

SECTION 12H - ELECTRICALLY ADJUSTABLE REAR VISION MIRRORS

CAUTION:

This vehicle will be equipped with a Supplemental Restraint System (SRS). A SRS will consist of either seat belt pre-tensioners and a driver's side air bag, or seat belt pre-tensioners and a driver's and front passenger's side air bags. Refer to CAUTIONS, Section 12M, before performing any service operation on, or around any SRS components, the steering mechanism or wiring. Failure to follow the CAUTIONS could result in SRS deployment, resulting in possible personal injury or unnecessary SRS system repairs.

CAUTION:

This vehicle may be equipped with LPG (Liquefied Petroleum Gas). In the interests of safety, the LPG fuel system should be isolated by turning 'OFF' the manual service valve and then draining the LPG service lines, before any service work is carried out on the vehicle. Refer to the LPG leaflet included with the Owner's Handbook for details or LPG Section 2 for more specific servicing information.

1. GENERAL INFORMATION

Electrically adjustable rear vision mirrors are fitted as standard equipment on all VT Series Models.

Each exterior mirror assembly has two internal reversible motors: one to adjust the mirror face up and down (vertical position), the other to adjust the mirror face right and left (horizontal position).

The rear vision mirrors are adjusted from the interior of the vehicle by a mirror control switch mounted in the driver's side front door pull handle.

The control switch has two controls. A slide select switch that has two positions: Left mirror and Right mirror, and a toggle type direction switch, which is used to control the direction of movement of the mirror face.

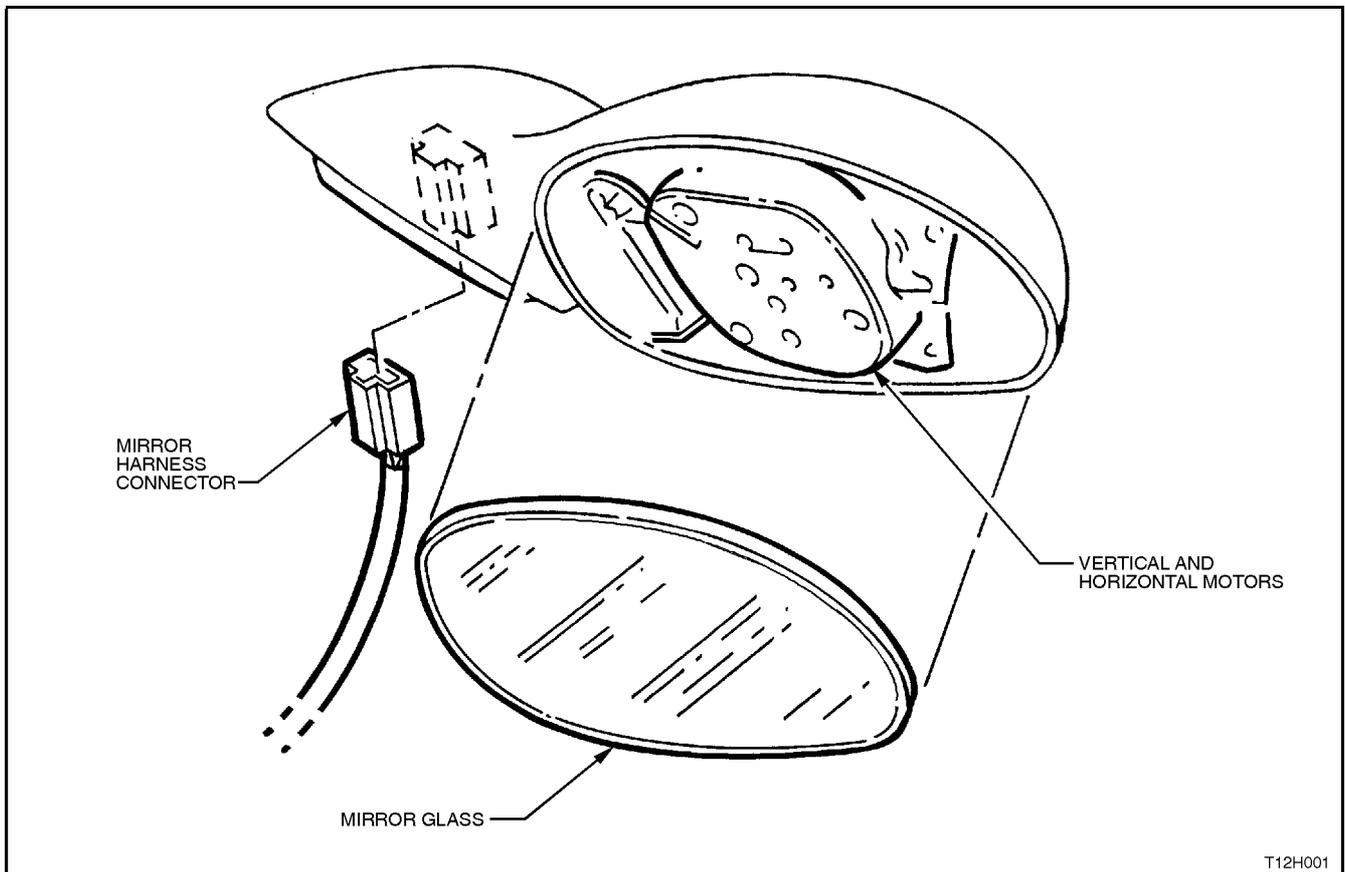


Figure 12H-1

1.1 CONTROL SWITCH OPERATION

The mirror control switch is two switches in one; a select switch which is used to select either the left or right hand mirror, and a directional toggle switch which is used to move the mirror face in the required direction.

