

4. BCM DIAGNOSTICS

4.1 PREREQUISITES TO DIAGNOSIS AND TROUBLESHOOTING

PRELIMINARY SYSTEM REQUIREMENTS

Before proceeding with system checks, ensure the following:

- No moisture is present in the wiring harness connections in the A-pillars.
- Sound ground connections are available for all functioning components, particularly at the body ground connection (adjacent to the battery).
- The battery is in good condition and charged above 11.5 volts.

PRE-DELIVERY MODE

To provide additional battery protection, the vehicle is delivered with the BCM in pre-delivery mode. In this mode, the battery saver period is set to 3 minutes. For further information refer to [1.1, BATTERY SAVER MODE](#) in this Section.

Pre-delivery mode is disabled once the vehicle has travelled for a total of 30 minutes at speeds above 20 km/h. This value is estimated to be the equivalent period prior to customer delivery.

Pre-delivery mode can be enabled or disabled by using the trip computer buttons and the Multi-Function Display (MFD) or by using TECH 2.

SAFETY REQUIREMENTS

When carrying out work that involves the risk of an electrical short circuit, disconnect the battery. However, refer to [Section 00, 5. BATTERY DISCONNECTION PROCEDURES](#) before disconnecting the battery.

To avoid the risk of being caught in the mechanism, do not touch mechanical components during function checks.

EQUIPMENT AND CHECKING

When undertaking any electrical checks on these systems, any digital multimeter that is used MUST have a minimum impedance of 10 megohms.

Exercise care when taking readings from wiring harness connectors. It is preferred that the back probing method with individual connectors is employed wherever possible to avoid terminal damage and subsequent connection failure.

When carrying out wiring checks as directed by the diagnostic charts, use the adaptors contained in the applicable connector test adaptor kit J35616-A (previously KM609) rather than probe terminals and connectors using incorrect sized multimeter connections. This prevents spreading the terminals and damaging the wiring harness.

NOTE: Some steps in the diagnostic charts test for an abnormal or 'false' signal. This method is used when the normal or 'correct' signal is of limited diagnostic value.

IMPORTANT:

- Ensure that the ignition is turned off and the battery ground lead is disconnected before any test requiring disconnection or reconnection of BCM connectors X1, X2 or X3.
- When checking the system, observe the exact order of the test steps.
- If the required nominal value is not achieved in any stage, the problem must be rectified before proceeding further.
- Check that the correct multimeter range is selected (as specified) before the test is carried out, unless the multimeter being used has an auto ranging function.
- To lower the BCM so as to gain access to wiring harness connectors, refer to [2.1 BODY CONTROL MODULE](#) in this Section.
- Testing various systems requires access to specific wiring harness connectors. For the location of these connectors, refer to [Section 120, FUSES AND WIRING HARNESSES](#).

TECH 2 Diagnostic Tool

TECH 2 is a hand-held diagnostic computer designed specifically to help Holden Retailer technicians to diagnose and repair electronic systems used on Holden vehicles.

TECH 2, with the appropriate software, cables and adaptors, is capable of reading serial data when connected to the Data Link Connector (DLC). The DLC is located in the instrument panel lower right-hand trim, below the steering column.

Legend

Data Link Connector (DLC)

DLC Adaptor

DLC Cable

TECH 2 diagnostic tool.

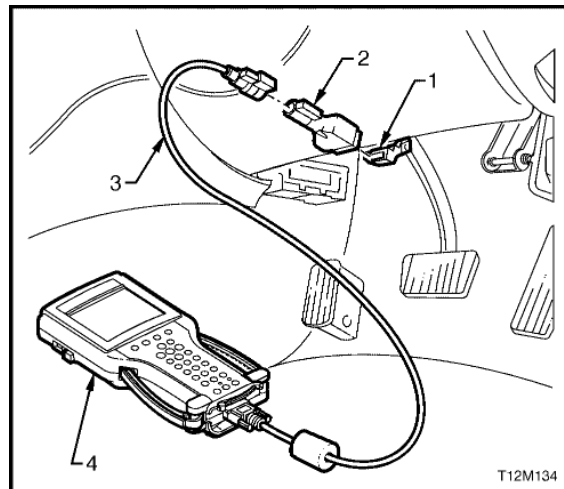


Figure 12J-211

For additional general information on connecting and operating TECH 2, refer to [Section 0C, TECH 2](#).

MODULE LOCATION

Right-hand Drive

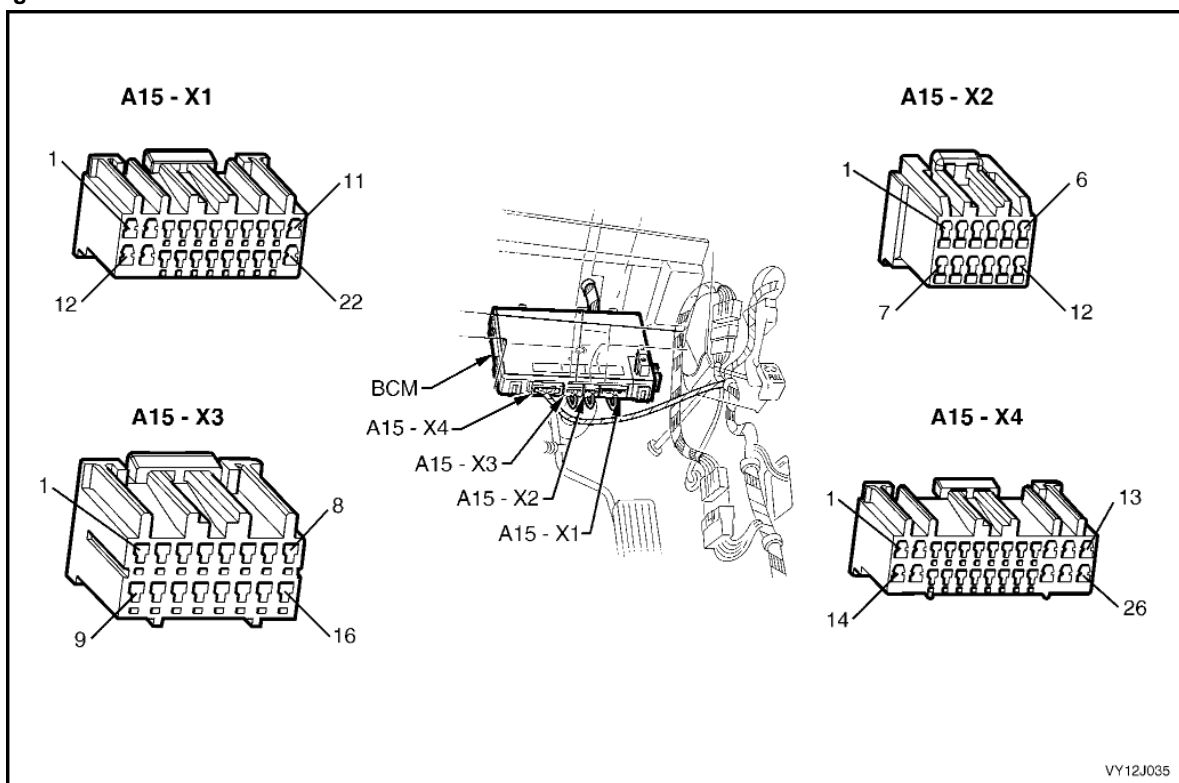


Figure 12J-212

Left-hand Drive

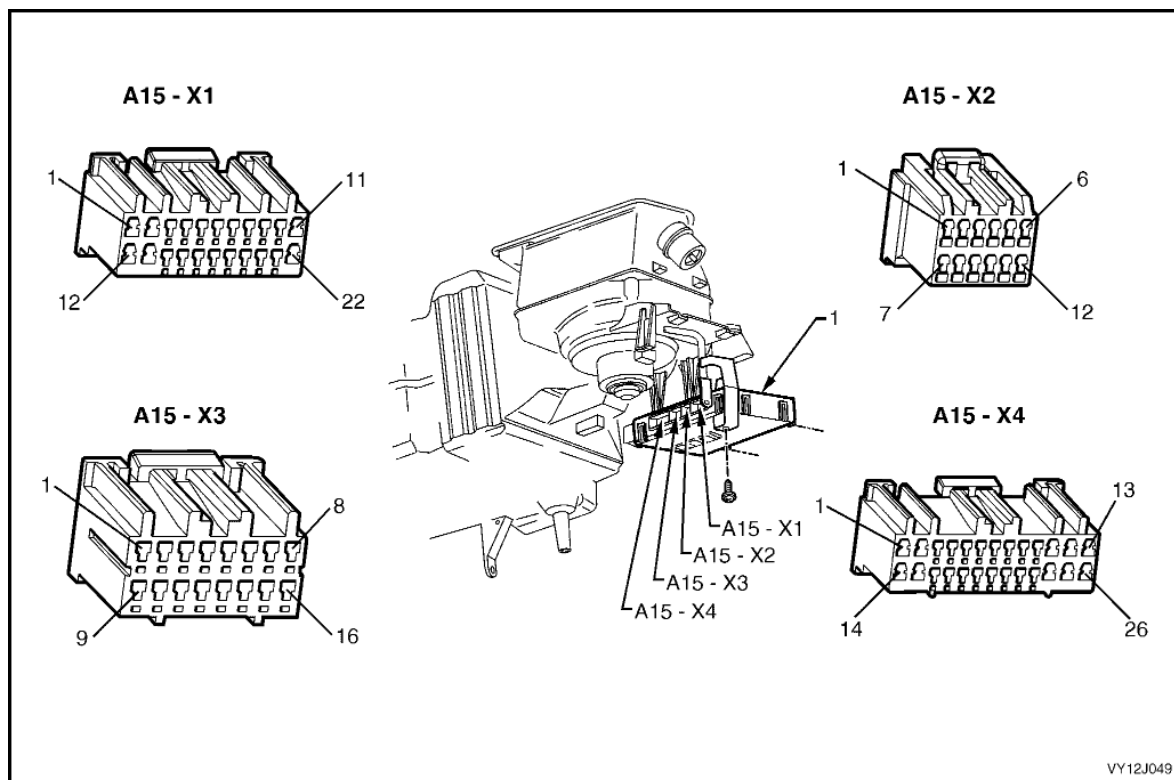


Figure 12J-213

ABBREVIATIONS

The following abbreviations are used in this Section:

BCM – Body Control Module

PCM – Powertrain Control Module

PIM – Powertrain Interface Module

RF – Radio Frequency

MFD – Multi Function Display

HVAC – Heating, Ventilation and Air Conditioning

SRS – Supplemental Restraint System

DLC – Data Link Connector.

4.2 SERIAL DATA COMMUNICATION (BUS MASTER)

CIRCUIT DESCRIPTION

The vehicle system control modules, as well as the TECH 2 diagnostic scan tool, communicate with each other via the data bus. Excluding the GEN III V8 PCM, all control modules communicating on the data bus use UART communication.

UART is a 5 volt data bus that toggles the voltage to ground (0 volt) at a fixed-bit pulse width and transmits data at 8.2 kilobits per second. When there is no communication on the UART data bus, the system voltage is 5 volts.

The GEN III V8 PCM uses Class 2 communication. This toggles the data bus from 0 volt to 7 volts with either a short or long pulse width at an average rate of 10.4 kilobits per second. When there is no communication on the Class 2 data bus, the system voltage is 0 volt. The PIM converts Class 2 communication into UART and UART into Class 2.

TECH 2 is able to communicate with both UART and Class 2 control modules.

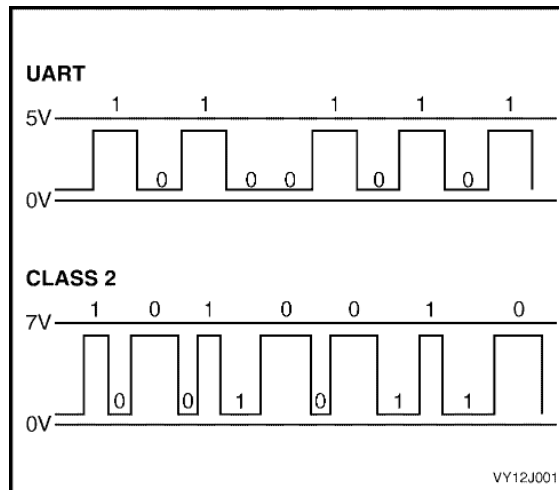


Figure 12J-214

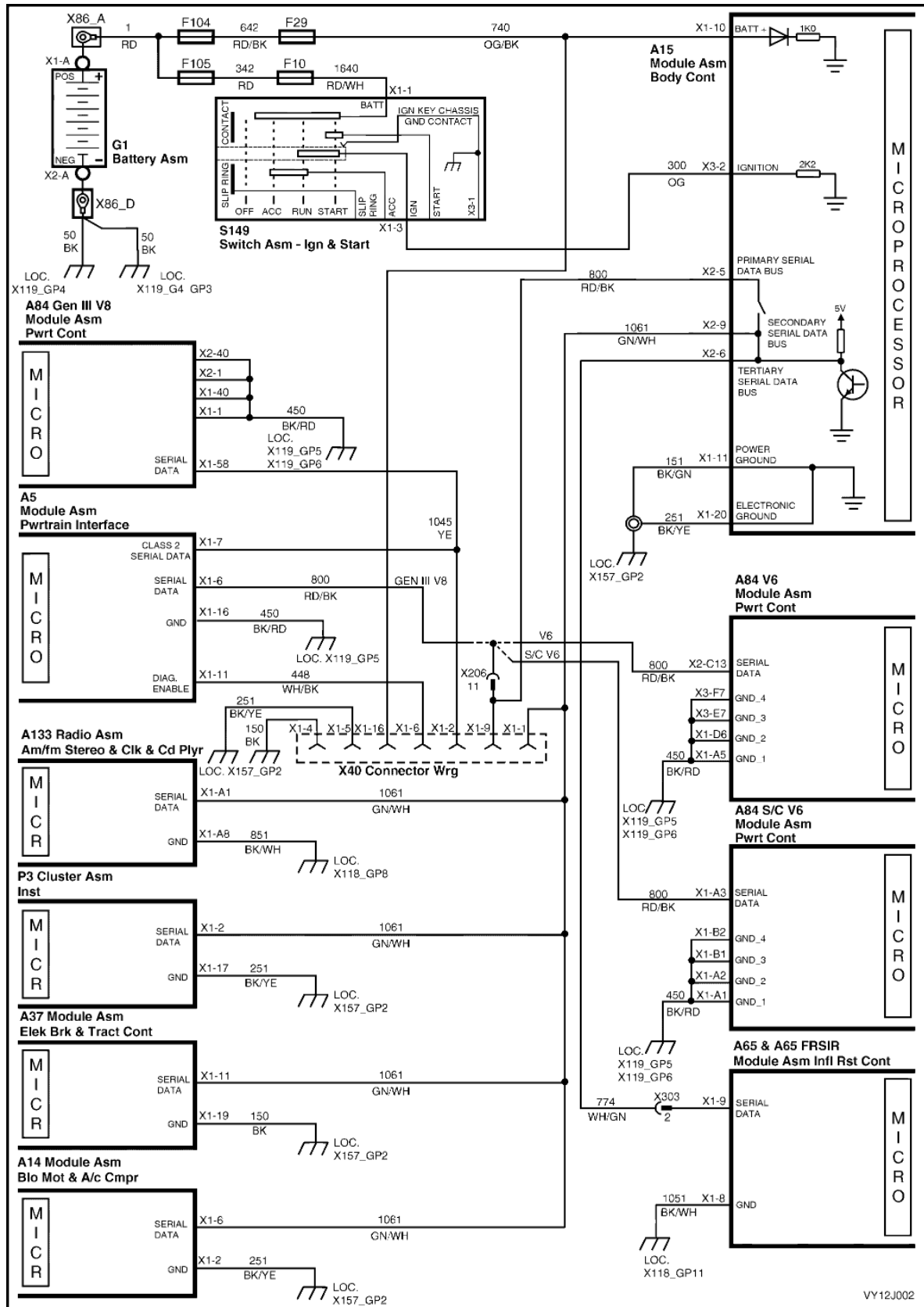


Figure 12J-215

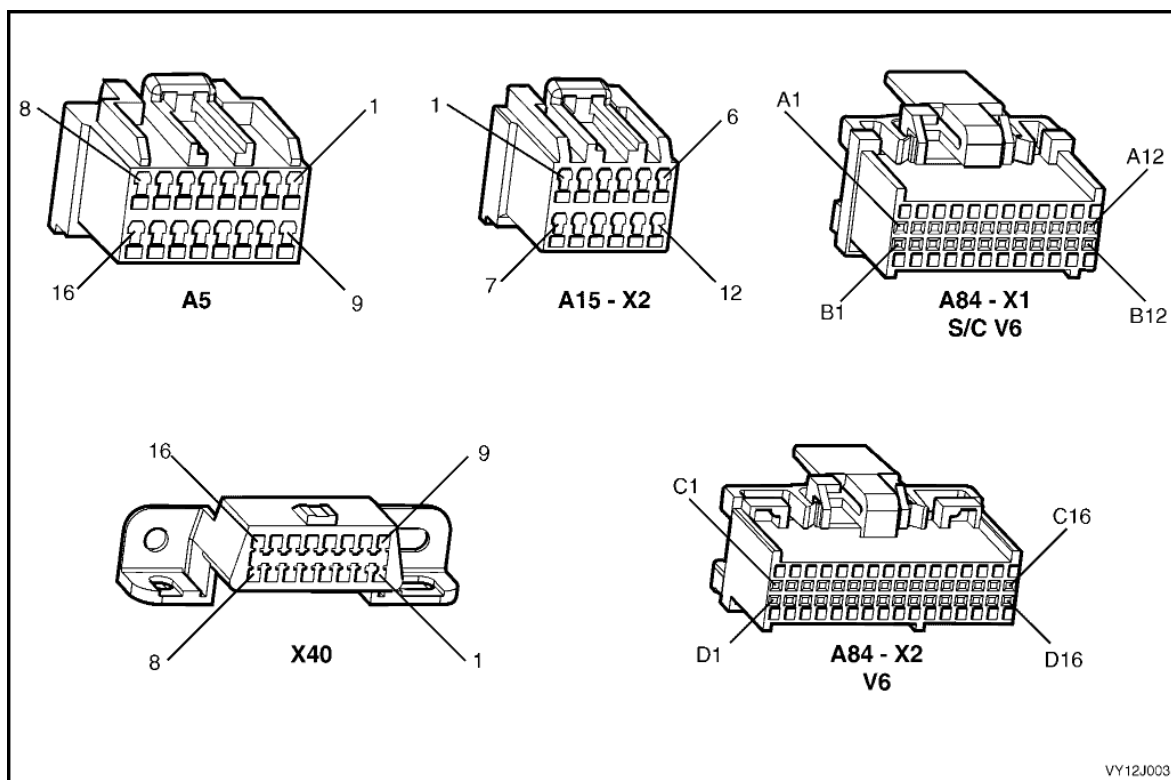


Figure 12J-216

SERIAL DATA COMMUNICATION DIAGNOSTIC CHART

IMPORTANT: Disconnection of the battery affects certain vehicle electronic systems. Refer to **Section 00, 5. BATTERY DISCONNECTION PROCEDURES** before disconnecting the battery.

