



Emissions Inspector Study Guide

Subject: On-Board Diagnostics Testing

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Air Quality & Emissions Testing

- Motor vehicles are the largest source of pollutants hydrocarbon (HC) and carbon monoxide (CO) in Texas.
- Motor vehicles emit toxic air pollutants and contribute to the formation of ground level ozone. A “typical” vehicle emits a half ton of air pollution annually. A malfunctioning vehicle emits many times that amount.
- Ozone is formed by atmospheric reaction between hydrocarbons (HC) and oxides of nitrogen (NO_x).
- Hydrocarbons (HC) emissions and oxides of nitrogen (NO_x) are the main causes of urban smog.



History of Emissions Program in Texas

- Texas emissions testing began in 1990 and has evolved into the current program now in use.
- The primary testing program currently in place is the On-Board Diagnostics (OBD II) test. OBD II protocol began in 1996.
- Gasoline powered vehicles that are 2-24 years old must complete an On-Board Diagnostics (OBD) test in accordance with State and Federal requirements. The primary purpose of OBD II is to ensure that vehicles emit the minimum level of pollutants through their useful life.



1996 Chevy Corvette

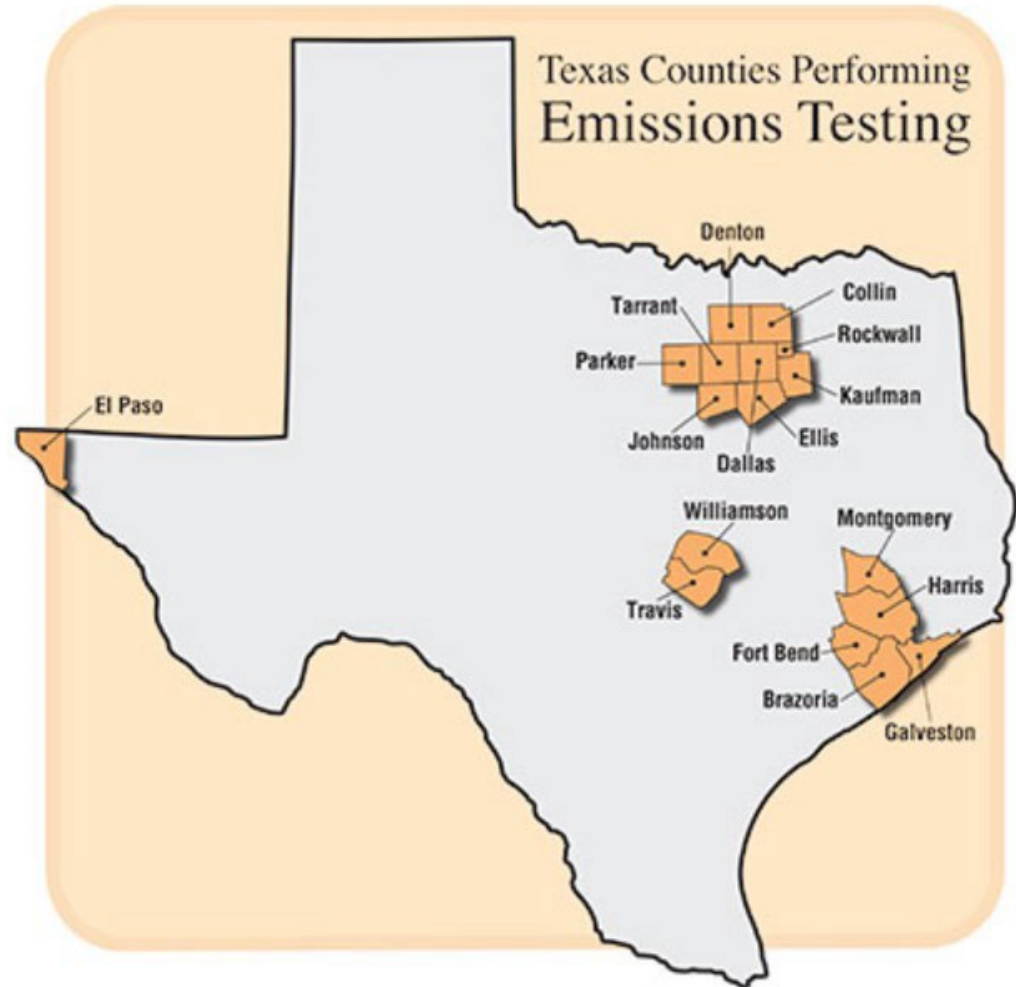


2020 Chevy Corvette



Affected Counties

- An Affected County is any county participating in an inspection and maintenance program (I/M) to reduce harmful emissions from motor vehicles.
- 17 counties in Texas are participating in Emissions Testing and Bexar County will implement in 2026.





Designated & Exempt Vehicles

Designated Vehicles

- Any vehicle capable of being powered by gasoline.
- 2-24 years of age.
- Required to be registered in an “affected” county.
- Primarily operated in an “affected” county.

Exempt Vehicles

- Vehicles not capable of being powered by gasoline, including electric and diesel-powered.
- Vehicles not registered in an affected county or not primarily operated in an affected county.



Waivers and Extensions

To apply for a waiver, motorists must demonstrate that they have taken every reasonable measure to comply with the requirements of the vehicle emissions I/M program and a waiver shall have minimal impact on air quality.

Individual Vehicle Waiver

- The motorist has taken every reasonable measure to comply with the requirements of the vehicle emissions I/M program and a waiver shall have minimal impact on air quality.

Low Mileage Waiver

- Low mileage exemption for motorists who drive less than 5,000/year.
 - Fail both the initial test and free retest.
 - Incur \$100 of emissions related repairs.
 - Drive less than 5,000 miles/year.

