

**Figure 12J-259**

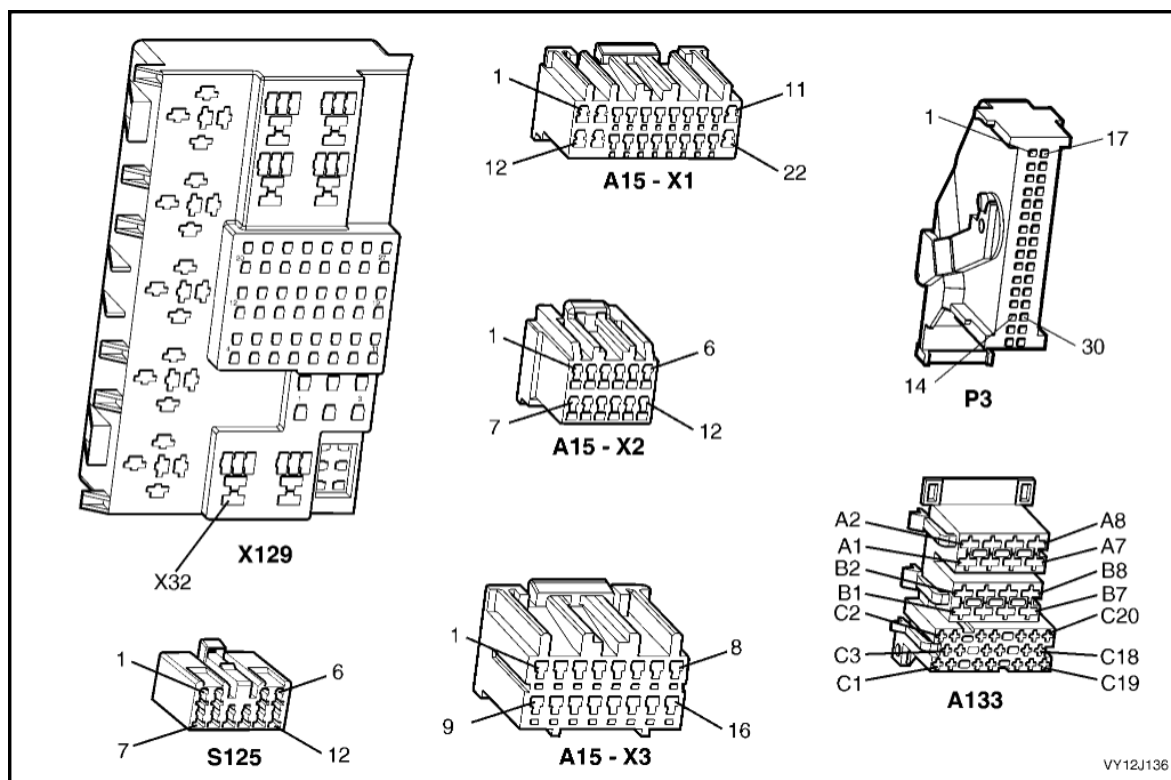


Figure 12J-260

#### INSTRUMENT DIMMING CONTROL DIAGNOSTIC CHART

STEP	ACTION	VALUE	YES	NO
1	Are the globes/LEDs for the control switches (transmission illumination, HVAC illumination, OCC illumination, hazard switch assembly, tripmeter/odometer assembly TCS), radio and instrument cluster operational		Go to Step 2.	Go to Section 12B, LIGHTING SYSTEM.
2	Turn the ignition on. Does the trip computer illuminate?		Go to Step 3.	Go to Section 12C, 3.4 INSTRUMENT ILLUMINATION DIAGNOSTIC CHART.
3	1. With the ignition on, turn on the park lamps. Is the backlighting of the control switches illuminated?		Go to Step 4.	Go to Section 12B, LIGHTING.
4	1. With both the ignition and the park lamps turned on, move and hold the light dimmer slider (part of the headlamp switch assembly) upwards. Does the illumination level ramp up to full intensity?		Go to Step 5.	Go to Step 7.
5	1. With both the ignition and the park lamps turned on, move and hold the light intensity slider downwards. Does the illumination level fade to minimum intensity (35%)?		Go to Step 6.	Go to Step 14.
6	When operating the Priority 1 and Priority 2 keys, is the illumination intensity as set for each key?		System OK.	Go to 4.3 REMOTE RECEIVER / KEY in this Section.

STEP	ACTION	VALUE	YES	NO
7	1. Turn the ignition off and the headlamp switch. Connect TECH 2 to the DLC. Turn the ignition on. Turn on the park lamps. Select Diagnostics / Model Year / Vehicle Model / Body / Body Control Module / Miscellaneous Tests / Lamps / Instrument Illumination. Perform the test as directed by TECH 2 and vary the light intensity from minimum to maximum. Is the value as specified?	Minimum = 35% Maximum = 100%	Go to Step 8.	Go to Step 12.
8	1. With TECH 2 connected, exit to the Body Control Module menu and select Data Display / Instrument Illumination / Instrument Illumination. 2. Move and hold the light dimmer slider upwards. Does TECH 2 display Up?		Go to Step 9.	Go to Step 10.
9	1. With TECH 2 connected, exit to the Body Control Module menu and select Miscellaneous Tests / Lamps / Instrument Illumination Switch Voltage. 2. Perform the test as directed by TECH 2 and vary the light intensity up and down. Are the values as specified?	Minimum = 1 volt Maximum = 3.5 volts	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Go to Step 10.
10	1. With both the ignition and the park lamps turned on, back-probe BCM connector terminal X2-3, circuit 44 (White wire) with a voltmeter to ground. 2. Vary the light intensity from minimum to maximum. Is the value as specified?	Minimum = 0 volt Maximum = 5 volts	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Go to Step 11.
11	1. Check the integrity of circuit 44 (White wire). Is the circuit OK?		Replace the headlamp switch assembly. Refer to Section 12B, 3.23 HEADLAMP SWITCH ASSEMBLY.	Repair faulty circuit 44.
12	When performing the TECH 2 Instrument Illumination test, did the light intensity alter slightly but not through the full range?		Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Go to Step 13.
13	1. With both the ignition and the park lamps turned on, back-probe BCM connector terminal X1-5, circuit 230 (Grey wire) with a jumper lead to ground. Does the backlighting of the control switches illuminate at full intensity?		Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Repair faulty circuit 230.
14	1. Turn the ignition off and the headlamp switch. 2. Connect TECH 2 to the DLC. 3. Turn the ignition on. 4. Turn on the park lamps. 5. Select Diagnostics / Model Year / Vehicle Model / Body / Body Control Module / Miscellaneous Tests / Lamps / Instrument Illumination. 6. Perform the test as directed by TECH 2 and vary the light intensity from maximum to minimum. Is the value as specified?	Maximum = 100% Minimum = 35%	Go to Step 15.	Go to Step 12.
15	1. With TECH 2 connected, exit to the Body Control Module menu and select Data Display / Instrument Illumination / Instrument Illumination Switch. 2. Move the light dimmer slider downwards. Does TECH 2 display Down?		Go to Step 9.	Go to Step 11.
<b>WHEN ALL DIAGNOSIS AND REPAIRS ARE COMPLETE, VERIFY CORRECT OPERATION</b>				

## 4.15 AIR CONDITIONING INTERFACE

### CIRCUIT DESCRIPTION

Level 1 model vehicles are fitted with a manual air conditioning system which incorporates an air conditioning interface in the BCM. Level 2 and 3 model vehicles are fitted with Occupant Climate Control (OCC), which does not use an interface.

The engine must be running for the air conditioner to cool or dry the air.

#### Manual system

The BCM remembers the system status when the ignition is switched from on to off or when the blower fan is turned off, but resets the system status to Off when the battery is disconnected.

If the air conditioner switch is pressed while the blower fan is turned off, the BCM will turn the air conditioning on next time the blower fan is turned on, provided that the ignition has not been turned off in the meantime.

The blower fan is controlled by the blower inhibit relay, which is energised when the ignition is on. When the air conditioner switch is pressed to turn on the air conditioner, a battery voltage signal is sent to the BCM. When this signal is received in conjunction with a blower fan On signal (and an ignition On signal), the BCM sends an air conditioner On request to the PCM (via the PIM on vehicles with a GEN III V8 engine) via the primary data bus. If the PCM inputs are within preset parameters, the PCM energises the air conditioner relay to switch on and engage the air compressor clutch.

When the air conditioning system is energised, the BCM provides a ground connection to illuminate the air conditioner indicator LED.

For more information about this system, refer to [Section 2C, HVAC CLIMATE CONTROL \(MANUAL A/C\) SERVICING AND DIAGNOSIS](#).

