MITSUBISHI MOTORS
TECHNICAL INFORMATION

TECHNICAL SERVICE BULLETIN

SUBJECT:	No:	TSB-04-13-012
NEW OBD-II DRIVE CYCLE PATTERNS — SERVICE MANUAL REVISION	DATE:	December, 2004
	MODEL:	See below

CIRCULATE TO:	[ ] GENERAL MANAGER	[ ] PARTS MANAGER	[X] TECHNICIAN
[X] SERVICE ADVISOR	[X] SERVICE MANAGER	[ ] WARRANTY PROCESSOR	[ ] SALES MANAGER

TSB Revision *TSB-04-13-012*

PURPOSE

OBD-II drive cycle patterns described in service manuals for affected vehicles have been updated. Using the new information in this bulletin will make it easier to maintain correct vehicle parameters when driving the drive cycles to set OBD-II readiness codes.

AFFECTED VEHICLES

1999 3000GT
1999-2002 Mirage
1999-2005 Galant, Eclipse, Eclipse Spyder, and Montero
1999-2004 Montero Sport
2004-05 Endeavor
2002-05 Lancer
2004 Lancer Sportback
2003-05 Lancer Evolution and Outlander

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OBD-II DRIVE CYCLE <99MY – 05MY>

⚠ CAUTION

Two technicians should always be in the vehicle when carrying out a test.

NOTE: Check that the diagnosis trouble code (DTC) is not output before driving the OBD-II drive cycle. Erase the DTC if it has been output.

NOTE: Drive cycle patterns are not established for Vehicle speed sensor monitor (DTC P0500), Closed throttle position switch monitor (DTC P0510), Power steering pressure switch monitor (P0551). Please reference the MUT data list to judge whether these monitor items are normal.

DRIVE CYCLE PATTERN LIST for 99MY

MONITOR ITEM	DIAGNOSTIC TROUBLE CODE (DTC)	PATTERN
Heated oxygen sensor (front) monitor <Readiness test item>	P0130, P0150	1
Heated oxygen sensor heater monitor <Readiness test item>	P0135, P0141, P0155, P0161	2
Exhaust gas recirculation (EGR) system monitor <Readiness test item>	P0400	3
Catalytic converter monitor <Readiness test item>	P0420, P0421, P0431	4
Evaporative emission system leak monitor (small leak and gross leak) <Readiness test item>	P0442, P0455	5
Airflow sensor monitor	P0100	7
Manifold absolute pressure sensor monitor	P0105	
Throttle position sensor monitor	P0120	
Engine coolant temperature sensor monitor	P0115	8
Air fuel ratio feedback monitor	P0125	10
Heated oxygen sensor (rear) monitor	P0136, P0156	12
Misfire monitor	P0300, P0301, P0302, P0303, P0304, P0305, P0306	14
Fuel tank pressure sensor monitor	P0450	15
Idle speed control system monitor	P0505	18
Waste gate actuator monitor	P1103	26
Manifold differential pressure sensor monitor	P1400	19
Fuel trim monitor	P0170, P0173	20

OBD-II DRIVE CYCLE <99MY – 05MY>

MONITOR ITEM	DIAGNOSTIC TROUBLE CODE (DTC)	PATTERN
Barometric pressure sensor monitor	P0105	29
Intake air temperature sensor monitor	P0110	
Injector monitor	P0201, P0202, P0203, P0204, P0205, P0206	
Crankshaft position sensor monitor	P0335	
Camshaft position sensor monitor	P0340	
Exhaust gas recirculation (EGR) solenoid monitor	P0403	
Evaporative emission purge solenoid monitor	P0443	
Evaporative emission ventilation solenoid monitor	P0446	
Waste gate solenoid monitor	P1104	
Fuel pressure solenoid monitor	P1105	
Communication line monitor	P1600	

DRIVE CYCLE PATTERN LIST for 00MY

MONITOR ITEM	DIAGNOSTIC TROUBLE CODE (DTC)	PATTERN
Heated oxygen sensor (front) monitor <Readiness test item>	P0130, P0150	1
Heated oxygen sensor heater monitor <Readiness test item>	P0135, P0141, P0155, P0161	2
Exhaust gas recirculation (EGR) system monitor <Readiness test item>	P0400	3
Catalytic converter monitor <Readiness test item>	P0420, P0421, P0431	4
Evaporative emission system leak monitor (small leak and gross leak) <Readiness test item>	P0442, P0455	5
Evaporative emission system leak monitor (very small leak) <Readiness test item>	P0442	6
Airflow sensor monitor	P0100	7
Manifold absolute pressure sensor monitor	P0105	
Throttle position sensor monitor	P0120	
Engine coolant temperature sensor monitor	P0115	8
Thermostat monitor	P0128	9
Air fuel ratio feedback monitor	P0125	10
Heated oxygen sensor (rear) monitor	P0136, P0156	12
Misfire monitor	P0300, P0301, P0302, P0303, P0304, P0305, P0306	14
Fuel tank pressure sensor monitor	P0450	15
Fuel level sensor monitor	P0460	17
Idle speed control system monitor	P0505	18
Manifold differential pressure sensor monitor	P1400	19
Fuel trim monitor	P0170, P0173	21

OBD-II DRIVE CYCLE <99MY – 05MY>

MONITOR ITEM	DIAGNOSTIC TROUBLE CODE (DTC)	PATTERN
Barometric pressure sensor monitor	P0105	29
Intake air temperature sensor monitor	P0110	
Fuel tank temperature sensor monitor	P0180	
Injector monitor	P0201, P0202, P0203, P0204, P0205, P0206	
Crankshaft position sensor monitor	P0335	
Camshaft position sensor monitor	P0340	
Exhaust gas recirculation (EGR) solenoid monitor	P0403	
Evaporative emission purge solenoid monitor	P0443	
Evaporative emission ventilation solenoid monitor	P0446	
Communication line monitor	P1600	

DRIVE CYCLE PATTERN LIST for 01MY

MONITOR ITEM	DIAGNOSTIC TROUBLE CODE (DTC)	PATTERN
Heated oxygen sensor (front) monitor <Readiness test item>	P0130, P0133, P0150, P0153	1
Heated oxygen sensor heater monitor <Readiness test item>	P0135, P0141, P0155, P0161	2
Exhaust gas recirculation (EGR) system monitor <Readiness test item>	P0400, P0401	3
Catalytic converter monitor <Readiness test item>	P0421, P0431	4
Evaporative emission system leak monitor (small leak and gross leak) <Readiness test item>	P0442, P0455	5
Evaporative purge system monitor	P0441	
Evaporative emission system leak monitor (very small leak) <Readiness test item>	P0442	6
Airflow sensor monitor	P0100, P0102	7
Manifold absolute pressure sensor monitor	P0106, P0107	
Throttle position sensor monitor	P0120, P0122	
Engine coolant temperature sensor monitor	P0115	8
Thermostat monitor	P0128	9
Air fuel ratio feedback monitor	P0125, P0134, P0154	10
Heated oxygen sensor (rear) monitor	P0136, P0139, P0156, P0159	12
Fuel tank temperature sensor monitor	P0183	22
Misfire monitor	P0300, P0301, P0302, P0303, P0304, P0305, P0306	14
Fuel tank pressure sensor monitor	P0450, P0451	15
Idle speed control system monitor	P0505, P0506, P0507	18
Manifold differential pressure sensor monitor	P1400	19

OBD-II DRIVE CYCLE <99MY – 05MY>

MONITOR ITEM	DIAGNOSTIC TROUBLE CODE (DTC)	PATTERN
Fuel trim monitor	P0170, P0171, P0172, P0173, P0174, P0175	21
Airflow sensor monitor	P0101, P0103	29
Barometric pressure sensor monitor	P0105, P0107, P0108	
Manifold absolute pressure sensor monitor	P0108	
Intake air temperature sensor monitor	P0110, P0111	
Engine coolant temperature sensor monitor	P0116, P0117	
Throttle position sensor monitor	P0121, P0123	
Closed throttle position switch monitor	P0123	
Fuel tank temperature sensor monitor	P0181	
Injector monitor	P0201, P0202, P0203, P0204, P0205, P0206	
Crankshaft position sensor monitor	P0335	
Camshaft position sensor monitor	P0340	
Exhaust gas recirculation (EGR) solenoid monitor	P0403	
Evaporative emission purge solenoid monitor	P0443	
Evaporative emission ventilation solenoid monitor	P0446	
Communication line monitor	P1600	

