

4.6 ABS & ABS/ETC SELF DIAGNOSTICS

DIAGNOSTIC TROUBLE CODES

The ABS and ABS/ETC control modules are equipped with a self diagnostic capability that can detect and isolate ABS and ABS/ETC problems or failures. When a problem or failure is detected, the ABS or ABS/ETC control module sets a diagnostic trouble code (DTC) that represents that particular problem or failure. There are twenty one DTCs on ABS and twenty nine on ABS/ETC systems that may be set by the ABS or ABS/ETC control module. Depending on the DTC set, either the ABS, ETC or both ABS and ETC systems will be disabled. If the ABS is disabled, it will allow for conventional non ABS braking only and the ABS warning lamp will be turned on. The control module has the capacity of storing three DTC's.

NOTE:

Warning lamp will illuminate whilst fault is active. If a fault has occurred and is not active, the lamp will not be illuminated and a fault code will be stored.

The control module performs an automatic test once during each ignition cycle when the vehicle reaches approximately 6 km/h (18km/h if the stop lamp switch signal is received). The automatic test cycles each solenoid valve and the pump motor to check component operation. If any error is detected during this test, the ABS or ABS/ETC control module will set a DTC. This test may be heard and felt while it is taking place and is a normal mode of operation.

The ABS or ABS/ETC control module can display the DTCs via the ABS warning lamp only when the 'Diagnostic Service Mode' has been entered. Entering the diagnostic service mode is accomplished by either earthing terminal 12 of the Data Link Connector (DLC) using a test lead fitted with suitable terminals and using ABS warning lamp to flash system DTCs as described under Flash Code Diagnostics Display in this Section or by using Tech 2 (refer to [4.7 TECH 2 DIAGNOSTICS](#) in this Section).

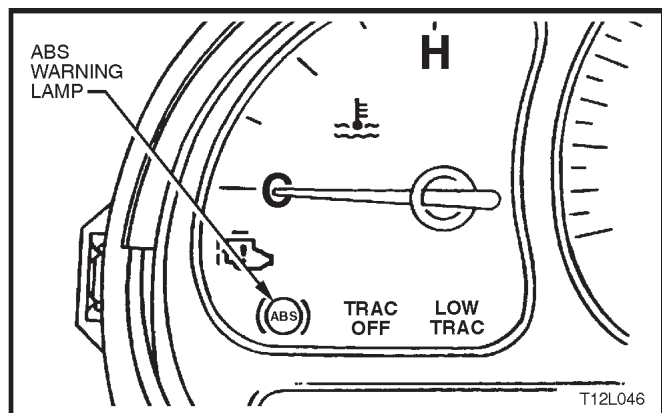


Figure 12L-78

FLASH CODE DIAGNOSTICS DISPLAY

To enable the ABS warning lamp to flash system DTCs, the vehicle must be stopped (vehicle speed is less than 10 km/h), terminal 12 of the DLC earthed (DLC terminal 5) using a test lead fitted with suitable terminals and then the ignition turned on. The flash code diagnostics will remain enabled as long as terminal 12 is earthed, serial data line communication has not been initiated or until any wheel speed is greater than 10 km/h.

Approximately 3 seconds after earthing terminal 12 (ignition on) of the DLC, the ABS or ABS/ETC control module will begin flashing the ABS warning lamp.

The flash sequence will begin with DTC 12 to signal the beginning of the flash code display. DTC 12 will flash three times. Each stored code will then be displayed three times. After all codes have been displayed, the sequence will repeat, starting with DTC 12.

The following charts set out all the possible diagnostic trouble codes.

NOTE:

Flash code diagnosis is not fully supported on certain trouble codes involving the solenoid valves or motor due to the valve relay inside the control unit being disabled. Trouble codes 41, 42, 45, 46, 47, 48, 55, 56, 61 and 63 will prevent the ABS warning lamp from turning off. These faults can only be read through the DLC using TECH 2.

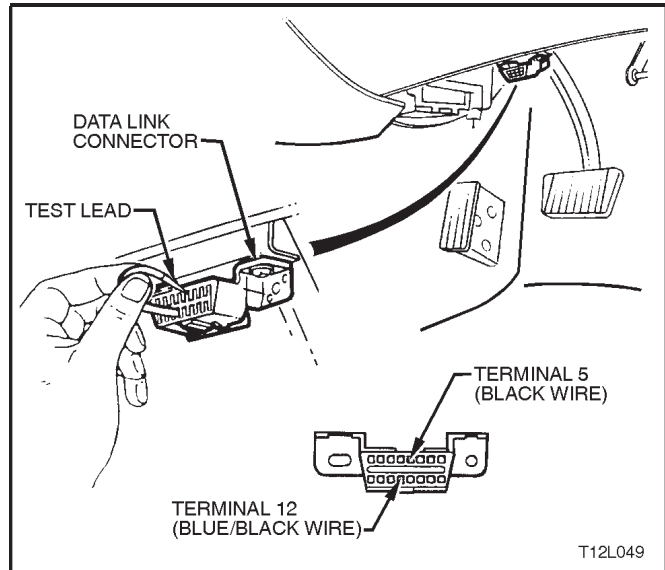
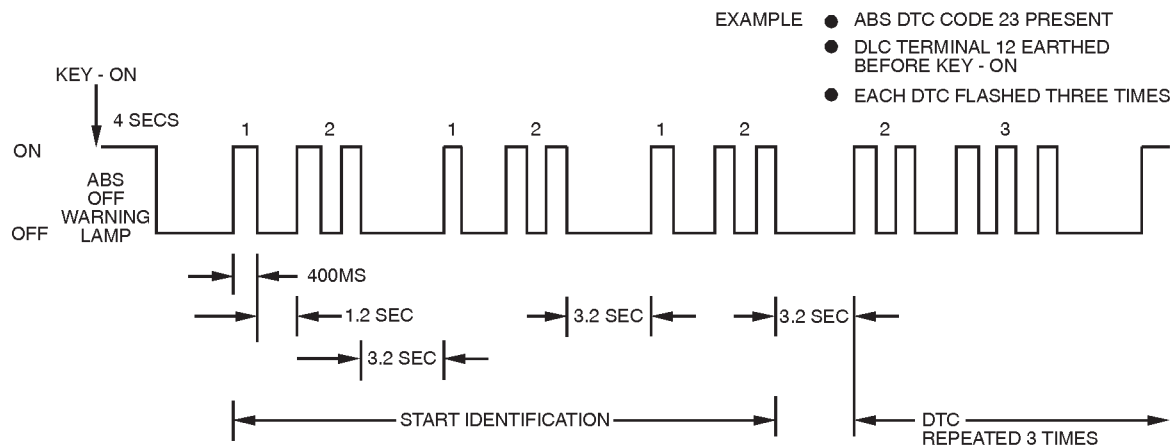