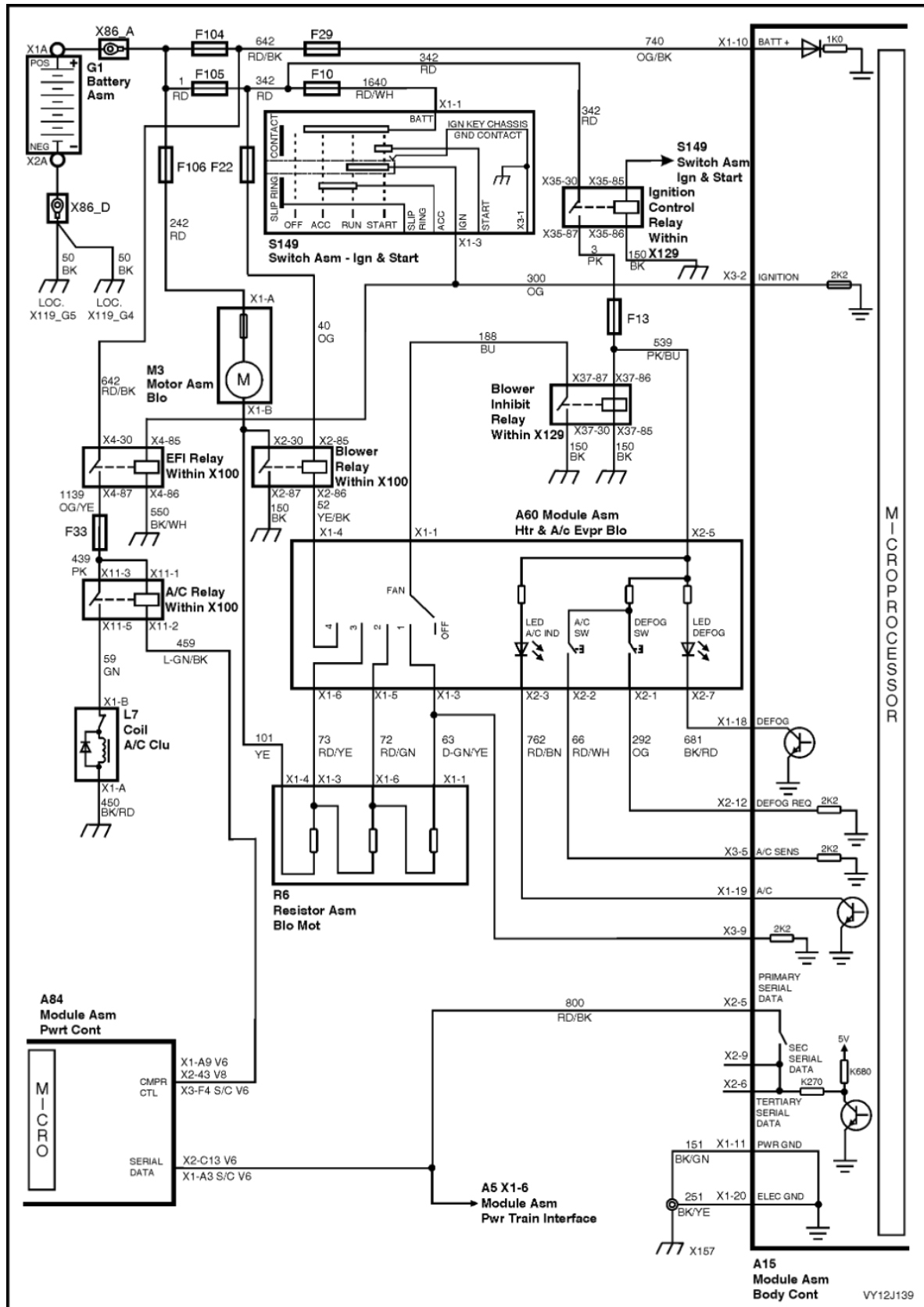


Figure 12J-261

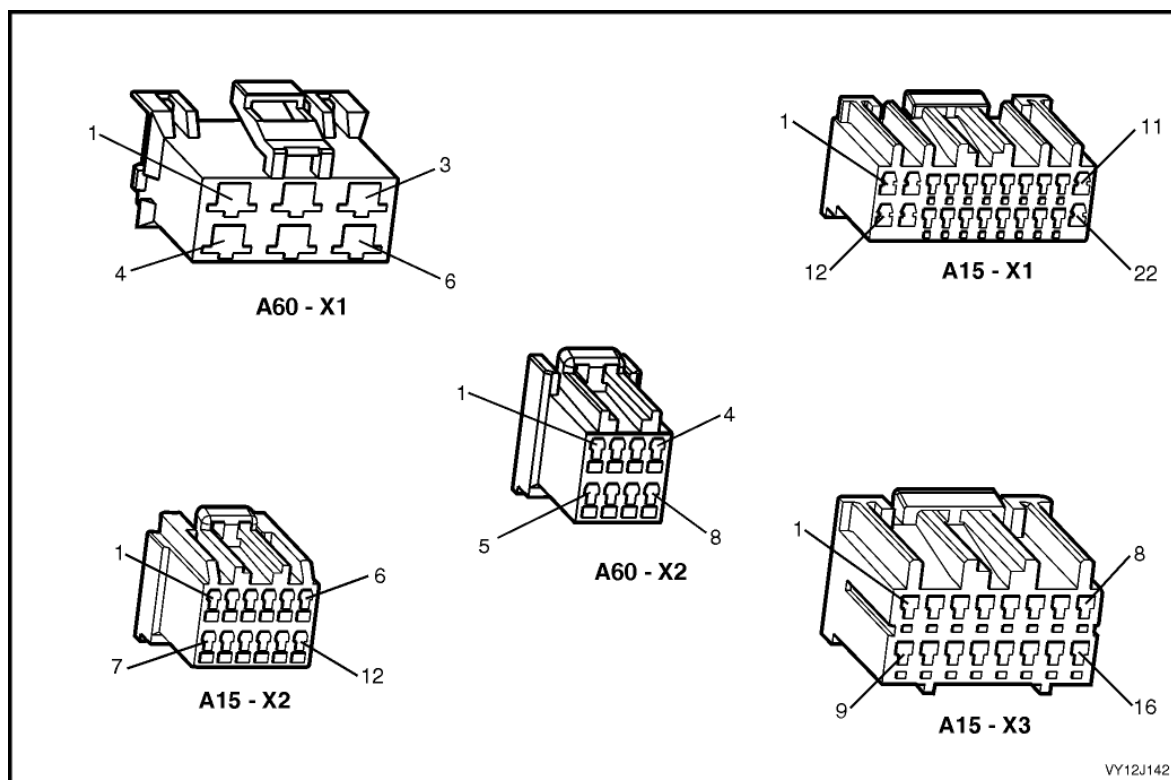


Figure 12J-262

#### AIR CONDITIONING INTERFACE DIAGNOSTIC CHART – LEVEL 1

STEP	ACTION	VALUE	YES	NO
1	1. Turn the ignition on. 2. Back-probe BCM connector terminal X3-2, circuit 300 (Orange wire) with a voltmeter to ground. Is the value as specified?	Battery voltage	Go to Step 2.	Check and repair ignition power supply to BCM.
2	1. Start the engine 2. Turn the ignition on. 3. Turn the blower fan switch to speed 1. 4. Turn on the air conditioner. Does the air compressor clutch engage?		Go to Step 3.	Go to Step 7.
3	1. Start the engine. 2. Adjust the temperature control dial to cold. 3. Run the air conditioner for 2 minutes. Is the air being cooled?		Go to Step 4.	Go to Section 2C, HVAC CLIMATE CONTROL (MANUAL A/C) SERVICING AND DIAGNOSIS.
4	In Step 2, did the air conditioning indicator LED illuminate?		Go to Step 5.	Go to Step 8.
5	1. In turn, switch off the blower fan then the air conditioner checking that the air compressor clutch disengages with each change. Does the air compressor clutch disengage?		Stop the engine and go to Step 6.	Go to Step 15.
6	In Step 5, did the air conditioning indicator LED extinguish?		System OK at BCM. For further diagnosis, go to Section 2C, HVAC CLIMATE CONTROL (MANUAL A/C) SERVICING AND DIAGNOSIS.	Go to Step 18.

STEP	ACTION	VALUE	YES	NO
7	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 / Inputs and Outputs / A/C Switch. 5. Press the A/C switch momentarily. Does TECH 2 display the A/C switch status?	On = switch pressed Off = switch released	Go to Step 8.	Go to Step 11.
8	1. With TECH 2 connected, exit A/C Switch and select A/C Indicator. 2. Press the A/C switch. Does TECH 2 display On?		Go to Step 9.	Go to Step 13.
9	1. With TECH 2 connected, exit A/C Indicator and select A/C Blower Switch. 2. Turn the A/C blower fan switch to speed 1. Does TECH 2 display On?		Go to Step 10.	Go to Step 12.
10	1. With TECH 2 connected, exit A/C Switch and select Ignition Switch. 2. Turn the ignition on. Does TECH 2 display On?		System OK at BCM. For further diagnosis, go to Section 2C, HVAC CLIMATE CONTROL (MANUAL A/C) SERVICING AND DIAGNOSIS.	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.
11	1. Check the integrity of circuit 66 (Red / White wire). Is the circuit OK?		Go to Section 2C, HVAC CLIMATE CONTROL (MANUAL A/C) SERVICING AND DIAGNOSIS.	Repair faulty circuit 66.
12	1. Check the integrity of circuit 63 (Dark-green / Yellow wire). Is the circuit OK?		Go to Section 2C, HVAC CLIMATE CONTROL (MANUAL A/C) SERVICING AND DIAGNOSIS.	Repair faulty circuit 63.
13	1. With the ignition turned on, back-probe the HVAC switch module connector terminal X2-3, circuit 762 (Red / Black wire) with a jumper lead to ground. Does the air conditioning indicator LED illuminate?		Go to Step 14.	Go to Section 2C, HVAC CLIMATE CONTROL (MANUAL A/C) SERVICING AND DIAGNOSIS.
14	1. With the ignition turned on, back-probe BCM connector terminal X1-19, circuit 762 (Red / Black wire) with a jumper lead to ground. Does the air conditioning indicator LED illuminate?		Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Repair faulty circuit 762.
15	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 / Air Conditioning Interface / A/C Switch. Does TECH 2 display Off?		Go to Section 2C, HVAC CLIMATE CONTROL (MANUAL A/C) SERVICING AND DIAGNOSIS.	Go to Step 16.

STEP	ACTION	VALUE	YES	NO
<b>16</b>	<b>V6 engine</b> 1. With TECH 2 connected, exit to the Vehicle Model menu and select Engine / V6 / Data Display / All Data / A/C Request. <b>Gen III V8 engine</b> 1. With TECH 2 connected, exit to the Vehicle Model menu and select Engine / GEN III V8 / Data Display / Engine Data / A/C Request. Does TECH 2 display Off?		Go to Section 2C, HVAC CLIMATE CONTROL (MANUAL A/C) SERVICING AND DIAGNOSIS.	Go to Step 17.
<b>17</b>	1. Check the integrity of circuit 800 (Red / Black wire). Is the circuit OK?		Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Repair faulty circuit 800.
<b>18</b>	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 / Air Conditioning Interface / A/C Indicator. Does TECH 2 display Off?		Go to Step 19.	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.
<b>19</b>	1. Check the integrity of circuit 762 (Red / Black wire). Is the circuit OK?		Go to Section 2C, HVAC CLIMATE CONTROL (MANUAL A/C) SERVICING AND DIAGNOSIS.	Repair faulty circuit 762.
<b>WHEN ALL DIAGNOSIS AND REPAIRS ARE COMPLETE, VERIFY CORRECT OPERATION</b>				

### OCC Air Conditioner

The OCC control module communicates with the PCM using both the primary and secondary data buses.

