DRIVE CYCLES

OBD-II Vehicles - OBD-II Readiness Monitors

* PLEASE READ THIS FIRST *

NOTE: **This article applies to OBD-II equipped vehicles only.**

NOTE: **Some manufacturers do not provide a specific drive cycle test procedure. Some manufacturers include drive cycle procedures as part of self-diagnostics. Always check appropriate Self-Diagnostics or Testing W/Codes article for information related to drive cycle testing procedures. Some manufacturers may incorporate readiness testing as a part of the DTC test.**

NOTE: **A number of vehicles have had recalls related to "Readiness Monitor" issues, or may have testability issues. Some vehicles may not be testable for emission controls. See VEHICLE RECALLS, TESTABILITY ISSUES & VEHICLES CURRENTLY NOT TESTABLE for details on these vehicles.**

ACURA

NOTE: **Drive cycles for Acura models are also known as "System Readiness Codes".**

For drive cycle test procedures, see appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

CHRYSLER/JEEP

NOTE: **For 1995-99 models, also see TSB 25-02-98 NON TURBO GAS ENGINE I/M OBDII "CARB" READINESS MONITOR INFORMATION .**

1995 FCC PCM

2.0L FWD FCC PCM Equipped Vehicles

The following procedure has been established to assist technicians in the field with enabling and running OBD-II Monitors on 1995 Avenger, Neon, Sebring & Talon 2.0L models equipped with FCC PCM. The order listed in the following procedure is intended to allow the technician to effectively complete each monitor and to set the CARB Readiness Status in the least time possible.

Upstream O2S Monitor

Perform the following:

- Ensure engine is at normal operating temperature, above 170°F.

- Operate the vehicle for a period of time, more than 2 minutes, at a speed above 25 MPH.
- Bring the vehicle to a complete stop, with foot on the brake and transaxle in gear (A/T) or neutral (M/T).

The monitor should run while vehicle is stopped with the engine idling. Wait for a few minutes to allow the monitor to complete before turning off engine.

Downstream O2 Monitor

Perform the following:

- Ensure engine is at normal operating temperature, above 170°F.
- Decel Fuel Shut-off is Active.
- Minimum Engine RPM = 1600 RPM.
- Upstream O2S is less than .471 volts.

The PCM begins the Downstream O2S rationality test. The PCM looks at the Downstream O2S volts for 5 seconds, if less than .295 volts, the test passes. If the Downstream O2S is greater than .295 volts, the test increments a count of 1 and the test is done again. A count of 3 will set a DTC and store Freeze Frame Data.

Rich (High Voltage) Output Test

Perform the following:

- Engine coolant temperature is above 170°F.
- At WOT TPS voltage for more than 2 seconds.
- Upstream O2S volts is above .490 volts.

The PCM begins the Downstream O2S rationality test. The PCM looks at Downstream O2S volts for 5 seconds, if more than .608 volts, the test passes. If the Downstream O2S is less than .608 volts, the test increments a count of 1 and the test is done again. A count of 3 will set a DTC and store Freeze Frame Data.

EGR Monitor

Perform the following:

- EGR Solenoid is enabled.
- Vehicle speed more than 3 MPH.
- Time from Start/Run is more than 2:09 minutes.
- The Fuel Control is in Closed Loop.
- No Limp-In or OBD-II Monitor faults present.
- Purge is enabled.
- Engine coolant temperature more than 144°F.
- MAP Range during Monitor: 11.70" to 16.20".

- RPM Range during Monitor: 2200 RPM to 2400 RPM.
- Actual TP Sensor above minimum TP Sensor Range: .295 volts to 1.0 volt.
- Maximum Short Term Adapt = +6%.
- The PCM stores the EGR on Short Term Adaptive Memory value.

The PCM begins the monitor. The PCM turns off the EGR Solenoid. The PCM uses a modified ramp rate for Short Term Adaptive Memory. The PCM stores the EGR off Short Term Adaptive Memory value. The PCM determines the Short Term Adaptive Memory shift. Between 3% to 17% Short Term shift adaptive memory, an EGR Monitor passes. Less than 3% rich or more than 17% shift rich will run the test again. 3 failed tests will equal a 1 trip EGR Monitor Failure.

Catalyst Monitor

Perform the following:

- Engine coolant temp above 170°F.
- Accumulated open throttle time of 3:00 minutes.
- Vehicle speed above 20 MPH
- TP Sensor is open for 4:00 minutes (A/T) or 5:00 minutes (M/T).
- MAP range during monitor: 14.60" to 18.20".
- The RPM range during monitor: 1500 RPM to 2000 RPM.
- Time spent in MAP and RPM ranges should be more than 3.9 seconds.
- No Limp-In or OBD-II Monitor faults present.

NOTE: If the vehicle speed drops below 20 MPH or the throttle is closed, the timer counts back down until the vehicle speed is above 20 MPH, then the counter resumes counting up again.

The PCM begins the monitor. The PCM starts a timer and counts the Upstream O2S switches and counts the Downstream O2S switches until 20 seconds is reached. After 20 seconds is reached, the PCM divides the Downstream O2S switches by the Upstream O2S switches to determine the switching frequency. If it is less than the calibrated amount, the catalyst monitor passes. If it is more than the calibrated amount, the test increments a count of 1 and the test is done again. A count of 2 will cause the monitor to fail 1 trip and store Freeze Frame Data.

Purge Flow Monitor

Perform the following:

- A Purge Free Cell Update must take place.
- A/T transmission is in gear at idle, Cell 12, or M/T is in Cell 13.

To perform a Purge Free Cell Update:

- The engine must be running in Closed Loop.
- Engine coolant temperature above 170°F for more than 1 minute.
- The PCM attempts a Purge Free Updated every other time the Cell is entered.
- The engine must remain in the Cell for 20 seconds to complete a Purge Free Update.
- The Purge Free Cell will update once the Purge Duty Cycle returns from 0% to some other value, and the PCM begins Stage I of the Purge Flow Monitor.

Stage I: If any of the Purge Normal Cells are richer than their Purge Free Cell Mirrors by the calibrated amount, Stage I Passes. Stop testing this trip. Stage I Pass Specifications. If less than the specification, continue with Stage II.

Stage II: Perform the following:

- Delay for 1 second from Stage I.
- Minimum BARO more than 21.70".
- Maximum Throttle Change (TPS) less than .060 volts.
- Maximum MAP vacuum change less than 0.50" vacuum.
- Maximum RPM change less than 96 RPM.
- Maximum charging system voltage change less than 0.99 volts.
- Maximum generator duty cycle change less than 14% duty cycle.

The PCM updates the Cell with purge on for 1 second. The PCM updates the Cell with purge off for 2 seconds. In Stage II, the PCM subtracts the Purge Normal Cell value from the Purge Free Cell Value. If the difference is greater than calibrated amount, Stage II Passes and no further testing is performed that trip.

If the difference is less than the calibrated amount, continue testing. The PCM averages the Short Term Adaptive Memory percent and the RPM for 3 seconds. The PCM stores the averaged Short Term Adaptive Memory and the RPM value and then reads and stores the IAC Steps. The PCM begins increasing the Purge Flow (by increasing the Purge Solenoid Duty Cycle) .40% every 44 milliseconds. The PCM begins a new averaging for Short Term Adaptive Memory and RPM. The PCM continues taking new IAC step readings. The PCM compares Short Term Adaptive, RPM and IAC Steps from before the Purge Duty Cycle was increased during Stage II until 1 of 3 things happen:

- Short Term Adaptive % changes by 5.0%.
- IAC Steps change by 1 Step.
- RPM changes by approximately: 100 RPM

If any of the above happen, Stage II passes. If not and 99% Purge Solenoid Duty Cycle is reached, Stage II Fails. This will cause the Purge Flow Monitor to Fail 1 Trip and Freeze Frame Data will be stored.

Secondary Air Monitor

Stage I runs when the Secondary Air Solenoid is on (Upstream Air Added). The Secondary Air Solenoid is

switched on, or goes from blocked to upstream air under the following conditions:

- Secondary Air Solenoid on Times:
  A. Engine Running.
  B. Coolant Temp after Start-Up below 120°F ECT = 2:00 minimum, above 120°F ECT = 0:20 minimum.
- In Decel and all following items met:
  A. Engine Temp above 0°F.
  B. Engine Temp below 154°F.
  C. MAP above 19" vacuum.
  D. RPM above 1220 RPM.
  E. RPM below 3500 RPM.

The PCM begins Stage I: The PCM monitors the Downstream O2S while the Secondary Air Solenoid is on (in the Upstream mode). If Downstream O2S is below .725 volts, the PCM goes to Step A. If Downstream O2S is above .745 volts, the PCM goes to Step B.

A. If the Downstream O2S is less than .725 volts, the PCM waits for the Secondary Air to be turned off. After the Secondary Air is turned off, the PCM monitors the Downstream O2S for 2 Seconds. If the Downstream O2S voltage is now above .745 volts, Stage I Passes and all testing is stopped this trip. If it is not above .745 volts, Stage I fails and Stage II begins.

Or

B. If the Downstream O2S is greater than .745 volts with the Secondary Air Solenoid on (Upstream Air Mode), then the PCM fails Stage I and Stage II begins. The PCM begins Stage II after the following:

- Stage I Failed.
- Fuel System in Closed Loop.
- At Idle.
- Test not already failed this Trip.
- RPM above 700 RPM.

In Stage II, the PCM richens the mixture until the Downstream O2S switches rich by doing the following:

- The PCM changes the Upstream O2S rich switch point from .490 volts to 1.02 volts.
- The PCM increments a counter by 0.02 volts every 2 seconds.
- The PCM stops updating Long Term Adaptive Memory.
- The PCM turns off the purge solenoid (No Purge Flow).
- The PCM uses the Purge Free Idle Cell value for fuel calculations.
- The PCM modifies the Fuel Ramps of Short Term Adaptive Memory.

If the Downstream O2S does not switch to rich (above .745 volts) before the Upstream O2S counter gets to 1.12 volts, the PCM fails Stage II and the Secondary Air Monitor fails 1 trip and Freeze Frame Data is stored.

Or

If the Downstream O2S switches to rich (above .745 volts) before the Upstream O2S counter gets to 1.196 volts, the PCM turns the Secondary Air Solenoid on (Upstream Air Mode). The PCM resets Short Term Adaptive Memory to -1.5% and begins reducing the Short Term Adaptive Memory by -0.39% every 0.430 seconds until the Upstream O2S is below .859 volts.

Once the Upstream O2S is below .859 volts, the PCM holds the Short term Adaptive Memory at its present value. The PCM checks to see if the Downstream O2S has switched below .725 volts. If so, the PCM Passes Stage II and no further Testing is done this Trip. If the Downstream O2S has not switched below .725 volts, wait a maximum of 20 Seconds. If either 20 Seconds passes or the Downstream O2S has not switched below .725 volts, the PCM fails Stage II and the Secondary Air Monitor fails 1 trip and Freeze Frame Data is stored.

Oxygen Sensor Heater Monitor (Both Upstream & Downstream O2)

Perform the following:

- Engine running at least 5 minutes.
- Shut the Engine off.
- Minimum battery voltage with engine off is more than 10 volts.
- The PCM delays for 5 seconds.
- The PCM keeps the power to the O2S Heaters off (keeps the ASD Relay off for now).
- The PCM begins pulsing the O2 Sensors with 5 volts for 35 milliseconds every 1.6 Seconds.
- The PCM then monitors the O2S voltage before and during each pulse.

If the initial voltage difference between the Pulse on and Pulse off minus the next Pulse on and Pulse off difference is more than 1.5 volts, the Oxygen Sensors are too cool and all testing is stopped. If the initial voltage difference minus the next voltage difference is less than 1.5 volts, the Oxygen Sensors are properly heated and the testing continues. Next, the cool-down phase begins. The PCM continues to pulse the Oxygen Sensor with 5 volts and then back to .45 volts. The PCM monitors and stores the first Pulse on and the first Pulse off voltages and then subtracts them from each other. The PCM then subtracts the voltage difference from each new set of Pulse on and Pulse off reads, to the difference of the voltage reads taken just before.

Once the PCM sees a difference between readings of at least .490 volts, the sensors have properly cooled and the O2 Sensor Heaters are ready to be tested. If 3:40 minutes have elapsed and still a voltage difference of .490 has not been reached, the PCM begins heating the O2 Sensor that has cooled and disables testing on the O2 Sensor which has not fully cooled. If all Oxygen Sensors have cooled properly, the PCM then grounds the ASD Relay (to provide the O2 Heaters with voltage). The PCM continues to Pulse 5 volts to all O2 Sensors after the ASD Relay is turned on.

The O2 Heaters can pass by one of two methods: First, with the 5-volt Pulse on, the PCM compares to the next

5-Volt Pulse on value. If the voltages between spikes (on Pulses) has decreased by .157 volts. The O2 Heater monitor passes and all testing is stopped this trip. Secondly, the voltage difference between the Pulse on voltage is compared to next Pulse on voltage and is less than the prior voltage Pulse on, for 10 out of the 30 Pulses (33%), this indicates a Heating Trend and the O2 Heater Passes. If neither a Heating Trend nor the Absolute voltage is reached, the O2 Heater monitor fails 1 trip and the Freeze Frame Data is stored.

Misfire Monitor

Misfire monitor is continuously running during engine operation. For the Misfire monitor to be enabled, the Adaptive Numerator must be learned since battery disconnect and every Key on there after (known as Power-on learning). The Adaptive Numerator is a software learning routine that tells the PCM where the crankshaft slots are. Since every crankshaft is different, the PCM must learn exactly where its particular crankshaft slots are; otherwise its RPM calculations would be wrong. After a battery disconnect and then a power-up of the PCM, the Adaptive Numerator is set to a value which it would be at if everything were perfect (crankshaft slots, sensors, PCM hardware, etc.). If the Adaptive Numerator is equal to the default value, no learning has happened and the Misfire Monitor will not run. To allow the PCM to learn the Adaptive Numerator, the following must happen:

- Open Throttle.
- Engine Cool Temp Above 100°F; Or if below 100°F, Wait For ECT Rise Of 59°F.
- More Than 10" Vacuum.
- Above 1200 RPM.
- Below 3000 RPM - A/T.
- Below 3488 RPM - M/T.

Once the PCM has learned the Adaptive Numerator, the Misfire Monitor will run.

Fuel System Monitor

Fuel System monitor is continuously running during engine operation.

1995-2002 JTEC

OBD-II Monitor Enabling Criteria RWD/4WD JTEC PCM Equipped Vehicles

The following procedure has been established to assist technicians in the field with enabling and running OBD-II Monitors on RWD/4WD trucks and Jeep models equipped with Jeep/Truck Engine Controller (JTEC). The order listed in the following procedure is intended to allow the technician to effectively complete each monitor and to set the CARB Readiness Status in the least time possible.

NOTE: Once the monitor run process has begun, do not turn off the ignition. By turning the ignition key off the monitor enabling conditions will be lost. Only the O2 Heater Monitor runs after key off.

NOTE: By performing a battery disconnect, or erasing diagnostic trouble codes, the

CARB Readiness and all additional OBD information will be cleared.

Monitor Run Process Tip

The following is an outline of the Monitoring Run Process, including suggestions and tips in order to aid in the process of meeting the enabling criteria for these monitors. The most efficient order has been outlined below. For example, the first two monitors have very similar enable criteria; it is possible that the Evaporative Leak Detection Monitor will run during the O2 Sensor Heater Monitor.

Evaporative Leak Detection Monitor (If Equipped With An LDP System)

This monitor requires a cold start, usually an overnight soak or parked for at least 8 hours without the engine running. The engine coolant temperature must be within 10 degrees of ambient/battery temperature, and the sensed Ambient (outside) Temperature must be between approximately 40°F and 90°F.

O2 Sensor Heater Monitor

This monitor requires a cold start, usually an overnight soak or parked for at least 8 hours without the engine running. The engine coolant temperature must be within 10 degrees of ambient/battery temperature, and the sensed Ambient (outside temperature) must be between approximately 0°F and 100°F. The monitor should run directly after starting the engine.

Catalyst Monitor

The vehicle will need to be driven at a steady highway speed for a few minutes. The monitor will typically enable and start running at approximately 35 to 40 MPH for 2.5L and 4.0L engines, 50 to 60 MPH for all others). If the vehicle is equipped with a manual transmission, using 4th gear may assist in meeting the monitor running criteria.

O2 Sensor Monitor

The vehicle will need to be driven for a period of time at a steady highway speed. Approximately 35 to 40 MPH for 2.5L and 4.0L engines, 50 to 60 MPH for all others and brought to a stop for a short period of time with the A/T left in Drive. The O2 Monitor will not run in Park or Neutral, except for vehicles equipped with a M/T.

Purge Monitor

The Purge Free cells must be updated before the monitor will run. The enabling conditions are similar to the O2 Sensor Monitor enabling conditions such as, the vehicle will need to be driven for a period of time at highway speeds and brought to a complete stop. The Purge Flow Monitor will attempt to run every OTHER throttle closure. If all of the parameters are met and it still does not run, with your foot firmly on the Brake, quickly open and close the throttle, this will allow another Purge Free update, and then the Purge Flow Monitor should run.

Misfire Monitor

Misfire monitor is continuously running during engine operation. For the Misfire monitor to be enabled, the

Adaptive Numerator must be learned since battery disconnect and every Key on there after (known as Power-on learning).

The Adaptive Numerator is a software learning routine that tells the PCM where the crankshaft slots are. Since every crankshaft is different, the PCM must learn exactly where its particular crankshaft slots are; otherwise its RPM calculations would be wrong. After a battery disconnect and then a power-up of the PCM, the Adaptive Numerator is set to a value which it would be at if everything were perfect (crankshaft slots, sensors, PCM hardware, etc.). If the Adaptive Numerator is equal to the default value, no learning has happened and the Misfire Monitor will not run.

To allow the PCM to learn the Adaptive Numerator, the following must happen:

- Open Throttle.
- Engine Cool Temp Above 100°F Or If Below 100°F, Wait For ECT Rise Of 59°F.
- More than 10" Vacuum.
- Above 1200 RPM.
- Below 3000 RPM - A/T.
- Below 3488 RPM - M/T.

Once the PCM has learned the Adaptive Numerator, the Misfire Monitor will run.

Fuel System Monitor

Fuel System monitor is continuously running during engine operation.

1995-2002 SBEC

OBD-II Monitor Enabling Criteria FWD/AWD SBEC PCM Equipped Vehicles

The following procedure has been established to assist technicians in the field with enabling and running OBD-II Monitors on FWD cars and FWD/AWD vans equipped with Single Board Engine Controller (SBEC). The order listed in the following procedure is intended to allow the technician to effectively complete each monitor and to set the CARB Readiness Status in the least time possible.

NOTE: Once the monitor run process has begun, DO NOT turn off the ignition. By turning the ignition key off, the monitor enabling conditions will be lost. Only the O2 Heater Monitor runs after key off.

NOTE: By performing a battery disconnect, or erasing diagnostic trouble codes, the CARB Readiness and all additional OBD information will be cleared.

Monitor Run Process Tip

The following is an outline of the Monitoring Run Process, including suggestions and tips in order to aid in the process of meeting the enabling criteria for these monitors. The most efficient order has been outlined below,

the first two monitors have very similar enable criteria, so it is possible that the Evaporative Leak Detection Monitor will run while operating the vehicle to enable the Catalyst Monitor.

Evaporative Leak Detection Monitor (If Equipped)

This monitor requires a cold start, usually an overnight soak or parked for at least 8 hours without the engine running. The engine coolant temperature must be within 10 degrees of ambient/battery temperature, and the sensed Ambient (outside) temperature must be between approximately 40°F and 90°F.

Catalyst Monitor

The vehicle will need to be driven at a steady highway speed for a few minutes. The monitor will typically enable and start running around 45 to 60 mph under normal driving conditions. If the vehicle is equipped with a manual transmission, using 4th gear may assist in meeting the monitor running criteria.

EGR Monitor

The EGR monitor enable conditions are basically that the vehicle is in closed loop operation and coolant temperature above 170°F. It is necessary to maintain the TPS, MAP, MPH and RPM ranges at a constant with very little fluctuation to allow the monitor to complete during the cycle.

O2 Sensor Monitor

The vehicle will need to be driven for a period of time at highway speeds and brought to a complete stop for a short period of time, with the A/T left in Drive the monitor should run. The O2 Monitor will not run in Park or Neutral on A/T equipped vehicles.

Purge Monitor

The Purge Free cells must be updated before the monitor will run. The enabling conditions are similar to the O2 Sensor Monitor enabling conditions such as, the vehicle will need to be driven for a period of time at highway speeds and brought to a complete stop. The Purge Flow Monitor will attempt to run every OTHER throttle closure. If all of the parameters are met and it still does not run, with your foot firmly on the Brake, quickly open and close the throttle, this will allow another Purge Free update, and then the Purge Flow Monitor should run.

O2 Sensor Heater Monitor

The vehicle will need to be driven for a period of time at highway speeds to satisfy the enabling conditions for the O2 Sensor Heater Monitor. The monitor runs with the ignition key off after vehicle operation. Allow the vehicle to hot soak for a few minutes before checking to determine if the monitor completed the cycle. Turning the key on prematurely will abort the monitor test and the vehicle will have to be driven to arm the enabling conditions again.

Misfire Monitor

Misfire monitor is continuously running during engine operation. For the Misfire monitor to be enabled, the Adaptive Numerator must be learned since battery disconnect and every Key on there after (known as Power-on

learning).

The Adaptive Numerator is a software learning routine that tells the PCM where the crankshaft slots are. Since every crankshaft is different, the PCM must learn exactly where its particular crankshaft slots are; otherwise its RPM calculations would be wrong. After a battery disconnect and then a power-up of the PCM, the Adaptive Numerator is set to a value which it would be at if everything were perfect (crankshaft slots, sensors, PCM hardware, etc.). If the Adaptive Numerator is equal to the default value, no learning has happened and the Misfire Monitor will not run.

