

## 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 with Diagnostic Trouble Codes (DTCs). Since various components need to be monitored during different driving conditions, the OBD II system runs separate monitoring programs called readiness monitors.
- The hand-held tester's software must be version 9.0 or newer to view the readiness monitor status. From the "ENHANCED OBD II" Menu, select "MONITOR STATUS" to view the readiness monitor status.
- A generic OBD II scan tool can also be used to view the readiness monitor status.
- When the readiness monitor status reads "complete", the necessary conditions have been met for running performance tests for that readiness monitor.

#### HINT:

Many state Inspection and Maintenance (I/M) programs require a vehicle's readiness monitor status to show "complete".

- The readiness monitor will be reset to "incomplete" if:
  - The ECM has lost battery power or blown a fuse.
  - DTCs have been cleared.
  - The conditions for running the readiness monitor have not been met.
- If the readiness monitor status shows "incomplete", follow the appropriate readiness monitor drive pattern to change the status to "complete".

#### CAUTION:

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

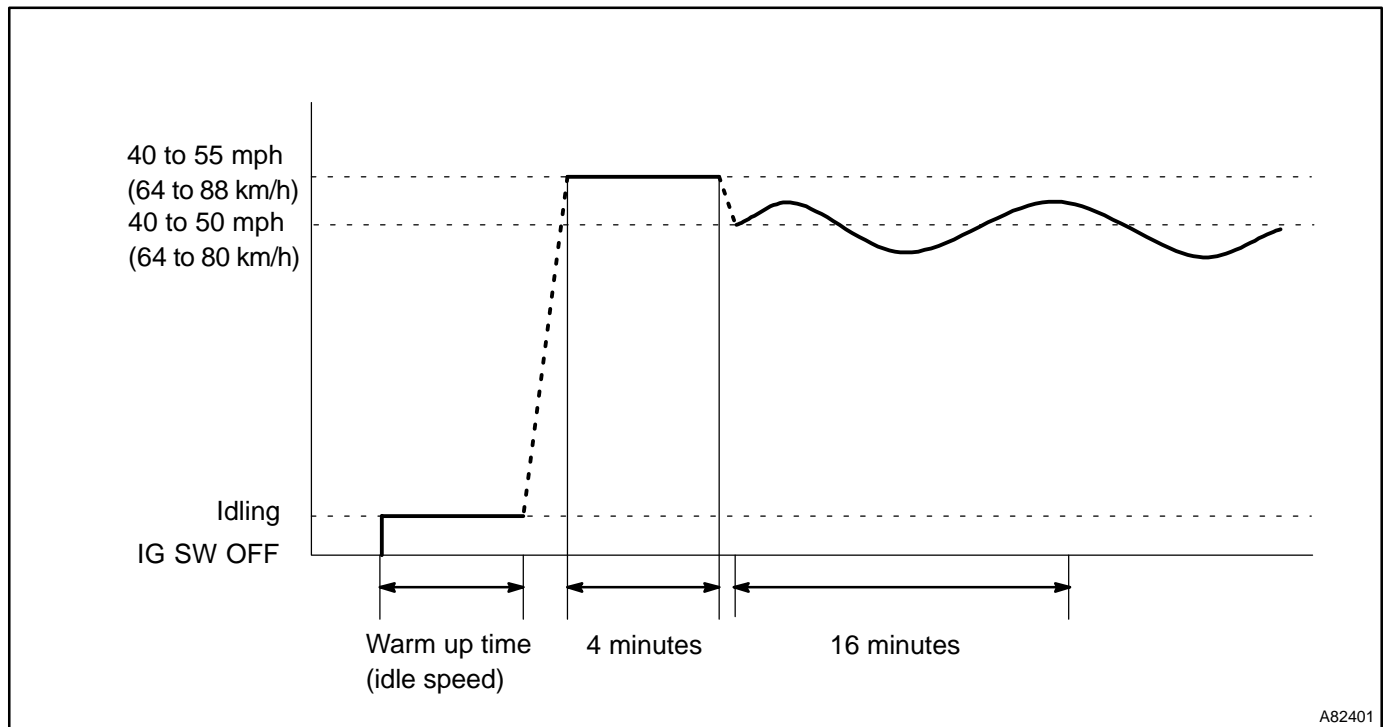
#### NOTICE:

**The following drive patterns are the fastest method of completing all the requirements necessary for making the readiness monitor status read "complete".**