Low-income Time Extension

- If the vehicle failed the emissions test and vehicle owner's annual income is below the national poverty level, the motorist may be granted a one-year extension.

Advise customers to contact their local Texas Department of Public Safety Vehicle Inspection Waiver office for [further information on waivers and extensions or visit Waivers and Time Extensions | Department of Public Safety \(texas.gov\)](#)



Testing Fees

Refer to the following fee chart for your “affected county”

- Dallas/Ft. Worth
- El Paso County
- Houston/Galveston
- Travis and Williamson





TEXAS DEPARTMENT OF PUBLIC SAFETY Consumer Information



Prerequisites for Inspection:

- Proof of liability insurance.
- CNG fuel vehicles must provide proof of the system's expiration date.

Inspection items for (F.M.C.S.R) Commercial Vehicles Only are as follows:

| | | |
|------------------|----------------------|--------------------------|
| Backup Lamp | Identification Lamps | Service Brake System |
| Beam Indicator | License Plates | Side Marker Lamp |
| Cab Lamps (Truck | Lamp | Side Reflector |
| Clearance Lamps | Mirrors | Suspension |
| Tractor Only) | Mud Flaps | Tail Lamp |
| Coupling Devices | Parking Brake | Tires |
| Emission System | Rear Reflectors | Tractor Protection Valve |
| Exhaust System | Rear Impact Guard | Turn Signals |
| Fuel System | Reflective Tape | Wheel Assembly |
| Frame | Seatbelts | Windshield |
| Gas Cap | Steering System | Window Tint |
| Horn | Stop Lamps | Windshield Wipers |
| Hazard Warning | | |
| Headlamps | | |

Passenger cars and light duty trucks registered in an affected county requiring emissions testing will have the following items inspected:

| | |
|--------------------------------------|---------------|
| Catalytic Converter System | Gas Cap |
| Exhaust System | Intake System |
| EGR System | PCV System |
| Evaporative Emissions Control System | |

| INSPECTION TYPE | AMOUNT YOU PAY AT STATION |
|--|---------------------------|
| Commercial | \$40.00 |
| Emissions-only vehicles (El Paso, Travis, & Williamson Counties) | \$11.50 |
| Emissions-only vehicles (All other Emissions Counties) | \$18.50 |

If a vehicle fails on the initial inspection and the statutory fee is charged, the vehicle must have required repairs completed and presented to the initial station within 15 days for one free re-inspection.

Online Resources:

For more information, please visit <https://www.dps.texas.gov/rsd/vi/index.htm>
or submit your questions to <https://www.dps.texas.gov/apps/rsd/contact/Contact?sProgram=VI>

Vehicle Recall Information

Scan QR Code to search Vehicle Recall Information or visit

www.nhtsa.gov



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Texas Department of Public Safety

INSPECTING ONBOARD DIAGNOSTIC (OBD II) SYSTEMS



INTRODUCTION: OBD II Inspection

- On-Board diagnostic systems (OBD) on gasoline-powered vehicles from 2-24 years old will be checked as part of the Texas vehicle inspection program.
- The purpose of this course is to familiarize potential vehicle inspectors with the OBD II systems and what it means when a vehicle fails the OBD II inspection.
- OBDII systems monitor all components that affect vehicle emissions. OBD II systems detect and record malfunctions of these components, often before the motorist becomes aware of any problem.
- The OBD II inspection consists of checking the results of the self-tests that have occurred while the vehicle was driven prior to the time of inspection.
- The vehicle does not have to be warmed-up to perform an OBD II inspection.
- This course addresses:
 - Air quality in Texas – Why are we concerned about vehicle pollution?
 - The Texas OBD II Inspection Procedure



OBD II Testing: Air Quality

WHY ARE WE CONCERNED ABOUT MOTOR VEHICLE POLLUTION?

- Motor vehicles emit toxic air pollutants and contribute to the formation of ground level ozone.
- A “typical” vehicle emits a half ton of air pollution annually.
- A malfunctioning vehicle emits many times that amount.



OBD II Testing: Ozone



Texas has a serious ozone pollution problem. Motor vehicles are the largest source of ground-level ozone (smog) in Texas. Smog damages lung tissue and aggravates respiratory disease.



Ozone is formed by atmospheric reaction between hydrocarbons (HC) and oxides of nitrogen (NOX).



Motor vehicles are the largest source of toxic/carcinogenic air pollutants in Texas. Toxic compounds threaten human health even at very low levels.



Carbon monoxide (CO) is a toxic air pollutant that impairs cardiovascular function. Motor vehicles are the largest source of CO in Texas.



The primary purpose of the OBD II is to ensure that vehicles emit the minimum level of pollutants through their useful life.



OBD II Inspection



OBD II systems monitor all components that affect vehicle emissions.



OBD II systems detect and record malfunctions of these components, often before the motorist becomes aware of any problem.



The OBD II inspection consists of checking the results of the self tests that have occurred while the vehicle was driven **prior** to the time of inspection.



The vehicle **does not** have to be warmed up to perform an OBD II emissions inspection.