To allow the PCM to learn the Adaptive Numerator, the following must happen:

- Open Throttle.
- Engine Cool Temp Above 100°F, Or If Below 100°F Wait for ECT Rise of 59°F.
- More Than 10" Vacuum.
- Above 1200 RPM.
- Below 3000 RPM - A/T.
- Below 3488 RPM - M/T.

Once the PCM has learned the Adaptive Numerator, the Misfire Monitor will run.

Fuel System Monitor

Fuel System monitor is continuously running during engine operation.

FORD MOTOR CO.

1996-99 GASOLINE MODELS

Introduction

The purpose of the OBD-II drive cycle is to execute the OBD-II monitors and identify any concerns with the OBD-II system. The DTC P1000 code will be erased of all OBD-II monitors have completed during the OBD-II drive cycle.

The scan tool will be used to observe the status of each OBD-II monitor at the completion of the OBD-II drive cycle. The completion status of the Exhaust Gas Recirculation (EGR), Heated Oxygen Sensor (HO2S), Evaporative emission (EVAP), secondary Air Injection (AIR) (if applicable) and catalyst efficiency monitors can be monitored during the OBD-II drive cycle by viewing the On-Board Readiness Menu on the scan tool.

> **WARNING: Strict observance of posted speed limits and attention to driving conditions are mandatory when proceeding through the following drive cycles.**

Vehicle Preparation for OBD-II or Monitor Repair Verification Drive Cycle

NOTE: Vehicles equipped with Power Take Off (PTO) must have this system disengaged before proceeding. Verify by viewing the PTO PID for OFF status.

1. Attach a scan tool and access the ECT, FLI, IAT PIDs. Verify the IAT PID is between 50-100°F (10-38° C). Verify the FLI PID is between 15% and 85% (only available on EVAP Running Loss systems).
2. Warm the vehicle until the ECT PID reaches a minimum of 130°F (54°C).
3. Clear all DTC's with the scan tool by pressing clear with the key on engine off. P1000 will remain. Leave the key in the ON position, and start the vehicle.
4. Access the On-Board System Readiness Menu on the scan tool to view the status of the OBD-II monitors.
5. Proceed with the OBD-II Drive Cycle or selected monitor repair verification drive cycle. Once started, the engine must not be turned off.

OBD-II Drive Cycle

NOTE: The IAT PID must be between 50-100°F (10-38°C) during the OBD-II drive cycle to enter into all the OBD-II monitors. The FLI PID must be between 15% and 85% at all times.

1. Drive in stop-and-go traffic with at least 4 idle periods (30 seconds each) while observing the status of the OBD-II monitor on the scan tool. If the Exhaust Gas Recirculation (EGR), Heated Oxygen Sensor (HO2S), Evaporative (EVAP) emission, secondary Air (AIR) (if applicable) or catalyst efficiency monitor have not completed, drive on the highway at a constant speed over 40 mph not to exceed 65 mph for up to 15 minutes. Heavy accelerations, sudden decelerations and wide open throttles are not recommended. If the scan tool sends out a three pulse beep at any time, the OBD-II drive cycle has completed.

   NOTE: Vehicles equipped with the EVAP purge flow system or EVAP vapor management flow system monitor do not require EVAP monitor completion to clear the DTC P1000.

   If the EGR, HO2S, EVAP, secondary AIR (if applicable) or catalyst efficiency monitor has not completed, perform the corresponding monitor verification drive cycle. See **MONITOR REPAIR VERIFICATION DRIVE CYCLES** .

2. Bring the vehicle to a stop and retrieve Continuous Memory DTCs to verify the DTC P1000 has been erased.

Monitor Repair Verification Drive Cycles

Comprehensive Component Monitor Repair Verification Drive Cycle

1. Refer to and complete the Vehicle Application Preparation For OBD-II Drive Cycle before initiating the following repair verification steps. See **VEHICLE PREPARATION FOR OBD-II OR MONITOR REPAIR VERIFICATION DRIVE CYCLE** .
2. Start the engine and go through the entire OBD-II Drive Cycle until the Comprehensive Component

Monitor shows the completion status by clearing the code P1000 on the scan tool.

3. If the entire OBD-II Drive Cycle has been performed and the Comprehensive Component Monitor check has not completed, rerun Quick Test. See QUICK TEST in appropriate SELF-DIAGNOSTICS article.

EGR Monitor Repair Verification Drive Cycle (Except Probe)

1.

NOTE: The ambient air temperature or IAT PID must read a minimum of 32°F (0°C) to initiate the EGR monitor.

Refer to and complete the Vehicle Application Preparation For OBD-II Drive Cycle before initiating the following repair verification steps. See **VEHICLE PREPARATION FOR OBD-II OR MONITOR REPAIR VERIFICATION DRIVE CYCLE** .

2. Start the engine and drive the vehicle for 6 minutes. Drive in stop-and-go traffic for 5 minutes with at least two idle periods. Accelerate to 45 mph (35 mph on Escort/Tracer at more than 1/2 throttle). Maintain speed for 1 minute.
3. Rerun Quick Test. See QUICK TEST in appropriate SELF-DIAGNOSTICS article.

EGR Monitor Repair Verification Drive Cycle For (Probe)

1. Refer to and complete the Vehicle Application Preparation For OBD-II Drive Cycle before initiating the following repair verification steps. See **VEHICLE PREPARATION FOR OBD-II OR MONITOR REPAIR VERIFICATION DRIVE CYCLE** .
2. Start the engine and drive the vehicle for 24 minutes. Drive in stop-and-go traffic for 19 minutes with at least 4 idle periods. Accelerate to 40 mph at more than 1/2 throttle. Maintain speed for 1 minute. Accelerate on highway to 55 mph. Maintain speed for 4 minutes.
3. Rerun Quick Test. See QUICK TEST in appropriate SELF-DIAGNOSTICS article.

EVAP Running Loss Monitor System Repair Verification Drive Cycle

1. Perform the Vehicle Application Preparation for OBD-II Drive Cycle section. See **VEHICLE PREPARATION FOR OBD-II OR MONITOR REPAIR VERIFICATION DRIVE CYCLE** .
2. With the scan tool, verify the FTP V PID reads between 2.4 and 2.8 volts with the gas cap removed. Reinstall gas cap.
3. With the scan tool, view the OBD-II monitors through the On-Board System Readiness Menu.
4. Drive the vehicle at a constant speed between 35 mph and 65 mph with throttle as steady as possible. Observe the HO2S monitor on the scan tool until it completes (or see FUEL MONITOR OR HO2S MONITOR REPAIR VERIFICATION DRIVE CYCLE).
5. Bring the vehicle to a stop and access the following PIDs with the scan tool: IAT, FLI, FTP, V, EVAPPDC and EVAPCV.
6. Verify the following EVAP monitor entry condition: IAT between 50-100°F (10-38°C).
7. Drive the vehicle on the highway with a constant speed over 40 mph with throttle as steady as possible. During this time, verify the following additional EVAP monitor entry conditions using the FLI and FTPV PIDs. FLI stable, plus or minus 5 percent between the limits of 15 and 85 percent tank fill. FTP V stable

within plus or minus 0.1 volt.

8. Prior to running the EVAP monitor, when the EVAPPDC PID is less than 75 percent, the canister vent solenoid is open and the system is unsealed. To initiate the EVAP monitor, the EVAPPDC PID must increase to at least 75 percent. At this time, the EVAPCV PID will then display 100 percent (canister vent solenoid closed to seal the system and the monitor will begin to run. Continue to drive at steady throttle with light steering until the EVAPCV PID displays 0 percent (canister vent solenoid open, system unsealed). If this step does not occur as described, proceed to the following note, otherwise proceed to next step.

NOTE: During the drive cycle or hot ambient temperatures, fuel vapor (from the canister and/or tank) may keep the test from starting. This can be observed on the can tool when either the EVAPPDC PID never reaches 75 percent with stable FLI and FTP PID readings or the EVAPCV PID never goes to 100 percent (canister vent never closes) when the EVAPPDC PID is above the 75 percent minimum to start the test.

9. Bring the vehicle to a stop.
10. With the scan tool, view the EVAP monitor for completion through the On-Board System Readiness Menu. Repeat step 7 if the EVAP monitor is not complete.

EVAP Emission Monitor Repair Verification Drive Cycle (Probe)

1. Check the IAT PID on the scan tool to make sure that the intake air temperature (or ambient temperature) is 40°F (4°C) or greater to initiate the drive cycle.
2. Start the engine and drive the vehicle for 6 minutes. Drive in stop-and-go traffic for 5 minutes with at least two idle periods. Accelerate to 40 mph. Maintain speed for 1 minute.
3. Rerun Quick Test. See QUICK TEST in appropriate SELF-DIAGNOSTICS article.

Catalyst Monitor Repair Verification Drive Cycle

1. Refer to and complete the Vehicle Application Preparation For OBD-II Drive Cycle before initiating the following repair verification steps. See **VEHICLE PREPARATION FOR OBD-II OR MONITOR REPAIR VERIFICATION DRIVE CYCLE** .
2. Start the engine and drive the vehicle for 25 minutes. Drive in stop-and-go traffic for 20 minutes, include six different constant speeds between 25 and 45 mph. Drive on expressway or highway for an additional 5 minutes.
3. Rerun Quick Test. See QUICK TEST in appropriate SELF-DIAGNOSTICS article.

Fuel Monitor or HO2S Monitor Repair Verification Drive Cycle

1. Refer to and complete the Vehicle Application Preparation For OBD-II Drive Cycle before initiating the following repair verification steps. See **VEHICLE PREPARATION FOR OBD-II OR MONITOR REPAIR VERIFICATION DRIVE CYCLE** .
2. Start the engine and drive the vehicle for 7 minutes. Drive in stop-and-go traffic for 6 minutes, include one idle. Accelerate to 45 mph (35 mph on Escort/Tracer at more than 1/2 throttle). Maintain speed for 1

minute.

3. Rerun Quick Test. See QUICK TEST in appropriate SELF-DIAGNOSTICS article.

Misfire Monitor Repair Verification Drive Cycle

1. For applications with the Fuel Level Input (FLI) circuit to the PCM (terminal No. 12), check the fuel gauge and the FLI PID on the scan tool (if available). The Misfire Monitor can only be tested if the fuel gauge reads above one quarter full or the FLI PID is above 15 percent (percentage fuel tank fill).
2. Start the engine and drive the vehicle to a location where speeds can reach 55 to 60 mph and coast down to 40 mph without traffic interference.
3. Accelerate at wide-open throttle to allow vehicle to shift at red-line (if equipped with a tachometer). Immediately return to normal speed limits.
4. Perform the following drive procedure three consecutive times. Accelerate on highway to 60 mph. Maintain speed for 30 seconds. Coast down with foot off the accelerator pedal from 60 mph to 40 mph.
5. Rerun Quick Test. See QUICK TEST in appropriate SELF-DIAGNOSTICS article.

Secondary Air Monitor Repair Verification Drive Cycle

1. Refer to and complete the Vehicle Application Preparation For OBD-II Drive Cycle before initiating the following repair verification steps. See **VEHICLE PREPARATION FOR OBD-II OR MONITOR REPAIR VERIFICATION DRIVE CYCLE** .
2. Start the engine and proceed through the entire OBD-II Drive Cycle until the Secondary Air Monitor shows the On-Board Readiness Menu completion status on the scan tool.
3. If the entire OBD-II Drive Cycle has been performed and the Secondary Air Monitor check has not completed, rerun Quick Test. See QUICK TEST in appropriate SELF-DIAGNOSTICS article.

2000-2004 GASOLINE MODELS

Introduction

The following procedure is designed to execute and complete the OBD-II monitors and to clear the Ford P1000, I/M readiness code. To complete a specific monitor for repair verification, follow steps 1 through 4, then continue with the step described by the appropriate monitor found under the "OBD-II Monitor Exercised" column. See **Drive Cycle Procedures** . When the ambient air temperature is outside 40 to 100°F (4.4 to 37.8° C), or the altitude is above 8000 feet (2438 meters), the EVAP monitor will not run. If the P1000 code must be cleared in these conditions, the PCM must detect them once (twice on some applications) before the EVAP monitor can be "bypassed" and the P1000 cleared. The EVAP "bypassing" procedure is described in the drive cycle. The OBD-II Drive Cycle will be performed using a scan tool. Consult the instruction manual for each described function.

Drive Cycle Recommendations

1. Most OBD-II monitors will complete more readily using a "steady foot" driving style during cruise or acceleration modes. Operating the throttle in a "smooth" fashion will minimize the time required for monitor completion.

2. Fuel tank level should be between 1/2 and 3/4 fill with 3/4 fill being the most desirable.
3. The Evaporative Monitor can only operate during the first 30 minutes of engine operation. When executing the procedure for this monitor, stay in part throttle mode and drive in a smooth fashion to minimize "fuel slosh".

Drive Cycle Procedures

OBDII Monitor Exercised	Drive Cycle Procedure	Purpose of Drive Cycle Procedure
Drive Cycle Preparation	1. Install scan tool. Turn key on with the engine off. Cycle key off, then on. Select appropriate Vehicle & Engine qualifier. Clear all DTC's/Perform a PCM reset.	Bypass engine soak timer. Resets OBDII Monitor status.
	2. Begin to monitor the following PIDs: ECT, EVAPDC, FLI (if available) and TP MODE. Start vehicle WITHOUT returning to Key Off.	
Prep for Monitor Entry	3. Idle vehicle for 15 seconds. Drive at 64 Km/h (40 MPH) until ECT is at least 76.7°C (170°F). 4. Is IAT within 4.4 to 37.8°C (40 to 100°F)? **If not, complete the following steps, but note that step 14 will be required to "bypass" the EVAP monitor and clear the P1000.**	Engine warm-up and provide IAT input to the PCM.
HEGO	5. Cruise at 64 Km/h (40 MPH) for at least 5 minutes.	Executes the HEGO monitor.
EVAP	6. Cruise at 64 to 128 Km/h (45 to 65 MPH) for 10 minutes (avoid sharp turns and hills). NOTE: To initiate the monitor TP MODE should = PT, EVAPDC must be > 75%, and FLI must be between 15 and 85%.	Executes the EVAP monitor (If IAT is within 4.4 to 40°C (40 to 120° F).
Catalyst	7. Drive in stop-and-go traffic conditions. Include five different constant cruise speeds, ranging from 32 to 112 Km/h (20 to 70 MPH) over a 10 minute period.	Executes the Catalyst Monitor.
EGR	8. From a stop, accelerate to 72 Km/h (45 MPH) at 1/2 to 3/4 throttle. Repeat 3 times.	Executes the EGR Monitor.
SEC AIR/CCM (Engine)	9. Bring the vehicle to a stop. Idle with transmission in drive (neutral for M/T) for 2 minutes.	Executes the ISC portion of the CCM.
CCM (Trans)	10. For M/T, accelerate from 0 to 80 Km/h (0 to 50 MPH), continue to step 11. For A/T, from a stop and in overdrive, moderately accelerate to 80 Km/h (50 MPH) and cruise for at least 15 seconds. Stop vehicle and repeat without overdrive to 64 Km/h (40 MPH) cruising for at least 30 seconds. While at 64 Km/h (40 MPH), activate overdrive and accelerate to 80 Km/h (50 MPH) and cruise for at least 15 seconds. Stop for at least 20 seconds and repeat step 10 five times.	Executes the transmission portion of the CCM.
Misfire & Fuel Monitors	11. From a stop, accelerate to 104 Km/h (65 MPH). Decelerate at closed throttle until 64 Km/h (40 MPH) (no brakes). Repeat this 3 times.	Allows learning for the misfire monitor.
Readiness Check	12. Access the On-Board System Readiness (OBDII monitor status) function on the scan tool. Determine whether all non-continuous monitors have completed. If not, go to step 13.	Determines if any monitor has not completed.
Pending Code Check and EVAP Monitor "Bypass" Check	13. With the scan tool, check for pending codes. Conduct normal repair procedures for any pending code concern. Otherwise, rerun any incomplete monitor. If the EVAP monitor is not complete AND IAT was out of the 4.4 to 37.8 °C (40 to 100 °F) temperature range in step #4, or the altitude is over 2438 m. (8000 ft.), the EVAP "bypass" procedure must be followed. Proceed to Step 14.	Determines if a pending code is preventing the clearing of P1000.
EVAP Monitor "Bypass"	14. Park vehicle for a minimum of 8 hours. Repeat steps 2 through 12. DO NOT REPEAT STEP 1.	Allow the "bypass" counter to increment to two.

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Fig. 1: Drive Cycle Procedures (2000-2004 Ford, Lincoln & Mercury Vehicles)
Courtesy of FORD MOTOR CO.

2003-2004 6.0L DIESEL

Description

Primary function of drive cycle procedure is to clear DTC P1000 and to satisfy specifications for SAE J1979. Each OBD-II monitor must run during drive cycle. If drive cycle has been completed and DTC P1000 is not cleared, repeat entire drive cycle. If a particular step is interrupted, repeat drive mode. If drive cycle is interrupted with a key-off, only drive modes that were incomplete must be run.

Performing Drive Cycle

NOTE: Rough road conditions may prevent certain steady state conditions and steady accelerations from validating the transmission and load-related monitors. On models with Power Take-Off (PTO), disengage PTO system before performing drive cycle.

1. Turn ignition on, but do not crank engine until WAIT TO START indicator turns off, or 10 seconds has passed (whichever is greater).
2. Start engine. Allow engine to idle with transmission in Park or Neutral for 40 seconds.
3. The following conditions must be followed to run certain OBD-II monitors that require engine to be under a load. Accelerate steadily to 3rd gear (A/T) or 4th gear (M/T) and keep engine speed at 1500 RPM for 3 seconds. Accelerate steadily from 35 MPH to 65 MPH in about 15 seconds (A/T) or 11 seconds minimum (M/T). Repeat this procedure 3 times while maintaining conditions set in this step. Before proceeding, turn all accessories off and disengage TOW/HAUL.
4. Before continuing, using scan tool, select EOT PID from PID/DATA MONITOR & RECORD menu. Ensure EOT PID value is more than 140°F (60°C). Allow engine to idle for 20 seconds in Park or Neutral. Turn ignition off. Start engine and allow engine to idle for 40 seconds in Park or Neutral. Repeat QUICK TEST in appropriate SELF-DIAGNOSTICS article. Drive cycle is complete.
5. If DTC P1000 is present after performing drive cycle, repeat step 3 maintaining a minimum MFDES PID value of 35 milligrams/stroke with engine speed at more than 2000 RPM for 11 seconds. Also, maintain a minimum MFDES of 30 milligrams/stroke with engine speed at more than 2800 RPM for at least 6 seconds. Repeat step 4 . MFDES PID value must remain less than 12 milligrams/stroke for 11 seconds.

1996-2004 7.3L DIESEL

Description

Primary function of drive cycle procedure is to clear DTC P1000 and to satisfy specifications for SAE J1979. Each OBD-II monitor must run during drive cycle. If drive cycle has been completed and DTC P1000 is not cleared, repeat entire drive cycle. If a particular step is interrupted, repeat drive mode. If drive cycle is interrupted with a key-off, only drive modes that were incomplete must be run.

Performing Drive Cycle

1. Turn ignition on, but do not crank engine until WAIT TO START indicator turns off, or 10 seconds has passed (whichever is greater).

2. Start engine. Allow engine to idle with transmission in Park or Neutral for 40 seconds.
3. The following conditions must be followed to run certain OBD-II monitors that require engine to be under a load. On A/T models, select OVERDRIVE CANCEL to perform test in 3rd gear. On all models, turn on accessories (headlights, A/C compressor, blower fan, etc.). DO NOT use hazards or PTO. Select an uphill or level road. DO NOT select a downhill road. Driving downhill will unload engine and defeat test.
4. Accelerate steadily to 3rd gear (A/T) or 4th gear (M/T) and keep engine speed at 1500 RPM for 3 seconds. Accelerate steadily from 35 MPH to 65 MPH in about 15 seconds (A/T) or 11 seconds minimum (M/T). Repeat this procedure 3 times while maintaining conditions set in step **3)** . Before proceeding, turn all accessories off and disengage OVERDRIVE CANCEL. On A/T models, go to next step. On M/T models, go to step 6 .
5. On A/T models, drive vehicle in 4th gear continuously for one minute. Accelerate steadily from a full stop to 4th gear and then return to a full stop. Repeat this procedure 10 times, then go to next step.
6. Before continuing, use NGS tester and select EOT PID from PID/DATA MONITOR & RECORD menu. Ensure EOT PID value is more than 140°F (60°C). Allow engine to idle for 20 seconds in Park or Neutral. Turn ignition off. Start engine and allow engine to idle for 40 seconds in Park or Neutral. Repeat QUICK TEST in appropriate SELF-DIAGNOSTICS article. Drive cycle is complete.
7. If DTC P1000 is present after performing drive cycle, repeat step 4 maintaining a minimum MFDES PID value of 37 milligrams/stroke with engine speed at more than 1500 RPM for 11 seconds. Also, maintain a minimum MFDES of 37 milligrams/stroke with engine speed at more than 2300 RPM for at least 6 seconds. Repeat step 6 . MFDES PID value must remain less than 12 milligrams/stroke for 11 seconds.

GENERAL MOTORS

WARNING: Strict observance of posted speed limits and attention to driving conditions are mandatory when proceeding through the following drive cycles.

NOTE: A Drive Cycle may be referred to as Inspection/Maintenance (I/M) Complete System Set Procedure.

DRIVE CYCLE (1996-2000 MODELS)

Description

Several states require that a vehicle pass On-Board Diagnostic (OBD) system tests and the I/M emission inspection in order to renew license plates. This is accomplished by viewing the I/M system status display on a scan tool. Using a scan tool, the technician can observe the I/M system status in order to verify that the vehicle meets the criteria that complies with the local area requirements.

