5. SELECTING THE VEHICLE

Once you've pressed ENTER from the power-up screen, the following steps must be performed to select the manufacturer, model year, model and engine type of the vehicle being tested. Remember, if you make a mistake, you can always press EXIT to go back to the previous menu.

SELECTING THE MANUFACTURER

A menu of manufacturers available for testing is displayed in a scrolling menu. You can scroll down one screen at a time by pressing YES, or up one screen at a time by pressing NO. Press ↑ or ↓ to scroll one manufacturer at a time, until the → arrow is opposite Mazda.

Then press ENTER to select.

SELECTING THE MODEL YEAR

Once the manufacturer is selected, the Select Model Year menu is displayed. Press the last two digits of the year model being tested; 9, 0 for 1990 models, 9, 1 for 1991 models, and so on.

SELECTING THE MODEL

The Model Select menu displays models available for testing. Press the NO key until the model being tested is displayed, then press the YES key.

SELECTING THE ENGINE AND ENGINE TYPE

Next, the Engine Select menu is displayed. For selected vehicles, you will also be asked to select the fuel type, such as EGI MFI. Press NO until the engine and fuel type of the vehicle is displayed, then press YES.

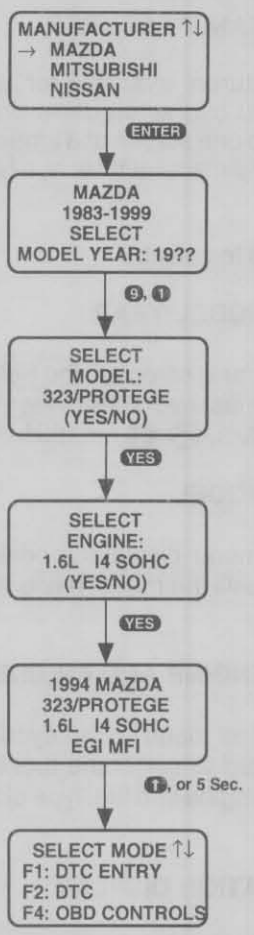
VEHICLE INFORMATION DISPLAY

After the vehicle is selected, the tester displays a summary screen of the selected vehicle. Information displayed includes the year, manufacturer, model, engine size and type, and additional information such as the type of fuel system.

SELECT MODE MENU

When the above steps are completed, the Select Mode menu displays the test modes available for the selected vehicle and system. Refer to Sections 6 (Test Modes), 7 (OBD Controls), and the Common Test Modes OBD, OBD I Systems section for instructions on operating the test modes with Mazda vehicles.

MAZDA VEHICLE SELECTION



ACTIVE KEYS	
0 - 9	Enter model year.
YES NO	Used to answer questions in tester display.
EXIT	Return to previous display

6. TEST MODES

When the Select Mode menu is displayed, test modes available for Mazda vehicles may be selected.

Operating instructions for test modes other than DTC ENTRY, DTCs, and OBD CONTROLS are included in the Common Test Modes OBD, OBD I Systems section. You may select Mode F1: DTC ENTRY, Mode F5: SYSTEM TESTS, and Mode F8: INFORMATION without connecting the tester to the vehicle.

READING CODES

Detailed operating instructions for using Modes F1: DTC ENTRY and F2: DTC with Mazda vehicles are included in the following procedure. Remember that F2: DTC is automatically displayed with Mazda vehicles that have "CHECK" as the adapter type listed in Section 1.

Operating instructions for Mode F4: OBD CONTROLS are included in Section 7.

IMPORTANT:
Follow the Submode F0: Prepare Vehicle instructions to ensure proper vehicle preparation prior to testing. The vehicle must be completely warmed up in order for the tester to communicate properly with the vehicle.

MODE F1	DTC ENTRY

When Mode F1: DTC ENTRY is selected, the tester displays submodes which, after your selection, can provide information on how to read diagnostic trouble codes (DTCs) from the vehicle, how to clear DTCs from the vehicle (or tester memory), obtain a text description of entered or selected DTCs, and review entered or selected DTCs as a result of manually retrieving codes from the ECU.

DTC ENTRY SUBMODES
F0: HOW TO READ
F1: ENTER DTC(s)
F2: DTC LIST
F3: REVIEW DTC
F4: CLEAR DTC(s)

Manually reading DTCs

To manually read Diagnostic Trouble Codes (DTCs) on Mazda vehicles from 1983-95, there is a single method that should be used. This requires an analog voltmeter and a single wire jumper that is placed across a self test input pin to ground of the 1 pin or 17 pin DLC. Using the analog voltmeter set to a 20 volt scale and connected to the self test output pin of the Data Link Connector (DLC), the DTC can be interpreted from the analog voltmeter needle flashes.

For the automobile manufacturers that mention the use of an analog voltmeter to read manual DTCs, the Mastertech Oscilloscope may be used. Set up the single channel oscilloscope and make connections the same way as the analog voltmeter (above). Choose the 20v/division scale and a slow time/division (e.g. 1-2 sec/division) —the DTCs will be shown as a waveform on the display.

DTC ENTRY	MODE F1
HOW TO READ	SUBMODE F0

This submode provides information on how to manually read DTCs from the vehicle. Step by step screen instructions provide information to correctly set up the vehicle ECU. This is performed by following the tester instruction screens. If you have trouble, additional DTC retrieval information is described below. If you refer to the manual for this information, make sure that you are following the correct steps for the system that you are working on.

DTC ENTRY	MODE F1
ENTER DTC(s)	SUBMODE F1

On Mazda vehicles, the Enter DTCs submode allows you to enter manually read DTCs. This submode provides you with a text description of the numeric DTC that was entered into the tester.

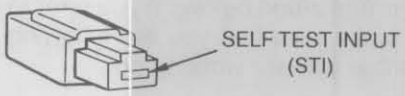
The Enter DTC Submode displays two question marks for DTC Entry. The tester screen prompts you to enter the DTCs read from the analog voltmeter. Be careful when reading the DTC from the analog voltmeter. Incorrect voltmeter needle interpretation can cause the wrong DTC description to be displayed. Once all DTCs have been manually read and recorded, enter each DTC into the tester as described in the Common Test Modes OBD, OBD I Systems section.

Refer to the appropriate procedure for manually reading ECU DTCs on the following pages.

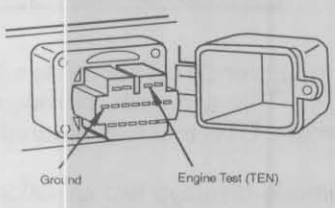
Manually Reading DTCs from Mazda Vehicles using 6 Pin, 1 pin and 6 pin, 17pin DLCs and analog voltmeter:

1. Locate the 1 pin, 6 pin, and 17 pin Diagnostic Connector.

2a. **6 pin and 1 pin DLC only:** Connect a suitable jumper wire from the self test input (STI) terminal 1 pin DLC (single lead, shell color sometimes green or black) to ground.

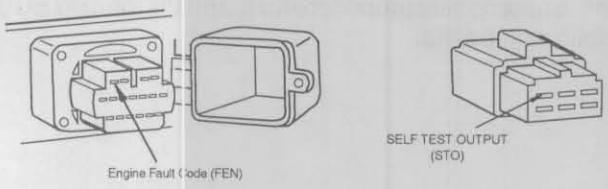


2b. **17 pin DLC only:** Connect a suitable jumper wire from the engine test input (TEN) terminal to ground.



2c. On vehicles with **only the 6 pin DLC**, go to Step 3.

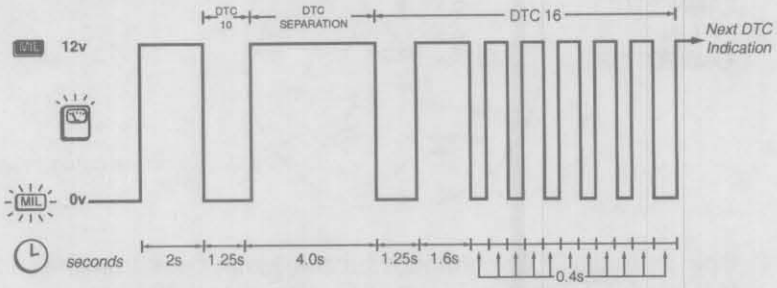
3. Connect analog voltmeter red lead to engine fault code output (FEN or STO) terminal in the 6 pin or 17 pin DLCs (refer to service manual for correct wire) and voltmeter black lead to ground. Set analog voltmeter to 20 volt scale.



4. Turn ignition switch to ON.

5. DTC indication will begin on voltmeter.

   Voltmeter will fluctuate 0 to 12 volts if DTCs are stored in ECU. If a DTC is stored in ECU, the STO line will first indicate 12 volts. The first number of 0 volt, 1.2 second indications will equal the 10's digit of a 2-digit DTC. After a 1.6 second pause, the second number of 0 volt, 0.4 second indications will equal the 1's digit. DTCs are separated by 12 volt indication for 4.0 seconds.



6. If no malfunctions are present, meter will read constant 12 volts.

7. After recording DTCs turn ignition switch off.

8. Disconnect voltmeter and jumper leads.

9. Erase DTCs when all repairs are completed.

NOTE: All connector views are tester side

MAZDA

Manually Reading DTCs from Mazda Vehicles using Ford EEC-IV engine control system and Ford's 6 pin plus 1 pin Data Link Connector:

1. Locate the 1 pin and 6 pin Diagnostic Link Connector.

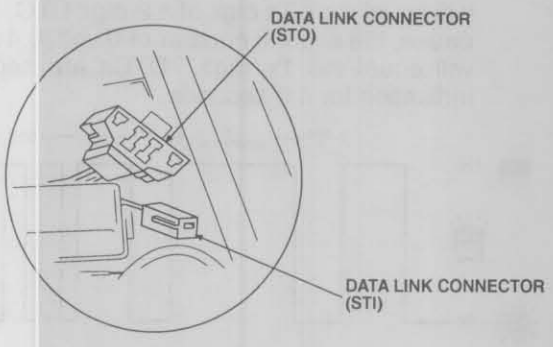


FIGURE M-1: MAZDA/FORD DIAGNOSTIC LINK CONNECTOR

2. 6 pin and 1 pin DLC connect a suitable jumper wire from the self test input (STI) terminal 1 pin DLC (single lead, shell color gray or black) to ground.

3. **Reading Key On, Engine Off (KOEO) DTCs**: Warm engine to normal operating temperature. Turn the ignition key off and wait 10 seconds. Now turn the ignition key to run.

   DTC indication will begin on dashboard MIL. The dashboard MIL will flash KOEO DTCs first, then a separator code, followed by Continuous DTCs (see Figure M-2). For 3-digit DTCs the first set of MIL flashes will equal the 100s digit. After a 2.0 second pause, the second set of flashes will equal the 10s digit. After another 2.0 second pause, the third set of flashes will equal the 1s digit. Then a 6.0-9.0 second pause between the separator code and KOEO or Continuous DTCs will occur. If there are 2 or more DTCs of the same type, there will be a 4.0 second pause between each DTC. After recording DTCs, turn off ignition switch and disconnect jumper lead from DLC.

4. **Reading Key On, Engine Running (KOER) DTCs**: Warm engine to normal operating temperature. Turn the ignition key off and wait 10 seconds. Now start the engine.

5. DTC indication will begin on dashboard MIL. Rotate steering wheel 1/2 turn, depress and release brake pedal. If a single MIL flash occurs, depress and release throttle pedal. Wait for PCM to exercise all outputs. The dashboard MIL will flash KOER DTCs. For 3-digit DTCs the first set of flashes will equal the 100s digit. After a 2.0 second pause, the second set of flashes will

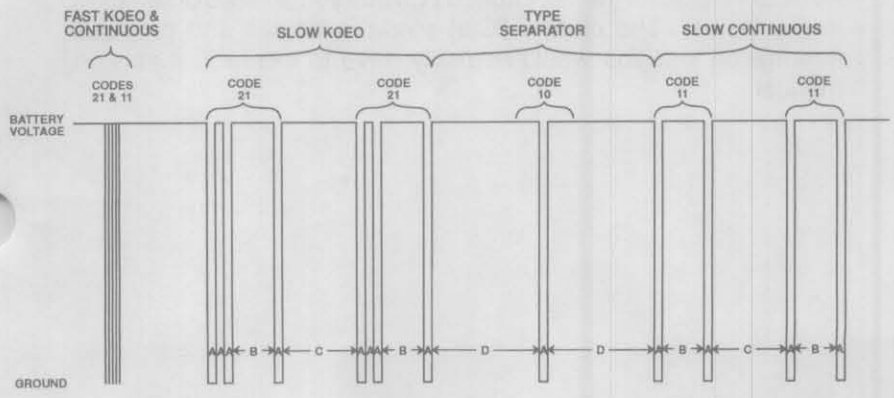
equal the 10s digit. After another 2.0 second pause, the third set of flashes will equal the 1s digit. If there are 2 or more DTCs, there will be a 4.0 second pause between each DTC. After recording DTCs, turn off ignition switch and disconnect jumper lead from DLC.

6. If no malfunctions are present, the MIL will flash DTC 111.
7. Disconnect jumper leads.
8. Erase all DTCs when all repairs are completed.

Manually Clearing DTCs from Mazda Vehicles using Ford EEC-IV engine control system and Ford's 6 pin plus 1 pin Data Link Connector:

1. Turn ignition key off, wait 10 seconds.
2. Connect jumper from STI line in 1-pin DLC to ground.
3. Turn ignition key to run.
4. When MIL begins to flash DTCs, remove jumper from ground. Turn off ignition key, disconnect jumper lead from DLC.
5. Perform KOEO test to confirm that DTCs have been cleared and the system sends a pass DTC. If no malfunctions are present, the MIL will flash DTC 111.
6. Disconnect jumper leads.

FIGURE M-2: EXAMPLE OF EEC-IV FAST AND SLOW KOEO AND CONTINUOUS CODES.



MODE F1	DTC ENTRY
SUBMODE F2	DTC LIST

This submode provides you with a way to view all possible ECU DTCs, including DTC numbers and descriptions. You can also select the DTCs obtained from the analog voltmeter as an alternative way of entering DTCs into the tester's memory. As you scroll through the available DTCs you can view a description of the DTC obtained from the analog voltmeter. You can "Select" the DTC on the tester screen for later review or printing. Refer to the Common Test Modes OBD, OBD I Systems section for further information.

MODE F1	DTC ENTRY
SUBMODE F3	REVIEW DTC

This submode provides you with a review of the DTCs that you entered or selected in the tester. The description of the entered or selected DTC will be displayed, along with a numerical summary of the entered or selected DTC. Review DTC is intended to provide you with an electronic clipboard that keeps track of the DTCs that you have encountered during diagnosis.

MODE F1	DTC ENTRY
SUBMODE F4	CLEAR DTC(s)

This submode has two options for you to chose. Option F0 is to view text screens that provide information on how to clear the DTCs from ECU memory. This is performed by tester keypad presses. Option F1 clears the tester memory from DTCs that you entered or selected in the tester. The clear DTC(s) mode is helpful and provides information that you would normally have to locate in a service manual.

DTC	MODE F2

To read DTCs on all 1983-95 vehicles you will need to locate the vehicle DLC and connect the Mazda Check Adapter to the tester and vehicle.

To locate the DLC, select F1: DLC LOCATION from the Information menu. If necessary, refer to the Common Test Modes OBD, OBD I Systems section for further instructions.

When Mode F2: DTC is selected, the tester displays four DTC submodes:

F1: READ DTC(s)
F2: DTC LIST
F3: REVIEW DTC
F4: CLEAR DTC(s)

MODE F2	DTC
SUBMODE F1	READ DTC(s)

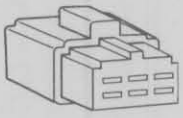
This submode provides automated DTC retrieval from the vehicle ECU. Step by step screen instructions guide you to connect the ORANGE Mazda Check adapter to the vehicle DLC and to start and warm the engine to normal operating temperature. This is performed by following the tester instruction screens. If you have trouble, additional F1: READ DTC(s) retrieval information is described below.

This submode is available for all 1983-95 Mazda vehicles.

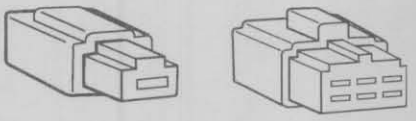
Note: the Orange Mazda CHECK adapter has three DLC connectors and a single ground lead. For engine diagnostics, there are three options to facilitate adapter cable connection.

MAZDA ON-VEHICLE DLC CONFIGURATION

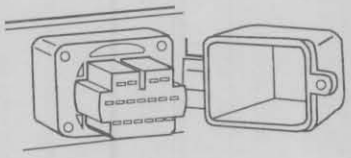
Single 6 pin DLC –
Use Connector A
and ground lead



1 pin and 6 pin DLCs –
Use Connectors A and B,
and ground lead



Single 17 pin DLC –
Use Connector C and
ground lead



(All views are vehicle side)

Note: when reading DTC's from Mazda vehicles make sure the engine is at normal operating temperature and testing is performed in a well-ventilated area.

Reading DTCs from all 1983-95 Mazda ECU using the F1: Read DTCs mode in Asian Imports cartridge:

1. Insert Asian cartridge into MASTERTECH or TECH 1A,
2 Connect Mazda Check adapter (Orange) to data link cable. (Tester will display the correct adapter connection to use).
3. Connect the Check adapter to the vehicle DLC. Press F1: DLC LOCATION from the Information menu for Data Link Connector location assistance.
4. Connect ground clip to vehicle engine or chassis.
5. Power MASTERTECH or TECH 1A with 12v power cable.
6. Select Mazda vehicle to test.
7. Press F2: DTCs from Mazda test mode menu.
8. Press F1: READ DTCs submode from DTC test menu. Follow instructions on the tester display.
9. Tester will automatically command the vehicle ECU into the correct mode required to read DTCs, and will display all received DTCs on the tester display.

MODE F2	DTC
SUBMODE F2	DTC LIST

This submode provides you with a way to view all possible ECU DTCs, including DTC numbers and descriptions. You can also select the DTCs obtained from the analog voltmeter as an alternative way of entering DTCs into the tester's memory. As you scroll through the available DTCs you can view a description of the DTC obtained from the analog voltmeter. You can "Select" the DTC on the tester screen for later review or printing. Refer to the Common Test Modes OBD, OBD I Systems section for further information.

MODE F2	DTC
SUBMODE F3	REVIEW DTC

This submode provides you with a review of the DTCs that you entered or selected in the tester. The description of the entered or selected DTC will be displayed, along with a numerical summary of the entered or selected DTC. Review DTC is intended to provide you with an electronic clipboard that keeps track of the DTCs that you have encountered during diagnosis.

MODE F2	DTC
SUBMODE F4	CLEAR DTC(s)

This submode has two options for you to chose. Option 1 is an automated function which the tester clears DTCs from the vehicle ECU memory. This is performed by tester keypad presses. Option 2 clears the tester memory from DTCs that you entered or selected in the tester. The clear DTC(s) mode is helpful and provides information that you would normally have to locate in a service manual.

IMPORTANT:
Follow the Submode F0: Prepare Vehicle instructions to ensure proper vehicle preparation prior to testing. The vehicle must be completely warmed up in order for the tester to communicate properly with the vehicle.

7. OBD CONTROLS

The OBD Controls mode is used to select a submenu of tests applicable to Mazda vehicles. Pressing F4 from the Select Mode menu displays a list of tests available. To return to the Select Mode menu, press EXIT.

Once you have selected the test mode, operation begins. Detailed operating instructions for each OBD Control test are on the following pages.

There are descriptions of two OBD Controls available in the Mazda specific section. Each output control test can provide you with enhanced diagnostic information which will help to pin-point Air–Fuel Ratio (AFR) problems and ECU switch input problems.

Mazda output tests can guide you through ECU Switch Input tests and O2S Monitor tests.

NOTE: Test results may not be accurate when a Tech 1 is used.

MAZDA

MODE F4	OBD CONTROLS
SUBMODE F0	SWITCH TEST

Available on selected 1988-95 Mazda passenger cars and trucks, switch tests can be used to monitor the switch inputs to the engine ECU. On Mazda vehicles, the switch monitor lamp circuit is monitored by the tester during certain test conditions so you can determine switch operation.

When you select a vehicle the available switch tests will be listed in the OBD Controls menu under F0: SWITCH TESTS.

SUPPORTED MAZDA SWITCH TESTS

Air Conditioning	A/T Hold
Backup/5th gear	Blower Motor
Brake	Clutch
Cooling Fan	Cooling Fan Relay
Daytime Running Lamp (DRL)	Fog Lamp
Headlamp	Inhibitor (A/T)
Knock	Neutral (M/T)
NO. 1 Thermo	NO. 2 Thermo
Rear Defrost	TP-idle
TP-idle/power	TP-power

Note: when performing the Switch Test, make sure the vehicle is properly warmed up and is tested in a well–ventilated area.

OPERATING PROCEDURE

1. Press F0 to select Switch Tests from the OBD Controls menu. Press ↑ or ↓ until the → is opposite the desired Switch Test. Then press ENTER.

2. The tester displays instructions for performing the Switch Test. Press ENTER when each step has been completed.

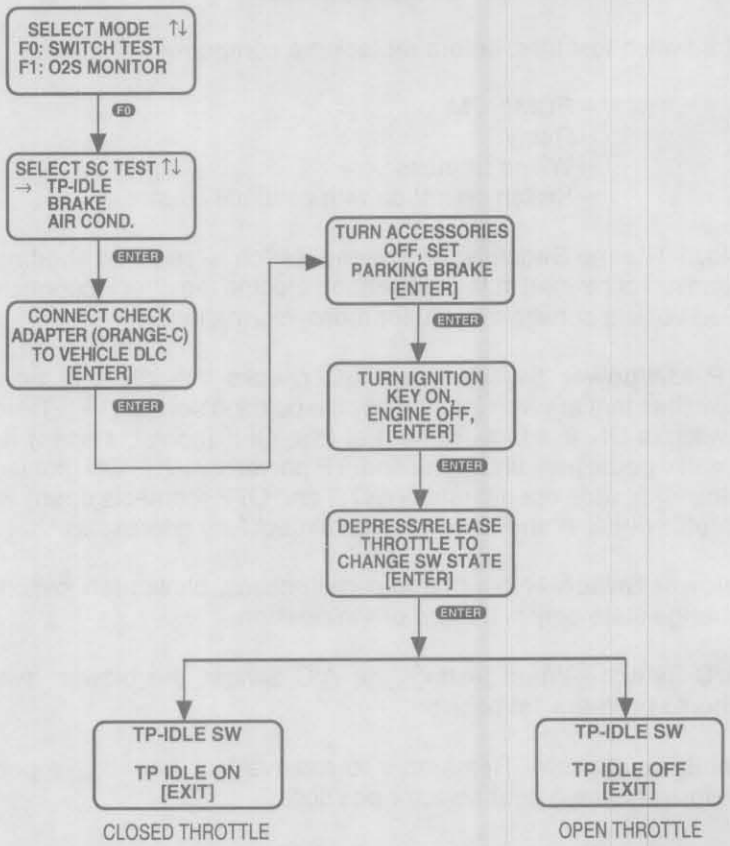
3. Follow the instructions on the tester display. When each instruction is completed, the tester indicates if further action is necessary. If a problem is detected, press EXIT to return to the OBD Controls menu.

4. As a result of following the steps on the display, the tester will monitor and display the switch state. Press EXIT to return to the OBD Controls menu.

5. When finished, press EXIT to return to the OBD Controls menu.

OBD CONTROLS	MODE F4
SWITCH TEST	SUBMODE F0

SWITCH TEST



ACTIVE KEYS	
↑ ↓	Scroll Up or Down.
ENTER	Used when each step has been completed.
EXIT	Return to OBD Controls menu.

MODE F4	OBD CONTROLS
SUBMODE F0	SWITCH TEST

NOTES ON SWITCH TEST OPERATION:

If a switch test fails, before replacing a component, check:

- ECM/PCM
- Relay
- Wiring harness
- Switch operation with continuity tester

No. 1 Thermo Switch/No. 2 Thermo Switch — requires shorting a terminal contained in the underhood electric fan check connector. See vehicle service manual for more information.

TP idle/power Switch—This test checks the idle and power switches that are built into the throttle position sensor (TP). TP idle switch is ON (contacts closed) at idle, OFF (contacts open) with throttle pedal partially depressed. TP power switch is ON (contacts closed) at wide open throttle (WOT) and OFF (contacts open) with throttle pedal in any other position except fully depressed.

Blower Switch—Note that in certain cases, blower fan switches change state only in the 3rd or 4th position.

A/C Switch—When testing the A/C Switch, the blower switch should be in the 1st position.

Inhibitor Switch—Remember to remove foot from brake pedal before changing gear selector position.

Important: Make sure parking brake has been set and wheels have been blocked to prevent vehicle motion.

OBD CONTROLS	MODE F4
O2S MONITOR	SUBMODE F1

The O2S MONITOR is available on selected 1983-95 Mazda vehicles. To check test application, select the OBD Controls menu for F1: O2S MONITOR as a possible selection. On Mazda vehicles, the switch monitor lamp circuit is monitored with the engine running so you can determine Oxygen Sensor output (rich or lean) states.

The O2S Monitor provides you with a guided procedure which tests the condition of the oxygen sensor (the oxygen sensor, known as O2S, is mounted in the engine exhaust system and is in direct contact with the exhaust gases. The O2S changes its output according to the rich or lean condition of the O2 present in the exhaust gases).

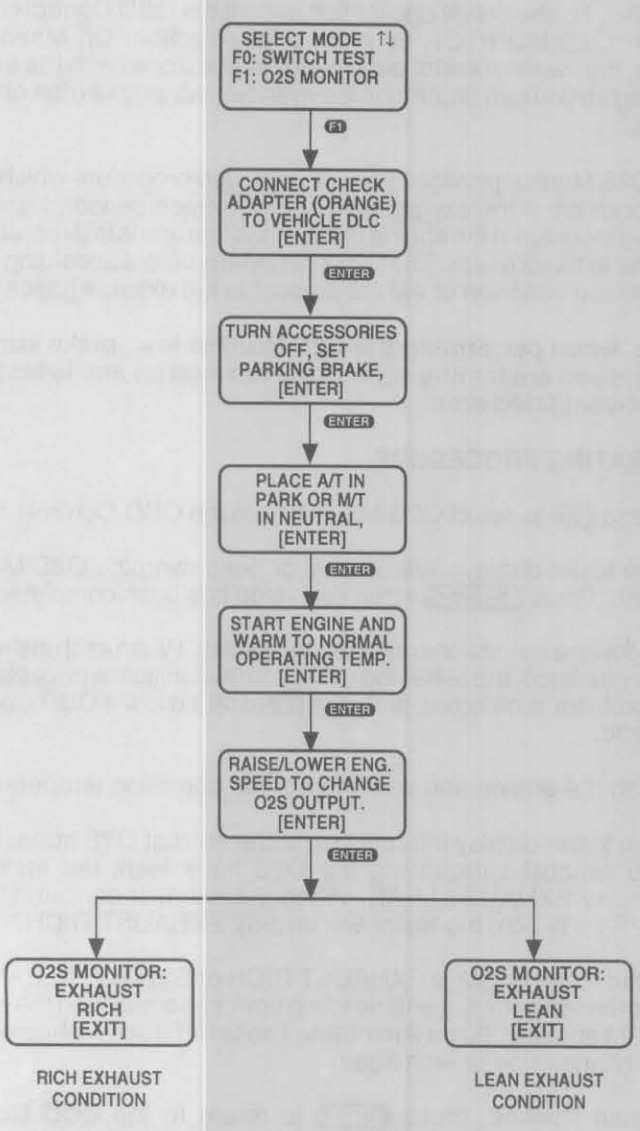
Note: when performing the O2S Monitor test, make sure the vehicle you are testing is properly warmed up and is tested in a well-ventilated area.

OPERATING PROCEDURE

1. Press F1 to select O2S Monitor from the OBD Controls menu.
2. The tester displays instructions for performing the O2S Monitor Test. Press ENTER when each step has been completed.
3. Follow the instructions on the tester display. When each instruction is completed, the tester indicates if further action is necessary. If a problem is detected, press EXIT to return to the OBD Controls menu.
4. Start the engine and warm to normal operating temperature.
5. The tester display informs you of the current O2S state. When the exhaust surrounding the O2S tip is lean, the tester will display EXHAUST LEAN. When the exhaust surrounding the O2S tip is rich, the tester will display EXHAUST RICH.
6. If the tester displays EXHAUST RICH or EXHAUST LEAN for a prolonged period of engine idling time, raise and hold the engine RPM above 2000 for 3 minutes. The tester display should begin to change rich or lean again.
7. When finished, press EXIT to return to the OBD Controls menu.

ACTIVE KEYS	
ENTER	Used when each step has been completed.
EXIT	Return to OBD Controls menu.

MODE F4	OBD CONTROLS
SUBMODE F1	O2S MONITOR



NOTE ON O2S MONITOR OPERATION: On some early 1983-84 Mazda vehicles, it is necessary to disconnect the throttle position sensor before O2S monitor can begin. Consult factory service manual for additional information.

8. MAZDA DIAGNOSTIC TROUBLE CODES (DTCs)

DTCs available for Mazda vehicles are listed in the following charts.

Some code numbers have different descriptors depending on the selected vehicle. Only codes available for the selected vehicle are displayed by the tester.

OBD, OBD I SYSTEMS

YEAR	DTC NO.	DESCRIPTOR
1983	1	ENGINE SPEED (RPM SIGNAL)
	2	WATER THERMO SENSOR
	3	O2 SENSOR
	4	VACUUM SENSOR
	5	EGR POSITION SENSOR

YEAR	DTC NO.	DESCRIPTOR
1984	1	ENGINE SPEED (RPM SIGNAL)
	2	WATER THERMO SENSOR
	2	AIR FLOW METER
	3	O2 SENSOR
		WATER THERMO SENSOR
	4	VACUUM SENSOR
		O2 SENSOR
	5	EGR POSITION SENSOR
		THROTTLE SENSOR
	6	ATMOSPHERIC PRESSURE SENSOR

MAZDA DTCs

YEAR	DTC NO.	DESCRIPTOR
1985	1	ENGINE SPEED (RPM SIGNAL)
	2	WATER THERMO SENSOR AIR FLOW METER
	3	O2 SENSOR WATER THERMO SENSOR
	4	VACUUM SENSOR O2 SENSOR
	5	EGR POSITION SENSOR THROTTLE SENSOR
	6	ATMOSPHERIC PRESSURE SENSOR

MAZDA DTCs

YEAR	DTC NO.	DESCRIPTOR
1986	1	ENGINE SPEED (RPM SIGNAL) CRANK ANGLE SENSOR IGNITION PULSE
	2	WATER THERMO SENSOR AIR FLOW METER
	3	FEEDBACK SYSTEM WATER THERMO SENSOR
	4	VACUUM SENSOR INTAKE AIR TEMPERATURE SENSOR (AIR FLOW METER) TEMPERATURE SENSOR
	5	EGR POSITION SENSOR O2 SENSOR FEEDBACK SYSTEM
	6	THROTTLE SENSOR ATMOSPHERIC PRESSURE SENSOR
	7	BOOST SENSOR
	8	EGR POSITION SENSOR
	9	ATMOSPHERIC PRESSURE SENSOR
	12	COIL WITH IGNITER (TRAILING SIDE)
	15	INTAKE AIR TEMPERATURE SENSOR (DYNAMIC CHAMBER)
	22	NO.1 CYLINDER SENSOR

MAZDA

MAZDA DTCs

YEAR	DTC NO.	DESCRIPTOR
1987	1	IGNITION PULSE
		IGNITION PULSE CIRCUIT
		CRANK ANGLE SENSOR
	2	AIR FLOW METER
	3	WATER THERMO SENSOR
	4	TEMPERATURE SENSOR
		INTAKE AIR TEMPERATURE SENSOR
	5	FEEDBACK SYSTEM
		O2 SENSOR
	6	ATMOSPHERIC PRESSURE SENSOR
		THROTTLE SENSOR
	7	BOOST SENSOR
		PRESSURE SENSOR
	8	EGR POSITION SENSOR
	9	ATMOSPHERIC PRESSURE SENSOR
		WATER THERMO SENSOR OR CIRCUIT
	12	COIL WITH IGNITER (TRAILING SIDE)
	13	VACUUM SENSOR OR CIRCUIT
	14	ATMOSPHERIC PRESSURE SENSOR OR CIRCUIT
	15	O2 SENSOR OR CIRCUIT
		INTAKE AIR TEMPERATURE SENSOR (DYNAMIC CHAMBER)
		INTAKE AIR TEMPERATURE SENSOR (INTAKE AIR PIPE)
	16	EGR POSITION SENSOR OR CIRCUIT
	17	FEEDBACK SYSTEM
	18	A/F SOLENOID VALVE OR CIRCUIT
	22	NO. 1 CYLINDER SENSOR
		SLOW FUEL CUT SOLENOID VALVE OR CIRCUIT
	23	COASTING RICHER SOLENOID VALVE OR CIRCUIT
	26	PURGE SOLENOID VALVE OR CIRCUIT
	28	DUTY SOLENOID VACUUM VALVE OR CIRCUIT
	29	DUTY SOLENOID VENT VALVE OR CIRCUIT
	30	ACV SOLENOID VALVE OR CIRCUIT
	35	IDLE UP SOLENOID VALVE (FOR A/T) OR CIRCUIT
	45	VACUUM SOLENOID VALVE OR CIRCUIT

MAZDA DTCs

YEAR	DTC NO.	DESCRIPTOR
1988	1	IGNITION COIL
		IGNITION PULSE
		CRANK ANGLE SENSOR
		IGNITION PULSE CIRCUIT
	2	NE SIGNAL
		DISTRIBUTOR (NE SIGNAL)
		AIR FLOW METER
	3	G1 SIGNAL
		DISTRIBUTOR (G1 SIGNAL)
		WATER THERMO SENSOR
		GROUP SENSOR (DISTRIBUTOR)
	4	G2 SIGNAL
		DISTRIBUTOR (G2 SIGNAL)
		INTAKE AIR TEMPERATURE SENSOR (AIR FLOW METER)
	5	KNOCK SENSOR OR KNOCK CONTROL UNIT
		O2 SENSOR
	6	THROTTLE SENSOR
	7	PRESSURE SENSOR
		BOOST SENSOR
	8	AIR FLOW METER
	9	WATER THERMO SENSOR
		ATMOSPHERIC PRESSURE SENSOR
		WATER THERMO SENSOR OR CIRCUIT
	10	INTAKE AIR THERMO SENSOR (AIR FLOW METER)
	11	INTAKE AIR THERMO SENSOR (DYNAMIC CHAMBER)

MAZDA DTCs

YEAR	DTC NO.	DESCRIPTOR
1988 (cont.)	12	THROTTLE SENSOR
		COIL WITH IGNITER (TRAILING SIDE)
		THROTTLE SENSOR (VARIABLE RESISTOR TYPE)
	13	VACUUM SENSOR OR CIRCUIT
	14	ATMOSPHERIC PRESSURE SENSOR
		VACUUM SENSOR OR CIRCUIT
	15	O2 SENSOR
		INTAKE AIR TEMPERATURE SENSOR (DYNAMIC CHAMBER)
		INTAKE AIR TEMPERATURE SENSOR (INTAKE AIR PIPE)
		O2 SENSOR OR CIRCUIT
	16	EGR POSITION SENSOR
		EGR POSITION SENSOR OR CIRCUIT
	17	FEEDBACK SYSTEM
	18	A/F SOLENOID VALVE OR CIRCUIT
	22	SLOW FUEL CUT SOLENOID VALVE OR CIRCUIT
	23	COASTING RICHER SOLENOID VALVE OR CIRCUIT
	25	SOLENOID VALVE (PRESSURE REGULATOR CONTROL)
	26	SOLENOID VALVE (NO.1 PURGE CONTROL VALVE)

MAZDA DTCs

YEAR	DTC NO.	DESCRIPTOR
1988 (cont.)	26	SOLENOID VALVE (PURGE CONTROL)
		SOLENOID VALVE (NO.2 PURGE CONTROL VALVE)
		PURGE SOLENOID VALVE OR CIRCUIT
	27	SOLENOID VALVE (VACUUM SWITCH VALVE)
		SOLENOID VALVE (NO.1 PURGE CONTROL)
	28	SOLENOID VALVE (EGR)
		SOLENOID VALVE (EGR VACUUM)
		DUTY SOLENOID VACUUM VALVE OR CIRCUIT
	29	SOLENOID VALVE (EGR-VENT)
		DUTY SOLENOID VENT VALVE OR CIRCUIT
	30	ACV SOLENOID VALVE OR CIRCUIT
	34	BAC VALVE (IDLE SPEED CONTROL)
		SOLENOID VALVE (IDLE SPEED CONTROL)
		IDLE-UP SOLENOID VALVE (FOR A/C) OR CIRCUIT
	35	IDLE-UP SOLENOID VALVE (FOR A/T) OR CIRCUIT
	40	SOLENOID VALVE (TRIPLE INDUCTION CONTROL SYSTEM) OR O2 SENSOR RELAY
	41	SOLENOID VALVE (VARIABLE RESONANCE INDUCTION SYSTEM)
	42	SOLENOID VALVE (WASTE GATE)
	45	VACUUM SOLENOID VALVE OR CIRCUIT

MAZDA DTCs

YEAR	DTC NO.	DESCRIPTOR
1989	1	IGNITION PULSE
		IGNITION PULSE (IGNITER, IGNITION COIL)
		IGNITION COIL (TRAILING SIDE)
		IGNITION PULSE CIRCUIT
	2	NE SIGNAL
		DISTRIBUTOR (NE SIGNAL)
		CRANK ANGLE SENSOR (NE SIGNAL)
	3	DISTRIBUTOR (G SIGNAL)
		G1 SIGNAL
		DISTRIBUTOR (G1 SIGNAL)
		G SIGNAL
		CRANK ANGLE SENSOR (G SIGNAL)
	4	G2 SIGNAL
		DISTRIBUTOR (G2 SIGNAL)
	5	KNOCK SENSOR OR KNOCK CONTROL UNIT
	8	AIRFLOW METER
		AIRFLOW SENSOR
		AIRFLOW METER (AFM)
	9	WATER THERMOSENSOR
		WATER THERMOSENSOR OR CIRCUIT
	10	INTAKE AIR THERMOSENSOR (AIRFLOW METER)
		INTAKE AIR THERMOSENSOR (AFM)
	11	INTAKE AIR THERMOSENSOR (DYNAMIC CHAMBER)
		INTAKE AIR THERMOSENSOR (ENGINE)
	12	THROTTLE SENSOR

MAZDA DTCs

YEAR	DTC NO.	DESCRIPTOR
1989 (cont.)		THROTTLE SENSOR (FULL RANGE)
	13	PRESSURE SENSOR (INTAKE MANIFOLD PRESSURE)
		VACUUM SENSOR OR CIRCUIT
	14	ATMOSPHERIC PRESSURE SENSOR
		ATMOSPHERIC PRESSURE SENSOR (WITHIN ECU)
		ATMOSPHERIC PRESSURE SENSOR (ATP)
		ATMOSPHERIC PRESSURE OR CIRCUIT
	15	O2 SENSOR
		O2 SENSOR OR CIRCUIT
	16	EGR POSITION SENSOR
		EGR POSITION SENSOR OR CIRCUIT
	17	FEEDBACK SYSTEM
	18	THROTTLE SENSOR (NARROW RANGE)
		AIR/FUEL SOLENOID VALVE OR CIRCUIT
	20	METERING OIL PUMP POSITION SENSOR
	22	SLOW FUEL CUT SOL. VALVE OR CKT.
	23	COASTING RICHER SOL. VALVE OR CKT.
	25	SOLENOID VALVE (PRESSURE REGULATOR CONTROL)
	26	SOLENOID VALVE (NO. 1 PURGE CONTROL)
		SOLENOID VALVE (PURGE CONTROL)
		SOLENOID VALVE (NO. 2 PURGE CONTROL)
		STEP MOTOR (METERING OIL PUMP)
	27	SOLENOID VALVE (NO. 2 PURGE CONTROL)
		SOLENOID VALVE (NO. 1 CONTROL)
		METERING OIL PUMP (MOP)
	28	SOLENOID VALVE (EGR)

MAZDA DTCs

YEAR	DTC NO.	DESCRIPTOR
1989 (cont.)		SOLENOID VALVE (EGR-VACUUM)
	29	SOLENOID VALVE (EGR VENT)
	30	SPLIT AIR SOLENOID VALVE
		ACV SOLENOID VALVE OR CIRCUIT
	31	SOLENOID VALVE (RELIEF)
	32	SOLENOID VALVE (SWITCH)
	33	PORT AIR SOLENOID VALVE
	34	SOLENOID VALVE (IDLE SPEED CONTROL)
		IDLE SPEED CONTROL VALVE (ISC VALVE)
		IDLE SPEED CONTROL VALVE (BACVALVE)
		SOLENOID VALVE (BYPASS AIR CONTROL)
	35	IDLE UP SOLENOID VALVE OR CIRCUIT
	37	METERING OIL PUMP (MOP)
	38	SOLENOID VALVE (ACCELERATED WARM-UP SYSTEM)
		SOLENOID VALVE (ACCELERATED WARM-UP SYSTEM OR AIR SUPPLY VALVE (ASV))
	40	SOLENOID VALVE (TRIPLE INDUCTION CONTROL SYSTEM) OR O2 SENSOR RELAY
		AUXILIARY PORT VALVE
	41	SOLENOID VALVE (VARIABLE RESONANCE INDUCTION SYSTEM)
		SOLENOID VALVE (VARIABLE DYNAMIC EFFECT INTAKE CONTROL)
	42	SOLENOID VALVE (WASTE GATE)
		DUTY SOLENOID (TURBO BOOST PRESSURE CONTROL)
	45	VACUUM SOLENOID VALVE OR CIRCUIT
	51	FUEL PUMP RESISTOR RELAY
	71	INJECTOR (FRONT SECONDARY)
	73	INJECTOR (REAR SECONDARY)

MAZDA DTCs

YEAR	DTC NO.	DESCRIPTOR
1990	1	IGNITION PULSE
		IGNITION PULSE (IGNITER IGNITION COIL)
		IGNITION COIL (TRAILING SIDE)
		IGNITION PULSE CIRCUIT
	2	NE SIGNAL
		DISTRIBUTOR (NE SIGNAL)
		CRANK ANGLE SENSOR (NE SIGNAL)
	3	G SIGNAL
		G1 SIGNAL
		DISTRIBUTOR (G1 SIGNAL)
		DISTRIBUTOR (G SIGNAL)
		CRANK ANGLE SENSOR (G SIGNAL)
	4	G2 SIGNAL
		DISTRIBUTOR (G2 SIGNAL)
	5	KNOCK SENSOR OR KNOCK CONTROL UNIT
	8	AIRFLOW METER
		AIRFLOW SENSOR
	9	WATER THERMOSENSOR
		WATER THERMOSENSOR OR CIRCUIT
	10	INTAKE AIR THERMOSENSOR
		INTAKE AIR THERMOSENSOR (AIRFLOW METER)
	11	INTAKE AIR THERMOSENSOR (DYNAMIC CHAMBER)
		INTAKE AIR THERMOSENSOR (ENGINE)
	12	THROTTLE SENSOR
		THROTTLE SENSOR (FULL RANGE)
	13	PRESSURE SENSOR (INTAKE MANIFOLD PRESSURE)
		VACUUM SENSOR OR CIRCUIT
	14	ATMOSPHERIC PRESSURE SENSOR (IN ECU)
		ATMOSPHERIC PRESSURE SENSOR

MAZDA DTCs

YEAR	DTC NO.	DESCRIPTOR
1990 (cont.)		ATMOSPHERIC PRESSURE SENSOR (ATP)
		ATMOSPHERIC PRESSURE SENSOR OR CIRCUIT
	15	O2 SENSOR
		LEFT SIDE O2 SENSOR
		O2 SENSOR OR CIRCUIT
	16	EGR POSITION SENSOR (CALIFORNIA ONLY)
		EGR POSITION SENSOR
		EGR POSITION SENSOR OR CIRCUIT
	17	FEEDBACK SYSTEM
		FEEDBACK SYSTEM (LEFT SIDE)
	18	THROTTLE SENSOR (NARROW RANGE)
		AIR/FUEL SOLENOID VALVE OR CIRCUIT
	20	METERING OIL PUMP POSITION SENSOR
	22	SLOW FUEL CUT SOLENOID VALVE OR CIRCUIT
	23	RIGHT SIDE O2 SENSOR
		COASTING RICHER SOLENOID VALVE OR CIRCUIT
	24	FEEDBACK SYSTEM (RIGHT SIDE)
	25	SOLENOID VALVE (PRESSURE REGULATOR)
		SOLENOID VALVE (PRESSURE REGULATOR CONTROL)
	26	SOLENOID VALVE (PURGE CONTROL)
		STEP MOTOR (METERING OIL PUMP)
		PURGE SOLENOID VALVE OR CIRCUIT
	27	METERING OIL PUMP (MOP)
	28	SOLENOID VALVE (EGR)
		SOLENOID VALVE (EGR-VACUUM)
		DUTY SOLENOID VACUUM VALVE OR CIRCUIT
	29	SOLENOID VALVE (EGR-VENT)

MAZDA DTCs

YEAR	DTC NO.	DESCRIPTOR
1990 (cont.)		DUTY SOLENOID VENT VALVE OR CIRCUIT
	30	SPLIT AIR SOLENOID VALVE
		ACV SOLENOID VALVE OR CIRCUIT
	31	SOLENOID VALVE (RELIEF)
	32	SOLENOID VALVE (SWITCH)
	33	PORT AIR SOLENOID VALVE
	34	ISC VALVE
		IDLE SPEED CONTROL VALVE (BAC VALVE)
		SOLENOID VALVE (IDLE SPEED CONTROL)
		SOLENOID VALVE (BYPASS AIR CONTROL)
		IDLE-UP SOLENOID VALVE (FOR A/C) OR CIRCUIT
	35	IDLE-UP SOLENOID VALVE (FOR A/T) OR CIRCUIT
	36	O2 SENSOR HEATER RELAY
	37	METERING OIL PUMP (MOP)
	38	SOLENOID VALVE (ACCELERATED WARM-UP SYSTEM)
		SOLENOID VALVE (ACCELERATED WARM-UP SYSTEM OR AIR SUPPLY VALVE)
	40	SOLENOID VALVE (TRIPLE INDUCTION CONTROL SYSTEM) OR O2 SENSOR HEATER
		AUXILIARY PORT VALVE
	41	SOLENOID VALVE (VICS)
		SOLENOID VALVE (VARIABLE RESONANCE INDUCTION SYSTEM)
		SOLENOID VALVE (VARIABLE DYNAMIC EFFECT INTAKE CONTROL)
	42	SOLENOID VALVE (WASTE GATE)
		DUTY SOLENOID (TURBO BOOST PRESSURE CONTROL)
	45	VACUUM SOLENOID VALVE OR CIRCUIT
	51	FUEL PUMP RESISTOR RELAY
	71	INJECTOR (FRONT SECONDARY)
	73	INJECTOR (REAR SECONDARY)

MAZDA DTCs

YEAR	DTC NO.	DESCRIPTOR
1991	1	IGNITION PULSE
		IGNITION PULSE (IGNITER, IGNITION COIL)
		IGNITION COIL (TRAILING SIDE)
		G PULSE CIRCUIT
	2	NE SIGNAL
		DISTRIBUTOR (NE SIGNAL)
		CRANK ANGLE SENSOR (NE SIGNAL)
	3	G SIGNAL
		G1 SIGNAL
		DISTRIBUTOR (G1 SIGNAL)
		CRANK ANGLE SENSOR (G SIGNAL)
	4	G2 SIGNAL
		DISTRIBUTOR (G2 SIGNAL)
	5	KNOCK SENSOR OR KNOCK SENSOR CIRCUIT
		KNOCK SENSOR OR KNOCK SENSOR CONTROL UNIT
		KNOCK SENSOR
	8	AIRFLOW METER
		AIRFLOW SENSOR
	9	WATER THERMOSENSOR
		WATER THERMOSENSOR OR CIRCUIT
	10	INTAKE AIR THERMOSENSOR
		INTAKE AIR THERMOSENSOR (AIRFLOW METER)
	11	INTAKE AIR THERMOSENSOR (DYNAMIC CHAMBER)
		INTAKE AIR THERMOSENSOR (ENGINE)
	12	THROTTLE SENSOR
		THROTTLE SENSOR (FULL RANGE)
	13	PRESSURE SENSOR (INTAKE MANIFOLD PRESSURE)
		VACUUM SENSOR OR CIRCUIT

MAZDA DTCs

YEAR	DTC NO.	DESCRIPTOR
1991 (cont.)	14	ATMOSPHERIC PRESSURE SENSOR (IN ECU)
		ATMOSPHERIC PRESSURE SENSOR
		ATMOSPHERIC PRESSURE SENSOR (ATP)
		ATMOSPHERIC PRESSURE SENSOR OR CIRCUIT
	15	O2 SENSOR
		LEFT SIDE O2 SENSOR
		O2 SENSOR OR CIRCUIT
	16	EGR POSITION SENSOR
		EGR POSITION SENSOR OR CIRCUIT
	17	FEEDBACK SYSTEM
		FEEDBACK SYSTEM (LEFT SIDE)
	18	THROTTLE SENSOR (NARROW RANGE)
		AIR/FUEL SOLENOID VALVE OR CIRCUIT
	20	METERING OIL PUMP POSITION SENSOR
	22	SLOW FUEL CUT SOLENOID VALVE OR CIRCUIT
	23	RIGHT SIDE O2 SENSOR
		COASTING RICHER SOLENOID VALVE OR CIRCUIT
	24	FEEDBACK SYSTEM (RIGHT SIDE)
	25	SOLENOID VALVE (PRESSURE REGULATOR)
		SOLENOID VALVE (PRESSURE REGULATOR CONTROL)
	26	SOLENOID VALVE (PURGE CONTROL)
		STEP MOTOR (METERING OIL PUMP)
		PURGE SOLENOID VALVE OR CIRCUIT
	27	METERING OIL PUMP (MOP)
	28	SOLENOID VALVE (EGR)
		SOLENOID VALVE (EGR VACUUM)
		DUTY SOLENOID VACUUM VALVE OR CIRCUIT
	29	SOLENOID VALVE (EGR VENT)
		DUTY SOLENOID VENT VALVE OR CIRCUIT

*For 1991 Navajo, refer to the table on p. 8-28.

MAZDA DTCs

YEAR	DTC NO.	DESCRIPTOR
1991 (cont.)	30	SPLIT AIR SOLENOID VALVE
		ACV SOLENOID VALVE OR CIRCUIT
	31	SOLENOID VALVE (RELIEF)
	32	SOLENOID VALVE (SWITCH)
	33	PORT AIR SOLENOID VALVE
	34	ISC VALVE
		SOLENOID VALVE (BYPASS AIR CONTROL)
		IDLE-UP SOLENOID VALVE (FOR A/C) OR CIRCUIT
		SOLENOID VALVE (IDLE SPEED CONTROL)
		IDLE SPEED CONTROL VALVE (BAC VALVE)
	35	IDLE-UP SOLENOID VALVE (FOR A/T) OR CIRCUIT
	37	METERING OIL PUMP (MOP)
	38	SOLENOID VALVE (ACCELERATED WARM-UP SYSTEM)
		SOLENOID VALVE (ACCELERATED WARM-UP SYSTEM) OR AIR SUPPLY VALVE
	40	SOLENOID VALVE (TRIPLE INDUCTION CONTROL SYSTEM) OR O2 SENSOR HEATER
		O2 SENSOR HEATER RELAY
		AUXILIARY PORT VALVE
	41	SOLENOID VALVE (VICS)
		SOLENOID VALVE (VARIABLE RESONANCE INDUCTION SYSTEM)
		SOLENOID VALVE (VARIABLE DYNAMIC EFFECT INTAKE CONTROL)
	42	SOLENOID VALVE (WASTE GATE)
		DUTY SOLENOID (TURBO BOOST PRESSURE CONTROL)
	45	VACUUM SOLENOID VALVE OR CIRCUIT
	51	FUEL PUMP RESISTOR RELAY
	71	INJECTOR (FRONT SECONDARY)
	73	INJECTOR (REAR SECONDARY)

MAZDA DTCs

YEAR	DTC NO.	DESCRIPTOR
1992*	1	IGNITION PULSE
		IGNITION PULSE (IGNITER, IGNITION COIL)
		IG PULSE CIRCUIT
	2	NE SIGNAL
		NE2 SIGNAL
		NE2 SIGNAL CRANK ANGLE SENSOR 2
		DISTRIBUTOR (NE SIGNAL)
	3	G SIGNAL
		G1 SIGNAL
		G SIGNAL CRANK ANGLE SENSOR 1
		DISTRIBUTOR (NE SIGNAL)
	4	G2 SIGNAL
		NE1 SIGNAL
		NE1 SIGNAL CRANK ANGLE SENSOR
		DISTRIBUTOR (G2 SIGNAL)
	5	KNOCK SENSOR OR KNOCK SENSOR CONTROL UNIT
		KNOCK SENSOR
		LEFT SIDE KNOCK SENSOR
	6	VEHICLE SPEED SENSOR
		SPEED SIGNAL
	7	RIGHT SIDE KNOCK SENSOR
	8	AIRFLOW METER
		AIRFLOW SENSOR
	9	WATER THERMOSENSOR
		WATER THERMOSENSOR OR CIRCUIT
	10	INTAKE AIR THERMOSENSOR
		INTAKE AIR THERMOSENSOR (AIRFLOW METER)
	11	INTAKE AIR THERMOSENSOR (DYNAMIC CHAMBER)

*For 1992 Navajo DTCs, refer to the table on p. 8-30.

MAZDA DTCs

YEAR	DTC NO.	DESCRIPTOR
1992 (cont.)	12	THROTTLE SENSOR
	13	VACUUM SENSOR OR CIRCUIT
	14	ATMOSPHERIC PRESSURE SENSOR (IN ECU)
		ATMOSPHERIC PRESSURE SENSOR
		ATMOSPHERIC PRESSURE SENSOR OR CIRCUIT
	15	O2 SENSOR (INACTIVATION)
		O2 SENSOR
		LEFT SIDE O2 SENSOR
		O2 SENSOR OR CIRCUIT
	16	EGR POSITION SENSOR (CALIFORNIA ONLY)
		EGR POSITION SENSOR
		EGR POSITION SENSOR OR CIRCUIT
	17	O2 SENSOR (INVERSION)
		FEEDBACK SYSTEM
		LEFT SIDE FEEDBACK SYSTEM
		FEEDBACK SYSTEM (INVERSION)
	18	AIR/FUEL SOLENOID VALVE OR CIRCUIT
	22	SLOW FUEL CUT SOLENOID VALVE OR CIRCUIT
	23	RIGHT SIDE O2 SENSOR
		COASTING RICHER SOLENOID VALVE OR CIRCUIT
	24	RIGHT SIDE FEEDBACK SYSTEM
	25	SOLENOID VALVE (PRESSURE REGULATOR)
		SOLENOID VALVE (PRESSURE REGULATOR CONTROL)
	26	SOLENOID VALVE (PURGE CONTROL)
		PURGE SOLENOID VALVE OR CIRCUIT

MAZDA DTCs

YEAR	DTC NO.	DESCRIPTOR
1992 (cont.)	28	SOLENOID VALVE (EGR)
		SOLENOID VALVE (EGR VACUUM)
		DUTY SOLENOID VACUUM VALVE OR CIRCUIT
	29	SOLENOID VALVE (EGR VENT)
		DUTY SOLENOID VENT VALVE OR CIRCUIT
	30	RELAY (COLD START INJECTOR)
		ACV SOLENOID VALVE OR CIRCUIT
	34	ISC VALVE
		IDLE SPEED CONTROL VALVE (BAC VALVE)
		IDLE-UP SOLENOID VALVE (FOR A/C) OR CIRCUIT
		SOLENOID VALVE (IDLE SPEED CONTROL)
	35	IDLE-UP SOLENOID VALVE (FOR A/T) OR CIRCUIT
	36	RIGHT SIDE O2 SENSOR HEATER
		O2 SENSOR HEATER
	37	LEFT SIDE O2 SENSOR HEATER
	41	SOLENOID VALVE (VICS)
		SOLENOID VALVE (VRIS 1)
	42	SOLENOID VALVE (WASTE GATE)
	45	VACUUM SOLENOID VALVE OR CIRCUIT
	46	SOLENOID VALVE (VRIS 2)
	55	PULSE GENERATOR
	60	1-2 SHIFT SOLENOID VALVE
	61	2-3 SHIFT SOLENOID VALVE
	62	3-4 SHIFT SOLENOID VALVE
	63	LOCKUP SOLENOID VALVE
	65	A/C SIGNAL (EC-AT CU)
	67	ELECTRICAL COOLING FAN RELAY NO2
	69	WATER THERMOSENSOR (FAN)

MAZDA DTCs

YEAR	DTC NO.	DESCRIPTOR
1993*	1	IGNITION PULSE (IGNITER, IGNITION COIL)
		IGNITION PULSE
		IG PULSE CIRCUIT
	2	NE SIGNAL
		NE SIGNAL (CRANKSHAFT POSITION SENSOR)
		NE2 SIGNAL, CRANKSHAFT POSITION SENSOR 2
		NE2 SIGNAL
		DISTRIBUTOR (NE SIGNAL)
		NE2 SIGNAL CRANK ANGLE SENSOR 2
		CRANK ANGLE SENSOR (NE SIGNAL)
	3	G SIGNAL (DOHC AND CALIFORNIA B6)
		G SIGNAL (CRANKSHAFT POSITION SENSOR)
		G SIGNAL, CRANKSHAFT POSITION SENSOR 1
		G SIGNAL
		DISTRIBUTOR (G1 SIGNAL)
		G SIGNAL CRANK ANGLE SENSOR 1
		CRANK ANGLE SENSOR (G SIGNAL)
	4	NE1 SIGNAL, CRANKSHAFT POSITION SENSOR
		NE1 SIGNAL
		DISTRIBUTOR (G2 SIGNAL)
		NE1 SIGNAL CRANK ANGLE SENSOR
	5	KNOCK SENSOR
		LEFT SIDE KNOCK SENSOR
	6	VEHICLE SPEED SENSOR
		SPEED SIGNAL
		SPEEDOMETER SENSOR
	7	RIGHT SIDE KNOCK SENSOR
	8	AIRFLOW METER
		AIRFLOW SENSOR

*For 1993 Navajo DTCs, refer to the table on p. 8-30.

MAZDA DTCs

YEAR	DTC NO.	DESCRIPTOR
1993 (cont.)	9	WATER THERMOSENSOR
		ENGINE COOLANT TEMPERATURE SENSOR (CIS)
		ENGINE COOLANT TEMPERATURE SENSOR
		ENGINE COOLANT TEMPERATURE SENSOR OR CIRCUIT
	10	INTAKE AIR THERMOSENSOR
		INTAKE AIR TEMPERATURE SENSOR (IN AIR FLOW SENSOR)
		INTAKE AIR THERMOSENSOR (AIRFLOW METER)
	11	INTAKE AIR TEMPERATURE SENSOR
		INTAKE AIR TEMPERATURE SENSOR (ON DYNAMIC CHAMBER)
		INTAKE AIR THERMOSENSOR
	12	THROTTLE SENSOR
		THROTTLE POSITION SENSOR
		THROTTLE SENSOR (FULL RANGE)
	13	PRESSURE SENSOR
		VACUUM SENSOR OR CIRCUIT
	14	ATMOSPHERIC PRESSURE SENSOR (IN ECU)
		BAROMETRIC ABSOLUTE PRESSURE SENSOR
		BAROMETRIC ABSOLUTE PRESSURE SENSOR (IN PCME)
		ATMOSPHERIC PRESSURE SENSOR
		BAROMETRIC ABSOLUTE PRESSURE SENSOR OR CIRCUIT
	15	O2 SENSOR (INACTIVATION)
		HEATED O2 SENSOR
		HEATED O2 SENSOR (LH)
		O2 SENSOR
		O2 SENSOR (LEFT SIDE)
		O2 SENSOR OR CIRCUIT

MAZDA DTCs

YEAR	DTC NO.	DESCRIPTOR
1993 (cont.)	16	EGR FUNCTION SENSOR (CALIFORNIA)
		EGR FUNCTION SENSOR
		EGR POSITION SENSOR
		EGR SWITCH (CALIFORNIA ONLY)
		EGR POSITION SENSOR OR CIRCUIT
	17	O2 SENSOR (INVERSION)
		CLOSED LOOP SYSTEM
		CLOSED LOOP SYSTEM (LH)
		FEEDBACK SYSTEM
		FEEDBACK SYSTEM (INVERSION)
		FEEDBACK SYSTEM (LEFT SIDE)
	18	THROTTLE SENSOR (NARROW RANGE)
		MIXTURE CONTROL SOLENOID
		OR CIRCUIT
	20	METERING OIL PUMP POSITION SENSOR
	22	SLOW FUEL CUT SOLENOID VALVE
		OR CIRCUIT
	23	HEATED O2 SENSOR (RH)
		O2 SENSOR (RIGHT SIDE)
		FUEL THERMOSENSOR
		COASTING RICHER SOLENOID VALVE
		OR CIRCUIT
	24	CLOSED LOOP SYSTEM (RH)
		FEEDBACK SYSTEM (RIGHT SIDE)
	25	SOLENOID VALVE (PRESSURE REGULATOR)
		SOLENOID VALVE (PRESSURE
		REGULATOR CONTROL)
	26	SOLENOID VALVE (PURGE CONTROL)
		METERING OIL PUMP (STEPPING MOTOR)
		PURGE SOLENOID VALVE OR CIRCUIT
	27	METERING OIL PUMP

MAZDA DTCs

YEAR	DTC NO.	DESCRIPTOR
1993 (cont.)	28	SOLENOID VALVE (EGR CONTROL)
		SOLENOID VALVE (EGR VACUUM)
		SOLENOID VALVE (EGR)
		DUTY SOLENOID VACUUM VALVE OR CIRCUIT
	29	SOLENOID VALVE (EGR VENT)
		DUTY SOLENOID VENT VALVE OR CIRCUIT
	30	RELAY (COLD START INJECTOR)
		SOLENOID VALVE (SPLIT AIR BYPASS)
		ACV SOLENOID VALVE OR CIRCUIT
	31	SOLENOID VALVE (RELIEF 1)
	32	SOLENOID VALVE (SWITCHING)
	33	SOLENOID VALVE (PORT AIR BYPASS)
	34	ISC VALVE
		IDLE AIR CONTROL VALVE
		IDLE SPEED CONTROL VALVE (BAC VALVE)
		IDLE-UP SOLENOID VALVE (FOR A/C) OR CIRCUIT
	35	IDLE-UP SOLENOID VALVE (FOR A/T) OR CIRCUIT
	36	RIGHT SIDE O2 SENSOR HEATER
		O2 SENSOR HEATER
	37	LEFT SIDE O2 SENSOR HEATER
		METERING OIL PUMP
	38	SOLENOID VALVE (ACCELERATED WARM-UP SYSTEM)
	39	SOLENOID VALVE (RELIEF 2)
	40	SOLENOID VALVE (PURGE CONTROL)
	41	SOLENOID VALVE (VICS)
		SOLENOID VALVE (VRIS 1)
		SOLENOID VALVE (VRIS)
	42	SOLENOID VALVE (TURBO PRECONTROL)
	43	SOLENOID VALVE (WASTEGATE CONTROL)

MAZDA DTCs

YEAR	DTC NO.	DESCRIPTOR
1993 (cont.)	44	SOLENOID VALVE (TURBO CONTROL)
	45	SOLENOID VALVE (CHARGE CONTROL)
		VACUUM SOLENOID VALVE OR CIRCUIT
	46	SOLENOID VALVE (VRIS 2)
		SOLENOID VALVE (CHARGE RELIEF)
	50	SOLENOID VALVE (DOUBLE THROTTLE CONTROL)
	51	FUEL PUMP RELAY
	54	AIR PUMP RELAY
	55	VEHICLE SPEED PULSE GENERATOR
		VEHICLE SPEED PULSE GENERATOR (ATX)
	56	ATF THERMOSENSOR (ATX)
	60	1-2 SHIFT SOLENOID VALVE
	61	2-3 SHIFT SOLENOID VALVE
	62	3-4 SHIFT SOLENOID VALVE
	63	LOCKUP SOLENOID VALVE
	64	SOLENOID VALVE (3-2 TIMING)
	65	SOLENOID VALVE (LOCKUP)
		A/C SIGNAL (PCMT)
	66	SOLENOID VALVE (LINE PRESSURE)
	67	COOLANT FAN RELAY (NO1)
	68	COOLANT FAN RELAY (NO2, NO3)
	69	ENGINE COOLANT TEMPERATURE SENSOR (FAN)
		WATER THERMOSENSOR (FAN)
	71	INJECTOR (FRONT SECONDARY)
	73	INJECTOR (REAR SECONDARY)
	76	SLIP LOCK UP OFF SIGNAL (EC-AT CU)
	77	TORQUE REDUCED SIGNAL (EC-AT CU)

MAZDA DTCs

YEAR	DTC NO.	DESCRIPTOR
1994*	1	IGF SIGNAL
		IGNITION PULSE (IGNITER IGNITION COIL)
	2	NE SIGNAL
		NE2 SIGNAL CRANKSHAFT POSITION SENSOR NO2
		NE2 SIGNAL
	3	G SIGNAL
		G SIGNAL CRANKSHAFT POSITION
		SENSOR NO1
		G1 SIGNAL
		SGC SIGNAL
		SGC SIGNAL CRANKSHAFT POSITION SENSOR 1
		SGT SIGNAL
	4	NE1 SIGNAL CRANKSHAFT POSITION SENSOR NO1
		SGC SIGNAL
		SGT SIGNAL
		SGT SIGNAL CRANKSHAFT POSITION SENSOR
		G2 SIGNAL
	5	KNOCK SENSOR
		LEFT SIDE KNOCK SENSOR
	6	VEHICLE SPEED SENSOR
	7	RIGHT SIDE KNOCK SENSOR
	8	VOLUME AIRFLOW SENSOR
		MASS AIRFLOW SENSOR
	9	ENGINE COOLANT TEMPERATURE SENSOR
	10	INTAKE AIR TEMPERATURE SENSOR
	11	INTAKE AIR TEMPERATURE SENSOR
	12	THROTTLE POSITION SENSOR
		FUEL PUMP RELAY
	13	MANIFOLD ABSOLUTE PRESSURE SENSOR

*For 1994 B Series, Navajo, and 626/MX6 w/EEC-IV and ATX, refer to the table on p. 8-30.

MAZDA DTCs

YEAR	DTC NO.	DESCRIPTOR
1994 (cont.)	14	BAROMETRIC ABSOLUTE PRESSURE SENSOR (IN PCME)
		BAROMETRIC ABSOLUTE PRESSURE SENSOR
	15	O2 SENSOR (INACTIVATION)
		HEATED O2 SENSOR (INACTIVATION)
		LEFT SIDE HEATED O2 SENSOR (INACTIVATION)
		HEATED O2 SENSOR (LEFT SIDE)
	16	EGR FUNCTION SENSOR
	17	O2 SENSOR (INVERSION)
		HEATED O2 SENSOR (INVERSION)
		LEFT SIDE HEATED O2 SENSOR (INVERSION)
		CLOSED LOOP SYSTEM (LEFT SIDE)
	18	THROTTLE POSITION SENSOR (NARROW RANGE)
	20	METERING OIL PUMP POSITION SENSOR
	23	HEATED O2 SENSOR (RH)
	23	RIGHT SIDE HEATED O2 SENSOR (INACTIVATION)
		FUEL THERMOSENSOR
	24	CLOSED LOOP SYSTEM (RH)
		RIGHT SIDE HEATED O2 SENSOR (INVERSION)
	25	SOLENOID VALVE (PRESSURE REGULATOR)
		PRC SOLENOID VALVE
	26	SOLENOID VALVE (PURGE CONTROL)
		METERING OIL PUMP (STEPPING MOTOR)
	27	METERING OIL PUMP
	28	EGR SOLENOID VALVE
		EGR SOLENOID VACUUM
	29	EGR SOLENOID VALVE (VENT)
	30	COLD START INJECTOR RELAY
		SOLENOID VALVE (SPLIT AIR BYPASS)
	31	SECONDARY AIR BYPASS VALVE
	32	SECONDARY AIR SWITCHING VALVE
	33	SOLENOID VALVE (PORT AIR BYPASS)

MAZDA DTCs

YEAR	DTC NO.	DESCRIPTOR
1994 (cont.)	34	IAC VALVE
	35	PRC SOLENOID VALVE NO2
	36	RIGHT SIDE HEATED O2 SENSOR HEATER
		HEATED O2 SENSOR HEATER
	37	LEFT SIDE HEATED O2 SENSOR HEATER
		METERING OIL PUMP
	38	SOLENOID VALVE (ACCELERATED WARM-UP SYSTEM)
	39	SOLENOID VALVE (RELIEF 2)
	40	SOLENOID VALVE (PURGE CONTROL)
	41	SOLENOID VALVE (VICS)
		VRIS SOLENOID VALVE NO1
		VRIS SOLENOID VALVE
	42	SOLENOID VALVE (TURBO PRECONTROL)
	43	SOLENOID VALVE (WASTEGATE CONTROL)
	44	SOLENOID VALVE (TURBO CONTROL)
	45	SOLENOID VALVE (CHARGE CONTROL)
	46	VRIS SOLENOID VALVE NO2
		SOLENOID VALVE (CHARGE RELIEF)
	50	SOLENOID VALVE (DOUBLE THROTTLE CONTROL)
	51	FUEL PUMP RELAY (SPEED)
	54	AIR PUMP RELAY
	55	VEHICLE SPEED PULSE GENERATOR
	60	1-2 SHIFT SOLENOID VALVE
	61	2-3 SHIFT SOLENOID VALVE
	62	3-4 SHIFT SOLENOID VALVE
	63	LOCKUP SOLENOID VALVE
	65	A/C SIGNAL (PCMT)
	67	COOLANT FAN RELAY
	6	COOLANT FAN RELAY NO1
	71	INJECTOR (FRONT SECONDARY)
	73	INJECTOR (REAR SECONDARY)
	76	SLIP LOCK UP OFF SIGNAL (PCMT)
	77	TORQUE REDUCED SIGNAL (PCMT)

MAZDA DTCs (1991 NAVAJO)

YEAR	DTC NO.	DESCRIPTOR
1991 NAVAJO	11	SYSTEM PASS
	12	CANNOT CONTROL RPM DURING SELF TEST HIGH RPM CHECK (ENGINE RUNNING)
	13	CANNOT CONTROL RPM DURING SELF TEST LOW RPM CHECK (ENGINE RUNNING)
	14	PIP CIRCUIT FAILURE (CONTINUOUS MEMORY)
	15	ECA READ ONLY MEMORY (ROM) TEST FAILED (KOEO)
	15	ECA KEEP ALIVE MEMORY (KAM) TEST FAILED (CONTINUOUS MEMORY)
	16	IGNITION DIAGNOSTIC MONITOR (IDM) SIGNAL NOT RECEIVED (KOEO)
	18	SAW CIRCUIT FAILURE (ENGINE RUNNING)
	18	LOSS OF IDM INPUT TO PROCESSOR/IDM CIRCUIT FAILURE (CONTINUOUS MEMORY)
	19	FAILURE IN ECA INTERNAL VOLTAGE (KOEO)
	21	ECT OUT OF SELF TEST RANGE (KOEO/ENGINE RUNNING)
	22	BP OUT OF SELF TEST RANGE (KOEO, ENGINE RUNNING, CONTINUOUS MEMORY)
	23	TP OUT OF SELF TEST RANGE (KOEO, ENGINE RUNNING)
	24	AIR CHARGE TEMP (ACT) OUT OF SELF TEST RANGE (KOEO, ENGINE RUNNING)
	26	MAF OUT OF SELF TEST RANGE (KOEO, ENGINE RUNNING)
	29	INSUFFICIENT INPUT FROM THE VEHICLE SPEED SENSOR (CONTINUOUS MEMORY)
	41	HEGO SENSOR CIRCUIT INDICATES SYSTEM LEAN (ENGINE RUNNING)
	41	NO HEGO SWITCH DETECTED (CONTINUOUS MEMORY)
	42	HEGO SENSOR CIRCUIT INDICATES SYSTEM RICH (ENGINE RUNNING)
	45	COIL 1, 2, OR 3 FAILURE (CONTINUOUS MEMORY)

MAZDA DTCs (1991 NAVAJO) (cont.)