DRIVE CYCLE PATTERN LIST for 02MY

MONITOR ITEM	DIAGNOSTIC TROUBLE CODE (DTC)	PATTERN
Heated oxygen sensor (front) monitor <Readiness test item>	P0133, P0153	1
Heated oxygen sensor heater monitor <Readiness test item>	P0135, P0141, P0155, P0161	2
Exhaust gas recirculation (EGR) system monitor <Readiness test item>	P0401	3
Catalytic converter monitor <Readiness test item>	P0421, P0431	4
Evaporative emission system leak monitor (small leak and gross leak) <Readiness test item>	P0442, P0455	5
Evaporative purge system monitor	P0441	
Fuel tank pressure sensor monitor	P0452, P0453	
Evaporative emission system leak monitor (very small leak) <Readiness test item>	P0456	6
Airflow sensor monitor	P0101	7
Manifold absolute pressure sensor monitor	P0106, P0107	
Throttle position sensor monitor	P0121	
Intake air temperature sensor monitor	P0111	23
Engine coolant temperature sensor monitor	P0116, P0125	8
Thermostat monitor	P0128	9

OBD-II DRIVE CYCLE <99MY – 05MY>

MONITOR ITEM	DIAGNOSTIC TROUBLE CODE (DTC)	PATTERN
Air fuel ratio feedback monitor	P0134, P0154	11
Heated oxygen sensor monitor	P0130, P0131, P0132, P0136, P0137, P0138, P0150, P0151, P0152, P0156, P0157, P0158	
Heated oxygen sensor (rear) monitor	P0139, P0159	13
Fuel tank temperature sensor monitor	P0181	22
Misfire monitor	P0300, P0301, P0302, P0303, P0304, P0305, P0306	14
Fuel tank pressure sensor monitor	P0451	16
Idle speed control system monitor	P0506, P0507	18
Manifold differential pressure sensor monitor	P1400	19
Fuel trim monitor	P0171, P0172, P0174, P0175	21
Airflow sensor monitor	P0102	29
Barometric pressure sensor monitor	P0107, P0108	
Manifold absolute pressure sensor monitor	P0108	
Intake air temperature sensor monitor	P0112, P0113	
Engine coolant temperature sensor monitor	P0117, P0118	
Throttle position sensor monitor	P0122, P0123	
Closed throttle position switch monitor	P0123	
Fuel tank temperature sensor monitor	P0182, P0183	
Injector monitor	P0201, P0202, P0203, P0204, P0205, P0206	
Crankshaft position sensor monitor	P0335	
Camshaft position sensor monitor	P0340	
Exhaust gas recirculation (EGR) solenoid monitor	P0403	
Evaporative emission purge solenoid monitor	P0443	
Evaporative emission ventilation solenoid monitor	P0446	

DRIVE CYCLE PATTERN LIST for 03MY

MONITOR ITEM	DIAGNOSTIC TROUBLE CODE (DTC)	PATTERN
Heated oxygen sensor (front) monitor <Readiness test item>	P0133, P0153	1
Heated oxygen sensor heater monitor <Readiness test item>	P0135, P0141, P0155, P0161	2
Exhaust gas recirculation (EGR) system monitor <Readiness test item>	P0401	3
Catalytic converter monitor <Readiness test item>	P0420, P0421, P0431	4

OBD-II DRIVE CYCLE <99MY – 05MY>

MONITOR ITEM	DIAGNOSTIC TROUBLE CODE (DTC)	PATTERN
Evaporative emission system leak monitor (small leak and gross leak) <Readiness test item>	P0442, P0455	5
Evaporative purge system monitor	P0441	
Fuel tank pressure sensor monitor	P0452, P0453	
Evaporative emission system leak monitor (very small leak) <Readiness test item>	P0456	6
Airflow sensor monitor	P0101	7
Throttle position sensor monitor	P0121	
Intake air temperature sensor monitor	P0111	23
Engine coolant temperature sensor monitor	P0116, P0125	8
Thermostat monitor	P0128	9
Air fuel ratio feedback monitor	P0134, P0154	11
Heated oxygen sensor monitor	P0130, P0131, P0136, P0137, P0150, P0151, P0156, P0157	
Heated oxygen sensor (rear) monitor	P0139, P0159	13
Fuel tank temperature sensor monitor	P0181	22
Waste gate system monitor	P0234	25
Misfire monitor	P0300, P0301, P0302, P0303, P0304, P0305, P0306	14
Fuel tank pressure sensor monitor	P0451	16
Power steering pressure switch monitor	P0554	27
Idle speed control system monitor	P0506, P0507	18
Manifold differential pressure sensor monitor	P1400	19
Fuel trim monitor	P0171, P0172, P0174, P0175	21

OBD-II DRIVE CYCLE <99MY – 05MY>

MONITOR ITEM	DIAGNOSTIC TROUBLE CODE (DTC)	PATTERN
Fuel pressure solenoid monitor	P0090	29
Airflow sensor monitor	P0102	
Barometric pressure sensor monitor	P0107, P0108	
Intake air temperature sensor monitor	P0112, P0113	
Engine coolant temperature sensor monitor	P0117, P0118	
Throttle position sensor monitor	P0122, P0123	
Closed throttle position switch monitor	P0123	
Heated oxygen sensor monitor	P0132, P0138, P0152, P0158	
Fuel tank temperature sensor monitor	P0182, P0183	
Injector monitor	P0201, P0202, P0203, P0204, P0205, P0206	
Waste gate solenoid monitor	P0243	
Crankshaft position sensor monitor	P0335	
Camshaft position sensor monitor	P0340	
Exhaust gas recirculation (EGR) solenoid monitor	P0403	
Evaporative emission purge solenoid monitor	P0443	
Evaporative emission ventilation solenoid monitor	P0446	
Intake manifold tuning solenoid monitor	P0660	

DRIVE CYCLE PATTERN LIST for 04MY

MONITOR ITEM	DIAGNOSTIC TROUBLE CODE (DTC)	PATTERN
Heated oxygen sensor (front) monitor <Readiness test item>	P0133, P0153	1
Heated oxygen sensor heater monitor <Readiness test item>	P0135, P0141, P0155, P0161	2
Exhaust gas recirculation (EGR) system monitor <Readiness test item>	P0401	3
Catalytic converter monitor <Readiness test item>	P0420, P0421, P0431	4
Evaporative emission system leak monitor (small leak and gross leak) <Readiness test item>	P0442, P0455	5
Evaporative purge system monitor	P0441	
Fuel tank pressure sensor monitor	P0452, P0453	
Evaporative emission system leak monitor (very small leak) <Readiness test item>	P0456	6
Airflow sensor monitor	P0101	7
Manifold absolute pressure (MAP) sensor monitor	P0106, P0107	
Throttle position sensor monitor	P0121	
Intake air temperature sensor monitor	P0111	23
Engine coolant temperature sensor monitor	P0116, P0125	8
Thermostat monitor	P0128	9

OBD-II DRIVE CYCLE <99MY – 05MY>

MONITOR ITEM	DIAGNOSTIC TROUBLE CODE (DTC)	PATTERN
Air fuel ratio feedback monitor	P0134, P0154	11
Heated oxygen sensor monitor	P0130, P0131, P0136, P0137, P0150, P0151, P0156, P0157	
Heated oxygen sensor (rear) monitor	P0139, P0159	13
Fuel tank temperature sensor monitor	P0181	22
Waste gate system monitor	P0234	25
Misfire monitor	P0300, P0301, P0302, P0303, P0304, P0305, P0306	14
Fuel tank pressure sensor monitor	P0451	16
Power steering pressure switch monitor	P0554	27
Idle speed control system monitor	P0506, P0507	18
Manifold differential pressure sensor monitor	P1400	19
Fuel trim monitor	P0171, P0172, P0174, P0175	21
Fuel pressure solenoid monitor	P0090	29
Airflow sensor monitor	P0102, P0103	
Manifold absolute pressure (MAP) sensor monitor	P0108	
Intake air temperature sensor monitor	P0112, P0113	
Engine coolant temperature sensor monitor	P0117, P0118	
Throttle position sensor monitor	P0122, P0123	
Closed throttle position switch monitor	P0123	
Heated oxygen sensor monitor	P0132, P0138, P0152, P0158	
Fuel tank temperature sensor monitor	P0182, P0183	
Injector monitor	P0201, P0202, P0203, P0204, P0205, P0206	
Waste gate solenoid monitor	P0243	
Crankshaft position sensor monitor	P0335	
Camshaft position sensor monitor	P0340	
Exhaust gas recirculation (EGR) solenoid monitor	P0403	
Exhaust gas recirculation (EGR) valve (stepper motor) monitor	P0403	
Evaporative emission purge solenoid monitor	P0443	
Evaporative emission ventilation solenoid monitor	P0446	
Barometric pressure sensor monitor	P2228, P2229	