The System Status display indicates only if the PCM has completed the required tests (DTCs). The System Status display does not necessarily mean that the test has passed. If a failure indication is present for a DTC associated with one of the systems, that test has failed. Diagnosis and repair are necessary in order to meet the I/M requirement. Verify that the vehicle passes all of the diagnostic tests associated with the displayed System Status prior to returning the vehicle to the customer.

Conditions for Updating I/M System Status

Each system requires at least one, and sometimes several, diagnostic tests. The results of these tests are reported by a Diagnostic Trouble Code (DTC). A system monitor is complete when either all of the DTCs comprising the monitor have run and passed, or any one of the DTCs comprising the monitor have illuminated the MIL. Once all of the tests are completed, the I/M System Status display will indicate YES in the COMPLETED column. For example, when the HO2S Heater Test indicates YES, all of the oxygen sensor heaters have been diagnosed. If the vehicle has four heated oxygen sensors, all four heater circuits have been diagnosed. The I/M System Status will indicate NO under the Completed column when any of the required tests for that system have not run. The following is a list of conditions that would set the I/M system status indicator to NO:

- The vehicle is new from the factory and has not yet been driven through the necessary drive conditions to complete the tests.
- The battery has been disconnected or discharged below operating voltage.
- The control module power or ground has been interrupted.
- The control module has been reprogrammed.
- The control module DTCs have been cleared as part of a service procedure.

Monitored Emission Control Systems

The OBD-II System monitors all emission control systems that are on-board. Not all vehicles have a full complement of emission control systems. For example, a vehicle may not be equipped with secondary Air Injection (AIR) or Exhaust Gas Recirculation (EGR). The OBD-II regulations require monitoring of the following:

- Air conditioning system.
- Catalytic converter efficiency.
- Comprehensive component monitoring. Emission related inputs and outputs.
- Evaporative (EVAP) emissions system.
- Exhaust Gas Recirculation (EGR) system.
- Fuel delivery system.
- Heated catalyst monitoring.
- Misfire monitoring.
- Oxygen Sensor system (O2S or HO2S).
- Oxygen sensor heater system (HO2S heater).
- Secondary Air Injection (AIR) system.

Systems such as fuel delivery, misfire, and comprehensive components may not be listed in a system status list. These tests run continuously on some vehicles and may not require an indicator.

Drive Cycle

Typical OBD II Drive Cycle

Diagnostic Time Schedule for I/M Readiness	
Vehicle Drive Status	**What is Monitored?**
Cold Start, coolant temperature less than 50°C (122° F)	--
Idle 2.5 minutes in Drive (Auto) Neutral (Man), A/C and rear defogger ON	HO2S Heater, Misfire, Secondary Air, Fuel Trim, EVAP Purge
A/C off, accelerate to 90 km/h (55 mph), 1/2 throttle.	Misfire, Fuel Trim, Purge
3 minutes of Steady State - Cruise at 90 km/h (55 mph)	Misfire, EGR, Secondary Air, Fuel Trim, HO2S, EVAP Purge
Clutch engaged (Man), no braking, decelerate to 32 km/h (20 mph)	EGR, Fuel Trim, EVAP Purge
Accelerate to 90-97 km/h (55-60 mph), 3/4 throttle	Misfire, Fuel Trim, EVAP Purge
5 minutes of Steady State Cruise at 90-97 km/h (55-60 mph)	Catalyst Monitor, Misfire, EGR, Fuel Trim, HO2S, EVAP Purge
Decelerate, no breaking. End of Drive Cycle	EGR, EVAP Purge
Total time of OBD II Drive Cycle 12 minutes	--

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Fig. 2: Typical Drive Cycle (1996-2000 GM Vehicles - Except Metro, Prizm, Saturn & Tracker) Courtesy of GENERAL MOTORS CORP.

DRIVE CYCLE (2001-2003 MODELS)

Description

The following procedure is designed to satisfy the enable criteria necessary to execute all of the I/M readiness diagnostics, and complete the trips for those particular diagnostics. When all diagnostic tests are completed, the I/M System Status indicators are set to YES. Perform this test when more than one or all of the I/M System Status indicators are set to NO.

Rough road conditions may prevent some of the tests from running. Extreme high or low ambient temperatures may prevent tests such as Heated Oxygen Sensor (HO2S) heater and Evaporative Emission (EVAP) system from initiating. If a step is interrupted before completion, perform the remaining portion of the set procedures. Any portion of the set procedure that requires the engine at operating temperature may be repeated. This allows most of the diagnostics to run and the remaining tests can be performed using the individual System Set Procedures.

If the vehicle has recently run, start the Drive Cycle Procedure at step 3. This will allow the tests that require the engine at operating temperature to run. Using this method allows shorter cool down periods if the tests requiring a cold start do not initiate.

The scan tool can be used to monitor each of the I/M System Status indicators during the Drive Cycle Procedure. When all of the indicators for a test step have updated to YES, testing can move on to the next step even if the remaining portion of the test is not complete. For example, step 3 is designed to run the Evaporative Emission (EVAP), Secondary Air Injection (AIR), and Heated Oxygen Sensor (HO2S) tests. The procedure instructs the technician to operate the vehicle in the enable conditions for 6 minutes. If all 3 tests have updated to YES within 4 minutes, it is not necessary to continue with the enable conditions and testing can advance to

the next step.

Enable Conditions

NOTE: It may not be necessary to meet all conditions below to enable specific monitors to run an individual diagnostic test. For more information on enable conditions for running specific monitors, see SELF DIAGNOSTIC SYSTEM in appropriate SELF DIAGNOSTICS article.

- Barometric Pressure (BARO) is greater than 74 kPa.
- Engine Coolant Temperature (ECT) is less than 75°F (24°C).
- Intake Air Temperature (IAT) is less than 75°F (24°C).
- The difference between the IAT and the ECT is 11°F (6°C) or less.
- The battery voltage is 9-18 volts.
- The fuel level is between 1/4 and 3/4.

Inspection/Maintenance (I/M) System Check

Any DTCs set may prevent the required monitors from running. In most cases, anytime a control module is reprogrammed or the DTCs are cleared as part of a repair procedure, all the I/M system status indicators will reset to NO. Prior to performing Drive Cycle Procedure (Inspection/Maintenance Complete System Set Procedure), perform Inspection/Maintenance System Check. See **Fig. 3** .

Step	Action	Value (s)	Yes	No
1	**Important** Many DTC related repairs will instruct the technician to clear the DTC information. This procedure will reset ALL of the I/M System Status indicators to NO, and require performing the I/M Complete System Set Procedure. 2. Repair any DTCs or driveability concerns that would prevent the I/M System Status tests from completing. Did you find and repair a DTC or driveability concern?	--	Go to Step 3	Go to Step 2
2	1. Review any service bulletins for software updates that may prevent I/M readiness. 2. Perform any reprogramming or repairs indicated by the service bulletins. Was a reprogramming or repair service required?	--	Go to Inspection/Maintenance (I/M) Complete System Set Procedure	Go to Step 3
3	With a scan tool, observe the I/M System Status display. Is more than one test indicating a NO status?	--	Go to Inspection/Maintenance (I/M) Complete System Set Procedure	Go to the I/M System Set Procedure for the indicated system

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Fig. 3: Inspection/Maintenance System Check (2001-2003 GM Vehicles - Except Metro, Prizm, Saturn & Tracker)
Courtesy of GENERAL MOTORS CORP.

Inspection/Maintenance (I/M) Complete System Set Procedure

The step numbers below refer to the step numbers in **Fig. 4** on 2001-2003 GM vehicles, except Metro, Prizm, Saturn & Tracker.

1. Ensure you perform **INSPECTION/MAINTENANCE (I/M) SYSTEM CHECK** before performing this test. Failure to do so may result in difficulty updating the status to YES.
2. This step is to run the HO2S Heater Tests and initiate the EVAP System Test. Preprogramming the scan tool will reduce the amount of time the oxygen sensor heaters operate while verifying the enable criteria. The Engine Control Module (ECM) considers the engine to be cold if the following conditions are met: ECT less than 95°F (35°C), ECT and IAT are within 11°F (6°C) of each other at start up.

3. This step is to run the EVAP, AIR and the Oxygen Sensor Tests. The EVAP Test begins once the engine coolant reaches a calibrated temperature. The AIR Test, if equipped, begins shortly after Closed Loop and the indicated speed is achieved. The Oxygen Sensor Tests begin once the engine is at operating temperature, in Closed Loop fuel control, and a calibrated amount of time has elapsed.
4. This step is to run the Exhaust Gas Recirculation (EGR) Tests. The EGR Tests are run during a gradual deceleration with a closed throttle. The vehicle speed is required in order to maintain a high, steady Manifold Absolute Pressure (MAP) signal.
5. This step is to run the Catalyst Tests. This test runs during the idle period immediately following a cruise period that meets a minimum calibrated RPM and time period.
6. Perform the individual system test for any of the systems that do not update to YES.
7. The I/M System Status only reports on whether or not a diagnostic has run, not what the outcome of the test was. If any emission related DTC sets after the tests are complete, the DTC will require diagnosis. See appropriate SELF DIAGNOSTICS article.

Step	Action	Value(s)	Yes	No
1	Did you perform the Inspection/Maintenance (I/M) System Check?	--	Go to Step 2	Go to Inspection/Maintenance (I/M) System Check
2	**Important** Whenever the ignition is turned ON, ignition positive voltage is supplied to the HO2S heaters. After verifying the enable criteria, turn OFF the ignition for approximately 5 minutes to allow the sensors to cool before continuing with the test. Once the engine is started, DO NOT turn the engine OFF for the remaining portion of the set procedure. 1. Preprogram the scan tool with the vehicle information before the ignition is turned ON. 2. Ensure the vehicle is within the Conditions for Running specified in the supporting text. 3. Turn OFF all of the accessories, e.g., A/C, blower fan, etc. 4. Set the vehicle parking brake. 5. Verify the transmission is in Park for automatic transmissions and Neutral for manual transmissions. 6. Start the engine and allow the engine to idle. 7. Allow the engine to idle for the specified time. Is the action complete?	2 minutes	Go to Step 3	--
3	In order for the next group of tests to run, the vehicle must operate in the following conditions: 1. Acceleration at part throttle to 90 km/h (55 mph) with this speed maintained until the engine reaches operating temperature. This may be up to 8-10 minutes depending on the start up coolant temperature. 2. Continued operation under these conditions for an additional 6 minutes. Is the action complete?	--	Go to Step 4	--

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Fig. 4: Inspection/Maintenance Complete System Set Procedure - 1 Of 2 (2001-2003 GM Vehicles - Except Metro, Prizm, Saturn & Tracker)
Courtesy of GENERAL MOTORS CORP.

4	In order for the next group of tests to run, the vehicle must operate in the following conditions: 1. Vehicle speed reduced to 72 km/h (45 mph) with this speed maintained for one additional minute. 2. Four decelerations of 25 seconds each from 72 km/h (45 mph) while the following criteria is maintained: o The throttle is closed o NO brake application on either manual or automatic transmission o NO clutch actuation on a manual transmission o NO manual downshift o The vehicle speed remains above 40 km/h (25 mph) o After each deceleration period, vehicle is returned to 72 km/h (45 mph) under part throttle acceleration and speed is maintained for 15 seconds. Is the action complete?	--	Go to Step 5	--
5	In order for the next group of tests to run, the vehicle must operate in the following conditions: 1. Acceleration at part throttle to 75-89 km/h (45-55 mph) with this speed maintained for 2 minutes. 2. Deceleration to 0 km/h (0 mph). 3. Engine idling for 2 minutes while the following criteria is maintained: o Service brake depressed o Automatic transmission in drive o Manual transmission in neutral with the clutch pedal depressed Is the action complete?	--	Go to Step 6	--
6	Use a scan tool in order to observe the I/M System Status display. Did all of the I/M System Status indicators update to YES?	--	Go to Step 7	See appropriate SELF-DIAGNOSTICS article.
7	Use a scan tool in order to observe the Emission Related DTC portion of the I/M System Status display. Does the scan tool indicate any Emission Related DTCs set?	--	See appropriate SELF-DIAGNOSTICS article.	System OK

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Fig. 5: Inspection/Maintenance Complete System Set Procedure - 2 Of 2 (2001-2003 GM Vehicles - Except Metro, Prizm, Saturn & Tracker)

Courtesy of GENERAL MOTORS CORP.

HONDA

NOTE: Drive cycles for Honda models are also known as "System Readiness Codes".

For drive cycle test procedures, see appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

LEXUS

NOTE: Drive cycles for Lexus models are also known as "Test Drive Confirmation" tests. These Test Drive Confirmation tests are included in the appropriate Diagnostic Trouble Code tests. For drive cycle test procedures, see appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

NISSAN

DRIVE CYCLES (1996 & 1997 MODELS)

NOTE: Drive cycles are referred to as System Readiness Test (SRT) drive patterns.

Introduction

To identify the correct drive pattern, the following information is need:

- Vehicle Model
- Year
- Engine Type
- Transmission Type
- Emissions Certification (California Or Federal)
- Powertrain (Trucks: 2WD Or 4WD)
- ECM Part Number

The following tables should be used to identify which Drive Pattern(s) to be used on specified models. See **Fig. 6** and **Fig. 7** . To identify SRT drive pattern layout, see **Fig. 8** .

For more information on 1996 and 1997 SRT drive patterns, see Technical Service Bulletin No. NTB98-01C, dated January 3, 2003. See SYSTEM READINESS TEST (SRT) DRIVE PATTERNS .

				1 trip or 2 trip SRT					
Model	Model Year	T/M	ECM Part No.23710-XXXXX	Drive Pattern	EGR	O_2 Heater	O_2 Sensor	Catalyst	EVAP
Altima (Fed)	'96	M/T	5E400, 5E401, 5E402, 5E403, 5E404	1	1 trip	N/A	1 trip	1 trip	N/A
		A/T	5E410, 5E411, 5E412, 5E413, 5E414	2					
Altima (Cal)	'96	M/T	5E500	3	1 trip	1 trip	1 trip	1 trip	N/A
			5E501, 5E502, 5E503, 5E504	4	2 trip	2 trip	2 trip	2 trip	N/A
Altima (Cal)	'96	A/T	5E510	5	1 trip	1 trip	1 trip	1 trip	N/A
			5E511, 5E512, 5E513, 5E514	6	2 trip	2 trip	2 trip	2 trip	N/A
Altima	'97	M/T	5E700, 5E701, 5E702, 5E703, 5E704, 5E705, 5E720, 5E721, 5E722, 5E723, 5E724, 5E725	7	2 trip	2 trip	2 trip	2 trip	N/A
		A/T	5E710, 5E711, 5E712, 5E713, 5E714, 5E715, 5E760, 5E761, 5E762, 5E763, 5E764, 5E765	8					
	'97.5	M/T	5E800, 5E801, 5E802, 5E803, 5E804, 5E810, 5E811, 5E812, 5E813, 5E814, 5E860, 5E870	9					
		A/T	5E805, 5E806, 5E807, 5E808, 5E809, 5E815, 5E816, 5E817, 5E818, 5E819, 5E865, 5E875	10					
Maxima	'96	M/T	54U00, 54U01, 54U02, 54U03, 54U04, 54U05, 54U06, 56U60, 56U61, 56U62, 56U63, 56U64, 56U66	11	1 trip	1 trip	1 trip	1 trip	2 trip
		A/T	54U10, 54U11, 54U12, 54U13, 54U14, 54U15, 54U16, 56U70, 56U71, 56U72, 56U73, 56U74, 56U76	12					
	'97	M/T	0L700, 0L701, 0L702, 0L707, 0L708, 0L709, 0L760, 0L761, 0L762, 0L767, 0L768, 0L769	13	2 trip	2 trip	2 trip	2 trip	2 trip
		A/T	0L710, 0L711, 0L712, 0L717, 0L718, 0L719, 0L770, 0L771, 0L772, 0L777, 0L778, 0L779	14					
Pathfinder	'96	M/T	0W000, 0W005, 0W060, 0W061, 0W063	15	1 trip	1 trip	1 trip	1 trip	N/A
		A/T	0W010, 0W015, 0W065, 0W066, 0W067, 0W069	16					
	'97	M/T	1W200, 1W201, 1W202, 1W203, 1W204, 1W260, 1W262	17	2 trip	2 trip	2 trip	2 trip	2 trip
		A/T	1W205, 1W206, 1W207, 1W208, 1W209, 1W265, 1W266, 1W268	18					
Quest	'96	A/T	1B000, 1B001, 1B002	19	1 trip	1 trip	1 trip	1 trip	N/A
	'97		1B010, 1B011, 1B012, 1B013, 1B014	20	2 trip	2 trip	2 trip	2 trip	N/A
Sentra-200SX (GA16)	'96	M/T	0M220, 0M221, 0M224, 0M262, 0M263, 0M269, 0M270, 0M271, 0M272, 0M273, 0M274, 1M214, 1M217, 1M222, 1M565, 1M566	21	1 trip	1 trip	1 trip	1 trip	N/A
			0M260, 0M261, 0M264, 0M279, 0M282, 0M283, 1M204, 1M216, 1M221, 1M520, 1M521	22	1 trip	N/A	1 trip	1 trip	N/A
		A/T	0M222, 0M223, 0M265, 0M266, 0M267, 0M268, 0M275, 0M276, 0M277, 0M278, 0M280, 0M284, 1M219, 1M223, 1M275, 1M575, 1M576, 1M580, 1M581	23	1 trip	1 trip	1 trip	1 trip	N/A
	'97	M/T	3M200, 3M202, 3M203, 3M204, 3M205, 3M206, 3M207, 3M208, 3M209, 3M260, 3M261, 3M270, 3M271, 3M300, 3M302, 3M303, 3M304, 3M305, 3M306, 3M307, 3M308, 3M309, 3M360, 3M361, 3M370, 3M371	24	2 trip	2 trip	2 trip	2 trip	2 trip
		A/T	3M210, 3M212, 3M213, 3M214, 3M215, 3M216, 3M217, 3M218, 3M219, 3M265, 3M266, 3M275, 3M276, 3M310, 3M312, 3M313, 3M314, 3M315, 3M316, 3M317, 3M318, 3M319, 3M365, 3M366, 3M375, 3M376	25					

Note: SRT Items highlighted in gray indicate the drive pattern section for that item must be repeated if the trip is interrupted by releasing the throttle when not directed to do so.

No gray highlight indicates the drive pattern for that SRT item will resume at point of interruption if the drive pattern for that SRT item is interrupted by releasing the throttle when not directed to do so.

G00215371

Fig. 6: Nissan SRT System Chart (Part 1)

				1 trip or 2 trip SRT					
Model	Model Year	T/M	ECM Part No.23710-XXXXX	Drive Pattern	EGR	O_2 Heater	O_2 Sensor	Catalyst	EVAP
200SX (SR20)	'96/'97	M/T	1M860, 1M861, 1M870, 1M871, 1M872	26	1 trip	1 trip	1 trip	1 trip	N/A
	'96/'97	A/T	1M865, 1M866, 1M875, 1M876, 1M877	27					
Truck (2WD)	'96	M/T	1S700, 1S701, 1S702, 1S703	28	1 trip	1 trip	1 trip	1 trip	1 trip
			1S300, 1S301, 1S306, 1S307, 1S704, 1S706, 1S708, 1S709, 1S717, 1S718, 1S719, 1S720, 1S721, 1S722, 1S723, 1S724	29	2 trip	2 trip	2 trip	2 trip	2 trip
		A/T	1S710, 1S712	30	1 trip	1 trip	1 trip	1 trip	1 trip
			1S302, 1S303, 1S308, 1S713, 1S714, 1S716, 1S768, 1S770, 1S771, 1S772, 1S781, 1S782	31	2 trip	2 trip	2 trip	2 trip	2 trip
	'97	M/T	1S300, 1S301, 1S306, 1S307, 1S308, 1S704, 1S706, 1S708, 1S709, 1S717, 1S718, 1S719, 1S720, 1S721, 1S722, 1S723, 1S724,	32	2 trip	2 trip	2 trip	2 trip	2 trip
		A/T	1S302, 1S303, 1S710, 1S712, 1S713, 1S714, 1S716, 1S768, 1S770, 1S771, 1S772, 1S781, 1S782	33					
Truck (4WD)	'96	M/T	1S760, 1S761, 1S762, 1S763	34	1 trip	1 trip	1 trip	1 trip	1 trip
			1S304, 1S305, 1S309, 1S310, 1S764, 1S766, 1S769, 1S774, 1S775, 1S776, 1S777, 1S778, 1S779, 1S780, 1S784, 1S783	35	2 trip	2 trip	2 trip	2 trip	2 trip
	'97	M/T	1S304, 1S305, 1S309, 1S310, 1S764, 1S766, 1S769, 1S774, 1S775, 1S776, 1S777, 1S778, 1S779, 1S780, 1S783, 1S784	36	2 trip	2 trip	2 trip	2 trip	2 trip
240SX	'96	M/T	72F00, 72F01, 72F02, 72F03, 72F04, 72F05	37	1 trip	1 trip	1 trip	1 trip	2 trip
		A/T	72F10, 72F11, 71F12, 72F13, 72F14, 72F15	38					
	'97	M/T	81F00, 81F01, 81F02, 81F03	39	2 trip	2 trip	2 trip	2 trip	2 trip
		A/T	81F10, 81F11, 81F12, 81F13	40					
300ZX (Non-turbo)	'96	M/T	54P60, 54P61	41	1 trip	1 trip	1 trip	1 trip	N/A
			54P74, 54P62	42	2 trip	2 trip	2 trip	2 trip	N/A
		A/T	54P65, 54P66	43	1 trip	1 trip	1 trip	1 trip	N/A
			54P75, 54P67	44	2 trip	2 trip	2 trip	2 trip	N/A
300ZX (Turbo)	'96	M/T	54P00, 54P01, 54P02, 54P03, 54P70, 54P04	45	1 trip	1 trip	1 trip	1 trip	N/A
		A/T	54P05, 54P06, 54P07, 54P08, 54P71, 54P09	46					

Note: SRT Items highlighted in gray indicate the drive pattern section for that item must be repeated if the trip is interrupted by releasing the throttle when not directed to do so.