YEAR	DTC NO.	DESCRIPTOR
1991 NAVAJO	51	ECT INDICATED -40°F/ CIRCUIT OPEN (KOEO, CONTINUOUS MEMORY)
	53	TP CIRCUIT ABOVE MAXIMUM VOLTAGE (KOEO, CONTINUOUS MEMORY)
	54	ACT INDICATED -40°F/ CIRCUIT OPEN (KOEO, CONTINUOUS MEMORY)
	56	MAF CIRCUIT ABOVE MAXIMUM VOLTAGE (KOEO, CONTINUOUS MEMORY)
	61	ECT INDICATED 254°F/ CIRCUIT GROUNDED (KOEO, CONTINUOUS MEMORY)
	63	TP CIRCUIT BELOW MINIMUM VOLTAGE (KOEO, CONTINUOUS MEMORY)
	64	ACT INDICATED 254°F/ CIRCUIT GROUNDED (KOEO, CONTINUOUS MEMORY)
	66	MAF CIRCUIT BELOW MINIMUM VOLTAGE (CONTINUOUS MEMORY)
	67	NEUTRAL DRIVE SWITCH (NDS) CIRCUIT OPEN, A/C ON (KOEO)
	67	CLUTCH SWITCH CIRCUIT FAILURE (CONTINUOUS MEMORY)
	72	INSUFFICIENT MAF CHANGE DURING DYNAMIC RESPONSE TEST (ENGINE RUNNING)
	73	INSUFFICIENT TP CHANGE DURING DYNAMIC RESPONSE TEST (ENGINE RUNNING)
	74	BRAKE ON/OFF (BOO) CIRCUIT FAILURE, NOT ACTUATED (ENGINE RUNNING)
	77	OPERATOR ERROR, DYNAMIC RESPONSE/CYLINDER BALANCE TESTS (ENGINE RUNNING)
	79	A/C ON, DEFROST ON DURING SELF TEST
	86	SHIFT SOLENOID CIRCUIT FAILURE (KOEO)
	87	PRIMARY FUEL PUMP CIRCUIT FAILURE (KOEO, CONTINUOUS MEMORY)
	89	CLUTCH CONVERTER OVERRIDE CIRCUIT FAILURE (KOEO)
	95	FUEL PUMP CIRCUIT OPEN, ECA TO MOTOR GROUND (KOEO, CONTINUOUS MEMORY)
	96	FUEL PUMP CIRCUIT OPEN, BATTERY TO ECA (KOEO, CONTINUOUS MEMORY)
	98	HARD FAULT PRESENT (ENGINE RUNNING)

MAZDA DTCs (1992-94 NAVAJO, 1994 B SERIES, 1994 626/MX6 W/EEC-IV and ATX)

YEAR	DTC NO.	DESCRIPTOR
1992-94 NAVAJO 1994 B SERIES 1994 626/MX6 w/EEC-IV and ATX	111	SYSTEM PASS
	112	IAT SENSOR OUTPUT BELOW 0.2v/INDICATED 254°F
	113	IAT SENSOR OUTPUT ABOVE 4.6v/INDICATED -40°F
	114	IDLE AIR TEMP. OUT OF EXPECTED RANGE
	116	ECT OUT OF EXPECTED RANGE
	117	ECT SENSOR OUTPUT BELOW 0.2v/INDICATED 254°F
	118	ECT SENSOR OUTPUT ABOVE 4.6v/INDICATED -40°F
	121	TP OUT OF EXPECTED RANGE (INCONSISTENT WITH MAF)
	122	TPS OUTPUT BELOW 0.5v
	123	TPS OUTPUT ABOVE 4.6v
	124	TP SENSOR VOLTAGE HIGHER THAN EXPECTED
	125	TP SENSOR VOLTAGE LOWER THAN EXPECTED
	129	INSUFFICIENT MAF/MAP CHANGE DURING DYNAMIC RESPONSE TEST
	136	LEFT BANK HO2 SENSOR OUTPUT CONTINUES LEAN CONDITION
	137	LEFT BANK HO2 SENSOR OUTPUT CONTINUES RICH CONDITION
	139	LEFT BANK HO2 SENSOR CIRCUIT, OPEN/SHORT
	144	RIGHT BANK HO2 SENSOR CIRCUIT, OPEN/SHORT
	157	MAF CIRCUIT BELOW 0.4v
	158	MAF CIRCUIT ABOVE 4.5v
	159	MAF OUT OF EXPECTED RANGE
	167	INSUFFICIENT TP CHANGE DURING DYNAMIC RESPONSE TEST
	171	RIGHT BANK ADAPTIVE FUEL CONTROL EXCEEDS LIMITS (HEGO UNABLE TO SWITCH)
	172	RIGHT BANK HO2 SENSOR OUTPUT CONTINUES LEAN CONDITION
	173	RIGHT BANK HO2 SENSOR OUTPUT CONTINUES RICH CONDITION

MAZDA DTCs (1992-94 NAVAJO, 1994 B SERIES, 1994 626/MX6 W/EEC-IV and ATX) (cont.)

YEAR	DTC NO.	DESCRIPTOR
1992-94 NAVAJO 1994 B SERIES 1994 626/MX6 w/EEC-IV and ATX (cont.)	175	LEFT BANK HO2 SENSOR OUTPUT CONTINUES LEAN CONDITION
	176	LEFT BANK HO2 SENSOR OUTPUT CONTINUES RICH CONDITION
	177	LEFT BANK HO2 SENSOR OUTPUT CONTINUES RICH CONDITION
	179	RIGHT BANK FUEL SYSTEM AT LEAN ADAPTIVE LIMIT AT PART THROTTLE/SYSTEM RICH
	181	RIGHT BANK FUEL SYSTEM AT RICH ADAPTIVE LIMIT AT PART THROTTLE/SYSTEM LEAN
	182	RIGHT BANK FUEL SYSTEM AT LEAN ADAPTIVE LIMIT AT IDLE/SYSTEM RICH
	183	RIGHT BANK FUEL SYSTEM AT RICH ADAPTIVE LIMIT AT IDLE/SYSTEM LEAN
	184	MAF HIGHER THAN EXPECTED
	185	MAF LOWER THAN EXPECTED
	186	INJECTOR PULSE WIDTH HIGHER THAN EXPECTED
	187	INJECTOR PULSE WIDTH LOWER THAN EXPECTED
	188	LEFT BANK FUEL SYSTEM AT LEAN ADAPTIVE LIMIT AT PART THROTTLE/SYSTEM RICH
	189	LEFT BANK FUEL SYSTEM AT RICH ADAPTIVE LIMIT AT PART THROTTLE/SYSTEM LEAN
	191	LEFT BANK FUEL SYSTEM AT LEAN ADAPTIVE LIMIT AT IDLE/SYSTEM RICH
	192	LEFT FUEL SYSTEM AT RICH ADAPTIVE LIMIT AT IDLE/SYSTEM LEAN
	211	NO CAMSHAFT POSITION SIGNAL (PIP CIRCUIT FAILURE)
	212	IGNITION DIAGNOSTIC MONITOR (IN IGNITION CONTROL MODULE) NO SIGNAL
	213	SPARK OUTPUT OPEN (SAW/SPOUT CIRCUIT)
	214	CAMSHAFT POSITION SIGNAL OPEN/SHORT

MAZDA DTCs (1992-94 NAVAJO, 1994 B SERIES, 1994 626/MX6 W/EEC-IV and ATX) (cont.)

YEAR	DTC NO.	DESCRIPTOR
1992-94 NAVAJO	215	COIL 1 PRIMARY CIRCUIT OPEN/SHORT
	216	COIL 2 PRIMARY CIRCUIT OPEN/SHORT
	217	COIL 3 PRIMARY CIRCUIT OPEN/SHORT
1994 B SERIES	218	IGNITION DEAGNOSTIC MONITOR (LEFT) IN IGNITION CONTROL MODULE, NO SIGNAL
1994 626/MX6 w/EEC-IV and ATX (cont.)	219	SPARK OUTPUT OPEN (SAW/SPOUT CIRCUIT)
	222	INGITION DIAGNOSTIC MONITOR (RIGHT) IN IGNITION CONTROL MODULE, NO SIGNAL
	223	NO DUAL PLUG OPERATION
	224	COIL 1, 2, 3, OR 4 PRIMARY CIRCUIT OPEN
	226	NO IGNITION DIAGNOSTIC MONITOR (IN IGNITION CONTROL MODULE), NO SIGNAL
	232	COIL 1, 2, OR 3 PRIMARY CIRCUIT FAILURE
	241	OCTANE ADJUST CIRCUIT OPEN
	244	CYLINDER IDENTIFICATION DISPLAY CIRCUIT
	326	DIFFERENTIAL PRESSURE FEEDBACK EGR SENSOR OUTPUT LESS THAN EXPECTED
	327	DIFFERENTIAL PRESSURE FEEDBACK EGR SENSOR OUTPUT BELOW .02v
	332	DIFFERENTIAL PRESSURE FEEDBACK EGR SENSOR, LOW FLOW
	335	DIFFERENTIAL PRESSURE FEEDBACK EGR SENSOR OUT OF RANGE DURING KOEO
	336	DIFFERENTIAL PRESSURE FEEDBACK EGR SENSOR, HIGH OUTPUT
	337	DIFFERENTIAL PRESSURE FEEDBACK EGR SENSOR ABOVE 4.8v
	341	OCTANE ADJUST CIRCUIT OPEN
	411	IAC SOLENOID FAILED LOW RPM TEST DURING KOER
	412	IAC SOLENOID FAILED HIGH RPM TEST DURING KOER
	415	ADAPTIVE IAC AT MINIMUM LIMIT
	416	ADAPTIVE IAC AT MAXIMUM LIMIT
	452	NO VEHICLE SPEED SENSOR SIGNAL

MAZDA DTCs (1992-94 NAVAJO, 1994 B SERIES, 1994 626/MX6 W/EEC-IV and ATX) (cont.)

YEAR	DTC NO.	DESCRIPTOR
1992-94 NAVAJO 1994 B SERIES 1994 626/MX6 w/EEC-IV and ATX (cont.)	511	PCM (ECA) READ ONLY MEMORY (ROM) TEST FAILED DURING KOEO
	512	POWER TO PCM (ECA) KEEP ALIVE MEMORY (KAM) TEST FAILED
	513	FAILURE IN PCM (ECA) INTERNAL VOLTAGE
	519	STEERING PRESSURE SENSOR CIRCUIT IS CLOSED
	519	POWER STEERING PRESSURE SWITCH OPEN DURING KOEO
	521	POWER STEERING PRESSURE SWITCH OPEN DURING KOER
	522	VEHICLE NOT IN PARK OR NEUTRAL DURING KOEO
	525	A/C SWITCH ON DURING KOEO
	528	CLUTCH SWITCH OR PARK/NEUTRAL POSITION OPEN/SHORT
	528	CLUTCH PEDAL SWITCH/PARK NEUTRAL SWITCH OPEN/SHORT (M/T)
	536	STOPLIGHT SWITCH OPEN/SHORT OR NOT ACTUATED DURING SELF TEST
	538	DYNAMIC RESPONSE TEST, INCORRECT RPM CHANGE (OPERATOR ERROR)
	538	INVALID CYLINDER BALANCE TEST DUE TO THROTTLE MOVEMENT
	539	A/C SWITCH ON DURING KOEO OR KOER
	542	FUEL PUMP OPEN/SHORT
	543	FUEL PUMP CIRCUIT OPEN
	554	PRESSURE REGULATOR CONTROL CIRCUIT FAILURE
	556	FUEL PUMP OPEN/SHORT
	558	EGR VACUUM REGULATOR SOLENOID OPEN/SHORT
	559	A/C RELAY CIRCUIT FAULT
	563	HIGH FAN CONTROL CIRCUIT FAILURE
	565	CANISTER PURGE SOLENOID VALVE OPEN/SHORT

MAZDA DTCs (1992-94 NAVAJO, 1994 B SERIES, 1994 626/MX6 W/EEC-IV and ATX) (cont.)

YEAR	DTC NO.	DESCRIPTOR
1992-94 NAVAJO 1994 B SERIES 1994 626/MX6 w/EEC-IV and ATX (cont.)	566	3-4 SHIFT SOLENOID VALVE (A/T ONLY) OPEN/SHORT
	571	EGR SOLENOID VALVE (VENT) OUTPUT CIRCUIT
	572	EGR SOLENOID VALVE (VACUUM) OUTPUT CIRCUIT
	629	TORQUE CONVERTER CLUTCH SOLENOID OPEN/SHORT
	998	PCM IS IN FAIL SAFE MODE, HARD FAULT PRESENT

MAZDA DTCs

YEAR	DTC NO.	DESCRIPTOR
1995	1	IGF SIGNAL NOT PRESENT
	2	CRANKSHAFT SENSOR, NO NE SIGNAL (V6 626/MX6, V6 MX3, RX7)
		NE SIGNAL NOT PRESENT (929, 2WD MPV)
		CAMSHAFT SENSOR, NO SGT SIGNAL (2.0L 626/MX6)
		SGT SIGNAL NOT PRESENT (2.6L MPV)
	3	CRANKSHAFT SENSOR, NO G SIGNAL (RX7)
		SGC SIGNAL NOT PRESENT (929/2.6L MPV, 1.6L MX3)
		CAMSHAFT SENSOR, NO SGC SIGNAL (V6 626/MX6)
		DISTRIBUTOR (G1) SHORT CIRCUIT (MPV V6)
		SGT SIGNAL NOT PRESENT (MX5/MIATA)
	4	CAMSHAFT SENSOR, NO SGT SIGNAL (1.8L MX3)
		SGT SIGNAL NOT PRESENT (929/1.6L MX3)
		SGC SIGNAL NOT PRESENT (MX5/MIATA)
		DISTRIBUTOR (G2) SHORT CIRCUIT (3.0L MPV)
	5	(LEFT) KNOCK SENSOR, OPEN/SHORT CIRCUIT
	6	VSS, NO SIGNAL
	7	RIGHT KNOCK SENSOR, OPEN/SHORT CIRCUIT
	8	MAF/AIR FLOW SENSOR, OPEN/SHORT CIRCUIT
	9	ECT SENSOR, OPEN/SHORT CIRCUIT
	10	IAT SENSOR, OPEN/SHORT CIRCUIT
	11	IAT SENSOR, OPEN/SHORT CIRCUIT
	12	TPS, OPEN/SHORT CIRCUIT
	13	MAP SENSOR, OPEN/SHORT CIRCUIT
	14	BARO SENSOR, OPEN/SHORT CIRCUIT
	15	O2 SENSOR INACTIVE (2.6L MPV, 1.6L MX3, RX7)
		LEFT HO2 SENSOR STUCK OVER 1500 RPM (2.5L 626/MX6, 929, 1.8L MX3)
		HO2 SENSOR INACTIVE (2.0L 626/MX6, 3.0L MPV, MX5/MIATA)
	16	EGR SENSOR, OPEN/SHORT CIRCUIT OR STUCK VALVE

MAZDA DTCs

YEAR	DTC NO.	DESCRIPTOR
1995 cont.	17	O2 SENSOR (INVERSION) INACTIVE (RX7, 2.6L MPV) HO2 SENSOR, STICKING (1.6 MX3, MX5/MIATA) LEFT CLOSED LOOP OPERATION STUCK OVER 1500 RPM (1.8L MX3) LEFT HO2 SENSOR INACTIVE (2.5L 626/MX6, 929) HO2 SENSOR (INVERSION) INACTIVE (2.0L 626/MX6, 3.0L MPV)
	18	TPS (NARROW) OPEN/SHORT
	20	OIL PUMP SENSOR, OPEN/SHORT CIRCUIT
	23	FUEL THERMOSENSOR, OPEN/SHORT CIRCUIT (RX7) HO2 SENSOR INACTIVE, RIGHT BANK (2.5L 626/MX6, 929, 1.8L MX3)
	24	RIGHT CLOSED LOOP OPERATION STUCK OVER 1500 RPM (1.8L MX3) RIGHT HO2 SENSOR INACTIVE (2.5L 626/MX6, 929)
	25	PRC SOLENOID VALVE, OPEN/SHORT CIRCUIT
	26	PURGE SOLENOID VALVE, OPEN/SHORT CIRCUIT OIL PUMP (STP MOTOR) OPEN/SHORT CIRCUIT (RX7)
	27	METER OIL PUMP, OPEN/SHORT CIRCUIT
	28	EGR VALVE (VAC), OPEN/SHORT CIRCUIT
	29	EGR VALVE (VENT), OPEN/SHORT CIRCUIT
	30	SPLIT AIR BYPASS VALVE, OPEN/SHORT CIRCUIT (RX7) COLD-START RELAY, OPEN/SHORT (929)
	31	SECONDARY AIR BYPASS VALVE, OPEN/SHORT CIRCUIT
	32	SECONDARY AIR SWITCHING VALVE, OPEN/SHORT CIRCUIT
	33	PORT AIR BYPASS SOLENOID, OPEN/SHORT CIRCUIT
	34	IAC SOLENOID VALVE, OPEN/SHORT CIRCUIT
	35	PRC SOLENOID VALVE 2, OPEN/SHORT CIRCUIT

MAZDA DTCs

YEAR	DTC NO.	DESCRIPTOR
1995 cont.	36	(RIGHT) O2 SENSOR HEATER CIRCUIT, OPEN/SHORT
	37	METER OIL PUMP, LOW BATTERY VOLTS (RX7)
		LEFT O2 SENSOR, HEATER CIRCUIT OPEN/SHORT (929)
	38	WARM-UP SYSTEM VALVE, OPEN/SHORT CIRCUIT
	39	RELIEF 2 SOLENOID VALVE, OPEN/SHORT CIRCUIT
	40	PURGE SOLENOID VALVE, OPEN/SHORT CIRCUIT
	41	VICS SOLENOID VALVE, OPEN/SHORT CIRCUIT (929, 1.6LMX3)
		VRIS VALVE 1, OPEN/SHORT (2.5L 626/MX6, 1.8L MX3)
		TURBO PRECONTROL SOLENOID VALVE CIRCUIT (3.0L MPV)
	42	TURBO PRECONTROL SOLENOID VALVE CIRCUIT
	43	WASTEGATE VALVE, OPEN/SHORT CIRCUIT
	44	TURBO CONTROL VALVE, OPEN/SHORT CIRCUIT
	45	CHARGE CONTROL VALVE, OPEN/SHORT CIRCUIT
	46	CHARGE RELIEF VALVE, OPEN/SHORT CIRCUIT (RX7)
		VRIS VALVE 2, OPEN/SHORT CIRCUIT (2.5L 626/MX6, 1.8L MX3)
	50	DOUBLE THROTTLE CONTROL SOLENOID VALVE, OPEN/SHORT CIRCUIT
	51	FUEL PUMP RELAY (SPEED)
	54	AIR PUMP RELAY, OPEN/SHORT CIRCUIT
	65	A/C SIGNAL (TCM), OPEN/SHORT CIRCUIT
	71	INJECTION (FRONT SECONDARY), OPEN/SHORT CIRCUIT
	73	INJECTION (REAR SECONDARY), OPEN/SHORT CIRCUIT
	76	SLIP TCC SIGNAL, OPEN/SHORT CIRCUIT
	77	TORQUE REDUCED SIGNAL, OPEN/SHORT CIRCUIT

OBD II SYSTEMS

YEAR	DTC NO.	DESCRIPTOR
1995-98 OBD II	P0100	MAF/VAF Circuit Malfunction
	P0102	MAF Sensor Circuit, Low Input
	P0103	MAF Sensor Circuit, High Input
	P0105	MAP/BARO Circuit Malfunction
	P0106	BARO/EGR Boost Sensor Circuit Performance
	P0107	BARO/EGR Boost Sensor Circuit, Low Input
	P0108	BARO/EGR Boost Sensor Circuit, High Input
	P0110	IAT Circuit Malfunction
	P0111	IAT Circuit Performance Problem
	P0112	IAT Circuit, Low Input
	P0113	IAT Circuit, High Input
	P0115	ECT Circuit Malfunction
	P0117	ECT Sensor, Low Input
	P0118	ECT Sensor, High Input
	P0120	Throttle Position Circuit Malfunction
	P0121	TPS Circuit Malfunction
	P0122	TPS Circuit, Low Input
	P0123	TPS Circuit, High Input
	P0125	Coolant Temp. Low for Too Long, no Closed Loop Fuel Control
	P0126	ECT Sensor, Low Temp.
	P0130	O2 Sensor, Bank 1 Sensor 1, Circuit Malfunction
	P0131	Upstream HO2 Sensor Circuit, Bank 1, Low Voltage
	P0132	HO2 Sensor Circuit, Bank 1 Sensor 1, High Voltage
	P0133	Upstream HO2 Sensor, Bank 1, Slow Response
	P0134	HO2 Sensor , Bank 1 Sensor 1, no Activity
	P0135	Upstream HO2 Sensor, Bank 1, Circuit Malfunction
	P0136	Downstream HO2 Sensor Circuit Malfunction, Bank 1
	P0137	Downstream HO2 Sensor, Low Voltage, Bank 1
	P0138	Downstream HO2 Sensor Circuit, Bank 1, High Voltage
	P0140	HO2 Sensor Circuit, Bank 1 Sensor 2, no Activity
	P0141	Downstream HO2 Sensor, Bank 1, Heater Circuit Malfunction
	P0142	HO2 Sensor, Bank 1 Sensor 3, Circuit Malfunction
	P0146	HO2 Sensor Circuit, Bank 1 Sensor 3, no Activity
	P0147	HO2 Sensor, Bank 1 Sensor 3, Heater Circuit Malfunction
	P0150	O2 Sensor, Bank 2 Sensor 1, Circuit Malfunction
	P0151	Upstream HO2 Sensor Circuit, Bank 2, Low Voltage
	P0152	HO2 Sensor, Bank 2 Sensor 1, High Voltage
	P0153	Upstream HO2 Sensor, Bank 2, Slow Response

MAZDA DTCs (CONT.)

YEAR	DTC NO.	DESCRIPTOR
1995-98 OBD II	P0154	O2 Sensor Circuit, Bank 2 Sensor 1, no Activity
	P0155	Upstream HO2 Sensor, Bank 2, Heater Circuit Malfunction
	P0160	O2 Sensor Heater Circuit, Bank 2 Sensor 2, no Activity
	P0161	HO2 Sensor Heater, Bank 2 Sensor 2, Circuit Malfunction
	P0170	Bank 1 Fuel Trim Malfunction
	P0171	Fuel System, A/F Ratio Lean, Bank 1
	P0172	Fuel System, A/F Ratio Rich, Bank 1
	P0173	Bank 2 Fuel Trim Malfunction
	P0174	Fuel System, A/F Ratio Lean, Bank 2
	P0175	Fuel System, A/F Ratio Rich, Bank 2
	P0230	Fuel Pump Primary Circuit Malfunction
	P0231	Fuel Pump Secondary Circuit Low
	P0232	Fuel Pump Secondary Circuit High
	P0300	Random Misfire Detected
	P0301	Cylinder No. 1, Misfire Detected
	P0302	Cylinder No. 2, Misfire Detected
	P0303	Cylinder No. 3, Misfire Detected
	P0304	Cylinder No. 4, Misfire Detected
	P0305	Cylinder No. 5, Misfire Detected
	P0306	Cylinder No. 6, Misfire Detected
	P0320	PIP Sensor Circuit Malfunction
	P0325	Knock Sensor Circuit Malfunction
	P0335	Crankshaft Position Sensor Circuit Malfunction
	P0339	Crankshaft Position Sensor Circuit Intermittent
	P0340	Camshaft Position Sensor, Circuit Malfunction
	P0350	Ignition Coil, Primary Circuit, Malfunction
	P0351	Ignition Coil A, Primary Circuit Malfunction
	P0352	Ignition Coil B, Primary Circuit Malfunction
	P0353	Ignition Coil C, Primary Circuit Malfunction
	P0354	Ignition Coil D, Primary Circuit Malfunction
	P0400	EGR Flow, System Malfunction
	P0401	EGR Flow Insufficient
	P0402	EGR Detection, Excessive Flow
	P0420	Catalyst Below Threshold, Bank 1
	P0421	Warm-up Catalyst Efficiency Below Threshold
	P0422	EVAP Control System Malfunction (Leak Check)
	P0430	Catalyst, Bank 2, Below Threshold
	P0440	EVAP Control System Malfunction

MAZDA DTCs (CONT.)

YEAR	DTC NO.	DESCRIPTOR
1995-98 OBD II	P0441	EVAP Purge Control Malfunction
	P0442	Small Leak Detected in EVAP System
	P0443	EVAP System Purge Control Valve Circuit Malfunction
	P0446	Excess Fuel Tank Pressure or a Vent Control Malfunction
	P0450	EVAP System Pressure Sensor Malfunction
	P0452	Fuel Tank Pressure Sensor, Low Input
	P0453	Fuel Tank Pressure Sensor, High Input
	P0455	EVAP Control System, Leak or Blockage
	P0460	Fuel Level Sensor Circuit Malfunction
	P0461	Fuel Level Sensor Circuit Range Performance
	P0462	Fuel Level Sensor Circuit, Low Input
	P0463	Fuel Level Sensor Circuit, High Input
	P0470	Exhaust Pressure Sensor Malfunction
	P0500	VSS Malfunction
	P0501	VSS Signal Intermittent
	P0503	VSS Circuit Intermittent
	P0505	IAC System Malfunction
	P0506	Idle Control System, RPM Lower than Expected
	P0507	Idle Control System, RPM Higher than Expected
	P0510	Closed Throttle Position Switch Malfunction
	P0550	P/S Pressure Switch Circuit Malfunction
	P0603	ECM/PCM KAM Memory Test Error
	P0605	PCM ROM Test Error
	P0703	Brake ON/OFF Switch Input Error
	P0704	Clutch Pedal Position Switch Circuit Malfunction
	P0705	Transmission Range Sensor Circuit Failure
	P0706	Transmission Range Sensor, Short Circuit or Sensor Malfunction
	P0707	Transmission Range Sensor, Low Input
	P0708	Transmission Range Sensor, High Input
	P0710	Transmission Fluid Temp. Sensor Circuit Malfunction
	P0711	Transmission Fluid Temp. Sensor Circuit Malfunction
	P0712	Transmission Fluid Temp. Circuit, Low Input
	P0713	Transmission Fluid Temp. Circuit, High Input
	P0715	Turbine Shaft Speed Sensor Circuit (Signal Lost)
	P0720	Output Shaft Speed Sensor Signal Lost
	P0721	Output Shaft Speed Sensor, Erratic Signal
	P0725	Engine Speed Input Circuit Malfunction

MAZDA DTCs (CONT.)

YEAR	DTC NO.	DESCRIPTOR
1995-98 OBD II	P0731	Gear 1, Incorrect Ratio
	P0732	Gear 2, Incorrect Ratio
	P0733	Gear 3, Incorrect Ratio
	P0734	Gear 4, Incorrect Ratio
	P0735	Gear 5, Incorrect Ratio
	P0736	Reverse Gear, Incorrect Ratio
	P0740	TCC System Malfunction
	P0741	TCC, Mechanical System Performance
	P0742	TCC Solenoid Valve Stuck ON
	P0743	Torque Converter Clutch System, Electrical Problem
	P0745	Pressure Control Solenoid Malfunction
	P0746	Electrical Pressure Control Solenoid Performance
	P0750	Shift Solenoid A, Malfunction
	P0751	Shift Solenoid A, Performance
	P0752	Shift Solenoid 1, Stuck ON
	P0755	Shift Solenoid B, Malfunction
	P0756	Shift Solenoid B, Performance
	P0757	Shift Solenoid 2, Stuck ON
	P0760	Shift Solenoid C, Malfunction
	P0761	Shift Solenoid C, Performance
	P0765	Shift Solenoid 4, Open/Short or PCM Driver Failure
	P0781	1st to 2nd Shift Error
	P0782	2nd to 3rd Shift Error
	P0783	3rd to 4th Shift Error
	P0784	4th to 5th Shift Error
	P1000	OBDII Monitor Drive Cycle Incomplete
	P1001	KOER Self-Test not Complete
	P1100	MAF Sensor Intermittent
	P1101	MAF Sensor Out of Range
	P1102	MAF Inconsistent with TPS, Lower than Expected
	P1103	MAF Inconsistent with TPS, Greater than Expected
	P1110	IAT Sensor (Dynamic Chamber), Open or Short
	P1112	IAT Sensor Intermittent or Out of Range
	P1113	IAT Sensor Circuit (Lysholm Compressor), Open or Short
	P1116	ECT Sensor Out of Range
	P1117	ECT Sensor Intermittent
	P1120	TP Sensor Out of Range/Low

MAZDA DTCs (CONT.)

YEAR	DTC NO.	DESCRIPTOR
1995-98 OBD II	P1121	TP Sensor, Inconsistent with MAF
	P1122	Throttle Position Closed Switch, Stuck
	P1124	TP Sensor Out of Range/Low
	P1125	TP Sensor, Circuit Intermittent
	P1127	Downstream HO2 Sensor not Tested
	P1128	Upstream HO2 Sensor, Swapped from Bank to Bank
	P1129	Downstream HO2 Sensor Swapped from Bank to Bank
	P1130	Upstream HO2 Sensor, no Switch-Limit, Bank 1
	P1131	Upstream HO2 Sensor, no Switch-Lean, Bank 1
	P1132	Upstream HO2 Sensor, no Switch-Rich, Bank 1
	P1137	HO2 Sensor, Bank 1 Sensor 2, Lack of Sensor, Indicates Lean
	P1138	HO2 Sensor, Bank 1 Sensor 2, Lack of Sensor, Indicates Rich
	P1143	HO2 Sensor, Bank1 Sensor 3, Lack of Sensor, Indicates Lean
	P1144	HO2 Sensor, Bank 1 Sensor 3, Lack of Sensor, Indicates Rich
	P1150	Upstream HO2 Sensor, no Switch-Limit, Bank 2
	P1151	Upstream HO2 Sensor, no Switch-Lean, Bank 2
	P1152	Upstream HO2 Sensor, no Switch-Rich, Bank 2
	P1169	HO2 Sensor, Bank 1 Sensor 2, Inversion
	P1170	HO2 Sensor, Bank 1 Sensor 1, Inversion
	P1173	HO2 Sensor, Bank 2 Sensor 1, Inversion
	P1195	EGR Barometric Pressure Sensor, Open or Short
	P1196	Ignition (Start) Switch Input Malfunction
	P1235	Fuel Pump Control Out of Range, Open or Short
	P1236	Fuel Pump Control Out of Range, Open or Short
	P1250	Fuel Pressure Circuit, Open or Short
	P1252	Pressure Regulator Control Solenoid Valve No. 2, Open or Short
	P1260	Theft Detected, Engine Disabled
	P1270	RPM/Vehicle Speed Limiter Reached
	P1309	Misfire Detection Monitor not Enabled
	P1345	No SGC Signal
	P1351	Ignition Diagnostic Monitor Circuit Malfunction
	P1352	Ignition Coil 1, Primary Circuit Malfunction
	P1353	Ignition Coil 2, Primary Circuit Malfunction
	P1354	Ignition Coil 3, Primary Circuit Malfunction
	P1358	Ignition Diagnostic Monitor Out of Range
	P1359	Spark Output Circuit Malfunction
	P1360	Ignition Coil A, Secondary Circuit Malfunction

MAZDA DTCs (CONT.)

YEAR	DTC NO.	DESCRIPTOR
1995-98 OBD II	P1361	Ignition Coil B, Secondary Circuit Malfunction
	P1362	Ignition Coil C, Secondary Circuit Malfunction
	P1364	Ignition Coil Primary Circuit Malfunction
	P1365	Ignition Coil Secondary Circuit malfunction
	P1390	Octane Adjust Out of Range
	P1400	Differential Pressure Feedback EGR Sensor Circuit, Low Voltage
	P1401	Differential Pressure Feedback EGR Sensor Circuit, High Voltage
	P1402	EGR Valve Position Sensor, Open or Short
	P1403	Differential Pressure Feedback EGR Sensor, Hoses Reversed
	P1405	Differential Pressure Feedback EGR Sensor, Upstream Hose Off/Plugged
	P1406	Differential Pressure Feedback EGR Sensor, Downstream Hose Off/Plugged
	P1407	EGR Valve, no Flow Detected
	P1408	EGR Flow, Out of Range
	P1409	EGR Vacuum Regulator, Circuit Malfunction
	P1410	EGR Boost Sensor or Solenoid Valve, Frozen
	P1443	EVAP Control System Circuit Malfunction
	P1444	Purge Flow Sensor Circuit, Low Input
	P1445	Purge Flow Sensor Circuit, High Input
	P1449	Canister Drain Cut Valve, Open or Short
	P1450	Fuel Tank, Unable to Bleed Vacuum
	P1451	EVAP Vent Valve Circuit Malfunction
	P1455	Fuel Tank Level Sensor, Open or Short
	P1457	Purge Solenoid Valve Control System Malfunction
	P1460	Wide-Open Throttle A/C Cut-Off Circuit Malfunction
	P1464	A/C Demand Out of Range
	P1474	Cooling Fan Control, Primary Circuit Malfunction
	P1479	Condenser Fan, Primary Control Circuit Malfunction
	P1485	EGR Solenoid Vacuum Valve, Open or Short
	P1486	EGR Vent Solenoid, Open or Short
	P1487	EGR Boost Solenoid Valve Circuit Open or Short
	P1496	EGR Valve Motor, Coil 1, Open or Short
	P1497	EGR Valve Motor, Coil 2, Open or Short
	P1498	EGR Valve Motor, Coil 3, Open or Short
	P1499	EGR Valve Motor, Coil 4, Open or Short
	P1500	VSS Circuit Intermittent
	P1501	VSS Circuit Out of Range

MAZDA DTCs (CONT.)

YEAR	DTC NO.	DESCRIPTOR
1995-98 OBD II	P1502	VSS Circuit, Signal Lost
	P1504	IAC Circuit Malfunction
	P1505	IAC Circuit at Adaptive Clip
	P1506	IAC Circuit, Overspeed Error
	P1507	IAC Circuit, Underspeed Error
	P1508	Bypass Air Solenoid Valve No. 1, Open or Short
	P1509	Bypass Air Solenoid Valve No. 2, Open or Short
	P1521	Variable Resonance Induction Solenoid 1, Open or Short
	P1522	Variable Resonance Induction Solenoid 2, Open or Short
	P1523	VICS Circuit Malfunction, Open or Short
	P1524	Charge Air Cooler Bypass Solenoid Valve Circuit, Open or Short
	P1525	ABV (Vacuum), Open or Short
	P1526	ABV (Vent), Open or Short
	P1527	Accelerate Warm-up, Open or Short
	P1540	ABV Control System, Open or Short
	P1566	Backup Power Supply, Circuit Malfunction
	P1601	Communication Line Error (A/T)
	P1602	Immobilizer Unit, PCM Communication Error
	P1603	Immobilizer System, Codeword not Registered (PCM)
	P1604	Immobilizer System, Key ID Number Unregistered (PCM)
	P1605	PCM KAM Power Circuit Test Error
	P1608	PCME (CPU) Malfunction
	P1609	PCM Knock I/C Damaged
	P1621	Immobilizer System, Codeword Problem After Engine Crank
	P1622	Immobilizer System, Key ID Number does not Match
	P1623	Immobilizer System, Codeword/Key ID, Read/Write Error (PCM)
	P1624	Immobilizer System, Communication Counter =0
	P1627	ECM/TCS Line Communication Error
	P1628	ECM/TCS Line (ABV) Communication Error
	P1631	Generator Output Voltage Signal, no Electricity
	P1632	Battery Voltage Monitor Signal, Circuit Malfunction
	P1633	Battery Voltage, Overcharge
	P1634	Generator Terminal B, Circuit Open
	P1650	PSP Switch Out of Range
	P1651	PSP Switch Input Error
	P1652	PSP Switch Failed ON
	P1701	Transmission Solenoid Malfunction

MAZDA DTCs (CONT.)

YEAR	DTC NO.	DESCRIPTOR
1995-98 OBD II	P1702	Transmission Range Sensor Circuit, Intermittent Malfunction
	P1703	Brake On/Off Switch Out of Range
	P1704	Digital Transmission Range Sensor Malfunction
	P1705	Transmission Range Sensor, Out of Range
	P1709	KOEO Self-Test, PNP in Gear
	P1711	Transmission Fluid Temp. Circuit Out of Range
	P1713	No Transmission Fluid Temp. Change for Low Range Operation
	P1714	Shift Solenoid 1, Mechanical Failure
	P1715	Shift Solenoid 2, Mechanical Failure
	P1716	Shift Solenoid 3, Mechanical Failure
	P1717	Shift Solenoid 4, Mechanical Failure
	P1718	No Transmission Fluid Temp. Change for High Range Operation
	P1719	OD Drum Speed Signal Lost During Operation
	P1720	No VSS 2 Signal
	P1729	4x4 Low Switch Error
	P1740	TCC Solenoid, Mechanical Failure Detected
	P1741	TCC Control Error
	P1742	TCC Solenoid Failed ON
	P1743	TCC Solenoid Failed ON
	P1744	TCC System Stuck in OFF Position
	P1746	Electric Pressure Control Solenoid, Open Circuit
	P1747	Electric Pressure Control Solenoid, Short Circuit
	P1749	Electric Pressure Control Solenoid, Failed Low
	P1751	Shift Solenoid A Performance
	P1754	Coast Clutch Solenoid Malfunction
	P1756	Shift Solenoid B Performance
	P1761	Shift Solenoid C Performance
	P1762	SS3/SS4/OD Band Failure
	P1765	3-2 Timing Valve, Open or Short
	P1770	Overrunning Clutch Solenoid, Open or Short
	P1780	Transmission Control Switch Circuit Out of Range
	P1781	4x4 Low Switch Out of Range
	P1783	Transmission Over Temp. Condition
	P1788	Var. Force Solenoid 2, Circuit Open
	P1789	Var. Force Solenoid 2, Circuit Shorted
	P1790	TPS, Open or Short
	P1792	BARO Circuit Malfunction

MAZDA DTCs (CONT.)

YEAR	DTC NO.	DESCRIPTOR
1995-98 OBD II	P1794	Battery or Battery Circuit Failure
	P1795	Idle Switch, Open or Short
	P1797	Park/Neutral Signal, Open or Short
	P1804	4WD High Indicator Circuit
	P1806	4WD High Indicator Short to Voltage
	P1808	4WD Low Indicator Circuit
	P1810	4WD Low Indicator Short to Voltage
	P1812	4WD Mode Select Circuit
	P1815	4x4 Shift Control Switch Short to Ground
	P1820	Transfer Case Relay Module, CW Relay Circuit
	P1822	Transfer Case Relay Module, CW Relay Short to Battery Voltage
	P1824	Elec. Shift Relay Circuit
	P1826	Elec. Shift Relay, Short to Voltage
	P1828	Transfer Case Relay Module, CCW Relay Circuit
	P1830	Transfer Case Relay Module, CCW Relay Short to Battery Voltage
	P1846	Transfer Case Touch Drive Plate A Circuit
	P1848	Transfer Case Touch Drive Plate A, Short to Battery Voltage
	P1850	Transfer Case Touch Drive Plate B Circuit
	P1852	Transfer Case Touch Drive Plate B, Short to Battery Voltage
	P1854	Transfer Case Touch Drive Plate C Circuit
	P1856	Transfer Case Touch Drive Plate C, Short to Battery Voltage
	P1858	Transfer Case Touch Drive Plate D Circuit
	P1860	Transfer Case Touch Drive Plate D, Short to Battery Voltage
	P1862	Transfer Case Touch Drive Plate (Y/W)
	P1864	Transfer Case Touch Drive Plate (Y/W)
	P1866	Transfer Case System Concern
	P1867	Transfer Case Contact Plate

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1. VEHICLES AND SYSTEMS

Using the Asian cartridge, the following Mitsubishi vehicles can be diagnosed.

MODEL	ENGINE	ENGINE TYPE	FUEL TYPE	ADAPTER TYPE	CODE TYPE
1984					
CORDIA	1.8L I4 TURBO	G62B	ECI EFI	NONE	MANCODE
STARION	2.6L I4 TURBO	G54B	TBI	NONE	MANCODE
TREDIA	1.8L I4 TURBO	G62B	ECI EFI	NONE	MANCODE
1985					
CORDIA	1.8L I4 TURBO	G62B	ECI EFI	NONE	MANCODE
GALANT	2.4L I4	G64B	MPI	NONE	MANCODE
MIRAGE	1.6L I4 TURBO	G32B	ECI EFI	NONE	MANCODE
STARION	2.6L I4 TURBO	G54B	ECI EFI	NONE	MANCODE
TREDIA	1.8L I4 TURBO	G62B	ECI EFI	NONE	MANCODE
1986					
CORDIA	1.8L I4 TURBO	G62B	ECI EFI	NONE	MANCODE
GALANT	2.4L I4	G64B	MPI	NONE	MANCODE
MIRAGE	1.6L I4 TURBO	G32B	ECI EFI	NONE	MANCODE
STARION	2.6L I4 TUR INT	G54B	ECI EFI	NONE	MANCODE
STARION	2.6L I4 TURBO	G54B	ECI EFI	NONE	MANCODE
TREDIA	1.8L I4 TURBO	G62B	ECI EFI	NONE	MANCODE

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MODEL	ENGINE	ENGINE TYPE	FUEL TYPE	ADAPTER TYPE	CODE TYPE
1987					
CORDIA	1.8L I4 TURBO	G62B	ECI EFI	NONE	MANCODE
GALANT	2.4L I4	G64B	MPI	CHECK	AUTOCODE
MIRAGE	1.6L I4	G32B	ECI EFI	NONE	MANCODE
STARION	2.6L I4 TUR INT	G54B	ECI EFI	CHECK	AUTOCODES
STARION	2.6L I4 TURBO	G54B	ECI EFI	CHECK	AUTOCODES
TREDIA	1.8L I4 TURBO	G62B	ECI EFI	NONE	MANCODE
VAN/WAGON	2.4L I4	G64B	MPI	CHECK	AUTOCODES
1988					
CORDIA	1.8L I4 TURBO	G62B	ECI EFI	NONE	MANCODE
GALANT SIGMA	3.0L V6	6G72	MPI	CHECK	AUTOCODES
MIRAGE	1.6L I4 TURBO	G32B	ECI EFI	NONE	MANCODE
STARION	2.6L I4 TURBO	G54B	ECI EFI	CHECK	AUTOCODES
TREDIA	1.8L I4 TURBO	G62B	ECI EFI	NONE	MANCODE
VAN/WAGON	2.4L I4	G64B	MPI	CHECK	AUTOCODES
1989					
GALANT	2.0L I4 DOHC	4G63	MPI	CHECK	AUTOCODES
GALANT	2.0L I4 SOHC-8V	4G63	MPI	CHECK	AUTOCODES
MIRAGE	1.5L I4 SOHC	4G15	MPI	CHECK	AUTOCODES
MIRAGE	1.6L I4 DOHC	4G61	MPI	CHECK	AUTOCODES
MONTERO	3.0L V6	6G72	MPI	CHECK	AUTOCODES
SIGMA	3.0L V6	6G72	MPI	CHECK	AUTOCODES
STARION	2.6L I4 TUR INT	G54B	ECI EFI	CHECK	AUTOCODES
VAN/WAGON	2.4L I4	4G64	MPI	CHECK	AUTOCODES

MODEL	ENGINE	ENGINE TYPE	FUEL TYPE	ADAPTER TYPE	CODE TYPE
1990					
ECLIPSE	1.8L I4	4G37	MPI	CHECK	AUTOCODES
ECLIPSE	2.0L I4	4G63	MPI	CHECK	AUTOCODES
ECLIPSE	2.0L I4 TURBO	4G63	MPI	CHECK	AUTOCODES
GALANT	2.0L I4 DOHC	4G63	MPI	CHECK	AUTOCODES
GALANT	2.0L I4 DOHC TUR	4G63	MPI	CHECK	AUTOCODES
GALANT	2.0L I4 SOHC-8V	4G63	MPI	CHECK	AUTOCODES
MIRAGE	1.5L I4 SOHC	4G15	MPI	CHECK	AUTOCODES
MIRAGE	1.6L I4 DOHC	4G61	MPI	CHECK	AUTOCODES
MONTERO	3.0L V6	6G72	MPI	CHECK	AUTOCODES
PRECIS	1.5L I4	G4AM	MPI	CHECK	AUTOCODES
SIGMA	3.0L V6	6G72	MPI	CHECK	AUTOCODES
TRUCK	2.4L I4	4G64	MPI	CHECK	AUTOCODES
TRUCK	3.0L V6	6G72	MPI	CHECK	AUTOCODES
VAN/WAGON	2.4L I4	4G64	MPI	CHECK	AUTOCODES
1991					
3000GT	3.0L V6 DOHC	6G72	MPI	CHECK	AUTOCODES
3000GT	3.0L V6 DOHC TUR	6G72	MPI	CHECK	AUTOCODES
ECLIPSE	1.8L I4	4G37	MPI	CHECK	AUTOCODES
ECLIPSE	2.0L I4	4G63	MPI	CHECK	AUTOCODES
ECLIPSE	2.0L I4 TURBO	4G63	MPI	CHECK	AUTOCODES
GALANT	2.0L I4 DOHC	4G63	MPI	CHECK	AUTOCODES
GALANT	2.0L I4 DOHC TUR	4G63	MPI	CHECK	AUTOCODES
GALANT	2.0L I4 SOHC-8V	4G63	MPI	CHECK	AUTOCODES
MIRAGE	1.5L I4 SOHC	4G15	MPI	CHECK	AUTOCODES
MIRAGE	1.6L I4 DOHC	4G61	MPI	CHECK	AUTOCODES
MONTERO	3.0L V6	6G72	MPI	CHECK	AUTOCODES
PRECIS	1.5L I4	G4AJ	MPI	CHECK	AUTOCODES
TRUCK	2.4L I4	4G64	MPI	CHECK	AUTOCODES
TRUCK	3.0L V6	6G72	MPI	CHECK	AUTOCODES

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MODEL	ENGINE	ENGINE TYPE	FUEL TYPE	ADAPTER TYPE	CODE TYPE
1992					
3000GT	3.0L V6 DOHC	6G72	MPI	CHECK	AUTOCODES
3000GT	3.0L V6 DOHC TUR	6G72	MPI	CHECK	AUTOCODES
DIAMANTE	3.0L V6 DOHC	6G72	MPI	CHECK	AUTOCODES
DIAMANTE	3.0L V6 SOHC	6G72	MPI	CHECK	AUTOCODES
ECLIPSE	1.8L I4 SOHC	4G37	MPI	CHECK	AUTOCODES
ECLIPSE	2.0L I4 DOHC	4G63	MPI	CHECK	AUTOCODES
ECLIPSE	2.0L I4 DOHC TUR	4G63	MPI	CHECK	AUTOCODES
EXPO	2.4L I4	4G64	MPI	CHECK	AUTOCODES
EXPO LRV	1.8L I4	4G93	MPI	CHECK	AUTOCODES
GALANT	2.0L I4 DOHC	4G63	MPI	CHECK	AUTOCODES
GALANT	2.0L I4 DOHC TUR	4G63	MPI	CHECK	AUTOCODES
GALANT	2.0L I4 SOHC-8V	4G63	MPI	CHECK	AUTOCODES
MIRAGE	1.5L I4 SOHC	4G15	MPI	CHECK	AUTOCODES
MIRAGE	1.6L I4 DOHC	4G61	MPI	CHECK	AUTOCODES
MONTERO	3.0L V6	6G72	MPI	CHECK	AUTOCODES
TRUCK	2.4L I4	4G64	MPI	CHECK	AUTOCODES
TRUCK	3.0L V6	6G72	MPI	CHECK	AUTOCODES
1993					
3000GT	3.0L V6 DOHC	6G72	MPI	CHECK	AUTOCODES
3000GT	3.0L V6 DOHC TUR	6G72	MPI	CHECK	AUTOCODES
DIAMANTE	3.0L V6 DOHC	6G72	MPI	CHECK	AUTOCODES
DIAMANTE	3.0L V6 SOHC	6G72	MPI	CHECK	AUTOCODES
DIAMANTE WAGON	3.0L V6 SOHC	6G72	MPI	CHECK	AUTOCODES
ECLIPSE	1.8L I4 SOHC	4G37	MPI	CHECK	AUTOCODES
ECLIPSE	2.0L I4 DOHC	4G63	MPI	CHECK	AUTOCODES
ECLIPSE	2.0L I4 DOHC TUR	4G63	MPI	CHECK	AUTOCODES
EXPO	2.4L I4	4G64	MPI	CHECK	AUTOCODES
EXPO LRV	1.8L I4	4G93	MPI	CHECK	AUTOCODES
EXPO LRV	2.4L I4	4G64	MPI	CHECK	AUTOCODES
GALANT	2.0L I4 DOHC	4G63	MPI	CHECK	AUTOCODES
GALANT	2.0L I4 SOHC-16V	4G63	MPI	CHECK	AUTOCODES
GALANT	2.0L I4 SOHC-8V	4G63	MPI	CHECK	AUTOCODES
MIRAGE	1.5L I4 SOHC	4G15	MPI	CHECK	AUTOCODES
MIRAGE	1.8L I4 SOHC	4G93	MPI	CHECK	AUTOCODES
MONTERO	3.0L V6	6G72	MPI	CHECK	AUTOCODES
PRECIS	1.5L I4	G4AJ	MPI	CHECK	AUTOCODES
TRUCK	2.4L I4	4G64	MPI	CHECK	AUTOCODES
TRUCK	3.0L V6	6G72	MPI	CHECK	AUTOCODES

MODEL	ENGINE	ENGINE TYPE	FUEL TYPE	ADAPTER TYPE	CODE TYPE
1994					
DIAMANTE	3.0L V6 DOHC	6G72	MPI	JUMPER	MANCODE
DIAMANTE	3.0L V6 SOHC	6G72	MPI	JUMPER	MANCODE
DIAMANTE WAGON	3.0L V6 SOHC	6G72	MPI	JUMPER	MANCODE
ECLIPSE	1.8L I4 SOHC	4G37	MPI	CHECK	AUTOCODES
ECLIPSE	2.0L I4 DOHC	4G63	MPI	CHECK	AUTOCODES
ECLIPSE	2.0L I4 DOHC TUR	4G63	MPI	CHECK	AUTOCODES
EXPO	2.4L I4 SOHC	4G64	MPI	JUMPER	MANCODE
EXPO LRV	1.8L I4 SOHC	4G93	MPI	JUMPER	MANCODE
EXPO LRV	2.4L I4 SOHC	4G64	MPI	JUMPER	MANCODE
GALANT	2.4L I4 DOHC	4G64	MPI	JUMPER	MANCODE
GALANT	2.4L I4 SOHC	4G64	MPI	JUMPER	MANCODE
MIRAGE	1.5L I4 SOHC	4G15	MPI	NONE	MANCODE
MIRAGE	1.8L I4 SOHC	4G93	MPI	NONE	MANCODE
MONTERO	3.0L V6 SOHC	6G72	MPI	NONE	MANCODE
MONTERO	3.5L V6 DOHC	6G74	MPI	JUMPER	MANCODE
PRECIS	1.5L I4	G4AJ	MPI	CHECK	AUTOCODES
TRUCK	2.4L I4	4G64	MPI	CHECK	AUTOCODES
TRUCK	3.0L V6	6G72	MPI	CHECK	AUTOCODES

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MODEL	ENGINE	ENGINE TYPE	FUEL TYPE	ADAPTER TYPE	CODE TYPE
1995					
3000GT	3.0L V6	6G72	MFI	JUMPER	MILCODES
3000GT	3.0L V6 TURBO	6G72	MFI	JUMPER	MILCODES
DIAMANTE/WAGON	3.0L V6 SOHC	6G72	MFI	NONE	MANCODES
DIAMANTE	3.0L V6 DOHC	6G72	MFI	NONE	MANCODES
ECLIPSE	2.0L I4	420A	MFI	NONE	MANCODES
ECLIPSE	2.0L I4 TURBO	4G63	MFI	**OBD II** *	AUTOCODES
GALANT	2.4L I4 SOHC	4G64	MFI	NONE	MANCODES
GALANT	2.4L I4 DOHC	4G64	MFI	NONE	MANCODES
MIRAGE	1.5L I4	4G15	MFI	NONE	MANCODES
MIRAGE (CAL)	1.5L I4	4G15	MFI	**OBD II** *	AUTOCODES
MIRAGE	1.8L I4	4G93	MFI	NONE	MANCODES
MIRAGE (CAL)	1.8L I4	4G93	MFI	**OBD II** *	AUTOCODES
EXPO LRV	1.8L I4	4G93	MFI	JUMPER	MANCODES
EXPO LRV (CAL)	1.8L I4	4G93	MFI	**OBD II** *	AUTOCODES
EXPO LRV	2.4L I4	4G64	MFI	NONE	MANCODES
EXPO LRV (CAL)	2.4L I4	4G64	MFI	**OBD II** *	AUTOCODES
EXPO	2.4L I4	4G64	MFI	NONE	AUTOCODES
EXPO (CAL FWD)	2.4L I4	4G64	MFI	**OBD II** *	AUTOCODES
MONTERO	3.0L V6 12 V	4G72	MFI	NONE	MANCODES
MONTERO	3.0L V6 24 V	4G72	MFI	NONE	MANCODES
MONTERO	3.5L V6	4G74	MFI	NONE	MANCODES
TRUCK	2.4L I4	4G64	MFI	NONE	MANCODES
TRUCK	3.0L V6	4G72	MFI	NONE	MANCODES

*** Use Common Test Modes OBD II Systems section for operating instructions and test mode information.**

MODEL	ENGINE	ENGINE TYPE	FUEL TYPE	ADAPTER TYPE	CODE TYPE
1996					
3000GT	3.0L V6	6G72	MFI	**OBD II ***	AUTOCODES
3000GT	3.0L V6 TURBO	6G72	MFI	**OBD II ***	AUTOCODES
DIAMANTE	3.0L V6 SOHC	6G72	MFI	**OBD II ***	AUTOCODES
DIAMANTE	3.0L V6 DOHC	6G72	MFI	**OBD II ***	AUTOCODES
ECLIPSE	2.0L I4 DOHC	420A	MFI	**OBD II ***	AUTOCODES
ECLIPSE	2.0L I4 DOHC TURBO	4G63	MFI	**OBD II ***	AUTOCODES
ECLIPSE	2.4L I4 SOHC	4G64	MFI	**OBD II ***	AUTOCODES
EXPO	2.4L I4	4G64	MFI	**OBD II ***	AUTOCODES
EXPO LRV	2.4L I4	4G64	MFI	**OBD II ***	AUTOCODES
EXPO LRV	1.8L I4	4G93	MFI	**OBD II ***	AUTOCODES
GALANT	2.4L I4	4G64	MFI	**OBD II ***	AUTOCODES
MIRAGE	1.5L I4	4G15	MFI	**OBD II ***	AUTOCODES
MIRAGE	1.8L I4	4G93	MFI	**OBD II ***	AUTOCODES
MONTERO	3.0L V6 12V	4G72	MFI	**OBD II ***	AUTOCODES
MONTERO	3.0L V6 24V	4G72	MFI	**OBD II ***	AUTOCODES
MONTERO	3.0L V6 DOHC	4G74	MFI	**OBD II ***	AUTOCODES
1997					
3000GT	3.0L V6	6G72	MFI	**OBD II ***	AUTOCODES
3000GT	3.0L V6 TURBO	6G72	MFI	**OBD II ***	AUTOCODES
DIAMANTE	3.5L V6	6G74	MFI	**OBD II ***	AUTOCODES
ECLIPSE	2.4L I4	420A	MFI	**OBD II ***	AUTOCODES
ECLIPSE	2.0L I4 TURBO	4G63	MFI	**OBD II ***	AUTOCODES
ECLIPSE SPYDER	2.0L I4 TURBO	4G63	MFI	**OBD II ***	AUTOCODES
ECLIPSE SPYDER	2.4L I4	4G64	MFI	**OBD II ***	AUTOCODES
GALANT	2.4L I4	4G64	MFI	**OBD II ***	AUTOCODES
MIRAGE	1.5L I4	4G15	MFI	**OBD II ***	AUTOCODES
MIRAGE	1.8L I4	4G93	MFI	**OBD II ***	AUTOCODES
MONTERO	3.5L V6	6G74	MFI	**OBD II ***	AUTOCODES
MONTERO SPORT	2.4L I4	4G64	MFI	**OBD II ***	AUTOCODES
MONTERO SPORT	3.0L V6	6G72	MFI	**OBD II ***	AUTOCODES
1998					
3000GT	3.0L V6	6G72	MFI	**OBD II ***	AUTOCODES
3000GT	3.0L V6 TURBO	6G72	MFI	**OBD II ***	AUTOCODES
DIAMANTE	3.5L V6	6G74	MFI	**OBD II ***	AUTOCODES
ECLIPSE	2.0L I4	420A	MFI	**OBD II ***	AUTOCODES
ECLIPSE	2.0L I4 TURBO	4G63	MFI	**OBD II ***	AUTOCODES
ECLIPSE SPYDER	2.4L I4	4G64	MFI	**OBD II ***	AUTOCODES
ECLIPSE SPYDER	2.0L I4 TURBO	4G63	MFI	**OBD II ***	AUTOCODES
GALANT	2.4L I4	4G64	MFI	**OBD II ***	AUTOCODES
MIRAGE	1.5L I4	4G15	MFI	**OBD II ***	AUTOCODES
MIRAGE	1.8L I4	4G93	MFI	**OBD II ***	AUTOCODES
MONTERO	3.5L V6	6G74	MFI	**OBD II ***	AUTOCODES
MONTERO SPORT	2.4L I4	4G64	MFI	**OBD II ***	AUTOCODES
MONTERO SPORT	3.0L V6	6G72	MFI	**OBD II ***	AUTOCODES

*** Use Common Test Modes OBD II Systems section for operating instructions and test mode information.**

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2. MITSUBISHI SPECIFIC INFORMATION

The Mitsubishi vehicles covered by the Asian Imports Cartridge are separated into two different sections within the Asian Imports Operator's Manual. The vehicle's on-board system will determine which section of the Operator's Manual will need to be used. Vehicles that are OBD II certified have information about the operating test modes in the Common Test Modes OBD II Systems section of the Operator's Manual. Vehicles that have OBD or OBD I systems have test mode information in this section of the Operator's Manual. In these sections, you will find information on test modes available, how to connect the tester to the vehicle, and operating instructions for the different test modes. A complete list of Mitsubishi Diagnostic Trouble Codes is included at the back of each section.

To determine which section of the Operator's Manual to use for diagnostic information and instructions, look at Adapter Type of the Vehicle and Systems chart. If the vehicle you are testing has an OBD II adapter type, use the Common Test Modes OBD II Systems section of the Operator's Manual. If the vehicle you are testing does not have the OBD II Adapter Type, use this section to diagnose the vehicle under test.

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3. TEST MODES AVAILABLE

The following test modes are available when testing Mitsubishi vehicles. Operating instructions for test modes other than the DTC ENTRY and DTCs are included in the Common Test Modes OBD, OBD I Systems section. There are also Mitsubishi specific instructions for operating the test modes. Refer to Section 6 (Test Modes).

MODE F1: DTC ENTRY
- SUBMODE F0: HOW TO READ
- SUBMODE F1: ENTER DTC(s)
- SUBMODE F2: DTC LIST
- SUBMODE F3: REVIEW DTC
- SUBMODE F4: CLEAR DTC (s)

MODE F2: DTC
- SUBMODE F1: READ DTC(s)
- SUBMODE F2: DTC LIST
- SUBMODE F3: REVIEW DTC
- SUBMODE F4: CLEAR DTC(s)

MODE F5: SYSTEM TESTS
- SUBMODE F0: PREP VEHICLE

MODE F8: INFORMATION
- SUBMODE F1: DLC LOCATION*
- SUBMODE F3: ID INFO
- SUBMODE F4: DJC LOCATION*

* Note that not all models support DJC, or DLC Location Test modes. The tester will automatically choose which test mode to display, depending on your vehicle selection.

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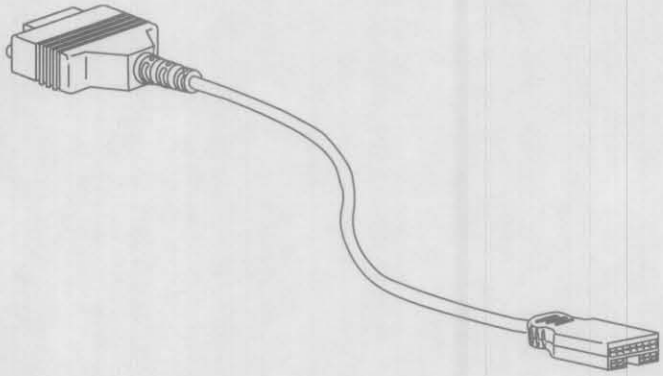
4. GETTING STARTED

Before operating the Asian Imports Cartridge with a Mitsubishi vehicle, the following steps must be performed:

1. Make sure the vehicle ignition is OFF.

2. Refer to the Vehicles and Systems table to see if the vehicle you are testing requires the Check Adapter Cable. If so, connect the Mitsubishi Check Adapter Cable to the end of the DLC cable, then connect the yellow connector end to the vehicle Check connector.



MITSUBISHI CHECK ADAPTER CABLE

3. Plug the tester power cable into the vehicle cigarette lighter. The power cable may also be directly connected to the battery via the optional battery clip adapter (P/N 02001636).

   NOTE: Since the cigarette lighter can be switched, some tests require that the power cable be directly connected to the battery via the battery clip adapter.

4. Turn on the tester and select the application software that you will be using. Verify that the correct screen is displayed. The tester should display a screen similar to the one below.

Tester stand-alone display

5. If the display is correct, press ENTER. If the display is not correct, refer to Appendix D.

6. Follow the instructions on the following page to select the vehicle type you are testing by entering required vehicle information into the tester.

5. SELECTING THE VEHICLE

Once you've pressed ENTER from the power-up screen, the following steps must be performed to select the manufacturer, model year, model and engine type of the vehicle being tested. Remember, if you make a mistake, you can always press EXIT to go back to the previous menu.

SELECTING THE MANUFACTURER

A menu of manufacturers available for testing is displayed in a scrolling menu. You can scroll down one screen at a time by pressing YES, or up one screen at a time by pressing NO. Press ↑ or ↓ to scroll one manufacturer at a time, until the → arrow is opposite the manufacturer you wish to select.

Press ↑ or ↓ to scroll to Mitsubishi. Then press ENTER to select.

SELECTING THE MODEL YEAR

Once the manufacturer is selected, the Select Model Year menu is displayed. Press the last two digits of the year model being tested; 9, 0 for 1990 models; 9, 1 for 1991 models, and so on.

SELECTING THE MODEL

The Model Select menu displays models available for testing. Press the NO key until the model being tested is displayed, then press the YES key.

SELECTING THE ENGINE AND ENGINE TYPE

Next, the Select Engine menu is displayed. Press NO until the engine and fuel type of the vehicle is displayed, then press YES.

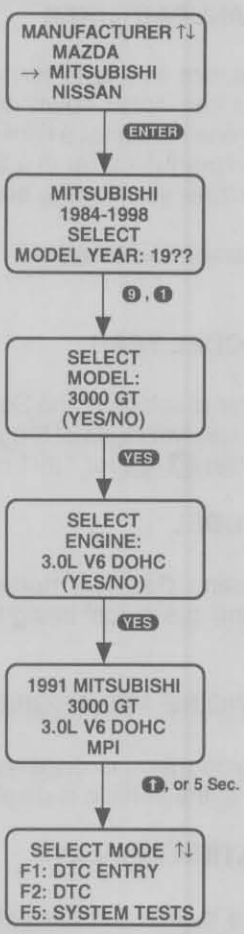
VEHICLE INFORMATION DISPLAY

After the vehicle type is selected the tester displays a summary screen of the selected vehicle. Information displayed includes the year, manufacturer, model, engine size, and additional information such as the type of fuel system.

SELECT MODE MENU

When the above steps are completed, the Select Mode menu displays the test modes available for the selected vehicle and system. Refer to Section 6 (Test Modes), and the Common Test Modes OBD, OBD I Systems section for instructions on operating the test modes with Mitsubishi vehicles.

MITSUBISHI VEHICLE SELECTION



ACTIVE KEYS	
0 - 9	Enter model year.
YES NO	Used to answer questions in tester display.
EXIT	Return to previous display

6. TEST MODES

When the Select Mode menu is displayed, test modes available for Mitsubishi vehicles may be selected.

Operating instructions for test modes other than DTC Entry and DTCs are included in the Common Test Modes OBD, OBD I Systems section. You may select these modes without connecting the tester to the vehicle.

READING CODES

Detailed operating instructions for using Modes F1: DTC ENTRY and F2: DTC with Mitsubishi vehicles are included in the following procedure. F1: DTC Entry is displayed with all Mitsubishi vehicles, and F2: DTC is automatically displayed with Mitsubishi vehicles that have "CHECK" as the adapter type listed in Vehicles and Systems section.

IMPORTANT:
Follow the Submode F0: Prepare Vehicle instructions to ensure proper vehicle preparation prior to testing. The vehicle must be completely warmed up in order for the tester to communicate properly with the vehicle.

DTC ENTRY	MODE F1

When Mode F1: DTC Entry is selected, the tester displays submodes which, after your selection, can provide information on how to read diagnostic trouble codes (DTCs) from the vehicle, how to clear DTCs from the vehicle (or tester memory buffer), obtain a text description of entered or selected DTCs, and review entered or selected DTCs as a result of manually retrieving codes from the ECU.

DTC ENTRY SUBMODES
F0: HOW TO READ
F1: ENTER DTC(s)
F2: DTC LIST
F3: REVIEW DTC
F4: CLEAR DTC(s)

MODE F1	DTC ENTRY

Manually reading DTCs

To manually read Diagnostic Trouble Codes (DTCs) on Mitsubishi vehicles from 1984-95, there are 2 methods that can be used. The most common method requires an analog voltmeter. Using the analog voltmeter set to a 20v scale and connected to the Data Link Connector (DLC), the DTC can be interpreted from the analog voltmeter needle flashes. The second method requires the 16 pin Mitsubishi Jumper (P/N 02002095) which connects 2 pins of the 16 pin DLC to flash DTCs on the instrument panel mounted Malfunction Indicator Lamp (MIL).

For the automobile manufacturers that mention the use of an analog voltmeter to read manual DTCs, the Mastertech Oscilloscope may be used. Set up the single channel oscilloscope and make connections the same way as the analog voltmeter (above). Choose the 20v/division scale and a slow time/division (e.g. 1-2 sec/division) —the DTCs will be shown as a waveform on the display.

Note that manually retrieving DTCs from select 1994-95 Mitsubishi vehicles requires you to locate and jumper the 16 pin Diagnostic Connector. The vehicles that require the use of a jumper are noted as "Jumper" in the Adapter Type column in the Mitsubishi coverage table (found at the beginning of this section). Refer to the section on manually reading DTCs from the 1994-95 Mitsubishi vehicles in this section.

To manually read DTCs on select 1994-95 Mitsubishi vehicles, locate the Malfunction Indicator Lamp (MIL) and observe the flashing MIL.

Follow the detailed instructions on the following pages to manually read the DTCs. Once the DTCs have been manually read from the ECU, the tester can define the code. A complete list of Mitsubishi DTCs is also included in Section 7.

DTC ENTRY	MODE F1
HOW TO READ	SUBMODE F0

This submode provides information on how to manually read DTCs from the vehicle. Step by step screen instructions provide information to correctly set up the vehicle ECU. This is performed by following the tester instruction screens. If you have trouble, additional DTC retrieval information is described below. If you refer to the manual for this information, make sure that you are following the correct steps for the system that you are working on.

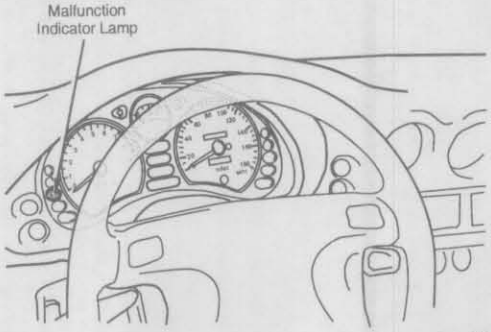
DTC ENTRY	MODE F1
ENTER DTC(s)	SUBMODE F1

On Mitsubishi vehicles, the Enter DTCs submode allows you to enter manually read DTCs. This submode provides you with a text description of the numeric DTC that was entered into the tester.