OBD-II DRIVE CYCLE <99MY – 05MY>

DRIVE CYCLE PATTERN LIST for 05MY

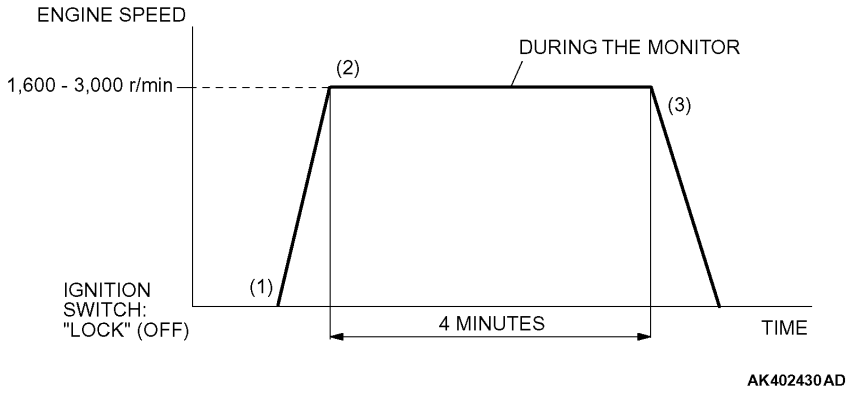
MONITOR ITEM	DIAGNOSTIC TROUBLE CODE (DTC)	PATTERN
Heated oxygen sensor (front) monitor <Readiness test item>	P0133, P0153	1
Heated oxygen sensor heater monitor <Readiness test item>	P0135, P0141, P0155, P0161	2
Exhaust gas recirculation (EGR) system monitor <Readiness test item>	P0401	3
Catalytic converter monitor <Readiness test item>	P0420, P0421, P0431	4
Evaporative emission system leak monitor (small leak and gross leak) <Readiness test item>	P0442, P0455	5
Evaporative purge system monitor	P0441	
Fuel tank pressure sensor monitor	P0450	
Evaporative emission system leak monitor (very small leak) <Readiness test item>	P0456	6
Airflow sensor monitor	P0101	7
Manifold absolute pressure (MAP) sensor monitor	P0106, P0107	
Throttle position sensor monitor	P0121	
Intake air temperature sensor monitor	P0111	24
Engine coolant temperature sensor monitor	P0116, P0125	8
Thermostat monitor	P0128	9
Air fuel ratio feedback monitor	P0134, P0154	11
Heated oxygen sensor monitor	P0130, P0131, P0136, P0137, P0150, P0151, P0156, P0157	
Heated oxygen sensor (rear) monitor	P0139, P0159	13
Fuel tank temperature sensor monitor	P0181	22
Misfire monitor	P0300, P0301, P0302, P0303, P0304, P0305, P0306	14
Fuel tank pressure sensor monitor	P0451	16
Power steering pressure switch monitor	P0554	27
Idle speed control system monitor	P0506, P0507	18
MIVEC system monitor	P1020	28
Fuel trim monitor	P0171, P0172, P0174, P0175	21

OBD-II DRIVE CYCLE <99MY – 05MY>

MONITOR ITEM	DIAGNOSTIC TROUBLE CODE (DTC)	PATTERN
Fuel pressure solenoid monitor	P0090	29
Airflow sensor monitor	P0102, P0103	
Manifold absolute pressure (MAP) sensor monitor	P0108	
Intake air temperature sensor monitor	P0112, P0113	
Engine coolant temperature sensor monitor	P0117, P0118	
Throttle position sensor monitor	P0122, P0123	
Heated oxygen sensor monitor	P0132, P0138, P0152, P0158	
Fuel tank temperature sensor monitor	P0182, P0183	
Injector monitor	P0201, P0202, P0203, P0204, P0205, P0206	
Waste gate solenoid monitor	P0243	
Crankshaft position sensor monitor	P0335	
Camshaft position sensor monitor	P0340	
Exhaust gas recirculation (EGR) solenoid monitor	P0403	
Exhaust gas recirculation (EGR) valve (stepper motor) monitor	P0403	
Evaporative emission purge solenoid monitor	P0443	
Evaporative emission ventilation solenoid monitor	P0446	
Fuel tank pressure sensor monitor	P0452, P0453	
Fuel level sensor monitor	P0462, P0463	
Engine oil control valve monitor	P1021	
Barometric pressure sensor monitor	P2228, P2229	

OBD-II DRIVE CYCLE <99MY – 05MY>

PATTERN 1

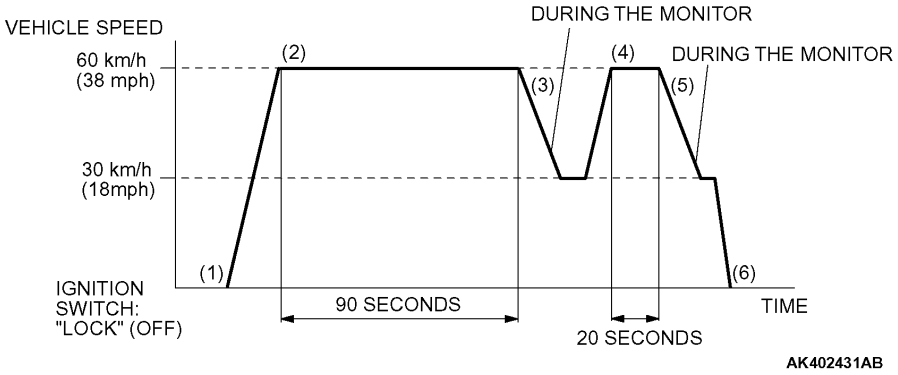
Drive cycle pattern	
Inspection conditions	• Engine coolant temperature: More than 82°C (180°F) • Intake air temperature: More than –10°C (14°F) • Barometric pressure: More than 76 kPa (22.5 inHg) • Condition of A/T: Selector lever "D" range
Test procedure	1. Start the engine with all the accessories switched OFF. 2. Drive the vehicle for 4 minutes at the following conditions. (During the monitor) *NOTE: When the system is normal, the monitor is completed earlier.* • Vehicle speed: More than 30 km/h (19 mph) • Engine speed: More than 1,600 r/min, less than 3,000 r/min • Engine load: More than 30%, less than 60% <except Mirage 1.5L> • Manifold pressure: More than 26.7 kPa (7.9 inHg), less than 66.6 kPa (19.8 inHg) <Mirage 1.5L> • Without rapid accelerator pedal work 3. Stop the vehicle at the safe place and turn the ignition switch to "LOCK" (OFF) position. 4. Start the engine and do Steps 1 to 3 again. *NOTE: When the vehicle is operating normally and the OBD-II Drive Cycle is carried out, the Readiness Codes will be set as "Complete" on the first drive cycle. The second drive cycle is required to set the Readiness Codes as "Complete" if a fault is detected during the first drive cycle.* 5. Confirm that the diagnostic trouble code (DTC) is not output.

PATTERN 2

Inspection condition	Engine coolant temperature at the engine started: More than 20°C (68°F)
Test procedure	1. Start the engine with all the accessories switched OFF. 2. Let the engine idle for 10 seconds. (During the monitor) 3. Turn the ignition switch to the "LOCK" (OFF) position. 4. Start the engine and do Steps 1 to 3 again. *NOTE: When the vehicle is operating normally and the OBD-II Drive Cycle is carried out, the Readiness Codes will be set as "Complete" on the first drive cycle. The second drive cycle is required to set the Readiness Codes as "Complete" if a fault is detected during the first drive cycle.* 5. Confirm that the diagnostic trouble code (DTC) is not output.