No gray highlight indicates the drive pattern for that SRT item will resume at point of interruption if the drive pattern for that SRT item is interrupted by releasing the throttle when not directed to do so.

G00215372

Fig. 7: Nissan SRT System Chart (Part 2)

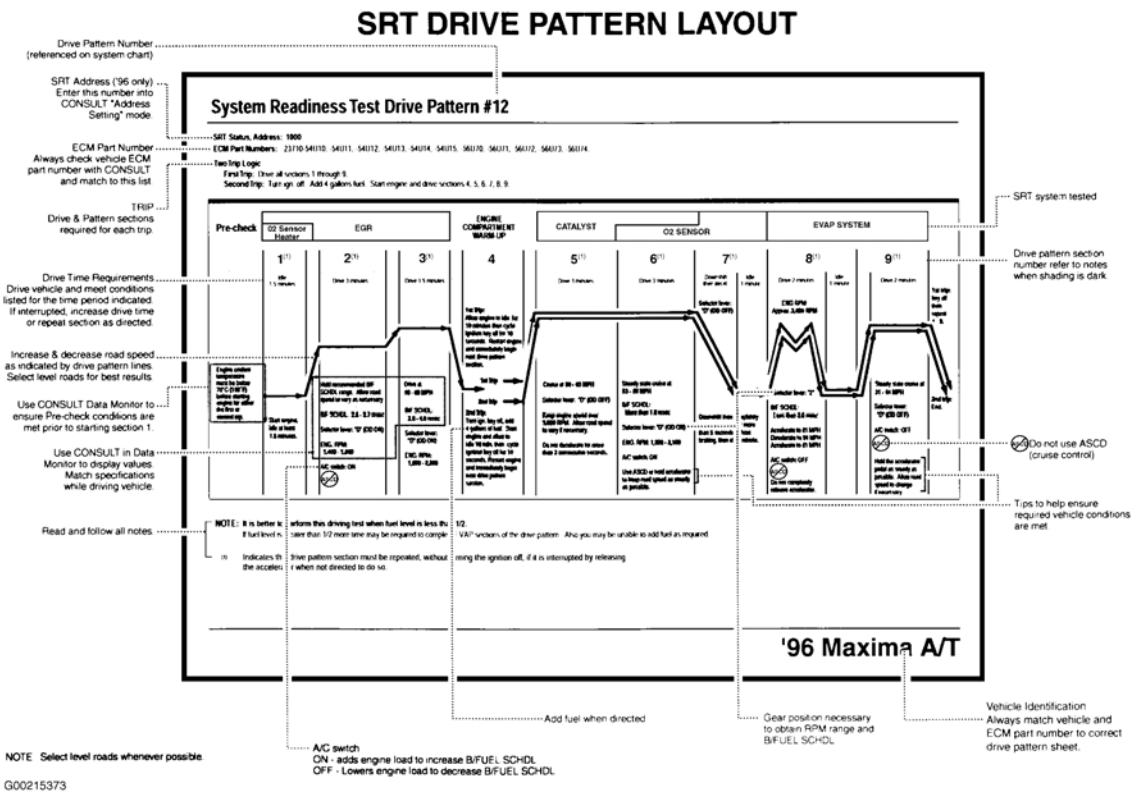


Fig. 8: SRT Drive Pattern Layout

Nissan SRT Drive Patterns

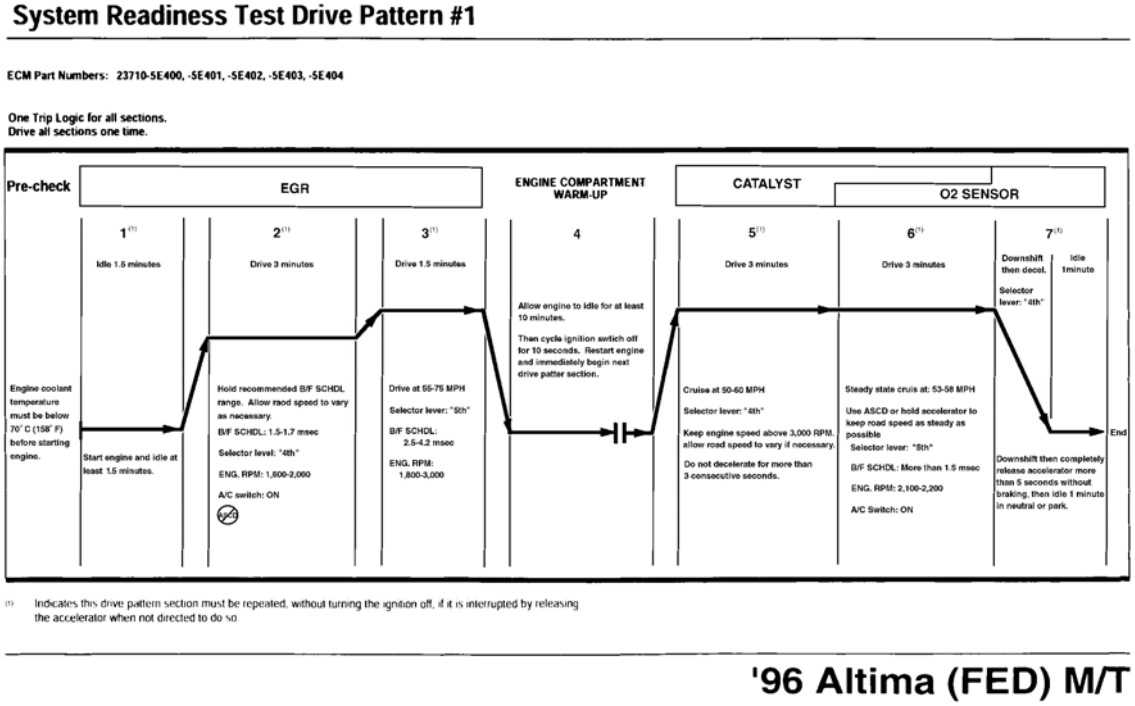
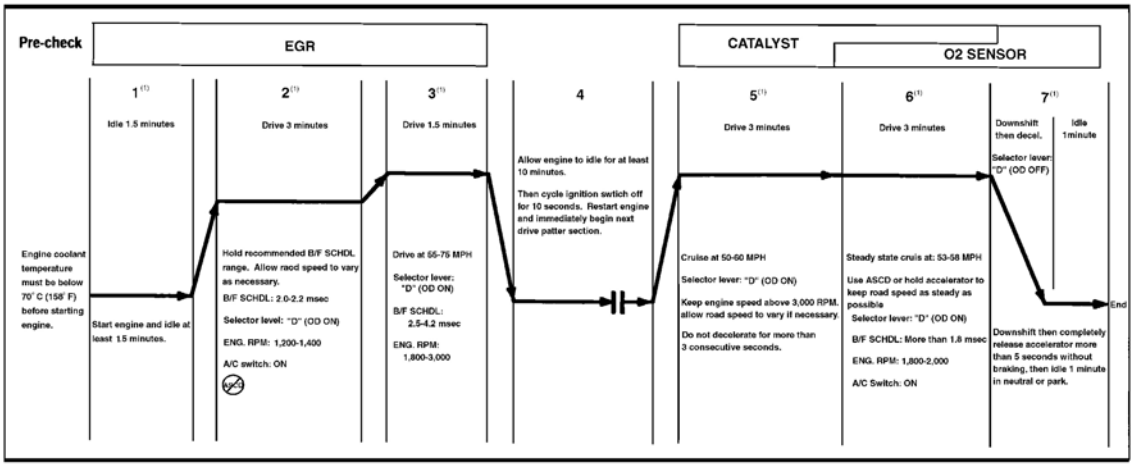


Fig. 9: System Readiness Test Drive Pattern #1: 1996 Altima (FED) M/T

System Readiness Test Drive Pattern #2

ECM Part Numbers: 23710-5E410, -5E411, -5E412, -5E413, -5E414

One Trip Logic for all sections.
Drive all sections one time.



(1) Indicates this drive pattern section must be repeated, without turning the ignition off, if it is interrupted by releasing the accelerator when not directed to do so.

'96 Altima (FED) A/T

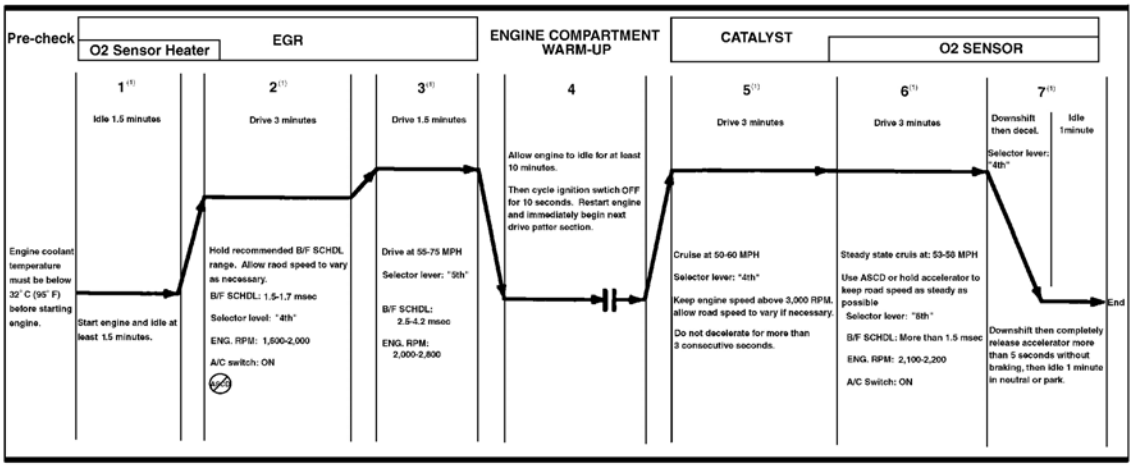
G00215375

Fig. 10: System Readiness Test Drive Pattern #2; 1996 Altima (FED) A/T

System Readiness Test Drive Pattern #3

ECM Part Numbers: 23710-5E500

One Trip Logic for all sections.
Drive all sections one time.



(1) Indicates this drive pattern section must be repeated, without turning the ignition off, if it is interrupted by releasing the accelerator when not directed to do so.

'96 Altima (CAL) M/T

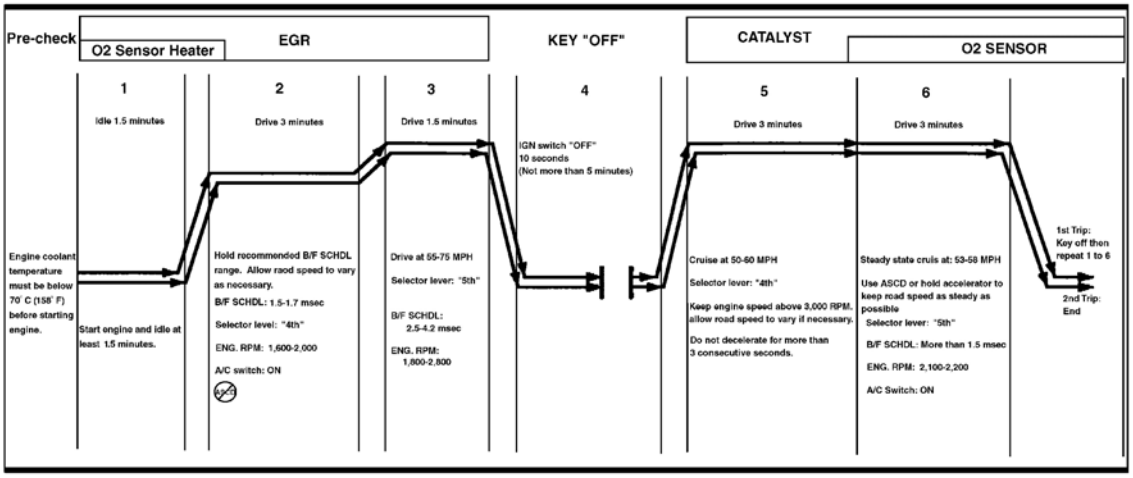
G00215376

Fig. 11: System Readiness Test Drive Pattern #3; 1996 Altima (CAL) M/T

System Readiness Test Drive Pattern #4

ECM Part Numbers: 23710-5E501, -5E502, -5E503, -5E504

Two Trip Logic (all sections)
1st Trip: Drive 1 through 6, then turn ign. off and allow engine to cool to 158°F.
2nd Trip: Drive sections 1 through 6 again.



'96 Altima (CAL) M/T

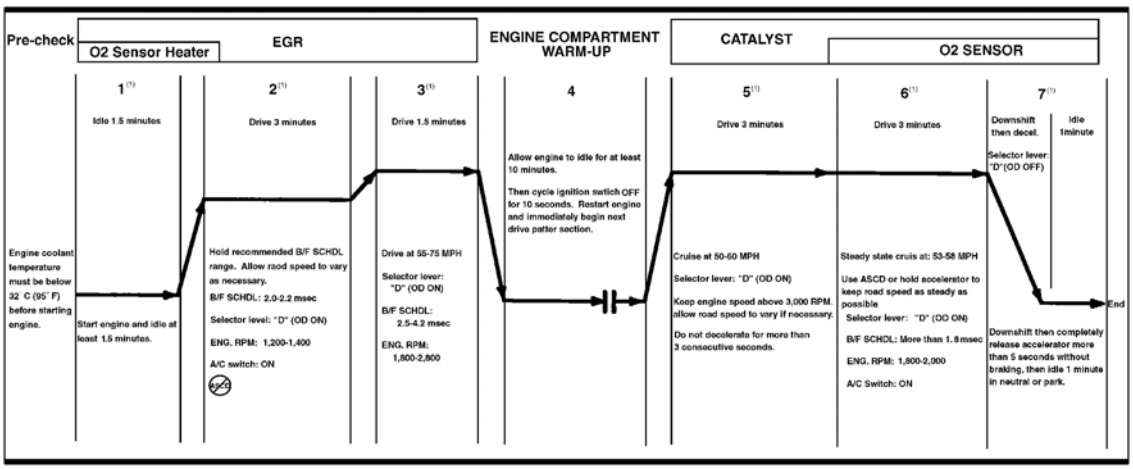
G00215377

Fig. 12: System Readiness Test Drive Pattern #4; 1996 Altima (CAL) M/T

System Readiness Test Drive Pattern #5

ECM Part Numbers: 23710-5E510

One Trip Logic for all sections.
Drive all sections one time.



(1) Indicates this drive pattern section must be repeated, without turning the ignition off, if it is interrupted by releasing the accelerator when not directed to do so.

'96 Altima (CAL) A/T

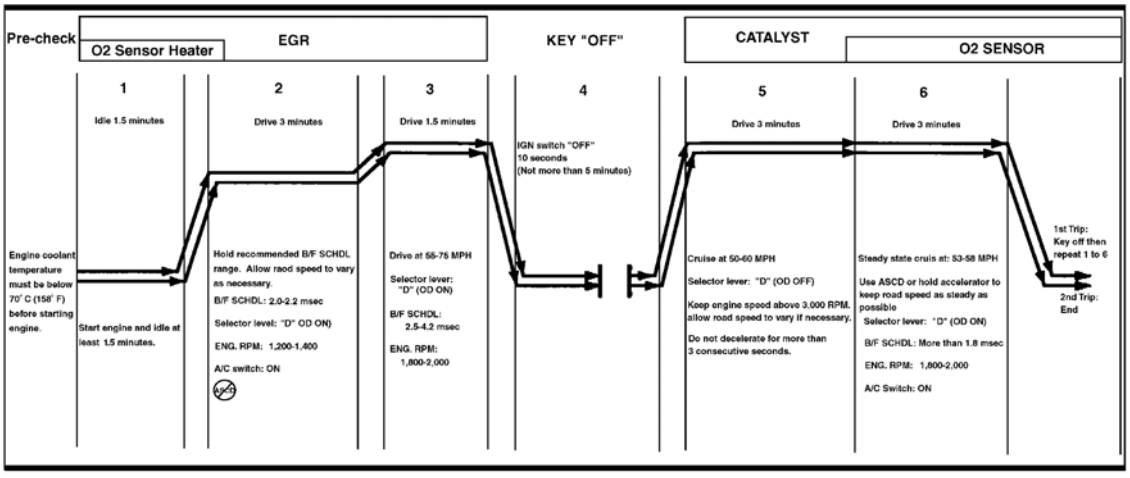
G00215378

Fig. 13: System Readiness Test Drive Pattern #5; 1996 Altima (CAL) A/T

System Readiness Test Drive Pattern #6

ECM Part Numbers: 23710-5E511, -5E512, -5E513, -5E514

Two Trip Logic (all sections)
1st Trip: Drive 1 through 6, then turn ign. off and allow engine to cool to 158°F.
2nd Trip: Drive sections 1 through 6 again.



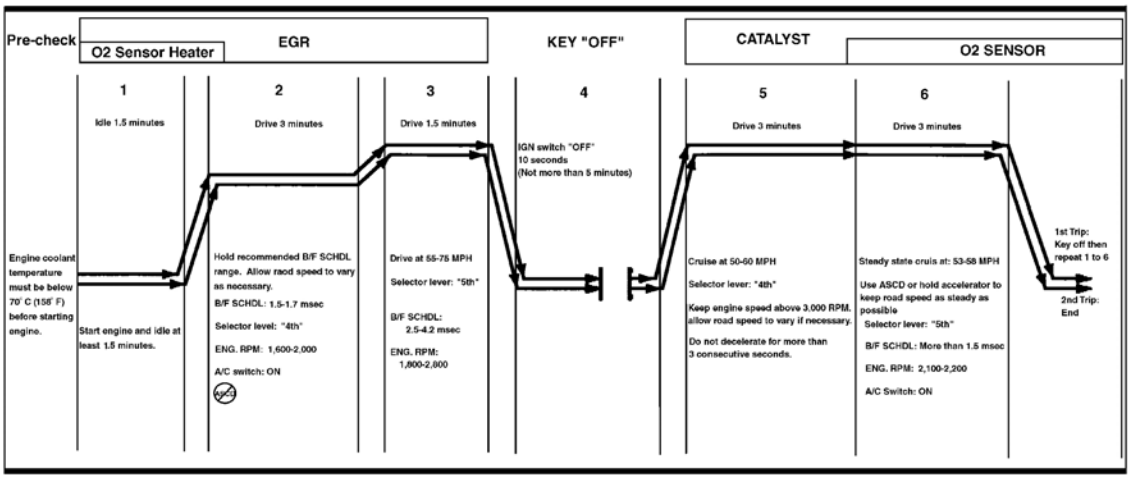
G00215379

Fig. 14: System Readiness Test Drive Pattern #6; 1996 Altima (CAL) A/T

System Readiness Test Drive Pattern #7

ECM Part Numbers: 23710-5E700, -5E701, -5E702, -5E703, -5E704, -5E705, -5E720, -5E721, -5E722, -5E723, -5E724, -5E725

Two Trip Logic (all sections)
1st Trip: Drive 1 through 6, then turn ign. off and allow engine to cool to 158°F.
2nd Trip: Drive sections 1 through 6 again.



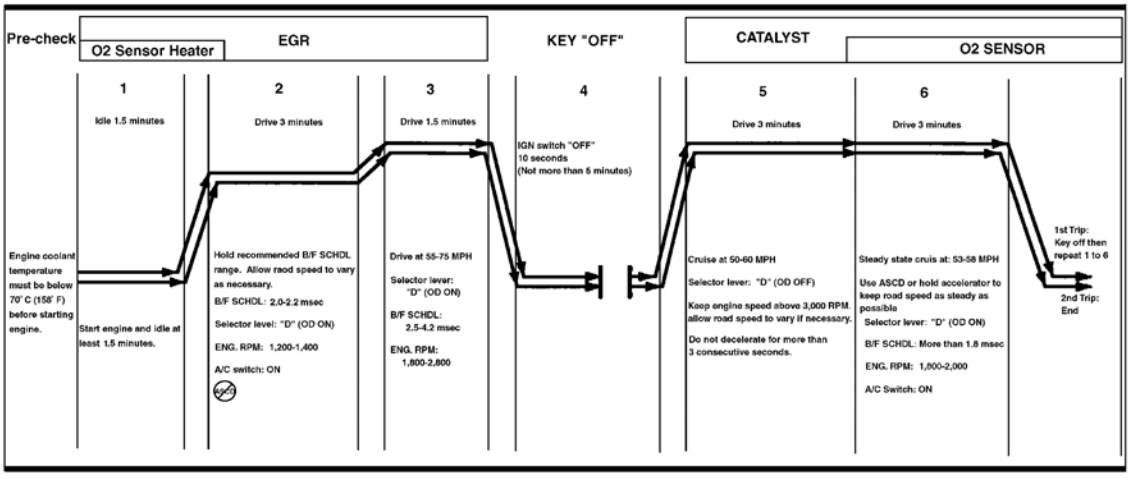
G00215380

Fig. 15: System Readiness Test Drive Pattern #7; 1997 Altima M/T

System Readiness Test Drive Pattern #8

ECM Part Numbers: 23710-5E710, -5E711, -5E712, -5E713, -5E714, -5E715, -5E760, -5E761, -5E762, -5E763, -5E764, -5E765

Two Trip Logic (all sections)
1st Trip: Drive 1 through 6, then turn ign. off and allow engine to cool to 158°F.
2nd Trip: Drive sections 1 through 6 again.