The Enter DTC Submode displays two question marks for DTC Entry. The tester screen prompts you to enter the DTCs read from an analog voltmeter or the Malfunction Indicator Light (MIL). Be careful when reading the DTC from the analog voltmeter or MIL. Incorrect voltmeter or MIL interpretation can cause the wrong DTC description to be displayed. Once all DTCs have been manually read and recorded, enter each DTC into the tester as described in the Common Test Modes OBD, OBD I Systems section.

Mitsubishi service and repair information indicates that Code 0 is supported for OBD systems. Code 0 refers to ECU-related failures, and is valid when the engine MIL does not illuminate or will not illuminate for 2 seconds when turning ignition on. Refer to the service manual for further explanation of Code 0.

Refer to the appropriate procedure for manually reading ECU LED DTCs on the following pages.

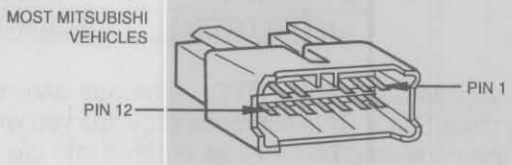


Manually reading DTCs from models that use 12 pin or 12 pin and 16 pin DLC and analog voltmeter:

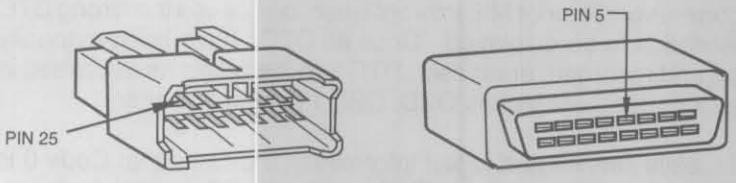
DLC type is vehicle dependent; refer to information displayed on tester F0: HOW TO READ for DLC type.

1. Locate the 12 pin or 12 pin and 16 pin Diagnostic Connector.

2a. **12 PIN DLC ONLY:** Connect analog voltmeter red lead to pin 1 diagnosis terminal and voltmeter black lead to pin 12 (ground) terminal of diagnosis connector.



2b. **12 PIN and 16 PIN DLC ONLY:** Connect analog voltmeter red lead to pin 25 of 12 pin DLC, and black lead to pin 5 of 16 pin DLC.



3. Turn ignition switch to ON.

4. DTC indication will begin on voltmeter.

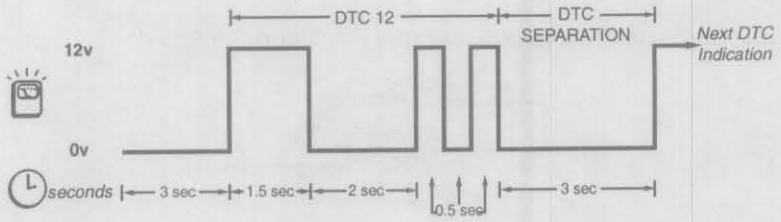
   Voltmeter will fluctuate 0v to 12v if DTCs are stored in ECU. If a DTC is stored in ECU, the first number of 12v, 1.5 sec. indications will equal the 10s digit of a 2-digit DTC. After a 2.0 second pause, the second number of 12v, 0.5 sec. indications will equal the 1s digit. DTCs are separated by 0v indication for 3.0 sec..

5. If no malfunctions are present, meter will read 12v once per second.

6. After recording DTCs turn ignition switch off.

7. Disconnect voltmeter leads.

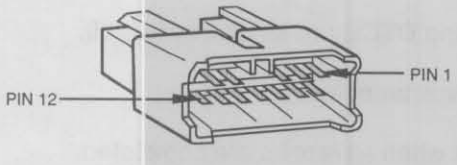
8. Erase DTCs when all repairs are completed.



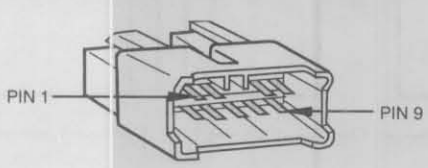
Manually reading DTCs from 1985-87 Mitsubishi Galant, 1987-88 Mitsubishi Van/Wagon that use 9 pin or 12 pin DLC and Analog Voltmeter with Digital Decimal output:

1. Locate the 9 or 12 pin Diagnostic Connector.

2a. Connect analog voltmeter red lead to pin 1 diagnosis terminal and voltmeter black lead to pin 12 (12 pin) or pin 9 (9 pin) terminal of diagnosis connector.



2b. Same as in 2a above, but use Pin 1 and Pin 9.



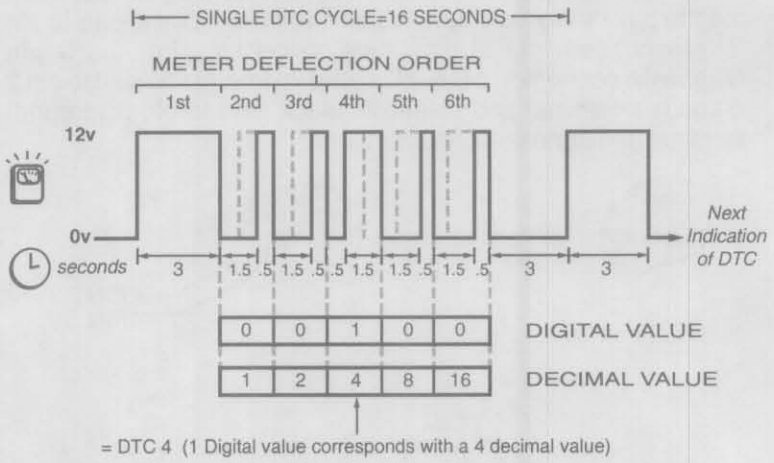
3. Turn ignition switch to ON.

Each DTC output cycle takes 16s. The first 12v deflection corresponds to a 3 sec. Start indication; second 12v deflection corresponds to a decimal value of 1; third 12v deflection corresponds to a decimal value of 2; fourth 12v deflection corresponds to a decimal value of 4; fifth 12v deflection corresponds to a decimal value of 8; sixth 12v deflection corresponds to a decimal value of 16, followed by a 0v Stop indication for 3s. DTCs are decoded by interpreting the ON time of meter 12v deflections 2-6. If the meter displays 12v for 1.5 sec., then that digital value is 1. If the meter displays 12v for 0.5 sec., then that digital value is 0. To get the value of the DTC add the decimal value of digital 1's obtained in the meter deflection order. DTCs are separated by 12v, 3 sec. reading after the Stop indication.

4. The normal DTC condition is indicated by meter indications 2-6, which are 12v, 1.5 sec. deflections separated by 0v, 0.5 sec.

5. After recording DTCs turn ignition switch off.
6. Disconnect voltmeter leads.

7. Erase DTCs when all repairs are completed.

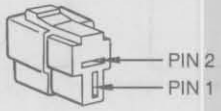


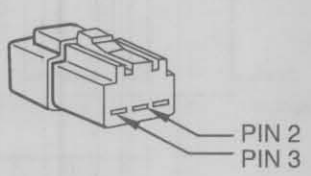
Manually reading DTCs from Models that use 2 pin or 3 pin DLC and analog voltmeter:

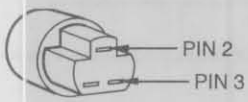
DLC type is vehicle dependent; refer to information displayed on tester F0: HOW TO READ for DLC type.

1. Locate the 2 pin or 3 pin Diagnostic Connector.

2. For the **2 pin** diagnostic connector, connect analog voltmeter red lead to pin 1 diagnosis terminal and voltmeter black lead to pin 2 (ground) terminal of diagnosis connector. For the **3 pin** diagnostic connector, connect analog voltmeter red lead to pin 2 diagnosis terminal and voltmeter black lead to pin 3 (ground) terminal of diagnosis connector.







3. Turn ignition switch to ON.

4. DTC indication will begin on voltmeter.

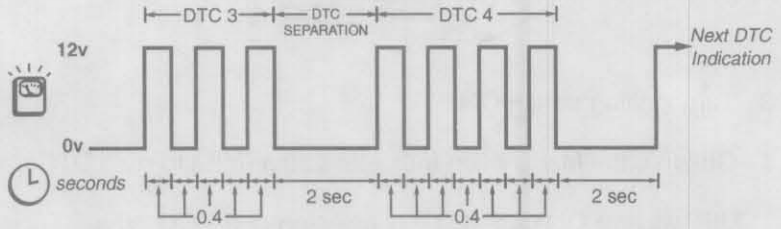
   Voltmeter will fluctuate 0v to 12v if DTCs are stored in ECU. If a DTC is stored in ECU, the first number of 12v, 0.4s indications will equal the 1s digit of a 1-digit DTC. DTC 12v pulses will be output every 0.4s. DTCs are separated by 0v for 2s indication.

5. If no DTCs are in ECU, voltmeter will read constant 12v.

6. After recording DTCs turn ignition switch off.

7. Disconnect voltmeter leads.

8. Erase DTCs when all repairs are completed.

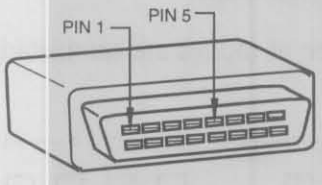


Manually Reading DTCs from 1994-95 Mitsubishi Vehicles using the dashboard malfunction indicator lamp:

DLC type is vehicle dependent; refer to information displayed on tester F0: HOW TO READ for DLC type.

1. Locate the 16 pin Diagnostic Connector.

2. Jumper the 16 pin diagnostic connector pins 1 and 5 with the single wire Mitsubishi/Chrysler Imports jumper (P/N 02002106). Use F4: DJC LOCATION for diagnostic connector location.



3. Turn ignition switch ON.

4. Observe the Malfunction Indicator Lamp (MIL) to read DTCs.

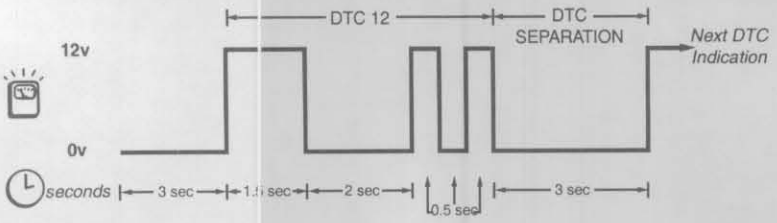
   MIL will turn ON/OFF if DTCs are stored in ECU. If a DTC is stored in ECU, the first number of MIL flashes indicates the 10s digit of a 2-digit DTC. After a 2.0 second pause, the second number of MIL flashes indicates the 1s digit. Each DTC is separated by MIL OFF for 3.0s.

5. If no malfunctions are present, MIL will read ON once per second.

6. After recording DTCs turn ignition switch off.

7. Disconnect jumper leads.

8. Erase DTCs when all repairs are completed.



DTC ENTRY	MODE F1
DTC LIST	SUBMODE F2

This submode provides you with a way to view all possible ECU DTCs, including DTC numbers and descriptions. You can also select the DTCs obtained from the analog voltmeter or MIL as an alternative way of entering DTCs into the tester's memory. As you scroll through the available DTCs you can view a description of the DTC obtained from the analog voltmeter or MIL. You can "Select" the DTC on the tester screen for later review or printing. Refer to the Common Test Modes OBD, OBD I Systems section for further information.

MODE F1	DTC ENTRY
SUBMODE F3	REVIEW DTC

This submode provides you with a review of the DTC(s) that you entered or selected in the tester. The description of the entered or selected DTC(s) will be displayed, along with a numerical summary of the entered or selected DTC(s). Review DTC is intended to provide you with an electronic clipboard that keeps track of the DTCs that you have encountered during diagnosis.

DTC ENTRY	MODE F1
CLEAR DTC(s)	SUBMODE F4

This submode has two options for you to chose. Option F0 is to view text screens that provide information on how to clear the DTCs from ECU memory. This is performed by tester keypad presses. Option F1 clears the tester memory from DTCs that you entered or selected in the tester. The clear DTC(s) mode is helpful and provides information that you would normally have to locate in a service manual.

MODE F2	DTC

To read DTCs on all 1989-93 and select 1987-88 and 1994-95 Mitsubishi vehicles you will need to locate the vehicle DLC and connect the Mitsubishi Check Adapter to the tester and vehicle.

To locate the DLC, select F1: DLC LOCATION from the Information menu. If necessary, refer to the Common Test Modes OBD, OBD I Systems section for further instructions.

When Mode F2: DTC is selected, the tester displays four DTC submodes:

F1: READ DTC(s)
F2: DTC LIST
F3: REVIEW DTC
F4: CLEAR DTC(s)

MODE F2	DTC
SUBMODE F1	READ DTC(s)

This submode provides automated DTC retrieval from the vehicle ECU. Step by step screen instructions guide you to connect the YELLOW Mitsubishi Check adapter to the vehicle DLC and to start and warm the engine to normal operating temperature. This is performed by following the tester instruction screens. If you have trouble, additional F1: READ DTC(s) retrieval information is described below.

This submode is available for all 1989-93 and select 1987, 1988, and 1994-95 Mitsubishi vehicles. If you are unsure of the Read DTC test application, check the Code Type column in the Mitsubishi Vehicle Coverage table (found at the beginning of this section). If the ECU Modes column indicates "Autocodes", then the vehicle supports F1: READ DTC(s).

Note: when reading DTCs from Mitsubishi vehicles make sure the engine is at normal operating temperature and testing is performed in a well-ventilated area.

Reading DTCs from all 1989-93 and selected 1987, 1988, and 1994-95 Mitsubishi ECUs using the F1: Read DTCs mode in Asian Imports cartridge:

1. Insert Asian cartridge into MASTERTECH or TECH 1/TECH 1A.
2 Connect Mitsubishi Check adapter (Yellow) to DLC.
3. Connect the Check adapter to the vehicle DLC. Press F1: DLC LOCATION from the Information menu for Data Link Connector location assistance.
4. Power MASTERTECH or TECH 1/TECH 1A with 12v power cable.
5. Select Mitsubishi vehicle to test.
6. Press F2: DTCs from Mitsubishi test mode menu.
7. Press F1: READ DTCs submode from DTC test menu. Follow instructions on the tester display.
8. Tester will automatically command the vehicle ECU into the correct mode required to read DTCs, and will display all received DTCs on the tester display.

MODE F2	DTC
SUBMODE F2	DTC LIST

This submode provides you with a way to view all possible ECU DTCs, including DTC numbers and descriptions. You can also select the DTCs obtained from the analog voltmeter or MIL. as an alternative way of entering DTCs into the tester's memory. As you scroll through the available DTCs you can view a description of the DTC obtained from the analog voltmeter or MIL. You can "Select" the DTC on the tester screen for later review or printing. Refer to the Common Test Modes OBD, OBD I Systems section for further information.

MODE F2	DTC
SUBMODE F3	REVIEW DTC

This submode provides you with a review of the DTCs that you entered or selected in the tester. The description of the entered or selected DTC will be displayed, along with a numerical summary of the entered or selected DTC. Review DTC is intended to provide you with an electronic clipboard that keeps track of the DTCs that you have encountered during diagnosis.

MODE F2	DTC
SUBMODE F4	CLEAR DTC(s)

This submode has two options for you to chose. Option 1 is a series of instructions which inform you how to clear DTCs from the ECU. Option 2 clears DTC's from the tester's memory that you entered or selected. The clear DTC(s) mode is helpful and provides information that you would normally have to locate in a service manual.

IMPORTANT:
Follow the Submode F0: Prepare Vehicle instructions to ensure proper vehicle preparation prior to testing. The vehicle must be completely warmed up in order for the tester to communicate properly with the vehicle.

7. MITSUBISHI DIAGNOSTIC TROUBLE CODES (DTCs)

DTCs available for Mitsubishi vehicles are listed in the following charts.

Some code numbers have different descriptors depending on the selected vehicle. Only codes available for the selected vehicle are displayed by the tester.

OBD, OBD I SYSTEMS

YEAR	DTC NO.	DESCRIPTOR
1984	1	O2 SENSOR OR CKT FAILURE
	2	IGNITION SIGNAL OR CKT FAILURE
	3	AIR FLOW SENSOR OR CKT FAILURE
	4	PRESSURE SENSOR OR CKT FAILURE
	5	TP SENSOR OR TPS CKT FAILURE
	6	ISC MOTOR POS. SWITCH OR CKT
	7	ENGINE COOLANT TEMP. SENSOR
	8	VEHICLE SPEED SENSOR OR CKT

YEAR	DTC NO.	DESCRIPTOR
1985	1	O2 SENSOR OR CKT FAILURE
	2	IGNITION SIGNAL OR CKT FAILURE
	3	AIR FLOW SENSOR OR CKT FAILURE
	4	PRESSURE SENSOR OR CKT FAILURE
	5	TP SENSOR OR TPS CKT FAILURE
	6	ISC MOTOR POS. SWITCH OR CKT
	7	ENGINE COOLANT TEMP. SENSOR

MITSUBISHI DTCs

YEAR	DTC NO.	DESCRIPTOR
1986	1	O2 SENSOR OR CKT FAILURE
	2	IGNITION SIGNAL OR CKT FAILURE
	3	AIR FLOW SENSOR OR CKT FAILURE
	4	PRESSURE SENSOR OR CKT FAILURE BARO SENSOR OR CIRCUIT FAILURE
	5	TP SENSOR OR TPS CKT FAILURE
	6	ISC MOTOR POS. SWITCH OR CKT
	7	ENGINE COOLANT TEMP. SENSOR
	8	NO. 1 CYL SENSOR OR CKT FAILURE
	9	NORMAL OPERATION

YEAR	DTC NO.	DESCRIPTOR
1987	1	O2 SENSOR OR CKT FAILURE
	2	IGNITION SIGNAL OR CKT FAILURE CRANK ANGLE SENSOR OR CKT
	3	AIR FLOW SENSOR OR CKT FAILURE
	4	PRESSURE SENSOR OR CKT FAILURE BARO SENSOR OR CKT FAILURE
	5	TP SENSOR OR TPS CKT FAILURE
	6	ISC MOTOR POS. SWITCH OR CKT
	7	ENGINE COOLANT TEMP. SENSOR
	8	NO. 1 CYL TDC SENSOR OR CKT

MITSUBISHI DTCs

YEAR	DTC NO.	DESCRIPTOR
1988	1	O2 SENSOR OR CKT FAILURE
	2	IGNITION SIGNAL OR CKT FAILURE CRANK ANGLE SENSOR OR CKT
	3	AIR FLOW SENSOR OR CKT FAILURE
	4	PRESSURE SENSOR OR CKT FAILURE BARO SENSOR OR CKT FAILURE
	5	TP SENSOR OR TPS CKT FAILURE
	6	ISC MOTOR POS. SWITCH OR CKT MOTOR POSITION SENSOR OR CKT
	7	ENGINE COOLANT TEMP. SENSOR
	8	NO. 1 CYL TDC SENSOR OR CKT
	11	O2 SENSOR OR CKT FAILURE
	12	AIR FLOW SENSOR OR CKT FAILURE
	13	IAT SENSOR OR CKT FAILURE
	14	TP SENSOR OR TPS CKT FAILURE
	21	ENGINE COOLANT TEMP. SENSOR
	22	CRANK ANGLE SENSOR OR CKT
	23	NO. 1 CYL TDC SENSOR OR CKT
	24	SPEED SENSOR OR CKT FAILURE
	25	BARO SENSOR OR CKT FAILURE
	41	INJECTOR OR CKT FAILURE
	42	FUEL PUMP OR CKT FAILURE
	43	EGR SYSTEM: VALVE, SOLENOID, VAC, OR TEMP. SENSOR

MITSUBISHI DTCs

YEAR	DTC NO.	DESCRIPTOR
1989	0	ECU OR CIRCUIT FAILURE
	1	O2 SENSOR OR CKT FAILURE
	2	IGNITION SIGNAL OR CKT FAILURE
	3	AIR FLOW SENSOR OR CKT FAILURE
	5	TP SENSOR OR TPS CKT FAILURE
	6	ISC MOTOR POS. SWITCH OR CKT
	7	ENGINE COOLANT TEMP. SENSOR
	11	O2 SENSOR OR CKT FAILURE
		HEATED O2 SENSOR OR CKT FAILURE
	12	AIR FLOW SENSOR OR CKT FAILURE
	13	IAT SENSOR OR CKT FAILURE
	14	TP SENSOR OR TPS CKT FAILURE
	15	MOTOR POSITION SENSOR OR CKT
		ISC MOTOR POS. SENSOR OR CKT
	21	ENGINE COOLANT TEMP. SENSOR
	22	CRANK ANGLE SENSOR OR CKT
	23	NO. 1 CYL TDC SENSOR OR CKT
		TDC SENSOR OR CIRCUIT FAILURE
		CAMSHAFT POS. SENSOR OR CKT
	24	SPEED SENSOR OR CKT FAILURE
	25	BARO SENSOR OR CKT FAILURE
	31	KS OR KS CIRCUIT FAILURE
	41	INJECTOR OR CKT FAILURE
	42	FUEL PUMP OR CKT FAILURE
	43	EGR SYSTEM: VALVE, SOLENOID, VAC, OR TEMP. SENSOR
	44	IGNITION COIL OR CKT FAILURE
		IGNITION SIGNAL OR CKT FAILURE

MITSUBISHI DTCs

YEAR	DTC NO.	DESCRIPTOR
1990	0	ECU OR CIRCUIT FAILURE
	11	O2 SENSOR OR CKT FAILURE
		HEATED O2 SENSOR OR CKT FAILURE
	12	AIR FLOW SENSOR OR CKT FAILURE
	13	IAT SENSOR OR CKT FAILURE
	14	TP SENSOR OR TPS CKT FAILURE
	15	MOTOR POSITION SENSOR OR CKT
		ISC MOTOR POS. SENSOR OR CKT
	21	ENGINE COOLANT TEMP. SENSOR
	22	CRANK ANGLE SENSOR OR CKT
	23	NO. 1 CYL TDC SENSOR OR CKT
		NO. 1 & 4 CYL. TDC SENSOR OR CKT
		TDC SENSOR OR CIRCUIT FAILURE
		CAMSHAFT POS. SENSOR OR CKT
	24	SPEED SENSOR OR CKT FAILURE
	25	BARO SENSOR OR CKT FAILURE
	31	KS OR KS CIRCUIT FAILURE
	41	INJECTOR OR CKT FAILURE
	42	FUEL PUMP OR CKT FAILURE
	43	EGR SYSTEM: VALVE, SOLENOID, VAC, OR TEMP. SENSOR
	44	IGNITION COIL OR CKT FAILURE
		IGNITION SIGNAL OR CKT FAILURE

MITSUBISHI DTCs

YEAR	DTC NO.	DESCRIPTOR
1991	0	ECU OR CIRCUIT FAILURE
	11	O2 SENSOR OR CKT FAILURE
		REAR BANK O2 OR CKT FAILURE
		HEATED O2 SENSOR OR CKT FAILURE
	12	AIR FLOW SENSOR OR CKT FAILURE
	13	IAT SENSOR OR CKT FAILURE
	14	TP SENSOR OR TPS CKT FAILURE
	15	MOTOR POSITION SENSOR OR CKT
		ISC MOTOR POS. SENSOR OR CKT
	21	ENGINE COOLANT TEMP. SENSOR
	22	CRANK ANGLE SENSOR OR CKT
	23	NO. 1 CYL TDC SENSOR OR CKT
		NO. 1 & 4 CYL. TDC SENSOR OR CKT
		TDC SENSOR OR CIRCUIT FAILURE
		CAMSHAFT POS. SENSOR OR CKT
	24	SPEED SENSOR OR CKT FAILURE
	25	BARO SENSOR OR CKT FAILURE
	31	KS OR KS CIRCUIT FAILURE
	36	IGNITION TIMING ADJUSTMENT
	39	O2 SENSOR OR CKT FAILURE
		FRONT BANK O2 SENSOR OR CKT
	41	INJECTOR OR CKT FAILURE
	42	FUEL PUMP OR CKT FAILURE
	43	EGR SYSTEM: VALVE, SOLENOID, VAC, OR TEMP. SENSOR
	44	IGNITION COIL OR CKT FAILURE
		IGNITION SIGNAL OR CKT FAILURE
		IGN SIGNAL OR CKT (NO. 1 & 4 CYL)
	52	IGN SIGNAL OR CKT (NO. 2 & 5 CYL)
	53	IGN SIGNAL OR CKT (NO. 3 & 6 CYL)
	61	TORQUE REDUCED SIGNAL OR CKT
	62	INDUCTION CNTRL VALVE POS. SNSR

MITSUBISHI DTCs

YEAR	DTC NO.	DESCRIPTOR
1992	0	ECU OR CIRCUIT FAILURE
	11	O2 SENSOR OR CKT FAILURE
		HEATED O2 SENSOR OR CKT FAILURE
		REAR BANK HEATED O2 SNSR OR CKT
	12	AIR FLOW SENSOR OR CKT FAILURE
	13	IAT SENSOR OR CKT FAILURE
	14	TP SENSOR OR TPS CKT FAILURE
	15	MOTOR POSITION SENSOR OR CKT
	21	ENGINE COOLANT TEMP. SENSOR
	22	CRANK ANGLE SENSOR OR CKT
	23	TDC SENSOR OR CIRCUIT FAILURE
		NO.1 CYL TDC SENSOR OR CKT
		NO.1 & 4 CYL. TDC SENSOR OR CKT
		CAMSHAFT POS. SENSOR OR CKT
	24	SPEED SENSOR OR CKT FAILURE
	25	BARO SENSOR OR CKT FAILURE
	31	KS OR KS CIRCUIT FAILURE
	36	IGNITION TIMING ADJUSTMENT
	39	FRONT BANK O2 SENSOR OR CKT
	41	INJECTOR OR CKT FAILURE
	42	FUEL PUMP OR CKT FAILURE
	43	EGR SYSTEM: VALVE, SOLENOID, VAC, OR TEMP. SENSOR
	44	IGN SIGNAL OR CKT (NO. 1 & 4 CYL)
		IGNITION SIGNAL OR CKT FAILURE
	52	IGN SIGNAL OR CKT (NO. 2 & 5 CYL)
	53	IGN SIGNAL OR CKT (NO. 3 & 6 CYL)
	55	IAC VALVE POS. SENSOR OR CKT
	61	TORQUE REDUCED SIGNAL OR CKT
	62	INDUCTION CNTRL VALVE POS. SNSR
	71	VACUUM CONTROL SOLENOID VALVE
	72	VENT CONTROL SOLENOID VALVE

MITSUBISHI DTCs

YEAR	DTC NO.	DESCRIPTOR
1993	0	ECU OR CIRCUIT FAILURE
	11	O2 SENSOR OR CKT FAILURE
		HEATED O2 SENSOR OR CKT FAILURE
		O2 SNSR OR FRONT HEATED O2 SNSR
		FRONT O2 SENSOR OR CKT FAILURE
		REAR BANK HEATED O2 SNSR OR CKT
	12	VOLUME AIR FLOW SNSR OR CKT
	13	IAT SENSOR OR CKT FAILURE
	14	TP SENSOR OR TPS CKT FAILURE
	15	ISC MOTOR POS. SENSOR OR CKT
		MOTOR POSITION SENSOR OR CKT
	21	ENGINE COOLANT TEMP. SENSOR
	22	CRANK ANGLE SENSOR OR CKT
	23	CAMSHAFT POS. SENSOR OR CKT
		NO.1 CYL TDC SENSOR OR CKT
	24	SPEED SENSOR OR CKT FAILURE
	25	BARO SENSOR OR CKT FAILURE
	31	KS OR KS CIRCUIT FAILURE
	32	MAP SENSOR OR CKT FAILURE
	36	IGNITION TIMING ADJUSTMENT
	39	FRONT HEATED O2 SENSOR OR CKT
	41	INJECTOR OR CKT FAILURE
	42	FUEL PUMP OR CKT FAILURE
	43	EGR SYSTEM: VALVE, SOLENOID,
		VAC, OR TEMP. SENSOR
	44	IGNITION SIGNAL OR CKT FAILURE
		IGN SIGNAL OR CKT (NO. 1 & 4 CYL)
	52	IGN SIGNAL OR CKT (NO. 2 & 5 CYL)
	53	IGN SIGNAL OR CKT (NO. 3 & 6 CYL)
	55	IAC VALVE POS. SENSOR OR CKT
	59	REAR HEATED O2 SENSOR OR CKT
	61	TORQUE REDUCED SIGNAL OR CKT
	62	INDUCTION CNTRL VALVE POS. SNSR
	71	TRACTION CONTROL VACUUM SOLENOID
	72	TRACTION CONTROL VENT SOLENOID

MITSUBISHI DTCs

YEAR	DTC NO.	DESCRIPTOR
1994	0	ECU OR CIRCUIT FAILURE
	11	HEATED O2 SENSOR OR CKT FAILURE
		O2 SENSOR OR CKT FAILURE
		FRONT HEATED O2 OR CKT FAILURE
		O2 SNSR OR FRONT HEATED O2 SNSR
		HTD O2 SNSR OR LF HTD O2 SNSR.
	12	VOLUME AIR FLOW SNSR OR CKT
	13	IAT SENSOR OR CKT FAILURE
	14	TP SENSOR OR TPS CKT FAILURE
	15	ISC MOTOR POS. SWITCH OR CKT
		MOTOR POSITION SENSOR OR CKT
	21	ENGINE COOLANT TEMP. SENSOR
	22	CRANK ANGLE SENSOR OR CKT
	23	CAMSHAFT POS. SENSOR OR CKT
	24	SPEED SENSOR OR CKT FAILURE
	25	BARO SENSOR OR CKT FAILURE
	31	KS OR KS CIRCUIT FAILURE
	32	MAP SENSOR OR CKT FAILURE
	36	IGNITION TIMING ADJUSTMENT
	39	RF HEATED O2 SENSOR OR CKT
	41	INJECTOR OR CKT FAILURE
	42	FUEL PUMP OR CKT FAILURE
	43	EGR SYSTEM: VALVE, SOLENOID, VAC, OR TEMP. SENSOR
	44	IGN SIGNAL OR CKT (NO.1 & 4 CYL)
		IGNITION SIGNAL OR CKT FAILURE
	52	IGN SIGNAL OR CKT (NO. 2 & 5 CYL)
		IGN SIGNAL OR CKT (NO. 2 & 3 CYL)
	53	IGN SIGNAL OR CKT (NO. 3 & 6 CYL)
	55	IAC VALVE POS. SENSOR OR CKT
	59	LR HEATED O2 SENSOR OR CKT
		REAR HEATED O2 SENSOR OR CKT
	61	TORQUE REDUCED SIGNAL OR CKT
	62	INDUCTION CNTRL VALVE POS. SNSR
	69	RR HEATED O2 SENSOR OR CKT
	71	TRACTION CONTROL VACUUM SOLENOID
	72	TRACTION CONTROL VENT SOLENOID

MITSUBISHI DTCs

YEAR	DTC NO.	DESCRIPTOR
1995	11	(LEFT) FRONT HO2 SENSOR OR CIRCUIT
	12	VOLUME AIR FLOW SENSOR OR CIRCUIT
	13	IAT SENSOR OR CIRCUIT
	14	TPS OR CIRCUIT
	15	IDLE SPEED CONTROL SENSOR OR CIRCUIT
	21	ECT SENSOR OR CIRCUIT
	22	CRANKSHAFT POSITION SENSOR OR CIRCUIT
	23	CAMSHAFT POSITION SENSOR OR CIRCUIT
	24	VEHICLE SPEED SENSOR OR CIRCUIT
	25	BARO PRESSURE SENSOR OR CIRCUIT
	31	KNOCK SENSOR OR CIRCUIT
	32	MAP SENSOR CIRCUIT
	36	IGNITION TIMING ADJUSTMENT SIGNAL OR CIRCUIT
	39	(RIGHT FRONT) HO2 SENSOR OR CIRCUIT
	41	INJECTOR CIRCUIT
	42	FUEL PUMP CIRCUIT
	43	EGR SYSTEM: VALVE, SOLENOID, VAC, OR TEMP. SENSOR
	44	IGNITION COIL OR POWER, CYLINDERS 1/4
	52	IGNITION COIL OR POWER, CYLINDERS 2/3 (4 CYLINDER)
	52	IGNITION COIL OR POWER, CYLINDERS 2/5 (6 CYLINDER)
	53	IGNITION COIL OR POWER, CYLINDERS 3/6
	55	IAC VALVE POSITION SENSOR OR CIRCUIT
	59	(LEFT) REAR HO2 SENSOR OR CIRCUIT
	61	TORQUE REDUCTION SIGNAL
	62	INDUCTION VALVE POSITION SENSOR CIRCUIT
	69	RIGHT REAR HO2 SENSOR OR CIRCUIT
	71	TRACTION CONTROL (VACUUM) SOLENOID OR CIRCUIT
	72	TRACTION CONTROL (VENT) SOLENOID OR CIRCUIT

MITSUBISHI ECLIPSE NON-TURBO DTCs

YEAR	DTC NO.	DESCRIPTOR
1995	11	LOSS OF CRANK SIGNAL AT PCM OR TIMING
	13	NO CHANGE IN MAP SENSOR FROM START TO RUN
	14	MAP SENSOR VOLTAGE HIGH OR LOW
	15	VSS SIGNAL NOT PRESENT
	16	KNOCK SENSOR 1, CIRCUIT MALFUNCTION
	17	ENGINE TEMP. TOO COLD TOO LONG, NO CLOSED LOOP FUEL CONTROL
	21	HO2 SENSOR CIRCUIT MALFUNCTION
	22	ECT VOLTAGE HIGH OR LOW
	23	IAT VOLTAGE HIGH OR LOW
	24	TPS VOLTAGE HIGH OR LOW, DOES NOT AGREE WITH MAP SENSOR
	25	IAC MOTOR CIRCUIT MALFUNCTION, TARGET IDLE NOT REACHED
	27	FUEL INJECTOR CONTROL CIRCUIT MALFUNCTION
	31	EVAP SYSTEM MALFUNCTION
	32	EGR SOLENOID OR CIRCUIT MALFUNCTION
	33	A/C CLUTCH RELAY OR CIRCUIT MALFUNCTION
	35	HIGH OR LOW FAN RELAY CIRCUIT MALFUNCTION
	36	SECONDARY AIR INJECTION SYSTEM MALFUNCTION
	37	PNP SWITCH FAILURE
	41	GENERATOR FIELD NOT SWITCHING
	42	ASD/FUEL PUMP RELAY CIRCUIT MALFUNCTION
	43	IGNITION COIL PRIMARY CIRCUIT MALFUNCTION, CYLINDER MISFIRE
	44	BATTERY TEMP. SENSOR OUT OF RANGE
	46	CHARGING SYSTEM VOLTAGE HIGH
	47	CHARGING SYSTEM VOLTAGE LOW
	51	FUEL SYSTEM LEAN
	52	FUEL SYSTEM RICH
	53	PCM FAILURE, SPI COMMUNICATIONS
	54	NO CAM SIGNAL AT PCM
	62	PCM FAILURE, SRI MILE NOT STORED
	63	PCM FAILURE, EEPROM WRITE DENIED
	64	CATALYTIC CONVERTER EFFICIENCY FAILURE
	65	PSP SWITCH FAILURE
	66	NO CCD MESSAGES FROM TCM

OBD II SYSTEMS

YEAR	DTC NO.	DESCRIPTOR
1995-98 OBD II	P0100	Volume Air Flow Circuit Mlafunction
	P0105	BARO Pressure Circuit Malfunctin
	P0106	BARO Pressure Sensor, Out of Range
	P0107	MAP Sensor, Low Voltage
	P0108	MAP Sensor, High Voltage
	P0110	IAT Sensor Circuit Malfunction
	P0112	IAT Sensor, Low Voltage
	P0113	IAT Sensor, High voltage
	P0115	ECT Circuit Malfunction
	P0117	ECT Sensor, Low voltage
	P0118	ECT Sensor, High Voltage
	P0120	TPS Circuit Malfunction
	P0121	TPS Voltage Does not Match MAP
	P0122	TPS, Low Voltage
	P0123	TPS, High Voltage
	P0125	Excessive Time to Enter Closed Loop
	P0130	(Right) Front O2 Sensor, Malfunction
	P0131	Upstream HO2 Sensor, Voltage Grounded
	P0132	Upstream HO2 Sensor, Shorted to Heater Circuit Voltage
	P0133	Upstream HO2 Sensor, Response
	P0134	Upstream HO2 Sensor, Stays at Center
	P0135	(Right) Front HO2 Sensor, Malfunction
	P0136	Right Rear O2 Sensor, Malfunction
	P0137	Downstream HO2 Sensor, Voltage Grounded
	P0138	Downstream HO2 Sensor, Shorted to Heater Circuit Voltage
	P0139	Downstream HO2 Sensor, Stays at Center
	P0140	Downstream HO2 Sensor, Stays at Center
	P0141	(Right) Rear HO2 Sensor Malfunction
	P0150	(Left) Rear O2 Sensor Malfunction
	P1055	(Left) Front HO2 Sensor Malfunction
	P0156	(Left) Rear O2 Sensor Malfunction
	P0161	HO2 Sensor Heater Circuit Malfunction, Bank 2 Sensor 2
	P0170	Bank 1 Fuel Trim Malfunction
	P0171	Fuel System Lean
	P0172	Fuel System Rich
	P0173	Bank 2 Fuel Trim Malfunction
	P0201	Injector Circuit, Cylinder No. 1, Malfunction
	P0202	Injector Circuit, Cylinder No. 2, Malfunction

MITSUBISHI DTCs (CONT.)

YEAR	DTC NO.	DESCRIPTOR
1995-98 OBD II	P0203	Injector Circuit, Cylinder No. 3, Malfunction
	P0204	Injector Circuit, Cylinder No. 4, Malfunction
	P0205	Injector Circuit, Cylinder No. 5, Malfunction
	P0206	Injector Circuit, Cylinder No. 6, Malfunction
	P0220	Fuel Pump Relay Control Circuit
	P0300	Random Misfire Detected
	P0301	Cylinder No. 1, Misfire Detected
	P0302	Cylinder No. 2, Misfire Detected
	P0303	Cylinder No. 3, Misfire Detected
	P0304	Cylinder No. 4, Misfire Detected
	P0305	Cylinder No. 5, Misfire Detected
	P0306	Cylinder No. 6, Misfire Detected
	P0325	Knock Sensor 1, Circuit Malfunction
	P0335	Crankshft Position Sensor Circuit Malfunction
	P0340	Camshft Position Sensor Circuit Malfunction
	P0351	Ignition Coil No. 1 Primary Circuit Malfunction
	P0352	Ignition Coil No. 2 Primary Circuit Malfunction
	P0400	EGR Flow Malfunction
	P0401	EGR System Failure
	P0403	EGR Solenoid Malfunction
	P0420	Bank 1 Catalyst Efficiency Below Threshold
	P0421	Warm Up Catalyst, Bank 1, Efficiency Below Threshold
	P0422	Catalytic Converter Efficiency failure
	P0431	Warm Up Catalyst, Bank 2, Efficiency Below Threshold
	P0440	EVAP Emission Control System Malfunction
	P0441	Evaporative Purge Flow Monitor Failure
	P0442	EVAP Control system, Small Leak Detected
	P0443	EVAP Control System, Purge Control Valve, Circuit Malfunction
	P0446	EVAP Control System, Vent Control Malfunction
	P0450	EVAP Control System Pressure Sensor Malfunction
	P0455	EVAP Control System, Large Leak Detected
	P0500	VSS Malfunction
	P0505	IAC Motor Circuit Malfunction
	P0510	Closed TPS Switch Malfunction
	P0551	PSP Sensor Circuit
	P0600	PCM Failure or CCD/PCM Communication
	P0601	Internal Controller Failure
	P0604	ICM RAM Checksum Failure

MITSUBISHI DTCs (CONT.)

YEAR	DTC NO.	DESCRIPTOR
1995-98 OBD II	P0605	ICM ROM Checksum Failure
	P0700	Transmission DTC ICM (Watchdog Circuit)
	P0705	TRS Sensor (PRNDL Input) Circuit Malfunction
	P0710	TFT Sensor Circuit Malfunction
	P0715	Speed Error: Input Speed Sensor Circuit
	P0720	Speed Error: Output speed Sensor Circuit
	P0725	Engine Speed Input Circuit Malfunction
	P0731	1st Gear, Incorrect Ratio
	P0732	2nd Gear, Incorrect Ratio
	P0733	3rd Gear, Incorrect Ratio
	P0734	4th Gear, Incorrect Ratio
	P0736	Reverse Gear, Incorrect Ratio
	P0740	TCC Lock Up Control, Out of Range
	P0750	Shift Solenoid A (Low Reverse) Malfunction
	P0755	Shift Solenoid B Malfunction
	P0760	Shift Solenoid C Malfunction
	P0765	Shift Solenoid D Malfunction
	P1100	Induction Control Motor Position Sensor, Circuit Malfunction
	P1101	Traction Control Vacuum Solenoid Malfunction
	P1102	Traction Control Ventilation Solenoid Malfunction
	P1103	Turbo Waste Gate Actuator Malfunction
	P1104	Turbo Waste Gate Solenoid Malfunction
	P1105	Fuel Pressure Solenoid Malfunction
	P1294	Target Idle not Reached (+/- 200 RPM)
	P1295	No 5 Volt Signal to TPS
	P1296	No 5 Volt Signal to MAP Sensor
	P1297	No Change in MAP Sensor from Start to Run
	P1300	Ignition Timing Adjustment Circuit Malfunction
	P1390	Timing Belt Skipped 1 Tooth or More
	P1391	Intermittent Loss of CMP or CKP
	P1400	MDP Sensor Circuit Malfunction
	P1443	EVAP system Purge Control Valve 2, Circuit Malfunction
	P1486	EVAP Control System, Pinched Hose
	P1487	High Speed Radiator Fan Control Relay Circuit
	P1489	High Speed Condenser Fan Control Relay Circuit
	P1490	Low Speed Fan Control Relay Circuit Malfunction
	P1492	Battery Temp. Sensor, High Voltage

MITSUBISHI DTCs (CONT.)

YEAR	DTC NO.	DESCRIPTOR
1995-98 OBD II	P1493	Battery Temp. Sensor, Low Voltage
	P1494	EVAP Ventilation Solenoid Switch or Mechanical Fault
	P1495	EVAP Ventilation Solenoid Circuit
	P1496	5 Volt Output Supply Too Low
	P1500	Generator FR Terminal Circuit Malfunction
	P1600	Serial Communication Link Malfunction
	P1696	PCM Failure, EEPROM Write Denied
	P1697	PCM Failure, SRI Mile not stored
	P1698	No CCD Message from TCM
	P1715	Pulse Generator Assembly Malfunction
	P1738	Transmission Overheat High Temp. Operation Activated
	P1739	TCM Power-up While Vehicle Being Driven
	P1750	Transmission Solenoid Assembly Malfunction
	P1765	TCM Sensed Volts on Pressure Switch When Unexpected
	P1767	EATX Realy Always ON, Contacts Closed
	P1768	EATX Realy Always OFF, Contacts Open
	P1770	Inadequate Element Volume: L/R
	P1771	Inadequate Element Volume: 2-4
	P1772	Inadequate Element Volume: OD
	P1775	Solenoid Switch Valve Latched in LU Position
	P1776	Solenoid Switch Valve Latched in LR Position
	P1781	OD Pressure Switch Circuit
	P1782	2-4 Pressure Switch Circuit
	P1784	L/R Pressure Switch Circuit
	P1787	OD Hydraulic Pressure Switch Circuit
	P1788	2-4 Hydraulic Pressure Switch Circuit
	P1789	OD/2-4 Hydraulic Pressure Switch Circuit
	P1790	Error After Shift, Check Speed Code Error
	P1791	Engine: ECT Input to TCM
	P1791	Transmission: Slip or no Pressure
	P1792	Battery Power was Disconnected Since Power Down
	P1793	TRD Link communication Error
	P1794	Speed Sensor Ground
	P1795	PCM: TPS Circuit
	P1795	ICM: Malfunction
	P1798	Worn Transmission Fluid, Shudder Detected with A/C Clutch

MITSUBISHI DTCs (CONT.)

YEAR	DTC NO.	DESCRIPTOR
1995-98 OBD II	P1799	Calculated Transmissin Fluid Temp. in Use
	P1899	PNP Switch (Trans Range Switch) Failure

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1. VEHICLES AND SYSTEMS

Using the Asian cartridge, the following Nissan vehicles can be diagnosed.

MODEL	ENGINE	ENGINE TYPE	FUEL TYPE	ECU MODES	CODE TYPE	ADAPTER TYPE
1984						
200SX	1.8L I4 TURBO	CA18ET	EFI	2	ECU LED	NONE
200SX	2.0L	CA20E	EFI	2	ECU LED	NONE
300ZX	3.0L	VG30E	EFI	2	ECU LED	NONE
300ZX	3.0L V6 TURBO	VG30ET	EFI	2	ECU LED	NONE
1985						
200SX	1.8L I4 TURBO	CA18ET	EFI	2	ECU LED	NONE
200SX	2.0L I4	CA20E	EFI	2	ECU LED	NONE
300ZX	3.0L V6	VG30E	PFI	2	ECU LED	NONE
	300ZX TURBO	3.0L V6 VG30ET	PFI	2	ECU LED	NONE
MAXIMA	3.0L V6	VG30E	PFI	2	ECU LED	NONE
STANZA	2.0L I4	CA20E	EFI	2	ECU LED	NONE
1986						
200SX	1.8L I4 TURBO	CA18ET	EFI	2	ECU LED	NONE
200SX	2.0L I4	CA20E	EFI	2	ECU LED	NONE
300ZX	3.0L V6	VG30E	PFI	2	ECU LED	NONE
300ZX	3.0L V6 TURBO	VG30ET	PFI	2	ECU LED	NONE
MAXIMA	3.0L V6	VG30E	PFI	2	ECU LED	NONE
STANZA WGN	2.0L I4	CA20E	EFI	2	ECU LED	NONE
PICKUP D21 SERIES	2.4L I4	Z24I	EFI	2	ECU LED	NONE
PICKUP D21 SERIES	3.0 V6	VG30I	EFI	2	ECU LED	NONE

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MODEL	ENGINE	ENGINE TYPE	FUEL TYPE	ECU MODES	CODE TYPE	ADAPTER TYPE
1987						
200SX	1.8L I4 TURBO	CA18ET	EFI	5	ECU LED	CHECK
200SX	2.0L I4	CA20E	EFI	5	ECU LED	CHECK
200SX	3.0L V6	VG30E	EFI	5	ECU LED	CHECK
300ZX	3.0, 3.0L V6 TURBO	VG30E, VG30ET	EFI	5	ECU LED	CHECK
MAXIMA	3.0L V6	VG30E	EFI	5	ECU LED	CHECK
PULSAR NX	1.6L I4	E16I	EFI	5	ECU LED	CHECK
PULSAR NX	1.6L I4	CA16DE	EFI	5	ECU LED	CHECK
SENTRA	1.6L I4	E16I	EFI	5	ECU LED	CHECK
STANZA	2.0L I4	CA20E	EFI	5	ECU LED	CHECK
VAN	2.4L I4	Z24I	TBI	5	ECU LED	CHECK
PATHFINDER	2.4L I4	Z24I	TBI	5	ECU LED	CHECK
TRUCK	2.4L I4	Z24I	TBI	5	ECU LED	CHECK
PATHFINDER	3.0L V6	VG30I	TBI	5	ECU LED	CHECK
TRUCK	3.0L V6	VG30I	TBI	5	ECU LED	CHECK
1988						
200SX	1.8L I4 TURBO	CA18ET	EFI	5	CA: MIL/LED FED: ECU LED	CHECK
200SX	2.0L I4	CA20E	EFI	5	CA: MIL/LED FED: ECU LED	CHECK
200SX	3.0L V6	VG30E	EFI	5	CA: MIL/LED FED: ECU LED	CHECK
300ZX	3.0, 3.0L V6 TURBO	VG30E, VG30ET	EFI	5	CA: MIL/LED FED: ECU LED	CHECK
MAXIMA	3.0L V6	VG30E	EFI	5	MIL LED	CHECK
PULSAR NX	1.8L I4	CA18DE	EFI	5	CA: MIL/LED FED: ECU LED	CHECK
SENTRA	1.6L I4	E16I	EFI	5	CA: MIL/LED FED: ECU LED	CHECK
STANZA	2.0L I4	CA20E	EFI	5	CA: MIL/LED FED: ECU LED	CHECK
VAN	2.4L I4	Z24I	TBI	5	CA: MIL/LED FED: ECU LED	CHECK
PATHFINDER	2.4L I4	Z24I	TBI	5	CA: MIL/LED FED: ECU LED	CHECK
TRUCK	2.4L I4	Z24I	TBI	5	CA: MIL/LED FED: ECU LED	CHECK
PATHFINDER	3.0L V6	VG30I	TBI	5	CA: MIL/LED FED: ECU LED	CHECK
TRUCK	3.0L V6	VG30I	TBI	5	CA: MIL/LED	CHECK

MODEL	ENGINE	ENGINE TYPE	FUEL TYPE	ECU MODES	CODE TYPE	ADAPTER TYPE
1989						
240SX	2.4L I4	KA24E	EFI	5	CA: MIL/LED FED: ECU LED	CHECK
300ZX	3.0, 3.0L V6 TURBO	VG30E, VG30ET	EFI	5	CA: MIL/LED FED: ECU LED	CHECK
MAXIMA	3.0L V6	VG30E	EFI	5	MIL/LED	CHECK
PULSAR NX	1.6L I4	GA16I	TBI	5	CA: MIL/LED FED: ECU LED	CHECK
PULSAR NX	1.8L I4	CA18DE	EFI	5	CA: MIL/LED FED: ECU LED	CHECK
SENTRA	1.6L I4	GA16I	EFI	5	CA: MIL/LED FED: ECU LED	CHECK
STANZA	2.0L I4	CA20E	EFI	5	CA: MIL/LED FED: ECU LED	CHECK
VAN	2.4L I4	Z24I	TBI	5	CA: MIL/LED FED: ECU LED	CHECK
PATHFINDER	2.4L I4	Z24I	TBI	5	CA: MIL/LED FED: ECU LED	CHECK
TRUCK	2.4L I4	Z24I	TBI	5	CA: MIL/LED FED: ECU LED	CHECK
PATHFINDER	3.0L V6	VG30I	TBI	5	CA: MIL/LED FED: ECU LED	CHECK
TRUCK	3.0L V6	VG30I	TBI	5	CA: MIL/LED FED: ECU LED	CHECK
1990						
240SX	2.4L I4	KA24E	EFI	5	CA: MIL/LED FED: ECU LED	CHECK
300ZX	3.0L V6	VG30DE	EFI	2	MIL/LED	NONE
MAXIMA	3.0L V6	VG30E	EFI	5	MIL/LED	CHECK
PULSAR NX	1.6L I4	GA16I	TBI	5	CA: MIL/LED FED: ECU LED	CHECK
SENTRA	1.6L I4	GA16I	TBI	5	CA: MIL/LED FED: ECU LED	CHECK
STANZA	2.4L I4	KA24E	EFI	2	CA: MIL/LED FED: ECU LED	NONE
AXXESS	2.4L I4	KA24E	MPFI	5	CA: MIL/LED FED: ECU LED	CHECK
PATHFINDER/ TRUCK	2.4L I4	KA24E	MPFI	5	CA: MIL/LED FED: ECU LED	CHECK
PATHFINDER/ TRUCK	3.0L V6	VG30E	MPFI	5	MIL/LED	CHECK

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MODEL	ENGINE	ENGINE TYPE	FUEL TYPE	ECU MODES	CODE TYPE	ADAPTER TYPE
1991						
240SX	2.4L I4	KA24E	EFI	2	MIL/LED	NONE
300ZX	3.0, 3.0L V6 TURBO	VG30DE, VG30DETT	EFI	2	MIL/LED	NONE
MAXIMA	3.0L V6	VG30E	EFI	5	MIL/LED	CHECK
SENTRA	1.6, 2.0L I4	GA16DE, SR20DE	EFI	2	MIL/LED	NONE
NX COUPE	1.6, 2.0L I4	GA16DE, SR20DE	EFI	2	MIL/LED	NONE
STANZA	2.4L I4	KA24E	EFI	2	MIL/LED	NONE
PATHFINDER	2.4L I4	KA24E	MPFI	5	MIL/LED	CHECK
TRUCK	2.4L I4	KA24E	MPFI	5	MIL/LED	CHECK
PATHFINDER	3.0L V6	VG30E	MPFI	5	MIL/LED	CHECK
TRUCK	3.0L V6	VG30E	MPFI	5	MIL/LED	CHECK
1992						
240SX	2.4L I4	KA24DE	SFI	2	MIL/LED	NONE
300ZX	3.0, 3.0L V6 TURBO	VG30DE, VG30DETT	SFI	2	MIL/LED	NONE
MAXIMA	3.0L V6	VG30E	SFI	5	MIL/LED	CHECK
MAXIMA	3.0L V6	VE30DE	SFI	2	MIL/LED	NONE
SENTRA	2.0L I4	SR20DE	SFI	2	MIL/LED	NONE
SENTRA	1.6L I4	GA16DE	SFI	2	MIL/LED	NONE
PATHFINDER /PICKUP	3.0L V6	VG30E	MFI	5	MIL/LED	CHECK
PATHFINDER /PICKUP	2.4L I4	KA24E	MFI	5	MIL/LED	CHECK
NX COUPE	2.0L I4	SR20DE	SFI	2	MIL/LED	NONE
NX COUPE	1.6L I4	GA16DE	SFI	2	MIL/LED	NONE
STANZA	2.4L I4	KA24E	SFI	2	MIL/LED	NONE

MODEL	ENGINE	ENGINE TYPE	FUEL TYPE	ECU MODES	CODE TYPE	ADAPTER TYPE
1993						
240SX	2.4 I4	KA24DE	SFI	2	MIL/LED	NONE
300ZX	3.0, 3.0L V6 TURBO	VG30DE, VG30DETT	SFI	2	MIL/LED	NONE
ALTIMA	2.4L I4	KA24DE	SFI	2	MIL/LED	NONE
MAXIMA	3.0L V6	VG30E	SFI	5	MIL/LED	NONE
MAXIMA	3.0L V6	VE30DE	SFI	2	MIL/LED	CHECK
NX COUPE	2.0L I4	SR20DE	SFI	2	MIL/LED	NONE
NX COUPE	1.6L I4	GA16DE	SFI	2	MIL/LED	NONE
PATHFINDER/ TRUCK	3.0L V6	VG30E	MFI	5	MIL/LED	CHECK
TRUCK	2.4L I4	KA24E	MFI	5	MIL/LED	CHECK
QUEST	3.0L V6	VG30E	SFI	2	MIL/LED	JUMPER
SENTRA	2.0L I4	SR20DE	SFI	2	MIL/LED	NONE
SENTRA	1.6L I4	GA16DE	SFI	2	MIL/LED	NONE
1994						
240SX	2.4L I4	KA24DE	SFI	2	MIL/LED	NONE
300ZX	3.0, 3.0L V6 TURBO	VG30DE, VG30DETT	SFI	2	MIL/LED	NONE
ALTIMA	2.4L I4	KA24DE	SFI	2	MIL/LED	NONE
MAXIMA	3.0L V6	VG30E	SFI	5	MIL/LED	CHECK
MAXIMA	3.0L V6	VE30DE	SFI	2	MIL/LED	NONE
PATHFINDER/ TRUCK	3.0L V6	VG30E	SFI	5	MIL/LED	CHECK
TRUCK	2.4L I4	KA24E	SFI	5	MIL/LED	CHECK
QUEST	3.0L V6	VG30E	SFI	2	MIL/LED	JUMPER
NX COUPE	1.6L I4	GA16DE	SFI	2	MIL/LED	NONE
SENTRA	2.0L I4	SR20DE	SFI	2	MIL/LED	NONE
SENTRA	1.6L I4	GA16DE	SFI	2	MIL/LED	NONE

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MODEL	ENGINE	ENGINE TYPE	FUEL TYPE	ECU MODES	CODE TYPE	ADAPTER TYPE
1995						
240SX	2.4L I4	KA24DE	EGI	N/A	AUTOCODES	**OBD II ***
300ZX	3.0L V6	VG30DE	MPFI	2	MIL/LED	NONE
300ZX TURBO	3.0L V6	VG30DETT	MPFI	2	MIL/LED	NONE
STANZA/ALTIMA	2.4L I4	KA24DE	MPFI	N/A	AUTOCODES	**OBD II ***
MAXIMA	3.0L V6	VQ30DE	MPFI	N/A	AUTOCODES	**OBD II ***
PATHFINDER/ TRUCK	3.0L V6	VG30E	MPFI	3	LED	NONE
TRUCK	2.4L I4	KA24DE	MPFI	3	LED	NONE
QUEST	3.0L V6	VG30E	SFI	N/A	MIL	NONE
SENTRA/200SX	2.0L I4	SR20DE	MPFI	N/A	AUTOCODES	**OBD II ***
SENTRA/200SX	1.6L I4	GA16DE	MPFI	N/A	AUTOCODES	**OBD II ***
1996						
SENTRA/200SX	1.6L I4	GA16DE	MPFI	N/A	AUTOCODES	**OBD II ***
240SX	2.4L I4	KA24DE	EGI	N/A	AUTOCODES	**OBD II ***
300ZX	3.0L V6	VG30DE	MPFI	N/A	AUTOCODES	**OBD II ***
300ZX TURBO	3.0L V6	VG30DETT	MPFI	N/A	AUTOCODES	**OBD II ***
STANZA/ALTIMA	2.4L I4	KA24DE	MPFI	N/A	AUTOCODES	**OBD II ***
MAXIMA	3.0L V6	VQ30DE	MPFI	N/A	AUTOCODES	**OBD II ***
PATHFINDER	3.0L V6	VG33E	MPFI	N/A	AUTOCODES	**OBD II ***
QUEST	3.0L V6	VG30E	SFI	N/A	AUTOCODES	**OBD II ***
TRUCK	2.4L I4	KA24E	MPFI	N/A	AUTOCODES	**OBD II ***
1997						
SENTRA/200SX	1.6L I4	GA16DE	MPFI	N/A	AUTOCODES	**OBD II ***
SENTRA/200SX	2.0L I4	SR20DE	MPFI	N/A	AUTOCODES	**OBD II ***
240SX	2.4L I4	KA24DE	MPFI	N/A	AUTOCODES	**OBD II ***
ALTIMA	2.4L I4	KA24DE	MPFI	N/A	AUTOCODES	**OBD II ***
MAXIMA	3.0L V6	VQ30DE	MPFI	N/A	AUTOCODES	**OBD II ***
PATHFINDER	3.3L V6	VG33E	MPFI	N/A	AUTOCODES	**OBD II ***
QUEST	3.0L V6	VG30E	MPFI	N/A	AUTOCODES	**OBD II ***
TRUCK	2.4L I4	KA24E	MPFI	N/A	AUTOCODES	**OBD II ***
1998						
SENTRA/200SX	1.6L I4	GA16DE	MPFI	N/A	AUTOCODES	**OBD II ***
SENTRA/200SX	2.0L I4	SR20DE	MPFI	N/A	AUTOCODES	**OBD II ***
240SX	2.4L I4	KA24DE	MPFI	N/A	AUTOCODES	**OBD II ***
ALTIMA	2.4L I4	KA24DE	MPFI	N/A	AUTOCODES	**OBD II ***
MAXIMA	3.0L V6	VQ30DE	MPFI	N/A	AUTOCODES	**OBD II ***
PATHFINDER	3.3L V6	VG33E	MPFI	N/A	AUTOCODES	**OBD II ***
QUEST	3.0L V6	VG30E	MPFI	N/A	AUTOCODES	**OBD II ***
FRONTIER	2.4L I4	KA24DE	MPFI	N/A	AUTOCODES	**OBD II ***

*Use Common Test Modes OBD II Systems section for operating instructions and test mode information.

2. NISSAN SPECIFIC INFORMATION

The Nissan vehicles covered by the Asian Imports Cartridge are separated into two different sections within the Asian Imports Operator's Manual. The vehicle's on-board system will determine which section of the Operator's Manual will need to be used. Vehicles that are OBD II certified have information about the operating test modes in the Common Test Modes OBD II Systems section of the Operator's Manual. Vehicles that have OBD or OBD I systems have test mode information in this section of the Operator's Manual. In these sections, you will find information on test modes available, how to connect the tester to the vehicle, and operating instructions for the different test modes. A complete list of Nissan Diagnostic Trouble Codes is included at the back of each section.

To determine which section of the Operator's Manual to use for diagnostic information and instructions, look at Adapter Type of the Vehicle and Systems chart. If the vehicle you are testing has an OBD II adapter type, use the Common Test Modes OBD II Systems section of the Operator's Manual. If the vehicle you are testing does not have the OBD II Adapter Type, use this section to diagnose the vehicle under test.

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3. TEST MODES AVAILABLE

The following test modes are available when testing Nissan vehicles. Operating instructions for test modes other than DTC ENTRY, DTCs and OBD Controls are included in Common Test Modes OBD, OBD I Systems section. There are also Nissan specific instructions for operating the test modes in Section 6 (Test Modes). A description and operating instructions for each Output Test is included in Section 7 (OBD Controls).

MODE F1: DTC ENTRY
- SUBMODE F0: HOW TO READ
- SUBMODE F1: ENTER DTC(s)
- SUBMODE F2: DTC LIST
- SUBMODE F3: REVIEW DTC
- SUBMODE F4: CLEAR DTC(s)

MODE F2: DTC
- SUBMODE F1: READ DTC(s)
- SUBMODE F2: DTC LIST
- SUBMODE F3: REVIEW DTC
- SUBMODE F4: CLEAR DTC(s)

MODE F4: OBD CONTROLS
- SUBMODE F0: AFR MONITOR A
- SUBMODE F1: AFR MONITOR B
- SUBMODE F2: SWITCH TEST
- SUBMODE F3: RT DTC MONITOR

MODE F5: SYSTEM TESTS
- SUBMODE F0: PREP VEHICLE

MODE F8: INFORMATION
- SUBMODE F1: DLC LOCATION*
- SUBMODE F3: ID INFO
- SUBMODE F4: DJC LOCATION*
- SUBMODE F5: ECU LOCATION*

* Note that not all models support ECU, DJC, or DLC Location Test modes. The tester will automatically choose which test mode to display, depending on your vehicle selection.

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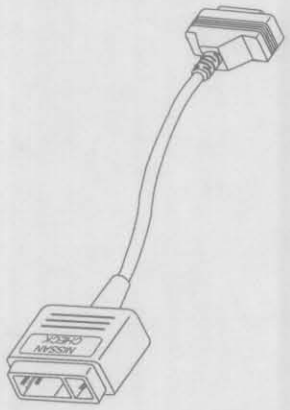
4. GETTING STARTED

Before operating the Asian Imports Cartridge with a Nissan vehicle, the following steps must be performed:

1. Make sure the vehicle ignition is OFF.

2. Refer to the Vehicle and Systems table to see if the vehicle you are testing requires the Check Adapter Cable. If so, connect the Nissan Check Adapter Cable to the end of the DLC cable, then connect the red connector end to the vehicle Check connector.



NISSAN CHECK ADAPTER CABLE

3. Plug the tester power cable into the vehicle cigarette lighter. The power cable may also be directly connected to the battery via the optional battery clip adapter (P/N 02001636).

   NOTE: Since the cigarette lighter can be switched, some tests require that the power cable be directly connected to the battery via the battery clip adapter.

4. Turn on the tester and select the application software that you will be using. Verify that the correct screen is displayed. The tester should display a screen similar to the one below.

Tester stand-alone display

5. If the display is correct, press ENTER. If the display is not correct, refer to Appendix D.

6. Follow the instructions on the following page to select the vehicle type you are testing by entering required vehicle information into the tester.

   NOTE: When removing the Nissan Check Adapter Cable from the vehicle DLC, remember to depress the retaining tab on the vehicle DLC. Failure to do so could cause wiring harness damage.

5. SELECTING THE VEHICLE

Once you've pressed ENTER from the power-up screen, the following steps must be performed to select the manufacturer, model year, model and engine type of the vehicle being tested. Remember, if you make a mistake, you can always press EXIT to go back to the previous menu.

SELECTING THE MANUFACTURER

A menu of manufacturers available for testing is displayed in a scrolling menu. You can scroll down one screen at a time by pressing YES, or up one screen at a time by pressing NO. Press ↑ or ↓ to scroll one manufacturer at a time, until the → arrow is opposite Nissan.

Then press ENTER to select.

SELECTING THE MODEL YEAR

Once the manufacturer is selected, the Select Model Year menu is displayed. Press the last two digits of the model year being tested; 9, 0 for 1990 models, 9, 1 for 1991 models, and so on.

SELECTING THE MODEL

The Model Select menu displays models available for testing. Press the NO key until the model being tested is displayed, then press the YES key.

SELECTING THE ENGINE AND ENGINE TYPE

Next, the Engine Select menu is displayed. For Maxima vehicles you will also be asked to select the engine type, such as VE30DE. Press NO until the engine and engine type of the vehicle is displayed, then press YES.

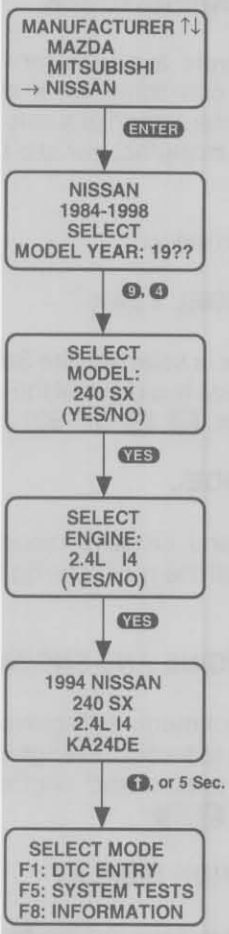
VEHICLE INFORMATION DISPLAY

After the vehicle type is selected the tester displays a summary screen of the selected vehicle. Information displayed includes the year, manufacturer, model, engine size and type, and additional information such as the type of fuel system.

SELECT MODE MENU

When the preceding steps are completed, the Select Mode menu displays the test modes available for the selected vehicle and system. Refer to Section 6 (Test Modes), Section 7 (OBD Controls), and the Common Test Modes OBD, OBD I Systems section for instructions on operating the test modes with Nissan vehicles.

NISSAN VEHICLE SELECTION



ACTIVE KEYS	
0 - 9	Enter model year.
YES NO	Used to answer questions in tester display.
EXIT	Return to previous display

6. TEST MODES

When the Select Mode menu is displayed, test modes available for Nissan vehicles may be selected.

Operating instructions for test modes other than DTC ENTRY, DTCs, and OBD Controls are included in Common Test Modes OBD, OBD I Systems section. You may select these modes without connecting the tester to the vehicle.

READING CODES

Detailed operating instructions for using Modes F1: DTC ENTRY and F2: DTC with Nissan vehicles are included in the following procedures. Remember that F1: DTC Entry is automatically displayed with Nissan vehicles that have "NONE" as the adapter type listed in the Vehicles and Systems table, and F2: DTC is automatically displayed with Nissan vehicles that have "CHECK" as the adapter type listed in the Vehicles and Systems table.

Operating instructions for Mode F4: OBD CONTROLS are included in Section 7.

IMPORTANT: Before testing, perform the System Test Submode F0: Prepare Vehicle instructions to ensure proper vehicle preparation prior to testing. The vehicle must be completely warmed up in order for the tester to communicate properly with the vehicle.

MODE F1	DTC ENTRY

When Mode F1: DTC ENTRY is selected, the tester displays submodes which can provide information on how to read diagnostic trouble codes (DTCs) from the vehicle, how to clear DTCs from the vehicle (or tester memory buffer), how to obtain a text description of entered or selected DTCs, and review entered or selected DTCs as a result of manually retrieving codes from the ECU.

DTC ENTRY SUBMODES
F0: HOW TO READ
F1: ENTER DTC(s)
F2: DTC LIST
F3: REVIEW DTC
F4: CLEAR DTC(s)

Manually Reading DTCs

To read DTCs on all 1984-86 and select 1990-95 Nissan vehicles you must locate the ECU and observe the flashing LEDs. If you do not know where the ECU is located, select Mode F5: ECU location from the Information menu. If necessary, refer to Common Test Modes OBD, OBD I Systems section for further instructions.

Follow the detailed instructions on the following pages to manually read the DTCs. Once the DTCs have been manually read from the ECU, the tester can define the code. A complete list of Nissan DTCs is included in Section 6.

Note that manually retrieving DTCs from the 1993-95 Nissan Quest requires you to locate, disconnect, and jumper the Diagnostic Connector. In this manual, the Diagnostic Connector is referred to as the Diagnostic Jumper Connector (DJC). Refer to the section on manually reading DTCs from the 1993-95 Nissan Quest in Mode F1, Submode F1.

DTC ENTRY	MODE F1
HOW TO READ	SUBMODE F0

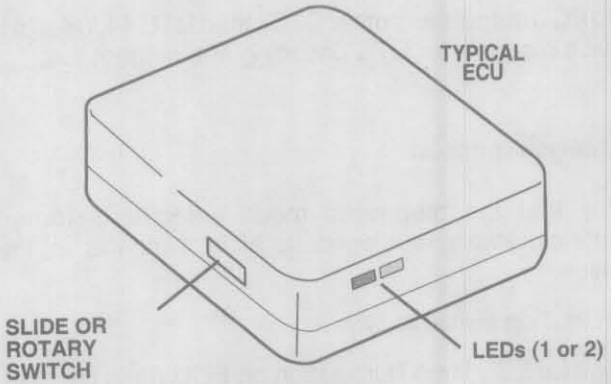
This submode provides information on how to manually read DTCs from the vehicle. Step-by-step screen instructions provide information to correctly set up the vehicle ECU. An example is provided in Common Test Modes section. If you have trouble, additional DTC retrieval information is described below. If you refer to the shop manual for this information, make sure that you are following the correct steps for the system that you are working on.

DTC ENTRY	MODE F1
ENTER DTC(s)	SUBMODE F1

On Nissan vehicles, the Enter DTCs submode allows you to manually read DTCs. This submode provides you with a text description of the numeric DTC that was entered into the tester.

The Enter DTC Submode displays two question marks for DTC Entry. The tester screen prompts you to enter the DTCs read from the ECU LED(s) or the Malfunction Indicator Light (MIL). Be careful when reading the DTC from the ECU LED(s) or MIL. Incorrect ECU LED or MIL interpretation can cause the wrong DTC description to be displayed. Once all DTCs have been manually read and recorded, enter each DTC into the tester as described in Common Test Modes OBD, OBD I Systems section.