Step 1. Determine Applicability

Inspection:

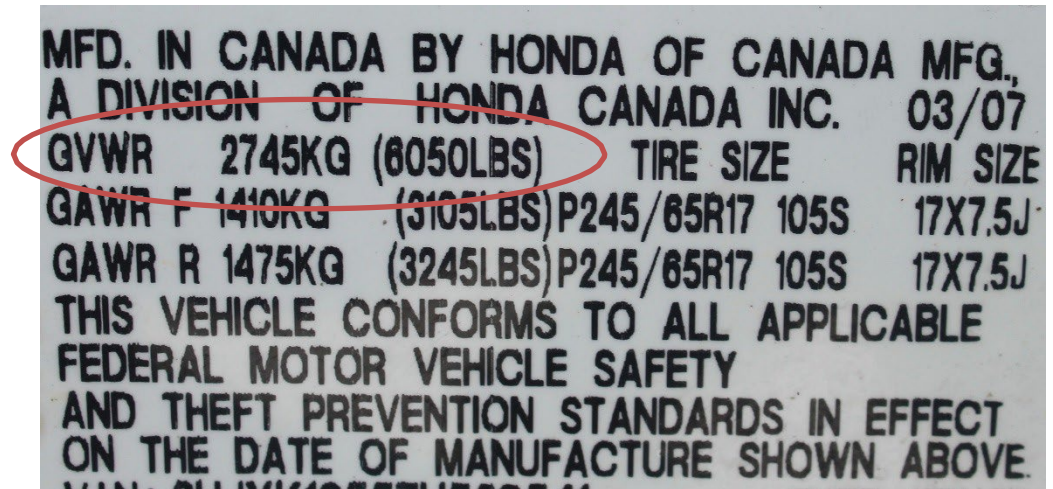
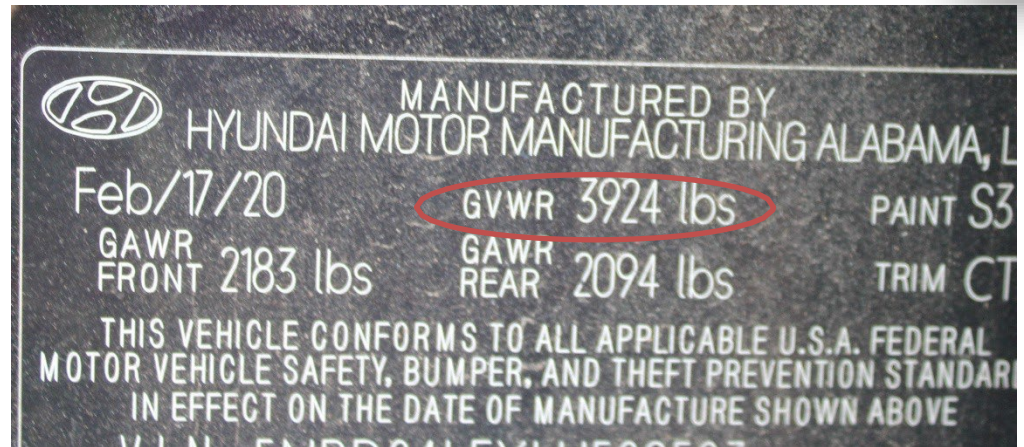
- The OBDII inspection consists of checking the results of the self-tests that have occurred while the vehicle was driven *prior* to the time of inspection
- The vehicle does not have to be warmed-up to perform an OBD II inspection

Applicability:

- OBDII systems are required on all 1996 or newer model gasoline powered vehicles with a GVWR (gross vehicle weight rating) of 8,500 pounds or less.
- Vehicles with a GVWR of 8,501 and greater are not required to have a Diagnostic Link Connector (DLC). However, if equipped, connect to the DLC.
- The inspector must enter all required information as accurately as reasonably possible. Incorrect information may cause inaccurate test results



GVWR Examples





Step 2. Connect Inspection System

- All vehicles 2-24 years old with a GVWR of 8,500 and less are equipped with a standard Diagnostic Link Connector (DLC).
- This allows a generic inspection tool to be used on all OBD II-equipped systems.



DLC Location

- With the ignition key off, locate the vehicle's Diagnostic Link Connector (DLC) and plug the OBD II test lead into the DLC.
- The diagnostic connector is required to be located between the driver's end of the instrument panel and approximately one-foot beyond the vehicle centerline, on or below the instrument panel.
- On most vehicles, the connector is located beneath the instrument panel, near the steering column. The connector is usually exposed.
- Some vehicles have hard-to-find DLC connectors. Refer to the manual to locate hard-to-find connectors.
- Use care when removing covers over any DLC.