**If forced to momentarily stop a drive pattern due to traffic or other factors, the drive pattern can be resumed. Upon completion of the drive pattern, in most cases, the readiness monitor status will change to "complete".**

**Sudden changes in vehicle load and speed, such as driving up and down hills and / or sudden acceleration, hinder readiness monitor completion.**

## 2. CATALYST MONITOR (A/F SENSOR TYPE)



### (a) Preconditions

The monitor will not run unless:

- The MIL is OFF.
- Engine Coolant Temperature (ECT) is 75°C (167°F) or greater.
- Intake Air Temperature (IAT) is -10°C (14°F) or greater.\*

### NOTICE:

\* 2002 and later MY vehicles:

**To complete the readiness test in cold ambient conditions (less than -10°C / 14°F), turn the ignition switch to the OFF position and then back to the ON position. Perform the drive pattern a second time.**

### (b) Drive Pattern

- (1) Connect the OBD II scan tool to DLC3 to check readiness monitor status and preconditions (refer to step (a)).
- (2) Drive vehicle at 40 to 55 mph (64 to 88 km/h) for approximately 4 minutes.

### NOTICE:

**Drive with smooth throttle operation and avoid sudden acceleration.**

**If IAT was less than 10°C (50°F) when the engine was started, drive the vehicle at 40 to 55 mph (64 to 88 km/h) for an additional 4 minutes.**

- (3) Drive vehicle allowing speed to fluctuate between 40 to 50 mph (64 to 80 km/h) for about 16 minutes.

### NOTICE:

**Drive with smooth throttle operation and avoid sudden closure of the throttle.**

- (4) Check the status of the readiness monitor on the scan tool display. If readiness monitor status did not switch to complete, ensure preconditions are met, turn the ignition OFF, and then repeat steps (2) and (3).