Refer to the appropriate procedure on the following pages for manually reading ECU LED DTCs.



Manually Reading DTCs from 1984-86 Nissan ECUs with the 2 LED System:

Non–turbocharged models:

1. Verify that the diagnostic mode selector is turned fully counterclockwise or diagnostic slide switch is in the OFF position.
2. Turn ignition switch to ON.
3. Check for LED lamp illumination on ECU (bulb check).
4. Turn the diagnostic mode selector fully clockwise or change the diagnostic slide switch to the ON position.
5. Observe the ECU LEDs for DTCs 23 and 31. The presence of these DTCs indicates that the ECU has not received input switch signals from the Accelerator and A/C and/or heater switch.
6. Depress and release accelerator pedal.
7. Observe the ECU LEDs for DTC 31. The presence of DTC 31 indicates that the ECU has not received an input switch signal from the A/C and/or heater switch.
8. If the vehicle has factory air conditioning, cycle the air conditioning/heater fan switch OFF, ON, OFF.
9. Observe the ECU LEDs for DTC 44. The presence of this DTC indicates that the ECU has not detected conditions to set a DTC and is not currently storing any DTCs.
10. Turn diagnostic mode selector fully counterclockwise or change the diagnostic slide switch to the OFF position, and turn the engine off.
11. If the ECU outputs any other DTCs than DTC 44, refer to factory service manuals for DTC decoding and diagnostics.

Turbocharged models:

1. Verify that the diagnostic mode selector is turned fully counterclockwise or diagnostic slide switch is in the OFF position.
2. Turn ignition switch to ON.
3. Check for LED lamp illumination on ECU (bulb check).

4. Turn the diagnostic mode selector fully clockwise or change the diagnostic slide switch into the ON position.
5. Observe the ECU LEDs for DTCs 23, 24, and 31. The presence of these DTCs indicates that the ECU has not received input switch signals from the Accelerator, Park/Neutral, and A/C and/or heater switch.
6. Depress and release accelerator pedal.
7. Observe the ECU LEDs for DTCs 24 and 31. The presence of these DTCs indicates that the ECU has not received input switch signals from the Park/Neutral and A/C and/or heater switch.
8. Shift automatic transmission from neutral through drive gears and back to neutral, or shift manual transmission from neutral to all gear selections and back to neutral.
9. Observe the ECU LEDs for DTC 31. The presence of this DTC indicates that the ECU has not received an input switch signal, from the A/C and/or heater switch.
10. Start the engine.
11. Observe the ECU LEDs for DTCs 14 and 31. The presence of these DTCs indicates that the ECU has not received input switch signals from the vehicle speed and A/C and/or heater switch.
12. Drive the vehicle above 6 MPH.
13. Observe the ECU LEDs for DTC 31. The presence of this DTC indicates that the ECU has not received an input switch signal from the A/C and/or heater switch.
14. If the vehicle has factory air conditioning, cycle the air conditioner switch and heater fan switch OFF, ON, OFF.
15. Observe the ECU LEDs for DTC 44. The presence of this DTC indicates that the ECU has not detected conditions to set a DTC and is not currently storing any DTC's.
16. Turn diagnostic mode selector fully counterclockwise or change the diagnostic slide switch to the OFF position, and turn off the engine.

NOTE: If the ECU has output any other DTCs than DTC 44, refer to factory service manuals for DTC decoding and diagnostics.

Manually reading DTCs from all 1987–89 and select 1990–95 Nissan ECUs with the 2–LED, 5–mode system:

NOTE: This procedure is for reference only. Use Mode F1: Read DTC(s) to let the tester retrieve DTCs.

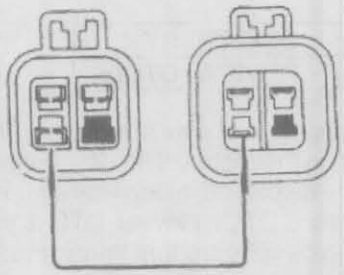
1. Locate the vehicle ECU.
2. Turn the ignition key to run (note ECU LEDs; they should light briefly for a bulb check).
3. Turn the diagnostic mode selector fully clockwise or change the diagnostic slide switch to the ON position.
4. Observe the ECU LEDs; when the LEDs flash three consecutive times, turn diagnostic mode selector fully counterclockwise or change the diagnostic slide switch to the OFF position.
5. Read the 2–digit DTCs from the ECU LEDs. Note that the RED LED is the 10's digit and the GREEN LED is the 1's digit.
6. Write down all received DTCs. The DTCs will be reported once, so if they are missed then the procedure must be repeated. Depending on the model year, DTC 44 or 55 indicates a pass DTC.
7. Turn ignition key off.

Manually reading DTCs from 1991–95 Nissan ECU's with the 1–LED, 2–mode system:

1. Use Mode F5: ECU LOCATION from the Information menu, to locate the vehicle ECU.
2. Turn the ignition key to ON (ECU LED and MIL should illuminate briefly for a bulb check).
3. Turn the rotary diagnostic mode selector fully clockwise, or change the diagnostic slide switch to the ON position.
4. Wait at least 2 seconds.
5. Turn the rotary diagnostic mode selector fully counterclockwise, or push the slide switch back to the original position.
6. Count the flashes on the ECU LED or MIL. Long flashes are the 10's digit and short flashes are the 1's digit.
7. Write down all received DTCs. The DTCs will be reported once, so if they are missed then the procedure must be repeated. DTC 44 or 55 indicates a pass DTC.
8. Turn ignition key OFF.

Manually reading DTCs from 1993–95 Nissan Quest 3.0L:

1. Locate the Diagnostic Jumper Connector (under hood, below MAF sensor, on bracket bolted to transaxle).
2. Turn the ignition key to ON.
3. Disconnect the Diagnostic Jumper Connector (DJC).
4. Referring to the illustration, use the Nissan jumper wire (P/N 02002075) to short the Blue/White wire and Grey/Blue wire between the DJC halves.



DIAGNOSTIC JUMPER CONNECTOR

5. Wait 2 seconds.
6. Disconnect the jumper wire and reconnect the DJC.
7. Record the DTCs by reading the flashing dashboard MIL.

Manually clearing DTCs from 1993–95 Nissan Quest 3.0L:

1. Perform the manually reading DTCs function.
2. Referring to the illustration, use the Nissan jumper wire (P/N 02002075) to short the Blue/White wire and Grey/Blue wire between the DJC halves.
3. Wait 2 seconds.
4. Disconnect the jumper wire and reconnect the DJC.
5. The MIL will illuminate constantly, indicating the DTCs have been erased.

MODE F1	DTC ENTRY
SUBMODE F2	DTC LIST

This submode provides you with a way to view all possible ECU DTCs, including DTC numbers and descriptions. You can also select the DTCs obtained from the ECU LED or MIL as an alternative way of entering DTCs into the tester's memory. As you scroll through the available DTCs you can view a description of the DTC obtained from the ECU LED. You can "Select" the DTC on the tester screen for later review or printing. Refer to the Common Test Modes OBD, OBD I Systems section for further information.

MODE F1	DTC ENTRY
SUBMODE F3	REVIEW DTC(s)

This submode provides you with a review of the DTCs that you entered or selected in the tester. The description of the entered or selected DTC will be displayed, along with a numerical summary of the entered or selected DTC. Review DTC is intended to provide you with an electronic clipboard that keeps track of the DTCs that you have encountered during diagnosis.

MODE F1	DTC ENTRY
SUBMODE F4	CLEAR DTC(s)

This submode has two options for you to chose. Option F0 is to view text screens that provide information on how to clear the DTCs from ECU memory. This is performed by tester keypad presses. Option F1 clears the tester memory of DTCs that you entered or selected in the tester. The clear DTC(s) mode is helpful and provides information that you would normally have to locate in a service manual.

DTC	MODE F2

To read DTCs on all 1987-89 and select 1990-95 Nissan vehicles you will need to locate the vehicle DLC and connect the Nissan Check Adapter to the tester and vehicle.

To locate the DLC, select F1: DLC LOCATION from the Information menu. If necessary, refer to the Common Test Modes OBD, OBD I Systems section for further instructions.

When Mode F2: DTC is selected, the tester displays four submodes:

DTC SUBMODES

F1: READ DTC(s)
F2: DTC LIST
F3: REVIEW DTC
F4: CLEAR DTC(s)

DTC	MODE F2
READ DTC(s)	SUBMODE F1

This submode is available for all 1987–89 and select 1990–95 Nissan vehicles. If you are unsure of the Read DTC test application, check the ECU Modes column in the Nissan Vehicle Coverage table (found at the beginning of this section). If the ECU Modes column indicates "5 Modes", then the vehicle supports F1: READ DTC(s).

This submode provides automated DTC retrieval from the vehicle ECU. Step-by-step screen instructions guide you to connect the RED Nissan Check adapter to the vehicle DLC and start and warm the engine to normal operating temperature. This is performed by following the tester instruction screens. If you have trouble, additional F1: READ DTC(s) retrieval information is described below.

Note: when reading DTCs from Nissan vehicles make sure the engine is at normal operating temperature and testing is performed in a well–ventilated area.

Reading DTCs from all 1987–89 and select 1990–95 Nissan ECUs with the 2 LED, 5–mode system:

1. Insert Asian cartridge into MASTERTECH or TECH 1A,
2. Connect Nissan Check adapter (Red) to DLC cable.
3. Connect the Check adapter to the vehicle DLC. Press F1: DLC LOCATION from the Information menu for Data Link Connector location assistance.
4. Power MASTERTECH or TECH 1A with 12v power cable.
5. Select Nissan vehicle to test.
6. Turn ignition key to start the engine.
7. Press F2: DTCs from Nissan test mode menu.
8. Press F1: READ DTCs submode from DTC test menu.
9. Tester will automatically command the vehicle ECU into the correct mode required to read DTCs, and will display all received DTCs on the tester display.

MODE F2	DTC
SUBMODE F2	DTC LIST

This submode provides you with a way to view all possible ECU DTCs, including DTC numbers and descriptions. You can also select the DTCs obtained from the ECU LED or MIL. as an alternative way of entering DTCs into the tester's memory. As you scroll through the available DTCs you can view a description of the DTC obtained from the ECU LED. You can "Select" the DTC on the tester screen for later review or printing. Refer to Common Test Modes OBD, OBD I Systems section for further information.

MODE F2	DTC
SUBMODE F3	REVIEW DTC

This submode provides you with a review of the DTCs that you entered or selected in the tester. The description of the entered or selected DTC will be displayed, along with a numerical summary of the entered or selected DTC. Review DTC is intended to provide you with an electronic clipboard that keeps track of the DTCs that you have encountered during diagnosis.

DTC	MODE F2
CLEAR DTC(s)	SUBMODE F4

This submode has two options for you to choose. Option 1 is an automated function during which the tester clears DTCs from the vehicle ECU memory. This is performed by tester keypad presses. Option 2 clears the tester memory of DTCs that you entered or selected in the tester. The clear DTC(s) mode is helpful and provides information that you would normally have to locate in a service manual.

IMPORTANT: Follow the Submode F0: Prepare Vehicle instructions to ensure proper vehicle preparation prior to testing. The vehicle must be completely warmed up in order for the tester to communicate properly with the vehicle.

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7. OBD CONTROLS

The OBD Controls mode is used to select a submenu of output tests applicable to Nissan vehicles. Pressing F4 from the Select Mode menu displays a list of tests available. To return to the Select Mode menu, press EXIT.

Once you have selected the test mode, operation begins. Detailed operating instructions for each output control test are on the following pages.

There are descriptions of four output tests available in the Nissan specific section. Each OBD Control test can provide you with enhanced diagnostic information which will help to pinpoint Air–Fuel Ratio (AFR) problems, ECU switch input problems, and real time diagnostic trouble code monitoring for intermittent component failure.

F0: AFR MONITOR A
Monitors engine control system open/closed loop operation and exhaust emission rich/lean status.

F1: AFR MONITOR B
Monitors engine control system open/closed loop operation with indication of AFR greater than 5% lean, greater than 5% rich, or between 5% lean and 5% rich.

F2: SWITCH TEST
Monitors ECU idle, starter, and vehicle speed switch input.

F3: RT DTC MONITOR
Real Time Diagnostic Trouble Code monitors intermittent crank signal, ignition primary, and air flow meter component.

MODE F4	OBD CONTROLS
SUBMODE F0	AFR MONITOR A

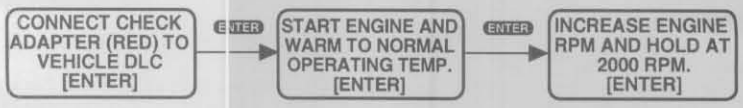
The AFR Monitor A miscellaneous test is available for all 1987–89 and select 1990–95 Nissan vehicles. If you are unsure of test application, check the ECU Modes column in the Nissan Vehicles and Systems table. If the ECU Modes column indicates "5 Modes", then the vehicle supports AFR Monitor A.

The AFR Monitor A test monitors and displays the ECU loop status and exhaust emission Rich/Lean content. The loop status can either be Open or Closed, depending on the commanded ECU state. And exhaust emission content can be Rich or Lean, depending on the level of oxygen present in exhaust emissions, which is detected by the oxygen sensor. Since this test monitors the operation of the green LED on the ECU, you can determine the operation of the green LED without locating and watching the ECU mounted LED. This test can help you to determine faulty fuel and emission system components in the service bay or on a road test.

Note: when performing the AFR Monitor A test, make sure the vehicle is properly warmed up and is tested in a well–ventilated area.

OPERATING PROCEDURE

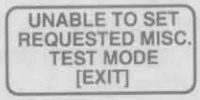
1. Press **F0** to select AFR Monitor A from the OBD Controls menu.
2. The tester displays instructions for preparing the vehicle to perform the test. Press **ENTER** when the instructions on each screen have been completed.



OBD CONTROLS	MODE F4
AFR MONITOR A	SUBMODE F0

3. When the preparations are complete the tester displays the status of the test. Press **EXIT** to return to the OBD Controls menu.

4. If the tester is unable to set the ECU to the selected mode, the following screen is displayed. Press **EXIT** to return to the OBD Controls menu.



ACTIVE KEYS	
F0	Select test.
ENTER	Used when instructions on each screen have been completed.
EXIT	Return to OBD Controls menu.

MODE F4	OBD CONTROLS
SUBMODE F1	AFR MONITOR B

The AFR Monitor B miscellaneous test is available for all 1987–89 and select 1990–95 Nissan vehicles. If you are unsure of test application, check the ECU Modes column in the Nissan Vehicles and Systems table. If the ECU Modes column indicates "5 Modes", then the vehicle supports AFR Monitor B.

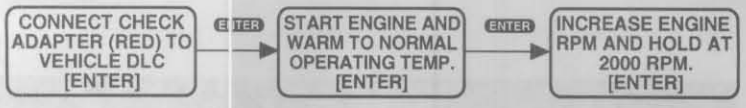
The AFR Monitor B test monitors and displays the ECU loop status and the percent AFR mixture Rich/Lean content of the exhaust emissions. The loop status can either be Open or Closed, depending on the commanded ECU state. And the AFR Monitor B gives you information about the percent Lean or Rich of engine exhaust emissions. If the oxygen sensor detects exhaust emissions to be more than 5% lean of normal (normal being 14.7:1, the stoichiometric equivalent of 14.7 parts of air to 1 part of fuel, which is the ideal air–fuel ratio), more than 5% Rich of normal, or between 5% lean and 5% rich of normal, then the tester will display an indication of the detected exhaust emission condition.

Note: when performing the AFR Monitor B test, make sure the vehicle is properly warmed up and is tested in a well–ventilated area.

OPERATING PROCEDURE

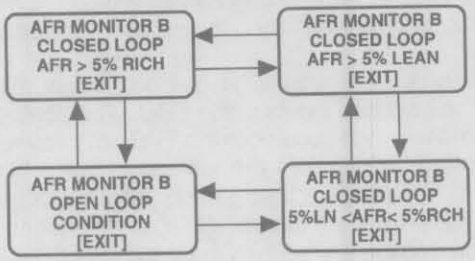
1. Press F1 to select AFR Monitor B from the OBD Controls Tests menu.

2. The tester displays instructions for preparing the vehicle to perform the test. Press ENTER when the instructions on each screen have been completed.

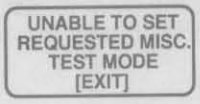


OBD CONTROLS	MODE F4
AFR MONITOR B	SUBMODE F1

3. When the preparations are complete the tester displays the status of the test. Press EXIT to return to the OBD Controls menu.



4. If the tester is unable to set the ECU to the selected mode, the following screen is displayed. Press EXIT to return to the OBD Controls menu.



ACTIVE KEYS	
F1	Select test.
ENTER	Used when instructions on each screen have been completed.
EXIT	Return to OBD Controls menu.

MODE F4	OBD CONTROLS
SUBMODE F2	SWITCH TEST

The Switch Test is available for all 1987–89 and select 1990–95 Nissan vehicles. If you are unsure of test application, check the ECU Modes column in the Nissan Vehicle and Systems table. If the ECU Modes column indicates "5 Modes", then the vehicle supports Switch Test.

The Switch Test provides you with a guided procedure which tests the condition of the switched inputs to the ECU. The components that are tested are the idle switch (located in the TPS on some vehicles), starter switch (the crank signal from the ignition switch while in the crank position), and the vehicle speed switch (which indicates a speed of greater than 12MPH when the vehicle speed sensor contacts close). If, while performing the Switch test, the tester detects a fault with either switched input, it will display a message about which circuit to check. Or if the test is completed and the tester does not detect a failure, a pass message will be displayed.

Note: when performing the Switch Test, make sure the vehicle is properly warmed up and is tested in a well–ventilated area.

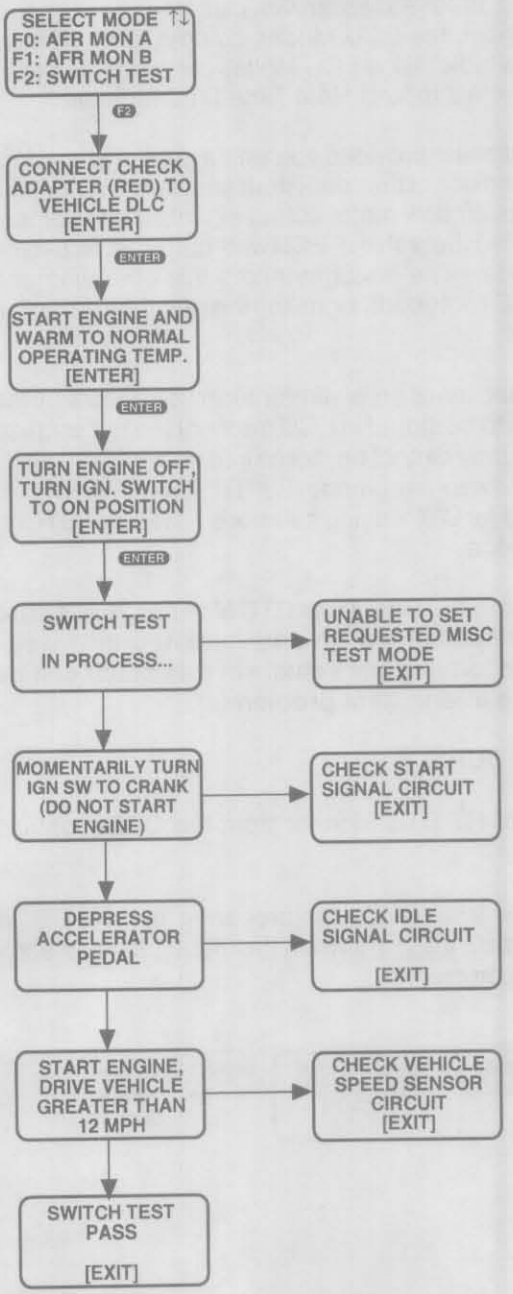
OPERATING PROCEDURE

1. Press F2 to select Switch Test from the OBD Controls menu.
2. The tester displays instructions for performing the Switch Test. Press ENTER when each step has been completed.
3. Follow the instructions on the tester display. When each instruction is completed, the tester indicates if further action is necessary. If a problem is detected, press EXIT to return to the OBD Controls menu.
4. The tester informs you if the switch passes the test. Press EXIT to return to the OBD Controls menu.
5. If the tester is unable to set the ECU to the selected mode, the tester informs you. Press EXIT to return to the OBD Controls menu.

	ACTIVE KEYS
F2	Select test.
ENTER	Used when each step has been completed.
EXIT	Return to Misc. Tests menu.

OBD CONTROLS	MODE F4
SWITCH TEST	SUBMODE F2

SWITCH TEST



Message if ECU does not enter switch test mode.

Message if ECU does not detect start signal.

Message if ECU does not detect idle switch signal.

Message if ECU does not detect VSS.

MODE F4	OBD CONTROLS
SUBMODE F3	RT DTC MONITOR

The Real Time (RT) DTC Monitor output control test is available for all 1987–89 and select 1990–95 Nissan vehicles. If you are unsure of test application, check the ECU Modes column in the Nissan Vehicles and Systems table. If the ECU Modes column indicates "5 Modes", then the vehicle supports Real Time DTC Monitor.

The Real Time DTC Monitor provides you with a guided procedure which monitors the condition of the crankshaft angle sensor, ignition primary signal, and the air flow meter output signal. If any component intermittently fails, the vehicle ECU will output a real–time diagnostic trouble code. The tester monitors this operation and changes from OK to NG (not good), signaling the real-time detection of a faulty component.

In some cases, the detection of a real–time intermittent failure by the ECU will cause a DTC to be stored in ECU memory (do not confuse this with RT DTCs, as they cannot be stored into non– volatile ECU memory). After performing submode F3: RT DTC MONITOR, always check the ECU for DTCs using submode F1: READ DTC(s) in the F2: DTC test mode.

Note: when performing the Real Time DTC Monitor, make sure the vehicle is properly warmed up and is tested in a well–ventilated area. Also, driving the vehicle in this mode can be helpful in duplicating intermittent problem(s).

OPERATING PROCEDURE

1. Press **F3** to select RT DTC Monitor from the OBD Controls menu.

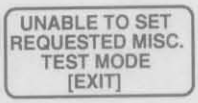
2. The tester displays instructions for preparing the vehicle to perform the test. Press **ENTER** when the instructions on each screen have been completed.

OBD CONTROLS	MODE F4
RT DTC MONITOR	SUBMODE F3

3. The tester displays the results of the test. OK is displayed if the sensor is functioning properly, or NG (Not Good) is displayed if a fault is detected. Examples are shown below.

4. Press EXIT to return to the OBD Controls menu.

5. If the tester is unable to set the ECU to the selected mode, the following screen is displayed. Press EXIT to return to the OBD Controls menu.



ACTIVE KEYS	
F3	Select test.
ENTER	Used when instructions on each screen have been completed.
EXIT	Return to OBD Controls menu.

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8. NISSAN DIAGNOSTIC TROUBLE CODES (DTCs)

DTCs available for Nissan vehicles are listed in the following charts.

Some code numbers have different descriptors depending on the selected vehicle. Only codes available for the selected vehicle are displayed by the tester.

OBD, OBD I SYSTEMS

YEAR	DTC NO.	DESCRIPTOR
1984	11	CKP SENSOR OR CKP CIRCUIT FAIL
	12	AIR FLOW METER CIRCUIT FAILURE
	13	ECT SENSOR OR ECT CKT FAILURE
		CYL. HEAD TEMP SENSOR FAILURE
	14	VSS OR VSS CIRCUIT FAILURE
	21	IGNITION SWITCH OR CKT FAILURE
	22	FUEL PUMP OR FP CIRCUIT FAILURE
	23	THROTTLE IDLE SWITCH FAILURE
	24	TRANS. SWITCH OR CIRCUIT FAILURE
		PARK/NEUTRAL SW. OR CKT FAILURE
	31	A/C OR A/C CIRCUIT FAILURE
	32	STARTER SIGNAL MALFUNCTION
	34	KNOCK SENSOR OR KS CKT FAILURE
	41	IAT SENSOR OR IAT CKT FAILURE
		FUEL TEMP SENSOR OR CKT FAILURE
	44	NO DTCs DETECTED BY ECU

NISSAN DTCs

YEAR	DTC NO.	DESCRIPTOR
1985	11	CKP SENSOR OR CKP CIRCUIT FAIL
	12	AIR FLOW METER CIRCUIT FAILURE
	13	ECT SENSOR OR ECT CKT FAILURE
		CYL. HEAD TEMP SENSOR FAILURE
	14	VSS OR VSS CIRCUIT FAILURE
	21	IGNITION SIGNAL OR CKT FAILURE
	22	FUEL PUMP OR FP CIRCUIT FAILURE
	23	THROTTLE IDLE SWITCH FAILURE
	24	TRANS. SWITCH OR CIRCUIT FAILURE
		PARK/NEUTRAL SW. OR CKT FAILURE
	31	E.I.C.D SYSTEM MALFUNCTION
		LOAD SIGNAL OR CIRCUIT FAILURE
		A/C OR A/C CIRCUIT FAILURE
	32	STARTER SIGNAL MALFUNCTION
	34	KNOCK SENSOR OR KS CIRCUIT FAILURE
	41	IAT SENSOR OR IAT CKT FAILURE
		DISREGARD IF DISPLAYED
		FUEL TEMP SENSOR OR CKT FAILURE
	44	NO DTCs DETECTED BY ECU

NISSAN DTCs

YEAR	DTC NO.	DESCRIPTOR
1986	11	CKP SENSOR OR CKP CIRCUIT FAILURE
	12	AIR FLOW METER CIRCUIT FAILURE
	13	ECT SENSOR OR ECT CKT FAILURE
		CYL. HEAD TEMP SENSOR FAILURE
	14	VSS OR VSS CIRCUIT FAILURE
	21	IGNITION SIGNAL OR CKT FAILURE
	22	FUEL PUMP OR FP CIRCUIT FAILURE
	23	THROTTLE IDLE SWITCH FAILURE
	24	TRANS. SWITCH OR CIRCUIT FAILURE
		PARK/NEUTRAL SW. OR CKT FAILURE
		CLUTCH/NEUT. SW OR CKT FAILURE
	31	IDLE CONTROL CIRCUIT FAILURE
		F.I.C.D SYSTEM MALFUNCTION
		LOAD SIGNAL OR CIRCUIT FAILURE
	32	STARTER SIGNAL MALFUNCTION
	33	O2S OR O2S CIRCUIT FAILURE
	34	KNOCK SENSOR OR KS CKT FAILURE
	41	IAT SENSOR OR IAT CKT FAILURE
		FUEL TEMP SENSOR OR CKT FAILURE
	42	TP SENSOR OR TPS CKT FAILURE
	43	FUEL INJECTOR OR CKT FAILURE
	44	NO DTCs DETECTED BY ECU

NISSAN DTCs

YEAR	DTC NO.	DESCRIPTOR
1987	11	CKP SENSOR OR CKP CIRCUIT FAIL
	12	AIR FLOW METER CIRCUIT FAILURE
	13	ECT SENSOR OR ECT CKT FAILURE
		CYL. HEAD TEMP SENSOR FAILURE
	21	IGNITION SIGNAL OR CKT FAILURE
	22	FUEL PUMP OR FP CIRCUIT FAILURE
		ERRATIC IDLE SPEED CONTROL
	23	THROTTLE IDLE SWITCH FAILURE
	31	A/C OR A/C CIRCUIT FAILURE
	32	STARTER SIGNAL MALFUNCTION
	33	O2S OR O2S CIRCUIT FAILURE
	34	KNOCK SENSOR OR KS CKT FAILURE
		KS OR KS CKT FAILURE (VG30ET)
	41	IAT SENSOR OR IAT CKT FAILURE
		FUEL TEMP SENSOR OR CKT FAILURE
	42	TP SENSOR OR TPS CKT FAILURE
	43	ERRATIC MIXTURE RATIO CONTROL
		FUEL INJECTOR OR CKT FAILURE
	44	NO DTCs DETECTED BY ECU

NISSAN DTCs

YEAR	DTC NO.	DESCRIPTOR
1988	11	CKP SENSOR OR CKP CIRCUIT FAIL
	12	AIR FLOW METER CIRCUIT FAILURE
	13	ECT SENSOR OR ECT CKT FAILURE
		CYL. HEAD TEMP SENSOR FAILURE
	14	VSS OR VSS CIRCUIT FAILURE
	15	ERRATIC MIXTURE RATIO CONTROL
	21	IGNITION SIGNAL OR CKT FAILURE
	22	FUEL PUMP OR FP CIRCUIT FAILURE
	23	THROTTLE IDLE SWITCH FAILURE
	24	FULL THROTTLE SWITCH FAILURE
	25	ERRATIC IDLE SPEED CONTROL
	31	FAULTY ECU OR ECU CKT FAILURE
	32	EGR CKT FAILURE (CA ONLY)
		EGR SENSOR OR EGR CKT FAILURE
	33	O2S OR O2S CIRCUIT FAILURE
	34	KNOCK SENSOR OR KS CKT FAILURE
		KS OR KS CKT FAILURE (VG30ET)
	35	EXHAUST GAS TEMP CKT (CA ONLY)
		EXHAUST GAS TEMP SENSOR CIRCUIT
	41	IAT SENSOR OR IAT CKT FAILURE
	42	FUEL TEMP SENSOR OR CKT FAILURE
		TPS OR TPS CKT FAIL (CA ONLY)
		TP SENSOR OR TPS CKT FAILURE
	44	NO DTCs DETECTED BY ECU
	45	INJECTOR LEAK (CA ONLY)
		INJECTOR LEAK
	51	FUEL INJECTOR OR CKT FAILURE
	55	NO DTCs DETECTED BY ECU

NISSAN DTCs

YEAR	DTC NO.	DESCRIPTOR
1989	11	CKP SENSOR OR CKP CIRCUIT FAIL
	12	AIR FLOW METER CIRCUIT FAILURE
	13	ECT SENSOR OR ECT CKT FAILURE
	13	CYL. HEAD TEMP SENSOR FAILURE
		ECT SENSOR OR ECT CKT FAILURE
	14	VSS OR VSS CIRCUIT FAILURE
	21	IGNITION SIGNAL OR CKT FAILURE
	22	FUEL PUMP OR FP CIRCUIT FAILURE
	23	THROTTLE IDLE SWITCH FAILURE
	24	FULL THROTTLE SWITCH FAILURE
	25	A.A.C. VALVE CIRCUIT FAILURE
	31	FAULTY ECU OR ECU CKT FAILURE
	32	EGR SENSOR OR EGR CKT FAILURE
	33	O2S OR O2S CIRCUIT FAILURE
	34	KS OR KS CKT FAILURE (VG30ET)
		KNOCK SENSOR OR KS CKT FAILURE
	35	EXHAUST GAS TEMP SENSOR CIRCUIT
	41	IAT SENSOR OR IAT CKT FAILURE
	42	FUEL TEMP SENSOR OR CKT FAILURE
	43	TP SENSOR OR TPS CKT FAILURE
	45	INJECTOR LEAK
		INJECTOR LEAK (CA ONLY)
	51	FUEL INJECTOR OR CKT FAILURE
	54	FAULTY A/T CONTROL UNIT
	55	NO DTCs DETECTED BY ECU

NISSAN DTCs

YEAR	DTC NO.	DESCRIPTOR
1990	11	CKP SENSOR OR CKP CIRCUIT FAIL
	12	AIR FLOW METER CIRCUIT FAILURE
	13	ECT SENSOR OR ECT CKT FAILURE
	14	VSS OR VSS CIRCUIT FAILURE
	21	IGNITION SIGNAL OR CKT FAILURE
	22	FUEL PUMP OR FP CIRCUIT FAILURE
	23	THROTTLE IDLE SWITCH FAILURE
	25	A.A.C. VALVE CIRCUIT FAILURE
	31	FAULTY ECU OR ECU CKT FAILURE
	32	EGR SENSOR OR EGR CKT FAILURE
	33	O2S OR O2S CIRCUIT FAILURE
		LEFT O2S OR CIRCUIT FAILURE
	34	KNOCK SENSOR OR KS CKT FAILURE
	35	EXHAUST GAS TEMP SENSOR CIRCUIT
	41	IAT SENSOR OR IAT CKT FAILURE
	42	FUEL TEMP SENSOR OR CKT FAILURE
	43	TP SENSOR OR TPS CKT FAILURE
	45	INJECTOR LEAK
	51	FUEL INJECTOR OR CKT FAILURE
	53	RIGHT O2S OR CIRCUIT FAILURE
	54	TCM TO ECU CIRCUIT FAILURE
		FAULTY A/T CONTROL UNIT
	55	NO DTCs DETECTED BY ECU

NISSAN DTCs

YEAR	DTC NO.	DESCRIPTOR
1991	11	CKP SENSOR OR CKP CIRCUIT FAIL
	12	AIR FLOW METER CIRCUIT FAILURE
	13	ECT SENSOR OR ECT CKT FAILURE
	14	VSS OR VSS CIRCUIT FAILURE
	21	IGNITION SIGNAL OR CKT FAILURE
	22	FUEL PUMP OR FP CIRCUIT FAILURE
	31	FAULTY ECU OR ECU CKT FAILURE
	32	EGR SENSOR OR EGR CKT FAILURE
	33	O2S OR O2S CIRCUIT FAILURE
		LEFT O2S OR CIRCUIT FAILURE
	34	KNOCK SENSOR OR KS CKT FAILURE
		KS OR KS CKT FAILURE (SR20DE)
	35	EXHAUST GAS TEMP SENSOR CIRCUIT
	41	IAT SENSOR OR IAT CKT FAILURE
	42	FUEL TEMP SENSOR OR CKT FAILURE
	43	TP SENSOR OR TPS CKT FAILURE
	45	INJECTOR LEAK
	51	FUEL INJECTOR OR CKT FAILURE
	53	RIGHT O2S OR CIRCUIT FAILURE
	54	TCM TO ECU CIRCUIT FAILURE
		FAULTY A/T CONTROL UNIT
	55	NO DTCs DETECTED BY ECU

NISSAN DTCs

YEAR	DTC NO.	DESCRIPTOR
1992	11	CKP SENSOR OR CKP CIRCUIT FAIL
	12	AIR FLOW METER CIRCUIT FAILURE
	13	ECT SENSOR OR ECT CKT FAILURE
	14	VSS OR VSS CIRCUIT FAILURE
	21	IGNITION SIGNAL OR CKT FAILURE
	22	FUEL PUMP OR FP CIRCUIT FAILURE
	31	FAULTY ECU OR ECU CKT FAILURE
	32	EGR SENSOR OR EGR CKT FAILURE
	33	O2S OR O2S CIRCUIT FAILURE
		LEFT O2S OR CIRCUIT FAILURE
	34	KNOCK SENSOR OR KS CKT FAILURE
	35	EXHAUST GAS TEMP SENSOR CIRCUIT
	41	IAT SENSOR OR IAT CKT FAILURE
	42	FUEL TEMP SENSOR OR CKT FAILURE
		TP SENSOR OR TPS CKT FAILURE
	45	INJECTOR LEAK
	51	FUEL INJECTOR OR CKT FAILURE
	53	RIGHT O2S OR CIRCUIT FAILURE
	54	TCM TO ECU CIRCUIT FAILURE
		FAULTY A/T CONTROL UNIT
	55	NO DTCs DETECTED BY ECU

NISSAN DTCs

YEAR	DTC NO.	DESCRIPTOR
1993	11	CKP SENSOR OR CKP CIRCUIT FAIL
	12	MAF SENSOR OR MAF CKT FAILURE
	13	ECT SENSOR OR ECT CKT FAILURE
	14	VSS OR VSS CIRCUIT FAILURE
	21	IGNITION SIGNAL OR CKT FAILURE
	22	FUEL PUMP OR FP CKT FAILURE
	31	FAULTY ECM OR ECM CKT FAILURE
	32	EGR SENSOR OR EGR CKT FAILURE
	33	O2S OR O2S CIRCUIT FAILURE
		LEFT HO2S OR CIRCUIT FAILURE
		HO2S OR HO2S CIRCUIT FAILURE
	34	KNOCK SENSOR OR KS CKT FAILURE
	35	EGR TEMP SENSOR OR CKT FAILURE
	41	IAT SENSOR OR IAT CKT FAILURE
	42	FUEL TEMP SENSOR OR CKT FAILURE
	43	TP SENSOR OR TPS CKT FAILURE
	45	INJECTOR LEAK
	51	FUEL INJECTOR OR CKT FAILURE
	53	RIGHT HO2S OR CIRCUIT FAILURE
	54	TCM TO ECU CIRCUIT FAILURE
		FAULTY A/T CONTROL UNIT
	55	NO DTCs DETECTED BY ECM

NISSAN DTCs

YEAR	DTC NO.	DESCRIPTOR
1994	11	CAMSHAFT POS. OR CIRCUIT FAILURE
	12	MAF SENSOR OR MAF CKT FAILURE
	13	ECT SENSOR OR ECT CKT FAILURE
	14	VSS OR VSS CIRCUIT FAILURE
	21	IGNITION SIGNAL OR CKT FAILURE
	22	FUEL PUMP OR FP CIRCUIT FAILURE
	31	FAULTY ECM OR ECM CKT FAILURE
	32	EGR SENSOR OR EGR CKT FAILURE
	33	LEFT HO2S OR CIRCUIT FAILURE O2S OR O2S CIRCUIT FAILURE HO2S OR HO2S CIRCUIT FAILURE
	34	KNOCK SENSOR OR KS CKT FAILURE
	35	EGR TEMP SENSOR OR CKT FAILURE
	41	IAT SENSOR OR IAT CKT FAILURE
	42	FUEL TEMP SENSOR OR CKT FAILURE
	43	TP SENSOR OR TPS CKT FAILURE
	45	INJECTOR LEAK
	51	FUEL INJECTOR OR CKT FAILURE
	53	RIGHT HO2S OR CIRCUIT FAILURE
	54	TCM TO ECU CIRCUIT FAILURE FAULTY A/T CONTROL UNIT
	55	NO DTCs DETECTED BY ECM

NISSAN DTCs

YEAR	DTC No.	DESCRIPTOR
1995	11	CAMSHAFT POSITION SENSOR
	12	MAF SENSOR CIRCUIT
	13	EOT SENSOR CIRCUIT
	14	VSS CIRCUIT
	21	IGNITION SIGNAL CIRCUIT
	26	BOOST PRESSURE SENSOR
	31	ECM
	32	EGR MALFUNCTION
	33	HO2 SENSOR CIRCUIT MALFUNCTION (LEFT BANK V6)
	33	HO2 SENSOR CIRCUIT MALFUNCTION
	33	O2 SENSOR CIRCUIT MALFUNCTION
	34	KNOCK SENSOR CIRCUIT
	35	EGR TEMP. SENSOR CIRCUIT
	41	IAT SENSOR CIRCUIT
	42	FUEL TEMP. SENSOR CIRCUIT
	43	TPS CIRCUIT
	45	INJECTOR LEAK
	51	INJECTOR CIRCUIT
	53	HO2 SENSOR CIRCUIT MALFUNCTION (RIGHT BANK V6)
	54	SIGNAL CIRCUIT FROM A/T CONTROL TO ECM
	55	NO MALFUNCTIONS PRESENT

OBD II SYSTEMS

YEAR	DTC NO.	DESCRIPTION
1995-98 OBD II	P0000	No Failure Detected
	P0100	MAF Sensor Circuit Malfunction
	P0105	Absolute Pressure Sensor Malfunction
	P0110	IAT Sensor circuit malfunction
	P0115	ECT circuit malfunction
	P0120	TPS circuit malfunction
	P0125	Coolant temp. Sensor Circuit Malfunction, no Closed Loop Fuel Control
	P0130	Front (H)O2 Sensor Circuit Malfunction, no Closed Loop
	P0131	Front HO2 Sensor, Lean Shift Monitor
	P0132	Front HO2 Sensor, Rich Shift Monitor
	P0133	Front HO2 Sensor, Response Monitor
	P0134	Front HO2 Sensor, Excessively High Voltage
	P0135	Front HO2S Heater Circuit Malfunction (Right Bank)
	P0136	Rear HO2 Sensor Circuit Malfunction
	P0137	Rear HO2 Sensor, Minimum Voltage Monitor
	P0138	Rear HO2 Sensor, Maximum Voltage Monitor
	P0139	Rear HO2 Sensor, Response Monitor
	P0140	Rear HO2 Sensor, Excessively High Voltage
	P0141	Rear HO2 Sensor Heater Circuit Malfunction
	P0150	Front HO2 Sensor Circuit, No Closed Loop Control (Left Bank)
	P0151	Front HO2 Sensor, Lean Shift Monitor (Left Bank)
	P0152	Front HO2 Sensor, Rich Shift Monitor (Left Bank)
	P0153	Front HO2 Sensor, Response Monitor (Left Bank)
	P0154	Front HO2 Sensor, Excessively High Voltage (Left Bank)
	P0155	Front HO2 Sensor Heater Circuit Malfunction, Left Bank
	P0156	Rear HO2 Sensor Circuit Malfunction (Left Bank)
	P0157	Rear HO2 Sensor, Minimum Voltage Monitor (Left Bank)
	P0158	Rear HO2 Sensor, Maximum Voltage Monitor (Left Bank)
	P0159	Rear HO2 Sensor, Response Monitor (Left Bank)
	P0160	Rear HO2 Sensor, Excessively High Voltage (Left Bank)
	P0161	Rear HO2 Sensor Heater Circuit Malfunction, Left Bank
	P0170	Fuel Injection System Malfunction (Right Bank)
	P0171	Fuel System Malfunction, Lean Condition (Right Bank)
	P0172	Fuel System Malfunction, Rich Condition (Right Bank)
	P0173	Fuel Injection System Malfunction (Left Bank)
	P0174	Fuel System Malfunction, Lean Condition (Left Bank)
	P0175	Fuel System Malfunction, Rich Condition (Left Bank)
	P0180	Fuel Tank Temp. Sensor Circuit Malfunction

NISSAN DTCs (CONT.)

YEAR	DTC NO.	DESCRIPTION
1995-98 OBD II	P0300	Random Misfire Detected
	P0301	Cylinder No. 1, Misfire Detected
	P0302	Cylinder No. 2, Misfire Detected
	P0303	Cylinder No. 3, Misfire Detected
	P0304	Cylinder No. 4, Misfire Detected
	P0305	Cylinder No. 5, Misfire Detected
	P0306	Cylinder No. 6, Misfire Detected
	P0325	Knock Sensor Circuit Malfunction
	P0335	Crankshaft Position Sensor Circuit Malfunction
	P0340	Camshaft Position Sensor Circuit Malfunction
	P0400	EGR System Malfunction
	P0402	EGRC-BPT Valve Malfunction
	P0420	Three-way Catalyst System Malfunction (Right Bank)
	P0430	Three-way Catalyst System Malfunction (Left Bank)
	P0440	EVAP System, Small Leak Detected
	P0443	EVAP Purge Control Valve Circuit Malfunction
	P0446	EVAP Vent Control Valve, Circuit Malfunction
	P0450	EVAP System, Pressure Sensor Malfunction
	P0500	Vehicle Speed Sensor Malfunction
	P0505	IAC Valve-AAC, System Malfunction
	P0510	Closed Throttle Sensor Idle Switch Malfunction
	P0600	Signal Circuit from A/T to ECM Malfunction
	P0605	ECM Malfunction
	P0705	Park/Neutral (Inhibitor) Switch Malfunction
	P0710	Trans. Fluid Temp. Sensor Out of Range
	P0720	A/T VSS Circuit Malfunction
	P0725	Engine RPM signal Malfunction
	P0731	A/T 1st Gear Shift Signal Malfunction
	P0732	A/T 2nd Gear Shift Signal Malfunction
	P0733	A/T 3rd Gear Shift Signal Malfunction
	P0734	A/T 4th Gear Signal or TCC Malfunction
	P0740	TCC Solenoid Valve Malfunction
	P0744	A/T TCC Signal, Improper Lock-Up Operation
	P0745	Line Pressure Solenoid Valve Malfunction
	P0750	Shift Solenoid A, Malfunction
	P0755	Shift Solenoid B, Malfunction
	P1105	MAP/BARO Switch Solenoid Valve Malfunction
	P1110	Valve Timing Control Valve System Malfunction

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NISSAN DTCs (CONT.)

YEAR	DTC NO.	DESCRIPTION
1995-98 OBD II	P1130	Swirl Control Solenoid Valve Malfunction
	P1150	W/G Control Solenoid Valve (Right Bank)
	P1155	W/G Control Solenoid Valve (Left Bank)
	P1160	Turbo Boost Sensor Circuit Malfunction
	P1165	Swirl Control Valve Vacuum Check Switch Malfunction
	P1168	Front HO2 Sensor Circuit Malfunction, no Closed Loop (Left Bank)
	P1220	Fuel Pump Control Module Circuit Malfunction
	P1320	Ignition Signal Primary Circuit Malfunction
	P1335	CKP Sensor (Reference) Circuit Malfunction
	P1336	CKP Sensor (OBD) or Flywheel Malfunction
	P1400	EGR Valve (and Canister) Control Solenoid Valve Malfunction
	P1401	EGR Temp. Sensor Circuit Malfunction
	P1402	EGR System Malfunction, High Flow
	P1440	EVAP Control System, Small Leak
	P1441	Vacuum Cut Valve Bypass Valve Malfunction
	P1443	Canister Control Vacuum Check Switch Malfunction
	P1444	Purge Control Valve or Solenoid Valve Malfunction
	P1445	Purge Volume Control Valve Malfunction
	P1446	EVAP Vent Control Valve Malfunction
	P1447	EVAP Purge Flow Monitoring Malfunction
	P1448	EVAP Vent Control System Malfunction
	P1550	TCC Solenoid Valve Malfunction
	P1605	A/T Diagnosis Communication Circuit Malfunction
	P1705	TPS Voltage Input to A/T Too High or Low
	P1706	Park/Neutral Switch Circuit Malfunction
	P1760	Overrun Clutch Solenoid Valve Malfunction
	P1775	TCC Solenoid Valve Circuit Malfunction
	P1776	A/T TCC Slip Detected During Lock-Up
	P1900	Cooling Fan Circuit Malfunction

SUBARU

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1. VEHICLES AND SYSTEMS

Using the **Asian Imports Cartridge**, the following Subaru vehicles can be diagnosed.

MODEL	ENGINE	FUEL SYSTEM	TRANS TYPE	ECU MODES	CODE TYPE	ADAPTER TYPE
1983						
BRAT	1.8L H4	ECC CARTER	A/T,M/T	ECULED	MANCODES	NONE
BRAT	1.8L H4	ECC HITACHI	A/T,M/T	ECULED	MANCODES	NONE
BRAT	1.8L H4	EFI TURBO	A/T	ECULED	MANCODES	NONE
DL	1.6L H4	ECC CARTER	M/T	ECULED	MANCODES	NONE
DL	1.6L H4	ECC HITACHI	M/T	ECULED	MANCODES	NONE
DL	1.8L H4	ECC CARTER	M/T	ECULED	MANCODES	NONE
DL	1.8L H4	ECC HITACHI	M/T	ECULED	MANCODES	NONE
GL	1.8L H4	ECC CARTER	A/T,M/T	ECULED	MANCODES	NONE
GL	1.8L H4	ECC HITACHI	A/T,M/T	ECULED	MANCODES	NONE
GL	1.8L H4	EFI TURBO	A/T	ECULED	MANCODES	NONE
STD	1.6L H4	ECC CARTER	M/T	ECULED	MANCODES	NONE
STD	1.6L H4	ECC HITACHI	M/T	ECULED	MANCODES	NONE
STD	1.8L H4	ECC CARTER	M/T	ECULED	MANCODES	NONE
STD	1.8L H4	ECC HITACHI	M/T	ECULED	MANCODES	NONE
1984						
BRAT	1.8L H4	ECC CARTER	A/T,M/T	ECULED	MANCODES	NONE
BRAT	1.8L H4	ECC HITACHI	A/T,M/T	ECULED	MANCODES	NONE
BRAT	1.8L H4	EFI TURBO	A/T	ECULED	MANCODES	NONE
DL	1.6L H4	ECC CARTER	M/T	ECULED	MANCODES	NONE
DL	1.6L H4	ECC HITACHI	M/T	ECULED	MANCODES	NONE
DL	1.8L H4	ECC CARTER	M/T	ECULED	MANCODES	NONE
DL	1.8L H4	ECC HITACHI	M/T	ECULED	MANCODES	NONE
GL	1.8L H4	ECC CARTER	A/T,M/T	ECULED	MANCODES	NONE
GL	1.8L H4	ECC HITACHI	A/T,M/T	ECULED	MANCODES	NONE
GL	1.8L H4	EFI TURBO	A/T	ECULED	MANCODES	NONE
STD	1.6L H4	ECC CARTER	M/T	ECULED	MANCODES	NONE
STD	1.6L H4	ECC HITACHI	M/T	ECULED	MANCODES	NONE
1985						
DL	1.8L H4	ECC	M/T	ECULED	MANCODES	NONE
GL	1.8L H4	ECC	A/T,M/T	ECULED	MANCODES	NONE
GL-10	1.8L H4	MPFI	A/T,M/T	ECULED	MANCODES	NONE
RX SEDAN	1.8L H4	MPFI TURBO	M/T	ECULED	MANCODES	NONE
SEDAN	1.8L H4	MPFI TURBO	A/T,M/T	ECULED	MANCODES	NONE
XT COUPE	1.8L H4	MPFI	A/T,M/T	ECULED	MANCODES	NONE
XT GL-10 COUPE	1.8L H4	MPFI TURBO	A/T,M/T	ECULED	MANCODES	NONE
1986						
3-DOOR	1.8L H4	MPFI TURBO	M/T	ECULED	MANCODES	NONE
DL	1.8L H4	ECC	M/T	ECULED	MANCODES	NONE
GL	1.8L H4	ECC	A/T,M/T	ECULED	MANCODES	NONE
GL	1.8L H4	MPFI	A/T,M/T	ECULED	MANCODES	NONE
RX SEDAN	1.8L H4	MPFI TURBO	M/T	ECULED	MANCODES	NONE
XT COUPE	1.8L H4	MPFI	A/T,M/T	ECULED	MANCODES	NONE
XT GL-10 COUPE	1.8L H4	MPFI TURBO	A/T,M/T	ECULED	MANCODES	NONE

SUBARU

MODEL	ENGINE	FUEL SYSTEM	TRANS TYPE	ECU MODES	CODE TYPE	ADAPTER TYPE
1987						
DL 3-DOOR	1.8L H4	SPFI	M/T	ECULED	MANCODES	NONE
DL SEDAN/WAGON	1.8L H4	SPFI	A/T,M/T	ECULED	MANCODES	NONE
GL 3-DOOR	1.8L H4	SPFI	A/T,M/T	ECULED	MANCODES	NONE
GL 3-DOOR	1.8L H4	MPFI TURBO	M/T	ECULED	MANCODES	NONE
GL	1.8L H4	SPFI	A/T,M/T	ECULED	MANCODES	NONE
GL	1.8L H4	MPFI TURBO	M/T	ECULED	MANCODES	NONE
GL-10	1.8L H4	SPFI	A/T,M/T	ECULED	MANCODES	NONE
GL-10	1.8L H4	MPFI TURBO	A/T,M/T	ECULED	MANCODES	NONE
JUSTY	1.2L I3	ECC	M/T	ECULED	MANCODES	NONE
RX	1.8L H4	MPFI TURBO	M/T	ECULED	MANCODES	NONE
XT	1.8L H4	MPFI	A/T,M/T	ECULED	MANCODES	NONE
XT	1.8L H4	MPFI TURBO	M/T	ECULED	MANCODES	NONE
XT GL-10 COUPE	1.8L H4	MPFI	A/T,M/T	ECULED	MANCODES	NONE
XT GL-10 COUPE	1.8L H4	MPFI TURBO	M/T	ECULED	MANCODES	NONE
1988						
DL	1.8L H4	SPFI	A/T,M/T	ECULED	MANCODES	NONE
GL	1.8L H4	SPFI	A/T,M/T	ECULED	MANCODES	NONE
GL	1.8L H4	MPFI TURBO	M/T	ECULED	MANCODES	NONE
GL-10	1.8L H4	SPFI	A/T	ECULED	MANCODES	NONE
GL-10	1.8L H4	MPFI TURBO	A/T,M/T	ECULED	MANCODES	NONE
JUSTY	1.2L I3	ECC	M/T	ECULED	MANCODES	NONE
RX	1.8L H4	MPFI TURBO	M/T	ECULED	MANCODES	NONE
XT	1.8L H4	MPFI	A/T,M/T	ECULED	MANCODES	NONE
XT6	2.7L H6	MPFI	A/T,M/T	ECULED	MANCODES	NONE
1989						
DL	1.8L H4	SPFI	A/T,M/T	ECULED	MANCODES	NONE
GL	1.8L H4	SPFI	A/T,M/T	ECULED	MANCODES	NONE
GL	1.8L H4	MPFI TURBO	A/T	ECULED	MANCODES	NONE
GL-10	1.8L H4	SPFI	A/T	ECULED	MANCODES	NONE
GL-10	1.8L H4	MPFI TURBO	A/T,M/T	ECULED	MANCODES	NONE
JUSTY	1.2L I3	ECC	M/T	ECULED	MANCODES	NONE
RX	1.8L H4	MPFI TURBO	M/T	ECULED	MANCODES	NONE
XT	1.8L H4	MPFI	A/T,M/T	ECULED	MANCODES	NONE
XT6	2.7L H6	MPFI	A/T,M/T	ECULED	MANCODES	NONE
1990						
JUSTY	1.2L I3	ECC	M/T	ECULED	MANCODES	NONE
JUSTY	1.2L I3	MPFI	M/T	ECULED	MANCODES	NONE
JUSTY	1.2L I3	MPFI	ECVT	ECULED	MANCODES	NONE
LEGACY	2.2L H4	MPFI	A/T,M/T	ECULED	MANCODES	NONE
LOYALE	1.8L H4	SPFI	A/T,M/T	ECULED	MANCODES	NONE
LOYALE	1.8L H4	MPFI TURBO	A/T,M/T	ECULED	MANCODES	NONE
XT	1.8L H4	MPFI	A/T,M/T	ECULED	MANCODES	NONE
XT6	2.7L H6	MPFI	4AT/5MT	ECULED	MANCODES	NONE
1991						
LEGACY	2.2L H4	MPFI	A/T,M/T	ECULED	MANCODES	NONE
LEGACY	2.2L H4	MPFI TURBO	A/T,M/T	ECULED	MANCODES	NONE
LOYALE	1.8L H4	SPFI	A/T,M/T	ECULED	MANCODES	NONE
LOYALE	1.8L H4	MPFI TURBO	A/T,M/T	ECULED	MANCODES	NONE
XT	1.8L H4	MPFI	A/T,M/T	ECULED	MANCODES	NONE
XT6	2.7L H6	MPFI	A/T,M/T	ECULED	MANCODES	NONE
1992						
LEGACY	2.2L H4	MPFI	A/T,M/T	ECULED	MANCODES	NONE
LEGACY	2.2L H4	MPFI TURBO	A/T,M/T	ECULED	MANCODES	NONE
SVX	3.3L H6	MPFI	4AT	MIL	MANCODES	NONE

MODEL	ENGINE	FUEL SYSTEM	TRANS TYPE	ECU MODES	CODE TYPE	ADAPTER TYPE
1993						
SVX	3.3L H6	MPFI	4AT	MIL	MANCODES	NONE
LEGACY	2.2L H4	MPFI	4AT/5MT	ECULED	MANCODES	NONE
LEGACY	2.2L H4	MPFI TURBO	4AT/5MT	ECULED	MANCODES	NONE
IMPREZA	1.8L H4	MPFI	4AT/5MT	ECULED	MANCODES	NONE
1994						
SVX	3.3L H6	MPFI	4AT	MIL	MANCODES	NONE
LEGACY	2.2L H4	MPFI	4AT/5MT	ECULED	MANCODES	NONE
LEGACY	2.2L H4	MPFI TURBO	4AT/5MT	ECULED	MANCODES	NONE
IMPREZA	1.8L H4	MPFI	4AT/5MT	ECULED	MANCODES	NONE
1995						
SVX	3.3L H6	MPFI	4AT	MIL	MANCODES	NONE
LEGACY	2.2L H4	MPFI	4AT/5MT	N/A	AUTOCODES	**OBDII***
IMPREZA	1.8L H4	MPFI	4AT/5MT	ECULED	MANCODES	NONE
1996						
LEGACY	2.2L H4	MPFI	4AT/5MT	N/A	AUTOCODES	**OBDII***
IMPREZA	1.8L H4	MPFI	4AT/5MT	N/A	AUTOCODES	**OBDII***
IMPREZA	2.2L H4	MPFI	4AT/5MT	N/A	AUTOCODES	**OBDII***
SVX	3.3L H6	MPFI	4AT	N/A	AUTOCODES	**OBDII***
1997						
IMPREZA	1.8L H4	MPFI	4AT/5MT	N/A	AUTOCODES	**OBDII***
IMPREZA	2.2L H4	MPFI	4AT/5MT	N/A	AUTOCODES	**OBDII***
LEGACY	2.2L H4	MPFI	4AT/5MT	N/A	AUTOCODES	**OBDII***
LEGACY	2.5L H4	MPFI	4AT/5MT	N/A	AUTOCODES	**OBDII***
SVX	3.3L H6	MPFI	4AT	N/A	AUTOCODES	**OBDII***
1998						
IMPREZA	2.2L H4	MPFI	4AT/5MT	N/A	AUTOCODES	**OBDII***
IMPREZA	2.5L H4	MPFI	4AT/5MT	N/A	AUTOCODES	**OBDII***
LEGACY	2.2L H4	MPFI	4AT/5MT	N/A	AUTOCODES	**OBDII***
LEGACY	2.5L H4	MPFI	4AT/5MT	N/A	AUTOCODES	**OBDII***
FORESTER	2.5L H4	MPFI	4AT/5MT	N/A	AUTOCODES	**OBDII***

*** Use Common Test Modes OBD II Systems section for operating instructions and test mode information.**

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2. SUBARU SPECIFIC INFORMATION

The Subaru vehicles covered by the Asian Imports Cartridge are separated into two different sections within the Asian Imports Operator's Manual. The vehicle's on-board system will determine which section of the Operator's Manual will need to be used. Vehicles that are OBD II certified have information about the operating test modes in the Common Test Modes OBD II Systems section of the Operator's Manual. Vehicles that have OBD or OBD I systems have test mode information in this section of the Operator's Manual. In these sections, you will find information on test modes available, how to connect the tester to the vehicle, and operating instructions for the different test modes. A complete list of Subaru Diagnostic Trouble Codes is included at the back of each section.

To determine which section of the Operator's Manual to use for diagnostic information and instructions, look at Adapter Type of the Vehicle and Systems chart. If the vehicle you are testing has an OBD II adapter type, use the Common Test Modes OBD II Systems section of the Operator's Manual. If the vehicle you are testing does not have the OBD II Adapter Type, use this section to diagnose the vehicle under test.

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3. TEST MODES AVAILABLE

The following test modes are available when testing Subaru vehicles. Operating instructions for test modes other than DTC Entry are included in the Common Test Modes OBD, OBD I Systems section. There are Subaru specific instructions for operating the test modes. Refer to Section 6 (Test Modes).

MODE F1: DTC ENTRY
- SUBMODE F0: HOW TO READ
  - SUBMODE F0: U-CHECK
  - SUBMODE F1: READ MEMORY
  - SUBMODE F2: D-CHECK
- SUBMODE F1: ENTER DTC(s)
- SUBMODE F2: DTC LIST
- SUBMODE F3: REVIEW DTC
- SUBMODE F4: CLEAR DTC(s)

MODE F5: SYSTEM TESTS
- SUBMODE F0: PREP VEHICLE

MODE F8: INFORMATION
- SUBMODE F3: ID INFO
- SUBMODE F4: DJC LOCATION
- SUBMODE F5: ECU LOCATION

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4. GETTING STARTED

Before operating the Asian Imports Cartridge with a Subaru vehicle, the following steps must be performed:

1. Make sure the vehicle ignition is OFF.

2. Plug the tester power cable into the vehicle cigarette lighter. The power cable may also be directly connected to the battery via the optional battery adapter cable (P/N 02001636).

   NOTE: Since the cigarette lighter can be switched, some tests require that the power cable be directly connected to the battery via the battery adapter cable.

3. Turn on the tester and select the application software that you will be using. Verify that the correct screen is displayed. The tester should display a screen similar to the one below.

Tester stand-alone display

4. If the display is correct, press ENTER. If the display is not correct, refer to Appendix D.

5. Follow the instructions on the following page to select the vehicle type you are testing by entering required vehicle information into the tester.

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5. SELECTING THE VEHICLE

Once you've pressed ENTER from the power-up screen, the following steps must be performed to select the manufacturer, model year, model and engine type of the vehicle being tested. Remember, if you make a mistake, you can always press EXIT to go back to the previous menu.

SELECTING THE MANUFACTURER

A menu of manufacturers available for testing is displayed in a scrolling menu. You can scroll down one screen at a time by pressing YES, or up one screen at a time by pressing NO. Press ↑ or ↓ to scroll one manufacturer at a time, until the → arrow is opposite Subaru.

Then press ENTER to select.

SELECTING THE MODEL YEAR

Once the manufacturer is selected, the Select Model Year menu is displayed. Press the last two digits of the year model being tested; 8, 9 for 1989 models, 9, 0 for 1990 models, and so on.

SELECTING THE MODEL

The Model Select menu displays models available for testing. Press the NO key until the model being tested is displayed, then press the YES key.

SELECTING THE ENGINE

Next, the Engine Select menu is displayed. Press NO until the engine type of the vehicle is displayed, then press YES.

SELECTING THE FUEL SYSTEM TYPE

Next, the Fuel System select menu is displayed (selected models only). Press NO until the fuel system type of the vehicle is displayed, then press YES.

SELECTING THE TRANSMISSION TYPE

Next, the Transmission select menu is displayed (selected models only). Press NO until the transmission type of the vehicle is displayed, then press YES.

SELECTING THE EMISSION TYPE

Next, the Emission select menu is displayed (selected models only). Press NO until the emission type of the vehicle is displayed, then press YES.

SELECTING THE DRIVE TYPE

Next, the Drive select menu is displayed (selected models only). Press NO until the drive system type (2WD or 4WD) of the vehicle is displayed, then press YES.

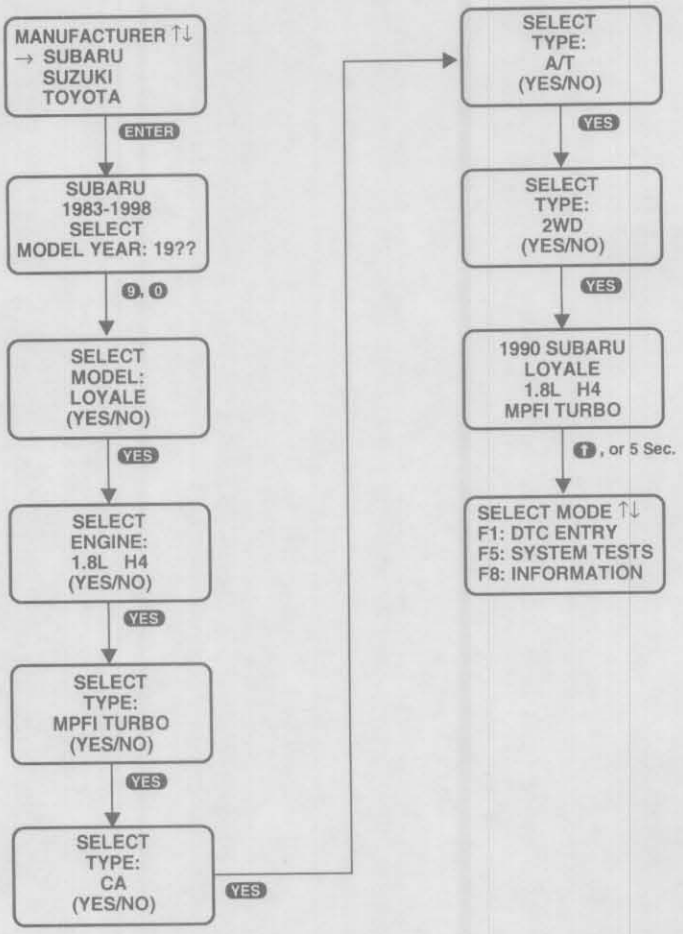
VEHICLE INFORMATION DISPLAY

After the engine, transmission, emission and drive types are selected, the tester displays a summary screen of the selected vehicle. Information displayed includes the year, manufacturer, model, engine size and type, and additional information such as the type of fuel system.

SELECT MODE MENU

When the above steps are completed, the Select Mode menu displays the test modes available for the selected vehicle and system. Refer to Section 6 (Test Modes) Subaru Specific Instructions for operating the test modes with Subaru vehicles.

SUBARU VEHICLE SELECTION



ACTIVE KEYS	
0 - 9	Enter model year.
YES NO	Used to answer questions in tester display.
ENTER	Confirm Power-up display.
EXIT	Return to previous display

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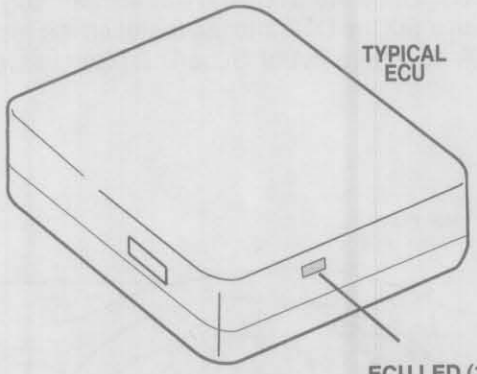
6. TEST MODES

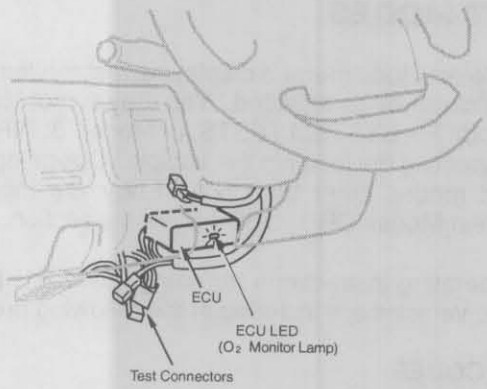
When the Select Mode menu is displayed, test modes available for Subaru vehicles may be selected. You may select Mode F1: DTC ENTRY, Mode F5: SYSTEM TESTS, or Mode F8: INFORMATION without connecting the tester to the vehicle. Operating instructions for the test modes other than DTC Entry are included in the Common Test Modes OBD, OBD I Systems section.

Detailed operating instructions for using Mode F1: DTC ENTRY with Subaru vehicles are included in the following procedure.

READING CODES

When Mode F1: DTC ENTRY is selected, the tester displays submodes which, after your selection, provide information on how to read diagnostic trouble codes (DTCs) from the vehicle, how to clear DTCs from the vehicle (or tester memory), obtain a text description of entered or selected DTCs, and review entered or selected DTCs as a result of manually retrieving codes from the ECU.

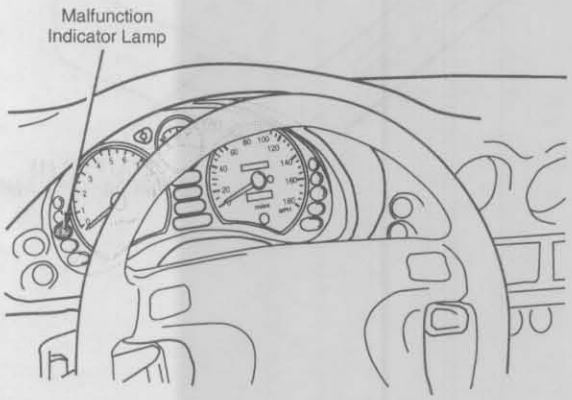




Manually Reading DTCs

To read DTC codes on Subaru vehicles you must connect the "Read Memory" or "Test Mode" connectors on the vehicle, then observe the instrument panel ECS lamp. If the ECS lamp is on, locate the ECU and observe the flashing LED. If you do not know where the ECU is located, select Mode F5: ECU LOCATION from the Information menu. If necessary, refer to the Common Test Modes OBD, OBD I Systems section for further instructions.

Follow the detailed instructions on the following pages to manually read the DTCs. Once the DTCs have been manually read from the ECU, you can input the DTC into the tester so the tester can define the code. A complete list of Subaru DTCs is also included in Section 7.



DTC ENTRY	MODE F1

When Mode F1: DTC ENTRY is selected, the tester displays five submodes:
F0: HOW TO READ
F1: ENTER DTC(s)
F2: DTC LIST
F3: REVIEW DTC
F4: CLEAR DTC(s)

DTC ENTRY	MODE F1
HOW TO READ	SUBMODE F0

This submode provides information on how to manually read DTCs from the vehicle. Step by step screen instructions provide information to correctly set up the vehicle ECU. This is performed by following the tester instruction screens. If you have trouble, additional DTC retrieval information is described below. If you refer to the factory service manual for this information, make sure that you are following the correct steps for the system you are working on.

DTC ENTRY	MODE F1
HOW TO READ	SUBMODE F0
U-CHECK	SUBMODE F0

This mode is functioning during normal vehicle operation, as long as the check connectors are NOT connected. If a DTC is detected, the ECS Lamp will light up to indicate that inspection is necessary. This mode is a user-oriented mode which only diagnoses the necessary components for start-up and driveability.

DTC ENTRY	MODE F1
HOW TO READ	SUBMODE F0
READ MEMORY	SUBMODE F1

To activate this submode, connect the Read Memory Connector while the Test Mode Connectors are disconnected. Use this mode to read past problems that have been stored in the vehicle ECU. Faults can be stored even when the monitor lamps are not lit. It effectively detects poor contact or loose connections of connectors, harnesses, etc. Step by step screen instructions provide information on DTC retrieval.

MODE F1	DTC ENTRY
SUBMODE F0	HOW TO READ
SUBMODE F2	D-CHECK

To activate this mode, connect the Test Mode connector while the Read Memory Connector are disconnected. Use this mode to check the entire fuel system and to detect faulty parts. Step by step screen instructions provide information on DTC retrieval.