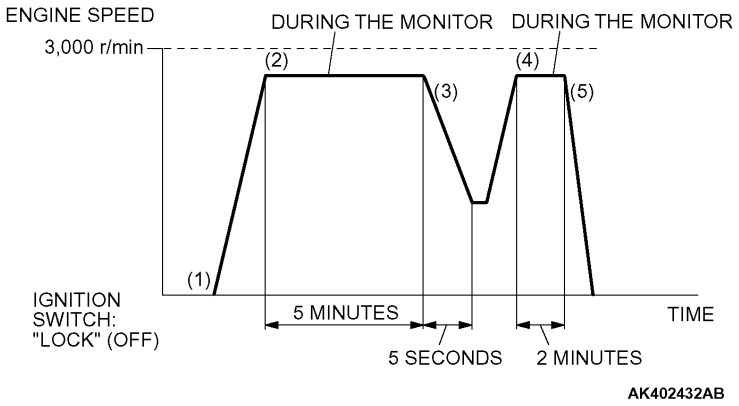
OBD-II DRIVE CYCLE <99MY – 05MY>

PATTERN 3

Drive cycle pattern	
Inspection conditions	• Engine coolant temperature: More than 82°C (180°F) • Intake air temperature: More than 5°C (41°F) • Barometric pressure: More than 76 kPa (22.5 inHg) • Condition of A/T: Selector lever "D" range
Test procedure	1. Start the engine with all the accessories switched OFF. 2. Accelerate until the vehicle speed is 60 km/h (38 mph) and then drive the vehicle for 90 seconds. 3. Release the accelerator pedal and reduce vehicle speed to 30 km/h (18 mph). (During the monitor) 4. Accelerate until the vehicle speed is 60 km/h (38 mph) and then drive the vehicle for 20 seconds. 5. Release the accelerator pedal and reduce vehicle speed to 30 km/h (18 mph). (During the monitor) 6. Stop the safe place and turn the ignition switch to "LOCK" (OFF) position. 7. Start the engine and do Steps 1 to 6 again. *NOTE: When the vehicle is operating normally and the OBD-II Drive Cycle is carried out, the Readiness Codes will be set as "Complete" on the first drive cycle. The second drive cycle is required to set the Readiness Codes as "Complete" if a fault is detected during the first drive cycle.* 8. Confirm that the diagnostic trouble code (DTC) is not output.

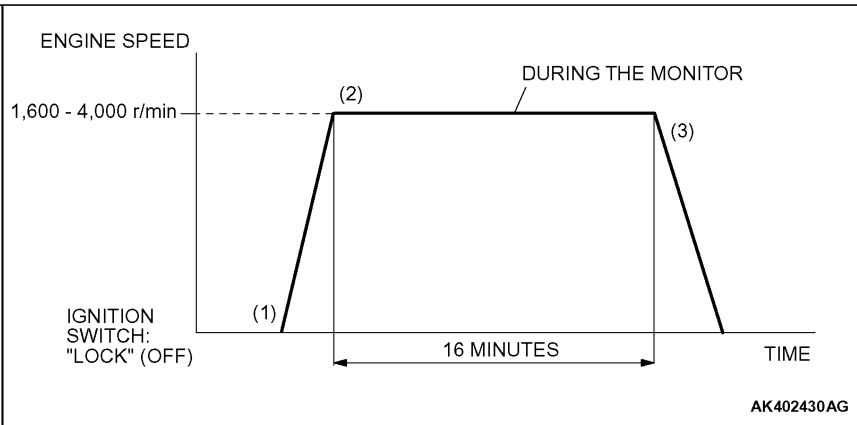
OBD-II DRIVE CYCLE <99MY – 05MY>

PATTERN 4

Drive cycle pattern	
Inspection conditions	• Engine coolant temperature: More than 30°C (86°F) • Intake air temperature: More than –10°C (14°F) • Barometric pressure: More than 76 kPa (22.5 inHg) • Condition of A/T: Selector lever "D" range
Test procedure	1. Start the engine with all accessories switched OFF. 2. Drive the vehicle for 5 minutes at the following conditions. (During the monitor) • Engine speed: Less than 3,000 r/min • Airflow rate: More than 76 Hz, less than 137 Hz <99MY – 02MY>, more than 95 Hz, less than 149 Hz or more than 15 g/sec, less than 29 g/sec <03MY – 05MY> • Manifold pressure: More than 24 kPa (7.0 inHg), less than 63 kPa (18.7 inHg) <Mirage 1.5L> • Accelerator pedal: Except full close • Without rapid accelerator pedal work 3. Release the accelerator pedal for 5 seconds. 4. Drive the vehicle for 2 minutes at the following conditions. (During the monitor) • Engine speed: Less than 3,000 r/min • Airflow rate: More than 76 Hz, less than 137 Hz <99MY – 02MY>, more than 95 Hz, less than 149 Hz or more than 15 g/sec, less than 29 g/sec <03MY – 05MY> • Manifold pressure: More than 24 kPa (7.0 inHg), less than 63 kPa (18.7 inHg) <Mirage 1.5L> • Accelerator pedal: Except full close • Without rapid accelerator pedal work *NOTE: When the system is normal, the monitor is completed earlier.* 5. Stop the safe place and turn the ignition switch to "LOCK" (OFF) position. 6. Start the engine and do Steps 1 to 5 again. *NOTE: When the vehicle is operating normally and the OBD-II Drive Cycle is carried out, the Readiness Codes will be set as "Complete" on the first drive cycle. The second drive cycle is required to set the Readiness Codes as "Complete" if a fault is detected during the first drive cycle.* 7. Confirm that the diagnostic trouble code (DTC) is not output.

OBD-II DRIVE CYCLE <99MY – 05MY>

PATTERN 5

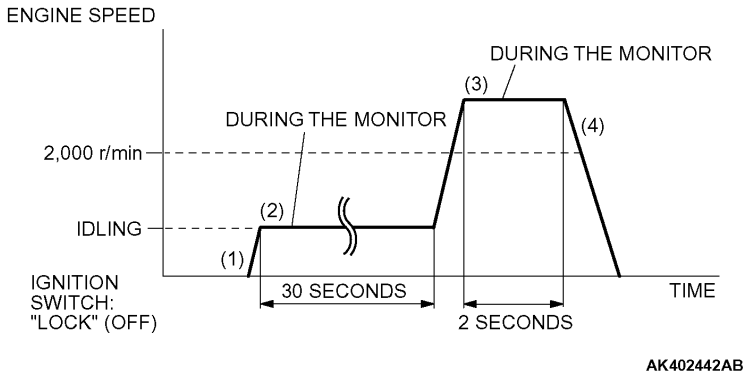
Drive cycle pattern	
Inspection conditions	• Engine coolant temperature at the engine started: Less than 30°C (86°F) <99 – 01MY>, less than 36°C (96°F) <02 – 05MY> • Intake air temperature at the engine started: Less than 30°C (86°F) <99 – 01MY>, less than 36°C (96°F) <02 – 05MY> • Rest of the fuel amount at the engine started: More than 30%, less than 50% <99 – 01MY>, more than 15%, less than 40% <02 – 05MY> • Engine coolant temperature: More than 60°C (41°F) • Intake air temperature: More than 5°C (41°F) • Barometric pressure: More than 76 kPa (22.5 inHg) • Fuel temperature: Less than 36°C (96°F) <02 – 05MY> • Condition of A/T: Selector lever "D" range
Test procedure	1. Start the engine with all the accessories switched OFF. 2. Drive the vehicle for 16 minutes at the following conditions. (During the monitor) • Engine speed: More than 1,600 r/min, less than 4,000 r/min • Vehicle speed: More than 30 km/h (18.7 mph) • Engine load: More than 26%, less than 50% <except Mirage 1.5L> • Manifold pressure: More than 26.7 kPa (7.9 inHg), less than 93.3 kPa (27.5 inHg) <Mirage 1.5L> • Without rapid accelerator pedal work *NOTE: Keep running as long as possible with the power steering pressure switch in the OFF position.* *NOTE: When the system is normal, the monitor is completed earlier.* 3. Stop the safe place and turn the ignition switch to "LOCK" (OFF) position. 4. Start the engine and do Steps 1 to 3 again. *NOTE: When the vehicle is operating normally and the OBD-II Drive Cycle is carried out, the Readiness Codes will be set as "Complete" on the first drive cycle. The second drive cycle is required to set the Readiness Codes as "Complete" if a fault is detected during the first drive cycle.* 5. Confirm that the diagnostic trouble code (DTC) is not output.

