATE THE CONDITION OF THE INSPECTION CERTIFICATE(S).

V - VOIDED **M - MISSING**

Programming Criteria: The system shall only accept the following entries: V-voided, or M - missing. Each entry shall be followed by hitting the "enter/continue" key.

Associated System File: **VEHICLE.DAT** **CERT_COND**
DECAL_COND

- -

3.9.20d **Number of Certificates Prompt:** **INDICATE HOW MANY CERTIFICATES/DECALS ARE AFFECTED.**

1 - ONE **2 - MORE THAN ONE**

Programming Criteria: If the auditor selects 1, display the next prompt. If the auditor selects 2, the system shall display prompt number 3.9.20f.

- -

3.9.20e **Certificate Number Prompt:** **ENTER THE INSPECTION CERTIFICATE/DECAL NUMBER**.

Programming Criteria:

A minimum of six (6) and maximum of nine (9) characters are required for this field. The system shall write a test record which shall consist of the current date in the TEST_DATE field, the 6-digit employee identification number of the auditor voiding the certificates/decals in the REPL_ID_NUM, the type of certificate in the SAFE_TEST_TYPE field, the entered certificate number in the CERT_NUM field, and the previously entered condition of the certificates (i.e., 'V'-voided, 'M'-missing) in the CERT_COND field in the VEHICLE.DAT file, or the entered decal number in the DECAL_NUM field, and the previously entered condition of the decal in the DECAL_COND field in the VEHICLE.DAT file. If the miss/void function is being conducted using the station manager menu, the entry in the REPL_ID_NUM shall be 10 9's (i.e., '9999999999'). The record shall be stored on the analyzer and transmitted to the Texas Information Management System along with the next emissions test. The analyzer will store the information in the VEHICLE.DAT file and print it on the weekly

inspection log report (VI-8B). The void indicator shall show 'VOID', if 'V' is in the CERT_COND (or DECAL_COND) field, or 'MISS', if 'M' is in the CERT_COND (or DECAL_COND) field. Then, the analyzer shall return to the Audit main menu.

The records for missing or voided certificates/decals must contain entries in the following fields, at a minimum, to be accepted as a valid test record:

VERSION		LICENSE_NUM	(Set to 'MISSVOID')
TEST_DATE	(Date of Entry)	SAFE_TEST_TYPE	
TEST_START_TIME	(Time of Entry)	TIMEOUT_FLAG	(Set to 'N')
TEST_END_TIME	(Time of Entry)	CERT_NUM	(Beginning Certificate Number)
STATION_NUM		CERT_NUM_2	(Ending Certificate Number)
STATION_NAME		CERT_COND	
ANALYZER_NUMBER		TIME_REDO	(Set to 'N')
INSPECTOR_NUM		DECAL_NUM	(Beginning Decal Number)
INSPECTOR_LNAME			
INSPECTOR_FNAME		DECAL_COND	
COUNTY_CODE			
VIN_ID_NUM	(Set to 'MISSVOID')	REPL_ID_NUM	(ID # of Miss/Void auditor)

(All other fields shall be appropriately filled with blanks/spaces and zeros).

The analyzer shall complete the VIN_ID_NUM and LICENSE_NUM fields automatically when this function is conducted by the auditor.

<u>Associated System File:</u> **VEHICLE.DAT**

CERT_NUM
TEST_DATE
CERT_COND
DECAL_NUM
DECAL_COND
REPL_ID_NUM
SAFE_TEST_TYPE

- - - -

BEGINNING:_____ ENDING:_____

Programming Criteria:

A minimum of six (6) and maximum of nine (9) characters are required for each field. The system shall write a test record for the certificate range indicated by the auditor. The test record shall consist of the current date in the TEST_DATE field, the 6-digit employee identification number of the auditor voiding the certificates/decals in the REPL_ID_NUM field, the type of certificate in the SAFE_TEST_TYPE field, the entered beginning certificate number in the CERT_NUM field, the entered ending certificate number in the CERT_NUM_2 field, and the previously entered condition of the certificates (i.e., 'V'-voided, 'M'-missing) in the CERT_COND field in the VEHICLE.DAT file, or the entered beginning decal number in the DECAL_NUM field, the entered ending certificate number in the DECAL_NUM_2 field, and the previously entered condition of the decal in the DECAL_COND field in the VEHICLE.DAT file. If the miss/void function is being conducted using the station manager menu, the entry in the REPL_ID_NUM shall be 10 9's (i.e., '9999999999'). The record shall be stored on the analyzer and transmitted to the Texas Information Management System along with the next emissions test. The analyzer will store the information in the VEHICLE.DAT file and print it on the weekly inspection log report (VI-8B). Each certificate number in the range shall appear on the Inspection Log (VI-8B) as a separate entry. For example, the range of certificates numbered 001 to 005 shall appear on the Inspection Log on five separate lines. Each line will have the same void indication. The void indicator shall show 'VOID', if 'V' is in the CERT_COND (or DECAL_COND) field, or 'MISS', if 'M' is in the CERT_COND (or DECAL_COND) field. Then, the analyzer shall return to the main menu.

The analyzer shall limit the range of certificates that can be voided based on the beginning certificate number that is entered by the auditor. The maximum ending certificate number shall be the next multiple of 50. For example, if the auditor enters A00238432, the maximum entry is A00238450. If the auditor enters A32985353, the maximum entry is A32985400. For decals, the maximum ending decal number shall be the next multiple of 10. If the auditor enters V32994822, the maximum entry is V32994830.

The records for missing or voided certificates/decals must contain entries in the following fields, at a minimum, to be accepted as a valid test record:

VERSION		LICENSE_NUM	(Set to 'MISSVOID')
TEST_DATE	(Date of Entry)	SAFE_TEST_TYPE	
TEST_START_TIME	(Time of Entry)	TIMEOUT_FLAG	(Set to 'N')

TEST_END_TIME	(Time of Entry)	CERT_NUM	(Beginning Certificate Number)
STATION_NUM		CERT_NUM_2	(Ending Certificate Number)
STATION_NAME		CERT_COND	
ANALYZER_NUMBER		TIME_REDO	(Set to 'N')
INSPECTOR_NUM		DECAL_NUM	(Beginning Decal Number)
INSPECTOR_LNAME		DECAL_NUM_2	(Ending Decal Number)
INSPECTOR_FNAME		DECAL_COND	
COUNTY_CODE			
VIN_ID_NUM	(Set to 'MISSVOID')	REPL_ID_NUM	(ID # of Miss/Void auditor)

(All other fields shall be appropriately filled with blanks/spaces and zeros).

The analyzer shall complete the VIN_ID_NUM and LICENSE_NUM fields automatically when this function is conducted by the auditor.

Associated System File: **VEHICLE.DAT**

CERT_NUM
CERT_NUM_2
TEST_DATE
CERT_COND
DECAL_NUM
DECAL_NUM_2
DECAL_COND
REPL_ID_NUM
SAFE_TEST_TYPE

3.9.21 Audit Menu Selection '21' "Certificate Correction/Replacement"

3.9.21a Certificate Search Prompt: ENTER THE SEARCH CRITERIA.

CERTIFICATE/DECAL NUMBER: _____
CERTIFICATE/DECAL TYPE: _____
VEHICLE VIN: _____
VEHICLE PLATE NUMBER: _____

Programming Criteria: The system shall allow the auditor to enter one or more of the search criteria. The system shall locate the vehicle's most recent passing test record by searching the records currently stored on the analyzer.

Associated System File: **VEHICLE.DAT**

CERT_NUM
DECAL_NUM
VIN_ID_NUM
LICENSE_NUM
SAFE_TEST_TYPE

- -

3.9.21b **Certificate Number Prompt:** **ENTER THE REPLACEMENT INSPECTION CERTIFICATE/DECAL NUMBER**.

Programming Criteria: A minimum of six (6) and maximum of nine (9) characters are required for this field. Upon confirmation of the replacement certificate/decal number, the analyzer shall write one test record.

The test record shall place the current date and time in the TEST_DATE and TEST_START_TIME field, the date and time of the target record in the ORIG_TEST_DATE, and ORIG_TEST_TIME fields, the 6-digit employee identification number of the auditor replacing the certificate/decal in the REPL_ID_NUM field, and the type of certificate in the SAFE_TEST_TYPE field. If the replacment is being conducted using the station manager menu, the entry in the REPL_ID_NUM shall be 10 9's (i.e., '9999999999'). For certificate replacement, the record shall be a duplicate of the target test record with an 'R' in the CERT_COND field, the replacement certificate number in the CERT_NUM field, and the certificate number of the target test record (the voided certificate number) in the CERT_NUM_2 field in the VEHICLE.DAT file. For decal replacement, the record shall be a duplicate of the target test record with an 'R' in the DECAL_COND field, the replacement decal number in the DECAL_NUM field, the certificate number of the target test record (the voided decal number) in the DECAL_NUM_2 field in the VEHICLE.DAT file. The analyzer will store the information in the VEHICLE.DAT file and print it on the weekly inspection log report (VI-8B). The entry shall appear on two separate lines on the Inspection Log (VI-8B). The first line shall contain the date of the original test, the type of certificate (or decal), the void indicator displaying 'VOID,' and the certificate (or decal) number of the target test record (i.e., the certificate number contained in CERT_NUM_2, or decal number contained in DECAL_NUM_2). The second line shall contain the entries from the duplicate using the replacement certificate number as the valid certificate number. The void indicator in this line shall display 'REPL.' The void indicator shall show 'REPL,' if 'R' is in the CERT_COND field or DECAL_COND field. The system shall transmit the test record to the Texas Information Management System, and return to the main menu.

Associated System File:	**VEHICLE.DAT**	**CERT_NUM**
		CERT_NUM_2
		TEST_DATE
		CERT_COND
		DECAL_NUM
		DECAL_NUM_2
		DECAL_COND
		REPL_ID_NUM
		SAFE_TEST_TYPE

3.9.22 Audit Menu Selection '22' "Status Screen"

The Auditors would like to access one screen which will:

- display the station and analyzer number, and software version number
- display the status of each lockout,
- display the contact limit, and the value of the no-contact limit counter, and
- display the date of the last gas calibration, leak check, and gas cap tester calibration.

When the auditor has selected twenty-two (22), the analyzer shall display the Status Screen. The analyzer shall use information stored in the CAL.DAT file and other sources to generate the Status Screen.

Status Screen:

1. Station Number
2. Analyzer Number
3. Propane Equivalency Factor (PEF) Number (N/A for OBD analyzers)
4. Span Gas Cylinder Values (N/A for OBD analyzers)
5. Date/time of last gas calibration & leak check (N/A for OBD analyzers)
6. Remaining space will store approximately test records (the analyzer should fill in the blank with a number.)
7. Date analyzer was last serviced
8. Current date and time
9. Software Version Number

Lockout Status Screen

1. State Lockout
2. Cabinet Tamper
3. Floppy Tamper
4. Communications Failure to Pay
5. Station Certification Expired
6. Station Certification Suspended
7. Station Certification Revoked
8. Maximum Tests w/o Comm.
9. Maximum OBDII Tests (LOW_VOL_STATION)

No Contact Limit : XXX
Number of Test w/o Communications: XXX

The analyzer shall also display an appropriate error messages in the event of an error or a failure of the following components: Floppy Disk Failure, Gas Analyzer Tamper, Gas Calibration Failure, Hard Disk Failure, Gas Analyzer Failure, Leak Check Failure, Internal Clock Failure, and Warm-Up Failure.

3.10 Main Menu Selection '10' "Recall Aborted Inspection"

3.10.1 Access Code Prompt: ENTER YOUR INSPECTOR'S ACCESS CODE

Programming Criteria:

The TX96 analyzer shall be designed to require the entry of the access code via the 2-D bar code reader. The inspector shall be required to enter his access code using the bar code reader for every inspection.

The TX96 analyzer shall be designed to require the entry of a special access code by the certified inspector before an official emissions inspection can begin. The access code shall neither be displayed nor printed on the Inspection Vehicle Inspection Report. This access code will be verified and linked to existing I/M Inspector number contained in the **INSPECTR.DAT** file. The analyzer shall not accept duplicate access code for different inspectors. Each inspector's access code shall be unique. The analyzer shall allow three attempts to enter a valid access code. Following each of the first two attempts, Error Message 1 shall be displayed. Error Message 2 shall be displayed for 5 minutes following the third attempt or until the inspector presses "enter/continue". The system shall then return to the main menu.

Error Messages: **1. "YOUR ACCESS CODE IS NOT VALID--TRY AGAIN"**

2. **"THE ACCESS CODE ENTERED IS NOT VALID. VERIFY YOUR ACCESS CODE NUMBER WITH YOUR LOCAL DPS OFFICE."**

Associated System File: **INSPECTR.DAT** **ACCESS_CODE**

- -

3.10.1a **PIN Number Prompt:** **ENTER YOUR INSPECTOR'S PIN NUMBER**

Programming Criteria:

The TX96 analyzer shall be designed to require the entry of a special PIN by the certified inspector before an official emissions inspection can begin. The PIN shall neither be displayed nor printed on the Inspection Vehicle Inspection Report. This access code will be verified and linked to existing I/M Inspector number contained in the **INSPECTR.DAT** file. The analyzer shall not accept duplicate PINs for different inspectors. Each inspector's access code shall be unique. The PIN will be encrypted on the analyzer and is unreadable to anyone. Also, any other files that contain the PIN (i.e. INSPECTR.REC) must be unreadable to anyone. The analyzer may encrypt or delete these files. The analyzer shall allow three attempts to enter a valid access code. Following each of the first two attempts, Error Message 1 shall be displayed. Error Message 2 shall be displayed for 5 minutes following the third attempt or until the inspector presses "enter/continue". The system shall then return to the main menu.

Error Messages:

1. **"YOUR PIN IS NOT VALID--TRY AGAIN"**

2. **"THE PIN ENTERED IS NOT VALID. CONTACT YOUR LOCAL DPS OFFICE TO RESET YOUR PIN."**

Associated System File: **INSPECTR.DAT** **PIN_NO**

- -

3.10.2 **Date Expiration Prompt:** **YOUR STATION/INSPECTOR CERTIFICATION EXPIRATION DATE IS MM DD YY**

Programming Criteria: The analyzer will then check the license expiration date and lockout flag for the inspector in the inspector file. The station license renewal date and lockout flag will then be checked in the station file. If either the station or the inspector license expiration date is within 60 days of today then the analyzer will display Message 1 indicating the expiration date. If the inspector or station dates have passed, Message 2 will be displayed. The analyzer shall countdown the final five days prior to the expiration date of the inspector or the station certification. The analyzer shall display Message 3 in addition to Message 1 or 2 during the five-day countdown. If it is thirty days past, the inspector or station date the system will set the station lockout flag in the station file or the inspector lockout flag in the inspector file to "Y" to indicate lockout has occurred.

If either the station or the inspector lockout flag is set, then analyzer will display a message that indicates lockout has occurred and returns to the main menu.

Error Messages:

1. **YOUR (STATION/INSPECTOR) CERTIFICATION EXPIRES MM/DD/YY.**

2. **YOUR STATION /OR INSPECTOR CERTIFICATION EXPIRED (date). CONTACT YOUR LOCAL DPS OFFICE.**

3. **YOUR (STATION/INSPECTOR) CERTIFICATION WILL EXPIRE IN X (5, 4, 3, 2, 1) DAY(S).**

Associated System File:		
	STATION.DAT	**STAT_EXP_DATE**
	INSPECTR.DAT	**INSP_EXP_DATE**
	LOCKOUT.DAT	
		INSP_LOCKOUT_FLAG
		STATE_LOCKOUT

- - - -

Programming Criteria: The system will display the license number and VIN of all records currently contained in RECALL.DAT file. The inspector will select the desired record.

The system will then display vehicle information for verification/modification by the inspector.

- -

3.10.4 Recall Aborted Test Logic

Programming Criteria: Based on the value of the test_type field in the RECALL.DAT file, the system will perform the test sequence, 'Safety and Emissions Inspection,' 'Safety Only Inspection,' 'Emissions Only Inspection' or 'Reinspection' as defined in 3.1, 3.2, 3.3, or 3.4, respectively.

Associated System Files: **RECALL.DAT TEST_TYPE**

1 - Safety and Emissions Inspection

2 - Safety Only Inspection

3 - Emissions Only Inspection

4 - Reinspection

3.11 Gas Cap Integrity Test

The gas cap integrity check is an integral part of the TX96 Analyzer system. It shall be a fully automatic feature of the analyzer system.

3.11.1 Gas Cap Connect Prompt:

REMOVE THE GAS CAP FROM THE VEHICLE AND CONNECT IT TO THE GAS CAP TESTER. REFER TO THE OPERATOR'S MANUAL, IF REQUIRED.

Programming Criteria: After the test is complete, the system shall then display the result.

Error Message: **ONLY 'CONTINUE/ENTER' WILL BE ACCEPTED--TRY AGAIN**

3.12 Main Menu Selection '12' "Missing, or Voided Certificates"

This selection works better using two submenus to accommodate accounting for inspection certificates, and/or emissions only decals.

3.12.1 Access Code Prompt: ENTER YOUR INSPECTOR'S ACCESS CODE

Programming Criteria:

The TX96 analyzer shall be designed to require the entry of the access code via the 2-D bar code reader. The inspector shall be required to enter his access code using the bar code reader for every inspection.

The TX96 analyzer shall be designed to require the entry of a special access code by the certified inspector before an official emissions inspection can begin. The access code shall neither be displayed nor printed on the Inspection Vehicle Inspection Report. This access code will be verified and linked to existing I/M Inspector number contained in the **INSPECTR.DAT** file. The analyzer shall not accept duplicate access code for different inspectors. Each inspector's access code shall be unique. The analyzer shall allow three attempts to enter a valid access code. Following each of the first two attempts, Error Message 1 shall be displayed. Error Message 2 shall be displayed for 5 minutes following the third attempt or until the inspector presses "enter/continue". The system shall then return to the main menu.

Error Messages:

1. **"YOUR ACCESS CODE IS NOT VALID--TRY AGAIN"**

2. **"THE ACCESS CODE ENTERED IS NOT VALID. VERIFY YOUR ACCESS CODE NUMBER WITH YOUR LOCAL DPS OFFICE."**

Associated System File: **INSPECTR.DAT** **ACCESS_CODE**

- -

3.12.1a **PIN Number Prompt:** **ENTER YOUR INSPECTOR'S PIN NUMBER**

Programming Criteria:

The TX96 analyzer shall be designed to require the entry of a special PIN by the certified inspector before an official emissions inspection can begin. The PIN shall neither be displayed nor printed on the Inspection Vehicle Inspection Report. This access code will be verified and linked to existing I/M Inspector number contained in the **INSPECTR.DAT** file. The analyzer shall not accept duplicate PINs for different inspectors. Each inspector's access code shall be unique. The PIN will be encrypted on the analyzer and is unreadable to anyone. Also, any other files that contain the PIN (i.e. INSPECTR.REC) must be unreadable to anyone. The analyzer may encrypt or delete these files. The analyzer shall allow three attempts to enter a valid access code. Following each of the first two attempts, Error Message 1 shall be displayed. Error Message 2 shall be displayed for 5 minutes following the third attempt or until the inspector presses "enter/continue". The system shall then return to the main menu.

Error Messages:

1. **"YOUR PIN IS NOT VALID--TRY AGAIN"**

2. **"THE PIN ENTERED IS NOT VALID. CONTACT YOUR LOCAL DPS OFFICE TO RESET YOUR PIN."**

Associated System File: **INSPECTR.DAT** **PIN_NO**

- -

3.12.2 **Date Expiration Prompt:** **YOUR STATION/INSPECTOR CERTIFICATION EXPIRATION DATE IS MM DD YY**

Programming Criteria: The analyzer will then check the license expiration date and lockout flag for the inspector in the inspector file. The station license renewal date and lockout flag will then be checked in the station file. If either the station or the inspector license expiration date is within 60 days of today then the analyzer will display Message 1 indicating the expiration date. If the inspector or station dates have passed, Message 2 will be displayed. The analyzer shall countdown the final five days prior to the expiration date of the inspector or the station certification. The analyzer shall display Message 3 in addition to Message 1 or 2 during the five-day countdown. If it is thirty days past the inspector or

station expiration date, the system will set the station lockout flag in the station file or the inspector lockout flag in the inspector file to "Y" to indicate lockout has occurred.

If either the station or the inspector lockout flag is set, the analyzer will display a message that indicates lockout has occurred and returns to the main menu.

Error Messages:

1. **YOUR (STATION/INSPECTOR) CERTIFICATION EXPIRES MM/DD/YY.**

2. **YOUR STATION /OR INSPECTOR CERTIFICATION EXPIRED (date). YOU ARE NOT AUTHORIZED TO PERFORM ANY EMISSIONS INSPECTION AT THIS TIME. PLEASE CONTACT YOUR LOCAL DPS OFFICE.**

3. **YOUR (STATION/INSPECTOR) CERTIFICATION WILL EXPIRE IN X (5, 4, 3, 2, 1) DAY(S).**

Associated System File:		
	INSPECTR.DAT	**INSP_EXP_DATE**
	STATION.DAT	**STAT_EXP_DATE**
	LOCKOUT.DAT	**INSP_LOCKOUT_FLAG**
		STATE_LOCKOUT

- - - -

Programming Criteria: The system shall only accept the following entries: ‘A,’ ‘B,’ ‘C,’ ‘D,’ ‘E,’ ‘G,’ ‘H,’ ‘J,’ or ‘K.’ Each entry shall be followed by hitting the “enter/continue” key. The system shall display the two previous numeric entries, and the type of certificate or decal that needs to be accounted for. The system shall display the previous two entries, and the type of certificate or decal that caused the lockout or prevention of subsequent official inspections.

Associated System File: **VEHICLE.DAT** **SAFE_TEST_TYPE**

- -

3.12.3 Certificate Condition Prompt:

INDICATE THE CONDITION OF THE INSPECTION CERTIFICATE(S).

V - VOIDED **M - MISSING**

Programming Criteria: The system shall only accept the following entries: V-voided, or M - missing. Each entry shall be followed by hitting the “enter/continue” key.

Associated System File: **VEHICLE.DAT** **CERT_COND**
DECAL_COND

- -

3.12.4 Number of Certificates Prompt: **INDICATE HOW MANY CERTIFICATES/DECALS ARE AFFECTED.**

1 - ONE **2 - MORE THAN ONE**

Programming Criteria: If the inspector selects 1, display the next prompt. If the inspector selects 2, the system shall display prompt number 3.12.6.

- -

3.12.5 <u>Certificate Number Prompt:</u> ENTER THE INSPECTION CERTIFICATE/DECAL NUMBER.

<u>Programming Criteria:</u>

A minimum of six (6) and maximum of nine (9) characters are required for this field. The system shall write a test record which shall consist of the current date in the TEST_DATE field, the 6-digit employee identification number of the inspector voiding the certificates/decals in the REPL_ID_NUM, the type of certificate in the SAFE_TEST_TYPE field, the entered certificate number in the CERT_NUM field, and the previously entered condition of the certificates (i.e., 'V'-voided, 'M'-missing) in the CERT_COND field in the VEHICLE.DAT file, or the entered decal number in the DECAL_NUM field, and the previously entered condition of the decal in the DECAL_COND field in the VEHICLE.DAT file. If the miss/void function is being conducted using the station manager menu, the entry in the REPL_ID_NUM shall be 10 9's (i.e., '9999999999'). The record shall be stored on the analyzer and transmitted to the Texas Information Management System along with the next emissions test. The analyzer will store the information in the VEHICLE.DAT file and print it on the weekly inspection log report (VI-8B). The void indicator shall show 'VOID', if 'V' is in the CERT_COND (or DECAL_COND) field, or 'MISS', if 'M' is in the CERT_COND (or DECAL_COND) field. Then, the analyzer shall return to the main menu.

The records for missing or voided certificates/decals must contain entries in the following fields, at a minimum, to be accepted as a valid test record:

VERSION		LICENSE_NUM	(Set to 'MISSVOID')
TEST_DATE	(Date of Entry)	SAFE_TEST_TYPE	
TEST_START_TIME	(Time of Entry)	TIMEOUT_FLAG	(Set to 'N')
TEST_END_TIME	(Time of Entry)	CERT_NUM	(Beginning Certificate Number)
STATION_NUM		CERT_NUM_2	(Ending Certificate Number)
STATION_NAME		CERT_COND	
ANALYZER_NUMBER		TIME_REDO	(Set to 'N')
INSPECTOR_NUM		DECAL_NUM	(Beginning Decal Number)
INSPECTOR_LNAME			
INSPECTOR_FNAME		DECAL_COND	
COUNTY_CODE			
VIN_ID_NUM	(Set to 'MISSVOID')	REPL_ID_NUM	(ID # of Miss/Void auditor)

(All other fields shall be appropriately filled with blanks/spaces and zeros).

The analyzer shall complete the VIN_ID_NUM and LICENSE_NUM fields automatically when this function is conducted by the inspector.

Associated System File:	**VEHICLE.DAT**	**CERT_NUM**
		TEST_DATE
		CERT_COND
		DECAL_NUM
		DECAL_COND
		REPL_ID_NUM
		SAFE_TEST_TYPE

- - - -

'M' is in the CERT_COND (or DECAL_COND) field. Then, the analyzer shall return to the main menu.

The analyzer shall limit the range of certificates that can be voided based on the beginning certificate number that is entered by the inspector. The maximum ending certificate number shall be the next multiple of 50. For example, if the inspector enters A00238432, the maximum entry is A00238450. If the inspector enters A32985353, the maximum entry is A32985400. For decals, the maximum ending decal number shall be the next multiple of 10. If the inspector enters V32994822, the maximum entry is V32994830.

The records for missing or voided certificates/decals must contain entries in the following fields, at a minimum, to be accepted as a valid test record:

VERSION		LICENSE_NUM	(Set to 'MISSVOID')
TEST_DATE	(Date of Entry)	SAFE_TEST_TYPE	
TEST_START_TIME	(Time of Entry)	TIMEOUT_FLAG	(Set to 'N')
TEST_END_TIME	(Time of Entry)	CERT_NUM	(Beginning Certificate Number)
STATION_NUM		CERT_NUM_2	(Ending Certificate Number)
STATION_NAME		CERT_COND	
ANALYZER_NUMBER		TIME_REDO	(Set to 'N')
INSPECTOR_NUM		DECAL_NUM	(Beginning Decal Number)
INSPECTOR_LNAME		DECAL_NUM_2	(Ending Decal Number)
INSPECTOR_FNAME		DECAL_COND	
COUNTY_CODE			
VIN_ID_NUM	(Set to 'MISSVOID')	REPL_ID_NUM	(ID # of Miss/Void auditor)

(All other fields shall be appropriately filled with blanks/spaces and zeros).

The analyzer shall complete the VIN_ID_NUM and LICENSE_NUM fields automatically when this function is conducted by the inspector.

<u>Associated System File:</u> **VEHICLE.DAT** **CERT_NUM**
CERT_NUM_2
TEST_DATE
CERT_COND
DECAL_NUM

DECAL_NUM_2

DECAL_COND

REPL_ID_NUM

SAFE_TEST_TYPE

3.13 Main Menu Selection '13' "Certificate Correction/Replacement"

This selection works better using two submenus to accommodate replacing inspection certificates, and emissions only decals.

3.13.1 Access Code Prompt: ENTER YOUR INSPECTOR'S ACCESS CODE

Programming Criteria:

The TX96 analyzer shall be designed to require the entry of the access code via the 2-D bar code reader. The inspector shall be required to enter his access code using the bar code reader for every inspection.

The TX96 analyzer shall be designed to require the entry of a special access code by the certified inspector before an official emissions inspection can begin. The access code shall neither be displayed nor printed on the Inspection Vehicle Inspection Report. This access code will be verified and linked to existing I/M Inspector number contained in the **INSPECTR.DAT** file. The analyzer shall not accept duplicate access code for different inspectors. Each inspector's access code shall be unique. The analyzer shall allow three attempts to enter a valid access code. Following each of the first two attempts, Error Message 1 shall be displayed. Error Message 2 shall be displayed for 5 minutes following the third attempt or until the inspector presses "enter/continue". The system shall then return to the main menu.

Error Messages:

1. **"YOUR ACCESS CODE IS NOT VALID--TRY AGAIN"**

2. **"THE ACCESS CODE ENTERED IS NOT VALID. VERIFY YOUR ACCESS CODE NUMBER WITH YOUR LOCAL DPS OFFICE."**

Associated System File: **INSPECTR.DAT** **ACCESS_CODE**

- -

3.13.1a **<u>PIN Number Prompt:</u>** **ENTER YOUR INSPECTOR'S PIN NUMBER**

<u>Programming Criteria:</u>

The TX96 analyzer shall be designed to require the entry of a special PIN by the certified inspector before an official emissions inspection can begin. The PIN shall neither be displayed nor printed on the Inspection Vehicle Inspection Report. This access code will be verified and linked to existing I/M Inspector number contained in the **INSPECTR.DAT** file. The analyzer shall not accept duplicate PINs for different inspectors. Each inspector's access code shall be unique. The PIN will be encrypted on the analyzer and is unreadable to anyone. Also, any other files that contain the PIN (i.e. INSPECTR.REC) must be unreadable to anyone. The analyzer may encrypt or delete these files. The analyzer shall allow three attempts to enter a valid access code. Following each of the first two attempts, Error Message 1 shall be displayed. Error Message 2 shall be displayed for 5 minutes following the third attempt or until the inspector presses "enter/continue". The system shall then return to the main menu.

<u>Error Messages:</u>

1. **"YOUR PIN IS NOT VALID--TRY AGAIN"**

2. **"THE PIN ENTERED IS NOT VALID. CONTACT YOUR LOCAL DPS OFFICE TO RESET YOUR PIN."**

<u>Associated System File:</u> **INSPECTR.DAT** **PIN_NO**

- -

3.13.2 **<u>Date Expiration Prompt:</u>** **YOUR STATION/INSPECTOR CERTIFICATION EXPIRATION DATE IS MM DD YY**

<u>Programming Criteria:</u> The analyzer will then check the license expiration date and lockout flag for the inspector in the inspector file. The station license renewal date and lockout flag will then be checked in the station file. If either the station or the inspector license expiration date is within 60 days of today then the analyzer will display Message 1 indicating the expiration date. If the inspector or station dates have passed, Message 2 will be displayed. The analyzer shall countdown the final five days prior to the expiration

date of the inspector or the station certification. The analyzer shall display Message 3 in addition to Message 1 or 2 during the five-day countdown. If it is thirty days past the inspector or station expiration date, the system will set the station lockout flag in the station file or the inspector lockout flag in the inspector file to "Y" to indicate lockout has occurred.

If either the station or the inspector lockout flag is set, the analyzer will display a message that indicates lockout has occurred and returns to the main menu.

Error Messages:

1. **YOUR (STATION/INSPECTOR) CERTIFICATION EXPIRES MM/DD/YY.**

2. **YOUR STATION /OR INSPECTOR CERTIFICATION EXPIRED (date). YOU ARE NOT AUTHORIZED TO PERFORM ANY EMISSIONS INSPECTION AT THIS TIME. PLEASE CONTACT YOUR LOCAL DPS OFFICE.**

3. **YOUR (STATION/INSPECTOR) CERTIFICATION WILL EXPIRE IN X (5, 4, 3, 2, 1) DAY(S).**

Associated System File:		
	INSPECTR.DAT	**INSP_EXP_DATE**
	STATION.DAT	**STAT_EXP_DATE**
	LOCKOUT.DAT	**INSP_LOCKOUT_FLAG**
		STATE_LOCKOUT

- - - -

Programming Criteria: The system shall allow the inspector to enter one or more of the search criteria. The system shall locate the vehicle's most recent passing test record by searching the records currently stored on the analyzer.

Associated System File: **VEHICLE.DAT**

CERT_NUM
DECAL_NUM
VIN_ID_NUM
LICENSE_NUM
SAFE_TEST_TYPE

- -

3.13.4 Certificate Number Prompt: **ENTER THE REPLACEMENT INSPECTION CERTIFICATE/DECAL NUMBER**.

Programming Criteria: A minimum of six (6) and maximum of nine (9) characters are required for this field. Upon confirmation of the replacement certificate/decal number, the analyzer shall write one test record.

The test record shall place the current date and time in the TEST_DATE and TEST_START_TIME field, the date and time of the target record in the ORIG_TEST_DATE, and ORIG_TEST_TIME fields, the ID number of the person replacing the certificate/decal in the REPL_ID_NUM field, and the type of certificate in the SAFE_TEST_TYPE field. If the replacment is being conducted using the station manager menu, the entry in the REPL_ID_NUM shall be 10 9's (i.e., '9999999999'). For certificate replacement, the record shall be a duplicate of the target test record with an 'R' in the CERT_COND field, the replacement certificate number in the CERT_NUM field, and the certificate number of the target test record (the voided certificate number) in the CERT_NUM_2 field in the VEHICLE.DAT file. For decal replacement, the record shall be a duplicate of the target test record with an 'R' in the DECAL_COND field, the replacement decal number in the DECAL_NUM field, the certificate number of the target test record (the voided decal number) in the DECAL_NUM_2 field in the VEHICLE.DAT file. The analyzer will store the information in the VEHICLE.DAT file and print it on the weekly inspection log report (VI-8B). The entry shall appear on two separate lines on the Inspection Log (VI-8B). The first line shall contain the date of the original test, the type of certificate (or decal), the void indicator displaying 'VOID,' and the certificate (or decal) number of the target test record (i.e., the certificate number contained in CERT_NUM_2, or decal number contained in DECAL_NUM_2). The second line shall contain the entries from the duplicate using the replacement certificate number as the valid certificate number. The void indicator in this line shall display 'REPL.' The void indicator shall show 'REPL,' if 'R' is in the CERT_COND

field or DECAL_COND field. The system shall transmit the test record to the Texas Information Management System, and return to the main menu.

Associated System File:	**VEHICLE.DAT**	**CERT_NUM**
		CERT_NUM_2
		TEST_DATE
		CERT_COND
		DECAL_NUM
		DECAL_NUM_2
		DECAL_COND
		REPL_ID_NUM
		SAFE_TEST_TYPE

3.14 Main Menu Selection '14' "Technical Bulletins/Announcements"

The analyzer shall be able to receive and display technical bulletins and announcements transmitted from the Texas Information Management System. The announcement shall be displayed and allow the inspector three options:

1) print the announcement,
2) save the announcement to the announcement file, or
3) delete the announcement.

The print option shall allow the inspector to print the announcement and return to the announcement display with the same three options. The delete option shall delete displayed announcement without saving it to the announcement file. The save option shall save the announcement to the announcement file.

Upon selecting this item from the main menu, the analyzer shall display the announcement receive most recently from the Texas Information Management System. The analyzer shall hold an announcement a maximum of 180 days from the date of receipt at the analyzer or until another save announcement replaces it. Announcement older than 180 days from the date of receipt shall be purged from the system. The inspector shall be able to page down, or scroll through the announcement, and shall have the option of printing any announcement while it is displayed on the screen. The option to delete announcement should be restricted to a lead technician or manager.

An inspector may receive an announcement during the initial contact with the Texas Information Management System. Upon receipt of the announcement, the analyzer shall print one copy of the announcement, display the announcement and allow the inspector three options:

1) print the announcement;
2) save the announcement to the announcement file; or
3) delete the announcement.

The print option shall allow the inspector to print the announcement and return to the announcement display with the same three options. The delete option shall delete displayed message without saving it to the announcement file. The save option shall save the announcement to the announcement file.

Emissions related recall information, if available, shall be transmitted by the Texas Information Management System Host for use during emissions-related inspections. The initial information that will appear on the analyzer screen will be the pertinent vehicle information as provided by the Texas Data host. The inspector shall review this information to ensure its accuracy. If manufacturer issued emission-related recall information is transmitted by the Texas Information Management System Host, the analyzer shall display the emission-related recall information.

Emission related Technical Service Bulletins (TSB) information, if available, shall be transmitted to the analyzer for use during emissions-related inspections. The TSB information may contain multiple bulletins. The TSBs are provided as information only (to assist the inspector if the vehicle subsequently fails the inspection). The TSB information is displayed at the time of, and immediately following, the display of the emissions-related recall information.

3.15 Main Menu Selection '15' "Communications Refresh"

3.15.1 Access Code Prompt: ENTER YOUR INSPECTOR'S ACCESS CODE

Programming Criteria:

The TX96 analyzer shall be designed to require the entry of the access code via the 2-D bar code reader. The inspector shall be required to enter his access code using the bar

code reader for every inspection.

The TX96 analyzer shall be designed to require the entry of a special access code by the certified inspector before an official emissions inspection can begin. The access code shall neither be displayed nor printed on the Inspection Vehicle Inspection Report. This access code will be verified and linked to existing I/M Inspector number contained in the **INSPECTR.DAT** file. The analyzer shall not accept duplicate access code for different inspectors. Each inspector's access code shall be unique. The analyzer shall allow three attempts to enter a valid access code. Following each of the first two attempts, Error Message 1 shall be displayed. Error Message 2 shall be displayed for 5 minutes following the third attempt or until the inspector presses "enter/continue". The system shall then return to the main menu.

Error Messages:

1. **"YOUR ACCESS CODE IS NOT VALID--TRY AGAIN"**

2. **"THE ACCESS CODE ENTERED IS NOT VALID. VERIFY YOUR ACCESS CODE NUMBER WITH YOUR LOCAL DPS OFFICE."**

Associated System File: **INSPECTR.DAT** **ACCESS_CODE**

- - - -

inspector presses “enter/continue”. The system shall then return to the main menu.

Error Messages:

1. **"YOUR PIN IS NOT VALID--TRY AGAIN"**

2. **"THE PIN ENTERED IS NOT VALID. CONTACT YOUR LOCAL DPS OFFICE TO RESET YOUR PIN."**

Associated System File: **INSPECTR.DAT** **PIN_NO**

- -

3.15.2 Date Expiration Prompt: **YOUR STATION/INSPECTOR CERTIFICATION EXPIRATION DATE IS MM DD YY**

Programming Criteria: The analyzer will then check the license expiration date and lockout flag for the inspector in the inspector file. The station license renewal date and lockout flag will then be checked in the station file. If either the station or the inspector license expiration date is within 60 days of today then the analyzer will display Message 1 indicating the expiration date. If the inspector or station dates have passed, Message 2 will be displayed. The analyzer shall countdown the final five days prior to the expiration date of the inspector or the station certification. The analyzer shall display Message 3 in addition to Message 1 or 2 during the five-day countdown. If it is thirty days past the inspector or station expiration date, the system will set the station lockout flag in the station file or the inspector lockout flag in the inspector file to "Y" to indicate lockout has occurred.

If either the station or the inspector lockout flag is set, the analyzer will display a message that indicates lockout has occurred and returns to the main menu.

Error Messages:

1. **YOUR (STATION/INSPECTOR) CERTIFICATION EXPIRES MM/DD/YY.**

2. **YOUR STATION /OR INSPECTOR CERTIFICATION EXPIRED (date). YOU ARE NOT AUTHORIZED TO PERFORM ANY EMISSIONS**

INSPECTION AT THIS TIME. PLEASE CONTACT YOUR LOCAL DPS OFFICE.

3. YOUR (STATION/INSPECTOR) CERTIFICATION WILL EXPIRE IN X (5, 4, 3, 2, 1) DAY(S).

Associated System File:	**INSPECTR.DAT**	**INSP_EXP_DATE**
	STATION.DAT	**STAT_EXP_DATE**
	LOCKOUT.DAT	**INSP_LOCKOUT_FLAG**
		STATE_LOCKOUT

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The analyzer shall contact the Texas Information Management System and transmit the information necessary to connect with ALLDATA. After the ALLDATA communications session is complete, the system shall return to the main menu. When the directory structure becomes available, it will be placed in Appendix P. The files for the ALLDATA communications shall be contained in the subdirectory called C:/TASDATA/. The three files are called ALLREP.DAT, VIDCOMM.DAT, and ALLDATA.DAT.

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3.18 Main Menu Selection '18' "Inspection Log (VI-8B)"

The Inspection Log (VI-8B) shall print after the analyzer's power up sequence or warm-up is complete. The analyzer will not conduct any official inspections until the Inspection Log has printed. The analyzer shall print two copies of the Inspection Log (VI-8B), and the operator shall be able to print additional copies after the initial two copies have printed. The analyzer shall print the log each Monday morning.

If the station has not conducted any inspections since printing of the previous Inspection Log, the system shall print a report reflecting that no inspections have been conducted during the reporting period. The analyzer shall allow an inspector or station manager to print the Inspection Log (VI-8B) from the main menu by pressing a key determined by the manufacturer, preferably 'F8.' The analyzer shall allow the inspector or station manager to print Inspection Logs from previous weeks by entering the appropriate week ending date. The Inspection Logs from previous weeks shall be based on the information available on the analyzer at the time of the request. The analyzer shall also allow an inspector or station manager to print an Inspection Log (VI-8B) for one inspector, in the event of a departing inspector. The inspector or station manager shall be required to input the upcoming week ending date, and the departing inspector's identification number. The analyzer shall be able to display all inspections conducted by the departing inspector and print the inspections in the format prescribed for an Inspection Log (VI-8B).

The format for an Inspection Log is contained in Appendix G. The items shall be displayed in the format displayed in Appendix G, inclusive of the 'audited by' line, where applicable. The items shall be listed in chronological order according to the test date. The analyzer shall place an indicator or flag (i.e. an asterisk, question mark, etc.) beside any item whose certificate or decal number is not next in sequence to the previous item. The analyzer shall determine sequential issuance by comparing the number of an issued certificate to the number of the previously issued certificate of the same type. Also, the number on an issued decal shall only be compared to the number of the previously issued decal. For example, the system shall compare the number of a 1-year Safety & Emissions certificate to the number of the previously issued 1-year Safety & Emissions certificate, and place the indicator beside the item if the numbers are not sequential. The analyzer shall not compare a 1-year Safety &

Emissions certificate to any other type of issued certificate (i.e., 1-year Safety Only, 2-year windshield, etc.,) or decal to determine sequential issuance. Appendix G states that the words 'FAIL:', and/or 'REPAIR:' shall appear only if fail codes or repair codes, respectively, are to be displayed. However, the blank line shall remain when there are no fail or repair codes to be displayed. Also, the analyzer shall print twelve (12) 3-line entries per page on the VI-8B. Count the 'audited by' line as a 3-line entry.

The analyzer shall indicate emissions phase failures on the Texas Department of Public Safety for VI-8b, which prints out weekly. The analyzer shall display failure code number 31 on the VI-8b, if a vehicle fails the emissions phase of the inspection. The analyzer shall display failure code 32 on the VI-8b, if a vehicle fails the gas cap integrity test.

When an auditor enters the audit mode, the system writes a record to the AUDITLOG.DAT file containing the date, time and "A" for the authorized login attempt. The record is written when the 'enter/continue' key is pressed after the access code is entered. If the Auditor selects the inspection log search under Section 3.9.13, the record for the successful login shall be appended with a 'Y' in the SEARCH field, and the time of the search in the TIME field when the Auditor presses 'continue/enter.' This selection by the auditor shall cause the 'audited by' line to appear in the VI-8B in chronological order with the entries caused by the test records. The auditor shall be given the option of printing the results of the search on the printer.

If the auditor selects the test type search while under Section 3.9.13, the items shall appear in the VI -8B format displayed in Appendix G. The items shall be displayed in sequential order according to the certificate number for all items that meet the search criteria. The analyzer shall place an indicator or flag (i.e., an asterisk, question mark, etc.) beside any item whose certificate number is not next in sequence to the previous item. The auditor shall be given the option of printing the results of the search on the printer. The auditor shall press a key designated by the manufacturer to return to the Audit Menu.

3.19 Main Menu Selection '19' "VI-30A Only"

3.19.1 Access Code Prompt: ENTER YOUR INSPECTOR'S ACCESS CODE

Programming Criteria:

The TX96 analyzer shall be designed to require the entry of the access code via the 2-D bar code reader. The inspector shall be required to enter his access code using the bar code reader for every inspection.

