

READINESS FAILURE FACT SHEET

Beginning in January 2005, the New York City Taxi and Limousine Commission (TLC) will implement mandatory on-board diagnostics (OBD II) inspections on all medallion taxicabs. OBD inspections will apply to most model year 1996 and newer light duty vehicles. For Hire vehicles, regulated by the TLC will also undergo an OBDII inspection. Instead of the existing tailpipe inspection at an approved NYS inspection facility 3 times a year, the OBD inspection will be performed using NYVIP equipment beginning spring of 2005. While the actual testing equipment varies, the testing criteria and guidelines described below will apply to both types of inspection.

WHAT IS A MONITOR?

An essential component of every OBD II inspection is the readiness check of each applicable monitor. The readiness evaluation is part of the final OBD II inspection result, and it could possibly be the only reason why a vehicle fails the TLC emissions inspection.

To complete an OBD inspection, the TLC and NYVIP test equipment makes an electronic request for information to the vehicle being inspected through a standardized connector. The subject vehicle responds back to the testing equipment with information including the status (“on” or “off”) of the Malfunction Indicator Light (MIL) and the readiness status of the emissions control systems. As listed below, these individual emissions control systems are commonly referred to as “monitors.” While there are eleven possible monitors, currently no vehicle has all 11 monitors present.

- Misfire (continuous)
- Fuel Trim (continuous)
- Comprehensive Components (continuous)
- Catalyst (CAT)
- Exhaust Gas Recirculation (EGR)
- Evaporative (EVAP)
- Oxygen (O2) Sensor
- Secondary Air
- Heated Catalyst
- Air Conditioning (AC) System
- O2 Sensor Heater

The exact number of monitors in any vehicle depends on the motor vehicle manufacturer’s emissions control strategy. Note that the misfire, fuel trim, and comprehensive components monitors are referred to as being “continuous.” These three monitors are found in every gasoline-powered OBD II vehicle, and are very different in design from the other eight monitors. The three continuous monitors are constantly being tested and evaluated by the vehicle’s computer, or power train control module (PCM), while the vehicle is running. Conversely, the other eight monitors are commonly referred to as being “non-continuous” monitors, as certain conditions need to occur before a test or series of tests can be completed by the PCM.

The conditions necessary for the vehicle to run self-diagnostic testing are referred to as the “enabling criteria.” Some monitors require that the vehicle to follow a prescribed “drive cycle” routine as part of the enabling criteria. Some non-continuous monitors require two drive cycles due to the need for a cool down and warm up periods in between.

Depending on the non-continuous monitor, variables such as speed, engine and ambient temperatures, load, fuel level, as well as other conditions must be met for the monitor to perform its self-test. For more information on drive cycles, see the discussion below.

It is very important to realize that the TLC and NY-VIP test equipment does not force the vehicle to perform testing on any monitor. Rather, the equipment simply asks the vehicle for information. The TLC and NY-VIP units then make the readiness determination based on the information supplied.

WHAT IS MEANT BY MONITOR STATUS?

As noted above, not all eleven monitors are present. When a particular emission control system is not applicable to the vehicle being tested, the monitor is reported as “**Unsupported.**” The vehicle cannot self-test this monitor simply because it does not exist. Most gasoline-powered OBD II vehicles have at least a few unsupported monitors. As expected, unsupported monitors have no role in the overall readiness evaluation or the overall OBD inspection result.

Those monitors that are incorporated into vehicle manufacturer’s emissions control design are referred to as being “Supported.” Supported monitors need to be evaluated by the vehicle’s PCM. For most gasoline-powered light duty vehicles, the common range of the number of “supported” monitors ranges between six to eight. When the vehicle’s PCM completes testing of a particular monitor, the readiness system status will be reported as “**Ready**” or “**Complete.**” Once a monitor is set as “Ready” or “Complete” it will remain in this state unless diagnostic trouble codes (DTCs) are cleared by a scan tool or if the PCM’s short term memory is erased by a power failure (i.e., disconnecting the battery).

