TOYOTA

Technical Service BULLETIN

March 29, 2002

Title:

READINESS MONITOR DRIVE PATTERNS

Models:

All '96 – '02

TSB

REVISED

ENGINE

EG003-02

TSB REVISION NOTICE:

The information updated in this TSB is red and underlined.

Introduction

The On–Board Diagnostic (OBDII) 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 OBDII 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 emissions test.

The current status of the Readiness Monitors can be seen by using the Toyota Diagnostic Tester with version 9.0 software (or newer), or a generic OBDII Scantool.
To view the Readiness Monitor status using the Toyota Diagnostic Tester, select "Monitor Status" from the Enhanced OBDII 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:

- ECU 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 change the readiness status to "complete."
Refer to the Readiness Monitor Drive Pattern Application Table to determine which drive pattern should be followed.

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Applicable Vehicles

- **All 1996 – 2002** model year **Toyota** vehicles.

Warranty Information

OP CODE	DESCRIPTION	TIME	OPN	T1	T2
N/A	Not Applicable to Warranty	–	–	–	–

Terms & Definitions

J1930 TERM	J1930 DEFINITION	TOYOTA/LEXUS DIAGNOSTIC TESTER PARAMETER
IAT	Intake Air Temperature	Intake Air
ECT	Engine Coolant Temperature	Coolant Temp

Required Tools & Material

TOOLS & MATERIAL	PART NUMBER	QUANTITY
Toyota Diagnostic Tester Kit	01001271	1
12 Megabyte Diagnostic Tester Program Card with version 9.0a Software (or later)	01002593-005	1

NOTE:

A generic OBDII Scantool can be used in place of the Toyota Diagnostic Tester.

CAUTION:

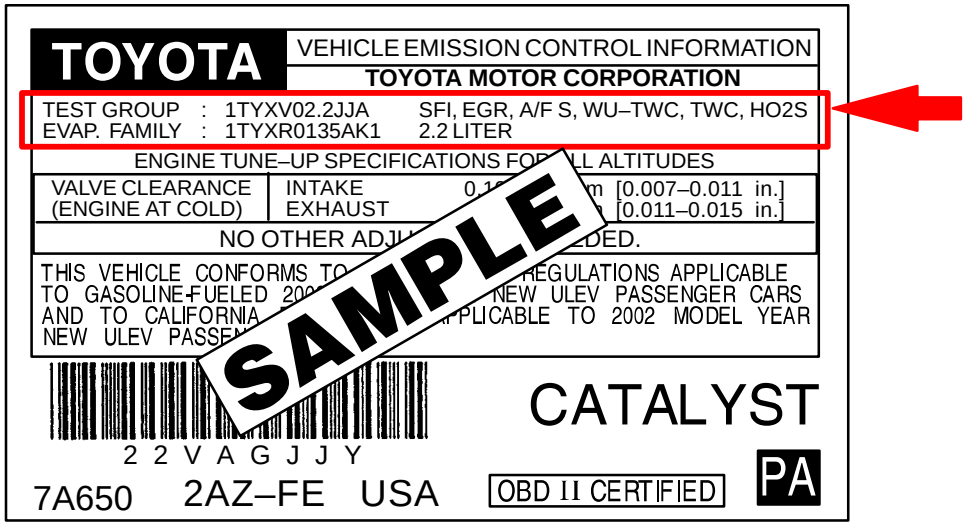
Strict observance of posted speed limits, traffic laws and road conditions are required when performing these drive patterns.

NOTE:

- **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).**

Underhood Emission Control Information Label

SAMPLE EMISSION CONTROL INFORMATION LABEL



EGR = Exhaust Gas Recirculation
A/F S = Air Fuel Sensor
O2S = Oxygen Sensor

Readiness Monitor Drive Pattern Application Tables

MODEL YEAR	MODEL	ENGINE	DRIVE TRAIN	CATEGORY	DRIVE PATTERN NUMBER*										
					EGR		CATALYST		EVAP				O2S/AF SENSOR		O2S/AF HTR
					1	2	3	4	5	6	7	8	9	10	11
1996	Tercel	5E–FE			X		X				X		X		X
	Paseo	5E–FE			X		X				X		X		X
	Corolla	7A–FE			X		X				X		X		X
	Celica	7A–FE			X		X				X		X		X
		5S–FE			X		X				X		X		X
	Camry	5S–FE	MTM		X		X				X		X		X
			ATM		X		X		X				X		X
		1MZ–FE	MTM		X		X		X				X		X
			ATM		X		X		X				X		X
	Avalon	1MZ–FE			X		X		X				X		X
	Supra	2JZ–GE			X		X		X				X		X
		2JZ-GTE			X		X				X		X		X
	RAV4	3S–FE			X		X		X				X		X
	Previa	2TZ–FZE			X		X				X		X		X
	Tacoma	2RZ–FE			X		X				X		X		X
		3RZ–FE			X		X		X				X		X
		5VZ–FE	2WD		X		X		X				X		X
			4WD	w/EGR**	X		X		X				X		X
				w/oEGR**	N/A		X		X				X		X
	4Runner	3RZ–FE			X		X		X				X		X
		5VZ–FE		w/EGR**	X		X		X				X		X
				w/oEGR**	N/A		X		X				X		X
	T100	3RZ–FE			X		X				X		X		X
		5VZ–FE	2WD or 4WD	w/EGR**	X		X		X				X		X
				w/oEGR**	N/A		X		X				X		X
	Land Cruiser	1FZ–FE				X	X		N/A				X		X

*** Readiness Monitor Drive Patterns:**

1. EGR (All Except 1FZ–FE Engine)
2. EGR (For 1FZ–FE Engine)
3. Catalyst (O2S Type)
4. Catalyst (AF Sensor Type)
5. EVAP (Internal Pressure Monitor/Non–Intrusive Type)
6. EVAP (Vacuum Pressure Monitor/Intrusive Type)
7. EVAP (Without Leak Detection)
8. EVAP (For Prius)
9. Oxygen Sensor Monitor (Front & Rear O2S System)
10. Oxygen/AF Sensor Monitor (Front AF Sensor & Rear O2S System)
11. Oxygen/AF Sensor Heater Monitor

**** Refer to Underhood Emissions Label on page 2.**

Readiness Monitor Drive Pattern Application Tables (Continued)

MODEL YEAR	MODEL	ENGINE	DRIVE TRAIN	CATEGORY	DRIVE PATTERN NUMBER*										
					EGR		CATALYST		EVAP				O2S/AF SENSOR		O2S/AF HTR
					1	2	3	4	5	6	7	8	9	10	11
1997	Tercel	5E–FE			X		X				X		X		X
	Paseo	5E–FE			X		X				X		X		X
	Corolla	7A–FE			X		X				X		X		X
	Celica	7A–FE			X		X				X		X		X
		5S–FE			X		X				X		X		X
	Camry	5S–FE	MTM		X		X				X		X		X
			ATM	Fed	X		X		X				X		X
				CA	X			X	X					X	X
		1MZ–FE	MTM		X		X		X				X		X
			ATM		X		X		X				X		X
	Avalon	1MZ–FE			X		X		X				X		X
	Supra	2JZ–GE			X		X		X				X		X
		2JZ-GTE			X		X				X		X		X
	RAV4	3S–FE			X		X		X				X		X
	Previa	2TZ–FZE			X		X				X		X		X
	Tacoma	2RZ–FE			X		X				X		X		X
		3RZ–FE			X		X		X				X		X
		5VZ–FE	2WD or 4WD	w/EGR**	X		X		X				X		X
			4WD	w/oEGR**	N/A		X		X				X		X
	4Runner	3RZ–FE			X		X		X				X		X
		5VZ–FE			N/A		X		X				X		X
	T100	3RZ–FE			X		X				X		X		X
		5VZ–FE	2WD	w/EGR**	X		X		X				X		X
			2WD or 4WD	w/oEGR**	N/A		X		X				X		X
	Land Cruiser	1FZ–FE				X	X		N/A				X		X

*** Readiness Monitor Drive Patterns:**

1. EGR (All Except 1FZ–FE Engine)
2. EGR (For 1FZ–FE Engine)
3. Catalyst (O2S Type)
4. Catalyst (AF Sensor Type)
5. EVAP (Internal Pressure Monitor/Non–Intrusive Type)
6. EVAP (Vacuum Pressure Monitor/Intrusive Type)
7. EVAP (Without Leak Detection)
8. EVAP (For Prius)
9. Oxygen Sensor Monitor (Front & Rear O2S System)
10. Oxygen/AF Sensor Monitor (Front AF Sensor & Rear O2S System)
11. Oxygen/AF Sensor Heater Monitor

