

MODULE 4 – Vehicle Emissions Inspection, Diagnostic and Repair Information

Module 4 Outline

19. The OBD I/M Inspection Process
20. Strategies for Addressing Challenging Unset Readiness Monitors
21. OBD Test Anomalies and Special Cases
22. Motorist Assistance Center (MAC) Referrals
23. Helpful Information Resources for Vehicle Repairers
24. The Applicability of Federal Vehicle Emissions Warranties
25. Prohibition Against Tampering

(19) The OBD I/M Inspection Process

The Massachusetts Vehicle Check on-board diagnostic (OBD) emissions test is designed to ensure that the vehicle keeps running as cleanly as it was designed to run, which in turn protects the air we breathe.

General Description

The OBD inspection test typically takes about 3 minutes. The inspector connects the inspection workstation to the vehicle's on-board computer, and then downloads engine and emissions control data. The workstation checks several OBD system functions:

Communication. Does the vehicle's OBD system communicate with the workstation? If the vehicle's OBD system cannot communicate with the station's workstation, the OBD system must be repaired before the emissions test can proceed.

Readiness. Is the vehicle's OBD system *Ready* to be tested? As the vehicle drives, the OBD system checks the performance of various emissions-related components and systems. If the OBD system has not performed enough of these self-checks, your vehicle is *Not Ready* for an emissions test.

OBD Vehicles Exempt from Readiness Checks. Some vehicles exhibit unique testing characteristics that prevent them from receiving a complete OBD emissions test. These particular vehicles will skip over the readiness checks and go directly to the malfunctioning indicator light (MIL), or the Check Engine light, check.

Check Engine Light. Is the Check Engine light (sometimes labeled as "Service Engine Soon") commanded on? When



this light is turned on, it indicates that one or more components of your vehicle's emission control system is not working as it was designed to work, and repairs are needed. If the light does not turn on when the OBD system tries to turn it on, this problem must be corrected.

Diagnostic Trouble Codes (DTCs). If the OBD system has detected an emissions-related problem, it will turn on the Check Engine light and store one or more DTCs that indicate which systems or components are not performing as designed. Reviewing these codes is the first step in diagnosing an emissions-related problem. These codes, along with other information in

the OBD system, can help guide emissions repair technicians to a proper diagnosis and take the “guess-work” out of the process.

Vehicle Inspection Report. The failing emission results are printed on the second page of the Vehicle Inspection Report (VIR), which the inspector will give the motorist when the inspection is finished.

The VIR provides information that a repair technician can use to diagnose the vehicle's emission problem.

On-Board Diagnostic (OBD) Test Results					
OBD Tampering Check	Pass	OBD Connector Result	Pass	OBD MIL Status Result	Fail
OBD Key-On Bulb Check	N/A	OBD Communication Result	Pass	OBD Readiness Monitor Result	Pass
OBD Engine-Running Bulb Check	Pass	OBD RPM Check	Pass	OBD Test QA Check	N/A
OBD Scan Tool Check Result	N/A	Pin 16 Volts Check	13.8		
On-Board Diagnostic (OBD) Monitor Results			OBD System Diagnostic Trouble Codes		
Catalyst Monitor	Ready		P1494		
Catalyst Heater Monitor	Not Supported				
Evaporative System Monitor	Ready				
Secondary Air System Monitor	Not Supported				
A/C System Monitor	Not Supported				
O2 Sensor Monitor	Not Ready				
O2 Sensor Heater Monitor	Not Ready				
Exhaust Gas Recirculation (EGR) Monitor	Not Supported				
OBD System Test - Failure Messages					
Your vehicle has FAILED its EMISSIONS TEST due to a problem with the engine or emission control systems found by the On-Board Diagnostic (OBD) system. The problem should be repaired and the vehicle re-inspected. Diagnostic Trouble Codes stored in the OBD system are listed above (if available) to assist in repairing the vehicle.					

Program Reminder: A Certificate of Rejection shall entitle the owner or operator to one free re-inspection, provided that the vehicle is submitted for re-inspection at the same inspection station which issued the Certificate of Rejection within 60 calendar days for motor vehicles

Types of Vehicle Emissions Inspection Failures

On-Board Diagnostic (OBD) Test Results					
OBD Tampering Check	Pass	OBD Connector Result	Pass	OBD MIL Status Result	Fail
OBD Key-On Bulb Check	N/A	OBD Communication Result	Pass	OBD Readiness Monitor Result	Pass
OBD Engine-Running Bulb Check	Pass	OBD RPM Check	Pass	OBD Test QA Check	N/A
OBD Scan Tool Check Result	N/A	Pin 16 Volts Check	13.8		

1. **Visual inspection for emission device tampering.** The Inspector is instructed to check for obvious signs of tampering of the OBDII system such as wiring modifications to the DLC.
Reported on the VIR as: OBD Tampering Check (Pass/Fail)
2. **Unable to locate or connect to DLC.** The Inspector is instructed to inspect the DLC for damage, if the connector is obstructed or if the connector is missing.
Reported on the VIR as: OBD Connector Result (Pass/Fail)
3. **Workstation scan tool does not communicate with vehicle.** The Inspector will be instructed to plug the workstation's scan tool in to the vehicle's DLC connector. The vehicle's emission computer must communicate with the MA Inspection Workstation using a generic OBDII protocol.
Reported on the VIR as: OBD Communication Result (Pass/Fail)
4. **The engine RPM is less than 250 (excluding hybrids).** The Inspector will be instructed to start the engine; workstation will acquire and record the vehicle's RPM.
Reported on the VIR as: OBD RPM Check (Pass/Fail)
5. **MIL fails visual OBD Engine-Running Bulb check (KOER).** The Inspector will be instructed to visually inspect the dashboard's check engine light to ensure it is lit-up as commanded by the vehicle's emission computer when the engine is running. This visual inspection is only performed when the vehicle fails the MIL Status Results (PCM has commanded the check-engine light on).
Reported on the VIR as: OBD Engine-Running Bulb check (Pass/Fail)
6. **MIL fails visual Key-on Bulb check (KOEO retest only).** The Inspector will be instructed to visually inspect the dashboard's check engine light to ensure it is lit-up as commanded by the vehicle's emission computer when the key is in the run (on) position but the engine is not running. This visual inspection is only requested by the workstation when the vehicle failed the initial inspection's OBD running bulb check.
Reported on the VIR as: Key-on Bulb check (Pass/Fail)
7. **MIL Commanded on, Readiness Criteria Not Met.** The majority of vehicles fail the OBD inspection for two reasons: Readiness Criteria is

not met or MIL is commanded on (DTC stored). But repair technicians need to be aware of the less frequent failure types that are described in the OBD I/M Test Anomalies and Special Cases section of this module.

Reported on the VIR as: OBD MIL Status Result and OBD Readiness Monitor Result.

Detail Description

OBDII Emission Inspection Process

The following is the procedure the Massachusetts Inspection Workstation will follow to communicate and collect the required data from the vehicle's emission computer.

1. Attach workstation scan tool to vehicle's DLC connector.
2. Measures and record DLC voltage (pin 4,5 & 16)
3. Determine vehicle's communication protocol
4. Request the vehicle's RPM (unless Hybrid)
5. Request the number of PCMs and PCM IDs from the vehicle (Mode\$01, PID\$00) using the approved protocols.
6. Request OBD emissions type (PID \$1C). This is a generic PID \$1C, OBD_SUP (OBD supported) that tells you if the vehicle is OBD-I, OBD-II or doesn't meet any OBD requirements.
7. Determine emission monitor(s) status
 - Do not evaluate readiness for vehicles on the exemption list
 - The vehicle may be referred to a Motorist Assistance Center if it has exceeded the allowable number of Not Ready failures
 - If a vehicle has all continuous and non-continuous monitors Unsupported, it shall fail the OBD inspection.
8. Evaluate the MIL command status based on the data returned from the vehicle's on-board diagnostic system.
 - If the MIL is commanded on, the workstation shall send a generic Mode \$03 request to the vehicle's emissions computer to retrieve the stored OBDII-related diagnostic trouble codes.
9. Send Mode \$09 (if ECU supported) requesting VIN, CAL ID, CVN from vehicle's ECU.



The I/M workstation scan tool will require a response for each request (Steps 2 through 9 above). If any response is missing, the vehicle will fail inspection for communication. It will be up to the repairer to determine which response element(s) is missing. **(See OBD Test Anomalies and Special Case section for more information.)**

How do I know what the vehicle failed for?

Before you begin any diagnosis or repairs, you should look at the Vehicle Inspection Report (VIR) to determine the reason for the emission failure or possible Motorist Assistance Center (MAC) referral. What if the motorist doesn't bring VIR with vehicle?