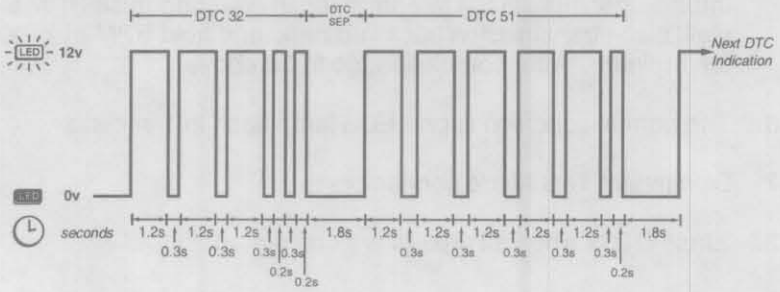
MODE F1	DTC ENTRY
SUBMODE F1	ENTER DTC(s)

On Subaru vehicles, the Enter DTCs submode allows you to enter manually read DTCs. This submode provides you with a text description of the numeric DTC that was entered into the tester.

The Enter DTC submode has two question marks on the tester display for entering the DTC. The tester screen prompts you to enter the DTCs read off the ECU LED or the Malfunction Indicator Light (MIL). Be careful when reading the DTC from the ECU LED or MIL. Incorrect ECU LED or MIL interpretation can cause the wrong DTC description to be displayed. Once all DTCs have been manually read and recorded, enter each DTC into the tester as described in the Common Test Modes OBD, OBD I Systems section.

Specific instructions for manually reading Subaru ECU LED DTCs are on the following page .

EXAMPLE OF DTC DISPLAY AND TIMING



Manually reading ECU Test Mode DTCs from 1983 Subaru vehicles using dashboard electronic control system (ECS) lamp and ECU LED (O2 Monitor LED):

1. Warm engine to normal operating temperature, turn all accessory switches OFF.

2. Turn OFF ignition key.

3. Connect the Test Mode connectors (black or clear). Use F4: DJC LOCATION from the Information menu for location information on the test mode connectors.

4. Start the engine and note the instrument panel ECS lamp (if engine will not start, read DTC from the O2 monitor ECU LED on the side of the ECU.

5a. If the ECS lamp is flashing ON/OFF in 1 second, then there are no Test Mode DTCs stored in the ECU. Disconnect Test Mode connectors and finish diagnosis.

5b. If the ECS lamp is ON while the engine is running, there are Test Mode DTCs stored in the ECU and the ECU LED will begin flashing DTCs. Use F5: ECU LOCATION from the Information menu for location information on the electronic control unit.

If Test Mode DTCs are stored in ECU, the ECU LED will begin indicating the DTCs. ECU LED flashes 10's digit, then the 1's digit with a 0.3 second delay. Each DTC is separated by a 1.8 second interval. DTC series is separated by a 1.8 second interval. If no DTCs are stored in ECU, the normal condition will be flashed on the ECS lamp. The normal condition is one ECS lamp flash every 1 second.

5c. If ECS lamp is OFF while engine is running, idle engine for 1 minute, vary engine RPM by performing 5 brief wide open throttle openings, place transmission in gear and raise RPM to stall, place transmission back into park, and hold RPM at 2500 for 1 minute. After completion, go to 5a above.

6. The normal condition is one ECS lamp flash in 1 second.

7. Disconnect Test Mode connectors .

8. Erase DTCs when all repairs are completed.

Manually reading Test Mode DTCs from 1983-1986 carbureted Subaru vehicles using the Electronic Control System (ECS) Lamp and ECU LED (O2 Monitor LED):

1. Warm engine to normal operating temperature, turn all accessories switches OFF.
2. Turn key OFF.
3. Connect Test Mode connectors. Use F4: DJC LOCATION from the Information menu for test mode connectors location.
4. Turn key ON (Do not start engine). ECS Lamp should flash an identification DTC on the O2 Monitor Lamp. Use F5: ECU LOCATION from the Information menu for ECU location information.
5. Start engine. ECS Lamp should OFF.
6. Drive vehicle for over 60 feet then idle engine for 1 minute.
7. Perform 2 brief WOT and run engine at 2500 RPM until ECS Lamp turns ON.
8. If ECS Lamp stays ON, record DTC(s) that are flashed by the O2 Monitor Lamp. The long segment (1.2 seconds ON) represents the tens digit. The short segment (0.2 seconds ON) represents the ones digit. Each DTC is separated by a 1.8 second delay. If the ECS Lamp blinks, the system is normal. Turn the key OFF and disconnect the Test Mode Connectors.

Manually reading Test Mode DTCs from 1984 EFI Turbo Subaru vehicles using the Electronic Control System (ECS) Lamp and ECU LED (O2 Monitor LED):

1. Warm engine to normal operating temperature, turn all accessories switches OFF.

2. Turn key OFF.

3. Connect Test Mode connectors. Use F4: DJC LOCATION from the Information menu for test mode connectors location.

4. Turn key ON (Do not start engine). ECS Lamp should turn ON and the fuel pump should cycle every 1.5 seconds.

5. Start engine. If engine will not start, check for DTC(s) by observing the O2 Monitor Lamp. If engine starts and the ECS Lamp turns ON, check for DTC(s) by observing the O2 Monitor Lamp. If engine starts and the ECS Lamp turns OFF, run the engine at idle for 1 minute.

6. Perform 5 brief WOT, place the transmission in gear, and run the engine up to stall speed in order to operate the pressure switch. Run the engine at 2500 RPM until the ECS Lamp turns ON.

7. If ECS Lamp stays ON, record DTC(s) that are flashed by the O2 Monitor Lamp. The long segment (1.2 seconds ON) represents the tens digit. The short segment (0.2 seconds ON) represents the ones digit. Each DTC is separated by a 1.8 second delay.

8. If the ECS Lamp blinks, the system is normal. Turn the key OFF and disconnect the Test Mode Connectors.

Manually reading Test Mode DTCs from 1985-1986 MPFI Subaru vehicles using the Electronic Control System (ECS) Lamp and ECU LED (O2 Monitor LED):

1. Warm engine to normal operating temperature, turn all accessories switches OFF.

2. Turn key OFF.

3. Connect Test Mode connectors. Use F4: DJC LOCATION from the Information menu for test mode connectors location.

4. Turn key ON (Do not start engine). ECS Lamp should turn ON and the fuel pump should cycle every 1.5 seconds.

5. Start engine. If engine will not start, check for DTC(s) by observing the O2 Monitor Lamp. If engine starts and the ECS Lamp turns ON, check for DTC(s) by observing the O2 Monitor Lamp. If engine starts and the ECS Lamp turns OFF, run the engine at idle for 1 minute.

6. Perform 5 brief WOT, place the transmission in gear, and run the engine up to stall speed in order to operate the pressure switch.

7. Run the engine at 2500 RPM until the ECS Lamp turns ON.

8. If ECS Lamp stays ON, record DTC(s) that are flashed by the O2 Monitor Lamp. The long segment (1.2 seconds ON) represents the tens digit. The short segment (0.2 seconds ON) represents the ones digit. Each DTC is separated by a 1.8 second delay.

9. If the ECS Lamp blinks, the system is normal. Turn the key OFF and disconnect the Test Mode Connectors.

Manually reading Test Mode DTCs from 1986 SPFI Subaru vehicles using the Electronic Control System (ECS) Lamp and ECU LED (O2 Monitor LED):

1. Warm engine to normal operating temperature, turn all accessories switches OFF.
2. Turn key OFF.
3. Connect the green Test Mode connectors. Use F4: DJC LOCATION from the Information menu for test mode connectors location.
4. Connect the Clear Memory connectors. Use F4: DJC LOCATION from the Information menu for test mode connectors location.
5. Turn key ON (Do not start engine). ECS Lamp should turn ON. The DTC that is flashed should correctly identify the vehicle under test. DTC 11 identifies a California emissions vehicle. DTC 12 identifies a Federal emissions vehicle. Use F5: ECU LOCATION from the Information menu for ECU location.
6. Disconnect the Clear Memory connectors.
7. Start engine. The ECS Lamp should turn OFF.
8. Drive vehicle above 6 MPH for over 1 minute.
9. Run engine above 2500 RPM until the ECS Lamp turns ON. If the ECS Lamp stays ON, check for DTC(s) by observing the O2 Monitor Lamp mounted on the ECU. Use F5: ECU LOCATION from the Information menu for ECU location. The long segment (1.2 seconds ON) represents the tens digit. The short segment (0.2 seconds ON) represents the ones digit. Each DTC is separated by a 1.8 second delay.
10. If the ECS Lamp blinks, the system is normal. Turn the key OFF and disconnect the Test Mode Connectors.

Manually reading Test Mode DTCs from 1987-1995 SPFI and MPFI Subaru vehicles (except Justy and SVX) using the Malfunction Indicator Lamp (MIL) and ECU LED (O2 Monitor LED):

1. Warm engine to normal operating temperature, turn all accessories switches OFF.
2. Turn key OFF.
3. Connect Test Mode connectors. Use F4: DJC LOCATION from the Information menu for test mode connectors location.
4. Turn key ON (Do not start engine). The MIL should turn ON.
5. Depress accelerator pedal to WOT then return it to half-throttle and hold it for 2 seconds. Then release pedal completely.
6. Start engine. The MIL should turn OFF. If the MIL stays ON, note the DTC(s) and continue.
7. Perform brief WOT, then drive the vehicle greater than 7 MPH for at least 1 minute (and shift up to 4th gear for manual transmissions).
8. Run the engine above 2000 RPM until the MIL turns ON. If the MIL stays ON, record DTC(s) that are flashed by the MIL or O2 Monitor Lamp depending on the model being tested. Use F5: ECU LOCATION from the Information menu to observe the O2 Monitor Lamp located on the ECU. The long segment (1.2 seconds ON) represents the tens digit. The short segment (0.2 seconds ON) represents the ones digit. Each DTC is separated by a 1.8 second delay. If the MIL blinks, the system is normal.
9. Turn the key OFF and disconnect the Test Mode Connectors.
10. Erase DTC(s) when all repairs are completed. Use F4: CLEAR DTC(s) from the DTC Entry menu for instructions on how to clear the DTC(s) from the vehicle and the tester.

Manually reading Test Mode DTCs from 1987-1988 Subaru Justy vehicles using the Malfunction Indicator Lamp (MIL) and ECU LED (O2 Monitor LED):

1. Warm engine to normal operating temperature, turn all accessories switches OFF.

2. Turn key OFF.

3. Connect the green Test Mode connectors. Use F4: DJC LOCATION from the Information menu for test mode connectors location.

4. Turn key ON (Do not start engine). The MIL should turn ON. The DTC that is flashed should correctly identify the vehicle under test. Use F5: ECU LOCATION from the Information menu for ECU location.

5. Start engine. The MIL should turn OFF.

6. Drive vehicle above 3 MPH for more than 60 feet

7. Allow engine to idle for over 20 seconds.

8. Turn clearance lamps (parking lamps), rear defogger, radiator and heater fans ON and then all OFF.

9. Run engine above 2700 RPM until the MIL turns ON. If the MIL stays ON, check for DTC(s) by observing the O2 Monitor Lamp mounted on the ECU. Use F5: ECU LOCATION from the Information menu for ECU location. The long segment (1.2 seconds ON) represents the tens digit. The short segment (0.2 seconds ON) represents the ones digit. Each DTC is separated by a 1.8 second delay.If the MIL blinks, the system is normal.

10. Turn the key OFF and disconnect the Test Mode Connectors.

11. Erase DTC(s) when all repairs are completed. Use F4: CLEAR DTC(s) from the DTC Entry menu for instructions on how to clear the DTC(s) from the vehicle and the tester.

Manually reading Test Mode DTCs from 1989-1990 Subaru Justy vehicles using the Malfunction Indicator Lamp (MIL) and ECU LED (O2 Monitor LED):

1. Connect the green Test Mode connectors. Use F4: DJC LOCATION from the Information menu for test mode connectors location.

2. Turn key ON (Do not start engine). The MIL should turn ON. The DTC that is flashed should correctly identify the vehicle under test. Use F5: ECU LOCATION from the Information menu for ECU location.

3. Start engine. The MIL should turn OFF.

4. Warm engine to normal operating temperature.

5. Depress clutch pedal completely then slowly release pedal completely.

6. Turn clearance lamps (parking lamps), rear defogger, and heater fans ON and then all OFF.

7. Drive vehicle above 30 MPH and at engine speed over 2500 RPM.

8. Keep engine speed above 2700 RPM until the MIL turns ON. If the MIL stays ON, check for DTC(s) by observing the O2 Monitor Lamp mounted on the ECU. Use F5: ECU LOCATION from the Information menu for ECU location. The long segment (1.2 seconds ON) represents the tens digit. The short segment (0.2 seconds ON) represents the ones digit. Each DTC is separated by a 1.8 second delay. If the MIL blinks, the system is normal.

9. Turn the key OFF and disconnect the Test Mode Connectors.

10. Erase DTC(s) when all repairs are completed. Use F4: CLEAR DTC(s) from the DTC Entry menu for instructions on how to clear the DTC(s) from the vehicle and the tester.

Manually reading Test Mode DTCs from 1990 Subaru Justy MPFI vehicles using the Malfunction Indicator Lamp (MIL) and ECU LED (O2 Monitor LED):

1. Start the engine and warm to normal operating temperature.
2. Turn key OFF.
3. Connect the green Test Mode connectors. Use F4: DJC LOCATION from the Information menu for test mode connectors location.
4. Turn key ON (Do not start engine). The MIL should turn ON. The DTC that is flashed should correctly identify the vehicle under test. Use F5: ECU LOCATION from the Information menu for ECU location.
5. Depress accelerator pedal to floor and then slowly release.
6. Start engine.
7. Turn heater fan, headlamp, and rear defogger switches ON and then all OFF.
8. Drive vehicle above 7 MPH.
9. Operate the engine speed above 2000 RPM until the MIL turns ON. If the MIL stays ON, check for DTC(s) by observing the O2 Monitor Lamp mounted on the ECU. Use F5: ECU LOCATION from the Information menu for ECU location. The long segment (1.2 seconds ON) represents the tens digit. The short segment (0.2 seconds ON) represents the ones digit. Each DTC is separated by a 1.8 second delay. If the MIL blinks, the system is normal.
10. Turn the key OFF and disconnect the Test Mode Connectors.
11. Erase DTC(s) when all repairs are completed. Use F4: CLEAR DTC(s) from the DTC Entry menu for instructions on how to clear the DTC(s) from the vehicle and the tester.

Manually reading Test Mode DTCs from 1992-1995 SVX Subaru vehicles using the Malfunction Indicator Lamp (MIL) and ECU LED (O2 Monitor LED):

1. Warm engine to normal operating temperature, turn all accessories switches OFF.
2. Turn key OFF.
3. Connect either diagnostic lead to pin 1 of the black connector. Use F4: DJC LOCATION from the Information menu for test mode connectors location.
4. Turn key ON (Do not start engine). The MIL should turn ON.
5. Start engine. The MIL should turn OFF. If the MIL stays ON, note the DTC(s) and continue.
6. Drive the vehicle greater than 7 MPH for at least 1 minute.
7. Run the engine above 2000 RPM until the MIL turns ON. If the MIL flashes DTC(s), perform fix. The long segment (1.2 seconds ON) represents the tens digit. The short segment (0.2 seconds ON) represents the ones digit. Each DTC is separated by a 1.8 second delay. If the MIL blinks, the system is normal.
8. Turn key OFF and disconnect diagnostic leads.
9. Erase DTC(s) when all repairs are completed. Use F4: CLEAR DTC(s) from the DTC Entry menu for instructions on how to clear the DTC(s) from the vehicle and the tester.

MODE F1	DTC ENTRY
SUBMODE F2	DTC LIST

This submode provides you with a way to view all possible ECU DTCs, including DTC numbers and descriptions You can also select the DTCs obtained from the ECU LED as an alternative way of entering DTCs into the tester's memory. As you scroll through the available DTCs you can view a description of the DTC obtained from the ECU LED. You can "Select" the DTC on the tester screen for later review or printing. Refer to the Common Test Modes OBD, OBD I Systems section for further information.

MODE F1	DTC ENTRY
SUBMODE F3	REVIEW DTC

This submode provides a way of reviewing DTCs that you selected or entered in the tester. The description of the entered or selected DTC will be displayed, along with a numerical summary of the entered or selected DTC. Review DTC is intended to provide you with an electronic clipboard that keeps track of the DTCs that you have encountered during diagnosis.

MODE F1	DTC ENTRY
SUBMODE F4	CLEAR DTCs

This helpful mode provides information on how to clear DTCs that the user would normally have to locate in the vehicle's service manual.

MODE F1	DTC ENTRY
SUBMODE F4	CLEAR DTCs
SUBMODE F0	FROM ECU

This submode provides step by step text screen instructions on how to clear DTCs from the ECU memory. These instructions are specific to the vehicle under test and should be followed closely. The dealer uses this mode to clear the DTCs from the memory after the affected part is repaired.

MODE F1	DTC ENTRY
SUBMODE F4	CLEAR DTCs
SUBMODE F0	FROM TESTER

This submode clears the tester memory of all DTCs that the user has entered or selected from the tester.

7. SUBARU DIAGNOSTIC TROUBLE CODES (DTCs)

DTCs available for Subaru vehicles are listed in the following charts.

Some code numbers have different descriptors depending on the selected vehicle. Only codes available for the selected vehicle are displayed by the tester.

OBD, OBD I SYSTEMS

YEAR	DTC NO.	DESCRIPTOR
1983	11	IGNITION PULSE FAILURE.
		IGN. PULSE SYS. (ENG OFF/CC/HA).
	12	STARTER SWITCH IN OFF MODE.
		IGN. PULSE SYS. (ENG OFF/CC/SL).
	13	STARTER SWITCH IN ON MODE.
		DUTY SOLENOID VLV REMAINS OFF.
	14	AIR FLOW METER OR CKT FAILURE.
		VACUUM SW 1 OFF (TEST MODE ONLY)
	15	SOLENOID VALVE 3 REMAINS OFF.
	21	AIR FLOW METER FLAP SEIZED.
		IGN. PULSE SYS. (ENG OFF/HC/HA).
	22	PRESSURE SWITCH FIXED ON/OFF POS
		IGN. PULSE SYS. (ENG OFF/HC/SL).
	23	IDLE SW FIXED ON/OFF POSITION.
		O2 SENSOR OR CIRCUIT FAILURE.
	24	FULL SW FIXED ON/OFF POSITION.
		VACUUM SW 2 OFF (TEST MODE ONLY)
	25	SOLENOID VALVE 1 REMAINS OFF.
	31	DUTY SOLENOID VLV REMAINS ON.
	32	THERMO SENSOR OR CIRCUIT FAILURE.
		O2 SENSOR OR CIRCUIT FAILURE.
	33	COOLANT THERMO SENSOR OR CKT.
		FDBK SYS FAILURE (TEST MODE ONLY)
	34	ASP. AIR THERMO SNSR OR CIRCUIT.
		AUTO CHOKE POWER REMAINS OFF.
	41	VACUUM SW 1 ON (TEST MODE ONLY)
	42	INJ FIXED IN ON/OFF POSITION
		VACUUM SW 2 ON (TEST MODE ONLY)
	43	AUTO CHOKE POWER REMAINS ON.
	51	SOLENOID VALVE 3 REMAINS ON.
	52	SOLENOID VALVE 1 REMAINS ON.

SUBARU DTCs

YEAR	DTC NO.	DESCRIPTOR
1984	11	IG PULSE FAILURE (OPEN/SHORT CKT)
		IGN. PULSE SYS. (ENG OFF/CC/MT).
	12	STARTER SW OR CKT REMAINS OFF
		IGN. PULSE SYS. (ENG OFF/CC/AT).
	13	STARTER SW OR CKT REMAINS ON
		IGN. PULSE SYS. (ENG OFF/HC/MT).
	14	AIR FLOW METER OR CKT FAILURE.
		IGN. PULSE SYS. (ENG OFF/HC/AT).
	15	IGN. PULSE SYS. (ENG OFF/CC/MT).
	16	IGN. PULSE SYS. (ENG OFF/CC/AT).
	17	IGN. PULSE SYS. (ENG OFF/HC/MT).
	18	IGN. PULSE SYS. (ENG OFF/HC/AT).
	21	AIR FLOW METER FLAP SEIZED.
	22	PRESSURE SWITCH FIXED ON/OFF POS
		VSS FAIL. (AT IN TEST MODE ONLY).
	23	IDLE SWITCH OR CIRCUIT FAILURE.
		O2 SENSOR OR CIRCUIT FAILURE.
	24	WOT SWITCH OR CIRCUIT FAILURE.
		THERMO SNSR FAIL LESS THAN 68degF
	25	THERMO SNSR FAIL ABOVE 230degF.
	31	DUTY SOLENOID VLV REMAINS ON.
	32	O2S OR CKT FAIL. (LOW OUTPUT).
		DUTY SOLENOID VLV REMAINS OFF.
	33	COOLANT THERMO SENSOR OR CKT.
		FDBK SYS FAILURE (TEST MODE ONLY)

DTC ENTRY	MODE F1

When Mode F1: DTC ENTRY is selected, the tester displays five submodes:
F0: HOW TO READ
F1: ENTER DTC(s)
F2: DTC LIST
F3: REVIEW DTC
F4: CLEAR DTC(s)

DTC ENTRY	MODE F1
HOW TO READ	SUBMODE F0

This submode provides information on how to manually read DTCs from the vehicle. Step by step screen instructions provide information to correctly set up the vehicle ECU. This is performed by following the tester instruction screens. If you have trouble, additional DTC retrieval information is described below. If you refer to the factory service manual for this information, make sure that you are following the correct steps for the system you are working on.

DTC ENTRY	MODE F1
HOW TO READ	SUBMODE F0
U-CHECK	SUBMODE F0

This mode is functioning during normal vehicle operation, as long as the check connectors are NOT connected. If a DTC is detected, the ECS Lamp will light up to indicate that inspection is necessary. This mode is a user-oriented mode which only diagnoses the necessary components for start-up and driveability.

DTC ENTRY	MODE F1
HOW TO READ	SUBMODE F0
READ MEMORY	SUBMODE F1

To activate this submode, connect the Read Memory Connector while the Test Mode Connectors are disconnected. Use this mode to read past problems that have been stored in the vehicle ECU. Faults can be stored even when the monitor lamps are not lit. It effectively detects poor contact or loose connections of connectors, harnesses, etc. Step by step screen instructions provide information on DTC retrieval.

MODE F1	DTC ENTRY
SUBMODE F0	HOW TO READ
SUBMODE F2	D-CHECK

To activate this mode, connect the Test Mode connector while the Read Memory Connector are disconnected. Use this mode to check the entire fuel system and to detect faulty parts. Step by step screen instructions provide information on DTC retrieval.

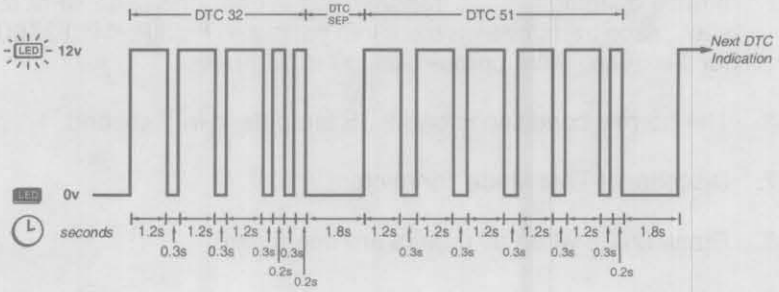
MODE F1	DTC ENTRY
SUBMODE F1	ENTER DTC(s)

On Subaru vehicles, the Enter DTCs submode allows you to enter manually read DTCs. This submode provides you with a text description of the numeric DTC that was entered into the tester.

The Enter DTC submode has two question marks on the tester display for entering the DTC. The tester screen prompts you to enter the DTCs read off the ECU LED or the Malfunction Indicator Light (MIL). Be careful when reading the DTC from the ECU LED or MIL. Incorrect ECU LED or MIL interpretation can cause the wrong DTC description to be displayed. Once all DTCs have been manually read and recorded, enter each DTC into the tester as described in the Common Test Modes OBD, OBD I Systems section.

Specific instructions for manually reading Subaru ECU LED DTCs are on the following page .

EXAMPLE OF DTC DISPLAY AND TIMING



Manually reading ECU Test Mode DTCs from 1983 Subaru vehicles using dashboard electronic control system (ECS) lamp and ECU LED (O2 Monitor LED):

1. Warm engine to normal operating temperature, turn all accessory switches OFF.

2. Turn OFF ignition key.

3. Connect the Test Mode connectors (black or clear). Use F4: DJC LOCATION from the Information menu for location information on the test mode connectors.

4. Start the engine and note the instrument panel ECS lamp (if engine will not start, read DTC from the O2 monitor ECU LED on the side of the ECU.

5a. If the ECS lamp is flashing ON/OFF in 1 second, then there are no Test Mode DTCs stored in the ECU. Disconnect Test Mode connectors and finish diagnosis.

5b. If the ECS lamp is ON while the engine is running, there are Test Mode DTCs stored in the ECU and the ECU LED will begin flashing DTCs. Use F5: ECU LOCATION from the Information menu for location information on the electronic control unit.

If Test Mode DTCs are stored in ECU, the ECU LED will begin indicating the DTCs. ECU LED flashes 10's digit, then the 1's digit with a 0.3 second delay. Each DTC is separated by a 1.8 second interval. DTC series is separated by a 1.8 second interval. If no DTCs are stored in ECU, the normal condition will be flashed on the ECS lamp. The normal condition is one ECS lamp flash every 1 second.

5c. If ECS lamp is OFF while engine is running, idle engine for 1 minute, vary engine RPM by performing 5 brief wide open throttle openings, place transmission in gear and raise RPM to stall, place transmission back into park, and hold RPM at 2500 for 1 minute. After completion, go to 5a above.

6. The normal condition is one ECS lamp flash in 1 second.

7. Disconnect Test Mode connectors .

8. Erase DTCs when all repairs are completed.

Manually reading Test Mode DTCs from 1983-1986 carbureted Subaru vehicles using the Electronic Control System (ECS) Lamp and ECU LED (O2 Monitor LED):

1. Warm engine to normal operating temperature, turn all accessories switches OFF.
2. Turn key OFF.
3. Connect Test Mode connectors. Use F4: DJC LOCATION from the Information menu for test mode connectors location.
4. Turn key ON (Do not start engine). ECS Lamp should flash an identification DTC on the O2 Monitor Lamp. Use F5: ECU LOCATION from the Information menu for ECU location information.
5. Start engine. ECS Lamp should OFF.
6. Drive vehicle for over 60 feet then idle engine for 1 minute.
7. Perform 2 brief WOT and run engine at 2500 RPM until ECS Lamp turns ON.
8. If ECS Lamp stays ON, record DTC(s) that are flashed by the O2 Monitor Lamp. The long segment (1.2 seconds ON) represents the tens digit. The short segment (0.2 seconds ON) represents the ones digit. Each DTC is separated by a 1.8 second delay. If the ECS Lamp blinks, the system is normal. Turn the key OFF and disconnect the Test Mode Connectors.

Manually reading Test Mode DTCs from 1984 EFI Turbo Subaru vehicles using the Electronic Control System (ECS) Lamp and ECU LED (O2 Monitor LED):

1. Warm engine to normal operating temperature, turn all accessories switches OFF.

2. Turn key OFF.

3. Connect Test Mode connectors. Use F4: DJC LOCATION from the Information menu for test mode connectors location.

4. Turn key ON (Do not start engine). ECS Lamp should turn ON and the fuel pump should cycle every 1.5 seconds.

5. Start engine. If engine will not start, check for DTC(s) by observing the O2 Monitor Lamp. If engine starts and the ECS Lamp turns ON, check for DTC(s) by observing the O2 Monitor Lamp. If engine starts and the ECS Lamp turns OFF, run the engine at idle for 1 minute.

6. Perform 5 brief WOT, place the transmission in gear, and run the engine up to stall speed in order to operate the pressure switch. Run the engine at 2500 RPM until the ECS Lamp turns ON.

7. If ECS Lamp stays ON, record DTC(s) that are flashed by the O2 Monitor Lamp. The long segment (1.2 seconds ON) represents the tens digit. The short segment (0.2 seconds ON) represents the ones digit. Each DTC is separated by a 1.8 second delay.

8. If the ECS Lamp blinks, the system is normal. Turn the key OFF and disconnect the Test Mode Connectors.

Manually reading Test Mode DTCs from 1985-1986 MPFI Subaru vehicles using the Electronic Control System (ECS) Lamp and ECU LED (O2 Monitor LED):

1. Warm engine to normal operating temperature, turn all accessories switches OFF.

2. Turn key OFF.

3. Connect Test Mode connectors. Use F4: DJC LOCATION from the Information menu for test mode connectors location.

4. Turn key ON (Do not start engine). ECS Lamp should turn ON and the fuel pump should cycle every 1.5 seconds.

5. Start engine. If engine will not start, check for DTC(s) by observing the O2 Monitor Lamp. If engine starts and the ECS Lamp turns ON, check for DTC(s) by observing the O2 Monitor Lamp. If engine starts and the ECS Lamp turns OFF, run the engine at idle for 1 minute.

6. Perform 5 brief WOT, place the transmission in gear, and run the engine up to stall speed in order to operate the pressure switch.

7. Run the engine at 2500 RPM until the ECS Lamp turns ON.

8. If ECS Lamp stays ON, record DTC(s) that are flashed by the O2 Monitor Lamp. The long segment (1.2 seconds ON) represents the tens digit. The short segment (0.2 seconds ON) represents the ones digit. Each DTC is separated by a 1.8 second delay.

9. If the ECS Lamp blinks, the system is normal. Turn the key OFF and disconnect the Test Mode Connectors.

Manually reading Test Mode DTCs from 1986 SPFI Subaru vehicles using the Electronic Control System (ECS) Lamp and ECU LED (O2 Monitor LED):

1. Warm engine to normal operating temperature, turn all accessories switches OFF.

2. Turn key OFF.

3. Connect the green Test Mode connectors. Use F4: DJC LOCATION from the Information menu for test mode connectors location.

4. Connect the Clear Memory connectors. Use F4: DJC LOCATION from the Information menu for test mode connectors location.

5. Turn key ON (Do not start engine). ECS Lamp should turn ON. The DTC that is flashed should correctly identify the vehicle under test. DTC 11 identifies a California emissions vehicle. DTC 12 identifies a Federal emissions vehicle. Use F5: ECU LOCATION from the Information menu for ECU location.

6. Disconnect the Clear Memory connectors.

7. Start engine. The ECS Lamp should turn OFF.

8. Drive vehicle above 6 MPH for over 1 minute.

9. Run engine above 2500 RPM until the ECS Lamp turns ON. If the ECS Lamp stays ON, check for DTC(s) by observing the O2 Monitor Lamp mounted on the ECU. Use F5: ECU LOCATION from the Information menu for ECU location. The long segment (1.2 seconds ON) represents the tens digit. The short segment (0.2 seconds ON) represents the ones digit. Each DTC is separated by a 1.8 second delay.

10. If the ECS Lamp blinks, the system is normal. Turn the key OFF and disconnect the Test Mode Connectors.

Manually reading Test Mode DTCs from 1987-1995 SPFI and MPFI Subaru vehicles (except Justy and SVX) using the Malfunction Indicator Lamp (MIL) and ECU LED (O2 Monitor LED):

1. Warm engine to normal operating temperature, turn all accessories switches OFF.
2. Turn key OFF.
3. Connect Test Mode connectors. Use F4: DJC LOCATION from the Information menu for test mode connectors location.
4. Turn key ON (Do not start engine). The MIL should turn ON.
5. Depress accelerator pedal to WOT then return it to half-throttle and hold it for 2 seconds. Then release pedal completely.
6. Start engine. The MIL should turn OFF. If the MIL stays ON, note the DTC(s) and continue.
7. Perform brief WOT, then drive the vehicle greater than 7 MPH for at least 1 minute (and shift up to 4th gear for manual transmissions).
8. Run the engine above 2000 RPM until the MIL turns ON. If the MIL stays ON, record DTC(s) that are flashed by the MIL or O2 Monitor Lamp depending on the model being tested. Use F5: ECU LOCATION from the Information menu to observe the O2 Monitor Lamp located on the ECU. The long segment (1.2 seconds ON) represents the tens digit. The short segment (0.2 seconds ON) represents the ones digit. Each DTC is separated by a 1.8 second delay. If the MIL blinks, the system is normal.
9. Turn the key OFF and disconnect the Test Mode Connectors.
10. Erase DTC(s) when all repairs are completed. Use F4: CLEAR DTC(s) from the DTC Entry menu for instructions on how to clear the DTC(s) from the vehicle and the tester.

Manually reading Test Mode DTCs from 1987-1988 Subaru Justy vehicles using the Malfunction Indicator Lamp (MIL) and ECU LED (O2 Monitor LED):

1. Warm engine to normal operating temperature, turn all accessories switches OFF.
2. Turn key OFF.
3. Connect the green Test Mode connectors. Use F4: DJC LOCATION from the Information menu for test mode connectors location.
4. Turn key ON (Do not start engine). The MIL should turn ON. The DTC that is flashed should correctly identify the vehicle under test. Use F5: ECU LOCATION from the Information menu for ECU location.
5. Start engine. The MIL should turn OFF.
6. Drive vehicle above 3 MPH for more than 60 feet
7. Allow engine to idle for over 20 seconds.
8. Turn clearance lamps (parking lamps), rear defogger, radiator and heater fans ON and then all OFF.
9. Run engine above 2700 RPM until the MIL turns ON. If the MIL stays ON, check for DTC(s) by observing the O2 Monitor Lamp mounted on the ECU. Use F5: ECU LOCATION from the Information menu for ECU location. The long segment (1.2 seconds ON) represents the tens digit. The short segment (0.2 seconds ON) represents the ones digit. Each DTC is separated by a 1.8 second delay.If the MIL blinks, the system is normal.
10. Turn the key OFF and disconnect the Test Mode Connectors.
11. Erase DTC(s) when all repairs are completed. Use F4: CLEAR DTC(s) from the DTC Entry menu for instructions on how to clear the DTC(s) from the vehicle and the tester.

Manually reading Test Mode DTCs from 1989-1990 Subaru Justy vehicles using the Malfunction Indicator Lamp (MIL) and ECU LED (O2 Monitor LED):

1. Connect the green Test Mode connectors. Use F4: DJC LOCATION from the Information menu for test mode connectors location.

2. Turn key ON (Do not start engine). The MIL should turn ON. The DTC that is flashed should correctly identify the vehicle under test. Use F5: ECU LOCATION from the Information menu for ECU location.

3. Start engine. The MIL should turn OFF.

4. Warm engine to normal operating temperature.

5. Depress clutch pedal completely then slowly release pedal completely.

6. Turn clearance lamps (parking lamps), rear defogger, and heater fans ON and then all OFF.

7. Drive vehicle above 30 MPH and at engine speed over 2500 RPM.

8. Keep engine speed above 2700 RPM until the MIL turns ON. If the MIL stays ON, check for DTC(s) by observing the O2 Monitor Lamp mounted on the ECU. Use F5: ECU LOCATION from the Information menu for ECU location. The long segment (1.2 seconds ON) represents the tens digit. The short segment (0.2 seconds ON) represents the ones digit. Each DTC is separated by a 1.8 second delay. If the MIL blinks, the system is normal.

9. Turn the key OFF and disconnect the Test Mode Connectors.

10. Erase DTC(s) when all repairs are completed. Use F4: CLEAR DTC(s) from the DTC Entry menu for instructions on how to clear the DTC(s) from the vehicle and the tester.

Manually reading Test Mode DTCs from 1990 Subaru Justy MPFI vehicles using the Malfunction Indicator Lamp (MIL) and ECU LED (O2 Monitor LED):

1. Start the engine and warm to normal operating temperature.
2. Turn key OFF.
3. Connect the green Test Mode connectors. Use F4: DJC LOCATION from the Information menu for test mode connectors location.
4. Turn key ON (Do not start engine). The MIL should turn ON. The DTC that is flashed should correctly identify the vehicle under test. Use F5: ECU LOCATION from the Information menu for ECU location.
5. Depress accelerator pedal to floor and then slowly release.
6. Start engine.
7. Turn heater fan, headlamp, and rear defogger switches ON and then all OFF.
8. Drive vehicle above 7 MPH.
9. Operate the engine speed above 2000 RPM until the MIL turns ON. If the MIL stays ON, check for DTC(s) by observing the O2 Monitor Lamp mounted on the ECU. Use F5: ECU LOCATION from the Information menu for ECU location. The long segment (1.2 seconds ON) represents the tens digit. The short segment (0.2 seconds ON) represents the ones digit. Each DTC is separated by a 1.8 second delay. If the MIL blinks, the system is normal.
10. Turn the key OFF and disconnect the Test Mode Connectors.
11. Erase DTC(s) when all repairs are completed. Use F4: CLEAR DTC(s) from the DTC Entry menu for instructions on how to clear the DTC(s) from the vehicle and the tester.

Manually reading Test Mode DTCs from 1992-1995 SVX Subaru vehicles using the Malfunction Indicator Lamp (MIL) and ECU LED (O2 Monitor LED):

1. Warm engine to normal operating temperature, turn all accessories switches OFF.
2. Turn key OFF.
3. Connect either diagnostic lead to pin 1 of the black connector. Use F4: DJC LOCATION from the Information menu for test mode connectors location.
4. Turn key ON (Do not start engine). The MIL should turn ON.
5. Start engine. The MIL should turn OFF. If the MIL stays ON, note the DTC(s) and continue.
6. Drive the vehicle greater than 7 MPH for at least 1 minute.
7. Run the engine above 2000 RPM until the MIL turns ON. If the MIL flashes DTC(s), perform fix. The long segment (1.2 seconds ON) represents the tens digit. The short segment (0.2 seconds ON) represents the ones digit. Each DTC is separated by a 1.8 second delay. If the MIL blinks, the system is normal.
8. Turn key OFF and disconnect diagnostic leads.
9. Erase DTC(s) when all repairs are completed. Use F4: CLEAR DTC(s) from the DTC Entry menu for instructions on how to clear the DTC(s) from the vehicle and the tester.

MODE F1	DTC ENTRY
SUBMODE F2	DTC LIST

This submode provides you with a way to view all possible ECU DTCs, including DTC numbers and descriptions You can also select the DTCs obtained from the ECU LED as an alternative way of entering DTCs into the tester's memory. As you scroll through the available DTCs you can view a description of the DTC obtained from the ECU LED. You can "Select" the DTC on the tester screen for later review or printing. Refer to the Common Test Modes OBD, OBD I Systems section for further information.

MODE F1	DTC ENTRY
SUBMODE F3	REVIEW DTC

This submode provides a way of reviewing DTCs that you selected or entered in the tester. The description of the entered or selected DTC will be displayed, along with a numerical summary of the entered or selected DTC. Review DTC is intended to provide you with an electronic clipboard that keeps track of the DTCs that you have encountered during diagnosis.

MODE F1	DTC ENTRY
SUBMODE F4	CLEAR DTCs

This helpful mode provides information on how to clear DTCs that the user would normally have to locate in the vehicle's service manual.

MODE F1	DTC ENTRY
SUBMODE F4	CLEAR DTCs
SUBMODE F0	FROM ECU

This submode provides step by step text screen instructions on how to clear DTCs from the ECU memory. These instructions are specific to the vehicle under test and should be followed closely. The dealer uses this mode to clear the DTCs from the memory after the affected part is repaired.

MODE F1	DTC ENTRY
SUBMODE F4	CLEAR DTCs
SUBMODE F0	FROM TESTER

This submode clears the tester memory of all DTCs that the user has entered or selected from the tester.

7. SUBARU DIAGNOSTIC TROUBLE CODES (DTCs)

DTCs available for Subaru vehicles are listed in the following charts.

Some code numbers have different descriptors depending on the selected vehicle. Only codes available for the selected vehicle are displayed by the tester.

OBD, OBD I SYSTEMS

YEAR	DTC NO.	DESCRIPTOR
1983	11	IGNITION PULSE FAILURE. IGN. PULSE SYS. (ENG OFF/CC/HA).
	12	STARTER SWITCH IN OFF MODE. IGN. PULSE SYS. (ENG OFF/CC/SL).
	13	STARTER SWITCH IN ON MODE. DUTY SOLENOID VLV REMAINS OFF.
	14	AIR FLOW METER OR CKT FAILURE. VACUUM SW 1 OFF (TEST MODE ONLY)
	15	SOLENOID VALVE 3 REMAINS OFF.
	21	AIR FLOW METER FLAP SEIZED. IGN. PULSE SYS. (ENG OFF/HC/HA).
	22	PRESSURE SWITCH FIXED ON/OFF POS IGN. PULSE SYS. (ENG OFF/HC/SL).
	23	IDLE SW FIXED ON/OFF POSITION. O2 SENSOR OR CIRCUIT FAILURE.
	24	FULL SW FIXED ON/OFF POSITION. VACUUM SW 2 OFF (TEST MODE ONLY)
	25	SOLENOID VALVE 1 REMAINS OFF.
	31	DUTY SOLENOID VLV REMAINS ON.
	32	THERMO SENSOR OR CIRCUIT FAILURE. O2 SENSOR OR CIRCUIT FAILURE.
	33	COOLANT THERMO SENSOR OR CKT. FDBK SYS FAILURE (TEST MODE ONLY)
	34	ASP. AIR THERMO SNSR OR CIRCUIT. AUTO CHOKE POWER REMAINS OFF.
	41	VACUUM SW 1 ON (TEST MODE ONLY)
	42	INJ FIXED IN ON/OFF POSITION VACUUM SW 2 ON (TEST MODE ONLY)
	43	AUTO CHOKE POWER REMAINS ON.
	51	SOLENOID VALVE 3 REMAINS ON.
	52	SOLENOID VALVE 1 REMAINS ON.

SUBARU DTCs

YEAR	DTC NO.	DESCRIPTOR
1984	11	IG PULSE FAILURE (OPEN/SHORT CKT)
		IGN. PULSE SYS. (ENG OFF/CC/MT).
	12	STARTER SW OR CKT REMAINS OFF
		IGN. PULSE SYS. (ENG OFF/CC/AT).
	13	STARTER SW OR CKT REMAINS ON
		IGN. PULSE SYS. (ENG OFF/HC/MT).
	14	AIR FLOW METER OR CKT FAILURE.
		IGN. PULSE SYS. (ENG OFF/HC/AT).
	15	IGN. PULSE SYS. (ENG OFF/CC/MT).
	16	IGN. PULSE SYS. (ENG OFF/CC/AT).
	17	IGN. PULSE SYS. (ENG OFF/HC/MT).
	18	IGN. PULSE SYS. (ENG OFF/HC/AT).
	21	AIR FLOW METER FLAP SEIZED.
	22	PRESSURE SWITCH FIXED ON/OFF POS
		VSS FAIL. (AT IN TEST MODE ONLY).
	23	IDLE SWITCH OR CIRCUIT FAILURE.
		O2 SENSOR OR CIRCUIT FAILURE.
	24	WOT SWITCH OR CIRCUIT FAILURE.
		THERMO SNSR FAIL LESS THAN 68degF
	25	THERMO SNSR FAIL ABOVE 230degF.
	31	DUTY SOLENOID VLV REMAINS ON.
	32	O2S OR CKT FAIL. (LOW OUTPUT).
		DUTY SOLENOID VLV REMAINS OFF.
	33	COOLANT THERMO SENSOR OR CKT.
		FDBK SYS FAILURE (TEST MODE ONLY)

SUBARU DTCs

YEAR	DTC NO.	DESCRIPTOR
1984 (cont.)	34	ASP. AIR THERMO SNSR OR CIRCUIT. BACKUP SYS FAIL. MEMORY NOT HIGH.
	35	BACKUP SYS FAIL. MEMORY NOT LOW.
	41	HIGH ALTITUDE SENSOR OR CKT.
	42	FUEL INJ. OR CKT (OPEN OR SHORT) VACUUM SW 2 ON (TEST MODE ONLY)
	43	VACUUM SW 2 OFF (TEST MODE ONLY)
	44	VACUUM SW 1 ON (TEST MODE ONLY)
	45	VACUUM SW 1 OFF (TEST MODE ONLY)
	52	SOLENOID VALVE 1 REMAINS ON.
	53	SOLENOID VALVE 1 REMAINS OFF.
	54	AUTO CHOKE POWER REMAINS ON.
	55	AUTO CHOKE POWER REMAINS OFF.
	62	SOL VLV2 ON (AT/MT/FED/not 4WD).
	63	SOL VLV2 OFF(AT/MT/FED/not 4WD).
	73	IGN. PULSE SYS. (ENG OFF/HC/MT).
	77	IGN. PULSE SYS. (ENG OFF/HC/MT).

SUBARU DTCs

YEAR	DTC NO.	DESCRIPTOR
1985	11	IG PULSE OR CKT (NO IG PULSE)
		IG PULSE-ENG OFF (5MT/2WD/49ST)
		IGN SW SIGNAL OR CKT FAILURE
	12	STARTER SW OR CKT-OFF MODE
		IG PULSE-ENG OFF (AT/FF/49ST)
		STARTER SW OR CKT-REMAINS OFF
	13	STARTER SW OR CKT-IN ON MODE
		STARTER SW OR CKT-REMAINS ON
	14	AIR FLOW METER OR CKT FAILURE
		AIR FLOW METER FLAP POSITION
	15	IGN PULSE-ENG. OFF(4MT/FF/49ST)
	21	AIR FLOW METER FLAP SEIZED
	22	PRESSURE SWITCH IN ON/OFF POS.
		VEHICLE SPEED SNSR OR CIRCUIT
		PRESSURE SWITCH ON/OFF FAILURE
		VACUUM SWITCH ON/OFF FAILURE
		VACUUM SWITCH IN ON/OFF POS.
	23	IDLE SWITCH IN ON/OFF POS.
		O2 SENSOR OR CIRCUIT FAILURE
		IDLE SWITCH ON/OFF FAILURE
	24	WOT SWITCH IN ON/OFF POS.
		THERMO SENSOR OR CKT FAILURE
		WOT SWITCH ON/OFF FAILURE
	25	PRESSURE SENSOR OR CKT FAILURE
	31	VEHICLE SPEED SNSR OR CIRCUIT
		SPEED SNSR FAIL ABOVE 6 MPH

SUBARU DTCs

YEAR	DTC NO.	DESCRIPTOR
1985 (cont.)	32	O2 SENSOR OR CIRCUIT FAILURE
		DUTY SOLENOID VALVE OR CKT
	33	COOLANT THERMO-SNSR OR CIRCUIT
		FEEDBACK SYSTEM (TEST MODE ONLY)
	34	ASPIRATED AIR THERMOSENSOR
		BACK-UP SYSTEM OR CKT FAILURE
	35	EGR SOL SWITCH ON/OFF OR CKT
		EGR SOL DRIVER CKT FAILURE
	41	BARO SENSOR OR CIRCUIT FAILURE
	42	FUEL INJ. FIXED IN ON/OFF POS.
		CLUTCH SW OR CKT (EXC. AT & 4WD)
	43	KDLH RELAY FIXED IN ON/OFF POS.
		KDLH DRIVER CKT FAILURE
	52	ASV SOL VALVE OR CIRCUIT FAILURE
	53	FUEL PUMP OR CIRCUIT FAILURE
	54	AUTO CHOKE CNTRL OR CKT FAILURE
	55	SHIFT-UP CNTRL SYSTEM (AT ONLY)
	62	EGR SOL VALVE OR CKT FAILURE
	63	CANP SOL VALVE OR CKT FAILURE
	64	VLC SOL VALVE OR CKT FAILURE
	65	FCV SOL VALVE OR CKT FAILURE
	71	IGN PULSE-ENG. OFF (5MT/FF/CA)
	72	IGN PULSE-ENG. OFF (AT/FF/CA)
	73	IGN PULSE-ENG. OFF (5MT/4WD/CA)
	74	IGN PULSE-ENG. OFF (AT/4WD/CA)

SUBARU DTCs

YEAR	DTC NO.	DESCRIPTOR
1986	11	IG PULSE OR CKT (NO IG PULSE)
		IG PULSE-ENG OFF (5MT/2WD/49ST)
		IGN SW SIGNAL OR CKT FAILURE
	12	STARTER SW OR CKT-IN OFF MODE
	13	STARTER SW OR CKT-IN ON MODE
	14	AIR FLOW METER OR CKT FAILURE
	15	PRESSURE SWITCH IN ON/OFF POS.
	16	CKP SENSOR OR CIRCUIT FAILURE
	17	STARTER SWITCH OR CKT FAILURE
	21	AIR FLOW METER FLAP SEIZED
	22	VEHICLE SPEED SNSR OR CIRCUIT
		PRESSURE SWITCH IN ON/OFF POS.
		VACUUM SWITCH IN ON/OFF POS.
	23	O2 SENSOR OR CIRCUIT FAILURE
		IDLE SW OR CKT ON/OFF FAILURE
	24	THERMO SENSOR OR CKT FAILURE
		WOT SW OR CKT ON/OFF FAILURE
	25	PRESSURE SENSOR OR CKT FAILURE
		TPS IDLE SWITCH OR CKT FAILURE
	31	VEHICLE SPEED SNSR OR CIRCUIT
	32	DUTY SOLENOID VALVE OR CKT
		O2 SENSOR OR CIRCUIT FAILURE
	33	FEEDBACK SYSTEM (TEST MODE ONLY)
		COOLANT THERMO-SNSR OR CIRCUIT
	34	BACK-UP SYSTEM OR CKT FAILURE
		ASPIRATED AIR THERMOSENSOR

SUBARU DTCs

YEAR	DTC NO.	DESCRIPTOR
1986 (cont.)	35	EGR SOL SWITCH ON/OFF OR CKT
		AIR FLOW METER OR CKT FAILURE
	41	BARO SENSOR OR CIRCUIT FAILURE
	42	CLUTCH SW OR CKT (EXC. AT & 4WD)
		FUEL INJ. FIXED IN ON/OFF POS.
		FUEL INJECTOR OR CIRCUIT FAILURE
	43	KDLH RELAY FIXED IN ON/OFF POS.
	46	NEUT/PARKING SW OR CKT FAILURE
	52	ASV SOL VALVE OR CIRCUIT FAILURE
	53	FUEL PUMP CNTRL OR CKT FAILURE
		FUEL PUMP OR CIRCUIT FAILURE
	54	AUTO CHOKE CNTRL OR CKT FAILURE
	55	SHIFT-UP CNTRL SYSTEM (AT ONLY)
		KDLH CONTROL SYSTEM OR CKT
	57	CANP SOL VALVE OR CKT FAILURE
	58	AIR CNTRL VALVE OR CKT FAILURE
	62	EGR SOL VALVE OR CKT FAILURE
	63	CANP SOL VALVE OR CKT FAILURE
	64	VLC SOL VALVE OR CKT FAILURE
	65	FCV SOL VALVE OR CKT FAILURE
	71	IGN PULSE-ENG. OFF (5MT/2WD/CA)
	73	IGN PULSE-ENG. OFF (5MT/4WD/CA)
	74	IGN PULSE-ENG. OFF (AT/4WD/CA)
	88	SPFI CONTROL UNIT FAILURE

SUBARU DTCs

YEAR	DTC NO.	DESCRIPTOR
1987	1	SPEC CODE MT/49ST/CAN
	2	SPEC CODE MT/CAL
	3	SPEC CODE AT/49ST/CAN
	4	SPEC CODE AT/CAL
	5	SPEC CODE MT/FED
	6	SPEC CODE MT/CAL/CAN
	7	SPEC CODE AT/FED
	8	SPEC CODE AT/CAL/CAN
	11	CRANK ANGLE SNSR REF PULSE OR CKT
		IGN PULSE CKT FAULT (ENG OFF)
	12	STARTER SW ON/ OFF (CRANKING)
		BACK-UP SYSTEM OR CKT FAILURE
	13	CKP SENSOR OR CIRCUIT FAILURE
	14	FUEL INJ. 1 & 2 OR CKT FAILURE
		DUTY SOLENOID VALVE OR CKT
		FUEL INJ. OUTPUT OR CKT FAILURE
	15	FUEL INJ. 3 & 4 OR CKT FAILURE
	21	WATER TEMP. SNSR SIGNAL OR CKT
		THERMO SENSOR OR CKT FAILURE
	22	KS OR KS CIRCUIT FAILURE
		VLC SOLENOID VALVE OR CKT
	23	AIR FLOW METER OR CKT FAILURE
		PRESSURE SENSOR OR CKT FAILURE
	24	IDLE UP SOLENOID OR CKT FAILURE
		AIR CONTROL VLV OR CKT FAILURE
	25	FCV SOLENOID OR CIRCUIT FAILURE

SUBARU DTCs

YEAR	DTC NO.	DESCRIPTOR
1987 (cont.)	31	THROTTLE SENSOR OR CKT FAILURE
	32	O2 SENSOR OR CIRCUIT FAILURE
		O2S SYSTEM OR CIRCUIT FAILURE
	33	VEHICLE SPEED SENSOR SIGNAL
		VEHICLE SPEED SNSR OR CIRCUIT
	34	EGR SOL VALVE ON/OFF OR CKT
	35	PURGE SOL VALVE ON/OFF OR CKT
		PURGE SOLENOID CONTROL SYSTEM
	41	SYSTEM LEAN CONDITION
		FEEDBACK SYSTEM OR CKT FAILURE
	42	IDLE SWITCH OR CIRCUIT FAILURE
	44	WASTEGATE SOL OR CKT FAILURE
	45	KDWN CNTRL RLY (ON/OFF POS.)
	51	NEUTRAL SW CKT (REMAINS ON)
	52	CLUTCH SWITCH OR CKT FAILURE
	61	PARKING SW CKT (REMAINS ON)
	62	IDLE-UP SYS. OR CKT(CL/REAR DEF)
	63	IDLE-UP SYS CKT (HTR/RAD FAN)

SUBARU DTCs

YEAR	DTC NO.	DESCRIPTOR
1988	1	SPEC CODE FWD/49ST/CAN
		SPEC CODE MT/49ST/CAN
	2	SPEC CODE FWD/CAL
		SPEC CODE MT/CAL
	3	SPEC CODE AT/49ST/CAN
	4	SPEC CODE AT/CAL
	5	SPEC CODE 4WD/49ST/CAN
		SPEC CODE MT/49ST/CAN
	6	SPEC CODE 4WD/CA
		SPEC CODE MT/CAL
	7	SPEC CODE AT/49ST/CAN
	8	SPEC CODE AT/CAL
	11	CRANK ANGLE SNSR REF PULSE OR CKT
	12	STARTER SW ON/OFF (CRANKING)
	13	CKP SENSOR OR CIRCUIT FAILURE
	14	FUEL INJ. 1 & 2 OR CKT FAILURE
		FUEL INJ. 5 & 6 OR CKT FAILURE
		FUEL INJ. OUTPUT OR CKT FAILURE
		DUTY SOLENOID VALVE OR CKT
	15	FUEL INJ. 3 & 4 OR CKT FAILURE
		FUEL INJ. 1 & 2 OR CKT FAILURE
		CFC SYSTEM OR CIRCUIT FAILURE
	21	WATER TEMP. SNSR SIGNAL OR CKT
	22	KS OR KS CIRCUIT FAILURE
		VLC SOLENOID VALVE OR CKT

SUBARU DTCs

YEAR	DTC NO.	DESCRIPTOR
1988 (cont.)	23	AIR FLOW METER OR CKT FAILURE
		PRESSURE SENSOR OR CKT FAILURE
	24	BYPASS AIR CONT. VALVE OR CIRCUIT
		AIR CONTROL VLV OR CKT FAILURE
		IDLE UP SOLENOID OR CKT FAILURE
	25	FUEL INJ. 3 & 4 OR CKT FAILURE
		FCV SOLENOID OR CIRCUIT FAILURE
	31	THROTTLE SENSOR OR CKT FAILURE
	32	O2 SENSOR OR CIRCUIT FAILURE
		O2S SYSTEM OR CIRCUIT FAILURE
	33	VEHICLE SPEED SENSOR SIGNAL
		VEHICLE SPEED SNSR OR CIRCUIT
	34	EGR SOL VALVE ON/OFF OR CKT
		EGR LINE CLOGGED OR CKT (CA ONLY)
	35	PURGE SOL VALVE ON/OFF OR CKT
		PURGE SOLENOID CONTROL SYSTEM
	41	SYSTEM LEAN CONDITION
	42	IDLE SWITCH OR CIRCUIT FAILURE
	45	KDWN CNTRL RLY (ON/OFF POS.)
	51	NEUT SWITCH OR CKT (NO SIGNAL)
		NEUTRAL SW CKT (REMAINS ON)
	52	CLUTCH SW OR CKT FAIL (FWD ONLY)
	55	EGR GAS TEMP. SENSOR (CA ONLY)
	61	PARKING SW CKT (SW REMAINS ON)
	62	IDLE-UP SYSTEM 1 OR CKT FAILURE
	63	IDLE-UP SYSTEM 2 OR CKT FAILURE

SUBARU DTCs

YEAR	DTC NO.	DESCRIPTOR
1989	1	SPEC CODE MT/49ST/CAN
	2	SPEC CODE MT/CAL
	3	SPEC CODE AT/49ST/CAN
		SPEC CODE AT/4WD/49ST/CAN
	4	SPEC CODE AT/CAL
		SPEC CODE AT/4WD/CAL
	5	SPEC CODE MT/FED/CAN
	6	SPEC CODE MT/CAL
	7	SPEC CODE AT/FWD/CAN/49ST
		SPEC CODE AT/FED/CAN
	8	SPEC CODE AT/FWD/CAL
		SPEC CODE AT/CAL
	11	CRANK ANGLE SNSR REF PULSE OR CKT
	12	STARTER SW ON/OFF (CRANKING)
	13	CKP SENSOR OR CIRCUIT FAILURE
	14	FUEL INJ. 1 & 2 OR CIRCUIT
		FUEL INJ. 5 & 6 OR CIRCUIT
		FUEL INJ. OUTPUT OR CKT FAILURE
		DUTY SOL. VLV. OR CKT FAILURE
	15	FUEL INJ. 3 & 4 OR CIRCUIT
		FUEL INJ. 1 & 2 OR CIRCUIT
		CFC SYSTEM OR CKT (MT ONLY)
	16	FEEDBACK SYSTEM OR CKT FAILURE
	17	FUEL PUMP AUTO CHOKE OR CKT
	21	WATER TEMP. SNSR SIGNAL OR CKT
		THERMOSENSOR OR CIRCUIT FAILURE
	22	KS OR KS CIRCUIT FAILURE
		VLC SOLENOID VLV OR CKT FAILURE
	23	AIR FLOW METER OR CKT FAILURE
		PRESSURE SENSOR OR CKT FAILURE

SUBARU DTCs

YEAR	DTC NO.	DESCRIPTOR
1989 (cont.)	24	BYPASS AIR CONT. VALVE OR CKT
		IDLE UP SOLENOID OR CKT FAILURE
		AIR CONTROL VLV OR CKT FAILURE
	25	FUEL INJ. 3 & 4 OR CIRCUIT
		FCV SOLENOID OR CIRCUIT FAILURE
	31	THROTTLE SENSOR OR CKT FAILURE
	32	O2 SENSOR OR CIRCUIT FAILURE
	33	VEHICLE SPEED SENSOR SIGNAL
	34	EGR SOL VALVE ON/OFF OR CKT
		EGR LINE CLOGGED OR CKT (CA ONLY)
	35	PURGE SOL VALVE ON/OFF OR CKT
		CPC SOLENOID OR CIRCUIT FAILURE
	41	SYSTEM LEAN CONDITION
		FEEDBACK SYSTEM FAIL (CA ONLY)
	42	IDLE SWITCH OR CIRCUIT FAILURE
	44	WASTEGATE CNTRL SOL OR CIRCUIT
	45	KDWN CNTRL RLY (ON/OFF POS.)
	46	RADIATOR FAN CONTROL SYSTEM
	51	NEUTRAL SW OR CKT (NO SIGNAL)
		NEUTRAL SW CKT (REMAINS ON)
	52	CLUTCH SW CKT (FWD w/MT ONLY)
	53	HAC SOLENOID OR CIRCUIT FAILURE
	55	EGR SENSOR OR CKT (CA ONLY)
		EGR GAS TEMP SNSR (CA ONLY)
	56	EGR SYSTEM (CALIF ONLY)
	61	PARKING SW CKT (SW REMAINS ON)
	62	IDLE-UP SYSTEM 1 OR CKT FAILURE
	63	IDLE-UP SYSTEM 2 OR CKT FAILURE

SUBARU DTCs

YEAR	DTC NO.	DESCRIPTOR
1990	1	SPEC CODE MT/49ST/CAN
		SPEC CODE FWD/MT/49ST/CAN
	2	SPEC CODE FWD/ECVT/49ST/CAN
		SPEC CODE MT/CAL
	3	SPEC CODE 4WD/MT/49ST/CAN
		SPEC CODE AT/49ST/CAN
	4	SPEC CODE 4WD/ECVT/49ST/CAN
		SPEC CODE AT/CAL
	5	SPEC CODE MT/FED/CAN
	6	SPEC CODE MT/CAL
	7	SPEC CODE AT/FED/CAN
	8	SPEC CODE AT/CAL
	10	SPEC CODE FWD/MT/CAL
	11	CRANK ANGLE SNSR REF PULSE OR CKT
		CKP SENSOR OR CKT (CAM SIG OK)
		CKP SNSR OR CKT (START SIG OK)
	12	STARTER SW POS. ON/OFF FAILURE
		STARTER SWITCH IGN SIG FAILURE.
		STARTER SW ON/OFF (CRANKING)
	13	CYL DISTINCTION SNSR(CKP SIG OK)
		CKP SNSR OR CKT (CRANK SIG OK)
		CKP SENSOR OR CIRCUIT FAILURE.
	14	FUEL INJ. 1 OR CIRCUIT FAILURE
		FUEL INJ. OUTPUT OR CKT FAILURE
		DUTY SOLENOID VALVE OR CKT
		FUEL INJ. 1 & 2 OR CKT FAILURE
	15	FUEL INJ. 2 OR CKT FAILURE
		CFC SYSTEM OR CIRCUIT FAILURE
		FUEL INJ. 3 & 4 OR CKT FAILURE
	16	FUEL INJ. 3 OR CKT FAILURE
		FEEDBACK SYSTEM OR CKT FAILURE

SUBARU DTCs

YEAR	DTC NO.	DESCRIPTOR
1990 (cont.)	17	FUEL INJ. 4 OR CKT FAILURE
		FUEL PUMP AUTO CHOKE OR CKT
	20	SPEC CODE FWD/ECVT/CAL
	21	WATER TEMP. SNSR SIGNAL OR CKT
		WATER TEMP. SNSR OR CKT FAILURE
	22	KS SNSR MONITOR CKT VOLTAGE
		VLC SOLENOID VALVE OR CKT
		KS OR KS CIRCUIT FAILURE
	23	PRESSURE SENSOR OR CKT FAILURE
		AIR FLOW METER OR CKT FAILURE
		AIR FLOW SNSR. SIGNAL VOLTAGE
	24	ISC SOL. VALVE CKT VOLTAGE
		AIR CONTROL VLV OR CKT FAILURE
		AIR CONTROL VLV MON CKT VOLTAGE
		IDLE UP SOLENOID OR CKT FAILURE
	25	FCV SOLENOID OR CIRCUIT FAILURE
	26	AIR TEMP. SENSOR OR CKT FAILURE
	30	SPEC CODE 4WD/MT/CAL
	31	THROTTLE SENSOR OR CKT FAILURE
		THROTTLE SENSOR VOLTAGE OR CKT
	32	O2 SENSOR OR CIRCUIT FAILURE
		O2 SNSR VOLTAGE OR CKT FAILURE
	33	VSS OR CIRCUIT (NO SIGNAL)
		VSS VOLTAGE OR CIRCUIT FAILURE
	34	EGR SOL VALVE ON/OFF OR CKT
		EGR LINE CLOGGED OR EGR CKT (CA)
	35	CPC SOL MONITOR CKT VOLTAGE
		PURGE SOL VALVE ON/OFF OR CKT
		PURGE SOL VALVE OR CKT FAILURE
	36	IGNITER MONITOR CKT VOLTAGE
	40	SPEC CODE 4WD/ECVT/CAL

SUBARU DTCs

YEAR	DTC NO.	DESCRIPTOR
1990 (cont.)	41	AFR ADAPTIVE LEARN CONTROL SYSTEM LEAN CONDITION
	42	IDLE SWITCH SIGNAL OR CKT
		IDLE SWITCH VOLTAGE SIGNAL
		IDLE SWITCH OR CIRCUIT FAILURE
	43	POWER SWITCH SIGNAL OR CKT
	44	WASTEGATE CONTRL SOL. OR CIRCUIT
	45	BARO SENSOR OR CIRCUIT FAILURE
		BARO SENSOR FAILURE
		KDWN CONTROL RLY (ON/OFF POS.)
	46	RADIATOR FAN CONTROL SYSTEM
	49	AIR FLOW SENSOR OR CKT FAILURE
	51	NEUTRAL SW CKT (REMAINS ON)
		NEUTRAL SW OR CKT (NO SIGNAL)
		AT INHIBITOR SWITCH OR CKT
	52	CLUTCH SW CKT (FWD w/MT/ECVT)
		PARKING SWITCH OR CKT FAILURE
	53	HAC SOLENOID OR CKT FAILURE
	55	EGR GAS TEMP. SENSOR (CA ONLY)
	61	PARKING SWITCH (REMAINS ON)
	62	ELEC LOAD SIGNAL (HDLP/REAR DEF)
		IDLE-UP SYSTEM 1 OR CKT FAILURE
	63	BLOWER FAN SW (REMAINS ON/OFF)
		IDLE-UP SYSTEM 2 OR CKT FAILURE
	65	VACUUM PRESSURE SENSOR OR CKT

SUBARU DTCs

YEAR	DTC NO.	DESCRIPTOR
1991	1	SPEC CODE MT/FED/2700cc SPEC CODE MT/FED/NON-TURBO
	2	SPEC CODE MT/CA/2700cc SPEC CODE MT/CA/NON-TURBO
	3	SPEC CODE AT/FED/CAN SPEC CODE AT/FED/2700cc SPEC CODE AT/FED/CAN/4WD/1800cc SPEC CODE AT/FED/NON-TURBO
	4	SPEC CODE AT/CAL SPEC CODE AT/CA/2700cc SPEC CODE AT/CA/4WD/1800cc SPEC CODE AT/CA/NON-TURBO
	5	SPEC CODE MT/FED/CAN SPEC CODE MT/FED/CAN/1800cc SPEC CODE MT/FED/TURBO
	6	SPEC CODE MT/CAL SPEC CODE MT/CA/1800cc SPEC CODE MT/CA/TURBO
	7	SPEC CODE AT/FED/CAN SPEC CODE AT/FED/FWD/1800cc SPEC CODE AT/FED/TURBO
	8	SPEC CODE AT/CAL SPEC CODE AT/CA/FWD/1800cc SPEC CODE AT/CA TURBO
	11	CRANK ANGLE SENSOR CIRCUIT FAILURE
	12	STARTER SWITCH SIGNAL ABNORMAL
	13	CAM ANGLE SENSOR CIRCUIT FAILURE
	14	FUEL INJECTOR NO. 1 INOPERATIVE (LEGACY) FUEL INJECTOR OUTPUT OR CIRCUIT FAILURE (LOYALE W/SPFI) FUEL INJECTORS NO. 1 & 2 OR CIRCUIT FAILURE (LOYALE W/MPFI) FUEL INJECTORS NO. 1 & 2, 1800cc (XT) FUEL INJECTORS NO. 5 & 6, 2700cc (XT6)
	15	FUEL INJECTOR NO. 2 INOPERATIVE (LEGACY) FUEL INJECTORS NO. 3 & 4 CIRCUIT FAILURE (LOYALE W/SPFI) FUEL INJECTORS NO. 3 & 4, 1800cc (XT) FUEL INJECTORS NO. 1 & 2, 2700cc (XT6)
	16	INJECTOR NO. 3, INOPERATIVE

SUBARU DTCs

YEAR	DTC NO.	DESCRIPTOR
1991 (cont.)	17	INJECTOR NO. 4, INOPERATIVE
	21	WATER TEMP. SENSOR CIRCUIT FAILURE
	22	KNOCK SENSOR CIRCUIT FAILURE
	23	AIR FLOW METER/SENSOR CIRCUIT FAILURE
	24	(BYPASS) AIR CONTROL VALVE CIRCUIT FAILURE
	25	FUEL INJECTORS NO. 3 & 4, CIRCUIT FAILURE
	31	TPS CIRCUIT FAILURE
	32	O2 SENSOR CIRCUIT FAILURE
	33	VSS SIGNAL ABNORMAL
	34	EGR SOLENOID VALVE CONTINUOUSLY ON OR OFF
	35	CANISTER PURGE SYSTEM FAILURE
	41	AIR/FUEL SYSTEM FAILURE
	42	IDLE SWITCH CIRCUIT ABNORMAL
	44	WASTEGATE CONTROL SYSTEM FAILURE
	45	PRESSURE SENSOR/EXCHANGE SOLENOID VALVE FAILURE (LEGACY TURBO)
		ATMOSPHERIC PRESSURE SENSOR FAULTY (LEGACY NON-TURBO)
		KICK-DOWN CONTROL RELAY FAILURE, CONTINUOUSLY ON OR OFF (LOYALE W/SPFI)
	49	AIR FLOW SENSOR: USE OF IMPROPER SENSOR
	51	NEUTRAL/INHIBITOR SWITCH CIRCUIT FAILURE
	52	PARKING SWITCH SIGNAL ABNORMAL
	55	EGR GAS TEMP. SENSOR, OPEN OR SHORT
	61	PARKING SWITCH CIRCUIT FAILURE, SWITCH CONTINUOUSLY ON