**** Refer to Underhood Emissions Label on page 2.**

Readiness Monitor Drive Pattern Application Tables (Continued)

MODEL YEAR	MODEL	ENGINE	DRIVE TRAIN	CATEGORY	DRIVE PATTERN NUMBER*										
					EGR		CATALYST		EVAP				O2S/AF SENSOR		O2S/AF HTR
					1	2	3	4	5	6	7	8	9	10	11
1998	Tercel	5E–FE			N/A		X		X				X		X
	Paseo	5E–FE					X		X				X		X
	Corolla	1ZZ–FE					X		X				X		X
	Celica	5S–FE			X		X				X		X		X
	Camry	5S–FE		Fed	X		X		X				X		X
				CA	X			X	X					X	X
		1MZ–FE	MTM		X		X		X				X		X
			ATM	Fed	X		X		X				X		X
				CA	X			X	X					X	X
	Avalon	1MZ–FE		Fed	X		X		X				X		X
				CA	X			X	X					X	X
	Supra	2JZ–GE			N/A		X		X				X		X
		2JZ-GTE			X		X				X		X		X
	RAV4	3S–FE		Fed	X		X		X				X		X
				CA	X			X	X					X	X
	Sienna	1MZ–FE			N/A		X		X				X		X
	Tacoma	2RZ–FE			X		X		X				X		X
		3RZ–FE			X		X		X				X		X
		5VZ–FE	2WD	w/EGR**	X		X		X				X		X
			4WD	w/oEGR**	N/A		X		X				X		X
	4Runner	3RZ–FE			X		X		X				X		X
		5VZ–FE			N/A		X		X				X		X
	T100	3RZ–FE			X		X		X				X		X
		5VZ–FE	2WD	w/EGR**	X		X		X				X		X
			2WD or 4WD	w/oEGR**	N/A		X		X				X		X
	Land Cruiser	2UZ–FE					X		X				X		X

*** Readiness Monitor Drive Patterns:**

1. EGR (All Except 1FZ–FE Engine)
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4. Catalyst (AF Sensor Type)
5. EVAP (Internal Pressure Monitor/Non–Intrusive Type)
6. EVAP (Vacuum Pressure Monitor/Intrusive Type)
7. EVAP (Without Leak Detection)
8. EVAP (For Prius)
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10. Oxygen/AF Sensor Monitor (Front AF Sensor & Rear O2S System)
11. Oxygen/AF Sensor Heater Monitor

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Readiness Monitor Drive Pattern Application Tables (Continued)

MODEL YEAR	MODEL	ENGINE	DRIVE TRAIN	CATEGORY	DRIVE PATTERN NUMBER*										
					EGR		CATALYST		EVAP				O2S/AF SENSOR		O2S/AF HTR
					1	2	3	4	5	6	7	8	9	10	11
1999	Tercel	5E–FE			X		X		X				X		X
	Paseo	5E–FE			X		X		X				X		X
	Corolla	1ZZ–FE			N/A		X		X				X		X
	Celica	5S–FE			X		X		X				X		X
	Camry	5S–FE		Fed	X		X		X				X		X
				CA	X			X	X					X	X
		1MZ–FE	MTM		X		X		X				X		X
			ATM	Fed	X		X		X				X		X
				CA	X			X	X					X	X
	Solara	5S–FE		Fed	X		X		X				X		X
				CA	X			X	X					X	X
		1MZ–FE	MTM		X		X		X				X		X
			ATM	Fed	X		X		X				X		X
				CA	X			X	X					X	X
	Avalon	1MZ–FE		Fed	X		X		X				X		X
				CA	X			X	X					X	X
	RAV4	3S–FE		Fed	X		X		X				X		X
				CA	X			X	X					X	X
	Sienna	1MZ–FE		Fed	N/A		X		X				X		X
				CA				X	X					X	X
	Tacoma	2RZ–FE			X		X		X				X		X
		3RZ–FE			X		X		X				X		X
		5VZ–FE	2WD	w/EGR**	X		X		X				X		X
			2WD or 4WD	w/oEGR**	N/A		X		X				X		X
	4Runner	3RZ–FE			X		X		X				X		X
		5VZ–FE		Fed	N/A		X		X				X		X
				CA				X	X					X	X
	Land Cruiser	2UZ–FE					X		X				X		X

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6. EVAP (Vacuum Pressure Monitor/Intrusive Type)
7. EVAP (Without Leak Detection)
8. EVAP (For Prius)
9. Oxygen Sensor Monitor (Front & Rear O2S System)
10. Oxygen/AF Sensor Monitor (Front AF Sensor & Rear O2S System)
11. Oxygen/AF Sensor Heater Monitor

**** Refer to Underhood Emissions Label on page 2.**

Readiness Monitor Drive Pattern Application Tables (Continued)

MODEL YEAR	MODEL	ENGINE	DRIVE TRAIN	CATEGORY	DRIVE PATTERN NUMBER*										
					EGR		CATALYST		EVAP				O2S/AF SENSOR		HTR
					1	2	3	4	5	6	7	8	9	10	11
2000	ECHO	1NZ–FE			N/A		X			X			X		X
	Corolla	1ZZ–FE					X			X			X		X
	Celica	1ZZ–FE					X			X			X		X
		2ZZ–GE					X			X			X		X
	MR2	1ZZ–FE					X			X			X		X
	Camry	5S–FE		Fed	X		X			X			X		X
				CA	X			X		X				X	X
		1MZ–FE	MTM		X		X			X			X		X
			ATM	Fed	X		X			X			X		X
				CA	X			X		X				X	X
	Solara	5S–FE		Fed	X		X			X			X		X
				CA	X			X		X				X	X
		1MZ–FE	MTM		X		X			X			X		X
			ATM	Fed	X		X			X			X		X
				CA	X			X		X				X	X
	Camry CNG	5S–FNE			X		N/A		N/A					X	X
	Avalon	1MZ–FE			N/A			X		X				X	X
	RAV4	3S–FE		Fed	X		X		X				X		X
				CA	X			X	X					X	X
	Sienna	1MZ–FE		Fed	N/A		X		X				X		X
				CA				X	X					X	X
	Tacoma	2RZ–FE			X		X		X				X		X
		3RZ–FE			X		X		X				X		X
		5VZ–FE	2WD	w/EGR**	X		X		X				X		X
			2WD or 4WD	w/o A/F S, w/oEGR**	N/A		X		X				X		X
				w/A/F S, w/oEGR**				X	X					X	X
	4Runner	3RZ–FE			X		X		X				X		X
		5VZ–FE		Fed	N/A		X		X				X		X
				CA				X	X					X	X
	Tundra	5VZ–FE		Fed			X		X				X		X
				CA				X	X					X	X
		2UZ–FE					X		X				X		X
	Land Cruiser	2UZ–FE					X		X				X		X

*** Readiness Monitor Drive Patterns:**

1. EGR (All Except 1FZ–FE Engine)
2. EGR (For 1FZ–FE Engine)
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11. Oxygen/AF Sensor Heater Monitor

**** Refer to Underhood Emissions Label on page 2.**

Readiness Monitor Drive Pattern Application Tables (Continued)

MODEL YEAR	MODEL	ENGINE	DRIVE TRAIN	CATEGORY	DRIVE PATTERN NUMBER*										
					EGR		CATALYST		EVAP				O2S/AF SENSOR		O2S/AF HTR
					1	2	3	4	5	6	7	8	9	10	11
2001	ECHO	1NZ–FE			N/A		X			X			X		X
	Corolla	1ZZ–FE					X			X			X		X
	Celica	1ZZ–FE					X			X			X		X
		2ZZ–GE					X			X			X		X
	MR2	1ZZ–FE					X			X			X		X
	Camry	5S–FE			X			X		X				X	X
		1MZ–FE	MTM		X		X			X			X		X
			ATM		X			X		X				X	X
	Solara	5S–FE			X			X		X				X	X
		1MZ–FE	MTM		X		X			X			X		X
			ATM		X			X		X				X	X
	Camry CNG	5S–FNE			X		N/A		N/A					X	X
	Avalon	1MZ–FE			N/A			X		X				X	X
	Prius	1NZ-FXE					X					X	X		X
	RAV4	1AZ–FE						X		X				X	X
	High-lander	2AZ–FE						X		X				X	X
		1MZ–FE						X		X				X	X
	Sienna	1MZ–FE						X		X				X	X
	Tacoma	2RZ–FE			X			X	X					X	X
		3RZ–FE			X			X	X					X	X
		5VZ–FE	2WD		X			X	X					X	X
			4WD		N/A			X	X					X	X
	4Runner	5VZ–FE						X		X				X	X
	Tundra	5VZ–FE						X	X					X	X
		2UZ–FE					X		X				X		X
	Land Cruiser	2UZ–FE					X		X				X		X
	Sequoia	2UZ–FE					X			X			X		X