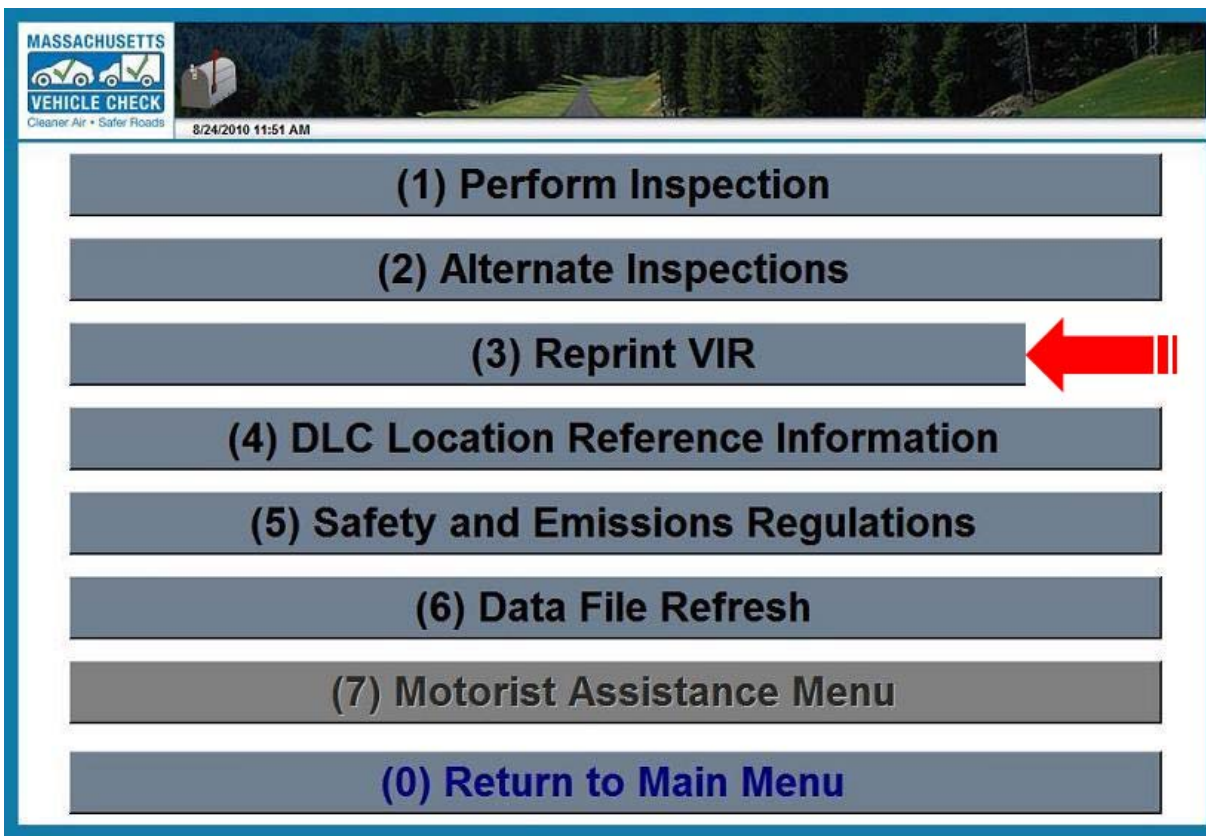
How to reprint a Vehicle Inspection Report VIR?

There are two (2) avenues available for the repair technician to access a duplicate VIR: the Massachusetts Inspection Workstation or via the Massachusetts Vehicle Check Web site

<http://www.massvehiclecheck.state.ma.us/>.

All Massachusetts inspection workstations have the ability to reprint a duplicate VIR even if the workstation did not perform the inspection. If your shop does not perform inspections, you have the ability to retrieve the VIR from a local inspection station that you may have a relationship with or utilize the MVC website.

Workstation VIR reprint procedure: From the Main Menu select:



(1) Vehicle Inspections, then (3) Reprint VIR.

The MVC website has a link that will return the VIR for the vehicle you are working once the VIN, plate number and plate type have been entered

- Home
- About the Program
- Information for Motorists
- Motorist Assistance Centers
- Commercial Inspection Program
- Inspection and Repair Industry
- Contact and Links



cleaner air safer roads

- ▶ Find an inspection station
- ▶ What if my vehicle doesn't pass?
- ▶ Find an emissions repair shop

Welcome to Massachusetts Vehicle Check!

VIR Reprint

Click here to reprint your vehicle inspection report.



<http://massvehiclecheck.state.ma.us/>

Often, a motorist may not seek repairs until they have failed the inspection several times, so it's a good idea to review all recent VIRs to get the complete picture.

(20) Strategies for Addressing Challenging Unset Readiness Monitors

Monitor Review

A monitor is a group of self-tests that the vehicle's OBDII software executes on emission components to determine if they can still perform their designed function.

Vehicles manufactured for sale in the United States are required to include software designed to indicate when emissions control systems have a defect that may lead to elevated tailpipe or evaporative emissions. This software will intrusively test the performance of each emission component. A monitor is the complete set of tests that are performed on one emission group.

For example, the Evaporative monitor consists of all tests necessary to examine the entire evaporative system ensuring the evaporative system is able to collect, store and then purge hydrocarbons (HC) in to the combustion chamber and not allow the HC fumes to be vented in to the atmosphere.

Continuous Monitors

Some monitors test continuously as the vehicle is being operated. These are known as Continuous monitors. They include the Comprehensive Component, Fuel System, and Misfire monitors. Continuous monitors should, in most cases, appear as *Complete* or *Ready* when viewed on a scan tool.

Non-Continuous Monitors

Some monitors test only when the defined operating conditions are present, these are known as Non-Continuous monitors and they do not run the entire time the vehicle is being operated. These monitors only test under certain operating conditions; these operating conditions, also called *enabling criteria*, must allow for the specific test to be run undetected by the driver with a certainty of obtaining the correct test results. This testing is only done under these specific conditions to prevent a false pass or a false fail result while running the test. By only running the monitor in a specific set of conditions the manufacturer can be sure that the results are accurate.

For example, the Evaporative monitor would not test the fuel system's ability to seal HC inside the fuel tank while the operator was refueling the vehicle and the fuel cap was removed. Built in to the PCM's software logic are all the conditions that must be satisfied before the test is allowed to begin.

Non-Continuous monitors may include Catalyst, Evaporative System, Secondary Air System, Oxygen Sensor, Oxygen Sensor Heater, and EGR System. Not all vehicle platforms use (support) all the non-continuous monitors listed.

Enabling Criteria

The OEM-defined enabling criteria include specific driving and engine operating conditions that must be met before the PCM will start the monitor test. If the vehicle is never driven/operated in a way that satisfies the enabling criteria for a particular monitor, that monitor will not start running. In most cases, monitors cannot be set using a scan tool; the vehicle's OBD system software will only begin a test once the enabling criteria are met. Once the PCM has finished testing the emission control system, the monitor is said to be *Complete* or *Ready*.

What Makes a Monitor Incomplete or Not Ready

Monitors on all vehicles are *Incomplete* or *Not Ready* until the OBD software runs its tests to completion. Once the non-continuous monitors are set to *Ready*, they should NOT change back to *Incomplete* or *Not Ready* until the DTCs are erased, battery power is disconnected, the PCM is disconnected and/or KAM (Keep Alive Memory) is lost. Just like the dashboard clock or radio presets in the vehicle, the PCM should have constant battery feed to power it. If that feed is missing due to a blown fuse or broken wire, the monitors will reset every time the key is cycled off.

Why Should Repair Technicians Care About Monitors?

The non-continuous monitors are checked as part of the Massachusetts vehicle emissions test. If there are too few *Complete* or *Ready* monitors, the vehicle fails the emissions test. When a vehicle is presented for a re-inspection, if there are too few *complete* monitors, the vehicle will be turned away from the emissions test, the results will print on the VIR (turn-away) document which will be handed to the motorist. This program element ensures the vehicle has been operated in such a manor allowing all the vehicle's emission components to be tested and eliminates the ability of anyone to clear DTCs before attempting a vehicle emission test. *Reminder:* if the DTCs have been cleared just prior to an inspection, the non-continuous readiness monitors will be *Incomplete* or *Not Ready*.

Along with accurately diagnosing and repairing the vehicle's emission failure, the repair process must also include confirming the repair. OBDII repairs can easily be confirmed by completing the applicable emission device readiness

monitor and then checking there is no pending or set DTCs. Completing the readiness monitors after a repair will reduce the potential come-back (MIL illumination) and guarantees the vehicle will be able to be re-inspected.

Vehicles that receive a turn-away for *Incomplete* monitors when presented for re-inspection will be considered a Retest Fail and will decrease the repair shop's score listed on the VIR. (Module 2, Section 15 describes the Emissions Repair Success Rating (ERSR) system. Once the repair data collection system is implemented, each registered repair shop's ERSR will be listed on the VIR of vehicles failing an OBD test.)

To pass the Massachusetts vehicle emissions test, 2000 and older model year vehicles may have a maximum of two (2) *Incomplete* or *Not Ready* non-continuous monitors. Also, 2001 and newer model year vehicles may have one (1) *Incomplete* or *Not Ready* non-continuous monitors.

Catalyst Monitor – Reinspection Requirement

In the Massachusetts Vehicle Check program, if the vehicle fails for a catalyst efficiency code (P0420-P0439), the catalyst monitor must be ready on the vehicle's re-inspection. No matter the model year or other monitor status, the catalyst monitor must be ready before the vehicle's attempted re-inspection; otherwise the vehicle will be turned away. For this reason, repair technicians should pay special attention to the status of the catalyst monitor after repairs are performed.

Catalytic Converters – Are they all the same?

Catalytic converters first appeared on vehicles in the mid-1970s. Today's OEM catalytic converters are designed to last in excess of 120,000 miles. As we are aware, many things lead to the degradation of a converter; vibration, shock, excessive heat, improper operation of the vehicle and poor maintenance of a vehicle. Given that many vehicles requiring a converter replacement have limited life expectancy, the cost of OEM converter become difficult to justify. But just because an aftermarket catalytic converter is available does it mean they are all the same and will behave the same?

There are several important items when considering installing an aftermarket catalytic converter(s).

- Original location and number of converter(s)
- The size and type of converter, bigger does not mean better
- Converter compliance is a result of reduction of tail pipe gas measurement. The aftermarket converter manufacturer must

demonstrate compliance by conducting vehicle mile accumulation and emission testing on actual production converters. To achieve this level of durability, the vehicle must be driven over a prescribed route until the accumulated mileage has-been achieved.

- Currently, there is no federal performance standard for the 49-state converter to pass an OBDII test.
- The only catalytic converters that are allowed to be sold and installed in California must meet an OBDII performance standard. These California approved converters perform much like original equipment. A link to California Air Resource Board (CARB)-approved catalytic converters can be found here:
www.arb.ca.gov/msprog/aftermktcat/aftermktcat.htm
- An aftermarket catalytic converter cannot be installed on a vehicle that is still under the manufacturer's warranty.

In many cases, it may be practical to explore the use of an aftermarket converter to repair a vehicle because it may reduce the overall cost of repair for your customers. The risk that you need to consider is that if you decide to use an aftermarket converter, that replacement catalytic converter does not have to pass a tailpipe test; it must satisfy the testing performed by the vehicle's emission ECU (the catalyst monitor must run to *Complete*). In other words, you and your customers should not expect a \$200 aftermarket CAT to perform as well as or last as long as a \$1,000 OEM or aftermarket CAT. When making your decision, it is important to remember that the OBDII catalyst monitor test was designed to evaluate an OEM catalytic convertor's performance. So, if an inferior grade of converter is used, a vehicle may struggle to set the catalyst monitor to *Ready* or a catalytic converter diagnostic trouble code may be triggered soon after the readiness monitor is run to *Complete*.