The directional toggle switch is designed to operate in only one direction at a time and is activated by depressing the edge of the toggle, causing the toggle to 'cock' in the required direction.

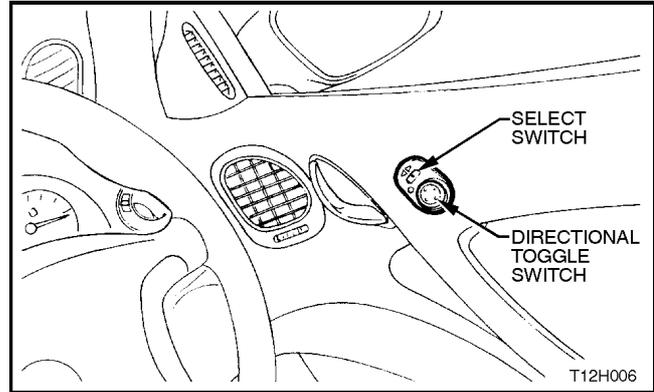


Figure 12H-2

1.2 CIRCUIT OPERATION

With the switches in the positions shown in Fig. 12H-3, the LH exterior rear view mirror is moved DOWNWARDS. Battery voltage from fuse F15 is applied through the directional contacts of the mirror switch to circuit 911 (Brown wire) to one side of all mirror assembly motors.

The LH mirror vertical motor has a path to earth through circuit 908 (Grey wire), through the LH side select switch contacts, through the directional contacts and circuit 156 (Black wire).

This allows the LH side vertical motor to operate and turns the mirror DOWNWARDS until the directional toggle switch is released.

When the directional toggle switch is depressed to move the mirror UPWARDS, the LH mirror vertical motor receives voltage, however, the voltage is reversed. Power is supplied through fuse F15, through the directional toggle and LH side select switch contacts, through circuit 908 (Grey wire) and through the motor. The motor is earthed through circuit 911 (Brown wire), through the directional switch contacts and circuit 156 (Black wire).

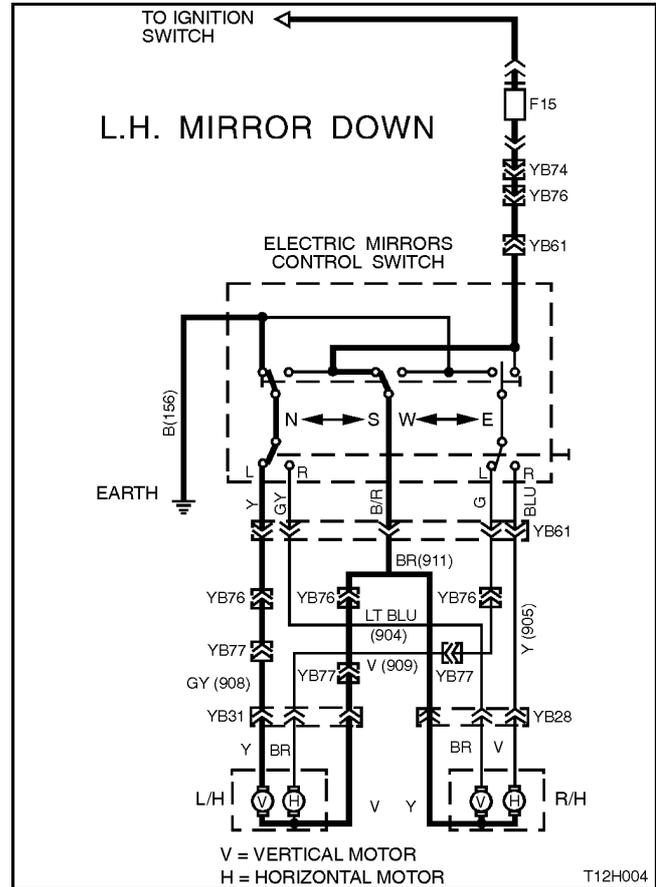


Figure 12H-3

The LH mirror INWARD and DOWNARD operation, operates similarly. When the directional switch is moved to the OUTWARD position, battery voltage from fuse F15 is applied through the directional centre contacts of the mirror control switch to circuit 911 (Brown wire) to one side of all mirror assembly motors.

The LH mirror horizontal motor has a path to earth through circuit 909 (Violet wire), through the LH side select switch contacts, through the directional contacts and through circuit 156 (Black wire).

This allows the LH side horizontal motor to operate and turns the mirror OUTWARDS until the directional toggle switch is released.