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11. Oxygen/AF Sensor Heater Monitor

Readiness Monitor Drive Pattern Application Tables (Continued)

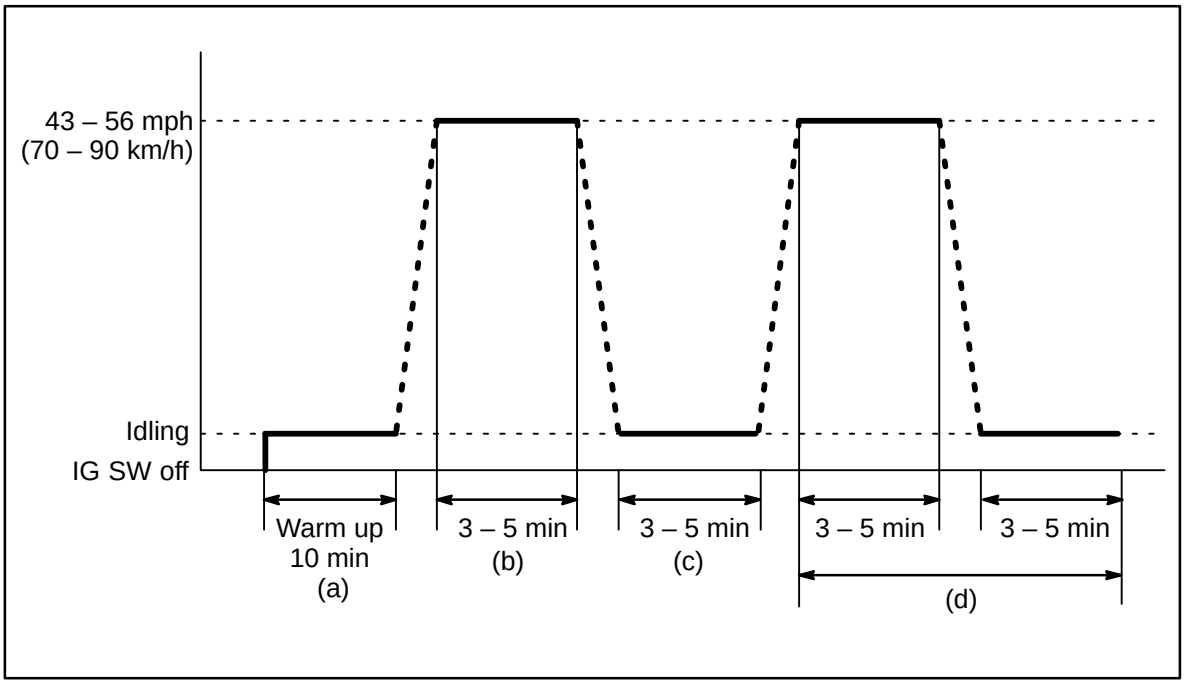
MODEL YEAR	MODEL	ENGINE	DRIVE TRAIN	CATEGORY	DRIVE PATTERN NUMBER*										
					EGR		CATALYST		EVAP				O2S/AF SENSOR		O2S/AF HTR
					1	2	3	4	5	6	7	8	9	10	11
2002	ECHO	1NZ–FE			N/A		X			X			X		X
	Corolla	1ZZ–FE					X			X			X		X
	Celica	1ZZ–FE					X			X			X		X
		2ZZ–GE					X			X			X		X
	MR2	1ZZ–FE					X			X			X		X
	Camry	2AZ–FE						X		X				X	X
		1MZ–FE	MTM		X		X			X			X		X
			ATM		X			X		X				X	X
	Solara	2AZ–FE			X			X		X				X	X
		1MZ–FE	MTM		X		X			X			X		X
			ATM		X			X		X				X	X
	Camry CNG	5S–FNE			X		N/A		N/A					X	X
	Avalon	1MZ–FE			N/A			X		X				X	X
	Prius	1NZ-FXE					X					X	X		X
	RAV4	1AZ–FE						X		X				X	X
	High-lander	2AZ–FE						X		X				X	X
		1MZ–FE						X		X				X	X
	Sienna	1MZ–FE						X		X				X	X
	Tacoma	2RZ–FE			X			X	X					X	X
		3RZ–FE			X			X	X					X	X
		5VZ–FE			N/A			X	X					X	X
	4Runner	5VZ–FE						X		X				X	X
	Tundra	5VZ–FE						X	X					X	X
		2UZ–FE					X		X				X		X
	Land Cruiser	2UZ–FE					X		X				X		X
	Sequoia	2UZ–FE					X			X			X		X

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1. EGR (All Except 1FZ–FE Engine)
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11. Oxygen/AF Sensor Heater Monitor

Readiness Monitor Drive Patterns: EGR Monitors

DRIVE PATTERN NO. 1: EGR Monitor (All Except 1FZ–FE Engine)



Preconditions

The monitor will not run unless:

- MIL is OFF.
- Altitude is 7800 feet (2400 m) or less.
- IAT (Intake Air) is 14°F (–10°C) or greater.

Drive Pattern Procedure

Connect the OBDII Scantool to the DLC3 connector to check monitor status and preconditions.

a. If IAT (Intake Air) is less than 50°F (10°C) when starting the engine, idle the engine for approximately 10 minutes.
b. Drive the vehicle at 43 – 56 mph (70 – 90 km/h) for a period of 3 – 5 minutes.

NOTE:
- **Do not allow the Throttle Position (TP) to exceed 30%.**
- **Drive with smooth throttle operation and avoid sudden acceleration.**

c. Stop the vehicle and let the engine idle for 3 – 5 minutes.
d. Repeat steps “b” and “c” once.

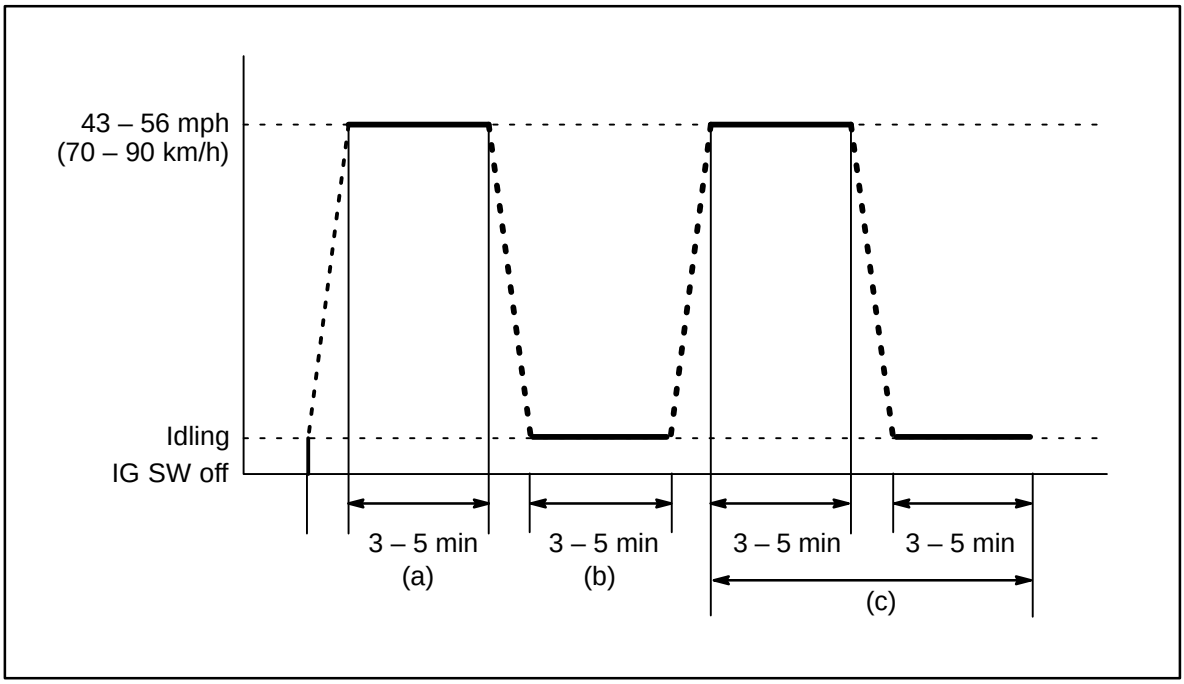
If readiness status does not switch to “complete,” ensure preconditions are met, turn the ignition OFF, then repeat steps “b” through “d.”