'97 Altima A/T

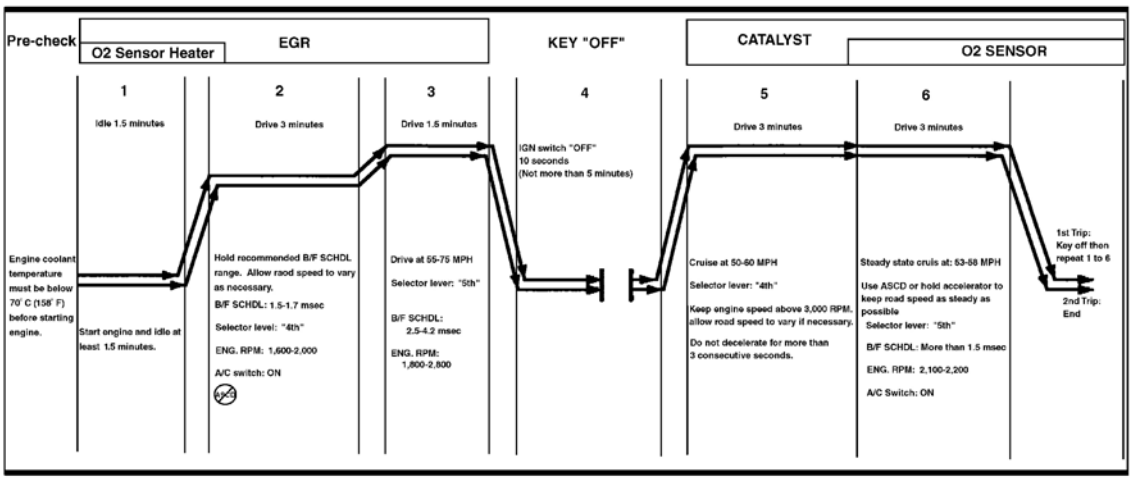
G00215381

Fig. 16: System Readiness Test Drive Pattern #8; 1997 Altima A/T

System Readiness Test Drive Pattern #9

ECM Part Numbers: 23710-5E800, -5E801, -5E802, -5E803, -5E804, -5E810, -5E811, -5E812, -5E813, -5E814, -5E860, -5E870

Two Trip Logic (all sections)
1st Trip: Drive 1 through 6, then turn ign. off and allow engine to cool to 158°F.
2nd Trip: Drive sections 1 through 6 again.



'97.5 Altima M/T

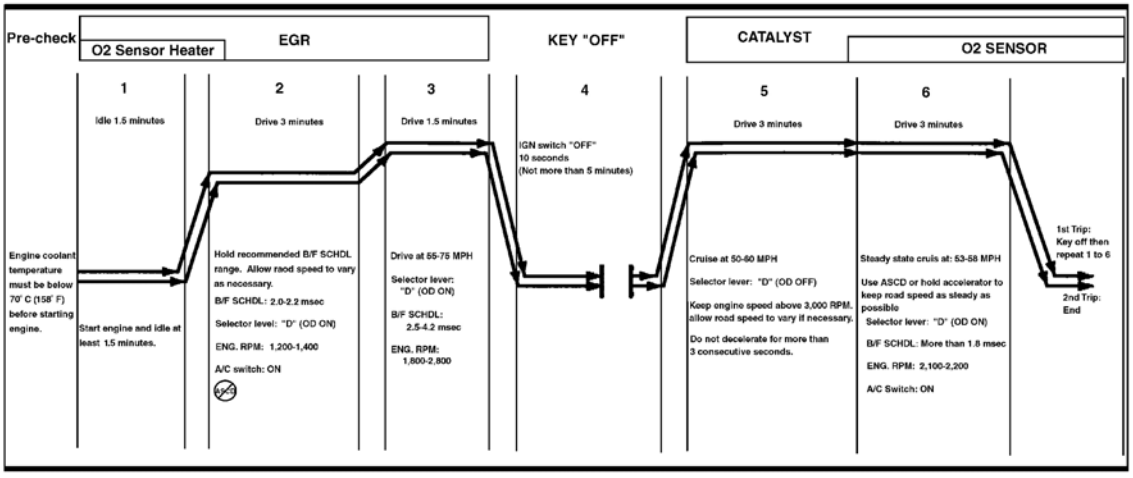
G00215382

Fig. 17: System Readiness Test Drive Pattern #9; 1997.5 Altima M/T

System Readiness Test Drive Pattern #10

ECM Part Numbers: 23710-5E805, -5E806, -5E807, -5E808, -5E809, -5E815, -5E816, -5E817, -5E818, -5E819, 5E865, -5E875

Two Trip Logic (all sections)
1st Trip: Drive 1 through 6, then turn ign. off and allow engine to cool to 158°F.
2nd Trip: Drive sections 1 through 6 again.



'97.5 Altima A/T

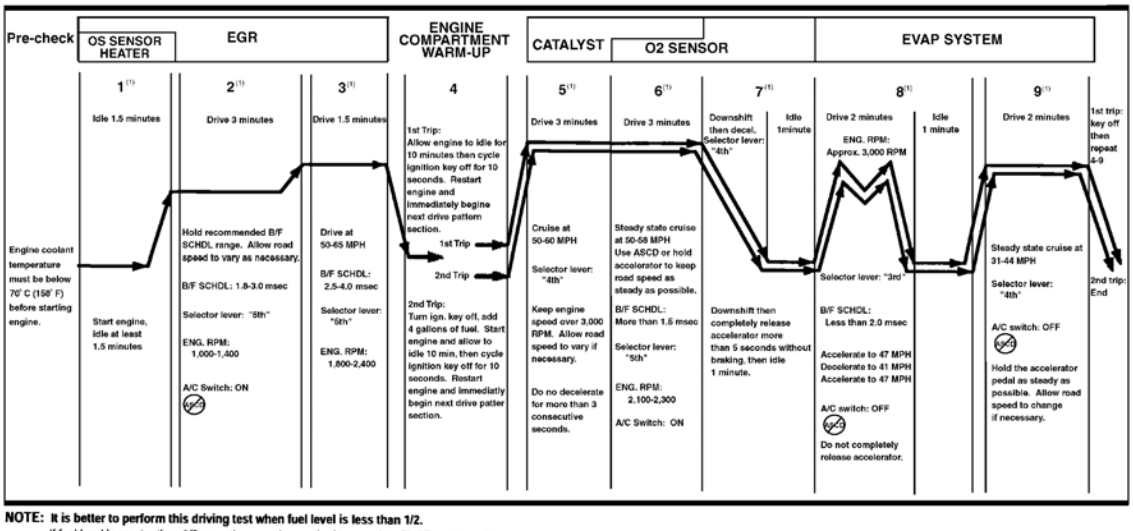
G00215383

Fig. 18: System Readiness Test Drive Pattern #10; 1997.5 Altima A/T

System Readiness Test Drive Pattern #11

ECM Part Numbers: 23710-54U00, -54U01, -54U02, -54U03, -54U04, -54U05, -54U06, -56U60, -56U61, -56U62, -56U63, -56U64, -56U66

Two Trip Logic
First Trip: Drive all sections 1 through 9.
Second Trip: Turn ign. off. **Add 4 gallons fuel.** Start engine and drive sections 4, 5, 6, 7, 8, 9.



NOTE: **It is better to perform this driving test when fuel level is less than 1/2.**
If fuel level is greater than 1/2 more time may be required to complete EVAP sections of the drive pattern. Also you may be unable to add fuel as required.

(1) Indicates this drive pattern section must be repeated, without turning the ignition off, if it is interrupted by releasing the accelerator when not directed to do so.

'96 Maxima M/T

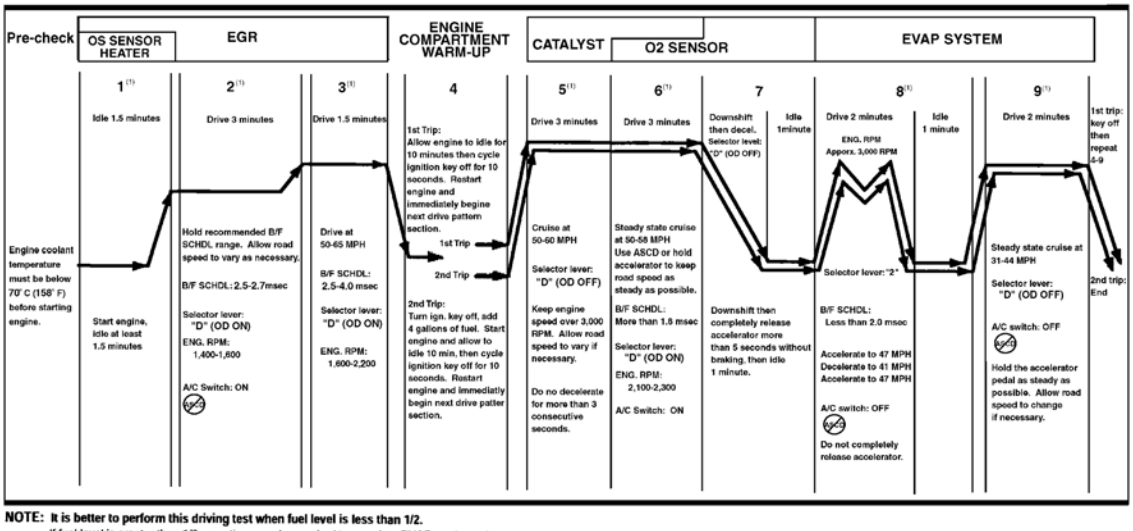
G00215384

Fig. 19: System Readiness Test Drive Pattern #11; 1996 Maxima M/T

System Readiness Test Drive Pattern #11

ECM Part Numbers: **23710-54U00, -54U01, -54U02, -54U03, -54U04, -54U05, -54U06, -56U60, -56U61, -56U62, -56U63, -56U64, -56U66**

Two Trip Logic
First Trip: Drive all sections 1 through 9.
Second Trip: Turn ign. off. **Add 4 gallons fuel**. Start engine and drive sections 4, 5, 6, 7, 8, 9.



NOTE: **It is better to perform this driving test when fuel level is less than 1/2.**
If fuel level is greater than 1/2 more time may be required to complete EVAP sections of the drive pattern. Also you may be unable to add fuel as required.

(1) Indicates this drive pattern section must be repeated, without turning the ignition off, if it is interrupted by releasing the accelerator when not directed to do so.

'96 Maxima M/T

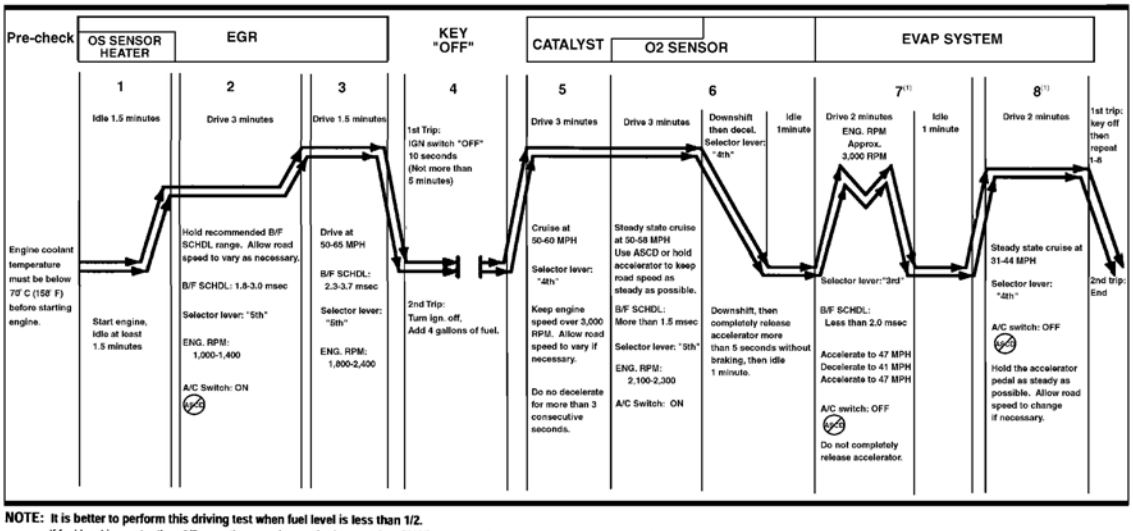
G00215385

Fig. 20: System Readiness Test Drive Pattern #12; 1996 Maxima A/T

System Readiness Test Drive Pattern #13

ECM Part Numbers: **23710-0L700, -0L701, -0L702, -0L707, -0L708, -0L709, -0L760, -0L761, -0L762, -0L767, -0L768, -0L769**

All Items: Two Trip Logic. Drive all sections two times.
First Trip: Drive all sections 1 through 8 then turn ign. off and allow engine to cool below 70°C. (158°F).
Second Trip: Start engine, drive sections 1,2,3. Turn ign. off and **add 4 gallons of fuel** in section 4, then start engine and drive sections 5, 6, 7, 8.



NOTE: **It is better to perform this driving test when fuel level is less than 1/2.**
If fuel level is greater than 1/2 more time may be required to complete EVAP sections of the drive pattern. Also you may be unable to add fuel as required.

(1) Indicates this drive pattern section must be repeated, without turning the ignition off, if it is interrupted by releasing the accelerator when not directed to do so.

'97 Maxima M/T

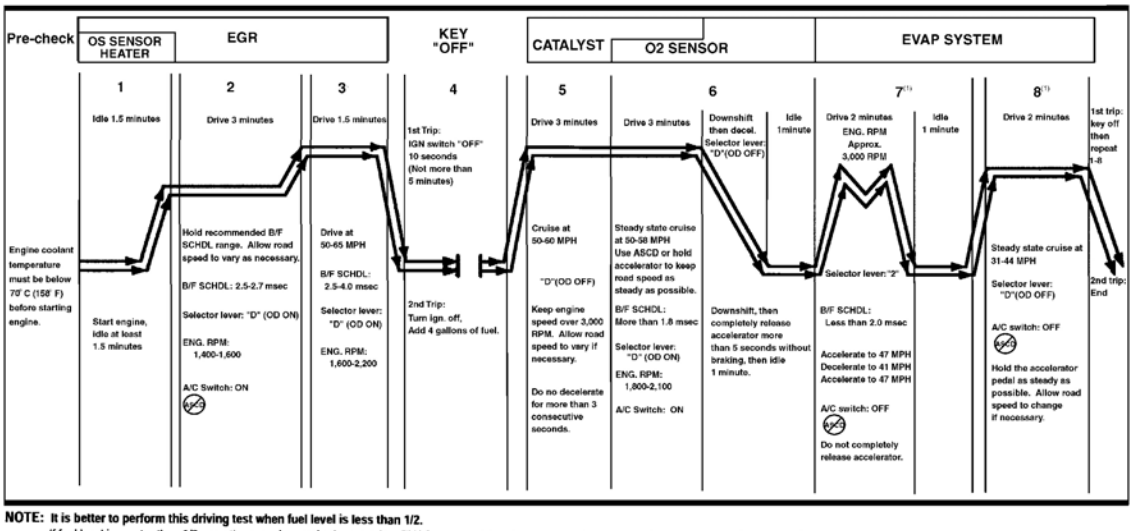
G00215386

Fig. 21: System Readiness Test Drive Pattern #13; 1997 Maxima M/T

System Readiness Test Drive Pattern #14

ECM Part Numbers: 23710-0L710, -0L711, -0L712, -0L717, -0L718, -0L719, -0L770, -0L771, -0L772, -0L777, -0L778, -0L779

All Items: Two Trip Logic. Drive all sections two times.
First Trip: Drive all sections 1 through 8 then turn ign. off and allow engine to cool below 70°C. (158°F).
Second Trip: Start engine, drive sections 1,2,3. Turn ign. off and **add 4 gallons of fuel** in section 4, then start engine and drive sections 5, 6, 7, 8.



NOTE: It is better to perform this driving test when fuel level is less than 1/2.
If fuel level is greater than 1/2 more time may be required to complete EVAP sections of the drive pattern. Also you may be unable to add fuel as required.

(1) Indicates this drive pattern section must be repeated, without turning the ignition off, if it is interrupted by releasing the accelerator when not directed to do so.

'97 Maxima A/T

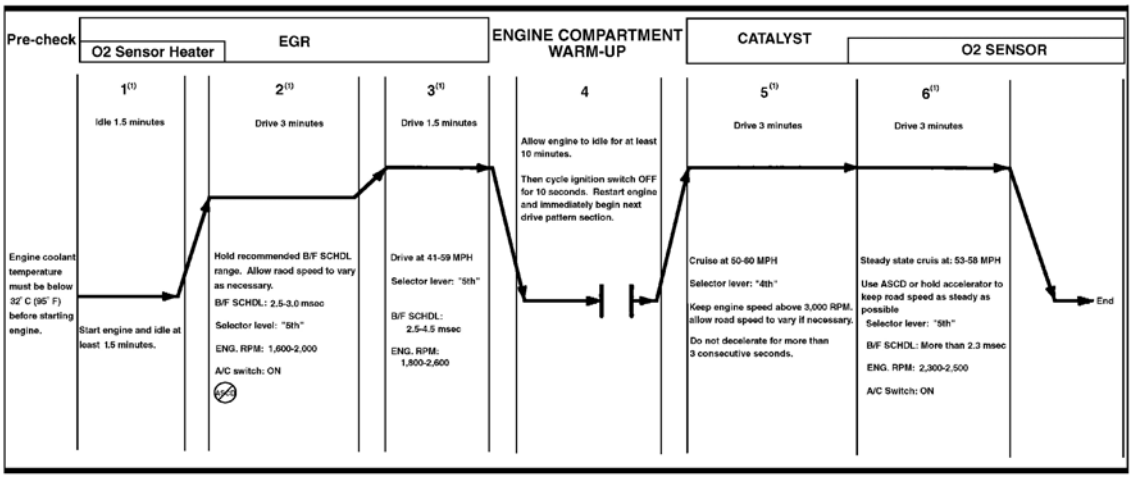
G00215387

Fig. 22: System Readiness Test Drive Pattern #14; 1997 Maxima A/T

System Readiness Test Drive Pattern #15

ECM Part Numbers: 23710-0W000, -0W005, -0W060, -0W061, -0W063

One Trip Logic for all sections.
Drive all sections one time.



(1) Indicates this drive pattern section must be repeated, without turning the ignition off, if it is interrupted by releasing the accelerator when not directed to do so.

'96 Pathfinder M/T

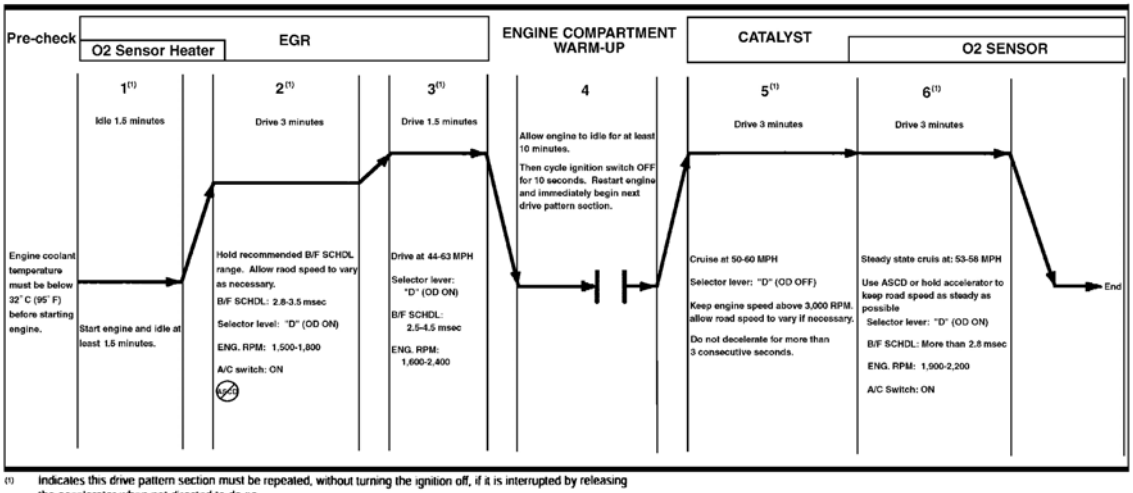
G00215388

Fig. 23: System Readiness Test Drive Pattern #15; 1996 Pathfinder M/T

System Readiness Test Drive Pattern #16

ECM Part Numbers: 23710-0W010, -0W015, -0W065, -0W066, -0W067, -0W069

One Trip Logic for all sections.
Drive all sections one time.



(1) Indicates this drive pattern section must be repeated, without turning the ignition off, if it is interrupted by releasing the accelerator when not directed to do so.

'96 Pathfinder A/T

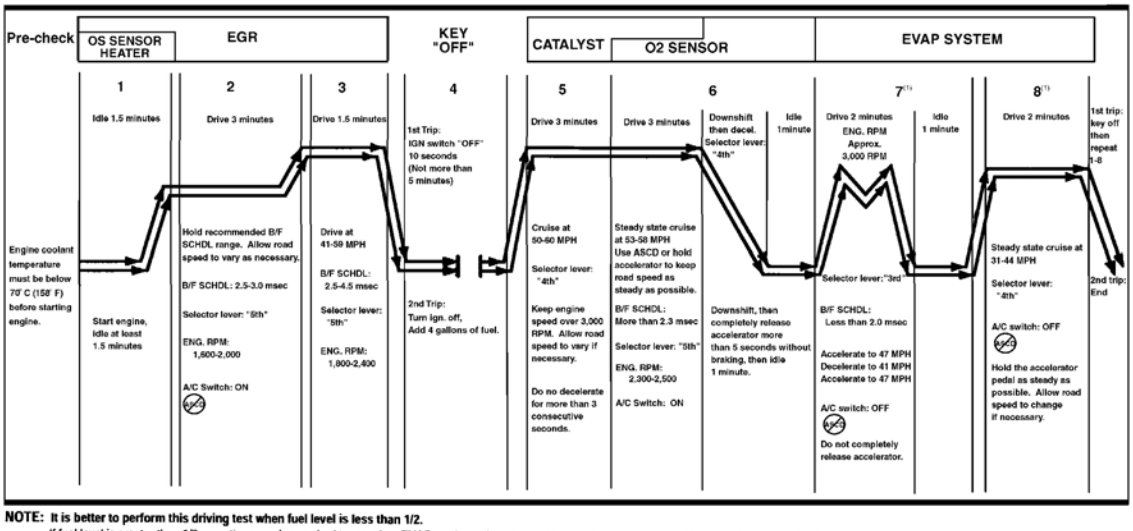
G00215389

Fig. 24: System Readiness Test Drive Pattern #16; 1996 Pathfinder A/T

System Readiness Test Drive Pattern #17

ECM Part Numbers: 23710-1W200, -1W201, -1W202, -1W203, -1W204, -1W260, -1W262

All Items: Two Trip Logic. Drive all sections two times.
First Trip: Drive all sections 1 through 8 then turn ign. off and allow engine to cool below 70°C. (158°F).
Second Trip: Start engine, drive sections 1,2,3. Turn ign. off and **add 4 gallons of fuel** in section 4, then start engine and drive sections 5, 6, 7, 8.