If the vehicle has not completed the testing of a supported monitor, the monitor status will be reported by the vehicle as “Not Complete” or “Not Ready.”

New York State has adopted the federal Environmental Protection Agency (EPA) guidance concerning readiness during OBD inspections. A vehicle will fail the TLC or NYVIP OBD II inspection if enough monitors are reported as “**Not Ready**” or “**Not Complete.**” TLC regulated vehicles from model year 1996 to model year 2000, inclusive, will fail if 3 or more monitors are set as “Not Ready;” while model year 2001 and newer vehicles will fail when 2 or more monitors are reported as “Not Ready.”

In summary, the readiness status of OBD monitors are considered in making the OBD II pass or fail determination. For most gasoline-powered vehicles, this involves 3 to 5 monitors.

GENERAL READINESS GUIDANCE

1. Operators should be advised against disconnecting their battery in an attempt to bypass the OBD inspection. This practice is counterproductive as it will lead to a readiness-related failure. The taxicab will have to be driven to re-set the monitors, and then return for a re-inspection.
2. Operators are encouraged to have emissions-related repairs completed when they are first identified by the illuminated MIL. A delay in effective repairs may result in increased fuel cost due to reduced fuel economy and potentially more costly repairs in the future.
3. Operators should realize that some vehicles are more difficult to make “Ready” than others and multiple attempts at completing a recognized drive cycles may be necessary.

OBD II - REPAIR SUGGESTIONS

1. Consult technical service bulletins (TSBs) before attempting repairs. If it is a common problem that has already been documented, it will save you a lot of time and frustration.
2. Use a professional grade scan tool to verify that the MIL is not commanded on. Confirm that there are no diagnostic trouble codes (DTCs) which may prevent a monitor from running to completion.
3. Use the “OBD generic” function on the scan tool, as these results may differ from the manufacturer specific protocols.
4. The practice of “clearing codes” should be used sparingly as possible, as all monitors will be re-set as “Not Ready” when this occurs. Whenever possible, instead of clearing codes after completing a repair, drive the vehicle sufficiently to allow the PCM to extinguish the MIL by itself.
5. Verify that the most current version of manufacturer’s firmware (PCM software) is installed on the vehicle’s computer, as the vehicle may need an upgrade to operate correctly.
6. Follow recommended diagnostic practices and procedures. Aimlessly replacing parts in an attempt to remove a DTC is generally ineffective and potentially very costly for the motorist. For example, an oxygen related DTC could actually be the result of an exhaust leak upstream of the O2 sensor. In this case, replacing a properly functioning O2 sensor will not resolve this problem.
7. Check the fuel level in the vehicle. Some monitors, in particular the EVAP monitor, may require the fuel level to be between 35% and 85% of full to initiate diagnostic testing.
8. Continuing education and training related to OBD repairs is recommended.

RUNNING AN OBDII DRIVE CYCLE

The purpose of completing an OBD II drive cycle is to force the vehicle to run its onboard diagnostics. Some form of drive cycle needs to be performed after DTCs have been erased from the PCM's memory or after the battery has been disconnected. If a TLC vehicle failed the OBD inspection for readiness, running through a prescribed drive cycle will "set" the readiness monitors to "Complete" so that the vehicle can be re-inspected and that future faults can be detected. The drive cycles for Ford Crown Victorias, as well as other vehicle drive cycles, can be found at <http://www.obdclearinghouse.com> under "Vehicle OEM Database" or within the vehicle's Service Manual.

If you would like more information on OBD or readiness monitors, visit the following websites:

www.obdclearinghouse.com

www.obdiicsu.com

www.iatn.net

www.obdii.com

<http://autocenter.weber.edu/OBD-CH/vehicleoems.asp>

www.nevecs.colostate.edu/

www.nastf.org