NOTE:

The readiness status may not switch to “complete” after the first drive pattern trip if a Pending Code has been set (first trip for a two–trip DTC).
- **Pending Codes are available from the DTC Info Menu in Enhanced OBDII.**
- **Pending Codes indicate a POTENTIAL problem was detected. A second trip is needed to confirm the DTC prior to diagnosis.**
- **Once a second trip is completed, a current DTC will be stored.**

Readiness Monitor Drive Patterns: EGR Monitors (Continued)

DRIVE PATTERN NO. 2: EGR Monitor (for 1FZ–FE Engine)



Preconditions

The monitor will not run unless:

- MIL is OFF.
- Altitude is 7800 feet (2400 m) or less.
- IAT (Intake Air) is 14°F (–10°C) or greater.
- ECT (Coolant Temp) is less than 104°F (40°C).

Drive Pattern Procedure

Connect the OBDII Scantool to DLC3 to check monitor status and preconditions.

a. Start the engine and as soon as safely possible begin driving the vehicle at 43 – 56 mph (70 – 90 km/h) for a period of 3 – 5 minutes.

NOTE:
- **Do not allow the Throttle Position (TP) to exceed 30%.**
- **Drive with smooth throttle operation and avoid sudden acceleration.**

b. Stop the vehicle and let the engine idle for 3 – 5 minutes.

c. Repeat steps “a” and “b” once.

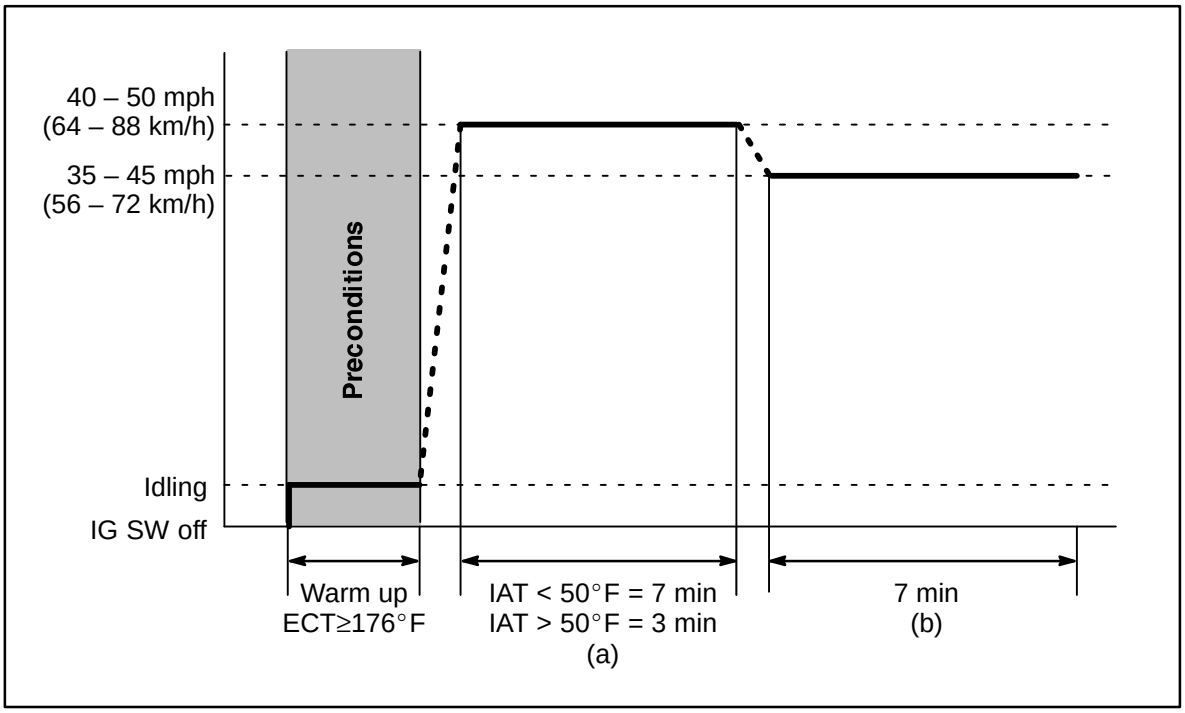
If readiness status does not switch to “complete,” ensure preconditions are met, turn the ignition OFF, then repeat steps “a” through “c.”

NOTE:

The readiness status may not switch to “complete” after the first drive pattern trip if a Pending Code has been set (first trip for a two–trip DTC).
- **Pending Codes are available from the DTC Info Menu in Enhanced OBDII.**
- **Pending Codes indicate a POTENTIAL problem was detected. A second trip is needed to confirm the DTC prior to diagnosis.**
- **Once a second trip is completed, a current DTC will be stored.**

Readiness Monitor Drive Patterns: Catalyst Monitors

DRIVE PATTERN NO. 3: Catalyst Monitor (O2S Type)



Preconditions

The monitor will not run unless:

- MIL is OFF.
- ECT (Coolant Temp) is 176°F (80°C) or greater.
- IAT (Intake Air) is 14°F (–10°C) or greater.*

*** For 2002 MY and later vehicles:** The readiness test can be completed in cold ambient conditions (less than 14°F / –10°C), if the drive pattern is repeated a second time after cycling the ignition OFF.

Drive Pattern Procedure

Connect the OBDII Scantool to DLC3 to check monitor status and preconditions.

Note the IAT (Intake Air) value during engine startup. The driving time must be adjusted during step “a” based upon IAT (Intake Air) value at startup.

a. Drive the vehicle at 40 – 55 mph (64 – 88 km/h) for the time described below:
   - If IAT (Intake Air) was less than 50°F (10°C) when the engine was started, drive for 7 minutes.
   - If IAT (Intake Air) was greater than 50°F (10°C) when the engine was started, drive for 3 minutes.

b. Drive the vehicle at 35 – 45 mph (56 – 72 km/h) for approximately 7 minutes.

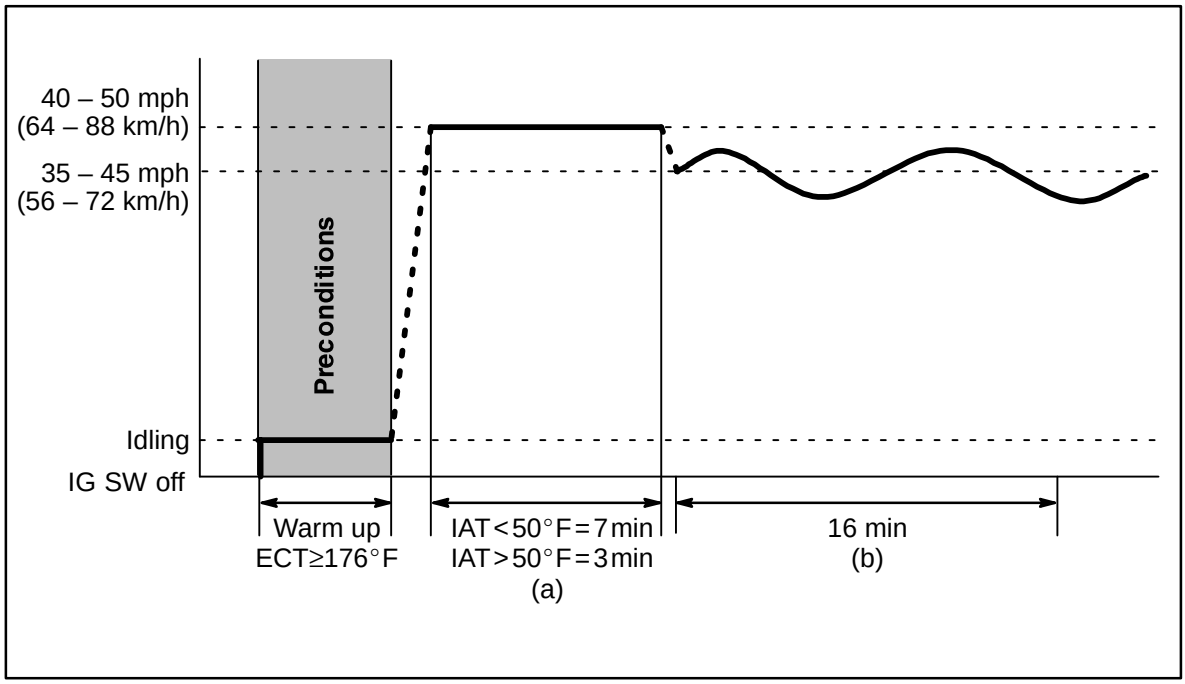
NOTE:
- **Drive with smooth throttle operation.**
- **Avoid sudden acceleration.**
- **Avoid sudden deceleration as much as possible with the throttle fully closed.**

If readiness status does not switch to “complete,” ensure preconditions are met, turn the ignition OFF, then repeat steps “a” and “b.”