The choice of converter to install will be made on a case-by-case basis depending on the vehicle, and after a discussion with the motorist about what an appropriate repair should be. In most cases, the motorist's primary concern is a passing inspection sticker; they need a sufficient number of monitors ready and no MIL commanded on. Many times the repair cost will drive the emission repair. To obtain the motorist's desired outcome, the repair shop will need to weigh the cost of a part versus the quality of a part. Repair technicians inherently wish to be helpful, but most times the cheaper option is not the best option and will not achieve the desired result.

There are aftermarket companies that make several grades of catalytic converters. After reviewing each converter's supporting documentation, choose the converter that matches the vehicle's specifications.

The current EPA aftermarket catalytic converter policy can be found following this URL: <http://www.epa.gov/otaq/cert/factshts/catcvrts.pdf>

Strategies to Help with Stubborn Monitors

As previously discussed, vehicles that cannot complete the required number of monitors will fail the initial inspection and then be continually turned away from the re-inspection until the unset monitors are ready. Stubborn monitors are challenging to work with because the vehicle won't tell you why the monitor(s) have not run. In most cases, the PCM will not even tell a repair technician if it has attempted to run the monitor. It will be up to the technician to research the vehicle's history, the enabling criteria and the accuracy of the data being interpreted by the PCM to determine the cause.

There are a small number of cars exempt from receiving a readiness test in the Massachusetts program. These vehicles will still receive an electronic OBDII test. Even if the readiness criteria have not been met, these vehicles are allowed to pass the readiness portion of the emission test. The following vehicles are not subject to the vehicle readiness monitor element of the Massachusetts Vehicle Check Program:

MODEL YEAR	MAKE	MODEL
1998	HYUNDAI	SONATA
1998	MITSUBISHI	ALL
1998	SAAB	900
1998	VOLVO	ALL

If you are working with a car on this list, remember that you don't have to worry about resetting its non-continuous monitors.

If you are working with a car that is not on this list, here are some strategies to consider:

Things to check first. In order to complete unset monitors, verify the following criteria

- No DTCs or Pending DTCs stored
- Coolant and Air temperature values
- Engine reaches and maintains operating temperature
- Engine is in fuel control, acceptable (total) fuel trims
- Vehicle fuel level above 15% and below 85%
- Battery and Alternator voltage is within limits

- Crankshaft relearn is completed
- Confirm the continuous monitors are *Complete/Ready*
- Confirm there are no relevant TSBs

Confirm you are using the manufacturer's suggested specific Drive Cycle, not a generic drive cycle. A drive cycle is a suggested pattern of operating conditions to provide the vehicle the best chance to initiate a non-continuous monitor. In the case of most vehicles, a week of normal city and highway driving will allow most monitors to run (200-300 miles). Depending on the enable criteria for certain monitors, some may not run during this week of driving. For instance, if the enabling criteria for Evaporative monitor is IAT above 32 °F and it has been below that temperature for several weeks, that monitor *may* not run.

There are L-1 technicians available at your local Motorist Assistance Centers to discuss the problem vehicles. There are drive cycles online and in service information which work for many vehicles. There is also a manufacturer's suggested specific Drive Cycle for the vehicle you are working on. Drive cycle information can be found via Mitchell OnDemand, ALLDATA, Identifix, OEM service information web sites, and other internet sources. Finding the OEM information can be challenging at times; however, if you are dealing with a stubborn vehicle monitor, it is always best to look up the specific drive cycle and enabling criteria.

Note: Several manufacturers have also released Technical Service Bulletins (TSBs) with updated drive cycles to assist the repair community. The most commonly used TSBs are: Nissan TSB 98-018C, Toyota TSB EG003-02, Lexus TSB EG002-02, and Mitsubishi TSB 04-13-012.

FYI: Portions (or all) of a non-continuous monitor(s) may run when the vehicle is turned off e.g. Chrysler's NVLD evaporative system. Be sure you review ALL the monitor's enabling criteria when attempting to complete / run a monitor.

Many times there will be no DTCs or check-engine light associated with stubborn not-ready monitors. Many cars will set a code if a sensor is out of range, but not always. For instance on early Saturns, it is very common to have an engine coolant temperature reading that will prevent monitors from running, but will not set a code or illuminate the MIL. The sensor leaks coolant into the ECT connector and corrosion occurs, resulting in a higher voltage reading at the PCM. In these cases, with a fully warm vehicle, the ECT reading is approximately 165 °F instead of the correct reading of at least 185 °F. Most of the monitors require a fully warmed up vehicle to run (as indicated by 185 °F or greater). The vehicle will not set a

code, because 165 °F is an acceptable reading for this vehicle, just not a high enough reading to satisfy the enabling criteria. The PCM never sees a fully warm engine and blocks the monitors from running. In other words, ALWAYS start with the basics when attempting to run monitors. Check the enabling criteria required to run the monitor(s) for the vehicle you are working on.

A recommended approach to monitors that are difficult to set begins with:

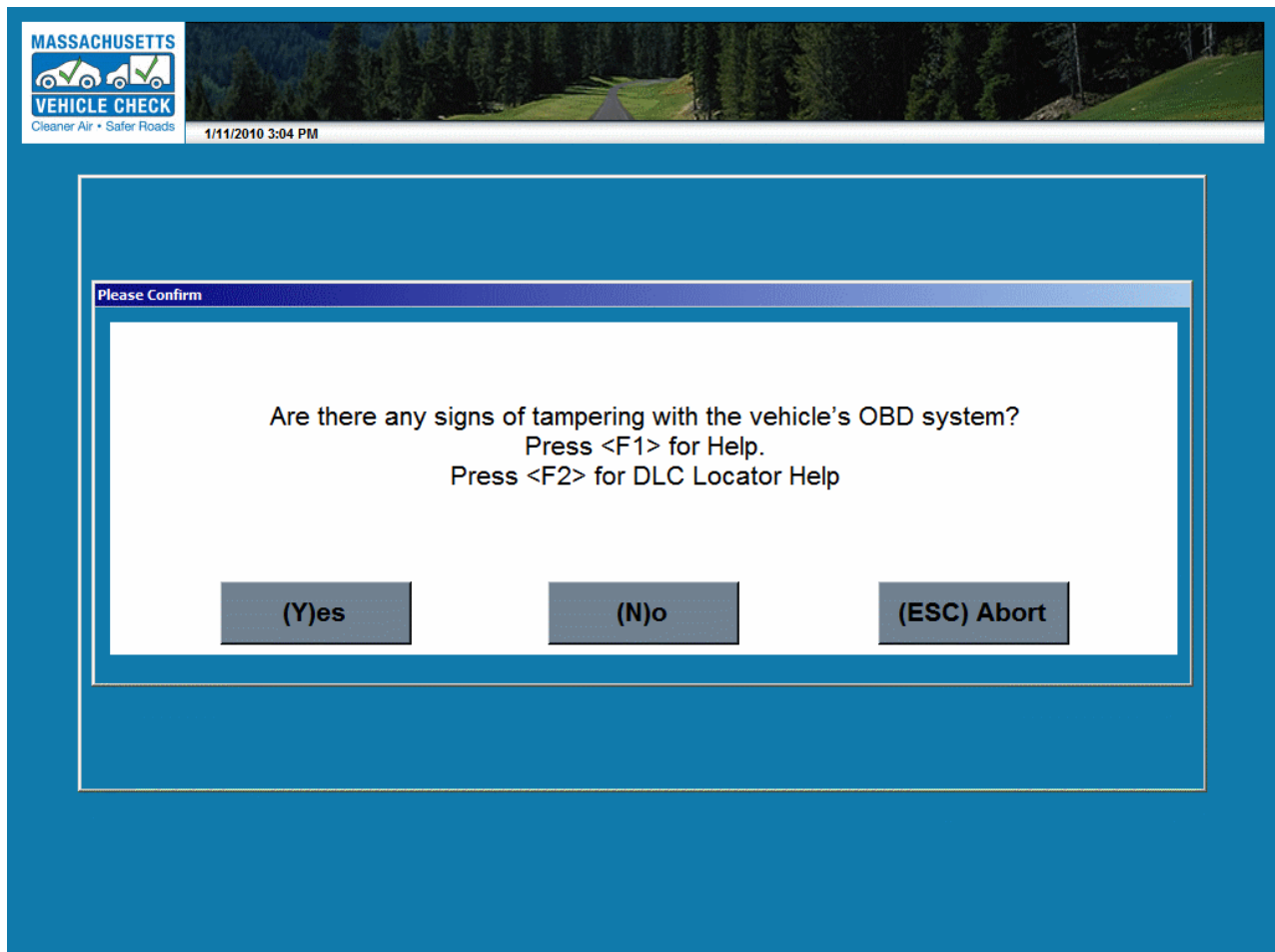
- Researching the enabling criteria and drive cycle for the particular model;
- Check for current or pending DTCs which may prevent the monitor(s) from setting;
- Check of all the relevant parameters (PIDs) for any inaccurate readings or readings which are outside the required range (such as ambient air temp, fuel level, etc.);
- Check for relevant TSBs or recalls.

If all the necessary operating conditions are met, a drive cycle may need to be run two (2) or more times consecutively to set all monitors. Your local Motorist Assistance Center (MAC) is available to help with resources, techniques and advice, as well as a dynamometer to help you address stubborn monitors.

(21) OBD Test Anomalies and Special Cases

Below are examples of OBD test anomalies and special cases that you may be asked to diagnose and repair. For some cases, you will see examples of the inspection workstation screens that illustrate how inspectors fail vehicles that exhibit these anomalies. For all cases, you will find a description of how to handle each scenario.