NOTE: It is better to perform this driving test when fuel level is less than 1/2.
If fuel level is greater than 1/2 more time may be required to complete EVAP sections of the drive pattern. Also you may be unable to add fuel as required.

(1) Indicates this drive pattern section must be repeated, without turning the ignition off, if it is interrupted by releasing the accelerator when not directed to do so.

'97 Pathfinder M/T

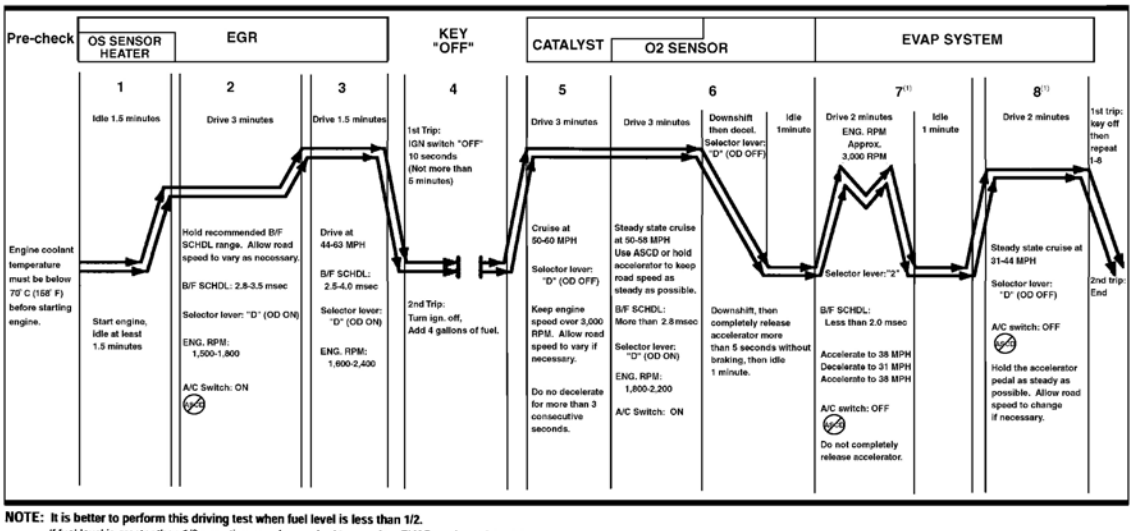
G00215390

Fig. 25: System Readiness Test Drive Pattern #17; 1997 Pathfinder M/T

System Readiness Test Drive Pattern #18

ECM Part Numbers: 23710-1W205, -1W206, -1W207, -1W208, -1W209, -1W265, -1W266, -1W268

All Items: Two Trip Logic. Drive all sections two times.
First Trip: Drive all sections 1 through 8 then turn ign. off and allow engine to cool below 70°C. (158°F).
Second Trip: Start engine, drive sections 1,2,3. Turn ign. off and **add 4 gallons of fuel** in section 4, then start engine and drive sections 5,6,7,8.



NOTE: **It is better to perform this driving test when fuel level is less than 1/2.**
If fuel level is greater than 1/2 more time may be required to complete EVAP sections of the drive pattern. Also you may be unable to add fuel as required.

(1) Indicates this drive pattern section must be repeated, without turning the ignition off, if it is interrupted by releasing the accelerator when not directed to do so.

'97 Pathfinder A/T

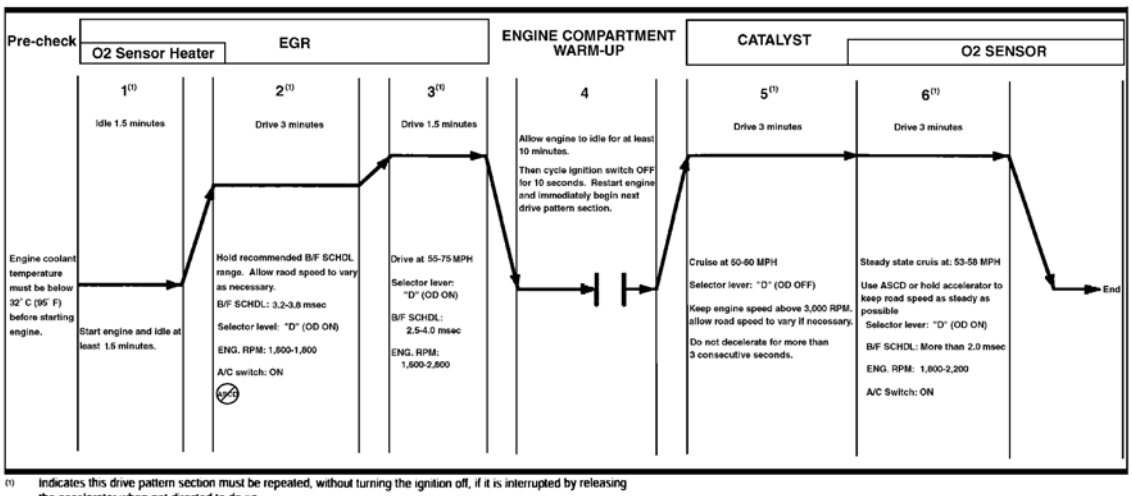
G00215391

Fig. 26: System Readiness Test Drive Pattern #18; 1997 Pathfinder A/T

System Readiness Test Drive Pattern #19

ECM Part Numbers: 23710-1B000, -1B001, -1B002

One Trip Logic for all sections.
Drive all sections one time.



(1) Indicates this drive pattern section must be repeated, without turning the ignition off, if it is interrupted by releasing the accelerator when not directed to do so.

'96 Quest A/T

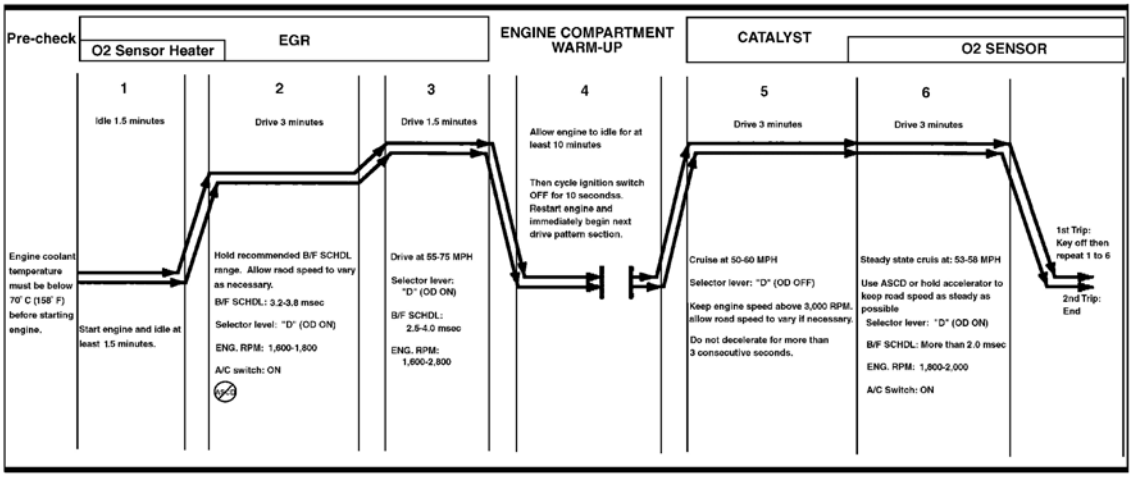
G00215392

Fig. 27: System Readiness Test Drive Pattern #19; 1996 Quest A/T

System Readiness Test Drive Pattern #20

ECM Part Numbers: 23710-1B010, -1B011, -1B012, -1B013, -1B014

Two Trip Logic (all sections)
1st Trip: Drive 1 through 6, then turn ign. off and allow engine to cool to 158°F.
2nd Trip: Drive sections 1 through 6 again.



'97 Quest A/T

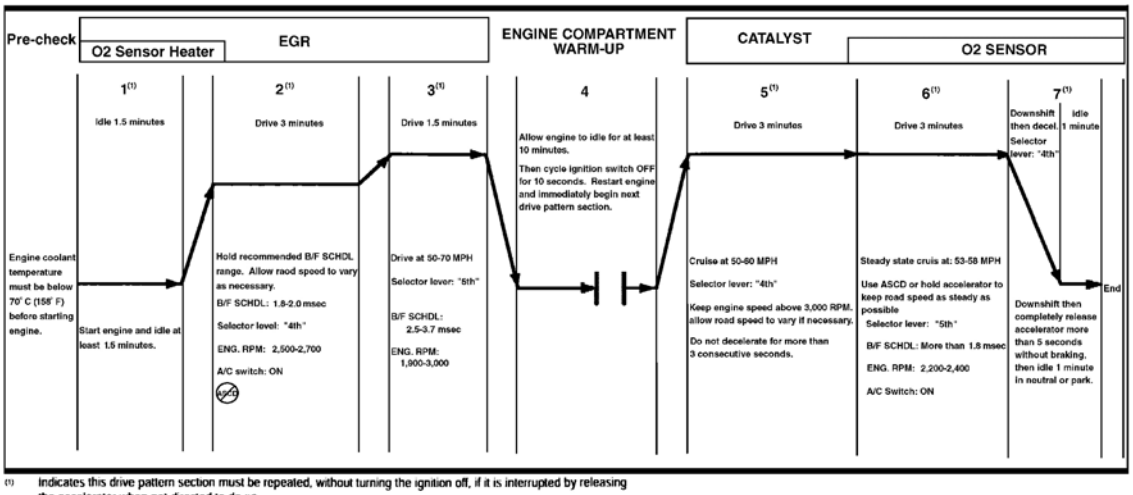
G00215393

Fig. 28: System Readiness Test Drive Pattern #20; 1997 Quest A/T

System Readiness Test Drive Pattern #21

ECM Part Numbers: 23710-0M220, -0M221, -0M224, -0M262, -0M263, -0M269, -0M270, -0M271, -0M272, -0M273, -0M274, -1M214, -1M217, 1M222, -1M565, -1M566

One Trip Logic for all sections.
Drive all sections one time.



(1) Indicates this drive pattern section must be repeated, without turning the ignition off, if it is interrupted by releasing the accelerator when not directed to do so.

'96 Sentra/200SX (GA16DE) M/T

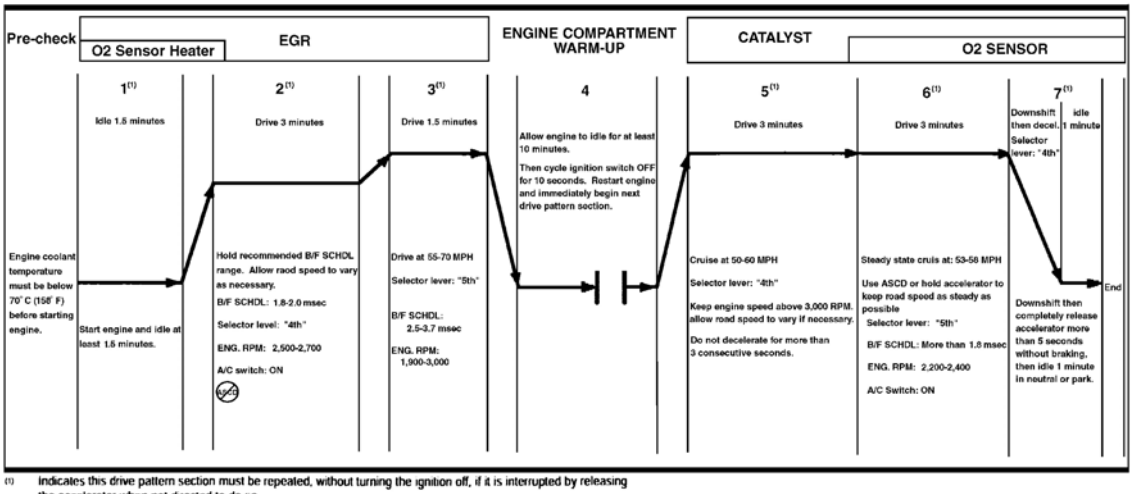
G00215394

Fig. 29: System Readiness Test Drive Pattern #21; 1996 Sentra/200SX (GA16DE) M/T

System Readiness Test Drive Pattern #22

ECM Part Numbers: 23710-0M260, -0M261, -0M264, -0M279, -0M282, -0M283, -1M204, -1M216, -1M221, -1M520, -1M521

One Trip Logic for all sections.
Drive all sections one time.



(1) Indicates this drive pattern section must be repeated, without turning the ignition off, if it is interrupted by releasing the accelerator when not directed to do so.

'96 Sentra/200SX (GA16DE) M/T

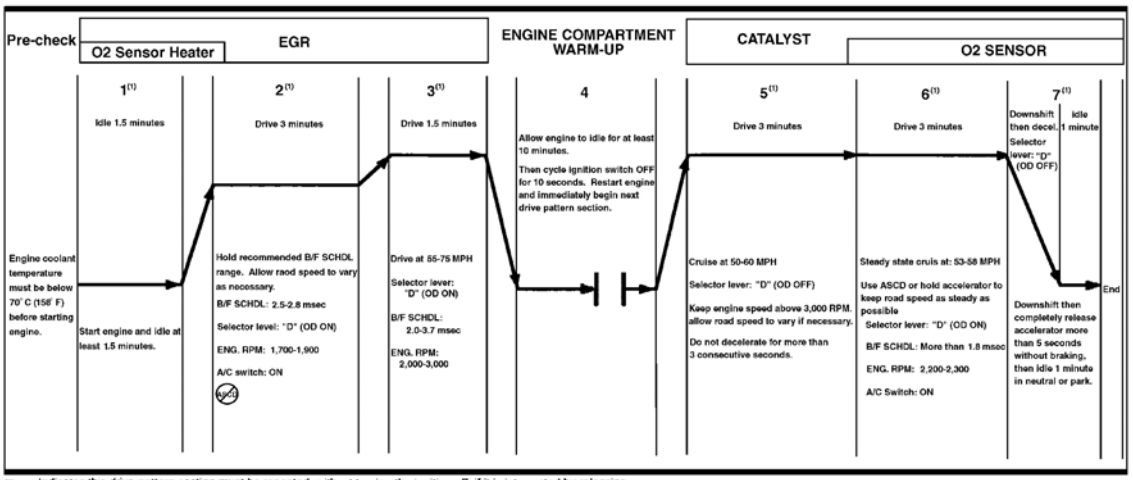
G00215395

Fig. 30: System Readiness Test Drive Pattern #22; 1996 Sentra/200SX (GA16DE) M/T

System Readiness Test Drive Pattern #23

ECM Part Numbers: 23710-0M222, -0M223, -0M265, -0M266, -0M267, -0M268, -0M275, -0M276, -0M277, -0M278, -0M280, -0M284, -1M219, -1M223, -1M275, -1M575, -1M576, -1M580, -1M581

One Trip Logic for all sections.
Drive all sections one time.



(1) Indicates this drive pattern section must be repeated, without turning the ignition off, if it is interrupted by releasing the accelerator when not directed to do so.

'96 Sentra/200SX (GA16DE) A/T

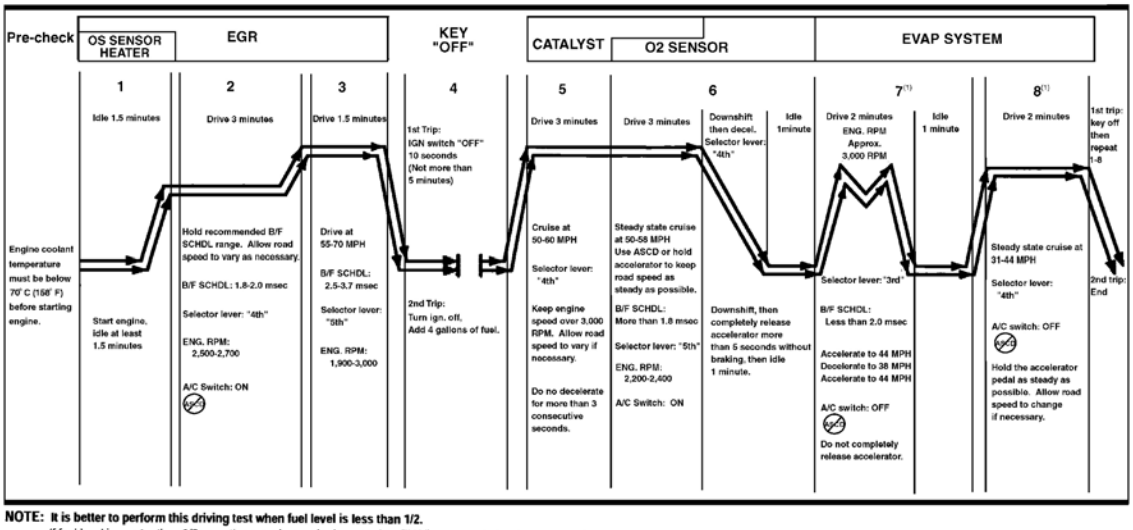
G00215396

Fig. 31: System Readiness Test Drive Pattern #23; 1996 Sentra/200SX (GA16DE) A/T

System Readiness Test Drive Pattern #24

ECM Part Numbers: **23710-3M200, -3M202, -3M203, -3M204, -3M205, -3M206, -3M207, -3M208, -3M209, -3M260, -3M261, -3M270, -3M271, -3M300, -3M302, -3M303, -3M304, -3M305, -3M306, -3M307, -3M308, -3M309, -3M360, -3M361, -3M370, -3M371**

All Items: Two Trip Logic. Drive all sections two times.
First Trip: Drive all sections 1 through 8 then turn ign. off and allow engine to cool below 70°C. (158°F).
Second Trip: Start engine, drive sections 1,2,3. Turn ign. off and **add 4 gallons of fuel** in section 4, then start engine and drive sections 5, 6, 7, 8.



NOTE: **It is better to perform this driving test when fuel level is less than 1/2.**
If fuel level is greater than 1/2 more time may be required to complete EVAP sections of the drive pattern. Also you may be unable to add fuel as required.

(1) Indicates this drive pattern section must be repeated, without turning the ignition off, if it is interrupted by releasing the accelerator when not directed to do so.

'97 Sentra/200SX (GA16DE) M/T

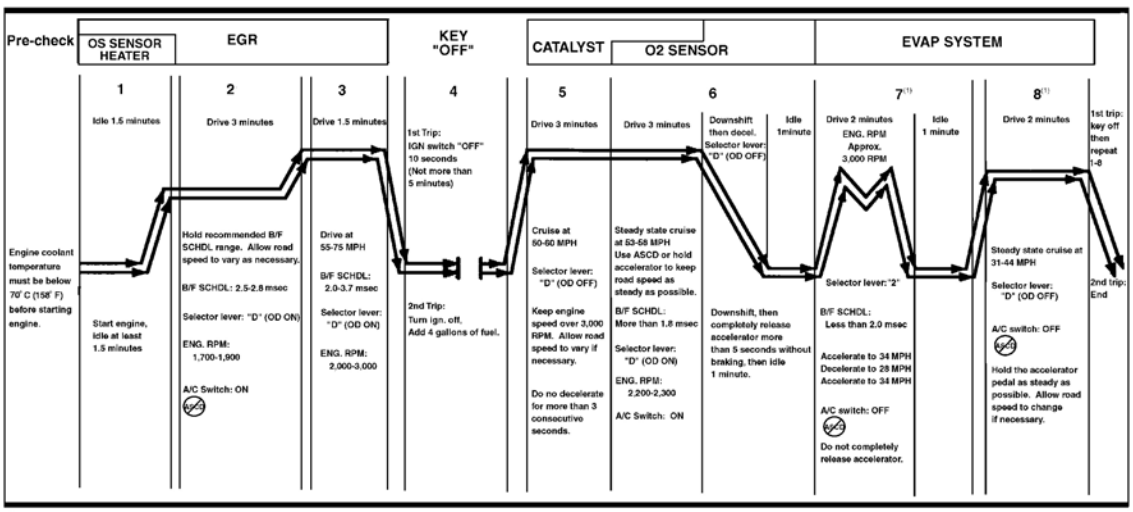
G00215397

Fig. 32: System Readiness Test Drive Pattern #24; 1997 Sentra/200SX (GA16DE) M/T

System Readiness Test Drive Pattern #25

ECM Part Numbers: **23710-3M210, -3M212, -3M213, -3M214, -3M215, -3M216, -3M217, -3M218, -3M219, -3M265, -3M266, -3M275, -3M276, -3M310, -3M312, -3M313, -3M314, -3M315, -3M316, -3M317, -3M318, -3M319, -3M365, -3M366, -3M375, -3M376**

All Items: Two Trip Logic. Drive all sections two times.
First Trip: Drive all sections 1 through 8 then turn ign. off and allow engine to cool below 70°C. (158°F).
Second Trip: Start engine, drive sections 1,2,3. Turn ign. off and **add 4 gallons of fuel** in section 4, then start engine and drive sections 5, 6, 7, 8.