STEP	ACTION	VALUE	YES	NO
1	1. Turn the ignition off. 2. Connect TECH 2 to the DLC. 3. Turn the ignition on. 4. Push power button on TECH 2. Does TECH 2 power up (screen illuminates and displays TECH 2)?		Go to Step 2.	Go to TECH 2 diagnosis. Refer to Section 0C, TECH 2.
2	1. With TECH 2 still connected and the ignition on, select Diagnostics / Model Year / Vehicle Model / Body / Body Control Module. Does TECH 2 display BCM system identification information (BCM level and type)?		For V6 or V6 S/C go to Step 3. For GEN III V8 go to Step 4.	Go to Step 8.
3	1. With TECH 2 still connected and the ignition on, exit to the System Selection Menu and select Engine / Engine Type (ie. V6 Supercharged). Does TECH 2 display PCM system identification information?		Go to Step 6.	Go to Step 14.
4	1. With TECH 2 still connected and the ignition on, exit Body Control Module and select Powertrain Interface Module. Can TECH 2 communicate with the Powertrain Interface Module?		Go to Step 5.	Go to Step 15.
5	1. With TECH 2 still connected and the ignition on, exit Body and select Diagnostics / Engine / Engine Type. Does TECH 2 display GEN III V8 PCM system identification information?		Go to Step 6.	Go to Step 7.

STEP	ACTION	VALUE	YES	NO
6	<p>1. With TECH 2 still connected and the ignition on, exit to the System Selection Menu and select Vehicle DTC Check.</p> <p>Can TECH 2 communicate with all control modules fitted to the vehicle? (If No Data displays next to a control module, then there is no communication between TECH 2 and that control module.)</p> <p>NOTE: If the vehicle is not equipped with a particular feature, for example ABS / TCS, No Data displays next to this module.</p>		System OK.	Go to Step 16.
7	<p>1. Turn the ignition off.</p> <p>2. Disconnect the PCM connector A84.</p> <p>3. Disconnect the PIM connector A5.</p> <p>4. Back-probe DLC (X40) terminal X1-2 and PCM (A84) terminal X1-58, circuit 1049 (Yellow wire) with an ohmmeter.</p> <p>Is the value as specified?</p>	Less than 1 ohm	Go to PCM diagnostics in Section 6C-3, POWERTRAIN – GEN III V8. Install all connectors.	Repair faulty circuit 1049. Install all connectors.
8	<p>1. With TECH 2 still connected and the ignition on, back-probe DLC connector terminal X1-9, circuit 800 (Red / Black wire) with a voltmeter to ground.</p> <p>Is the value as specified?</p>	3 to 4 volts (unstable)	Go to Step 9.	Go to Step 11.
9	<p>1. Turn the ignition on.</p> <p>2. Disconnect TECH 2 from the DLC.</p> <p>3. Back-probe DLC connector terminal X1-9, circuit 800 (Red / Black wire) with a voltmeter to ground.</p> <p>Is value as specified?</p>	3 to 4 volts (unstable)	Go to Step 10.	Go to TECH 2 diagnosis. Refer to Section 0C, TECH 2. Repair TECH 2 and return to Step 1.
10	<p>1. One at a time, disconnect the control modules on the secondary serial data bus (ABS, ABS / TCS, SRS, INS, Radio) and the PCM (PIM for GEN III V8 engine) on the primary serial data bus. Check each time if TECH 2 can communicate with the BCM (refer to Step 2), before restoring the connection.</p> <p>NOTE: The secondary serial data bus comprises the secondary serial data bus, circuit 1061 (Green / White wire) and the tertiary serial data bus, circuit 774 (White / Green wire).</p> <p>Does communication between the BCM and TECH 2 resume after disconnecting any of the control modules?</p>		Go to relevant part of this Section for diagnosis of suspect control module.	Install all connectors. Go to Step 13.
11	<p>1. Turn the ignition on.</p> <p>2. Back-probe DLC connector terminal X1-9, circuit 800 (Red / Black wire) with a voltmeter to ground.</p> <p>Is the value as specified?</p>	3 to 4 volts (unstable)	Go to TECH 2 diagnosis. Refer to Section 0C, TECH 2. Repair TECH 2 and return to Step 1.	Go to Step 12.
12	<p>1. Turn the ignition off.</p> <p>2. Disconnect the battery.</p> <p>3. Disconnect all control modules (refer to Step 10) and the BCM.</p> <p>4. Check the integrity of circuits 800 (Red / Black wire), 1061 (Green / White wire) and 774 (White / Green wire) (ie. short to voltage supply, short to ground).</p> <p>Are the circuits OK?</p>		Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this section. Connect the battery and refer to 2.1 BODY CONTROL MODULE, REINSTALL in this Section.	Repair faulty circuits 800, 1061 or 774 as necessary. Connect the battery and refer to 2.1 BODY CONTROL MODULE, REINSTALL in this Section.
13	<p>1. Perform the TECH 2 Self Test. Refer to Section 0C, TECH 2.</p> <p>Did TECH 2 test OK?</p>		Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this section.	Repair TECH 2 and return to Step 1.

STEP	ACTION	VALUE	YES	NO
14	1. Turn the ignition off. 2. Disconnect PCM (A84) connector. 3. Turn the ignition on. 4. Back-probe PCM terminal (X2-C13 for V6 or X1-A3 for V6 S/C), circuit 800 (Red / Black wire) with a voltmeter to ground. Is the value as specified?	3 to 4 volts (unstable)	Repair faulty circuit 800.	Go to Section 6C1, POWERTRAIN MANAGEMENT – V6 or 6C2, POWERTRAIN MANAGEMENT – V6 S/C for diagnosis of the PCM.
15	1. Turn the ignition off. 2. Disconnect PIM (A5) connector. 3. Turn the ignition on. 4. Back-probe PIM terminal X1-6, circuit 800 (Red / Black wire) with a voltmeter to ground. Is the value as specified?	3 to 4 volts (unstable)	Repair faulty circuit 800.	Go to PCM diagnostics in Section 6C-3, POWERTRAIN – GEN III V8.
16	1. Turn the ignition off. 2. In Step 6, was TECH 2 able to communicate with at least one of the control modules on the secondary serial data bus (ABS, ABS / TCS, INS, SRS, Radio)? NOTE: TECH 2 will display No Data next to a control module that it cannot communicate with in the DTC Check mode.		Go to Step 17.	Go to Step 18.
17	1. Disconnect the battery. 2. Use an ohmmeter to check continuity in circuits 1061 (White / Green wire) and 774 (Green / White wire) between the BCM and the suspect control module/s. Is there continuity?		Go to relevant part of this Section for diagnosis of suspect control module. Connect the battery and refer to 2.1 BODY CONTROL MODULE, REINSTALL in this Section.	Repair open circuit in circuit 1061 or 774 between the control module and the BCM. Connect the battery and refer to 2.1 BODY CONTROL MODULE, REINSTALL in this Section.
18	1. Disconnect the battery. 2. Check continuity between the BCM and all control modules on the secondary serial data bus. NOTE: The secondary serial data bus comprises the secondary serial data bus, circuit 1061 (Green / White wire) and the tertiary serial data bus, circuit 774 (White / Green wire). Is there continuity?		Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Repair faulty circuit 1061 or 774. Connect the battery and refer to 2.1 BODY CONTROL MODULE, REINSTALL in this Section.
WHEN ALL DIAGNOSIS AND REPAIRS ARE COMPLETE, CLEAR ALL DIAGNOSTIC TROUBLE CODES AND VERIFY CORRECT OPERATION				

4.3 REMOTE RECEIVER / KEY

CIRCUIT DESCRIPTION

When operating the remote coded key, an RF signal is transmitted to the Remote Receiver. This receiver transfers the received data from receiver terminal X1-2 to BCM terminal X2-1 via circuit 218 (Yellow wire). The receiver ground connection is from receiver terminal X1-7 to BCM terminal X1-14, circuit 219 (Brown / Green wire). The BCM responds to the received signal based on the frequency of the RF signal (the button on the key that is pressed). There are three buttons on the remote coded key: Unlock, Lock and Rear Compartment Release (station wagon tailgate or sedan boot).

Remote Coded Key Battery Failure

The remote coded key is powered by its own internal battery. If this battery fails, no RF signal is transmitted when operating the Lock, Unlock and Rear Compartment release buttons. However, if the battery loses power, the remote coded key reader has the ability to power the key once it is inserted into the ignition switch and turned on or to start. This enables theft deterrent disarming.

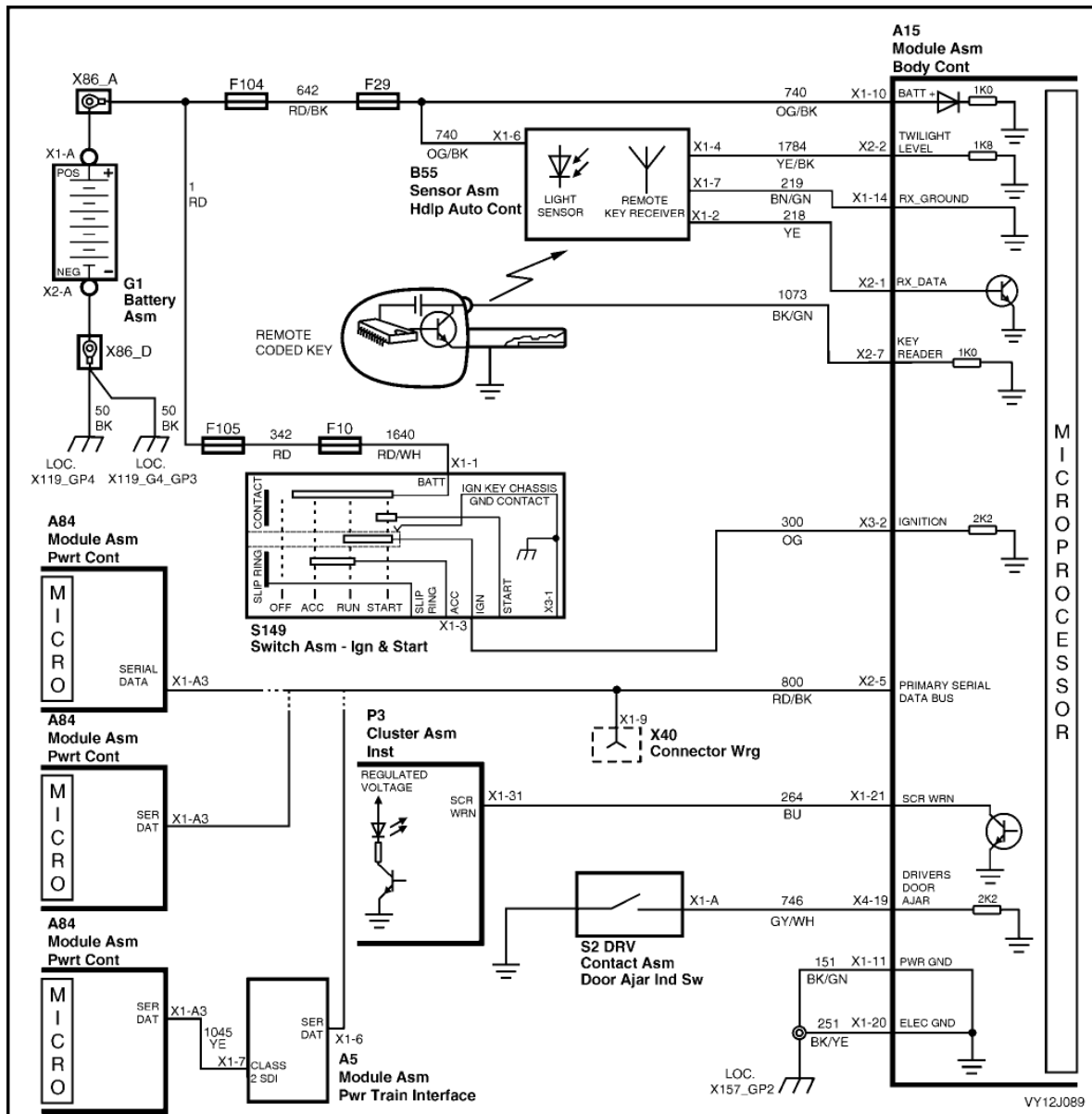


Figure 12J-217

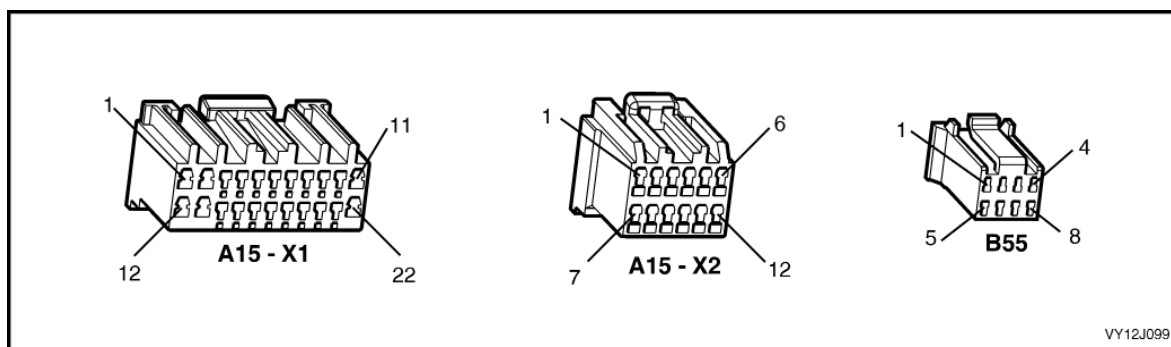


Figure 12J-218

REMOTE RECEIVER / KEY DIAGNOSTIC CHART

STEP	ACTION	VALUE	YES	NO
1	<ol style="list-style-type: none"> 1. Close and lock the doors. 2. Insert the remote coded key (the key) into the driver's door lock. 3. Use the key to unlock and lock the door. Do all the doors unlock and lock?		Go to Step 2.	Go to central door locking diagnosis. Refer to 4.5 CENTRAL DOOR LOCKING in this Section.
2	<ol style="list-style-type: none"> 1. Unlock the driver's door with the key. 2. With the theft deterrent LED flashing, insert the key into the ignition switch and Turn the ignition on. Does the theft deterrent LED turn off?		Go to Step 3.	Go to theft deterrent diagnosis. Refer to 4.7 THEFT DETERRENT SYSTEM in this Section.
3	<ol style="list-style-type: none"> 1. Lock the driver's door with the key. 2. Remove the key from the driver's door lock. 3. Operate the key Unlock button within 2 metres of the driver's door B-pillar. Does the driver's door only (two-stage unlock) or all doors (single-stage unlock) unlock?		Go to Step 4.	Go to Step 8.
4	When performing Step 3, did all of the following occur when the key Unlock button was pressed: <ul style="list-style-type: none"> • indicators flashed twice • dome lamp illuminated (dome lamp switch in Door position), and • theft deterrent LED turned off? 		Go to Step 5.	Go to theft deterrent diagnosis. Refer to 4.7 THEFT DETERRENT SYSTEM in this Section.
5	<ol style="list-style-type: none"> 1. Close all the doors. 2. Operate the Lock button on the key within 2 metres of the driver's door B-pillar. Do all doors lock?		Go to Step 6.	Go to Step 8.
6	When performing Step 5, did all of the following occur when the key Lock button was pressed: <ul style="list-style-type: none"> • theft deterrent LED began flashing • indicators flashed once, and • dome lamp turned off if illuminated (ensure switch is in Door position)? 		Go to Step 7.	Go to theft deterrent diagnosis. Refer to 4.7 THEFT DETERRENT SYSTEM in this Section.
7	<ol style="list-style-type: none"> 1. Stand within 2 metres of the rear of the vehicle and press the key rear compartment release button for 2 seconds. Does the rear compartment lid unlock?		System OK.	Go to Step 8.
8	<ol style="list-style-type: none"> 1. Connect TECH 2 to the DLC. 2. Select Diagnostics / Model Year / Vehicle Model / Body / Body Control Module / Data Display / Central Door Locking / Remote Key Status. 3. Operate the Unlock, Lock and Boot lid release buttons on the key. Are the values as specified?	Valid Key	Correct signal. Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Go to Step 9.