A) Visual inspection for emission device tampering



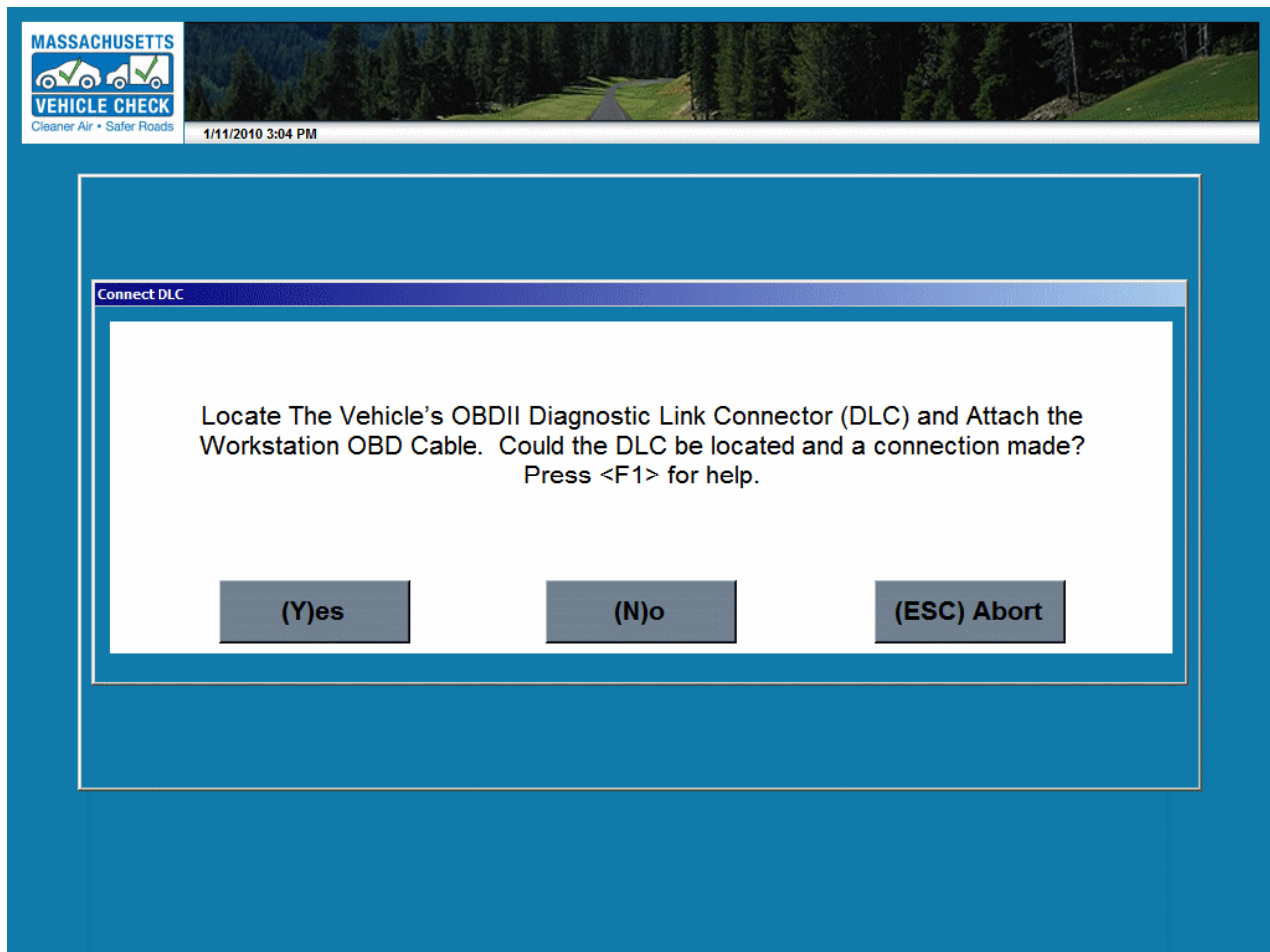
If the Inspector answers (Y)es to the question above, the vehicle will fail emissions for <OBD Tampering Check>. This is a visual inspection by the Inspector who then enters the pass/fail results by answering the workstation screen prompt above. The vehicle will still receive an OBDII electronic test and may have additional failure items from the electronic test.

The extent of the tamper inspection is determined by the Inspector's OBD knowledge. At a minimum, the Inspector is instructed during training to

check for obvious signs of tampering to the OBDII system such as wiring modifications to the DLC. If the Inspector suspects some other type of emission device tampering (e.g. oxygen sensor simulators, non-compliant PCM software, emission device items missing), the Inspector has the ability to fail the vehicle.

Most importantly this item is a visual inspection and the pass/fail outcome is determined solely by the Inspector's input. Call your Motorist Assistance Center (MAC) if you should come across this failure type.

B) Unable to locate or connect to DLC

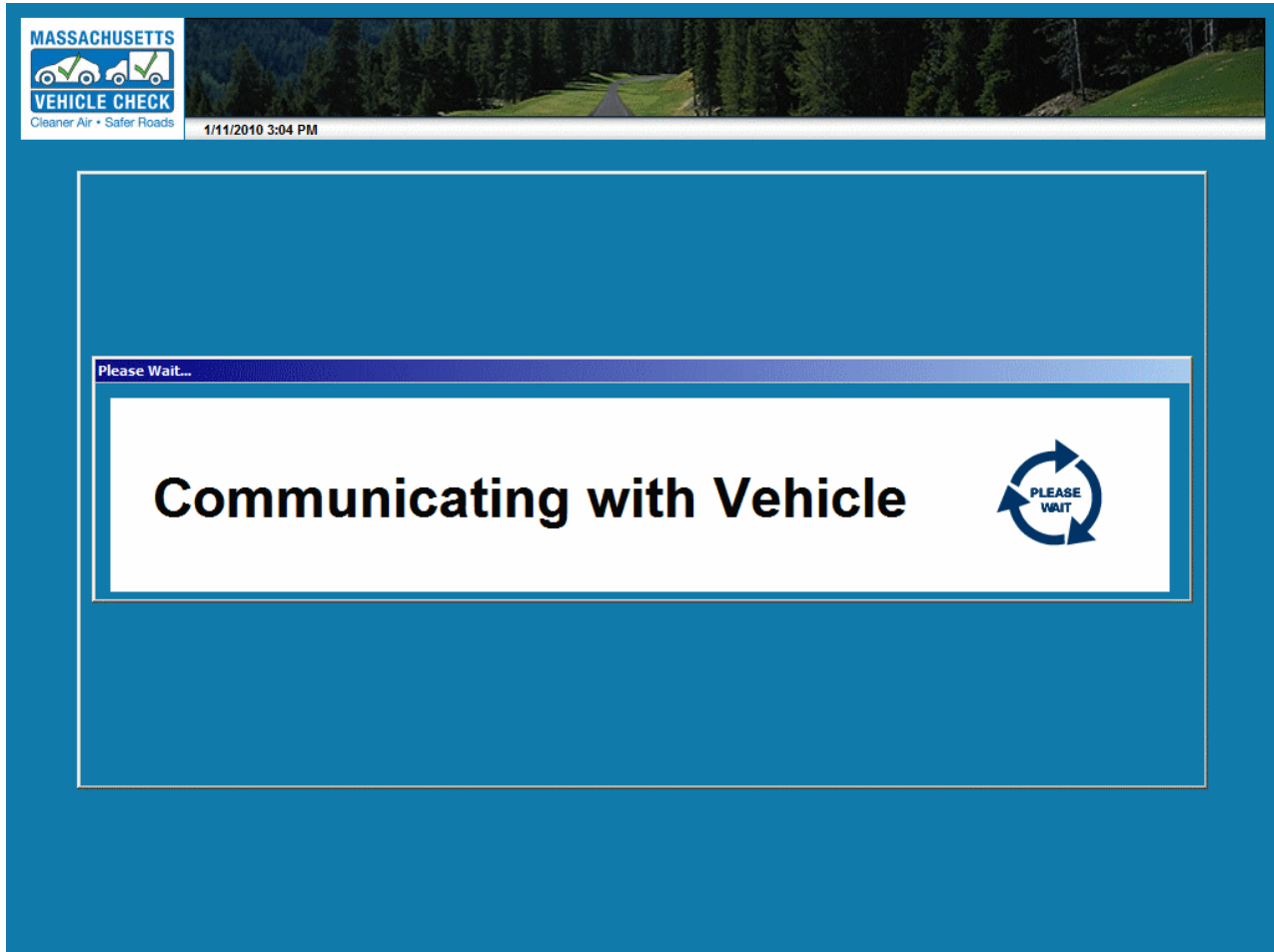


If the Inspector answers (N)o to the question above, the vehicle will fail emissions for <OBD Connector Result>

All OBDII vehicles must be equipped with a standard 16 pin OBDII connector in an unobstructed position to allow the inspector the ability to plug the workstation cable to this connector. There may be no other equipment

connected to this connector or it's wiring (such as aftermarket alarms, remote starters, etc.) The location of this connector varies by manufacturer, and is sometimes difficult to locate. If the location has been altered or obstructed by installed aftermarket equipment, or the connector is damaged or missing, the inspector will fail the vehicle until the connector is restored to its proper location and function.

C) Workstation scan tool does not communicate with vehicle



The MASS08 workstation communicates on the OBDII global/generic protocol only, not on the factory "enhanced" side. So, when attempting to communicate with a problem vehicle with whatever scan tools you have available at your shop, be sure to use the OBDII Generic option. If your scan tool requests any part of the VIN to identify the vehicle, you are most likely on the enhanced side of the scan tool. If your scan tool has an internal battery — as Genesis, Master tech, MODIS, SOLUS and others do — you may be able to communicate with a vehicle that has no power at the DLC, but do not assume the vehicle is okay. Your shop's scan tool may not need

power from the DLC to operate, but the emissions test equipment requires battery voltage from the vehicle. If the DLC has no power, you will need to take out a digital volt/ohm meter (DVOM) or scope to verify power and grounds at the DLC.

If after three attempts the workstation is not able to retrieve the required information from the vehicle, the workstation shall perform the OBD scan tool functionality self-check. If the workstation passes the OBD scan tool functionality self-check, the OBD emission test shall fail indicated on the VIR under <OBD Communication Result>.

If your shop's scan tool is missing a piece of OBDII data, it will report what was retrieved and will either leave the missing data block empty or submit a place holder in the block. For the emissions inspection, if any element of the required OBDII data is missing, the vehicle fails the emissions test for communication. It is important to point out that the Massachusetts Vehicle Check program OBD communication process is not what you are used to seeing on your shop's scan tool. For more details about the inspection process, please review the **OBDII Emission Inspection Process**, Section 19 (Steps 2 through 9).