### 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:

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

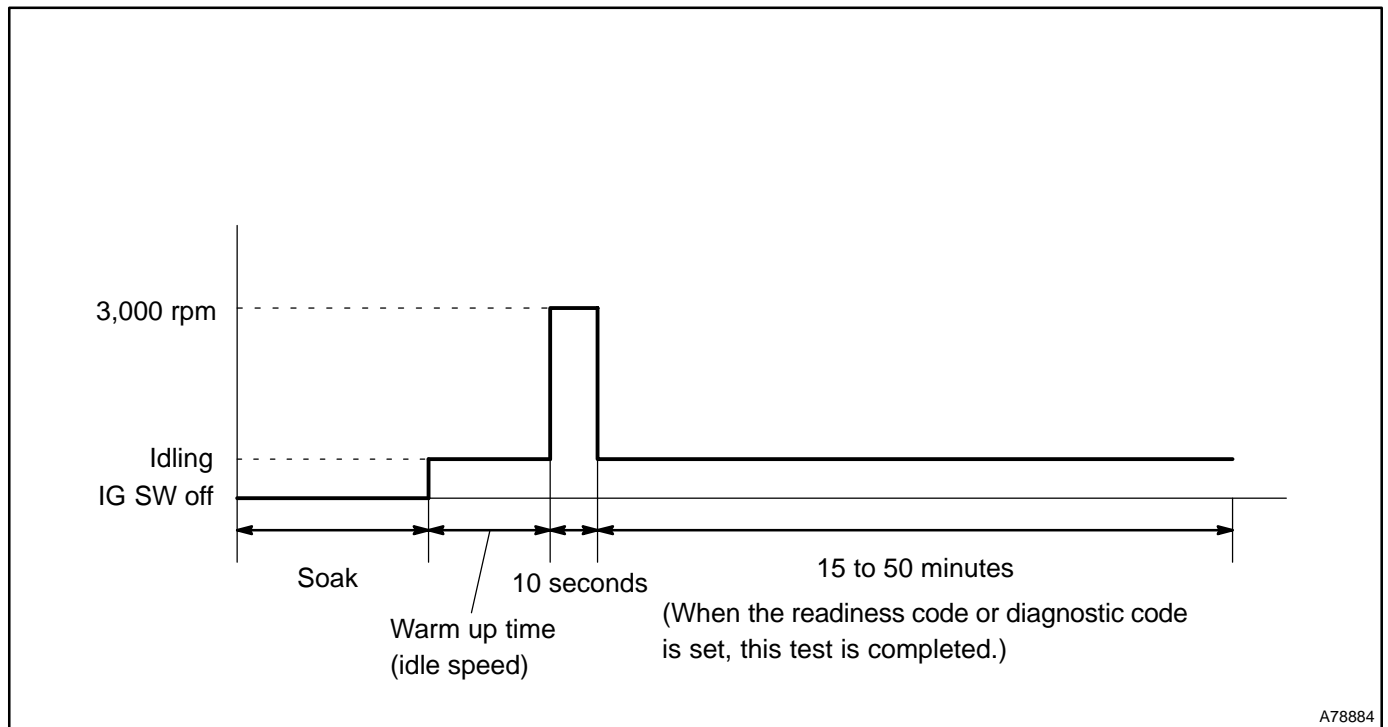
(b) Cold Soak Procedure

Let vehicle cold soak for 8 hours or until the difference between IAT and ECT is 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)



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##### (a) Preconditions

The monitor will not run unless:

- The MIL is OFF.
- Fuel level is approximately 1/2 to 3/4 full.
- The altitude is 7800 feet (2400 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).\*
- The 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 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).

##### NOTICE:

\* **NOTE for 2002 and later MY vehicles:**

The readiness test can be completed in cold ambient conditions (less than 4.4°C / 40°F) and / or high altitudes (more than 7,800 feet / 2,400 m). Finish the drive pattern, turn the ignition switch OFF and then on again, and repeat the drive pattern a second time.

**(b) Drive Pattern**

- (1) Connect the OBD II scan tool to DLC3 to check monitor status and preconditions (refer to step "a").
- (2) Release pressure in fuel tank by removing the fuel tank cap and then reinstalling it.
- (3) Start the engine and allow it to idle until ECT is 75°C (167°F) or more.
- (4) Run the engine at 3,000 rpm for about 10 seconds.
- (5) With the engine idling, turn the A/C ON to create slight electrical load. Wait 15 to 50 minutes.

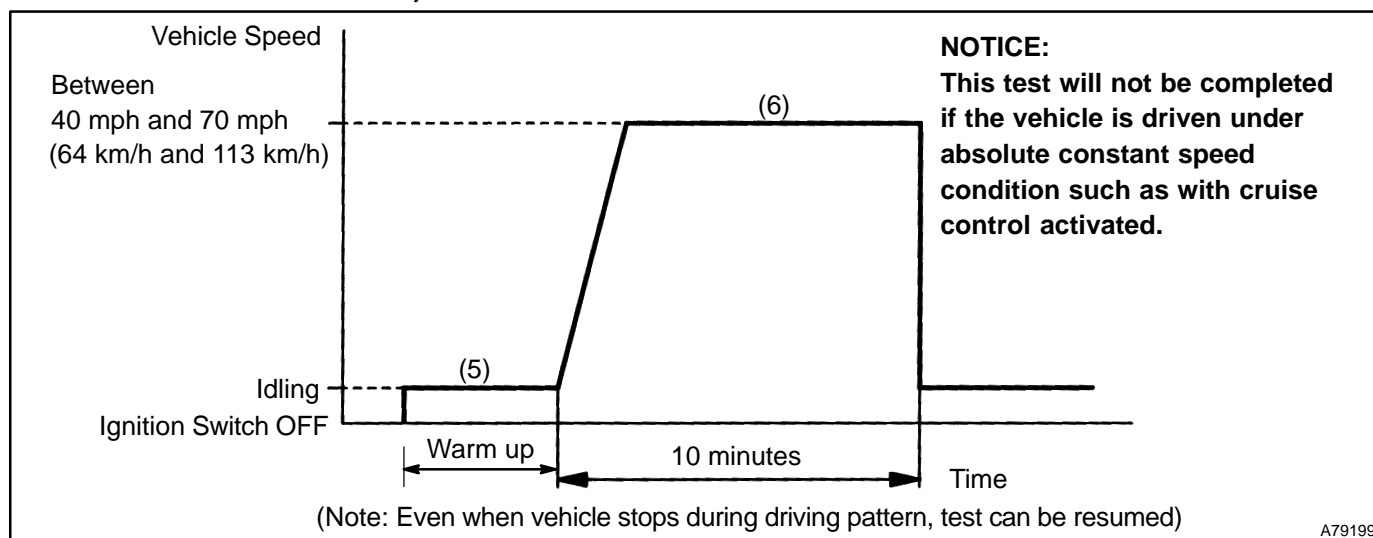
**NOTICE:**

**If the vehicle does not have A/C, put a slight electrical load on the engine by following the steps below:**

- **Set the parking brake securely.**
- **Use wheel chocks to secure the tires.**
- **Move the shift lever to drive (position D) and allow engine to idle for 15 to 50 minutes.**

