4.6 ABS SELF DIAGNOSTICS

DIAGNOSTIC TROUBLE CODES

The ABS control module is equipped with a self diagnostic capability that can detect and isolate ABS problems or failures. When a problem or failure is detected, the ABS control module sets a diagnostic trouble code (DTC) that represents that particular problem or failure. There are eighteen DTCs that may be set by the ABS control module. All of the DTCs will cause the control module to disable the ABS (allowing conventional non ABS braking only) and the 'ABS OFF' warning lamp will be turned on. The control module performs an automatic test once during each ignition cycle when the vehicle reaches approximately 6 km/h. 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 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 control module can display the DTCs via the 'ABS OFF' 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 OFF' warning lamp to flash system DTCs as described under 'Flash Code Diagnostics Display' in this Section or by using the Tech 1 Diagnostic Scan Tool (refer to '4.7 Tech 1 Diagnostics' in this Section).

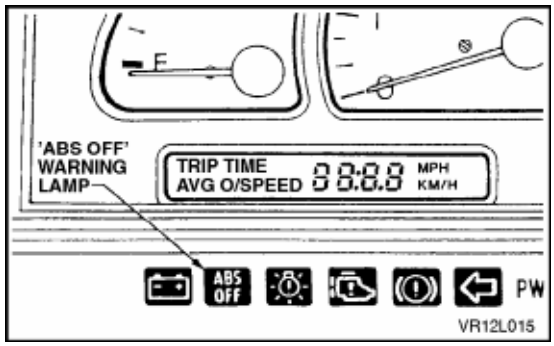

Figure 12L-79

FLASH CODE DIAGNOSTICS DISPLAY

To enable the 'ABS OFF' 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 of the DLC, the ABS control module will begin flashing the 'ABS OFF'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 chart on the next page sets out all the possible diagnostic trouble codes.

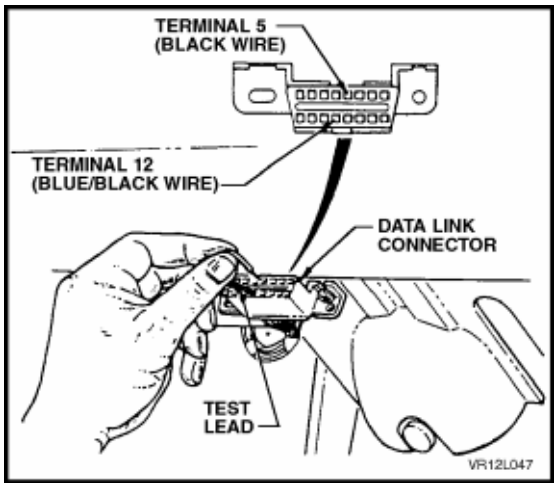

Figure 12L-80

DTC	CODE DESCRIPTION
12	Diagnostic System Operational
21	Right Hand Front Wheel Speed Sensor Fault
23	Right Hand Front Wheel Speed Sensor Continuity Fault
25	Left Hand Front Wheel Speed Sensor Fault
27	Left Hand Front Wheel Speed Sensor Continuity Fault

28	Wheel Speed Sensor Frequency Error
31	Right Hand Rear Wheel Speed Sensor Fault
33	Right Hand Rear Wheel Speed Sensor Continuity Fault
35	Left Hand Rear Wheel Speed Sensor Fault
37	Left Hand Rear Wheel Speed Sensor Continuity Fault
41	Right Hand Front Inlet Solenoid Valve Circuit Fault
42	Right Hand Front Outlet Solenoid Valve Circuit Fault
45	Left Hand Front Inlet Solenoid Valve Circuit Fault
46	Left Hand Front Outlet Solenoid Valve Circuit Fault
55	Rear Inlet Solenoid Valve Circuit Fault
56	Rear Outlet Solenoid Valve Circuit Fault
61	Pump Motor Relay Circuit Fault
63	Valve Relay Circuit Fault
71	ABS Control Module Internal Fault