The TX96 analyzer shall be designed to require the entry of a special access code by the certified inspector before an official emissions inspection can begin. The access code shall neither be displayed nor printed on the Inspection Vehicle Inspection Report. This access code will be verified and linked to existing I/M Inspector number contained in the **INSPECTR.DAT** file. The analyzer shall not accept duplicate access code for different inspectors. Each inspector's access code shall be unique. The analyzer shall allow three attempts to enter a valid access code. Following each of the first two attempts, Error Message 1 shall be displayed. Error Message 2 shall be displayed for 5 minutes following the third attempt or until the inspector presses "enter/continue". The system shall then return to the main menu.

Error Messages:

1. **"YOUR ACCESS CODE IS NOT VALID--TRY AGAIN"**

2. **"THE ACCESS CODE ENTERED IS NOT VALID. VERIFY YOUR ACCESS CODE NUMBER WITH YOUR LOCAL DPS OFFICE."**

Associated System File: **INSPECTR.DAT** **ACCESS_CODE**

- - - -

Error Messages: 1. **"YOUR PIN IS NOT VALID--TRY AGAIN"**

2. **"THE PIN ENTERED IS NOT VALID. CONTACT YOUR LOCAL DPS OFFICE TO RESET YOUR PIN."**

Associated System File: **INSPECTR.DAT** **PIN_NO**

- -

3.19.2 **Date Expiration Prompt:** **YOUR STATION/INSPECTOR CERTIFICATION EXPIRATION DATE IS MM DD YY**

Programming Criteria: The analyzer will then check the license expiration date and lockout flag for the inspector in the inspector file. The station license renewal date and lockout flag will then be checked in the station file. If either the station or the inspector license expiration date is within 60 days of today then the analyzer will display Message 1 indicating the expiration date. If the inspector or station dates have passed, Message 2 will be displayed. The analyzer shall countdown the final five days prior to the expiration date of the inspector or the station certification. The analyzer shall display Message 3 in addition to Message 1 or 2 during the five-day countdown. If it is thirty days past the inspector or station expiration date, the system will set the station lockout flag in the station file or the inspector lockout flag in the inspector file to "Y" to indicate lockout has occurred.

If any lockout is set, the analyzer will display a message that indicates a lockout has occurred and then return to the main menu.

Error Messages: **1. YOUR (STATION/INSPECTOR) CERTIFICATION EXPIRES MM/DD/YY.**

2. YOUR STATION /OR INSPECTOR CERTIFICATION EXPIRED (date). YOU ARE NOT AUTHORIZED TO PERFORM ANY EMISSIONS INSPECTION AT THIS TIME. PLEASE CONTACT YOUR LOCAL DPS OFFICE.

3. **YOUR (STATION/INSPECTOR) CERTIFICATION WILL EXPIRE IN X (5, 4, 3, 2, 1) DAY(S).**

Associated System File:	**STATION.DAT**	**STAT_EXP_DATE**
	INSPECTR.DAT	**INSP_EXP_DATE**
	LOCKOUT.DAT	**INSP_LOCKOUT_FLAG**
		STATE_LOCKOUT

- -

3.19.3 **Model Year Prompt:** **ENTER THE LAST TWO DIGITS OF THE VEHICLE MODEL YEAR.**

Programming Criteria: If no value is entered, the analyzer will display Message 1, and prompt the inspector to re-enter the last two digits of the vehicle model year. The system will display Message 2 in the event that the model year is beyond the current year +2, and prompt the inspector to re-enter the last two digits of the vehicle model year or the entire model year. The analyzer shall require the inspector to confirm any model year entry that is less than 1950.

Error Message: 1. **NO VALUE HAS BEEN ENTERED TRY AGAIN.**

2. **INVALID MODEL YEAR -- TRY AGAIN.**

Associated System File:	**VEHICLE.DAT**	**MODEL_YEAR**

- -

3.19.4 **License Type Prompt:** **"ENTER THE TYPE OF LICENSE PLATE OF THE VEHICLE."**

1.	**Texas Plate**	5.	**Exempt (Federal)**
2.	**No Plate**	6.	**Dealer Plate**
3.	**Out of State**	7.	**Temporary Buyer Tag**
4.	**Exempt (State)**	8.	**Other**

Programming Criteria: The inspector will be prompted to enter the license type of the vehicle. If the inspector selects license type ‘2,’or ‘8,’ the system will assign the License_Num field in the VEHICLE.DAT a value of "V" followed by the last seven digits of the VIN number, and skip the license prompt, number 3.19.5. The entry in the License_Num field shall be a “V” and the 7 rightmost characters of the VIN. If the entered VIN has less than 7 characters, the entry should be a “V” followed immediately by the entered VIN without filler spaces between the “V” and the entered VIN. The system will default to license type ‘1.’

Error Message: **THIS FIELD MUST BE ENTERED TO CONTINUE WITH THE TEST.**

Associated System File: **VEHICLE.DAT** **LICENSE_TYPE**

- -

3.19.5 **License Prompt:** **"ENTER THE LICENSE NUMBER OF THE VEHICLE."**

Programming Criteria: The inspector will be prompted to enter the license number of the vehicle. Upon confirming the license plate entry, the vehicle information is eligible to be stored in the RECALL.DAT file.

Error Message: **THIS FIELD MUST BE ENTERED TO CONTINUE WITH THE TEST.**

Associated System File: **VEHICLE.DAT** **LICENSE_NUM**

- -

3.19.5a **TxDOT Number Prompt:** **ENTER THE NUMBER FROM THE TxDOT REGISTRATION CERTIFICATE AFFIXED TO THE VEHICLE.**

Programming Criteria: The system shall only give this prompt if the inspector selected ‘Texas Plate’ (i.e., License_Type is ‘1’) as the license type of the vehicle in Section 3.19.4. The system will prompt for the TxDOT number as it appears on the vehicle.

Where available, the inspector will enter the TxDOT number by using the bar-code reader to scan the bar coded TxDOT number that is on the windshield of the vehicle. If a bar-code reader is not available, the inspector will be capable of entering the TxDOT number from the keyboard. The bar code should utilize the Code 39 symbology. The only information contained in the bar code are the start and stop characters, and the TxDOT number.

The system shall allow the inspector to see and edit the TxDOT number as it is being entered. When all characters of the TxDOT number have been entered, the system shall prompt the inspector to press "continue" or "enter". The inspector shall hit "continue" or "enter", the screen will blank the TxDOT number and ask the operator to reenter the TxDOT number under the same conditions as the previous entry. The two attempts must match. If the two attempts do not match, the analyzer will display Message 3 and prompt the inspector to enter the TxDOT number a third time. A minimum 10 characters are required for this field. If the entry is not within these parameters then the system will display Message 2. The format of the TxDOT number shall consist of eight numeric digits followed by two alpha characters. For example, 06691576WZ is a valid TxDOT number. If the entry is does not fit this format, then the system will display Message 4. If no value is entered, the analyzer will display Message 1.

Error Message: **1. THIS FIELD MUST BE ENTERED TO CONTINUE WITH THE TEST.**

2. A MINIMUM OF 10 CHARACTERS ARE NEEDED FOR THIS ENTRY--TRY AGAIN.

3. ENTRIES DO NOT MATCH -- TRY AGAIN.

4. THIS ENTRY MUST BE EIGHT NUMBERS FOLLOWED BY TWO LETTERS-- TRY AGAIN.

Associated System File: **VEHICLE.DAT** **TXDOT_NUM**

- -

3.19.6 **VIN Number Prompt:** **ENTER VIN NUMBER.**

Programming Criteria: The system will prompt for the VIN number as it appears on the vehicle. Where available, the inspector will enter the VIN number by using the bar-code reader to scan the bar-coded VIN on the

vehicle. If a bar-code reader is not available, the inspector will be capable of entering the VIN number from the keyboard. The analyzer will place a 'B' in the BARCODED_VIN field of the test record, if the VIN is entered using the bar code reader. Otherwise, the analyzer will place a 'K' in the BARCODED_VIN field of the test record.

The system shall allow the inspector to see and edit the VIN as it is being entered. When all characters of the VIN have been entered, the system shall prompt the inspector to press "continue" or "enter". The inspector shall hit "continue" or "enter", the screen will blank the VIN and ask the operator to reenter the VIN under the same conditions as the previous entry. The two attempts must match. If the two attempts do not match, the analyzer will display Message 3 and prompt the inspector to enter the VIN number a third time. A minimum of three and maximum of 17 characters are required for this field. If the entry is not within these parameters then the system will display Message 2. If no value is entered, the analyzer will display Message 1. The VIN verification algorithm shall be applied here. The algorithm shall be supplied under separate cover by the TNRCC. The VIN verification shall only be applied to vehicles with model years 1981 and newer. The analyzer will not allow the inspector to enter the letters 'I,' 'O,' or 'Q' for vehicle with model years 1981 and newer. The software should suggest possible substitute letters when the DPS algorithm indicates that the VIN is bad. For example, the software could ask if the entered '8' could be a 'B.'

Error Message: **1. THIS FIELD MUST BE ENTERED TO CONTINUE WITH THE TEST.**

2. A MINIMUM OF 3 OR MAXIMUM OF 17 CHARACTERS ARE NEEDED FOR THIS ENTRY--TRY AGAIN.

3. ENTRIES DO NOT MATCH -- TRY AGAIN.

Associated System File:	**VEHICLE.DAT**	**VIN_ID_NUM**
		VIN_FLAG
		BARCODED_VIN

- -

3.19.7 Vehicle Type Prompt:

SELECT THE VEHICLE TYPE

'P' - PASSENGER CAR/STATION WAGON

'T' - TRUCK/VAN/BUS/SPORTS UTILITY VEHICLE

'M' - MOTOR HOME

'B' - BUS

'C' - MOTORCYCLE

'L' - TRAILER

Programming Criteria: The inspector should select the vehicle type from the above list.

Error Message: **NO VALUES HAVE BEEN ENTERED--TRY AGAIN**

INVALID ENTRY--TRY AGAIN

Associated System File: **VEHICLE.DAT** **VEHICLE _TYPE**

- - - -

make/model list may supplied by the TNRCC.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN.**

Associated System File: **VEHICLE.DAT** **MAKE**

- -

3.19.9 **Model Prompt:** **SELECT THE VEHICLE MODEL.**

Programming Criteria: The system will then display the appropriate vehicle models based on the vehicle make entry. The analyzer shall present the option of 'other' as a model definition for use when there is no applicable definition for the vehicle under inspection. The 'other' option shall instruct the inspector to enter the model name and allow the inspector to enter up to 20 characters. An 'OTH' shall be placed in the MODEL_CODE field of the test record whenever the 'other' option is selected by the inspector.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN.**

Associated System File: **VEHICLE.DAT** **MODEL**
MODEL_CODE

- -

3.19.10 **Odometer Prompt:** **ENTER THE VEHICLE ODOMETER READING.**
A MINIMUM OF ONE NUMERIC ENTRY IS REQUIRED. DO NOT ENTER THE TENTH'S DIGIT.

Programming Criteria: Enter the vehicle odometer. Do not include tenth's. The system shall only accept numerical entries in this field.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **ODOMETER**

- - - -

required for this field. This certificate number shall not have any sequential issuance requirements because a certificate is not being issued. Do not use this certificate entry for any sequential issuance comparisons. The inspector shall be required to confirm/verify the certificate number entry. The enter key should allow the inspector to continue.

The safety certificate number consists of an alpha character, followed by up to eight digits. The alpha character usually does **not** correspond to the alpha character contained in the SAFE_TEST_TYPE field. They are, however, separated or indexed by the different types of safety inspections.

If the inspector enters fewer than 9 characters, the analyzer shall automatically load leading zeros to the numerical entry and show the analyzer number after the entry is confirmed. For example, an entry of an 'A', followed by a '123' shall be converted to 'A00000123' and displayed for the inspector to confirm the entry. The conversion will always end in a nine-character certificate number entry. The first character of a certificate number shall be an alphabetic character. The analyzer shall be able to enter the certificate number using the bar code reader. The only acceptable alpha character is 'V' for decals.

The analyzer shall restrict the alpha character to a list of acceptable alpha characters for a particular type of certificate or decal being issued. For example, if the inspector selects the '1-year windshield (safety & emissions)' certificate on the type of inspection prompt in Section 3.19.11, the inspector may only enter an 'A,' 'B,' 'C,' 'D,' 'E,' or 'F,' as the alpha character in the certificate number entry prompt. For Emission only Decals, the only acceptable alpha character is 'V.' For '1 Year Windshield (Safety Only)' certificate types, the acceptable alpha characters are 'G,' 'H,' 'I,' 'J,' 'K,' 'L,' 'M,' and 'P.' For '2 Year Windshield' certificate types, the acceptable alpha characters are 'N,' 'W,' and 'Q.' For 'Trailer/Motorcycle' certificate types, the acceptable alpha characters are 'X,' 'Y,' and 'Z.' For 'FMCSR (Truck)' certificate types, the acceptable alpha characters are 'T,' and 'U.' For 'FMCSR (Trailer)' certificate types, the acceptable alpha characters are 'R,' and 'S.'

Associated System File: **VEHICLE.DAT** **CERT_NUM**

- - - -

character and a maximum of seven (7) characters are required for this field. If no entry is made, the analyzer shall display the error message below. A valid entry must be made before the analyzer can proceed.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **VI30A_NUM**

- -

3.19.14 **Safety Test Fee Prompt:** **ENTER THE FEE FOR THE VI-30A ONLY, INCLUDING CENTS.**

Programming Criteria: The inspector shall enter the cost for the issuance of the VI-30A. If an inspector enters a fee greater than $10 dollars, the inspector shall be required to confirm the entry before proceeding to the next screen prompt. The analyzer shall display a warning message which states that the fee seems unusually large, please confirm the amount entered or reenter the fee.

Error Message: **NO VALUE HAS BEEN ENTERED--TRY AGAIN**.

Associated System File: **VEHICLE.DAT** **SAFE_INSP_COST**

- -

3.19.15 **Confirm Vehicle Info Display:**

The analyzer shall display the entered information to the inspector and allow the inspector to edit the information as appropriate.

- -

3.19.16 **End of Test Logic:**

Programming Criteria: The analyzer shall store the results in the appropriate file structure. Then, the system shall return to the main menu. When the analyzer conducts and completes the next emissions test, the information for the VI-30A issuance shall be transmitted to the Texas Information Management System Host.

Associated System File: **VEHICLE.DAT** **SAFE_INIT_TEST**

- -

3.20 Main Menu Selection '20' "Test on Resale Inspection"

3.20.1 Access Code Prompt: ENTER YOUR INSPECTOR'S ACCESS CODE

Programming Criteria:

The TX96 analyzer shall be designed to require the entry of the access code via the 2-D bar code reader. The inspector shall be required to enter his access code using the bar code reader for every inspection.

The TX96 analyzer shall be designed to require the entry of a special access code by the certified inspector before an official emissions inspection can begin. The access code shall neither be displayed nor printed on the Inspection Vehicle Inspection Report. This access code will be verified and linked to existing I/M Inspector number contained in the **INSPECTR.DAT** file. The analyzer shall not accept duplicate access code for different inspectors. Each inspector's access code shall be unique. The analyzer shall allow three attempts to enter a valid access code. Following each of the first two attempts, Error Message 1 shall be displayed. Error Message 2 shall be displayed for 5 minutes following the third attempt or until the inspector presses "enter/continue". The system shall then return to the main menu.

Error Messages:

1. **"YOUR ACCESS CODE IS NOT VALID--TRY AGAIN"**

2. **"THE ACCESS CODE ENTERED IS NOT VALID. VERIFY YOUR ACCESS CODE NUMBER WITH YOUR LOCAL DPS OFFICE."**

Associated System File: **INSPECTR.DAT** **ACCESS_CODE**

- -

3.20.1a **PIN Number Prompt:** **ENTER YOUR INSPECTOR'S PIN NUMBER**

Programming Criteria:

The TX96 analyzer shall be designed to require the entry of a special PIN by the certified inspector before an official emissions inspection can begin. The PIN shall neither be displayed nor printed on the Inspection Vehicle Inspection Report. This access code will be verified and linked to existing I/M Inspector number contained in the **INSPECTR.DAT** file. The analyzer shall not accept duplicate PINs for different inspectors. Each inspector's access code shall be unique. The PIN will be encrypted on the analyzer and is unreadable to anyone. Also, any other files that contain the PIN (i.e. INSPECTR.REC) must be unreadable to anyone. The analyzer may encrypt or delete these files. The analyzer shall allow three attempts to enter a valid access code. Following each of the first two attempts, Error Message 1 shall be displayed. Error Message 2 shall be displayed for 5 minutes following the third attempt or until the inspector presses "enter/continue". The system shall then return to the main menu.

Error Messages:

1. **"YOUR PIN IS NOT VALID--TRY AGAIN"**

2. **"THE PIN ENTERED IS NOT VALID. CONTACT YOUR LOCAL DPS OFFICE TO RESET YOUR PIN."**

Associated System File: **INSPECTR.DAT** **PIN_NO**

- -

3.20.2 **Date Expiration Prompt:** **YOUR STATION/INSPECTOR CERTIFICATION EXPIRATION DATE IS MM DD YY**

Programming Criteria: The analyzer will then check the license expiration date and lockout flag for the inspector in the inspector file. The station license renewal date and lockout flag will then be checked in the

station file. If either the station or the inspector license expiration date is within 60 days of today, then the analyzer will display Message 1 indicating the expiration date. If the inspector or station dates have passed, Message 2 will be displayed. The analyzer shall countdown the final five days prior to the expiration date of the inspector or the station certification. The analyzer shall display Message 3 in addition to Message 1 or 2 during the five-day countdown. If it is 30 days past the inspector or station expiration date, the system will set the station lockout flag in the station file or the inspector lockout flag in the inspector file to "Y" to indicate lockout has occurred.

If either the station or the inspector lockout flag is set, the analyzer will display a message that indicates lockout has occurred and returns to the main menu.

Error Messages:

1. **YOUR (STATION/INSPECTOR) CERTIFICATION EXPIRES MM/DD/YY.**

2. **YOUR STATION /OR INSPECTOR CERTIFICATION EXPIRED (date). YOU ARE NOT AUTHORIZED TO PERFORM ANY EMISSIONS INSPECTION AT THIS TIME. PLEASE CONTACT YOUR LOCAL DPS OFFICE.**

3. **YOUR (STATION/INSPECTOR) CERTIFICATION WILL EXPIRE IN X (5, 4, 3, 2, 1) DAY(S).**

Associated System File:		
	INSPECTR.DAT	**INSP_EXP_DATE**
	STATION.DAT	**STAT_EXP_DATE**
	LOCKOUT.DAT	**INSP_LOCKOUT_FLAG**
		STATE_LOCKOUT

- - - -

YES, CONTINUE WITH THE INSPECTION. (This vehicle is not exempt.)

NO, STOP THE TEST AND RETURN TO THE MAIN MENU.

Programming Criteria:

The system shall display the message listed above, and require the inspector to select the appropriate choice. The default shall be to the "yes, continue with the inspection." The inspector shall be able to use the arrow keys to highlight the appropriate selection and press "enter/continue" to select it. If the inspector selects "no, stop the test and return to the main menu," the system will end the sequence at this prompt and return to the Main Menu. Otherwise, the inspection will continue to the next prompt.

Error Message: **1. NO VALUE HAS BEEN ENTERED TRY AGAIN.**

2. THIS VEHICLE IS EXEMPT FROM TEST-ON-RESALE BECAUSE THE MODEL YEAR IS 1996 OR NEWER AND THE ODOMETER READING IS LESS THAN 50,000 MILES. PRESS "ENTER/CONTINUE" TO RETURN TO THE MAIN MENU.

- - - -

1 - required emission only test (decal),

2 - voluntary test,

3 - test on resale (not displayed or used), or

4 - remote sensing request.

The system will set the special_test field to 'C,' and set the test_type field to the following letters, based on the inspector selection:

1 - 'O'	3 -'C'
2 - 'I'	4 - 'B'

The system will default/highlight selection number 1 in this scenario.

In either case, the previously entered data shall be used as defaults when the model year and odometer screen prompts appear in the inspection sequence. The analyzer may skip these screen prompts since the data has already been entered.

There is no default on this screen. The inspector will be required to press at least one key to highlight a choice. Afterward, the inspector shall be able to use the arrow keys and the number keys to highlight the appropriate choice and will be able to press "continue/enter" to select it.

Error Message: **1. NO VALUE HAS BEEN ENTERED TRY AGAIN.**

Programming Criteria:	**VEHICLE.DAT**	**TEST_TYPE**
		EMISS_TEST_TYPE
		EMISS_INIT_TEST
		SPECIAL_TEST
	REINSPECT.DAT	**TEST_TYPE**
		EMISS_TEST_TYPE
		EMISS_INIT_TEST
		SPECIAL_TEST
	RECALL.DAT	**TEST_TYPE**
		EMISS_TEST_TYPE
		EMISS_INIT_TEST
		SPECIAL_TEST

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Appendix A

Emissions Standards

Emissions Standards

Light-duty Gasoline Vehicle and Light-duty Gasoline Trucks Up to 8,500 GVW Preconditioned Idle Test

MODEL YEAR	**CO, percent**	**HC, ppm**
1981 and newer	1.2	220
1980	4.0	400
1979	6.0	600
1978	6.5	650
1977	7.5	750
1976	7.5	750
1975	7.5	750
1974	8.0	800
1973	8.0	800
1972	8.5	850
1971	8.5	850

Emissions Standards

Heavy-duty Gasoline vehicle 8,501-80,000 GVW Preconditioned Idle Test

MODEL YEAR	**CO, percent**	**HC, ppm**
1994 and newer	3.0	300
1993	3.0	300
1992	3.0	300
1991	3.0	300
1990	3.0	300
1989	3.0	300
1988	3.0	300
1987	3.0	300
1986	3.0	300
1985	3.0	300
1984	5.0	500
1983	5.0	500
1982	5.0	500
1981	7.0	700
1980	7.0	700
1979	7.0	700
1978	9.0	900
1977	9.0	900
1976	9.0	900
1975	9.0	900
1974	9.0	900
1973	9.0	900
1972	9.0	900
1971	9.0	900

Appendix B

Customer Comments/Explanations
to be printed on
Vehicle Inspection Reports

(Reserved)

Appendix D

Help Screens
for the Safety Inspection

(69 pages)

(Reserved)

Safety Inspection

Item: Horn

Help Screen # 1

Inspect for:

a. Mounting.

b. Wiring and actuating device.

c. Harsh sound and audibility.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Vehicle is not equipped with a horn.

b. Horn or horn switch is not securely fastened.

c. Wiring insulation is worn, rubbed bare, or shows any evidence of burning, short circuiting, or poor connection.

d. Horn switch not readily accessible to vehicle operator.

e. Horn is actuated by grounding two naked wires or similar method.

f. Sound is not audible under normal conditions for 200 feet.

g. Horn emits an unusually loud or harsh sound or whistle.

h. Operation of the horn interferes with the operation of any other circuit.

I. Horn switch missing or inoperative.

Safety Inspection

Item: Windshield Wipers

Help Screen #2

Inspect for:

a. Required number of wipers.

b. Condition of wiper blade.

c. Free operation, making contact and control.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Vehicle is not equipped with the number of wipers with which it was originally equipped.

b. Wiper is inoperative, does not operate freely, or is improperly adjusted.

c. Wiper blade has damaged, hardened or badly worn rubber elements.

d. The portion of the rubber element that contacts the windshield is torn more than one inch on one end or is torn a total of one inch on both ends.

e. Any part of the rubber element is torn loose from the metal backing or blade base.

f. Metal parts of wiper blades or arms are damaged or come in contact with the windshield.

g. Wiper is incapable of adequately cleaning the windshield.

h. Wiper blades are not making proper contact with windshield.

I. Wiper controls are not operating properly or are located beyond the driver's reach.

Safety Inspection

Item: Mirror

Help Screen #3

Inspect for:

a. Mounting & view to the rear.

b. Condition of reflecting surface.

c. Cracked or broken glass.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Mirror does not provide the driver with a clear view to the rear of 200 feet.

b. Vehicle is not equipped with at least one mirror.

c. Mirror offers unsafe interference with driver's forward vision.

d. Reflective surface of mirror is cracked, broken, peeled, or tarnished, or has sharp edges.

e. Mirror is not mounted securely to prevent swing or excessive vibration unless the vehicle is equipped with another mirror which meets requirement.

NOTE: An inside mirror would meet all the above requirements. If the vehicle is equipped with more than one mirror, only one, either inside or outside, needs to meet all requirements.

Safety Inspection

Item: Steering System

Help Screen # 4

Inspect for:

a. Lash and free movement without jamming.

b. Mounting and condition of steering mechanism.

c. Fluid level and visible leaks in power steering unit.

d. Small or modified steering wheel.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. There is more than 2 inches of lash measured on the outside periphery of steering wheel rims 18 inches or less in diameter.

b. There is more than 3 inches of lash measured on the outside periphery of steering wheel rims over 18 inches in diameter.

c. It is impossible to turn the steering wheel from full right to full left without binding or jamming other than at wheel stops.

d. Steering mechanism is not firmly attached and free of frame cracks or missing bolts.

e. Modification of the steering systems so as to affect the proper steering of the vehicle or steering wheel has been modified or replaced with one that is noticeably smaller than original factory equipment.

f. Any excessively worn or broken parts in the steering system.

g. Visible leaks in power steering unit or hoses.

h. Power steering belt is cracked, frayed, or has pieces missing or tension is not adequate.

I. Fluid in power steering unit is below manufacturer recommended level. Do not overfill.

j. On motorcycles and motor driven cycles, handlebars or steering head is bent, loose, broken or damaged so as cause unsafe condition in steering.

k. On motorcycles and motor driven cycles,

handlebars grips extend to a height in excess of 15 inches above the saddle level.

NOTE: On vehicles equipped with power steering, engine must be running and the

fluid level, belt tension and condition must be adequate before testing.

Safety Inspection

Item: Seat Belts

Help Screen #5

Inspect for:

a. Presence of front seat belts (when required).

b. Unsafe belts, attachment fittings and buckles.

c. Anchor bolts.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Front lap seat belts are required and not present.

b. Seat belt webbing is frayed, spilt, or torn.

c. Belt anchorages or attachment fittings are loose, badly corroded, missing or not fastened to belt.

d. Belt buckles loose or inoperative.

e. All seat belt anchor bolts are not securely fastened to floor or are missing.

f. Pelvic restraint is not present.

g. Seat belt will not adjust to allow proper fit.

Safety Inspection

Item: Service Brake System

Help Screen #6A

Inspect for:

a. Visible leaks in brake lines, wheel cylinders or other part of the system.

b. Frayed or leaking hoses or cables, or unsafe mechanical parts.

c. Pedal reserve.

d. Stopping distance and equalization.

e. Fluid level in master cylinder.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Vehicle is not equipped with required service brakes .

b. Upon first application, there is less than 2 inches of pedal reserve as determined by the use of an accurate measurement on the fully applied brake pedal of vehicles equipped with conventional brakes.

c. Upon first application, there is less than 1 inch of pedal reserve as determined by the use of an accurate measurement on the fully applied brake pedal of vehicles with power brakes (power must be on and operating when tested).

d. On service brakes that cannot be checked with the use of an accurate measurement, there is less than a reserve of one third of the total travel distance of the brake actuator.

e. Brake pedal height cannot be maintained under moderate foot force (40 to 60 pounds for conventional - 15 to 20 pounds for power) for a period of 1 minute.

f. There is visible leakage or audible seepage in hydraulic lines and cylinders, or any other part of the service brake system.

g. Fluid level in the master cylinder is more than 1 inch below the top of the reservoir or below manufacture's recommended level.

h. Hoses or cables are restricted, abraded, crimped, cracked, leaking, frayed, or broken.

I. Brake rods or mechanical parts are missing, broken, badly worn or

misaligned.

j. Brake operating levers or control cables do not operate freely, improperly positioned, or misaligned.

k. Any part of the service brake system has been removed, disconnected, rendered inoperative.

l. There is an obvious metal to metal contact sound when brakes are applied, and upon investigation, drum or disk is being scored.

m. The service brakes do not develop the required total braking force as determined by machine tests.

n. Brakes do not meet requirements for stopping distances for the class of vehicle.

o. The brakes are not equalized as determined from road testing or by machine tests of the vehicle.

p. Brake warning lamp or signal comes on during test.

NOTE: It is imperative that brake system reservoir cover and the surrounding area be thoroughly cleaned before cover is removed for inspection to assure that NO DIRT OR WATER is mixed with the brake fluid.

Safety Inspection

Item: Parking Brake System

Help Screen #6B

Inspect for:

(Required on all motor vehicles beginning with year model 1960).

a. Operating mechanism.
b. Condition of mechanical parts and pull cables.
c. Holding ability.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Motor vehicle is not equipped with a parking brake.
b. Operating mechanism, when fully applied, does not hold the vehicle.
c. Actuating mechanism is not fully released when the release control is operated.
d. Any mechanical parts are missing, broken, badly worn or not operating properly.
e. Pull cables are badly worn, stretched, frayed, or not operating freely.
f. Parking brake will not hold the vehicle in place when, with the engine running, the vehicle is placed in forward gear and the engine is accelerated enough to cause a pull on the braking mechanism.

Safety Inspection

Item: Tires

Help Screen #7

Inspect for:

a. Worn spot that exposes ply or cord through the tread.

b. Tread cuts, fabric breaks, snags and sidewall cracks.

c. Visible bumps, bulges or knots.

d. Tread wear less than 2/32" in any two adjacent major grooves at one location.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Any tire with a localized worn spot that exposes the ply or cord through the tread.

b. Any tire with tread or sidewall cracks, cuts, or snags (as measured on the outside on the tire) in excess of one inch in any direction and deep enough to expose the body cords.

c. Any tire which has any visible bumps, bulges, or knots apparently related to tread or sidewall separation or partial failure of the tire structure, including bead area.

d. Any tire which has been regrooved or recut below the original groove depth, except special (regroovable) tires which have extra undertread rubber for this purpose (commercial vehicles only) and are identified as such.

e. Any dual wheel assembly where the side of one tire is in contact with the other. (Any duel tires that contact each other).

f. Any tire that is marked “Not for Highway Use”, “Farm Use Only,” “For Racing Purposes Only” or with other use restrictions that would indicate the tire is not meant for highway use. This includes temporary spares, inflatables, or small high pressure spares.

g. Any tire which has been repaired temporarily by the use of blowout patches and boots. Nail hole plugs or patched are not cause for rejection.

h. Any tire without tread wear indicators worn so that less than 2/32 (1/16) of an inch of tread design depth remain when measured (with a tread depth gauge) at

the lowest points in any two adjacent major grooves in the center or middle of the tire.

I. Any tire with tread wear indicators worn so that the tread wear indicators contact

the road in any two adjacent major grooves in the center or middle of the tire.

Safety Inspection

Item: Wheel Assembly

Help Screen #8

Inspect for:

a. Defective or bent rim flanges; loose, missing or damaged bolts, nuts, studs or lugs.

b. Defects and cracks that may impair safe mounting and proper retention of tires.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Loose, missing, or damaged wheel studs, bolts, nuts or lugs.

b. Any part of the wheel bent, cracked, rewelded, or damaged so as to affect safe operation of the vehicle.

c. Wheel nuts, studs, and clamps which are loose, broken, missing, or mismatched. Adequate thread engagement is imperative. Stud and nut threads on wheel lugs must engage completely through the entire threaded portion of the nut.

d. Rims and rings which are mismatched, bent, sprung, or otherwise damaged. Check for evidence of rim slippage - this is an indication of wear of loose nuts.

e. Disc wheels with elongated bolts, holes, or cracks between hand holes or stud holes, or both.

f. Cast wheels with cracks, evidence of wear in the clamp area, or both.

g. Rims have defects or cracks to the extent that they impair the safe mounting and proper retention of tires.

h. Any wheel cannot be securely fastened to the hub of the vehicle.

I. On motorcycles and motor-driven cycles, any spokes are bent, loose, broken, or missing.

Safety Inspection

Item: Exhaust System

Help Screen #9

Inspect for:

a. Loose or leaking joints.

b. Holes, leaking seams or patches.

c. System or its elements not securely fastened to vehicle.

d. Any part of exhaust system passes through (or terminates beneath) the passenger compartment.

e. Tail pipe broken, pinched or eroded off allowing fumes to penetrate passenger compartment.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Vehicle is not equipped with a muffler.

b. Any joint is loose or leaking, including manifolds. Does not include minor leakage at exhaust control valve (manifold damper or heat riser valve).

c. Manifold is cracked or broken causing leakage.

d. Holes, leaking seams, or patches on the muffler, resonators, exhaust pipe, tail pipe, or catalytic converter.

e. Exhaust system is not secured to the vehicle by mounting brackets designed for exhaust systems (wire is not acceptable).

f. Any brackets are loose, broken, or missing.

g. There is excessive vibration of exhaust line.

h. Any part of the exhaust system passes through the passenger compartment.

I. The tail pipe is broken, pinched, or eroded off to extent to allow exhaust fumes to penetrate into the interior of the passenger compartment.

j. The tail pipe fails to discharge exhaust from the rear, side or top of the passenger compartment of the vehicle.

NOTE: Holes in the exhaust system made by the manufacturer for drainage are not cause for rejection. The tail pipe must direct the exhaust fumes out from under the passenger compartment.

Safety Inspection

Item: Emission System

Help Screen #10

Inspect for:

(Required on motor vehicles equipped by manufacturer beginning with 1968 models).

a. Examine visually for presence of system.
b. Plumbing is loose, broken, leaking or improperly routed.
c. Systems has been altered, removed, or disconnected.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. The exhaust emission system has been removed.
b. The exhaust emission system has been disconnected.
c. The plumbing or hoses are loose, broken, leaking, or improperly routed.
d. Air pump (air injection type) belt is loose, removed, cracked, frayed, or has pieces missing.
e. The exhaust emission system has been altered in any manner to make it ineffective.
f. The catalytic converter has been removed, leaking, or disconnected on a 1984 or later model vehicle.

Safety Inspection

Item: Beam Indicator

Help Screen #11

Inspect for:

(Required on all motor vehicles beginning with 1948 models, except motorcycles and motor-driven cycles).

a. Proper switching indication.
b. Visibility without glare.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Vehicle not equipped with a beam indicator.
b. Improper switching indication.
c. Produces glaring light.
d. Inoperative for any reason.

Safety Inspection

Item: Tail Lamp

Help Screen #12

Inspect for:

a. Mounting visibility and required number.

b. Color and condition of lens.

c. Wiring and visibility.

d. Connected to burn when headlamps burn.

e. Any lamp projects a white light to the rear (except license plate lamp and backup lamp).

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Required lamp or lamps are not present.

b. Lamp is not securely mounted to vehicle.

c. Lamp does not completely emit a red light plainly visible 1,000 feet to the rear.

d. Lamp lens is cracked, broken, painted, missing, discolored, or does not fit properly.

e. Wiring is shoddy or electrical connections are poor.

f. Lamp is not wired so as to be lighted when head lamps or auxiliary driving lamps are lighted.

g. Lamp is obstructed by any part of body.

h. Lamp lens is not red color.

I. Lamps are not mounted on the same level and as widely spaced laterally as practicable.

j. Lamps are not mounted on rear of vehicle.

k. Lens is cracked or broken to the extent that a portion of the lens is missing and/or separated, permitting light from the bulb to emit through the crack or break.

Safety Inspection

Item: Stop Lamp

Help Screen #13

Inspect for:

a. Mounting, visibility and required number.

b. Color and condition of lens.

c. Actuation by application of service brakes.

d. Wiring and visibility.

e. Glaring or dazzling light.

f. Any lamps projects a white light to the rear (except license plate lamp and backup lamp).

NOTE: Lamp lens cannot be repaired with repair tape or repair kit.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Required lamp or lamps are not present.

b. Lamp is not securely mounted to the vehicle.

c. Lamp does not emit a red or amber light which is actuated on application of the service (foot) brake.

d. Lamp is not visible from a minimum distance of 300 feet to the rear of the vehicle to which it is attached.

e. Lamp lens is cracked, broken, painted, missing, discolored, or does not fit properly.

f. Wiring is shoddy or electrical connections are poor.

g. Lamp projects a glaring or a dazzling light.

h. Lamp is not mounted on rear of vehicle.

I. Lens is cracked or broken to the extent that a portion of the lens is missing and/or separated, permitting light from the bulb to emit through the crack or break.

Safety Inspection

Item: License Plate Lamp

Help Screen #14

Inspect for:

a. Mounting and wiring.

b. Illumination of license plate.

c. Lighting when headlamps are lighted.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Lamp is not present.

b. Lamp is not securely mounted to the vehicle.

c. Lamp is not placed to illuminate with a white light the rear registration plate.

d. Wiring insulation is worn, rubbed bare, or shows any evidence of burning, short circuiting, or poor electrical connections.

e. Lamp is not wired so as to be lighted when head lamps or auxiliary driving lamps are lighted.

f. Lamp emits a glaring light to the rear.

g. Lens is cracked or broken to the extent that a portion of the lens is missing and/or separated, permitting light from the bulb to emit through the crack or break.

Safety Inspection

Item: Rear Reflectors

Help Screen #15

Inspect for:

a. Color, location and condition of lens.

b. Mounting and visibility.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Reflector is not present.

b. Reflector is not of red color.

c. Reflector is not properly and/or securely mounted to the vehicle.

d. Reflector is cracked to the extent that the reflecting ability is impaired.

e. Reflector is discolored, deteriorated, or painted.

f. Visibility distance is not as required.

g. Requirements shown on lighting diagram are not met.

Safety Inspection

Item: Turn Signal Lamps

Help Screen #16

Inspect for:

(When required according to Rules and Regulations Manual).

a. Mounting, visibility and approved type.

b. Color and condition of lens.

c. Wiring, switch, telltale and proper indications.

d. Self-illumination and automatic flashing.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Lamps are required and not present.

b. Device is not securely mounted or properly located on the vehicle.

c. Device is not of a type meeting Department standards.

d. Lamp lens is cracked, broken, discolored, or missing.

e. Wiring insulation is worn, rubbed bare, or shows any evidence of burning, short circuiting, or poor electrical connections.

f. Switch is not convenient to driver or indicator light does not operate.

g. Signal shows any color other than white or amber to the front, or signal shows any color other than red or amber to the rear.

h. Signal does not flash or is not operating properly.

I. Signal is not clearly visible to the front and to the rear of the vehicle.

j. Lens is cracked or broken to the extent that a portion of the lens is missing and/or separated, permitting light from the bulb to emit through the crack or break.

NOTE: Selector switch must lock in proper turn position when applied but need not cancel automatically.

Safety Inspection

Item: Headlamps

Help Screen #17

Inspect for:

a. Mounting and approved type.

b. Improper connections, switching and dimmer switch.

c. Cracked, broken or missing lens.

d. Wiring.

e. Physical damage that would obviously cause a headlight beam to fail to sufficiently illuminate the roadway ahead of the vehicle.

f. Dirt moisture, contaminations or discolorations.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Lamp or lamp assembly is not securely fastened to the vehicle.

b. Lamp is improperly connected and does not light the proper filament for different switch positions.

c. Lamp lens is cracked, broken, discolored, or missing. (Exception: Composite or halogen type lamps will not be rejected for being cracked unless the reflector material in side the lamp is discolored or deteriorated).

d. Lamp is not of a type meeting Department standards.

e. Wiring insulation is worn, rubbed bare, or shows any evidence of burning, short circuiting, or poor electric connections.

f. Lamp lens is rotated, upside down, canted, or is marked “Right”, “Left”, #1 or #2 and not appropriately installed.

g. Lamp fails to function properly in any manner.

h. Lamp has dirt or any contamination or discoloration inside or moisture except condensed moisture in composite head lamps or nonsealed beam halogen lamps.

I. Lamp switch or dimmer switch does not operate properly and is not convenient to the driver.

j. Foreign material placed on head lamp lens, such as shields, half of lens, paint, tape, etc., that interferes with the light beam of the lamp.

k. Vehicle is not equipped with head lamps as required.

l. Lamp can be moved easily by hand, due

to a broken fender or loose support.

m. Lamp is missing.

n. Lens is other than clear (white).

o. Any filament in head lamps fails to burn except composite lamps with more than one bulb when both upper and lower beam burn when selected.

p. Wiring is dangling or connections are loose.

q. A good ground is not made by the lamp mounting.

r. Lamp is mounted on vehicle more than or less than prescribed mounting heights.

s. Head lamp is covered by any lens or cover located in front of the head lamp which is any shade or color other than clear.

t. There is physical damage that would obviously cause a headlight beam to fail to illuminate the roadway ahead of the vehicle sufficiently.

Safety Inspection

Item: Clearance Lamps

Help Screen #18

Inspect for:

a. Mounting and location.

b. Required color.

c. Cracked, broken or missing lens.

d. Wiring and visibility.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Lamps are not present.

b. Lamps are not securely mounted and properly located.

c. Lamps do not emit required color; lens or bulb painted.

d. Visibility requirements are not met.

e. Lenses are cracked, broken, discolored, or missing.

f. Wiring insulation is worn, rubbed bare, or shows any evidence of burning, short circuiting, or poor electrical connections.

g. Lens is cracked or broken to the extent that a portion of the lens is missing and/or separated, permitting light from the bulb to emit through the crack or break.

Safety Inspection

Item: Side Marker Lamps

Help Screen #19

Inspect for:

a. Mounting and location.

b. Required color.

c. Cracked, broken, or missing lens.

d. Wiring and visibility.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Lamps are not present.

b. Lamps are not securely mounted and properly located.

c. Lamps do not emit required color; lens or bulb painted.

d. Visibility requirements are not met.

e. Lenses are cracked, broken, discolored or missing.

f. Wiring insulation is worn, rubbed bare, or shows any evidence of burning, short circuiting, or poor electrical connections.

g. Lens is cracked or broken to the extent that a portion of the lens is missing and/or separated, permitting light form the bulb to emit through the crack or break.

Safety Inspection

Item: Cab Lamps

Help Screen #20

Inspect for:

(Truck tractors only)

a. Mounting and location.
b. Required color.
c. Cracked, broken or missing lens.
d. Wiring and visibility.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Lamps are required and not present.
b. Lamp is not securely mounted and properly located.
c. Lamp does not emit required color; lens or bulb painted.
d. Lamp lens is cracked, broken, discolored, or missing.
e. Lamp is not visible from distance between 500 feet and 50 feet.
f. Wiring insulation is worn, rubbed bare, or shows any evidence of burning, short circuiting, or poor electrical connections.
g. Lens is cracked or broken to the extent that a portion of the lens is missing and/or separated, permitting light from the bulb to emit through the crack or break.

Safety Inspection

Item: Side Reflectors

Help Screen #21

Inspect for:

a. Color, location and condition of lens.

b. Mounting and visibility.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Reflectors are not present.

b. Reflectors are not of the required color for its location on the vehicle.

c. Reflectors are not properly and/or securely mounted to the vehicle or if visibility distance is not as required.

d. Reflector is cracked to the extent that the reflecting ability is impaired.

e. Reflectors are discolored, deteriorated, or painted.

f. Requirements shown on lighting diagram are not met.

Safety Inspection

Item: School Buses

Help Screen #22

Inspect for:

a. School bus signs.
b. Fire extinguisher.
c. Warning lamps.
d. Convex crossover mirror.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. All equipment required by size, weight, or class of the vehicle does not meet requirements.
b. Signs are not present, readable, and of proper height.
c. Fire extinguisher is not of required capacity, proper type, or in good condition and properly located.
d. School bus RED signal lamps are not present, properly working, and in good condition.
e. Crossover mirror mounting is loose or will not adjust to different positions or will not hold firm after adjustment.
f. Crossover mirror offers unsafe interference with driver's forward vision or hides either front turn signal from view of oncoming driver.
g. Crossover mirror's reflective surface is cracked, broken, peeled, or tarnished, or has sharp edges.

NOTE: Some school buses may be equipped with eight warning signal lamps, four red and four amber, working in an automatic integrated system. This system of alternately flashing warning lamps will be accepted provided it has two red lamps on the front and two red lamps on the rear.

Safety Inspection

Item: Safety Guards or Flaps

Help Screen #23

Inspect for:

a. Mounting, condition and location.

b. Construction and material.

c. Height and width.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Safety guard or flap is not present.

b. Safety guard or flap is not securely mounted.

c. Safety guard or flap is not as wide as the tire that it is protecting.

d. Safety guard or flap is spilt or torn to the extent that it is ineffective.

e. The bottom edge of safety guard or flap is more than twelve (12) inches from the surface of the roadway.