When the directional toggle switch is depressed to move the mirror INWARDS, the LH mirror horizontal motor receives voltage, however the voltage is reversed. Power to the motor is supplied through fuse F15, through the directional and LH side select switch contacts, through circuit 909 (Violet wire) and through the motor. The motor is earthed through circuit 911 (Brown wire), through the directional switch contacts and circuit 156 (Black wire).

The RH mirror assembly operates in a similar manner as the LH mirror assembly when the select and directional switches contacts are selected, except:

To move the RH mirror down, power is supplied via circuit 911 (Brown wire) and earthed through circuits 904 (Light Blue wire) and 156 (Black wire). To move the RH mirror up, power is supplied through circuit 904 and earthed through circuits 911 and 156. To move the RH mirror out, power is supplied via circuit 911 and earthed through circuits 905 and 156. To move the RH mirror in, power is supplied through circuit 905 and earthed through circuits 911 and 156.

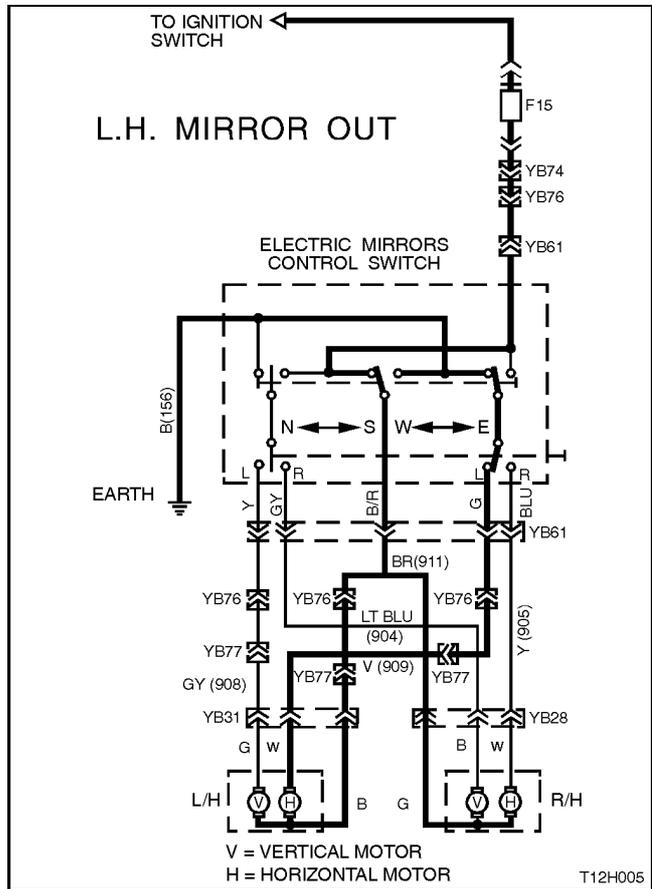


Figure 12H-4

2. SERVICE OPERATIONS

2.1 MIRROR ASSEMBLY

REMOVE

1. Disconnect battery earth lead.
2. Remove the mirror inner cover cap by gently prying cap away from door.
3. Remove door demist duct to allow access to the exterior rear view mirror retaining screws by pulling duct up and out of door trim.

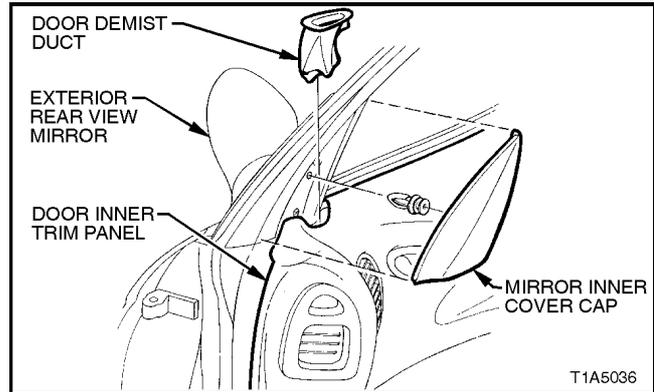


Figure 12H-5

4. Using a right angled screwdriver, remove the three screws securing the mirror to the door and while supporting the mirror, disconnect the mirror wiring harness connector.
5. Remove mirror assembly.

NOTE:

Fig. 12H-6 shows the door with the inner trim panel removed. To remove the three exterior rear vision mirror retaining screws, the inner door trim does not have to be removed.

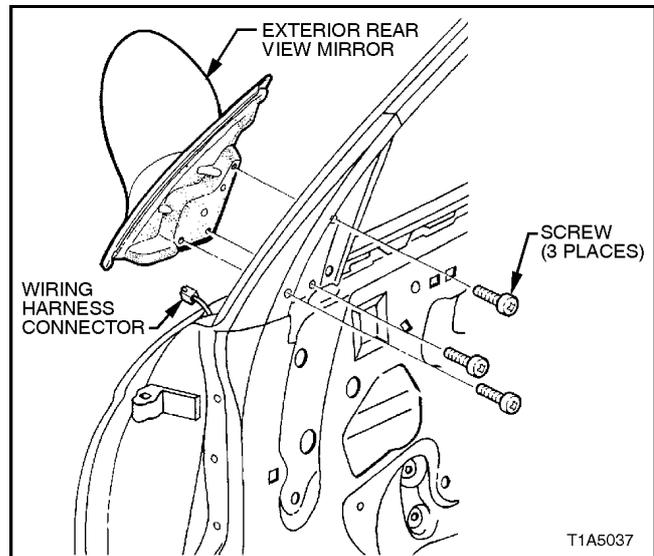


Figure 12H-6

TEST

The following operations, performed with the mirror assembly removed from the vehicle, check the mirror assembly horizontal and vertical motors. If the following operations prove that a mirror assembly is faulty, replace the mirror assembly.