STEP	ACTION	VALUE	YES	NO
9	1. On another VY Series vehicle with a fully functional key and receiver, connect TECH 2 to the DLC. 2. Select Remote Key Status as per Step 8. 3. Operate the Unlock, Lock and Boot lid release buttons on the key. Are the values as specified?	Invalid Code	Correct signal. Go to Step 10.	Programme a new key to the original vehicle. Refer to 2.3 REMOTE CODED KEY in this Section.
10	1. Return to the original vehicle which has the suspected faulty remote coded key / receiver. 2. Back-probe the remote receiver (B55) connector terminal X1-6, circuit 740 (Orange / Black wire) with a voltmeter to ground. Is the value as specified?	Battery voltage	Go to Step 11.	Check and repair faulty circuit 740.
11	1. Check the integrity of circuit 219 (Brown / Green wire) between BCM connector terminal X1-14 and remote receiver connector terminal X1-7. Is circuit 219 OK?		Go to Step 12.	Repair faulty circuit 219.
12	1. Check the integrity of circuit 218 (Yellow wire) between BCM connector terminal X2-1 and remote receiver connector terminal X1-2. Is circuit 218 OK?		Go to Step 13.	Repair faulty circuit 218.
13	1. Replace the remote receiver with a known functional remote receiver. 2. Connect TECH 2 to the DLC. 3. Select Body / Body Control Module / Data Display / Central Door Locking / Remote Key Function. 4. Operate the Unlock, Lock and Boot lid release button on the remote coded key. Are the values as specified?	Unlock request, Lock request, Boot release request	Replace faulty remote receiver. Refer to 2.5 REMOTE RECEIVER in this Section.	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.
WHEN ALL DIAGNOSIS AND REPAIRS ARE COMPLETE, VERIFY CORRECT OPERATION				

4.4 ACCESSORY POWER CONTROL

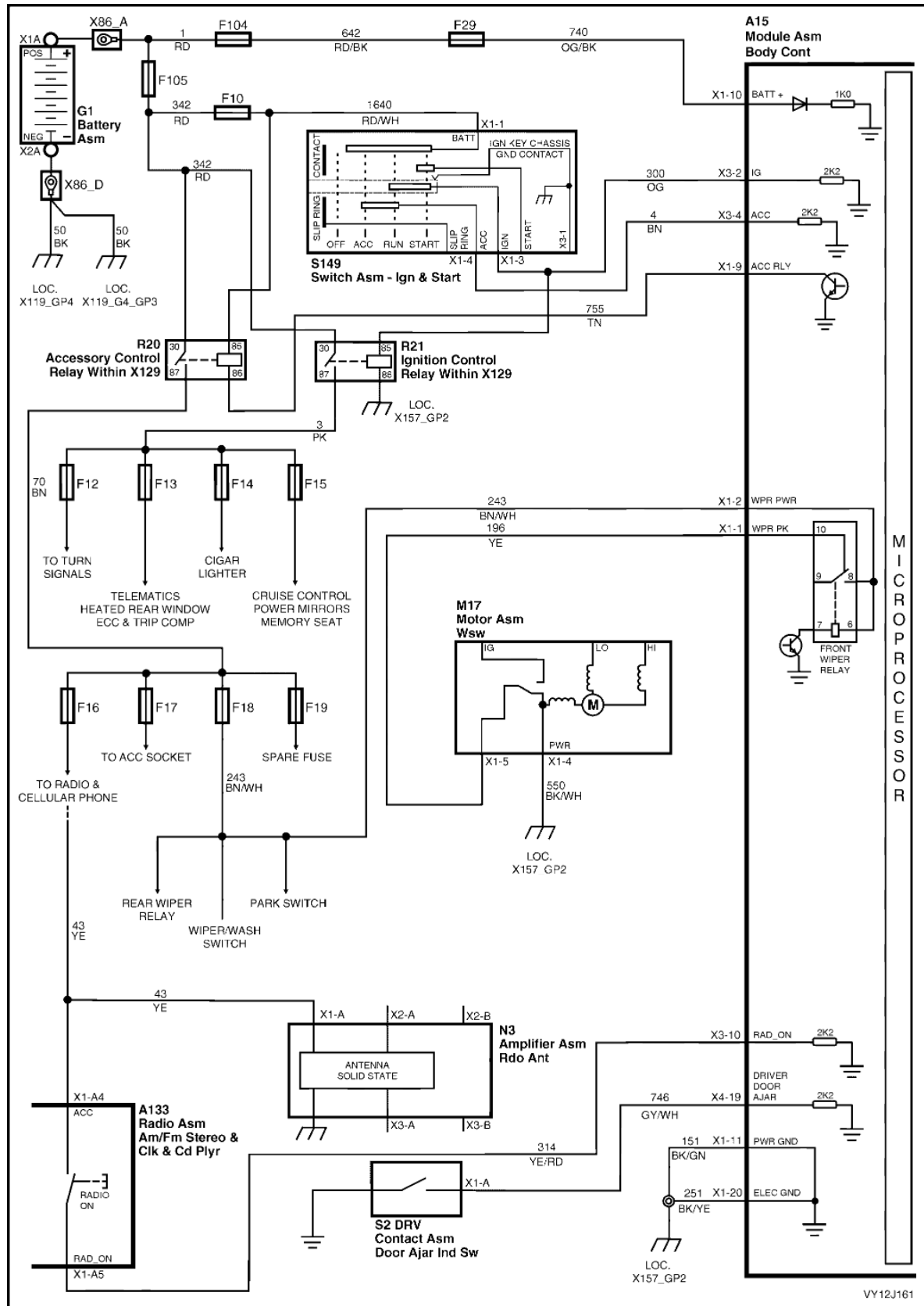
CIRCUIT DESCRIPTION

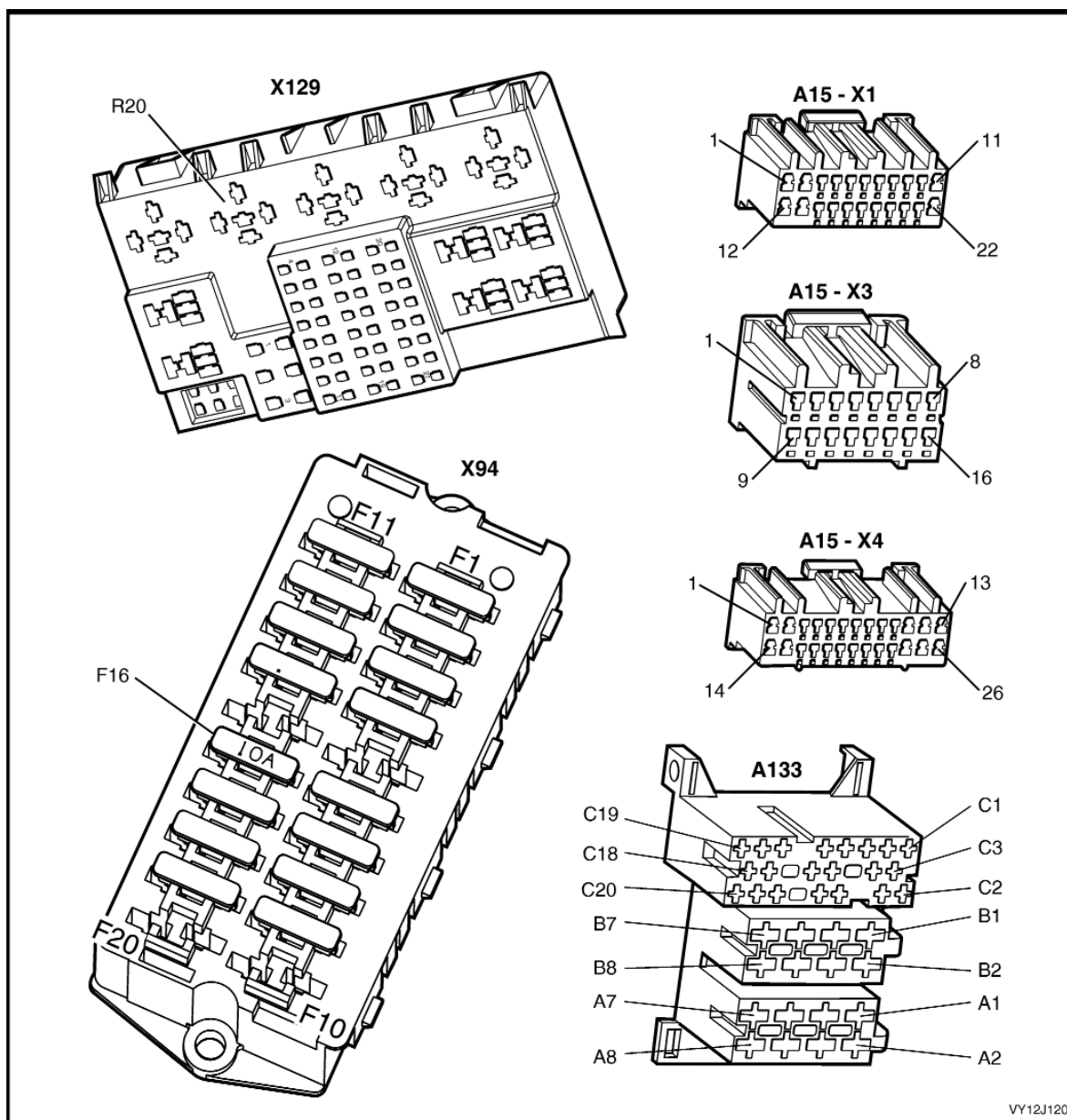
When the ignition is switched on or to Accessories or if the radio is switched on, the BCM energises the Accessory Control Relay supplying power to the radio and the wiper system. The BCM disables the relay (disconnecting the power) when the ignition is switched off or when the driver's door is opened (depending on the accessory shutdown option selected).

Turning the radio on when the ignition is off triggers the BCM to energise the Accessory Control Relay for a 60 minute period. However, if the radio is switched off within this period, the relay will be disabled immediately.

If the front wiper is active when disabling of the accessory power is initiated, the BCM monitors the wiper park input before disabling the Accessory Control Relay, which allows the wipers to park. If the wiper park input is not detected within 3 minutes, the BCM will automatically disable the relay.

When the key is switched to Accessories or On, a 12 volt supply from the ignition switch is detected by the BCM at either terminal X3-4, (Accessories output via circuit 4, Brown wire) or terminal X3-2 (On output via circuit 300, Orange wire).





VY12J120

Figure 12J-220

ACCESSORY POWER CONTROL DIAGNOSTIC CHART

STEP	ACTION	VALUE	YES	NO
1	1. Turn the ignition off. 2. Turn on the radio. Does the radio operate?		Go to Step 2.	Go to Step 3.
2	1. With the radio on, turn the ignition on then off. 2. If the Driver's Door shutdown user-option is selected, open the driver's door. Does the radio stop operating?		System OK.	Go to Step 12.
3	1. With the ignition off, turn off the radio and close the driver's door. 2. Probe both terminals of fuse F16 with a voltmeter to ground. 3. Turn on the radio. Are the values as specified?	Radio off = 0 volt Radio on = battery voltage	Go to Step 4.	Go to Step 5.

STEP	ACTION	VALUE	YES	NO
4	1. Check the integrity of circuit 43 (Yellow wire) connecting fuse F16 to radio terminal X1-A4. Is the circuit OK?		Go to Section 12D, 3.12 AUDIO SYSEM DIAGNOSTIC PROCEDURES.	Repair faulty circuit 43.
5	1. Turn off the radio. 2. Remove the Accessory Control Relay (R20) and back-probe the relay holder terminals 30 and 85 with a voltmeter to ground. Are the values as specified?	Battery voltage	Install the relay and go to Step 6.	Check and repair faulty circuit 1640 (Red / White wire) or circuit 342 (Red wire) as necessary.
6	1. With the radio and ignition off, back-probe Accessory Control Relay terminal 87 with a voltmeter to ground. 2. Turn on the radio. Is the value as specified?	Battery voltage (Relay audibly switches)	Repair faulty circuit 70 (Brown wire).	Go to Step 7.
7	1. Connect the voltmeter as in Step 6. 2. With the radio off and ignition off, back-probe Accessory Control Relay connector terminal 86 with a jumper lead to ground. Is the value as specified?	Battery voltage (Relay audibly switches)	Go to Step 8.	Replace the Accessory Control Relay (R20). Refer to Section 12O, 1.2 RELAYS.
8	1. Check the integrity of circuit 755 (Tan wire) connecting BCM terminal X1-9 to the Accessory Control Relay terminal 86. Is the circuit OK?		Go to Step 9.	Repair faulty circuit 755.
9	1. Connect TECH 2 to the DLC. 2. Select Diagnostics / Model Year / Vehicle Model / Body / Body Control Module / Data Display / Inputs and Outputs / Accessory Relay. 3. With the ignition off, turn on the radio. Does TECH 2 display On?		Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Go to Step 10.
10	1. With TECH 2 connected, exit Accessory Relay and select Radio Status. 2. Turn the ignition off and then on. 3. Turn the radio on. Does TECH 2 display On?		Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Go to Step 11.
11	1. Check the integrity of circuit 314 (Yellow / Red wire) connecting BCM terminal X3-10 to the radio terminal X1-A5. Is the circuit OK?		Refer to Section 12D, 3.12 AUDIO SYSTEM DIAGNOSTIC PROCEDURES.	Repair faulty circuit 314.
12	1. Connect TECH 2 to the DLC. 2. Select Diagnostics / Model Year / Vehicle Model / Body / Body Control Module / Data Display / Inputs and Outputs / Ignition Switch. 3. Ensure the ignition is off. Does TECH 2 display Off?		Go to Step 13.	Go to Step 18.
13	1. With TECH 2 connected and the ignition turned off, exit Ignition Switch and select Accessory Switch. Does TECH 2 display Off?		Go to Step 14.	Go to Step 19.
14	1. Back-probe BCM connector terminal X4-19, circuit 746 (Grey / White wire) with a voltmeter to ground. 2. Open the driver's door. Is the value as specified?	Less than 0.5 volt	Go to Step 15.	Check and repair faulty door ajar signal. Refer to 4.5 CENTRAL DOOR LOCKING, Part L – Door Ajar Switches in this Section.
15	1. With the ignition off and TECH 2 connected, exit Accessory Switch and select Accessory Relay. Does TECH 2 display On?		Go to Step 16.	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.

STEP	ACTION	VALUE	YES	NO
16	1. With the driver's door closed, the radio and ignition off and the Accessory Control Relay installed, back-probe the Accessory Control Relay terminal 86 with a voltmeter to ground. Is the value as specified?	Battery voltage	Replace the Accessory Control Relay (R20). Refer to Section 120, 1.2 RELAYS.	Go to Step 17.
17	1. Check the integrity of circuit 755 (Tan wire) connecting BCM terminal X1-9 to the Accessory Control Relay terminal 86. Is the circuit OK?		Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Repair faulty circuit 755.
18	1. Check the integrity of circuit 300 (Orange wire) connecting BCM terminal X3-2 to the ignition switch. Is the circuit OK?		Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Repair faulty circuit 300.
19	1. Check the integrity of circuit 4 (Brown wire) connecting BCM terminal X3-4 to the ignition switch. Is the circuit OK?		Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Repair faulty circuit 4.
WHEN ALL DIAGNOSIS AND REPAIRS ARE COMPLETE, VERIFY CORRECT OPERATION				

4.5 CENTRAL DOOR LOCKING

CIRCUIT DESCRIPTION

The central door-locking system enables simultaneous locking or unlocking of all doors and the station wagon tailgate, enhanced locking or 'deadlocking' of the doors as well as single-stage and two-stage unlocking.

NOTE: When investigating a complaint of a central door system locking problem or malfunction, always start the diagnosis with the functional check in this Section.

Functional check

The functional check is a quick check of the central door locking system. Perform this check with the purpose of locating which part of the system requires attention and therefore identifying which diagnostic chart to use. Refer to the list of charts following.

Diagnostic testing

Following the Functional Check Diagnostic Chart, there are twelve diagnostic charts to which you may be referred for further system diagnosis:

- **Part A** – Unlocking Doors using Driver's Door Lock Microswitch
- **Part B** – Locking Doors using Driver's Door Lock Microswitch
- **Part C** – Unlocking Doors using Driver's Door Lock Snib Actuator
- **Part D** – Locking Doors using Driver's Door Lock Snib Actuator
- **Part E** – Unlocking Doors using Passengers' Door Lock Snib Actuators
- **Part F** – Locking Doors using Front Passenger Door Lock Snib Actuator
- **Part G** – Unlocking the Tailgate
- **Part H** – Deadlocking Doors using Driver's Door Lock Microswitch
- **Part I** – Unlocking Doors From Deadlock
- **Part J** – Auto Door Locking (Gearshift out of Park Position)
- **Part K** – Auto Door Unlocking (Gearshift into Park Position)
- **Part L** – Door Ajar Switches.

