

READINESS MONITOR DRIVE PATTERN

1. PURPOSE OF THE READINESS TESTS

- The On-Board Diagnostic (OBD II) system is designed to monitor the performance of emission-related components and report any detected abnormalities in the form of Diagnostic Trouble Codes (DTCs). Since the various components need to be monitored during different driving conditions, the OBD II system is designed to run separate monitoring programs called Readiness Monitors. Many state Inspection and Maintenance (I/M) programs require that vehicles complete their Readiness Monitors prior to beginning an emission test.
- The current status of the Readiness Monitors can be seen by using the hand-held tester with version 9.0 software (or newer), or a generic OBD II Scan tool.
- To view the Readiness Monitor status using the hand-held tester, select "Monitor Status" from the Enhanced OBD II Menu.
- A status of "complete" indicates that the necessary conditions have been met to run the performance tests for the related Readiness Monitor.
- The Readiness Monitor will be reset to "incomplete" if:
 - ECM has lost power (battery or fuse).
 - DTCs have been cleared.
 - The conditions for running the Readiness Monitor have not been met.
- In the event that any Readiness Monitor shows "incomplete," follow the appropriate Readiness Monitor Drive Pattern to activate the monitor and change the readiness status to "complete."

CAUTION:

Strictly observe the posted speed limits, traffic laws, and road conditions when performing these drive patterns.

NOTICE:

These drive patterns represent the fastest method to satisfy all necessary conditions which allow the specific readiness monitor to complete.

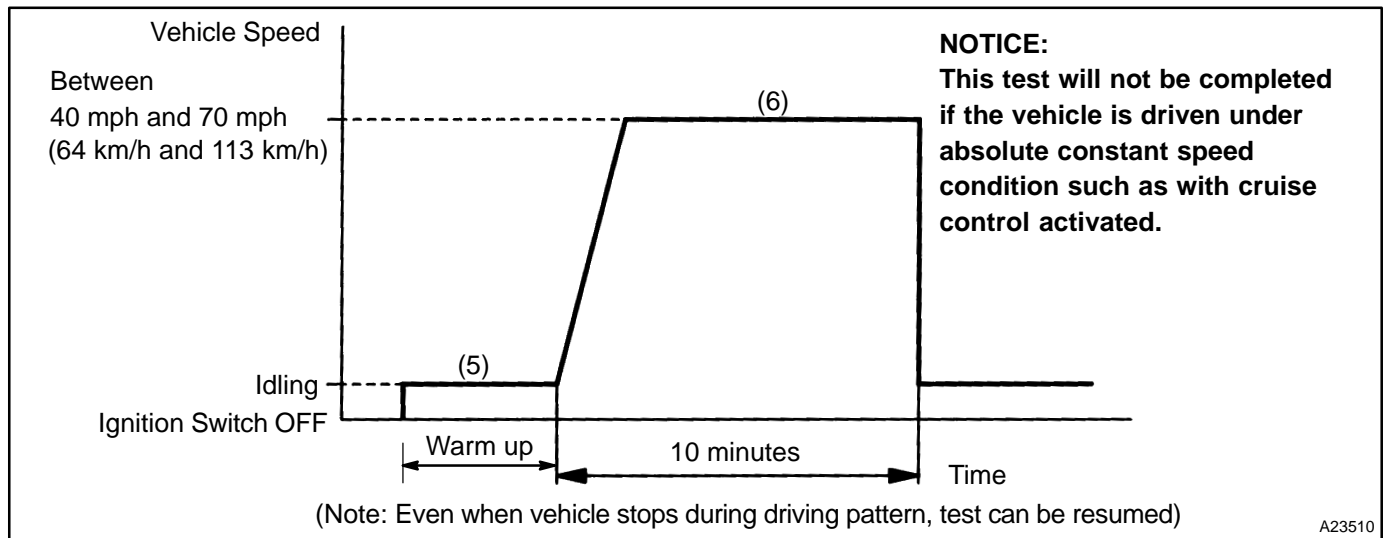
In the event that the drive pattern must be interrupted (possibly due to traffic conditions or other factors) the drive pattern can be resumed, and in most cases, the readiness monitor will still set to "complete".