NOTE: **It is better to perform this driving test when fuel level is less than 1/2.**
If fuel level is greater than 1/2 more time may be required to complete EVAP sections of the drive pattern. Also you may be unable to add fuel as required.

(1) Indicates this drive pattern section must be repeated, without turning the ignition off, if it is interrupted by releasing the accelerator when not directed to do so.

'97 Sentra/200SX (GA16DE) A/T

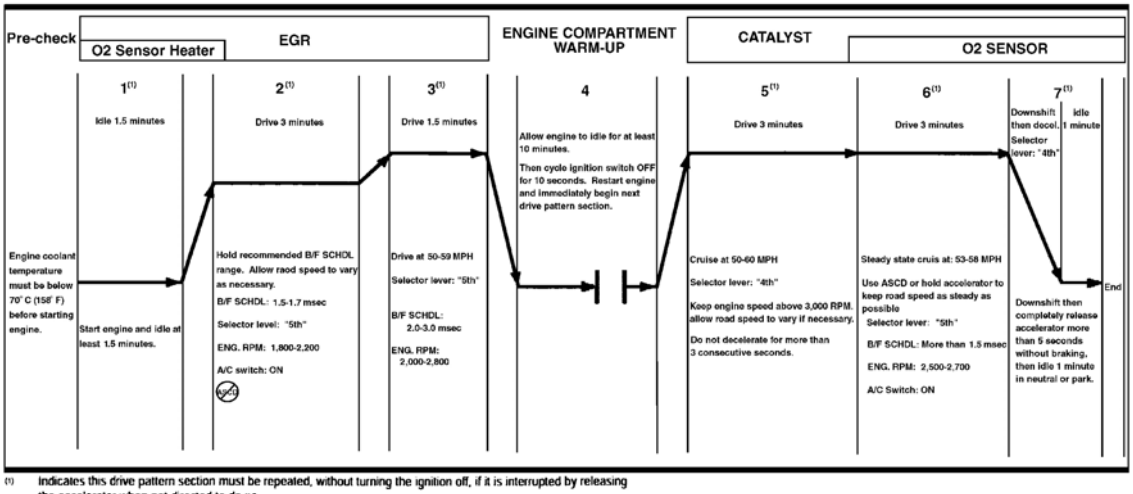
G00215398

Fig. 33: System Readiness Test Drive Pattern #25; 1997 Sentra/200SX (GA16DE) A/T

System Readiness Test Drive Pattern #26

ECM Part Numbers: 23710-1M860, 1M861, -1M870, -1M871, -1M872

One Trip Logic for all sections.
Drive all sections one time.



(1) Indicates this drive pattern section must be repeated, without turning the ignition off, if it is interrupted by releasing the accelerator when not directed to do so.

'96-'97 200SX (SR20DE) M/T

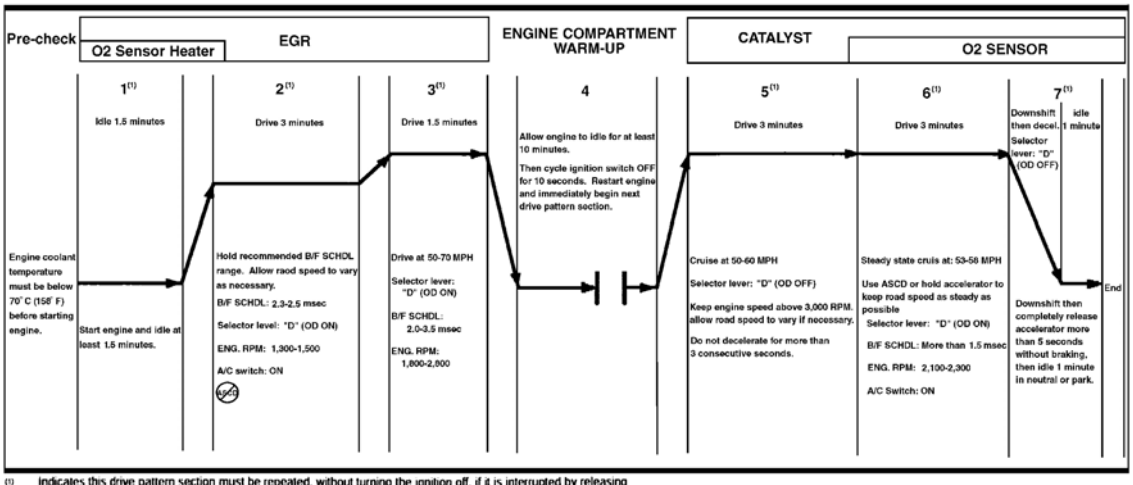
G00215399

Fig. 34: System Readiness Test Drive Pattern #26; 1996-97 200SX (SR20DE) M/T

System Readiness Test Drive Pattern #27

ECM Part Numbers: 23710-1M865, -1M866, -1M875, -1M876, -1M877

One Trip Logic for all sections.
Drive all sections one time.



(1) Indicates this drive pattern section must be repeated, without turning the ignition off, if it is interrupted by releasing the accelerator when not directed to do so.

'96-'97 200SX (SR20DE) A/T

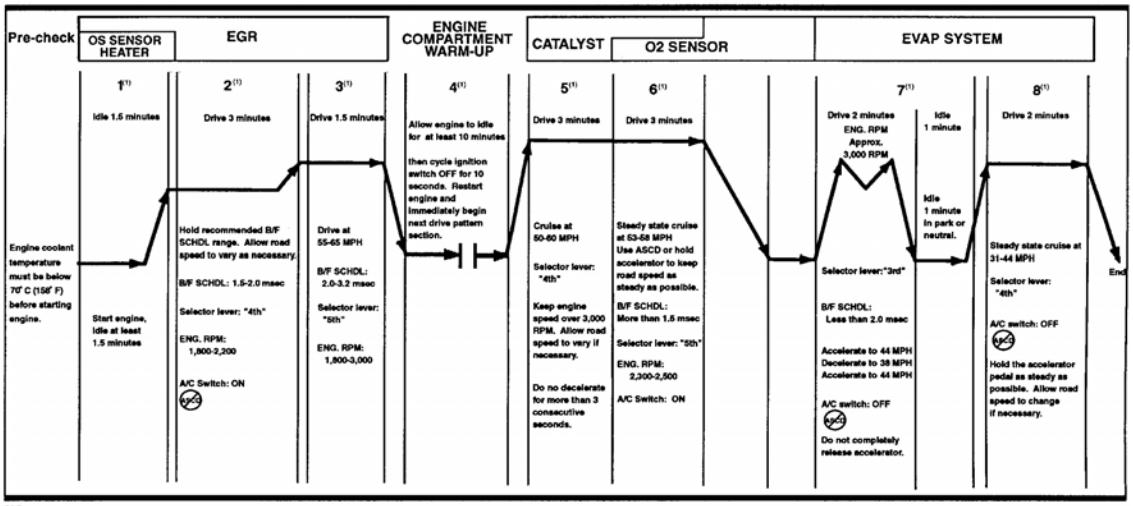
G00215400

Fig. 35: System Readiness Test Drive Pattern #27; 1996-97 200SX (SR20DE) A/T

System Readiness Test Drive Pattern #28

ECM Part Numbers: 23710-1S700, -1S701, -1S702, -1S703

One Trip Logic for all sections.
Drive all section one time.



NOTE: It is better to perform this driving test when fuel level is less than 1/2.
If fuel level is greater than 1/2 more time may be required to complete EVAP sections of the drive pattern. Also you may be unable to add fuel as required.

(1) Indicates this drive pattern section must be repeated, without turning the ignition off, if it is interrupted by releasing the accelerator when not directed to do so.