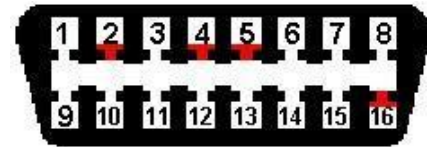
To pass the emissions inspection, the vehicle must communicate with the Massachusetts Inspection Workstation. Repairs can be verified with the inspection workstation by using the diagnostic menu on the workstation and performing a diagnostic inspection. This allows a complete inspection scenario to be performed without the vehicle's pass/fail result recorded (no fee charged). If the vehicle is able to communicate utilizing this diagnostic menu, the vehicle will communicate during the actual inspection. If you are unable to find a problem and the vehicle communicates with your generic tool, you are encouraged to call your nearest Motorist Assistance Center (MAC), or the technical help desk for assistance.

To pass the emission inspection, the vehicle must communicate with the MASS08 workstation.

In most cases a lack of pin 16 B+ voltage may be attributed to a blown fuse. Other possibilities for a lack of B+ at pin 16 could be the result of a broken wire, poor termination, or loose/damaged DLC terminal. A lack of ground observed at either pins 4 or 5 of the DLC may be the result of a broken wire, poor termination, or loose/damaged terminal(s) at pins 4 and 5.

Things to check:

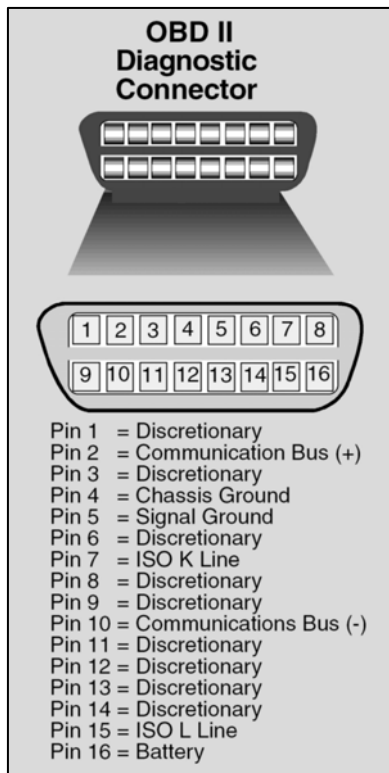
- Vehicle power between pin 16 to pin 4 & 5.
- Battery voltage to pin 16 of the DLC
- Uncompromised ground at pin 4&5. Any corrosion will cause havoc with sufficiently powering the scan tool.
- Load test the DLC power supply (pins 16, 4, 5) to be sure of the circuit's integrity.
- The DLC pins terminals have not been spread out.
- Scope the data lines to demonstrate the vehicle is communicating on the SAE specified terminal(s).



Pin 4 – Ground
 Pin 5 – Ground
 Pin 16 – B+

D) PIN 16/DLC Power

The data link connector contains sixteen (16) cavities for various but specific functions. Pin 16 for instance is supplied with a constant battery voltage that allows scan tool manufacturers to power their tool. **NOTE: In the Massachusetts Vehicle Inspection Program the workstation's scan tool is powered by B+ voltage from Pin 16 and a ground feed from Pins 4 and 5. If Pin16 to Pin 4 or Pin 5 = 0 volts the vehicle will FAIL communications.**



Pins two, six, seven, ten, fourteen, and fifteen are utilized by different types of communication protocols for executing dialog between a scan tool and the vehicle's computers. Pins four and five are designated for signal and or sensor grounds. Some cavities have been reserved for discretionary OEM usage, such as specific (OEM) scan tool interaction. Not all cavities are utilized at this time. Some cavities may have no terminals present and this is normal. DLC cavity pins' uses are specific and can be referenced against OBD II regulations as well as manufacturers' reference materials.

The use of a breakout box or back probing when testing the DLC is preferable because pushing a test light probe into the front side of the

connector could spread out (enlarge) the terminal cavity which will only serve to compound the vehicle's communication issues.

E) The engine RPM is less than 250 (excluding hybrids)

The inspection workstation requires a RPM value from the vehicle, therefore the vehicle must be running during the inspection and a RPM value must be captured. If the vehicle fails for OBD RPM Check, contact your Motorist Assistance Center (MAC) to discuss possible causes.

F) MIL fails visual MIL bulb check (KOER)

MASSACHUSETTS
VEHICLE CHECK
KOER for 2006 HYUNDAI SONATA

Key On Engine Running (KOER) Check

Check the vehicle's dashboard. Is the Malfunction Indicator Light (MIL) illuminated?

(Y)es (N)o

On Some Vehicles, the MIL will flash. Treat this as MIL Stays On
Press <F1> For Help

If a vehicle initially fails the emissions test for MIL commanded on, the inspector will be prompted to visually check the MIL operation. If the dashboard MIL is not lit when the key is in the on position and the engine is running (KOER), the vehicle will fail for this also. The MIL bulb or circuit must be repaired so as to respond correctly to the MIL command status of

the PCM. The repair technician should confirm the MIL is operational before sending the vehicle for reinspection.

G) MIL fails visual MIL bulb check (KOEO) during reinspection

MASSACHUSETTS
KOEO for 2006 HYUNDAI SONATA

Key On Engine Off (KOEO) Check
Turn Key to the On Position.
Do Not Start Engine.

Did the Malfunction Indicator Light (MIL)
Turn On?

(Y)es **(N)o**

On Some Vehicles, the MIL will briefly turn
on, then go off.

Press <F1> For Help

If a vehicle fails the initial emissions test for MIL bulb check KOER, at retest, the inspector will be prompted to check the MIL operation when the key is in the on position and the engine is off (KOEO). There is a requirement that the MIL will illuminate in the key on engine off position before the engine cranks to indicate the MIL is functional. If the vehicle's DTC has been repaired, the MIL will be off when the engine is running. The inspector will be prompted to confirm the MIL's operation in the key-on engine off position. If the MIL does not light during this check, the vehicle will fail the retest, and the OBD Key-on Bulb results will be shown on the VIR. As explained above, the MIL must be operational and correctly respond to PCM commands.

H) A vehicle may pass with a DTC in memory if the PCM has not currently requested the MIL on.

A vehicle will fail emissions when the PCM has commanded the MIL on, not because there are DTCs present in the PCM. There are many DTCs that do not command the MIL on and while these codes may warrant review, the repair technician may find it beneficial to focus on the codes that caused the MIL illumination before addressing the remaining codes. A vehicle will not fail the emissions test for a DTC which does not result in a MIL command. This can be a pending code or a DTC which does not meet the criteria to set a MIL command. An example of the latter would be a P0325 (knock sensor circuit) on some Nissan/Infiniti models.

I) Incorrect GVWR Entry During Inspection – Is the vehicle OBDII compliant?

As discussed in Module 1, not all vehicles inspected in Massachusetts are required to receive an OBD emissions test. There are vehicles that may have a 16-pin OBDII connector in the vehicle but were not built to be OBDII compliant. If an OBDII emission inspection is attempted on one of these non-compliant vehicles, the vehicle will most likely fail for unsupported monitors or insufficient number of monitors being complete or ready.

On the workstation's vehicle details screen, the Inspector is prompted to enter the vehicle's GVWR as displayed on the door tag. If the Inspector enters the incorrect GVWR, the workstation may request the incorrect emissions test. In most cases the vehicle cannot pass the incorrectly assigned emission test.

Model Year	GVWR listed on vehicle's Door Tag	Fuel Type	Test Type
Any passenger vehicles, all applicable model years	≤ 8500 lbs.	Gasoline & Diesel	OBDII test
Medium-duty vehicles, 2008 to present	≤ 14,000 lbs.	Gasoline	OBDII test
Medium-duty vehicles, 2007 to present	≤ 14,000 lbs.	Diesel	OBDII test

Model Year	GVWR listed on vehicle's Door Tag	Fuel Type	Test Type
Medium- and Heavy-duty vehicles, 1984 through 2007	> 10,000 lbs.	Diesel	Opacity tailpipe test ⁽¹⁾

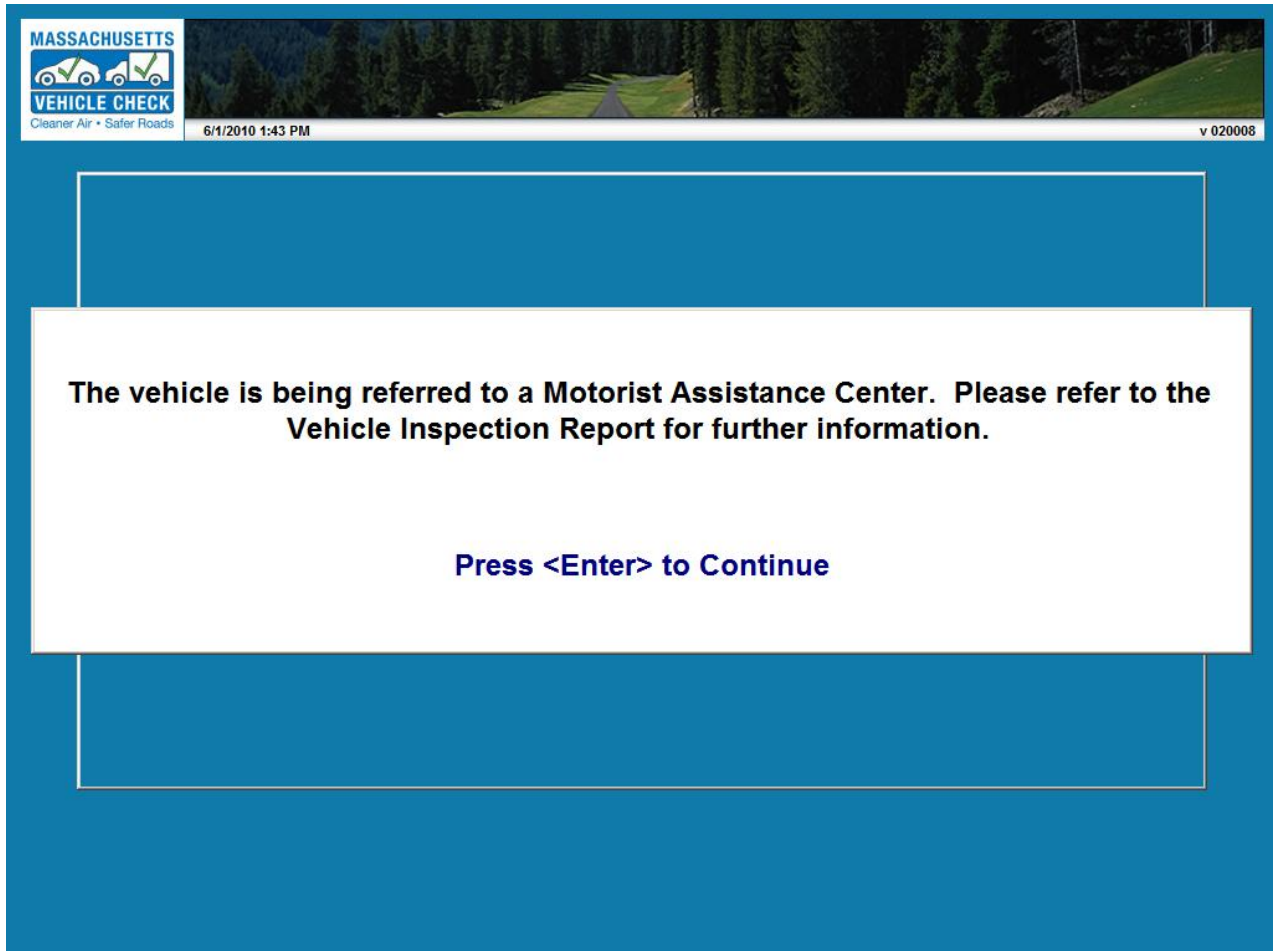
⁽¹⁾ For all vehicles greater than 10,000 lbs that are not subject to an OBD emissions test