When the air conditioner switch is pressed to turn on the air conditioner, the OCC turns on the blower fan and sends an air conditioner On request signal to the PCM (via the PIM on vehicles with a GEN III V8 engine). The signal is sent on the secondary data bus which links to the primary data bus within the BCM (through the data bus isolator switch), then on the primary data bus to the PCM (via the PIM on vehicles with a GEN III V8 engine).

When the air conditioner On request is received, the PCM ensures its inputs are within preset parameters and then energises the air conditioner relay to switch on and engage the air compressor clutch.

For more information about this system, refer to [Section 2F, HVAC OCCUPANT CLIMATE CONTROL \(AUTO A/C\) – DIAGNOSTICS](#).

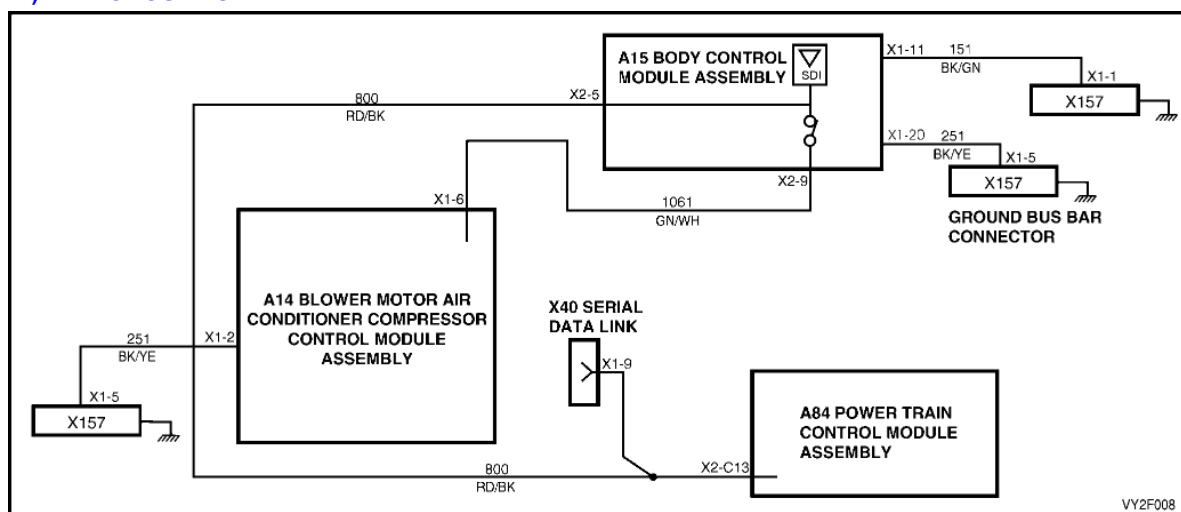


Figure 12J-263



# **AIR CONDITIONING INTERFACE DIAGNOSTIC CHART – LEVEL 2 AND LEVEL 3**

STEP	ACTION	VALUE	YES	NO
<b>1</b>	1. Start the engine. 2. Turn on the air conditioner. Does the air compressor clutch engage?		System OK at BCM. For further diagnosis, go to Section 2F, HVAC OCCUPANT CLIMATE CONTROL (AUTO A/C) DIAGNOSTICS.	Go to Step 2.
<b>2</b>	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 / Miscellaneous Tests / Data Bus Isolator. 5. Start the engine. 6. Press the Cutoff soft key on TECH 2 every 2 seconds for a period in excess of 10 seconds. Does the SRS telltale LED in the instrument cluster illuminate? <b>NOTE:</b> The SRS telltale will set a DTC. To clear the DTC, refer to 3.5 DAIGNOSTIC TROUBLE CODES in this Section.		Press the Normal soft key to reset the data bus isolator. System OK at BCM. For further diagnosis, go to Section 2F, HVAC OCCUPANT CLIMATE CONTROL (AUTO A/C) DIAGNOSTICS.	Press the Normal soft key to reset the data bus isolator and go to 4.2 SERIAL DATA COMMUNICATION in this Section.
<b>WHEN ALL DIAGNOSIS AND REPAIRS ARE COMPLETE, VERIFY CORRECT OPERATION</b>				

**Figure 12J-264**

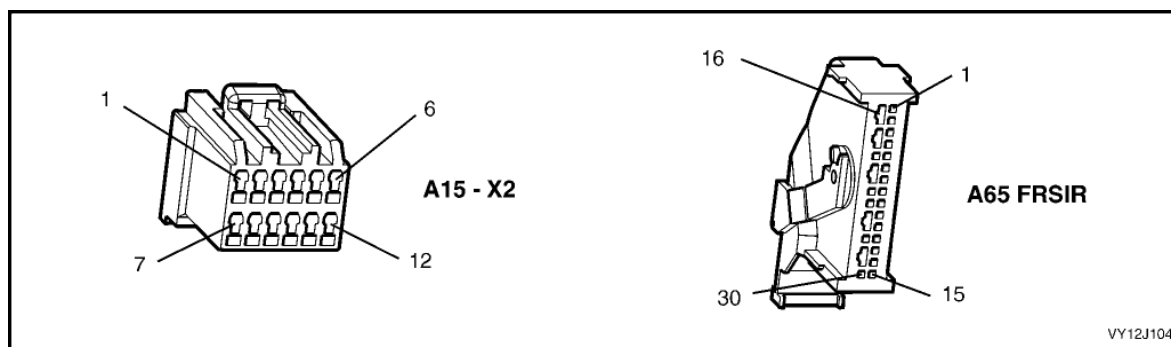


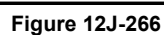
Figure 12J-265

# **SRS DEPLOYMENT VEHICLE SHUTDOWN DIAGNOSTIC CHART**

STEP	ACTION	VALUE	YES	NO
1	Is the Central Door Locking system fully functional?		Go to Step 2.	Go to 4.5 CENTRAL DOOR LOCKING in this Section.
2	Are the dome lamp functions controlled by the BCM functioning correctly?		Go to Step 3.	Go to 4.12 DOME LAMP DELAY CONTROL in this Section.
3	1. Connect TECH 2 to the DLC. 2. Select Diagnostics / Model Year / Vehicle Model / Body / Body Control Module. 3. Turn the ignition on. Does the screen display BCM system identification?		Go to Step 4.	Go to 4.2 SERIAL DATA COMMUNICATION (BUS MASTER) in this Section.
4	1. With the ignition on and TECH 2 connected, exit to the Body menu and select SRS. Is TECH 2 able to communicate with the SDM after 5 seconds?		Go to Section 12M, 4. DIAGNOSTICS.	Go to Step 5.
5	1. With the ignition on and TECH 2 connected, exit to the Body menu and select Instruments. After 5 seconds, is TECH 2 able to communicate with the instruments?		Go to Step 6.	Go to 4.2 SERIAL DATA COMMUNICATION (BUS MASTER) in this Section.
6	1. Turn the ignition off. 2. Back-probe between BCM connector terminal X2-9, circuit 1061 (Green / White wire) and terminal X2-6, circuit 774 (White / Green wire) with an ohmmeter. Is the value as specified?	Less than 1 ohm	Go to Step 7.	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.
7	1. With the ignition turned off, back-probe between BCM connector terminal X2-6 and SDM (A65) connector terminal X1-9, circuit 774 (White / Green wire) with an ohmmeter. Is the value as specified?	Less than 1 ohm	Go to Section 12M, 4. DIAGNOSTICS.	Repair faulty circuit 774.
<b>WHEN ALL DIAGNOSIS AND REPAIRS ARE COMPLETE, VERIFY CORRECT OPERATION</b>				

## DESCRIPTION

When a new remote key is programmed, it is assigned as the Priority 1 key and all remaining remote keys become Priority 2 keys.



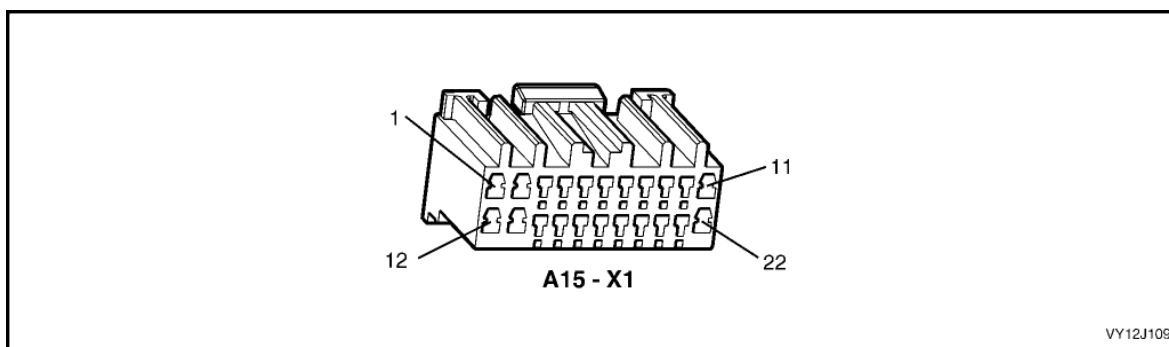


Figure 12J-267

### PRIORITY KEY SYSTEM DIAGNOSTIC CHART

Complete the following steps before proceeding with the Priority Key System diagnostic chart:

1. Have both remote keys at hand.
2. Ensure that both keys have serviceable batteries fitted.
3. Operate the unlock button on the first remote coded key.
4. Connect TECH 2 to the DLC.
5. Insert the first remote coded key into the ignition switch and turn the ignition on.
6. Using TECH 2, re-program this key to Priority 1. (Select Diagnostics / Model Year / Vehicle Model / Body / Body Control Module / Program / Set Key to Priority 1.)
7. Turn the ignition off.
8. Set the priority functions for this key (ie. instrument illumination level, auto headlamp off delay, antenna height, radio stations, two-stage unlock, lamp delay times and TCS).
9. Remove the first remote coded key and lock the doors.
10. Press the unlock button on the second remote coded key.
11. Insert the second remote coded key into the ignition switch and turn the ignition on.
12. Set the priority functions for this key.

**NOTE:** If the Priority settings cannot be set, refer to [4.2 SERIAL DATA COMMUNICATION \(BUS MASTER\)](#).

If a required function operates from one key but not the other key and it is established that both keys are fully operational, replace the BCM. Refer to [2.1 BODY CONTROL MODULE](#) in this Section.