OBD-II DRIVE CYCLE <99MY – 05MY>

PATTERN 6

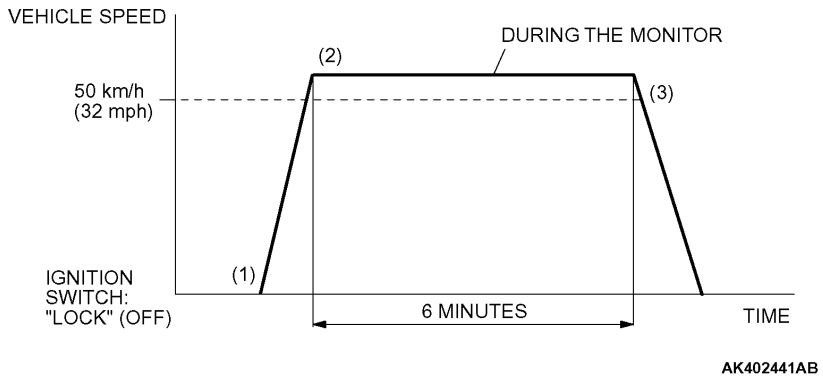
Inspection conditions	• Engine coolant temperature at the engine started: Less than 30°C (86°F) <00MY – 01MY>, less than 36°C (96°F) <02MY – 05MY> • Intake air temperature at the engine started: Less than 30°C (86°F) <00MY – 01MY>, less than 36°C (96°F) <02MY – 05MY> • Rest of the fuel amount at the engine started: More than 30%, less than 50% <00MY>, more than 60% <01MY>, more than 40%, less than 85% <02MY – 05MY> • Engine coolant temperature: More than 60°C <00MY – 01MY>, more than 20°C (68°F) <02MY – 05MY> • Intake air temperature: More than 5°C (41°F) • Barometric pressure: More than 76 kPa (22.5 inHg) • Fuel temperature: Less than 32°C (90°F)
Test procedure	1. Start the engine with all the accessories switched OFF. 2. Let the engine idle for 16 minutes. (During the monitor) *NOTE: When the system is normal, the monitor is completed earlier.* 3. Turn the ignition switch to "LOCK" (OFF) position. 4. Start the engine and do Steps 1 to 3 again. *NOTE: When the vehicle is operating normally and the OBD-II Drive Cycle is carried out, the Readiness Codes will be set as "Complete" on the first drive cycle. The second drive cycle is required to set the Readiness Codes as "Complete" if a fault is detected during the first drive cycle.* 5. Confirm that the diagnostic trouble code (DTC) is not output.

PATTERN 7

Drive cycle pattern	
Inspection condition	• Engine coolant temperature at the engine started: More than 0°C (32°F) • Condition of A/T: Selector lever "D" range
Test procedure	1. Start the engine with all the accessories switched OFF. 2. Let the engine idle for 30 seconds. (During the monitor) 3. Accelerate the vehicle for 2 seconds at the following conditions. (During the monitor) • Engine speed: More than 2,000 r/min • Engine load: More than 60% <except Mirage 1.5L> • Manifold pressure: More than 73.4 kPa (22 inHg) <Mirage 1.5L> • Throttle position sensor output voltage: More than 3.5 volts 4. Stop the safe place and turn the ignition switch to "LOCK" (OFF) position. 5. Start the engine and do Steps 1 to 4 again. 6. Confirm that the diagnostic trouble code (DTC) is not output.

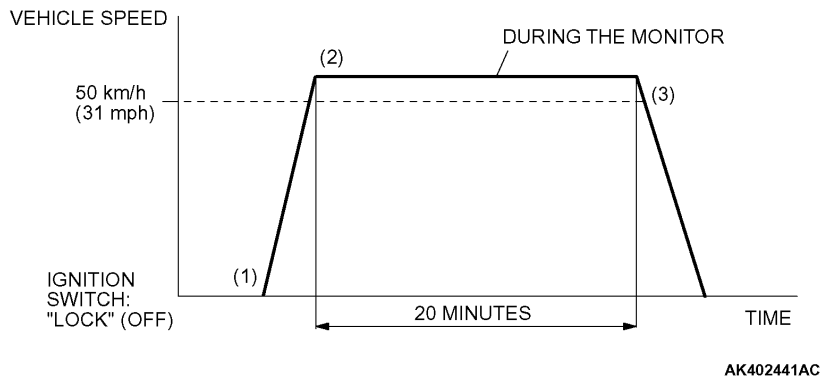
OBD-II DRIVE CYCLE <99MY – 05MY>

PATTERN 8

Drive cycle pattern	 AK402441AB
Inspection conditions	• Engine coolant temperature at the end of previous trip: More than 40°C (104°F) <99MY – 00MY>, more than 7°C (47°F) <01MY – 04MY> • Engine coolant temperature at the engine started: More than 40°C (104°F) <99MY – 00MY>, more than 7°C (47°F) <01MY – 05MY> • Intake air temperature: Less than 60°C (140°F) • Engine coolant temperature: More than 40°C (104°F) <01MY – 05MY> • Condition of A/T: Selector lever "D" range
Test procedure	1. Start the engine with all the accessories switched OFF. 2. Drive the vehicle for 6 minutes at the following condition. (During the monitor) • Engine speed: More than 1,500 r/min <99MY> • Engine load: More than 25% <except Mirage 1.5L> <99MY> • Manifold pressure: More than 40 kPa (12 inHg) <Mirage 1.5L> <99MY> • Vehicle speed: More than 50 km/h (32 mph) <00MY – 05MY> • Except fuel cut 3. Stop at safe place and turn the ignition switch to "LOCK" (OFF) position. 4. Start the engine and do Steps 1 to 3 again. <99MY – 03MY> 5. Confirm that the diagnostic trouble code (DTC) is not output.

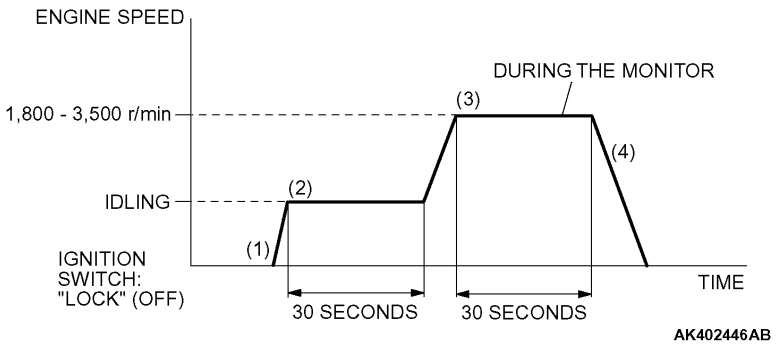
OBD-II DRIVE CYCLE <99MY – 05MY>

PATTERN 9

Drive cycle pattern	
Inspection conditions	• Engine coolant temperature at the engine started: More than 10°C (50°F), less than 76°C (168°F) • Difference between engine coolant temperature and intake air temperature at the engine started: Less than 5°C (9°F) • Dropping of intake air temperature since the engine started: Less than 2°C (3.6°F) • Condition of A/T: Selector lever "D" range
Test procedure	1. Start the engine with all the accessories switched OFF. 2. Drive the vehicle for 20 minutes at the following conditions. (During the monitor) • Vehicle speed: More than 50 km/h (32 mph) • Except fuel cut *NOTE: The system is normal if engine coolant temperature will rise more than 82°C (180°F) within 20 minutes.* 3. Stop at safe place and turn the ignition switch to "LOCK" (OFF) position. 4. Start the engine and do Steps 1 to 3 again. 5. Confirm that the diagnostic trouble code (DTC) is not output.