SUBARU DTCs

YEAR	DTC NO.	DESCRIPTOR
1992	11	CRANK ANGLE SENSOR CIRCUIT FAILURE
	12	STARTER SWITCH, ABNORMAL SIGNAL
	13	CAM ANGLE SENSOR CIRCUIT FAILURE
	14	INJECTOR NO. 1 INOPERATIVE
	15	INJECTOR NO. 2 INOPERATIVE
	16	INJECTOR NO. 3 INOPERATIVE
	17	INJECTOR NO. 4 INOPERATIVE
	18	INJECTOR NO. 5 INOPERATIVE
	19	INJECTOR NO. 6 INOPERATIVE
	21	WATER TEMP. SENSOR, ABNORMAL SIGNAL
	22	KNOCK SENSOR, ABNORMAL VOLTAGE IN MONITOR CIRCUIT (LEGACY) KNOCK SENSOR 1, ABNORMAL VOLTAGE IN MONITOR CIRCUIT, RIGHT BANK (SVX)
	23	AIR FLOW SENSOR, ABNORMAL VOLTAGE
	24	BYPASS AIR CONTROL SOLENOID VALVE CIRCUIT FAILURE
	28	KNOCK SENSOR 2, ABNORMAL VOLTAGE IN MONITOR CIRCUIT, LEFT BANK
	29	CRANK ANGLE SENSOR 2, ABNORMAL VOLTAGE IN MONITOR CIRCUIT
	31	THROTTLE SENSOR, ABNORMAL VOLTAGE IN CIRCUIT
	32	O2 SENSOR INOPERATIVE (LEGACY) O2 SENSOR 2, INOPERATIVE, RIGHT BANK (SVX)
	33	VSS 2, ABNORMAL VOLTAGE
	34	EGR SOLENOID VALVE INOPERATIVE
	35	PURGE CONTROL SOLENOID VALVE INOPERATIVE
	37	O2 SENSOR 2, INOPERATIVE, LEFT BANK (SVX)
	38	ENGINE TORQUE CONTROL CIRCUIT, SHORT CIRCUIT
	41	A/F LEARNING CONTROL FAULTY
	42	IDLE SWITCH, ABNORMAL VOLTAGE
	44	WASTEGATE CONTROL SOLENOID VALVE INOPERATIVE

SUBARU DTCs

YEAR	DTC NO.	DESCRIPTOR
1992 (cont.)	45	ATMOSPHERIC PRESSURE SENSOR FAULTY (LEGACY NON-TURBO)
		PRESSURE SENSOR/EXCHANGE SOLENOID VALVE FAULTY (LEGACY TURBO)
		ATMOSPHERIC PRESSURE SENSOR FAULTY, SENSOR IN ECU (SVX)
	49	IMPROPER AIR FLOW SENSOR IN USE
	51	NEUTRAL SWITCH, ABNORMAL SIGNAL (LEGACY M/T)
		INHIBITOR SWITCH, ABNORMAL SIGNAL (LEGACY A/T)
		NEUTRAL SWITCH, ABNORMAL SIGNAL FROM PARKING SWITCH (SVX)
	52	PARKING SWITCH, ABNORMAL SIGNAL
	55	EGR GAS TEMP. SENSOR, ABNORMAL SIGNAL
	56	EGR SYSTEM FAILURE (CAL)

SUBARU DTCs

YEAR	DTC NO.	DESCRIPTOR
1993	11	CRANK ANGLE SENSOR FAILURE
	12	STARTER SWITCH, ABNORMAL SIGNAL (LEGACY) STARTER SWITCH, ABNORMAL SIGNAL FROM IGN. SWITCH (SVX) STARTER SWITCH, CIRCUIT FROM ECM TO SWITCH, OPEN OR SHORT (IMPREZA)
	13	CAM ANGLE SENSOR SIGNAL FAILURE
	14	INJECTOR NO. 1 INOPERATIVE
	15	INJECTOR NO. 2 INOPERATIVE
	16	INJECTOR NO. 3 INOPERATIVE
	17	INJECTOR NO. 4 INOPERATIVE
	18	INJECTOR NO. 5 INOPERATIVE
	19	INJECTOR NO. 6 INOPERATIVE
	21	ECT SENSOR, ABNORMAL SIGNAL
	22	KNOCK SENSOR, ABNORMAL VOLTAGE IN MONITOR CIRCUIT (LEGACY) KNOCK SENSOR 1, ABNORMAL VOLTAGE IN MONITOR CIRCUIT, RIGHT BANK (SVX)
	23	AIR FLOW SENSOR CIRCUIT FAILURE
	24	(BYPASS) IDLE AIR CONTROL CIRCUIT FAILURE
	28	KNOCK SENSOR 2, ABNORMAL VOLTAGE, LEFT BANK
	29	CRANK ANGLE SENSOR 2, CIRCUIT FAILURE
	31	THROTTLE SENSOR CIRCUIT FAILURE
	32	O2 SENSOR INOPERATIVE (LEGACY) O2 SENSOR 1 INOPERATIVE, RIGHT BANK (SVX) O2 SENSOR OR CIRCUIT OPEN OR SHORT TO ECM (IMPREZA)
	33	VSS CIRCUIT FAILURE
	34	EGR SOLENOID VALVE OR CIRCUIT FAILURE
	35	PURGE CONTROL VALVE OR CIRCUIT FAILURE
	36	AIR SUCTION SOLENOID VALVE OR CIRCUIT FAILURE
	37	O2 SENSOR 2 INOPERATIVE, LEFT BANK
	38	ENGINE TORQUE CONTROL CIRCUIT, SHORT FROM ECU TO TCU
	41	A/F LEARNING CONTROL FAULTY

SUBARU DTCs

YEAR	DTC NO.	DESCRIPTOR
1993 (cont.)	42	IDLE SWITCH, ABNORMAL VOLTAGE
	44	WASTEGATE CONTROL SOLENOID VALVE INOPERATIVE
	45	ATMOSPHERIC PRESSURE SENSOR FAULTY (LEGACY NON-TURBO)
		PRESSURE SENSOR/EXCHANGE VALVE FAULTY (LEGACY TURBO)
		ATMOSPHERIC PRESSURE SENSOR FAULTY, SENSOR IN ECU (SVX)
	49	IMPROPER AIR FLOW SENSOR IN USE
	51	NEUTRAL SWITCH, ABNORMAL SIGNAL (SVX)
		INHIBITOR SWITCH, ABNORMAL SIGNAL (A/T)
		NEUTRAL POSITION SWITCH, ABNORMAL SIGNAL (M/T)
	52	PARKING SWITCH, ABNORMAL SIGNAL
	55	EGR GAS TEMP. SENSOR, ABNORMAL SIGNAL, SENSOR FAILURE
	56	EGR SYSTEM, VALVE OR HOSE MALFUNCTION

SUBARU DTCs

YEAR	DTC NO.	DESCRIPTOR
1994	11	NO CRANK ANGLE SENSOR SIGNAL ENTERED (LEGACY) CRANK SENSOR 1, NO SIGNAL FOR MORE THAN 3 SEC. W/START SWITCH ON (SVX) CRANK POSITION SENSOR, NO SIGNAL, BUT CAM SIGNAL PRESENT (IMPREZA)
	12	STARTER SWITCH, ABNORMAL SIGNAL (LEGACY) STARTER SWITCH, ABNORMAL SIGNAL FROM IGNITION SWITCH (SVX) STARTER SWITCH, ABNORMAL SIGNAL, OR OPEN IN CIRCUIT (IMPREZA)
	13	NO CAM ANGLE SIGNAL, 2 REVOLUTION SIGNAL FROM CRANK SENSOR (LEGACY) NO CAM ANGLE SIGNAL, SIGNAL FROM CRANK SENSOR 1 (SVX) NO CAM POSITION SIGNAL, CRANK POSITION SIGNAL PRESENT (IMPREZA)
	14	INJECTOR NO. 1 INOPERATIVE
	15	INJECTOR NO. 2 INOPERATIVE
	16	INJECTOR NO. 3 INOPERATIVE
	17	INJECTOR NO. 4 INOPERATIVE
	18	INJECTOR NO. 5 INOPERATIVE
	19	INJECTOR NO. 6 INOPERATIVE
	21	ECT SENSOR OR CIRCUIT FAILURE
	22	KNOCK SENSOR, ABNORMAL VOLTAGE IN MONITOR CIRCUIT (LEGACY) KNOCK SENSOR 1, ABNORMAL VOLTAGE IN MONITOR CIRCUIT, RIGHT BANK (SVX)
	23	AIR FLOW SENSOR, ABNORMAL VOLTAGE
	24	(BYPASS) AIR CONTROL SOLENOID VALVE OR CIRCUIT FAILURE
	28	KNOCK SENSOR 2, ABNORMAL VOLTAGE IN MONITOR CIRCUIT (LEFT BANK)
	29	NO CRANK ANGLE SENSOR 2 SIGNAL, TWO SIGNALS ENTERED FROM CAM SENSOR
	31	THROTTLE SENSOR, ABNORMAL VOLTAGE
	32	O2 SENSOR INOPERATIVE (LEGACY) O2 SENSOR 1 INOPERATIVE, RIGHT BANK (SVX) O2 SENSOR OR CIRCUIT FAILURE (IMPREZA)
	33	VSS 2 CIRCUIT FAILURE
	34	EGR SOLENOID VALVE OR CIRCUIT FAILURE

SUBARU DTCs

YEAR	DTC NO.	DESCRIPTOR
1994 (cont.)	35	PURGE CONTROL SOLENOID VALVE OR CIRCUIT FAILURE
	36	AIR SUCTION SOLENOID VALVE FAILURE, OR CIRCUIT OPEN/SHORT
	37	O2 SENSOR 2 INOPERATIVE, LEFT BANK
	38	ENGINE TORQUE CONTROL, SHORT BETWEEN ECU AND TCU
	41	A/F LEARNING CONTROL FAULTY
	42	IDLE SWITCH, ABNORMAL VOLTAGE
	44	WASTEGATE CONTROL SOLENOID VALVE INOPERATIVE
	45	ATMOSPHERIC PRESSURE SENSOR FAULTY (LEGACY NON-TURBO)
		PRESSURE SENSOR/EXCHANGE SOLENOID VALVE FAULTY (LEGACY TURBO)
		ATMOSPHERIC PRESSURE SENSOR FAULTY, SENSOR IN ECU (SVX)
	49	IMPROPER AIR FLOW SENSOR IN USE
	51	NEUTRAL SWITCH, ABNORMAL VOLTAGE FROM INHIBITOR SWITCH (SVX)
		INHIBITOR SWITCH, ABNORMAL SIGNAL (A/T)
		NEUTRAL POSITION SWITCH, ABNORMAL SIGNAL (M/T)
	52	PARKING SWITCH, ABNORMAL SIGNAL
	55	EGR GAS TEMP. SENSOR FAULTY
	56	EGR SYSTEM FAILURE

SUBARU DTCs

YEAR	DTC NO.	DESCRIPTOR
1995	11	CKP SENSOR OR CIRCUIT FAILURE (SENSOR 1,CAM SIGNAL OK)
	12	STARTER SWITCH SIGNAL FAILURE
	13	CAM ANGLE SENSOR FAILURE
	14	FUEL INJECTOR NO. 1 OR CIRCUIT FAILURE
	15	FUEL INJECTOR NO. 2 OR CIRCUIT FAILURE
	16	FUEL INJECTOR NO. 3 OR CIRCUIT FAILURE
	17	FUEL INJECTOR NO. 4 OR CIRCUIT FAILURE
	18	FUEL INJECTOR NO. 5 OR CIRCUIT FAILURE
	19	FUEL INJECTOR NO. 6 OR CIRCUIT FAILURE
	21	ECT SENSOR OR CIRCUIT FAILURE
	22	KNOCK SENSOR MONITOR CIRCUIT (RIGHT BANK)
	23	AIR FLOW SENSOR SIGNAL VOLTAGE
	24	BYPASS AIR VALVE/IAC CIRCUIT MALFUNCTION
	28	KNOCK SENSOR MONITOR CIRCUIT (LEFT BANK)
	29	CKP SENSOR 2 OR CIRCUIT FAILURE (CAM SIGNAL OK)
	31	TPS SIGNAL/VOLTAGE OR CIRCUIT FAILURE
	32	O2 SENSOR (RIGHT BANK) INOPERATIVE
	33	VSS 2 OR CIRCUIT FAILURE
	34	EGR SOLENOID VALVE OR CIRCUIT FAILURE
	35	PURGE SOLENOID VALVE OR CIRCUIT FAILURE
	36	AIR SUCTION VALVE OR CIRCUIT FAILURE
	37	O2 SENSOR (LEFT BANK) INOPERATIVE
	38	ENGINE TORQUE CONTROL, ECM/TCM CIRCUIT
	41	AIR/FUEL CONTROL, LEAN FAILURE
	52	PARKING SWITCH SIGNAL
	44	WASTEGATE SOLENOID CONTROL VALVE
	45	BARO SENSOR OR CIRCUIT FAILURE
	49	AIR FLOW SENSOR OR CIRCUIT FAILURE
	51	NEUTRAL/INHIBIT SWITCH SIGNAL OR CIRCUIT FAILURE
	52	PARKING SWITCH SIGNAL
	55	EGR TEMP. SENSOR OR CIRCUIT
	56	EGR SYSTEM MALFUNCTION

SUBARU DTCs

YEAR	DTC NO.	DESCRIPTOR
1995 (cont.)	61	FUEL TANK PRESSURE SOLENOID VALVE OR CIRCUIT
	62	FUEL TEMP. SENSOR OPEN/SHORT CIRCUIT
	63	FUEL TANK PRESSURE SENSOR OR CIRCUIT

OBD II SYSTEMS

YEAR	DTC NO.	DESCRIPTOR
1995-98 OBD II	P0100	MAF Sensor Circuit Malfunction
	P0101	MAF Sensor Range/Performance Problem
	P0102	MAF Sensor Circuit, Low Input
	P0103	MAF Sensor Circuit, High Input
	P0105	Pressure Sensor Circuit Malfunction
	P0106	Pressure Sensor Circuit Range/Performance Problem
	P0107	Pressure Sensor Circuit, Low Input
	P0108	Pressure Sensor Circuit, High Input
	P0115	ECT Sensor, Circuit Malfunction
	P0116	ECT Sensor, Low Input
	P0117	ECT Sensor, High Input
	P0117	ECT Sensor, Low Input (1998 Only)
	P0118	ECT Sensor, High Input
	P0120	TPS Circuit Malfunction
	P0121	TPS Circuit Range/Performance Problem
	P0122	TPS Circuit, Low Input
	P0123	TPS Circuit, High Input
	P0125	Coolant Temp. Low, no Closed Loop Fuel Control
	P0130	O2S Circuit Malfunction, Bank 1 Sensor 1
	P0133	O2S Circuit, Slow Response, Bank 1 Sensor 1
	P0135	Front O2 Sensor 1 Circuit, Slow Response
	P0136	Front HO2 Sensor 1, Circuit Malfunction
	P0139	Rear O2 Sensor, Slow Response
	P0141	Rear HO2 Sensor, Circuit Malfunction
	P0142	Front O2 Sensor 2, Circuit Malfunction
	P0145	Front O2 Sensor 2, Slow Response
	P0147	Front HO2 Sensor 2, Circuit Malfunction
	P0170	Fuel Trim Malfunction
	P0180	Fuel Temp. Sensor A, Circuit Malfunction
	P0181	Fuel Temp. Sensor A, Circuit Range/Performance
	P0182	Fuel Temp. Sensor A Circuit, Low Input
	P0183	Fuel Temp. Sensor A Circuit, High Input
	P0201	Fuel Injector No. 1, Circuit Malfunction
	P0202	Fuel Injector No. 2, Circuit Malfunction
	P0203	Fuel Injector No. 3, Circuit Malfunction
	P0204	Fuel Injector No. 4, Circuit Malfunction
	P0205	Fuel Injector No. 5, Circuit Malfunction
	P0206	Fuel Injector No. 6, Circuit Malfunction

SUBARU DTCs (CONT.)

YEAR	DTC NO.	DESCRIPTOR
1995-98 OBD II	P0261	Fuel Injector Circuit No. 1, Low Input
	P0262	Fuel Injector Circuit No. 1, High Input
	P0264	Fuel Injector Circuit No. 2, Low Input
	P0265	Fuel Injector Circuit No. 2, High Input
	P0267	Fuel Injector Circuit No. 3, Low Input
	P0268	Fuel Injector Circuit No. 3, High Input
	P0270	Fuel Injector Circuit No. 4, Low Input
	P0271	Fuel Injector Circuit No. 4, High Input
	P0301	Cylinder No. 1, Misfire Detected
	P0302	Cylinder No. 2, Misfire Detected
	P0303	Cylinder No. 3, Misfire Detected
	P0304	Cylinder No. 4, Misfire Detected
	P0305	Cylinder No. 5, Misfire Detected
	P0306	Cylinder No. 6, Misfire Detected
	P0325	Knock Sensor Circuit 1
	P0335	Crankshaft Position Sensor No. 1, Circuit Malfunction
	P0336	Crankshaft Position Sensor, Circuit Out of Range
	P0340	Camshaft Position Sensor, Circuit Malfunction
	P0341	Camshaft Position Sensor Circuit, Range/Performance
	P0385	Crankshaft Position Sensor 2, Circuit Malfunction
	P0400	EGR Flow, System Malfunction
	P0403	EGR Solenoid Circuit, Malfunction
	P0410	Secondary Air Injection System Malfunction
	P0412	Secondary Air Injection Switching Valve Malfunction
	P0420	Catalyst Efficiency Below Threshold
	P0440	EVAP Control System Malfunction
	P0441	EVAP Purge System, Incorrect Flow
	P0443	EVAP System Purge Control Valve Malfunction
	P0446	EVAP System Vent Control Valve Malfunction
	P0450	EVAP System Pressure Sensor Malfunction
	P0451	EVAP System Pressure Sensor Range/Performance Problem
	P0452	EVAP System Pressure Sensor, Low Input
	P0453	EVAP System Pressure Sensor, High Input
	P0461	Fuel Level Sensor Circuit, Range/Performance Problem
	P0462	Fuel Level Sensor Circuit, Low Input
	P0463	Fuel Level Sensor Circuit, High Input
	P0480	Cooling Fan Relay 1 Circuit, Low Input
	P0483	Cooling Fan Function Problem

SUBARU DTCs (CONT.)

YEAR	DTC NO.	DESCRIPTOR
1995-98 OBD II	P0500	VSS Malfunction
	P0505	Idle Control System Malfunction
	P0506	Idle Control System, RPM Lower Than Expected
	P0507	Idle Control System, RPM Higher Than Expected
	P0600	Serial Communication Link Malfunction
	P0601	Internal Control Module Memory Check Sum Error
	P0703	Brake Input Switch Malfunction
	P0705	Transmission Range Sensor Circuit Malfunction
	P0710	Transmission Fluid Temp. Sensor Malfunction
	P0720	Output Speed Sensor (VSS 1), Circuit Malfunction
	P0725	Engine Speed Input Circuit Malfunction
	P0731	Gear 1, Incorrect Ratio
	P0732	Gear 2, Incorrect Ratio
	P0733	Gear 3, Incorrect Ratio
	P0734	Gear 4, Incorrect Ratio
	P0740	Torque Converter Clutch System Malfunction
	P0743	Torque Converter Clutch System, Electrical Problem
	P0748	Pressure Control Solenoid, Electrical Problem
	P0753	Shift Solenoid A, Electrical Problem
	P0758	Shift Solenoid B, Electrical Problem
	P0760	Shift Solenoid C, Malfunction
	P0763	Shift solenoid C, Electrical Problem
	P1100	Starter Switch Circuit Malfunction
	P1101	Neutral Position Switch, Circuit Malfunction
	P1102	Pressure Sources Switching Solenoid Valve, Circuit Malfunction
	P1103	Engine Torque Control Signal Circuit Malfunction
	P1104	TCS signal Circuit Malfunction
	P1107	Air Injection System Diagnosis Solenoid Valve Circuit
	P1108	Induction Control Solenoid Valve Circuit
	P1120	Starter Switch Circuit, High Input
	P1121	Neutral Position Switch Circuit, Low Input
	P1122	Pressure Sources Switch Solenoid Valve, High Input
	P1124	TCS Signal Circuit, High Input
	P1141	MAF Sensor, Range/Performance Problem, High Input
	P1142	TPS Circuit, Range/Performance Problem, Low Input
	P1143	Pressure Sensor, Range/Performance Problem, Low Input
	P1144	Pressure sensor, Range/Performance Problem, High Input

SUBARU DTCs (CONT.)

YEAR	DTC NO.	DESCRIPTOR
1995-98 OBD II	P1300	CKP Sensor 2, Circuit Malfunction
	P1400	Fuel Tank Pressure Control Solenoid Valve
	P1401	Fuel Tank Pressure Control System Problem
	P1402	Fuel Level Sensor Circuit Malfunction
	P1420	Fuel Tank Pressure solenoid Valve, High Input
	P1421	EGR Circuit, High Input
	P1422	EVAP System, Purge Control Valve, High Input
	P1423	EVAP system, Vent Control, High Input
	P1440	Fuel Tank Pressure System, Low Input
	P1441	Fuel Tank Pressure system, High Input
	P1442	Fuel Level Sensor, Range/Performance Problem 2
	P1443	EVAP System, Vent Control Problem
	P1500	Radiator Fan Relay 1, Circuit Malfunction
	P1501	Radiator Fan Relay 2, Circuit Malfunction
	P1502	Radiator Fan Function Problem
	P1507	Idle Control System Malfunction (Fail-safe)
	P1520	Radiator Fan Relay 1, High Input
	P1540	VSS Sensor 2, Malfunction
	P1700	TPS Circuit Malfunction
	P1701	Cruise Control Set Signal Circuit
	P1702	A/T Diagnosis Input Signal Circuit, Low Input
	P1722	A/T Diagnosis Input Signal Circuit, High Input
	P1742	A/T Diagnosis Input Signal, Circuit Malfunction

TOYOTA

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1. VEHICLES AND SYSTEMS

Using the **Asian Imports Cartridge**, the Toyota vehicles on the following pages can be diagnosed.

MODEL	ENGINE	ENGINE TYPE	FUEL SYST	CODE TYPE	ADAPTER
1983					
CAMRY	2.0L I4	2S-E	EFI	MILCODES	JUMPER
STARLET	1.3L I4	4K-E	EFI	MILCODES	JUMPER
CELICA	2.4L I4	22R-E	EFI	MILCODES	JUMPER
CRESSIDA	2.8L I6	5M-GE	EFI	MANCODES	JUMPER
CELICA SUPRA	2.8L I6	5M-GE	EFI	MANCODES	JUMPER
1984					
CAMRY	2.0L I4	2S-E	EFI	MILCODES	JUMPER
CELICA	2.4L I4	22R-E	EFI	MILCODES	JUMPER
CRESSIDA	2.8L I6	5M-GE	EFI	MANCODES	JUMPER
CELICA SUPRA	2.8L I6	5M-GE	EFI	MANCODES	JUMPER
STARLET	1.3L I4	4K-E	EFI	MILCODES	JUMPER
VAN	2.0L I4	3Y-EC	EFI	MILCODES	JUMPER
TRUCK	2.4L I4	22R-E	EFI	MILCODES	JUMPER

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MODEL	ENGINE	ENGINE TYPE	FUEL SYST	CODE TYPE	ADAPTER
1985					
CAMRY	2.0L I4	2S-E	EFI	MILCODES	JUMPER
CELICA	2.4L I4	22R-EC	EFI	MILCODES	JUMPER
COROLLA	1.6L I4	4A-GE	EFI	MILCODES	JUMPER
CRESSIDA	2.8L I6	5M-GE	EFI	MILCODES	JUMPER
CELICA SUPRA	2.8L I6	5M-GE	EFI	MILCODES	JUMPER
VAN	2.0L I4	3Y-EC	EFI	MILCODES	JUMPER
TRUCK	2.4L I4	22R-E	EFI	MILCODES	JUMPER
TRUCK	2.4L I4	22R-TE	EFI TURBO	MILCODES	JUMPER
4 RUNNER	2.4L I4	22R-E	EFI	MILCODES	JUMPER
4 RUNNER	2.4L I4	22R-TE	EFI TURBO	MILCODES	JUMPER
1986					
CAMRY (USA)	2.0L I4	2S-EL	EFI	MILCODES	JUMPER
CAMRY (CANADA)	2.0L I4	2S-EL	EFI	MILCODES	JUMPER
CELICA	2.0L I4	2S-E	EFI	MILCODES	JUMPER
CELICA	2.0L I4	3S-GE	EFI	MILCODES	JUMPER
COROLLA	1.6L I4	4A-GE	EFI	MILCODES	JUMPER
CRESSIDA	2.8L I6	5M-GE	EFI	MILCODES	JUMPER
MR2	1.6L I4	4A-GE	EFI	MILCODES	JUMPER
CELICA SUPRA	2.8L I4	5M-GE	EFI	MILCODES	JUMPER
CELICA SUPRA[1]	3.0L I6	7M-GE	EFI	MILCODES	JUMPER
VAN	2.2L I4	4Y-EC	EFI	MILCODES	JUMPER
TRUCK	2.4L I4	22R-E	EFI	MILCODES	JUMPER
4 RUNNER	2.4L I4	22R-E	EFI	MILCODES	JUMPER
TRUCK	2.4L I4	22R-TE	EFI TURBO	MILCODES	JUMPER
4 RUNNER	2.4L I4	22R-TE	EFI TURBO	MILCODES	JUMPER
1987					
CAMRY	2.0L I4	3S-FE	EFI	MILCODES	JUMPER
CELICA	2.0L I4	3S-FE	EFI	MILCODES	JUMPER
CELICA	2.0L I4	3S-GE	EFI	MILCODES	JUMPER
COROLLA	1.6L I4	4A-C	CARB	MILCODES	JUMPER
COROLLA	1.6L I4	4A-GE	EFI	MILCODES	JUMPER
CRESSIDA	2.8L I6	5M-GE	EFI	MILCODES	JUMPER
MR2	1.6L I4	4A-GE	EFI	MILCODES	JUMPER
SUPRA	3.0L I6	7M-GE	EFI	MILCODES	JUMPER
SUPRA	3.0L I6	7M-GTE	EFI TURBO	MILCODES	JUMPER
VAN	2.2L I4	4Y-E	EFI	MILCODES	JUMPER
TRUCK	2.4L I4	22R	CARB	MILCODES	JUMPER
TRUCK	2.4L I4	22R-E	EFI	MILCODES	JUMPER
TRUCK	2.4L I4	22R-TE	EFI TURBO	MILCODES	JUMPER
4 RUNNER	2.4L I4	22RE	EFI	MILCODES	JUMPER

1 = Vehicle is a 1986

MODEL	ENGINE	ENGINE TYPE	FUEL SYST	CODE TYPE	ADAPTER
1988					
CAMRY	2.0L I4	3S-FE	EFI	MILCODES	JUMPER
CAMRY ALL-TRAC	2.0L I4	3S-FE	EFI	MILCODES	JUMPER
CELICA	2.0L I4	3S-FE	EFI	MILCODES	JUMPER
CELICA	2.0L I4	3S-GE	EFI	MILCODES	JUMPER
CELICA	2.0L I4	3S-GTE	EFI TURBO	MILCODES	JUMPER
CELICA ALL-TRAC	2.0L I4	3S-GTE	EFI TURBO	MILCODES	JUMPER
COROLLA	1.6L I4	4A-F	CARB	MILCODES	JUMPER
COROLLA	1.6L I4	4A-GE	EFI	MILCODES	JUMPER
COROLLA FX	1.6L I4	4A-GE	EFI	MILCODES	JUMPER
COROLLA FX16	1.6L I4	4A-GE	EFI	MILCODES	JUMPER
CRESSIDA	2.8L I6	5M-GE	EFI	MILCODES	JUMPER
MR2	1.6L I4	4A-GE	EFI	MILCODES	JUMPER
MR2	1.6L I4	4A-GZE	EFI	MILCODES	JUMPER
SUPRA	3.0L I6	7M-GE	EFI	MILCODES	JUMPER
SUPRA	3.0L I6	7M-GTE	EFI TURBO	MILCODES	JUMPER
VAN	2.2L I4	4Y-E	EFI	MILCODES	JUMPER
TRUCK	2.4L I4	22R-E	EFI	MILCODES	JUMPER
4 RUNNER	2.4L I4	22R-E	EFI	MILCODES	JUMPER
TRUCK	2.4L I4	22R-TE	EFI TURBO	MILCODES	JUMPER
4 RUNNER	2.4L I4	22R-TE	EFI TURBO	MILCODES	JUMPER
TRUCK	3.0L V6	3VZ-E	EFI	MILCODES	JUMPER
4 RUNNER	3.0L V6	3VZ-E	EFI	MILCODES	JUMPER
LAND CRUISER	4.0L I6	3F-E	EFI	MILCODES	JUMPER

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MODEL	ENGINE	ENGINE TYPE	FUEL SYST	INFO TYPE	ADAPTER
1989					
CAMRY	2.0L I4	3S–FE	PFI	CODES	CHECK
	2.5L V6	2VZ–FE	PFI	CODES	CHECK
CELICA	2.0L I4 (ST, GT)	3S–FE	PFI	CODES	CHECK
	2.0L I4 (GTS)	3S–GE	PFI	CODES	CHECK
	2.0L TURBO I4 (ALL TRAC)	3S–GTE	PFI	CODES	CHECK
COROLLA	1.6L I4 (CA ONLY)	4A–F	2V CARB	CODES	CHECK
	1.6L I4	4A–FE	PFI	CODES	CHECK
	1.6L I4	4A–GE	PFI	CODES	CHECK
CRESSIDA	3.0L I6	7M–GE	PFI	CODES & DATA	CHECK, TDCL
MR2	1.6L I4	4A–GE	PFI	CODES	CHECK
	1.6L I4 (SC)	4A–GZE	PFI	CODES	CHECK
SUPRA	3.0L I6	7M–GE	PFI	CODES	CHECK
	3.0L TURBO I6	7M–GTE	PFI	CODES	CHECK
TERCEL	1.5L I4 (CA ONLY)	3E	1V CARB	CODES	CHECK
LAND CRUISER	4.0L I6	3F–E	PFI	CODES	CHECK
VAN	2.2L I4	4Y–E	PFI	CODES	CHECK
4RUNNER 2WD & 4WD	2.4L I4	22R–E	PFI	CODES	CHECK
	3.0L V6	3VZ–E	PFI	CODES	CHECK
TRUCK 2WD & 4WD	2.4L I4 (CA ONLY)	22R	2V CARB	CODES	CHECK
	2.4L I4	22R–E	PFI	CODES	CHECK
	3.0L V6	3VZ–E	PFI	CODES	CHECK

MODEL	ENGINE	ENGINE TYPE	FUEL SYST	INFO TYPE	ADAPTER
1990					
CAMRY	2.0L I4	3S–FE	PFI	CODES	CHECK
	2.5L V6	2VZ–FE	PFI	CODES	CHECK
CELICA	1.6L I4	4A–FE	PFI	CODES	CHECK
	2.0L TURBO I4 (ALL TRAC)	3S–GTE	PFI	CODES	CHECK
	2.2L I4	5S–FE	PFI	CODES	CHECK
COROLLA	1.6L I4	4A–FE	PFI	CODES	CHECK
	1.6L I4	4A–GE	PFI	CODES	CHECK
CRESSIDA	3.0L I6	7M–GE	PFI	CODES & DATA	CHECK, TDCL
MR2	1.6L I4	4A–GE	PFI	CODES	CHECK
	1.6L I4 SC)	4A–GZE	PFI	CODES	CHECK
SUPRA	3.0L I6	7M–GE	PFI	CODES	CHECK
	3.0L TURBO I6	7M–GTE	PFI	CODES	CHECK
TERCEL	1.5L I4	3E–E	PFI	CODES	CHECK
	1.5L I4 (CA ONLY)	3E	1V CARB	CODES	CHECK
LAND CRUISER	4.0L I6	3F–E	PFI	CODES	CHECK
4RUNNER 2WD & 4WD	2.4L I4	22R–E	PFI	CODES	CHECK
	3.0L V6	3VZ–E	PFI	CODES	CHECK
TRUCK 2WD & 4WD	2.4L I4 (CA ONLY)	22R	2V CARB	CODES	CHECK
	2.4L I4	22R–E	PFI	CODES	CHECK
	3.0L V6	3VZ–E	PFI	CODES	CHECK

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MODEL	ENGINE	ENGINE TYPE	FUEL SYST	INFO TYPE	ADAPTER
1991					
CAMRY	2.0L I4	3S–FE	PFI	CODES	CHECK
	2.5L V6	2VZ–FE	PFI	CODES	CHECK
CELICA	1.6L I4	4A–FE	PFI	CODES	CHECK
	2.0L TURBO I4 (ALL TRAC)	3S–GTE	PFI	CODES	CHECK
	2.2L I4	5S–FE	PFI	CODES	CHECK
COROLLA	1.6L I4	4A–FE	PFI	CODES	CHECK
	1.6L I4	4A–GE	PFI	CODES	CHECK
CRESSIDA	3.0L V6	7M–GE	PFI	CODES & DATA	CHECK, TDCL
MR2	2.0L TURBO I4	3S–GTE	PFI	CODES	CHECK
	2.2L I4	5S–FE	PFI	CODES	CHECK
PREVIA	2.4L I4	2TZ–FE	PFI	CODES	CHECK
SUPRA	3.0L I6	7M–GE	PFI	CODES	CHECK
	3.0L TURBO I6	7M–GTE	PFI	CODES	CHECK
TERCEL	1.5L I4	3E–E	PFI	CODES	CHECK
LAND CRUISER	4.0L I6	3F–E	PFI	CODES	CHECK
4RUNNER 2WD & 4WD	2.4L I4	22R–E	PFI	CODES	CHECK
	3.0L V6	3VZ–E	PFI	CODES	CHECK
TRUCK 2WD & 4WD	2.4L I4	22R–E	PFI	CODES	CHECK
	3.0L V6	3VZ–E	PFI	CODES	CHECK

MODEL	ENGINE	ENGINE TYPE	FUEL SYST	INFO TYPE	ADAPTER
1992					
CAMRY	3.0L V6	3VZ–FE	PFI	CODES & DATA	CHECK, TDCL
	2.2L I4	5S–FE	PFI	CODES & DATA	CHECK, TDCL
CELICA	2.0L TURBO I4 (ALL TRAC)	3S–GTE	PFI	CODES & DATA	CHECK
	1.6L I4	4A–FE	PFI	CODES	CHECK
	2.2L I4	5S–FE	PFI	CODES & DATA	CHECK
COROLLA	1.6L I4	4A–FE	PFI	CODES	CHECK
CRESSIDA	3.0L V6	7M–GE	PFI	CODES & DATA	CHECK, TDCL
MR2	2.0L TURBO I4	3S–GTE	PFI	CODES	CHECK
	2.2L I4	5S–FE	PFI	CODES	CHECK
PASEO	1.5L I4	5E–FE	PFI	CODES	CHECK
PREVIA	2.4L I4	2TZ–FE	PFI	CODES	CHECK
SUPRA	3.0L I6	7M–GE	PFI	CODES	CHECK
	3.0L TURBO I6	7M–GTE	PFI	CODES	CHECK
TERCEL	1.5L I4	3E–E	PFI	CODES	CHECK
LAND CRUISER	4.0L I6	3F–E	PFI	CODES	CHECK
4RUNNER 2WD & 4WD	2.4L I4	22R–E	PFI	CODES	CHECK
	3.0L V6	3VZ–E	PFI	CODES & DATA	CHECK
TRUCK 2WD & 4WD	2.4L I4	22R–E	PFI	CODES	CHECK
	3.0L V6	3VZ–E	PFI	CODES & DATA	CHECK

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MODEL	ENGINE	ENGINE TYPE	FUEL SYST	INFO TYPE	ADAPTER
1993					
CAMRY	3.0L V6	3VZ–FE	PFI	CODES & DATA	CHECK, TDCL
	2.2L I4	5S–FE	PFI	CODES & DATA	CHECK, TDCL
CELICA	2.0L TURBO I4 (ALL TRAC)	3S–GTE	PFI	CODES & DATA	CHECK
	1.6L I4	4A–FE	PFI	CODES & DATA	CHECK
	2.2L I4	5S–FE	PFI	CODES & DATA	CHECK
COROLLA	1.6L I4	4A–FE	PFI	CODES & DATA	CHECK
	1.8L I4	7A–FE	PFI	CODES & DATA	CHECK
MR2	2.0L TURBO I4	3S–GTE	PFI	CODES & DATA	CHECK
	2.2L I4	5S–FE	PFI	CODES & DATA	CHECK
PASEO	1.5L I4	5E–E	PFI	CODES	CHECK
PREVIA	2.4L I4	2TZ–FE	PFI	CODES	CHECK
SUPRA	3.0L I6	2JZ–GE	PFI	CODES & DATA	CHECK, TDCL
	3.0L TURBO I6	2JZ–GTE	PFI	CODES & DATA	CHECK, TDCL
TERCEL	1.5L I4	3E–E	PFI	CODES	CHECK
LAND CRUISER	4.5L I6	1FZ–FE	PFI	CODES & DATA	CHECK
T100	3.0L V6	3VZ–E	PFI	CODES & DATA	CHECK
4RUNNER 2WD & 4WD	2.4L I4	22R–E	PFI	CODES & DATA	CHECK
	3.0L V6	3VZ–E	PFI	CODES & DATA	CHECK
TRUCK 2WD & 4WD	2.4L I4	22R–E	PFI	CODES & DATA	CHECK
	3.0L V6	3VZ–E	PFI	CODES & DATA	CHECK

MODEL	ENGINE	ENGINE TYPE	FUEL SYST	INFO TYPE	ADAPTER
1994					
SUPRA	3.0L I6	2JZ–GE	PFI	CODES & DATA	CHECK, TDCL
	3.0L TURBO I6	2JZ–GTE	PFI	CODES & DATA	CHECK, TDCL
CAMRY	3.0L V6	1MZ–FE	PFI	CODES & DATA	**OBD II***
	2.2L I4	5S–FE	PFI	CODES & DATA	CHECK, TDCL
CELICA	2.2L I4	5S–FE	PFI	CODES & DATA	CHECK
	1.8L I4	7A–FE	PFI	CODES & DATA	CHECK
COROLLA	1.6L I4	4A–FE	PFI	CODES & DATA	CHECK
	1.8L I4	7A–FE	PFI	CODES & DATA	CHECK
TERCEL	1.5L I4	3E–E	PFI	CODES	CHECK
MR2	2.0L TURBO I4	3S–GTE	PFI	CODES & DATA	CHECK
	2.2L I4	5S–FE	PFI	CODES & DATA	CHECK
PASEO	1.5L I4	5E–FE	PFI	CODES	CHECK
PREVIA	2.4L I4	2TZ–FE	PFI	CODES	CHECK
LAND CRUISER	4.5L I6	1FZ–FE	PFI	CODES & DATA	CHECK
T100	3.0L V6	3VZ–E	PFI	CODES & DATA	CHECK
4RUNNER 2WD & 4WD	2.4L I4	22R–E	PFI	CODES & DATA	CHECK
	3.0L V6	3VZ–E	PFI	CODES & DATA	CHECK
TRUCK 2WD & 4WD	2.4L I4	22R–E	PFI	CODES & DATA	CHECK
	3.0L V6	3VZ–E	PFI	CODES & DATA	CHECK

*** Use the Common Test Modes OBD II Systems section for operating instructions and test mode information.**

ELECTRONIC TRANSMISSIONS

Using the Asian cartridge, the following Toyota Electronic Transmission/Transaxle Applications can be diagnosed.

Toyota Model	Transmission
Supra Cressida Truck 4Runner T100	A340E
Camry	A540E
Camry	A541E
Camry	A540H
Camry Celica	A240E
Camry MR2	A241E
Paseo	A244E
Previa	A46DE
Corolla	A245E
Truck 4Runner	A340H

2. TOYOTA SPECIFIC INFORMATION

Two Ways to Diagnose Toyota

Toyota powertrain diagnosis can be performed with the Asian Imports cartridge installed in a Tech 1, Tech 1A, or Mastertech tester. Additionally, Toyota vehicles can be diagnosed with the aftermarket version of the Toyota OEM level program card software using the Mastertech tester only. Operating instructions and test mode information are available for the OEM level software in the Toyota/Lexus Program Card Operator's Manual.

If you do not have the necessary Program Card and Mastertech tester to perform OEM level diagnostics, you can use the Asian Imports Cartridge for limited model year coverage. The following Toyota section includes the test modes available, how to connect the tester to the vehicle, operating instructions for DTC entry, and the applicable DTCs for each model year.

Parameters that can be displayed by Toyota vehicles, along with a description and states or units/range of each parameter are listed in Section 9.

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3. TOYOTA OBD SYSTEMS

Toyota passenger cars and trucks are equipped with On–Board Diagnostic (OBD) systems that operate with engine fuel and emission systems. Toyota OBD include transmission (ECT), antilock brake (ABS), cruise control (CCS), air conditioning (A/C), and airbag (AB). For these systems, Toyota vehicles do not use a multiplexed vehicle network, and as a result the separated systems accompany engine OBD systems, with each additional system ECU having its own diagnostic trouble code (DTC) output line. In addition, engine ECUs support serial data communications. Following is information about each Toyota OBD system.

Engine Data List – Toyota engine serial data list is used to aid in diagnostics for the engine control system. Engine control module, input sensors, input switches, and output actuator data list parameters are provided to the tester by the ECU, via a serial data link. Toyota ECUs update this information at 1.3 seconds/update. Not all Toyota vehicles support data list, and in some cases where the tester has determined that a system is inactive and the data list selection is displayed, data list may still not be supported. If a vehicle has a TDCL and Check DLC, Data List may only be supported on the TDCL DLC. This is a function of the data link connector, so make sure that you are connected to the correct DLC for data list information. Review the Toyota application matrix, column titled Information Type, for the availability of serial data on the vehicle being tested.

Engine DTCs – Toyota engine DTCs are available on Toyota vehicles with electronic engine control. Engine DTCs are set by the engine ECU when problems with, but not limited to, the ECU, air–fuel ratio, throttle position, and air pump control are detected. In addition, Toyota engine ECUs can be commanded to a sensitive test mode, which is found in the Sensitive Test (this test triggers the engine ECU into a sensitive mode which detects engine DTCs using a test structure that is less stringent to DTC detection). The Asian Imports application cartridge supports reading engine DTCs automatically or manually, depending on the state (active or inactive) of the engine system.

Electronically Controlled Transmission DTCs – Toyota ECT DTCs are available on select Toyota vehicles with an ECT (refer to the factory service manual for the transmission type for the vehicle you are testing). ECT DTCs are set by the ECT ECU when problems with, but not limited to, the ECU, ATF temperature, accumulator control solenoid, and shift control solenoid(s) are detected. The Asian Imports application cartridge supports reading ECT DTCs automatically or manually, depending on the state (active or inactive) of the ECT system.

Antilock Brake DTCs – Toyota ABS DTCs are available on select Toyota vehicles equipped with ABS. ABS DTCs are set by the ABS ECU when problems with, but not limited to, the ECU, shorted pump motor relay, low brake fluid level, and pressure sensor problems are detected. The Asian Imports application cartridge supports reading ABS DTCs automatically or manually, depending on the state (active or inactive) of the ABS system.

Cruise Control DTC's – Toyota CCS DTCs are available on select Toyota vehicles with automatic cruise control. CCS DTCs are set by the CCS ECU when problems with, but not limited to, the ECU, actuator malfunction, and cruise control switch problems are detected. The Asian Imports application cartridge supports reading CCS DTCs automatically or manually, depending on the state (active or inactive) of the CCS system.

Air Conditioning DTCs – Toyota A/C DTCs are available on select Toyota vehicles with automatic air conditioning. A/C DTCs are set by the A/C ECU when problems with, but not limited to, the ECU, room temperature sensor, and air mix door problems are detected. Note that on some Toyota vehicles the A/C system does not support a dashboard MIL. The Asian Imports application cartridge supports reading A/C DTCs automatically or manually, depending on the state (active or inactive) of the A/C system.

Airbag DTCs – Toyota AB DTCs are available on select late model Toyota vehicles equipped with the airbag system. AB DTCs are set by the AB ECU when problems with, but not limited to, the ECU, squib malfunction, and warning light circuit problems are detected. The Asian Imports application cartridge supports reading AB DTCs automatically or manually, depending on the state (active or inactive) of the AB system.

A note about the **MIL**– On some of the above systems, the ECU DTC output line is routed to the dashboard mounted system MIL, which flashes out the DTC when the ECU is commanded to the diagnostic mode. In this case, the tester is connected to the vehicle DLC to command the ECU for the system under test into the diagnostic mode. When that process is started, the DTC can be read from the MIL. The DTC can then be entered into the tester for a description. Refer to Section 6, Selecting the Vehicle, System Inquiry, for more information on Inactive system detection.

Which systems are covered by the Asian Imports application cartridge software on the vehicle you are testing?

In order to take advantage of all possible systems available on the vehicle, the Asian Imports application cartridge incorporates an advanced system inquiry strategy that identifies the systems on the vehicle as active or inactive. Some Toyota vehicles can have a single active system, where others can have up to six. So the best possible way to identify the systems on your vehicle is to connect the tester to the Check and TDCL DLCs to determine the available active systems. Refer to Section 6, Selecting the Vehicle, System Inquiry, for more information on Inactive system detection.

The following chart lists Toyota ECUs that can be tested using the Asian Imports Cartridge, the test modes available for each system, and the DLC Cable adapter required. Not all vehicles are equipped with every ECU.

ECU	DATA LIST	DTC(S)	SNAPSHOT	ADAPTER
ENGINE	•	•	•	TDCL/CHECK
ECT		•		TDCL
ABS		•		TDCL
CCS		•		TDCL
A/C		•		TDCL
AIRBAG		•		CHECK

NOTE: If you are using the Asian Imports Cartridge with a TECH 1 tester, the available Toyota OBD systems will be limited to Engine Data List, Engine DTCs, and Transmission DTCs. Also, you will need a different TECH 1 14/15 Pin DLC Cable (P/N 02001980) which can be used with the Toyota/Lexus Check Adapter Cable (P/N 02001896) or the Toyota/Lexus TDCL Adapter Cable (P/N 02001895).

4. TEST MODES AVAILABLE

The following test modes are available when testing Toyota vehicles. Operating instructions for test modes other than DTC ENTRY or DTCs are included in the Common Test Modes OBD, OBD I Systems section. There are also Toyota specific instructions for operating the test modes in Toyota, Section 7.

MODE F0: DATA LIST - (ENGINE SYSTEM ONLY, IF ENGINE SYSTEM IS ACTIVE)

MODE F1: DTC ENTRY
- SUBMODE F0: HOW TO READ
- SUBMODE F1: ENTER DTC(s)
- SUBMODE F2: DTC LIST
- SUBMODE F3: REVIEW DTC(s)
- SUBMODE F4: CLEAR DTC(s)

MODE F2: DTC
- SUBMODE F0: HOW TO READ
- SUBMODE F1: READ/ENTER DTCs (IF SYSTEM IS INACTIVE)
- SUBMODE F3: REVIEW DTC
- SUBMODE F4: CLEAR DTC(s)
- SUBMODE F5: SENSITIVE DTC (ENGINE ONLY)

MODE F3: SNAPSHOT - (ENGINE SYSTEM ONLY, IF ENGINE SYSTEM IS ACTIVE)

NOTE: Some Toyota vehicles do not support the option to use "Any DTC" or "Single DTC" as a Snapshot trigger.

MODE F5: SYSTEM TESTS
- SUBMODE F0: PREP VEHICLE

MODE F8: INFORMATION
- SUBMODE F1: DLC LOCATION
- SUBMODE F3: ID INFO
- SUBMODE F4: DJC LOCATION

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5. GETTING STARTED

Before operating the Asian Imports Cartridge with a Toyota vehicle, the following steps must be performed:

1. Make sure the vehicle ignition is OFF.

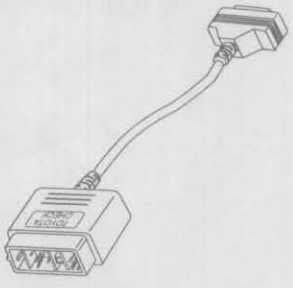
2. If the vehicle you are testing is equipped with Overdrive, turn the O/D switch to the ON position.

   NOTE: If the O/D switch is not in the ON position, the tester may not be able to read DTCs from the transmission ECU.

3. When testing a 1989-94 Toyota vehicle, either the Check Adapter Cable or the TDLC Adapter Cable is used to connect the tester to the vehicle DLC. Which adapter cable to use is determined by which system you wish to test. The following chart lists the systems that can be tested with each adapter cable.

ADAPTER	ACTIVE SYSTEMS THAT CAN BE TESTED
CHECK	ENGINE, AIRBAG
TDCL	ENGINE, ECT, ABS, CCS, A/C

Attach the appropriate adapter cable to the end of the tester DLC Cable, then connect the colored end of the cable to the vehicle DLC.



TOYOTA/LEXUS CHECK CONNECTOR CABLE (BLUE)

TOYOTA/LEXUS TDCL CONNECTOR CABLE (GREEN)

4a. **1989-94 TOYOTA VEHICLES ONLY:**
If the Check connector cable is used, the tester may be powered through the Check connector and it might not be necessary to use the cigarette lighter plug.

If the TDCL connector is used, plug the tester DC Power Cable into the vehicle cigarette lighter.

NOTE: Since the cigarette lighter and Check DLC can be switched, some tests, such as the Sens. DTC Test, require that the power cable be directly connected to the battery via the optional battery adapter cable (P/N 02001636).

4b. **1983-88 TOYOTA VEHICLES ONLY:**
Plug the tester power cable into the vehicle cigarette lighter. The power cable may also be directly connected to the battery via the optional battery adapter cable (P/N 02001636).

5. Turn on the tester and select the application software that you will be using. Verify that the correct screen is displayed. The tester should display a screen similar to the one below.

Tester stand-alone display

6. If the display is correct, press ENTER. If the display is not correct, refer to Appendix D.

7. Follow the instructions on the following pages to select the vehicle type you are testing.

6. SELECTING THE VEHICLE

Once you've pressed ENTER from the power-up screen, the following steps must be performed to select the manufacturer, model year, model and engine type of the vehicle being tested. Remember, if you make a mistake, you can always press EXIT to go back to the previous menu.

SELECTING THE MANUFACTURER

A menu of manufacturers available for testing is displayed in a self-scrolling menu. You can scroll down one screen at a time by pressing YES, or up one screen at a time by pressing NO. Press ↑ or ↓ to scroll one manufacturer at a time, until the → arrow is opposite Toyota.

Then press ENTER to select.

REPLAY SNAPSHOT DATA

If Snapshot data is stored in the tester memory, the tester asks if you wish to replay saved Snapshot data. Press YES to replay the saved data, or press NO to proceed to the Vehicle Selection displays.

SELECTING THE MODEL YEAR

Once the manufacturer is selected, the Select Model Year menu is displayed. Press the last two digits of the year model being tested; 9, 0 for 1990 models, 9, 1 for 1991 models, and so on.

SELECTING THE MODEL

The Select Model menu displays models available for testing. Press the NO key until the model being tested is displayed, then press the YES key.

SELECTING THE ENGINE

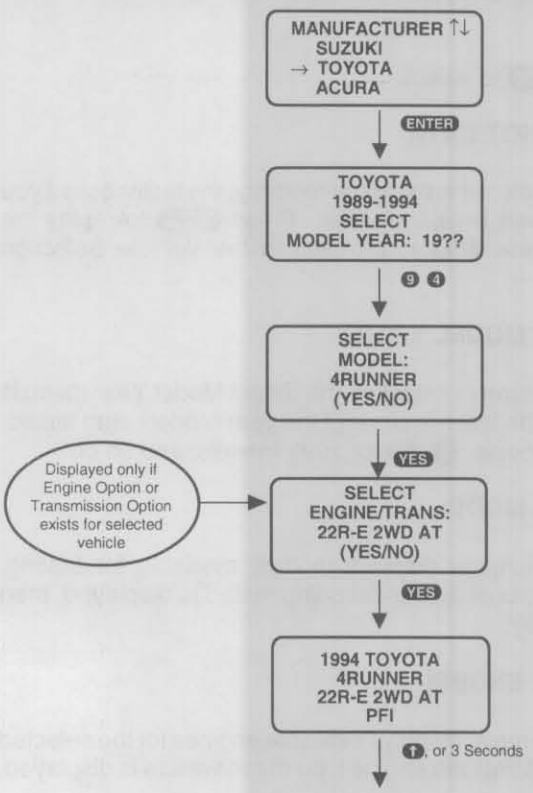
The Select Engine menu displays available engines for the selected model. Press NO until the engine type of the vehicle is displayed, then press YES.

VEHICLE INFORMATION DISPLAY

After the vehicle type is selected the tester displays a summary screen of the selected vehicle. Information displayed includes the year, manufacturer, model, engine size and type. The tester displays the summary screen for three seconds, then automatically advances to the System Inquiry displays.

If the summary screen is not correct, press EXIT to go backward through the vehicle selection displays until you reach the information that needs to be changed.

EXAMPLE OF TOYOTA VEHICLE SELECTION

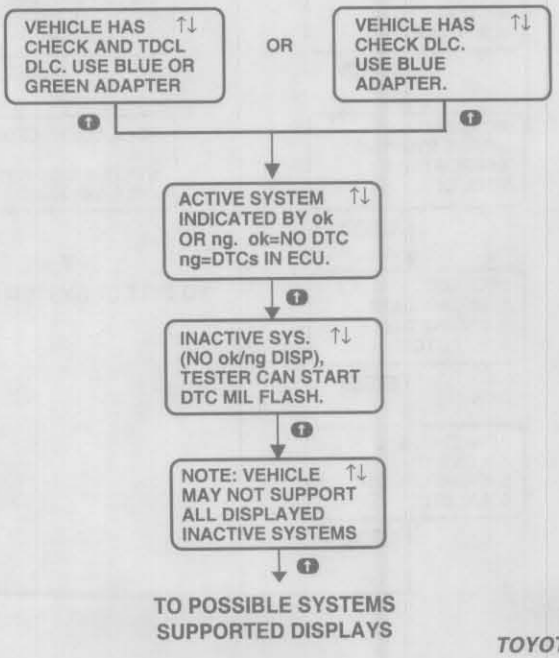


SYSTEM INQUIRY (1989-94 Vehicles Only)

Once the vehicle type is entered, the tester displays which adapter(s) can be used on the selected vehicle and then displays information screens which describe the operating differences between Active and Inactive Toyota OBD systems. Use the up and down arrows to scroll through the information displays.

If a system is Active, the tester can read DTCs directly from the ECU and show the DTC number and description on the tester display. Active systems are identified in the Select System menu with an "ok". It is displayed to indicate an active system that does not have DTCs stored in the ECU. "ng" (**n**o **g**ood) is displayed to indicate an active system that does have DTCs stored in the ECU (during the inquiry process the tester determines if the system ECU has stored DTCs or not).

If a system is Inactive, the tester cannot read DTCs directly from the ECU, so the DTCs must be manually read from the dashboard MIL and then entered into the tester using Mode F2, Submode F1: READ/ENTER DTCs. Note that some Inactive systems listed in the Possible System lists may not be supported by the vehicle under test. Inactive systems do not display "ok" or "ng" on the right hand side of the display (see Select System Menu section). The System Inquiry information screens then display possible Active systems available using the Toyota Check or TDCL Data Link Connector(s) (DLCs).

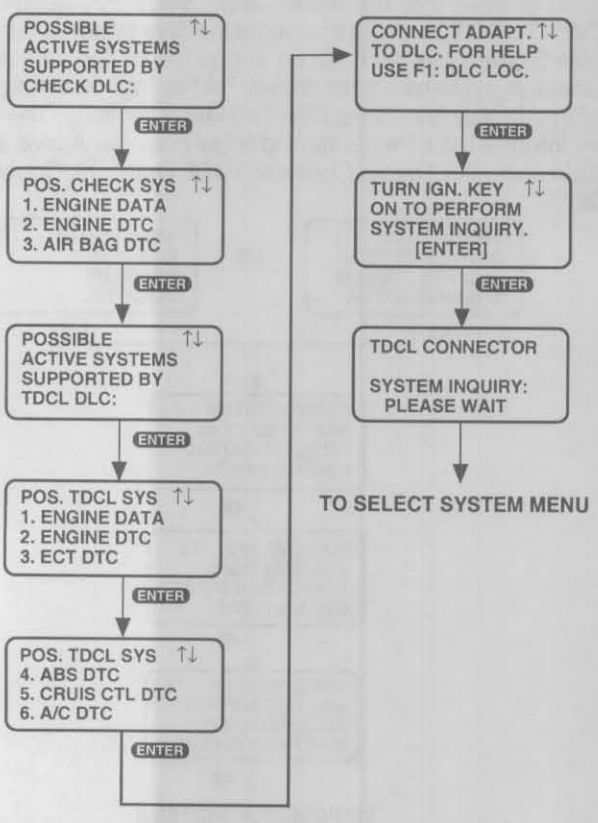


Possible System Supported Displays (1989-94 Vehicles Only)

When adapter cable and Active/Inactive information screens have been displayed, the tester instructs you to connect the adapter cable to the tester DLC cable and the vehicle DLC. If you are not sure where the vehicle DLC is located, press F9 at any time during system inquiry for DLC location information.

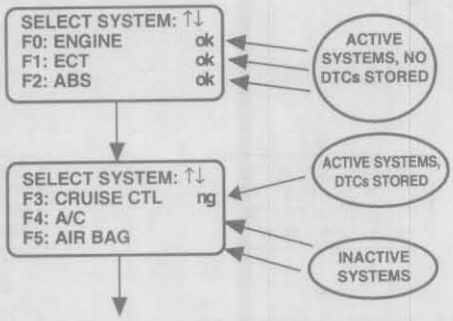
When the tester is connected to the vehicle, turn the ignition key to the ON position, then press ENTER to continue with the system inquiry. This portion of the system inquiry can take up to 30 seconds, depending on how many systems are available on the vehicle. The tester lists the systems that can be tested with the installed adapter.

Press ↑ or ENTER to continue to the Select System displays.



SELECT SYSTEM MENU

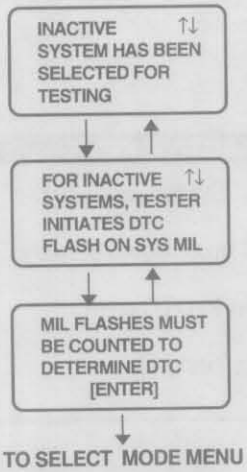
The Select System menu displays the systems available for testing on the selected vehicle. An "ok" next to a system indicates that the system is Active, an "ng" next to a system indicates it is Inactive. Press the function key listed to the left of the system you wish to test to advance to the Select Mode menu.



NOTE: If an ECU is malfunctioning and does not communicate with the tester, the ECU will be listed as Inactive in the Select System menu.

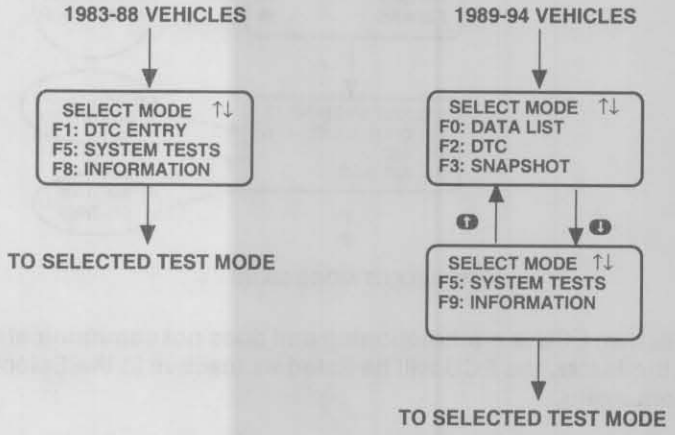
INACTIVE SYSTEM DISPLAYS

If an inactive system has been selected from the Select System Menu, the tester will display information screens. These screens remind you that DTCs will be output on the System MIL (Instrument Panel), and MIL flashes must be counted manually to read DTCs.



SELECT MODE MENU

When the above steps are completed, the Select Mode menu displays the test modes available for the selected vehicle and system. Refer to Section 7 (Test Modes) and the Common Test Modes OBD, OBD I Systems section for operating the test modes with Toyota vehicles. A list of Engine system test modes is shown below.



NOTE: For 1989-94 Toyota vehicles, modes F0: Data List and F3: Snapshot are displayed for engine systems only.

ACTIVE KEYS	
ENTER	Select System displays.
↓ ↑	Scroll up or down display.
EXIT	Return to DTC menu.
F9	Select Test Mode

7. TEST MODES

The Select Mode menu displays test modes available for the selected vehicle and system. Operating instructions for modes F0: DATA LIST, F2: DTC, and F3: SNAPSHOT are included in the Common Test Modes OBD, OBD I Systems section.

Instructions for selecting and operating mode F1: DTC ENTRY, F2: DTC, Submode F1: READ/ENTER DTCs, and Submode F5: SENSITIVE DTC are included in this section.

Detailed operating instructions for using Mode F1: DTC ENTRY with Toyota vehicles are included in the following procedure.

Reading Codes

When Mode F1: DTC ENTRY is selected, the tester displays submodes which, after your selection, provide information on how to read diagnostic trouble codes (DTCs) from the vehicle, how to clear DTCs from the vehicle (or tester memory), obtain a text description of entered or selected DTCs, and review entered or selected DTCs as a result of manually retrieving codes from the ECU.

To read DTCs on 1983-85 Toyota vehicles you must connect the single wire Toyota jumper (P/N 02002076) to the diagnostic jumper connector (DJC), and observe the MIL or analog voltmeter sweeps. To read DTCs on 1986-88 Toyota vehicles you must connect the single wire Toyota jumper (P/N 02002075) to the DJC, and observe the flashing MIL. If you do not know where the DJC is located, select Mode F4: DJC LOCATION from the Information menu. If necessary, refer to Common Test Modes OBD, OBD I Systems section for further instructions.

Follow the detailed instructions on the following pages to manually read the DTCs. Once the DTCs have been manually read from the MIL or analog voltmeter, you can input the DTC into the tester so the tester can define the code. A complete list of Toyota DTCs is also included in Section 8.

MODE F1	DTC ENTRY

This mode is available on 1983-88 Toyota vehicles.

When Mode F1: DTC ENTRY is selected, the tester displays five submodes. Operating instructions for the submodes are on the following pages.

F0: HOW TO READ
F1: ENTER DTC(s)
F2: DTC LIST
F3: REVIEW DTC
F4: CLEAR DTC(s)

Manually Reading DTCs

To manually read Diagnostic Trouble Codes (DTCs) on Toyota vehicles from 1983-88, there are 2 methods that can be used. The first method is for the 1983-84 Cressida and Celica Supra, which requires an analog voltmeter. Using the analog voltmeter set to a 20 volt scale and connected to the EFI Service connector, and a single wire jumper placed on the Diagnostic Jumper Connector (Check DJC), the DTC can be interpreted from the analog voltmeter needle flashes. The second method requires the use of a single wire jumper that is placed across 2 pins of the 2 or 17 pin DJC, depending on the model year. In a similar fashion, the DTCs are instead flashed out on the instrument panel mounted Malfunction Indicator Lamp (MIL).

For the automobile manufacturers that mention the use of an analog voltmeter to read manual DTCs, the Mastertech Oscilloscope may be used. Set up the single channel oscilloscope and make connections the same way as the analog voltmeter (above). Choose the 20v/division scale and a slow time/division (e.g. 1-2 sec/division) —the DTCs will be shown as a waveform on the display.

Note that manually retrieving DTCs from 1983-88 Toyota vehicles requires you to locate and jumper the Diagnostic Connector. The vehicles that require the use of a jumper are noted in the column "Adapter Type" in the Toyota coverage table (found at the beginning of this section). Refer to the section on manually reading DTCs from the 1983-88 Toyota vehicles in this section.

DTC ENTRY	MODE F1
HOW TO READ	SUBMODE F0

This submode provides information on how to manually read DTCs from the vehicle. Step by step screen instructions provide information to correctly set up the vehicle ECU. This is performed by following the tester instruction screens. If you have trouble, additional DTC retrieval information is described below. If you refer to the factory service manual for this information, make sure that you are following the correct steps for the system you are working on.

DTC ENTRY	MODE F1
ENTER DTC(s)	SUBMODE F1

This submode provides you with a description of how to obtain DTC information from the ECU and how to enter this information into the tester. On Toyota vehicles, there is one method to enter manually read DTCs which is the Enter DTC submode.

The Enter DTC submode has two question marks on the tester display for entering the DTC. The tester screen prompts you to enter the DTCs read off the analog voltmeter or the Malfunction Indicator Light (MIL). Be careful when reading the DTC from the analog voltmeter or MIL. Incorrect MIL interpretation can cause the wrong DTC description to be displayed. Once all DTCs have been manually read and recorded, enter each DTC into the tester as described in the Common Test Modes OBD, OBD I Systems section.

Specific instructions for manually reading Toyota analog voltmeter or MIL DTCs are on the following page.

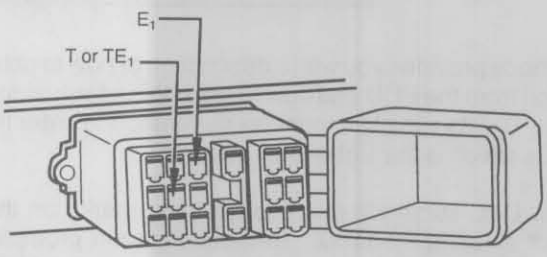
Manually Reading DTCs From 1986-88 Toyota Vehicles Using The Instrument Panel Malfunction Indicator Lamp:

1. Set the vehicle initial conditions by making sure that battery voltage is 11 volts or more, throttle valve fully closed (throttle position sensor IDL contacts closed), transmission or transaxle in Neutral position, accessories switched OFF engine at normal operating temperature.

2. Turn ignition key to ON, engine OFF.

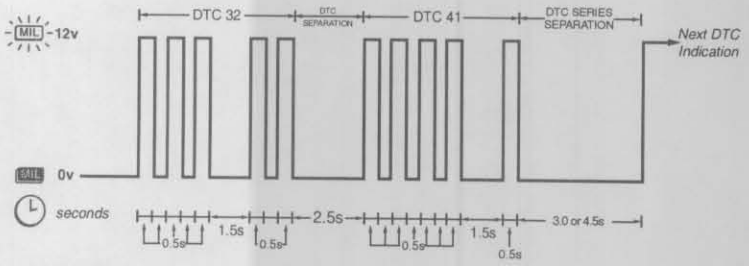
3. Locate the 17 pin Diagnostic Jumper Connector (press F8: DJC LOCATION from the Information menu for help on DJC location).

4. Jumper T (or TE1) and E1 terminals by connecting the single wire Toyota Jumper (P/N 02002075) to the vehicle's 17 pin DJC.



5. Dashboard MIL will begin flashing DTCs.

   The first number of MIL flashes will equal the 10's digit of a 2-digit DTC. After a 1.5 second pause, the second number of flashes will equal the 1's digit. If there are 2 or more codes, there will be a 2.5 second pause between each DTC. On a single digit DTC, the MIL will blink a number of times equal to the DTC. Single digit DTCs are separated by a 3.0 or 4.5 second pause. If no DTCs are stored in ECU, MIL will flash normal code.



6. For Toyota vehicles, there are three types of normal code conditions. One is 4 flashes in 1 second (late models), the second is 1 flash in 3.0 seconds, and the third is 1 flash in 4.5 seconds (late models).

7. Disconnect Toyota single wire jumper.

8. Erase DTCs when all repairs are completed.

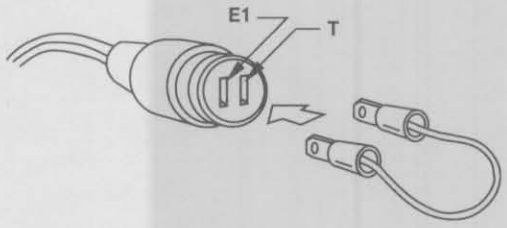
Manually Reading DTCs From 1983-85 Toyota Vehicles (except 1983-84 Celica Supra and Cressida) Using The Instrument Panel Malfunction Indicator Lamp:

1. Set the vehicle initial conditions by making sure that battery voltage is 11 volts or more, throttle valve fully closed (throttle position sensor IDL contacts closed), transmission or transaxle in Neutral position, accessories switched OFF engine at normal operating temperature.

2. Turn ignition key to ON, engine OFF.

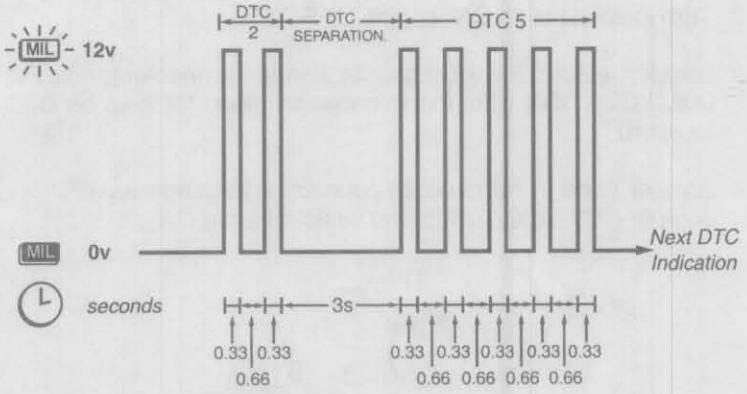
3. Locate the 2 pin Check Diagnostic Jumper Connector (press F8: DJC LOCATION from the Information menu for help on DJC location).

4. Jumper T and E1 terminals by connecting the single wire Toyota Jumper (P/N 02002076) to the vehicle's 2 pin DJC.



5. Dashboard MIL will begin flashing DTCs.

   The first number of MIL flashes will equal the 10's digit of a 2-digit DTC. After a 1.5 second pause, the second number of flashes will equal the 1's digit. If there are 2 or more codes, there will be a 2.5 second pause between each DTC. On a single digit DTC, the MIL will blink a number of times equal to the DTC. Single digit DTCs are separated by a 3.0 or 4.5 second pause. If no DTCs are stored in ECU, MIL will flash normal code.



All 1983-84 (exc. Cressida and Celica Supra) and selected 1985 vehicles only. Other 1985 have DTC output like that shown in the previous section.

6. For 1983-85 Toyota vehicles, there are two types of normal code conditions. One is 1 flash in 3.0 seconds, and the second is 1 flash in 4.5 seconds.

7. Disconnect Toyota single wire jumper.

8. Erase DTCs when all repairs are completed.

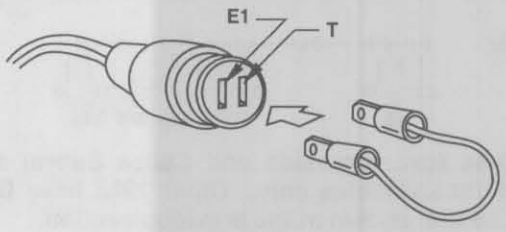
Manually Reading DTCs From 1983-84 Toyota Cressida and Celica Supra Vehicles Using an Analog Voltmeter or Mastertech Oscilloscope:

1. Set the vehicle initial conditions by making sure that battery voltage is 11 volts or more, throttle valve fully closed (throttle position sensor IDL contacts closed), transmission or transaxle in Neutral position, accessories switched OFF engine at normal operating temperature.