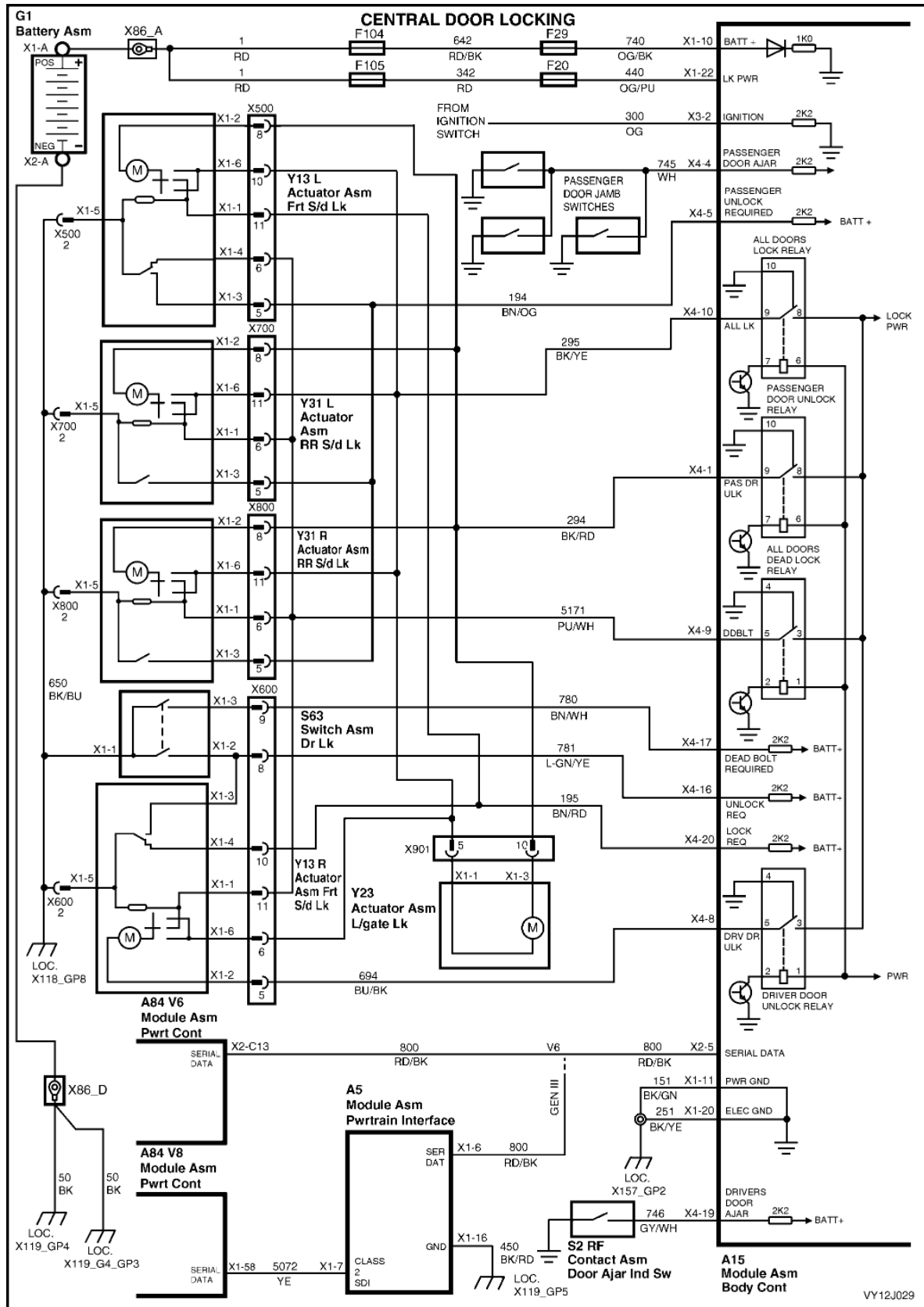


Figure 12J-221

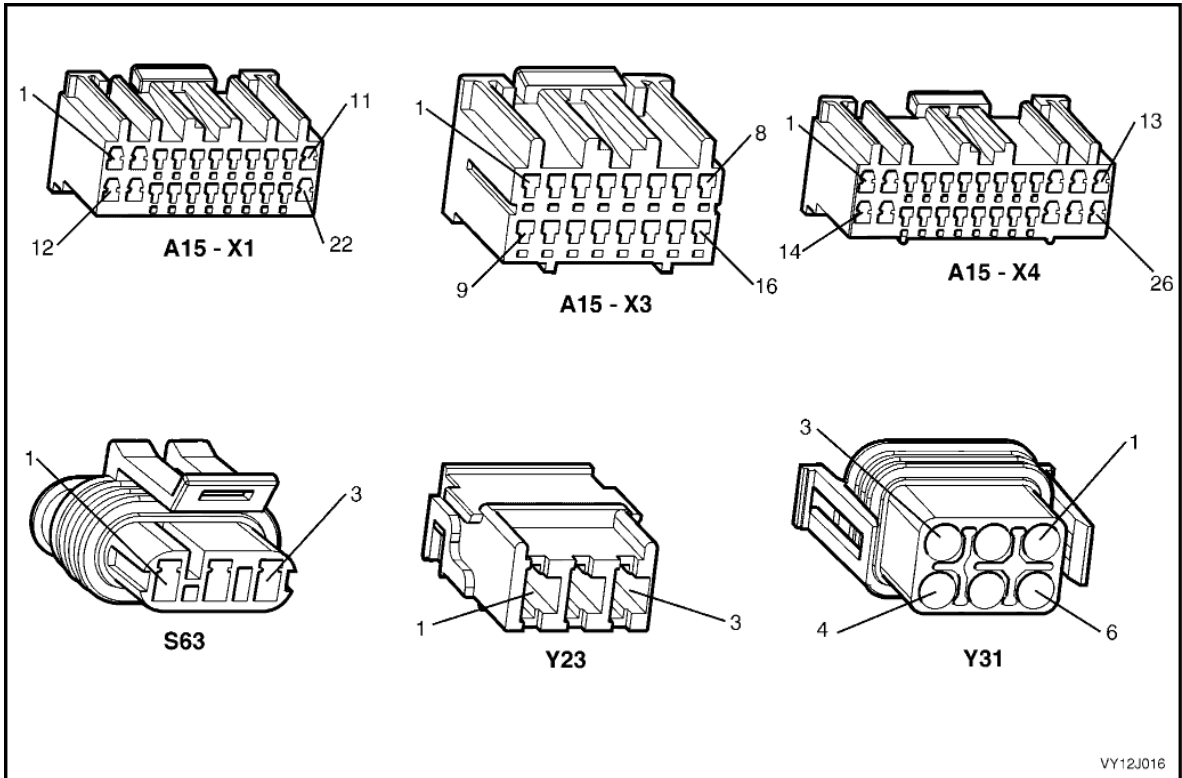


Figure 12J-222

FUNCTIONAL CHECK DIAGNOSTIC CHART

STEP	ACTION	VALUE	YES	NO
1	Are all door ajar switches and associated circuits functioning correctly?		Go to Step 2.	Go to Part L, Door Ajar Switches.
2	1. Lock all doors. 2. Operate the remote coded key Unlock button within 4 metres of driver's side B-pillar. Does driver's door unlock (2 stage unlocking) or all doors unlock (single-stage unlocking)?		Go to Step 4.	Go to Step 3.
3	1. Lock all doors. 2. Insert the ignition key into driver's door lock and operate the microswitch by turning the key to the unlock position. Do all doors unlock?		Go to remote receiver diagnosis. Refer to 4.3 REMOTE RECEIVER / KEY in this Section.	Go to Part A UNLOCKING DOORS USING DRIVER'S DOOR LOCK MICROSWITCH.
4	1. Unlock all doors. 2. Close all doors. 3. Operate the remote coded key Lock button within 4 metres of the driver's side B-pillar. Do all doors lock?		Go to Step 6.	Go to Step 5.
5	1. Unlock all doors. 2. Close all doors. 3. Insert the ignition key into the driver's door lock and operate the microswitch by turning the key to the lock position. Do all doors lock?		Go to remote receiver diagnosis. Refer to 4.3 REMOTE RECEIVER / KEY in this Section.	Go to Part B LOCKING DOORS USING DRIVER'S DOOR LOCK MICROSWITCH.
6	1. Close all doors. 2. Lock all doors. 3. Insert the ignition key into the driver's door lock and operate the microswitch by turning the key to the unlock position. Do all doors unlock?		Go to Step 7.	Go to Part A UNLOCKING DOORS USING DRIVER'S DOOR LOCK MICROSWITCH.
7	1. Close all doors. 2. Unlock all doors. 3. Insert the ignition key into the driver's door lock and operate the microswitch by turning the key to the lock position. Do all doors lock?		Go to Step 8.	Go to Part B LOCKING DOORS USING DRIVER'S DOOR LOCK MICROSWITCH.
8	1. Lock, but do not deadlock, all doors. 2. Operate the driver's door lock snib to unlock the door. Do all doors unlock?		Go to Step 9.	Go to Part C UNLOCKING DOORS USING DRIVER'S DOOR LOCK SNIB ACTUATOR.
9	1. Close all doors. 2. Operate the driver's door lock snib to lock the door. Do all doors lock?		Go to Step 10.	Go to Part D LOCKING DOORS USING DRIVER'S DOOR LOCK SNIB ACTUATOR.
10	1. Lock, but do not deadlock, all doors. 2. Operate each passenger's door lock snib to unlock each door. Does each door unlock?		Go to Step 11.	Go to Part E UNLOCKING DOORS USING PASSENGERS' DOOR LOCK SNIB ACTUATORS.

STEP	ACTION	VALUE	YES	NO
11	1. Close all doors. 2. Operate the front passenger's door lock snib to lock the door. Do all doors lock?		Go to Step 12 (wagon) or Go to Step 14 (sedan).	Go to Part F LOCKING DOORS USING FRONT PASSENGER'S DOOR LOCK SNIB ACTUATOR.
12	1. Lock the tailgate. 2. Insert the ignition key into the driver's door lock and operate the microswitch by turning the key to the unlock position. Does the tailgate unlock?		Go to Step 13.	Go to Part G UNLOCKING THE TAILGATE.
13	1. Unlock the tailgate. 2. Insert the ignition key into the driver's door lock and operate the microswitch by turning the key to the lock position. Does the tailgate lock?		Go to Step 14.	Replace tailgate lock actuator. Refer to Section 1A4, HOOD, REAR COMPARTMENT LID, LIFTGATE AND ENDGATE.
14	1. Unlock the doors. 2. Insert the ignition key into the driver's door lock and deadlock the doors by turning the key twice sequentially to the lock position. Are all the doors deadlocked?		Go to Step 15.	Go to Part H DEADLOCKING DOORS USING DRIVER'S DOOR LOCK MICROSWITCH.
15	1. Unlock all doors. 2. Close all doors. 3. Turn the ignition on. 4. Move the gearshift lever out of the P (park) position. Do all doors lock?		Go to Step 16.	Go to Part J, AUTO DOOR LOCKING (GEARSHIFT OUT OF PARK POSITION).
16	1. Turn the ignition off. 2. Lock all doors. 3. Move the gearshift lever into the N (neutral) position. 4. Turn the ignition on. 5. Move the gearshift lever into the P (park) position. 6. Turn the ignition off. Do all doors unlock?		Go to Step 17.	Go to Part K, AUTO DOOR UNLOCKING (GEARSHIFT INTO PARK POSITION).
17	1. Deadlock the doors. 2. Insert the ignition key into the driver's door lock and operate the microswitch by turning the key to the unlock position. Do all the doors unlock?		System OK.	Go to Part I UNLOCKING DOORS FROM DEADLOCK.
WHEN ALL DIAGNOSIS AND REPAIRS ARE COMPLETE, VERIFY CORRECT OPERATION				

PART A – UNLOCKING DOORS USING DRIVER'S DOOR LOCK MICROSWITCH

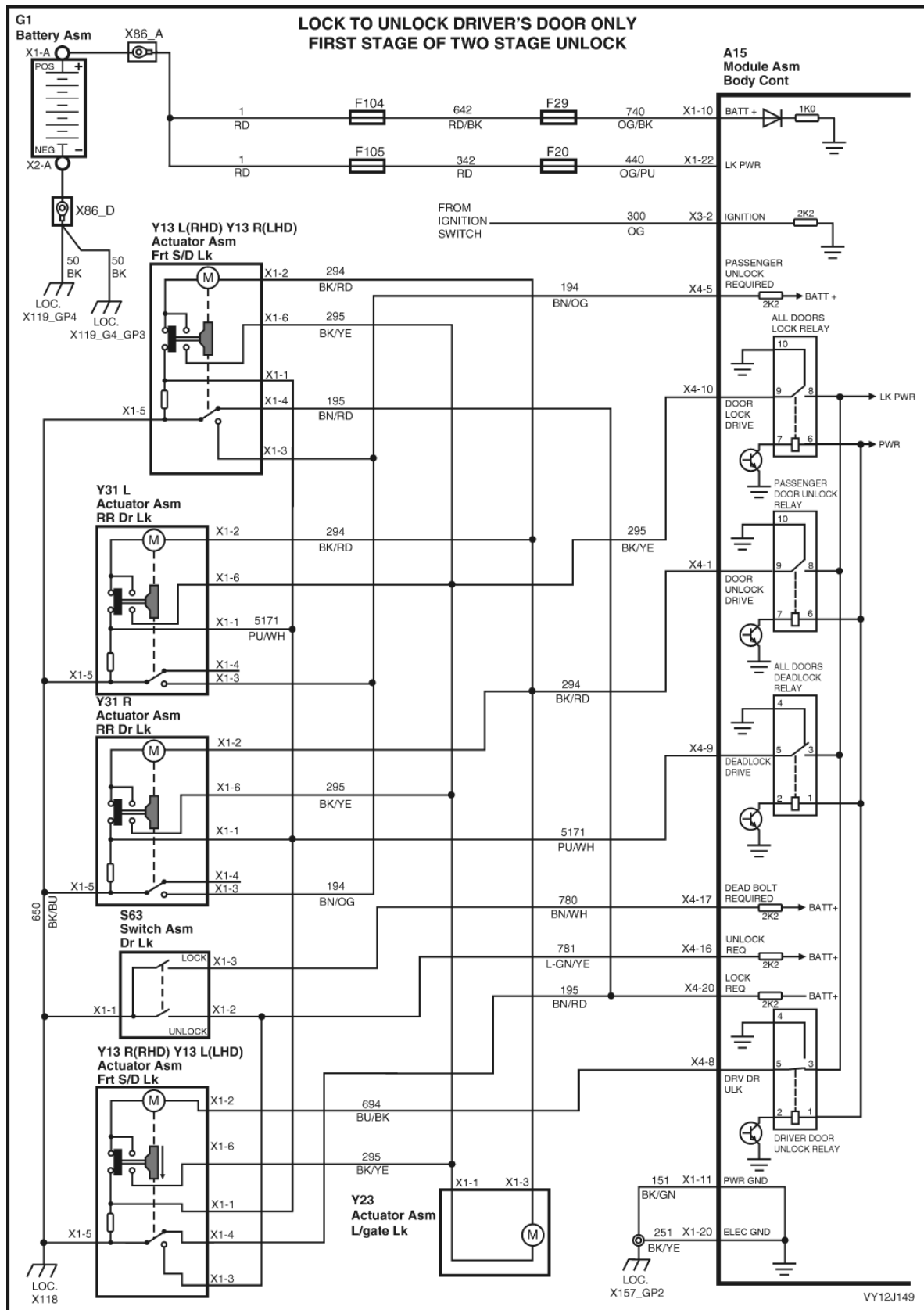
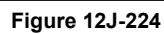


Figure 12J-223



Test description

The numbered descriptions below refer to selected steps in the following diagnostic chart.

3. Checks for the presence of an Unlock signal (false signal) while the doors are in the Locked state.
4. Checks if the false signal (from Step 3) is due to a BCM fault.
5. Checks if the false signal (from Step 4) is due to a fault in the driver's door lock actuator.
6. Checks if the false signal (from Step 5) is due to a fault in the driver's door lock switch.

UNLOCKING DOORS USING DRIVER'S DOOR LOCK MICROSWITCH DIAGNOSTIC CHART

STEP	ACTION	VALUE	YES	NO
1	Are all door ajar switches and associated circuits functioning correctly?		Go to Step 2.	Go to Part L, Door Ajar Switches.
2	1. Turn the ignition off. 2. Connect TECH 2 to the DLC. 3. Lock the doors. 4. Select Diagnostics / Model Year / Vehicle Model / Body / Body Control Module / Miscellaneous Tests / Central Locking. 5. Perform the test as instructed by TECH 2 and unlock the doors. Do all of the doors unlock?		Go to Step 3.	Go to Step 7.
3	1. Lock the doors. 2. With TECH 2 still connected, exit to the Body Menu and select Data Display / Central Door Locking / Driver's Door Unlock Switch. Does TECH 2 display On (unlocked)?		False signal. Go to Step 4.	Go to Step 17.
4	1. With TECH 2 still connected and Driver's Door Unlock Switch status displayed, disconnect BCM connector X4. 2. Close and lock the doors. Does TECH 2 display On?		False signal. Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Install BCM connector X4 and go to Step 5.
5	1. With TECH 2 still connected and Driver's Unlock Switch status displayed, disconnect the driver's door actuator (Y13) connector X1. Does TECH 2 display On?		False signal. Install the driver's door actuator (Y13) and go to Step 6.	Replace the driver's door lock actuator (Y13). Refer to Section 1A5, 2.7 FRONT DOOR LOCK ASSEMBLY.
6	1. With TECH 2 still connected and Driver's Unlock Switch status displayed, disconnect the driver's door lock switch (S63) connector. Does TECH 2 display On?		False signal. Install the driver's door lock switch (S63) connector. Repair faulty circuit 781 (Light-green / Yellow wire).	Replace the driver's door lock switch. Refer to Section 1A5, 2.8 FRONT DOOR OUTSIDE HANDLE ASSEMBLY.
7	While performing Step 1, did at least one door unlock?		Go to Step 8.	Go to Step 10.
8	1. Back-probe BCM connector terminal X4-8, circuit 694 (Blue / Black wire) with a voltmeter to ground. 2. Connect TECH 2 to the DLC. 3. Lock all doors. 4. Select Diagnostics / Model Year / Vehicle Model / Body / Body Control Module / Miscellaneous Tests / Central Locking. 5. Conduct test as instructed by TECH 2 and unlock the doors. Is the value as specified?	12 volts for 0.7 second	Go to Step 9.	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.
9	1. Back-probe BCM connector terminal X4-1, circuit 294 (Black / Red wire) with a voltmeter to ground. 2. Lock the doors. 3. Repeat TECH 2 Central Lock test (Step 7) and unlock the doors. Is value as specified?	12 volts for 0.7 second	Go to Step 10.	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.