To ensure rapid completion of readiness monitors, avoid sudden changes in vehicle load and speed (driving up and down hills and/or sudden acceleration).

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2. CATALYST MONITOR (ACTIVE AIR-FUEL RATIO CONTROL TYPE)



(a) Preconditions

The monitor will not run unless:

- The MIL is OFF

(b) Drive Pattern

- (1) Connect a hand-held tester or OBD II scan tool to the DLC3.
- (2) Turn the ignition switch to ON.
- (3) Turn the tester or scan tool ON.
- (4) Clear DTCs (where set) (see page [DI-42](#)).
- (5) Start the engine and warm it up.
- (6) Drive the vehicle at between 40 mph and 70 mph (64 km/h and 113 km/h) for at least 10 minutes.

(c) Monitor Status

- (1) Check the Readiness Monitor status displayed on the tester or scan tool.
- (2) If the status does not switch to COMPL (complete), extend the driving time.

3. EVAP MONITOR (VACUUM PRESSURE MONITOR)

NOTICE:

A cold soak must be performed prior to conducting the drive pattern to complete the Internal Pressure Readiness Monitor.

(a) Cold Soak Preconditions

The monitor will not run unless:

- MIL is OFF
- Fuel level is approximately 1/2 to 3/4
- Altitude is 7,800 feet (2,400 m) or less

(b) Cold Soak Procedure

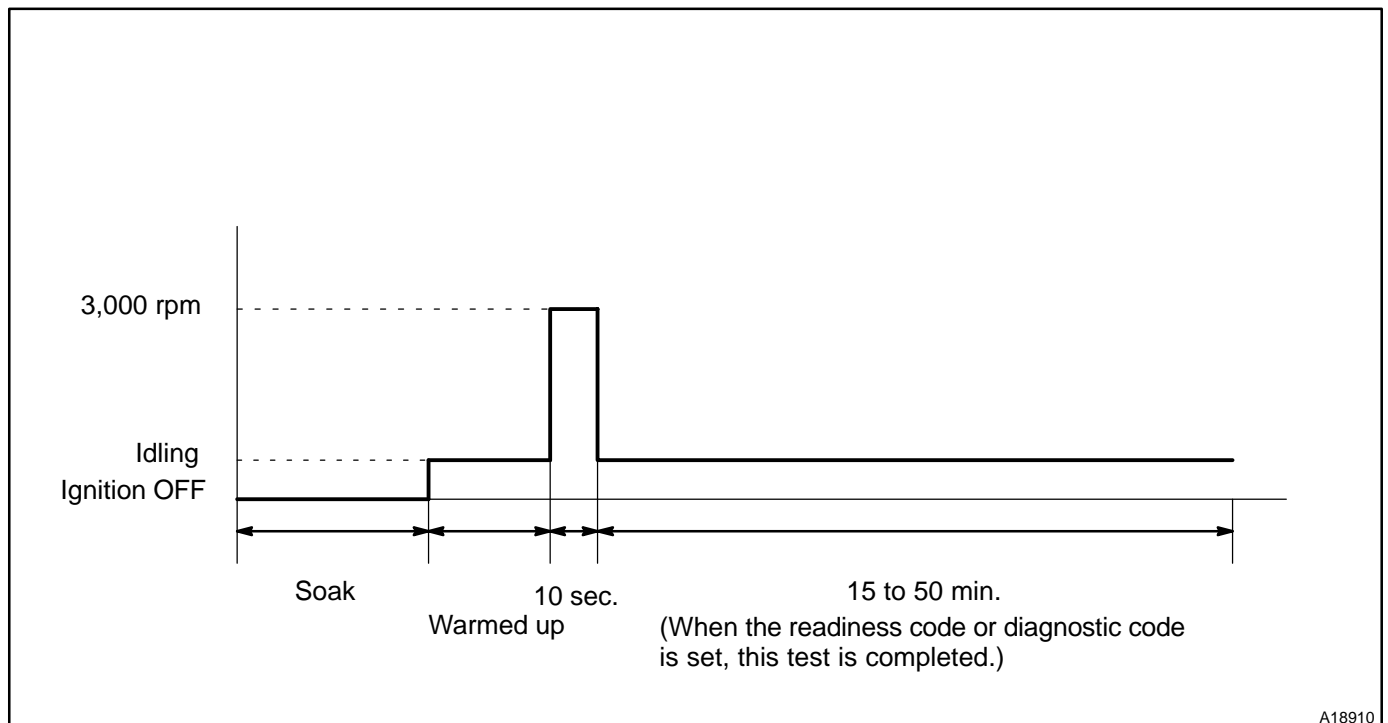
Let the vehicle cold soak for 8 hours or until the difference between IAT and ECT becomes less than 7°C (13°F)