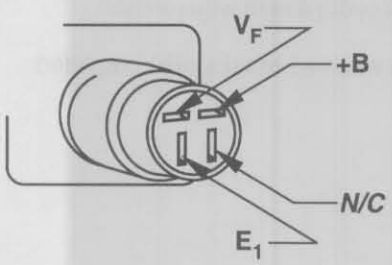
2. Turn ignition key to ON, engine OFF.

3. Locate the 2 pin Check Diagnostic Jumper Connector (press F4: DJC LOCATION from the Information menu for help on DJC location).

4. Jumper T and E1 terminals by connecting the single wire Toyota Jumper (P/N 02002076) to the vehicle's 2 pin DJC.

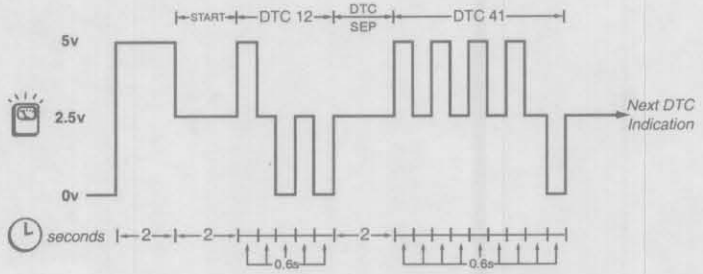


5. Install analog voltmeter to the EFI service connector. Place positive lead (+) on Vf terminal and negative lead (-) on E1 terminal. Set analog voltmeter to 20 volt scale.



6. Analog voltmeter will begin flashing DTCs.

   If DTCs are stored in ECU, there will be a 5 volt indication for 2 seconds followed by a 2.5 volt indication for another 2 seconds. Thereafter, the number of times the needle deflects between 2.5 volts and 5 volts every 0.6 seconds is the first digit (10's) of a 2-digit code. Next, the number of times the needle deflects between 2.5 volts and 0 volts every 0.6 seconds is the second digit (1's) of a 2-digit code. If no DTCs are stored in ECU, MIL will flash normal code.



7. If no malfunctions are present, the voltmeter needle will deflect between 2.5 and 5 volts every 0.6 seconds.

8. Disconnect Toyota single wire jumper.

9. Erase DTCs when all repairs are completed.

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DTC ENTRY	MODE F1
DTC LIST	SUBMODE F2

This submode provides you with a way to view all possible ECU DTCs, including DTC numbers and descriptions You can also select the DTCs obtained from the analog voltmeter or MIL as an alternative way of entering DTCs into the tester's memory. As you scroll through the available DTCs you can view a description of the DTC obtained from the analog voltmeter or MIL. You can "Select" the DTC on the tester screen for later review or printing. Refer to Common Test Modes OBD, OBD I Systems section for further information.

DTC ENTRY	MODE F1
REVIEW DTC(s)	SUBMODE F3

This submode provides a way of reviewing DTCs that you selected or entered into the tester. The description of the entered or selected DTC will be displayed, along with a numerical summary of the entered or selected DTC. Review DTC is intended to provide you with an electronic clipboard that keeps track of the DTCs that you have encountered during diagnosis.

DTC ENTRY	MODE F1
CLEAR DTC(s)	SUBMODE F4

This submode has two options for you to choose. Option F0 is to view text screens that provide information on how to clear the DTCs from ECU memory. This is performed by tester keypad presses. Option F1 clears the tester memory of DTCs that you entered or selected in the tester. The clear DTC(s) mode is helpful and provides information that you would normally have to locate in a service manual.

MODE F2	DTC
SUBMODE F1	READ/ENTER DTC(s)

This submode is available on 1989-94 Toyota Vehicles.

The purpose of the Read/Enter submode is to command the Inactive system ECU to flash DTCs on the dashboard MIL. After the DTC is read from the MIL, a description of the DTCs can then be displayed on the tester screen.

If a Toyota or Lexus system is determined as **Inactive**, the tester will command the ECU to begin flashing the DTC on the system MIL. The F1:READ/ENTER DTC(s) submode displays a message informing you that the tester has initiated DTC flashing on the MIL, and will hold in that mode until you have read the DTC(s) on the MIL.

After the DTC is read from the MIL, the tester screen will change to a DTC entry screen. At that screen, type in the DTC to obtain a description of the DTC.

OPERATING PROCEDURE

1. Press F2 to select DTCs from the select mode menu.

2. Press F1 to select READ/ENTER DTC(s) from the DTCs menu.

3. The tester displays a message indicating DTCs are being flashed on the MIL. Look at the MIL to read the flashes and determine the DTC. When the DTC cycle is repeated on the MIL and you have recorded the DTC, press YES.

```
DTCs BEING
OUTPUT. READ ON
MIL.
   DONE? [YES]
```

4. Use the tester keypad to enter the DTC displayed on the vehicle system ECU, then press ENTER. An example of the Enter DTC display for Toyota vehicles is shown below.

```
ENTER DTC
??

[ENTER]
```

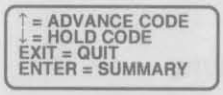
   All late model Toyota vehicles with Engine and optional Transmission, ABS, Cruise Control, Air Conditioning, and Airbag systems flash DTCs on the dashboard MIL. On select vehicles, the Air Conditioning system does not have a MIL for DTC

DTC	MODE F2
READ/ENTER DTC(s)	SUBMODE F1

reading. DTCs are flashed with the 10's digit first, followed by the 1's digit. There is a 1.5 second period between the 10's and 1's digit, and a 2.5 second period between individual DTCs.

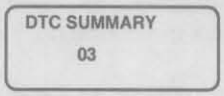
5. When ENTER is pressed, the tester displays the DTC number and a short description of the code.

6. After you enter the DTC, the tester asks for additional trouble code entry. Press YES to enter another DTC. If NO is pressed, the tester displays an instruction screen describing the functions available.



7. Press ↑ to move to the next DTC. If you wish to hold a DTC screen, press ↓ to freeze the automatic scrolling feature.

8. Press ENTER to view a summary screen of all entered DTCs.



9. Press EXIT to return to the DTC menu.

ACTIVE KEYS	
ENTER	Enter the displayed DTC and display summary screen.
YES	Enter another DTC.
NO	Advance to instruction screen.
F0 - F9	Enter DTC number.
↑	Move to the next DTC.
↓	Stop the automatic scrolling.
EXIT	Return to DTC menu.

MODE F2	DTC
SUBMODE F5	SENS DTC

This submode is available for 1989-94 Toyota vehicles.

The Sensitive DTC test submode applies to Toyota engine controllers, and is only available when the Engine system is Active.

Toyota engine ECUs have the capability to enter an increased sensitivity mode to detect fault code conditions. The Sens DTC submode is helpful for diagnosing intermittent problems.

If you are using a TECH 1 or TECH 1A tester, power the tester directly from the battery via the optional battery adapter cable (P/N 02001636).

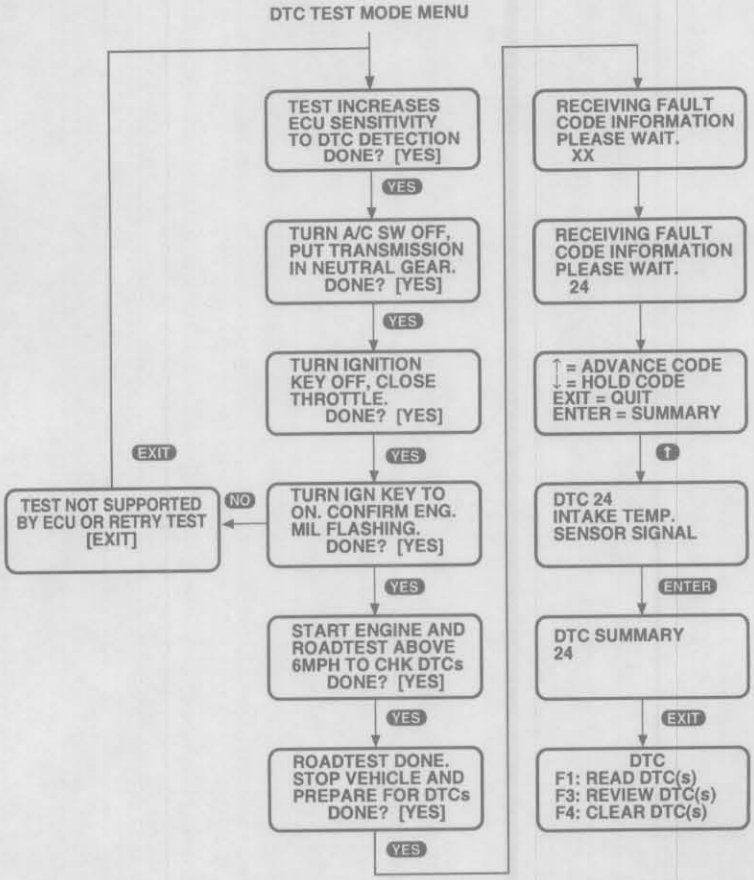
OPERATING PROCEDURE

1. Press F2 to select DTC's from the Select Mode menu.
2. Press F5 to select SENS DTC from the DTC menu.
3. The tester displays instructions for preparing the vehicle to capture DTCs in the Sensitive Mode. Follow the instructions on each display, then press YES to continue.
4. When the vehicle preparations are complete, the tester checks for DTCs, then displays the codes on line four.
5. The tester displays instructions for viewing the DTCs. Press ↑ to view the DTCs.
6. The tester displays the first DTC. Press ↑ to scroll through the captured DTCs. A DTC can be held by pressing the ↓ key while the code is displayed. Press the ↓ key to resume display of the DTCs.
7. Press ENTER to display a summary of the captured DTCs.
8. Press EXIT to return to the DTC menu.

NOTE: In some cases, Toyota ECUs do not support Sensitive DTC Mode. If the tester cannot command the ECU into Sensitive DTC Mode, an information screen will be displayed with test status or retry test.

DTC	MODE F2
SENS DTC	SUBMODE F5

EXAMPLE OF SENSITIVE DTC SUBMODE INSTRUCTIONS



ACTIVE KEYS	
↑ ↓	Advance to next DTC or hold displayed DTC.
YES	Confirm instructions on display are completed.
NO	Confirm MIL not flashing.
ENTER	Display DTC Summary.
EXIT	Return to DTC Entry menu.

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8. TOYOTA DIAGNOSTIC TROUBLE CODES (DTCs)

DTCs available for Toyota vehicles are listed in the following charts.

Some code numbers have different descriptors depending on the selected vehicle. Only codes available for the selected vehicle are displayed by the tester.

YEAR	DTC NO.	DESCRIPTOR
1983	1	NO DTCs-NORMAL OPERATION
	2	AIR FLOW METER OR CKT FAILURE
	3	AIR FLOW METER OR CKT FAILURE
	4	WATER THERMO SENSOR OR CKT
	5	O2 SENSOR OR CKT FAILURE
	6	IGNITION SIGNAL OR CKT FAILURE
	7	TP SENSOR OR CKT FAILURE
		TP SENSOR SIG OR CKT (IDL/PSW)
	11	ECU POWER SOURCE (B+) OR CKT
	12	CRANK ANGLE SENSOR OR CKT
	13	CRANK ANGLE SENSOR OR CKT
	14	IGNITION SIGNAL OR CKT FAILURE
	21	O2 SENSOR OR CKT FAILURE
	22	ECT SENSOR OR CIRCUIT FAILURE
	23	IAT SENSOR OR CKT FAILURE
	31	AIR FLOW METER OR CKT FAILURE
	32	AIR FLOW METER OR CKT FAILURE
	41	TP SENSOR OR CKT FAILURE
	42	VEHICLE SPEED SENSOR OR CKT
	43	STARTER SIGNAL OR CKT FAILURE
	51	A/C-ON N/S-OFF DURING DIAG. CK

TOYOTA DTCs

YEAR	DTC NO.	DESCRIPTOR
1984	1	NO DTCs-NORMAL OPERATION
	2	AIR FLOW METER OR CKT FAILURE
	3	AIR FLOW METER OR CKT FAILURE
	4	WATER THERMO SENSOR OR CKT
	5	O2 SENSOR OR CKT FAILURE
	6	IGNITION SIGNAL OR CKT FAILURE
	7	TP SENSOR OR CKT FAILURE
		TP SENSOR SIG OR CKT (IDL/PSW)
	11	ECU POWER SOURCE (B+) OR CKT
	12	CRANK ANGLE SENSOR OR CKT
	13	CRANK ANGLE SENSOR OR CKT
	14	IGNITION SIGNAL OR CKT FAILURE
	21	O2 SENSOR OR CKT FAILURE
	22	ECT SENSOR OR CIRCUIT FAILURE
	23	IAT SENSOR OR CKT FAILURE
	31	AIR FLOW METER OR CKT FAILURE
	32	AIR FLOW METER OR CKT FAILURE
	41	TP SENSOR OR CKT FAILURE
	42	VEHICLE SPEED SENSOR OR CKT
	43	STARTER SIGNAL OR CKT FAILURE
	51	A/C-ON N/S-OFF DURING DIAG. CK

TOYOTA DTCs

YEAR	DTC NO.	DESCRIPTOR
1985	1	NO DTCs-NORMAL OPERATION
	2	AIR FLOW METER OR CKT FAILURE
	3	AIR FLOW METER OR CKT FAILURE NO IGNITER PULSE (4x) OR CKT FAIL
	4	WATER THERMO SENSOR OR CKT
	5	O2 SENSOR OR CKT FAILURE
	6	IGNITION SIGNAL OR CKT FAILURE NO RPM SIGNAL ABOVE 1000 RPM
	7	TP SENSOR OR CKT FAILURE
	8	IAT SENSOR OR CKT FAILURE
	10	STARTER SIGNAL OR CKT FAILURE
	11	A/C-ON TPS-OFF DURING DIAG. CK A/C SW-ON DURING DIAGNOSIS CK MAIN RELAY OR ECU CKT FAILURE
	12	KS OR KS CKT FAILURE NO ECU RPM SIG. DURING CRANKING
	13	KS OR KS CKT FAILURE NO ECU IGN SIG ABOVE 1000 RPM
	14	NO IGNITER SIG. (6x) OR CKT FAIL
	21	O2 SENSOR OR CKT FAILURE
	22	ECT SENSOR OR CIRCUIT FAILURE
	23	IAT SENSOR OR CKT FAILURE
	31	AIR FLOW METER OR CKT FAILURE
	32	AIR FLOW METER OR CKT FAILURE
	41	TP SENSOR OR CKT FAILURE
	42	VEHICLE SPEED SENSOR OR CKT
	43	STARTER SIGNAL OR CKT FAILURE
	51	A/C-ON N/S-OFF DURING DIAG. CK
	52	KS OR KS CKT FAILURE
	53	KS OR KS CKT FAILURE

TOYOTA DTCs

YEAR	DTC NO.	DESCRIPTOR
1986	1	NO DTCs-NORMAL OPERATION
	2	AIR FLOW METER OR CKT FAILURE
	3	NO IGNITER PULSE (4x) OR CKT FAIL
		AIR FLOW METER OR CKT FAILURE
	4	WATER THERMO SENSOR OR CKT
	5	O2 SENSOR OR CKT FAILURE
	6	NO RPM SIGNAL ABOVE 1000 RPM
		IGNITION SIGNAL OR CKT FAILURE
		NO RPM SIGNAL ABOVE 1500 RPM
		ECU NE OR G SIG-IGN/START OR CKT
	7	TP SENSOR OR CKT FAILURE
	8	IAT SENSOR OR CKT FAILURE
	9	VEHICLE SPEED SENSOR OR CKT
	10	STARTER SIGNAL OR CKT FAILURE
	11	A/C P/N-ON TPS-OFF DURING DIAG
		MAIN RELAY OR ECU CKT FAILURE
		TP SENSOR OR CKT FAILURE
		A/C-ON TPS-OFF DURING DIAG. CK
	12	NO ECU RPM SIG. DURING CRANKING
		KS OR KS CKT FAILURE
		NO ECU NE/G SIG. DURING CRANKING
	13	NO ECU IGN SIG ABOVE 1000 RPM
		KS OR KS CKT FAILURE
		NO ECU NE SIG. ABOVE 1000 RPM
	14	NO IGNITER SIG. (6x) OR CKT FAIL
		ABNORMAL TURBO PRESS-TUR OR AFM
	21	O2 SENSOR OR CKT FAILURE
	22	ECT SENSOR OR CIRCUIT FAILURE
	23	IAT SENSOR OR CKT FAILURE
	24	IAT SENSOR OR CKT FAILURE
	31	AIR FLOW METER OR CKT FAILURE
	32	AIR FLOW METER OR CKT FAILURE
	41	TP SENSOR OR CKT FAILURE
	42	VEHICLE SPEED SENSOR OR CKT
	43	STARTER SIGNAL OR CKT FAILURE
	51	A/C P/N-ON TPS-OFF DURING DIAG
		A/C-ON N/S-OFF DURING DIAG. CK
	52	KS OR KS CKT FAILURE
	53	ECU OR KS CPU OR CIRCUIT FAILURE

TOYOTA DTCs

YEAR	DTC NO.	DESCRIPTOR
1987	1	NO DTCs-NORMAL OPERATION
	2	AIR FLOW METER OR CKT FAILURE
	3	NO IGNITER PULSE (4x) OR CKT FAIL
	4	WATER THERMO SENSOR OR CKT
	5	O2 SENSOR LEAN INDICATION
	6	NO ECU NE SIGNAL DURING CRANK/RUN
	7	TP SENSOR OR CKT FAILURE
	8	IAT SENSOR OR CKT FAILURE
	9	VEHICLE SPEED SENSOR OR CKT
	10	STARTER SWITCH SIGNAL FAILURE
	11	MAIN RELAY OR ECU CKT FAILURE
		A/C P/N-ON TPS-OFF DURING DIAG
		A/C-ON IDLE SW OFF DURING DIAG.
		TPS-OFF N/S-ON DURING DIAG. CK
	12	NO ECU RPM SIG. DURING CRANKING
		NO ECU NE/G SIG. DURING CRANKING
		KS OR KS CKT FAILURE
	13	NO RPM SIGNAL ABOVE 1000 RPM
		KS OR KS CKT FAILURE
	14	NO IGNITER SIG. (4x) OR CKT FAIL
		NO IGNITER SIG. (4-11x) OR CKT
		NO IGNITER SIG. (6x) OR CKT FAIL
		ABNORMAL TURBO PRESS-TUR OR AFM
	21	O2 SENSOR LEAN INDICATION
		O2 SENSOR OR CKT FAILURE
	22	ECT SENSOR OR CIRCUIT FAILURE
	23	IAT SENSOR OR CKT FAILURE
	24	IAT SENSOR OR CKT FAILURE
	31	AIR FLOW METER OR CKT FAILURE
	32	AIR FLOW METER OR CKT FAILURE
		HAC SENSOR OR CIRCUIT FAILURE
	34	TURBO PRESSURE MALFUNCTION
	41	TP SENSOR OR CKT FAILURE
	42	VEHICLE SPEED SENSOR OR CKT
	43	STARTER SIGNAL OR CKT FAILURE
	51	A/C P/N-ON TPS-OFF DURING DIAG
		A/C-ON N/S-OFF DURING DIAG. CK
	52	KS OR KS CKT FAILURE
	53	ECU OR CIRCUIT FAILURE

TOYOTA DTCs

YEAR	DTC NO.	DESCRIPTOR
1988	1	NO DTCs-NORMAL OPERATION
	2	AIR FLOW METER OR CKT FAILURE
	3	NO IGNITER PULSE (4x) OR CKT FAIL
	4	WATER THERMO SENSOR OR CKT
	5	O2 SENSOR OR CKT FAILURE
	6	NO ECU NE SIG. ABOVE 1500 RPM
	7	TP SENSOR OR CKT FAILURE
	8	IAT SENSOR OR CKT FAILURE
	10	STARTER SWITCH SIGNAL FAILURE
		MAIN RELAY OR ECU CKT FAILURE
		ECU POWER SUPPLY INTERM. FAILURE
		A/C P/N-ON TPS-OFF DURING DIAG
	12	NO ECU NE/G SIG. DURING CRANKING
		NO ECU TAC SIG. DURING CRANKING
		NO ECU NE/G SIG. DURING CRANK/RUN
		KS OR KS CKT FAILURE
	13	NO ECU NE SIG. ABOVE 1000 RPM
		NO ECU NE SIG. ABOVE 1500 RPM
		KS OR KS CKT FAILURE
	14	NO ECU IGF SIG (4-5x) OR CKT
		FUEL CUTOFF-HIGH TURBO BOOST
		NO IGNITER SIG. (4-11x) OR CKT
		NO IGNITER SIG. (8-11x) OR CKT
		NO IGNITER SIG. (4x) OR CKT FAIL
		NO IGNITER SIG. (6x) OR CKT FAIL
		NO ECU IGF SIG. (6-8x) OR CKT
	21	O2 SENSOR LEAN INDICATION
		O2 SENSOR OR CKT FAILURE
		O2 SENSOR OR O2 SENSOR HEATER
	22	ECT SENSOR OR CIRCUIT FAILURE
		ECT SW. TWS1 OR TWS2 CIRCUIT
	23	IAT SENSOR OR CKT FAILURE
	24	IAT SENSOR OR CKT FAILURE
	25	AFR LEAN MALF. FB FREQ. HIGH
		AFR LEAN MALFUNCTION
		AFR LEAN MALF. FB COMP. HIGH
		AFR LEAN MALF.-O2S/FI/ECM/AFH
		O2 SENSOR LEAN INDICATION
	26	AFR RICH MALF. FB FREQ. HIGH
		AFR RICH MALF. FB COMP. LOW

TOYOTA DTCs

YEAR	DTC NO.	DESCRIPTOR
1988 (cont.)	26	AFR RICH MALF. FB COMP. HIGH
		O2 SENSOR RICH INDICATION
		AIR-FUEL RATIO RICH MALFUNCTION
		AFR RICH MALF. FB FREQ. HIGH
		AFR RICH MALF. FB COMP. LOW
		AFR RICH MALF. - EBCV SYSTEM
	27	SUB-O2 SENSOR SIGNAL OR CKT
		SUB-O2 SENSOR HEATER OR SIGNAL
	28	NO.2 O2 SENSOR/ HEATER OR CKT
	32	AIR FLOW METER OR CKT FAILURE
		HAC SENSOR OR CIRCUIT FAILURE
	34	TURBO PRESSURE SIG-FUEL CUTOFF
	35	ALTITUDE SENSOR OR CKT FAILURE
		TURBO PRESSURE SENSOR OR CKT
		HAC SENSOR OR CIRCUIT FAILURE
	41	TP SENSOR OR CKT (IDL/PSW) FAIL
		TP SENSOR OR CKT (VTA) FAILURE
		TP SENSOR OR CKT (THS) FAILURE
		TP SENSOR OR CKT FAILURE
	42	VEHICLE SPEED SENSOR OR CKT
	43	STARTER SIGNAL OR CKT FAILURE
	51	A/C P/N-ON TPS-OFF DURING DIAG
		A/C-ON TPS-OFF DURING DIAG. CK
		A/C-ON IDL NSW-OFF DURING DIAG
		A/C-ON TPS-OFF DURING DIAG. CK
		A/C-ON N/S-OFF DURING DIAG. CK
		A/C-ON IDL+NSW NG DURING DIAG.
	52	KS OR KS CKT FAILURE
	53	ECU OR CIRCUIT FAILURE
		KS OR KS CKT FAILURE
	54	INTERCOOLER OR SYSTEM FAILURE
	71	EGR SYSTEM MALFUNCTION
	72	FUEL CUT SOL. OR CIRCUIT FAILURE

TOYOTA DTCs

AIR BAG		
YEAR	DTC NO.	DESCRIPTOR
89-94	11	SQUIB W/H GND OR FRNT SENS. SHORT
	12	SQUIB W/H +B SHORT
	13	SQUIB MALF. (SHORT)
	14	SQUIB MALF. (OPEN)
	15	FRONT SENSOR W/H OPEN
	22	WARNING LIGHT CIRCUIT
	24	AIRBAG SENSOR CONNECTION FAIL
	31	SENSOR ASSEMBLY
	41	MALF. RECORDED IN MEMORY
	53	SQUIB SHORT
	54	SQUIB OPEN
	63	SQUIB SHORT (PRELOADER LEFT)
	64	SQUIB OPEN (PRELOADER LEFT)
	73	SQUIB SHORT (PRELOADER RT)
	74	SQUIB OPEN (PRELOADER RT)

TOYOTA DTCs

ANTI-LOCK BRAKE SYSTEM		
YEAR	**DTC NO.**	**DESCRIPTOR**
89-94	11	SOLENOID RELAY OPEN
	12	SOLENOID RELAY SHORT
	13	PUMP MOTOR RELAY OPEN
	14	PUMP MOTOR RELAY SHORT
	15	TRAC BRAKE MAIN RELAY OPEN
	16	TRAC BRAKE MAIN RELAY SHORT
	17	TRAC PUMP MOTOR RELAY OPEN
	18	TRAC PUMP MOTOR RELAY SHORT
	21	RF SOLENOID OPEN OR SHORT
	22	LF SOLENOID OPEN OR SHORT
	23	RR SOLENOID OPEN OR SHORT
	24	LR SOLENOID OPEN OR SHORT
	25	MASTER CYL. CUT SOL. OPEN/SHORT
	26	ACCUMULATOR CUT SOL. OPEN/SHORT
	27	RESERVOIR CUT SOL. OPEN/SHORT
	31	RF SPEED SENSOR MALFUNCTION
	32	LF SPEED SENSOR MALFUNCTION
	33	RR SPEED SENSOR MALFUNCTION
	34	LR SPEED SENSOR MALFUNCTION
	35	LF/RR SPEED SENS MALFUNCTION
	36	RF/LR SPEED SENS MALFUNCTION
	37	SPD SENSOR ROTOR WHEEL FAILURE
	38	RR SPEED SENSOR MALFUNCTION
	39	LR SPEED SENSOR MALFUNCTION
	41	VOLTAGE MALFUNCTION

Anti-Lock Brake System continues on next page

TOYOTA DTCs

ANTI-LOCK BRAKE SYSTEM (CONTINUED)		
YEAR	DTC NO.	DESCRIPTOR
89-94	42	HIGH VOLTAGE
	43	TRAC SYS/DECEL. SENSOR MALF.
	44	DECELERATION SENS. OPEN/SHORT
	45	DECELERATION SENSOR MALF.
	46	DECELERATION SENSOR MALF.
	47	DECELERATION SENSOR MALF.
	51	ACTUATOR PUMP MOTOR LOCKED
	53	TRAC MOTOR OVER- OPERATING (DUR.)
	54	TRAC MOTOR OVER- OPERATING (FREQ)
	55	LOW BRAKE FLUID LEVEL
	56	PRESSURE SENSOR OPEN OR SHORT
	57	PRESSURE SENSOR STICKING
	61	TRAC ECU COM. LINE OPEN/SHORT
	62	ECU MALFUNCTION
	71	RF SENSOR LOW VOLTAGE
	72	LF SENSOR LOW VOLTAGE
	73	RR SENSOR LOW VOLTAGE
	74	LR SENSOR LOW VOLTAGE
	75	RF SENSOR ABNORMAL FREQ.
	76	LF SENSOR ABNORMAL FREQ.
	77	RR SENSOR ABNORMAL FREQ.
	78	LR SENSOR ABNORMAL FREQ.
	79	DECELERATION SENSOR MALF.

TOYOTA DTCs

AIR CONDITIONING		
YEAR	**DTC NO.**	**DESCRIPTOR**
89-94	11	ROOM TEMP SENSOR OPEN OR SHORT
	12	AMBIENT TEMP. SENS. OPEN/SHORT
	13	EVAPORATOR TEMP. SENS. OPEN/SHORT
	14	WATER TEMP. SENS. OPEN/SHORT
	15	DUCT SENSOR OPEN/SHORT (Dr)
	16	DUCT SENSOR OPEN/SHORT (Pa)
	21	SOLAR SENSOR OPEN/SHORT (Pa)
	22	COMPRESSOR LOCKED
	23	REFRIGERANT PRESS MALFUNCTION
	24	SOLAR SENSOR OPEN/SHORT (Dr)
	31	AIR MIX POSITION SENSOR
	32	AIR INLET POSITION SENSOR
	33	AIR MIX MALF. OR MODE POTEN. SIG.
	34	AIR INLET MALFUNCTION
	35	AIR BYPASS POS. SENSOR (Pr)
	36	WATER VALVE POSITION SENSOR
	41	AIR MIX MALFUNCTION
	42	AIR INLET MALFUNCTION
	43	MODE MALFUNCTION
	44	AIR BYPASS POS. SENSOR (Dr)
	45	AIR BYPASS POS. SENSOR (Pa)
	46	WATER VALVE POSITION SENSOR

TOYOTA DTCs

CRUISE CONTROL SYSTEM		
YEAR	**DTC NO.**	**DESCRIPTOR**
89-94	11	ACTUATOR MALF. (OPEN OR SHORT)
	12	CC MAG. CLUTCH RELEASE VLV FAIL
	13	POSITION SENSOR (OPEN OR SHORT)
	14	ACTUATOR POS. SENSOR MALF.
	21	VEHICLE SPD SENS SIGNAL (METER)
	22	VEHICLE SPD SENS SIGNAL (T/M)
	23	SPEED DECREASED 10 mph (16 Km/h)
	31	RESUME SWITCH ALWAYS ON
	32	CONTROL SWITCH GROUND SHORT
	33	SET & RES SW. ON SIMULTANEOUSLY
	34	CONTROL SWITCH OFF MALFUNCTION
	41	MOTOR ACTUATE MALFUNCTION
	42	SOURCE VOLTAGE DROP

TOYOTA DTCs

ELECTRONIC CONTROLLED TRANSMISSION		
YEAR	**DTC NO.**	**DESCRIPTOR**
89-94	37	DIRECT CLUTCH SPD SENSOR SIG.
	38	ATF TEMP. SENSOR SIGNAL
	41	THROTTLE POSITION SENSOR
	42	SPD SENSOR SIGNAL (METER)
	44	SPEED SENSOR REAR
	46	ACCUMULATOR CONTROL SOLENOID
	61	SPD SENSOR SIGNAL (T/M)
	62	NO.1 SHIFT CONTROL SOLENOID
	63	NO.2 SHIFT CONTROL SOLENOID
	64	LOCK-UP CONTROL SOLENOID
	65	TIMING SOLENOID
	67	OD DIRECT CLUTCH SPD SENSOR SIG.
	68	KICK-DOWN SWITCH
	73	DIFF. LOCK SOLENOID OPEN
	74	DIFF. LOCK SOLENOID OPEN
	76	NO.3 SHIFT CONTROL SOLENOID
	86	ENGINE SPEED SENSOR
	88	COMMUNICATION ERROR (TCM-ECM)

TOYOTA DTCs

ENGINE		
YEAR	DTC NO.	DESCRIPTOR
89-94	11	ECU (B+)
	12	RPM SIGNAL (CRANKING)
	13	RPM SIGNAL OR PHASE MALF.
	14	IGNITION SIGNAL (IGF1)
	15	IGNITION SIGNAL (IGF2)
	16	AT CONTROL SIGNAL
	17	G1 SIGNAL
	18	G2 SIGNAL
	21	MAIN O2S SIGNAL (& HEATER) FAIL
	22	COOLANT TEMP. SENSOR SIGNAL
	23	INTAKE TEMP. SENSOR SIGNAL
	24	INTAKE TEMP. SENSOR SIGNAL
	25	AIR-FUEL RATIO LEAN MALFUNCTION
	26	AIR-FUEL RATIO RICH MALFUNCTION
	27	SUB LH O2S SIG. (& HEATER) FAIL
	28	MAIN O2S SIGNAL (& HEATER) FAIL
	29	SUB RH O2S SIG. (& HEATER) FAIL
	31	VAF/MAF METER MAP SENSOR SIG.
	32	VAF METER SIGNAL
	33	IAC MALFUNCTION
	34	TURBO PRESSURE MALFUNCTION
	35	BARO/TURBO PRESS SENSOR SIGNAL
	36	CPS SENSOR
	41	THROTTLE POS. SENSOR SIGNAL
	42	VEHICLE SPEED SENSOR SIGNAL

Engine DTCs continue on next page

TOYOTA DTCs

ENGINE DTCs (CONTINUED)		
YEAR	**DTC NO.**	**DESCRIPTOR**
89-94	43	STARTER SIGNAL
	47	SUB THROTTLE POS. SENSOR SIGNAL
	48	AIR PUMP (EAP) MALFUNCTION
	51	SWITCH CONDITION SIGNAL
	52	KNOCK SENSOR SIGNAL
	53	KNOCK CONTROL PART IN ECU
	54	INTERCOOLER
	55	KNOCK SENSOR SIGNAL
	56	COOLING FAN PRESSURE SWITCH
	71	EGR SYSTEM MALFUNCTION
	72	AIR CONDITIONER RELAY OPEN
	78	FUEL PUMP CONTROL SIGNAL
	79	FUEL PUMP CONTROL SIGNAL
	81	TCM COMM. (ECT1)
	83	TCM COMM. (ESA1)
	84	TCM COMM. (ESA2)
	85	TCM COMM. (ESA3)

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9. DATA LIST PARAMETER DESCRIPTIONS

The Asian Imports Cartridge is capable of displaying a wide variety of ECM parameters in Data List and Snapshot.

This section provides a description of every parameter that can be displayed for Toyota vehicles. Remember, not all models are capable of displaying all parameters. Only parameters available for the selected vehicle are displayed by the tester.

There are two basic types of ECM parameters: discrete and analog. Discrete parameters are 'bits' of information and can be in only one of two distinct states (on/off, open/closed, etc.). Switches and solenoids are examples of discrete parameters. Analog parameters are used to represent quantities and are displayed as a value with appropriate units. Examples of analog parameters include Engine Speed, Coolant Temperature, Oxygen Sensor Voltage, etc.

A/C CLUTCH SIG.

STATES
ON/OFF

Air Conditioning switch status as input to vehicle ECM; based on state of dashboard A/C switch position. ON=A/C commanded on, OFF= A/C commanded off.

AFM OUTPUT
A/F METER RATIO

UNITS	RANGE
m^3/h	0 - 255 m^3/h

Air Flow Meter (AFM) output signal sent as an input to vehicle ECM (from the Air Flow Meter) and calculated into cubic meter/hour by the ECM; based on the rate of air flow through the AFM.

AFM OUTPUT
A/F METER RATIO

UNITS	RANGE
VOLTS	0 - 5V

Air Flow Meter (AFM) output voltage signal sent to the vehicle ECM from the Air Flow Meter; based on the rate of air flow through the AFM.

AFM SIG. PERIOD

UNITS	RANGE
mS	0 - 66

Time period of Karman-Vortex airflow meter sent as an input to the vehicle ECM from the Karman-Vortex airflow meter; based on the rate of air flow through the KV-AFM

CRANK SIGNAL

STATES
ON/OFF

Crank (starter motor) signal input as sent to vehicle ECU during engine cranking. ON=crank switch on, OFF=crank switch off.

DTC RESULT

STATES
SET/NOT SET

Result of ECM diagnostic self-test which checks for malfunction codes. NOT SET=no diagnostic trouble codes, SET=ECM has detected and stored diagnostic trouble codes.

ENG. COOLANT TEMP
(DEGREES)

UNITS	RANGE
DEGREES F	-58 – +260
DEGREES C	-50 – +127

Engine Coolant Temperature input as sent to the vehicle ECM and calculated by the ECM; based on cooling system thermostat condition and engine operation mode.

ENGINE SPEED

UNITS	RANGE
RPM	0 - 10000

Engine Speed signal as input to the vehicle ECU and calculated by the ECU; based on the signal from the distributor pulse generator.

IDLE SWITCH

STATES
ON/OFF

Idle Switch signal status as sent to the vehicle ECM; based on idle switch state in throttle position sensor. ON=switch closed (engine idling), OFF=switch open (engine off-idle).
Note: When testing the idle switch make sure the engine is running.

INJECTOR P/W

UNITS	RANGE
mSec	0 - 33

Injector solenoid Pulse Width (on-time) based on output calculated by the vehicle ECU; based on engine load, engine RPM and Throttle Position.

INTAKE AIR PRES.

UNITS	RANGE
mmHg	0 - 1244

Intake Air Pressure/Vacuum signal sent as an input to the vehicle ECM from the MAP/VAC sensor; based on engine load.

INTAKE AIR VOL.

UNITS	RANGE
g/S	0-510

Intake Air Volume is a measure of engine intake air volume through the air Flow Meter in grams per second (g/s). The more throttle opening, the greater intake air volume into the engine. This parameter applies to AFM equipped engines only.

ISC DUTY CYCLE

UNITS	RANGE
%	0 - 100

Idle Speed Control (ISC) valve percentage opening based on output calculated by the vehicle ECU; based on engine load, engine RPM and Throttle Position.

ISC VALVE

UNITS	RANGE
STEPS	0 - 215

Idle Speed Control (ISC) valve step based on output calculated by the vehicle ECU; based on engine load, engine RPM and Throttle Position.

KNOCK SIGNAL

STATES
ON/OFF

Knock sensor signal correction as commanded by vehicle ECM; based on engine load and indicates that the ECM advance/retard strategy is controlling ignition timing. ON=correction enabled, OFF= correction disabled.

LEAN MIX SENSOR

UNITS	RANGE
mA	0 - 72

Lean mixture sensor current as input to the vehicle ECM; based on air-fuel ratio (O2 content) of exhaust gases.

LEFT A/F FB

STATES
ON/OFF

Leftside air-fuel feedback signal state as commanded by vehicle ECM; based on engine load and left O2 sensor signal inputs to ECM. ON=feedback enabled, OFF=feedback disabled.

LEFT A/F TARGET

UNITS	RANGE
VOLTS	0 - 5V

Target (commanded) air fuel ratio in left-hand exhaust manifold as calculated by vehicle ECM.

LEFT O2S SIGNAL

STATES
RICH/LEAN

Left Oxygen Sensor state flag based on input to vehicle ECU; based on oxygen content in left exhaust stream, RICH=air fuel ratio above 14.7, LEAN=air fuel ratio below 14.7:1.

NEUTRAL SWITCH

STATES
P-N--/-R-DL

Neutral Safety switch status as input to vehicle ECM, based on the current gear selection of the transmission. P-N-- = current gear is PARK or NEUTRAL, -R-DL = current gear is REVERSE, DRIVE, or LOW.

RIGHT A/F FB

STATES
ON/OFF

Rightside air-fuel feedback signal state as commanded by vehicle ECM; based on engine load and right O2 sensor signal inputs to ECM. ON=feedback enabled, OFF=feedback disabled.

RIGHT A/F TARGET

UNITS	RANGE
VOLTS	0 - 5V

Target (commanded) air fuel ratio in right-hand exhaust manifold as calculated by vehicle ECM.

RIGHT O2S SIGNAL

STATES
RICH/LEAN

Right Oxygen Sensor state flag based on input to vehicle ECU; based on oxygen content in right exhaust stream, RICH=air fuel ratio above 14.7, LEAN=air fuel ratio below 14.7:1.

SPARK ADVANCE

UNITS	RANGE
DEGREES	-30 - +90

Ignition timing Spark Advance or Retard signal based on output calculated by the vehicle ECU; based on engine load, engine RPM and Throttle Position.

THROTTLE ANGLE

UNITS	RANGE
DEGREES	0 - 125

Angle of throttle plate in throttle body as sent to the vehicle ECM and calculated by the ECM; based on current position of throttle position sensor.

VEHICLE SPEED

UNITS	RANGE
MPH	0-125

Vehicle speed signal as input to vehicle ECM and calculated by the ECM; based on vehicle speed sensor input.

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COMMON TEST MODES OBD II SYSTEMS

Table of Contents continues on the following page.

Table of Contents continued.

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The OBD II Section defines available test modes, hardware requirements, and operating instructions for all OBD II compliant vehicles. All OBD II functions except OBD II Toolpak require communication with the vehicle ECU(s). Once the necessary hardware has been installed, communication between the tester and vehicle ECU(s) can be initialized.

1.0 TEST MODES AVAILABLE

The following test modes are available when testing Asian Imports vehicles that are OBD II compliant.

F0: Datalist
- F0: Display Data
- F1: Data Setup

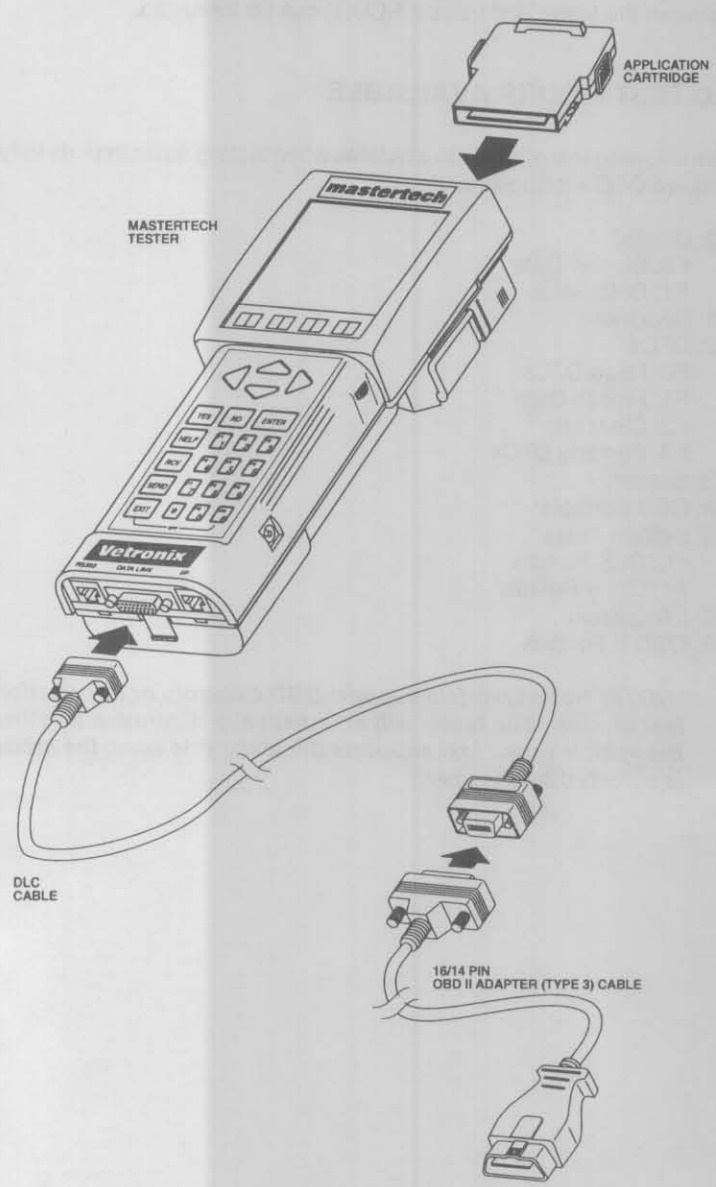
F1: Readiness
F2: DTCs
- F0: Read DTCs
- F1: Freeze Data
- F2: Clear Info
- F3: Pending DTCs

F3: Snapshot
F4: OBD Controls*
F5: System Tests
- F0: O2S Results
- F1: Other Results

F8: Information*
F9: OBD II Toolpak

NOTE: Not all models support OBD Controls or Information test modes. The tester will automatically determine whether the vehicle under test supports the test mode when the mode is selected by the user.

MASTERTECH SETUP



2.0 HARDWARE REQUIRED

In order to be fully functional, the Asian imports Application cartridge requires that special OBD II Interface Circuitry be used with the Mastertech and Tech 1/1A testers. This circuitry can be installed in the following configurations:

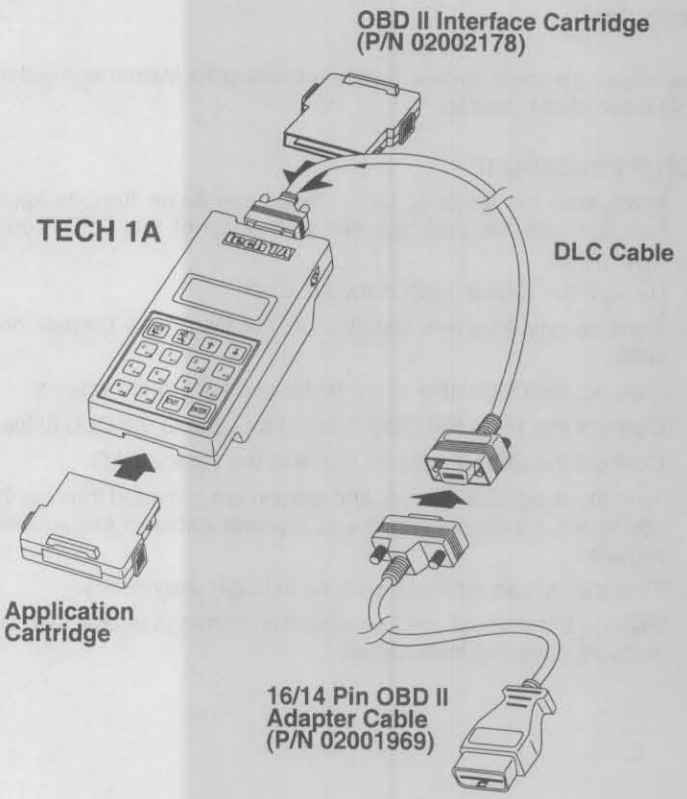
Mastertech

The following procedure describes how to setup the Mastertech tester to test OBD II compliant vehicles.

SETUP PROCEDURE

1. Make sure the tester is OFF. Insert the Asian Imports application cartridge into the cartridge slot at the top of the OBD II compliant Mastertech.
2. Be sure the vehicle ignition switch is off.
3. Remove any adapters installed on the Data Link Connector (DLC) cable.
4. Connect the DLC cable to the tester and tighten the screws.
5. Connect the 16/14 Pin OBD II Adapter Cable to the DLC cable.
6. Connect the OBD II Adapter Cable to the vehicle DLC.
7. Turn the tester ON. Power and ground are provided through the DLC connector, so connecting the 12V power cable to the vehicle is not required.
8. Turn the vehicle ignition switch on to begin diagnostics.
9. Refer to this manual and the application cartridge operator's manual for software operating instructions.

TECH 1A SETUP



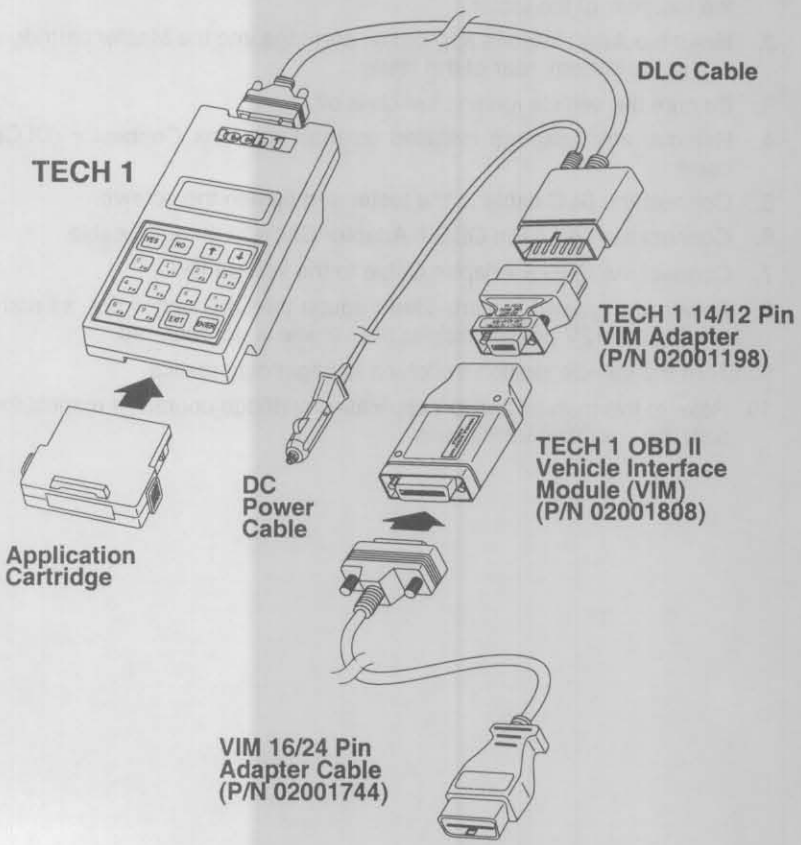
TECH 1A

The following procedure describes how to setup the TECH 1A tester to test OBD II compliant vehicles.

SETUP PROCEDURE

1. Insert the OBD II Interface Cartridge into the Auxiliary cartridge slot at the top, rear of the tester.
2. Insert the Asian Imports application cartridge into the Master cartridge slot at the bottom, rear of the tester.
3. Be sure the vehicle ignition switch is off.
4. Remove any adapters installed on the Data Link Connector (DLC) cable.
5. Connect the DLC cable to the tester and tighten the screws.
6. Connect the 16/14 Pin OBD II Adapter Cable to the DLC cable.
7. Connect the OBD II Adapter Cable to the vehicle DLC.
8. Power and ground are provided through the DLC connector, so connecting the 12V power cable to the vehicle is not required.
9. Turn the vehicle ignition switch on to begin diagnostics.
10. Refer to this manual and the application cartridge operator's manual for software operating instructions.

TECH 1 SETUP


DLC Cable
TECH 1
TECH 1 14/12 Pin
VIM Adapter
(P/N 02001198)
TECH 1 OBD II
Vehicle Interface
Module (VIM)
(P/N 02001808)
DC
Power
Cable
Application
Cartridge
VIM 16/24 Pin
Adapter Cable
(P/N 02001744)

TECH 1

The following procedure describes how to setup the TECH 1 tester to test OBD II compliant vehicles.

SETUP PROCEDURE

1. Insert the Asian Imports application cartridge into the Master cartridge slot at the bottom, rear of the tester.
2. Be sure the vehicle ignition switch is off.
3. Remove any adapters installed on the Data Link Connector (DLC) cable.
4. Connect the DLC cable to the tester and tighten the screws.
5. Connect the TECH 1 14/12 Pin VIM Adapter to the DLC cable.
6. Connect the TECH 1 OBD II Vehicle Interface Module (VIM) to the TECH 1 14/12 Pin VIM Adapter.
7. Connect the 16/24 Pin OBD II Adapter Cable to the VIM.
8. Connect the OBD II Adapter Cable to the vehicle DLC.
9. Connect the 12V power cable to the vehicle cigarette lighter.
10. Turn the vehicle ignition switch ON to begin diagnostics.
11. Refer to this manual and the application cartridge operator's manual for software operating instructions.

PRINTING CAPABILITIES

The Asian Imports software supports printing data via a TECH 1 printer, VP411 printer, or other compatible serial printer, connected to the tester. If you are using a TECH 1 tester, refer to the RS232 Operator's Manual for setup and printing instructions. If you are using a TECH 1A or MASTERTECH tester, refer to the tester Operator's Manual for setup and printing instructions.

Two types of printing are supported by the OBD II software:

- Pressing the F8 key in a DATA DISPLAY mode (e.g., DATA LIST or DTCs) causes the tester to print a list of data appropriate to the mode (a list of diagnostic data parameters or DTCs).
- The tester can be setup to print an image of the tester's screen (referred to as SCREEN PRINT).

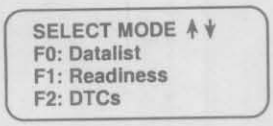
For information on the VP411 serial printer, contact your sales representative.

3.0 GETTING STARTED

POWERING THE MASTERTECH, TECH 1A OR TECH 1

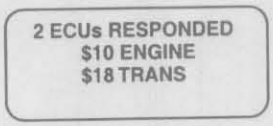
The tester must be provided with an external power source (e.g. vehicle power or an AC/DC power supply). OBD II compliant vehicles provide power at the Data Link Connector (DLC), so when using a MASTERTECH or TECH 1A, the tester only needs to be connected to the vehicle DLC. With the TECH 1, you must connect the DC Power Cable to the vehicle cigarette lighter or to an AC/DC power supply.

ESTABLISHING COMMUNICATION



By selecting the vehicle for testing, you are now at the main menu. You can initialize communication between the tester and the vehicle's ECU(s) by selecting F0: Powertrain. The SELECT MODE menu will be displayed.

If a snapshot has been saved in the tester's memory, a menu will be displayed to allow the selection of F1: REPLAY DATA before initialization begins. Replay of snapshot data does not require communication with the vehicle and can be displayed with power to the tester.



If the vehicle you are testing contains more than one OBD II ECU, the tester will display a list of all ECUs which have responded during the initialization process. Refer to the DISPLAYING DATA FOR MULTIPLE ECUs section.

COMMUNICATION FAILURE

If the tester fails to get a response from the vehicle, it will display a retry count and one of two error messages. At that point, it will continue to retry communication approximately every 3 seconds. If the communication problem is resolved (e.g. the ignition is switched to ON) and communication begins, the tester will automatically proceed to the next phase. If communication cannot be established, see APPENDIX D , IF YOU'RE HAVING A PROBLEM.

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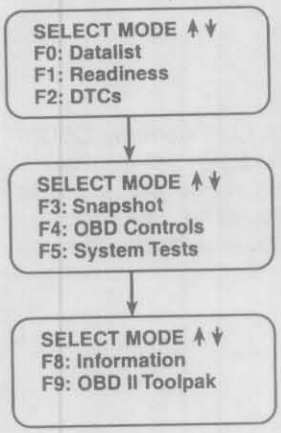
4.0 TEST MODES

Once communication with the vehicle has been established, a select mode menu is displayed. (In some cases, a readiness tests warning message is displayed prior to the menu. See READINESS TESTS section.)

SELECT MODE MENU



This menu allows you to perform basic testing on the vehicle. You can select the desired function by pressing the key indicated to the left of the function. The menu automatically scrolls every 3 seconds until you press ↑ or ↓, at which time scrolling stops.

Pressing ↑ or ↓ will then cause the menu to manually scroll.

If the vehicle you are testing contains more than one ECU, the tester will display a list of all ECUs which have responded during the initialization process. Refer to DISPLAY DATA FOR MULTIPLE ECUs section.

MODE F0	DATALIST
SUBMODE F0	DISPLAY DATA

F0: DATALIST

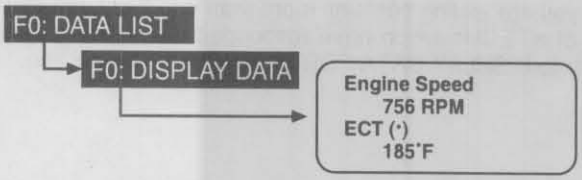
The DATA LIST mode allows you to view the current state of diagnostic data parameters as reported by the vehicle's ECUs.

DATA LIST MENU

When you select DATA LIST from the OBD II FUNCTIONS menu, the tester will display the DATALIST MENU. This menu allows you to either go directly to displaying data or to the DATA LIST SETUP mode to select the data you want to display.

F0: DISPLAY DATA

OPERATING PROCEDURE:



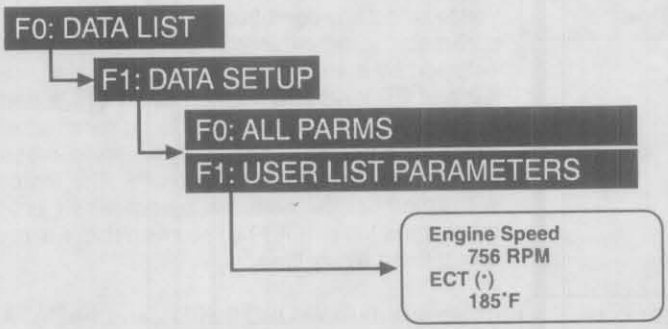
1. Select F0: DATA LIST from the SELECT MODE menu.
2. Select F0: DISPLAY DATA from the DATA LIST menu. The tester will display either ALL PARAMETERS or USER DATA LIST PARAMETERS, depending on which selection was last made since the tester was powered up.

DATA LIST	MODE F0
DATA SETUP	SUBMODE F1

F1: DATA SETUP

The DATA SETUP mode allows you to select the data you want to display. You can select either ALL PARAMETERS or USER LIST PARAMETERS which allows you to monitor any combination of parameters (from 1 parameter to all parameters). The update rate for the parameters depends on the number of parameters selected. A single parameter can be sampled as fast as 8 times per second. The more parameters that are selected, the slower the update rate will be.

OPERATING PROCEDURE:



1. Select F0: DATA LIST from the SELECT MODE menu.
2. Select F1: DATA SETUP from the DATA LIST menu.
3. Select F0: ALL PARMS. or F1: USER LIST PARAMETERS from the DATA LIST SETUP menu. The message "WAITING FOR DATA" will be displayed. The tester will display either ALL PARAMETERS or CUSTOM LIST PARAMETERS depending on which selection was made.

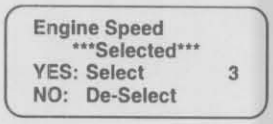
COMMON TEST MODES
OBD II SYSTEMS

MODE F0	DATA LIST
SUBMODE F1	DATA SETUP

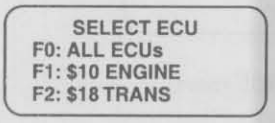
F0: ALL PARAMETERS

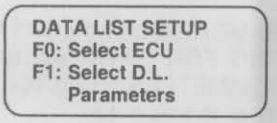
The selection of F0: ALL PARMS will monitor all of the information available from the ECU. Depending on the number of diagnostic data parameters in the data list, the update rate can be 3 seconds or longer.

F1: USER LIST PARAMETERS



The selection of F1: USER LIST PARAMETERS will display a list of parameters from which to select. F1:USER LIST PARAMETERS allows you to select any combination to monitor (from 1 parameter to all parameters). Parameters are selected by scrolling through the list using the ↑ and ↓ keys and then pressing YES and NO to select and deselect the listed parameter. When the parameters have been selected, press ENTER to go to the display mode. The tester will remember the selected parameters (until the tester is turned OFF) so you won't have to re-select them every time.



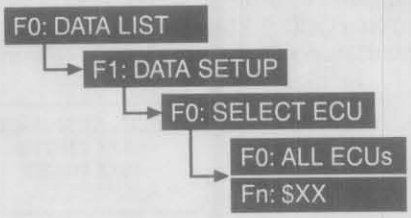


If there are multiple OBD II ECUs, and the DATA SETUP mode is selected, an additional DATA LIST SETUP menu is available. The F0: SELECT ECU menu allows you to select which ECU(s) will contribute to the DATA LIST. Once the ECU(s) that will contribute data are selected, press F1: DATA SETUP to choose all parameters available or a custom list of parameters from the chosen ECU(s).

DATA LIST	MODE F0
MULTIPLE ECUs	

MULTIPLE ECUs

Diagnostic parameter data can be selected from all ECUs or individual ECUs that the tester has identified. This mode should be set up before display data is selected to ensure your desired ECU data is being displayed.



n = User selected
XX = ECU description

OPERATING PROCEDURE (vehicles with multiple ECUs only):

1. Select F0: DATA LIST from the SELECT MODE menu.
2. Select F1: DATA SETUP from the DATA LIST menu.
3. Select F0: SELECT ECU from the DATA LIST SETUP menu.
4. Select F0: ALL ECUs or Fn:XX where n=user selected and XX= a description of the ECU from which you desire information.
5. After selecting the desired ECU, the user is returned to the DATA LIST SETUP menu, where the displayed diagnostic data parameters can be selected, or the user can exit the menu to the DATA LIST MENU, where the selected data list will be displayed.

MODE F0	DATA LIST
MULTIPLE ECUs	

MULTIPLE ECU DISPLAY

In some vehicles, diagnostic information can be sent to the tester by more than one OBD II ECU. For example, both an engine and a transmission controller may report engine speed and throttle position to the tester. The Asian Imports software provides support for multiple OBD II ECUs. If there are multiple OBD II ECUs, the software will inform you when establishing communication with the vehicle by displaying the following message:

```
2 ECUs RESPONDED
$XX ENGINE
$XX TRANS
```

MULTIPLE ECU STATUS INFORMATION

When viewing multiple OBD II ECU diagnostic data parameters, the symbol "=" (equal) or ">" (not equal) before the parameter name indicates the parameter is being updated by multiple ECUs. The "=" symbol indicates the displayed parameter value is is being reported as the same value by multiple ECUs. The ">" symbol indicates the displayed parameter value is not being reported as the same value by multiple ECUs. If there is no symbol before the parameter name, the parameter is being updated by a single ECU.

```
Engine Speed $XX
  > 149 RPM
Engine Speed $XX
  > 152 RPM
```

CHARACTER	STATUS
=	Indicates multiple controllers are reporting approximately the same value for the parameter.
>	Indicates multiple controllers are reporting different data values and the data values are exceeding the tolerance values for the parameter.
"blank"	Not a multiple ECU response.

DATA LIST	MODE F0
MULTIPLE ECUs	

The following table lists the tolerances for the different parameters being labelled "=" or ">". Multiple parameters that are within the tolerances are reported as being the same. Multiple parameters that are not within the tolerances are reported as being not the same.

PARAMETER	TOLERANCE
Engine Load	1.96%
ECT	5 °C
ST FT 1/ ST FT 2	3.91 %
LT FT 1/ LT FT 2	3.91 %
Fuel Pressure	15 kPaG
MAP	5 kPa
Engine Spd	2.5 RPM
Vehicle Spd	5 kph
Ign. Timing	2.5 °
IAT	5 °C
MAF	0.1 gm/s
TPS	1.96%
O2S Bx Sx	0.025 V
FT O2S Bx Sx	3.91%

MODE F0	DATA LIST
MULTIPLE ECUs	

ACTIVE KEYS	
YES / NO	Scroll through displayed data parameters, or for CUSTOM LIST SETUP, SELECT or DESELECT PARAMETERS.
↑ / ↓	Scroll through parameters in CUSTOM LIST.
F0	Mark top displayed parameter as "fixed" for creating your own data pairs; unlocks bottom parameter if fixed.
F1	Mark bottom displayed parameter as "fixed" for creating your own data pairs; unlocks top parameter if fixed.
F3	Toggle the data descriptor line with the Parameter Identification (PID) number and the ECU number.
F7	Toggle unit conversions for applicable parameters, between English and metric.
F8	Print data list (if equipped with serial printer).
EXIT	Return to DATA LIST MENU.

READINESS	MODE F1

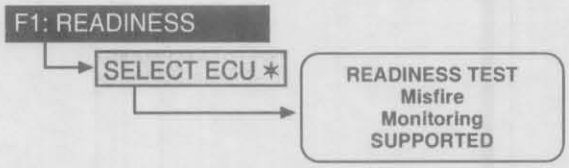
F1: READINESS

The READINESS test mode allows you to display the status of the vehicle's on-board monitors, which monitor the operation of the emissions-related components. These READINESS tests must run in order for the DTC and test result displays to accurately reflect the conditions of the vehicle's emissions-related components.

If the vehicle you are testing contains more than one OBD II ECU, you will be asked to select which ECU information you would like displayed.

Not All Vehicle System Readiness Tests Have Been Completed

If the tester determines that the ECU has not completed all of the readiness tests, it will display a warning message. You can then select the READINESS tests menu item from the SELECT MODE menu to examine the status of these tests. For information on how to complete any of the readiness tests, refer to service information from the vehicle manufacturer.



* For vehicles with multiple ECUs only.

OPERATING PROCEDURE:

1. Select F1: READINESS from the SELECT MODE menu.

2. Select the ECU from which you choose to monitor data (for vehicles with multiple ECUs only). The message "WAITING FOR DATA" is displayed, followed by the READINESS TEST information.

3. The first three items on the display indicate the vehicle's monitoring capability for continuously monitored systems:

- Misfire monitoring.
- Fuel system monitoring.
- Comprehensive component monitoring.

COMMON TEST MODES
OBD II SYSTEMS

MODE F1	READINESS

These are indicated as either being SUPPORTED or NOT SUPPORTED (N/A), depending on the vehicle's ECU.

The other 8 display items indicate the status of the tests which are performed at least "once per trip."

- Catalyst monitoring.
- Heated catalyst monitoring.
- Evaporative system monitoring.
- Secondary air system monitoring.
- A/C system refrigerant monitoring.
- Oxygen sensor monitoring.
- Oxygen sensor heater monitoring.
- EGR system monitoring.

These tests can be COMPLETED, NOT COMPLETED, or NOT SUPPORTED.

READINESS	MODE F1

READINESS TEST OPERATION

OBD II SYSTEM AND VEHICLE INFORMATION

The OBD II system is capable of identifying the likely area of a malfunction within the electronic engine control system. Observe the following before beginning diagnostic service:

- MIL OPERATION. When excessive tailpipe emissions or powertrain component failure are detected by the OBD II system, the Malfunction Indicator Lamp (MIL) will illuminate.
- LOW FUEL TANK LEVEL. Automobile manufacturers may disable READINESS tests which can be affected by running the vehicle out of fuel (example: a monitor may become disabled when fuel tank volume is below 15% of maximum fuel tank capacity).
- ALTITUDE. Automobile manufacturers may disable READINESS tests which can be affected by altitude (example: a READINESS test may become disabled when vehicle is operated above 8,000 feet elevation).
- AMBIENT TEMPERATURE. Automobile manufacturers may disable READINESS tests which can be affected by ambient temperature (example: a READINESS test may become disabled when a vehicle is started below 20°F ambient).
- POWER TAKE-OFF UNIT. Automobile manufacturers may disable READINESS tests which can be affected by power take-off unit operation (example: a READINESS test may become disabled when a vehicle power take-off is engaged or active).

All of the above are part of the California Air Resources Board OBD II regulation and are options available to the automobile manufacturer for vehicle Powertrain Control Module (PCM) development. In the case of some READINESS tests, per the above, a manufacturer may have determined that a READINESS test is unreliable or not complete when certain conditions exist, therefore not enabling proper operation.

ACTIVE KEYS	
↑	Move marker.
↓	Freeze menu scroll.
F8	Print readiness test results.
EXIT	Return to SELECT MODE menu.

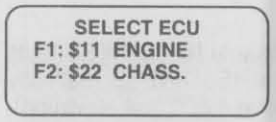
MODE F2	DTCs
SUBMODE F0	READ DTCs

F2: DIAGNOSTIC TROUBLE CODES (DTCs)

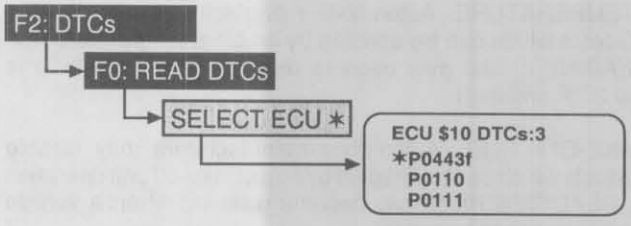
F0: READ DTCs

When you select the F0: READ DTCs mode, the tester reads all DTCs which have been stored by the vehicle's controllers and then displays:

- a two-column list of all DTCs.
- the ID of the ECU reporting the DTCs.
- how many codes have been reported by that ECU.



If the vehicle you are testing contains more than one OBD II ECU, you will be asked to select which ECU information you would like displayed.



* For vehicles with multiple ECUs only.

OPERATING PROCEDURE:

1. Select F2: DTCs from the SELECT MODE menu.
2. Select F0: READ DTCs for the DTC menu.
3. Select desired ECU from the SELECT ECU menu (for vehicles with multiple ECUs only). The DTC information will then be displayed.

DTCs	MODE F2
READ DTCs	SUBMODE F0

Generally, 6 DTCs can be displayed at one time. If more than 6 DTCs are reported by the ECU, the tester will display a "↓" prompt in the lower right-hand corner indicating that more DTCs are present but are not displayed. Use the ↑, ↓, ←, and → keys to move through the list of DTCs.

A DTC description can be displayed by moving the "*"next to the desired DTC and pressing ENTER. The ↑ and ↓ keys will scroll through the DTC descriptions.

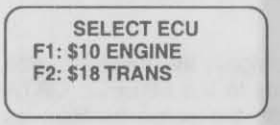
A DTC will display an " f " after the DTC number to signify that there is freeze data available for that DTC. You can go directly to the FREEZE DATA display by pressing F2. This performs exactly the same function as selecting FREEZE DATA from the SELECT MODE menu, but saves you a few key presses.

ACTIVE KEYS	
ENTER	Display the description for the selected DTC.
F2	Go directly to FREEZE DATA.
F8	Print freeze data list (if equipped with serial printer).
↑ / ↓ ← / →	Move through list of DTCs.
EXIT	Return to previous menu.

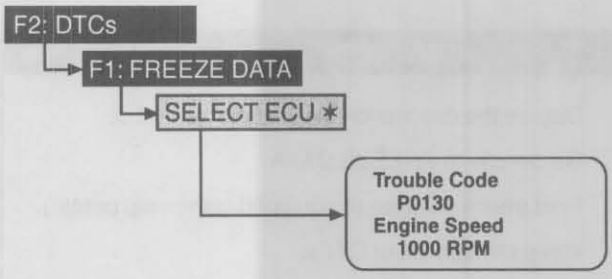
MODE F2	DTCs
SUBMODE F1	FREEZE DATA

F1: FREEZE DATA

The vehicle's ECU stores diagnostic data information about the state of the vehicle when a Diagnostic Trouble Code (DTC) occurs. This data is referred to as Freeze Frame Data and can be read by the tester using the FREEZE DATA mode. You can select this mode from the SELECT MODE menu.



If multiple ECUs are available, the SELECT ECU menu is displayed once FREEZE DATA is selected from the SELECT MODE menu. Only one ECU's data can be displayed in FREEZE DATA mode.



* For vehicles with multiple ECUs only.

OPERATING PROCEDURE:

1. Select F2: DTCs from the SELECT MODE menu
2. Select F1: FREEZE DATA from the menu.
3. Select the ECU from which you choose to monitor data (for vehicles with multiple ECUs only). The message "WAITING FOR DATA" will appear. The FREEZE DATA information will then be displayed.

FREEZE DATA is only available for the first DTC which was detected by the vehicle. The first parameter in the list is the DTC which caused the FREEZE DATA to be saved. The FREEZE DATA is displayed in the same format as the data list in the DATA LIST mode.

DTCs	MODE F2
FREEZE DATA	SUBMODE F1

ACTIVE KEYS	
YES / NO	Scroll through displayed data parameters.
F0	Mark top displayed parameter as "fixed" for creating your own data pairs; unlocks bottom parameters if fixed.
F1	Mark bottom displayed parameter as "fixed" for creating your own data pairs; unlocks top parameters if fixed.
F3	Toggle the data descriptor line with the Parameter Identification (PID) number and the ECU number.
F7	Toggle unit conversions for applicable parameters between English and metric.
F8	Print freeze data list (if equipped with a serial printer).
EXIT	Return to SELECT MODE menu.