STEP	ACTION	VALUE	YES	NO
10	1. Back-probe BCM terminal X1-22, circuit 440 (Orange / Purple wire) with a voltmeter to ground. Is the value as specified?	Battery voltage	Go to Step 11.	Check and repair fuses F20 and F105 and circuits to battery.
11	1. Back-probe BCM connector terminals X1-11, X1-20 and X3-1 with an ohmmeter to ground. Is the value as specified?	Less than 1 ohm	Go to Step 8.	Repair faulty circuit 151, 251 150 and check for positive ground connections to BCM.
12	1. Lock the doors. 2. Back-probe each door actuator connector terminal X1-2 (liftgate terminal X1-3), circuit 294 (Black / Red wire) with a voltmeter to ground. 3. Repeat TECH 2 Central Lock test (Step 7) and unlock the doors. Are the values as specified?	12 volts for 0.7 second	Go to Step 13.	Repair faulty circuit 694 or 294.
13	1. Disconnect BCM connector X4. 2. Back-probe BCM terminal X4-9 with a voltmeter to ground. Is the value as specified?	0 volt	Go to Step 14.	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.
14	1. Back-probe BCM terminal X4-9 with an ohmmeter to ground. Is the value as specified?	Less than 1 ohm	Install BCM connector X4 and go to Step 15.	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.
15	1. Back-probe each door lock actuator connector terminal X1-1, with a voltmeter to ground. Is the value as specified?	0 volt	Go to Step 16.	Repair faulty circuit 294.
16	1. Back-probe each door lock actuator connector terminal X1-1 with an ohmmeter to ground. Is the value as specified?	Less than 1 ohm	Replace the faulty door lock actuator (Y13 / Y31). Refer to Section 1A5, 2.7 FRONT DOOR LOCK ASSEMBLY or 3.7 REAR DOOR LOCK ASSEMBLY as necessary.	Repair faulty circuit 294.
17	1. With the doors locked, TECH 2 connected and Driver's Door Unlock Switch status displayed, insert the key into the driver's door lock and turn the key to the unlock position. Does TECH 2 display On?		Correct signal. Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Go to Step 18.
18	1. Back-probe driver's door lock switch terminal X1-1, circuit 650 (Black / Blue) with an ohmmeter to ground. Is the value as specified?	Less than 1 ohm	Go to Step 19.	Repair faulty circuit 650.
19	1. Disconnect the driver's door lock switch (S63) connector. 2. Back-probe the driver's door lock switch between terminals X1-2 and X1-1 with an ohmmeter. 3. With the doors locked, insert the key into the driver's door lock and turn the key to the unlock position. Is the value as specified?	Less than 1 ohm	Go to Step 20.	Replace the driver's door lock switch. Refer to Section 1A5, 2.8 FRONT DOOR OUTSIDE HANDLE ASSEMBLY.
20	1. Disconnect BCM connector X4. 2. Back-probe between driver's door lock switch terminal X1-2 and BCM connector terminal X4-16, circuit 781 (Light-green / Yellow) with an ohmmeter. Is the value as specified?	Less than 1 ohm	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Repair faulty circuit 781.
WHEN ALL DIAGNOSIS AND REPAIRS ARE COMPLETE, VERIFY CORRECT OPERATION				

PART B – LOCKING DOORS USING DRIVER'S DOOR LOCK MICROSWITCH

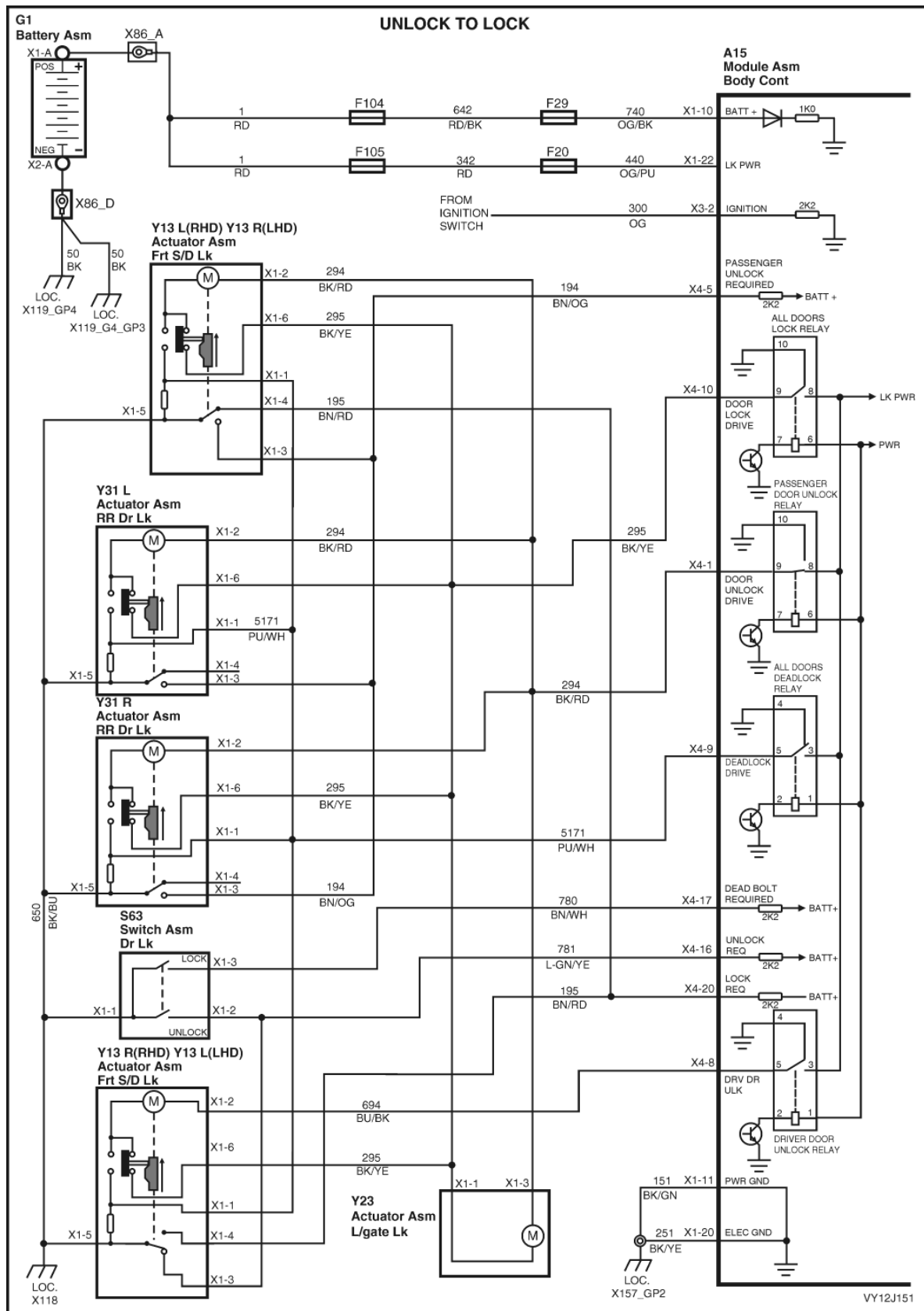


Figure 12J-225

Test description

The numbered descriptions below refer to selected steps in the following diagnostic chart.

3. Checks for the presence of a Lock signal (false signal) while the doors are in the Unlocked state.
4. Checks if the false signal (from Step 3) is due to a BCM fault.
5. Checks if the false signal (from Step 4) is due to a fault in the driver's door lock actuator.
6. Checks if the false signal (from Step 5) is due to a fault in the passenger's door lock actuator.

LOCKING DOORS USING DRIVER'S DOOR LOCK MICROSWITCH DIAGNOSTIC CHART

STEP	ACTION	VALUE	YES	NO
1	Are all door ajar switches and associated circuits functioning correctly?		Go to Step 2.	Go to Part L, Door Ajar Switches.
2	1. Turn the ignition off. 2. Connect TECH 2 to the DLC. 3. Close and unlock the doors. 4. Select Diagnostics / Model Year / Vehicle Model / Body / Body Control Module / Miscellaneous Tests / Central Locking. 5. Perform the test as instructed by TECH 2 and lock the doors. Do all of the doors lock?		Go to Step 3.	Go to Step 7.
3	1. Close and unlock the doors. 2. With TECH 2 still connected, exit to the System Selection Menu and select Data Display / Central Door Locking / Lock Switch. Does TECH 2 display On (locked)?		False signal. Go to Step 4.	Go to Step 16.
4	1. With TECH 2 still connected, doors closed and Lock Switch status displayed, disconnect BCM connector X4. Does TECH 2 display On?		False signal. Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Install BCM connector X4 and go to Step 5.
5	1. Disconnect the driver's door actuator (Y13) connector X1. 2. With TECH 2 still connected, and Lock Switch status displayed, close all doors. Does TECH 2 display On?		False signal. Install the driver's door actuator (Y13) and go to Step 6.	Replace the driver's door lock actuator (Y13). Refer to Section 1A5, 2.7 FRONT DOOR LOCK ASSEMBLY.
6	1. With TECH 2 still connected and Lock Switch status displayed, disconnect the front passenger's door actuator (Y13) connector X1. Does TECH 2 display On?		False signal. Install the passenger's door actuator (Y13) and repair faulty circuit 195 (Brown / Red wire).	Replace the passenger's door lock actuator (Y13). Refer to Section 1A5, 2.7 FRONT DOOR LOCK ASSEMBLY.
7	While performing Step 1, did at least one door lock?		Go to Step 11.	Go to Step 8.
8	1. Back-probe BCM terminal X1-22 with a voltmeter to ground. Is the value as specified?	Battery voltage	Go to Step 9.	Check and repair fuses F20 and F105 and circuits to battery.
9	1. Back-probe BCM connector terminals X1-11, X1-20 and X3-1, circuits 151, 251 and 150, with an ohmmeter to ground. Is the value as specified?	Less than 1 ohm	Go to Step 10.	Repair faulty circuit 151, 251 150 and check for positive ground connections to BCM.

STEP	ACTION	VALUE	YES	NO
10	1. Back-probe BCM connector terminal X4-10, circuit 295 (Black / Yellow wire) with a voltmeter to ground. 2. Connect TECH 2 to the DLC. 3. Close and unlock the doors. 4. Select Diagnostics / Model Year / Vehicle Model / Body / Body Control Module / Miscellaneous Tests / Central Locking. 5. Conduct test as instructed by TECH 2 and lock doors. Is the value as specified?	12 volts for 0.7 second	Go to Step 11.	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.
11	1. Back-probe each door actuator connector terminal X1-6 (liftgate terminal X1-1), circuit 295 (Black / Yellow wire) with a voltmeter to ground. 2. For each actuator, repeat the central locking test (Step 9) test as instructed by TECH 2 and lock the doors. Are the values as specified?	12 volts for 0.7 second	Go to Step 12.	Repair faulty circuit 295.
12	1. Disconnect BCM connector X4. 2. Back-probe BCM terminal X4-1 with a voltmeter to ground. Is the value as specified?	0 volt	Go to Step 13.	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.
13	1. Back-probe BCM terminal X4-1 with an ohmmeter to ground. Is the value as specified?	Less than 1 ohm	Install BCM connector X4 and go to Step 14.	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.
14	1. Back-probe each door lock actuator connector terminal X1-2, with a voltmeter to ground. Is the value as specified?	0 volt	Go to Step 15.	Repair faulty circuit 294.
15	1. Back-probe each door lock actuator connector terminal X1-2 with an ohmmeter to ground. Is the value as specified?	Less than 1 ohm	Replace the faulty door lock actuator (Y13 / Y31). Refer to Section 1A5, 2.7 FRONT DOOR LOCK ASSEMBLY or 3.7 REAR DOOR LOCK ASSEMBLY as necessary.	Repair faulty circuit 294.
16	1. With the doors unlocked, TECH 2 connected and Lock Switch status displayed, insert the key into the driver's door lock and turn the key to the lock position. Does TECH 2 display On?		Correct signal. Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Go to Step 17.
17	1. Back-probe driver's door lock actuator (Y13) terminal X1-5, circuit 650 (Black / Blue) with an ohmmeter to ground. Is the value as specified?	Less than 1 ohm	Go to Step 18.	Repair faulty circuit 650.
18	1. Disconnect BCM connector X4. 2. Back-probe between driver's door lock actuator (Y13) terminal X1-4 and BCM connector terminal X4-20, circuit 195 (Brown / Red wire) with an ohmmeter. Is the value as specified?	Less than 1 ohm	Replace faulty door lock actuator (Y13). Refer to Section 1A5, 2.7 FRONT DOOR LOCK ASSEMBLY.	Repair faulty circuit 195.
WHEN ALL DIAGNOSIS AND REPAIRS ARE COMPLETE, VERIFY CORRECT OPERATION				

PART C – UNLOCKING DOORS USING DRIVER'S DOOR LOCK SNIB ACTUATOR

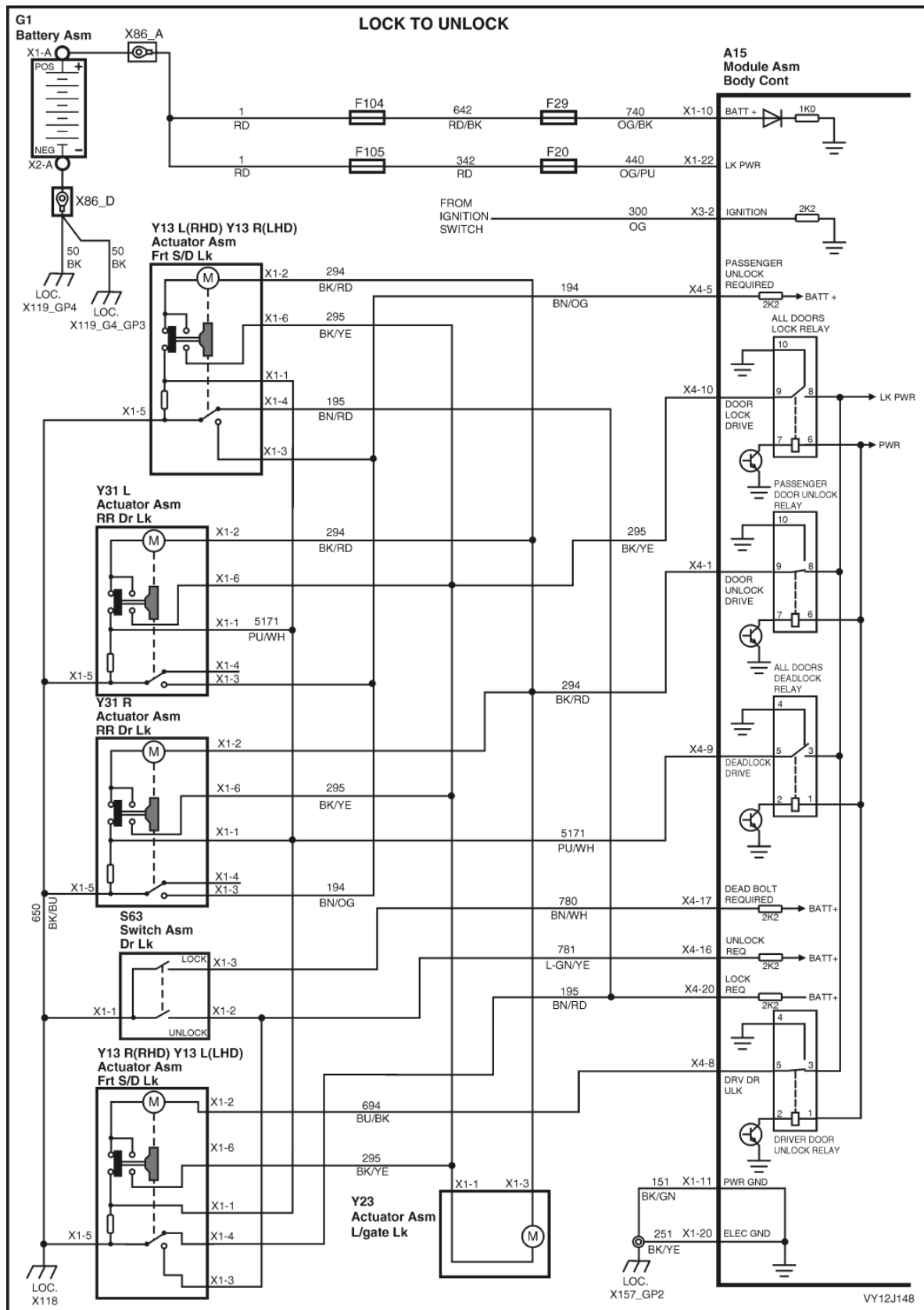


Figure 12J-226

Test description

The numbered descriptions below refer to selected steps in the following diagnostic chart.

4. Checks for the presence of an Unlock signal (false signal) while the doors are in the Locked state.

Checks if the false signal (from Step 4) is due to a BCM fault.

Checks if the false signal (from Step 5) is due to a circuit fault.

UNLOCKING DOORS USING DRIVER'S DOOR LOCK SNIB ACTUATOR DIAGNOSTIC CHART

STEP	ACTION	VALUE	YES	NO
1	Are all door ajar switches and associated circuits functioning correctly?		Go to Step 2.	Go to Part L, Door Ajar Switches.
2	Does the TECH 2 Central Locking Test unlock all doors?		Go to Step 3.	Go to Part A, Unlocking Doors using Driver's Door Lock Microswitch.
3	Is the driver's door lock switch (S63) functioning correctly?		Go to Step 4.	Go to Part A, Unlocking Doors using Driver's Door Lock Microswitch.
4	1. Connect TECH 2 to the DLC. 2. Lock the doors. 3. Select Diagnostics / Model Year / Vehicle Model / Body / Body Control Module / Data Display / Central Door Locking / Driver's Door Unlock Switch. Does TECH 2 display On?		False signal. Go to Step 5.	Go to Step 6.
5	1. With TECH 2 still connected and Driver's Door Unlock Switch status displayed, disconnect BCM connector X4. Does TECH 2 display On?		False signal. Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Install BCM connector X4 and go to Step 6.
6	1. With TECH 2 still connected and Driver's Unlock Switch status displayed, disconnect the driver's door actuator (Y13) connector X1. Does TECH 2 display On?		False signal. Repair faulty circuit 781 (Light-green / Yellow wire).	Go to Step 9.
7	1. With the doors locked, TECH 2 connected and Driver's Door Unlock Switch status displayed, move the driver's door lock snib button to the unlock position. Does TECH 2 display On?		Correct signal. Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Go to Step 8.
8	1. Disconnect BCM connector X4. 2. Disconnect driver's door lock actuator (Y13) connector X1. 3. Back-probe between driver's door lock switch terminal X1-3 and BCM connector terminal X4-16, circuit 781 (Light-green / Yellow) with an ohmmeter. Is the value as specified?	Less than 1 ohm	Go to Step 9.	Repair faulty circuit 781.
9	1. Back-probe driver's door lock actuator (Y13) terminal X1-5, circuit 650 (Black / Blue) with an ohmmeter to ground. Is the value as specified?	Less than 1 ohm	Replace the driver's door lock actuator (Y13). Refer to Section 1A5, 2.7 FRONT DOOR LOCK ASSEMBLY.	Repair faulty circuit 650.
WHEN ALL DIAGNOSIS AND REPAIRS ARE COMPLETE, VERIFY CORRECT OPERATION				