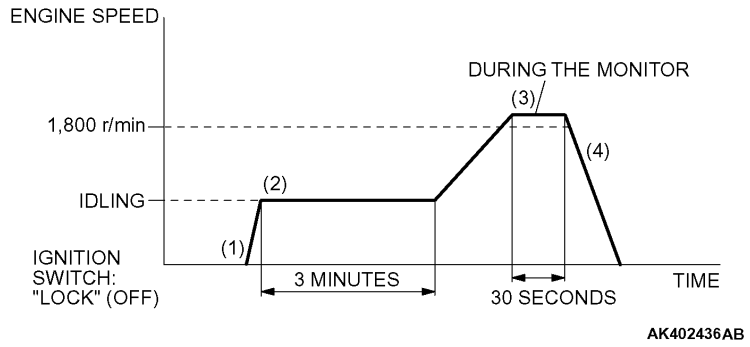
OBD-II DRIVE CYCLE <99MY – 05MY>

PATTERN 10

Drive cycle pattern	
Inspection conditions	• Engine coolant temperature: More than 82°C (180°F) • Condition of A/T: Selector lever "D" range
Test procedure	1. Start the engine with all the accessories switched OFF. 2. Let the engine idle for 30 seconds. 3. Drive the vehicle for 30 seconds at the following conditions. (During the monitor) • Engine speed: More than 1,800 r/min, less than 3,500 r/min • Engine load: More than 30%, less than 62% <except Mirage 1.5L> • Manifold pressure: More than 24 kPa (7.1 inHg), less than 77 kPa (22.4 inHg) <Mirage 1.5L> • Without rapid accelerator pedal work 4. Stop the safe place and turn the ignition switch to "LOCK" (OFF) position. 5. Start the engine and do Steps 1 to 4 again. 6. Confirm that the diagnostic trouble code (DTC) is not output.

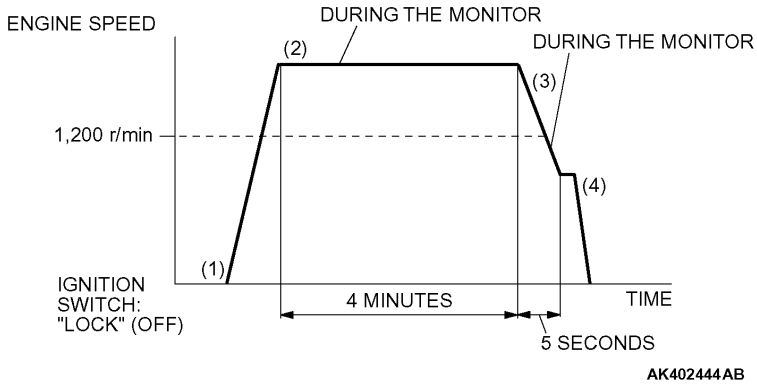
OBD-II DRIVE CYCLE <99MY – 05MY>

PATTERN 11

Drive cycle pattern	
Inspection conditions	• Engine coolant temperature: More than 82°C (180°F) • Condition of A/T: Selector lever "D" range
Test procedure	1. Start the engine with all the accessories switched OFF. 2. Let the engine idle for 3 minutes. 3. Drive the vehicle for 30 seconds at the following conditions. (During the monitor) • Engine speed: More than 1,800 r/m • Engine load: More than 30%, less than 80% <except Mirage 1.5L> • Manifold pressure: More than 24 kPa (7.1 inHg), less than 101 kPa (29 inHg) <Mirage 1.5L> • Throttle position sensor output: Less than 3.0 volts • Except fuel cut 4. Stop the safe place and turn the ignition switch to "LOCK" (OFF) position. 5. Start the engine and do Steps 1 to 4 again. <Heated oxygen sensor monitor> 6. Confirm that the diagnostic trouble code (DTC) is not output.

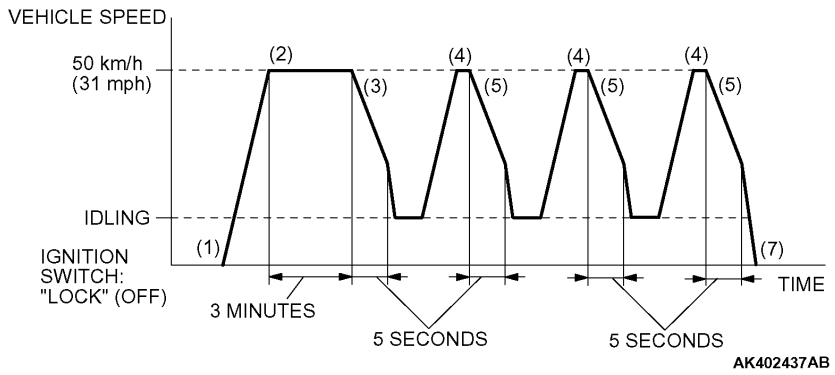
OBD-II DRIVE CYCLE <99MY – 05MY>

PATTERN 12

Drive cycle pattern	
Inspection conditions	• Engine coolant temperature: More than 82°C (180°F) • Intake air temperature: More than –10°C (14°F) • Barometric pressure: 76 kPa (22.5 inHg) • Condition of A/T: Selector lever "D" range
Test procedure	1. Start the engine with all the accessories switched OFF. 2. Drive the vehicle for 4 minutes at the following conditions. (During the monitor) • Engine speed: More than 1,200 r/min • Engine load: More than 25% <except Mirage 1.5L> • Manifold pressure: More than 40 kPa (12 inHg) <Mirage 1.5L> • Airflow rate: More than 113 Hz <except Montero Sport 2.4L>, more than 156 Hz <Montero Sport 2.4L> 3. Release the accelerator pedal for 5 seconds. (During the monitor) 4. Stop the safe place and turn the ignition switch to "LOCK" (OFF) position. 5. Start the engine and do Steps 1 to 4 again. 6. Confirm that the diagnostic trouble code (DTC) is not output.

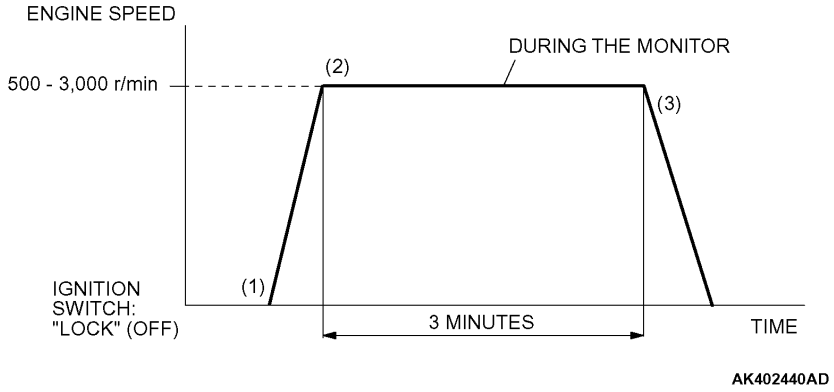
OBD-II DRIVE CYCLE <99MY – 05MY>

PATTERN 13

Drive cycle pattern	
Inspection conditions	• Engine coolant temperature: More than 76°C (169°F) • Condition of A/T: Selector lever "D" range
Test procedure	1. Start the engine with all the accessories switched OFF. 2. Drive the vehicle at 50 km/h (31 mph) for 3 minutes. 3. Release the accelerator pedal for 5 seconds then stop the safe place. 4. Accelerate until the vehicle speed is at 50 km/h (31 mph) at the following conditions. • Engine speed: More than 1,500 r/min • Engine load: More than 40% <except Mirage 1.5L> • Manifold pressure: More than 46.7 kPa (14 inHg) <Mirage 1.5L> 5. Release the accelerator pedal for 5 seconds then stop the safe place. 6. Repeat Steps 4 and 5 for 2 times. 7. Stop the safe place and turn the ignition switch to "LOCK" (OFF) position. 8. Start the engine and do Steps 1 to 7 again. 9. Confirm that the diagnostic trouble code (DTC) is not output.

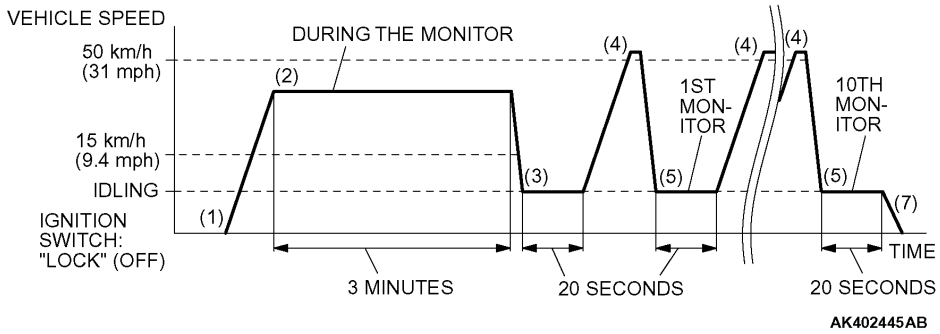
OBD-II DRIVE CYCLE <99MY – 05MY>

PATTERN 14

Drive cycle pattern	
Inspection conditions	• Engine coolant temperature: More than –10°C (14°F) • Intake air temperature: More than –10°C (14°F) • Barometric pressure: More than 76 kPa (22.5 inHg) • Condition of A/T: Selector lever "D" range
Test procedure	1. Start the engine with all the accessories switched OFF. 2. Drive the vehicle for 3 minutes at the following conditions. (During the monitor) • Engine speed: More than 500 r/min, less than 3,000 r/min • Engine load: More than 25% • Without rapid accelerator pedal change • Except fuel cut 3. Stop the vehicle at the safe place and turn the ignition switch to "LOCK" (OFF) position. 4. Start the engine and do Steps 1 to 3 again. 5. Confirm that the diagnostic trouble code (DTC) is not output.