**Check the readiness monitor status.**

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



### (a) Preconditions

The monitor will not run unless:

- The MIL is OFF

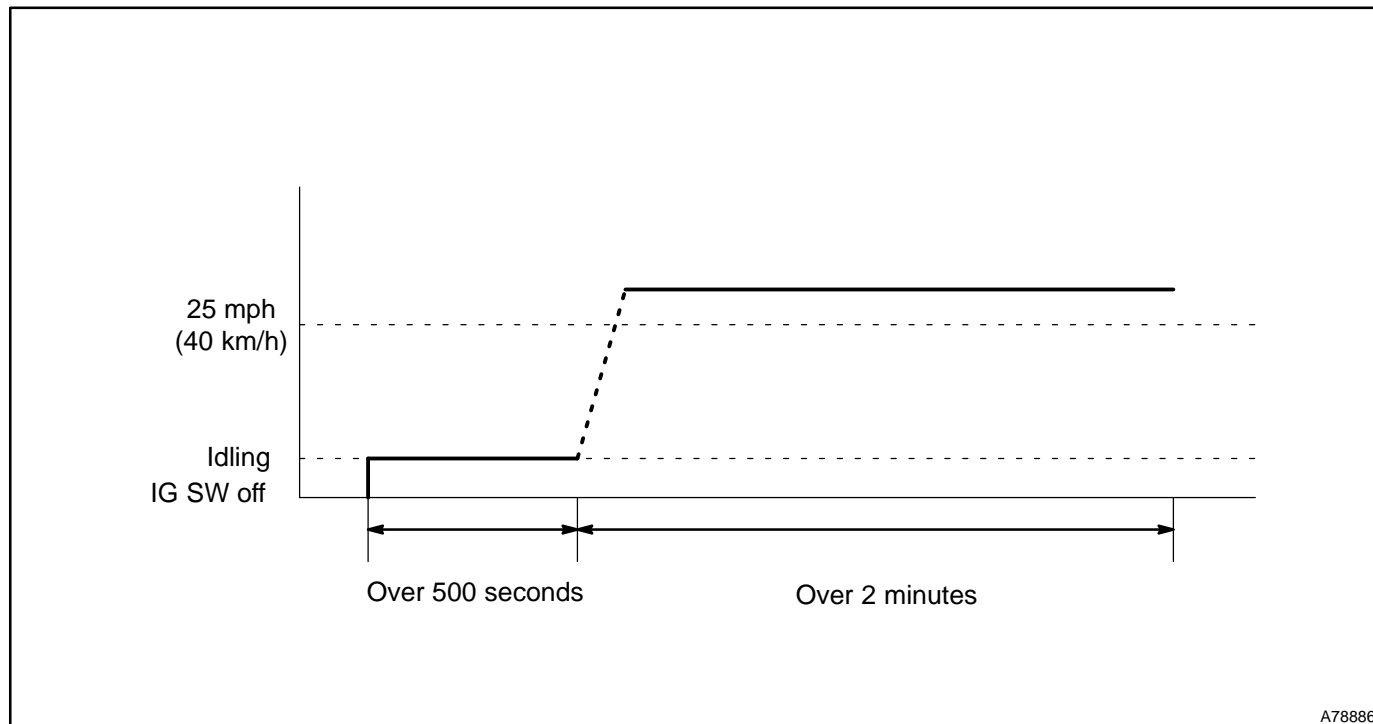
### (b) Drive Pattern

- (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 05-41).
- (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.

## 6. OXYGEN / A/F SENSOR HEATER MONITOR



### (a) Preconditions

The monitor will not run unless:  
The MIL is OFF.

### (b) Drive Pattern

- (1) Connect the OBD II scan tool to DLC3 to check monitor status and preconditions (refer to step (a)).
- (2) Start the engine and allow it to idle for 500 second or more.
- (3) Drive the vehicle at 25 mph (40 km/h) or more for at least 2 minutes.
- (4) Check the readiness monitor status. If the readiness monitor status did not change to "complete", check the the preconditions, turn the ignition switch OFF, and repeat steps (2) and (3).