STEP	ACTION	VALUE	YES	NO
1	1. Operate the unlock button on the Priority 1 and Priority 2 remote coded keys alternately, checking that the instrument illumination level is as set for each key.  Is the instrument illumination level recalled for both keys?		Go to Step 2.	Go to 4.14 INSTRUMENT DIMMER CONTROL in this Section.
2	1. Operate the unlock button on the Priority 1 and Priority 2 remote coded keys alternately, checking that the antenna height is as set for each key.  Is the antenna height recalled for both keys?		Go to Step 3.	Go to 4.18 POWER ANTENNA CONTROL in this Section.
3	1. Operate the unlock button on the Priority 1 and Priority 2 remote coded keys alternately, checking that the approach illumination delay is as set for each key.  Is the approach illumination delay recalled for both keys?		Go to Step 4.	Go to 4.13 AUTOMATIC LAMP CONTROL in this Section.
4	1. Operate the unlock button on the Priority 1 and Priority 2 remote coded keys alternately, checking that the automatic headlamp off delay is as set for each key.  Is the automatic headlamp off delay recalled for both keys?		Go to Step 5.	Go to 4.13 AUTOMATIC LAMP CONTROL in this Section.

STEP	ACTION	VALUE	YES	NO
5	1. Operate the unlock button on the Priority 1 and Priority 2 remote coded keys alternately, checking that the interior lamp timeout is as set for each key. Is the interior lamp timeout recalled for both keys?		Go to Step 6.	Go to 4.12 DOME LAMP DELAY CONTROL in this Section.
6	1. Operate the unlock button on the Priority 1 and Priority 2 remote coded keys alternately, checking that the two stage unlock settings are as set for each key. Are the two stage unlock settings recalled for both keys?		Go to Step 7.	Go to 4.5 CENTRAL DOOR LOCKING in this Section.
7	1. Operate the unlock button on the Priority 1 and Priority 2 remote coded keys alternately, checking that the door lock indication is as set for each key. Is the door lock indication recalled for both keys?		Go to Step 8.	Go to 4.5 CENTRAL DOOR LOCKING in this Section.
8	1. Operate the unlock button on the Priority 1 and Priority 2 remote coded keys alternately, checking that the autolock in drive settings are as set for each key. Are the autolock in drive settings recalled for both keys?		Go to Step 9.	Go to 4.5 CENTRAL DOOR LOCKING in this Section.
9	1. Operate the unlock button on the Priority 1 and Priority 2 remote coded keys alternately, checking that the accessory relay timeout is as set for each key. Is the accessory relay timeout recalled for both keys?		Go to Step 10.	Go to 4.4 ACCESSORY POWER CONTROL in this Section.
10	1. Operate the unlock button on the Priority 1 and Priority 2 remote coded keys alternately, checking that the auto headlamps off timing is as set for each key. Is the auto headlamps off setting recalled for both keys?		Go to Step 11.	Go to 4.13 AUTOMATIC LAMP CONTROL in this Section.
11	1. Operate the unlock button on the Priority 1 and Priority 2 remote coded keys alternately, checking that the trip computer mode and overspeed settings are as set for each key. Are the trip computer mode and overspeed settings recalled for both keys?		System OK.	Go to Section 12C, 3.4 DIAGNOSTIC FAULTS NOT COVERED BY DIAGNOSTIC TROUBLE CODES – TRIP COMPUTER SWITCH.
<b>WHEN ALL DIAGNOSIS AND REPAIRS ARE COMPLETE, VERIFY CORRECT OPERATION</b>				

## 4.18 POWER ANTENNA CONTROL

### CIRCUIT DESCRIPTION

The antenna up and down request signals are communicated from the radio to the BCM via the serial communications bus.

For level 1 vehicle models, the antenna height is adjusted by operating the antenna mast height switch.

For level 2 and 3 vehicle models, the antenna height is determined by the BCM based on user settings and the radio / CD player selections.

For level 3 vehicle models, when the unlock button on the remote key is pressed, the antenna height is recalled based on which key is used (Priority 1 or Priority 2).

During engine starting, the on signal is momentarily lost but the BCM assumes the signal is still active when it senses both ignition and accessory inputs as well as the radio / CD player status signal. This enables uninterrupted antenna operation and control during engine cranking. A hardwired signal is used from the Radio to the BCM to request the antenna, whenever tuner mode has been selected on the radio.

When the antenna down switch is pressed, the radio / CD player sends a Down input signal to the BCM through the secondary data bus.

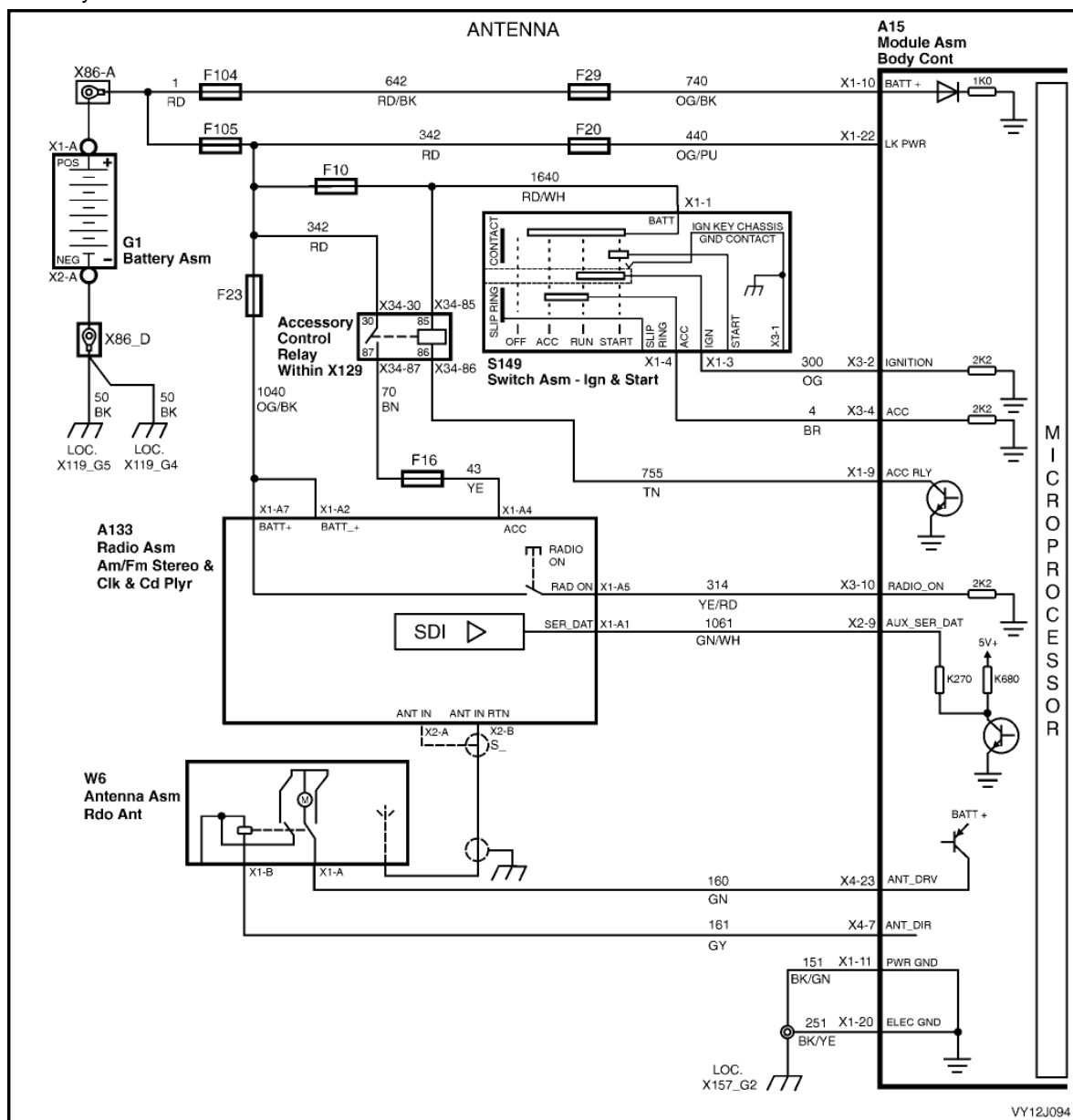


Figure 12J-268

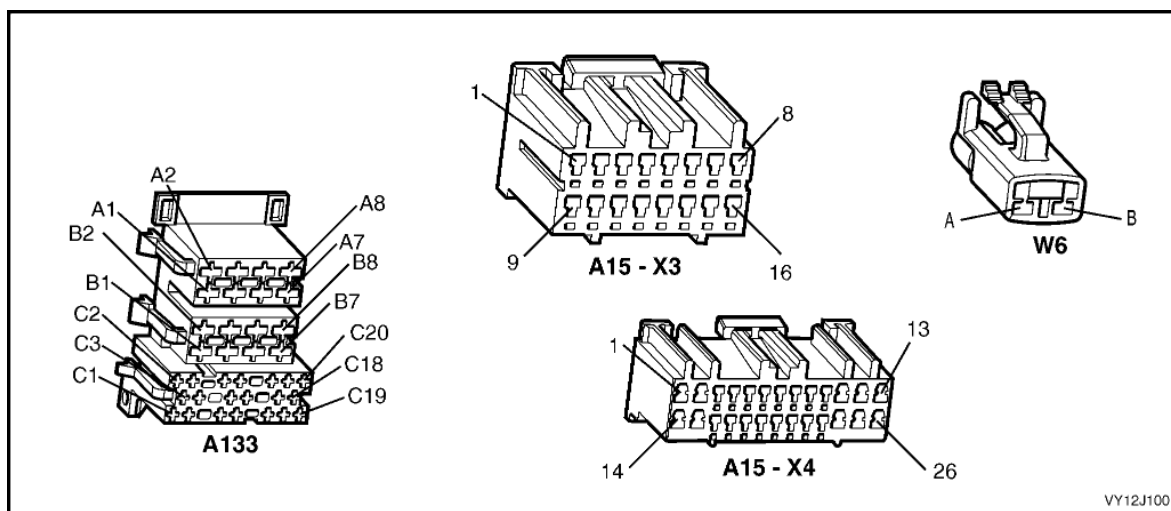


Figure 12J-269

#### POWER ANTENNA CONTROL DIAGNOSTIC CHART

STEP	ACTION	VALUE	YES	NO
1	Is the ignition switch functioning correctly?		Go to Step 2.	Replace the ignition switch.
2	Is the accessory control circuit functioning correctly?		Go to Step 3.	Go to 4.4 ACCESSORY POWER CONTROL in this Section.
3	Is battery power maintained at BCM connector terminal X1-22?		Go to Step 4.	Check and repair the power supply circuit.
4	1. Turn the ignition switch to the accessories position. 2. Turn on the radio. Does the antenna mast extend automatically?		Go to Step 5.	Go to Step 8.
5	1. Turn off the radio. Does the antenna start retracting within 3 seconds?		Go to Step 6.	Go to Step 21.
6	1. With the ignition turned to accessories, turn on the radio. 2. Operate the antenna down switch. Does the antenna mast retract?		Go to Step 7.	Go to Step 23.
7	1. With the ignition turned to accessories and the radio on, operate the antenna up switch. Does the antenna mast extend?		System OK.	Go to Step 24.
8	1. Turn the ignition off. 2. Connect TECH 2 to the DLC. 3. Select Diagnostics / Model Year / Vehicle Model / Body / Body Control Module / Data Display / Inputs and Outputs / Accessory Switch. 4. Turn the ignition switch to the accessories position. Does TECH 2 display On?		Go to Step 9.	Go to Step 16.
9	1. With TECH 2 connected, exit to the Data Display menu and select Serial Data Inputs / Radio. 2. Turn the ignition switch to the accessories position. 3. Turn on the radio. Does TECH 2 display On?		Go to Step 10.	Go to Step 17.