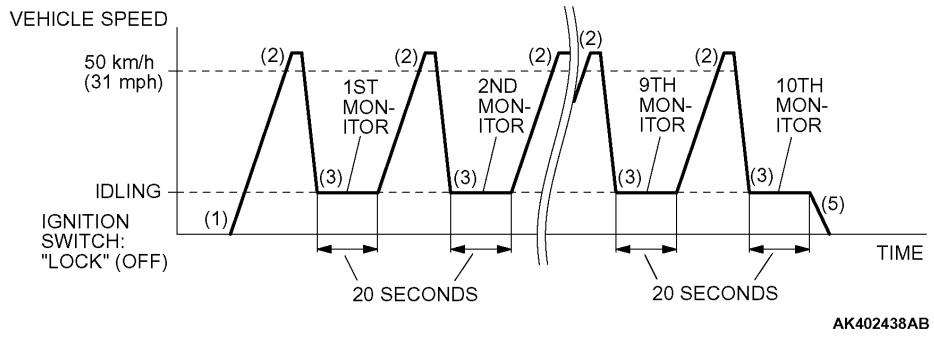
OBD-II DRIVE CYCLE <99MY – 05MY>

PATTERN 15

Drive cycle pattern	
Inspection conditions	• Engine coolant temperature at the engine started: Less than 30°C (86°F) • Intake air temperature at the engine started: Less than 30°C (86°F) • Rest of the fuel amount at the engine started: More than 30%, less than 50% • Engine coolant temperature: More than 60°C (140°F) • Intake air temperature: More than 5°C (41°F), less than 45°C (113°F) • Barometric pressure: More than 76 kPa (22.5 inHg) • Condition of A/T: Selector lever "D" range
Test procedure	1. Start the engine with all the accessories switched OFF. 2. Drive the vehicle for 3 minutes at the following conditions. (During the monitor) • Vehicle speed: More than 15 km/h (9.4 mph) • Engine speed: More than 1,600 r/min, less than 4,000 r/min • Engine load: More than 25%, less than 50% <except Mirage 1.5L> • Manifold pressure: More than 26.7 kPa (7.9 inHg), less than 93.3 kPa (27.5 inHg) <Mirage 1.5L> 3. Stop the safe place and let the engine idle for 20 seconds. 4. Accelerate until the vehicle speed is more than 50 km/h (31 mph). • Engine speed: More than 2,500 r/min • Engine load: More than 55% <except Mirage 1.5L> • Manifold pressure: More than 75 kPa (22.1 inHg) <Mirage 1.5L> 5. Stop at safe place and let the engine idle for 20 seconds. (During the monitor) 6. Repeat Steps 4 and 5 for 10 times. 7. Stop the vehicle at the safe place and turn the ignition switch to "LOCK" (OFF) position. 8. Start the engine and do Steps 1 to 7 again. 9. Confirm that the diagnostic trouble code (DTC) is not output.

OBD-II DRIVE CYCLE <99MY – 05MY>

PATTERN 16

Drive cycle pattern	
Inspection condition	Condition of A/T: Selector lever "D" range
Test procedure	1. Start the engine with all the accessories switched OFF. 2. Accelerate until the vehicle speed is more than 50 km/h (31 mph). • Engine speed: More than 2,500 r/min • Engine load: More than 55% <except Mirage 1.5L> • Manifold pressure: More than 75 kPa (22.1 inHg) <Mirage 1.5L> 3. Stop at safe place and let the engine idle for 20 seconds. (During the monitor) 4. Repeat Steps 2 and 3 for 10 times. 5. Stop the vehicle at the safe place and turn the ignition switch to "LOCK" (OFF) position. 6. Start the engine and do Steps 1 to 5 again. 7. Confirm that the diagnostic trouble code (DTC) is not output.

PATTERN 17

Inspection conditions	• Engine coolant temperature: More than 30°C (86°F) • Intake air temperature: More than –10°C (14°F) • Barometric pressure: More than 76 kPa (22.5 inHg) • Rest of the fuel amount: More than 30%, less than 80% • Condition of A/T: Selector lever "D" range
Test procedure	1. Start the engine with all the accessories switched OFF. 2. Drive the vehicle and turn the corner or change the lane. 3. Drive the vehicle for 3 minutes. (During the monitor) 4. Stop at safe place and turn the ignition switch to "LOCK" (OFF) position. 5. Start the engine and do Steps 1 to 4 again. 6. Confirm that the diagnostic trouble code (DTC) is not output.

OBD-II DRIVE CYCLE <99MY – 05MY>

PATTERN 18

Inspection conditions	• Engine coolant temperature: More than 82°C (180°F) • Intake air temperature: More than –10°C (14°F) • Barometric pressure: More than 76 kPa (22.5 inHg) • Condition of A/T: Selector lever "D" range
Test procedure	1. Start the engine with all the accessories switched OFF. 2. Accelerate until the vehicle speed is more than 1.5 km/h (1 mph). 3. Stop at safe place and let the engine idle for 1 minute. (During the monitor) 4. Turn the ignition switch to "LOCK" (OFF) position. 5. Start the engine and do Steps 1 to 4 again. 6. Confirm that the diagnostic trouble code (DTC) is not output.

PATTERN 19

Inspection conditions	• Engine coolant temperature: More than 45°C (113°F) • Intake air temperature at the engine started: More than 5°C (41°F) • Condition of A/T: Selector lever "D" range
Test procedure	1. Start the engine with all the accessories switched OFF. 2. Let the engine idle for 2 seconds. 3. Accelerate the vehicle with engine load more than 70% for 2 seconds. (During the monitor) 4. Drive the vehicle with engine load more than 30%, less than 45% for 2 seconds. (During the monitor) 5. Stop the safe place and turn the ignition switch to "LOCK" (OFF) position. 6. Start the engine and do Steps 1 to 5 again. 7. Confirm that the diagnostic trouble code (DTC) is not output.

PATTERN 20

Inspection conditions	• Engine coolant temperature at the engine started: Less than 100°C (212°F) • Intake air temperature at the engine started: Less than 60°C (140°F) • Engine coolant temperature: More than 82°C (180°F) • Intake air temperature: More than –10°C (14°F) • Barometric pressure: More than 76 kPa (22.5 inHg)
Test procedure	1. Start the engine with all the accessories switched OFF. 2. Drive the vehicle for 15 minutes at the following conditions. (During the monitor) • Airflow rate: More than 81 Hz <Mirage 1.8L>, more than 113 Hz <3000GT, Montero Sport 3.0L and 3.5L, Montero, Galant, Eclipse, Eclipse Spyder, Diamante, Sebring/ Stratus Coupe>, more than 156 Hz <Montero Sport 2.4L> • Engine speed: More than 1,160 r/min <Mirage 1.5L> 3. Turn the ignition switch to "LOCK" (OFF) position. 4. Start the engine and do Steps 1 to 3 again. 5. Confirm that the diagnostic trouble code (DTC) is not output.