OBD II Connector from a Worldwide Analyzer

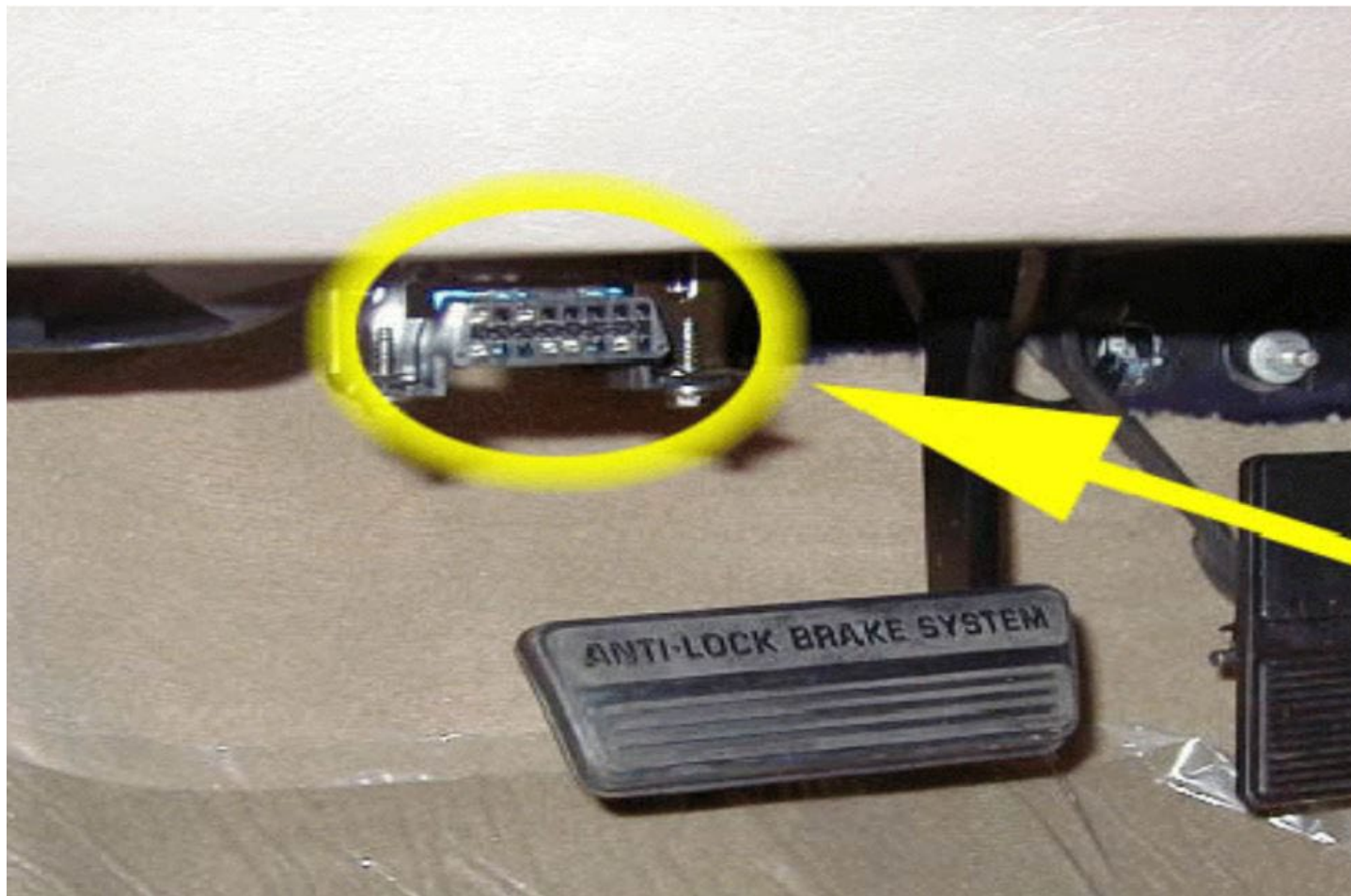


ESP Wireless OBD connector





Typical DLC Location





Not a typical DLC location



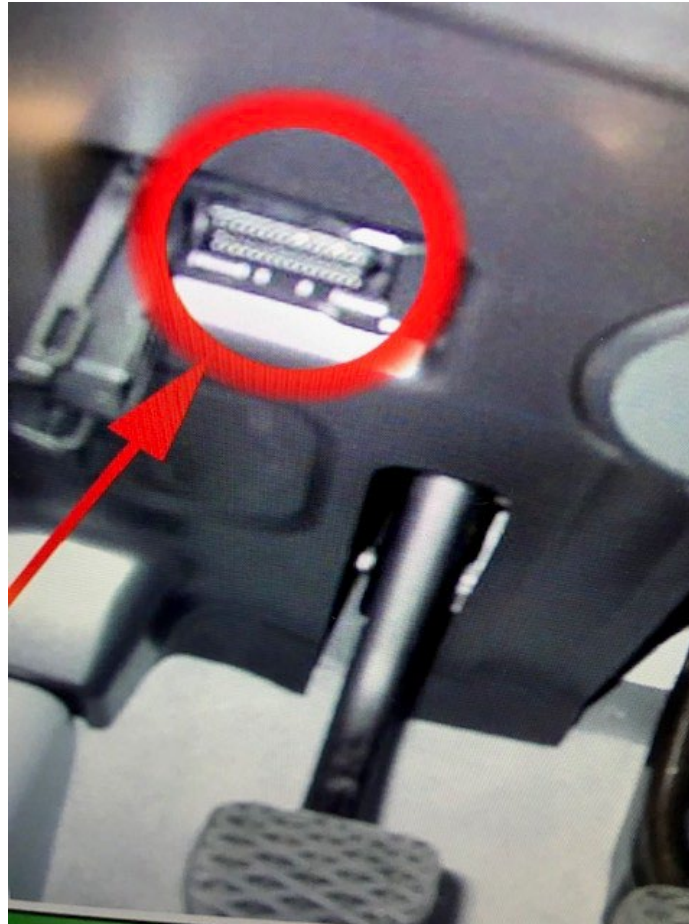


Hidden behind cover DLC location, located under steering wheel





Hidden behind two covers DLC location





Located on the passenger side





Hidden behind wooden cover DLC location



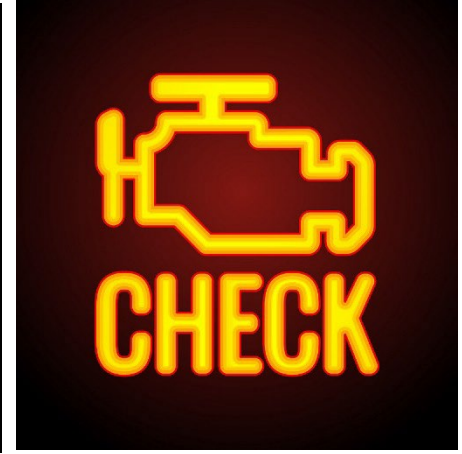
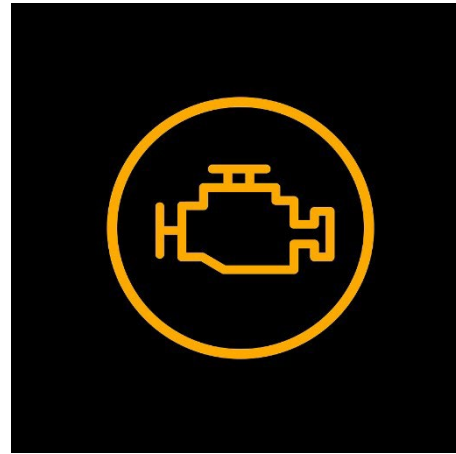
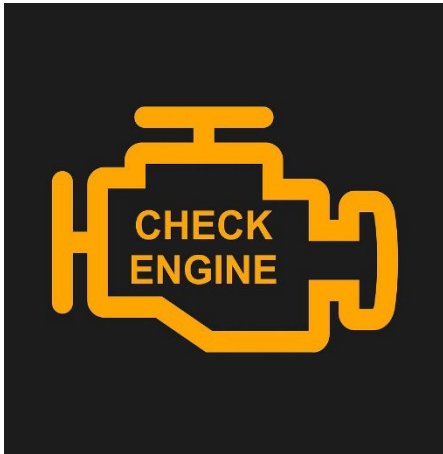


Step 3: Visual Inspection of Malfunction Indicator Light (MIL)

- The Malfunction Indicator Light (MIL) is the official term for the warning light (amber in color) 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," or the "International Engine Symbol" along with the word "Check," or some combination of these.
- The purpose of the MIL is to alert the driver to the malfunction so repairs can be performed in a timely manner.



MIL Symbols





Types of MIL Illumination

When a severe misfire occurs that could damage the catalytic converter, the MIL is required to flash on and off once per second. Flashing is intended to discourage vehicle operation.

Constant illumination of the MIL (i.e., it is not flashing) indicates that a problem has been detected and the vehicle should be serviced as soon as possible.



Visual Inspection of the MIL

- The Inspector is required to perform two checks of the **MIL**:
 - **Key-On Engine Off (KOEO)**
 - **Key-On Engine Running (KOER)**
 - **Warning:** *Failure to answer either question properly could result in a 6-month suspension of your inspector license and/or a possible fine.*
- Be sure to look at correct light. Do not fail vehicle if the “Maintenance Reminder Light” is on.
- After the KOER test, press continue on the analyzer to “Download MIL Status,” “Download Readiness Status,” and Diagnostic Trouble codes” (if any).
- The MIL Status refers to whether or not the Powertrain Control Module (PCM) has commanded the MIL to be turned on.



Visual Inspection of the MIL – Key On Engine Off (KOEO)

- Determine if the instrument panel MIL illuminates when the ignition key is turned to the “key on engine off” (KOEO) position.
- The MIL must come on when the ignition key is turned to the “key on engine off” position. This allows the inspector 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 “key on engine off” position.
- However, on some vehicles, e.g., Chryslers and Hondas, the MIL will illuminate very briefly when the key is turned to the “key on engine off” position and then will go out. This is **not** a reason for rejection.



Visual Inspection of the MIL- Key On Engine Running (KOER) Starting the engine