STEP	ACTION	VALUE	YES	NO
10	1. With the radio on and TECH 2 connected, exit to the Body Control Module menu and select Miscellaneous Tests / Antenna. 2. Turn the ignition switch to the Accessories position. 3. Perform the test as instructed by TECH 2 and extend the antenna mast. Does the antenna mast extend?		Go to Step 11.	Go to Step 14.
11	1. With the ignition switch turned to accessories, the radio on and TECH 2 connected, back-probe BCM connector terminal X4-7, circuit 161 (Grey wire) with a voltmeter to ground. 2. Perform the TECH 2 antenna test and extend the antenna mast. Is the value as specified while the mast is in motion?	Battery voltage	False reading. Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Go to Step 12.
12	1. Check the integrity of circuit 161 (Grey wire). Is the circuit OK?		Go to Step 13.	Repair faulty circuit 161.
13	1. Turn the ignition off. 2. Check the integrity of the antenna assembly ground connection. Is the ground connection OK?		Replace the antenna assembly (W6). Refer to Section 12D, ENTERTAINMENT SYSTEM.	Repair faulty circuit 851.
14	1. With the radio on and Miscellaneous Tests / Antenna selected, back-probe BCM connector terminal X4-23, circuit 160 (Green wire) with a voltmeter to ground. 2. Turn the ignition switch to the Accessories position. 3. Perform the test as instructed by TECH 2 and extend the antenna mast. Is the value as specified?	Battery voltage	Go to Step 15.	Replace the BCM. Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.
15	1. With the ignition switch turned to accessories, the radio on and TECH 2 connected, back-probe the power antenna assembly (W6) connector terminal X1-A, circuit 160 (Green wire) with a voltmeter to ground. 2. Perform the TECH 2 antenna test and extend the antenna mast. Is the value as specified?	Battery voltage	Go to Step 13.	Repair faulty circuit 160.
16	1. With the ignition turned to accessories, back-probe BCM connector terminal X3-4, circuit 4 (Brown wire) with a voltmeter to ground. Is the value as specified?	Battery voltage	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Repair faulty circuit 7.
17	1. With the ignition and the radio turned on, back-probe BCM connector terminal X3-10, circuit 314 (Yellow / Red wire) with a voltmeter to ground. Is the value as specified?	Battery voltage	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Go to Step 18.
18	1. With the ignition and the radio turned on, back-probe radio (A133) connector terminal X1-A5, circuit 314 (Yellow / Red wire) with a voltmeter to ground. Is the value as specified?	Battery voltage	Repair faulty circuit 314.	Go to Step 19.
19	1. With the ignition turned on, back-probe radio connector terminal X1-A4 with a voltmeter to ground. Is the value as specified?	Battery voltage	Go to Radio system diagnosis in Section 12D, ENTERTAINMENT SYSTEM.	Go to Step 20.

STEP	ACTION	VALUE	YES	NO
20	1. With the ignition turned on, back-probe the accessory control relay (R20) terminal X34-87 with a voltmeter to ground. Is the value as specified?	Battery voltage	Check and repair faulty circuits 43, 70 and / or fuse F16.	Go to 4.4 ACCESSORY POWER CONTROL.
21	1. With the ignition turned on, back-probe BCM connector terminal X4-7, circuit 161 (Grey wire) with a voltmeter to ground. 2. Turn on the radio. 3. Turn off the radio. Are the values as specified?	Radio on = battery voltage Radio off = less than 0.5 volt	Go to Step 22.	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.
22	1. Turn on the radio. 2. Back-probe the antenna connector terminal X1-B, circuit 161 (Grey wire) with a voltmeter to ground. 3. Turn off the radio. Is the value as specified?	Radio on = battery voltage Radio off = less than 0.5 volt	Replace antenna motor. Refer to Section 12D, ENTERTAINMENT SYSTEM.	Repair faulty circuit 161.
23	1. Turn the ignition off. 2. Connect TECH 2 to the DLC. 3. Turn the ignition on and then to ACC. 4. Turn on the radio. 5. Select Diagnostics / Model Year / Vehicle Model / Body / Body Control Module / Data Display / Antenna / Antenna and operate the antenna mast down switch. Does TECH 2 display Down?		Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Go to Step 27.
24	1. Turn the ignition off. 2. Connect TECH 2 to the DLC. 3. Select Diagnostics / Model Year / Vehicle Model / Body / Body Control Module / Data Display / Antenna / Antenna. 4. Turn the ignition to the accessories position. 5. With the radio turned on, operate the antenna mast up switch. Does TECH 2 display Up?		Go to Step 25.	Go to Step 28.
25	1. With the ignition and the radio turned on, back-probe BCM connector terminal X4-7, circuit 161 (Grey wire) with a voltmeter to ground. 2. Operate the antenna mast up switch. Is the value as specified?	Battery voltage	Go to Step 26.	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.
26	1. Back-probe BCM connector terminal X4-23, circuit 160 (Green wire) with a voltmeter to ground. 2. Operate the antenna mast up switch. Is the value as specified?	Battery voltage	Replace antenna assembly. Refer to Section 12D, ENTERTAINMENT SYSTEM.	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.
27	1. Check the integrity of circuit 1061 (Green / White wire) between the BCM and the radio / cassette player. Is the circuit OK?		Go to Radio system diagnosis in Section 12D, ENTERTAINMENT SYSTEM.	Repair faulty circuit 1061.
28	1. With TECH 2 connected and the ignition turned to the accessories position, exit to the Data Display menu and select / Antenna / Radio Status. 2. Turn on the radio. Does TECH 2 display On?		Go to Radio system diagnosis in Section 12D, ENTERTAINMENT SYSTEM.	Go to Step 29.
29	1. Back-probe BCM connector terminal X3-10, circuit 314 (Yellow / Red wire) with a voltmeter to ground. Is the value as specified?	Battery voltage	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Go to Radio system diagnosis in Section 12D, ENTERTAINMENT SYSTEM.
<b>WHEN ALL DIAGNOSIS AND REPAIRS ARE COMPLETE, VERIFY CORRECT OPERATION</b>				

## 4.19 HEATED REAR WINDOW

### CIRCUIT DESCRIPTION

With this system, the BCM imposes a time limit on the heating of the rear window. Power is toggled on or off as the heated-rear-window momentary-contact switch is pressed. The BCM enables heating of the rear window for a period of 15 minutes with subsequent activation of the switch resetting the time (to 15 minutes).

Rear window heating is available only when the ignition is on. This system defaults to Off when the ignition is turned off. The BCM controls the heated-rear-window operation after the system is switched on.