Using an ohmmeter connected to the electric mirror connector, refer Fig. 12H-7, check continuity of mirror wiring between the following terminals:

- Ter. 1 and Ter. 2
- Ter. 1 and Ter. 3
- Ter. 2 and Ter. 3

If the ohmmeter indicates an open circuit or a very high resistance (more than 200 ohms) replace the mirror assembly. If the mirror motor resistance is acceptable, proceed to Step 2.

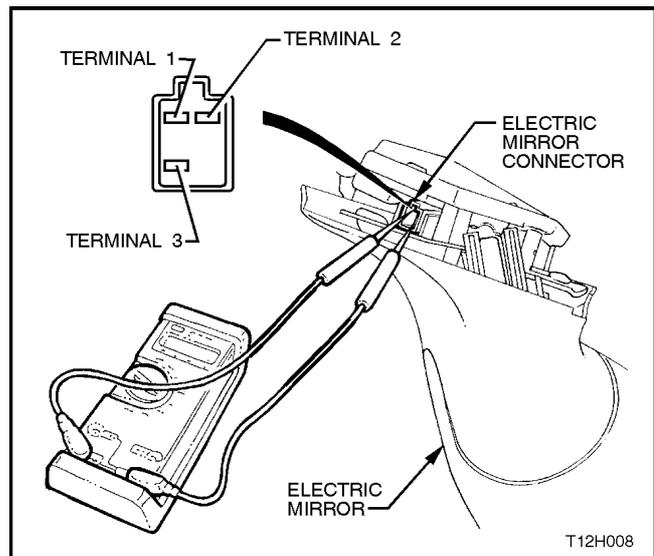


Figure 12H-7

2. Referring to Fig. 12H-8, connect leads from a 12 volt battery to the mirror harness connector terminals nominated in the following chart and observe mirror movement.

FUNCTION	TER. 1	TER. 2	TER. 3
LH MIRROR - IN	-	+	
LH MIRROR - OUT	+	-	
LH MIRROR - UP	+		-
LH MIRROR - DOWN	-		+
RH MIRROR - IN	+	-	
RH MIRROR - OUT	-	+	
RH MIRROR - UP	+		-
RH MIRROR - DOWN	-		+

+ = battery positive (12 volts)

- = battery negative

If the movement of the mirror is not as per the above chart, replace mirror assembly.

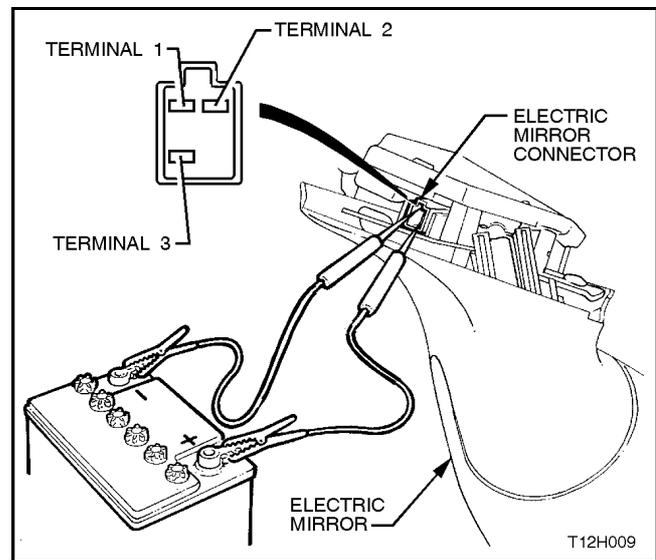


Figure 12H-8

REINSTALL

Installation of the exterior rear vision mirror is the reverse of the removal procedure, noting the following:

1. Ensure wiring harness and connector for the mirror are correctly routed.
2. Ensure the three mirror to door securing screws are tightened to the correct torque specification.

MIRROR TO DOOR SECURING SCREW TORQUE SPECIFICATION	2.5 - 3.0 Nm
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3. Ensure that when installing the door demist duct, that it clips into position.
4. Check mirror operation.

2.2 MIRROR GLASS

REPLACE

Adjust mirror glass so that it is in the fully "UP" and fully "IN" position.

Insert a screwdriver into the slot on the inside of the mirror glass and lever mirror glass away from the motor assembly, refer to Fig. 12H-9.

Remove mirror glass from motor assembly.