Safety Inspection

Item: Sun-Screening

Help Screen #24

Inspect for:

a. 1988 model & later.

b. Light transmission.

c. Color (must not be red or amber).

d. Tint is below AS-1 line or 5" if no AS-1 line is present.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Glass coating or sunscreening devices on windshields;

   1) Extends downward past the AS-1 line or more than five inches from top of windshield on vehicles without an AS-1 line; or

   2) is red or amber in color.

b. Glass coating or sunscreening devices on windows;

   1) windows immediately to the right and left of the driver which opens has less than 20 percent light transmittance.

c. Check calibrations before rejecting vehicles

EXEMPTIONS:

a. The following will not be considered as sunscreening or glass coating devices:

   1) Rearview mirror

   2) Sun Visors

   3) Motor carrier destination signs

   4) Rear Window wipers and motors

   5) Trunk lid handle or hinge.

   6) Luggage racks.

b. Do not inspect glass coating on vehicles used to transport passengers on a regular basis for a fee, i.e., taxi, limousine, and buses.

c. Vehicles used by persons with medical permits. Drivers of these vehicles must present a letter of authorization from the Texas Department of Public Safety to gain his exemption.

d. Multipurpose vehicles may be equipped with any non-reflective film on the side windows that is to the rear of the driver. No label required. (Those motor vehicles designed to carry 10 or fewer persons constructed either on a truck chassis or with special features for occasional off-road use.)

FMCSR Inspection

Item: Horn

Help Screen #1

Inspect for:

a. Mounting.

c. Wiring and actuating device.

b. Harsh sound and audibility.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Vehicle is not equipped with a horn.

b. Horn or horn switch is not securely fastened.

c. Wiring insulation is worn, rubbed bare, or shows any evidence of burning, short circuiting, or poor connection.

d. Horn switch not readily accessible to vehicle operator.

e. Horn is actuated by grounding two naked wires or similar method.

f. Sound is not audible under normal conditions for 200 feet.

g. Horn emits an usually loud or harsh sound or whistle.

h. Operation of the horn interferes with the operation of any other circuit.

I. Horn switch missing or inoperative.

FMCSR Inspection

Item: Windshield Wipers

Help Screen #2

Inspect for:

a. Required number of wipers.

b. Condition of wiper blade.

c. Free operation, making contact and control.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Vehicle is not equipped with the number of wipers with which it was originally equipped.

b. Wiper is inoperative, does not operate freely, or is improperly adjusted.

c. Wiper blade has damaged, hardened or badly worn rubber elements.

d. The portion of the rubber element that contacts the windshield is torn more than one inch on one end or is torn a total of one inch on both ends.

e. Any part of the rubber element is torn loose from the metal backing or blade base.

f. Metal parts of wiper blades or arms are damaged or come in contact with the windshield.

g. Wiper is incapable of adequately cleaning the windshield.

h. Wiper blades are not making proper contact with windshield.

I. Wiper controls are not operating properly or are located beyond the driver's reach.

FMCSR Inspection

Item: Mirrors

Help Screen #3

Inspect for:

a. Mounting and view to the rear.
b. Condition of reflecting surface.
c. Cracked or broken glass.
d. Required number.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Proper number of mirrors.
b. Clear view of 200 feet to rear
c. Interference of drivers forward vision
d. Reflective surface of mirrors is cracked, broken, peeled, or tarnished.
e. Not mounted securely to prevent swing or excessive vibration.

FMCSR Inspection

Item: Steering System

Help Screen #4

Inspect for:

a. Lash and free movement without jamming.

b. Mounting and condition of steering mechanism.

c. Fluid level and visible leaks in power steering unit.

d. Small or modified steering wheel.

e. Cracks and welds on steering axle and gear bow.

f. Loose Pitman arm.

g. Loose power assist cylinder on power steering unit.

h. Motion between linkage member and attachment point.

I. Loose clamps or bolts on tie rods or drag links.

j. Any modification or other condition that interferes with free movement of any steering component.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Steering Lash

b. Steering column.

   1. Any absence or looseness of U-bolt(s) or positioning part(s).

   2. Worn, faulty or obviously welded universal joint(s).

   3. Steering wheel not properly secured.

c. Front Axle beam and all steering components other than steering column.

   1. Any crack(s).

   2. Any obvious welded repair(s).

d. Steering Gear Box.

   1. Any mounting bolt(s) loose or missing.

   2. Any crack(s) in gear box or mounting brackets.

e. Pitman Arm.

   1. Any looseness of the pitman arm on the steering gear output shaft.

f. Power Steering.

   1. Auxiliary power assist cylinder loose.

g. Ball and Socket Joints.

   1. Any movement under steering load of a stud nut.

   2. Any motion, other than rotational, between any linkage member and its attachment point of more than 1/4 inch..

h. Tie rods and drag links.

   1. Loose clamp(s) or clamp bolt(s) on tie rods or drag links.

2. Any looseness in any threaded joint.

I. Nuts. Nut(s) loose or missing on tie rods, pitman arm, drag link, steering arm or tie rod arm.

j. Steering System. Any modification or other condition that interferes with free movement of any steering component.

FMCSR Inspection

Item: Seat Belts

Help Screen #5

Inspect for:

a. Presence of front seat belts (when required).

b. Unsafe belts, attachment fittings and buckles.

c. Anchor bolts.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Front lap seat belts are required and not present.

b. Seat belt webbing is frayed, spilt, or torn.

c. Belt anchorages or attachment fittings are loose, badly corroded, missing or not fastened to belt.

d. Belt buckles loose or inoperative.

e. All seat belt anchor bolts are not securely fastened to floor or are missing.

f. Pelvic restraint is not present.

g. Seat belt will not adjust to allow proper fit.

FMCSR Inspection

Item: Brake System

Help Screen #6A

Inspect for:

a. Present of required number of brakes.

b. Stopping distance.

c. Equalization.

d. Fluid level.

e. Frayed, leaking, damaged hoses or cables.

f. Visible leaks or audible leaks in brake lines and wheel cylinders.

g. Missing or broken mechanical components (shoes, pads, linings, anchor pins, etc.).

h. Readjustment limits.

I. Condition of linings and pads.

j. Mismatch air chamber sizes and slack adjuster length.

k. Cracks on brake drums and rotors.

l. Improper repair of hoses.

m. Tubing cracked, broken, or crimped.

n. Low pressure warning device.

o. Loose air compressor mounting bolts.

p. Broken or loose pulleys and brackets.

q. Break away device.

r. Low fluid warning light.

s. Vacuum reserve.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Absence of braking action on any axle required to have brakes upon application of the service brakes (such as missing brakes or brake shoe(s) failing to move upon application of a wedge, S-cam, or disc brake).

b. Missing or broken mechanical components including: shoes, lining, pads, springs, anchor pins, spiders, cam rollers, push rods, and air chamber mounting bolts.

c. Loose brake components including air chambers, spiders, and cam shaft support brackets.

d. Audible air leak at brake chamber (Example-ruptured diaphragm, loose chamber clamp, etc.).

e. Any brake stroke is at the readjustment limit.

f. Brake linings or pads.

1. Lining or pad is not firmly attached to the shoe:

2. Saturated with oil, grease, or brake fluid; or

3. Non-steering axles: Lining with a thickness less than 1/4 inch at the shoe center for air drum brakes, 1/16 inch or less at the shoe center for hydraulic and electric drum brakes and less than 1/8 inch air disc brakes.

4. Steering axles: Lining with a thickness less than 1/4 inch at the shoe center for drum brakes, less than 1/8 inch for air disc brakes and 1/16 inch or less for hydraulic disc and electric brakes.

g. Brake is missing on any axle required to have brakes.

h. Mismatch across any power unit steering axle of:

   1. Air chamber sizes.

2. Slack adjuster length.

I. Parking Brake System.

1. In accordance with Chapter 3.

j. Brake drums or rotors.

1. Any external crack or cracks that open upon brake application (do not confuse short hairline heat check cracks with flexural cracks).
2. Any portion of the drum or rotor is missing.

k. Brake Hose.

1. Hose with any damage extending through the outer reinforcement ply.
2. Bulge or swelling when air pressure is applied.
3. Any audible leaks.
4. Two hoses improperly joined (such as a splice made by sliding the hose ends over a piece of tubing and clamping the hose to the tube).
5. Air hose cracked, broken or crimped.

l. Brake Tubing.

1. Any audible leak.
2. Tubing cracked, broken or crimped.

m. Low pressure warning device.

1. Missing, inoperative, or does not operate at 55 psi and

   below, or the governor cut-out pressure, whichever is less.

n. Tractor protection valve.

1. Inoperable or missing tractor protection valve(s) on power unit.

o. Air Compressor.

1. Compressor drive belts cracked or frayed.

2. Loose compressor mounting bolts.
3. Cracked, broken or loose pulley.
4. Cracked or broken mounting brackets, braces or adapters.

p. Electric brakes.

1. Absence of braking action on any wheel required to have brakes.
2. Missing or inoperable breakaway braking device.

q. Hydraulic Brakes. (Including power assist over hydraulic and engine drive hydraulic booster).

   1. Master cylinder fluid level is 1 inch or more below the top of the reservoir or below manufacturers recommended level.
   2. No pedal reserve with engine running except by pumping pedal.
   3. Power assist unit fails to operate.
   4. Seeping or swelling brake hose(s) under application of pressure.
   5. Missing or inoperative check valve.
   6. Has any visually observed leaking hydraulic fluid in the brake system.
   7. Has hydraulic hose(s) abraded (chafed) through outer cover -to-fabric layer.
   8. Fluid lines or connections leaking, restricted, crimped, cracked or broken.
   9. Brake failure or low fluid warning light on and/or inoperative.

r. Vacuum Systems.

   1. Has insufficient vacuum reserve to permit one full brake application after engine is shut off.
   2. Has vacuum hose(s) or line(s) restricted, abraded (chafed) through outer cover to cord ply, crimped, cracked, broken or has collapsed of vacuum hoses(s) when vacuum is applied.
   3. Lacks an operative low-vacuum warning device as required.

FMCSR Inspection

Item: Parking Brake System

Help Screen #6B

Inspect for:

(Required on all motor vehicles beginning with model year 1960).

a. Operating mechanism.
b. Condition of mechanical parts and pull cable.
c. Holding ability.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Motor vehicle is not equipped with a parking brake.
b. Operating mechanism, when fully applied, does not hold the vehicle.
c. Actuating mechanism is not fully released when the release control is operated.
d. Any mechanical parts are missing, broken, badly worn, or not operating properly.
e. Pull cables are badly worn, stretched, frayed, or not operating freely.
f. Parking brake will not hold the vehicle in place when, with the engine running, the vehicle is placed in forward gear and the engine is accelerated enough to cause a pull on the braking mechanism.

FMCSR Inspection

Item: Steering Axle Tires

Help Screen #7A

Inspect for:

a. Worn spot that exposes ply or cord through the tread.

b. Tread cuts, fabric breaks, snags, sidewall cracks or separation.

c. Visible bumps bulges or knots.

d. 4/32" tread.

e. Mixed tire construction.

f. Boot, blowout patch or other ply repair.

g. Tire inflation.

h. Regrooved tires.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. With less than 4/32 inch tread when measured at any point on a major tread groove.

b. Has body ply or belt material exposed through the tread or sidewall.

c. Has any tread or sidewall separation.

d. Has a cut where the ply or belt material is exposed.

e. Labeled “Not for Highway Use” or displaying other marking which would exclude use of steering axle.

f. A bus operated with regrooved, recapped or retreaded tires on the front wheels.

g. A truck or truck tractor with regrooved tires on the front wheels.

h. A tube-type radial tire without radial tube stem markings. These markings include a red band around the tube stem, the word “radial” embossed in metal stems, or the word “radial” molded in rubber stems.

I. Mixing bias and radial tires on the same axle.

j. Tire flap protrudes through valve slot in rim and touches stem.

k. Regrooved tire except motor vehicles used solely in urban or suburban service (see exception 393.75 (e))

l. Boot, blowout patch or other ply repair.

m. Weight carried exceeds tire load limit. This includes overloaded tire resulting from low air pressure.

n. Tire is flat or has noticeable (e.g., can be

heard or felt) leak.

o. So mounted or inflated that it comes in contact with any part of the vehicle.

FMCSR Inspection

Item: Tires (all other)

Help Screen #7B

Inspect for:

a. Worn spot that exposes ply or cord through the tread.

b. Tread cuts, fabric break, snags or sidewall cracks.

c. Visible bumps, bulges, or knots.

d. Tread wear less than 2/32" in any two adjacent major grooves at one location.

e. Tire inflation.

f. Spare tire secured to vehicle.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Weight carried exceeds tire load limit. This includes overloaded tire resulting from low air pressure.

b. Tire is flat or has noticeable (e.g., can be heard or felt) leak.

c. Has body ply or belt material exposed through the tread or sidewall.

d. Has any tread or sidewall separation.

e. Has a cut where ply or belt materials is exposed.

f. So mounted or inflated that it comes in contact with any part of the vehicle. (This includes a tire that contacts its mate.)

g. Is marked “Not for highway use” or otherwise marked and having like meaning.

h. With less than 2/32 inch tread when measured at any point on a major tread groove.

FMCSR Inspection

Item: Wheel Assembly

Help Screen #8

Inspect for:

a. Defective or bent rim flanges, loose, missing or damaged bolts, nuts, studs or lugs.

b. Defects and cracks that may impair safe mounting and proper retention of tires.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Loose, missing, or damaged wheel studs, bolts, nuts, or lugs.

b. Any part of the wheel bent, cracked, rewelded, or damaged so as to affect safe operation of the vehicle.

c. Wheel nuts, studs, and clamps which are loose, broken, missing, or mismatched. Adequate thread engagement is imperative. Stud and nut threads on wheel lugs must engage completely through the entire threaded portion of the nut.

d. Rims and rings which are mismatched, bent, sprung, or otherwise damaged. Check for evidence of rim slippage - this is an indication of wear of loose nuts.

e. Disc wheels with elongated bolts, holes, or cracks between hand holes or stud holes, or both.

f. Cast wheels with cracks, evidence of wear in the clamp area, or both.

g. Rims have defects or cracks to the extent that they impair the safe mounting and proper retention of tires.

h. Any wheel cannot be securely fastened to the hub of the vehicle.

I. On motorcycles and motor-driven cycles, any spokes are bent, loose, broken, or missing.

FMCSR Inspection

Item: Exhaust System

Help Screen #9

Inspect for:

a. Loose or leaking joints.
b. Holes, leaking seams or patches.
c. System or its elements not securely fastened to vehicle.
d. Any part of exhaust system passes through (or terminates beneath) the passenger compartment.
e. Tail pipe broken, pinched or eroded off allowing fumes to penetrate passenger compartment.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Vehicle is not equipped with a muffler.
b. Any joint is loose or leaking, including manifolds. Does not include minor leakage at exhaust control valve (manifold damper or heat riser valve).
c. Manifold is cracked or broken causing leakage.
d. Holes, leaking seams, or patches on the muffler, resonators, exhaust pipe, tail pipe or catalytic converter.
e. Exhaust system is not secured to the vehicle by mounting brackets designed for exhaust systems (wire is not acceptable).
f. Any brackets are loose, broken, or missing.
g. There is excessive vibration of exhaust line.
h. Any part of the exhaust system passes through the passenger compartment.
I. The tail pipe is broken, pinched, or eroded off to extent to allow exhaust fumes to penetrate into the interior of the passenger compartment.
j. The tail pipe fails to discharge exhaust from the rear, sides or top of the passenger compartment of the vehicle.

NOTE: Holes in the exhaust system made by the manufacturer for drainage are not cause for rejection. The tail pipe must direct the exhaust fumes out from under the passenger compartment.

FMCSR Inspection
Item: Emission System
Help Screen #10

Inspect for:

(Required on motor vehicles equipped by manufacturer beginning with 1968 models).

a. Examine visually for presence of system.
b. Plumbing is loose, broken, leaking or improperly routed.
c. System has been altered, removed, or disconnected.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. The exhaust emission system has been removed.
b. The exhaust emission system has been disconnected.
c. The plumbing or hoses are loose, broken, leaking, or improperly routed.
d. Air pump (air injection type) belt is loose, removed, cracked, frayed, or has pieces missing.
e. The exhaust emission system has been altered in any manner to make it ineffective.
f. The catalytic converter has been removed, leaking, or disconnected on a 1984 or later model vehicle.

FMCSR Inspection
Item: Beam Indicator
Help Screen #11

Inspect for:

(Required on all motor vehicles beginning with 1948 models, except motorcycles and motor-driven cycles).

a. Proper switching indication.
b. Visibility without glare.

NOTE: For more details, see Rules and Regulations Manual.

Reject if: (when required)

a. Vehicle not equipped with a beam indicator.
b. Improper switching indication.
c. Produces glaring light.
d. Inoperative for any reason.

FMCSR Inspection
Item: Tail Lamp
Help Screen #12

Inspect for:

a. Mounting, visibility and required number.
b. Color and condition of lens.
c. Wiring and visibility.
d. Connected to burn when headlamps burn.
e. Any lamp projects a white light to the and rear (except license plate lamp backup lamp).

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Required lamp or lamps are not present.
b. Lamp is not securely mounted to vehicle.
c. Lamp does not completely emit a red light plainly visible 1,000 feet to the rear.
d. Lamp lens is cracked, broken, painted, missing, discolored, or does not fit properly.
e. Wiring is shoddy or electrical connections are poor.
f. Lamp is not wired so as to be lighted when headlamps or auxiliary driving lamps are lighted.
g. Lamp is obstructed by any part of the body.
h. Lamp lens is not red color.
I. Lamps are not mounted on the same level and as widely spaced laterally as practicable.
j. Lamps are not mounted on rear of vehicle.
k. Lens is cracked or broken to the extent that a portion of the lens is missing and/or separated, permitting light from the bulb to emit through the crack or break.

FMCSR Inspection
Item: Stop Lamp
Help Screen #13

Inspect for:

a. Mounting, visibility and required number.
b. Color and condition of lens.
c. Actuation by application of service brakes.
d. Wiring and visibility.
e. Glaring or dazzling light.
f. Any lamps projects a white light to the rear (except license plate lamp and backup lamp).

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Required lamp or lamps are not present.
b. Lamps is not securely mounted to the vehicle.
c. Lamp does not emit a red or amber light which is actuated on application of the service (foot) brake.
d. Lamp is not visible from a minimum distance of 300 feet to the rear of the vehicle to which it is attached.
e. Lamp lens is cracked, broken, painted, missing, discolored, or does not fit properly.
f. Wiring is shoddy or electrical connections are poor.
g. Lamp projects a glaring or a dazzling light.
h. Lamp is not mounted on rear of vehicle.
I. Lens is cracked or broken to the extent that a portion of the lens is missing and/or separated, permitting light from the bulb to emit through the crack or break.

NOTE: Lamps lenses cannot be repaired with repair tape or repair kit.

FMCSR Inspection
Item: License Plate Lamp
Help Screen #14

Inspect for:

a. Mounting and wiring.
b. Illumination of license plate.
c. Lighting when headlamps are lighted.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Lamp is not present.
b. Lamp is not securely mounted to the vehicle.
c. Lamp is not placed to illuminate with a white light the rear registration plate.
d. Wiring insulation is worn, rubbed bare, or shows any evidence of burning, short circuiting, or poor electrical connections.
e. Lamp is not wired so as to be lighted when head lamps or auxiliary driving lamps are lighted.
f. Lamp emits a glaring light to the rear.
g. Lens is cracked or broken to the extent that a portion of the lens is missing and/or separated, permitting light from the bulb to emit through the crack or break.

FMCSR Inspection
Item: Rear Reflectors
Help Screen #15

Inspect for:

a. Color, location and condition of lens.
b. Mounting and visibility.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Reflector is not present.
b. Reflector is not of red color.
c. Reflector is not properly and/or securely mounted to the vehicle.
d. Reflector is cracked to the extent that the reflecting ability is impaired.
e. Reflector is discolored, deteriorated, or painted.
f. Visibility distance is not as required.
g. Requirements shown on lighting diagram are not met.

FMCSR Inspection
Item: Turn Signal Lamps
Help Screen #16

Inspect for:

a. Mounting, visibility and approved type.
b. Color and condition of lens.
c. Wiring, switch, telltale and proper indications.
d. Self-illumination and automatic flashing.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Lamps are required and not present.
b. Device is not securely mounted or properly located on the vehicle.
c. Device is not of a type meeting Department standards.
d. Lamp lens is cracked, broken, discolored, or missing.
e. Wiring insulation is worn, rubbed bare, or shows any evidence of burning, short circuiting, or poor electrical connections.
f. Switch is not convenient to driver or indicator light does not operate.
g. Signal shows any color other than white or amber to the front, or signal shows any color other than red or amber to the rear.
h. Signal does not flash or is not operating properly.
I. Signal is not clearly visible to the front and to the rear of the vehicle.
j. Lens is cracked or broken to the extent that a portion of the lens is missing an/or separated, permitting light from the bulb to emit through the crack or break.

NOTE: Selector switch must lock in proper turn position when applied but need not cancel automatically.

FMCSR Inspection
Item: Headlamps
Help Screen #17

Inspect for:

a. Mounting and approved type.
b. Improper connections, switching and dimmer switch.
c. Cracked, broken or missing lens.
d. Wiring.
e. Physical damage that would obviously cause a headlight beam to fail to sufficiently illuminate the roadway ahead of the vehicle.
f. Dirt, moisture, contaminations or discolorations.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Lamp or lamp assembly is not securely fastened to the vehicle.
b. Lamp is improperly connected and does not light the proper filament for different switch positions.
c. Lamp lens is cracked, broken, discolored, or missing (Exception: Composite or halogen type lamps will not be rejected for being cracked unless the reflector material inside the lamp is discolored or deteriorated).
d. Lamp is not of a type meeting Department standards.
e. Wiring insulation is worn, rubbed bare, or shows any evidence of burning, short circuiting, or poor electrical connections.
f. Lamp lens is rotated, upside down, canted, or is marked “right”, “left”, #1 or #2 and not appropriately installed.
g. Lamp fails to function properly in any manner.
h. Lamp has dirt or any contamination or discoloration inside or moisture except condensed moisture in composite head lamps or nonsealed beam halogen lamps.
I. Lamp switch or dimmer switch does not operate properly and is not convenient to the driver.
j. Foreign material placed on head lamp lens, such as shields, half of lens, paint, tape, etc., that interferes with the light beam of the lamp.
k. Vehicle is not equipped with headlamps as required.
l. Lamp can be moved easily by hand, due to a broken fender or loose support.
m. Lamp is missing.
n. Lens is other than clear (white).

o. Any filament in head lamps fails to burn except composite lamps with more than one bulb when both upper and lower beam burn when selected.
p. Wiring is dangling or connections are loose.
q. A good ground is not made by the lamp mounting.
r. Lamp is mounted on vehicle more than or less than prescribed mounting heights.
s. Headlamp is covered by any lens or cover located front of the headlamp which is any shade or color other than clear.
t. There is physical damage that would obviously cause a headlight beam to fail to illuminate the roadway ahead of the vehicle sufficiently.

FMCSR Inspection
Item: Clearance Lamps
Help Screen #18

Inspect for:

a. Mounting and location.
b. Required color.
c. Cracked, broken, or missing lens.
d. Wiring and visibility.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Lamps are not present.
b. Lamps are not securely mounted and properly located.
c. Lamps do not emit required color; lens or bulb painted.
d. Visibility requirements are not met.
e. Lenses are cracked, broken, discolored, or missing.
f. Wiring insulation is worn, rubbed bare, or shows any evidence of burning, short circuiting, or poor electrical connections.
g. Lens is cracked or broken to the extent that a portion of the lens is missing and/or separated, permitting light from the bulb to emit through the crack or break.

FMCSR Inspection Item:
Side Marker Lamps
Help Screen #19

Inspect for:

a. Mounting and location.
b. Required color.
c. Cracked, broken, or missing lens.
d. Wiring and visibility.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Lamps are not present.
b. Lamps are not securely mounted and properly located.
c. Lamps do not emit required color; lens or bulb painted.
d. Visibility requirements are not met.
e. Lenses are cracked, broken, discolored, or missing.
f. Wiring insulation is worn, rubbed bare, or shows any evidence of burning, short circuiting, or poor electrical connections.
g. Lens is cracked or broken to the extent that a portion of the lens is missing and/or separated, permitting light from the bulb to emit through the crack or break.

FMCSR Inspection
Item: Cab Lamps
Help Screen #20

Inspect for:

(Truck tractors only)

a. Mounting and location.
b. Required color.
c. Cracked, broken, or missing lens.
d. Wiring and visibility.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Lamps are required and not present.
b. Lamp is not securely mounted and properly located.
c. Lamp does not emit required color; lens or bulb painted.
d. Lamp lens is cracked, broken, discolored, or missing.
e. Lamp is not visible from distance between 500 feet and 50 feet.
f. Wiring insulation is worn, rubbed bare, or shows any evidence of burning, short circuiting, or poor electrical connections.
g. Lens is cracked or broken to the extent that a portion of the lens is missing and/or separated, permitting light from the bulb to emit through the crack or break.

FMCSR Inspection
Item: Side Reflectors
Help Screen #21

Inspect for:

a. Color, location and condition of lens.
b. Mounting and visibility.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Reflectors are not present.
b. Reflectors are not of the required color for its location on the vehicle.
c. Reflectors are not properly and/or securely mounted to the vehicle or if visibility distance is not as required.
d. Reflector is cracked to the extent that the reflecting ability is impaired.
e. Reflectors are discolored, deteriorated, or painted.
f. Requirements shown on lighting diagram are not met.

FMCSR Inspection
Item: School Buses
Help Screen #22

Inspect for:

a. School bus signs.
b. Fire extinguisher.
c. Warning lamps.
d. Convex crossover mirror.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

2. a. All equipment required by size, weight, or class of the vehicle does not meet requirement.
   b. Signs are not present, readable, and of proper height.
3. c. Fire extinguisher is not of required capacity, proper type, or in good condition and properly located.
   d. School bus RED signal lamps are not present, properly working, and in good condition.
   e. Crossover mirror mounting is loose or will not adjust to different positions or will not hold firm after adjustment.
   f. Crossover mirror offers unsafe interference with driver's forward vision or hides either front turn signal from view of oncoming driver.
   g. Crossover mirror's reflective surface is cracked, broken, peeled, or tarnished, or has sharp edges.

NOTE: Some school buses may be equipped with eight warning signal lamps, four red and four amber, working in an automatic integrated system. This system of alternately flashing warning lamps will be accepted provided it has two red lamps on the front and two red lamps on the rear.

FMCSR Inspection Item:
Safety Guards Or Flaps
Help Screen #23

Inspect for:

a. Mounting, condition and location.
b. Construction and material.
c. Height and width.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Safety guard or flap is not present.
b. Safety guard or flap is not securely mounted.
c. Safety guard or flap is not as wide as the tire that it is protecting.
d. Safety guard or flap is split or torn to the extent that it is ineffective.
e. The bottom edge of safety guard or flap is more than twelve (12) inches from the surface of the roadway.

FMCSR Inspection
Item: Window Tinting or Coating
Help Screen #24

Inspect for:

a. Tinting on either side of the driver compartment.
b. Tint or coating extended more than 2" below the top of the windshield.
c. Tinting or coating has more than a 1" border at each side of windshield.
d. Tinting or coating or any other visor restricting materials are not above the top most portion of the steering wheel.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Tint or coating is extending more than 2 inches below the top of the windshield.
b. Tint or coating has more than 1 inch border at each side of windshield.
c. Tinting or coating and any vision restricting materials are not above the top most portion of the steering wheel.
d. No tinting is allowed on either side of the driver's compartment.

FMCSR Inspection
Item: ID Lamps
Help Screen #25

Inspect for:

a. Presence of lamps.
b. Mounting and location.
c. Required color.
d. Cracked, broken or missing lens.
e. Wiring and visibility.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Lamps are not present.
b. Not securely mounted and properly located.
c. Lamp does not emit proper color; lamp or bulb painted.
d. Lens cracked, broken, discolored or missing.
e. Wiring insulation is worn, rubbed bare or evidence of burning, short circuiting or poor connection.
f. Visibility requirements not met.
g. Lens is cracked or broken.

FMCSR Inspection Item:
Hazardous Warning Lamps
Help Screen #25

Inspect for:

a. Presence of lamps.
b. Mounting.
c. Required color.
d. Cracked, broken, or missing lens.
e. Visibility and wiring.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Lamps are not present.
b. Not securely mounted and properly located.
c. Lamp does not emit proper color; lamp or bulb painted.
d. Lens cracked, broken, discolored or missing.
e. Wiring insulation is worn, rubbed bare or evidence of burning, short circuiting or poor connection.
f. Visibility requirements not met.
g. Lens is cracked or broken.

FMCSR Inspection
Item: Backup Lamps
Help Screen #25

Inspect for:

a. Presence of lamps.
b. Mounting.
c. Required color.
d. Cracked, broken, or missing lens.
e. Visibility and wiring.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Lamps are not present.
b. Not securely mounted and properly located.
c. Lamp does not emit proper color; lamp or bulb painted.
d. Lens cracked, broken, discolored or missing.
e. Wiring insulation is worn, rubbed bare or evidence of burning, short circuiting or poor connection.
f. Visibility requirements not met.
g. Lens is cracked or broken.
h. Lamps are not activated properly when vehicle is in reverse.

FMCSR Inspection
Item: Coupling Devices
Help Screen #26

Inspect for:

a. Mounting.
b. Movement between components.
c. Fasteners missing or defective.
d. Any welds or metal cracks.
e. Pivot bracket pin missing.
f. Movement between pivot and bracket pin.
g. Any fore or aft stop missing or not securely attached.
h. Movement between slider bracket and slider base.
I. Horizontal movement between upper corner of 5th wheel halves.
j. Operating handle in closed or locked position.
k. King pin properly engaged.
l. All locking mechanism must be in good working order.
m. Any leaking air or hydraulic cylinder, hoses, or chambers.
n. Unattached or incapable of secure attachment (includes spare tire).
o. Any worn or repaired chains or cables or any safety devices missing.

NOTE: For more details, see rules and regulations manual.

1. Inspect fifth wheel for and reject if:
   a. Any fasteners missing or ineffective.
   b. Any movement between mounting components.
   c. Any mounting angle iron cracked or broken.
   d. Any fasteners missing or ineffective on mounting plates and pivot brackets.
   e. Any welds or parent metal cracked.
   f. More than 3/8 inch horizontal movement between pivot bracket pin and bracket.
   g. Pivot bracket pin missing or not secured.
   h. Any latching fasteners missing or ineffective on sliders.
   I. Any fore or aft stop missing or not securely attached.
   j. Movement more than 3/8 inch between slider bracket and slider base.
   k. Any slider component cracked in parent metal or weld.
   l. Horizontal movement between the upper and lower fifth wheel halves exceeds ½ inch on lower coupler.
   m. Operating handle not in closed or locked position.
   n. Kingpin not properly engaged.
   o. Separation between upper and lower coupler allowing light to show through from side to side.
   p. Cracks in the fifth wheel plate. Exceptions: Cracks in fifth wheel approach ramps and casting shrinkage crack in the ribs of the body of a cast fifth wheel.
   q. Locking mechanism parts missing, broken, or deformed to the extent the kingpin is not securely held.
2. Inspect Pintle Hooks for and reject if:

   a. Any missing or ineffective fasteners (a fastener is not considered missing if there is an empty hole in the device but not corresponding hole in the frame or vice versa).
   b. Mounting surface cracks extending from point of attachment (e.g., cracks in the frame at mounting bolt holes).
   c. Loose mounting.
   d. Frame cross member providing pintle hook attachment cracked.
   e. Cracks anywhere in pintle hook assembly.
   f. Any welded repairs to the pintle hook.
   g. Any part of the horn section reduced by more than 20 percent.
   h. Latch insecure.
3. Inspect Drawbar/Towbar Eye for and reject if:
   a. Any cracks in attachment welds.
   b. Any missing or ineffective fasteners.
   c. Any part of the eye reduced by more than 20 percent.
4. Inspect Drawbar/Towbar Tongue for and reject if:
   a. Ineffective latching mechanism.
   b. Missing or ineffective stop.
   c. Movement of more than 1/4 inch between slider and housing.
   d. Any leaking, air or hydraulic cylinders, hoses, or chambers, (other than slight oil weeping normal with hydraulic seals).
   e. Any cracks.
   f. Movement of 1/4 inch between subframe and drawbar at point of attachment.

5. Inspect Safety Devices for and reject if:
    a. Safety devices missing.
    b. Unattached or incapable of secure attachment.
    c. Chains and hooks.
        1) Worn to the extent of a measurable reduction in link cross section.
        2) Improper repairs including welding, wire, small bolts, rope and tape.
    d. Cable
        1) Kinked or broken cable strands.
        2) Improper clamps or clamping.
6. Inspect Saddle-Mounts for and reject if:
    a. Any missing or ineffective fasteners.
    b. Loose mountings.
    c. Any cracks or breaks in a stress or load bearing member.
    d. Horizontal movement between upper and lower saddle-mount halves exceeds 1/4 inch.

FMCSR Inspection
Item: Fuel System
Help Screen #27

Inspect for:

a. Visible leaks.
b. Filler cap presence.
c. Properly mounted fuel tank.
d. LPG decal.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Visible leaks.
b. Filter cap missing.
c. Fuel tank not securely mounted.
d. No valid Liquefied Petroleum Gas Tax Decal Issued by the State Comptroller for LPG powered vehicles.

FMCSR Inspection
Item: Suspension System
Help Screen #28

Inspect for:

a. Any cracked broken, missing or loose parts on any part of the suspension system.
b. Deflated air suspension.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. U-bolt, spring hanger or other axle parts are cracked broken, loose or missing.
b. Any leaf spring assembly leaves broken or missing.
c. Coil spring broken.
d. Rubber spring missing.
e. Any leaves displaced that could cause contact with a tire, rim, brake drum, or frame.
f. Broken torsion bar spring.
g. Deflated air suspension.
h. Torque, radius, or tracking component cracked, loose, broken or missing.

FMCSR Inspection
Item: Frame
Help Screen #29

Inspect for:

a. Any part of frame member is cracked, broken loose or sagging.
b. Any loose or missing fasteners to any body of mechanical part.
c. Body or frame contact with tire or wheel assembly.
d. Any missing or non-engaged locking pins or adjustable axle assemblies.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Any part of frame member is cracked, broken, loose, or sagging.
b. Fasteners attaching the engine, transmission, steering gear, suspension, body parts and fifth wheel loose or missing.
c. Any condition that causes the body or frame to be in contact with a tire or wheel assembly.
d. Locking pins missing or not engaged on adjustable axle assemblies.

FMCSR Inspection
Item: Commercial Windshield
Help Screen #30

Inspect for:

a. Cracked or damaged.
b. Tinting and visibility.

NOTE: For more details, see Rules and Regulations Manual.

Reject if:

a. Any crack over 1/4 inch wide.
b. Any damaged area of 3/4 inch or more in diameter.
c. Damage area is closer than 3 inches to any other damaged area.
d. Any crack less than 1/4 inch wide intersecting with any other crack.

Appendix E

Help Screens
for the VI - 7 Rejection Receipt

(Reserved)

Appendix F

Help Screens
for the VI - 8B Inspection Log

(Reserved)

Appendix G

Format for
VI - 8B Inspection Log

```
                    TEXAS DEPARTMENT OF PUBLIC SAFETY
                     VEHICLE INSPECTION STATION LOG
                   NANNNNN  EEEEEEEEEEEEEEEEEEEEEEEE
                     WEEK ENDING, SATURDAY, MMDDYY
-------------------------------------------------------------------------------
NNN MM/DD VOID A ANNNNNNNN NNNNNNNN EEEEEEEE EEEEEEEEEEEEEEEE YYYY AAAA NNNNNN
    FAIL: EEEEEEEEEEEEEEEEEEEEEEEEEEEEE REPAIR: EEEEEEEEEEEEEEEEEEEEEEEEEEEEE
    $9,999.99  INSPECTOR: EEEEEEEEEEEEEEEEEEE ___________________________________

                     AUDITED BY 4444 ON MMDDYY @ HHMM
-------------------------------------------------------------------------------

STATION REPRESENTATIVE: ____________________________________________  PAGE NN OF NN
```

****

N = Numeric Character
A = Alpha Character
E = Either Alpha or Numeric Character
MM = Month (Date)
DD = Day (Date)
YY = Year (Date)
VOID = Void Indicator
YYYY = Year including century (Vehicle Year Model)
$9,999.99 = Cost/Fee

****

Header Fields (Top to Bottom, Left to Right)

Line 1 (Centered)

No Variable Fields
Text: "**TEXAS DEPARTMENT OF PUBLIC SAFETY**"

Line 2 (Centered)

No Variable Fields
Text: "**VEHICLE INSPECTION STATION LOG**"

Line 3 (Centered)

Two Variable Fields: Station Number and Station Name
Field #1: Station Number - Characters 7; ***NANNNNN***
Field #2: Station Name - Characters 25; ***EEEEEEEEEEEEEEEEEEEEEEEEE***

Line 4 **(Centered)**

One Variable Field
Text: "**WEEK ENDING, SATURDAY,** "
Field #1: Date - Characters 6; ***MMDDYY***

Line 5

No Variable Fields
Text: "**---**"

Record Fields (Top to Bottom, Left to Right)

Line 1

One Counter Field, Ten Variable Fields, No Text

Counter Field: Record Number - Characters 3; ***NNN*** (Sequentially numbered beginning with 001 for each week, include leading zeroes).

Field #1: Date of Inspection - Characters 5; ***MM/DD***

Field #2: Void Indicator - Characters 4; ***AAAA*** (Read ***VOID, MISS, or REPL*** if cert_cond field is set to 'V,' 'M,' or 'R,' respectively, blank and strip if cert_cond is blank).

Field #3: Type of Test - Characters 1; ***A***

Field #4: Certificate or Decal Number - Characters 9; ***ANNNNNNNN***

Field #5: VI-30A Number - Characters 7; ***NNNNNNN***

Field #6: Vehicle Registration Number - Characters 8; ***EEEEEEEE***

Field #7: Vehicle Identification Number - Characters 17; ***EEEEEEEEEEEEEEEEE***

Field #8: Vehicle Year Model - Characters 4; ***NNNN***

Field #9: Vehicle Make - Characters 4; ***AAAA***

Field #10: Odometer Reading - Characters 6; ***NNNNNN***

Line 2 (Begin at column 5)

Two Variable Fields with Dependant Text

Text: "**FAIL:** " (Should only appear if there are fail codes to display)

Field #1: Fail Codes - Characters up to 4 with separators; NNA/... (Maximum field length: 30 characters)

Text: "**REPAIR:** " (Should only appear if there are repair codes to display)

Field #2: Repair Codes - Characters up to 4 with separators; NNA/... (Maximum field length: 30 characters)

If there are no fail or repair codes to display this line should be left blank and stripped from the record.

Line 3 (Begin at column 5)

Two Variable Fields with Text

Field #1: Cost - Characters 9; ***$9,999.99***

Text: " **INSPECTOR:** "

Field #2: Inspector Driver License Number - Characters 20; ***EEEEEEEEEEEEEEEEEEEE***

Text: " _____"

There should be a blank line inserted after each record to separate them from one another, unless it is the last record on the page.. There should be no partial records on a page. If it will not fit on the page, the whole record should be printed on the next page.

Footer Fields (Top to Bottom, Left to Right)

Line 1

No Variable Fields
Text: "**----------**"

Line 2

To be left Blank

Line 3

Two Counter Fields with Text
Text: "**STATION REPRESENTATIVE:**
_____ **PAGE** "
Counter Field #1: Page Number - Characters 2; ***NN***
Text: " **OF** "
Counter Field #2: Total Number of Pages - Characters 2; ***NN***

Auditing Indicator

If a DPS Representative accesses the Analyzer data base for the purpose of conducting a station audit, the following caveat will be inserted on the report immediately following the last certificate issued prior to the access.

Line 1

Three Variable Fields and Text
Text: "**AUDITED BY** "

Field #1: DPS Representative's Last Name - Characters 15; ***AAAAAAAAAAAAAAA***
Text: " **ON** "
Field #2: Date of Audit - Characters 8; ***MMDDYYYY***
Text: " **@** "
Field #3: Time of Audit - Characters 4; ***HHMM***

The Date (Field #2 above) and Time (Field #3 above) shall be automatically entered into the Inspection Log (VI-8B). There should be a blank line inserted after each caveat to separate them from other records, unless it is the last entry on the page.

TEXAS DEPARTMENT OF PUBLIC SAFETY
VEHICLE INSPECTION STATION LOG
NANNNNN EEEEEEEEEEEEEEEEEEEEEEEE
WEEK ENDING, SATURDAY, MMDDYY

NNN MM/DD VOID A ANNNNNNNN NNNNNNN EEEEEEEE EEEEEEEEEEEEEEEE YYYY AAAA NNNNNN
FAIL: EEEEEEEEEEEEEEEEEEEEEEEEEEEEE REPAIR: EEEEEEEEEEEEEEEEEEEEEEEEEEEEE
$9,999.99 INSPECTOR: EEEEEEEEEEEEEEEEEEE _____

NNN MM/DD VOID A ANNNNNNNN NNNNNNN EEEEEEEE EEEEEEEEEEEEEEEE YYYY AAAA NNNNNN
FAIL: EEEEEEEEEEEEEEEEEEEEEEEEEEEEE REPAIR: EEEEEEEEEEEEEEEEEEEEEEEEEEEEE
$9,999.99 INSPECTOR: EEEEEEEEEEEEEEEEEEE _____

NNN MM/DD VOID A ANNNNNNNN NNNNNNN EEEEEEEE EEEEEEEEEEEEEEEE YYYY AAAA NNNNNN
FAIL: EEEEEEEEEEEEEEEEEEEEEEEEEEEEE REPAIR: EEEEEEEEEEEEEEEEEEEEEEEEEEEEE
$9,999.99 INSPECTOR: EEEEEEEEEEEEEEEEEEE _____

NNN MM/DD VOID A ANNNNNNNN NNNNNNN EEEEEEEE EEEEEEEEEEEEEEEE YYYY AAAA NNNNNN
FAIL: EEEEEEEEEEEEEEEEEEEEEEEEEEEEE REPAIR: EEEEEEEEEEEEEEEEEEEEEEEEEEEEE
$9,999.99 INSPECTOR: EEEEEEEEEEEEEEEEEEE _____

NNN MM/DD VOID A ANNNNNNNN NNNNNNN EEEEEEEE EEEEEEEEEEEEEEEE YYYY AAAA NNNNNN
FAIL: EEEEEEEEEEEEEEEEEEEEEEEEEEEEE REPAIR: EEEEEEEEEEEEEEEEEEEEEEEEEEEEE
$9,999.99 INSPECTOR: EEEEEEEEEEEEEEEEEEE _____

NNN MM/DD VOID A ANNNNNNNN NNNNNNN EEEEEEEE EEEEEEEEEEEEEEEE YYYY AAAA NNNNNN
FAIL: EEEEEEEEEEEEEEEEEEEEEEEEEEEEE REPAIR: EEEEEEEEEEEEEEEEEEEEEEEEEEEEE
$9,999.99 INSPECTOR: EEEEEEEEEEEEEEEEEEE _____

NNN MM/DD VOID A ANNNNNNNN NNNNNNN EEEEEEEE EEEEEEEEEEEEEEEE YYYY AAAA NNNNNN
FAIL: EEEEEEEEEEEEEEEEEEEEEEEEEEEEE REPAIR: EEEEEEEEEEEEEEEEEEEEEEEEEEEEE
$9,999.99 INSPECTOR: EEEEEEEEEEEEEEEEEEE _____

NNN MM/DD VOID A ANNNNNNNN NNNNNNN EEEEEEEE EEEEEEEEEEEEEEEE YYYY AAAA NNNNNN
FAIL: EEEEEEEEEEEEEEEEEEEEEEEEEEEEE REPAIR: EEEEEEEEEEEEEEEEEEEEEEEEEEEEE
$9,999.99 INSPECTOR: EEEEEEEEEEEEEEEEEEE _____

AUDITED BY AAAAAAAAAAAAAAA ON MMDDYYYY @ HHMM

NNN MM/DD VOID A ANNNNNNNN NNNNNNN EEEEEEEE EEEEEEEEEEEEEEEE YYYY AAAA NNNNNN
FAIL: EEEEEEEEEEEEEEEEEEEEEEEEEEEEE REPAIR: EEEEEEEEEEEEEEEEEEEEEEEEEEEEE
$9,999.99 INSPECTOR: EEEEEEEEEEEEEEEEEEE _____

NNN MM/DD VOID A ANNNNNNNN NNNNNNN EEEEEEEE EEEEEEEEEEEEEEEE YYYY AAAA NNNNNN
FAIL: EEEEEEEEEEEEEEEEEEEEEEEEEEEEE REPAIR: EEEEEEEEEEEEEEEEEEEEEEEEEEEEE
$9,999.99 INSPECTOR: EEEEEEEEEEEEEEEEEEE _____

NNN MM/DD VOID A ANNNNNNNN NNNNNNN EEEEEEEE EEEEEEEEEEEEEEEE YYYY AAAA NNNNNN
FAIL: EEEEEEEEEEEEEEEEEEEEEEEEEEEEE REPAIR: EEEEEEEEEEEEEEEEEEEEEEEEEEEEE
$9,999.99 INSPECTOR: EEEEEEEEEEEEEEEEEEE _____

NNN MM/DD VOID A ANNNNNNNN NNNNNNN EEEEEEEE EEEEEEEEEEEEEEEE YYYY AAAA NNNNNN
FAIL: EEEEEEEEEEEEEEEEEEEEEEEEEEEEE REPAIR: EEEEEEEEEEEEEEEEEEEEEEEEEEEEE
$9,999.99 INSPECTOR: EEEEEEEEEEEEEEEEEEE _____

STATION REPRESENTATIVE: _____ PAGE NN OF NN

Appendix H

Help Screen for
VI - 18 Requisition
for
Inspection Certificates

(Reserved)

Appendix I

File Layout

FILE LAYOUT
(Subject to Change based on EPA's Final OBD Guidance)

The following terms are used in describing the files found in this appendix.