PART D – LOCKING DOORS USING DRIVER'S DOOR LOCK SNIB ACTUATOR

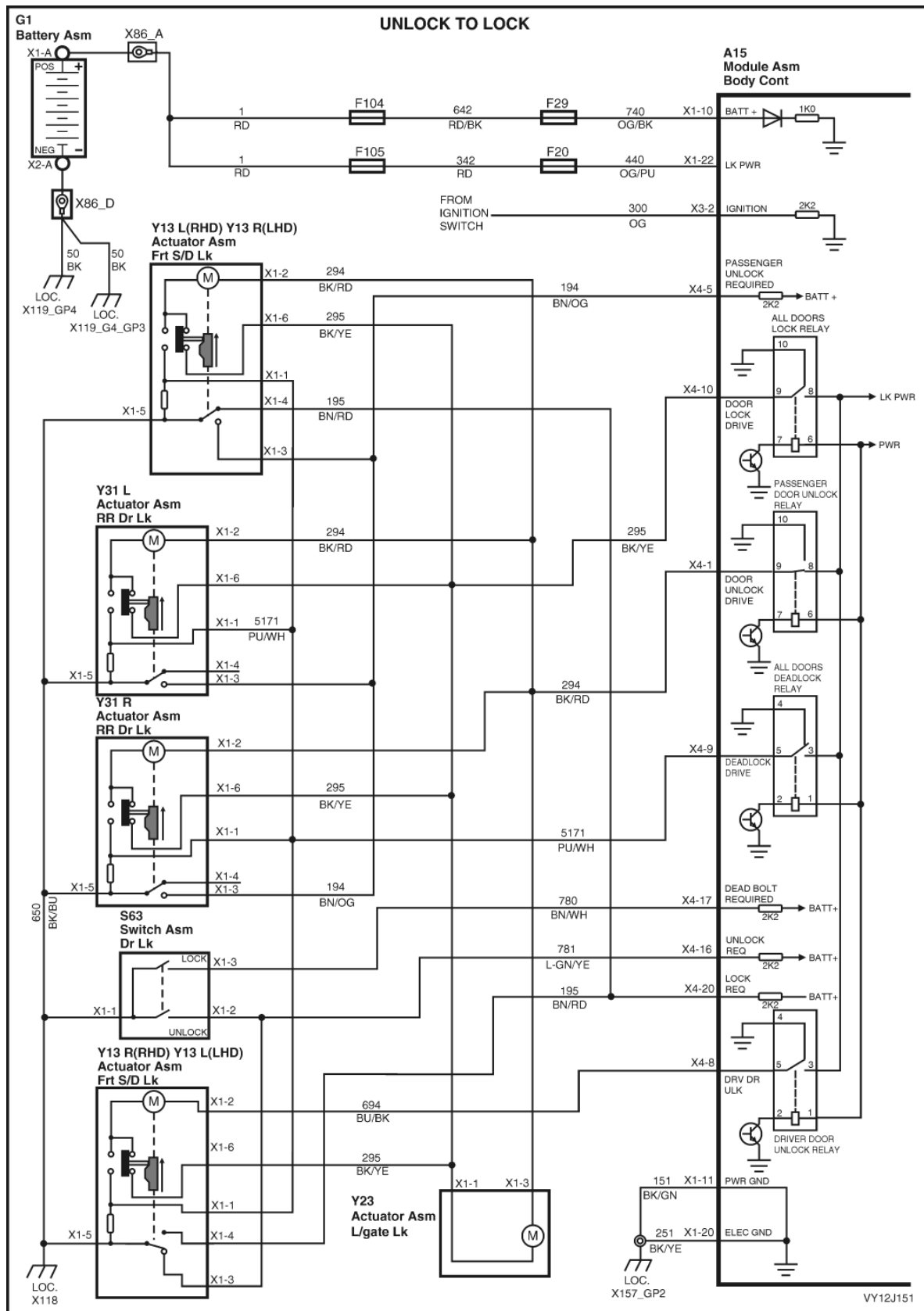


Figure 12J-227

Test description

The numbered descriptions below refer to selected steps in the following diagnostic chart.

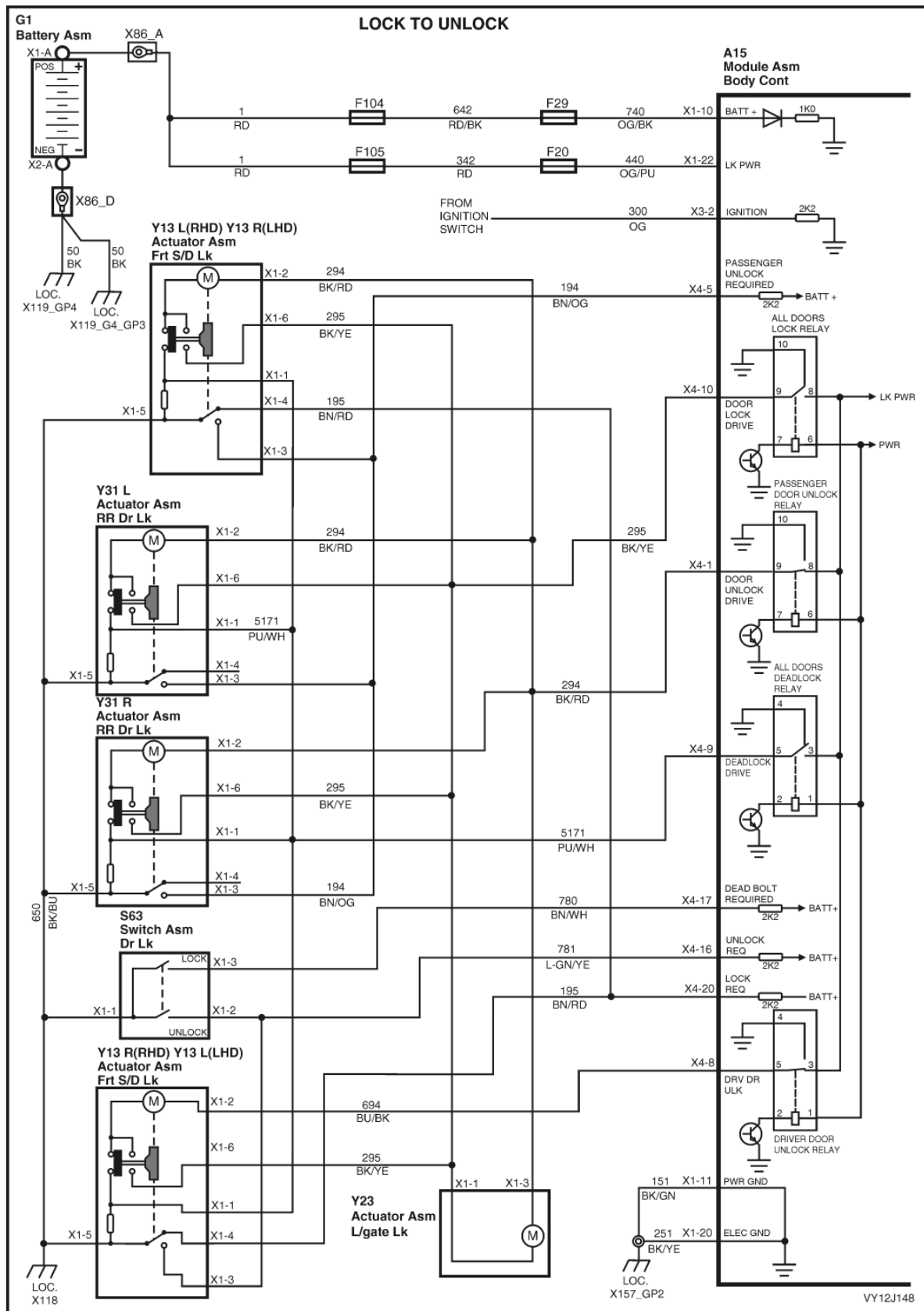
5. Checks for the presence of a Lock signal (false signal) while the doors are in the Unlocked state.
6. Checks if the false signal (from Step 5) is due to a BCM fault.
7. Checks if the false signal (from Step 6) is due to a fault in the driver's door lock actuator or its ground connection.
8. Checks if the false signal (from Step 7) is due to a fault in the front passenger's door lock actuator or its ground connection.

LOCKING DOORS USING DRIVER'S DOOR LOCK SNIB ACTUATOR DIAGNOSTIC CHART

STEP	ACTION	VALUE	YES	NO
1	Are all door ajar switches and associated circuits functioning correctly?		Go to Step 2.	Go to Part L, Door Ajar Switches.
2	Does the TECH 2 Central Locking Test lock all doors?		Go to Step 3.	Go to Part B, Locking Doors using Driver's Door Lock Microswitch.
3	Is the driver's door ajar indicator switch (S2) functioning correctly?		Go to Step 4.	Go to Part B, Locking Doors using Driver's Door Lock Microswitch.
4	Is the driver's door lock switch (S63) is functioning correctly?		Go to Step 5.	Go to Part A, Unlocking Doors using Driver's Door Lock Microswitch.
5	1. Connect TECH 2 to the DLC. 2. Close and unlock the doors. 3. Select Diagnostics / Model Year / Vehicle Model / Body / Body Control Module / Data Display / Central Door Locking / Lock Switch. Does TECH 2 display On?		False signal. Go to Step 10.	Go to Step 13.
6	1. With TECH 2 still connected and Lock Switch status displayed, disconnect BCM connector X4. Does TECH 2 display On?		False signal. Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Install BCM connector X4 and go to Step 7.
7	1. With TECH 2 still connected and Lock Switch status displayed, disconnect the driver's door actuator (Y13) connector X1. Does TECH 2 display On?		False signal. Install driver's door actuator connector and go to Step 8.	Go to Step 11.
8	1. With TECH 2 still connected and Lock Switch status displayed, disconnect the front passenger's door lock actuator (Y13) connector X1. Does TECH 2 display On?		False signal. Repair faulty circuit 781 (Light-green / Yellow wire).	Go to Step 12.
9	1. With the doors unlocked, TECH 2 connected and Lock Switch status displayed, move the driver's door lock snib button to the lock position. Does TECH 2 display On?		Correct signal. Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Go to Step 10.
10	1. Disconnect BCM connector X4. 2. Disconnect driver's and front passenger's door lock actuators (Y13) connector X1. 3. Back-probe between BCM connector terminal X4-20 and terminal X1-4 of the driver and passenger door lock actuators, circuit 195 (Brown / Red) with an ohmmeter. Are the values as specified?	Less than 1 ohm	Go to Step 11.	Repair faulty circuit 781.

STEP	ACTION	VALUE	YES	NO
11	1. Back-probe the driver's door lock actuator (Y13) terminal X1-5, circuit 650 (Black / Blue) with an ohmmeter to ground. Is the value as specified?	Less than 1 ohm	Replace the driver's door lock actuator (Y13). Refer to Section 1A5, 2.7 FRONT DOOR LOCK ASSEMBLY.	Repair faulty circuit 650.
12	1. Back-probe the front passenger's door lock actuator (Y13) terminal X1-5, circuit 650 (Black / Blue) with an ohmmeter to ground. Is the value as specified?	Less than 1 ohm	Replace the front passenger's door lock actuator (Y13). Refer to Section 1A5, 2.7 FRONT DOOR LOCK ASSEMBLY.	Repair faulty circuit 650.
WHEN ALL DIAGNOSIS AND REPAIRS ARE COMPLETE, VERIFY CORRECT OPERATION				

PART E – UNLOCKING DOORS USING PASSENGERS' DOOR LOCK SNIB ACTUATORS



Test description

The numbered descriptions below refer to selected steps in the following diagnostic chart.

3. Checks for the presence of an Unlock signal (false signal) while the doors are in the Locked state.
4. Checks if the false signal (from Step 3) is due to a BCM fault.
5. Checks if the false signal (from Step 4) is due to a fault in the front passenger's door lock actuator.
6. Checks if the false signal (from Step 5) is due to a fault in the LHS rear passenger's door actuator.
7. Checks if the false signal (from Step 6) is due to a fault in the RHS rear passenger's door actuator or the circuit.

UNLOCKING DOORS USING PASSENGERS' DOOR LOCK SNIB ACTUATORS DIAGNOSTIC CHART

STEP	ACTION	VALUE	YES	NO
1	Are all door ajar switches and associated circuits functioning correctly?		Go to Step 2.	Go to Part L, Door Ajar Switches.
2	Does the TECH 2 Central Locking Test unlock all doors?		Go to Step 3.	Go to Part A, Unlocking Doors using Driver's Door Lock Microswitch.
3	1. Connect TECH 2 to the DLC. 2. Lock the doors. 3. Select Diagnostics / Model Year / Vehicle Model / Body / Body Control Module / Data Display / Central Door Locking / Passenger Doors Unlock Switch. Does TECH 2 display On?		False signal. Go to Step 4.	Go to Step 8.
4	1. With TECH 2 still connected and Passenger Doors Unlock Switch status displayed, disconnect BCM connector X4. Does TECH 2 display On?		False signal. Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Install BCM connector X4 and go to Step 5.
5	1. With TECH 2 still connected and Passenger Doors Switch status displayed, disconnect the front passenger's door actuator (Y13) connector X1. Does TECH 2 display On?		False signal. Go to Step 6.	Replace the front passenger's door lock actuator (Y13). Refer to Section 1A5, 2.7 FRONT DOOR LOCK ASSEMBLY.
6	1. With TECH 2 still connected and Passenger Doors Switch status displayed, disconnect the LHS rear passenger's door actuator (Y31) connector X1. Does TECH 2 display On?		False signal. Go to Step 7.	Replace the LHS rear passenger's door lock actuator (Y31). Refer to Section 1A5, 3.7 REAR DOOR LOCK ASSEMBLY.
7	1. With TECH 2 still connected and Passenger Doors Switch status displayed, disconnect the RHS rear passenger's door actuator (Y31) connector X1. Does TECH 2 display On?		False signal. Repair faulty circuit 194 (Brown / Orange wire).	Replace the RHS rear passenger's door lock actuator (Y31). Refer to Section 1A5, 3.7 REAR DOOR LOCK ASSEMBLY.
8	1. With the doors locked, TECH 2 connected and Driver's Door Unlock Switch status displayed, move the front passenger door lock snib button to the unlock position. 2. Lock all doors and repeat this for each rear passenger door. Does TECH 2 display On for each passenger door lock?		Correct signal. Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Go to Step 9.

STEP	ACTION	VALUE	YES	NO
9	1. Disconnect each suspect passenger door lock actuator connector. 2. Back-probe each disconnected passenger door lock actuator terminal X1-5, circuit 650 (Black / Blue wire) with an ohmmeter to ground. Is the value as specified?	Less than 1 ohm	Replace the faulty door lock actuator (Y13 / Y31). Refer to Section 1A5, 2.7 FRONT DOOR LOCK ASSEMBLY or 3.7 REAR DOOR LOCK ASSEMBLY as necessary.	Repair faulty circuit 650.
WHEN ALL DIAGNOSIS AND REPAIRS ARE COMPLETE, VERIFY CORRECT OPERATION				

PART F – LOCKING DOORS USING FRONT PASSENGER DOOR LOCK SNIB ACTUATOR

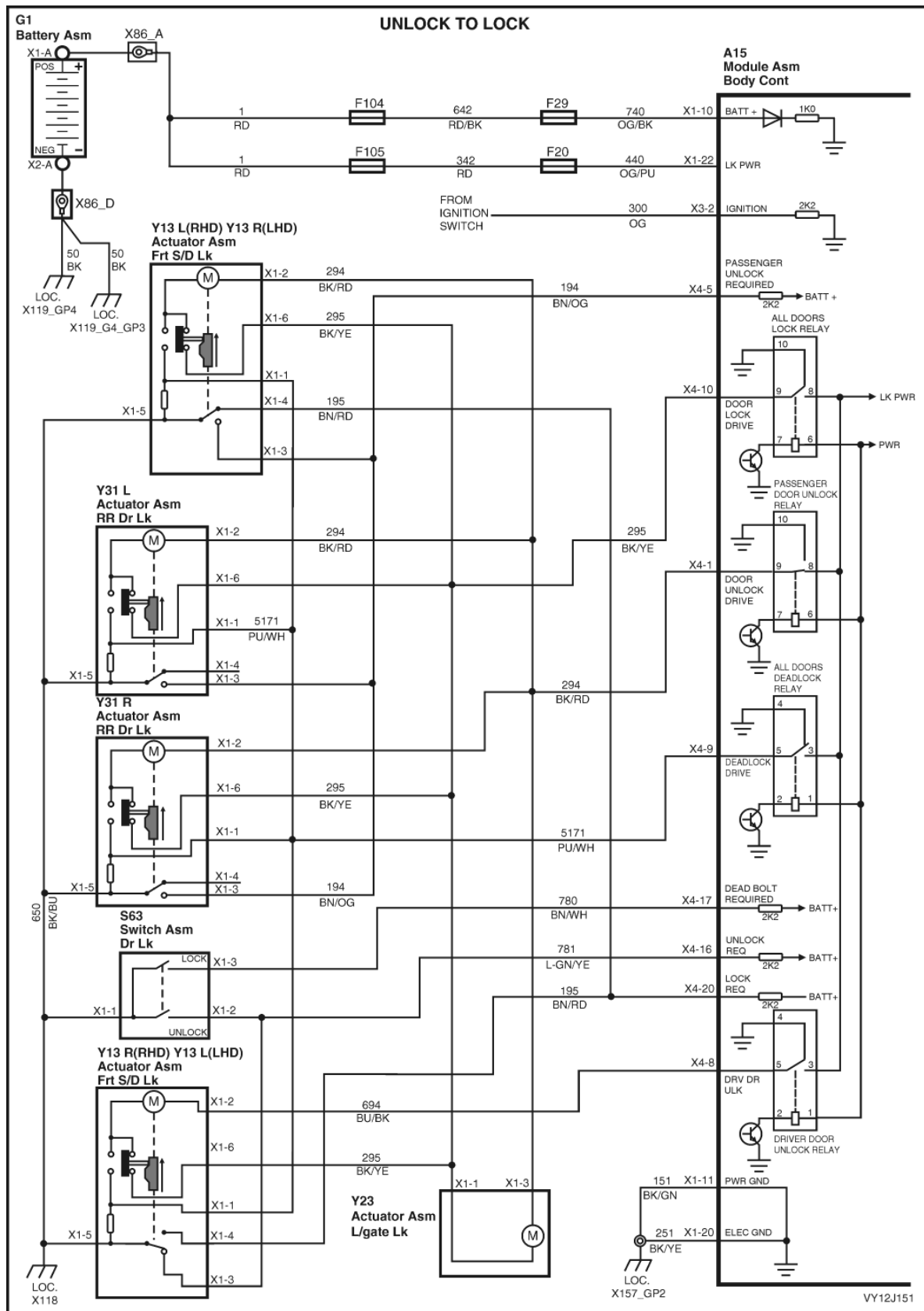


Figure 12J-229

LOCKING DOORS USING FRONT PASSENGER DOOR LOCK SNIB ACTUATOR DIAGNOSTIC CHART

STEP	ACTION	VALUE	YES	NO
1	Are all door ajar switches and associated circuits functioning correctly?		Go to Step 2.	Go to Part L, Door Ajar Switches.
2	Does the TECH 2 Central Locking Test lock all doors?		Go to Step 3.	Go to Part B, Locking Doors using Driver's Door Lock Microswitch.
3	Is the driver's door lock actuator (Y13) functioning correctly?		Go to Step 4.	Go to Part A and Part B, Unlocking and Locking Doors using Driver's Door Lock Microswitch.
4	Is the driver's door lock switch (S63) is functioning correctly?		Go to Step 5.	Go to Part A and Part B, Unlocking and Locking Doors using Driver's Door Lock Microswitch.
5	1. Turn the ignition off. 2. Disconnect BCM connector X4. 3. Disconnect the front passenger's door lock actuator (Y13) connector X1. 4. Back-probe between BCM connector terminal X4-20 and terminal X1-4 of the passenger door lock actuator, circuit 195 (Brown / Red) with an ohmmeter. Are the values as specified?	Less then 1 ohm	Go to Step 6.	Repair faulty circuit 195.
6	1. Back-probe the front passenger's door lock actuator (Y13) terminal X1-5, circuit 650 (Black / Blue wire) with an ohmmeter to ground. Is the value as specified?	Less then 1 ohm	Replace the front passenger's door lock actuator (Y13). Refer to Section 1A5, 2.7 FRONT DOOR LOCK ASSEMBLY.	Repair faulty circuit 650.
WHEN ALL DIAGNOSIS AND REPAIRS ARE COMPLETE, VERIFY CORRECT OPERATION				