Notice the different lights/warnings on the vehicle. The inspector needs to watch for the MIL (amber in color) to the left of the speedometer. If operating correctly, the MIL will disappear after a couple of seconds. If the MIL is on while the engine is running, the vehicle's OBD system has determined that there is a problem with the vehicle.



Visual Inspection of the MIL – Key On Engine Running (KOER)

KOER

- Start the engine and allow it to idle. Determine if the MIL is illuminated while the engine is running.
- If the MIL is on while the engine is running, the vehicle's OBD system has determined that there is a problem with the vehicle. In this case, there should be one or more diagnostic trouble codes (DTCs) stored in the vehicle's computer.
- If the MIL is not illuminated, the analyzer does not consider any DTC's, i.e. Pending or History codes.



Visual Inspection of the MIL: Key On Engine Running (KOER) MIL remains illuminated



If the MIL remains on while the engine is running, the vehicle's OBD system has determined that there is a problem with the vehicle.



Be sure to look at the correct light



- The MIL will illuminate the “Service Engine Soon,” “Check Engine,” or the international engine symbol.
- Maintenance Required (as shown) **are not** MILs.
- **Do not fail** a vehicle if the maintenance required reminder light is illuminated.



Step 4: OBD II System Download

- **After the KOER test, press continue to download data obtained from the vehicle's OBDII system.** Test system will communicate with the On-board computer. If communication cannot be established, the analyzer will prompt the inspector to recheck the connection and try again. If communication is established, the test system will perform the following tasks:
 - Downloads MIL status
 - Downloads readiness status
 - Diagnostic trouble codes (DTCs)



MIL Status

- MIL status refers to whether or not the PCM has commanded the MIL to be on.
- The purpose of checking the MIL status using the inspection system is to determine if the vehicle's OBD system has commanded the MIL to turn on based on a malfunction.
- This allows the inspector to determine if there is a malfunction, even if the MIL is not actually illuminated.
- The MIL may not be on because of a problem with the MIL itself, or due to tampering with the MIL (check engine light).



Readiness

- OBD II systems must indicate whether or not the onboard diagnostic system has monitored each component.
- Components that have been diagnosed are termed “Ready,” meaning they were tested by the OBD II system.
- Once a monitor has been set to “Ready,” it will continue to indicate “Ready” unless the vehicle’s battery has been disconnected or the codes have been cleared with a scan tool.