HINT:

Examples:

- Scenario 1
ECT = 24°C (75°F)
IAT = 16°C (60°F)
Difference between ECT and IAT is 8°C (15°F)
→ The monitor will not run because difference between ECT and IAT is greater than 7°C (13°F)
- Scenario 2
ECT = 21°C (70°F)
IAT = 20°C (68°F)
Difference between ECT and IAT is 1°C (2°F)
→ The monitor will run because difference between ECT and IAT is less than 7°C (13°F)

4. EVAP MONITOR (VACUUM PRESSURE MONITOR) (CONTINUED)



(a) Preconditions

The monitor will not run unless:

- MIL is OFF
- Fuel level is approximately 1/2 to 3/4
- Altitude is 7,800 feet (2,400 m) or less
- Engine Coolant Temperature (ECT) is between 4.4°C and 35°C (40°F and 95°F)
- Intake Air Temperature (IAT) is between 4.4°C and 35°C (40°F and 95°F)
- Cold Soak Procedure has been completed
- Before starting the engine, the difference between ECT and IAT must be less than 7°C (13°F)

HINT:

Examples:

- Scenario 1
ECT = 24°C (75°F)
IAT = 16°C (60°F)
Difference between ECT and IAT is 8°C (15°F)
→ The monitor will not run because difference between ECT and IAT is higher than 7°C (13°F)
- Scenario 2
ECT = 21°C (70°F)
IAT = 20°C (68°F)
Difference between ECT and IAT is 1°C (2°F)
→ The monitor will run because difference between ECT and IAT is less than 7°C (13°F)

The readiness test can be completed in cold ambient conditions (less than 40°F / 4.4°C) and/or at high altitudes (more than 7,800 feet / 2,400 m) if the drive pattern is repeated a second time after cycling the ignition off.

(b) Drive Pattern

- (1) Connect the OBD II scan tool to DLC3 to check monitor status and preconditions (refer to (a)).
- (2) Release pressure in fuel tank by removing the fuel tank cap and then reinstall it.
- (3) Start the engine and allow it to idle until ECT becomes 75°C (167°F) or higher.
- (4) Run the engine at 3,000 rpm for approximately 10 seconds.
- (5) Allow the engine to idle with the A/C ON (to create slight load) for 15 to 50 minutes.

NOTICE:

If the vehicle is not equipped with A/C, put a slight load on the engine by doing the following :

- **Securely set the parking brake.**
- **Block the drive wheels with wheel chocks.**
- **Allow the vehicle to idle in drive for 15 to 50 minutes.**

5. AIR-FUEL RATIO (A/F) AND OXYGEN SENSOR (HO2) MONITOR (ACTIVE AIR-FUEL RATIO CONTROL TYPE)

(a) Preconditions

The monitor will not run unless:

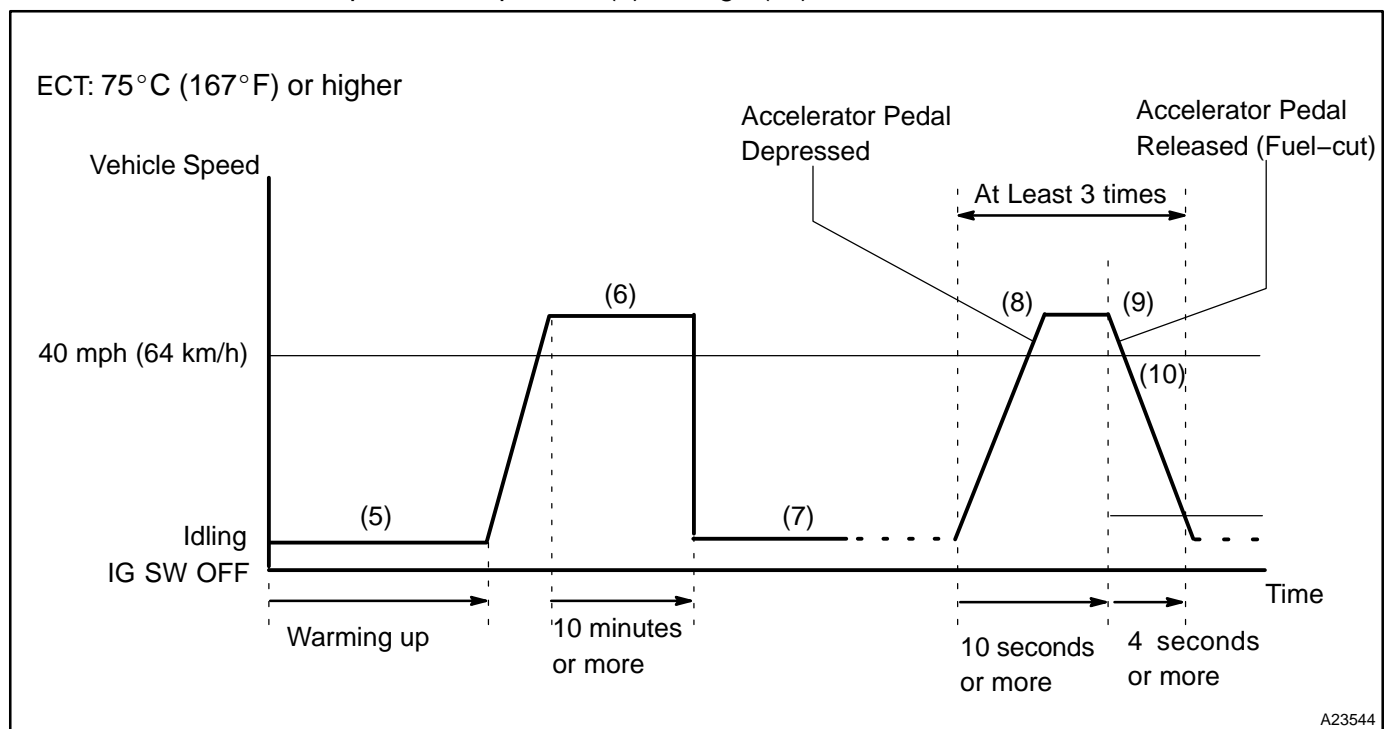
- 2 minutes or more have elapsed since the engine was started.
- The Engine Coolant Temperature (ECT) is 75°C (167°F) or higher.
- Air-fuel ratio feedback control is performed.
- Fuel-cut control is performed for 8 seconds or more.