PART G – UNLOCKING THE TAILGATE

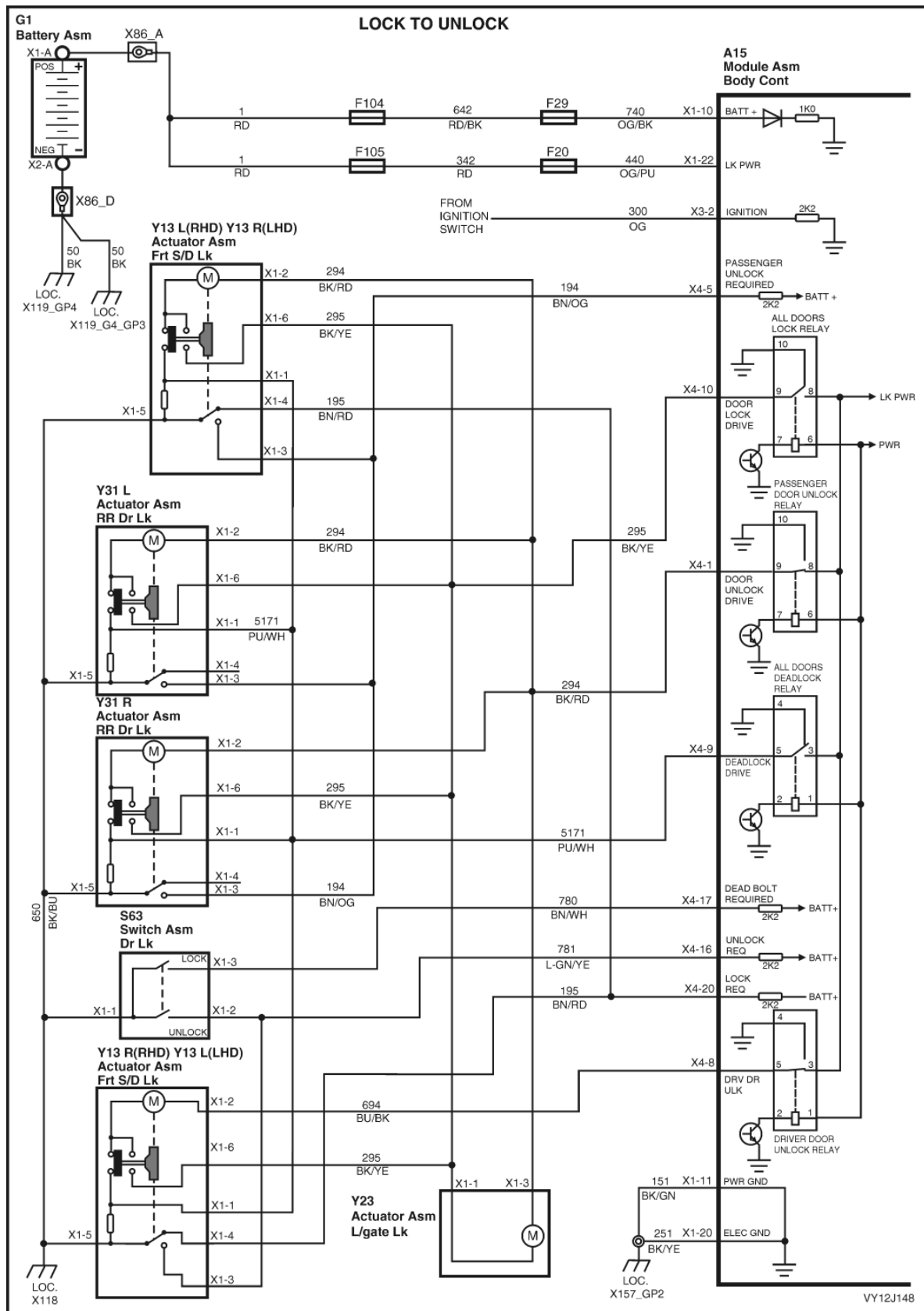


Figure 12J-230

UNLOCKING THE TAILGATE DIAGNOSTIC CHART

STEP	ACTION	VALUE	YES	NO
1	Are all door ajar switches and associated circuits functioning correctly?		Go to Step 2.	Go to Part L, Door Ajar Switches.
2	Does the TECH 2 Central Locking Test unlock all doors?		Go to Step 3.	Go to Part A, Unlocking Doors using Driver's Door Lock Microswitch.
3	<ol style="list-style-type: none">1. Lock the doors and tailgate.2. Connect TECH 2 to the DLC.3. Select Diagnostics / Model Year / Vehicle Model / Body / Body Control Module / Miscellaneous Test / Central Locking.4. Back-probe tailgate lock actuator (Y23) connector terminal X1-3, circuit 294 (Black / Red wire) with a voltmeter to ground.5. Conduct test as instructed by TECH 2 and unlock the doors. Is the value as specified?	12 volts for 0.7 second	Go to Step 4.	Repair faulty circuit 294.
4	<ol style="list-style-type: none">1. Back-probe tailgate lock actuator connector terminal X1-1, circuit 295 (Black / Yellow wire) with an ohmmeter to ground. Is the value as specified?	Less than 1 ohm	Replace tailgate lock actuator. Refer to Section 1A4, 4.8 LIFTGATE ACTUATOR ASSEMBLY.	Repair faulty circuit 295.
WHEN ALL DIAGNOSIS AND REPAIRS ARE COMPLETE, VERIFY CORRECT OPERATION				

PART H – DEADLOCKING DOORS USING DRIVER'S DOOR LOCK MICROSWITCH

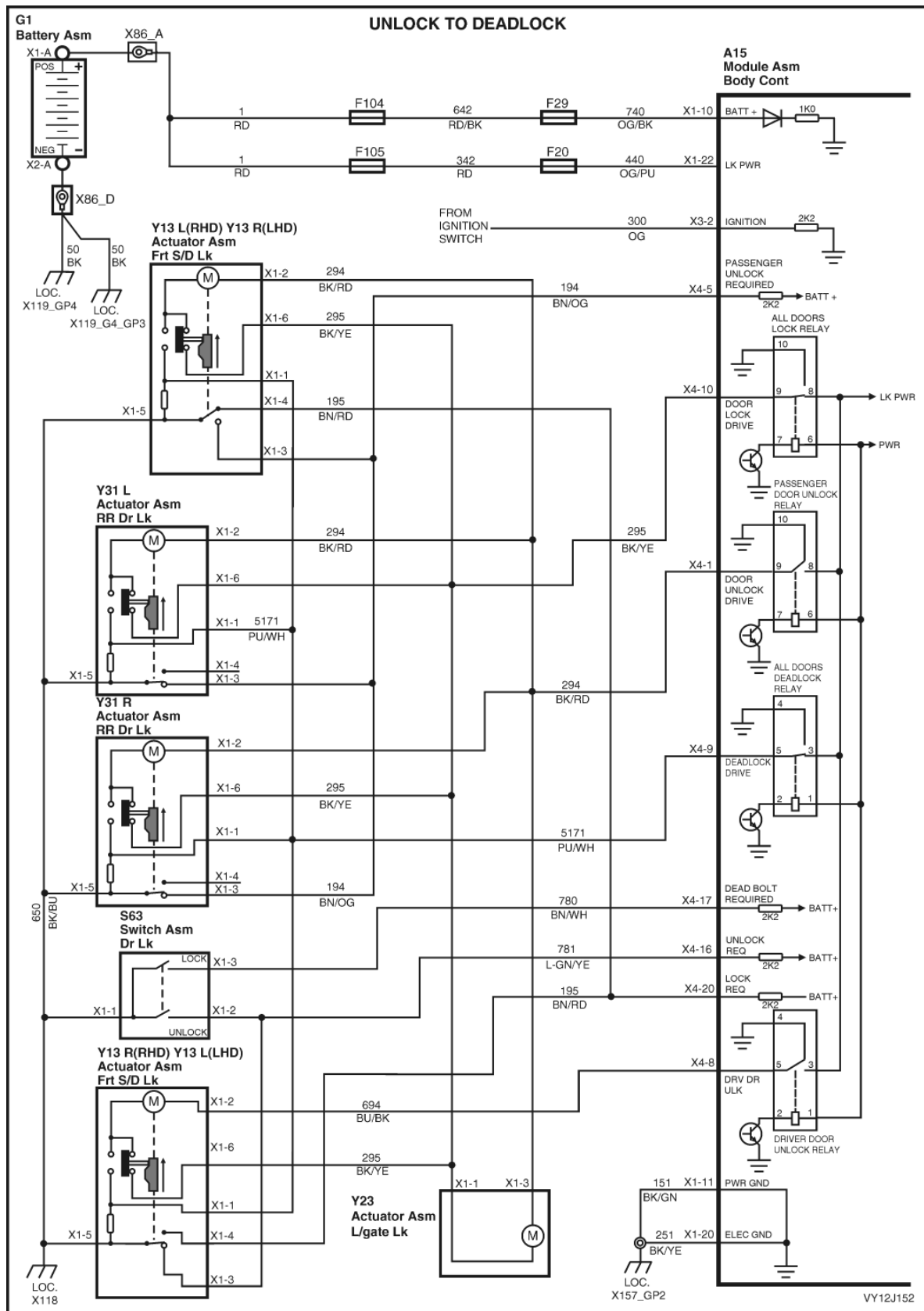


Figure 12J-231

Test description

The numbered descriptions below refer to selected steps in the following diagnostic chart.

4. Checks for the presence of an Ignition On signal (false signal) while the ignition switch is turned off.

5. Checks if the false signal (from Step 4) is due to a BCM fault.

DEADLOCKING DOORS USING DRIVER'S DOOR LOCK MICROSWITCH DIAGNOSTIC CHART

STEP	ACTION	VALUE	YES	NO
1	Are all door ajar switches and associated circuits functioning correctly?		Go to Step 2.	Go to Part L, Door Ajar Switches.
2	Does the TECH 2 Central Locking Test unlock all doors?		Go to Step 3.	Go to Part A, Unlocking Doors using Driver's Door Lock Microswitch.
3	Does the TECH 2 Central Locking Test lock all doors?		Go to Step 4.	Go to Part B, Locking Doors using Driver's Door Lock Microswitch.
4	1. Turn the ignition off. 2. Connect TECH 2 to the DLC. 3. Turn the ignition on. 4. Select Diagnostics / Model Year / Vehicle Model / Body / Body Control Module / Data Display / Central Door Locking / Ignition Switch. Does TECH 2 display On?		False signal. Go to Step 5.	Go to Step 7.
5	1. Back-probe BCM connector terminal X3-2, circuit 300 (Orange wire) with a voltmeter to ground. 2. While reading the voltmeter, Turn the ignition on and then turn it off. Are the values as specified?	Ignition ON = 12 volts Ignition OFF = 0 volt	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Go to Step 6.
6	1. Disconnect ignition switch (S149) connector. 2. Back-probe ignition switch terminal X1-3 with a voltmeter to ground. 3. While reading the voltmeter, Turn the ignition on and then turn it off. Are the values as specified?	Ignition ON = 12 volts Ignition OFF = 0 volt	Repair faulty circuit 300.	Check ignition switch function. Refer to Section 9A, 2.6 IGNITION SWITCH.
7	1. With the ignition off, the doors unlocked and TECH 2 still connected, exit to the Body Menu and select Miscellaneous Tests / Central Door Locking. 2. Conduct test as instructed by TECH 2 and deadlock the doors. Do all of the doors deadlock?		Go to Step 11.	Go to Step 8.
8	In Step 4, did at least one door deadlock?		Go to Step 10.	Go to Step 9.
9	1. Back-probe BCM terminal X4-9 with a voltmeter to ground. 2. With the ignition turned off and doors closed, conduct the TECH 2 Central Locking Test and deadlock the doors. Is the value as specified?	12 volts for 0.7 second	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Go to Step 10.
10	1. Lock the doors. 2. Back-probe each door actuator connector terminal X1-1, circuit 5171 (Purple / White wire) with a voltmeter to ground. 3. From the Body Menu in TECH 2, select Miscellaneous Tests / Central Locking. 4. For each door, Perform the test as instructed by TECH 2 and deadlock the doors. Are the values as specified?	12 volts for 0.7 second	Replace the faulty door lock actuator (Y13 / Y31). Refer to Section 1A5, 2.7 FRONT DOOR LOCK ASSEMBLY or 3.7 REAR DOOR LOCK ASSEMBLY as necessary.	Repair faulty circuit 5171.

STEP	ACTION	VALUE	YES	NO
11	1. With the ignition turned off, doors closed and TECH 2 still connected, exit to the Body Menu and select Data Display / Central Door Locking / Deadlock Switch. 2. Insert the key into the driver's door lock and turn the key to the lock position twice sequentially. Does TECH 2 display On (deadlock)?		Correct signal. Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Go to Step 12.
12	1. Disconnect the driver's door lock switch (S63) connector. 2. Back-probe the driver's door lock switch between terminals X1-3 and X1-1 with an ohmmeter. 3. Insert the key into the driver's door lock and turn the key to the lock position. Is the value as specified?	Less than 1 ohm	Go to Step 13.	Replace the driver's door lock switch. Refer to Section 1A5, 2.8 FRONT DOOR OUTSIDE HANDLE ASSEMBLY.
13	1. Back-probe the driver's door lock switch terminal X1-5, circuit 650 (Black / Blue wire) with an ohmmeter to ground. Is the value as specified?	Less than 1 ohm	Repair faulty circuit 780 (Brown / White wire).	Repair faulty circuit 650.
WHEN ALL DIAGNOSIS AND REPAIRS ARE COMPLETE, VERIFY CORRECT OPERATION				