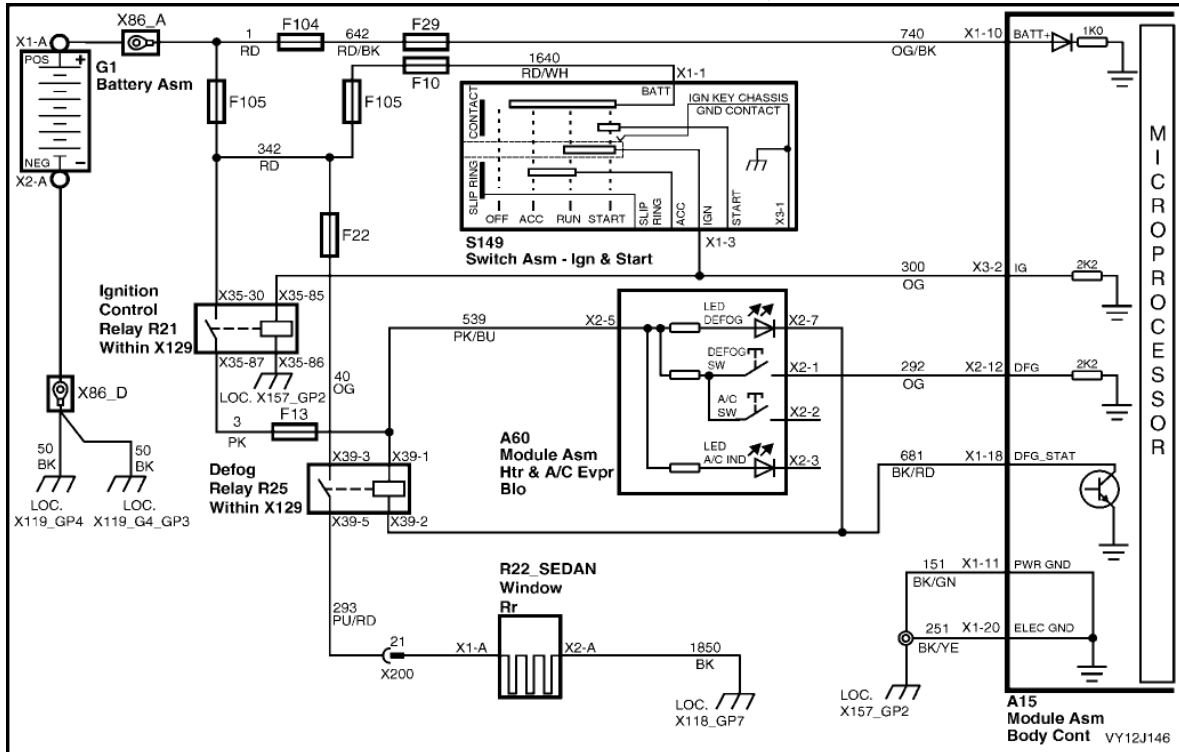


Figure 12J-270

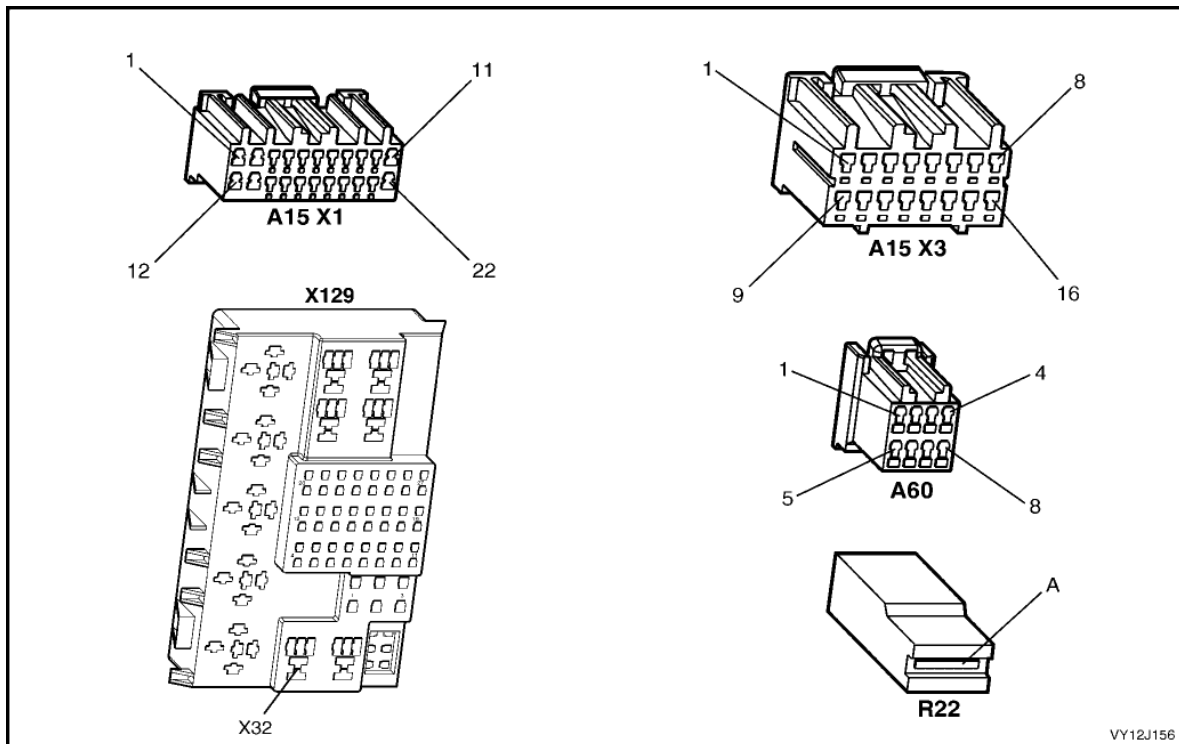


Figure 12J-271

## HEATED-REAR-WINDOW DIAGNOSTIC CHART

STEP	ACTION	VALUE	YES	NO
1	Are the ignition switch and ignition control circuits functioning correctly?		Go to Step 2.	Replace the ignition switch or repair ignition control circuit fault/s as necessary.
2	1. Turn the ignition on. 2. Operate the heated-rear-window switch. Does the heated-rear-window switch LED illuminate?		Go to Step 3.	Go to Step 4.
3	With the ignition on and the heated-rear-window switch LED illuminated, does the rear window demist?		System OK.	Go to Step 12.
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 / Occupant Climate Control / Data Display / Switch Data / Rear Demist Switch. 5. Press and hold the heated-rear-window switch. Does TECH 2 display On?		Go to Step 5.	Go to Step 10.
5	1. With the ignition on, back-probe BCM connector terminal X1-18, circuit 681 (Black / Red wire) with a jumper lead to ground. Does the heated-rear-window LED illuminate?		Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Go to Step 6.
6	1. With the ignition on, back-probe heated-rear-window switch (A60) connector terminal X2-7 circuit 681 (Black / Red wire) with a jumper lead to ground. Does the heated-rear-window LED illuminate?		Repair faulty circuit 681.	Go to Step 7.
7	1. With the ignition on, back-probe heated-rear-window switch connector terminal X2-5, circuit 539 (Pink / Blue wire) with a voltmeter to ground. Is the value as specified?	Battery voltage	Replace the heated-rear-window switch.	Go to Step 8.
8	1. Back-probe fuse F13, circuit 539 (Pink / Blue wire) with a voltmeter to ground. Is the value as specified?	Battery voltage	Repair faulty circuit 539.	Go to Step 9.
9	1. Check fuse F13. Is the fuse OK?		Repair faulty circuit 3 (Pink wire).	Replace fuse F13.
10	1. With the ignition on, back-probe BCM connector terminal X2-12, circuit 292 (Orange wire) with a voltmeter to ground. 2. Press and hold the heated-rear-window switch. Is the value as specified?	Battery voltage	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Go to Step 11.
11	1. With the ignition on, back-probe heated-rear-window switch connector terminal X2-1, circuit 292 (Orange wire) with a voltmeter to ground. 2. Press and hold the heated-rear-window switch. Is the value as specified?	Battery voltage	Repair faulty circuit 292.	Replace the heated-rear-window switch.
12	1. With the ignition on, back-probe heated-rear-window (R22) connector terminal X1-A, circuit 293 (Purple / Red wire) with a voltmeter to ground. 2. Operate the heated-rear-window switch. Is the value as specified?	Battery voltage	Go to Step 13.	Go to Step 14.
13	1. Turn the ignition off. 2. Back-probe heated-rear-window connector terminal X2-A, circuit 1850 (Black wire) with an ohmmeter to ground. Is the reading as specified?	Less than 1 ohm	Replace or repair the heated-rear-window element.	Repair faulty circuit 1850.

STEP	ACTION	VALUE	YES	NO
<b>14</b>	1. With the ignition on, back-probe heated-rear-window relay connector terminal X39-5, circuit 293 (Purple / Red wire) with a voltmeter to ground. 2. Operate the heated-rear-window switch. Is the value as specified?	Battery voltage	Repair faulty circuit 293.	Go to Step 15.
<b>15</b>	1. Back-probe heated-rear-window relay connector terminal X39-3, circuit 40 (Orange wire) with a voltmeter to ground. Is the value as specified?	Battery voltage	Go to Step 16.	Repair the power supply circuit, including circuit 40 (Orange wire) and fuse F22.
<b>16</b>	1. Turn the ignition off. 2. Back-probe heated-rear-window relay connector terminal X39-1, circuit 539 (Pink / Blue wire) with a voltmeter to ground. Is the value as specified?	Battery voltage	Go to Step 17.	Repair faulty circuit 539.
<b>17</b>	1. Back-probe heated-rear-window relay connector terminal X39-2, circuit 681 (Black / red wire) with a voltmeter to ground. 2. Operate the heated-rear-window switch. 3. Switch on the ignition. Is the value as specified?	Less than 1 volt	Go to Step 18.	Repair faulty circuit 681.
<b>18</b>	1. With the ignition on, back-probe heated-rear-window relay connector terminal X39-2, circuit 681 (Black / red wire) with an ohmmeter to ground. Is the value as specified?	Less than 1 ohm	Replace the heated-rear-window relay.	Repair faulty circuit 681.
<b>WHEN ALL DIAGNOSIS AND REPAIRS ARE COMPLETE, VERIFY CORRECT OPERATION</b>				

## 4.20 REAR LAMP FAILURE WARNING SYSTEM

### CIRCUIT DESCRIPTION

The BCM monitors current flow of the tail, stop and licence plate lamps (for bulb failure, poor power and ground circuits and fuse integrity). When the ignition is turned on, the MFD displays the appropriate warning via data from the instrument cluster. Refer to [Section 12C, INSTRUMENT OPERATION – ALL MODELS, ANIMATED WARNINGS](#).

If battery voltage is not present at both the park lamp and stop lamp BCM inputs when the ignition is on, the BCM determines that one of these two fuses has failed. The BCM then signals the instrument cluster (which signals the MFD) via the secondary data bus, that a fuse is faulty.

When the parking lamps are turned on, the BCM checks the current flowing from the lamp circuits. If this current does not match the pre-learnt current flow, the BCM signals the instrument cluster (and MFD). Refer to [1.20, BULB RE-LEARN PROCEDURE](#).

When the brake pedal is pressed, battery voltage is applied to the ABS or ABS / TCS control module, which sends a signal to the BCM via the secondary serial data bus. The BCM interprets this signal as the stop lamp switch input signal and checks the current flowing from the rear lamp circuits. If this current does not match the pre-learnt current flow, the BCM signals the instrument cluster (and MFD).

If one of these signals is received, the MFD displays the appropriate warning message, following, and an icon:

- Rear Brake Bulb Fail
- Rear Lamp Bulb Fail
- Rear Lamp Fuse Fail.