NOTE:
The readiness status may not switch to “complete” after the first drive pattern trip if a Pending Code has been set (first trip for a two–trip DTC).
- **Pending Codes are available from the DTC Info Menu in Enhanced OBDII.**
- **Pending Codes indicate a POTENTIAL problem was detected. A second trip is needed to confirm the DTC prior to diagnosis.**
- **Once a second trip is completed, a current DTC will be stored.**

Readiness Monitor Drive Patterns: Catalyst Monitors (Continued)

DRIVE PATTERN NO. 4: Catalyst Monitor (AF Sensor Type)



Preconditions

The monitor will not run unless:

- MIL is OFF.
- ECT (Coolant Temp) is 176°F (80°C) or greater.
- IAT (Intake Air) is 14°F (–10°C) or greater.*

*** For 2002 MY and later vehicles:** The readiness test can be completed in cold ambient conditions (less than 14°F / –10°C), if the drive pattern is repeated a second time after cycling the ignition OFF.

Drive Pattern Procedure

Connect the OBDII Scantool to DLC3 to check monitor status and preconditions.

Note the IAT (Intake Air) value during engine startup. The driving time must be adjusted during step “a” based upon IAT (Intake Air) value at startup.

a. Drive the vehicle at 40 – 55 mph (64 – 88 km/h) for the time described below:
   - If IAT (Intake Air) was less than 50°F (10°C) when the engine was started, drive for 7 minutes.
   - If IAT (Intake Air) was greater than 50°F (10°C) when the engine was started, drive for 3 minutes.

b. Drive the vehicle allowing speed to fluctuate between 35 – 45 mph (56 – 72 km/h) for about 16 minutes.

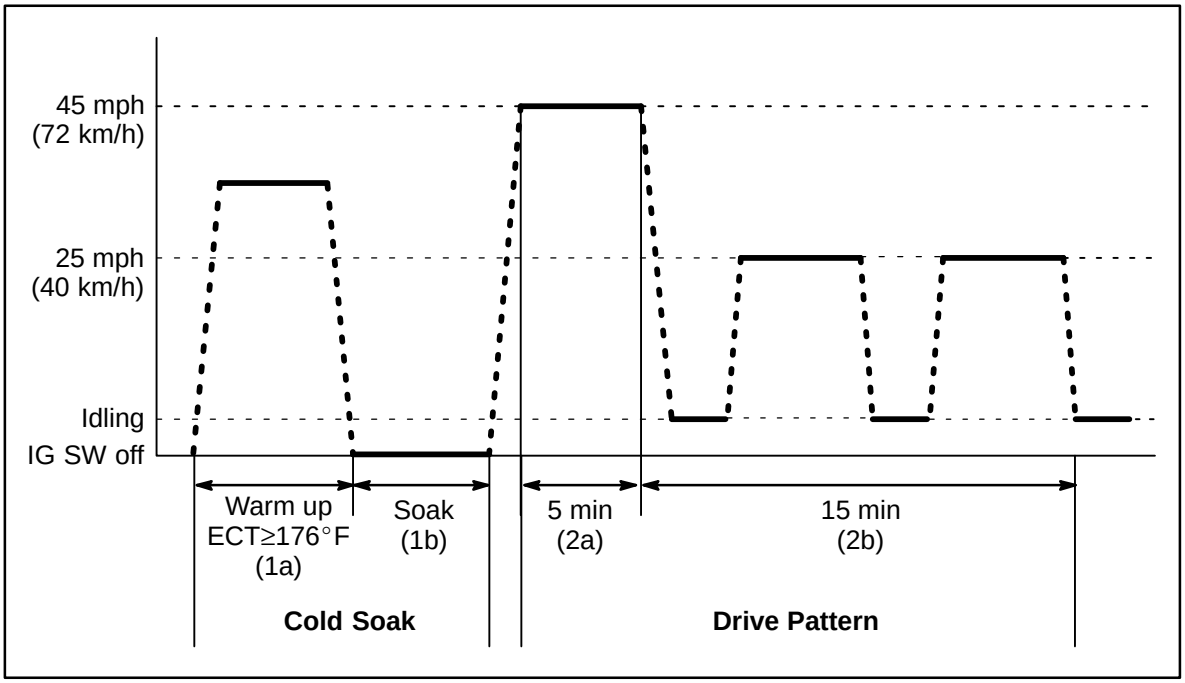
NOTE:
- **Drive with smooth throttle operation.**
- **Avoid sudden acceleration.**
- **Avoid sudden deceleration as much as possible with the throttle fully closed.**

If readiness status does not switch to “complete,” ensure preconditions are met, turn the ignition OFF, then repeat steps “a” and “b.”

NOTE:
The readiness status may not switch to “complete” after the first drive pattern trip if a Pending Code has been set (first trip for a two–trip DTC).
- **Pending Codes are available from the DTC Info Menu in Enhanced OBDII.**
- **Pending Codes indicate a POTENTIAL problem was detected. A second trip is needed to confirm the DTC prior to diagnosis.**
- **Once a second trip is completed, a current DTC will be stored.**

Readiness Monitor Drive Patterns: EVAP Monitors

DRIVE PATTERN NO. 5: EVAP Monitor (Internal Pressure Monitor/Non–Intrusive Type)



Cold Soak Preconditions

The monitor will not run unless:

- MIL is OFF.
- Fuel level is between 1/2 to 3/4 full (for faster completion).
- Altitude is 7800 feet (2400 m) or less.

IMPORTANT:

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

Cold Soak Procedure

1a. Start the engine and allow ECT (Coolant Temp) to reach 176°F (80°C) or greater. (This can be done by letting the engine idle or by driving the vehicle.)

1b. Let the vehicle cold soak for 8 hours or until the difference between IAT (Intake Air) and ECT (Coolant Temp) is less than 13°F (7°C).

■ **Example 1**

- ECT (Coolant Temp) = 75°F (24°C).
- IAT (Intake Air) = 60°F (16°C).
- Difference between ECT (Coolant Temp) and IAT (Intake Air) is 15°F (8°C).

  ⇒ The monitor will not run because the difference between ECT (Coolant Temp) and IAT (Intake Air) is greater than 13°F (7°C).

■ **Example 2**

- ECT (Coolant Temp) = 70°F (21°C).
- IAT (Intake Air) = 68°F (20°C).
- Difference between ECT (Coolant Temp) and IAT (Intake Air) is 2°F (1°C).

  ⇒ The monitor will run because the difference between ECT (Coolant Temp) and IAT (Intake Air) is less than 13°F (7°C).

Readiness Monitor Drive Patterns: EVAP Monitors (Continued)

Drive Pattern Preconditions

The monitor will not run unless:

- MIL is OFF.
- Fuel level is between 1/2 to 3/4 full (for faster completion).
- Altitude is 7800 feet (2400 m) or less.
- ECT (Coolant Temp) is between 40°F and 95°F (4.4°C – 35°C).
- IAT (Intake Air) is between 40°F and 95°F (4.4°C – 35°C).
- Cold Soak Procedure has been completed.

NOTE:

Before starting the engine, the difference between ECT (Coolant Temp) and IAT (Intake Air) must be less than 13°F (7°C). (Refer to Examples 1 and 2 on previous page.)

Drive Pattern Procedure

- Connect the OBDII Scantool to DLC3 to check monitor status and preconditions.
- Release the pressure in the fuel tank by removing and then reinstalling the fuel tank cap.
- Start the engine and begin driving as directed.

NOTE:

- **Do not turn the ignition off until the drive pattern is complete.**
- **Drive on smooth roads to reduce excessive fuel sloshing.**

2a. Start the engine and as soon as safely possible begin driving at approximately 45 mph (72km/h) for 5 minutes. (See illustration on previous page.)

2b. Drive the vehicle at approximately 25 mph (40 km/h) for 15 minutes and include a minimum of two stops for approximately 30 seconds. (See illustration on previous page.)

The monitor should complete within approximately 20 minutes. If it does not, ensure preconditions are met and repeat the drive pattern process beginning with the Cold Soak Procedure.