Readiness

- Normally, the readiness status of all components or systems will remain in a **“Ready”** state.
- However, methods such as disconnecting the battery or clearing the codes with a scan tool to temporarily extinguish the MIL have occurred.
- If either method has been utilized to extinguish any DTCs present, all non-continuous components or systems will be set to a **“Not Ready”** status.



Readiness

- OBD-equipped vehicles model year 1996 through 2000 shall fail the emissions portion of the I/M program if more than two OBD monitors are set to ***“Not Ready”***.
- OBD-equipped vehicles model year 2001 and newer that are subject to OBD testing shall fail the emissions portion of the I/M program if more than one OBD monitor is set to ***“Not Ready”***.



Diagnostic Trouble Codes (DTCs)

- Under the OBD II requirements, all manufacturers must comply with a standardized convention format for diagnostic trouble codes (DTCs).
- The universal DTC format consists of a 5-character, alphanumeric code, consisting of a single letter character followed by four (4) numbers. i.e. (P0301).
- Whenever the MIL is illuminated, a DTC should be stored in the vehicles PCM.
- If the MIL is commanded on, the system will download DTCs. A DTC describes a failure identified by the OBD II system.



How a Monitor Becomes Ready

- The powertrain control module (PCM-OBD II terminology for the onboard computer) sets a monitor to “ready” after an “*appropriate, manufacturer recommended*” drive cycle has been performed.
- Although normal driving **may** set a monitor to “ready” in a couple of days, a Dealer or qualified technician has the best information on Drive Cycles and how to get a vehicle ready.



Probable Causes of OBD II Failures

- Once a monitor has been set to “ready”, it will continue to indicate “ready” unless the vehicle’s battery has been disconnected or codes cleared with a scanning tool.
- OBD II-equipped vehicles model year 1996 to 2000 shall fail the emissions test if more than two OBD II monitors are set to “not ready”.
- OBD II-equipped vehicles model 2001 and newer shall fail the emissions test if more than one OBD II monitor is set to “not ready”.
- A flashing MIL indicates a catalyst damaging condition; steady MIL indicates a problem that could cause emissions to exceed 1.5 times the standard.
- Readiness status; the OBD II system has run enough system monitors prior to the OBD II inspection.



Inspection Pass/Fail Criteria

- **1) The MIL does not illuminate at all when the ignition key is turned to the “key on, engine off” (KOEO) position.**
 - This test determines if the MIL is working. The OBD II system cannot alert drivers to the problems if the MIL does not work.
 - Inspectors are to follow the directions and answer each question on the analyzer:
 - 1. Is the vehicle a “Hybrid”?
 - 2. Is the vehicle “Keyless”?
 - Inaccurate Information can and will affect test results.



Inspection Pass/Fail Criteria

- **2) The MIL is illuminated when the engine is running – “key on, engine running” (KOER)**
 - The reason for the failure is because the vehicle’s OBD II system has detected a malfunction and turned on the MIL to alert the driver. If the MIL is on while the engine is running, the vehicle’s OBD II system has detected that there is a problem, emissions related or not. In this case, there should be one or more diagnostic trouble codes (DTCs) stored in the vehicle’s computer.



Inspection Pass/Fail Criteria

- **3) The MIL status, as indicated by the scan tool, is ON.**
 - The purpose of checking MIL status using the inspection system is to determine if the vehicle's OBD II system has *commanded the MIL to turn on* based on a malfunction.
 - In most cases, the MIL should also be illuminated when the engine is running. However, even if the MIL is not illuminated with the engine running, the vehicle will fail because the inspection system shows that the vehicle's OBD II system tried to turn the MIL on as a result of a malfunction.



Inspection Pass/Fail Criteria

- **4) More than the allowable numbers of monitors are not ready.**
- Typically, the readiness status of all components or systems will be “ready.” However, if the vehicle’s battery has been recently disconnected or if the DTC’s have been recently cleared with a scan tool and the appropriate drive cycle has not been completed, components or systems will be set to “not ready”. This may have been done to temporarily extinguish the MIL for the inspection.



Inspection Abort/Fail

- **5) DLC communication failure:**
 - If after 2 attempts, communication between analyzer and the vehicle's OBD II system cannot be established, the emissions test will be aborted.
 - The analyzer will prompt the inspector to verify connection. However, if inspector selects "continue" on the analyzer, the vehicle will fail and instruct the inspector to continue with the fuel cap pressure test to complete the emissions test, if applicable.
 - Customers will not be charged a fee if the test is aborted.



Non-Communication vehicles over 8501 GVWR

- **5) Vehicles over 8,501 GVWR Non Communication**
- Vehicles with a GVWR over 8,501 are not required to have a DLC. However, if vehicle is equipped with a connector, connect analyzer to the OBD DLC.
- After entering in the correct GVWR of the vehicle and there is no connector, the analyzer will continue the Heavy Duty Inspection Sequence.



Fuel Cap Pressure Test

Every gasoline powered vehicle from 2-24 years old will be checked to determine if the gas cap is missing or defective.