Example: The information for a 1999 Dodge Ram Pickup was entered in to the inspection workstation. The workstation software decoded the vehicle's VIN and returned a GVWR of 9000 lbs; the decoded value was changed to 8000 lbs. This minor edit changed the vehicle's inspection from a safety-only inspection test to an electronic OBDII test. The 1999 Dodge PU is not OBDII compliant and cannot pass the incorrectly assigned emission test.

VIN	1B7KF2367XJ*****
DECODED	1999 Dodge Ram Pickup
Make	Dodge
Model	Ram Pickup
Series	2500
Body Type	4 Door Cab; Quad
Engine Type	L6, 5.9L; Turbo
Fuel Type	Diesel

Once the vehicle has failed the initial inspection, the emission type is locked for this inspection cycle. When the vehicle returns for a re-inspection, the workstation will request the same incorrect emission test. To break this cycle the repair technician will need to call the MAC or the motorist hotline (866-941-6277).

J) Has the vehicle been referred to a MAC?



A vehicle may be referred to a MAC by the workstation for several reasons. The MAC referral the repair technician will most likely encounter is for a persistent readiness issue. If the vehicle has a MAC referral, it will be shown on the latest VIR and cannot be retested until the referral flag is removed by a MAC. To have the flag removed, either the motorist or the repair technician should call the motorist hotline, who will notify the nearest MAC. A MAC representative will then contact you to assist with the issue.

A vehicle may be referred to a MAC for several other reasons. In this case, the motorist is instructed to call the motorist hotline for assistance, but they will sometimes just come to a repair facility instead. If at any time you are unsure why a vehicle failed inspection, or cannot be retested, you are encouraged to call your nearest MAC or the station support hotline (1-877-834-4677). The staff at the MAC is there for you and eager to help in any way they can.

(22) Motorist Assistance Center (MAC) Referrals

What are MAC Referrals?

MAC referrals are designed to allow the Massachusetts Vehicle Check Program to assist during the inspection process when there are unusual inspection results, special concerns with the vehicle or a vehicle continues to be turned-away from an inspection due to readiness. MAC Referrals can occur via two mechanisms: 1) test results during the inspection that automatically trigger the MAC referral by the workstation or 2) the Department Of Environmental Protection or the Registry of Motor Vehicles may manually “flag” a particular vehicle for a MAC referral prior to the inspection. Following is a list of all possible reasons for a MAC referral and how they are triggered.

MAC Referral Reason	Triggered by	Details
Vehicle Cannot get “Ready”	Inspection results	Vehicle has been turned away repeatedly for being “Not Ready” over a certain time period (e.g., 3 times over a 2 week period or more)*
Kit Car visual inspection at MAC	Inspection results	Inspector identifies as “KIT CAR”, and it meets certain regulatory requirements to receive a visual inspection of its emission and safety components when first registered or on ownership change
Unusual Test Results	Inspection Results	If a vehicle’s emissions test shows unusual results, it may be referred to a MAC for specialized testing prior to incurring costs for repairs.*
Targeted Inspection	The Agencies	MassDEP may require that certain vehicles undergo additional specialized testing at a MAC.
Program Evaluation Inspection	The Agencies	MassDEP may require that certain vehicles be inspected at a MAC for program evaluation purposes.

* Parameters are configurable and may be changed by the Agencies.

The goal for a readiness MAC referral is to initiate a discussion with the motorist to help them with the current loop they are stuck in and also to provide repair assistance to you the repairer. Many times the motorist receives a turn-away and is instructed to “drive the vehicle”. The motorist repeatedly drives and attempts a test without any diagnosis or repairs and then becomes frustrated with the process. The MAC referral “flag” interrupts

this cycle so that a discussion can take place with the motorist in an attempt to resolve the readiness turn-away scenario. The motorist may not understand the circumstances and once counseled is able to complete the process. Many times the MAC will identify an issue that is preventing a monitor from becoming ready and will refer the vehicle to you, the repair shop.

Once the MVC assistance hotline has assigned the assistance case to the appropriate MAC, the MAC L-1 will begin by evaluating the vehicle's history and the vehicle model's history and may use a specific drive cycle on a dynamometer to attempt to get the vehicle ready. In some instances, potentially out-of-range (blocking) enabling criteria will be identified. In these cases the MAC L-1 will encourage the motorist to visit a registered repair shop for further diagnosis.

The repair technician is encouraged to contact the MAC directly with emission repair issues. The MAC has unique experience dealing with these type of emission failures and would like the opportunity to assist the repair community with vehicles that are not ready, vehicles with reoccurring DTC's, and to assist with any unusual vehicle inspection type scenarios in order to help identify the concern(s) preventing the vehicle from receiving a passing inspection sticker as quickly as possible.

Once the vehicle is ready for a re-inspection, the MAC referral will need to get "cleared" before the vehicle can be re-inspected. If the flag is not cleared, the inspection workstation will not allow the inspection to proceed. The vehicle will simply continue to receive turn-away documents until the MAC clears the flag. To get the MAC referral cleared, you will need to contact your local MAC. MACs are open from 8 am to 5 pm Monday through Friday, and 8 am to 3 pm on Saturday.

How do I know when there is a MAC referral and for what reason?

On the VIR, all MAC Referrals will have an Overall Result of "Refer MAC" in the upper left section of the first page and an Emissions Result of "FAIL" or "Turnaway" below it. The section at the top of the first page of the VIR called "Please Review This Important Information" will provide a general description of the reason for the MAC referral. For more specific reasons, you'll need to review the section of the VIR that shows the OBD test results.

Inspection Cannot Proceed

Please Review This Important Information

Your vehicle could not be re-tested today because its OBD system continues to be "Not Ready." Because several attempts have been made to re-test it and it continues to be "Not Ready," you must contact a Motorist Assistance Center (MAC) where technicians will assist you in getting the OBD system "Ready" for its re-test. Your vehicle cannot return to an inspection station for its re-test until you have spoken with a MAC technician. Please call the Motorist Hotline at 1-866-941-6277 to be contacted by MAC personnel. The Hotline is staffed from 7 a.m. to 5 p.m. Monday, Wednesday, Friday, and Saturday, and from 7 a.m. to 8 p.m. on Tuesday and Thursday. Questions? Visit www.mass.gov/vehiclecheck or call the Motorist Hotline at the number above.

Overall Result: Refer MAC

Vehicle Information

Station Information

MAC Referral for Readiness

Vehicle Inspection Report

Please Review This Important Information

Your vehicle is being referred to a Motorist Assistance Center (MAC) for specialized testing. Your vehicle cannot return to a state-licensed inspection station for your re-test until you have visited a MAC. If your vehicle has failed its safety test, you must fix all safety defects immediately. Do not drive your vehicle until all safety repairs have been made. Please call the Motorist Hotline at 1-866-941-6277 to schedule an appointment. The Hotline is staffed from 7 a.m. to 5 p.m. Monday, Wednesday, Friday, and Saturday, and from 7 a.m. to 8 p.m. on Tuesday and Thursday. Questions? Visit www.mass.gov/vehiclecheck or call the Motorist Hotline at the number above.

Overall Result: Refer MAC

Vehicle Information

Station Information

Safety Result Pass

VIN

Name:

Emissions Result Fail

License Plate

Address:

MAC Referral for specialized testing

MAC Referral Goals

- To assist motorist by way of education or a drive cycle on the dynamometer
- To assist repair technicians by way of the MAC's past experience, vehicle specific research, and usage of the MAC dynamometer
- To evaluate the inspection test results to ensure the vehicle received the correct emission inspection

Reminder - Vehicles cannot be re-inspected until MAC referral flag is cleared by the MAC.

What does the repair technician do with a MAC Referral?

Except for MAC Referral Reason 1 (Vehicle Cannot Get "Ready"), **all MAC referrals must visit the MAC first before performing any diagnosis or repairs.** You are advised to ask the Motorist whether they have visited the MAC at the beginning of your process. This is critical because it is quite possible the MAC referral was caused by an improper inspection and the vehicle does not require any repairs. The L-1 at the MAC will inspect the vehicle first to determine what the next step(s) should be.

You are encouraged to contact the MAC, they will be glad to discuss the reason for the MAC referral, what they found, and what needs to be done so the vehicle can receive an inspection sticker.

Reminder: For the readiness referral flag, call the MAC once you feel the vehicle is ready for a re-inspection. The inspection workstation will not allow an inspection to occur until the flag has been removed.