TERM	DESCRIPTION
NUM(X)	The field is X bytes long and can contain only numeric characters "0" - "9" and any fixed characters specified in the format description. Numeric fields will be filled.
CHAR(X)	The field is X bytes long and can contain any alphanumeric character unless otherwise specified. Character fields are left justified and filled with spaces.
: . / -	These are fixed characters which are always placed in the same place within the field as indicated in the format description.

In general a term will be followed by a format description which indicates any fixed character locations. For example the format description HH:MM indicates that a colon will be present in the 3rd byte of the field. The format description XXX.XX indicates a fixed decimal point location with the "." being located in the 4th byte of the field. An 'e' in the left margin indicates that the field contains safety and emissions information. An 's' in the left margin indicates that the field contains only safety information. The offsets for each field are in the left margin listed prior to the e's and s's.

All records shall be prepared by first blank filling them. All numeric data fields shall be prepared by zero filling them.

When a new floppy is initialized by the auditor, the following hard disk files will be copied to the floppy disk. The purpose of backing up the data files to the floppy disk is to allow analyzers to be exchanged in the case of loaner units, and to be present in case of system failure.

HARD DISK FILES COPIED TO FLOPPY

STATION.DAT
INSPECTR.DAT
REINSPEC.DAT
CAL.DAT
AUDITGAS.DAT
AUDITNOT.DAT
AUDITLOG.DAT
LOCKOUT.DAT
PERFORM.DAT

STATION.DAT This is both hard disk and floppy based file accessed through the audit screen, containing data specific to the individual stations. Record length is 512 bytes.

0,e	STATION_NUM	CHAR(7)	Entered by the DPS under the audit menu.
7,e	ANALYZER_NUMBER	CHAR(8)	Entered by the DPS under the audit menu.
15,e	STATION_NAME	CHAR(25)	Entered by the DPS under the audit menu.
40,e	ST_ADDRESS	CHAR(20)	The street address of the station.
60,e	CITY	CHAR(13)	The city in which the station is located.
73,e	ZIP	CHAR(10)	The zip code of the station.
83,e	STAT_TX_PHONE	CHAR(12)	The analyzer phone number that is tied to the TX96 analyzer. XXX XXX-XXXX
95,e	STAT_PHONE	CHAR(12)	The station's telephone number for the TX96 analyzer is housed. XXX XXX-XXXX
107,e	STAT_EXP_DATE	NUM(8)	(MMDDYYYY)
115,e	SAFE_STATION_TYPE	CHAR(1)	Default to 'P' - 'Public'. Set to 'F' - 'Fleet' or 'G' - 'Government' by state representative under audit menu or via electronic transmission.
116,e	M-F_HR_OPEN	NUM(4)	(HHMM) Time the station opens Mondays - Fridays • Value of positions one and two (hour) must not be greater than "24." • Value of positions three and four (minute) must not be greater that "59."
120,e	M-F_HR_CLOSE	NUM(4)	(HHMM) Time the station closes Mondays - Fridays • Value of positions one and two (hour) must not be greater than "24." • Value of positions three and four (minute) must not be greater that "59."
124,e	SAT_HR_OPEN	NUM(4)	(HHMM) Time the station opens on Saturday. • Value of positions one and two (hour) must not be greater than "24." • Value of positions three and four (minute) must not be greater that "59."
128,e	SAT_HR_CLOSE	NUM(4)	(HHMM)

			Time the station closes on Saturday. • Value of positions one and two (hour) must not be greater than “24.” • Value of positions three and four (minute) must not be greater that “59.”
132,e	SUN_HR_OPEN	NUM(4)	(HHMM) Time the station opens on Sunday. • Value of positions one and two (hour) must not be greater than “24.” • Value of positions three and four (minute) must not be greater that “59.”
136,e	SUN_HR_CLOSE	NUM(4)	(HHMM) Time the station closes on Sunday. • Value of positions one and two (hour) must not be greater than “24.” • Value of positions three and four (minute) must not be greater that “59.”
140,e	COUNTY_CODE	CHAR(3)	The county where tested. Dallas - 057 Denton - 061 El Paso - 071 Fort Bend - 079 Harris - 101 Galveston - 084 Collin - 043 Brazoria - 020 Liberty - 146 Chambers - 036 Tarrant - 220 Montgomery - 170 Waller - 237 Out of State or Federal - 000
143,e	OBDII_ONLY	CHAR(1)	‘Y’ - OBDII only station, do not allow any tailpipe testing. ‘N’ - Not an OBDII only station, allow tailpipe testing.
144,e	MAIL_ST_ADDRESS	CHAR(20)	The station or corporate office mailing address.
164,e	MAIL_CITY	CHAR(13)	The station or corporate office mailing address city.
177,e	MAIL_ZIP	CHAR(10)	The station or corporate office mailing address zip code.
187,e	EMAIL_ADDRESS	CHAR(50)	Email address of the station or corporate office.
237,e	ANALYZER_NO_EXT	CHAR(3)	Analyzer extension for server/node solution, entered by the DPS under the audit menu.
240,e	SPACE	CHAR(270)	
510,e	CARRIAGE RETURN AND LINE FEED	CHAR(2)	2 BYTES

SYSTEM.DAT This is both hard disk and floppy based file containing data specific to the individual stations. Record length is 146 bytes.

0,e	OBDII_MODEL_YR	NUM(4)	Received from VID
4,e	OBDII_FAIL_ST_DT	NUM(8)	(MMDDYYYY)
12,e	MISFIRE_MON	CHAR(1)	OBD II Readiness Monitor for engine Misfire 'Y' - Yes, use as pass/fail criteria for OBDII phase 'N' - No, do not use as pass/fail criteria for OBDII phase
13,e	FUEL_SYS_MON	CHAR(1)	OBD II Readiness Monitor for the Fuel System 'Y' - Yes, use as pass/fail criteria for OBDII phase 'N' - No, do not use as pass/fail criteria for OBDII phase
14,e	COMPR_COMPR_MON	CHAR(1)	OBD II Readiness Monitor for the Comprehensive Components 'Y' - Yes, use as pass/fail criteria for OBDII phase 'N' - No, do not use as pass/fail criteria for OBDII phase
15,e	CATALYST_MON	CHAR(1)	OBD II Readiness Monitor for the Catalytic Converter 'Y' - Yes, use as pass/fail criteria for OBDII phase 'N' - No, do not use as pass/fail criteria for OBDII phase
16,e	HEAT_CATALYST_MON	CHAR(1)	OBD II Readiness Monitor for the Heated Catalytic Converter 'Y' - Yes, use as pass/fail criteria for OBDII phase 'N' - No, do not use as pass/fail criteria for OBDII phase
17,e	EVAP_SYS_MON	CHAR(1)	OBD II Readiness Monitor for the Evaporative System 'Y' - Yes, use as pass/fail criteria for OBDII phase 'N' - No, do not use as pass/fail criteria for OBDII phase
18,e	SEC_AIR_SYS_MON	CHAR(1)	OBD II Readiness Monitor for the Secondary Air System 'Y' - Yes, use as pass/fail criteria for OBDII phase 'N' - No, do not use as pass/fail criteria for OBDII phase
19,e	AIR_COND_SYS_MON	CHAR(1)	OBD II Readiness Monitor for the Air Conditioner System 'Y' - Yes, use as pass/fail criteria for OBDII phase 'N' - No, do not use as pass/fail criteria for OBDII phase
20,e	OXYGEN_SENSOR_MON	CHAR(1)	OBD II Readiness Monitor for the Oxygen Sensor 'Y' - Yes, use as pass/fail criteria for OBDII phase 'N' - No, do not use as pass/fail criteria for OBDII phase
21,e	HEAT_O2_SENS_MON	CHAR(1)	OBD II Readiness Monitor for the Oxygen Sensor Heater 'Y' - Yes, use as pass/fail criteria for OBDII phase 'N' - No, do not use as pass/fail criteria for OBDII phase
22,e	EGR_SYS_MON	CHAR(1)	OBD II Readiness Monitor for the Exhaust Gas Recirculation (EGR) Valve

			'Y' - Yes, use as pass/fail criteria for OBDII phase 'N' - No, do not use as pass/fail criteria for OBDII phase
23,e	THERMOSTAT_MON	CHAR(1)	OBD II Readiness Monitor for the Thermostat (beginning with M/Y 2000) 'Y' - Yes, use as pass/fail criteria for OBDII phase 'N' - No, do not use as pass/fail criteria for OBDII phase
24,e	PCV_MON	CHAR(1)	OBD II Readiness Monitor for the PCV Valve (beginning with M/Y 2002) 'Y' - Yes, use as pass/fail criteria for OBDII phase 'N' - No, do not use as pass/fail criteria for OBDII phase
25,e	SECXSEC_FLAG	CHAR(1)	'Y' - Yes, collect second-by-second data for this inspection. 'N' - No, do not collect second-by-second data.
26,e	MAX_NOT_READY_NUM	NUM(2)	Maximum number of OBDII readiness monitors that can be set to “not ready” during a valid OBDII inspection.
28,e	MAX_NT_RDY_BGN_YR	CHAR(4)	YYYY-max number of readiness monitors applies to vehicles whose model year is greater than or equal to the year contained in this field.
32,e	MAX_NT_RDY_END_YR	CHAR(4)	YYYY-max number of readiness monitors applies to vehicles whose model year is less than or equal to the year contained in this field.
36,e	SPACE	CHAR(108)	
144,e	CARRIAGE RETURN AND LINE FEED	CHAR(2)	2 BYTES

INSPECTR.DAT This is both hard disk and floppy based file accessed through the audit screen containing information about the stations inspectors. Record length is 512 bytes.

0,e	INSPECTOR_NUM	CHAR(20)	Number assigned by the DPS through the audit screen.
20,e	INSPECTOR_LNAME	CHAR(15)	Inspector's last name.
35,e	INSPECTOR_FNAME	CHAR(10)	Inspector's first name.
45,e	ACCESS_CODE	CHAR(5)	This is the access code/password for the inspector which is verified prior to each test.
50,e	INSP_EXP_DATE	NUM(8)	(MMDDYYYY) The date the inspectors license expires. This is checked along with the access_code prior to each test.
58,e	INSP_LOCKOUT_FLAG	CHAR(1)	This is a flag which is set by the system or the audit screen to prevent an individual inspector from performing tests. Set to 'Y' by system or audit screen. Set to 'N' by audit screen or electronic transmission.
59,e	ASM_ESP	CHAR(1)	Inspector is certified to do ASM inspections on an ESP analyzer. 'Y' - certified, 'N' - not certified
60,e	ASM_SNAP	CHAR(1)	Inspector is certified to do ASM inspections on an Snapon analyzer. 'Y' - certified, 'N' - not certified
61,e	ASM_SPX	CHAR(1)	Inspector is certified to do ASM inspections on an SPX analyzer. 'Y' - certified, 'N' - not certified
62,e	ASM_WW	CHAR(1)	Inspector is certified to do ASM inspections on an Worldwide analyzer. 'Y' - certified, 'N' - not certified
63,e	PIN_NO	CHAR(5)	Encrypted access number known only by the inspector.
68,e	SPACE	CHAR(442)	
510,e	CARRIAGE RETURN AND LINE FEED	CHAR(2)	2 BYTES

VEHICLE.DAT This is both a hard disk and floppy based file containing all vehicle/test information for each test conducted. These records are maintained on hard disk for a period of 180 days. Records older than 180 days should be automatically purged from the hard disk by the system. Record length is 1024 bytes.

0,e	VERSION	CHAR(4)	XXXX This is the software version in use.
4,e	TEST_DATE	NUM(8)	(MMDDYYYY) This is the date of the test. • First two positions of test_date must be between “01” and less than “12”(inclusive) • Date (positions 2 and 3) must not be greater than the number of days in a given month • Date (positions 2 and 3) must not be greater than 29 if the given month is February in leap year
12,e	TEST_START_TIME	NUM(6)	(HHMMSS) This is the time the test started. • Value of test_start_time positions one and two (hour) must not be greater than “24.” • Value of test_start_time positions three and four (minute) must not be greater that “59.” • Value of test_start_time positions five and six (second) must not be greater than “59.”
18,e	TEST_END_TIME	NUM(6)	(HHMMSS) This is the time the test ended.
24,e	EMISS_TEST_TYPE	CHAR(1)	Set the EMISS_TEST_TYPE field to ‘1’ if the inspector conducts an OBDII emissions test, ‘2’ if the inspector conducts a two-speed idle emissions test, and a ‘3’ if the inspector conducts an ASM emissions test.
25,e	TEST_TYPE	CHAR(1)	If the inspector selects one of the following choices from the main menu: 1 - Safety & Emission Inspection 2 - Safety Only 3 - Emissions Only 4 - Reinspection 5 - Reprint The system will set test_type field to the following: 1 - ‘A’ 5 - ‘K’ 2 - ‘H’ If 3 - Emissions Only is selected, prompt the inspector to indicated if the test is a: 1 - required emission only test (decal) 2 - voluntary test 3 - test on resale (not displayed or used)

4 - remote sensing request

The system will set test_type field to the following:

1 - ‘O’	3 - ‘C’
2 - ‘I’	4 - ‘B’

The system will default/highlight selection number 1 in all of the scenarios.

NOTE: The tests and their corresponding letters are cross-referenced below:

A) Emission & Safety Test
B) Remote Sensing Request
C) Test on Resale
D) Accelerated Vehicle Retirement Test
E) Dispute Test
F) Waiver - Minimum Expenditure
G) Federal Test
H) Safety Only Test
I) Voluntary Emissions Test
J) Waiver - Individual Vehicles
K) Reprint
L) Waiver - Low Income Time Extension
M) Parts Availability Time Extension
N) Other (Special Test)
O) Required Emissions Only Test (Decal)
P) Waiver - Low Mileage

26,e	SPECIAL_TEST	CHAR(1)	Reserved for character mentioned above. Choice ‘F’ is reserved for ‘minimum expenditure waiver tests,’ and choice ‘G’ is reserved for ‘federal tests’. Choice ‘D’ and choice ‘E’ are reserved for accelerated vehicle retirement tests, tests, and arbitration/dispute tests, respectively. Choice ‘J’ is reserved for ‘individual vehicle waiver tests. Choice ‘L,’ ‘M,’ and ‘N,’ are reserved for ‘low income time extension tests,’ ‘parts availability time extension tests,’ and ‘other special tests,’ respectively. Choice ‘C’ is reserved for Test on Resale tests. Otherwise, left blank.
27,e	VID_ID_NUM	CHAR(11)	Sent by Texas Information Management System.
38,e	EMISS_INIT_TEST	CHAR(1)	After an inspection has been completed, the system will set initial_test_type to the character “I” for initial test. After an reinspection has been completed, the system shall set initial_test_type to the character “R” for reinspection test. Otherwise, left blank.
39,e	SAFE_INIT_TEST	CHAR(1)	If there is no previous inspection for this vehicle, or the previous inspection was more than sixteen days prior to this inspection, set the SAFE_INIT_TEST to ‘I.’ If the previous inspection was less than sixteen days prior to this inspection, set the SAFE_INIT_TEST to ‘R.’ Otherwise, left blank.
40,e	STATION_NUM	CHAR(7)	This field must be the authorized station number from the STATION.DAT file.
47,e	STATION_NAME	CHAR(25)	Entered by the DPS under the audit menu.

72,e	ANALYZER_NUMBER	CHAR(8)	This field must be the analyzer number from the STATION.DAT file.
80,e	INSPECTOR_NUM	CHAR(20)	This is the inspector number from INSPECTR.DAT associated with the inspector's access code.
100,e	INSPECTOR_LNAME	CHAR(15)	Inspector's last name.
115,e	INSPECTOR_FNAME	CHAR(10)	Inspector's first name.
125,e	MODEL_YEAR	CHAR(4)	YYYY Model year of the vehicle.
129,e	COUNTY_CODE	CHAR(3)	The county where tested. Dallas - 057 Denton - 061 El Paso - 071 Fort Bend - 079 Harris - 101 Galveston - 084 Collin - 043 Brazoria - 020 Liberty - 146 Chambers - 036 Tarrant - 220 Montgomery - 170 Waller - 237 Out of State or Federal - 000
132,e	VIN_ID_NUM	CHAR(17)	The VIN number of the vehicle.
149,e	VIN_FLAG	CHAR(1)	If DPS check digit algorithm indicates bad VIN number, set to ‘B’-bad. If not, leave blank.
150,e	LICENSE_NUM	CHAR(8)	License number of the vehicle or dealer number if unlicensed.
158,e	LICENSE_TYPE	NUM(1)	This is type of plate. 1 - Texas Plate 2 - No Plate 3 - Out of state 4 - Exempt (State) 5 - Exempt (Federal) 6 - Dealer Plate (Metal/Hard) 7 - Temporary Sticker (Paper) 8 - Other After selecting number ‘2’or ‘8,’ the license_num field should be set to 'V' followed by the last 7 char of the VIN number. The default for this field is number ‘1.’
159,e	INJECT_CARB	CHAR(1)	Injection/carburetion. 'F' - Fuel Injection 'C' - Carburetion 'O' - Other Otherwise, left blank.
160,e	VEHICLE_TYPE	CHAR(1)	'P' - Passenger Car/Station Wagon

			'T' - Truck/Van/Bus/Sports Utility Vehicle 'M' - Motor home 'B' - Bus 'C' - Motorcycle 'L' - Trailer
161,e	GVW_TYPE	NUM(1)	Gross vehicle weight class. 1 - Light 2 - Heavy Otherwise, left blank.
162,e	GVW_ACTUAL	NUM(5)	Actual gross vehicle weight rating. Otherwise, left blank.
167,e	MAKE	CHAR(4)	Vehicle make selected from possible list using NCIC make definitions.
171,e	MODEL	CHAR(20)	Vehicle model type is selected based on the vehicle make entry.
191,e	ENGINE_SIZE	CHAR(5)	Values converted to cubic centimeters by the analyzer. Otherwise, left blank.
196,e	CYLINDERS	CHAR(2)	The number of cylinders, “1-16.” 'R' - Rotary This entry is made by the inspector if the vehicle inspected is equipped by a rotary engine. Otherwise, left blank.
198,e	TRANSMISSION	CHAR(1)	Transmission type. 'A' - Automatic 'M' - Manual Otherwise, left blank.
199,e	ODOMETER	NUM(6)	The odometer reading excluding tenths.
205,e	FUEL_TYPE	CHAR(1)	The fuel type 'G' - Gas 'D' - Diesel 'B' - Bi-fueled (Dual Fueled) Otherwise, left blank.
206,e	IGNITION	CHAR(1)	The ignition type. 'C' - Conventional 'D' - Distributorless 'Q' - Quad4 Otherwise, left blank.
207,e	DUAL_EXHAUST	CHAR(1)	This is 'Y' Yes or 'N' No. Otherwise, left blank.
208,e	PRE-TUNE	CHAR(1)	This is a 'Y' Yes or 'N' No to the question "Was pre-tuning done on this vehicle prior to testing?" Otherwise, left blank.

209,s	SAFE_TEST_TYPE	CHAR(1)	Safety Inspection Type. The inspector will select “A”- “K” excluding “I” from the keyboard. If the selection is not “G” or “K”, then fields SAFE_25 through SAFE_30 will be left blank. Valid entries for this field are A - K, excluding I. Otherwise, left blank.
210,s	SAFE_1	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Acceptable entries are (A, B, P, F, R, N) Otherwise, left blank.
211,s	SAFE_2	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Acceptable entries are (A, B, C, D P, F, R, N) Otherwise, left blank.
212,s	SAFE_3	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, P, F, R, N)
213,s	SAFE_4	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, E, G, P, F, R, N)
214,s	SAFE_5	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, E, G, P, F, R, N)
215,s	SAFE_6A	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, E, G, H, I, J, K, L, M, O, P, Q, S, T, U, V, F, R, N)
216,s	SAFE_6B	CHAR(1)	'P' - Pass

			'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
217,s	SAFE_7	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
218,s	SAFE_7A	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, E, G, P, F, R, N)
219,s	SAFE_7B	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, E, G, P, F, R, N)
220,s	SAFE_8	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, E, G, P, F, R, N)
221,s	SAFE_9	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, E, G, P, F, R, N)
222,e	SAFE_10A	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (P, F, R, N)
223,e	SAFE_10B	CHAR(1)	'P' - Pass 'F' - Fail

			'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (P, F, R, N)
224,e	SAFE_10C	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (P, F, R, N)
225,e	SAFE_10D	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (P, F, R, N)
226,e	SAFE_10E	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (P, F, R, N)
227,e	SAFE_10F	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (P, F, R, N)
228,s	SAFE_11	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
229,s	SAFE_12	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
230,s	SAFE_13	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair

			'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
231,s	SAFE_14	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
232,s	SAFE_15	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
233,s	SAFE_16	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
234,s	SAFE_17	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, E, G, H, I, J, K, P, F, R, N)
235,s	SAFE_18	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
236,s	SAFE_19	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
237,s	SAFE_20	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair

			'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
238,s	SAFE_21	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
239,s	SAFE_22A	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Acceptable entries are (A, B, C, D, P, F, R, N)
240,s	SAFE_22B	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
241,s	SAFE_22C	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (P, F, R, N)
242,s	SAFE_22D	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
243,s	SAFE_23	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
244,s	SAFE_24	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA

			Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)	
245,s	SAFE_25	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (P, F, R, N)	
246,s	SAFE_26	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, P, F, R, N)	
247,s	SAFE_27	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)	
248,s	SAFE_28	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, P, F, R, N)	
249,s	SAFE_29	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (E, G, P, F, R, N)	
250,s	SAFE_30	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, P, F, R, N)	
251,e	PRI_CURB_IDLE_CO	NUM(5)	XX.XX	Otherwise, zero filled.
256,e	PRI_CURB_IDLE_HC	NUM(4)	XXXX	Otherwise, zero filled.
260,e	PRI_CURB_IDLE_CO_2	NUM(4)	XX.X	Otherwise, zero filled.

264,e	PRI_CURB_IDLE_O_2	NUM(4)	XX.X	Otherwise, zero filled.
268,e	PRI_CURB_IDLE_RPM	NUM(4)	XXXX	Otherwise, zero filled.
272,e	PRI_HIGH_SPEED_CO	NUM(5)	XX.XX	Otherwise, zero filled.
277,e	PRI_HIGH_SPEED_HC	NUM(4)	XXXX	Otherwise, zero filled.
281,e	PRI_HIGH_SPEED_CO_2	NUM(4)	XX.X	Otherwise, zero filled.
285,e	PRI_HIGH_SPEED_O_2	NUM(4)	XX.X	Otherwise, zero filled.
289,e	PRI_HIGH_SPEED_RPM	NUM(4)	XXXX	Otherwise, zero filled.
293,e	ALT_CURB_IDLE_CO	NUM(5)	XX.XX	Otherwise, zero filled.
298,e	ALT_CURB_IDLE_HC	NUM(4)	XXXX	Otherwise, zero filled.
302,e	ALT_CURB_IDLE_CO_2	NUM(4)	XX.X	Otherwise, zero filled.
306,e	ALT_CURB_IDLE_O_2	NUM(4)	XX.X	Otherwise, zero filled.
310,e	ALT_CURB_IDLE_RPM	NUM(4)	XXXX	Otherwise, zero filled.
314,e	ALT_HIGH_SPEED_CO	NUM(5)	XX.XX	Otherwise, zero filled.
319,e	ALT_HIGH_SPEED_HC	NUM(4)	XXXX	Otherwise, zero filled.
323,e	ALT_HIGH_SPEED_CO_2	NUM(4)	XX.X	Otherwise, zero filled.
327,e	ALT_HIGH_SPEED_O_2	NUM(4)	XX.X	Otherwise, zero filled.
331,e	ALT_HIGH_SPEED_RPM	NUM(4)	XXXX	Otherwise, zero filled.
335,e	DILUTION	NUM(4)	XX.X	Otherwise, zero filled.
339,e	DILUTION_PF_FLAG	CHAR(1)	'P' - Pass 'F' - Fail Otherwise, left blank.	
340,e	DILUTION_LIMIT	NUM(4)	The applicable dilution criteria for the vehicle. Otherwise, zero filled.	
344,e	HC_CUTPOINT_HI	NUM(4)	The applicable HC cutpoint/standard for the vehicle. Otherwise, zero filled.	
348,e	CO_CUTPOINT_HI	NUM(5)	The applicable CO cutpoint/standard for the vehicle.	
353,e	RPM_BYPASS	CHAR(1)	'B' - Bypass If the rpm bypass selection is selected, then fill this field with	

			the letter ‘b’. Otherwise, left blank.
354,e	TIMEOUT_FLAG	CHAR(1)	'Y' - Yes 'N' - No If the emissions test ended due to time out conditions, set TIMEOUT_FLAG to ‘Y.’ Otherwise, set to ‘N.’ If no emissions test, left blank.
355,e	HC_PF_FLAG	CHAR(1)	'P' - Pass 'F' - Fail Otherwise, left blank.
356,e	CO_PF_FLAG	CHAR(1)	'P' - Pass 'F' - Fail Otherwise, left blank.
357,s	INSUR_EXP_DT	NUM(8)	(MMDDYYYY) This is the expiration date of the vehicle owner’s proof of insurance. Otherwise, zero filled.
365,s	VI30A_NUM	CHAR(7)	This is the safety inspection’s VI 30A number, if applicable. Otherwise, left blank.
372,s	VI30A_FLAG	CHAR(1)	'Y' - 'Yes', indicates if VI 30A is applicable. 'N' - 'No' Otherwise, left blank.
373,s	SAFETY_PF_FLAG	CHAR(1)	'P' - Pass 'F' - Fail Otherwise, left blank.
374,e	EMISS_PF_FLAG	CHAR(1)	'P' - Pass 'F' - Fail 'T' - Time ran out during test. 'D' - Dilution condition ended test Otherwise, left blank.
375,e	GAS_CAP_MISS	CHAR(1)	'Y' - Yes 'N' - No Otherwise, left blank.
376,e	GAS_CAP_TESTABLE	CHAR(1)	'Y' - Yes 'N' - No Otherwise, left blank.
377,e	GAS_CAP_PF_FLAG	CHAR(1)	'P' - Pass 'F' - Fail Otherwise, left blank.
378,e	CERT_NUM	CHAR(9)	Certificate number entry. If no certificate issued, left blank.

387,e	CERT_NUM_2	CHAR(9)	Certificate number entry. If no certificate issued, left blank.
396,e	CERT_COND	CHAR(1)	Condition of previous certificate, ‘V’ - voided, ‘M’ - missing, ‘C’ - correct, ‘R’ - replacement. Otherwise, left blank.
397,e	EMISS_INSP_COST	NUM(5)	99.99 Emission inspection price (market driven, fixed) Otherwise, zero filled.
402,s	SAFE_INSP_COST	NUM(7)	9999.99 Safety inspection cost plus applicable safety related repairs. Otherwise, zero filled.
409,e	OVERALL_COST	CHAR(7)	9999.99 Sum of all costs associated with the inspection including repair costs, where applicable. Otherwise, zero filled.
416,e	OVERALL_RESULTS	CHAR(1)	'P' - Pass 'F' - Fall This is the overall test results of the vehicle inspected.
417,e	REP_CST_YIS	NUM(8)	99999.99 - Total cost of repairs performed at the same facility where inspection was performed. Otherwise, zero filled.
425,e	REP_CST_RRF	NUM(8)	99999.99 - Total cost of repairs performed at a Recognized Emissions Repair Facility. Otherwise, zero filled.
433,e	REP_CST_NRF	NUM(8)	99999.99 - Total cost of repairs performed at a non-recognized repair facility. Otherwise, zero filled.
441,e	REP_CST_MSP	NUM(8)	99999.99 - Total parts costs for self-performed repairs by the motorist. Otherwise, zero filled.
449,e	SPACE	CHAR(152)	
601,e	REP_OVERALL_COST	NUM(8)	99999.99 Otherwise, zero filled.
609,e	ABORT	CHAR(1)	'J'-Before sampling, 'A'-Aborted Test, Blank, if test completed and not aborted.
610,e	ABORT_CODE	NUM(2)	01 OIL SYSTEM LEAK WARNING LIGHT IS ON 02 COOLANT SYSTEM LEAK WARNING LIGHT IS ON 03 FUEL SYSTEM LEAK 04 EXCESSIVE ENGINE NOISE 05 VEHICLE DOES NOT REQUIRE INSPECTION

			06 BMW, PEUGEOT, VOLVO AUTOMATIC TRANSMISSION 99 OTHER (INDICATE REASON ON THE VIR) Otherwise, left blank.
612,e	MODEL_CODE	CHAR(3)	The NCIC model code or acceptable TNRCC code. Otherwise, left blank.
615,e	TIMEOUT_REDO	CHAR(1)	'Y' - Yes 'N' - No If after 290 seconds a valid test condition was not obtained, and the inspector elects to restart the emissions test, set this field to 'Y'. Otherwise, set to 'N'.
616,e	ORIG_TEST_DATE	NUM(8)	MMDDYYYY Otherwise, zero filled.
624,e	ORIG_TEST_TIME	NUM(6)	HHMMSS Otherwise, zero filled.
630,e	REPL_ID_NUM	CHAR(20)	ID number of the individual that conducts the replacement. INSP_NUM for inspectors, DPS_NUM for Auditors, and ‘9999999999’ (10 9's) for Managers. Otherwise, left blank.
650,e	HC_CUTPOINT_LOW	NUM(4)	HC cutpoint for the low speed idle portion of the emissions phase of the inspection. Otherwise, zero filled.
654,e	CO_CUTPOINT_LOW	NUM(5)	CO cutpoint for the low speed idle portion of the emissions phase of the inspection. Otherwise, zero filled.
659,e	DECAL_NUM	CHAR(9)	Safety Emissions Decal number. Otherwise, left blank.
668,e	DECAL_NUM_2	CHAR(9)	Safety Emissions Decal number for replacements. Otherwise, left blank.
677,e	DECAL_COND	CHAR(1)	Condition of previous decal, ‘V’ - voided, ‘M’ - missing, ‘C’ - correct, ‘R’ - replacement. Otherwise, left blank.
678,e	TXDOT_NUM	CHAR(10)	TxDOT number entered by inspector when Texas plate present. Otherwise, left blank.
688,e	WAIVER_NUM	CHAR(7)	Waiver number entered by auditor if a waiver is issued. Otherwise, left blank.
695,e	2ND_GAS_CAP_MISS	CHAR(1)	'Y' - Yes 'N' - No Blank, if only one gas cap tested.
696,e	2ND_GAS_CAP_TEST	CHAR(1)	'Y' - Yes

			'N' - No Blank, if only one gas cap tested.
697,e	GAS_CAP_PF_FLAG_1	CHAR(1)	'P' - Pass 'F' - Fail Blank, if gas cap not tested.
698,e	GAS_CAP_PF_FLAG_2	CHAR(1)	'P' - Pass 'F' - Fail Blank, if only one gas cap tested.
699,e	REP_GRP	CHAR(1)	‘1’ - Fuel System, ‘2’ - Ignition/Electrical System, ‘3’ - Emissions System, ‘4’ - Engine Mechanical, ‘5’ - Miscellaneous, ‘6’ - No Repairs Performed on Vehicle
700,e	PERF_REPAIRS	CHAR(1)	‘1’ - Recognized Emissions Repair Tech ‘2’ - Other Repair Technician (Non-Recognized) ‘3’ - Motorist (Self-Repair)
701,e	BARCODED_VIN	CHAR(1)	
702,e	BARCODED_TXDOT_NO	CHAR(1)	
703,e	BARCODED_LIC_PLT	CHAR(1)	
704,e	OBD2_MIL_CHECK	CHAR(1)	Y, N
705,e	OBD2_MIL_ON_RUN	CHAR(1)	Y, N
706,e	OBD2_PF_FLAG	CHAR(1)	P, F
707,e	OBD2_READY_RES	CHAR(1)	P, F - Outcome of OBD Readiness Monitors
708,e	OBD2_FAULT_CD_RES	CHAR(1)	
709,e	OBD2_MIL_STATUS	CHAR(1)	
710,e	OBD2_DLC_RES	CHAR(1)	B,C, Blank - line up with GA ‘c=connector, d-damaged/tampered, f=fail, i=inaccessible/obstructed, n=no signal, p=pass’
711,e	MISFIRE_READY	CHAR(1)	
712,e	FUEL_SYS_READY	CHAR(1)	
713,e	COMPR_COMPNT_RDY	CHAR(1)	

714,e	CATATLYST_READY	CHAR(1)		
715,e	HEATED_CAT_READY	CHAR(1)		
716,e	EVAP_SYS_RDY	CHAR(1)		
717,e	SEC_AIR_SYS_RDY	CHAR(1)		
718,e	AIR_COND_SYS_RDY	CHAR(1)		
719,e	O2_SENSOR_READY	CHAR(1)		
720,e	O2_SENSOR_HTR_RDY	CHAR(1)		
721,e	EGR_SYS_READY	CHAR(1)		
722,e	THERMOSTAT_RDY	CHAR(1)		
723,e	PCV_RDY	CHAR(1)		
724,e	FAULT_CODES(DTCs)	CHAR(50)		
774,e	DTC_STORED	NUM(2)		
776,e	OBD2_RPM	NUM(4)		
780,e	PID_COUNT	CHAR(2)		
782,e	PCM_ID	CHAR(2)		
784,e	OBD_VIN	CHAR(17)	VIN from the OBD computer, where available	
801,e	80_INCHES	CHAR(1)	‘Y’ - Yes, the vehicle is at least 80" wide ‘N’ - No, the vehicle is less than 80" wide	
802,e	PRI_AVG_5015_CO	NUM(5)	XX.XX	Otherwise, zero filled.
807,e	PRI_AVG_5015_HC	NUM(4)	XXXX	Otherwise, zero filled.
811,e	PRI_AVG_5015_CO2	NUM(4)	XX.X	Otherwise, zero filled.
815,e	PRI_AVG_5015_NO	NUM(4)	XXXX	Otherwise, zero filled.
819,e	PRI_AVG_5015_O2	NUM(4)	XX.X	Otherwise, zero filled.
823,e	PRI_AVG_2525_CO	NUM(5)	XX.XX	Otherwise, zero filled.
828,e	PRI_AVG_2525_HC	NUM(4)	XXXX	Otherwise, zero filled.
832,e	PRI_AVG_2525_CO2	NUM(4)	XX.X	Otherwise, zero filled.

836,e	PRI_AVG_2525_NO	NUM(4)	XXXX	Otherwise, zero filled.
840,e	PRI_AVG_2525_O2	NUM(4)	XX.X	Otherwise, zero filled.
844,e	ALT_AVG_5015_CO	NUM(5)	XX.XX	Otherwise, zero filled.
849,e	ALT_AVG_5015_HC	NUM(4)	XXXX	Otherwise, zero filled.
853,e	ALT_AVG_5015_CO2	NUM(4)	XX.X	Otherwise, zero filled.
857,e	ALT_AVG_5015_NO	NUM(4)	XXXX	Otherwise, zero filled.
861,e	ALT_AVG_5015_O2	NUM(4)	XX.X	Otherwise, zero filled.
865,e	ALT_AVG_2525_CO	NUM(5)	XX.XX	Otherwise, zero filled.
870,e	ALT_AVG_2525_HC	NUM(4)	XXXX	Otherwise, zero filled.
874,e	ALT_AVG_2525_CO2	NUM(4)	XX.X	Otherwise, zero filled.
878,e	ALT_AVG_2525_NO	NUM(4)	XXXX	Otherwise, zero filled.
882,e	ALT_AVG_2525_O2	NUM(4)	XX.X	Otherwise, zero filled.
886,e	PRI_AVG_5015_RPM	NUM(4)	XXXX	Otherwise, zero filled.
890,e	PRI_AVG_2525_RPM	NUM(4)	XXXX	Otherwise, zero filled.
894,e	ALT_AVG_5015_RPM	NUM(4)	XXXX	Otherwise, zero filled.
898,e	ALT_AVG_2525_RPM	NUM(4)	XXXX	Otherwise, zero filled.
902,e	ASM_RESTART_CNTR	NUM(1)	X, Number of restarts during the test procedure.	
903,e	SPACE	CHAR(1)		
904,e	DILUTION_5015	NUM(4)	X.XX	Otherwise, zero filled.
908,e	DILUTION_2525	NUM(4)	X.XX	Otherwise, zero filled.
912,e	SPACE	CHAR(1)		
913,e	RELATIVE_HUMIDITY	NUM(5)	XX.XX	Otherwise, zero filled
918,e	HUMIDITY_CORR_5015	NUM(4)	X.XX	Otherwise, zero filled.
922,e	HUMIDITY_CORR_2525	NUM(4)	X.XX	Otherwise, zero filled.
926,e	SPACE	CHAR(1)		

927,e	ACCEL_VIOLAT_5015	NUM(1)	The number of acceleration violations during the ASM 5015 Mode.
928,e	ACCEL_VIOLAT_2525	NUM(1)	The number of acceleration violations during the ASM 2525 Mode.
929,e	THP_5015	NUM(4)	XX.X Total Horsepower used to set the dynamometer.
933,e	THP_2525	NUM(4)	XX.X Total Horsepower used to set the dynamometer.
937,e	AMB_BULB_TEMP	NUM(3)	XXX Otherwise, zero filled. Ambient dry bulb temperature in °F prior to each test.
940,e	BARO_PRESSURE	NUM(3)	XXX Otherwise, zero filled. Barometric Pressure (Absolute) measured in mm of Hg prior to each test.
943,s	SAFE_10	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
944,s	SAFE_16A	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
945,s	SAFE_16B	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
946,s	SAFE_33	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (J, K, E, G, P, F, R, N)
947,s	SAFE_34	CHAR(1)	'P' - Pass 'F' - Fail

			'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
948,s	SAFE_35	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
949,s	SAFE_36	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
950,e	NO_PF_FLAG	CHAR(1)	'P' - Pass 'F' - Fail Otherwise, left blank.
951,e	TEST_WEIGHT	CHAR(5)	
956,e	SPACE	CHAR(5)	
961,e	AXLE_TYPE	CHAR(1)	‘Y’ - vehicle has AWD, Full-Time Four Wheel Drive or non-disengageable traction control. ‘N’ - vehicle is testable on the ASM two wheel dynamometer.
962,e	TEST_REC_NUM	NUM(6)	Id for second-by-second data, if turned on.
968,e	TAILPIPE_START_TIME	NUM(6)	(HHMMSS) This is the time the tailpipe (ASM or TSI) test started. • Value of test_start_time positions one and two (hour) must not be greater than “24.” • Value of test_start_time positions three and four (minute) must not be greater that “59.” • Value of test_start_time positions five and six (second) must not be greater than “59.”
974,e	TAILPIPE_END_TIME	NUM(6)	(HHMMSS) This is the time the tailpipe (ASM or TSI) test ended.
980,e	BODY_STYLE	CHAR(1)	Vehicle Body style for ASM test.
981,e	ANALYZER_NO_EXT	CHAR(3)	Analyzer extension for server/node solution, entered from the VID or by the DPS under the audit menu .

984,e	DPS_SAFE_SEQ	CHAR(1)	Number of the DPS safety item sequence selected by the lane inspector.
985,e	HC_CUTPOINT_2525	NUM(4)	XXXX
989,e	CO_CUTPOINT_2525	NUM(5)	XX.XX
994,e	NO_CUTPOINT_2525	NUM(4)	XXXX
998,e	HC_CUTPOINT_5015	NUM(4)	XXXX
1002,e	CO_CUTPOINT_5015	NUM(5)	XX.XX
1007,e	NO_CUTPOINT_5015	NUM(4)	XXXX
1011,e	SPACE	CHAR(11)	
1022,e	CARRIAGE RETURN AND LINE FEED	CHAR(2)	2 BYTES

REINSPEC.DAT This is both a hard disk and floppy based file containing all vehicle/test information for each test conducted. These records are maintained on hard disk for a period of 180 days. Records older than 180 days should be automatically purged from the hard disk by the system. Record length is 1024 bytes.

0,e	VERSION	CHAR(4)	XXXX This is the software version in use.
4,e	TEST_DATE	NUM(8)	(MMDDYYYY) This is the date of the test. • First two positions of test_date must be between “01” and less than “12”(inclusive) • Date (positions 2 and 3) must not be greater than the number of days in a given month • Date (positions 2 and 3) must not be greater than 29 if the given month is February in leap year
12,e	TEST_START_TIME	NUM(6)	(HHMMSS) This is the time the test started. • Value of test_start_time positions one and two (hour) must not be greater than “24.” • Value of test_start_time positions three and four (minute) must not be greater that “59.” • Value of test_start_time positions five and six (second) must not be greater than “59.”
18,e	TEST_END_TIME	NUM(6)	(HHMMSS) This is the time the test ended.
24,e	EMISS_TEST_TYPE	CHAR(1)	Set the EMISS_TEST_TYPE field to ‘1’ if the inspector conducts an OBDII emissions test, ‘2’ if the inspector conducts a two-speed idle emissions test, and a ‘3’ if the inspector conducts an ASM emissions test.
25,e	TEST_TYPE	CHAR(1)	If the inspector selects one of the following choices from the main menu: 1 - Safety & Emission Inspection 2 - Safety Only 3 - Emissions Only 4 - Reinspection 5 - Reprint The system will set test_type field to the following: 1 - ‘A’ 5 - ‘K’ 2 - ‘H’ If 3 - Emissions Only is selected, prompt the inspector to indicated if the test is a: 1 - required emission only test (decal) 2 - voluntary test 3 - test on resale (not displayed or used)

4 - remote sensing request

The system will set test_type field to the following:

1 - ‘O’	3 - ‘C’
2 - ‘I’	4 - ‘B’

The system will default/highlight selection number 1 in all of the scenarios.