OBD-II DRIVE CYCLE <99MY – 05MY>

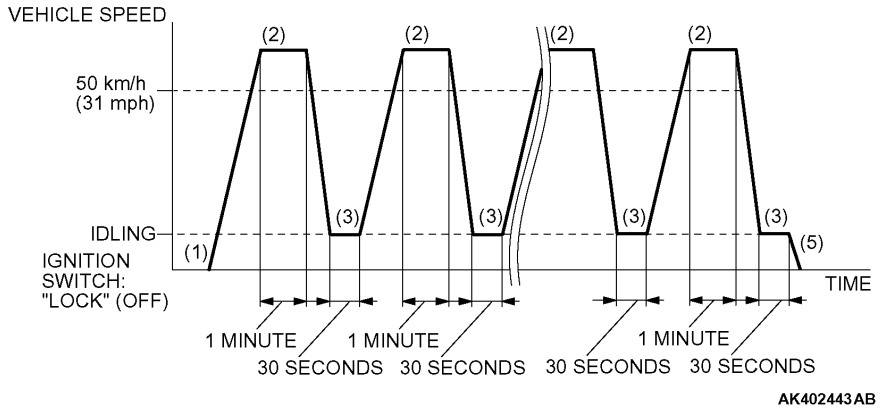
PATTERN 21

Inspection conditions	• Engine coolant temperature at the engine started: Less than 100°C (212°F) <00MY – 01MY> • Intake air temperature at the engine started: Less than 60°C (140°F) <00MY – 01MY> • Engine coolant temperature: More than 82°C (180°F) • Intake air temperature: More than –10°C (14°F) <00MY – 01MY> • Barometric pressure: More than 76 kPa (22.5 inHg) <00MY – 01MY>
Test procedure	1. Start the engine with all the accessories switched OFF. 2. Let the engine idle for 15 minutes. (During the monitor) 3. Turn the ignition switch to "LOCK" (OFF) position. 4. Start the engine and do Steps 1 to 3 again. 5. Confirm that the diagnostic trouble code (DTC) is not output.

PATTERN 22

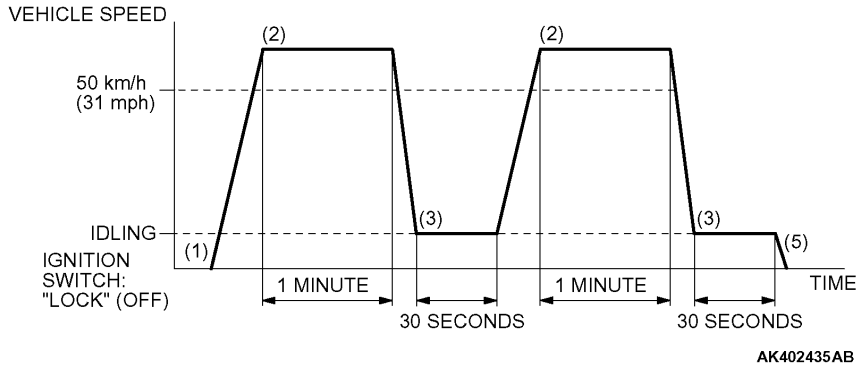
Inspection conditions	• Engine coolant temperature at the engine started: More than –10°C (14°F), less than 33°C (91°F) • Difference between engine coolant temperature and intake air temperature at the engine started: Less than 5°C (9°F) • Condition of A/T: Selector lever "D" range
Test procedure	1. Start the engine with all the accessories switched OFF. 2. Drive the vehicle at more than 30 km/h (19 mph) until engine coolant temperature rises more than 60°C (140°F). (During the monitor) 3. Stop at safe place and turn the ignition switch to "LOCK" (OFF) position. 4. Start the engine and do Steps 1 to 3 again. 5. Confirm that the diagnostic trouble code (DTC) is not output.

PATTERN 23

Drive cycle pattern	
Inspection conditions	• Engine coolant temperature: More than 76°C (169°F) • Condition of A/T: Selector lever "D" range
Test procedure	1. Start the engine with all the accessories switched OFF. 2. Drive the vehicle at more than 50 km/h (31 mph) for 1 minute. 3. Stop at safe place and let the engine idle for 30 seconds. 4. Repeat Steps 2 and 3 for 4 times. 5. Stop the safe place and turn the ignition switch to "LOCK" (OFF) position. 6. Start the engine and do Steps 1 to 5 again. <02MY – 03MY> 7. Confirm that the diagnostic trouble code (DTC) is not output.

OBD-II DRIVE CYCLE <99MY – 05MY>

PATTERN 24

Drive cycle pattern	
Inspection conditions	• Engine coolant temperature: More than 76°C (169°F) • Condition of A/T: Selector lever "D" range
Test procedure	1. Start the engine with all the accessories switched OFF. 2. Drive the vehicle at more than 50 km/h (31 mph) for 1 minute. 3. Stop at safe place and let the engine idle for 30 seconds. 4. Repeat Steps 2 and 3 again. 5. Stop the safe place and turn the ignition switch to "LOCK" (OFF) position. 6. Confirm that the diagnostic trouble code (DTC) is not output.

PATTERN 25

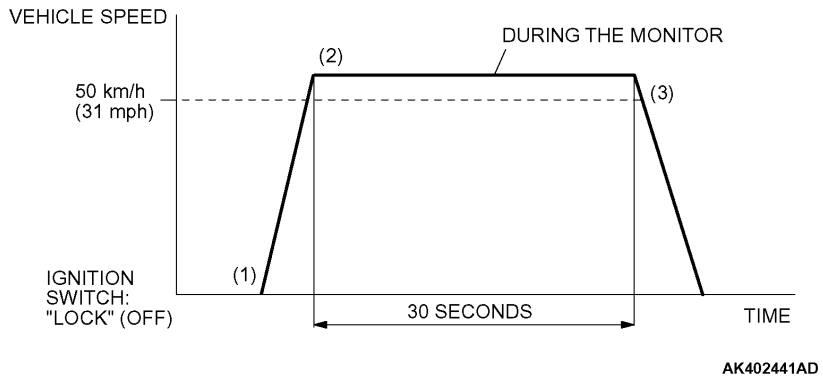
Test procedure	1. Start the engine with all the accessories switched OFF. 2. Accelerate with throttle position sensor output more than 4.2 volts for 5 seconds. (During the monitor) 3. Stop at safe place and turn the ignition switch to "LOCK" (OFF) position. 4. Start the engine and do Steps 1 to 3 again. 5. Confirm that the diagnostic trouble code (DTC) is not output.

PATTERN 26

Inspection conditions	• Engine coolant temperature: More than 82°C (180°F) • Barometric pressure: More than 76 kPa (22.5 inHg) • Condition of A/T: Selector lever "D" range
Test procedure	1. Start the engine with all the accessories switched OFF. 2. Drive the vehicle for 5 seconds at the following conditions. (During the monitor) • Engine speed: More than 3,000 r/min, less than 4,000 r/min • Throttle position sensor output: Less than 4.2 volts 3. Stop the safe place and turn the ignition switch to "LOCK" (OFF) position. 4. Start the engine and do Steps 1 to 3 again. 5. Confirm that the diagnostic trouble code (DTC) is not output.

OBD-II DRIVE CYCLE <99MY – 05MY>

PATTERN 27

Drive cycle pattern	
Inspection conditions	• Engine coolant temperature: More than 30°C (86°F) • Condition of A/T: Selector lever "D" range
Test procedure	1. Start the engine with all the accessories switched OFF. 2. Drive the vehicle at more than 50 km/h (31 mph) for 30 seconds. (During the monitor) 3. Stop the vehicle at the safe place and turn the ignition switch to "LOCK" (OFF) position. 4. Start the engine and do Steps 1 to 3 again. 5. Confirm that the diagnostic trouble code (DTC) is not output.

PATTERN 28

Inspection condition	Engine coolant temperature: More than 77°C (171°F)
Test procedure	1. Start the engine with all the accessories switched OFF. 2. Let the engine idle for 30 seconds. 3. Drive the engine at more than 4,813 r/min for 5 seconds. (During the monitor) 4. Turn the ignition switch to "LOCK" (OFF) position. 5. Start the engine and do Steps 1 to 4 again. 6. Confirm that the diagnostic trouble code (DTC) is not output.

PATTERN 29

Inspection conditions	• Engine coolant temperature: More than 30°C (86°F) <99MY> • Intake air temperature: More than –10°C (14°F) <99MY – 01MY> • Barometric pressure: More than 76 kPa (22.5 inHg) <99MY – 01MY> • Fuel temperature sensor: Less than 36°C (96°F) <05MY – Fuel tank pressure sensor monitor> • Rest of the fuel amount at the engine started: Less than 85% <05MY – Fuel tank pressure sensor monitor>
Test procedure	1. Start the engine with all the accessories switched OFF. 2. Let the engine idle at the engine speed less than 1,000 r/min for 15 seconds. (During the monitor) 3. Shift the selector lever to "D" range with braking, then let the engine idle for 30 seconds. (During the monitor) <A/T only> 4. Turn the ignition switch to "LOCK" (OFF) position. 5. Start the engine and do Steps 1 to 4 again. <99MY – 03MY> 6. Confirm that the diagnostic trouble code (DTC) is not output.