(b) Drive Pattern

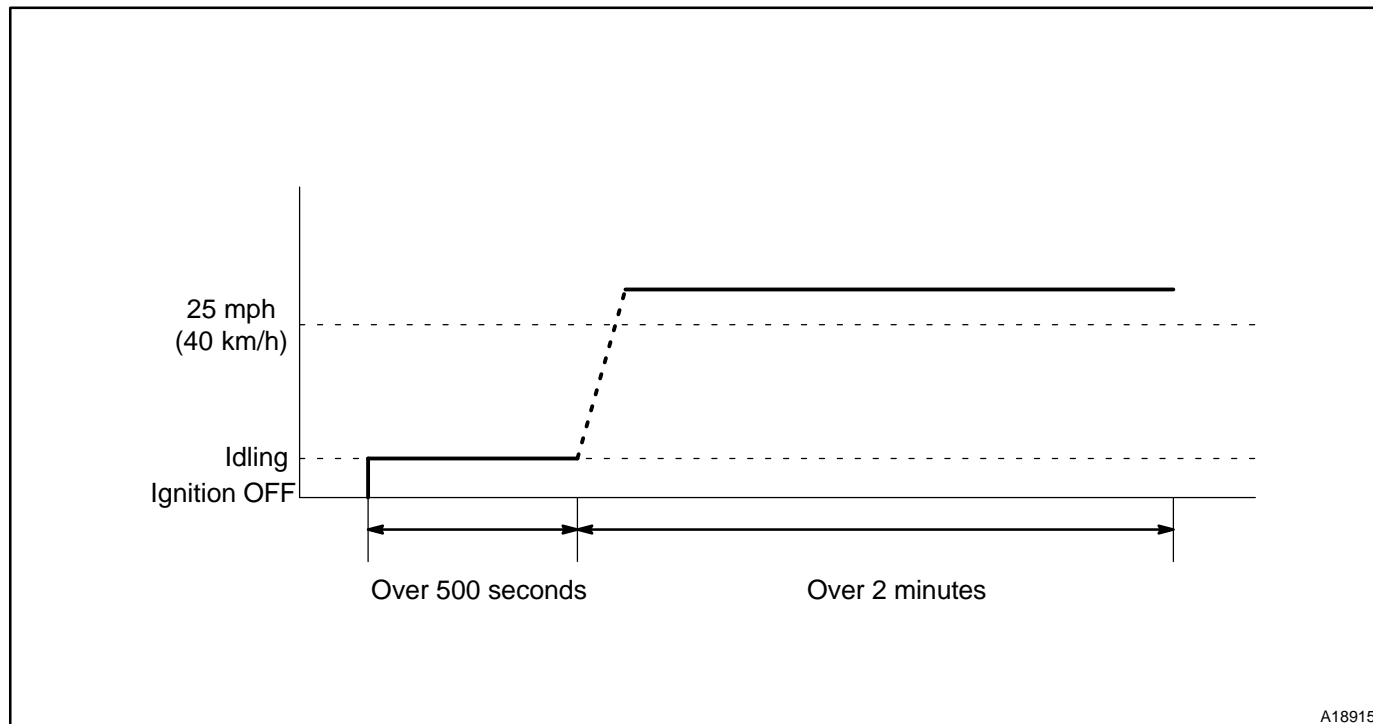
- (1) Connect the hand-held tester to DLC3.
- (2) Turn the ignition switch to ON.
- (3) Clear DTCs (see page [DI-42](#)).
- (4) Start the engine, and warm it up until the ECT reaches 75°C (167°F) or higher.
- (5) Drive the vehicle at 40 mph (64 km/h) or more for at least 10 minutes.
- (6) Change the transmission to 2nd gear.
- (7) Accelerate the vehicle to 30 mph (48 km/h) or more by depressing the accelerator pedal for at least 10 seconds.
- (8) Soon after performing step (8) above, release the accelerator pedal for at least 4 seconds without depressing the brake pedal, in order to execute fuel-cut control.
- (9) Stop the vehicle and allow the engine to idle for 10 seconds or more.
- (10) Allow the vehicle to decelerate until the vehicle speed declines to less than 6 mph (10 km/h).
- (11) Repeat steps from (8) through (10) above at least 3 times in one driving cycle.

(c) Monitor Status

- (1) Check the Readiness Monitor status displayed on the tester.
- (2) If the status does not switch to COMPL (complete), make sure that the preconditions have been met, and then perform steps from (5) through (11) in Drive Pattern above.



6. OXYGEN SENSOR HEATER MONITOR



(a) Preconditions

The monitor will not run unless:

- MIL is OFF

(b) Drive Pattern

- (1) Connect the OBD II scan tool to the DLC3 to check monitor status and preconditions (refer to (a)).
- (2) Start the engine and allow it to idle for 500 seconds or more.
- (3) Drive the vehicle at 25 mph (40 km/h) or more for at least 2 minutes.
- (4) Check the status of the readiness monitor on the scan tool display. If readiness status did not switch to complete, ensure the preconditions are met, turn the ignition off and then repeat steps (2) and (3).