NOTE: The tests and their corresponding letters are cross-referenced below:

A) Emission & Safety Test	H) Safety Only Test
B) Remote Sensing Request	I) Voluntary Emissions Test
C) Test on Resale	J) Waiver - Individual Vehicles
D) Accelerated Vehicle Retirement Test	K) Reprint
E) Dispute Test	L) Waiver - Low Income Time Extension
F) Waiver - Minimum Expenditure	M) Parts Availability Time Extension
G) Federal Test	N) Other (Special Test)
	O) Required Emissions Only Test (Decal)
	P) Waiver - Low Mileage

26,e	SPECIAL_TEST	CHAR(1)	Reserved for character mentioned above. Choice ‘F’ is reserved for ‘minimum expenditure waiver tests,’ and choice ‘G’ is reserved for ‘federal tests’. Choice ‘D’ and choice ‘E’ are reserved for accelerated vehicle retirement tests, tests, and arbitration/dispute tests, respectively. Choice ‘J’ is reserved for ‘individual vehicle waiver tests. Choice ‘L,’ ‘M,’ and ‘N,’ are reserved for ‘low income time extension tests,’ ‘parts availability time extension tests,’ and ‘other special tests,’ respectively. Otherwise, left blank.
27,e	VID_ID_NUM	CHAR(11)	Sent by Texas Information Management System.
38,e	EMISS_INIT_TEST	CHAR(1)	After an inspection has been completed, the system will set initial_test_type to the character “I” for initial test. After an reinspection has been completed, the system shall set initial_test_type to the character “R” for reinspection test. Otherwise, left blank.
39,e	SAFE_INIT_TEST	CHAR(1)	If there is no previous inspection for this vehicle, or the previous inspection was more than sixteen days prior to this inspection, set the SAFE_INIT_TEST to ‘I.’ If the previous inspection was less than sixteen days prior to this inspection, set the SAFE_INIT_TEST to ‘R.’ Otherwise, left blank.
40,e	STATION_NUM	CHAR(7)	This field must be the authorized station number from the STATION.DAT file.
47,e	STATION_NAME	CHAR(25)	Entered by the DPS under the audit menu.

72,e	ANALYZER_NUMBER	CHAR(8)	This field must be the analyzer number from the STATION.DAT file.
80,e	INSPECTOR_NUM	CHAR(20)	This is the inspector number from INSPECTR.DAT associated with the inspector's access code.
100,e	INSPECTOR_LNAME	CHAR(15)	Inspector's last name.
115,e	INSPECTOR_FNAME	CHAR(10)	Inspector's first name.
125,e	MODEL_YEAR	CHAR(4)	YYYY Model year of the vehicle.
129,e	COUNTY_CODE	CHAR(3)	The county where tested. Dallas - 057 Denton - 061 El Paso - 071 Fort Bend - 079 Harris - 101 Galveston - 084 Collin - 043 Brazoria - 020 Liberty - 146 Chambers - 036 Tarrant - 220 Montgomery - 170 Waller - 237 Out of State or Federal - 000
132,e	VIN_ID_NUM	CHAR(17)	The VIN number of the vehicle.
149,e	VIN_FLAG	CHAR(1)	If DPS check digit algorithm indicates bad VIN number, set to ‘B’-bad. If not, leave blank.
150,e	LICENSE_NUM	CHAR(8)	License number of the vehicle or dealer number if unlicensed.
158,e	LICENSE_TYPE	NUM(1)	This is type of plate. 1 - Texas Plate 2 - No Plate 3 - Out of state 4 - Exempt (State) 5 - Exempt (Federal) 6 - Dealer Plate (Metal/Hard) 7 - Temporary Sticker (Paper) 8 - Other After selecting number ‘2’or ‘8,’ the license_num field should be set to 'V' followed by the last 7 char of the VIN number. The default for this field is number ‘1.’
159,e	INJECT_CARB	CHAR(1)	Injection/carburetion. 'F' - Fuel Injection 'C' - Carburetion 'O' - Other Otherwise, left blank.
160,e	VEHICLE_TYPE	CHAR(1)	'P' - Passenger Car/Station Wagon

			'T' - Truck/Van/Bus/Sports Utility Vehicle 'M' - Motor home 'B' - Bus 'C' - Motorcycle 'L' - Trailer
161,e	GVW_TYPE	NUM(1)	Gross vehicle weight class. 1 - Light 2 - Heavy Otherwise, left blank.
162,e	GVW_ACTUAL	NUM(5)	Actual gross vehicle weight rating. Otherwise, left blank.
167,e	MAKE	CHAR(4)	Vehicle make selected from possible list using NCIC make definitions.
171,e	MODEL	CHAR(20)	Vehicle model type is selected based on the vehicle make entry.
191,e	ENGINE_SIZE	CHAR(5)	Values converted to cubic centimeters by the analyzer. Otherwise, left blank.
196,e	CYLINDERS	CHAR(2)	The number of cylinders, “1-16.” 'R' - Rotary This entry is made by the inspector if the vehicle inspected is equipped by a rotary engine. Otherwise, left blank.
198,e	TRANSMISSION	CHAR(1)	Transmission type. 'A' - Automatic 'M' - Manual Otherwise, left blank.
199,e	ODOMETER	NUM(6)	The odometer reading excluding tenths.
205,e	FUEL_TYPE	CHAR(1)	The fuel type 'G' - Gas 'D' - Diesel 'B' - Bi-fueled (Dual Fueled) Otherwise, left blank.
206,e	IGNITION	CHAR(1)	The ignition type. 'C' - Conventional 'D' - Distributorless 'Q' - Quad4 Otherwise, left blank.
207,e	DUAL_EXHAUST	CHAR(1)	This is 'Y' Yes or 'N' No. Otherwise, left blank.
208,e	PRE-TUNE	CHAR(1)	This is a 'Y' Yes or 'N' No to the question "Was pre-tuning done on this vehicle prior to testing?" Otherwise, left blank.

209,s	SAFE_TEST_TYPE	CHAR(1)	Safety Inspection Type. The inspector will select “A”- “K” excluding “I” from the keyboard. If the selection is not “G” or “K”, then fields SAFE_25 through SAFE_30 will be left blank. Valid entries for this field are A - K, excluding I. Otherwise, left blank.
210,s	SAFE_1	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Acceptable entries are (A, B, P, F, R, N) Otherwise, left blank.
211,s	SAFE_2	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Acceptable entries are (A, B, C, D P, F, R, N) Otherwise, left blank.
212,s	SAFE_3	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, P, F, R, N)
213,s	SAFE_4	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, E, G, P, F, R, N)
214,s	SAFE_5	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, E, G, P, F, R, N)
215,s	SAFE_6A	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are A, B, C, D, E, G, H, I, J, K, L, M, O, P, Q, S, T, U, V, F, R, N)
216,s	SAFE_6B	CHAR(1)	'P' - Pass

			'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
217,s	SAFE_7	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
218,s	SAFE_7A	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, E, G, P, F, R, N)
219,s	SAFE_7B	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, E, G, P, F, R, N)
220,s	SAFE_8	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, E, G, P, F, R, N)
221,s	SAFE_9	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, E, G, P, F, R, N)
222,e	SAFE_10A	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (P, F, R, N)
223,e	SAFE_10B	CHAR(1)	'P' - Pass 'F' - Fail

			'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (P, F, R, N)
224,e	SAFE_10C	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (P, F, R, N)
225,e	SAFE_10D	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (P, F, R, N)
226,e	SAFE_10E	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (P, F, R, N)
227,e	SAFE_10F	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (P, F, R, N)
228,s	SAFE_11	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
229,s	SAFE_12	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
230,s	SAFE_13	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair

			'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
231,s	SAFE_14	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
232,s	SAFE_15	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
233,s	SAFE_16	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
234,s	SAFE_17	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, E, G, H, I, J, K, P, F, R, N)
235,s	SAFE_18	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
236,s	SAFE_19	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
237,s	SAFE_20	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair

			'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
238,s	SAFE_21	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
239,s	SAFE_22A	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Acceptable entries are (A, B, C, D, P, F, R, N)
240,s	SAFE_22B	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
241,s	SAFE_22C	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (P, F, R, N)
242,s	SAFE_22D	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
243,s	SAFE_23	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
244,s	SAFE_24	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA

			Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)	
245,s	SAFE_25	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (P, F, R, N)	
246,s	SAFE_26	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, P, F, R, N)	
247,s	SAFE_27	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)	
248,s	SAFE_28	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, P, F, R, N)	
249,s	SAFE_29	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (E, G, P, F, R, N)	
250,s	SAFE_30	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, P, F, R, N)	
251,e	PRI_CURB_IDLE_CO	NUM(5)	XX.XX	Otherwise, zero filled.
256,e	PRI_CURB_IDLE_HC	NUM(4)	XXXX	Otherwise, zero filled.
260,e	PRI_CURB_IDLE_CO_2	NUM(4)	XX.X	Otherwise, zero filled.

264,e	PRI_CURB_IDLE_O_2	NUM(4)	XX.X	Otherwise, zero filled.
268,e	PRI_CURB_IDLE_RPM	NUM(4)	XXXX	Otherwise, zero filled.
272,e	PRI_HIGH_SPEED_CO	NUM(5)	XX.XX	Otherwise, zero filled.
277,e	PRI_HIGH_SPEED_HC	NUM(4)	XXXX	Otherwise, zero filled.
281,e	PRI_HIGH_SPEED_CO_2	NUM(4)	XX.X	Otherwise, zero filled.
285,e	PRI_HIGH_SPEED_O_2	NUM(4)	XX.X	Otherwise, zero filled.
289,e	PRI_HIGH_SPEED_RPM	NUM(4)	XXXX	Otherwise, zero filled.
293,e	ALT_CURB_IDLE_CO	NUM(5)	XX.XX	Otherwise, zero filled.
298,e	ALT_CURB_IDLE_HC	NUM(4)	XXXX	Otherwise, zero filled.
302,e	ALT_CURB_IDLE_CO_2	NUM(4)	XX.X	Otherwise, zero filled.
306,e	ALT_CURB_IDLE_O_2	NUM(4)	XX.X	Otherwise, zero filled.
310,e	ALT_CURB_IDLE_RPM	NUM(4)	XXXX	Otherwise, zero filled.
314,e	ALT_HIGH_SPEED_CO	NUM(5)	XX.XX	Otherwise, zero filled.
319,e	ALT_HIGH_SPEED_HC	NUM(4)	XXXX	Otherwise, zero filled.
323,e	ALT_HIGH_SPEED_CO_2	NUM(4)	XX.X	Otherwise, zero filled.
327,e	ALT_HIGH_SPEED_O_2	NUM(4)	XX.X	Otherwise, zero filled.
331,e	ALT_HIGH_SPEED_RPM	NUM(4)	XXXX	Otherwise, zero filled.
335,e	DILUTION	NUM(4)	XX.X	Otherwise, zero filled.
339,e	DILUTION_PF_FLAG	CHAR(1)	'P' - Pass 'F' - Fail Otherwise, left blank.	
340,e	DILUTION_LIMIT	NUM(4)	The applicable dilution criteria for the vehicle. Otherwise, zero filled.	
344,e	HC_CUTPOINT_HI	NUM(4)	The applicable HC cutpoint/standard for the vehicle. Otherwise, zero filled.	
348,e	CO_CUTPOINT_HI	NUM(5)	The applicable CO cutpoint/standard for the vehicle.	
353,e	RPM_BYPASS	CHAR(1)	'B' - Bypass If the rpm bypass selection is selected, then fill this field with	

			the letter ‘b’. Otherwise, left blank.
354,e	TIMEOUT_FLAG	CHAR(1)	'Y' - Yes 'N' - No If the emissions test ended due to time out conditions, set TIMEOUT_FLAG to ‘Y.’ Otherwise, set to ‘N.’ If no emissions test, left blank.
355,e	HC_PF_FLAG	CHAR(1)	'P' - Pass 'F' - Fail Otherwise, left blank.
356,e	CO_PF_FLAG	CHAR(1)	'P' - Pass 'F' - Fail Otherwise, left blank.
357,s	INSUR_EXP_DT	NUM(8)	(MMDDYYYY) This is the expiration date of the vehicle owner’s proof of insurance. Otherwise, zero filled.
365,s	VI30A_NUM	CHAR(7)	This is the safety inspection’s VI 30A number, if applicable. Otherwise, left blank.
372,s	VI30A_FLAG	CHAR(1)	'Y' - 'Yes', indicates if VI 30A is applicable. 'N' - 'No' Otherwise, left blank.
373,s	SAFETY_PF_FLAG	CHAR(1)	'P' - Pass 'F' - Fail Otherwise, left blank.
374,e	EMISS_PF_FLAG	CHAR(1)	'P' - Pass 'F' - Fail 'T' - Time ran out during test. 'D' - Dilution condition ended test Otherwise, left blank.
375,e	GAS_CAP_MISS	CHAR(1)	'Y' - Yes 'N' - No Otherwise, left blank.
376,e	GAS_CAP_TESTABLE	CHAR(1)	'Y' - Yes 'N' - No Otherwise, left blank.
377,e	GAS_CAP_PF_FLAG	CHAR(1)	'P' - Pass 'F' - Fail Otherwise, left blank.
378,e	CERT_NUM	CHAR(9)	Certificate number entry. If no certificate issued, left blank.

387,e	CERT_NUM_2	CHAR(9)	Certificate number entry. If no certificate issued, left blank.
396,e	CERT_COND	CHAR(1)	Condition of previous certificate, ‘V’ - voided, ‘M’ - missing, ‘C’ - correct, ‘R’ - replacement. Otherwise, left blank.
397,e	EMISS_INSP_COST	NUM(5)	99.99 Emission inspection price (market driven, fixed) Otherwise, zero filled.
402,s	SAFE_INSP_COST	NUM(7)	9999.99 Safety inspection cost plus applicable safety related repairs. Otherwise, zero filled.
409,e	OVERALL_COST	CHAR(7)	9999.99 Sum of all costs associated with the inspection including repair costs, where applicable. Otherwise, zero filled.
416,e	OVERALL_RESULTS	CHAR(1)	'P' - Pass 'F' - Fall This is the overall test results of the vehicle inspected.
417,e	REP_CST_YIS	NUM(8)	99999.99 - Total cost of repairs performed at the same facility where inspection was performed. Otherwise, zero filled.
425,e	REP_CST_RRF	NUM(8)	99999.99 - Total cost of repairs performed at a Recognized Emissions Repair Facility. Otherwise, zero filled.
433,e	REP_CST_NRF	NUM(8)	99999.99 - Total cost of repairs performed at a non-recognized repair facility. Otherwise, zero filled.
441,e	REP_CST_MSP	NUM(8)	99999.99 - Total parts costs for self-performed repairs by the motorist. Otherwise, zero filled.
449,e	SPACE	CHAR(152)	
601,e	REP_OVERALL_COST	NUM(8)	99999.99 Otherwise, zero filled.
609,e	ABORT	CHAR(1)	'J'-Before sampling, 'A'-Aborted Test, Blank, if test completed and not aborted.
610,e	ABORT_CODE	NUM(2)	01 OIL SYSTEM LEAK WARNING LIGHT IS ON 02 COOLANT SYSTEM LEAK WARNING LIGHT IS ON 03 FUEL SYSTEM LEAK 04 EXCESSIVE ENGINE NOISE 05 VEHICLE DOES NOT REQUIRE INSPECTION

			06 BMW, PEUGEOT, VOLVO AUTOMATIC TRANSMISSION 99 OTHER (INDICATE REASON ON THE VIR) Otherwise, left blank.
612,e	MODEL_CODE	CHAR(3)	The NCIC model code or acceptable TNRCC code. Otherwise, left blank.
615,e	TIMEOUT_REDO	CHAR(1)	'Y' - Yes 'N' - No If after 290 seconds a valid test condition was not obtained, and the inspector elects to restart the emissions test, set this field to 'Y'. Otherwise, set to 'N'.
616,e	ORIG_TEST_DATE	NUM(8)	MMDDYYYY Otherwise, zero filled.
624,e	ORIG_TEST_TIME	NUM(6)	HHMMSS Otherwise, zero filled.
630,e	REPL_ID_NUM	CHAR(20)	ID number of the individual that conducts the replacement. INSP_NUM for inspectors, DPS_NUM for Auditors, and ‘9999999999’ (10 9's) for Managers. Otherwise, left blank.
650,e	HC_CUTPOINT_LOW	NUM(4)	HC cutpoint for the low speed idle portion of the emissions phase of the inspection. Otherwise, zero filled.
654,e	CO_CUTPOINT_LOW	NUM(5)	CO cutpoint for the low speed idle portion of the emissions phase of the inspection. Otherwise, zero filled.
659,e	DECAL_NUM	CHAR(9)	Safety Emissions Decal number. Otherwise, left blank.
668,e	DECAL_NUM_2	CHAR(9)	Safety Emissions Decal number for replacements. Otherwise, left blank.
677,e	DECAL_COND	CHAR(1)	Condition of previous decal, ‘V’ - voided, ‘M’ - missing, ‘C’ - correct, ‘R’ - replacement. Otherwise, left blank.
678,e	TXDOT_NUM	CHAR(10)	TxDOT number entered by inspector when Texas plate present. Otherwise, left blank.
688,e	WAIVER_NUM	CHAR(7)	Waiver number entered by auditor if a waiver is issued. Otherwise, left blank.
695,e	2ND_GAS_CAP_MISS	CHAR(1)	'Y' - Yes 'N' - No Blank, if only one gas cap tested.
696,e	2ND_GAS_CAP_TEST	CHAR(1)	'Y' - Yes

			'N' - No Blank, if only one gas cap tested.
697,e	GAS_CAP_PF_FLAG_1	CHAR(1)	'P' - Pass 'F' - Fail Blank, if gas cap not tested.
698,e	GAS_CAP_PF_FLAG_2	CHAR(1)	'P' - Pass 'F' - Fail Blank, if only one gas cap tested.
699,e	REP_GRP	CHAR(1)	‘1’ - Fuel System, ‘2’ - Ignition/Electrical System, ‘3’ - Emissions System, ‘4’ - Engine Mechanical, ‘5’ - Miscellaneous, ‘6’ - No Repairs Performed on Vehicle
700,e	PERF_REPAIRS	CHAR(1)	‘1’ - Recognized Emissions Repair Tech ‘2’ - Other Repair Technician (Non-Recognized) ‘3’ - Motorist (Self-Repair)
701,e	BARCODED_VIN	CHAR(1)	
702,e	BARCODED_TXDOT_NO	CHAR(1)	
703,e	BARCODED_LIC_PLT	CHAR(1)	
704,e	OBD2_MIL_CHECK	CHAR(1)	Y, N
705,e	OBD2_MIL_ON_RUN	CHAR(1)	Y, N
706,e	OBD2_PF_FLAG	CHAR(1)	P, F
707,e	OBD2_READY_RES	CHAR(1)	
708,e	OBD2_FAULT_CD_RES	CHAR(1)	
709,e	OBD2_MIL_STATUS	CHAR(1)	
710,e	OBD2_DLC_RES	CHAR(1)	B,C, Blank - line up with GA ‘c=connector, d-damaged/tampered, f=fail, i=inaccessible/obstructed, n=no signal, p=pass’
711,e	MISFIRE_READY	CHAR(1)	
712,e	FUEL_SYS_READY	CHAR(1)	
713,e	COMPR_COMPNT_RDY	CHAR(1)	

714,e	CATATLYST_READY	CHAR(1)		
715,e	HEATED_CAT_READY	CHAR(1)		
716,e	EVAP_SYS_RDY	CHAR(1)		
717,e	SEC_AIR_SYS_RDY	CHAR(1)		
718,e	AIR_COND_SYS_RDY	CHAR(1)		
719,e	O2_SENSOR_READY	CHAR(1)		
720,e	O2_SENSOR_HTR_RDY	CHAR(1)		
721,e	EGR_SYS_READY	CHAR(1)		
722,e	THERMOSTAT_RDY	CHAR(1)		
723,e	PCV_RDY	CHAR(1)		
724,e	FAULT_CODES(DTCs)	CHAR(50)		
774,e	DTC_STORED	NUM(2)		
776,e	OBD2_RPM	NUM(4)		
780,e	PID_COUNT	CHAR(2)		
782,e	PCM_ID	CHAR(2)		
784,e	OBD_VIN	CHAR(17)	VIN from the OBD computer, where available	
801,e	80_INCHES	CHAR(1)	‘Y’ - Yes, the vehicle is at least 80" wide ‘N’ - No, the vehicle is less than 80" wide	
802,e	PRI_AVG_5015_CO	NUM(5)	XX.XX	Otherwise, zero filled.
807,e	PRI_AVG_5015_HC	NUM(4)	XXXX	Otherwise, zero filled.
811,e	PRI_AVG_5015_CO2	NUM(4)	XX.X	Otherwise, zero filled.
815,e	PRI_AVG_5015_NO	NUM(4)	XXXX	Otherwise, zero filled.
819,e	PRI_AVG_5015_O2	NUM(4)	XX.X	Otherwise, zero filled.
823,e	PRI_AVG_2525_CO	NUM(5)	XX.XX	Otherwise, zero filled.
828,e	PRI_AVG_2525_HC	NUM(4)	XXXX	Otherwise, zero filled.
832,e	PRI_AVG_2525_CO2	NUM(4)	XX.X	Otherwise, zero filled.

836,e	PRI_AVG_2525_NO	NUM(4)	XXXX	Otherwise, zero filled.
840,e	PRI_AVG_2525_O2	NUM(4)	XX.X	Otherwise, zero filled.
844,e	ALT_AVG_5015_CO	NUM(5)	XX.XX	Otherwise, zero filled.
849,e	ALT_AVG_5015_HC	NUM(4)	XXXX	Otherwise, zero filled.
853,e	ALT_AVG_5015_CO2	NUM(4)	XX.X	Otherwise, zero filled.
857,e	ALT_AVG_5015_NO	NUM(4)	XXXX	Otherwise, zero filled.
861,e	ALT_AVG_5015_O2	NUM(4)	XX.X	Otherwise, zero filled.
865,e	ALT_AVG_2525_CO	NUM(5)	XX.XX	Otherwise, zero filled.
870,e	ALT_AVG_2525_HC	NUM(4)	XXXX	Otherwise, zero filled.
874,e	ALT_AVG_2525_CO2	NUM(4)	XX.X	Otherwise, zero filled.
878,e	ALT_AVG_2525_NO	NUM(4)	XXXX	Otherwise, zero filled.
882,e	ALT_AVG_2525_O2	NUM(4)	XX.X	Otherwise, zero filled.
886,e	PRI_AVG_5015_RPM	NUM(4)	XXXX	Otherwise, zero filled.
890,e	PRI_AVG_2525_RPM	NUM(4)	XXXX	Otherwise, zero filled.
894,e	ALT_AVG_5015_RPM	NUM(4)	XXXX	Otherwise, zero filled.
898,e	ALT_AVG_2525_RPM	NUM(4)	XXXX	Otherwise, zero filled.
902,e	ASM_RESTART_CNTR	NUM(1)	X, Number of restarts during the test procedure.	
903,e	SPACE	CHAR(1)		
904,e	DILUTION_5015	NUM(4)	X.XX	Otherwise, zero filled.
908,e	DILUTION_2525	NUM(4)	X.XX	Otherwise, zero filled.
912,e	SPACE	CHAR(1)		
913,e	RELATIVE_HUMIDITY	NUM(5)	XX.XX	Otherwise, zero filled
918,e	HUMIDITY_CORR_5015	NUM(4)	X.XX	Otherwise, zero filled.
922,e	HUMIDITY_CORR_2525	NUM(4)	X.XX	Otherwise, zero filled.
926,e	SPACE	CHAR(1)		

927,e	ACCEL_VIOLAT_5015	NUM(1)	The number of acceleration violations during the ASM 5015 Mode.
928,e	ACCEL_VIOLAT_2525	NUM(1)	The number of acceleration violations during the ASM 2525 Mode.
929,e	THP_5015	NUM(4)	XX.X Total Horsepower used to set the dynamometer.
933,e	THP_2525	NUM(4)	XX.X Total Horsepower used to set the dynamometer.
937,e	AMB_BULB_TEMP	NUM(3)	XXX Otherwise, zero filled. Ambient dry bulb temperature in °F prior to each test.
940,e	BARO_PRESSURE	NUM(3)	XXX Otherwise, zero filled. Barometric Pressure (Absolute) measured in mm of Hg prior to each test.
943,s	SAFE_10	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
944,s	SAFE_16A	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
945,s	SAFE_16B	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
946,s	SAFE_33	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (J, K, E, G, P, F, R, N)
947,s	SAFE_34	CHAR(1)	'P' - Pass 'F' - Fail

			'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
948,s	SAFE_35	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
949,s	SAFE_36	CHAR(1)	'P' - Pass 'F' - Fail 'R' - Repair 'N' - NA Otherwise, left blank. Acceptable entries are (A, B, C, D, P, F, R, N)
950,e	NO_PF_FLAG	CHAR(1)	'P' - Pass 'F' - Fail Otherwise, left blank.
951,e	TEST_WEIGHT	CHAR(5)	
956,e	SPACE	CHAR(5)	
961,e	AXLE_TYPE	CHAR(1)	Y - vehicle has AWD, Full-Time Four Wheel Drive or non-disengageable traction control. N - vehicle is testable on the ASM two wheel dynamometer.
962,e	TEST_REC_NUM	NUM(6)	Id for second-by-second data, if turned on.
968,e	TAILPIPE_START_TIME	NUM(6)	(HHMMSS) This is the time the tailpipe (ASM or TSI) test started. • Value of test_start_time positions one and two (hour) must not be greater than “24.” • Value of test_start_time positions three and four (minute) must not be greater that “59.” • Value of test_start_time positions five and six (second) must not be greater than “59.”
974,e	TAILPIPE_END_TIME	NUM(6)	(HHMMSS) This is the time the tailpipe (ASM or TSI) test ended.
980,e	BODY_STYLE	CHAR(1)	Vehicle Body style for ASM test.
981,e	ANALYZER_NO_EXT	CHAR(3)	Analyzer extension for server/node solution, entered from the VID or by the DPS under the audit menu .

984,e	DPS_SAFE_SEQ	CHAR(1)	Number of the DPS safety item sequence selected by the lane inspector.
985,e	HC_CUTPOINT_2525	NUM(4)	XXXX
989,e	CO_CUTPOINT_2525	NUM(5)	XX.XX
994,e	NO_CUTPOINT_2525	NUM(4)	XXXX
998,e	HC_CUTPOINT_5015	NUM(4)	XXXX
1002,e	CO_CUTPOINT_5015	NUM(5)	XX.XX
1007,e	NO_CUTPOINT_5015	NUM(4)	XXXX
1011,e	SPACE	CHAR(11)	
1022,e	CARRIAGE RETURN AND LINE FEED	CHAR(2)	2 BYTES

RECALL.DAT This is both a hard disk and floppy based file containing vehicle information for tests aborted after the vehicle information is entered and prior to initiating sampling for the official emissions test. The system will automatically purge any record in this file on both hard and floppy disk older than 72 hours. Record length is 204 bytes long.

0,e	TEST_DATE	NUM(8)	(MMDDYYYY) This is the date of the test. • First two positions of test_date must be between “01” and less than “12”(inclusive) • Date (positions 2 and 3) must not be greater than the number of days in a given month • Date (positions 2 and 3) must not be greater than 29 if the given month is February in leap year
8,e	EMISS_TEST_TYPE	CHAR(1)	The analyzer will set the EMISS_TEST_TYPE field to ‘1’ if the inspector conducts an OBDII emissions test, ‘2’ if the inspector conducts a two-speed idle emissions test, and a ‘3’ if the inspector conducts an ASM emissions test.
9,e	TEST_TYPE	CHAR(1)	If the inspector selects one of the following choices from the main menu: 1 - Safety & Emission Inspection 2 - Safety Only 3 - Emissions Only 4 - Reinspection 5 - Reprint The system will set test_type field to the following: 1 - ‘A’ 5 - ‘K’ 2 - ‘H’ If 3 - Emissions Only is selected, prompt the inspector to indicated if the test is a: 1 - required emission only test (decal) 2 - voluntary test 3 - test on resale (not displayed or used) 4 - remote sensing request The system will set test_type field to the following: 1 - ‘O’ 3 - ‘C’ 2 - ‘I’ 4 - ‘B’ The system will default/highlight selection number 1 in all of the scenarios.

NOTE: The tests and their corresponding letters are cross-referenced below:

A)	Emission & Safety Test	H)	Safety Only Test
B)	Remote Sensing Request	I)	Voluntary Emissions Test
C)	Test on Resale	J)	Waiver - Individual Vehicles
D)	Accelerated Vehicle Retirement Test	K)	Reprint

			E) Dispute Test F) Waiver - Minimum Expenditure G) Federal Test L) Waiver - Low Income Time Extension M) Parts Availability Time Extension N) Other (Special Test) O) Required Emissions Only Test (Decal) P) Waiver - Low Mileage
10,e	SPECIAL_TEST	CHAR(1)	Reserved for character mentioned above. Choice 'F' is reserved for 'minimum expenditure waiver tests,' and choice 'G' is reserved for 'federal tests'. Choice 'D' and choice 'E' are reserved for accelerated vehicle retirement tests, and arbitration/dispute tests, respectively. Choice 'J' is reserved for 'individual vehicle waiver tests. Choice 'L,' 'M,' and 'N,' are reserved for 'low income time extension tests,' 'parts availability time extension tests,' and 'other special tests,' respectively.
11,e	VID_ID_NUM	CHAR(11)	Sent by the Texas Information Management System host.
22,e	EMISS_INIT_TEST	CHAR(1)	After an inspection has been completed, the system will set initial_test_type to the character "I" for initial test. After a reinspection has been completed, the system shall set initial_test_type to the character "R" for reinspection test.
23,e	SAFE_INIT_TEST	CHAR(1)	If there is no previous inspection for this vehicle, or the previous inspection was more than sixteen days prior to this inspection, set the SAFE_INIT_TEST to 'I.' If the previous inspection was less than sixteen days prior to this inspection, set the SAFE_INIT_TEST to 'R.'
24,e	STATION_NUM	CHAR(7)	This field must be the authorized station number from the STATION.DAT file.
31,e	STATION_NAME	CHAR(25)	Entered by the DPS under the audit menu.
56,e	ANALYZER_NUMBER	CHAR(8)	This field must be the analyzer number from the STATION.DAT file.
64,e	INSPECTOR_NUM	CHAR(20)	This is the inspector number from INSPECTR.DAT associated with the inspector's access code.
84,e	INSPECTOR_LNAME	CHAR(15)	Inspector's last name.
99,e	INSPECTOR_FNAME	CHAR(10)	Inspector's first name.
109,e	MODEL_YEAR	CHAR(4)	YYYY Model year of the vehicle.
113,e	COUNTY_CODE	CHAR(3)	The county where tested. Dallas - 057 Denton - 061 El Paso - 071 Fort Bend - 079

			Harris - 101 Galveston - 084 Collin - 043 Brazoria - 020 Liberty - 146 Chambers - 036 Tarrant - 220 Montgomery - 170 Waller - 237 Out of State or Federal - 000
116,e	VIN_ID_NUM	CHAR(17)	The VIN number of the vehicle.
133,e	VIN_FLAG	CHAR(1)	If DPS check digit algorithm indicates bad VIN number, set to ‘B’-bad. If not, leave blank.
134,e	LICENSE_NUM	CHAR(8)	License number of the vehicle or dealer number if unlicensed.
142,e	LICENSE_TYPE	NUM(1)	This is type of plate. 1 - Texas Plate 2 - No Plate 3 - Out of state 4 - Exempt (State) 5 - Exempt (Federal) 6 - Dealer Plate (Metal/Hard) 7 - Temporary Sticker (Paper) 8 - Other After selecting number ‘2’or ‘8,’ the license_num field should be set to 'V' followed by the last 7 char of the VIN number. The default for this field is number ‘1.’
143,e	INJECT_CARB	CHAR(1)	Injection/carburetion. 'F' - Fuel Injection 'C' - Carburetion 'O' - Other
144,e	VEHICLE_TYPE	CHAR(1)	'P' - Passenger Car/Station Wagon 'T' - Truck/Van/Bus/Sports Utility Vehicle 'M' - Motor home
145,e	GVW_TYPE	NUM(1)	Gross vehicle weight class. 1 - Light 2 - Heavy
146,e	GVW_ACTUAL	NUM(5)	Actual gross vehicle weight rating.
151,e	MAKE	CHAR(4)	Vehicle make selected from possible list using NCIC make definitions.
155,e	MODEL	CHAR(20)	Vehicle model type is selected based on the vehicle make entry.
175,e	ENGINE_SIZE	CHAR(5)	Values converted to cubic centimeters by the analyzer.

180,e	CYLINDERS	CHAR(2)	The number of cylinders, “1-16.” 'R' - Rotary This entry is made by the inspector if the vehicle inspected is equipped by a rotary engine.
182,e	TRANSMISSION	CHAR(1)	Transmission type. 'A' - Automatic 'M' - Manual
183,e	ODOMETER	NUM(6)	The odometer reading excluding tenths.
189,e	FUEL_TYPE	CHAR(1)	The fuel type 'G' - Gas 'D' - Diesel 'B' - Bi-fueled (Dual Fueled)
190,e	IGNITION	CHAR(1)	The ignition type. 'C' - Conventional 'D' - Distributorless 'Q' - Quad4
191,e	DUAL_EXHAUST	CHAR(1)	This is 'Y' Yes or 'N' No.
192,e	PRE-TUNE	CHAR(1)	This is a 'Y' Yes or 'N' No to the question "Was pre-tuning done on this vehicle prior to testing?
193 ,s	SAFE_TEST_TYPE	CHAR(1)	Safety Inspection Type. The inspector will select “A”- “G” from the keyboard. If the selection is “A” - “F,” then fields SAFE_25 through SAFE_30 will be left blank.
194,s	INSUR_EXP_DT	NUM(8)	(MMDDYYYY) This is the expiration date of the vehicle owner’s proof of insurance.
202,e	CARRIAGE RETURN AND LINE FEED	CHAR(2)	2 BYTES

CAL.DAT This is both a hard disk and floppy based file containing all gas calibration records. Records will be maintained on the hard disk for 12 months. Procedures must be programmed which periodically purged those records older than 12 months from the hard disk. Record length is 640 bytes.

GAS CALIBRATION RECORD

Automatic Input

0,e	GAS_CAL_INDICATOR	CHAR(1)	'W' - Weekly 3 day calibration 'L' - Leak check 'O' - Any other cal.(including 6 month calibration)
1,e	STATION_NUM	CHAR(7)	This field must be the authorized station number from the STATION.DAT file.
8,e	ANALYZER_NUMBER	CHAR(8)	
16,e	CAL_DATE	NUM(8)	(MMDDYYYY)
24,e	CAL_TIME (24-hour clock)	NUM(6)	(HHMMSS)
30,e	PEF	CHAR(3)	This must be a 3 digit numeric, which contains a decimal point. The decimal will not be stored.

Calibration Gases

33,e	HC LOW SPAN GAS (propane ppm)	NUM(4)	XXXX
37,e	CO LOW SPAN GAS (%)	NUM(5)	XX.XX
42,e	CO_2 LOW SPAN GAS (%)	NUM(4)	XX.X
46,e	NO LOW SPAN GAS (propane ppm)	NUM(4)	XXXX
50,e	HC MID SPAN GAS (Propane ppm)	NUM(4)	XXXX
54,e	CO MID SPAN GAS (%)	NUM(5)	XX.XX
59,e	CO_2 MID SPAN GAS (%)	NUM(4)	XX.X
63,e	NO MID SPAN GAS (propane ppm)	NUM(4)	XXXX

Before Calibration Readings

67,e	HC ZERO READING	NUM(5)	XXXXX
72,e	CO ZERO READING	NUM(6)	XXX.XX
78,e	CO_2 ZERO READING	NUM(5)	XXX.X
83,e	NO ZERO READING	NUM(5)	XXXXX
88,e	O_2 READING	NUM(4)	XX.X
92,e	HC LOW SPAN READING	NUM(5)	XXXXX
97,e	CO LOW SPAN READING	NUM(5)	XX.XX
102,e	CO_2 LOW SPAN READING	NUM(5)	XXX.X
107,e	NO LOW SPAN READING	NUM(5)	XXXXX
112,e	HC MID SPAN READING	NUM(5)	XXXXX

117,e	CO MID SPAN READING	NUM(5)	XX.XX
122,e	CO_2 MID SPAN READING	NUM(5)	XXX.X
127,e	NO MID SPAN READING	NUM(5)	XXXXX

Calibration Results

132,e	HC ZERO READING	NUM(5)	XXXXX
137,e	CO ZERO READING	NUM(6)	XXX.XX
143,e	CO_2 ZERO READING	NUM(5)	XXX.X
148,e	NO ZERO READING	NUM(5)	XXXXX
153,e	O_2 READING	NUM(4)	XX.X
157,e	HC LOW SPAN READING	NUM(5)	XXXXX
162,e	CO LOW SPAN READING	NUM(5)	XX.XX
167,e	CO_2 LOW SPAN READING	NUM(5)	XXX.X
172,e	NO LOW SPAN READING	NUM(5)	XXXXX
177,e	HC MID SPAN READING	NUM(5)	XXXXX
182,e	CO MID SPAN READING	NUM(5)	XX.XX
187,e	CO_2 MID SPAN READING	NUM(5)	XXX.X
192,e	NO MID SPAN READING	NUM(5)	XXXXX
197,e	SPAN TEST RESULTS (P/F)	CHAR(1)	
198,e	LEAK CHECK RESULT	CHAR(1)	'P' - Pass 'F' - Fail 'N' - Not done
199,e	GAS_CAP_CHECK_RSLT	CHAR(1)	'P' - Pass 'F' - Fail 'N' - Not done

DYNAMOMETER CALIBRATION RECORD

Automatic Input

200,e	DYNO_CAL_DATE	NUM(8)	(MMDDYYYY)
208,e	CAL_START_TIME	NUM(6)	(HHMMSS)
214,e	CAL_END_TIME	NUM(6)	(HHMMSS)
220,e	ROLL_DIAMETER	NUM(4)	XX.X (INCHES)
224,e	BASE_INERTIA	NUM(4)	XXXX
228,e	COASTDWN_HP_2525	NUM(4)	XX.X
232,e	COASTDWN_TIME_2525	NUM(3)	XXX (SECONDS)
235,e	COASTDWN_HP_5015	NUM(4)	XX.X
239,e	COASTDWN_TIME_5015	NUM(3)	XXX (SECONDS)
242,e	PARASITIC_HP_LOSS_2525	NUM(4)	X.XX

246,e	PARASITIC_HP_LOSS_5015	NUM(4)	X.XX
250,e	DYNO_CAL_RESULT	CHAR(1)	'P' - Pass 'F' - Fail 'N' - Not done
251,e	SPACE	CHAR(387)	
638,e	CARRIAGE RETURN AND LINE FEED	CHAR(2)	2 BYTES

AUDITGAS.DAT This is both a hard disk and floppy based file containing the gas.audit. Records will be maintained on the hard disk for 180 days. Procedures must be programmed that periodically purge collected records from the hard disk older than 180 days. Only gas audit records are to be stored in this file. Record length is 640 bytes.

0,e	STATION_NUM	CHAR(7)	This field must be the authorized station number from the STATION.DAT file.
7,e	STATION_NAME	CHAR(25)	This field must be the station name from the STATION.DAT file.
32,e	ANALYZER_NUMBER	CHAR(8)	
40,e	AUDIT_DATE	NUM(8)	(MMDDYYYY) Updated by State. The system will enter the date automatically when the DPS representative/technician accesses the Gas Audit Selection from the audit menu.
48,e	AUDIT_TIME	NUM(4)	(HHMM) Updated by State. The system will enter the date automatically when the DPS representative/technician accesses the Gas Audit Selection from the audit menu.
52,e	CAL_PORT	CHAR(1)	'C', if the audit gas is enter through the calibration port. Otherwise, left blank.
53,e	HC_HANGUP	NUM(3)	No entry if CAL_PORT contains a 'C'. Otherwise, average HC hang-up value.
56,e	DPS_REP_ID	CHAR(6)	This field must be the authorized station number from the STATION.DAT file.

GAS AUDIT RECORD

Automatic Input

62,e	PEF	CHAR(3)	This must be a 3 digit numeric, which contains a decimal point. The decimal will not be stored.

Audit Gases Bottle Values

65,e	HC ZERO SPAN GAS (propane ppm)	NUM(4)	XXXX
69,e	CO ZERO SPAN GAS (%)	NUM(5)	XX.XX
74,e	CO2 ZERO SPAN GAS (%)	NUM(4)	XX.X
78,e	NO ZERO SPAN GAS (propane ppm)	NUM(4)	XXXX
82,e	O2 ZERO SPAN GAS	NUM(4)	XX.X
86,e	HC LOW SPAN GAS (propane ppm)	NUM(4)	XXXX
90,e	CO LOW SPAN GAS (%)	NUM(5)	XX.XX

95,e	CO2 LOW SPAN GAS (%)	NUM(4)	XX.X
99,e	NO LOW SPAN GAS (propane ppm)	NUM(4)	XXXX
103,e	HC MID1 SPAN GAS (Propane ppm)	NUM(4)	XXXX
107,e	CO MID1 SPAN GAS (%)	NUM(5)	XX.XX
112,e	CO2 MID1 SPAN GAS (%)	NUM(4)	XX.X
116,e	NO MID1 SPAN GAS (propane ppm)	NUM(4)	XXXX
120,e	HC MID2 SPAN GAS (Propane ppm)	NUM(4)	XXXX
124,e	CO MID2 SPAN GAS (%)	NUM(5)	XX.XX
129,e	CO2 MID2 SPAN GAS (%)	NUM(4)	XX.X
133,e	NO MID2 SPAN GAS (propane ppm)	NUM(4)	XXXX
137,e	HC HIGH SPAN GAS (Propane ppm)	NUM(4)	XXXX
141,e	CO HIGH SPAN GAS (%)	NUM(5)	XX.XX
146,e	CO2 HIGH SPAN GAS (%)	NUM(4)	XX.X
150,e	NO HIGH SPAN GAS (propane ppm)	NUM(4)	XXXX
	Audit Readings		
154,e	HC ZERO READING	NUM(5)	XXXXX
159,e	CO ZERO READING	NUM(6)	XXX.XX
165,e	CO2 ZERO READING	NUM(5)	XXX.X
170,e	NO ZERO READING	NUM(5)	XXXXX
175,e	O2 READING	NUM(4)	XX.X
179,e	HC LOW SPAN READING	NUM(5)	XXXXX
184,e	CO LOW SPAN READING	NUM(5)	XX.XX
189,e	CO2 LOW SPAN READING	NUM(5)	XXX.X
194,e	NO LOW SPAN READING	NUM(5)	XXXXX
199,e	HC MID1 SPAN READING	NUM(5)	XXXXX
204,e	CO MID1 SPAN READING	NUM(5)	XX.XX
209,e	CO2 MID1 SPAN READING	NUM(5)	XXX.X
214,e	NO MID1 SPAN READING	NUM(5)	XXXXX
219,e	HC MID2 SPAN READING	NUM(5)	XXXXX
224e	CO MID2 SPAN READING	NUM(5)	XX.XX
229,e	CO2 MID2 SPAN READING	NUM(5)	XXX.X
234,e	NO MID2 SPAN READING	NUM(5)	XXXXX
239,e	HC HIGH SPAN READING	NUM(5)	XXXXX
244,e	CO HIGH SPAN READING	NUM(5)	XX.XX

249,e	CO2 HIGH SPAN READING	NUM(5)	XXX.X
254,e	NO HIGH SPAN READING	NUM(5)	XXXXX
259,e	SPAN TEST RESULTS (P/F)	CHAR(1)	
260,e	LEAK CHECK RESULT	CHAR(1)	'P' - Pass 'F' - Fail 'N' - Not done
261,e	GAS_CAP_CHECK_RSLT	CHAR(1)	'P' - Pass 'F' - Fail 'N' - Not done

DYNAMOMETER CALIBRATION RECORD
Automatic Input

262,e	DYNO_CAL_DATE	NUM(8)	(MMDDYYYY)
270,e	CAL_START_TIME	NUM(6)	(HHMMSS)
276,e	CAL_END_TIME	NUM(6)	(HHMMSS)
282,e	ROLL_DIAMETER	NUM(4)	XX.X (INCHES)
286,e	BASE_INERTIA	NUM(4)	XXXX
290,e	COASTDWN_HP_2525	NUM(4)	XX.X
294,e	COASTDWN_TIME_2525	NUM(3)	XXX (SECONDS)
297,e	COASTDWN_HP_5015	NUM(4)	XX.X
301,e	COASTDWN_TIME_5015	NUM(3)	XXX (SECONDS)
304,e	PARASITIC_HP_LOSS_2525	NUM(4)	X.XX
308,e	PARASITIC_HP_LOSS_5015	NUM(4)	X.XX
312,e	DYNO_CAL_RESULT	CHAR(1)	'P' - Pass 'F' - Fail 'N' - Not done
313,e	OVERALL_RESULTS	CHAR(1)	'P' - Pass 'F' - Fail
314,e	SPACE	CHAR(325)	
638,e	CARRIAGE RETURN AND LINE FEED	CHAR(2)	2 BYTES

AUDITNOT.DAT This is both a hard disk and floppy based file containing all auditors notes. The auditors notes will be maintained on the hard disk until it is deleted by the auditors. This file allows the auditors to make entries and comments after the monthly audit. This should allow for free form notes to be entered and reviewed by the auditors. Record length is 361 bytes.