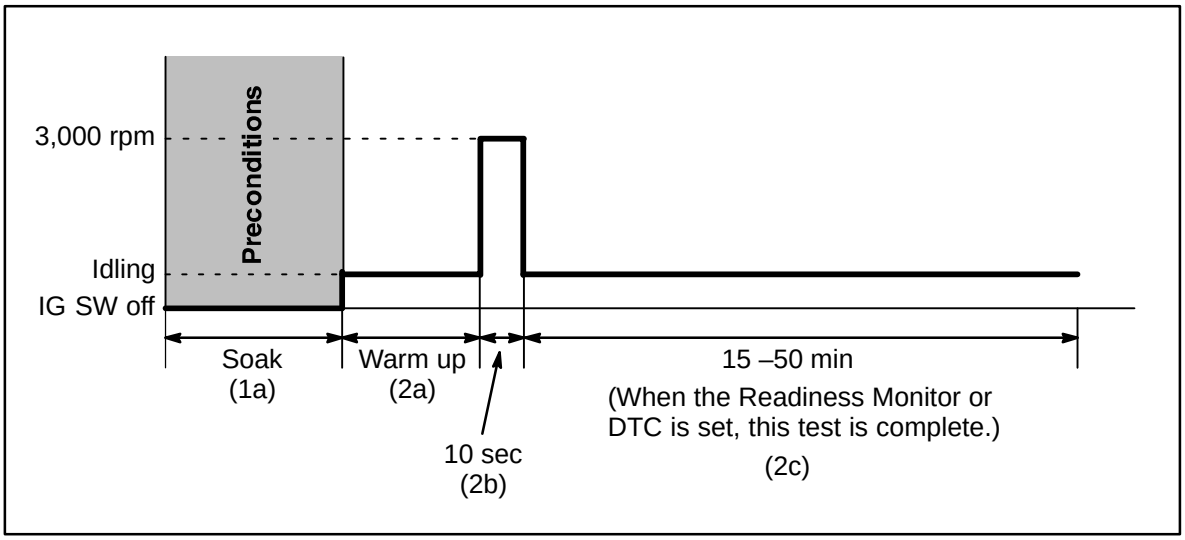
NOTE:

The readiness status may not switch to “complete” after the first drive pattern trip if a Pending Code has been set (first trip for a two–trip DTC).

- **Pending Codes are available from the DTC Info Menu in Enhanced OBDII.**
- **Pending Codes indicate a POTENTIAL problem was detected. A second trip is needed to confirm the DTC prior to diagnosis.**
- **Once a second trip is completed, a current DTC will be stored.**

Readiness Monitor Drive Patterns: EVAP Monitors (Continued)

DRIVE PATTERN NO. 6: EVAP Monitor (Vacuum Pressure Monitor/Intrusive Type)



Cold Soak Preconditions

The monitor will not run unless:

- MIL is OFF.
- Fuel level is between 1/2 to 3/4 full (for faster completion).
- Altitude is 7800 feet (2400 m) or less.

Cold Soak Procedure

1a. Let the vehicle cold soak for 8 hours or until the difference between IAT (Intake Air) and ECT (Coolant Temp) is less than 13°F (7°C).

■ **Example 1**

- ECT (Coolant Temp) = 75°F (24°C).
- IAT (Intake Air) = 60°F (16°C).
- Difference between ECT (Coolant Temp) and IAT (Intake Air) is 15°F (8°C).

⇒ The monitor will not run because the difference between ECT (Coolant Temp) and IAT (Intake Air) is greater than 13°F (7°C).

■ **Example 2**

- ECT (Coolant Temp) = 70°F (21°C).
- IAT (Intake Air) = 68°F (20°C).
- Difference between ECT (Coolant Temp) and IAT (Intake Air) is 2°F (1°C).

⇒ The monitor will run because the difference between ECT (Coolant Temp) and IAT (Intake Air) is less than 13°F (7°C).

Readiness Monitor Drive Patterns: EVAP Monitors (Continued)

Drive Pattern Preconditions

The monitor will not run unless:

- MIL is OFF.
- Fuel level is between 1/2 to 3/4 full (for faster completion).
- Altitude is 7800 feet (2400 m) or less.*
- ECT (Coolant Temp) is between 40°F and 95°F (4.4°C – 35°C).
- IAT (Intake Air) is between 40°F and 95°F (4.4°C – 35°C).*
- Cold Soak Procedure has been completed.

*** For 2002 MY and later vehicles:** The readiness test can be completed in cold ambient conditions (less than 40°F / 4.4°C) and/or at high altitudes (more than 7800 feet / 2400 m) if the complete drive pattern (including Cold Soak) is repeated a second time after cycling the ignition OFF.

NOTE:

Before starting the engine, the difference between ECT (Coolant Temp) and IAT (Intake Air) must be less than 13°F (7°C). (Refer to Examples 1 and 2 on previous page.)

Drive Pattern Procedure

- Connect the OBDII Scantool to DLC3 to check monitor status and preconditions.
- Release the pressure in the fuel tank by removing and then reinstalling the fuel tank cap.

2a. Start the engine and allow it to idle until ECT (Coolant Temp) is 167°F (75°C) or greater. (See illustration on previous page.)

2b. Race the engine at 3,000 rpm for approximately 10 seconds. (See illustration on previous page.)

2c. Allow the engine to idle with the A/C ON (to create a slight load) for 15 – 50 minutes. (See illustration on previous page.)

NOTE:

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 – 50 minutes.**

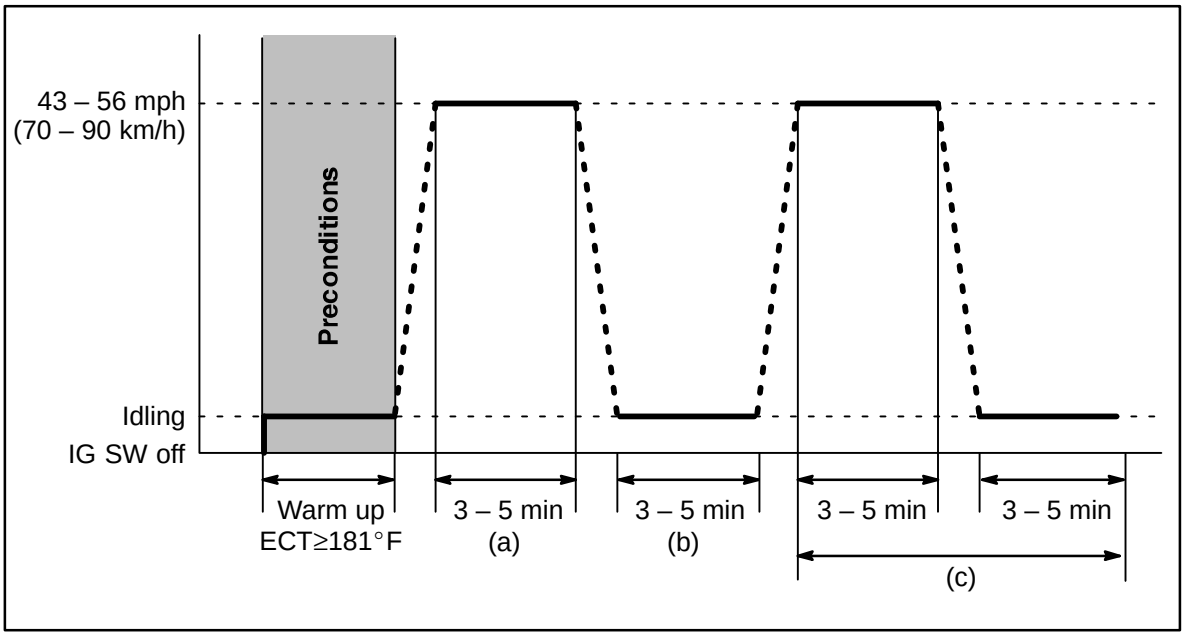
NOTE:

The readiness status may not switch to “complete” after the first drive pattern trip if a Pending Code has been set (first trip for a two–trip DTC).

- **Pending Codes are available from the DTC Info Menu in Enhanced OBDII.**
- **Pending Codes indicate a POTENTIAL problem was detected. A second trip is needed to confirm the DTC prior to diagnosis.**
- **Once a second trip is completed, a current DTC will be stored.**

Readiness Monitor Drive Patterns: EVAP Monitors (Continued)

DRIVE PATTERN NO. 7: EVAP Monitor (Without Leak Detection)



Preconditions

The monitor will not run unless:

- MIL is OFF.
- Altitude is 7800 feet (2400 m) or less.
- ECT (Coolant Temp) is 181°F (83°C) or greater.
- IAT (Intake Air) is 41°F (5°C) or greater.