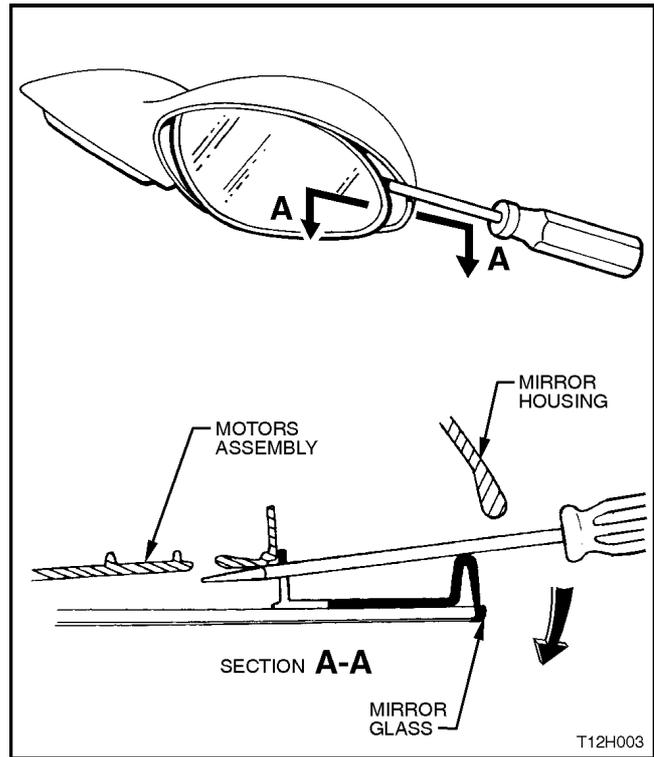


Figure 12H-9

Install new mirror glass onto motor assembly, ensuring that the anti-vibration spring rod is at a right angle to the mirror glass and that it aligns with the corresponding aperture in the mirror housing, refer to Fig. 12H-10

While supporting the mirror housing, push mirror glass squarely onto the mirror motor assembly until it is firmly seated.

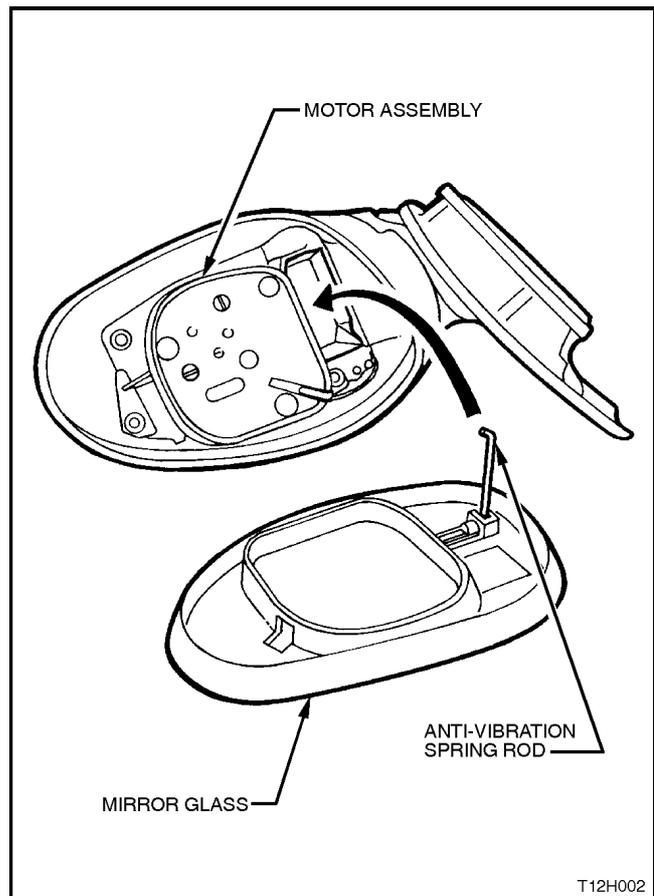


Figure 12H-10

2.3 MIRROR CONTROL SWITCH

REMOVE

1. Remove door inner trim panel, refer to [Section 1A5 FRONT & REAR DOOR ASSEMBLIES](#).
2. Disconnect the door electrical harness from the control switch harness assembly.
3. From inside of door trim assembly, push the control switch free and remove the switch.