0,e	STATION_NUM	CHAR(7)	This field must be the authorized station number from the STATION.DAT file.
7,e	ANALYZER_NUMBER	CHAR(8)	This field must be the authorized analyzer number from the STATION.DAT file.
15,e	DATE	NUM(8)	(MMDDYYYY)
23,e	TIME	NUM(6)	(HHMM)
29,e	SPACE	CHAR(4)	Former DPS representative/technician ID number.
33e	NOTES	CHAR(319)	Record length may vary (maximum 319 characters).
352,e	GAS_CAP_CAL_RES	CHAR(1)	Gas Cap Tester Calibration Results ‘P’ - Pass ‘F’ - Fail ‘N’ - Not Done
353,e	DPS_REP_ID	CHAR(6)	DPS representative/technician ID number, new length
359,e	CARRIAGE RETURN AND LINE FEED	CHAR(2)	2 BYTES

AUDITLOG.DAT This is both a hard disk and floppy based file containing all audit login attempts. Records will be maintained on hard disk for 180 days. Procedures must be programmed that periodically purge the collected records from the hard disk older than 180 days. Only audit log records are to be stored in this file. Record length is 64 bytes.

0,e	STATION_NUM	CHAR(7)	This field must be the authorized station number from the STATION.DAT file.
7,e	ANALYZER_NUMBER	CHAR(8)	This field must be the authorized analyzer number from the STATION.DAT file.
15,e	DATE	NUM(8)	(MMDDYYYY) Date of the login attempt.
23,e	TIME	NUM(4)	(HHMM) Time of the login attempt.
27,e	LOGON	CHAR(1)	'U' - Unauthorized login attempt 'A' - Authorized login attempt
28,e	DPS_REP_ID	CHAR(4)	old DPS representative/technician ID format.
32,e	SEARCH	CHAR(1)	'Y' - Yes, otherwise, blank.
33,e	TIME	NUM(4)	(HHMM) Time of the DPS search request. Zero filled if SEARCH is blank.
37,e	BAD_DPS_ID	CHAR(1)	'U' - Did not match DPS_REP_ID in AUDITOR.DAT file, login unathorized. 'A' - Matched value in DPS_REP_ID - login authorized
38,e	DPS_REP_ID	CHAR(6)	DPS representative/technician ID number, new length
44,e	SPACE	CHAR(18)	
62,e	CARRIAGE RETURN AND LINE FEED	CHAR(2)	2 BYTES

AUDITOR.DAT This is both a hard disk and floppy based file containing all DPS representatives/inspectors authorized to access the Audit Menu. Records will be maintained on hard disk. Record length is 64 bytes.

0,e	DPS_REP_ID	CHAR(6)	DPS Representative/technician ID number, new length
6,e	AUDITOR_LNAME	CHAR(15)	DPS Representative/Auditor's last name.
21,e	AUDITOR_FNAME	CHAR(10)	DPS Representative/Auditor's first name.
31,e	SPACE	CHAR(31)	
62,e	CARRIAGE RETURN AND LINE FEED	CHAR(2)	2 BYTES

AUDTMENU.DAT This is both a hard disk and floppy based file containing activity of the DPS representatives/inspectors during the authorized access of the Audit Menu. Records will be maintained on hard disk. Once this file is successfully transmitted to the TIMS, it may be erased. Record length is 64 bytes.

0,e	DPS_REP_ID	CHAR(6)	DPS Representative/technician ID number, new length
6,e	MENU_NUMBER	CHAR(2)	Audit Main Menu selection number
8,e	MENU_IN_OUT	CHAR(1)	'I' - In the menu. 'O' - Out of the menu.
9,e	DATE	NUM(8)	(MMDDYYYY) Date of the login attempt.
17,e	TIME	NUM(4)	(HHMM) Time of the login attempt.
21,e	STATION_NUM	CHAR(7)	This field must be the authorized station number from the STATION.DAT file.
28,e	ANALYZER_NUMBER	CHAR(8)	This field must be the authorized analyzer number for the STATION.DAT file.
36,e	SPACE	CHAR(26)	
62,e	CARRIAGE RETURN AND LINE FEED	CHAR(2)	2 BYTES

DEFLK.DAT This is both a hard disk and floppy based file containing the top forty used deficiency codes that will be entered by the DPS representatives/inspectors during the authorized access of the Audit Menu. Records will be maintained on hard disk. Record length is 256 bytes.

0,e	LK_CODE	NUM(5)	This field contained the DPS deficiency code number.
5,	SPACE	NUM(3)	
8,e	LK_DESC_TXT	CHAR(200)	DPS deficiency code description for the corresponding code number.
208,e	SPACE	CHAR(46)	
254,e	CARRIAGE RETURN AND LINE FEED	CHAR(2)	2 BYTES

LOCKOUT.DAT This is both a hard disk based file containing lockout information. The record will be maintained on the hard disk and updated by the Texas Information Management System host. Only lockout information is to be stored in this file. This file indicates that the fields shall toggle between entries of Y's and 'N's or 1's and 0's. A lockout is active or ‘on’ if the field contains a '1' or 'Y.' The lockout is disabled or ‘off’ if the field contains a '0' or a 'N.' If the analyzer uses 0's and 1's in this file, the lockout status screen shall display N’s or No’s and Y’s or Yes’s. The logic by which the lockouts are set and cleared shall not be affected. Record length is 14 bytes.

0,e	STATE_LOCKOUT	CHAR(1)	Set to '1' or 'Y' by audit screen. Set to 'N' by electronic transmission.
1,e	CABINET_TAMPER	CHAR(1)	Set to '1' or 'Y' by system. Set to '0' or 'N' by service technician, or audit screen.
2,e	FLOPPY_TAMPER	CHAR(1)	Set to '1' or 'Y' by system. Set to '0' or 'N' by service technician, or audit screen.
3,e	STAT_CERT_EXP	CHAR(1)	Set to '1' or 'Y' by system. Set to '0' or 'N' by electronic transmission.
4,e	STAT_CERT_SUSP	CHAR(1)	Set to '1' or 'Y' by system. Set to '0' or 'N' by electronic transmission.
5,e	STAT_CERT_REVOK	CHAR(1)	Set to '1' or 'Y' by system. Set to '0' or 'N' by electronic transmission.
6,e	COMM_FAIL_PAY	CHAR(1)	Set to '1' or 'Y' or to '0' or 'N' by electronic transmission.
7,e	MAX_TEST_WO_COMM	CHAR(1)	Set to '1' or 'Y' by system or electronic transmission. Set to '0' or 'N' by electronic transmission.
8,e	NO_CONTACT_LIMIT	NUM(3)	Sent by Texas Information Management System host. Maximum number of tests that can be conducted without contact with the Texas Information Management System host.
11,e	LOW_VOL_STATION	CHAR(1)	Set to '1' or 'Y' or to '0' or 'N' by electronic transmission
12,e	CARRIAGE RETURN AND LINE FEED	CHAR(2)	2 BYTES

ESC.DAT This is a hard disk based file containing emissions standards. Records will be maintained on the hard disk until updated by the Texas Information Management System. Only emissions standards are to be stored in this file. Record length is 64 bytes.

0,e	EMISS_STND_CAT	NUM(2)	Ranges from 1 to 50
2,e	START_YEAR	NUM(4)	XXXX
6,e	END_YEAR	NUM(4)	XXXX
10,e	GVW_TYPE	NUM(1)	1 = Light-duty, or 2 = Heavy duty
11,e	AVG_HC_IDLE_PASS	NUM(4)	Reserved for future use. (XXXX)
15,e	AVG_CO_ILDE_PASS	NUM(5)	Reserved for future use. (XX.XX)
20,e	AVG_HC_HIGH_PASS	NUM(4)	Reserved for future use. (XXXX)
24,e	AVG_CO_HIGH_PASS	NUM(5)	Reserved for future use. (XX.XX)
29,e	MAX_HC_IDLE	NUM(4)	(XXXX)
33,e	MAX_CO_IDLE	NUM(5)	(XX.XX)
38,e	MAX_HC_HIGH	NUM(4)	(XXXX)
42,e	MAX_CO_HIGH	NUM(5)	(XX.XX)
47,e	MIN_CO+CO2	NUM(5)	(XX.XX)
52,e	MAX_IDLE_RPM	NUM(4)	(XXXX)
56,e	SPACE	CHAR(6)	
62,e	CARRIAGE RETURN AND LINE FEED	CHAR(2)	2 BYTES

TXVRT.DAT This is a hard disk based file containing vehicle test parameters. Records will be maintained on the hard disk until updated by the Texas Information Management System. Only vehicle test parameters are to be stored in this file. Record length is 247 bytes.

0,e	VRT_RECORD_ID	NUM(5)	VRT identifier
5,e	MODEL_YR	NUM(4)	(YYYY) Vehicle Model year
9,e	VEHICLE_BODY_TYPE	NUM(1)	1 = SEDAN, 2 = STATION WAGON, 3 = PICKUP, 4 = SPORT/UTILITY VEHICLE, 5 = MINIVAN, 6 = FULL-SIZE VAN
10,e	VEHICLE_STNDS_TYPE	CHAR(1)	P - passenger, T - truck
11,e	VEHICLE_MAKE	CHAR(17)	Make of Vehicle Under Test (VUT). Vehicle make selected from possible list using the Sierra Lookup Table naming convention
28,e	MAKE	CHAR(4)	Vehicle make selected from possible list using NCIC make definitions.
32,e	VEHICLE_MODEL_NM	CHAR(23)	Model of Vehicle Under Test (VUT). Vehicle model selected from possible list using the Sierra Lookup Table naming convention
55,e	MODEL	CHAR(20)	Vehicle model type is selected based on the vehicle make entry.
75,e	MODEL_CODE	CHAR(3)	The NCIC model code or acceptable TNRCC code. Otherwise, left blank.
78,e	NUMBER_CYLINDERS	NUM(2)	Number of cylinders: valid numbers 3-17 (17=rotary)
80,e	ENGINE_SIZE	NUM(4)	Engine Size in cubic centimeters (cc)
84,e	TRANSMISSION	CHAR(1)	A=Auto, M=Manual, E=Either
85,e	VEHICLE_REF_NO	CHAR(8)	Row source reference
93,e	GVWR	NUM(5)	Gross vehicle weight from inspector entry
98,e	VEHICLE_TEST_WT	NUM(4)	Weight from table
102,e	ASM_HP_2525	NUM(4)	test hp 2525
106,e	ASM_HP_5015	NUM(4)	test hp 5015
110,e	DYNO_TEST_AVAIL	CHAR(1)	Y=YES N=NO

111,e	FUEL_CAP_ADAP	CHAR(1)	A=Dark Blue, B=Yellow, C=Red, E=Green, F=Black, G=Gray, H=Threaded, L=Light Blue, O=Orange, T=Tan/Brown, Z=Varies, U=Untestable, N=unknown or no adapter required
112,e	ASM_CUTPT_ROW_ID	NUM(5)	
117,e	MISFIRE_MON	CHAR(1)	OBD II Readiness Monitor for engine Misfire
118,e	FUEL_SYS_MON	CHAR(1)	OBD II Readiness Monitor for the Fuel System
119,e	COMPR_COMPR_MON	CHAR(1)	OBD II Readiness Monitor for the Comprehensive Components
120,e	CATALYST_MON	CHAR(1)	OBD II Readiness Monitor for the Catalytic Converter
121,e	HEAT_CATALYST_MON	CHAR(1)	OBD II Readiness Monitor for the Heated Catalytic Converter
122,e	EVAP_SYS_MON	CHAR(1)	OBD II Readiness Monitor for the Evaporative System
123,e	SEC_AIR_SYS_MON	CHAR(1)	OBD II Readiness Monitor for the Secondary Air System
124,e	AIR_COND_SYS_MON	CHAR(1)	OBD II Readiness Monitor for the Air Conditioner System
125,e	OXYGEN_SENSOR_MON	CHAR(1)	OBD II Readiness Monitor for the Oxygen Sensor
126,e	HEAT_O2_SENS_MON	CHAR(1)	OBD II Readiness Monitor for the Oxygen Sensor Heater
127,e	EGR_SYS_MON	CHAR(1)	OBD II Readiness Monitor for the Exhaust Gas Recirculation (EGR) Valve
128,e	THERMOSTAT_MON	CHAR(1)	OBD II Readiness Monitor for the Thermostat (beginning with M/Y 2000)
129,e	PCV_MON	CHAR(1)	OBD II Readiness Monitor for the PCV Valve (beginning with M/Y 2002)
130,e	EXEMPT_MK_OBD2TST	CHAR(17)	(NCIC) Make to exempt OBD II test
147,e	EXEMPT_MD_OBD2TST	NUM(23)	(999) Model code for Model to exempt from OBD II test
170,e	MAX_NUM_NOT_READY	NUM(1)	Maximum number of monitors not set to allow a pass
171,e	DLC_LOCATION	NUM(1)	Location of DLC, number 1-9 Per EPA Locator Grid
172,e	DLC_COVERED	CHAR(1)	Y=DLC is covered, N=No cover Per EPA Locator Grid
173,e	FORCE_TEST_TYPE	CHAR(1)	A=ASM, T=TSI, O=OBD, or Blank (default test based on MY of vehicle being tested)

174,e	SPACE	CHAR(63)	
237,e	ROW_DATE	NUM(8)	MMDDYYYY - date of the last VRT update.
245,e	CARRIAGE RETURN AND LINE FEED	CHAR(2)	2 BYTES

DFLTHP.DAT This is a hard disk based file containing vehicle test parameters. Records will be maintained on the hard disk until updated by the Texas Information Management System. Only vehicle test parameters are to be stored in this file. Record length is 247 bytes.

0,e	VEHICLE_BODY_TYPE	NUM(1)	1 = SEDAN, 2 = STATION WAGON, 3 = PICKUP, 4 = SPORT/UTILITY VEHICLE, 5 = MINIVAN, 6 = FULL-SIZE VAN
1,e	NUMBER_CYLINDERS	NUM(2)	Number of cylinders: valid numbers 3-17 (17=rotary)
3,	SPACE	CHAR(4)	
7,e	DYNO_ROLL_SIZE	NUM(4)	XX.X, 08.6, 20.0
11,e	ASM_HP_5015	NUM(4)	test hp 5015
15,e	SPACE	CHAR(4)	
19,e	ASM_HP_2525	NUM(4)	test hp 2525
23,e	SPACE	CHAR(4)	
27,e	VEHICLE_TEST_WT	NUM(4)	Weight from table
31,e	SPACE	CHAR(214)	
245,e	CARRIAGE RETURN AND LINE FEED	CHAR(2)	2 BYTES

PERFORM.DAT This is both hard disk and floppy based file accessed through the audit screen. The system will purge records older than 180 days automatically from the hard disk. Record length is 768 bytes.

0,e	STATION_NUM	CHAR(7)	This field must be the authorized station number from the STATION.DAT file.
7,e	STATION_NAME	CHAR(25)	This field must be the station name from the STATION.DAT file.
32,e	ANALYZER_NUMBER	CHAR(8)	
40,e	TODAY'S DATE	NUM(8)	(MMDDYYYY)
48,e	DATE_LAST_REPORT	NUM(8)	(MMDDYYYY) Date of the last Station Performance Report.
56,e	DATE_LAST_CALIBRAT	NUM(8)	(MMDDYYYY) The date of the last three-day gas calibration and leak check.
64,e	STATION_ SIGN	CHAR(1)	'P' - Pass 'F' - Fail
65,e	PRICE POSTED	CHAR(1)	'P' - Pass 'F' - Fail
66,e	HOURS POSTED	CHAR(1)	'P' - Pass 'F' - Fail
67,e	CERT_OF_APPT	CHAR(1)	'P' - Pass 'F' - Fail
68,e	INSPECTOR LICENSE	CHAR(1)	'P' - Pass 'F' - Fail
69,e	DISPLAY_BOARD	CHAR(1)	'A' - Pass 'B' - Fail
70,e	CURR_EMISS_MANUAL	CHAR(1)	'P' - Pass 'F' - Fail
71,e	CERTIFICATES	CHAR(1)	'P' - Pass 'F' - Fail
72,e	PUBLIC RELATION PAMPHLET	CHAR(1)	'P' - Pass 'F' - Fail
73,e	TUNE-UP TOOLS	CHAR(1)	'P' - Pass 'F' - Fail

74,e	PROPANE ENRICH-MENT KIT	CHAR(1)	'P' - Pass 'F' - Fail
75,e	FUEL INLET RESTRICTOR GAUGE	CHAR(1)	'P' - Pass 'F' - Fail
76,e	FLEX PROBES	CHAR(1)	'P' - Pass 'F' - Fail
77,e	APPVD_BAR90_GAS	CHAR(1)	'A' - Pass 'B' - Fail
78,e	RULES_REGS_MANUAL	CHAR(1)	'P' - Pass 'F' - Fail
79,e	BRAKE_TEST_AREA	CHAR(1)	'P' - Pass 'F' - Fail
80,e	REQUIRED_EQUIP	CHAR(1)	'A' - Pass 'B' - Fail
81,e	TACHOMETER_LEAD	CHAR(1)	'A' - Pass 'B' - Fail
82,e	GAS_CAP_TESTER	CHAR(1)	'A' - Pass 'B' - Fail
83,e	INSP_ON_DUTY	CHAR(1)	'A' - Pass 'B' - Fail
84,e	INSPECTION_BAY	CHAR(1)	'A' - Pass 'B' - Fail
85,e	APPR_WIN_TINT_MTR	CHAR(1)	'P' - Pass 'F' - Fail
86,e	ANLYZR_PRNTR_SUPPL	CHAR(1)	'A' - Pass 'B' - Fail
87,e	OVERALL_RESULT	CHAR(1)	'P' - Pass 'F' - Fail
88,e	CHANGE ACCESS CODE	CHAR(1)	'Y' - Yes 'N' - No
89,e	NEW DATA DISK	CHAR(1)	'Y' - Yes 'N' - No
90,e	RESET TAMPER	CHAR(1)	'Y' - Yes 'N' - No

91,e	SOFTWARE UPDATE	CHAR(1)	'Y' - Yes 'N' - No
92,e	STATION LOCKOUT	CHAR(1)	'Y' - Yes 'N' - No
93,e	INSPECTOR LOCKOUT	CHAR(1)	'Y' - Yes 'N' - No
94,e	LETTER DELIVERED	CHAR(1)	'Y' - Yes 'N' - No
95,e	TECHNICAL BULLETINS	CHAR(1)	'Y' - Yes 'N' - No
96,e	DPS_REP_ID	CHAR(6)	DPS Representative/technician ID number, new length
102,e	BARCODE_SCANNER	CHAR(1)	‘Y’ - Yes, ‘N’ - No, can also be edited under FSR menu
103,e	CD_ROM	CHAR(1)	‘Y’ - Yes, ‘N’ - NO, can also be edited under FSR menu
104,e	DVD	CHAR(1)	‘Y’ - Yes, ‘N’ - NO, can also be edited under FSR menu
105,e	MODEL_NUM	CHAR(15)	Analyzer model number, can also be edited under FSR menu
120,e	SERIAL_NUMBER_1	CHAR(15)	Primary analyzer serial number, can also be edited under FSR menu
135,e	SERIAL_NUMBER_2	CHAR(15)	Secondary analyzer serial number, can also be edited under FSR menu
150,e	MANU_ID	CHAR(20)	Free text for Manu ID, can also be edited under FSR menu
170,e	VIOLATION_CDS	CHAR(25)	These are the violation codes entered by the DPS auditor.
195,e	ACTION_CDS	CHAR(10)	These are the action codes entered by the DPS auditor. Each action code is alphanumeric of length 2, and has expected values of ‘C’ - for Citation Issued, ‘W’ for Warning Issued, ‘S’ for Suspension Recommended, and ‘R’ for Revocation Recommended, or a combination of these values.
205,e	TICKET_NOS	CHAR(70)	The ticket numbers entered by the DPS auditor.
275,e	NOTES	CHAR(319)	Record length may vary (maximum 320 characters). Copy of the NOTES field in AUDITNOT.DAT file for transmission to VID.
594,e	SPACE	CHAR(172)	
766,e	CARRIAGE RETURN	CHAR(2)	2 BYTES

AND LINE FEED

VIRMSGS.DAT This is both a hard disk and floppy based file containing the messages that will be printed on the VIR at the conclusion of an inspection. Records will be maintained on hard disk. Record length is variable.

0,e	MESSAGE_DELIMIT	CHAR(3)	&*&
3,e	MESSAGE_NUM	NUM(2)	Record number of this message block in file.
5,e	NUM_MSG_BLKS	NUM(2)	Total number of message blocks in file.
7,e	MESSAGE_ID	CHAR(8)	Message Identifier
15,e	DATE_UPDATE	NUM(8)	MMDDYYYY, date of last update.
23,e	MESSG_LN_COUNT	NUM(2)	Message line count
25,e	CARRIAGE RETURN AND LINE FEED	CHAR(2)	<CR><LF>
27,e	MESSAGE_TEXT	CHAR(Var)	ASCII text with up to 76 characters per line for screen messages/ 110 characters per line messages. 1000 bytes/message. Each message line terminates with <CR><LF>.

SECXSEC.DAT This is both a hard disk and floppy based file containing the second by second data from the last ASM test. Records will be maintained on hard disk. Once this file is successfully transmitted to the TIMS, it may be erased. Record length is 64 bytes.

0,e	TEST_REC_NUM	NUM(6)	
6,e	STATION_NUM	CHAR(7)	This field must be the authorized station number from the STATION.DAT file.
13,e	ANALYZER_NUM	CHAR(8)	This field must be the authorized analyzer number from the STATION.DAT file.
21,e	TIME_INCREMENT	NUM(3)	“001” - “ 270"
24,e	VEHICLE_SPEED	NUM(4)	XX.X, vehicle speed during the inspection.
28,e	HC	NUM(4)	HC reading in ppm (Not DCF Adjusted), XXXX
32,e	CO	NUM(5)	CO reading in ppm (Not DCF Adjusted), XX.XX
37,e	CO2	NUM(4)	CO2 reading in ppm (Not DCF Adjusted), XX.X
41,e	NO	NUM(4)	NO reading in ppm (Not DCF Adjusted), XXXX
45,e	O2	NUM(4)	O2 reading in ppm (Not DCF Adjusted), XX.X
49,e	AIR_FUEL_RATIO	NUM(4)	Air Fuel Ratio, XX.X
53,e	SPACE	CHAR(9)	
62,e	CONTROL_CHARS	CHAR(2)	<CR><LF>, 2 BYTES

TXDTC.DAT This is both a hard disk and floppy based file containing the OBDII diagnostic trouble codes that if present when the malfunction indicator light is commanded on, will result in failure of the emissions phase of the inspection. Records will be maintained on hard disk. Record length is 128 bytes.

0,e	FAULT_CODE(DTC)	CHAR(5)	
5,e	FAULT_CD_DESC	CHAR(50)	Written description of the fault code.
55,e	FAIL_FLAG	CHAR(1)	'Y' - Yes, fail the vehicle if this code is present, when MIL commanded on. 'N' - No, do not fail the vehicle if this code is present, when the MIL is commanded on.
56,e	SPACE	CHAR(70)	
126,e	CONTROL_CHARS	CHAR(2)	<CR><LF>, 2 BYTES

ESC_ASM.DAT This is a hard disk based file containing emissions standards. Records will be maintained on the hard disk until updated by the Texas Information Management System. Only emissions standards are to be stored in this file. Record length is 64 bytes.

0,e	ASM_CUTPT_ROW_ID	NUM(5)	
5,e	MODEL_YEAR	NUM(4)	XXXX
9,e	VEHICLE_TEST_WT	NUM(4)	XXXX
13,e	VEHICLE_STNDS_TYPE	CHAR(1)	P = Passenger, or T = Truck
14,e	MIN_GVWR	NUM(4)	
18,e	MAX_GVWR	NUM(4)	
22,e	HC_CUTPOINT_2525	NUM(4)	XXXX
26,e	CO_CUTPOINT_2525	NUM(5)	XX.XX
31,e	NO_CUTPOINT_2525	NUM(4)	XXXX
35,e	HC_CUTPOINT_5015	NUM(4)	XXXX
39,e	CO_CUTPOINT_5015	NUM(5)	XX.XX
44,e	NO_CUTPOINT_5015	NUM(4)	XXXX
48,e	DATE	DATE(8)	MMDDYYYY, date of last update
56,e	SPACE	CHAR(6)	
62,e	CARRIAGE RETURN AND LINE FEED	CHAR(2)	2 BYTES

Appendix J

Sample of a
Vehicle Inspection
Report

Example: Vehicle Inspection Report

Vehicle Identification

Test Date: 5/24/95
Test Time: 10:56
Test Type: Initial/Reinspection
Test: Preconditioned 2-Speed Idle
Version Number: 9501
License Number: CKS 72E
Vehicle ID Number: 124329RIOE2833LK4
Vehicle Make: CHEV
Vehicle Model: CELEBRITY WAGON
Vehicle Year: 1988
Vehicle Type: P
Engine Size: 2500
Cylinders: 4
Transmission: AUTOMATIC
Fuel Type: GASOLINE
Odometer: 73592

Station Identification

Station Name: Bob's Texaco
Station Number: TP34927
Station Address: 123
Station City, TX Zip
Inspector First Name: Guy
Inspector Last Name: Heine
Analyzer Number: TX98327

Safety Fee XXXX.XX
(Include safety related repairs)
Emissions Repair Costs: XXXX.XX
Emissions Test Fee: XX.XX
Total Inspection Cost: XXXX.XX

Pollutant	High Speed Emission Results RPM: 2487			Low Speed Emission Results RPM: 981		
	Standard	Current Reading	Result	Standard	Current Reading	Result
HC (ppm)	220	8	PASS	220	5	PASS
CO (%)	1.2	0.2	PASS	1.2	0.4	PASS
CO2 (%)		14.0			11.4	
DILUTION(%)	>6.0	14.2	PASS	>6.0	11.8	PASS

Gas Cap Missing: Yes/No
Gas Cap Testable: Yes/No
Gas Cap Integrity Test Result: PASS

Certificate Number Issued: XXXXXXXXX

OVERALL RESULT: PASS

Consult your owner's manual or your dealer for information concerning manufacturers' warrenties on emissions related components.

I certify that I have properly performed the emissions test according to applicable rules and regulations.

_____
Certified Inspector's Signature

Appendix K

Reference: 40 CFR Part 51,
Subpart S, Appendix B
(I) Idle Test

Appendix L

Flow Charts

(Available Upon Request)

Appendix M

Acceptance Test Procedures (ATP)
(Play Scripts)

(Available Upon Request)

Appendix N

Example
Public Awareness Statements

(Draft/Sample - Subject to revisions as needed)
(Emissions Passed, OBD Passed)

MOTORIST ALERT

Beginning May, 2002, the On-Board Diagnostic systems (OBD) on 1996 and newer vehicles will be checked as part of the annual vehicle emissions inspection program in Texas. When the Malfunction Indicator Light (MIL) of the OBD system of your vehicle is on, this may indicate a malfunction of an emission component(s) and may cause the vehicle to fail the annual inspection. Therefore, proper diagnosis and correction of this condition is recommended.

(See Handout)

PUBLIC AWARENESS STATEMENT PASSING VEHICLE

CONGRATULATIONS, your vehicle has passed the emissions (I/M) test portion of your annual safety inspection! By maintaining your car in good working condition you are doing your share for clean air. You are also saving money on gas and extending the life of your vehicle because your emissions control equipment is working as it should.

There is an air pollution problem in many Texas cities and cars and trucks cause a large amount of that pollution. High levels of air pollution affect the health and welfare of many citizens. Identifying cars and trucks that are not working properly and ensuring that they are repaired helps in the air pollution battle. Thanks for doing your part, continue to follow your vehicle manufacturers' maintenance schedule, and drive safely!

If you have any additional questions regarding the I/M test, call your local Department of Public Safety Motor Vehicle Inspection Office.

I certify that I have performed the Emissions Test according to state regulations and procedures manuals.

Inspector_____

(Draft/Sample - Subject to revisions as needed)
(Emissions Failed, OBD Passed)

MOTORIST ALERT

Beginning May, 2002, the On-Board Diagnostic systems (OBD) on 1996 and newer vehicles will be checked as part of the annual vehicle emissions inspection program in Texas. When the Malfunction Indicator Light (MIL) of the OBD system of your vehicle is on, this may indicate a malfunction of an emission component(s) and may cause the vehicle to fail the annual inspection. Therefore, proper diagnosis and correction of this condition is recommended.

(See Handout)

PUBLIC AWARENESS STATEMENT FAILED VEHICLE

Your vehicle has failed the emissions (I/M) portion of your annual safety inspection. The rating your vehicle received indicates that emissions related components are not operating at highest efficiency and repairs are needed.

The testing inspector should provide you with a fact sheet of additional information on what you should do next. Vehicles that fail the test must be repaired and pass a retest before a safety sticker can be issued. Some newer vehicles that fail the I/M test may be covered by manufacturers' warranties. Consult your owner's manual or your dealer for details.

The fact sheet you receive should also include information on various waivers available, retest details and referee services. Feel free to go over this information with your testing inspector.

There is an air pollution problem in many Texas cities and poorly running cars and trucks cause a large part of that pollution. By having the proper repairs made you will be doing your share for clean air. Also, keeping your vehicle in good repair will improve performance, give you better fuel economy, and extend the life of your vehicle.

If you have any additional questions regarding the I/M test, call your local Department of Public Safety Motor Vehicle Inspection Office.

I certify that I have performed the emissions test according to state regulations and procedures manuals and have provided additional information to the customer on repairs, retest and waivers.

Inspector_____

(Draft/Sample - Subject to revisions as needed)
(Emissions Passed, OBD Failed)

ON-BOARD DIAGNOSTIC (OBD) ADVISORY STATEMENT

Your vehicle's computerized self-diagnostic system (OBD) registered a fault(s) indicated by the MIL light being illuminated while the engine is running. This is probably an indication of a malfunction of an emission component. However, multiple and/or seemingly unrelated faults may be an indication of an emission-related problem that occurred previously but upon further evaluation by the OBD system was determined to be only temporary. Therefore, proper diagnosis by a qualified technician is required to positively identify the source of any emission-related problem.

MOTORIST ALERT

Beginning May, 2002, the On-Board Diagnostic systems (OBD) on 1996 and newer vehicles will be checked as part of the annual vehicle emissions inspection program in Texas. When the Malfunction Indicator Light (MIL) of the OBD system of your vehicle is on, this may indicate a malfunction of an emission component(s) and may cause the vehicle to fail the annual inspection. Therefore, proper diagnosis and correction of this condition is recommended.

(See Handout)

PUBLIC AWARENESS STATEMENT PASSING VEHICLE

CONGRATULATIONS, your vehicle has passed the emissions (I/M) test portion of your annual safety inspection! By maintaining your car in good working condition you are doing your share for clean air. You are also saving money on gas and extending the life of your vehicle because your emissions control equipment is working as it should.

There is an air pollution problem in many Texas cities and cars and trucks cause a large amount of that pollution. High levels of air pollution affect the health and welfare of many citizens. Identifying cars and trucks that are not working properly and ensuring that they are repaired helps in the air pollution battle. Thanks for doing your part, continue to follow your vehicle manufacturers' maintenance schedule, and drive safely!

If you have any additional questions regarding the I/M test, call your local Department of Public Safety Motor Vehicle Inspection Office.

I certify that I have performed the Emissions Test according to state regulations and procedures manuals.

Inspector_____

(Draft/Sample - Subject to revisions as needed)
(Emissions Failed, OBD Failed)

ON-BOARD DIAGNOSTIC (OBD) ADVISORY STATEMENT

Your vehicle's computerized self-diagnostic system (OBD) registered a fault(s) indicated by the MIL light being illuminated while the engine is running. This is probably an indication of a malfunction of an emission component. However, multiple and/or seemingly unrelated faults may be an indication of an emission-related problem that occurred previously but upon further evaluation by the OBD system was determined to be only temporary. Therefore, proper diagnosis by a qualified technician is required to positively identify the source of any emission-related problem.

MOTORIST ALERT

Beginning May, 2002, the On-Board Diagnostic systems (OBD) on 1996 and newer vehicles will be checked as part of the annual vehicle emissions inspection program in Texas. When the Malfunction Indicator Light (MIL) of the OBD system of your vehicle is on, this may indicate a malfunction of an emission component(s) and may cause the vehicle to fail the annual inspection. Therefore, proper diagnosis and correction of this condition is recommended.

(See Handout)

PUBLIC AWARENESS STATEMENT FAILED VEHICLE

Your vehicle has failed the emissions (I/M) portion of your annual safety inspection. The rating your vehicle received indicates that emissions related components are not operating at highest efficiency and repairs are needed.

The testing inspector should provide you with a fact sheet of additional information on what you should do next. Vehicles that fail the test must be repaired and pass a retest before a safety sticker can be issued. Some newer vehicles that fail the I/M test may be covered by manufacturers' warranties. Consult your owner's manual or your dealer for details.

The fact sheet you receive should also include information on various waivers available, retest details and referee services. Feel free to go over this information with your testing inspector.

There is an air pollution problem in many Texas cities and poorly running cars and trucks cause a large part of that pollution. By having the proper repairs made you will be doing your share for clean air. Also, keeping your vehicle in good repair will improve performance, give you better fuel economy, and extend the life of your vehicle.

If you have any additional questions regarding the I/M test, call your local Department of Public Safety Motor Vehicle Inspection Office.

I certify that I have performed the emissions test according to state regulations and procedures manuals and have provided additional information to the customer on repairs, retest and waivers.

Inspector_____

Appendix O

Sample

Vehicle Repair Form (VRF)

Appendix P

ALLDATA File Structure
&
File Layout

Texas file structure, ALLREP.DAT
to be used with ALLDATA software.

Directory\Filename: C:\TASDATA\ALLREP.DAT

Offset	Description	Length	Format	Justification
0	VIN	17	Alphanumeric	left
17	License Plate Number	8	Alphanumeric	left
25	Model Year	4	Numeric	left
29	Make	5	Alphanumeric	left
34	Model	20	Alphanumeric	left
54	Num. Cylinders	2	Numeric	left
56	Engine Size (Cubic cm.)	5	Numeric	
61	Transmission Type	1	Alpha (A,M)	
62	<CR><LF>	2	Control Char.	
	Total	64		

TEXAS file structure, VIDCOMM.DAT
to be used with ALLDATA software.

Directory\Filename: C:\TASDATA\VIDCOMM.DAT

Offset	Description	Length	Format	Justification
0	Network phone number	15	Alphanumeric w/special chars.	left
15	Station license number	8	Alphanumeric	left
23	TAS number	8	Alphanumeric	left
31	Name D&R vendor 1	20	Alphanumeric	left
51	Name D&R vendor 2	20	Alphanumeric	left
71	Name D&R vendor 3	20	Alphanumeric	left
91	Name D&R vendor 4	20	Alphanumetic	left
111	Name D&R vendor 5	20	Alphanumeric	left
131	Phone number (D&R) 1	15	Alphanumeric	left
146	Phone number (D&R) 2	15	Alphanumeric	left
161	Phone number (D&R) 3	15	Alphanumeric	left
176	Phone number (D&R) 4	15	Alphanumeric	left
191	Phone number (D&R) 5	15	Alphanumeric	left
206	D&R file name vendor 1	12	Alphanumeric	left
218	D&R file name vendor 2	12	Alphanumeric	left
230	D&R file name vendor 3	12	Alphanumeric	left
242	D&R file name vendor 4	12	Alphanumeric	left
254	D&R file name vendor 5	12	Alphanumeric	left
266	Comm. port base address	3	Hexadecimal	left
269	Comm port interrupt	2	Numeric	
271	No contact limit	3	Numeric	
274	<CR><LF>	2	Control Char.	
	Total	276		

Directory\Filename: C:\TASDATA\ALLDATA.DAT

Offset	Description	Length	Format	Justification
0	Modem Type	4	Numeric	left
4	Dial Prefix	4	Numeric	left
8	Printer Port	1	Numeric	left

9	Printer Type	3	Numeric	left

Modem Type is an ASCII number where the number equals:

1	ATI-2400etc
2	Okidata-Okitel-2400B Plus
3	US Robotics 2400
4	US Robotics 14400
5	US Robotics 28800
6	Practical Peripherals 2400
7	Practical Peripherals 14400

If the modem is not known, or not on the list, then leave the 4 chars blank (spaces). If the modem is not known, the alldata program will ask the customer in the setup account screen. We can add modems to this list as needed.

Dial Prefix is ASCII. This is just prepended to the telephone number for dialing into alldata (e.g. 9).

Printer Port is ASCII. The number corresponds to LPT1, LPT2, etc.

Printer Type is an ASCII number where the number equals:

1	HP deskjet
2	Epson LQ / Epson LQ emulation
3	IBM proprinter / emulation
4	Epson FX / Epson FX emulation
5	Okidata ML-380
6	IBM X24 / emulation

Most printers work with the alldata application with one of the above printers. If you happen to use a printer that doesn't work with one of these, we can write the appropriate driver and include it here. If you have printers available to test, we can quickly determine which emulation will work with that printer. If your program doesn't know the type of printer to use, leave it blank (spaces). The alldata program will inquire from the customer (Alldata customer service will help pick the proper printer driver if help is needed).

Appendix Q

Diagnostic Link Connector (DLC)
Mapping Diagram

Diagnostic Link Connector (DLC) Mapping Diagram Explanation

The mapping diagram of DLC locations contains a divided instrument panel (IP) with numbered areas. Each numbered area represents specific sections of the IP where manufacturers may have located DLCs. This document briefly clarifies the numbered locations on the mapping diagram. We will use this mapping diagram to catalog manufacturer responses to the recent 208 letter requesting OBD DLC locations for 96MY and future vehicles. Areas 1-3 fall within the preferred DLC location while the remaining areas, 4-8, fall into the allowable DLC location according to EPA requirements. Areas 4-8 require that manufacturers label the vehicle in the preferred location to notify parties of the alternate connector location.

Preferred Location(s)

Location #1:
This location represents a DLC positioned on the underside of the IP directly under the steering column (or approximately 150mm left or right of the steering column). Visualizing the underside of an IP divided into three equal parts from inside the passenger compartment, this represents the center section.

Location #2
This location represents a DLC positioned on the underside of the IP between the steering column and the driver's side passenger door. Visualizing the underside of an IP divided into three equal parts from inside the passenger compartment, this represents the left section.

Location #3
This location represents a DLC positioned on the underside of the IP between the steering column and the center console. Visualizing the underside of an IP divided into three equal parts from inside the passenger compartment, this represents the right section.

Allowable Location(s)

Location #4
This location represents a DLC positioned on the upper part of the IP between the steering column and the center console (but not on the center console, see location #6).

Location #5
This location represents a DLC positioned on the upper part of the IP between the steering column and the driver side, passenger door.

Location #6
This location represents a DLC positioned on the vertical section of the center console and left of the vehicle center line.

Location #7
This location represents a DLC positioned 300 mm right of the vehicle centerline either on the vertical section of the center console or on the passenger side of the vehicle.

Location #8
This location represents a DLC positioned on the horizontal section of the center console either left or right of the vehicle center line. This does not include the horizontal section of the center console that extends into the rear passenger area (see location #9).

Location #9
This location, not shown, represents any DLC positioned in an area other than those mentioned above (e.g., in the rear passenger area on the driver side armrest).