Drive Pattern Procedure

Connect the OBDII Scantool to DLC3 to check monitor status and preconditions.

a. Drive the vehicle at 43 – 56 mph (70 – 90 km/h) for a period of 3 – 5 minutes.

NOTE:
- **Do not allow the Throttle Position (TP) to exceed 30%.**
- **Drive with smooth throttle operation and avoid sudden acceleration.**

b. Stop the vehicle and let the engine idle for 3 – 5 minutes.

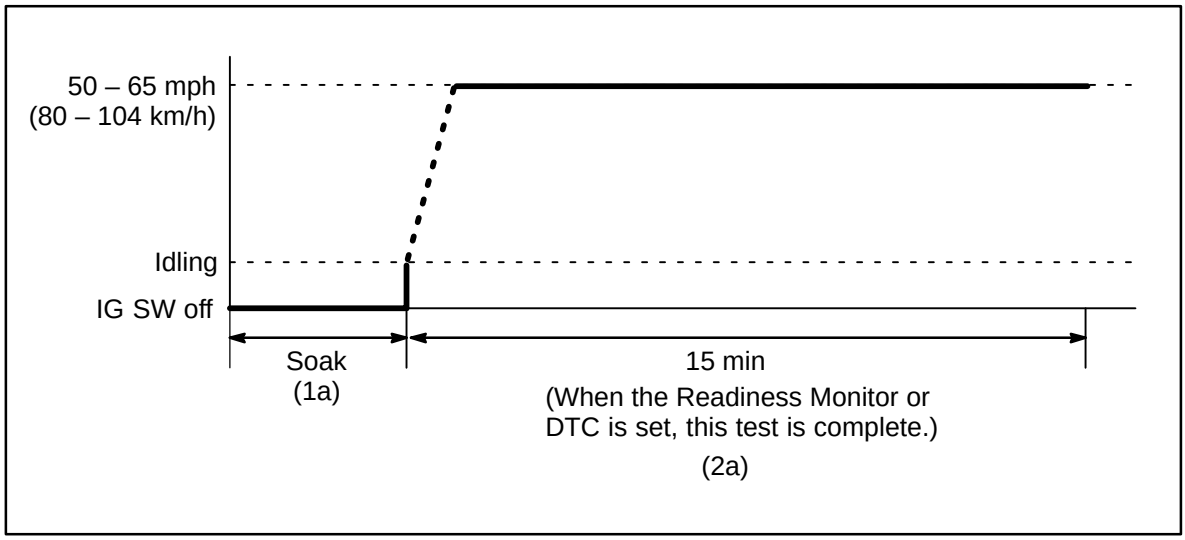
c. Repeat steps “a” and “b” once.

If readiness status does not switch to “complete,” ensure preconditions are met, turn the ignition OFF, then repeat steps “a” through “c.”

NOTE:
The readiness status may not switch to “complete” after the first drive pattern trip if a Pending Code has been set (first trip for a two–trip DTC).
- **Pending Codes are available from the DTC Info Menu in Enhanced OBDII.**
- **Pending Codes indicate a POTENTIAL problem was detected. A second trip is needed to confirm the DTC prior to diagnosis.**
- **Once a second trip is completed, a current DTC will be stored.**

Readiness Monitor Drive Patterns: EVAP Monitors (Continued)

DRIVE PATTERN NO. 8: EVAP Monitor (For Prius)



Cold Soak Preconditions

The monitor will not run unless:

- MIL is OFF.
- Altitude is 7800 feet (2400 m) or less.

IMPORTANT:

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

Cold Soak Procedure

1a. Let the vehicle cold soak for 8 hours or until the difference between IAT (Intake Air) and ECT (Coolant Temp) is less than 13°F (7°C).

■ **Example 1**

- ECT (Coolant Temp) = 75°F (24°C).
- IAT (Intake Air) = 60°F (16°C).
- Difference between ECT (Coolant Temp) and IAT (Intake Air) is 15°F (8°C).

  ⇒ The monitor will not run because the difference between ECT (Coolant Temp) and IAT (Intake Air) is greater than 13°F (7°C).

■ **Example 2**

- ECT (Coolant Temp) = 70°F (21°C).
- IAT (Intake Air) = 68°F (20°C).
- Difference between ECT (Coolant Temp) and IAT (Intake Air) is 2°F (1°C).

  ⇒ The monitor will run because the difference between ECT (Coolant Temp) and IAT (Intake Air) is less than 13°F (7°C).

Readiness Monitor Drive Patterns: EVAP Monitors (Continued)

Drive Pattern Preconditions

The monitor will not run unless:

- MIL is OFF.
- Altitude is 7800 feet (2400 m) or less.
- ECT (Coolant Temp) is between 40°F and 95°F (4.4°C – 35°C).
- IAT (Intake Air) is between 40°F and 95°F (4.4°C – 35°C).*
- Cold Soak Procedure has been completed.

NOTE:

Before starting the engine, the difference between ECT (Coolant Temp) and IAT (Intake Air) must be less than 13°F (7°C). (Refer to Examples 1 and 2 on previous page.)

Drive Pattern Procedure

- Connect the OBDII Scantool to DLC3 to check monitor status and preconditions.
- Release the pressure in the fuel tank by removing and then reinstalling the fuel tank cap.
- Start the engine and as soon as safely possible begin driving as directed.

2a. Drive the vehicle at 50 – 65 mph (80 – 104 km/h) for about 15 minutes. (See illustration on previous page.)

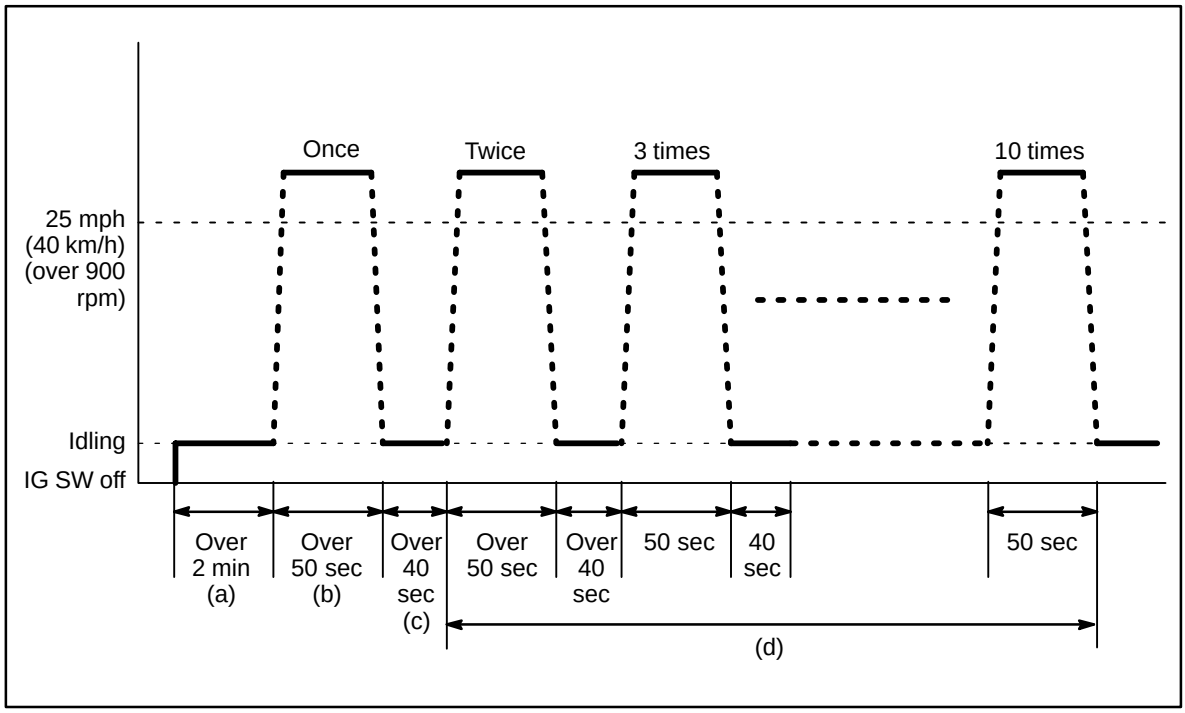
NOTE:

- **Do not turn the ignition off until the drive pattern is complete.**
- **Drive on smooth roads to reduce excessive fuel sloshing.**

If vehicle speed drops under 45 mph (72 km/h) repeat step “2a.”

Readiness Monitor Drive Patterns: Oxygen Monitors

DRIVE PATTERN NO. 9: Oxygen Sensor Monitor (Front and Rear O2S System)



Preconditions

The monitor will not run unless:

- MIL is OFF.