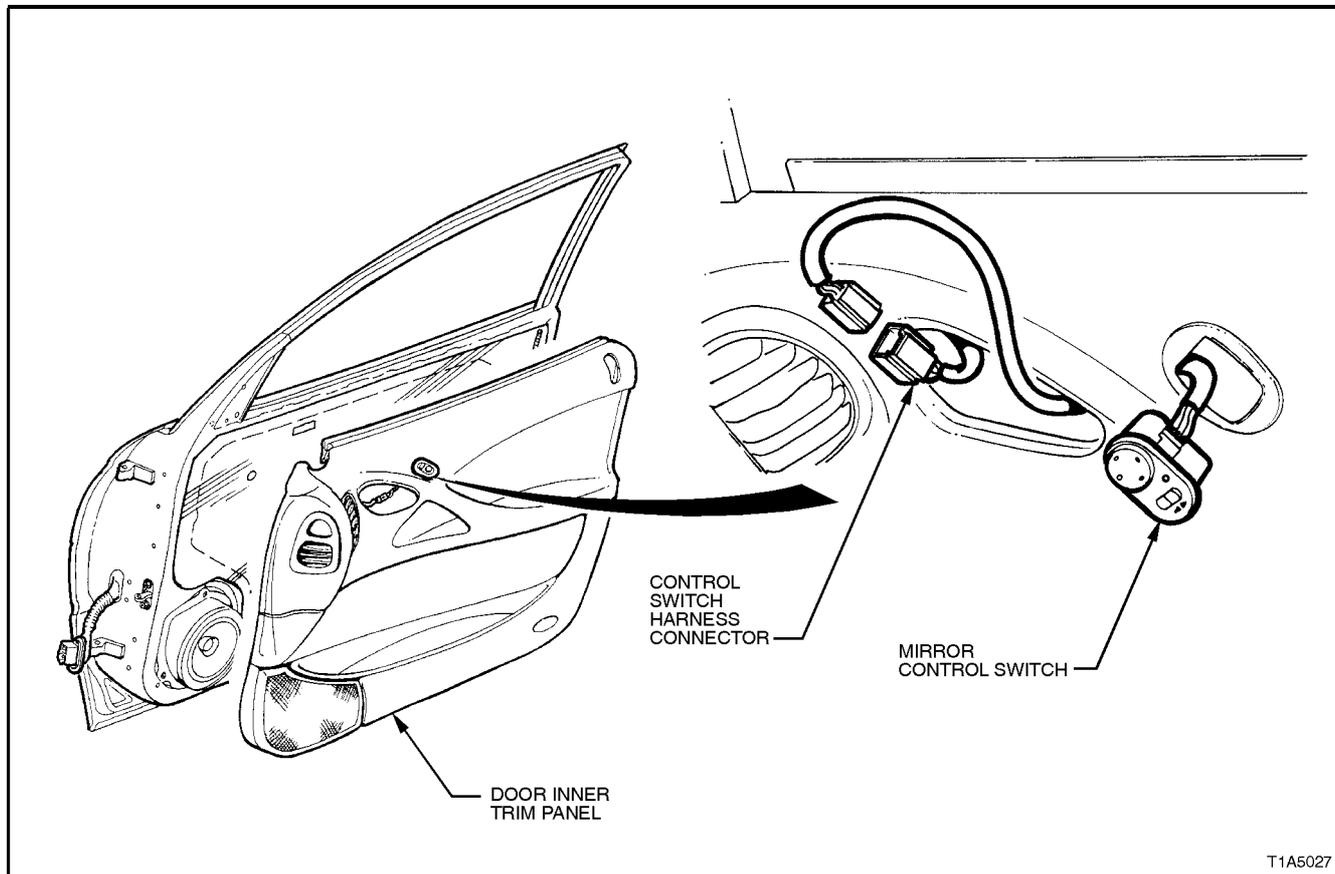


Figure 12H-11

TESTING SWITCH CONTACTS

With reference to the Figs. 12H-12 and 12H-13 and the following three charts, the mirror control switch contacts can be checked for continuity between the various terminals with the aid of an ohmmeter.

Attach an ohmmeter to the appropriate terminals nominated in the following two charts.

Select the appropriate mirror on the select switch, i.e. LH or RH and depress the directional toggle switch in the direction indicated in the chart. The ohmmeter should indicate continuity if the switch is OK.

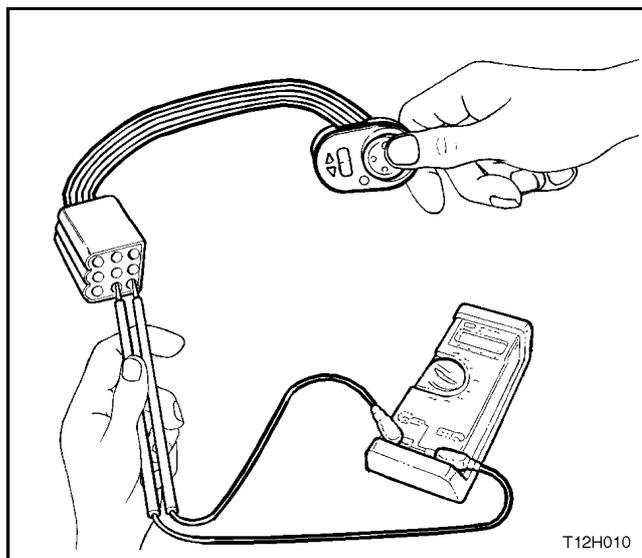


Figure 12H-12

LEFT HAND MIRROR

FUNCTION	SWITCH WIRE COLOURS	VALUE
Out	Light Green and Black	Continuity
In	Light Green and Brown	Continuity
Up	Yellow and Black	Continuity
Down	Yellow and Brown	Continuity

RIGHT HAND MIRROR

FUNCTION	SWITCH WIRE COLOURS	VALUE
Out	Blue and Brown	Continuity
In	Blue and Black	Continuity
Up	Grey and Black	Continuity
Down	Grey and Brown	Continuity

For the following test of switch contacts, attach an ohmmeter to the appropriate terminals nominated in the following chart and then depress and hold the directional toggle switch in the direction indicated in the chart and Fig. 12H-13. The ohmmeter should indicate continuity if the switch is OK.