Appendix R

Safety Screen Lists
Entry Item Sequences

(HS represents "help screen,"
so HS - 5 = help screen #5.
FHS represents "FMCSR help screen,"
so FHS - 5 = FMCSR help screen #5)

INSPECTION PROCEDURE (Sequence #1)
PASSENGER CAR/MOTOR HOME/TRUCKS UNDER 80" WIDTH

Seat Belts (SAFE_5)(display HS - 5)
Presence (Failed - A, Repaired - B)
Cut or frayed (Failed - C, Repaired - D)
Mounting (Failed - E, Repaired - G)

Parking Brake System (SAFE_6B)(display HS - 6B)
Does not hold vehicle (Failed - A, Repaired - B)
Missing/Broken parts (Failed - C, Repaired - D)

Horn (SAFE_1)(display HS - 1)
Operation (Failed - A, Repaired - B)

Turn Signal Switch and Indicator Lamp (SAFE_16B) new
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")
Switch accessible and locks in position (Failed - A, Repaired - B)
Indicator lamp operation (Failed - C, Repaired - D)

Beam Indicator (SAFE_11)(display HS - 11)
High beam indicator (Failed - A, Repaired - B)
Switch mounting (Failed - C, Repaired - D)

Wipers (SAFE_2)(display HS - 2)
Switch and Operation (Failed - C, Repaired - D)
Blade condition (Failed - A, Repaired - B)

Rear view mirror (SAFE_3)(display HS - 3)
Presence (Failed - A, Repaired - B)

Window Tinting and Sunscreening (SAFE_24)(display HS - 24)
Light transmission (Failed - A, Repaired - B)
Tint or Coating out of Specifications (Failed - C, Repaired - D)

Headlamps (SAFE_17)(display HS - 17)
Mounting, operation, & approved type (Failed - A, Repaired - B)
Lens cracked, broken, or discolored (Failed - C, Repaired - D)
Reflective material discolored or deteriorated (Failed - E, Repaired - G)
Lamp contaminated (Failed - H, Repaired - I)
Liquid (Failed - J, Repaired - K)

Turn Signals (SAFE_16A) new
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")
Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Tail Lamps (SAFE_12)(display HS - 12)
Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Stop Lamps (SAFE_13)(display HS - 13)
Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Rear Reflectors (SAFE_15)(display HS - 15)

Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

License Plate Lamp (SAFE_14)(display HS - 14)

Operation (Failed - A, Repaired - B)
Lens cracked or broken (Failed - C, Repaired - D)

Tires (SAFE_7)(display HS - 7)

Cuts, tears, cord exposed, visible bulges (Failed - C, Repaired - D)
Excessive tire wear (Failed - A, Repaired - B)

Wheel Assembly (SAFE_8)(display HS - 8)

Bent, broken, cracked (Failed - C, Repaired - D)
Missing lugs or studs (Failed - A, Repaired - B)

Mud Flaps/Safety Guards (SAFE_23)
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")

Presence/condition (Failed - A, Repaired - B)
Mounting (Failed - C, Repaired - D)

Brake System (SAFE_6A)(display HS - 6A)

Leaks (Failed - E, Repaired - G)
Brake cables (Failed - J, Repaired - L)
Stopping distance (Failed - A, Repaired - B)
Pulling right or left (Failed - C, Repaired - D)
Metal on Metal (Failed - O, Repaired - Q)

Exhaust System (SAFE_9)(display HS - 9)

Required muffler, clamps and hangers (Failed - C, Repaired - D)
Leaks (Failed - A, Repaired - B)

Emission System (SAFE_10) new
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")

Components presence (Failed - A, Repaired - B)
Components disconnected/disabled (Failed - C, Repaired - D)

Power Steering System (SAFE_4)(display HS - 4)

Fluid level and belt condition (Failed - H, Repaired - I)
Fluid leaks (Failed - J, Repaired - K)
Excessive lash (Failed - A, Repaired - B)
Modification (Failed - C, Repaired - D)
Binding/jamming (Failed - E, Repaired - G)

Master Cylinder (SAFE_33) new
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")

Fluid level (Failed - J, Repaired - K)
Fluid leaks (Failed - E, Repaired - G)

INSPECTION PROCEDURE (Sequence #2)
MOTORCYCLE/MOTOR-DRIVEN CYCLE/MOPED

Horn (SAFE_1)(display HS - 1)
Operation (Failed - A, Repaired - B)
Rear View Mirror (SAFE_3)(display HS - 3)
Presence (Failed - A, Repaired - B)
Steering System (SAFE_4)(display HS - 4)
Handlebar height (Failed - H, Repaired - I)
Binding/jamming (Failed - E, Repaired - G)
Service Brake System (SAFE_6A)(display HS - 6A)
Stopping Distance (Failed - A, Repaired - B)
Missing/Broken parts (Failed - L, Repaired - M)
Leaks (Failed - E, Repaired - G)
Metal on Metal (Failed - O, Repaired - Q)
Tires (SAFE_7)(display HS - 7)
Cuts/Tears (Failed - C, Repaired - D)
Excessive tire wear (Failed - A, Repaired - B)
Wheel Assembly (SAFE_8)(display HS - 8)
Bent, broken, cracked (Failed - C, Repaired - D)
Missing lugs or studs (Failed - A, Repaired - B)
Spokes (Failed - E, Repaired - G)
Exhaust System (SAFE_9)(display HS - 9)
Required muffler, clamps and hangers (Failed - C, Repaired - D)
Leaks (Failed - A, Repaired - B)
Tail Lamp (SAFE_12)(display HS - 12)
Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)
Stop Lamp (SAFE_13)(display HS - 13)
Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)
License Plate Lamp (SAFE_14)(display HS - 14)
Operation (Failed - A, Repaired - B)
Lens cracked or broken (Failed - C, Repaired - D)
Rear Reflectors (SAFE_15)(display HS - 15)
Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)
Headlamps (SAFE_17)(display HS - 17)
Mounting, operation, & approved type (Failed - A, Repaired - B)
Lens cracked, broken, or discolored (Failed - C, Repaired - D)
Reflective material discolored or deteriorated (Failed - E, Repaired - G)
Lamp contaminated (Failed - H, Repaired - I)
Liquid (Failed - J, Repaired - K)

INSPECTION PROCEDURE (Sequence #3)
SCHOOL BUS-SAFETY INSPECTION

Horn (SAFE_1)(display HS - 1)
Operation (Failed - A, Repaired - B)
Wipers (SAFE_2)(display HS - 2)
Switch and Operation (Failed - C, Repaired - D)
Blade condition (Failed - A, Repaired - B)
Rear View Mirror (SAFE_3)(display HS - 3)
Presence (Failed - A, Repaired - B)
Steering System (SAFE_4)(display HS - 4)
Modification (Failed - C, Repaired - D)
Binding/jamming (Failed - E, Repaired - G)
Excessive lash (Failed - A, Repaired - B)
Fluid level and belt condition (Failed - H, Repaired - I)
Fluid leaks (Failed - J, Repaired - K)
Seat Belts-Driver Only (SAFE_5)(display HS - 5)
Presence (Failed - A, Repaired - B)
Cut or frayed (Failed - C, Repaired - D)
Mounting (Failed - E, Repaired - G)
Service Brake System (SAFE_6A)(display HS - 6A)
Stopping distance (Failed - A, Repaired - B)
Pull left or right (Failed - C, Repaired - D)
Missing/Broken parts (Failed - L, Repaired - M)
Leaks (Failed - E, Repaired - G)
Metal to Metal (Failed - O, Repaired - Q)
Parking Brake System (SAFE_6B)(display HS - 6B)
Does not hold vehicle (Failed - A, Repaired - B)
Missing/Broken parts (Failed - C, Repaired - D)
Tires (SAFE_7)(display HS - 7)
Cuts, tears, cord exposed, visible bulges (Failed - C, Repaired - D)
Excessive wear (Failed - A, Repaired - B)
Approval type (Failed -E, Repaired - G)
Wheel Assembly (SAFE_8)(display HS - 8)
Bent, broken, cracked (Failed - C, Repaired - D)
Missing lugs/studs (Failed - A, Repaired - B)
Exhaust System (SAFE_9)(display HS - 9)
Required muffler, clamps, and hangers (Failed - C, Repaired - D)
Leaks (Failed - A, Repaired - B)
Emission System (SAFE_10)
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")
Components presence (Failed - A, Repaired - B)
Components disconnected or disabled (Failed - C, Repaired - D)
Beam Indicator (SAFE_11)(display HS - 11)
High beam indicator (Failed - A, Repaired - B)

Switch mounting (Failed - C, Repaired - D)

Headlamps (SAFE_17)(display HS - 17)

Mounting, operation, & approved type (Failed - A, Repaired - B)
Lens cracked, broken, or discolored (Failed - C, Repaired - D)
Reflective material discolored or deteriorated (Failed - E, Repaired - G)
Lamp contaminated (Failed - H, Repaired - I)
Liquid (Failed - J, Repaired - K)

Tail Lamps (SAFE_12)(display HS - 12)

Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Stop Lamps (SAFE_13)(display HS - 13)

Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

License Plate Lamp (SAFE_14)(display HS - 14)

Operation (Failed - A, Repaired - B)
Lens cracked or broken (Failed - C, Repaired - D)

Rear Reflectors (SAFE_15)(display HS - 15)

Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Turn Signals (SAFE_16A) new
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")

Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Turn Signal Switch and Indicator Lamp (SAFE_16B) new
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")

Switch accessible and locks in position (Failed - A, Repaired - B)
Indicator lamp operation (Failed - C, Repaired - D)

Clearance Lamps (SAFE_18)(display HS - 18)

Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Side Marker Lamps (SAFE_19)(display HS - 19)

Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Side Reflectors (SAFE_21)(display HS - 21)

Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

School Bus Signs (SAFE_22A)(display HS - 22)

Size (Failed - A, Repaired - B)
Location (Failed - C, Repaired - D)

Hazard Warning Lighting (SAFE_35) new
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")

Mounting, operation, approved type (Failed - A, Repaired - B)
Color and condition of lens (Failed - C, Repaired - D)

Convex Mirror (SAFE_22D)(display HS - 22)

Mounting (Failed - A, Repaired - B)

Condition (Failed - C, Repaired - D)

Fire Extinguisher (SAFE_22B)(display HS - 22)

Presence (Failed - A, Repaired - B)

Approved type (Failed -C, Repaired - D)

INSPECTION PROCEDURE (Sequence #4)
TRUCKS/MOTOR HOMES OVER 80" WIDTH

Seat Belts (SAFE_5)(display HS - 5)
Presence (Failed - A, Repaired - B)
Cut or frayed (Failed - C, Repaired - D)
Mounting (Failed - E, Repaired - G)

Service Brake System (SAFE_6A)(display HS - 6A)
Stopping distance (Failed - A, Repaired - B)
Pulling right or left (Failed - C, Repaired - D)
Metal on Metal (Failed - O, Repaired - Q)
Leaks (Failed - E, Repaired - G)

Parking Brake System (SAFE_6B)(display HS - 6B)
Does not hold vehicle (Failed - A, Repaired - B)
Missing/Broken parts (Failed - C, Repaired - D)

Horn (SAFE_1)(display HS - 1)
Operation (Failed - A, Repaired - B)

Turn Signal Switch and Indicator Lamp (SAFE_16B) new
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")
Switch accessible and locks in position (Failed - A, Repaired - B)
Indicator lamp operation (Failed - C, Repaired - D)

Beam Indicator (SAFE_11)(display HS - 11)
High beam indicator (Failed - A, Repaired - B)
Switch mounting (Failed - C, Repaired - D)

Wipers (SAFE_2)(display HS - 2)
Switch and Operation (Failed - C, Repaired - D)
Blade condition (Failed - A, Repaired - B)

Rear view mirror (SAFE_3)(display HS - 3)
Presence (Failed - A, Repaired - B)

Window Tinting and Sunscreening (SAFE_24)(display HS - 24)
Light transmission (Failed - A, Repaired - B)
Tint or Coating out of Specifications (Failed - C, Repaired - D)

Headlamps (SAFE_17)(display HS - 17)
Mounting, operation, & approved type (Failed - A, Repaired - B)
Lens cracked, broken, or discolored (Failed - C, Repaired - D)
Reflective material discolored or deteriorated (Failed - E, Repaired - G)
Lamp contaminated (Failed - H, Repaired - I)
Liquid (Failed - J, Repaired - K)

Turn Signals (SAFE_16A) new
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")
Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Tail Lamps (SAFE_12)(display HS - 12)
Mounting, operation and approved type (Failed - A, Repaired - B)

Color, condition of lens, visibility (Failed - C, Repaired - D)

Stop Lamps (SAFE_13)(display HS - 13)

Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Rear Reflectors (SAFE_15)(display HS - 15)

Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Clearance Lamps (SAFE_18)(display HS - 18)

Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Side Marker Lamps (SAFE_19)(display HS - 19)

Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Cab Lamps (SAFE_20)(display HS - 20)

Operation (Failed - A, Repaired - B)
Presence (Failed - C, Repaired - D)

Side Reflectors (SAFE_21)(display HS - 21)

Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Reflective Tape (SAFE_34) new
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")

Presence (Failed - A, Repaired - B)
Location (Failed - C, Repaired - D)

License Plate Lamp (SAFE_14)(display HS - 14)

Operation (Failed - A, Repaired - B)
Lens cracked or broken (Failed - C, Repaired - D)

Tires (SAFE_7)(display HS - 7)

Cuts, tears, cord exposed, visible bulges (Failed - C, Repaired - D)
Excessive tire wear (Failed - A, Repaired - B)

Wheel Assembly (SAFE_8)(display HS - 8)

Bent, broken, cracked (Failed - C, Repaired - D)
Missing lugs or studs (Failed - A, Repaired - B)

Mud Flaps/Safety Guards (SAFE_23)
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")

Presence/condition (Failed - A, Repaired - B)
Mounting (Failed - C, Repaired - D)

Exhaust System (SAFE_9)(display HS - 9)

Required muffler, clamps and hangers (Failed - C, Repaired - D)
Leaks (Failed - A, Repaired - B)

Emission System (SAFE_10) new
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")

Components presence (Failed - A, Repaired - B)
Components disconnected/disabled (Failed - C, Repaired - D)

Power Steering System (SAFE_4)(display HS - 4)

Fluid level and belt condition (Failed - H, Repaired - I)
Fluid leaks (Failed - J, Repaired - K)
Excessive lash (Failed - A, Repaired - B)
Modification (Failed - C, Repaired - D)
Binding/jamming (Failed - E, Repaired - G)

Master Cylinder (SAFE_33) new
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")

Fluid level (Failed - J, Repaired - K)
Fluid leaks (Failed - E, Repaired - G)

INSPECTION PROCEDURE (Sequence #5)
TRUCK TRACTOR

Horn (SAFE_1)(display HS - 1 or FHS - 1)
Operation (Failed - A, Repaired - B)
Wipers (SAFE_2)(display HS - 2 or FHS - 2)
Switch and Operation (Failed - C, Repaired - D)
Blade condition (Failed - A, Repaired - B)
Rear View Mirrors (SAFE_3)(display HS - 3 or FHS - 3)
Presence (Failed - A, Repaired - B)
Steering System (SAFE_4)(display HS - 4 or FHS - 4)
Excessive lash (Failed - A, Repaired - B)
Modification (Failed - C, Repaired - D)
Binding/jamming (Failed - E, Repaired - G)
Fluid level and belt condition (Failed - H, Repaired - I)
Fluid leaks (Failed - J, Repaired - K)
Turn Signal Switch and Indicator Lamp (SAFE_16B) new
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")
Switch accessible and locks in position (Failed - A, Repaired - B)
Indicator lamp operation (Failed - C, Repaired - D)
Seat Belts - (SAFE_5)(display HS - 5 or FHS - 5)
Presence (Failed - A, Repaired - B)
Cut or frayed (Failed - C, Repaired - D)
Mounting (Failed - E, Repaired - G)
Service Brake System (SAFE_6A)(display HS - 6A or FHS - 6A)
Stopping distance (Failed - A, Repaired - B)
Pulling right or left (Failed - C, Repaired - D)
Metal on Metal (Failed - O, Repaired - Q)
Leaks (Failed - E, Repaired - G)
Parking Brake System (SAFE_6B)(display HS - 6B or FHS -6B)
Does not hold vehicle (Failed - A, Repaired - B)
Missing/Broken parts (Failed - C, Repaired - D)
Tires (SAFE_7)(display HS - 7 or, for FMCSR(Truck), either "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual," or both FHS - 7A and FHS - 7B)
Cuts, Tears, Cord Exposed, Visible Bulges (Failed - C, Repaired - D)
Excessive Wear (Failed - A, Repaired - B)
Wheel Assembly (SAFE_8)(display HS - 8 or FHS - 8)
Bent, broken, cracked (Failed - C, Repaired - D)
Missing lugs or studs (Failed - A, Repaired - B)
Exhaust System (SAFE_9)(display HS - 9 or FHS - 9)
Required muffler, clamps and hangers (Failed - C, Repaired - D)
Leaks (Failed - A, Repaired - B)
Emission System (SAFE_10)
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")

Components presence (Failed - A, Repaired - B)
Components disconnected or disabled (Failed - C, Repaired - D)

Beam Indicator (SAFE_11)(display HS - 11 or FHS - 11)
High beam indicator (Failed - A, Repaired - B)
Switch mounting (Failed - C, Repaired - D)

Tail Lamps (SAFE_12)(display HS - 12 or FHS - 12)
Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Stop Lamps (SAFE_13)(display HS - 13 or FHS - 13)
Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Rear Reflectors (SAFE_15)(display HS - 15 or FHS - 15)
Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Turn Signals (SAFE_16A) new
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")
Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Cab Lamps (SAFE_20)(display HS - 20 or FHS - 20)
Operation (Failed - A, Repaired - B)
Color Condition of Lens (Failed - C, Repaired - D)

Headlamps (SAFE_17)(display HS - 17 or FHS - 17)
Mounting, operation, & approved type (Failed - A, Repaired - B)
Lens cracked, broken, or discolored (Failed - C, Repaired - D)
Reflective material discolored or deteriorated (Failed - E, Repaired - G)
Lamp contaminated (Failed - H, Repaired - I)
Liquid (Failed - J, Repaired - K)

Hazard Warning Lighting (SAFE_35) new (display only if during a FMCSR (TRUCK) inspection)
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")
Mounting, operation, approved type (Failed - A, Repaired - B)
Color and condition of lens (Failed - C, Repaired - D)

Coupling Devices (SAFE_26)(display FHS - 26) (display only if during a FMCSR (TRUCK) inspection)
Loose, cracked, excessive wear (Failed - A, Repaired - B)

Fuel System (SAFE_27)(display FHS - 27) (display only if during a FMCSR (TRUCK) inspection)
Leaks (Failed - A, Repaired - B)
Mounting (Failed - C, Repaired - D)

Suspension (SAFE_28)(display FHS - 28) (display only if during a FMCSR (TRUCK) inspection)
Broken, loose, missing parts (Failed - A, Repaired - B)

Frame (SAFE_29)(display FHS - 29) (display only if during a FMCSR (TRUCK) inspection)
Cracked, broken, loose, sagging (Failed - E, Repaired - G)

Window Tinting and Sunscreening (SAFE_24)(display HS - 24 or FHS - 24)
Light transmission (Failed - A, Repaired - B)
Tint or Coating out of Specifications (Failed - C, Repaired - D)

INSPECTION PROCEDURE (Sequence #6)
SAFETY TRAILER & MOBILE HOME

Service Brake System (SAFE_6A)(display HS - 6A)
Stopping distance (Failed - A, Repaired - B)
Leaks (Failed - E, Repaired - G)
Wiring (Failed - H, Repaired - I)
Metal on Metal (Failed - O, Repaired - Q)

Tires (SAFE_7)(display HS - 7)
Cuts, Tears, Cord Exposed, Visible Bulges (Failed - C, Repaired - D)
Excessive Wear (Failed - A, Repaired - B)

Wheel Assembly (SAFE_8)(display HS - 8)
Bent, broken, cracked (Failed - C, Repaired - D)
Missing lugs or studs (Failed - A, Repaired - B)

Mud Flaps/Safety Guards (SAFE_23)
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")
Presence/condition (Failed - A, Repaired - B)
Mounting (Failed - C, Repaired - D)

Tail Lamps (SAFE_12)(display HS - 12)
Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Stop Lamps (SAFE_13)(display HS - 13)
Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

License Plate Lamp (SAFE_14)(display HS - 14)
Operation (Failed - A, Repaired - B)
Lens cracked or broken (Failed - C, Repaired - D)

Rear Reflectors (SAFE_15)(display HS - 15)
Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Turn Signals (SAFE_16A) new
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")
Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Clearance Lamps (SAFE_18)(display HS - 18)
Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Side Marker Lamps (SAFE_19)(display HS - 19)
Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

INSPECTION PROCEDURE (Sequence #7)
SCHOOL BUS-F.M.C.S.R INSPECTION

Horn (SAFE_1)(display FHS - 1)
Operation (Failed - A, Repaired - B)
Wipers (SAFE_2)(display FHS - 2)
Switch and Operation (Failed - C, Repaired - D)
Blade condition (Failed - A, Repaired - B)
Windshield (SAFE_30)(display FHS - 30)
Excessive cracks (Failed - A, Repaired - B)
Rear View Mirror (SAFE_3)(display FHS - 3)
Presence (Failed - A, Repaired - B)
Steering System (SAFE_4)(display FHS - 4)
Modification (Failed - C, Repaired - D)
Binding/jamming (Failed - E, Repaired - G)
Excessive lash (Failed - A, Repaired - B)
Fluid level and belt condition (Failed - H, Repaired - I)
Fluid leaks (Failed - J, Repaired - K)
Seat Belts-Driver Only (SAFE_5)(display FHS - 5)
Presence (Failed - A, Repaired - B)
Cut or frayed (Failed - C, Repaired - D)
Mounting (Failed - E, Repaired - G)
Service Brake System (SAFE_6A)(display FHS - 6A)
Stopping distance (Failed - A, Repaired - B)
Pull left or right (Failed - C, Repaired - D)
Missing/Broken parts (Failed - L, Repaired - M)
Leaks (Failed - E, Repaired - G)
Metal to Metal (Failed - O, Repaired - Q)
Low air warning device (Failed - S, Repaired - T)
Wiring (Failed - H, Repaired - I)
Parking Brake System (SAFE_6B)(display FHS - 6B)
Does not hold vehicle (Failed - A, Repaired - B)
Missing/Broken parts (Failed - C, Repaired - D)
Steering Axle Tires (SAFE_7A)(display FHS - 7A)
Cuts, tears, cord exposed, visible bulges (Failed - C, Repaired - D)
Excessive wear (Failed - A, Repaired - B)
Approval type (Failed -E, Repaired - G)
All Other Tires (SAFE_7B)(display FHS - 7B)
Cuts, tears, cord exposed, visible bulges (Failed - C, Repaired - D)
Excessive wear (Failed - A, Repaired - B)
Approval type (Failed -E, Repaired - G)
Wheel Assembly (SAFE_8)(display FHS - 8)
Bent, broken, cracked (Failed - C, Repaired - D)
Missing lugs or studs (Failed - A, Repaired - B)
Exhaust System (SAFE_9)(display FHS - 9)
Required muffler, clamps and hangers (Failed - C, Repaired - D)

Leaks (Failed - A, Repaired - B)

Emission System (SAFE_10)
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")

Components presence (Failed - A, Repaired - B)
Components disconnected or disabled (Failed - C, Repaired - D)

Beam Indicator (SAFE_11)(display FHS - 11)

High beam indicator (Failed - A, Repaired - B)
Switch mounting (Failed - C, Repaired - D)

Headlamps (SAFE_17)(display FHS - 17)

Mounting, operation, & approved type (Failed - A, Repaired - B)
Lens cracked, broken, or discolored (Failed - C, Repaired - D)
Reflective material discolored or deteriorated (Failed - E, Repaired - G)
Lamp contaminated (Failed - H, Repaired - I)
Liquid (Failed - J, Repaired - K)

Tail Lamps (SAFE_12)(display FHS - 12)

Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Stop Lamps (SAFE_13)(display FHS - 13)

Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

License Plate Lamp (SAFE_14)(display FHS - 14)

Operation (Failed - A, Repaired - B)
Lens cracked or broken (Failed - C, Repaired - D)

Rear Reflectors (SAFE_15)(display FHS - 15)

Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Turn Signals (SAFE_16A) new
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")

Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Turn Signal Switch and Indicator Lamp (SAFE_16B) new
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")

Switch accessible and locks in position (Failed - A, Repaired - B)
Indicator lamp operation (Failed - C, Repaired - D)

Clearance Lamps (SAFE_18)(display FHS - 18)

Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Side Marker Lamps (SAFE_19)(display FHS - 19)

Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Side Reflectors (SAFE_21)(display FHS - 21)

Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

School Bus Signs (SAFE_22A)(display FHS - 22)

Size (Failed - A, Repaired - B)

Location (Failed - C, Repaired - D)

Hazard Warning Lighting (SAFE_35) new
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")

Mounting, operation, approved type (Failed - A, Repaired - B)

Color and condition of lens (Failed - C, Repaired - D)

Back-up Lamps (SAFE_36) new
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")

Mounting, operation and approved type (Failed - A, Repaired - B)

Color, condition of lens, visibility (Failed - C, Repaired - D)

Fuel System (SAFE_27)(display FHS - 27)

Leaks (Failed - A, Repaired - B)

Mounting (Failed - C, Repaired - D)

Suspension (SAFE_28)(display FHS - 28)

Broken, loose, missing parts (Failed - A, Repaired - B)

Frame (SAFE_29)(display FHS - 29)

Cracked, broken, loose, sagging (Failed - E, Repaired - G)

Window Tinting and Sunscreening (SAFE_24)(display FHS - 24)

Light transmission (Failed - A, Repaired - B)

Tint or Coating out of Specifications (Failed - C, Repaired - D)

Convex Mirror (SAFE_22D)(display FHS - 22)

Mounting (Failed - A, Repaired - B)

Condition (Failed - C, Repaired - D)

Fire Extinguisher (SAFE_22B)(display FHS - 22)

Presence (Failed - A, Repaired - B)

Approved type (Failed -C, Repaired - D)

INSPECTION PROCEDURE (Sequence #8)
FMCSR VEHICLES

Horn (SAFE_1)(display FHS - 1)
Operation (Failed - A, Repaired - B)
Wipers (SAFE_2)(display FHS - 2)
Switch and Operation (Failed - C, Repaired - D)
Blade condition (Failed - A, Repaired - B)
Windshield (SAFE_30)(display FHS - 30)
Excessive cracks (Failed - A, Repaired - B)
Rear View Mirror (SAFE_3)(display FHS - 3)
Presence (Failed - A, Repaired - B)
Beam Indicator (SAFE_11)(display FHS - 11)
High beam indicator (Failed - A, Repaired - B)
Switch mounting (Failed - C, Repaired - D)
Seat Belts (SAFE_5)(display FHS - 5)
Presence (Failed - A, Repaired - B)
Cut or frayed (Failed - C, Repaired - D)
Mounting (Failed - E, Repaired - G)
Steering System (SAFE_4)(display FHS - 4)
Modification (Failed - C, Repaired - D)
Binding/jamming (Failed - E, Repaired - G)
Excessive lash (Failed - A, Repaired - B)
Fluid level and belt condition (Failed - H, Repaired - I)
Fluid leaks (Failed - J, Repaired - K)
Service Brake System (SAFE_6A)(display FHS - 6A)
Stopping distance (Failed - A, Repaired - B)
Pull left or right (Failed - C, Repaired - D)
Missing/Broken parts (Failed - L, Repaired - M)
Metal to Metal (Failed - O, Repaired - Q)
Low air warning device (Failed - S, Repaired - T)
Tractor protection device (Failed - U, Repaired - V)
Leaks (Failed - E, Repaired - G)
Wiring (Failed - H, Repaired - I)
Parking Brake System (SAFE_6B)(display FHS - 6B)
Does not hold vehicle (Failed - A, Repaired - B)
Missing/Broken parts (Failed - C, Repaired - D)
Steering Axle Tires (SAFE_7A)(display FHS - 7A)
Cuts, tears, cord exposed, visible bulges (Failed - C, Repaired - D)
Excessive wear (Failed - A, Repaired - B)
Approval type (Failed -E, Repaired - G)
All Other Tires (SAFE_7B)(display FHS - 7B)
Cuts, tears, cord exposed, visible bulges (Failed - C, Repaired - D)
Excessive wear (Failed - A, Repaired - B)
Approval type (Failed -E, Repaired - G)
Wheel Assembly (SAFE_8)(display FHS - 8)

Bent, broken, cracked (Failed - C, Repaired - D)
Missing, loose, lugs or studs (Failed - A, Repaired - B)

Mud Flaps/Safety Guards (SAFE_23)
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")

Presence/condition (Failed - A, Repaired - B)
Mounting (Failed - C, Repaired - D)

Exhaust System (SAFE_9)(display FHS - 9)

Required muffler, clamps and hangers (Failed - C, Repaired - D)
Leaks (Failed - A, Repaired - B)

Emission System (SAFE_10)
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")

Components presence (Failed - A, Repaired - B)
Components disconnected or disabled (Failed - C, Repaired - D)

Tail Lamps (SAFE_12)(display FHS - 12)

Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Stop Lamps (SAFE_13)(display FHS - 13)

Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

License Plate Lamp (SAFE_14)(display FHS - 14)

Operation (Failed - A, Repaired - B)
Lens cracked or broken (Failed - C, Repaired - D)

Turn Signals (SAFE_16A) new
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")

Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Turn Signal Switch and Indicator Lamp (SAFE_16B) new
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")

Switch accessible and locks in position (Failed - A, Repaired - B)
Indicator lamp operation (Failed - C, Repaired - D)

Rear Reflectors (SAFE_15)(display FHS - 15)

Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Clearance Lamps (SAFE_18)(display FHS - 18)

Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Side Marker Lamps (SAFE_19)(display FHS - 19)

Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Cab Lamps (SAFE_20)(display FHS - 20)

Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Side Reflectors (SAFE_21)(display FHS - 21)

Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Headlamps (SAFE_17)(display FHS - 17)

Mounting, operation, & approved type (Failed - A, Repaired - B)
Lens cracked, broken, or discolored (Failed - C, Repaired - D)
Reflective material discolored or deteriorated (Failed - E, Repaired - G)
Lamp contaminated (Failed - H, Repaired - I)
Liquid (Failed - J, Repaired - K)

Hazard Warning Lighting (SAFE_35) new
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")

Mounting, operation, and approved type (Failed - A, Repaired - B)
Color and condition of lens (Failed - C, Repaired - D)

Back-up Lamps (SAFE_36) new
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")

Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Coupling Devices (SAFE_26)(display FHS - 26)

Loose, cracked, excessive wear (Failed - A, Repaired - B)

Fuel System (SAFE_27)(display FHS - 27)

Leaks (Failed - A, Repaired - B)
Mounting (Failed - C, Repaired - D)

Suspension (SAFE_28)(display FHS - 28)

Broken, loose, missing parts (Failed - A, Repaired - B)

Frame (SAFE_29)(display FHS - 29)

Cracked, broken, loose, sagging (Failed - E, Repaired - G)

Window Tinting and Sunscreening (SAFE_24)(display FHS - 24)

Light transmission (Failed - A, Repaired - B)
Tint or Coating out of Specifications (Failed - C, Repaired - D)

INSPECTION PROCEDURE (Sequence #9)
COMMERCIAL TRAILER

Service Brake System (SAFE_6A)(display FHS - 6A)
Stopping distance (Failed - A, Repaired - B)
Leaks (Failed - E, Repaired - G)
Wiring (Failed - H, Repaired - I)
Metal on Metal (Failed - O, Repaired - Q)

Tires (SAFE_7)(display FHS - 7B)
Cuts, Tears, Cord Exposed, Visible Bulges (Failed - C, Repaired - D)
Excessive Wear (Failed - A, Repaired - B)

Wheel Assembly (SAFE_8)(display FHS - 8)
Bent, broken, cracked (Failed - C, Repaired - D)
Missing lugs or studs (Failed - A, Repaired - B)

Mud Flaps/Safety Guards (SAFE_23)
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")
Presence/condition (Failed - A, Repaired - B)
Mounting (Failed - C, Repaired - D)

Tail Lamps (SAFE_12)(display FHS - 12)
Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Stop Lamps (SAFE_13)(display FHS - 13)
Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

License Plate Lamp (SAFE_14)(display FHS - 14)
Operation (Failed - A, Repaired - B)
Lens cracked or broken (Failed - C, Repaired - D)

Rear Reflectors (SAFE_15)(display FHS - 15)
Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Turn Signals (SAFE_16A) new
(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")
Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Clearance Lamps (SAFE_18)(display FHS - 18)
Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Side Marker Lamps (SAFE_19)(display FHS - 19)
Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Side Reflectors (SAFE_21)(display FHS - 21)
Mounting, operation and approved type (Failed - A, Repaired - B)
Color, condition of lens, visibility (Failed - C, Repaired - D)

Reflective Tape (Vehicles Over 80" Width) (SAFE_34) new

(display "For help with this item, please see the Texas Department of Public Safety Rules and Regulations Manual.")

Presence (Failed - A, Repaired - B)

Location (Failed - C, Repaired - D)

Coupling Devices (SAFE_26)(display FHS - 26)

Loose, cracked, excessive wear (Failed - A, Repaired - B)

Suspension (SAFE_28)(display FHS - 28)

Broken, loose, missing parts (Failed - A, Repaired - B)

Frame (SAFE_29)(display FHS - 29)

Cracked, broken, loose, sagging (Failed - E, Repaired - G)

Appendix S

(Test Standards and Calculations)

A1. Test Standards and Calculations

(a) Emissions Standards

(1) Start-up ASM-2 Standards. Start-up standards should be used during the first cycle of the program. The exhaust emissions standards for the following model years and vehicle types are cross-referenced by the number in the column in A1(a)(3), as noted in the column headings:

(i) Light Duty Vehicles

Model Years	Hydrocarbons	Carbon Monoxide	Oxides of Nitrogen
1994+ Tier 1	1	21	41
1991-1995	2	22	42
1983-1990	4	23	43
1981-1982	4	26	43
1980	4	26	48
1977-1979	11	30	48
1975-1976	11	30	50
1974	13	34	50

(ii) Light Duty Trucks 1 (less than 6000 pounds GVWR)

Model Years	Hydrocarbons	Carbon Monoxide	Oxides of Nitrogen
1994+Tier 1≤3750 LVW	1	21	41
1994+Tier 1>3750 LVW	2	22	42
1991-1995	5	26	43
1988-1990	7	29	44
1984-1987	7	29	49
1979-1983	11	31	49
1975-1978	12	32	50
1974	13	34	50

(iii) Light Duty Trucks 2 (greater than 6000 pounds GVWR)

Model Years	Hydrocarbons	Carbon Monoxide	Oxides of Nitrogen
1994+Tier 1≤5750 LVW	2	22	42
1994+Tier 1>5750 LVW	5	26	45
1991-1995	5	26	46
1988-1990	7	29	47
1984-1987	7	29	49

(iii) Light Duty Trucks 2 (greater than 6000 pounds GVWR) cont.

Model Years	Hydrocarbons	Carbon Monoxide	Oxides of Nitrogen
1979-1983	11	31	49
1975-1978	12	32	50
1974	13	34	50

(2) Final ASM-2 Standards. The following exhaust emissions standards are designed to achieve the emission reduction credits issued by EPA. They should only be used after at least one cycle of operation using the start-up standards in A1(a)(1). The exhaust emissions standards for the following model years and vehicle types are cross-referenced by the number in the column in A1(a)(3), as noted in the column headings:

(i) Light Duty Vehicles

Model Years	Hydrocarbons	Carbon Monoxide	Oxides of Nitrogen
1994+ Tier 1	1	21	41
1983-1995	1	21	41
1981-1982	1	23	41
1980	1	23	45
1977-1979	6	27	45
1975-1976	6	27	48
1974	10	32	48

(ii) Light Duty Trucks 1 (less than 6000 pounds GVWR)

Model Years	Hydrocarbons	Carbon Monoxide	Oxides of Nitrogen
1994+Tier 1	1	21	41
1988-1995	3	24	42
1984-1987	3	24	46
1979-1983	8	28	46
1975-1978	9	29	48
1974	10	32	48

(iii) Light Duty Trucks 2 (greater than 6000 pounds GVWR)

Model Years	Hydrocarbons	Carbon Monoxide	Oxides of Nitrogen
1994+Tier 1	1	21	41
1988-1995	3	24	46

(iii) Light Duty Trucks 2 (greater than 6000 pounds GVWR) cont.

Model Years	Hydrocarbons	Carbon Monoxide	Oxides of Nitrogen
1984-1987	3	24	46
1979-1983	8	28	46
1975-1978	9	29	48
1974	10	32	48

(3) ASM 2525 and 5015 Concentration Tables

Please find concentration tables in Appendix T:

(i) ASM2525 and ASM5015 Hydrocarbon (ppm C6) Table
(ii) ASM2525 and ASM5015 Carbon Monoxide (%CO) Table
(iii) ASM2525 and ASM5015 Nitric Oxide (%NO) Table

(b) Test Score Calculation

(1) Exhaust Gas Measurement Calculation

(i) Measurement Start. The analysis and recording of exhaust gas concentrations shall begin 15 seconds after the applicable test mode begins, or sooner if the system response time (to 100%) is less than 15 seconds. The analysis and recording of exhaust gas concentrations shall not begin sooner than the time period equivalent to the response time of the slowest transducer.

(ii) Sample Rate. Exhaust gas concentrations shall be analyzed at a minimum rate of once per second.

(iii) Negative Values. Negative gram per second readings shall be integrated as zero and recorded as such.

(iv) Emission Measurement Calculations. Partial stream (concentration) emissions shall be calculated based on a running 10 second average. The values used for HC(j), CO(j), and NO(j) are the raw (uncorrected) tailpipe concentrations.

$$\text{(A) AvgHC} = \frac{\sum_{j-10}^{j} HC(j) * DCF(j)}{10}$$

$$\text{(B) AvgCO} = \frac{\sum_{j-10}^{j} CO(j) * DCF(j)}{10}$$

$$\text{(C) AvgNO} = \frac{\sum_{j-10}^{j} NO(j) * DCF(j)}{10}$$

(iv) Dilution Correction Factor. The analyzer software shall multiply the raw emissions values by the Dilution Correction Factor (DCF) during any valid ASM-2 emissions test. The DCF accounts for exhaust sample dilution (either intentional or unintentional) during an emissions test. The analyzer software shall calculate the DCF using the following procedure, and shall select the appropriate vehicle fuel formula. If the calculated DCF exceeds 3.0 then a default value of 3.0 shall be used.

(A) $X = \frac{[CO2]measured}{[CO2measured + [CO]measured}$

Where [CO2]measured and [CO]measured are the instantaneous ASM-2 emissions test readings.

(B) Calculate [CO2]adjusted using the following formula.

For Gasoline:
[CO2]adjusted = [X/(4.644+1.88X)] * 100

(C) Calculate the DCF using the following formula:

$DCF = \frac{[CO2]adjusted}{[CO2]measured}$

(v) NO Humidity Correction Factor. The NO measurement shall be adjusted based on relative humidity using a correction factor Kh, calculated as follows:

(A) $Kh = \frac{1}{1 - 0.0047(H-75)}$

(B) H = Absolute humidity in grains of water per pound of dry air
$= \frac{(43.478)Ra*Pd}{PB-(Pd*Ra/100)}$

(C) Ra = Relative humidity of the ambient air, percent.

(D) Pd = Saturated vapor pressure, mm Hg at the ambient dry bulb temperature. If the temperature is above 86_F, then it shall be used in lieu of the higher temperature, until EPA supplies final correction factors.

(E) PB = Barometric pressure, mm Hg.

(2) Pass/Fail Determination. A pass or fail determination shall be made for each applicable test mode based on a comparison of the applicable test standards and the measured value for HC, CO, and NO as described in A1(b)(1)(iii). A vehicle shall pass the test mode if the emission values for HC, CO, and NO are simultaneously below or equal to the applicable short test standards for all three pollutants. A vehicle shall fail the test mode if the values for HC, CO, or NO, or any combination or the three, are above the applicable standards at the expiration of the test time.

Appendix T

ASM-2 5015 and 2525 Concentration Tables

ASM-2 2525 and 5015 Concentration Tables.

i. ASM 2525 and ASM 5015 Hydrocarbon Table (ppm C6)

Column ETW	1 5015	1 2525	2 5015	2 2525	3 5015	3 2525	4 5015	4 2525
1750	142	136	224	216	257	249	291	282
1875	134	129	212	205	243	236	275	266
2000	127	123	201	194	230	223	260	252
2125	121	116	191	184	219	212	246	239
2250	115	111	182	175	208	201	234	227
2375	109	106	173	167	198	192	223	216
2500	105	101	166	160	189	183	212	206
2625	100	97	159	153	181	175	203	197
2750	96	93	152	147	173	168	194	189
2875	92	89	146	141	167	161	187	181
3000	89	86	141	136	160	155	180	174
3125	86	83	136	132	155	150	173	168
3250	83	80	132	127	149	145	167	162
3375	81	78	128	123	145	140	162	157
3500	78	76	124	120	140	136	157	152
3625	76	74	120	117	136	132	152	148
3750	74	72	117	114	133	129	148	144
3875	72	70	114	111	129	125	144	140
4000	71	68	112	108	126	122	140	137
4125	69	67	109	106	123	119	137	133
4250	67	65	107	103	120	117	134	130
4375	66	64	104	101	118	114	131	127
4500	65	63	102	99	115	112	128	124

Column ETW	1 5015	1 2525	2 5015	2 2525	3 5015	3 2525	4 5015	4 2525
4625	63	61	100	97	113	109	125	122
4750	62	60	98	95	110	107	122	119
4875	61	59	96	93	108	105	120	117
5000	60	58	94	92	106	103	117	114
5125	58	57	93	90	104	101	115	112
5250	57	56	91	88	102	99	112	110
5375	56	55	89	86	100	97	110	107
5500	55	54	87	85	98	95	108	105
5625	54	53	86	83	96	93	106	103
5750	53	52	84	82	94	91	104	101
5875	52	51	83	80	92	90	102	99
6000	51	50	81	79	90	88	100	97
6125	50	49	80	78	89	86	98	95
6250	50	48	79	76	87	85	96	94
6375	49	48	77	75	86	84	95	92
6500	48	47	76	74	85	83	93	91
6625	48	46	76	74	84	82	92	90
6750	47	46	75	73	83	81	91	89
6875	47	46	75	73	83	81	91	89
7000	47	46	74	72	83	80	91	88
7125	47	46	74	72	82	80	90	88
7250	47	46	74	72	82	80	90	88
7375	47	46	74	72	82	80	90	88
7500	47	46	74	72	82	80	90	88

Column ETW	5 5015	5 2525	6 5015	6 2525	7 5015	7 2525	8 5015	8 2525
1750	324	315	374	364	390	381	407	397
1875	306	297	353	344	368	359	384	375
2000	289	281	333	325	348	339	363	354
2125	274	267	316	308	329	321	343	335
2250	260	253	299	292	312	305	325	318
2375	247	241	284	277	297	290	309	302
2500	236	230	271	264	283	276	294	288
2625	225	219	259	252	270	263	281	274
2750	216	210	247	241	258	252	269	262
2875	207	201	237	231	247	241	257	251
3000	199	194	228	222	237	232	247	241
3125	191	186	219	214	228	223	238	232
3250	185	180	211	206	220	215	229	224
3375	179	174	204	199	213	208	221	216
3500	173	169	198	193	206	201	214	209
3625	168	164	192	187	200	195	207	203
3750	163	159	186	182	194	189	201	197
3875	159	155	181	177	188	184	196	191
4000	155	151	176	172	183	179	191	186
4125	151	147	172	168	179	175	186	181
4250	147	143	167	164	174	170	181	177
4375	144	140	164	160	170	166	177	173
4500	141	137	160	156	166	162	172	169

Column ETW	5 5015	5 2525	6 5015	6 2525	7 5015	7 2525	8 5015	8 2525
4625	137	134	156	152	162	159	169	165
4750	134	131	153	149	159	155	165	161
4875	132	128	149	146	155	152	161	157
5000	129	126	146	143	152	148	157	154
5125	126	123	143	139	148	145	154	150
5250	123	120	140	136	145	142	150	147
5375	121	118	137	133	142	139	147	144
5500	118	115	134	130	139	136	144	141
5625	116	113	131	128	136	133	141	138
5750	113	111	128	125	133	130	138	135
5875	111	108	125	122	130	127	135	132
6000	109	106	123	120	127	124	132	129
6125	107	104	120	118	125	122	129	126
6250	105	102	118	115	123	120	127	124
6375	103	101	116	113	120	118	125	122
6500	102	99	114	112	119	116	123	120
6625	101	98	113	110	117	114	121	119
6750	100	97	112	109	116	113	120	117
6875	99	97	111	109	115	113	119	117
7000	99	96	111	108	115	112	119	116
7125	98	96	111	108	115	112	119	116
7250	98	96	111	108	115	112	119	116
7375	98	96	111	108	115	112	119	116
7500	98	96	111	108	115	112	119	116

Column ETW	9 5015	9 2525	10 5015	10 2525	11 5015	11 2525	12 5015	12 2525
1750	457	447	706	694	774	761	843	828
1875	431	421	665	653	729	717	794	780
2000	407	398	627	616	688	676	749	736
2125	385	376	592	582	650	638	707	695
2250	365	357	560	551	615	604	669	658
2375	346	339	531	522	583	573	635	624
2500	329	322	505	496	554	544	603	593
2625	314	307	481	472	528	518	574	564
2750	300	294	459	451	503	495	548	539
2875	287	281	439	431	481	473	524	515
3000	276	270	420	413	461	453	502	493
3125	265	260	404	397	443	435	482	474
3250	256	250	388	382	426	419	464	456
3375	247	241	374	368	411	404	447	440
3500	239	234	362	355	397	390	432	424
3625	231	226	350	344	384	377	418	411
3750	224	220	339	333	372	365	405	398
3875	218	213	329	323	361	355	393	386
4000	212	208	320	314	351	345	382	375
4125	206	202	311	305	341	335	371	365
4250	201	197	303	297	332	326	361	355
4375	196	192	295	290	323	318	352	346
4500	192	188	287	282	315	310	343	337

Column ETW	9 5015	9 2525	10 5015	10 2525	11 5015	11 2525	12 5015	12 2525
4625	187	183	280	275	308	302	335	329
4750	183	179	273	269	300	295	327	321
4875	179	175	267	262	293	288	319	313
5000	175	171	260	256	286	281	311	305
5125	171	167	254	250	279	274	304	298
5250	167	163	248	244	272	267	296	291
5375	163	159	242	238	266	261	289	284
5500	159	156	236	232	259	255	282	277
5625	156	152	231	226	253	248	276	271
5750	152	149	225	221	247	243	269	264
5875	149	146	220	216	241	237	263	258
6000	146	143	215	211	236	232	257	252
6125	143	140	210	206	231	227	251	247
6250	140	137	206	202	226	222	246	242
6375	138	135	202	198	222	218	242	237
6500	136	133	199	195	218	214	238	233
6625	134	131	196	192	215	211	234	230
6750	132	129	194	190	213	209	232	227
6875	132	129	193	189	211	207	230	225
7000	131	128	192	188	211	207	229	225
7125	131	128	192	188	211	206	229	225
7250	131	128	192	188	211	206	229	225
7375	131	128	192	188	211	206	229	225
7500	131	128	192	188	211	206	229	225

Column ETW	13 5015	13 2525
1750	1118	1098
1875	1052	1034
2000	992	975
2125	938	921
2250	887	872
2375	841	827
2500	800	786
2625	761	748
2750	726	714
2875	695	683
3000	666	654
3125	639	628
3250	615	604
3375	593	583
3500	573	563
3625	554	544
3750	537	527
3875	521	512
4000	506	497
4125	492	484
4250	479	471
4375	467	459
4500	455	447