PART I – UNLOCKING DOORS FROM DEADLOCK

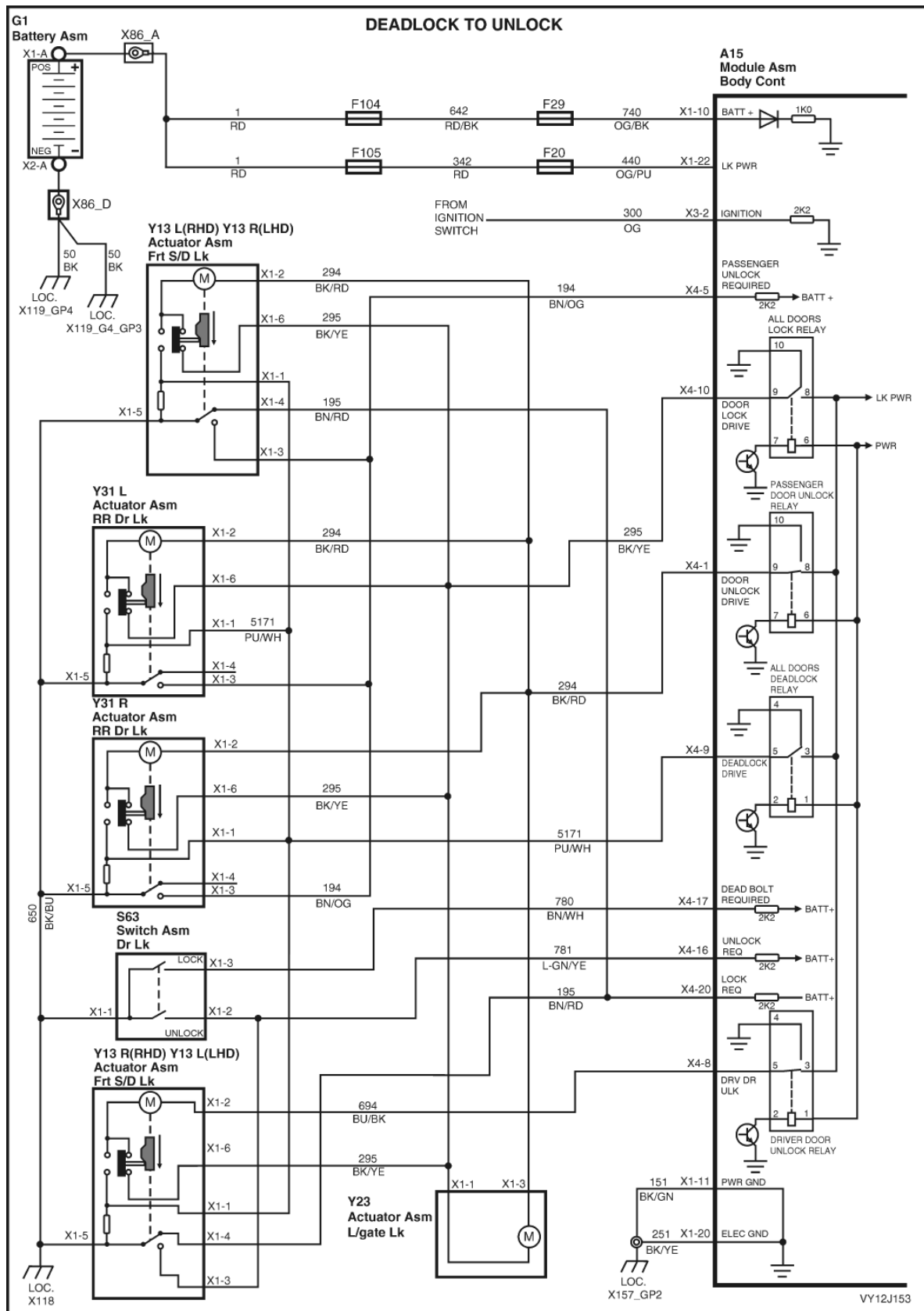
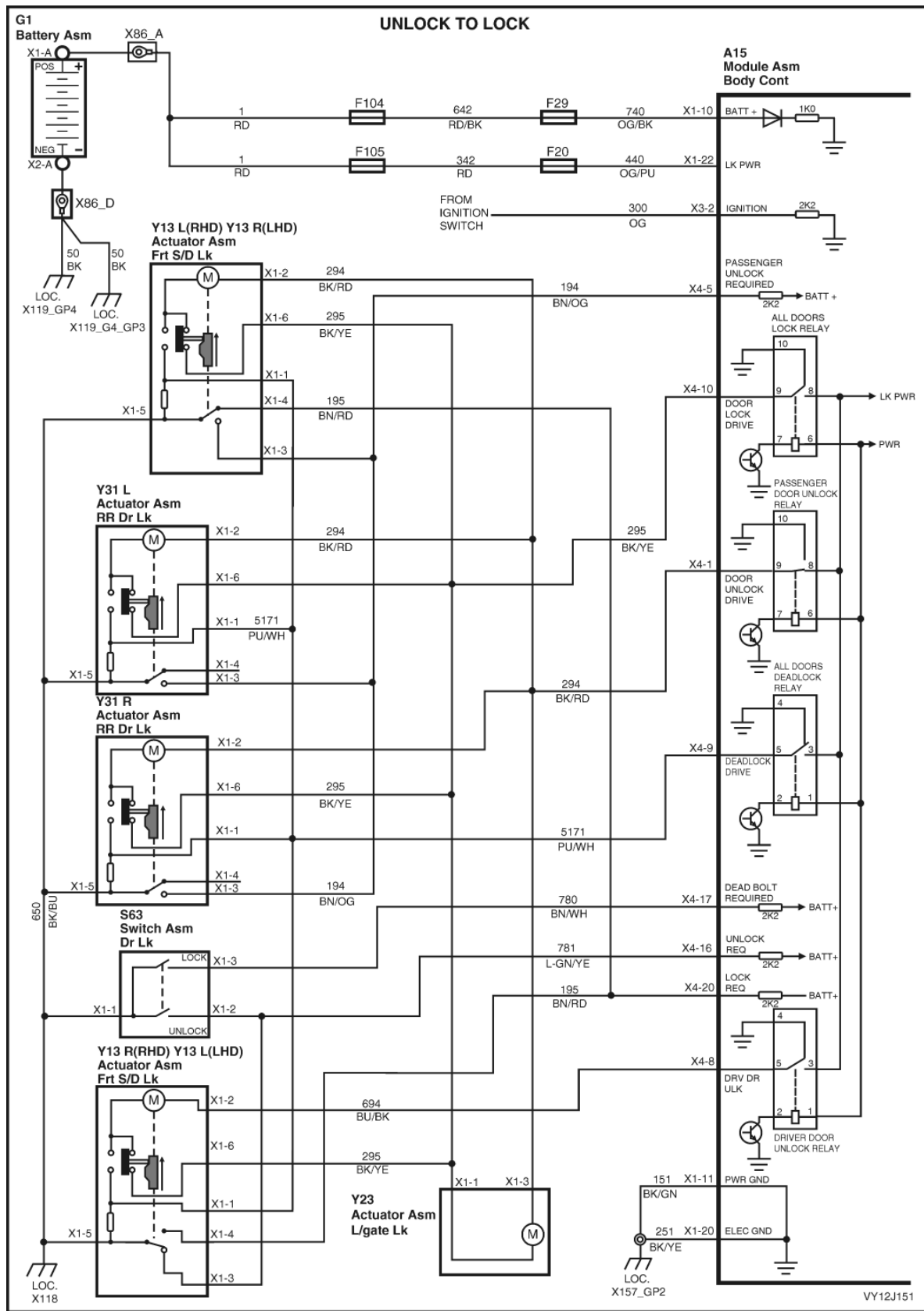


Figure 12J-232

UNLOCKING DOORS FROM DEADLOCK DIAGNOSTIC CHART

STEP	ACTION	VALUE	YES	NO
1	Are all door ajar switches and associated circuits functioning correctly?		Go to Step 2.	Go to Part L, Door Ajar Switches.
2	Does the TECH 2 Central Locking Test unlock all doors?		Go to Step 3.	Go to Part A, Unlocking Doors using Driver's Door Lock Microswitch.
3	Does the TECH 2 Central Locking Test lock all doors?		Go to Step 4.	Go to Part B, Locking Doors using Driver's Door Lock Microswitch.
4	Do the doors deadlock using the driver's door lock microswitch?		Go to Step 5.	Go to Part H, Deadlocking Doors using Driver's Door Lock Microswitch.
5	1. Back-probe BCM connector terminal X4-10, circuit 295 (Black / Yellow wire) with a voltmeter to ground. Is the value as specified?	0 volt	Go to Step 6.	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.
6	1. Back-probe BCM connector terminal X4-10, circuit 295 (Black / Yellow wire) with an ohmmeter to ground. Is the value as specified?	Less than 1 ohm	Check actuator adjustment. Refer to Section 1A5, 2.7 FRONT DOOR LOCK ASSEMBLY or 3.7 REAR DOOR LOCK ASSEMBLY as necessary.	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.
WHEN ALL DIAGNOSIS AND REPAIRS ARE COMPLETE, VERIFY CORRECT OPERATION				

PART J – AUTO DOOR LOCKING (GEARSHIFT OUT OF PARK POSITION)



AUTO DOOR LOCKING (GEARSHIFT OUT OF PARK POSITION) DIAGNOSTIC CHART

STEP	ACTION	VALUE	YES	NO
1	Are all door ajar switches and associated circuits functioning correctly?		Go to Step 2.	Go to Part L, Door Ajar Switches.
2	Does the TECH 2 Central Locking Test unlock all doors?		Go to Step 3.	Go to Part A, Unlocking Doors using Driver's Door Lock Microswitch.
3	Does the TECH 2 Central Locking Test lock all doors?		Go to Step 4.	Go to Part B, Locking Doors using Driver's Door Lock Microswitch.
4	Is Autolock in drive enabled?		Go to Step 5.	Enable autolock in drive (YES) in the BCM Program / User Settings.
5	1. Turn the ignition off. 2. Connect TECH 2 to the DLC. 3. Turn the ignition on. 4. Select Diagnostics / Model Year / Vehicle Model / Body / Body Control Module / Data Display / Central Door Locking / Ignition Switch. Does TECH 2 display On?		Go to Step 8.	Go to Step 6.
6	1. Back-probe BCM connector terminal X3-2, circuit 300 (Orange wire) with a voltmeter to ground. 2. While reading the voltmeter, Turn the ignition on and then turn it off. Are the values as specified?	Ignition ON = 12 volts Ignition OFF = 0 volt	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Go to Step 7.
7	1. Disconnect ignition switch (S149) connector. 2. Back-probe ignition switch terminal X1-3 with a voltmeter to ground. 3. While reading the voltmeter, Turn the ignition on and then turn it off. Are the values as specified?	Ignition ON = 12 volts Ignition OFF = 0 volt	Repair faulty circuit 300.	Check ignition switch function. Refer to Section 9A, 2.6 IGNITION SWITCH.
8	1. From the TECH 2 Body Menu, select Data Display / Serial Data Inputs / PRNDL Switch. 2. Close the doors. 3. Turn the ignition on. 4. Move the Gearshift lever from P (park) to the N (neutral) position. Does TECH 2 display Neutral?		Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Refer to the relevant PCM diagnostics from either Section 6C1, POWERTRAIN – V6, Section 6C2, POWERTRAIN – V6 S/C or Section 6C3, POWERTRAIN – GEN III V8
WHEN ALL DIAGNOSIS AND REPAIRS ARE COMPLETE, VERIFY CORRECT OPERATION				

PART K – AUTO DOOR UNLOCKING (GEARSHIFT IN PARK POSITION, KEY OFF)

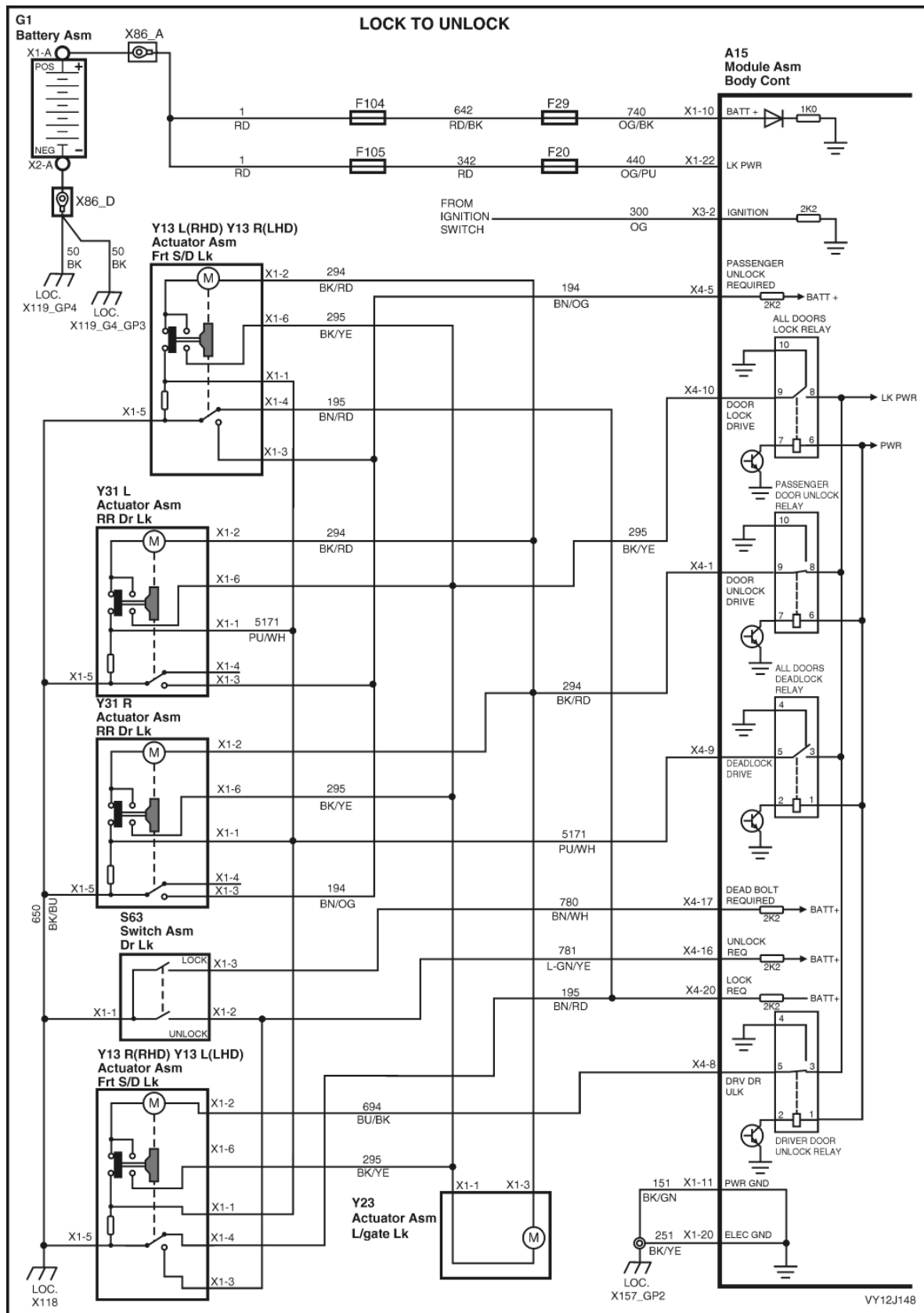


Figure 12J-234

AUTO DOOR UNLOCKING – KEY OFF. DIAGNOSTIC CHART

STEP	ACTION	VALUE	YES	NO
1	Are all door ajar switches and associated circuits functioning correctly?		Go to Step 2.	Go to Part L, Door Ajar Switches.
2	Does the TECH 2 Central Locking Test unlock all doors?		Go to Step 3.	Go to Part A, Unlocking Doors using Driver's Door Lock Microswitch.
3	Does the TECH 2 Central Locking Test lock all doors?		Go to Step 4.	Go to Part B, Locking Doors using Driver's Door Lock Microswitch.
4	Is Autolock in drive enabled?		Go to Step 5.	Enable autolock in drive (YES) in the BCM Program / User Settings.
5	1. Turn the ignition off. 2. Connect TECH 2 to the DLC. 3. Turn the ignition on. 4. Select Diagnostics / Model Year / Vehicle Model / Body / Body Control Module / Data Display / Central Door Locking / Ignition Switch. Does TECH 2 display On?		Go to Step 8.	Go to Step 6.
6	1. Back-probe BCM connector terminal X3-2, circuit 300 (Orange wire) with a voltmeter to ground. 2. While reading the voltmeter, Turn the ignition on and then turn it off. Are the values as specified?	Ignition ON = 12 volts Ignition OFF = 0 volt	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Go to Step 7.
7	1. Disconnect ignition switch (S149) connector. 2. Back-probe ignition switch terminal X1-3 with a voltmeter to ground. 3. While reading the voltmeter, Turn the ignition on and then turn it off. Are the values as specified?	Ignition ON = 12 volts Ignition OFF = 0 volt	Repair faulty circuit 300.	Check ignition switch function. Refer to Section 9A, 2.6 IGNITION SWITCH.
8	1. From the TECH 2 Body Menu, select Data Display / Serial Data Inputs / PRNDL Switch. 2. Close the doors. 3. Turn the ignition on. 4. Ensure that the Gearshift lever is in the P (park) position. Does TECH 2 display Park?		Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Refer to the relevant PCM diagnostics from either Section 6C1, POWERTRAIN – V6, Section 6C2, POWERTRAIN – V6 S/C or Section 6C3, POWERTRAIN – GEN III V8
WHEN ALL DIAGNOSIS AND REPAIRS ARE COMPLETE, VERIFY CORRECT OPERATION				

Test description

The numbered descriptions below refer to selected steps in the following diagnostic chart.

1. Checks for the presence of a Closed signal (false signal) while the driver's door is open.
2. Checks for the presence of an Open signal (false signal) while the driver's door is closed.
3. Checks for the presence of a Closed signal (false signal) while a passenger door is open.
4. Checks for the presence of an Open signal (false signal) while the passenger doors are closed.
6. Checks if the false signal (from Step 2) is due to a BCM fault.
9. Checks if the false signal (from Step 4) is due to a BCM fault.

PART L – DOOR AJAR SWITCHES

DIAGNOSTIC CHART

STEP	ACTION	VALUE	YES	NO
1	1. Open the driver's door. 2. Connect TECH 2 to the DLC. 3. Select Diagnostics / Model Year / Vehicle Model / Body / Body Control Module / Data Display / Central Door Locking / Driver's Door. Does TECH 2 display Closed?		False signal. Go to Step 5.	Go to Step 2.
2	1. With TECH 2 still connected and Driver's Door status displayed, close the door. Does TECH 2 display Open?		False signal. Go to Step 6.	Go to Step 3.
3	1. With TECH 2 still connected, exit Driver's Door and select Passenger Doors. 2. Open each passenger door, only one at a time. Does TECH 2 display Closed for any door?	Closed	False signal. Go to Step 8.	Go to Step 4.
4	1. With TECH 2 still connected and Passenger Doors status displayed, close the doors. Does TECH 2 display Open?	Open	False signal. Go to Step 9.	System OK.
5	1. Connect an ohmmeter between the ajar switch base and a known good ground. Is the value as specified?	Less then 1 ohm	Go to Step 6.	Repair faulty ground connection to switch.
6	1. With TECH 2 still connected, the driver's door open and Driver's Door status displayed, disconnect BCM connector X4. Does TECH 2 display Closed?		False signal. Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Install BCM connector X4 and go to Step 7.
7	1. Remove and disconnect the Driver's Door Ajar Switch (S2). (Refer to Section 12B, 3.11 DOOR JAMB SWITCHES.) 2. Connect an ohmmeter between the ajar switch connector terminal and the ajar switch base. 3. Press in the ajar switch plunger fully Are the values as specified?	Switch at rest = less then 1 ohm Switch pressed = open circuit	Repair faulty circuit 746 (Grey / White wire).	Replace driver's door ajar switch. Refer to Section 12B, 3.11 DOOR JAMB SWITCHES.
8	1. Connect an ohmmeter between each suspect passenger door ajar switch base and a known good ground. Are the values as specified?	Less then 1 ohm	Go to Step 9.	Repair faulty ground connection to switch.
9	1. With TECH 2 connected, Passenger Door status displayed and the suspect passenger door open, disconnect BCM connector X4. Does TECH 2 display Closed?		False signal. Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Install BCM connector X4 and go to Step 10.
10	1. Remove and disconnect each passenger door ajar switch (S2). (Refer to Section 12B, 3.11 DOOR JAMB SWITCHES.) 2. Connect an ohmmeter between the ajar switch connector terminal and the ajar switch base. 3. Press in the ajar switch plunger fully Are the values as specified?	Switch at rest = less then 1 ohm Switch pressed = open circuit	Repair faulty circuit 745 (White wire).	Replace passenger door ajar switch. Refer to Section 12B, 3.11 DOOR JAMB SWITCHES.
WHEN ALL DIAGNOSIS AND REPAIRS ARE COMPLETE, VERIFY CORRECT OPERATION				