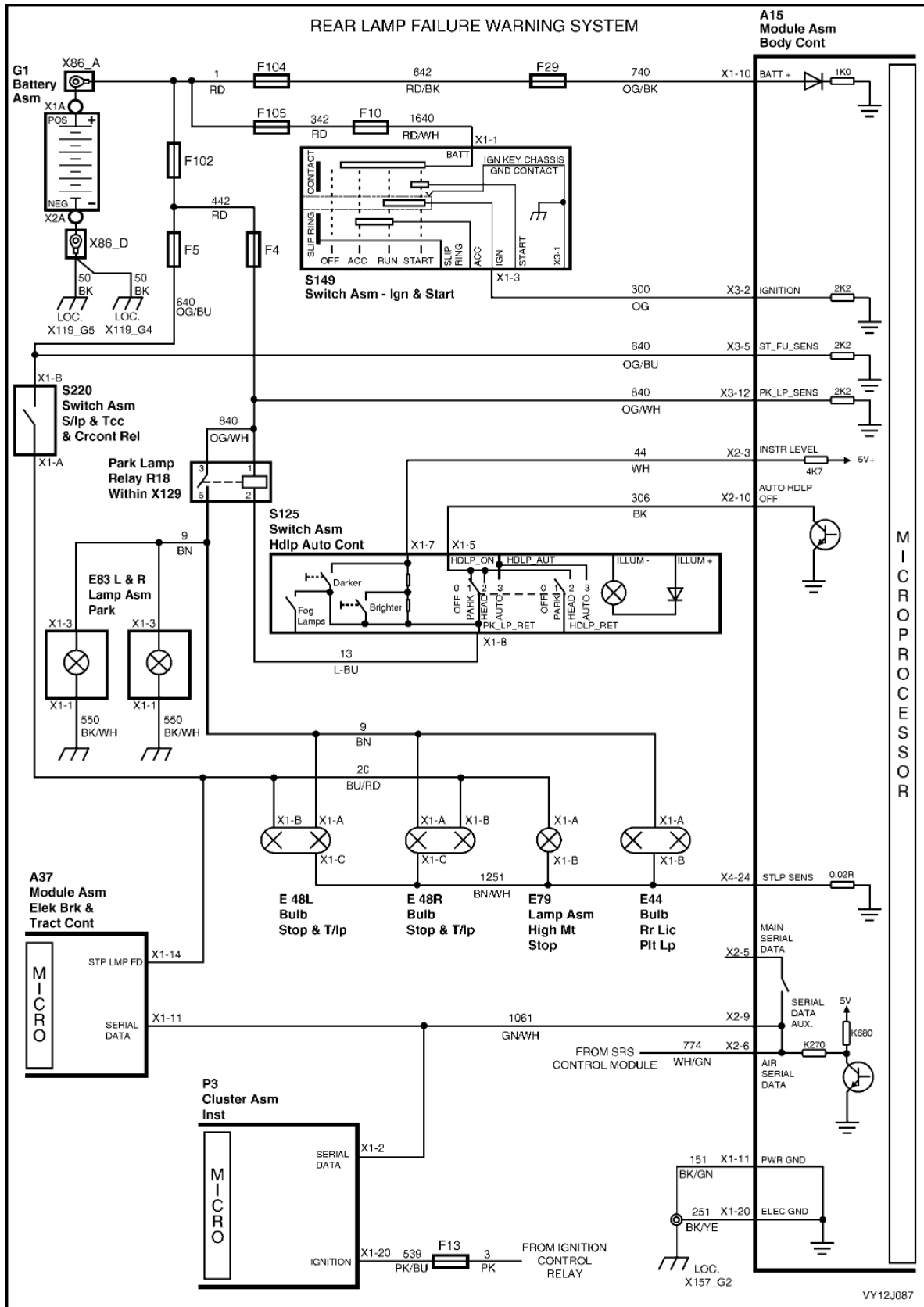


Figure 12J-272

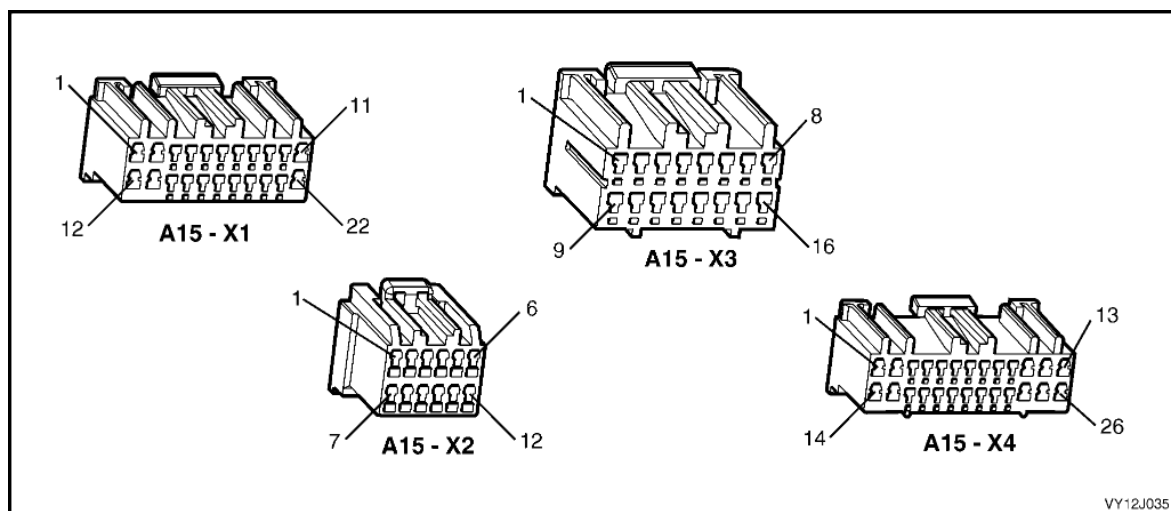


Figure 12J-273

# REAR LAMP FAILURE WARNING SYSTEM DIAGNOSTIC CHART

STEP	ACTION	VALUE	YES	NO
1	Is the MFD is functioning correctly?		Go to Step 2	Refer to Section 12C, INSTRUMENTATION in this Section.
2	1. Turn off the ignition. 2. Turn off the headlamp switch. 3. Ensure the brake pedal is in its rest position. 4. Turn on the ignition. Does the MFD display Rear Lamp Fuse Fail warning?		Go to Step 7.	Go to Step 3.
3	1. Turn off the ignition. 2. Turn on the park lamps. 3. Turn on the ignition. Does the MFD display the Rear Lamp Bulb Fail warning?		Go to Step 12.	Go to Step 4.
4	1. Turn off the ignition. 2. Turn off the headlamp switch. 3. Remove a tail lamp bulb. 4. Turn on the park lamps. 5. Turn on the ignition. Does the MFD display the Rear Lamp Bulb Fail warning?		Go to Step 5.	Go to Step 17.
5	1. Turn off the ignition. 2. Turn off the headlamp switch. 3. Install the rear tail lamp bulb. 4. Turn on the ignition. 5. Press the brake pedal. Does the MFD display the Rear Brake Bulb Fail warning?		Go to Step 21.	Go to Step 6.
6	1. Turn off the ignition. 2. Turn off the headlamp switch. 3. Remove a brake lamp bulb. 4. Turn on the ignition. 5. Press the brake pedal. Does the MFD display the Rear Brake Bulb Fail warning?		System OK.	Go to Step 23.



STEP	ACTION	VALUE	YES	NO
<b>7</b>	1. Turn off the ignition. 2. Turn off the headlamp switch. 3. Ensure the brake pedal is in its rest position. 4. Connect TECH 2 to the DLC. 5. Turn on the ignition. 6. Select Diagnostics / Model Year / Vehicle Model / Body / Body Control Module / Data Display / Rear Lamp Failure / Rear Brake Lamp Fuse. Does TECH 2 display Failed?		Go to Step 8.	Go to Step 9.
<b>8</b>	1. Back-probe BCM connector terminal X3-5, circuit 640 (Orange / Blue wire) with a voltmeter to ground. Is the value as specified?	Battery voltage	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Repair faulty circuit 640 or replace fuse F5 or fusible link F102, as required.
<b>9</b>	1. With TECH 2 connected, exit to the Rear Lamp Failure menu and select Rear Park Lamp Fuse. Does TECH 2 display Failed?		Go to Step 10.	Go to Step 11.
<b>10</b>	2. Back-probe BCM connector terminal X3-12, circuit 840 (Orange / White wire) with a voltmeter to ground. Is the value as specified?	Battery voltage	Replace the BCM. Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Repair faulty circuit 840 or replace fuse F4 or fusible link F102, as required.
<b>11</b>	1. Ensure that the headlamp switch is off and the brake pedal is in its rest position. 2. With TECH 2 connected, exit to the Normal Mode menu and select Rear Lamp Bulb Failed Warning. 3. Turn the ignition off then on. Does the screen display Bulb Failed Warning Lamp On?		Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Go to Section 12C, 3.4 DIAGNOSING FAULTS NOT COVERED BY TECH 2 DIAGNOSTIC TOOL, Brake Fail / Park Brake Warning
<b>12</b>	1. Turn on the park lamps. 2. Check to see if <b>all</b> tail lamps are illuminated. Are all tail lamps illuminated?		Go to Step 13.	Go to Step 14.
<b>13</b>	1. Perform the relearn procedure as detailed in 1.14 REAR LAMP FAILURE WARNING SYSTEM in this Section. 2. Turn on the ignition. 3. Turn on the park lamps. Does the MFD display the Rear Lamp Bulb Fail warning?		Go to Step 4.	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.
<b>14</b>	While carrying out Step 12, did at least one tail lamp illuminate?		Check and repair faulty bulb and / or tail lamp circuit.	Go to Step 15.
<b>15</b>	1. Turn off the ignition. 2. Disconnect BCM connector X1 and back-probe the harness terminal X1-11, circuit 151 (Black / Green wire) with an ohmmeter to ground. Is the value as specified?	Below 1 ohm	Go to Step 16	Repair faulty circuit 151.
<b>16</b>	1. Turn on the ignition. 2. Back-probe BCM connector terminal X4-24, circuit 1251 (Brown / White wire) with a jumper lead to ground. 3. Turn on the park lamps. Do the lamps illuminate?		Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Repair faulty circuits 1251 and / or 9 (including park lamp relay).