Column ETW	13 5015	13 2525
4625	444	436
4750	433	425
4875	423	415
5000	412	405
5125	402	395
5250	393	386
5375	383	376
5500	374	367
5625	365	359
5750	357	350
5875	348	342
6000	341	334
6125	333	327
6250	326	320
6375	320	314
6500	315	309
6625	310	304
6750	307	301
6875	305	299
7000	304	298
7125	304	298
7250	304	298
7375	304	298
7500	304	298

ii. ASM 2525 and ASM 5015 Carbon Monoxide Table (% CO)

Column ETW	21 5015	21 2525	22 5015	22 2525	23 5015	23 2525	24 5015	24 2525
1750	0.80	0.77	1.26	1.22	1.64	1.83	2.02	2.43
1875	0.75	0.73	1.19	1.16	1.55	1.72	1.91	2.29
2000	0.71	0.69	1.13	1.09	1.47	1.63	1.81	2.17
2125	0.68	0.66	1.07	1.04	1.39	1.54	1.71	2.05
2250	0.64	0.62	1.02	0.99	1.32	1.47	1.62	1.94
2375	0.61	0.59	0.97	0.94	1.26	1.39	1.54	1.85
2500	0.59	0.57	0.93	0.90	1.20	1.33	1.47	1.76
2625	0.56	0.54	0.89	0.86	1.15	1.27	1.41	1.68
2750	0.54	0.52	0.85	0.82	1.10	1.21	1.34	1.60
2875	0.52	0.50	0.82	0.79	1.05	1.16	1.29	1.54
3000	0.50	0.48	0.79	0.76	1.01	1.12	1.24	1.48
3125	0.48	0.46	0.76	0.73	0.98	1.08	1.19	1.42
3250	0.46	0.45	0.73	0.71	0.94	1.04	1.15	1.37
3375	0.45	0.43	0.71	0.69	0.91	1.00	1.11	1.32
3500	0.44	0.42	0.69	0.67	0.88	0.97	1.08	1.28
3625	0.42	0.41	0.67	0.65	0.86	0.94	1.05	1.24
3750	0.41	0.40	0.65	0.63	0.83	0.92	1.02	1.20
3875	0.40	0.39	0.63	0.61	0.81	0.89	0.99	1.17
4000	0.39	0.38	0.62	0.60	0.79	0.87	0.96	1.14
4125	0.38	0.37	0.60	0.58	0.77	0.85	0.94	1.11
4250	0.37	0.36	0.59	0.57	0.75	0.83	0.92	1.08
4375	0.36	0.35	0.58	0.56	0.74	0.81	0.89	1.06
4500	0.36	0.35	0.57	0.55	0.72	0.79	0.87	1.03

Column ETW	21 5015	21 2525	22 5015	22 2525	23 5015	23 2525	24 5015	24 2525
4625	0.35	0.34	0.55	0.54	0.70	0.77	0.85	1.01
4750	0.34	0.33	0.54	0.53	0.69	0.76	0.84	0.99
4875	0.34	0.33	0.53	0.52	0.67	0.74	0.82	0.97
5000	0.33	0.32	0.52	0.51	0.66	0.73	0.80	0.95
5125	0.32	0.31	0.51	0.50	0.65	0.71	0.78	0.92
5250	0.32	0.31	0.50	0.49	0.63	0.70	0.77	0.90
5375	0.31	0.30	0.49	0.48	0.62	0.68	0.75	0.89
5500	0.30	0.30	0.48	0.47	0.61	0.67	0.73	0.87
5625	0.30	0.29	0.47	0.46	0.59	0.65	0.72	0.85
5750	0.29	0.29	0.46	0.45	0.58	0.64	0.70	0.83
5875	0.29	0.28	0.45	0.44	0.57	0.63	0.69	0.81
6000	0.28	0.28	0.44	0.44	0.56	0.62	0.67	0.80
6125	0.28	0.27	0.44	0.43	0.55	0.61	0.66	0.78
6250	0.27	0.27	0.43	0.42	0.54	0.60	0.65	0.77
6375	0.27	0.26	0.42	0.42	0.53	0.59	0.64	0.76
6500	0.26	0.26	0.42	0.41	0.52	0.58	0.63	0.74
6625	0.26	0.26	0.41	0.41	0.52	0.57	0.62	0.73
6750	0.26	0.26	0.41	0.41	0.51	0.57	0.61	0.73
6875	0.26	0.25	0.40	0.40	0.51	0.56	0.61	0.72
7000	0.25	0.25	0.40	0.40	0.51	0.56	0.61	0.72
7125	0.25	0.25	0.40	0.40	0.51	0.56	0.61	0.72
7250	0.25	0.25	0.40	0.40	0.50	0.56	0.61	0.72
7375	0.25	0.25	0.40	0.40	0.50	0.56	0.61	0.72
7500	0.25	0.25	0.40	0.40	0.50	0.56	0.61	0.72

Column ETW	25 5015	25 2525	26 5015	26 2525	27 5015	27 2525	28 5015	28 2525
1750	2.21	2.73	2.78	3.64	2.97	3.94	3.16	4.24
1875	2.09	2.58	2.63	3.43	2.81	3.71	2.98	4.00
2000	1.97	2.43	2.48	3.24	2.65	3.51	2.82	3.77
2125	1.87	2.30	2.35	3.06	2.51	3.32	2.67	3.57
2250	1.77	2.18	2.23	2.90	2.38	3.14	2.53	3.38
2375	1.69	2.07	2.12	2.76	2.26	2.98	2.40	3.21
2500	1.61	1.97	2.02	2.62	2.15	2.84	2.29	3.05
2625	1.53	1.88	1.92	2.50	2.05	2.70	2.18	2.91
2750	1.47	1.80	1.84	2.39	1.96	2.58	2.09	2.78
2875	1.41	1.72	1.76	2.29	1.88	2.47	2.00	2.66
3000	1.35	1.66	1.69	2.19	1.80	2.37	1.92	2.55
3125	1.30	1.59	1.63	2.11	1.74	2.28	1.84	2.45
3250	1.26	1.53	1.57	2.03	1.67	2.20	1.78	2.36
3375	1.21	1.48	1.52	1.96	1.62	2.12	1.72	2.28
3500	1.17	1.43	1.47	1.89	1.56	2.05	1.66	2.20
3625	1.14	1.39	1.42	1.84	1.52	1.98	1.61	2.13
3750	1.11	1.35	1.38	1.78	1.47	1.92	1.56	2.07
3875	1.08	1.31	1.34	1.73	1.43	1.87	1.52	2.01
4000	1.05	1.28	1.31	1.68	1.39	1.82	1.48	1.95
4125	1.02	1.24	1.27	1.64	1.36	1.77	1.44	1.90
4250	1.00	1.21	1.24	1.60	1.32	1.72	1.40	1.85
4375	0.97	1.18	1.21	1.56	1.29	1.68	1.37	1.81
4500	0.95	1.16	1.18	1.52	1.26	1.64	1.34	1.76

Column ETW	25 5015	25 2525	26 5015	26 2525	27 5015	27 2525	28 5015	28 2525
4625	0.93	1.13	1.15	1.48	1.23	1.60	1.30	1.72
4750	0.91	1.10	1.13	1.45	1.20	1.57	1.28	1.68
4875	0.89	1.08	1.10	1.42	1.17	1.53	1.25	1.64
5000	0.87	1.05	1.08	1.38	1.15	1.49	1.22	1.60
5125	0.85	1.03	1.05	1.35	1.12	1.46	1.19	1.57
5250	0.83	1.01	1.03	1.32	1.10	1.43	1.16	1.53
5375	0.81	0.99	1.01	1.29	1.07	1.39	1.14	1.50
5500	0.80	0.97	0.99	1.26	1.05	1.36	1.11	1.46
5625	0.78	0.94	0.97	1.24	1.03	1.33	1.09	1.43
5750	0.76	0.92	0.94	1.21	1.01	1.30	1.07	1.40
5875	0.75	0.91	0.92	1.18	0.98	1.27	1.04	1.37
6000	0.73	0.89	0.91	1.16	0.96	1.25	1.02	1.34
6125	0.72	0.87	0.89	1.13	0.94	1.22	1.00	1.31
6250	0.71	0.85	0.87	1.11	0.93	1.20	0.98	1.28
6375	0.69	0.84	0.86	1.09	0.91	1.18	0.96	1.26
6500	0.68	0.83	0.84	1.08	0.90	1.16	0.95	1.24
6625	0.67	0.82	0.83	1.06	0.88	1.14	0.94	1.23
6750	0.67	0.81	0.82	1.05	0.88	1.13	0.93	1.21
6875	0.66	0.80	0.82	1.04	0.87	1.12	0.92	1.20
7000	0.66	0.80	0.82	1.04	0.87	1.12	0.92	1.20
7125	0.66	0.80	0.81	1.04	0.87	1.12	0.92	1.20
7250	0.66	0.80	0.81	1.04	0.86	1.12	0.92	1.20
7375	0.66	0.80	0.81	1.04	0.86	1.12	0.92	1.20
7500	0.66	0.80	0.81	1.04	0.86	1.12	0.92	1.20

Column ETW	29 5015	29 2525	30 5015	30 2525	31 5015	31 2525	32 5015	32 2525
1750	3.54	4.85	3.92	5.45	4.31	6.06	5.07	7.26
1875	3.34	4.57	3.70	5.14	4.06	5.70	4.78	6.84
2000	3.16	4.31	3.49	4.85	3.83	5.38	4.51	6.45
2125	2.99	4.08	3.31	4.58	3.63	5.09	4.26	6.10
2250	2.83	3.86	3.13	4.34	3.44	4.82	4.04	5.78
2375	2.69	3.66	2.98	4.12	3.26	4.57	3.83	5.48
2500	2.56	3.48	2.83	3.91	3.10	4.35	3.65	5.21
2625	2.44	3.32	2.70	3.73	2.96	4.14	3.48	4.96
2750	2.33	3.17	2.58	3.56	2.83	3.95	3.32	4.73
2875	2.23	3.03	2.47	3.41	2.71	3.78	3.18	4.53
3000	2.14	2.91	2.37	3.27	2.60	3.62	3.05	4.34
3125	2.06	2.79	2.28	3.14	2.50	3.48	2.93	4.17
3250	1.99	2.69	2.20	3.02	2.40	3.35	2.82	4.01
3375	1.92	2.60	2.12	2.91	2.32	3.23	2.72	3.87
3500	1.86	2.51	2.05	2.82	2.24	3.12	2.63	3.74
3625	1.80	2.43	1.99	2.73	2.17	3.02	2.55	3.62
3750	1.74	2.36	1.93	2.64	2.11	2.93	2.47	3.51
3875	1.69	2.29	1.87	2.57	2.05	2.85	2.40	3.40
4000	1.65	2.22	1.82	2.49	1.99	2.77	2.33	3.31
4125	1.61	2.16	1.77	2.43	1.94	2.69	2.27	3.22
4250	1.56	2.11	1.73	2.36	1.89	2.62	2.21	3.13
4375	1.53	2.06	1.68	2.31	1.84	2.55	2.16	3.05
4500	1.49	2.01	1.64	2.25	1.80	2.49	2.11	2.98

Column ETW	29 5015	29 2525	30 5015	30 2525	31 5015	31 2525	32 5015	32 2525
4625	1.46	1.96	1.61	2.19	1.76	2.43	2.06	2.90
4750	1.42	1.91	1.57	2.14	1.72	2.37	2.01	2.83
4875	1.39	1.87	1.53	2.09	1.68	2.32	1.96	2.77
5000	1.36	1.82	1.50	2.04	1.64	2.26	1.92	2.70
5125	1.33	1.78	1.46	2.00	1.60	2.21	1.87	2.64
5250	1.30	1.74	1.43	1.95	1.56	2.16	1.83	2.58
5375	1.27	1.70	1.40	1.90	1.53	2.11	1.79	2.51
5500	1.24	1.66	1.37	1.86	1.49	2.06	1.75	2.46
5625	1.21	1.62	1.34	1.82	1.46	2.01	1.71	2.40
5750	1.19	1.59	1.31	1.78	1.43	1.96	1.67	2.34
5875	1.16	1.55	1.28	1.74	1.40	1.92	1.63	2.29
6000	1.14	1.52	1.25	1.70	1.37	1.88	1.60	2.24
6125	1.11	1.49	1.23	1.66	1.34	1.84	1.57	2.19
6250	1.09	1.46	1.20	1.63	1.31	1.80	1.54	2.15
6375	1.07	1.43	1.18	1.60	1.29	1.77	1.51	2.11
6500	1.06	1.41	1.16	1.57	1.27	1.74	1.48	2.07
6625	1.04	1.39	1.15	1.55	1.25	1.72	1.46	2.04
6750	1.03	1.37	1.14	1.54	1.24	1.70	1.45	2.02
6875	1.02	1.36	1.13	1.52	1.23	1.68	1.44	2.00
7000	1.02	1.36	1.12	1.52	1.23	1.68	1.43	2.00
7125	1.02	1.36	1.12	1.52	1.22	1.68	1.43	2.00
7250	1.02	1.36	1.12	1.52	1.22	1.68	1.43	2.00
7375	1.02	1.36	1.12	1.52	1.22	1.68	1.43	2.00
7500	1.02	1.36	1.12	1.52	1.22	1.68	1.43	2.00

Column ETW	33 5015	33 2525	34 5015	34 2525
1750	5.26	7.44	8.02	9.90
1875	4.96	7.05	7.56	9.90
2000	4.68	6.68	7.14	9.90
2125	4.43	6.34	6.75	9.66
2250	4.20	6.00	6.40	9.14
2375	3.98	5.69	6.07	8.67
2500	3.79	5.41	5.78	8.25
2625	3.61	5.15	5.51	7.85
2750	3.45	4.92	5.26	7.50
2875	3.30	4.70	5.03	7.17
3000	3.17	4.51	4.83	6.87
3125	3.04	4.33	4.64	6.60
3250	2.93	4.17	4.47	6.35
3375	2.83	4.02	4.31	6.13
3500	2.73	3.88	4.17	5.92
3625	2.65	3.76	4.04	5.73
3750	2.57	3.64	3.91	5.55
3875	2.49	3.54	3.80	5.39
4000	2.43	3.44	3.70	5.24
4125	2.36	3.34	3.60	5.09
4250	2.30	3.25	3.51	4.96
4375	2.24	3.17	3.42	4.83
4500	2.19	3.09	3.34	4.71

Column ETW	33 5015	33 2525	34 5015	34 2525
4625	2.14	3.02	3.26	4.60
4750	2.09	2.95	3.18	4.49
4875	2.04	2.87	3.11	4.38
5000	1.99	2.81	3.03	4.28
5125	1.95	2.74	2.97	4.18
5250	1.90	2.68	2.90	4.08
5375	1.86	2.61	2.83	3.98
5500	1.82	2.55	2.77	3.89
5625	1.77	2.49	2.70	3.80
5750	1.74	2.43	2.64	3.71
5875	1.70	2.38	2.59	3.62
6000	1.66	2.33	2.53	3.54
6125	1.63	2.28	2.48	3.47
6250	1.60	2.23	2.43	3.40
6375	1.57	2.19	2.39	3.34
6500	1.54	2.15	2.35	3.28
6625	1.52	2.12	2.32	3.23
6750	1.50	2.10	2.29	3.20
6875	1.49	2.08	2.28	3.17
7000	1.49	2.08	2.27	3.17
7125	1.49	2.08	2.27	3.17
7250	1.49	2.08	2.27	3.17
7375	1.49	2.08	2.27	3.17
7500	1.49	2.08	2.27	3.17

iii. ASM 2525 and ASM 5015 Nitric Oxide Table (% NO)

Column ETW	41 5015	41 2525	42 5015	42 2525	43 5015	43 2525	44 5015	44 2525
1750	1212	1095	1819	1642	2272	2114	2725	2587
1875	1142	1031	1713	1547	2181	1991	2649	2435
2000	1077	973	1616	1460	2058	1877	2499	2295
2125	1018	920	1527	1380	1944	1774	2360	2167
2250	964	871	1446	1307	1839	1678	2232	2050
2375	915	827	1372	1240	1744	1592	2115	1943
2500	869	786	1304	1179	1657	1512	2009	1845
2625	828	749	1242	1123	1577	1440	1912	1756
2750	791	715	1186	1072	1504	1374	1823	1675
2875	756	684	1134	1026	1438	1313	1742	1601
3000	725	656	1088	984	1378	1258	1668	1533
3125	696	630	1045	945	1323	1208	1601	1471
3250	670	607	1006	910	1273	1163	1539	1415
3375	647	585	970	878	1227	1121	1483	1363
3500	625	566	937	848	1184	1082	1432	1316
3625	605	547	907	821	1146	1047	1384	1273
3750	586	531	879	796	1110	1014	1340	1233
3875	569	515	853	773	1077	984	1300	1195
4000	553	501	829	751	1046	956	1262	1161
4125	538	487	807	731	1017	930	1227	1128
4250	524	475	786	712	990	905	1194	1098
4375	510	463	766	694	964	882	1162	1069
4500	498	451	747	677	939	859	1132	1042

Column ETW	41 5015	41 2525	42 5015	42 2525	43 5015	43 2525	44 5015	44 2525
4625	486	440	728	661	916	838	1104	1015
4750	474	430	711	645	893	818	1076	990
4875	463	420	694	630	872	798	1049	966
5000	452	410	677	615	850	778	1023	942
5125	441	400	661	600	830	760	998	919
5250	431	391	646	586	810	741	974	896
5375	420	382	631	573	790	723	950	874
5500	410	373	616	559	771	706	926	853
5625	401	364	601	546	752	689	904	832
5750	391	356	587	534	734	673	882	812
5875	383	348	574	522	717	657	860	793
6000	374	340	561	510	701	642	840	774
6125	366	333	549	499	685	628	822	757
6250	359	326	538	489	671	615	804	741
6375	352	320	528	480	658	604	788	727
6500	346	315	519	473	647	593	775	714
6625	341	311	512	466	638	585	763	704
6750	338	307	507	461	631	578	755	696
6875	335	305	503	458	626	574	749	691
7000	335	305	502	457	624	573	747	689
7125	335	305	502	457	625	573	747	689
7250	335	305	502	457	625	573	747	689
7375	335	305	502	457	625	573	747	689
7500	335	305	502	457	625	573	747	689

Column	45	45	46	46	47	47	48	48
ETW	5015	2525	5015	2525	5015	2525	5015	2525
1750	3178	3060	3631	3532	4084	4005	4990	4950
1875	3117	2879	3586	3323	4054	3767	4990	4655
2000	2941	2713	3383	3131	3824	3548	4707	4384
2125	2776	2561	3192	2955	3609	3348	4441	4136
2250	2625	2422	3018	2794	3411	3165	4197	3909
2375	2487	2295	2859	2646	3231	2998	3974	3701
2500	2361	2179	2714	2512	3066	2845	3771	3512
2625	2246	2073	2581	2389	2916	2706	3585	3339
2750	2142	1976	2460	2277	2779	2579	3416	3181
2875	2046	1888	2350	2175	2654	2463	3261	3037
3000	1959	1808	2249	2082	2539	2357	3120	2906
3125	1879	1734	2157	1997	2435	2260	2992	2787
3250	1806	1667	2073	1920	2340	2172	2874	2677
3375	1740	1606	1997	1849	2253	2092	2767	2577
3500	1679	1550	1926	1784	2174	2018	2668	2486
3625	1623	1498	1862	1724	2100	1950	2578	2401
3750	1571	1451	1802	1669	2033	1887	2494	2323
3875	1523	1407	1747	1618	1970	1829	2417	2251
4000	1479	1365	1695	1570	1912	1775	2345	2184
4125	1437	1327	1647	1526	1857	1724	2277	2122
4250	1398	1291	1602	1484	1806	1677	2214	2063
4375	1360	1257	1559	1444	1757	1632	2154	2007
4500	1325	1224	1518	1406	1711	1589	2096	1953

Column ETW	45 5015	45 2525	46 5015	46 2525	47 5015	47 2525	48 5015	48 2525
4625	1291	1193	1479	1370	1666	1548	2042	1903
4750	1259	1163	1441	1336	1624	1508	1989	1854
4875	1227	1134	1405	1302	1583	1470	1938	1806
5000	1196	1106	1369	1269	1542	1433	1889	1760
5125	1167	1078	1335	1237	1503	1397	1840	1715
5250	1138	1051	1301	1206	1465	1362	1793	1672
5375	1109	1025	1269	1176	1428	1327	1747	1629
5500	1082	1000	1237	1147	1392	1294	1703	1587
5625	1055	975	1206	1118	1357	1261	1659	1547
5750	1029	951	1176	1090	1323	1230	1617	1508
5875	1004	928	1147	1064	1290	1199	1577	1471
6000	980	906	1120	1039	1259	1171	1539	1435
6125	958	886	1094	1015	1230	1144	1503	1401
6250	937	867	1070	993	1203	1119	1469	1371
6375	919	850	1049	973	1179	1096	1439	1343
6500	902	835	1030	956	1158	1077	1413	1318
6625	889	823	1014	941	1140	1060	1391	1298
6750	879	813	1003	931	1127	1048	1374	1283
6875	872	807	995	924	1118	1040	1364	1273
7000	870	805	992	921	1115	1037	1360	1269
7125	870	805	992	921	1115	1037	1360	1269
7250	870	805	992	921	1115	1037	1360	1269
7375	870	805	992	921	1115	1037	1360	1269
7500	870	805	992	921	1115	1037	1360	1269

Column ETW	49 5015	49 2525	50 5015	50 2525	51 5015	51 2525
1750	4990	4960	4990	4980	4990	4990
1875	4990	4738	4990	4906	4990	4990
2000	4778	4535	4919	4838	4990	4990
2125	4578	4349	4853	4776	4990	4990
2250	4395	4179	4792	4720	4990	4990
2375	4228	4024	4736	4668	4990	4990
2500	4076	3881	4685	4620	4990	4990
2625	3936	3752	4639	4577	4990	4990
2750	3809	3579	4596	4374	4990	4772
2875	3669	3417	4484	4176	4892	4556
3000	3510	3270	4290	3996	4680	4359
3125	3366	3135	4114	3832	4488	4180
3250	3234	3012	3952	3681	4311	4016
3375	3113	2899	3804	3544	4150	3866
3500	3002	2796	3669	3418	4002	3728
3625	2900	2701	3544	3302	3867	3602
3750	2806	2614	3429	3195	3741	3485
3875	2719	2533	3323	3096	3625	3377
4000	2638	2457	3224	3003	3517	3276
4125	2562	2387	3131	2917	3416	3182
4250	2490	2320	3044	2836	3321	3094
4375	2423	2258	2961	2759	3230	3010
4500	2359	2198	2883	2686	3145	2930

Column	49	49	50	50	51	51
ETW	5015	2525	5015	2525	5015	2525
4625	2297	2140	2807	2616	3063	2854
4750	2238	2085	2735	2549	2983	2780
4875	2180	2032	2665	2483	2907	2709
5000	2125	1980	2597	2420	2833	2640
5125	2070	1930	2530	2359	2760	2573
5250	2017	1881	2466	2298	2690	2507
5375	1966	1833	2403	2240	2621	2443
5500	1916	1786	2341	2183	2554	2381
5625	1867	1740	2282	2127	2489	2321
5750	1820	1697	2224	2074	2426	2262
5875	1774	1654	2168	2022	2366	2206
6000	1731	1614	2116	1973	2308	2152
6125	1690	1577	2066	1927	2254	2102
6250	1653	1542	2020	1884	2204	2056
6375	1619	1510	1979	1846	2159	2014
6500	1590	1483	1943	1813	2119	1977
6625	1565	1460	1913	1785	2087	1947
6750	1546	1443	1890	1764	2062	1924
6875	1534	1432	1875	1750	2046	1909
7000	1530	1428	1870	1745	2040	1904
7125	1531	1428	1874	1745	2045	1904
7250	1531	1428	1874	1745	2045	1904
7375	1531	1428	1874	1745	2045	1904
7500	1531	1428	1874	1745	2045	1904

Appendix U

(Test Procedures)

A2 Test Procedures (Addressed by Software Requirements)

(a) General Requirements

(1) Vehicle Characterization. The following information shall be determined from the vehicle being tested and used to automatically select the dynamometer power absorption settings:

(I) Vehicle type: LDGV, LDGT1, LDGT2, HDGT, and others as needed
(ii) Chassis model year
(iii) Make
(iv) Model
(v) Number of cylinders
(vi) Cubic inch or liters displacement of the engine
(vii) Transmission type
(viii) Equivalent Test Weight

(2) Ambient Conditions. The ambient temperature, absolute humidity, and barometric pressure shall be recorded continuously during the test cycle or as a single set of readings up to 4 minutes before the start of the driving cycle.

(3) Restart. If shut off, the vehicle shall be restarted as soon as possible before the test and shall be running for at least 30 seconds prior to the start of the ASM-2 driving cycle.

(4) Void Test Conditions. The test shall immediately end and any exhaust gas measurements shall be voided if the instantaneous measured concentration of CO plus CO_2 falls below six percent or the vehicle's engine stalls at any time during the test sequence.

(5) Vehicle Brakes. The vehicle's brakes shall not be applied during the test modes. If the vehicle's brakes are applied during testing the mode timer shall be reset to zero (tt = 0).

(6) Test Termination. The test shall be aborted or terminated upon reaching the overall maximum test time.

(b) Vehicle Pre-inspection and Preparation

(1) Accessories. All accessories (air conditioning, heat, defogger, radio, automatic traction control if switchable, etc.) shall be turned off (if necessary, by the inspector).

2. Traction Control and Four-Wheel Drive (4WD). Vehicles with traction control systems that cannot be turned off shall not be tested on two wheel drive dynamometers. Vehicles with 4WD that cannot be turned off shall only be tested on 4WD dynamometers. If the 4WD function can be disabled, then the 4WD vehicles may be tested on two wheel drive dynamometers.

(3) Exhaust Leaks. The vehicle shall be inspected for exhaust leaks. Audio assessment while blocking exhaust flow, or gas measurement of carbon dioxide or other gases shall be acceptable. Vehicles with leaking exhaust systems shall be rejected from testing.

(4) Fluid Leaks. The vehicle shall be inspected for fluid leaks. Vehicles with leaking engine oil, transmission fluid, or coolant shall be rejected from testing.

(5) Mechanical Condition. Vehicles with obvious mechanical problems (engine, transmission, brakes, or exhaust) that either create a safety hazard or could bias test results shall be rejected from testing.

(6) Operating Temperature. The vehicle shall be at normal operating temperature prior to the start of the test. The vehicle temperature gauge, if equipped and operating, shall be checked to assess temperature. Vehicles in overheated condition shall be rejected from testing.

(7) Tire Condition. Vehicles shall be rejected from testing if tread indicators, tire cords, bubbles, cuts, or other damage are visible. Vehicles shall be rejected from testing if they have space-saver tires or if they do not have reasonably sized tires on the drive axle or axles. Vehicles may be rejected if they have different sized tires on the drive axle or axles. In test-and-repair facilities, drive wheel tires shall be checked with a gauge for adequate tire pressure. In test-only facilities, drive wheel tires shall be visually checked for adequate pressure level. Drive wheel tires that appear low shall be inflated to approximately 30 psi, or to tire side wall pressure, or vehicle manufacturer's recommendation. Alternatively, vehicles with apparent low tire pressure may be rejected from testing.

(8) Gear Selection. The vehicle shall be operated during each mode of the test with the gear selector in drive for automatic transmissions and in second (or third if more appropriate) for manual transmissions for the loaded modes.

(9) Roll Rotation. The vehicle shall be maneuvered onto the dynamometer with the drive wheels positioned on the dynamometer rolls. Prior to test initiation, the rolls shall be rotated until the vehicle laterally stabilizes on the dynamometer. Vehicles that cannot be stabilized on the dynamometer shall be rejected from testing. Drive wheel tires shall be dried if necessary to prevent slippage.

(10) Vehicle Restraint. Testing shall not begin until the vehicle is restrained. Any restraint system shall meet the requirements of 2.5.8.1. In addition, the parking brake shall be set for front wheel drive vehicles prior to the start of the test, unless parking brake functions on front axle or it is automatically disengaged when in gear.

(11) Vehicle Conditioning

(i) Queuing Time. When a vehicle waits in a queue more than 20 minutes or when a vehicle is shut-off for more than 5 minutes prior to the test, vehicle conditioning shall be performed for 60 seconds, as specified in A2(b)(10)(ii). Emissions may be monitored during this cycle and if passing readings are obtained, as specified for the ASM-2 cycle inA2(d), then the cycle may be terminated and the respective ASM mode skipped.

(ii) Discretionary Preconditioning. Vehicles shall be preconditioned by driving the vehicle on the dynamometer using the 5015 mode of the ASM-2 test as specified in A2(d).

(c) Equipment Preparation and Settings

(1) Analyzer Warm-Up. Emission testing shall be locked out until the analyzer is warmed-up and

stable. The analyzer shall reach stability within 30 minutes from startup. If an analyzer does not achieve stability within the allotted time frame, it shall remain locked out from testing. The instrument shall be considered "warmed-up" when the zero and span readings from HC, CO, NO, and CO_2 have stabilized within the accuracy values specified in 2.4.6.7 for five minutes without adjustment (this does not require span gas verification of warm-up, but provides the quality assurance method for checking).

(2) Emission Sample System Purge. While a lane is in operation, the sample system shall be continuously purged after each test for at least 15 minutes if not taking measurements. The system purge should consist of flowing fresh air through the complete system for 5 minutes or until the HC reading is less than 15 ppm C6.

(3) Probe Insertion. The sample probe shall be inserted into the vehicle's tailpipe to a minimum depth of 10 inches. If the vehicle's exhaust system prevents insertion to this depth, a tailpipe extension shall be used.

(4) Multiple Exhaust Pipes. Exhaust gas concentrations from vehicle engines equipped with functionally independent multiple exhaust pipes shall be sampled simultaneously.

(5) Analyzer Preparation. The analyzer shall perform an automatic zero, an ambient air reading, and an HC hang-up check prior to each test. This process shall occur within two minutes of the start of the test.

(i) Automatic Gas Zero. The analyzer shall conduct automatic zero adjustments using the zero gas specified in 2.4.6.1(b)(1)(iii). The zero adjustment shall include the HC, CO, CO_2, and NO channels. Bottled or generated zero air may be used. The zero adjustment shall include the HC, CO, CO_2 and NO channels. The O_2 channel shall have its span adjusted while the other channels are being zeroed. The analyzer shall perform two steps while zeroing:

1 . Zero Air: The analyzer shall be zeroed, and the O_2 sensor spanned, using either bottled or generated zero air as specified in 2.4.6.1(b)(1)(iii).

2. Ambient Air: Ambient air, filtered for particulates, shall be introduced to the analyzer before the sample pump, but after the sample probe, hose, and filter/water trap. The analyzer shall record the concentrations of the five measured gases, but shall make no adjustments. When the analyzer performs a HC hangup check before the start of an inspection, the recorded ambient air readings shall be subtracted from the sampling readings to determine the amount of HC hangup (residual HC) in the sampling system. The analyzer shall be locked out from testing until (a) the ambient air has less than 15 ppm HC, 0.02% CO, and 25 ppm NO, and (b) until the residual HC obtained through the sample probe is less than 12 ppm. A unit with a clean sample system shall have an HC hangup time of no more than 120 seconds. If the HC hangup does not drop below 10 ppm within 150 seconds, the following message shall be displayed: "POSSIBLE DIRTY FILTERS OR SAMPLE".

ii) Zero Drift Lockout Threshold. If zero and/or span drift cause the infrared signal levels to move beyond the adjustment range of the analyzer, the operator shall be locked out from testing and instructed to call for service. (The analyzer manufacturer shall indicate, in writing, at what point the drift lockout will occur.)

(6) Cooling System. When ambient temperatures exceed 72 degrees F, testing shall not begin until the cooling system blower is positioned and activated. The cooling system blower shall be positioned to direct air to the vehicle cooling system, but shall not be directed at the catalytic converter.

(7) Dynamometer Warm-Up. The dynamometers that do not have temperature compensation shall be automatically warmed-up prior to official testing and shall be locked out until it is warmed-up. Dynamometers resting (not operated for at least 30 seconds and at least 15 mph) for more than 30 minutes shall pass the coast-down check specified in 2.5.7.2 prior to use in testing. Dynamometers with temperature compensation may be warmed-up per the manufacturers recommendation.

(8) Dynamometer Settings. Dynamometer power absorption and inertia weight settings shall be automatically chosen from an EPA-supplied electronic look-up table which will be referenced based upon the vehicle identification information obtained. Vehicles not listed shall be tested using default power absorption and inertia settings in the latest version of the EPA I/M Look-up Table, As posted on EPA's web site. At a minimum the look-up table on the ASM host computer should be updated once per year.

(9) Engine Speed. Engine speed measurement equipment shall be attached on all 1996 and newer light duty vehicles and trucks, and in test-and-repair programs, engine speed shall also be monitored on all pre-1996 vehicles. Starting in 1998, the SAE-standardized OBD plug shall be used on 1996 and newer vehicles. Engine speed measurement equipment shall meet the requirements of 2.9.

(d) Test Procedures.

The test sequence shall consist of both ASM-2 modes described in A2(d)(1) and (2), and shall be performed by conducting the 5015 mode first followed by the 2525 mode (with appropriate change in transition requirements specified in A2(d)(1)(iv). Vehicles that fail the first-chance test described in A2(d) shall receive a second-chance test if the conditions in A2(e) apply. The test timer shall start (tt=0) when the conditions specified in A2(c)(2) and (3) are met and the mode timer initiates as specified in A2(d)(1) or (2). Approximate test times for various test scenarios are described below. The test shall be immediately terminated or aborted upon reaching the overall maximum test time.

(1) ASM-2 5015 Mode

(i) The mode timer shall start (mt=0) when the dynamometer speed (and corresponding power) is maintained within 15+/-1.0 miles per hour for 5 continuous seconds. If the inertia simulation error exceeds the tolerance specified in 2.5.5.2 for more than 3 consecutive seconds after the mode timer is started, the test mode timer shall be set to mt=0. Should this happen a second time, the test shall be aborted. The dynamometer shall apply the correct torque for 15.0 mph for the torque at any testing speed within the tolerance of 15+/-1.0 miles per hour (i.e., constant torque load over speed range).

The torque tolerance shall be +/- 5% of the correct torque at 15 mph.

(ii) The dynamometer power shall be automatically selected from an EPA-supplied or EPA-approved look-up table, based upon the vehicle identification information described in A2(a)(1). Vehicles not listed in the look-up table and for which Equivalent Test Weight is not available shall be tested using the following default settings:

DEFAULT ASM-2 5015 DYNAMOMETER HORSEPOWER SETTINGS
FOR 8.6" ROLLERS BASED ON NUMBER OF ENGINE CYLINDERS

VEHICLE TYPE	3 CYL.	4 CYL.	5 & 6 CYL.	8 CYL.	>8 CYL.
SEDAN	7.9	11.4	13.8	16.4	16.0
STATION WAGON	8.1	11.7	13.8	16.1	16.1
MINI-VAN	10.2	14.1	15.8	17.9	18.2
PICKUP TRUCK	9.6	13.1	16.4	19.2	21.1
SPORT/UTILITY	10.1	13.4	15.5	19.4	21.1
FULL VAN	10.3	13.9	17.7	19.6	20.5

If the dynamometer speed or torque falls outside the speed or torque tolerance for more than 2 consecutive seconds, or for more than 5 seconds total, the mode timer shall reset to zero and resume timing. The minimum mode length shall be determined as described in A2(d)(2)(iii). The maximum mode length shall be 90 seconds elapsed time (mt=90).

During the 10 second period used for the pass decision, the dynamometer speed shall not fall more than 0.5 mph (absolute drop, not cumulative). If the speed at the end of the 10 second period is more than 0.5 mph less than the speed at the start of the 10 second period, testing shall continue until the speed stabilizes enough to meet this criterion.

The ten second emissions window shall be matched to the corresponding vehicle speed trace time window. This shall be performed by subtracting the nominal response time for the analyzers from the mode time to determine the time for the corresponding vehicle speed.

(iii) The pass/fail analysis shall begin after an elapsed time of 25 seconds (mt=25). A pass or fail determination shall be made for the vehicle and the mode shall be terminated as follows:

(A) The vehicle shall pass the ASM5015 mode and the mode shall be immediately terminated if, at any point between an elapsed time of 25 seconds (mt=25) and 90 seconds (mt=90), the 10 second running average measured values for each pollutant are simultaneously less than or equal to the applicable test standards described in A1(a).

2. Pass/Fail determinations may be made at mt=15 seconds if a 50% safety margin in cutpoints is applied from mt=15 to mt=25 seconds, i.e. emissions for all pollutants are 50% below the appropriate ASM standards.

(C) The vehicle shall fail the ASM5015 mode and the mode shall be terminated if the requirements of A2(d)(1)(iii)(A) are not satisfied by an elapsed time of 90 seconds (mt=90).

(iv) Upon termination of the ASM5015 mode, the vehicle shall immediately begin accelerating to the speed required for the ASM2525 mode. The dynamometer torque shall smoothly transition during the acceleration period and shall automatically reset to the load required for the ASM2525 mode as specified in A2(d)(2)(i) once the roll speed specified in A2(d)(2)(i) is achieved.

(2) ASM2525 Mode.

(i) The mode timer shall start (mt=0) when the dynamometer speed (and corresponding power) are maintained within 25+/-1.0 miles per hour for 5 continuous seconds. If the inertia simulation error exceeds the tolerance specified in 2.5.5.2 for more than 3 consecutive seconds after the mode timer is started, the test mode timer shall be set to mt=0. Should this happen a second time, the test shall be aborted. The dynamometer shall apply the correct torque for 25.0 mph for the torque at any testing speed within the tolerance of 25+/-1.0 miles per hour (i.e., constant torque load over speed range). The torque tolerance shall be +/- 5% of the correct torque at 25 mph.

(ii) The dynamometer power shall be automatically selected from an EPA-supplied or EPA-approved look-up table, based upon the vehicle identification information described in A2(a)(1). Vehicles not listed in the look-up table and for which ETW is not available shall be tested using the following default settings:

DEFAULT ASM-2 2525 DYNAMOMETER HORSEPOWER SETTINGS
FOR 8.6" ROLLERS BASED ON NUMBER OF ENGINE CYLINDERS

VEHICLE TYPE	3 CYL.	4 CYL.	5 & 6 CYL.	8 CYL.	>8 CYL.
SEDAN	6.9	9.5	11.5	13.7	13.3
STATION WAGON	6.8	9.7	11.5	13.4	13.3
MINI-VAN	8.8	11.7	13.2	14.9	15.3
PICKUP TRUCK	8.0	10.9	13.6	16.0	17.8
SPORT/UTILITY	8.8	11.2	12.9	16.1	17.8
FULL VAN	9.0	11.6	14.7	16.3	17.2

If the dynamometer speed or torque falls outside the speed or torque tolerance for more than 2 consecutive seconds, or for more than 5 seconds total, the mode timer shall reset to zero and resume timing. The minimum mode length shall be determined as described in A2(d)(2)(iii). The maximum mode length shall be 90 seconds elapsed time (mt=90).

During the 10 second period used for the pass decision, the dynamometer speed shall not fall more than 0.5 mph (absolute drop, not cumulative). If the speed at the end of the 10 second period is more than 0.5 mph less than the speed at the start of the 10 second period, testing shall continue until the speed stabilizes enough to meet this criterion.

(iii) The pass/fail analysis shall begin after an elapsed time of 25 seconds (mt=25). A pass or fail determination shall be made for the vehicle and the mode shall be terminated as follows:

(A) The vehicle shall pass the ASM2525 mode if, at any point between an elapsed time of 25 seconds (mt=25) and 90 seconds (mt=90), the 10 second running average measured values of each pollutant are simultaneously less than or equal to the applicable test standards described in A1(a). If the vehicle passed the ASM5015 mode, as described in A2(d)(1)(iii), the ASM2525 mode shall be terminated upon obtaining passing scores for all three pollutants. If the vehicle failed the ASM5015 mode, the ASM2525 mode shall continue for an elapsed time of 90 seconds (mt=90).

2. Pass/Fail determinations may be made at mt=15 seconds if a 50% safety margin in cutpoints is applied from mt=15 to mt=25 seconds, i.e. emissions for all pollutants are 50% below the appropriate ASM standards.

(C) The vehicle shall fail the ASM2525 mode and the mode shall be terminated if the requirements of A2(d)(2)(iii)(A) are not satisfied by an elapsed time of 90 seconds (mt=90).

(e) Second Chance Tests.

(1) If the vehicle fails the first-chance test, the test timer shall reset to zero (tt=0) and a second-chance test shall be performed, except as noted below. If the vehicle is not tested within 20 minutes of failing the test it shall be preconditioned for an additional 60 seconds prior to the start of the retest. The second-chance test shall be of the same maximum duration as the first chance test.

(2) Repetition or extension of failed modes for two mode ASM tests. Except in the case of vehicles subject to preconditioning specified in A2(b)(10)(i), if at least 90 seconds of loaded preconditioning is performed, as specified in A2(b)(10)(ii), then the second-chance test may be omitted.

(i) If the vehicle failed only the first mode (ASM5015) of the first chance test, then that mode shall be repeated upon completion of the second mode (ASM2525). The repeated mode shall be performed as described in A2(d)(1) except that the provisions of A2(d)(1)(iv) shall be omitted. The test will terminate when the mode ends or when the vehicle passes, whichever occurs first.

Failing vehicles shall undergo a speed variation consisting of an acceleration to 20 mph in approximately 2-4 seconds, a deceleration with braking to 10 mph in approximately 4-6 seconds, and a final acceleration to 15 mph in approximately 4-8 seconds. The times here should be taken as general guidelines as all vehicles will respond differently to this procedure. This procedure is performed to reduce pattern failures in vehicles with emission control systems that

(ii) If the vehicle is failing only the second mode (ASM2525) of the first chance test, then the second mode shall not end at 90 seconds but shall continue for up to 180 seconds. Mode and test timers shall not reset but rather continue up to 180 seconds. The provisions of A2(d)(2) shall continue to apply throughout the 180 second test period.

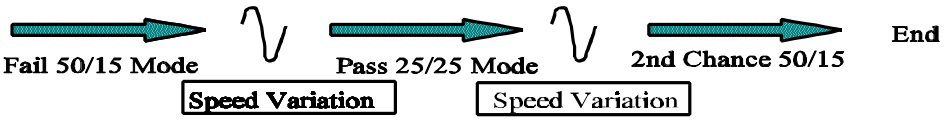
(iii) If the vehicle failed both modes (ASM5015 and ASM 2525) of the first chance test, then the vehicle shall receive a second-chance test for the ASM5015. If the vehicle fails the second-chance ASM5015, then the vehicle shall fail the test. Otherwise, the vehicle shall also receive a second-chance ASM2525.

The four possible outcomes described above are illustrated in Figure1, B-11. Each mode has a maximum time of 90 seconds.

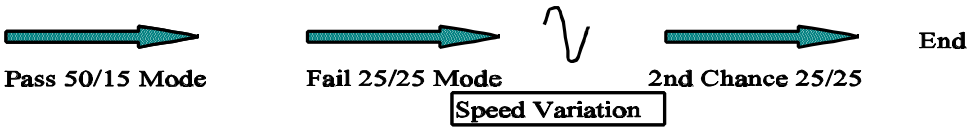
Figure 1

Outcome 1 - Vehicle Passes Both Modes (Total Max Time Approximately 180s)

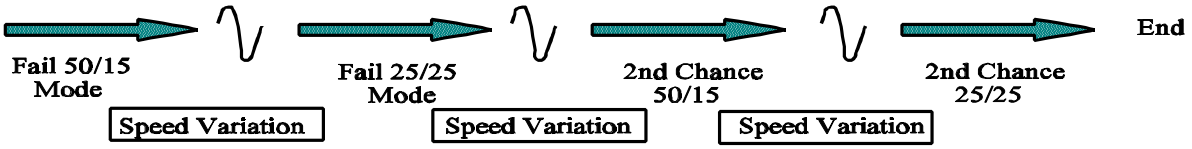
Outcome 2 - Vehicle Fails 50/15, Passes 2525 (Total Max Time Approximately 270s)



Outcome 3 - Vehicle Passes 50/15, Fails 25/25 (Total Max Time Approximately 270s)



Outcome 4 - Vehicle Fails Both Modes (Total Max Time Approximately 360s)



Appendix T

Vehicle Lookup Table