(23) Helpful Information Resources for Vehicle Repairers

1. IATN (iATN.com)

IATN is the largest online automotive community for repair technicians in the world. With the help of corporate sponsorship and technicians volunteering their time, iATN is a great resource to help hone one's diagnosis.

iATN International Automotive Technicians' Network
Sitemap | Help | Login

» Home | Standard Membership | Premium Membership | New Member Registration | Having Car Trouble?
» About iATN | Industry Sponsors | Press Kit | IATN Careers | Member Directory | Contact iATN | Join iATN | Latest News

iATN Mission of Excellence

"To promote the continued growth, success and image of the professional automotive technician by providing a forum for the exchange of knowledge and the promotion of education, professionalism, and integrity."

Having Car Trouble?

Are you looking for a professional auto mechanic to service your vehicle? Try our iATN Shop Finder to locate an auto repair shop, nearly anywhere in the world!

» [Repair Shop Finder](#)

iATN Auto Repair Q&A

iATN members may view yesterday's [automotive repair discussion](#) on [Asian](#), [Chrysler](#), [European](#), [Ford](#), and [GM](#) vehicles, including this month's [automotive discussion](#) and top [diagnostic trouble codes](#).

Find Repair Solutions

Are you a professional automotive technician with a difficult diagnostic or repair job? Join iATN today, and take advantage of the iATN TechHelp system. You'll find help from thousands of your peers with just about any kind of repair issue! [Premium subscribers](#) gain immediate access to a fully searchable knowledge base containing over ten years of professional automotive repair questions and answers spanning well over a million records.

» [Join iATN](#)

International Automotive Technicians' Network

The world's largest online community of automotive professionals.

Accelerating quality automotive repair since 1995.

Welcome to iATN

The International Automotive Technicians' Network is the largest network of automotive repair professionals in the world: a group of 72,171 from 154 countries. The members of this group exchange technical knowledge with their peers around the globe, sharing over 1.6 million years of experience.

iATN has been proudly serving the automotive service industry and the needs of professional automotive mechanics around the world, for over ten years.

The World's Top Automotive Technicians

The combined knowledge of thousands of top automotive repair technicians networking together helps the members of iATN provide some of the highest quality automotive repair, diagnosis and service in the world.

Are you looking for a professional automotive repair technician to service your vehicle? Use our [Repair Shop Finder](#) to find an iATN member repair shop near you. Each of the repair facilities listed in our repair shop finder have access to the combined experience of 72,171 automotive technicians from around the world. You can also browse our membership listings by area from our [member directory](#).

How to Become an iATN Member and Sponsor

For a preview of features available to the professional automotive technician members of iATN, along with details on requirements, how to join, and what to expect, please visit our [membership overview](#). iATN is supported by many of the automotive industry's top companies, associations, and trade publications. These industry sponsors, along with our sponsoring shop and automotive technician members, make this network possible. Visit our [industry sponsors](#) index for a complete list of the iATN industry sponsors.

Join the Largest Network of Automotive Technicians Now!

Are you a full-time professional automotive technician interested in networking with other professionals from around the world? Do you have at least four years of full-time work experience as an automotive technician, or are you currently ASE certified? If you answered yes, [join iATN](#) or read more about membership in our [membership overview](#).

Once inside, you'll find many great features, such as [iATN TechHelp](#), where professional automotive technicians discuss highly technical auto repair problems

Login

Username:

Password:

Save

[Forgot Login?](#) | [Secure Login](#)

Latest News

October 6, 2010 We've just released a new poll question on the Members Only homepage: "Does your company provide electronic notification for vehicle status updates?" [Read more here.](#)

» [More News](#)

Testimonials

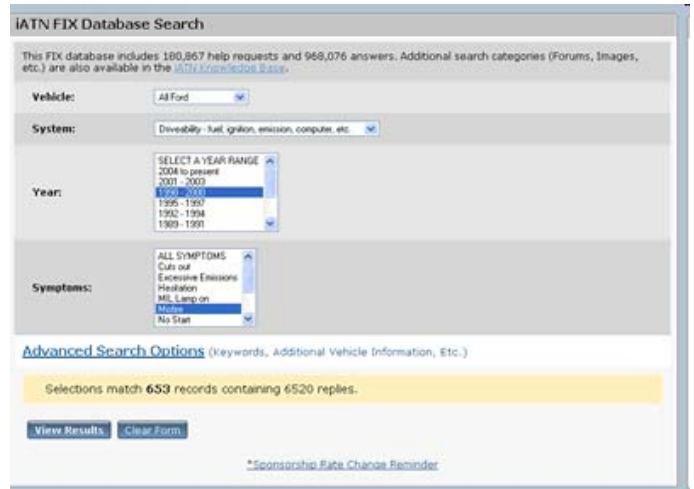
In this time of rapid technology change, we need access to as much information as possible if we're to succeed in this industry. I openly recommend iATN to the professionals with whom I work and instruct.

Martin Smith
Technician/Instructor
Abbotsford, British Columbia,
Canada

» [Sponsor Testimonials](#)

Countries:	154
Members:	72,171
Experience (Years):	1,654,222

The iATN fix database is a good resource for common problems, specifications and voltage readings for sensors, and supposed silver bullets. These are all different technicians' opinions on a fix, so it is wise to take what one reads with a grain of salt and review all responses.



2. NATIONAL AUTOMOTIVE SERVICE TASK FORCE (WWW.NASTF.org)

NASTF makes available all of the factory websites and reprogramming information you need. Some manufacturers give you free access to information such as wiring diagrams and others charge a modest fee. Reprogramming files and online access to factory scan tool software (i.e. Ford, GM, Toyota, and Volvo etc) is also made available.

Quote from the website: "The National Automotive Service Task Force is a not-for-profit, no-dues task force established to facilitate the identification and correction of gaps in the availability and accessibility of automotive service information, service training, diagnostic tools and equipment, and communications for the benefit of automotive service professionals. NASTF is a voluntary, cooperative effort among the automotive service industry, the equipment and tool industry, and automotive manufacturers."

Link to all Factory Websites (<http://www.oemonestop.com>)



3. ALLDATA

ALLDATA is perhaps the most useful computerized resource at your disposal. It provides specifications, wiring diagrams, DTC information, component locations, and repair instructions gathered largely from factory repair manuals. The days are over where you can memorize all the repair information you need. There are not bookshelves big enough to contain the information we need. Having a computerized repair database is a must.



4. MITCHELL ONDEMAND

Mitchell works very similar to ALLDATA. Key differences between the two include that in Mitchell the wiring diagrams can be manipulated with colors and removing wires for the sake of making them easier to read. Furthermore, everything in Mitchell is in alphabetical order and engine sizes are not part of the vehicle selection.



5. IDENTIFIX DIRECT HIT (WWW.IDENTIFIX.com)

Identifix is a resource that provides diagnostic trouble code setting criteria, maintenance schedules, labor times, wiring diagrams, articles, silver bullets and TSBs via a national automotive repair database. You can choose these options by model year, make, model, and engine.

IDENTIFIX DIRECT-HIT

TRAINING

New Vehicle | Referral | Logout

⌘ No Vehicle Selected :: Jerry Truglia : A.T.T.S.

⌘ Create, Select or Search for a vehicle to obtain exact information for that vehicle.

You viewed a Hotline Archive for a 2002 Jeep Liberty Sport 3.7L. Please [Click Here](#) to provide the fix now, or [Click Here](#) to be reminded later.

Create a New Vehicle

Year: Please Select
 Make:
 Model:
 Engine:

Remember: Open a recent or previous vehicle record when requesting an additional hotline call on the same vehicle. This will ensure your shop's billing is correct.

Select a Recent Vehicle

- [2004 Nissan Altima 2.5L](#)
- [2004 Nissan Altima 3.5L](#)
- [2002 Jeep Liberty Sport 3.7L](#) [What Fixed it?](#)
- [2005 Nissan Altima 2.5L](#)
- [1997 Honda Civic LX 1.6L](#) [What Fixed it?](#)
- [1997 Honda Civic LX 1.6L](#)

Only My Vehicles are being shown Has Fix Posted Has Hotline Reference

Search for a Previous Vehicle

Year: (All Years)
 Make: (All Makes)
 Model: (All Models)

Limit Search to:
 Has Fix Posted
 Has Hotline Reference
 My Vehicles

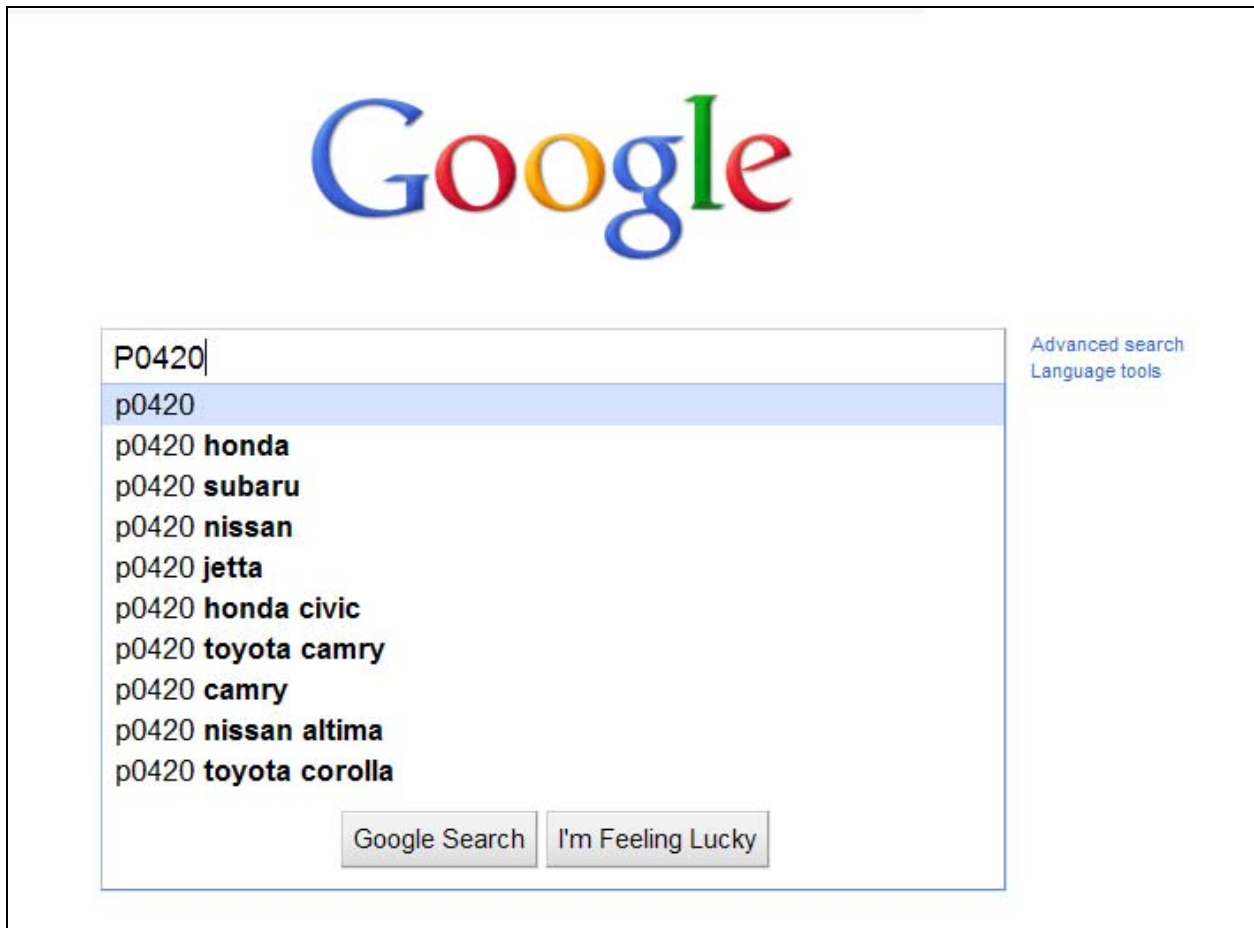
Customer Last Name:
 Repair Order Number:
 License Plate Number:
 Hotline Ref. Number:

New Vehicle | Referral | Help | Logout | FAQ | Contact Us | Privacy Policy | Español | Français

6. GOOGLE (google.com)

If you use the internet, you are probably no stranger to Google. This website is a good clearing house of information from throughout the internet. Simply type in Google.com and when the web page loads up type in the DTC or whatever problem you are looking to solve. You will not always find your answer, but then again, there is no website that can.

As a word of caution, take much of what you find on non-professional websites with a grain of salt. Do It Yourselfers might be very opinionated, but they lack the professional background of technicians. However, if your Google search yields professional articles and websites from technicians themselves, that might be much more helpful.



Training/Seminars

7. TECHNICIANS SERVICE TRAINING (TSTSEMINARS.org)



Technicians Service Training

The screenshot shows the 'Live Sessions' page on the TST website. The page has a navigation menu on the left with options like 'Attend a Session', 'Host a Session', and 'Support'. The main content area displays a table of upcoming sessions for Tuesday, June 22, 2010, starting at 12:58 p.m. The table includes columns for Date & Time, Topic, Fee, Presenter, and Duration. There are 10 sessions listed, each with a 'Start' button and a 'More' icon. A search bar is located at the top of the session list, and there are tabs for 'Today', 'Upcoming', 'Daily', 'Weekly', and 'Monthly' views.

Date & Time	Topic	Fee	Presenter	Duration
Sep 16, 2010 7:00 pm	Doc Hill: Top DTCS including...	USD \$60.00	G Triglia	3 hours
Oct 7, 2010 7:00 pm	Ken Zanders: Communication Pr...	USD \$60.00	G Triglia	3 hours
Nov 11, 2010 7:00 pm	John Anello: Scan Tool Tips &...	USD \$60.00	G Triglia	3 hours
Dec 9, 2010 7:00 pm	John Thompson: Fuel System An...	USD \$60.00	G Triglia	3 hours
Jan 13, 2011 7:00 pm	Case Hobbs: Electronic Suspend...	USD \$60.00	G Triglia	3 hours
Feb 16, 2011 7:00 pm	Case DeCoursey: Airbag Case S...	USD \$60.00	G Triglia	3 hours
Mar 26, 2011 7:00 pm	8th Annual Prg Event with Joh...	USD \$109.97	G Triglia	3 hours
Apr 6, 2011 1:00 pm	Rob Farnegole: ECHAP from A.T...	USD \$60.00	G Triglia	3 hours
May 6, 2011 7:00 pm	Clare Cooper: Diagnostic Case...	USD \$60.00	G Triglia	3 hours
Jun 9, 2011 7:00 pm	Tony Martin: Road World Case...	USD \$60.00	G Triglia	3 hours

Technicians Service Training is the only automotive training not-for-profit in the county. Training is a necessity for technicians to work on ever-changing vehicles, but it is not always accessible.

TST has changed this. They provide seminars on advanced topics with the nation's leading instructors in four of their chapters (including Auburn, Massachusetts) and online to an international audience.

It is the online seminars that are relevant to us here. By either following the links on TSTseminars.org or going directly to TSTseminars.webex.com you can get live video, audio, and PowerPoint of their live seminars. This makes training more accessible than ever before.

8. Automotive Training Group (ATG)



ATG | AUTOMOTIVE TRAINING GROUP

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Advanced Technical Training for Automotive Professionals

News

New Manual: Advanced Body, Security & Chassis Systems, \$110.

ATG offers highly technical courses backed up with unmatched technical information and trainer experience. Our classes are designed around the balanced goal of presenting complex information and techniques in ways that everyone can understand while still challenging the most experienced technicians. <http://www.atgtraining.com/seminars.html>

9. Carquest Training Institute (CTI)

[En Español](#) - [Canada](#) - [Contact Us](#)

CARQUEST AUTO PARTS
Great people, great products, great prices!SM

CAREERS **PRODUCTS** **PROFESSIONALS** **LOCATIONS** **PROMOTIONS** **ABOUT CARQUEST**

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CARQUEST Technical Institute
industry leading technician training

CARQUEST Technical Institute Schedule

CARQUEST Technical Institute offers a variety of courses throughout the United States. To register for a course listed below, contact your local [CARQUEST Auto Parts store](#).



CARQUEST Technical Institute offers a variety of courses throughout the United States. To register for a course follow this link
<http://carquest.com/carquest/proCTIclassSchedule.html>

(24) The Applicability of Federal Vehicle Emissions Warranties

Federal Vehicle Emission Control Warranties for 1995 and Newer Cars and Trucks¹

Contrary to popular belief, California vehicle emission system control warranties, do not replace federal vehicle emission system control warranties. The federal vehicle emission system control warranties remain in full effect in addition to those imposed by the state of California. There are two types of federal vehicle emission warranties: (1) The Performance Warranty; and, (2) The Design and Defects Warranty.

The Performance Warranty - covers repairs which are required during the first 2 years or 24,000 miles of vehicle use (whichever first occurs) should a vehicle fail an emission test. Specified major emission control components are covered for the first 8 years or 80,000 miles (whichever first occurs). This warranty covers 1995 and newer passenger cars and trucks up to 8,500 lbs., GVW. Residents of an area with an Inspection and Maintenance (I/M) program that meets federal guidelines are eligible for this warranty protection; however, certain conditions must be met.

The Federal Performance Warranty mirrors California's Section 2038 Performance Warranty Requirements for 1990 and subsequent model year vehicles and engines. The difference in the two warranties is that California's warranty provides for five additional model years coverage (1990 and newer as opposed to 1995 and newer) than does the federal warranty and provides one additional year and 26,000 additional miles of coverage than does the federal warranty. In comparing California's vehicle emission control system warranties to the federal warranties, it is important to understand that only four states other than California provide this additional coverage as part of their LEV program. The federal performance warranty covers vehicles nationwide including non LEV states.

The Design and Defects Warranty - The Federal Design and Defect Warranty covers repair of emission related parts on model year 1995 and newer vehicles, which become defective during the warranty period. Emission control and emission related parts are covered for the first 2 years or 24,000 miles of vehicle use (whichever first occurs); and, Specified major emission control components are covered for the first 8 years or 80,000 miles of vehicle use (whichever first occurs). The specified major emissions control components are:

- Catalytic converters
- The electronic emissions control unit or computer (ECU)
- The onboard emissions diagnostic device or computer (OBD)

According to federal law, an emission control or emission related part, or a specified major emission control component, that fails because of a defect in materials or workmanship, must be repaired or replaced by the vehicle manufacturer free of charge as long as the vehicle has not exceeded the warranty time or mileage limitations for the failed part.

The federal Design and Defects Warranty is similar to California's Section 2037 Defects Warranty Requirements for 1990 vehicles and engines. It differs in that, it too provides coverage for five model years less than does the California warranty and provides one year and 26,000 miles less coverage than does the California warranty. The California warranty covers "high priced parts" for 7 years or 70,000 miles (whichever first occurs), while the federal warranty covers "specified major emission control components", which may or may not be included on a manufacturer's California "high priced parts list" for a period of 8 years or 80,000 miles (whichever first occurs). If a catalytic converter, ECU computer or OBD computer (which may be incorporated into the PCM), is listed as a "high priced part" but is beyond the time and/or mileage requirements of California's 7 years or 70,000 defect warranty but is still within the federal 8 years or 80,000 mile warranty coverage period, the federal warranty period applies. This is due to the fact that while California is allowed to enact vehicle control strategies that are more stringent than those of EPA the state cannot enact such laws that are less stringent than those of EPA.

¹The preceding information regarding Federal Vehicle Emission Control Warranties was taken directly from the EPA Question and Answers publication located on the internet Web site: <http://www.epa.gov/obd/pubs/420f09048.pdf>

Please consult the above EPA web site for more detailed information regarding the above federal warranties including valuable information regarding manufacturer responsibilities and consumer guidance on how to file a warranty claim.

(25) Prohibition Against Tampering

All persons are prohibited from tampering with any vehicle emissions control device or system. No person or entity shall take any action or fail to take any action that causes a motor vehicle to no longer comply with federal or state law, with standards for the motor vehicle emissions inspection, or with requirements for motor vehicle registration. This provision shall not be construed as preventing the temporary alteration of equipment for the purpose of motor vehicle repair or quality assurance by the Department, Registry, or their designees.

Tampering means the act of a person to remove or render inoperative any device or element of design installed on or in a motor vehicle in compliance with regulations under §203(a) of the federal Clean Air Act, or to cause a vehicle to operate using a fuel which the vehicle is not certified to use, or to operate on a fuel not approved or certified by the U.S. Environmental Protection Agency or the California Air Resources Board. (310 CMR 60.02)