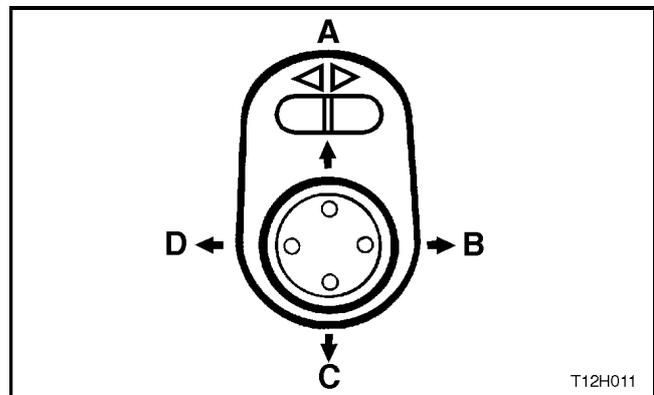


Figure 12H-13

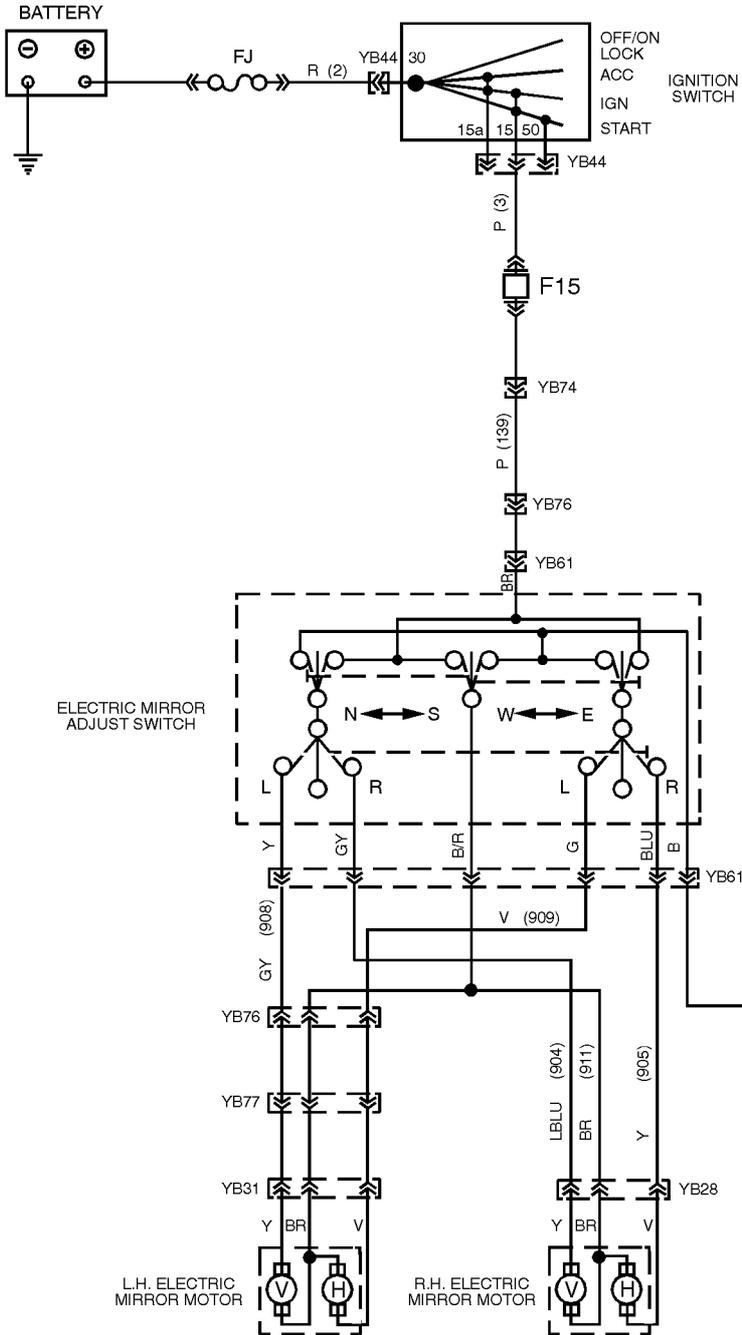
TOGGLE DIRECTION	SWITCH WIRE COLOURS	VALUE
A	Black/Red and Brown	Continuity
B	Black/Red and Black	Continuity
C	Black/Red and Black	Continuity
D	Black/Red and Brown	Continuity

REINSTALL

Reinstallation of the exterior rear vision mirror control switch is the reverse of the removal procedure.