Figure 12L-79

FLASH CODE DIAGNOSTICS DISPLAY



VR12L045

Figure 12L-80

ABS DIAGNOSTIC TROUBLE CODES (EXCLUDING ABS/ETC)

| DTC | CODE DESCRIPTION |
|------------|--|
| 12 | No Fault |
| 21 | Front Right Wheel Speed Sensor Incorrect Signal |
| 23 | Front Right Wheel Speed Sensor Short Circuit or Open Circuit |
| 25 | Front Left Wheel Speed Sensor Incorrect Signal |
| 27 | Front Left Wheel Speed Sensor Short Circuit or Open Circuit |
| 28 | Wheel Speed Sensor Frequency Error |
| 31 | Rear Right Wheel Speed Sensor Incorrect Signal |
| 33 | Rear Right Wheel Speed Sensor Short Circuit or Open Circuit |
| 35 | Rear Left Wheel Speed Sensor Incorrect Signal |
| 37 | Rear Left Wheel Speed Sensor Short Circuit or Open Circuit |
| 41 | Front Right Inlet Valve Solenoid Fault |
| 42 | Front Right Outlet Valve Solenoid Fault |
| 45 | Front Left Inlet Valve Solenoid Fault |
| 46 | Front Left Outlet Valve Solenoid Fault |
| 55 | Rear Axle Inlet Valve Solenoid Fault |
| 56 | Rear Axle Outlet Valve Solenoid Fault |
| 61 | Pump Motor or Relay Fault |
| 63 | Valve Solenoid Relay Circuit Fault |
| 67 | Stop Lamp Switch Circuit Fault |
| 71 | Control Module Internal Fault |
| 85 | System Voltage Too Low |

ABS/ETC DIAGNOSTIC TROUBLE CODES (EXCLUDING ABS)

| DTC | CODE DESCRIPTION |
|-----|--|
| 12 | No Fault |
| 21 | Front Right Wheel Speed Sensor Incorrect Signal |
| 23 | Front Right Wheel Speed Sensor Short Circuit or Open Circuit |
| 25 | Front Left Wheel Speed Sensor Incorrect Signal |
| 27 | Front Left Wheel Speed Sensor Short Circuit or Open Circuit |
| 28 | Wheel Speed Sensor Frequency Error |
| 31 | Rear Right Wheel Speed Sensor Incorrect Signal |
| 33 | Rear Right Wheel Speed Sensor Short Circuit or Open Circuit |
| 35 | Rear Left Wheel Speed Sensor Incorrect Signal |
| 37 | Rear Left Wheel Speed Sensor Short Circuit or Open Circuit |
| 41 | Front Right Inlet Valve Solenoid Fault |
| 42 | Front Right Outlet Valve Solenoid Fault |
| 45 | Front Left Inlet Valve Solenoid Fault |
| 46 | Front Left Outlet Valve Solenoid Fault |
| 47 | Priming Valve Solenoid Fault |
| 48 | Switching Valve Solenoid Fault |
| 51 | Rear Right Inlet Valve Solenoid Fault |
| 52 | Rear Right Outlet Valve Solenoid Fault |
| 55 | Rear Left Inlet Valve Solenoid Fault |
| 56 | Rear Left Outlet Valve Solenoid Fault |
| 61 | Pump Motor or Relay Fault |
| 62 | RPM Signal Fault |
| 63 | Valve Solenoid Relay Circuit Fault |
| 67 | Stop Lamp Switch Circuit Fault |
| 71 | Control Module Internal Fault |
| 72 | Serial Data Fault |
| 73 | Requested Torque Circuit Fault |
| 74 | Actual Torque Circuit Fault |
| 78 | Incorrect Option Coding |
| 85 | System Voltage Too Low |

CLEARING DTCS

Any DTCs stored in the ABS or ABS/ETC control module's memory can be erased in one of three ways:

1. Diagnostic Request Line Procedure.
2. Tech 2 Clear Codes Selection.
3. Ignition Cycle Default.

These three methods are detailed as follows.

IMPORTANT:

Whichever method is used, be sure to verify proper system operation and absence of any DTCs when clearing procedure is completed. The ABS or ABS/ETC control module will not permit DTC clearing until all of the codes have been displayed. Also, DTCs cannot be cleared by unplugging the ABS or ABS/ETC control module, disconnecting the battery cables, or turning the ignition OFF (except on an ignition cycle default).