'96 Truck (2WD) M/T

G00215401

Fig. 36: System Readiness Test Drive Pattern #28; 1996 Truck (2WD) M/T

C:\DOCUME~1\JAYFOS~1\LOCALS~1\Temp\mric_tmp\~od171.jpg (2347 x 1652) @ 564.48px

Fig. 37: System Readiness Test Drive Pattern #29; 1996 Truck (2WD) M/T

Fig. 38: System Readiness Test Drive Pattern #30; 1996 Truck (2WD) A/T

Fig. 39: System Readiness Test Drive Pattern #31; 1996 Truck (2WD) A/T

Fig. 40: System Readiness Test Drive Pattern #32; 1997 Truck (2WD) M/T

Fig. 41: System Readiness Test Drive Pattern #33; 1997 Truck (2WD) A/T

C:\DOCUME~1\JAYFOS~1\LOCALS~1\Temp\mric_tmp\~od176.jpg (2354 x 1661) @ 564.48px

Fig. 42: System Readiness Test Drive Pattern #34; 1996 Truck (4WD) M/T

C:\DOCUME~1\JAYFOS~1\LOCALS~1\Temp\mric_tmp\~od177.jpg (2351 x 1652) @ 564.48px

Fig. 43: System Readiness Test Drive Pattern #35; 1996 Truck (4WD) M/T

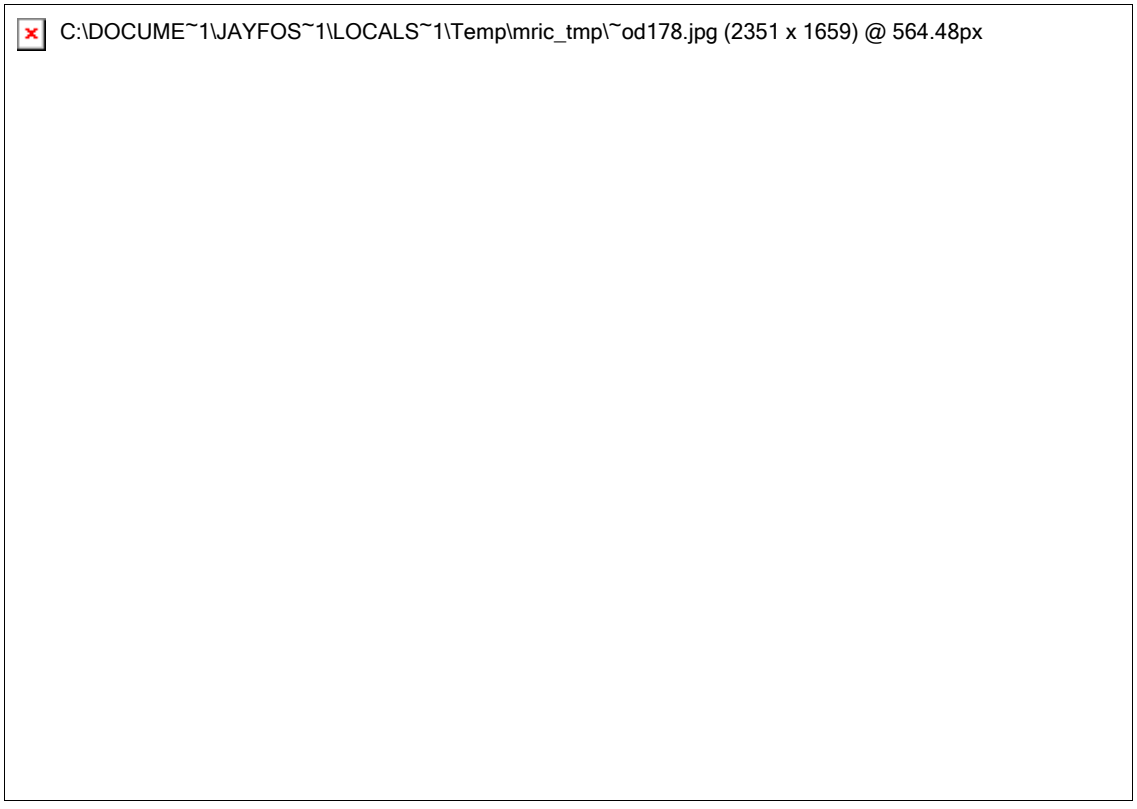


Fig. 44: System Readiness Test Drive Pattern #36; 1997 Truck (4WD) M/T

Fig. 45: System Readiness Test Drive Pattern #37; 1996 240SX M/T

Fig. 46: System Readiness Test Drive Pattern #38; 1996 240SX A/T

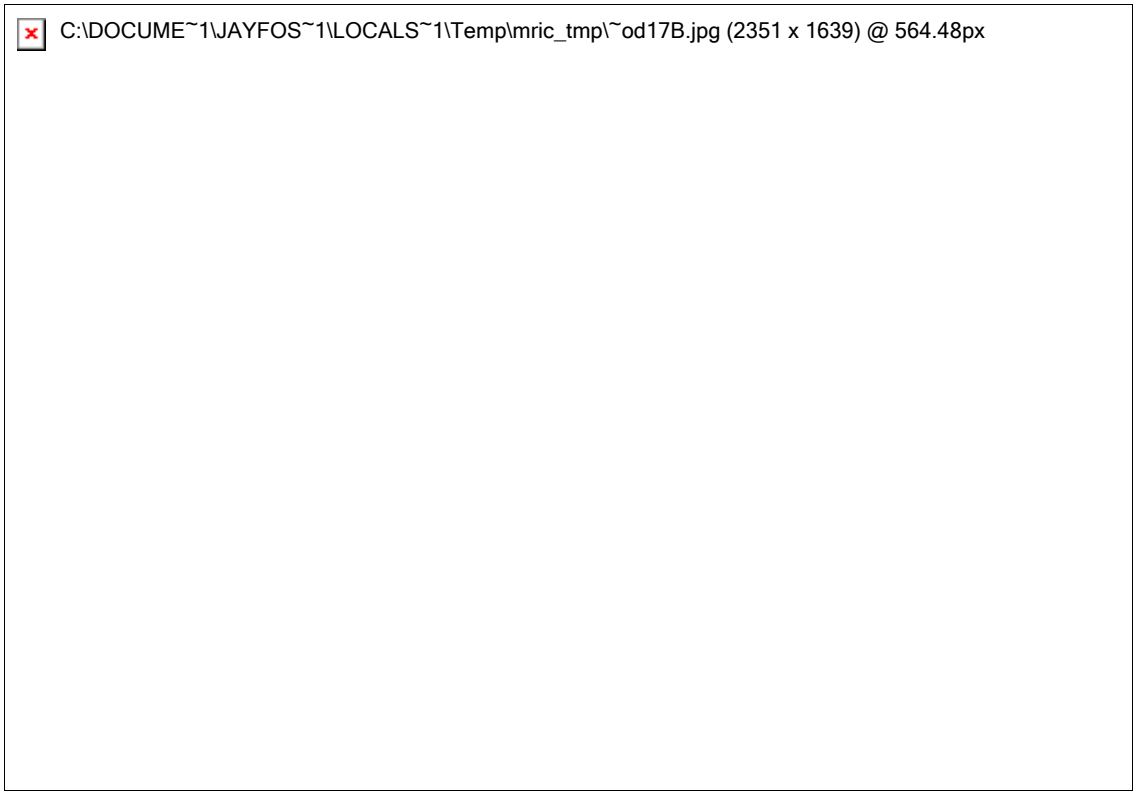


Fig. 47: System Readiness Test Drive Pattern #39; 1997 240SX M/T

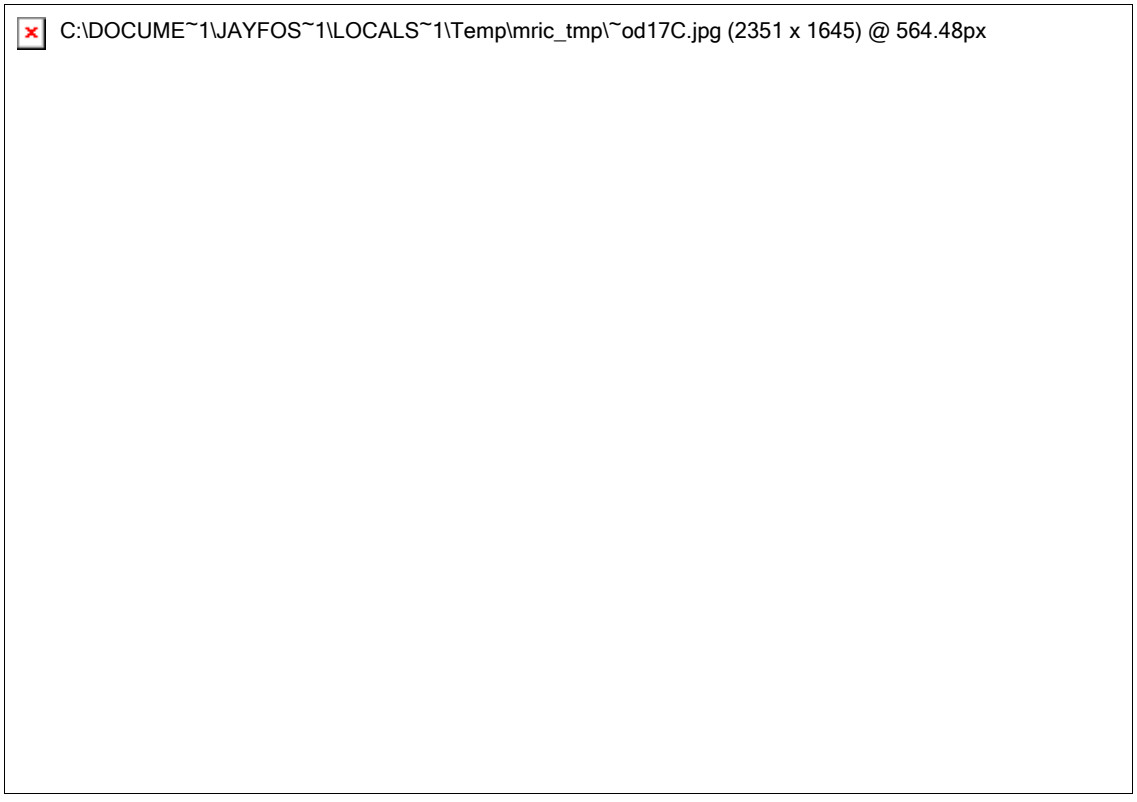


Fig. 48: System Readiness Test Drive Pattern #40; 1997 240SX A/T

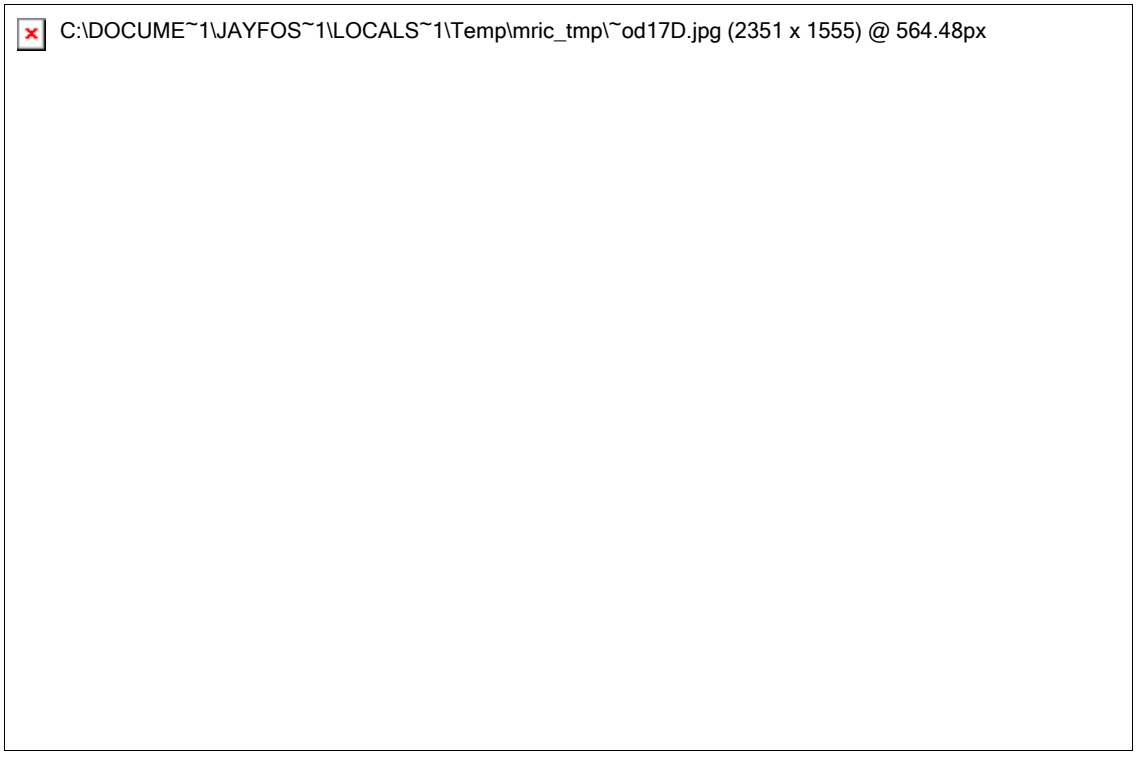


Fig. 49: System Readiness Test Drive Pattern #41; 1996 300ZX (Non-turbo) M/T

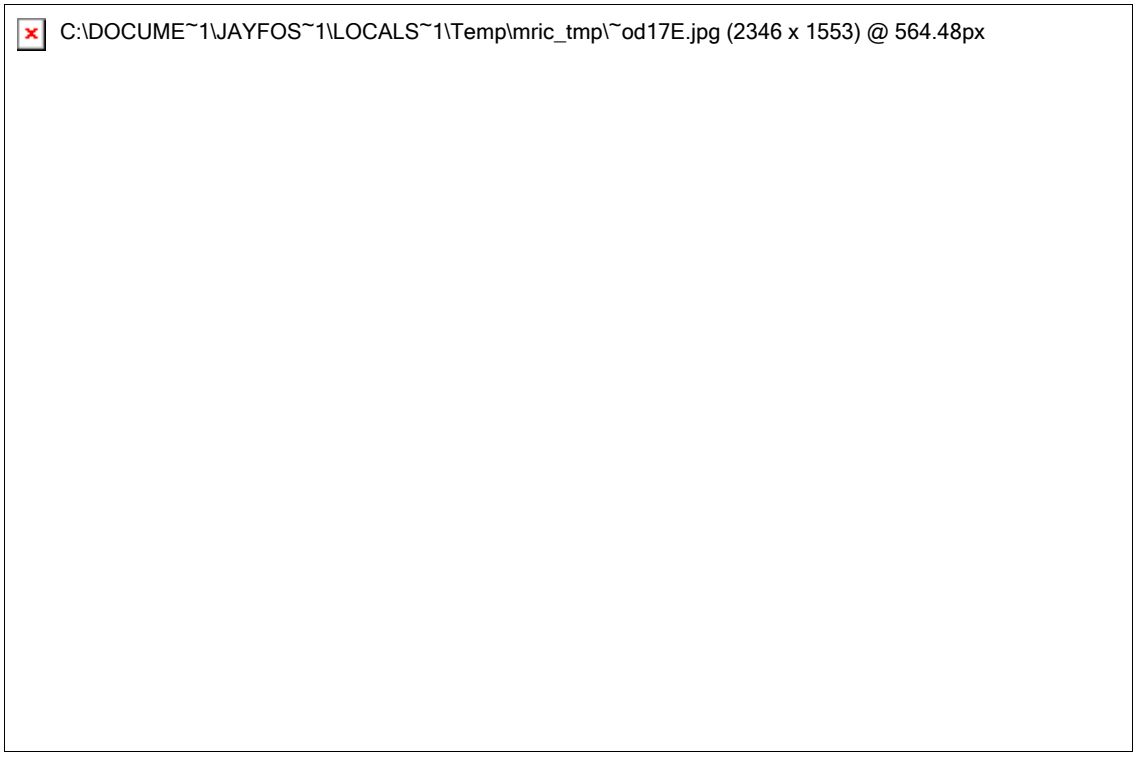


Fig. 50: System Readiness Test Drive Pattern #42; 1996 300ZX (Non-turbo) M/T

C:\DOCUME~1\JAYFOS~1\LOCALS~1\Temp\mric_tmp\~od17F.jpg (2346 x 1554) @ 564.48px

Fig. 51: System Readiness Test Drive Pattern #43; 1996 300ZX (Non-turbo) A/T

C:\DOCUME~1\JAYFOS~1\LOCALS~1\Temp\mric_tmp\~od180.jpg (2346 x 1553) @ 564.48px

Fig. 52: System Readiness Test Drive Pattern #44; 1996 300ZX (Non-turbo) A/T

C:\DOCUME~1\JAYFOS~1\LOCALS~1\Temp\mric_tmp\~od181.jpg (2349 x 1560) @ 564.48px

Fig. 53: System Readiness Test Drive Pattern #45; 1996 300ZX (Turbo) M/T

C:\DOCUME~1\JAYFOS~1\LOCALS~1\Temp\mric_tmp\~od182.jpg (2349 x 1559) @ 564.48px

Fig. 54: System Readiness Test Drive Pattern #46; 1996 300ZX (Turbo) A/T

TOYOTA

NOTE: **Drive cycles for Toyota models are also known as "Test Drive Confirmation" tests. These Test Drive Confirmation tests are included in the appropriate Diagnostic Trouble Code tests. For drive cycle test procedures, see appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.**

VEHICLE RECALLS, TESTABILITY ISSUES & VEHICLES CURRENTLY NOT TESTABLE

VEHICLE RECALLS

NOTE: **Recall information is currently only available for certain 1995-96 DaimlerChrysler vehicles. See Fig. 55. For full text of recall, see RECALL 678 - REPROGRAM PCM .**

Vehicles that have been recalled to correct readiness monitor issues.

The following vehicles had a problem resetting all readiness monitors to 'not completed', but the vehicles were subsequently recalled to correct the problem. If you come across one of these vehicles and all readiness monitors reset to 'not completed' after the ignition key is cycled off, the vehicle may need to have the appropriate recall performed (these vehicles will not be handled differently by the Smog Check machine).

Model Year	Make	Model	Problem	Notes
1996	Chrysler	Cirrus Concorde LHS Sebring Sebring Convertible	All monitors reset to "incomplete" on every ignition key-off.	If the readiness monitors reset to "incomplete" on ignition key-off, verify recall has been performed.
1996	Dodge	Avenger Intrepid Stratus Neon	All monitors reset to "incomplete" on every ignition key-off.	If the readiness monitors reset to "incomplete" on ignition key-off, verify recall has been performed.
1996	Eagle	Talon Vision	All monitors reset to "incomplete" on every ignition key-off.	If the readiness monitors reset to "incomplete" on ignition key-off, verify recall has been performed.
1996	Plymouth	Breeze Neon	All monitors reset to "incomplete" on every ignition key-off.	If the readiness monitors reset to "incomplete" on ignition key-off, verify recall has been performed.

G00228494

Fig. 55: Vehicle Recalls

TESTABILITY ISSUES

VEHICLE RECALLS & NOTE INDEX

1996-2002	
All Models	See **Fig. 56** .
Chrysler	
1996	
Cirrus, Concorde, LHS, Sebring & Sebring Convertible	See **Fig. 56** .
Dodge	
1996	
Avenger, Intrepid, Stratus, Neon & Stealth	See **Fig. 56** .
Eagle	
1996	
Talon & Vision	See **Fig. 57** .
Hyundai	
2003	
Tiburon	See **Fig. 57** .
Infiniti	
1996	
All Models	See **Fig. 57** .
Mercedes-Benz	
1996	
C220, C280, E320, S320 & SL320	See **Fig. 57** .
2001-2003	
All Models	See **Fig. 57** .
Mitsubishi	
1996-1997	
Diamante, 3000GT, 3000GT Spyder, Montero & Montero Sport With 3.0L Or 3.5L Engines	See **Fig. 57** .
1996	
All Models (Montero Most Common)	See **Fig. 57** .
1996-2001	
All Models Except Non-Turbo 2.0L Engine, Diamante, 3000GT, 3000GT Spyder, Montero & Montero Sport With 3.0L Or 3.5L Engines	See **Fig. 58** .
Nissan	
1996	
All Models	See **Fig. 58** .
1997	
2.0L 200SX	See **Fig. 58** .
Plymouth	
1996	

Breeze & Neon	See **Fig. 58** .
Saab	
1996-1998	
All Models	See **Fig. 58** .
Subaru	
1996	
All Models	See **Fig. 58** .
Toyota	
1997	
Paseo & Tercel	See **Fig. 58** .
Volkswagen & Audi	
1997-2002	
All Models With Non-OEM Stereos	See **Fig. 58** .
Volvo	
1996	
850 Turbo	See **Fig. 59** .
1996-1998	
All Models Except 850 Turbo	See **Fig. 59** .

Make	Model Year	Model	Problem	Action
Audi and Volkswagen	1996-2002	All models with non-OEM stereos	If the OEM stereo has been replaced with an aftermarket stereo, these vehicles may not communicate with the analyzer and/or OBD code scanner and may cause severe damage to the analyzer/scanner. For more information, see VW Technical service bulletin 02-03 dated June 10, 2002.	BAR recommends that you check with your analyzer/scan tool manufacturer to determine whether or not your analyzer/scan tool has complete current/voltage override protection. Override protection will protect the test equipment in cases where aftermarket installations cause over current conditions. BAR's June 22, 2002 ET Blast provides a method of checking for high voltage conditions using a test light. An alternative is to send all 96-newer VW/Audis with non-OEM radio installations to a VW/Audi dealership for verification of proper OBD function.
Chrysler	1996	Cirrus, Concorde, LHS, Sebring, Sebring Convertible	All monitors reset to "incomplete" upon every ignition key-off.	A manufacturer recall is in effect. If the readiness monitors reset to "incomplete" upon ignition key-off, determine if recall has been performed. If not, refer to dealer for the recall.
Dodge	1996	Avenger Intrepid Stratus Neon	All monitors reset to "incomplete" upon every ignition key-off	A manufacturer recall is in effect. If the readiness monitors reset to "incomplete" on ignition key-off, verify recall has been performed. If not, refer to dealer for the recall.
Dodge	1996	All 1996 Dodge Stealth models with 3.0L V6 engines	All monitors reset to "incomplete" upon ignition key-off if **all** monitors set to "complete" prior to ignition off.	Via the vehicle look-up process, the test analyzer automatically ignores monitor status; the monitors are not used for pass/fail decisions. No action on your part necessary.

G00228495

Fig. 56: Vehicles With Testability Issues (1 Of 4)

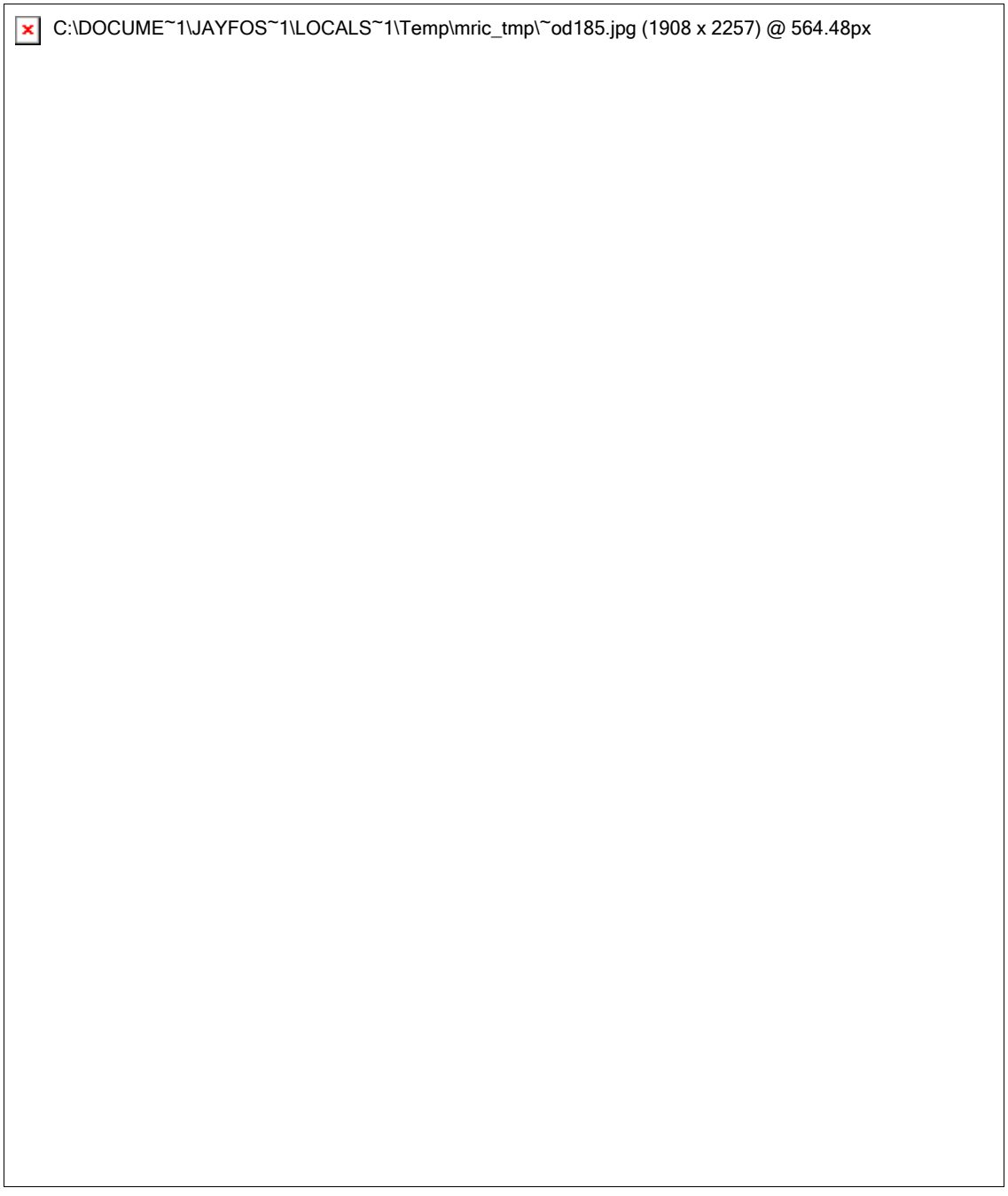


Fig. 57: Vehicles With Testability Issues (2 Of 4)

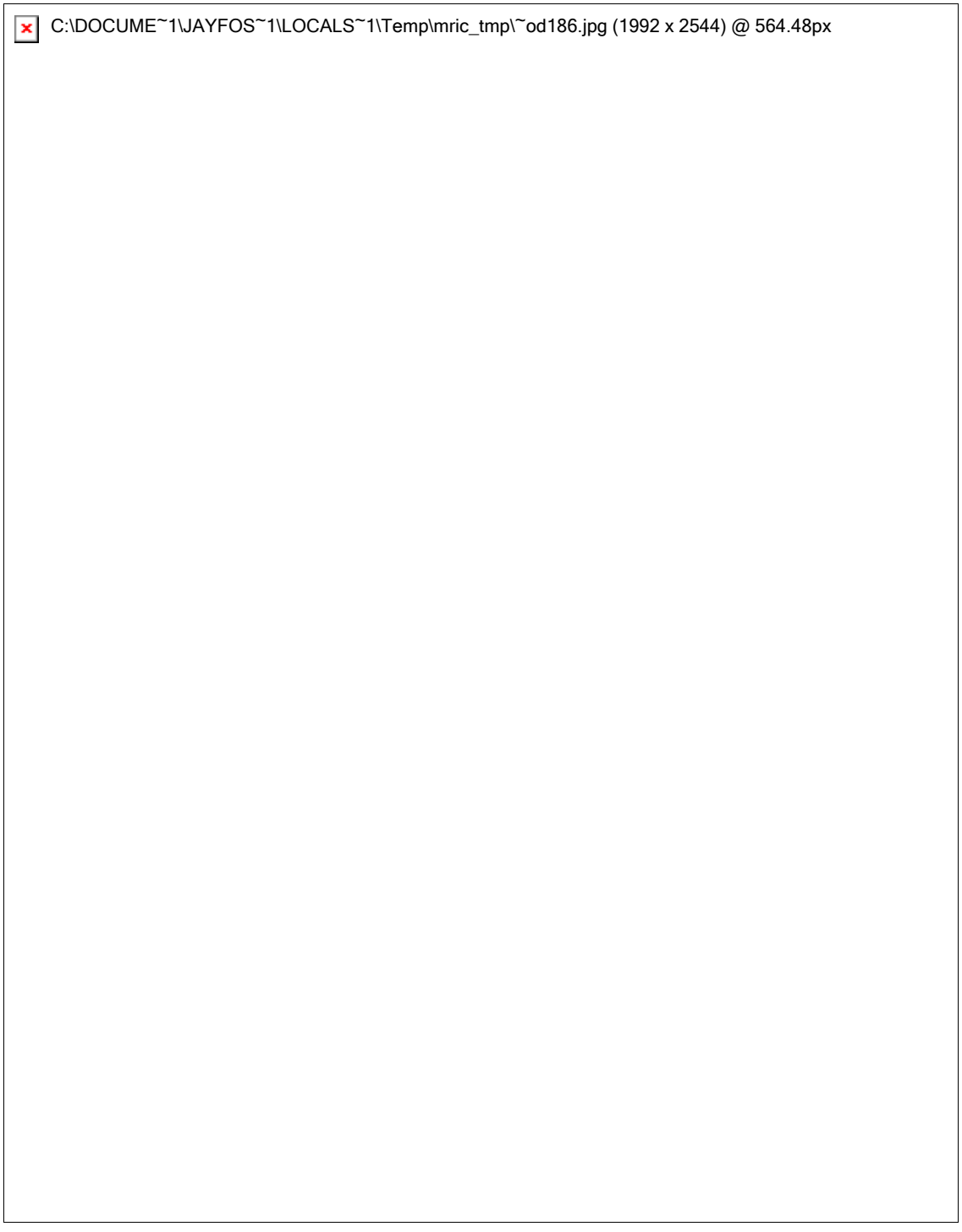


Fig. 58: Vehicles With Testability Issues (3 Of 4)

Make	Model Year	Model	Problem	Action
Volvo	1996	850 Turbo	All monitors reset to "incomplete" upon every ignition key-off.	Via VID communication, the test analyzer ignores monitor status; the monitors are not used for pass/fail decisions.
Volvo	1996-1998	All Models except 850 Turbo	Some monitors are difficult to set to "complete."	Volvo provides driving cycles in its service information to assist technicians to operate monitors. See Volvo Technical Service Bulletin #SB 2-23-0056.

G00228498

Fig. 59: Vehicles With Testability Issues (4 Of 4)

VEHICLES CURRENTLY NOT TESTABLE

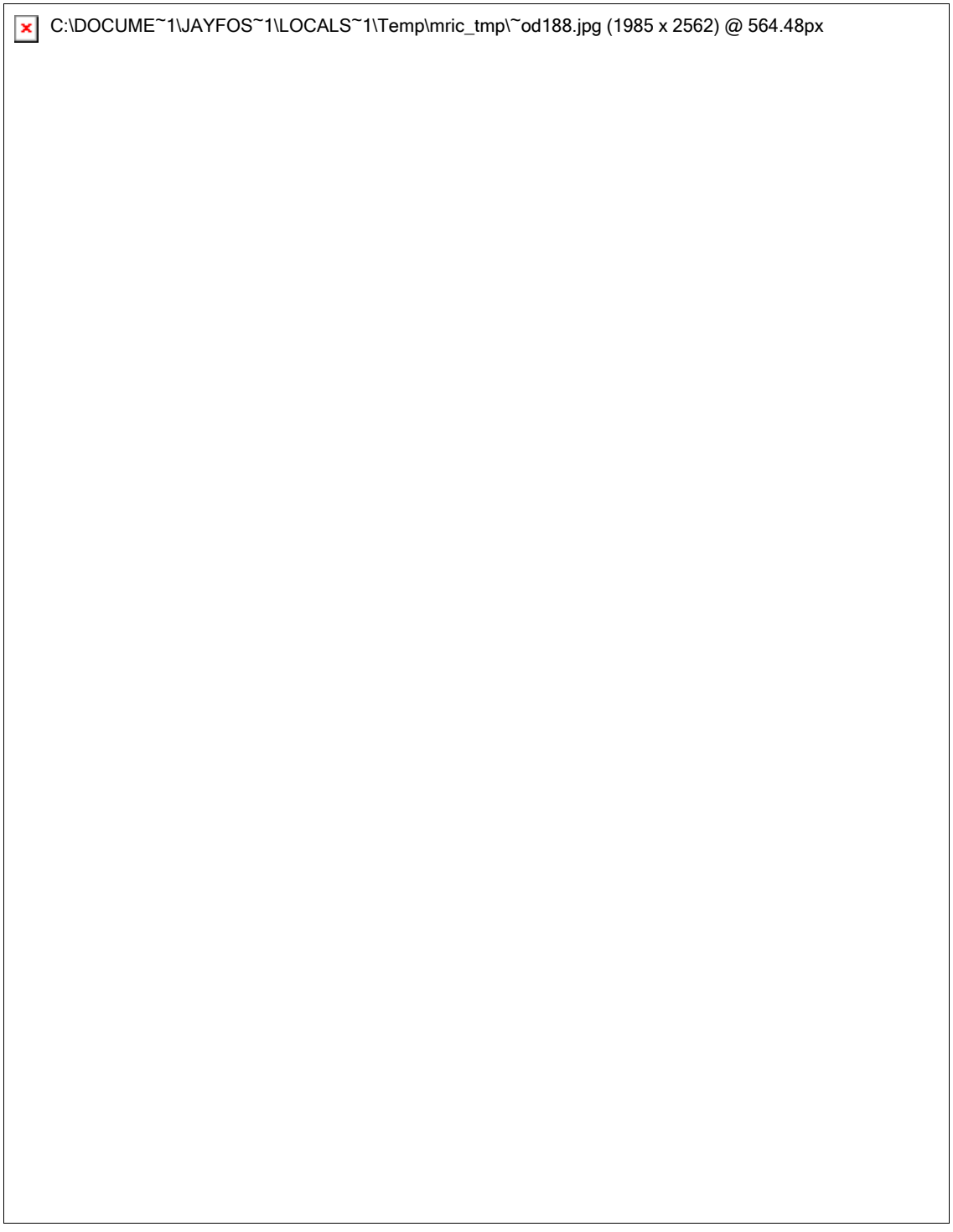


Fig. 60: Vehicles Currently Not Testable (1 Of 2)

Model Year	Make	Model	Problem	Solution
2004	Saab	9-3	Uses CAN, currently incompatible with BAR97s.	OBD II functional is automatically bypassed via analyzer vehicle look up process.
2004	Saturn	Ion	Uses CAN, currently incompatible with BAR97s.	OBD II functional is automatically bypassed via analyzer vehicle look up process.
2004	Mazda	Mazda3, Mazda6, RX8	Uses CAN, currently incompatible with BAR97s.	OBD II functional is automatically bypassed via analyzer vehicle look up process.
2004	Porsche	Cayenne S, Cayenne Turbo	Uses CAN, currently incompatible with BAR97s.	OBD II functional is automatically bypassed via analyzer vehicle look up process.
2004	Lexus	LS430	Uses CAN, currently incompatible with BAR97s.	OBD II functional is automatically bypassed via analyzer vehicle look up process.
2004	Toyota	Prius	Uses CAN, currently incompatible with BAR97s.	OBD II functional is automatically bypassed via analyzer vehicle look up process.

G00228500

Fig. 61: Vehicles Currently Not Testable (2 Of 2)