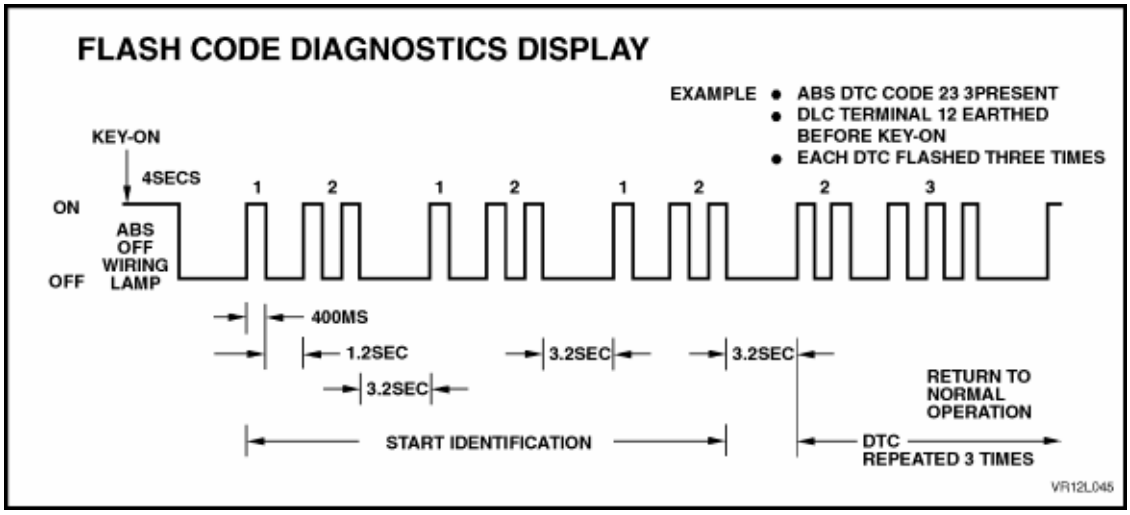

Figure 12L-81

CLEARING DTCs

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

1. Diagnostic Request Line Procedure.
2. Tech 1 "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 control module will not permit DTC clearing until all of the codes have been displayed. Also, DTCs cannot be cleared by unplugging the ABS control module, disconnecting the battery cables, or turning the ignition 'OFF' (except on an ignition cycle default).

Diagnostic Request Line Procedure

To clear trouble codes via the DLC diagnostic request line (terminal 12), go through the following procedure.

1. Turn ignition 'OFF'.
2. Connect a test lead fitted with suitable terminals between DLC terminals 5 (black wire) and 12 (blue/black wire).
3. Turn ignition on (this will enable Flash Code Diagnostics Display) and allow all codes to be displayed.
4. Disconnect one end of test lead from DLC for approximately 1 second then reconnect for no less than 1 second. Repeat this step at least 2 more times within 10 seconds, leaving test lead connected to DLC upon completion of final connection.

Observe flashing 'ABS OFF' warning lamp. Only DTC 12 should be flashed. If not, trouble codes have not been properly cleared. Begin clearing code procedure again at Step 1. If DTCs are cleared, wait at least 15 seconds before turning ignition 'OFF'.

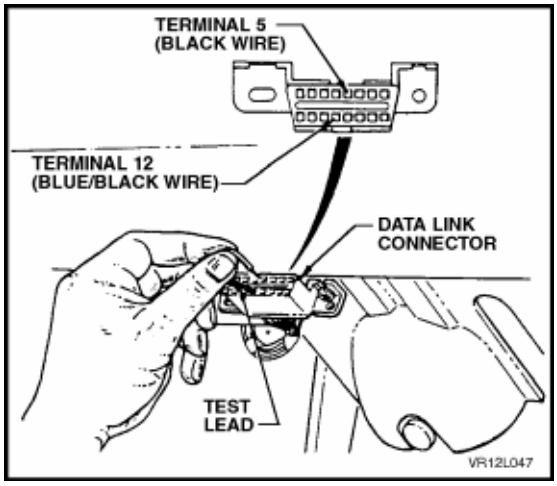

Figure 12L-82

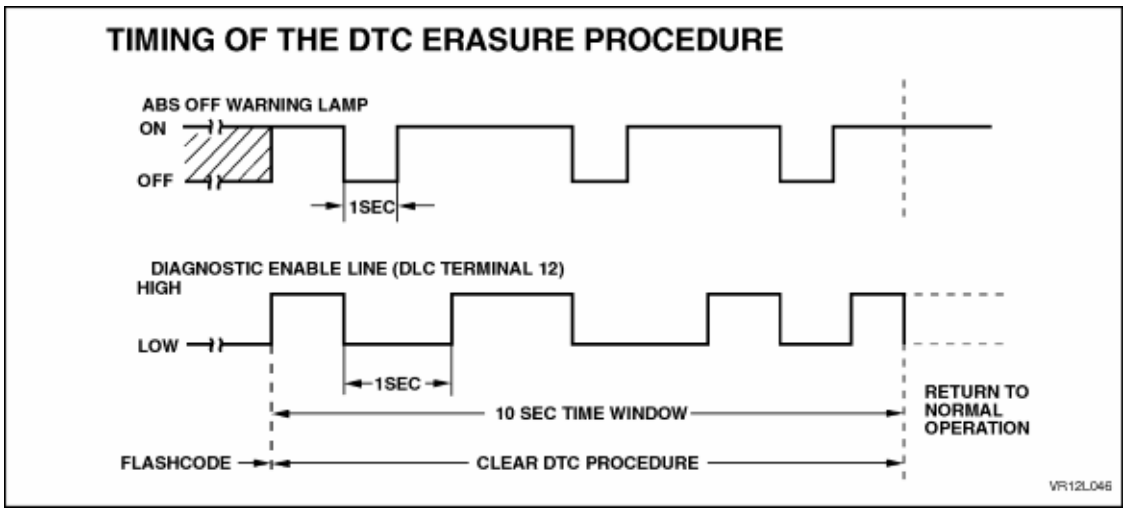

Figure 12L-83

Tech 1 "Clear Codes" Procedure

Before clearing DTCs, check and note any history code data, as this information will also be cleared.

Select the appropriate menu, and select the 'Clear Codes' function. Verify that DTCs have been cleared by using the Tech 1 to read ABS codes. If any are present, either the DTCs were not cleared, or an ABS fault still exists.

Ignition Cycle Default

If the ignition is cycled 100-times without a particular fault reappearing, that fault code will be erased from ABS control module memory, and the ignition cycle counter inside the control module will be reset to zero.