Inspection Procedure:

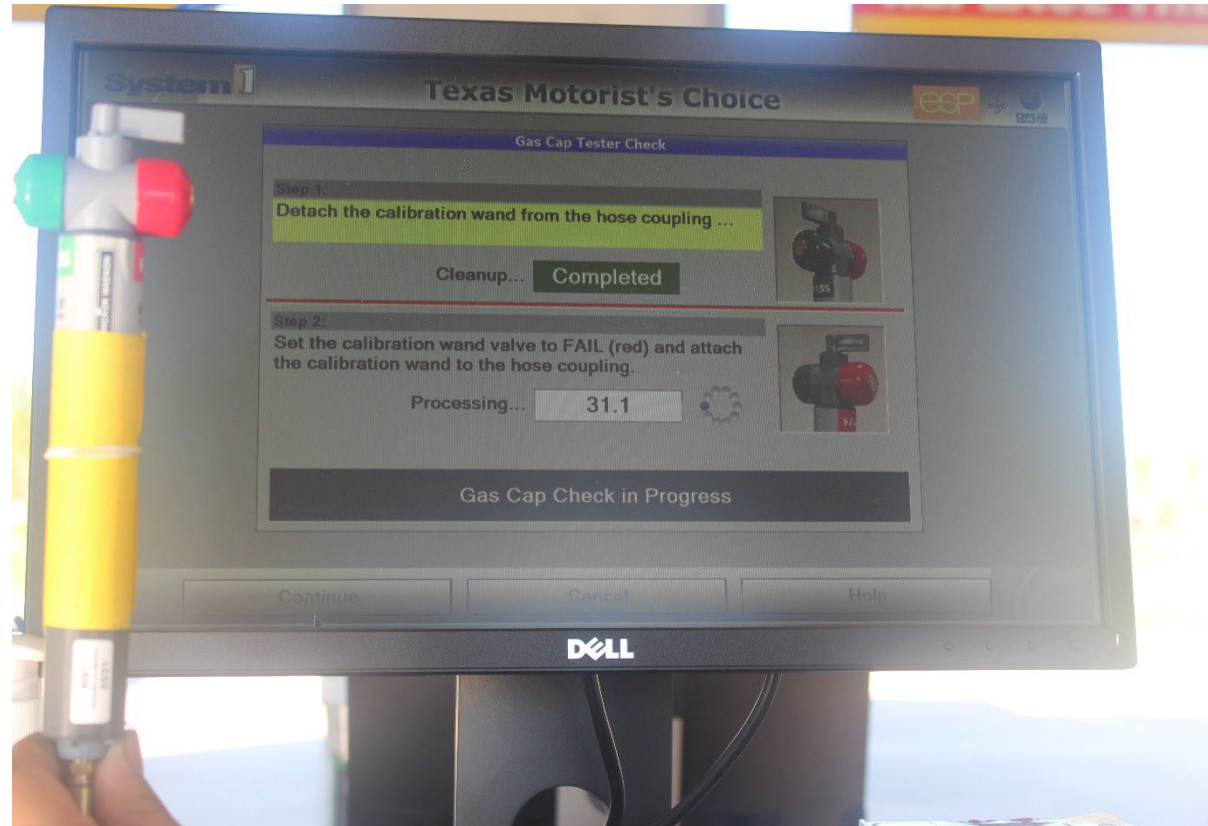
- Conduct daily calibration check of the gas cap testing device.
- Check for presence.
- Check for the correct type of gas cap(s).
- Remove gas cap(s) and test using the approved testing device.
- Any gas cap(s) failing the initial test will be tested a second time to verify failure.



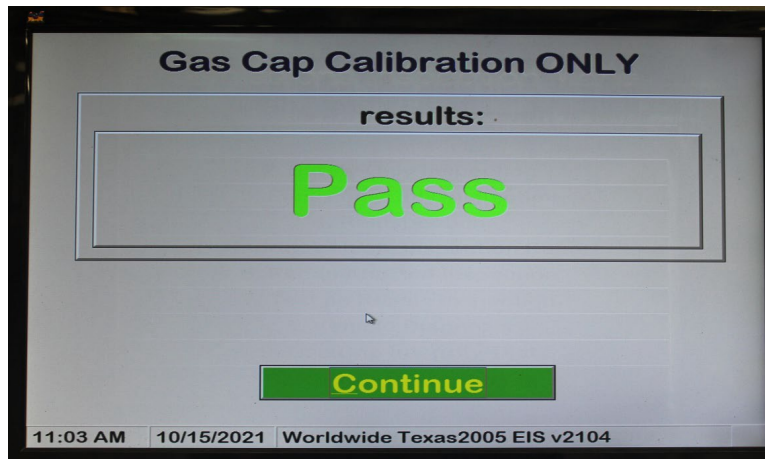
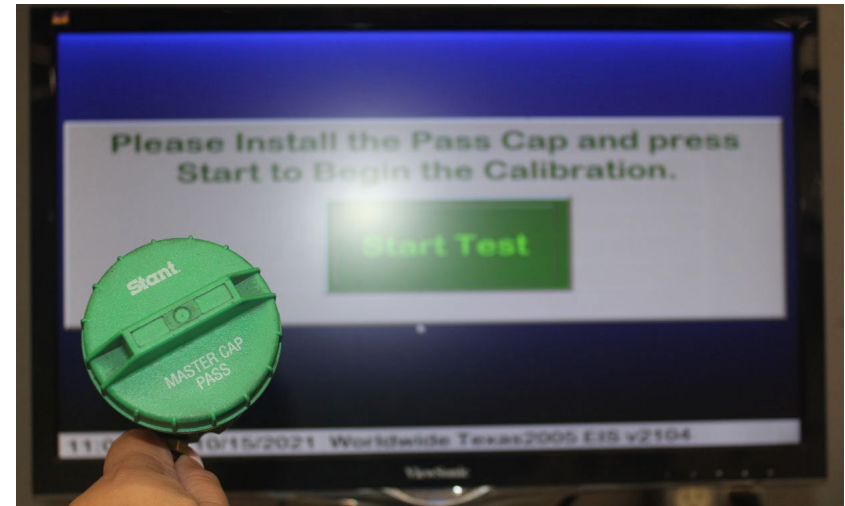
Visual Inspection Items

- Catalytic Converter System
- Exhaust System
- EGR system
- Evaporative emissions Control System
- Intake System
- PCV System
- Presence of a Gas Cap

Fuel Cap Calibration (Using ESP equipment)



Fuel Cap Calibration (Using Worldwide equipment)



Inspector preparing for fuel cap test





Vehicle Inspection Report

Customers will receive a vehicle inspection report, whether the vehicle passes or fails the inspection, signed by the inspector performing the test that includes the following information:

- a) The MIL illumination check results.
- b) If the MIL is illuminated, DTC Numbers and explanations.
- c) Readiness results.
- d) Alert statement based on the reason for failing OBD.