Drive Pattern Procedure

Connect the OBDII Scantool to DLC3 to check monitor status and preconditions.

a. Start the engine and allow it to idle for 2 minutes or more.

b. Drive the vehicle at 25 mph (40 km/h) or more for at least 50 seconds. Be sure engine speed remains above 900 rpm.

c. Stop the vehicle and allow the engine to idle for 40 seconds or more.

d. Perform steps “b” and “c” ten times.

If readiness status does not switch to “complete,” ensure preconditions are met, turn the ignition OFF, then repeat steps “a” through “d.”

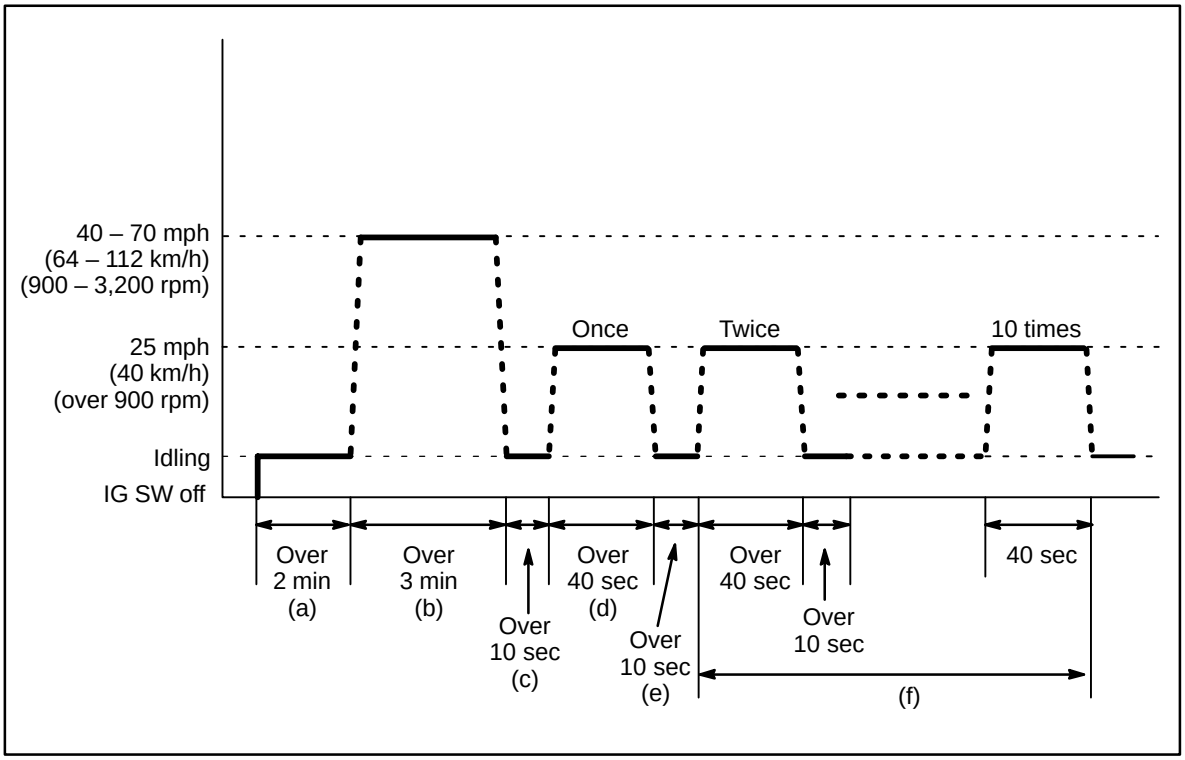
NOTE:

The readiness status may not switch to “complete” after the first drive pattern trip if a Pending Code has been set (first trip for a two–trip DTC).

- **Pending Codes are available from the DTC Info Menu in Enhanced OBDII.**
- **Pending Codes indicate a POTENTIAL problem was detected. A second trip is needed to confirm the DTC prior to diagnosis.**
- **Once a second trip is completed, a current DTC will be stored.**

Readiness Monitor Drive Patterns: Oxygen Monitors (Continued)

DRIVE PATTERN NO. 10: Oxygen/Air Fuel Ratio Sensor Monitor (Front AF Sensor and Rear O2S System)



Preconditions

The monitor will not run unless:

- MIL is OFF.

Drive Pattern Procedure

Connect the OBDII Scantool to DLC3 to check monitor status and preconditions.

a. Start the engine and allow it to idle for 2 minutes or more.

b. Drive the vehicle at 40 – 70 mph (64 – 112 km/h) or more for at least 3 minutes. Be sure to maintain engine speed between 900 and 3,200 rpm.

c. Stop the vehicle and allow the engine to idle for 10 seconds or more.

d. Drive the vehicle at 25 mph (40 km/h) for at least 40 seconds or more. Be sure to maintain engine speed above 900 rpm.

e. Stop the vehicle and allow the engine to idle for 10 seconds or more.

f. Perform steps “d” and “e” ten times.

If readiness status does not switch to “complete,” ensure preconditions are met, turn the ignition switch OFF, then repeat steps “a” through “f.”

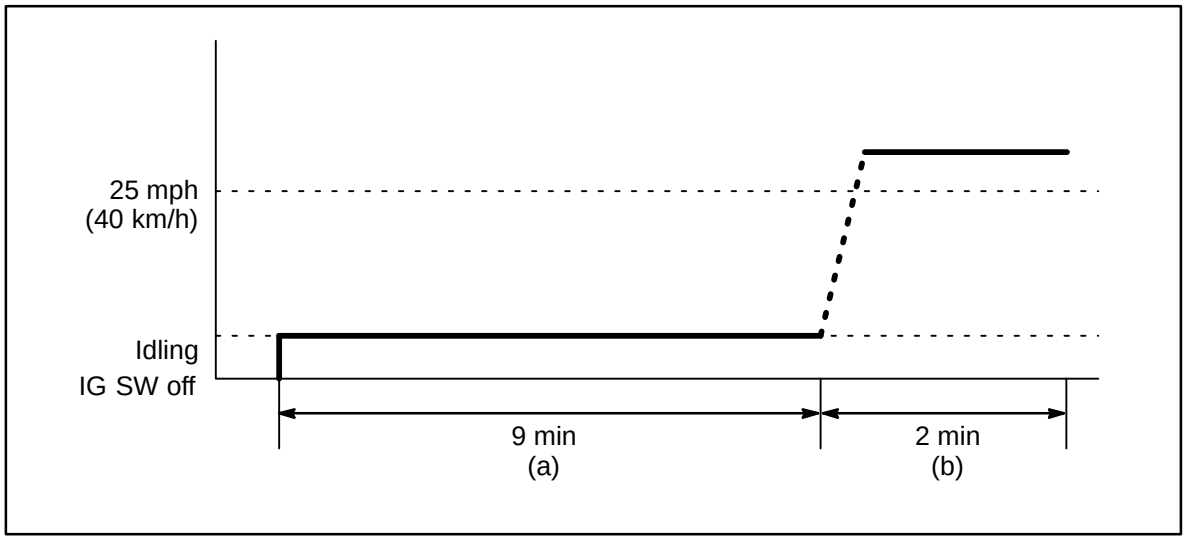
NOTE:

The readiness status may not switch to “complete” after the first drive pattern trip if a Pending Code has been set (first trip for a two–trip DTC).

- **Pending Codes are available from the DTC Info Menu in Enhanced OBDII.**
- **Pending Codes indicate a POTENTIAL problem was detected. A second trip is needed to confirm the DTC prior to diagnosis.**
- **Once a second trip is completed, a current DTC will be stored.**

Readiness Monitor Drive Patterns: Oxygen Monitors (Continued)

DRIVE PATTERN NO. 11: Oxygen/AF Sensor Heater Monitor



Preconditions

The monitor will not run unless:

- MIL is OFF.

Drive Pattern Procedure

Connect the OBDII Scantool to DLC3 to check monitor status and preconditions.

a. Start the engine and allow it to idle for 9 minutes.

b. Drive the vehicle at 25 mph (40 km/h) or more for at least 2 minutes.

If readiness status does not switch to “complete,” ensure preconditions are met, turn the ignition OFF, then repeat steps “a” and “b.”

NOTE:

The readiness status may not switch to “complete” after the first drive pattern trip if a Pending Code has been set (first trip for a two–trip DTC).

- **Pending Codes are available from the DTC Info Menu in Enhanced OBDII.**
- **Pending Codes indicate a POTENTIAL problem was detected. A second trip is needed to confirm the DTC prior to diagnosis.**
- **Once a second trip is completed, a current DTC will be stored.**