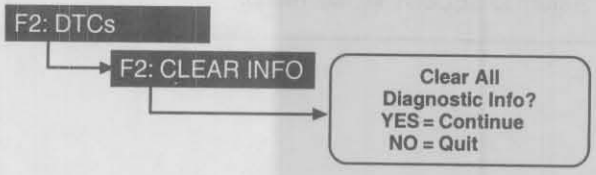
MODE F2	DTCs
SUBMODE F2	CLEAR INFO

F2: CLEAR INFORMATION

The CLEAR INFORMATION mode is used to clear DTCs from all vehicle ECUs along with any other diagnostic information which the controller has saved, such as FREEZE DATA.

IMPORTANT: Clearing diagnostic information also clears the status of readiness tests (making them incomplete). It can take 30 to 60 minutes of vehicle drive and engine run time (and in some cases longer) to complete all of these tests if they are cleared. Some inspection and maintenance programs require that the readiness tests be complete before the inspection can proceed.

When you select F2: CLEAR INFO, you are first prompted with a warning message. This is to prevent inadvertent clearing of codes. If you press NO or EXIT in response to the prompt, the tester will return to the DTC menu. If you press YES in response to the prompt, the tester will cause all OBD II controllers to clear all emissions-related DTCs, FREEZE DATA, and READINESS TEST results. When the function is complete, the tester will display the screen "ALL DIAGNOSTIC INFORMATION CLEARED."



OPERATING PROCEDURE:

1. Select F2: DTCs from the SELECT MODE menu.
2. Select F2: CLEAR INFO from the DTCs menu.
3. Press YES to clear DTCs. A warning message will appear to prevent accidental clearing of codes. A screen will then appear to confirm deletion of diagnostic information stored in the vehicle controllers.

DTCs	MODE F2
CLEAR INFO	SUBMODE F2

Module(s)
$10
Did Not Respond

Try Again With
Ignition ON And
Eng. NOT Running
[EXIT]

Some vehicles will not allow DTCs to be cleared while the engine is running. In this case, the tester will display a prompt screen to turn off the engine, leaving the key in the ON position. For some vehicles, communication may be lost when the key is turned off and then back on. If a COMMUNICATION ERROR screen is displayed, exit back to the MAIN MENU and re-select Powertrain. You should now be able to clear the diagnostic information.

ACTIVE KEYS	
YES	Clears all emissions-related information.
NO / EXIT	Return to SELECT MODE menu.

COMMON TEST MODES
OBD II SYSTEMS

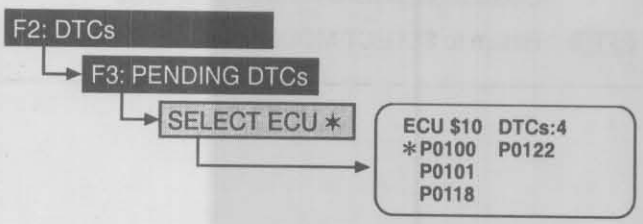
MODE F2	DTCs
SUBMODE F3	PENDING DTCs

F3: PENDING DTCs

For PENDING DTCs mode, the vehicle's controller performs analysis similar to that used to determine if the equivalent DTC is present, but with less stringent requirements. For example, a DTC may require a condition to be present for several drive cycles, while the equivalent pending DTCs may be set with the first occurrence of the condition.

Results of the PENDING DTCs request are displayed in a manner similar to the DTC display mode. They are displayed with the same Pxxxx DTC designations and the same descriptors as the DTCs.

If the vehicle you are testing contains more than one OBD II ECU, you are asked to select which ECU information you would like displayed.

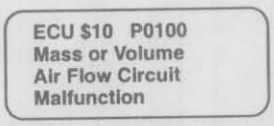


* For vehicles with multiple ECUs only.

OPERATING PROCEDURE:

1. Select F2: DTCs from the SELECT MODE menu.
2. Select F3: PENDING DTCs from the DTCs menu.
3. Select the ECU from which you choose to monitor data (for vehicles with multiple ECUs only). The message "WAITING FOR DATA" is displayed, followed by the PENDING DTCs information.

DTCs	MODE F2
PENDING DTCs	SUBMODE F3



A detailed description can be displayed for any pending DTC by moving the * next to the desired code and pressing ENTER. The * is moved by pressing the arrow keys.

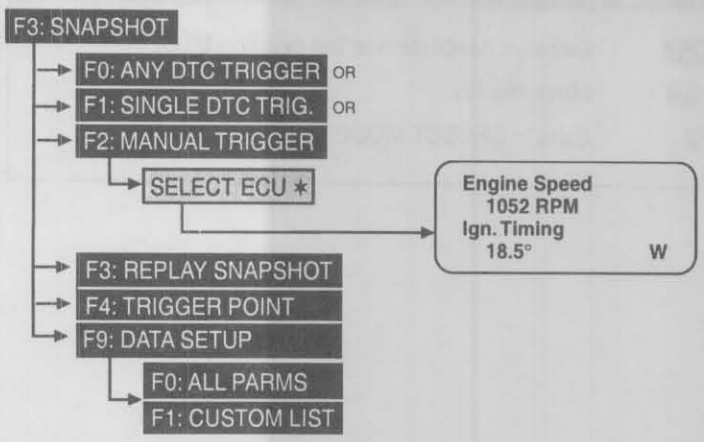
ACTIVE KEYS	
ENTER	Displays description of the pending DTC.
↑ / ↓	Move marker.
EXIT	Exits to SELECT MODE menu.

MODE F3	SNAPSHOT

F3: SNAPSHOT

SETUP

The SNAPSHOT mode helps the user to isolate an intermittent or transient problem by storing data parameters before or after the problem occurs. The information can be saved and used for a later replay or hardcopy print option.



* For vehicles with multiple ECUs only.

OPERATING PROCEDURE:

1. Select F3: SNAPSHOT from the SELECT MODE menu.
2. Select any of the available trigger types from SNAPSHOT MENU.
3. Data from only one ECU can be saved in tester memory. Therefore, if multiple ECUs are detected, you will be asked to select one of the ECUs.
4. To choose which snapshot parameters are displayed, press F9 to select DATA SETUP from the SNAPSHOT MENU. After selecting F9: DATA SETUP, refer to F0: ALL PARMS and F1: CUSTOM LIST PARAMETERS in the DATA LIST section for displaying all parameters or selecting a custom list of parameters.

SNAPSHOT	MODE F3
TRIGGER POINT	SUBMODE F4

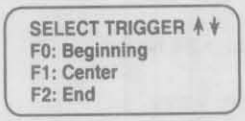
TRIGGER TYPES

In the SNAPSHOT mode, data is saved in the tester while it is waiting for a trigger condition. Once the trigger occurs, data continues to be saved in the tester's memory until the memory is full. SNAPSHOT MENU allows the user to start the snapshot process by selecting a trigger mode. Three types of triggers can be selected:

TRIGGER TYPES

KEYPRESS	DESCRIPTION
F0: ANY DTC	Snapshot trigger on the occurrence of any DTC.
F1: SINGLE DTC	Snapshot trigger on the occurrence of a single DTC that you specify.
F2: MANUAL TRIG.	Snapshot trigger by an ENTER, EXIT, or F9 key press.

TRIGGER POINT SETUP



The snapshot menu allows you to select how much data is saved after trigger occurs by selecting F4: TRIG. POINT from the SNAPSHOT MENU screen. To change the trigger point, select the key next to the desired point. This trigger point is saved as long as the tester has power.

MODE F3	SNAPSHOT
SUBMODE F3	SNAPSHOT REPLAY

SNAPSHOT DATA CAPTURE

When the trigger type is selected, the tester displays a status message in the form of a flashing "W" indicating that the tester is storing data and waiting for the trigger.

While waiting for a trigger to occur, you can press the ENTER, EXIT, or F9 key at any time to trigger the snapshot manually regardless of the trigger type selected.

When a trigger has occurred, the flashing "W" will change to a constantly displayed "T."

When the tester memory is full, the tester displays an "0" to indicate that the snapshot is complete. Pressing EXIT after a trigger has occurred will end the data capture phase.

F3: SNAPSHOT REPLAY

Once you have captured snapshot data, you can examine it by pressing F3 from the SNAPSHOT menu. Use the ↑ and ↓ keys to scroll through the samples. The last snapshot is retained in the tester unless:

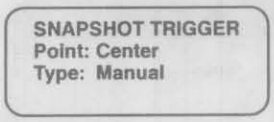
- It is overwritten by a new snapshot.
- A new application is selected from the application menu.
- A new master cartridge is installed in the tester.
- The tester is unplugged from power for more than 24 hours.

You can review the captured snapshot in one of two ways:

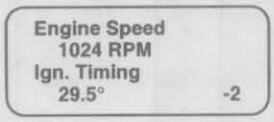
1. A snapshot can also be replayed after communication is established by selecting F3: SNAPSHOT REPLAY from SNAPSHOT MENU.

2. Without vehicle communications by selecting F1: REPLAY SNAPSHOT DATA from the MAIN MENU (this menu option is only displayed if a snapshot has been taken).

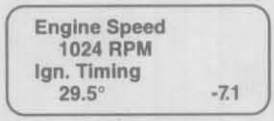
SNAPSHOT	MODE F3
SNAPSHOT REPLAY	SUBMODE F3



When the SNAPSHOT REPLAY mode is first entered, the tester displays information about the saved snapshot. The snapshot's trigger point (Beginning, Center, or End) and trigger type (Manual, Any DTC or Single DTC) are displayed for a couple seconds before the snapshot data is displayed. When replaying a saved snapshot, the sample at the time of the trigger is initially displayed. Samples before and/or after the trigger can be viewed by pressing the ↑ and ↓ keys to scroll through the samples.



The sample number of a snapshot is displayed in the lower right of the display screen. This index number will initially be a "0"; samples after the trigger will be displayed as positive numbers and samples before the trigger will be displayed as negative numbers. While replaying a snapshot, pressing ENTER will cause the software to toggle between the sample index and the sample time. The sample time display gives the time in seconds (relative to the trigger sample) at which the TECH 1 received the currently displayed sample. For example, a sample time of +3.4 means the sample was received 3.4 seconds after the trigger sample. A sample time of -2.6 seconds means the sample was received 2.6 seconds before the trigger.



MODE F3	SNAPSHOT

ACTIVE KEYS	
YES / NO	Scroll through displayed data parameters.
↑ / ↓	Scroll through samples.
F0	Mark top displayed parameter as "fixed" for creating your own data pairs.
F1	Mark bottom displayed parameter as "fixed" for creating your own data pairs.
F2	Display trouble codes for current sample.
F3	Toggle the data descriptor line with the Parameter Identification (PID) number and the ECU number.
F4	Display first (earliest) sample.
F5	Display trigger sample ("0").
F6	Display last (most recent) sample.
F7	Toggle unit conversions for applicable parameters.
F8	Print data list (if equipped with serial printer).
EXIT	Return to SNAPSHOT MENU.

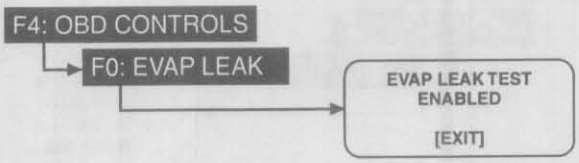
OBD CONTROLS	MODE F4
EVAP LEAK	SUBMODE F0

F4: OBD CONTROLS

The OBD CONTROLS mode allows the user to perform individual output controls to check for proper vehicle component or system operation. The OBD CONTROLS that the user can control depend on the vehicle under test.

F0: EVAP LEAK

The EVAP LEAK test is used to enable the conditions required to conduct an evaporation system leak test. Selecting F0: EVAP LEAK does not actually run the test, but instead closes the system, preventing leakage. Off-board test equipment can then be used to test the vehicle's evaporative emission system. The vehicle manufacturer is responsible for automatically aborting the leak test when necessary.



If the conditions necessary to run the evaporative emissions system leak test are not correct, the vehicle ECU may respond with a manufacturer defined reason the test cannot be run or may not respond at all. If the vehicle PCM does not support OBD CONTROLS, the tester will display "No Control Tests Supported" when the OBD CONTROLS test mode is selected.

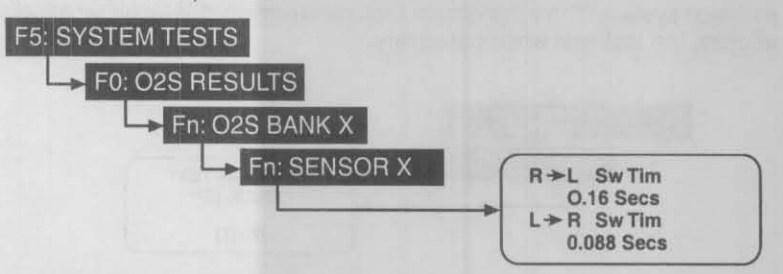
MODE F5	SYSTEM TEST
SUBMODE F0	O2S RESULTS

F5: SYSTEM TEST

F0: O2S RESULTS

The OXYGEN SENSOR (O2S) RESULTS mode allows the tester to display the results of the oxygen sensor testing performed by the vehicle's engine controller. These tests are "once per trip" tests and are performed after the ignition is turned on under conditions defined by the vehicle manufacturer. The O2S RESULTS mode is not available for all vehicles. Some vehicles use the other results test mode to report results of O2S testing.

n = User selected
X = Vehicle dependent



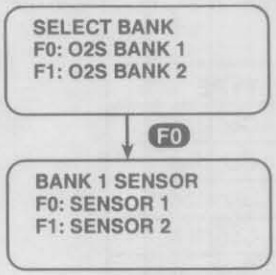
OPERATING PROCEDURE:

1. Select F5: SYSTEM TEST from the SELECT MODE menu.
2. Select F0: O2S RESULTS from the SELECT TEST menu.
3. Select the desired bank from SELECT BANK menu.
4. Select the desired oxygen sensor from the BANK and SENSOR menu. The message "WAITING FOR DATA" is displayed, followed by the Oxygen Sensor data display.

If the tester displays the warning message indicating that the O2S MONITORING TEST RESULTS may not be valid, the vehicle ECU is reporting that the O2S tests have not been completed or that the selected ECU does not monitor the O2S tests. The status of the oxygen sensor tests can be monitored in F1: READINESS TEST MODE under the value of OXYGEN SENSOR MONITORING For some vehicles, O2S test results may not be available until all readiness tests have been completed.

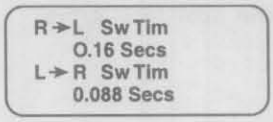
SYSTEM TEST	MODE F5
O2S RESULTS	SUBMODE F0

O2 SENSOR TEST MENU



The vehicle can provide O2S test results for up to 8 oxygen sensors. When O2S RESULTS is selected, the tester queries the ECU to determine which oxygen sensors are present. It then displays a list of these sensors so that you can select which sensor's test results to examine. To select a bank or sensor, press the number listed on the left. Refer to APPENDIX B: OBD II OXYGEN SENSOR LOCATION INFORMATION for a discussion of oxygen sensor locations. If there is no response to the query, the tester displays a warning message indicating that the O2S Test results may not be supported.

O2S DATA DISPLAYS



Once the sensor has been selected, the tester determines which O2 sensor data parameters are available for display. It then displays data for each of the parameters. The parameters vary depending on the vehicle manufacturer. Only parameters which are supported by the vehicle ECU are displayed.

MODE F5	SYSTEM TEST
SUBMODE F0	O2S RESULTS

The OXYGEN SENSOR MONITORING TEST RESULTS are reported as constants programmed in the vehicle ECU or calculated values by the vehicle ECU. Refer to the table below for programmed and calculated data parameters.

PARAMETER	TID	TYPE
R>>L O2S V	$01	Constant
L>>R O2S V	$02	Constant
LOW SW V	$03	Constant
HIGH SW V	$04	Constant
R>>L SW TIM	$05	Calculated
L>>R SW TIM	$06	Calculated
MIN O2S V	$07	Calculated
MAX O2S V	$08	Calculated
O2S TRANS T	$09	Calculated

NOTE: Parameter IDs greater than 9 are manufacturer-specific and are therefore defined only by an ID preceded by a "$" (e.g., $70 and $71 for Chrysler O2S test results). You should refer to the vehicle's service manual to determine how to interpret these parameters.

SYSTEM TEST	MODE F5
O2S RESULTS	SUBMODE F0

ADDITIONAL O2S INFORMATION

```
TID $05  Val  $29
Min $0A  Max  $32
TID $06  Val  $16
Min $0A  Max  $32
```

Pressing F5 while the O2S RESULTS data is being displayed will cause the tester to display additional information about the displayed parameters. The tester displays the Test ID number (TID) along with hexadecimal displays of the current data value ("Val"), the ECU programmed minimum value ("Min") and the maximum ECU programmed value ("Max") for this parameter. "Min" and "Max" are values reported by the ECU. "Val" should be within those limits.

ACTIVE KEYS

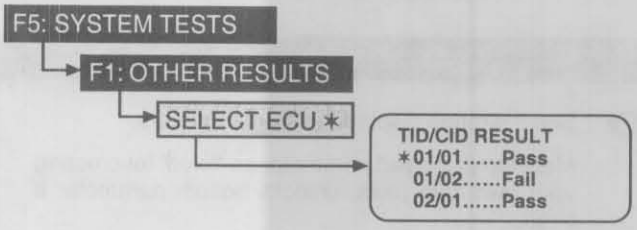
YES / NO	Scroll through displayed data parameters.
F0	Mark top displayed parameter as "fixed" for creating your own data pairs; unlocks bottom parameter if fixed.
F1	Mark bottom displayed parameter as "fixed" for creating your own data pairs; unlocks top parameter if fixed.
F3	Toggle the data descriptor line with the Parameter Identification (PID) number and the ECU number.
F4	Toggle the data descriptor line with the Test Identification (TID) number and the oxygen bank and sensor.
F5	Toggle the data descriptor line with the Test Identification (TID) number and the hexadecimal equivalent of the received data. The calculated value line is toggled with the "Min" and "Max" values received from the ECU for that TID.
F8	Print data list (if equipped with serial printer).
EXIT	Return to SELECT MODE menu.

MODE F5	SYSTEM TEST
SUBMODE F1	OTHER RESULTS

F1: OTHER TEST RESULTS

The OTHER RESULTS test mode is similar to the O2 sensor test results. Some manufacturers use this mode as an alternate means of reporting O2 sensor test results. In this mode, the vehicle's ECU reports data for various Test IDs (TIDs) and Component IDs (CIDs) that are specified by the vehicle manufacturer. Descriptions for the TIDs and CIDs are available in the vehicle service manual or from the manufacturer.

If the vehicle you are testing contains more than one OBD II ECU, you will be asked to select which ECU information you would like displayed.



* For vehicles with multiple ECUs only.

OPERATING PROCEDURE:

1. Select F5: SYSTEM TESTS from the SELECT MODE menu.
2. Select F1: OTHER RESULTS from the SELECT TEST menu.
3. Select the ECU from which you choose to monitor data (for vehicles with multiple ECUs only). The message "WAITING FOR DATA" is displayed, followed by the OTHER RESULTS test information.

SYSTEM TEST	MODE F5
OTHER RESULTS	SUBMODE F1

```
01/01 ECU $10
Test Value $0200
Min Limit  N/A
Max Limit  $0300
```

In addition to reporting data for these TIDs and CIDs, the vehicle reports test limits (minimum, maximum, or both) for acceptable operation. The tester compares the data with the test limits and displays a PASS or FAIL indication for each TID and CID. The actual received data can be viewed by moving the star cursor (*) with the arrow keys to the desired item and pressing ENTER. If "N/A" (not available) is displayed for a limit, then the ECU did not send a value for that limit.

ACTIVE KEYS	
ENTER	Displays actual received data.
↑ / ↓	Move marker.
EXIT	Return to SYSTEM TESTS menu.

MODE F8	INFORMATION
SUBMODE F0	VIN

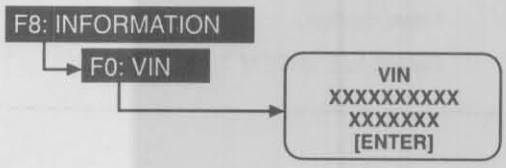
F8: INFORMATION

The INFORMATION mode is used to enable the user to request vehicle specific information from the vehicle ECU, such as VIN, Software Calibration ID, or Software Verification Number.

If the vehicle PCM does not support vehicle PCM information, the tester will display "No Vehicle Info Supported" when the INFORMATION mode is selected.

F0: VIN

The VIN selection allows the user to electronically read the Vehicle Identification Number that is stored in the vehicle's ECU. This mode is only selectable when it is supported by the vehicle ECU.



OPERATING PROCEDURE:

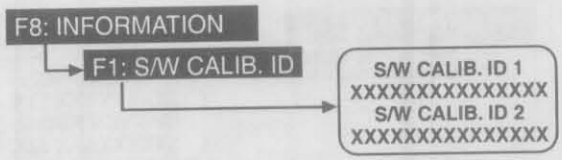
1. Select F8: INFORMATION from the SELECT MODE menu.

2. Select F0: VIN from the SELECT TYPE menu.

INFORMATION	MODE F8
S/W CALIB. ID	SUBMODE F1

F1: S/W CALIB. ID

The S/W CALIBRATION ID selection is used for identification of the software calibration contained within the vehicle ECU. Each software calibration ID uniquely identifies the software installed in the ECU. Multiple calibration IDs may be reported for a ECU, depending on software architecture. A calibration ID number will have at least one unique software verification number. This mode is only selectable when it is supported by the vehicle ECU.



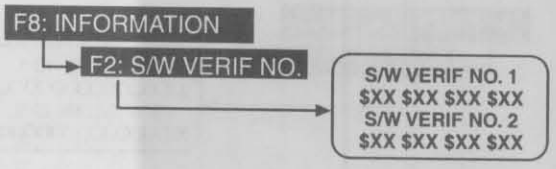
OPERATING PROCEDURE:

1. Select F8: INFORMATION from the SELECT MODE menu.
2. Select F1: S/W CALIB. from the SELECT TYPE menu.

MODE F8	INFORMATION
SUBMODE F2	S/W VERIF ID.

F2: S/W VERIF ID.

The SOFTWARE VERIFICATION NUMBER selection is used for determining whether emission-related calibrations within the ECU software have been altered. Software Verification Numbers are calculated based on memory content at the time of the request. Any changes to calibration will be detected in the Software Verification Number. This mode is only selectable when it is supported by the vehicle.



OPERATING PROCEDURE:

1. Select F8: INFORMATION from the SELECT MODE menu.
2. Select F2: S/W VERIF NO. from the SELECT TYPE menu.

NOTE: Multiple Software Verification Numbers may be reported by an ECU. Each Software Verification Number will correspond to a unique Software Calibration ID number.

NOTE: Turn the engine off when requesting the Software Verification Number from the vehicle ECU. Failure to turn the engine off may cause the ECU to require more time to calculate the calibration number and may therefore not respond to the request.

OBD II TOOLPAK	MODE F9

F9:OBD II TOOLPAK

The OBD II Toolpak is used to help diagnose and troubleshoot OBD II compliant powertrain control systems. Using the OBD II Toolpak mode provides you with pertinent text and data so you can learn about and more efficiently diagnose the vehicle under test.

Examples of data features contained within the program are:

- Vehicle preparation
- Diagnostic procedures
- Repair verification
- Diagnostic data parameter descriptions
- Diagnostic data parameter common values
- Diagnostic Trouble Code (DTC) Library
- Readiness Test description
- Oxygen sensor location information
- Oxygen sensor type information
- Oxygen sensor maintenance information

When using this application cartridge on 1994 to current OBD II compliant PCM vehicles, the cartridge will display diagnostic data parameters based on Society of Automotive Engineers (SAE) recommended practice J1979. Additionally, the basic functions contained within this cartridge are required by California Air Resources Board (California ARB) as part of the On-Board Diagnostics level II (OBD II).

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OBD II TOOLPAK	MODE F9

SELECTING OBD II TOOLPAK MODE

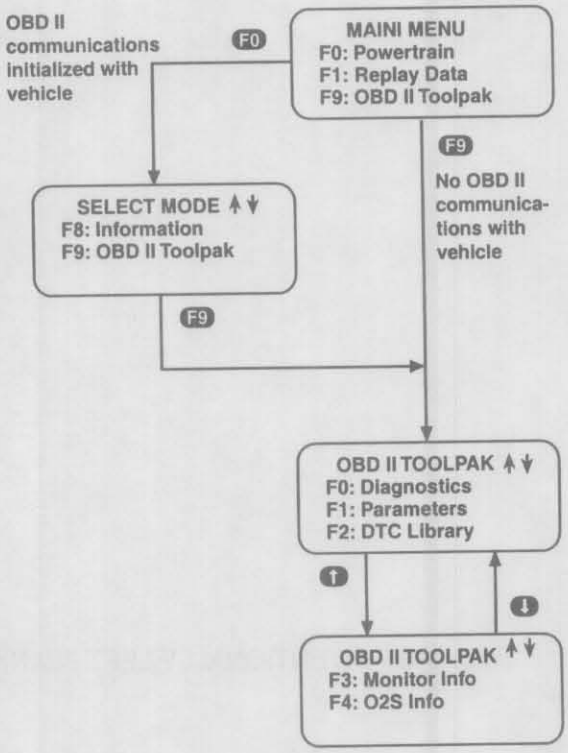
The OBD II Toolpak functions can be entered in two ways: from the main menu or from the Select Mode menu.

FROM THE OBD II MENU

Entering F9: OBD II Toolpak from the main menu is available any time power is applied to the tester.

FROM THE SELECT MODE MENU

Entering F9: OBD II Toolpak from the Select Mode menu is only available after communication with the OBD II compliant vehicle has been initialized.



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OBD II TOOLPAK	MODE F9
DIAGNOSTICS	SUBMODE F0
PREP VEHICLE	SUBMODE F0

F0: DIAGNOSTICS

The F0: Diagnostics mode provides the following information:

- How to prepare a vehicle powertrain system for testing
- How to perform a diagnostic approach using each of the software modes on OBD II compliant vehicles.
- How to verify a repair using the modes is contained in the F0: Diagnostics mode.

F0: PREP VEHICLE

The Prep Vehicle mode is used to properly prepare the vehicle powertrain for diagnostic procedures. Following the instructions in this mode will ensure that the vehicle system is preconditioned and ready for diagnostic testing.

OPERATING PROCEDURE:

1. Press F9 to select OBD II TOOLPAK from the Select Mode menu.
2. Press F0 to select Diagnostics from the OBD II Toolpak menu.
3. Press F0 to select Prep Vehicle from the Diagnostics menu.
4. Review and answer the prompts that are displayed on the screen using the YES and NO keys. Use ↑ or ↓ to advance through the text description screens.
5. Press EXIT to return to the previous menu.

ACTIVE KEYS	
↑ / ↓	Scroll up and down.
YES / NO	Answer question or query.
ENTER	Advance to the next menu.
EXIT	Exit to the previous question or test menu.

COMMON TEST MODES
OBD II SYSTEMS

MODE F9	OBD II TOOLPAK
SUBMODE F0	DIAGNOSTICS
SUBMODE F1	PROCEDURE

F1: PROCEDURE

The OBD II system represents the latest in on-board failure detection strategies. Strategies such as misfire detection, component, and fuel system status are some examples of diagnostic data that can be obtained from the OBD II system.

Along with the new, more stringent methods of failure detection came standardized diagnostic test modes. These standardized test modes are supported in the Asian Imports software program as modes F0 through F8. After using Asian Imports software modes F0-F8 you will notice new types of diagnostic data that are displayed on the tester.

F1: Diagnostic Procedure is designed to assist you in learning how to diagnose an OBD II system fault or assess current system condition. While there are many approaches that can be used, there is no one right way to perform this task.

This submode helps formalize a strategy and teaches you how, using a sensible approach, to use the Asian Imports software modes F0-F8 and determine a solution to a problem within the OBD II system.

OPERATING PROCEDURE

1. Press F9 to select OBD II TOOLPAK from the Select Mode menu.

2. Press F0 to select Diagnostics from the OBD II Toolpak menu.

3. Press F1 to select Procedure from the Diagnostics menu.

   First time users: to ensure proper operation, this mode is best reviewed before actual testing on the vehicle is performed. Prior to the testing it will be to your advantage to know the answers to the following:

   - Is the MIL on?
   - Are DTCs present? If so, record the DTC numbers.
   - Is the fuel tank cap installed and is it tight (3 clicks)?
   - Is the fuel tank level greater than 15% of total volume?

OBD II TOOLPAK	MODE F9
DIAGNOSTICS	SUBMODE F0
PROCEDURE	SUBMODE F1

4. Press ↑, ↓, YES, NO, or ENTER to review and answer the prompts displayed on the screen, and to read any key help screens that may be displayed for navigation help.

5. Press EXIT to return to the previous question or test menu.

ACTIVE KEYS	
↑ / ↓	Scroll up and down.
YES / NO	Answer question or query.
ENTER	Advance to the next menu.
EXIT	Exit to the previous question or test menu.

COMMON TEST MODES
OBD II SYSTEMS

MODE F9	OBD II TOOLPAK
SUBMODE F0	DIAGNOSTICS
SUBMODE F9	REPAIR VERIFICATION

F9: REPAIR VERIFICATION

After repairs are made to a vehicle powertrain system the status of system DTC's and monitor tests should be checked. Using this submode will help determine the effectiveness of repairs just completed to the system using the test modes within the Asian Imports program, including the importance of manufacturer OBD II drive cycle and monitor completion after repairs.

OPERATING PROCEDURE

1. Press F9 to select OBD II TOOLPAK from the Select Mode menu.
2. Press F0 to select Diagnostics from the OBD II Toolpak menu. The key help screen will be displayed.
3. Press F9 to select Repair Verification from the Diagnostics menu.

   First time users: to ensure proper operation, this mode is best reviewed before actual testing on vehicle is performed.
4. Use the ↑ and ↓ keys to review the prompts that are displayed on the screen. Read any key help screens that may be displayed for navigation help.

   NOTE: For automobile manufacturer drive cycle information, refer to the service manual for the vehicle that is currently being tested.
5. Press EXIT to return to the previous question or test menu.

ACTIVE KEYS	
↑ / ↓	Scroll up and down.
EXIT	Exit to the previous question or test menu.

OBD II TOOLPAK	MODE F9
PARAMETERS	SUBMODE F1

F1: PARAMETERS

The Parameters submode displays text descriptions for each diagnostic data parameter displayed in the Asian Imports software application. Common high and low values for each diagnostic data parameter are also available for reference.

NOTE: When the tester is connected to the vehicle and Data List is selected, the total number of displayed diagnostic data parameters will depend on the vehicle ECU calibration. This is not a function of the tester.

MODE F9	OBD II TOOLPAK
SUBMODE F1	PARAMETERS
SUBMODE F0	DEFINITIONS

F0: DEFINITIONS

The text descriptions of each diagnostic data parameter are available when the tester is connected to a vehicle and a live data list is displayed, or during a shop or training review session and the tester is not connected to a vehicle.

OPERATING PROCEDURE - Viewing on-vehicle live data list

1. Set up and display a data list using F0: Data List.

2. Scroll through the Data List until the parameter for which you want information is displayed. Press F0 to select the top parameter, or press F1 to select the bottom parameter. An asterisk (*) will appear next to the selected parameter.

3. Press ENTER to display the first text screen for the selected parameter. Press ↓ to advance through the text description screens. Press ↑ to view the previous text description screen.

4. To select a different parameter, press EXIT to return to the Data List parameter pair screen. Press the opposite function key used to select the previous parameter (F0 or F1) to deselect the parameter. The asterisk (*) will disappear.

   Scroll through the Data List until a parameter for which you want information is displayed. Repeat Steps 2 and 3.

5. Press EXIT to return to the Data List parameter pair screen or Select Mode menu.

OBD II TOOLPAK	MODE F9
PARAMETERS	SUBMODE F1
DEFINITIONS	SUBMODE F0

OPERATING PROCEDURE - Not viewing on-vehicle live data list

1. Press F9 to select OBD II Toolpak.
2. Press F1 to select Parameters from the OBD II Toolpak menu.
3. Press F0 to select Definitions from the Parameters menu. The key help screen will be displayed.
4. Press ↑ or ↓ to move the cursor to the desired diagnostic data parameter.
5. Press ENTER to display the first text screen for the selected parameter. Press ↓ to advance through the text description screens. Press ↑ to view the previous text description screen.
6. Press EXIT to return to the Parameter Definition list or the Parameters menu.

ACTIVE KEYS	
F9	Select OBD II Toolpak.
↑ / ↓	Scroll up and down.
F0 / F1	Select or deselect a parameter.
ENTER	View parameter description.
EXIT	Exit to the previous test menu.

COMMON TEST MODES
OBD II SYSTEMS

MODE F9	OBD II TOOLPAK
SUBMODE F1	PARAMETERS
SUBMODE F1	RANGES

F1: RANGES

Common high and low values for each diagnostic data parameter are available when connected to a vehicle and viewing a live data list, or during a shop or training review session. Current diagnostic data parameter values are available during connection to the vehicle powertrain system. The common high and low values were obtained by collecting data from actual OBD II certified I4, V6, and V8 powertrain systems operating with no faults detected.

OPERATING PROCEDURE

1. Press F9 to select OBD II TOOLPAK from the Select Mode menu.

2. Press F1 to select Parameters from the OBD II Toolpak menu.

3. Press F1 to select Ranges from the Parameters menu. The key help screen will be displayed.

4. Press ↓ , ↑ , or ENTER to advance through the text description screens. These text screens indicate that the displayed common high and low values are from actual OBD II certified systems.

5. Press ↑ or ↓ to move the cursor to the desired data parameter.

6. Press ENTER to display the first data condition screen for the selected parameter. The data condition screen displays the condition for which the hi/lo data is valid. The data condition and parameter name will toggle on the first display line. The YES or NO keys can be used to toggle between the data condition and the parameter name.

7. Press ↑ or ↓ to advance through the data conditions. As before, The data condition and parameter name will toggle on the first display line. The YES or NO keys can be used to toggle between the data condition and the parameter name.

   The data conditions are listed in the following chart:

OBD II TOOLPAK	MODE F9
PARAMETERS	MODE F1
RANGES	SUBMODE F1

Data Condition	Display, Line 1
key on, engine off	Key On, Eng Off:
key on, engine running at idle	KOER, IDLE RPM:
key on, engine running at 2500 RPM	KOER, 2500 RPM:
key on, engine running, in drive, 0 MPH	KOER-DRV, 0MPH:
key on, engine running, in drive, 15 MPH	KOER-DRV, 15MPH:
key on, engine running, in drive, 25 MPH	KOER-DRV, 25MPH:
key on, engine running, in drive, 35 MPH	KOER-DRV, 35MPH:
key on, engine running, in drive, 45 MPH	KOER-DRV, 45MPH:
key on, engine running, in drive, 55 MPH	KOER-DRV, 55MPH:
key on, engine running, in drive, wide open throttle acceleration	KOER-DRV, WOT:
key on, engine running, in drive, closed throttle deceleration	KOER-DRV, CTD:

8. The actual value for the current parameter is displayed on line 2 (**ONLY** if the tester is connected to an OBD II system and F9: OBD II Toolpak is selected from the select mode menu). If the tester is not connected to an OBD II system and F9: OBD II Toolpak has not been selected from the select mode menu only the common high and low values are displayed.

9. Common high (hi) and low (lo) parameter values for the data condition are displayed on lines 3 and 4 (common hi and lo values were obtained from actual vehicle powertrain systems with OBD II certified systems).

10. Press EXIT to return to the parameter list or Parameters menu.

ACTIVE KEYS	
↑ / ↓	Scroll up and down.
ENTER	Select parameter to view.
YES & NO	Toggle display.
EXIT	Exit to the previous test menu.

MODE F9	OBD II TOOLPAK
SUBMODE F2	DTC LIBRARY

F2: DTC LIBRARY

An OBD II ECU is capable of setting a DTC which indicates the failed circuit or component. In some cases, reading DTCs from the ECU may reveal multiple stored DTCs. However, the ECU is programmed to potentially store several hundred DTC's.

F2: DTC Library enables you to obtain text description information for each powertrain DTC available for display. The DTC Library consists of a combination of DTCs defined by the manufacturer specifically for the vehicle under test and DTCs defined by the Society of Automotive Engineers (SAE). For any DTC number that is not defined by the manufacturer of the vehicle under test, a description defined by Society of Automotive Engineers (SAE) recommended practice J2012 will be displayed. A specific DTC may be entered individually or you can scroll through the entire DTC list.

OPERATING PROCEDURE

1. Press F9 to select OBD II TOOLPAK from the Select Mode menu.
2. Press F2 to select DTC Library from the OBD II Toolpak menu. The key help screen will be displayed.
3. Use the tester keys 0 - 9 to enter the four digit number of the DTC for which information is desired.
4. Press ENTER to display the DTC number and text description. Use ↑ or ↓ to scroll through the DTC list. Holding the ↑ or ↓ key causes continuous scrolling. A text description of the code will be displayed.
5. Press EXIT to return to the enter DTC number screen or the OBD II Toolpak menu.

ACTIVE KEYS	
↑ / ↓	Scroll up and down.
0 - 9	Enter DTC Number.
ENTER	View DTC description.
EXIT	Exit to the previous test menu.

OBD II TOOLPAK	MODE F9
READINESS INFORMATION	SUBMODE F3

F3: READINESS INFORMATION

Readiness Tests represent a segment of new legislated diagnostic information that can be displayed by the tester. A Readiness Test is a specific test that the ECU performs. When the ECU runs a Readiness Test, it tests the particular portion of the electronic powertrain control system (Catalyst, O2S Sensor, etc.) for the respective monitor. Readiness Tests can reveal the status of the system and it is recommended that service technicians become familiar with Readiness Tests when working on OBD II compliant systems.

OPERATING PROCEDURE

1. Press F9 to select OBD II TOOLPAK from the Select Mode menu.
2. Press F3 to select Readiness Test from the OBD II Toolpak menu. The key help screen will be displayed.
3. Press ↑ or ↓ to move the cursor to the desired Readiness test.
4. Press ENTER to display the first text screen for the selected Readiness test. Press ↓ to advance through the text description screens. Press ↑ to view the previous text description screen.
5. Press EXIT to return to the select monitor list or the OBD II Toolpak menu.

ACTIVE KEYS	
↑ / ↓	Scroll up and down.
ENTER	Select monitor to view.
EXIT	Exit to the previous test menu.

MODE F9	OBD II TOOLPAK
SUBMODE F4	O2S INFORMATION

F4: OXYGEN SENSOR INFORMATION

On-Board Diagnostic (OBD) and On-Board Diagnostic generation I (OBD I) system's oxygen sensor (O2S) has been a major component within an electronic powertrain control system. In those systems, the upstream (ahead of catalytic converter) O2S sensor is used to detect air/fuel ratios ahead of the catalytic converter.

With OBD II, the system now uses an additional oxygen sensor that is placed downstream of the catalytic converter. The addition of a downstream oxygen sensor enables the PCM to perform a catalytic converter efficiency test. As a result of OBD II's downstream oxygen sensors, vehicle equipment may include many oxygen sensors on a vehicle; for example, a vehicle with dual exhaust and two separate catalytic converters can have four O2 sensors.

Using F4: O2S Information a text based description of expected O2S locations, nomenclature, type used, plus how to inspect, torque, and remove and replace O2Ss is displayed.

OBD II TOOLPAK	MODE F9
O2S INFORMATION	SUBMODE F4
LOCATION	SUBMODE F0

F0: LOCATION

This mode is used to obtain information on oxygen sensor identification (bank number and sensor number) for the vehicle under test. A sample of actual vehicles with OBD II was used to determine the unique types of exhaust type, number of catalytic converters and oxygen sensors. This information was then arranged in a way that you can select the configuration based on vehicle equipment.

Using this mode can assist you in learning about the OBD II system's new oxygen sensor naming and location conventions.

NOTE: Use of this mode requires knowledge of the vehicle's emissions equipment configuration: exhaust type (dual, single, single with a "y" connection), number of catalytic converters, and number of oxygen sensors.

Refer to the Appendix B for further OBD II Oxygen Sensor Location Information.

OPERATING PROCEDURE

1. Press F9 to select OBD II TOOLPAK from the Select Mode menu.
2. Press F4 to select O2S Information from the OBD II Toolpak menu.
3. Press F0 to select Location from the O2S Information menu. The key help screen will be displayed. Press ENTER or wait to advance.
4. A series of information screens will appear. They remind you to review and obtain the following information from the vehicle configuration:

   -exhaust type (dual, single, single with a "y" connection)
   -total number of catalytic converters
   -total number of oxygen sensors

   Press ENTER or wait to advance.

COMMON TEST MODES
OBD II SYSTEMS

MODE F9	OBD II TOOLPAK
SUBMODE F4	O2S INFORMATION
SUBMODE F0	LOCATION

5. Using information obtained in step 4, select exhaust system type.

6. Using information obtained in step 4, select number of catalytic converters (if required).

7. Using information obtained in step 4, select number of oxygen sensors (if required).

8. A confirmation screen with your selected data is displayed. The key help screen will be displayed. Press ENTER or wait to advance.

9. Press ↓ to advance through the text description screens. Press ↑ to back up through the text description screens. These text screens contain bank number and sensor number information that the OBD II system uses for its naming convention. Using this information will help your understanding of the OBD II system.

10. Press EXIT to return to previous menu.

ACTIVE KEYS	
↑ / ↓	Scroll up and down.
F0	Select O2S location, exhaust system, number of catalytic converters, number of oxygen sensors
F1	Select exhaust system, number of catalytic converters, number of oxygen sensors
F2	Select exhaust system, number of oxygen sensors
F4	Select O2S Information
ENTER	Advance program from current screen
EXIT	Exit to the previous test menu.

OBD II TOOLPAK	MODE F9
O2S INFORMATION	SUBMODE F4
TYPE	SUBMODE F1

F1: TYPE

Mode F1: Type provides text based information about how the electronic powertrain control system utilizes heated (upstream and downstream) and non-heated (upstream and downstream) oxygen sensors. Information on sensor signal, PCM use, and heater operation is provided. This mode can assist you in learning about the importance of an OBD II system's oxygen sensor based on the types of O2Ss that are currently used on vehicles.

NOTE: Use of this mode requires knowledge about the oxygen sensor type (upstream, downstream, heated, non-heated) for the current vehicle under test.

OPERATING PROCEDURE

1. Press F9 to select OBD II TOOLPAK from the Select Mode menu.
2. Press F4 to select O2S Info from the OBD II Toolpak menu.
3. Press F1 to select Type from the O2S Information menu. The key help screen will be displayed. Press ENTER or wait to advance.
4. Press F0 to select upstream oxygen sensor or F1 to select downstream oxygen sensor.
5. Press F0 to select heated oxygen sensor or F1 to select non-heated oxygen sensor.
6. Press ↓ to advance through the text description screens. Press ↑ to back up through the text description screens. These text screens contain oxygen sensor (O2S) signal information and O2S use information for each sensor type. Using this information will help your understanding of the OBD II system.
7. Press EXIT to return to the previous menu.

ACTIVE KEYS	
↑ / ↓	Scroll up and down.
F0	Select upstream or heated O2S.
F1	Select downstream or non-heated O2S.
ENTER	Advance program from current screen.
EXIT	Exit to the previous test menu.

MODE F9	OBD II TOOLPAK
SUBMODE F4	O2S INFORMATION
SUBMODE F2	MAINTENANCE

F2: MAINTENANCE

Mode F2: Maintenance provides three submodes of text based information on the inspection, torque specification, and standard removal & replacement description for oxygen sensors. Using F2: Maintenance can help you understand and review O2S sensor inspection, O2S sensor torque requirements, and guidelines for O2S sensor removal and replacement.

OBD II TOOLPAK	MODE F9
O2S INFORMATION	SUBMODE F4
MAINTENANCE	SUBMODE F2
INSPECTION	SUBMODE F0

F0: INSPECTION

Mode F0: Inspection provides information about O2S contamination, how to check signal full range operation, and recommended O2S sensor change intervals.

OPERATING PROCEDURE

1. Press F9 to select OBD II TOOLPAK from the Select Mode menu.
2. Press F4 to select O2S Information from the OBD II Toolpak menu.
3. Press F2 to select Maintenance from the O2S Information menu.
4. Press F0 to select Inspection from the select maintenance menu. The key help screen will be displayed. Press ENTER or wait to advance.
5. Press ↑ to advance through the text description screens. Press ↓ to back up through the text description screens. These text screens contain oxygen sensor (O2S) contamination information, how to check O2S sensor full range operation, and expected O2S sensor signal range.
6. Press EXIT to return to the previous menu.

ACTIVE KEYS	
↑ / ↓	Scroll up and down.
F0	Select Inspection.
F2	Select Maintenance.
F4	Select O2S Information.
ENTER	Advance program from current screen.
EXIT	Exit to the previous test menu.

MODE F9	OBD II TOOLPAK
SUBMODE F4	O2S INFORMATION
SUBMODE F2	MAINTENANCE
SUBMODE F1	TORQUE SPECIFICATION

F1: TORQUE SPECIFICATION

Mode F1: Torque Specification provides information about O2S installation and O2S Torque requirements.

OPERATING PROCEDURE

1. Press F9 to select OBD II TOOLPAK from the Select Mode menu.
2. Press F4 to select O2S Information from the OBD II Toolpak menu.
3. Press F2 to select Maintenance from the O2S Information menu.
4. Press F1 to select Torque Specification from the select maintenance menu. The key help screen will be displayed. Press ENTER or wait to advance.
5. Press ↓ to advance through the text description screens. Press ↑ to back up through the text description screens. These text screens contain oxygen sensor (O2S) installation information and O2S Torque requirements.
6. Press EXIT to return to the previous menu.

ACTIVE KEYS	
↑ / ↓	Scroll up and down.
1	Select Torque Specification.
F2	Select Maintenance.
F4	Select O2S Information.
ENTER	Advance program from current screen.
EXIT	Exit to the previous test menu.

OBD II TOOLPAK	MODE F9
O2S INFORMATION	SUBMODE F4
MAINTENANCE	SUBMODE F2
REMOVE AND REPLACE	SUBMODE F2

F2: REMOVE AND REPLACE

Mode F2: Remove and Replace provides standard O2S removal and replacement information. Removal information for O2 sensors describes a proper method of how to remove an O2S from the vehicle, and replacement information for O2 sensors describes a proper method of how to replace an O2S into the vehicle. This mode describes a sound method of O2S sensor removal and replacement based on automobile manufacturer procedures.

OPERATING PROCEDURE

1. Press F9 to select OBD II TOOLPAK from the Select Mode menu.
2. Press F4 to select O2S Information from the OBD II Toolpak menu.
3. Press F2 to select Maintenance from the O2S Information menu.

O2S Removal

4. Press F0 to select Remove from the O2S R&R information menu. The key help screen will be displayed. Press ENTER or wait to advance.
5. Press ↑ to advance through the text description screens. Press ↓ to back up through the text description screens. These text screens contain items to watch out for during oxygen sensor (O2S) removal from the vehicle exhaust pipe.
6. Press EXIT to return to previous menu.

MODE F9	OBD II TOOLPAK
SUBMODE F4	O2S INFORMATION
SUBMODE F2	MAINTENANCE
SUBMODE F2	REMOVE AND REPLACE

O2S Replacement

7. Press F1 to select Replace from the O2S R&R information menu. The key help screen will be displayed. Press ENTER or wait to advance.

8. Press ↓ to advance through the text description screens. Press ↑ to back up through the text description screens. These text screens contain items to watch out for during oxygen sensor (O2S) installation into the vehicle exhaust pipe.

9. Press EXIT to return to previous menu.

ACTIVE KEYS	
↑ / ↓	Scroll up and down.
F0	Select Remove O2S Info.
F1	Select Replace O2S Info.
F2	Select O2S Remove and Replace Info.
F4	Select O2S Information.
ENTER	Advance program from current screen.
EXIT	Exit to the previous test menu.

5.0 ASIAN IMPORTS DIAGNOSTIC DATA PARAMETERS

The following are the generic diagnostic data parameters defined by the SAE for OBD II vehicles. Not all parameters are displayed for all vehicles. Prior to displaying data, the tester queries the vehicle to determine which parameters are available for that vehicle.

AIR STATUS

STATES
UPSTRM,DNSTRM, ATM/OFF,RSRVD

Air Status displays information about the OBD II system's commanded secondary or auxiliary air injection diverter valve position. The possible states are diverting secondary air upstream of the first catalytic converter (UPSTRM), downstream of the first catalytic converter (DNSTRM), or venting to the atmosphere (ATM/OFF). RSRVD is applicable for future applications.

ECT (°)

UNITS	RANGE
°F	-40 to +419
°C	-40 to +215

Engine Coolant Temperature (ECT) is an analog input to the ECU. This parameter provides a temperature indication of engine coolant near the ECT sensor. ECT sensors can be located in the intake manifold, cylinder head, or water pump housing. Typical ECT is 200 °F (warm engine at idle). Note that the (°) in parenthesis indicates the parameter is temperature-related.

ENGINE LOAD

UNITS	RANGE
%	0 to 100

Engine Load is derived by the ECU from a measure of current engine airflow divided by engine peak airflow. Engine Load directly increases with throttle angle and drive conditions and is an indicator of percent engine capacity in any given operating mode. Engine Load is typically 5% at engine idle and 80% or greater during Wide Open Throttle (warm engine).

COMMON TEST MODES
OBD II SYSTEMS

ENGINE SPEED

UNITS	RANGE
RPM	0 to 8000

Engine Speed is an indication of crankshaft revolutions per minute. The ECU uses input engine speed to make determinations about current engine operating conditions and the operation of various engine management system output components.

FT-O2S B1 S1 FT-O2S B2 S1
FT-O2S B1 S2 FT-O2S B2 S2
FT-O2S B1 S3 FT-O2S B2 S3
FT-O2S B1 S4 FT-O2S B2 S4

UNITS	RANGE
%	-100 to +100

Fuel Trim-Oxygen Sensor (FT-O2S) Bx Sx represents the short-term correction to fuel injection that may be adopted by the ECU. In this case, oxygen sensor fuel trim represents the ECU's determination of exhaust gas oxygen content and relates the data to a short-term adjustment to fuel strategy, based on information obtained from the applicable O2S. Associated with the OBD II system and the parameter label are "Bx" and "Sx." Bx refers to Bank 1 or 2 and Sx refers to the sensor in positions 1, 2, 3, or 4. Refer to APPENDIX B: OBD II OXYGEN SENSOR LOCATION INFORMATION for a more complete description of the O2S naming convention.

FUEL PRESSURE

UNITS	RANGE
kPa	0 to 765
psi	0 to 111

Fuel Pressure data parameter is a gauge measure of the engine fuel rail pressure. The fuel pressure parameter can be displayed in metric units (kPa) or in English units (psi).

FUEL STATUS 1
FUEL STATUS 2

STATES
OPEN LOOP/CLOSED LOOP OL-DRIVE/OL-FAULT/CL-FAULT/ RESERVED/UNUSED

Fuel Status represents fuel control status of the feedback loop between the vehicle ECU and the oxygen sensor. Fuel Status can be displayed for both Bank 1 and Bank 2. If only Bank 1 is used for fuel control, FUEL STATUS 2 is displayed as UNUSED. The states of Fuel Status can be Open Loop, Closed Loop, Open Loop due to vehicle being driven at wide open throttle or coasting (OL-DRIVE), Open Loop due to a fault with the OBD II system (OL-FAULT), Closed Loop with only one oxygen sensor being used for fuel control and a fault with at least one oxygen sensor (CL-FAULT), or a display of a reserved status (RESERVED), which is used for future support.

IAT (°)

UNITS	RANGE
°F	-40 to +419
°C	-40 to +215

Intake Air Temperature (IAT) is an analog input to the ECU. This parameter provides a temperature indication of engine intake air temperature as it flows across the IAT sensor. IAT sensors can be located in the intake manifold, intake air plumbing, or airbox. Typical IAT is 140 °F (warm engine at idle). Note that the (°) in parenthesis indicates the parameter is temperature related.

IGN. TIMING

UNITS	RANGE
°	-64 to +64

Spark Advance (IGN. TIMING) is the amount of ignition electronic spark advance that the ECU is currently commanding. The amount of ignition spark advance is based on several inputs to the ECU (engine load, throttle angle, engine temperature, etc.) and a lookup table in the ECU's memory. For OBD II systems, Spark Advance should be the timing advance for cylinder number 1 and does not include mechanical advance (if applicable). Spark Advance increases with engine RPM, and a typical value is 10-20 degrees at idle (warm engine).

LT FT 1
LT FT 2

UNITS	RANGE
%	-100 to +100

Long-Term Fuel Trim (LT FT) is the measure of adaptive or feedback fuel correction strategy for the injection of fuel into the engine. Long-Term Fuel Trim represents the ECU's steady long-term adjustment to fuel strategy determined from a lookup table in its memory. This parameter changes slowly over time (at a rate slower than Short-Term Fuel Trim) and varies with engine design and engine operating conditions. The numeric character in LT FT 1 and LT FT 2 define the cylinders that are grouped as a bank for fuel feedback correction. Bank 1 is the bank which contains cylinder number 1. Expected values for this parameter are ±10.0% (warm engine at idle).

MAF (R)

UNITS	RANGE
lb/min	0 to 86
gm/s	0 to 655

Mass Air Flow (MAF) sensor is an input to the ECU and represents the amount of air that the engine is taking into the manifold, displayed as a flow rate (pounds per minute or grams per second). MAF flow rate will increase with engine load and is typically 4-7 gm/sec at idle or 17-20 gm/sec at 2500 RPM (warm engine). Note that the R in parenthesis indicates the parameter is rate-related.

MAP (P)

UNITS	RANGE
kPa	0 to 255
inHg	0 to 75

Manifold Absolute Pressure (MAP) sensor is a measure of the pressure within the intake manifold relative to atmospheric pressure. Depending on MAP sensor design, a frequency or analog output signal can be generated by a MAP sensor for input to the vehicle ECU. Atmospheric pressure equals the addition of manifold and vacuum pressures. MAP pressure increases with engine load and depending on altitude is typically 40 kPa at idle (warm engine, at sea level). Note that the P in parenthesis indicates the parameter is pressure-related.

MIL STATUS

STATES
OFF/ON

Malfunction Indicator Lamp (MIL) Status is an indication of the current MIL state. If no emission-related faults exist, the MIL will be OFF. If a DTC is stored in the ECU due to a system fault or the vehicle is operated in a condition that causes tailpipe emissions to exceed 1.5 times the allowed value for that vehicle, the MIL will be ON. In most cases, if a hard fault exists, the MIL will remain illuminated. Also, the MIL can illuminate then extinguish while driving the vehicle (which means the vehicle exceeded tailpipe emission standards).

OBD CERT.

STATES
OBD II, OBD, OBD2/OBD, OBD I, NO OBD

On-Board Diagnostics (OBD) Certification displays the level of OBD that the vehicle ECU is certified to. The states of OBD certification can be to OBD II (California Air Resources Board) requirements, OBD (federal) requirements, OBD II and OBD requirements, OBD I requirements, or No OBD requirements. This information can be helpful when determining certification and ordering parts.

O2S B1 S1 O2S B2 S1
O2S B1 S2 O2S B2 S2
O2S B1 S3 O2S B2 S3
O2S B1 S4 O2S B2 S4

UNITS	RANGE
Volts	0 to 1.25

Oxygen Sensor (O2S) Bx Sx is the output voltage of the O2S that is input to the ECU. The O2S signal is a measure of the oxygen content in the exhaust emission gases that surround the sensor tip and is a primary input to the ECU. Once the O2S is warmed up (>500 °F), its output voltage will fluctuate above and below a threshold of 0.450 volts. Values greater than 0.450v indicate a rich condition, while values less than 0.450v indicate a lean condition. If the O2S has not achieved its normal operating temperature, its value may remain at 0.450v. Associated with the OBD II system and the parameter label are "Bx" and "Sx." Bx refers to Bank 1 or 2 and Sx refers to the sensor in positions 1, 2, 3, or 4. Refer to APPENDIX B: OBD II OXYGEN SENSOR LOCATION INFORMATION for a more complete description of the O2S naming convention.

ST FT 1
ST FT 2

UNITS	RANGE
%	-100 to +100

Short-Term Fuel Trim (ST FT) is the measure of adaptive or feedback fuel correction strategy for the injection of fuel into the engine. Short-Term Fuel Trim represents the ECU's dynamic short-term adjustment to fuel strategy determined from a lookup table in its memory. This parameter is continually changing over time (at a rate faster than Long-Term Fuel Trim) and varies with engine design and engine operating conditions. The numeric character in ST FT 1 and ST FT 2 defines the cylinders that are grouped as a bank for fuel feedback correction. Bank 1 is the bank which contains cylinder number 1. Expected values for this parameter can be ±2.0% (warm engine at idle).

STORED DTCS

UNITS	RANGE
none	0 to 127

Stored DTCs is the number of emission-related diagnostic trouble codes (DTCs) that have been stored in the reporting ECU. (For OBD II systems, there can be multiple OBD II-compliant ECUs. Also, more than one ECU can report more than one stored DTC.) Therefore, the number of stored DTCs refers to the ECU whose data is currently being displayed. Remember also that OBD II DTCs are 5 characters and are broken into system categories:

System: Pxxxx=Powertrain
Bxxxx=Body
Cxxxx=Chassis

Category: x0100 to x0999=SAE-defined DTCs
x1000 or greater=Manufacturer-defined DTCs

TPS (%)

UNITS	RANGE
%	0 to 100

Throttle Position Sensor (TPS) is an input to the ECU and provides information about throttle plate opening. For OBD II systems, TPS voltage is converted by the ECU and displayed as a relative or absolute throttle opening value. Therefore, this indicates how much the throttle is opened off its throttle stop and not in relation to a zero voltage level. TPS percentage changes with the movement of the accelerator pedal and should display 0-20% at idle to above 80% at Wide Open Throttle.

VEHICLE SPEED

UNITS	RANGE
MPH	0 to 158
km/h	0 to 255

Vehicle Speed is an indication of vehicle speed in miles per hour or kilometers per hour. The ECU uses vehicle speed to make determinations about current engine operating conditions and the operation of various engine management system output components.

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APPENDICES

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A: UNDERSTANDING OBD II

WHAT IS OBD II?

The California Air Resource Board (CARB) requires that, by model year 1996, all vehicles sold in California (under 8500 GVWR) contain a certain minimum "On-Board Diagnostic" capability to diagnose emissions-related failures of the engine control system. These diagnostic requirements have been designated as OBD II (On-Board Diagnostics, Phase II) with a goal of monitoring "all of the emissions-related components on-board the vehicle for proper operation." CARB's intent with the OBD II program is to "permit the State's Inspection and Maintenance Program to evolve into a check of the on-board computer for the presence of Diagnostic Trouble Codes (DTCs); underhood and tailpipe inspections would no longer be required."

CARB has left the task of defining the Standards and Recommended Practices needed to implement their OBD II requirements to the Society of Automotive Engineers (SAE). The SAE committees that define these documents are made up of worldwide representatives from the vehicle manufacturers, tool manufacturers, service industry, and regulatory agencies, plus other related automotive disciplines. The glossary in Appendix D contains a brief description of the SAE "J" documents which provide these definitions.

Part of the OBD II program is for the vehicle to provide a standard interface for off-board diagnostic test equipment. This standard interface includes a standard test connector (referred to as the J1962 connector), a standard communication protocol (SAE J1850 or ISO 9141-2), and a standard set of diagnostic test modes (defined by SAE J1979).

In addition to defining the California-mandated emissions testing requirements, OBD II satisfies the EPA's federal OBD testing requirements through 1998. Therefore, equipment used to access the vehicle's OBD II data can also be used to test vehicles under the federal OBD requirements which are in the process of being implemented in some states.

OBD II SCAN TOOL

Part of the intent of CARB's OBD II program is that a single diagnostic tester can be used to read the diagnostic information from any OBD II-compliant vehicle. A tester which satisfies this requirement can be designated as an **OBD II Scan Tool** and is defined by the SAE document J1978. One of the requirements of the OBD II Scan Tool is that it has to work with any OBD II-compliant vehicle and be able to automatically determine all information required to communicate with the vehicle. The operator does not enter any vehicle-specific information such as the vehicle manufacturer, model year, or engine. The OBD II Scan Tool determines what protocol the vehicle uses, what diagnostic parameters can be read from the vehicle, and what tests are supported by the vehicle.

The SAE Recommended Practice J1978 defines the basic requirements for an OBD II Scan Tool. SAE Recommended Practice J1979 defines the test modes used by both the vehicle and the OBD II Scan Tool to access vehicle information and functions. The following test modes are required for a basic OBD II Scan Tool:

- Display Current Diagnostic Data Parameters (J1979, Mode 1).
- Display Diagnostic Trouble Codes, DTCs (J1979, Mode 3).
- Display Freeze Frame Data captured by the vehicle along with a DTC (J1979, Mode 2).
- Clear DTCs and Freeze Frame Data from the on-board controller's memory (J1979, Mode 4).
- Display results of Oxygen Sensor Monitoring Tests (J1979, Mode 5).
- Display status of the vehicle's on-board Readiness Tests.

In addition to these required OBD II Scan Tool functions, the Vetronix testers provide a number of enhancements to the basic OBD II diagnostic functions:

- Road test support through the capture of sequences of data parameters (Snapshot mode).
- User-selectable parameter list allowing the user to trade off update rate for amount of data.
- Display results of on-board monitoring tests, both Continuous and Non-Continuous (J1979, Modes 6 and 7).
- Print data parameters.
- Displays results for control of on-board system, test, or component (J1979, Mode 8)
- Displays vehicle specific information such as VIN and calibration IDs (J1979, Mode 9)

OBD II COMMUNICATION PROTOCOLS

One of the OBD II requirements is that the vehicle contain a standard serial communication link to off-board test equipment. This "standard" communication link turns out to be three separate links, two defined by the SAE and one defined by ISO:

- J1850 10.4K VPW Protocol
  Uses a single-wire 7-volt bus communicating at 10,400 bits/second using Variable Pulse Width (VPW) data encoding.

- J1850 41.6K PWM Protocol
  Uses a two-wire 5-volt bus communicating at 41,600 bits/second using Pulse Width Modulation (PWM) data encoding.

- ISO 9141-2 Protocol
  Uses a single-wire 12-volt bus communicating at 10,400 bits/second using UART data encoding.

A vehicle manufacturer can satisfy the OBD II requirements by implementing any one of the three protocols. The OBD II Scan Tool must provide support for all three protocols in order to allow it to communicate with all OBD II vehicles.

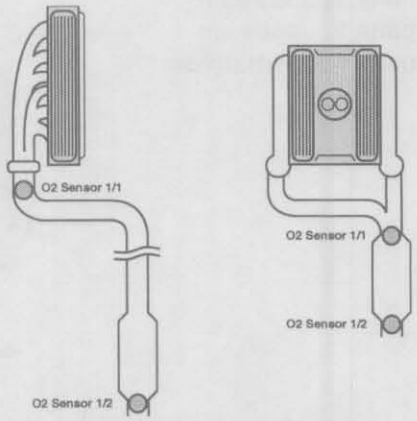
B: OBD II OXYGEN SENSOR LOCATION INFORMATION

OBD II compliant engine management systems use a new naming convention for oxygen sensors (O2S). The need for this sensor convention was required because of the OBD II system's use of a downstream O2S.

O2S location information is divided into cylinder bank and O2S location. Bank 1 contains the sensor that is downstream from the engine cylinder bank which has number 1 cylinder. Bank 2 contains the sensor opposite the cylinder Bank 1.

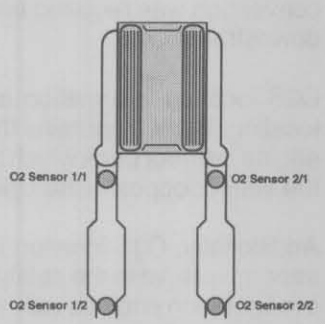
Additionally, O2S location is separated into upstream and downstream, relative to the catalytic converter. For inline engines and V-configuration engines with Y exhaust systems and one O2S ahead of the catalytic converter, O2S 1 is the upstream sensor and O2S 2 is the downstream sensor. This results in the naming convention bank/location. Examples are:

O2S B1 S1 = bank 1, upstream
O2S B1 S2 = bank 1, downstream



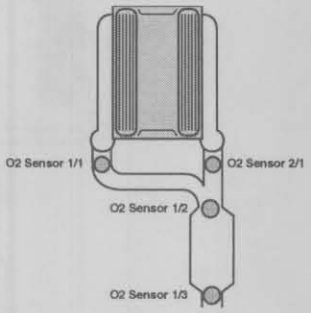
For V-configuration engines with dual exhaust systems, there may be a separate upstream and downstream O2S for each bank. This will result in the following naming convention:

O2S B1 S1 = bank 1, upstream
O2S B1 S2 = bank 1, downstream
O2S B2 S1 = bank 2, upstream
O2S B2 S2 = bank 2, downstream



On some V-configuration engines with 2 upstream O2S, there may be an O2S 3. O2S 3 is the downstream O2S after the catalytic converter. This configuration may have a third O2S ahead of the catalytic converter and results in the following naming convention:

O2S B1 S1 = bank 1, upstream
O2S B1 S2 = bank 1, upstream
O2S B2 S1 = bank 2, upstream
O2S B1 S3 = bank 1, downstream



Together, these conventions are all used to identify the O2S that may be causing a DTC or producing a faulty signal. The O2S naming conventions shown here are consistent with J1979. Please consult the appropriate service manual for more information on the vehicle that you are working on.

C: DEFINITION OF CODE TYPE

The Asian Imports application cartridge uses five description for code types, which are Auto, Manual, ECU LED, Malfunction Indicator Lamp (MIL) codes, or OBDII DTCs.

Autocodes Term used when tester can read codes from the vehicle ECU automatically, via the data link connector. Used when vehicle is supported with F2: DTC.

Mancodes Term used when tester provides information on the tester display about how to read codes from vehicle ECU, and there is no connection to the vehicle via a diagnostic connector. Equipment used to manually read DTCs includes single wire jumper, analog voltmeter, ECU LED, or Mastertech oscilloscope function. Used when vehicle is supported with F1: DTC ENTRY.

ECU LED Term used when tester provides information the on tester display about how to read ECU codes from vehicle ECU LED, and there is no connection to the vehicle via a diagnostic connector. Equipment used to manually read DTCs includes single wire jumper. Used when vehicle is supported with F1: DTC ENTRY.

MILcodes Term used when tester provides information the on tester display about how to read ECU codes from vehicle MIL, and there is no connection to the vehicle via a diagnostic connector. Equipment used to manually read DTCs includes single wire jumper. Used when vehicle is supported with F1: DTC ENTRY.

OBD II DTC Term used to describe a powertrain code that can be read from a vehicle ECU automatically, via the data link connector. The Society of Automotive Engineers (SAE) has defined a standardized set of five-character, alpha-numeric DTCs which can be read from an ECU by scantool. These DTCs are only available on OBD II compliant vehicles.

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D: IF YOU'RE HAVING A PROBLEM

This appendix describes some of the possible problems which you might run into when you try to use the Aian Imports Software on an OBD II compliant vehicle.

1. OBD II Interface Circuitry Not Installed

OBD II Interface Circuitry Not Installed

Possible Cause:

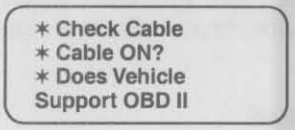
a. OBD II Interface Circuitry is not installed in the Tester.

Recommendations:

- Verify that the vehicle's ignition is on.
- Remove power from the tester by unplugging the DLC cable and reconnecting the cable.
- Verify that the OBD II Interface Circuitry is installed in your tester in one of the following configurations:
  - an OBD II Interface Cartridge is installed in the top slot of the TECH 1A.
  - a Vehicle Interface Module (VIM) is connected "in-line" with the serial data cable for either the TECH 1 or TECH 1A.
  - an OBD II compliant daughter board inside the Mastertech

IMPORTANT:
The OBD II Interface Cartridge will not work with a TECH 1. An error message, OBD II INTERFACE CIRCUITRY NOT INSTALLED, will be displayed if you attempt to use the OBD II Interface Cartridge with a TECH 1.

2. TESTER is Unable to Communicate with the Vehicle.



Possible Causes:

a. Vehicle's ignition is off.

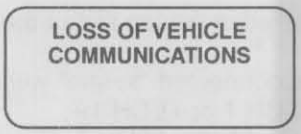
b. Diagnostic cable is not plugged into vehicle's diagnostic connector.

c. Vehicle is not OBD II-compatible.

Recommendations:

- Verify that the vehicle's ignition is on.
- Verify that cable is plugged into vehicle's diagnostic connector.
- Check underhood decal for OBD II certification.

3. TESTER Loses Communication with the Vehicle



Possible Causes:

a. Vehicle's ignition was turned off.

b. Diagnostic cable came loose from vehicle's diagnostic connector.

c. Vehicle failed to respond to query from tester.

Recommendations:

- Verify that the vehicle's ignition is on.
- Verify that cable is plugged into vehicle's diagnostic connector.
- Turn tester and vehicle's ignition off. Then turn ignition to on, followed by turning on the tester and attempting to reestablish communication.
- Some vehicles fail to respond properly to tester queries for certain tests. This is particularly true with oxygen sensor tests if all readiness tests have not been completed. If possible, drive the vehicle to complete the readiness tests and then rerun the tests.

4. Parameter Update Rate is Slow

Possible Cause:

- A slow update rate is characteristic of OBD II communications. A typical update rate is approximately 125 to 150 ms per parameter (7 or 8 updates per second for a single parameter). Therefore, a typical list of 20 parameters will only be updated approximately every 3 seconds.

Recommendation:

- If a faster update rate is needed, select fewer parameters using the CUSTOM LIST function. Select only the parameters needed for a test. For example, you can look at just an oxygen sensor signal and get an update of 7 or 8 times a second.

5. Not All Parameters Displayed

Possible Cause:

- The vehicle is not reporting all of the parameters. The Asian Imports software queries the vehicle's ECU to determine what parameters are supported by the ECU on OBD II compliant vehicles. The tester then creates a data list based on these parameters. If the vehicle contains a particular sensor, but does not tell the TESTER that it supports that parameter (e.g. a downstream oxygen sensor) the software will not display that parameter.

Recommendation:

- Diagnosis must be performed based on other diagnostic data or procedures.