Penalties

State law prohibits any person from selling, offering for sale, or using any system or device for the purpose of circumventing the emission control device on a vehicle or vehicle engine. State law also prohibits any person from removing or disconnecting any part of the emission control system of a motor vehicle, except to install replacement parts which are equally effective in reducing emissions. Violators are subject to penalties under the TCAA of up to \$25,000 per violation.



TAC Rule §114.20



Penalties

Figure: 37 TAC §23.62(b)

Violations and Penalty Schedule

| Category | 1 st | 2 nd | 3 rd | 4 th |
|--|--|---------------------|---------------------|---------------------|
| A | \$250 | \$500.00 | 6 month suspension | 12 month suspension |
| B | \$500.00 | 12 month suspension | Revocation | Lifetime revocation |
| C* | 12 month suspension | Revocation | Lifetime revocation | |
| *Category C violation §23.62(c)(3)(D). | Revocation | Lifetime revocation | | |
| D (Failing to possess a valid driver's license) | Suspension until bar removed | | | |
| E | \$500.00 | 12 month suspension | Revocation | Lifetime revocation |
| Administrative action (Failure to pay) | Suspension until penalty is paid in full | | | |



Review

What is a designated vehicle?

- A. A diesel-powered vehicle.
- B. A vehicle registered in an “affected” county.
- C. A vehicle from 2-24 years of age.

**January 1st, 2025, only gas-powered Passenger Cars and Light Duty Trucks registered in an affected county that is 2-24 years of age.*



Review

Motorcycles are required to have emissions testing.

- A. True
- B. False

**The correct answer is B. Motorcycles are considered exempt vehicles.*

All vehicles qualify for a waiver at a DPS Waiver Station when they fail the emission test.

- A. True
- B. False

**The correct answer is B. Only motorists/vehicles meeting the requirements for an Individual, low income, or low mileage waiver.*



Review

Do motor vehicles emit toxic air pollutants and contribute to the formation of ground level ozone?

A. True

B. False

**The correct answer is A. Motor vehicles emit toxic air pollutants and contribute to the formation of ground level ozone. A “typical” vehicle emits a half ton of air pollution annually.*



Review

Motor vehicle-related smog (ground level ozone) damages lung tissue and aggravates respiratory disease.

- A. True
- B. False

**The correct answer is A. Motor vehicle-related smog (ground level ozone) damages lung tissue and aggravates respiratory disease.*

Inspectors should warm up a vehicle before performing an OBD II emissions inspection.

- A. True
- B. False

**The correct answer is B. The vehicle does not have to be warmed up to perform an OBD II emissions inspection.*



Review

OBD II systems were required on all model year 1996 or newer gasoline powered vehicles with GVWR of 8,500 pounds or less.

A. True

B. False

**The correct answer is A. OBD II systems were required on all 1996 or newer model gasoline powered vehicles with GVWR of 8,500 pounds or less.*



Review

The Maintenance Light is the official term for the warning light (amber in color) that is illuminated by the vehicle's OBD system when a malfunction occurs.

A. True

B. False

**The correct answer is B. The Malfunction Indicator Light (MIL) is the official term for the warning light that is illuminated by the OBD system when a malfunction occurs.*



Review

A flashing MIL light is intended to discourage vehicle operation because:

- A. There is no oil.
- B. You are about to run out of gas.
- C. Severe misfire may be occurring that could damage the catalytic converter.

**The correct answer is C. When a severe misfire occurs that could damage the catalytic converter, the MIL is required to flash on and off once per second. Flashing is intended to discourage vehicle operation.*



Review

When conducting a visual inspection of the MIL – Key On, Engine Off (KOEO), it is acceptable for vehicles like a Honda to illuminate very briefly when the key is turned to the “key on, engine off” position and then goes off. It does not have to stay on.

- A. True
- B. False

The correct answer is A. On most vehicles, the MIL will stay illuminated as long as the key is in the “key on, engine off” position. However, on some vehicles, e.g., Chryslers and Hondas, the MIL will illuminate very briefly when the key is turned to the “key on, engine off” position and then will go out. This is **not a reason for rejection.*



Review

A 2000 Toyota Corolla with 1 OBD Monitor set to “Not Ready” will fail an emissions test in an I/M program.

- A. True
- B. False

**The correct answer is B. For vehicles year model 1996 – 2000, we allow two (2) non-continuous monitors to be "Not Ready" and still pass the test, but three (3) or more "Not Ready" readings will cause the vehicle to fail.*

If the MIL does not illuminate at all when the ignition key is turned to the “key on engine off” (KOEO) position, it will pass.

- A. True
- B. False

**The correct answer is B. The MIL must come on when the ignition key is turned to the “key on engine off” position. This allows the inspector to check that the MIL is capable of illuminating if a malfunction were to occur.*



End of Program



**Remember, you have a responsibility to
the motorists and citizens of Texas to
ensure vehicles are**

SAFE!