STEP	ACTION	VALUE	YES	NO
17	1. Turn off the ignition. 2. Connect TECH 2 to the DLC. 3. Turn on the ignition. 4. Turn on the park lamps. 5. Select Diagnostics / Model Year / Vehicle Model / Body / Body Control Module / Normal Mode / Rear Lamp Bulb Fail. Does TECH 2 display status?	Yes	Go to Instruments diagnosis in Section 12C, INSTRUMENTS.	Go to Step 18.
18	1. With the ignition on, the park lamps on and TECH 2 connected, exit to the Data Display menu and select Headlamps / Headlamp Switch. Does TECH 2 display On?		Install the tail lamp bulb and go to Step 19.	Install the tail lamp bulb and go to Step 20.
19	1. Perform the relearn procedure as detailed in 1.14 REAR LAMP FAILURE WARNING SYSTEM in this Section. 2. Remove a tail lamp bulb. 3. Turn on the park lamps. 4. Turn on the ignition. Does the rear lamp failure warning-lamp illuminate?		Go to Step 5.	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.
20	1. Turn on the ignition. 2. Turn on the park lamps. 3. Back-probe BCM connector terminal X2-3, circuit 44 (White wire) with a voltmeter to ground. Is the value as specified?	3.3 volts	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Check and repair faulty circuit 44 (including headlamp switch).
21	1. Turn on the ignition. 2. Press the brake pedal. Are all brake lamps illuminated?		Go to Step 22.	Check and repair brake lamp circuit (including faulty bulb).
22	1. Perform the relearn procedure as detailed in 1.14 REAR LAMP FAILURE WARNING SYSTEM in this Section. 2. Turn on the ignition. 3. Press the brake pedal. Does the MFD display the Rear Brake Bulb Fail warning?		Go to Step 6.	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.
23	1. Connect TECH 2 to the DLC. 2. Turn on the ignition. 3. Select Diagnostics / Model Year / Vehicle Model / Body / Body Control Module / Data Display / Serial Data Inputs/ Stop Lamp Switch. 4. Press the brake pedal. Does TECH 2 display On?		Go to Step 24.	Go to ABS and ABS / TCS diagnosis in Section 5B, ABS & TCS.
24	1. Perform the relearn procedure as detailed in 1.14 REAR LAMP FAILURE WARNING SYSTEM in this Section. 2. Remove a brake lamp bulb. 3. Turn on the ignition. 4. Press the brake pedal. Does the MFD display the Rear Brake Bulb Fail warning?		System OK.	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.
<b>WHEN ALL DIAGNOSIS AND REPAIRS ARE COMPLETE, VERIFY CORRECT OPERATION</b>				

## 4.21 HAZARD LAMP CONTROL

### CIRCUIT DESCRIPTION

The BCM drives the simultaneous operation of the left and right indicator lamps when the BCM receives a ground (On) signal from the hazard warning switch, or a valid RF signal as:

- the theft deterrent system is being armed
- the doors are being deadlocked
- the key unlock button is pressed.

**NOTE:** As the vehicle is being passively armed, the indicators are not automatically operated.

When the hazard warning switch is activated, the BCM receives a hazard lamp On request and activates the internal Hazard/theft Indicator Relay to simultaneously flash the left and right indicator lamps.

### Hazard Illumination Relay

General Motors Brazil vehicles are fitted with the Hazard Illumination Relay (R26). This supplies power to illuminate the hazard warning switch while the ignition is on and also causes the hazard warning switch illumination to flash while the hazard lamps are activated.

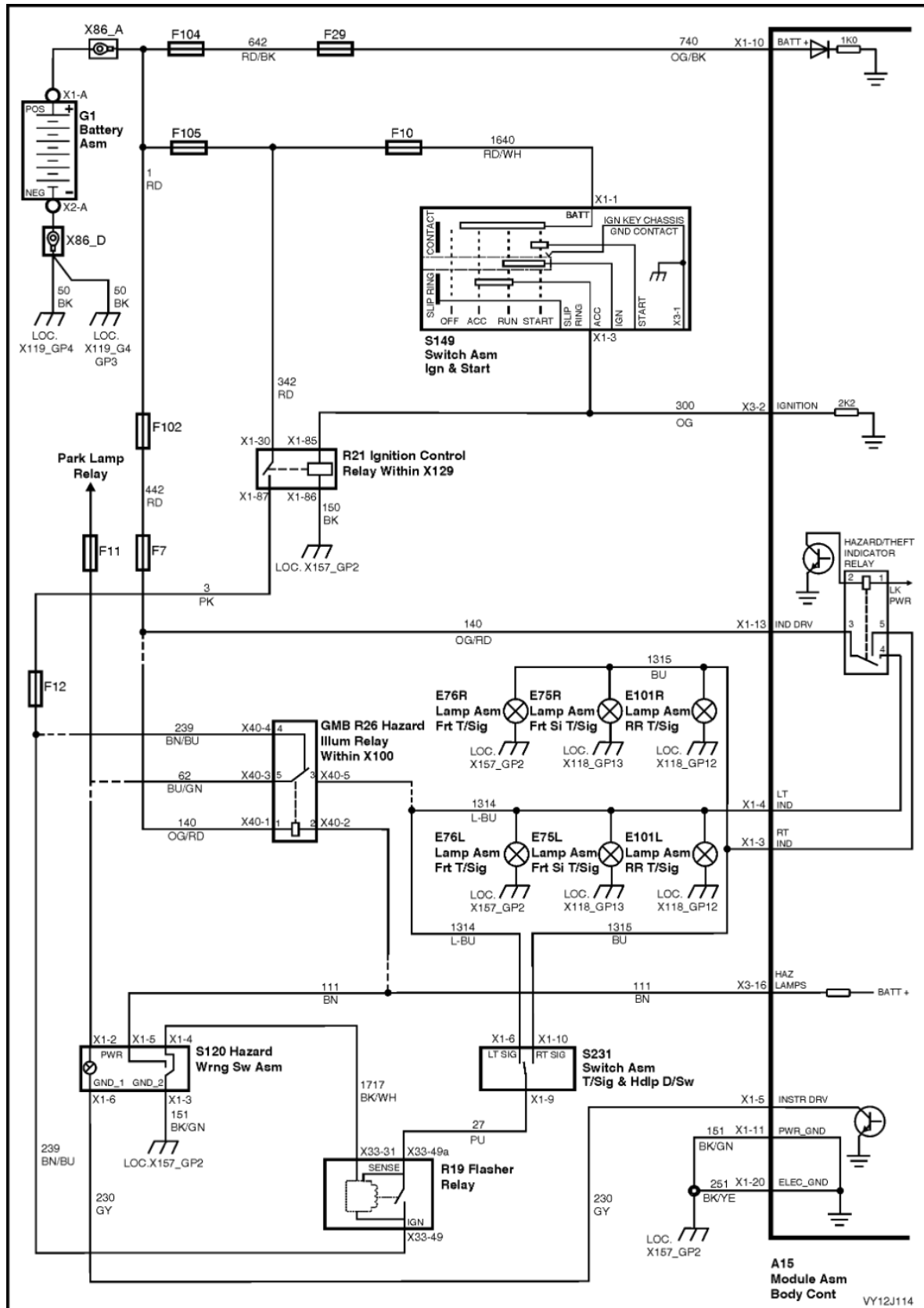


Figure 12J-274

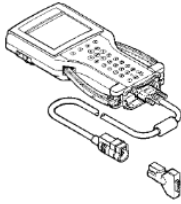
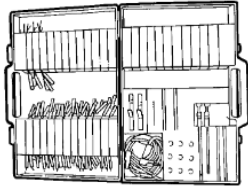
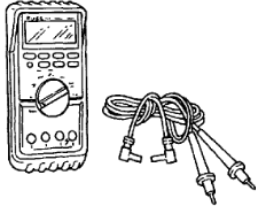
## HAZARD LAMP CONTROL DIAGNOSTIC CHART

STEP	ACTION	VALUE	YES	NO
1	Does the remote key function correctly?		Go to Step 2.	Go to 4.3 REMOTE RECEIVER / KEY in this Section.
2	Does the central locking system operate correctly?		Go to Step 3.	Go to 4.5 CENTRAL DOOR LOCKING in this Section.
3	1. Close all doors With the doors unlocked, press the remote coded key lock button. Do the indicator lamps flash?		Go to Step 5.	Go to Step 4.
4	In Step 3, did one side of indicator lamps flash?		Right-side OK – Go to Step 8. Left-side OK – Go to Step 9.	Go to Step 6.
5	1. Press the hazard warning switch to activate the hazard lamps (on). Do all indicator lamps flash and continue to flash?		System OK.	Go to Step 7.
6	1. Switch the ignition off. Connect TECH 2 to the DLC. Select Diagnostics / Model Year / Vehicle Model / Body / Body Control Module / Miscellaneous Tests / Lamps / Indicators. Perform the test as instructed by TECH 2. Do the indicator lamps illuminate (for a short time)?		Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Go to Step 9.
7	1. Press the hazard warning switch (on). Back probe BCM connector terminal X3-16 circuit 111 (Brown wire) with an ohmmeter to ground. Is the value as specified?	Less than 1 ohm.	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Check and repair circuit 111 (including the hazard warning switch assembly).
8	1. Turn the ignition off. 2. Turn the hazard lamps off. 3. Back-probe BCM connector terminal X1-4, circuit 1314 (Light-blue wire) with a jumper lead to battery voltage. Do the left side indicator lamps illuminate?		Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Check and repair circuit 1314 (including left-side hazard lamps).
9	1. Turn the ignition off. 2. Turn the hazard lamps off. 3. Back-probe BCM connector terminal X1-3, circuit 1315 (Blue wire) with a jumper lead to battery voltage. Do the right side indicator lamps illuminate?		Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Check and repair circuit 1315 (including right-side hazard lamps).
10	1. Back probe BCM connector terminal X1-13, circuit 140 (Orange / Red wire) with a voltmeter to ground. Is the value as specified?	Battery voltage	Replace the BCM. Refer to 2.1 BODY CONTROL MODULE in this Section.	Check and repair circuit 140 (including fuses F7 and F102).
<b>WHEN ALL DIAGNOSIS AND REPAIRS ARE COMPLETED, VERIFY CORRECT OPERATION</b>				

## 5. TORQUE WRENCH SPECIFICATIONS

	Nm
Body Control Module Retaining Screw .....	0.1 – 0.3
Remote Coded Key Housing Screw Torque Specification.....	0.7 – 0.9
Instrument Panel Outer Cover Retaining Screws .....	0.1 – 0.3
Windshield Defroster Grille Retaining Screws .....	0.1 – 0.3
Door Speaker Retaining Screws .....	0.1 – 0.3

## 6. SPECIAL TOOLS

TOOL NUMBER	ILLUSTRATION	DESCRIPTION	TOOL CLASSIFICATION
70000861		TECH 2 DIAGNOSTIC SCAN TOOL Used for diagnosis of vehicle electrical system. Previously released.	Mandatory
J35616-A (KM609)		CONNECTOR TEST ADAPTOR KIT Used when carrying out electrical diagnostic circuit checks. Previously released.	Desirable
3588 (J39200)		DIGITAL MULTIMETER Must have at least 10 M $\Omega$ input impedance and be capable of reading frequencies. Previously released.	Available