3. DIAGNOSIS

ELECTRICALLY ADJUSTABLE REAR VISION MIRRORS WIRING DIAGRAM



YB28 (R.H. FRONT DOOR HARNESS) R.H. ELECTRIC MIRROR MOTOR Y (905) BR (911) LBLU (904)	YB31 (L.H. FRONT DOOR HARNESS) L.H. ELECTRIC MIRROR MOTOR V (909) BR (911) GY (908)
YB44 (M.W.H) IGNITION SWITCH BR (4) V (5) P (3) R (2)	YB61 (R.H. FRONT DOOR HARNESS) ELECTRIC MIRROR ADJUST SWITCH Y (905) B/BLU (156) LBLU (904) P (139) BR (911) GY (908) V (909)
YB74 (BODY HARNESS) BODY HARNESS CONNECTOR BR/B (199) BR/W (19) BR/Y (141) Y (885) V (884) BLU (883) B (882) T (30) W/G (174) O/B (1140) GY (118) BR/W (33) P (139) LBLU (411) B/Y (155) O/BLU (47)	
YB76 (BODY HARNESS) R.H.F DOOR HARNESS CONNECTOR G/O (673) LG/Y (193) BLU/B (293) BR/R (195) O/B (1140) GY (908) V (909) BR (911) W/BLU (1126) B/Y (295) BLU/W (672) B/BLU (156) V/W (394) P (139) BR/W (197) LG (200) G (117)	
YB77 (BODY HARNESS) L.H.F DOOR HARNESS CONNECTOR G (667) BR/O (194) B/R (294) O/B (1140) GY (908) V (909) BR (911) W/BLU (1124) B/Y (295) BLU (666) B/BLU (156) V/W (394) T (201) GY (118)	

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Figure 12H-14

3.1 ELECTRIC MIRROR/S INOPERATIVE

STEP	ACTION	VALUE	YES	NO
1.	<ul style="list-style-type: none"> Are both electric rear view mirrors inoperative? 		Go to Step 2.	Go to Step 3.
2.	<ul style="list-style-type: none"> Is fuse F15 OK (located in fuse panel)? 		Go to step 3.	Replace blown fuse, check wiring for cause of fuse blowing. Re-check system.
3.	<ul style="list-style-type: none"> Remove RH front door inner trim panel, refer to Section 1A5 FRONT AND REAR DOOR.ASSEMBLIES. Reconnect mirror control switch. Turn ignition ON. Using a test light at the switch side of connector YB61, check for power at brown. Does test light illuminate ? 		Go to Step 4.	Check and repair open circuit in circuit 139 (Pink wire) from fuse F15 to control switch. Re-check system.
4.	<ul style="list-style-type: none"> Using an ohmmeter, check circuit 156 for continuity between connector YB61 (Black wire) and earth connection (location E6). Is wiring OK ? 		Go to Step 5.	Check and repair open circuit in earth circuit 156 (Black wire). Re-check system
5.	<ul style="list-style-type: none"> At connector YB61, check for continuity in the following circuits: <ul style="list-style-type: none"> Circuit 911 (Brown wire) to circuit 909 (Violet wire) (LH mirror horizontal motor). Circuit 911 (Brown wire) to circuit 908 (Grey wire). (LH mirror vertical motor). Circuit 911 (Brown wire) to circuit 905 (Yellow wire) (RH mirror horizontal motor). Circuit 911 (Brown wire) to circuit 904 (L/Blue wire) (RH mirror vertical motor). Is wiring OK ? 		Go to Step 6.	Check and repair open circuit. Re-check system.
6.	<ul style="list-style-type: none"> Check mirror control switch, refer to 2.3 MIRROR CONTROL SWITCH, in this Section. Is mirror control switch OK ? 		System OK.	Replace mirror control switch. Re-check system.

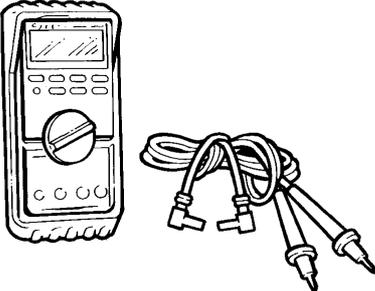
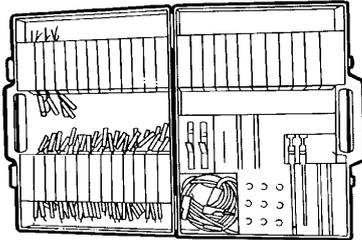
3.2 EITHER MIRROR NOT WORKING IN ONE OR MORE DIRECTIONS

STEP	ACTION	VALUE	YES	NO
1.	<ul style="list-style-type: none"> Remove mirror control switch and test switch contacts, refer to 2.3 MIRROR CONTROL SWITCH in this Section. Are mirror switch contacts OK ? 		Go to Step 2.	Replace mirror control switch. Re-check system.
2.	<ul style="list-style-type: none"> With connector YB61, check for continuity in the following the particular circuit that the mirror is operating: LH mirror horizontal: circuit 911 (Brown wire) to circuit 909 (Violet wire). LH mirror vertical: circuit 911 (Brown wire) to circuit 908 (Grey wire). RH mirror horizontal: circuit 911 (Brown wire) to circuit 905 (Yellow wire). RH mirror vertical: circuit 911 (Brown wire) to circuit 904 (L/Blue wire). Is wiring OK ? 		Go to Step 3.	Check and repair open circuit. Re-check system.
3.	<ul style="list-style-type: none"> Check faulty mirror assembly, refer to 2.1 MIRROR ASSEMBLY, in this Section. Is mirror OK ? 		System OK.	Replace mirror assembly. Re-check system.

4. TORQUE WRENCH SPECIFICATIONS

	Nm
Mirror to Door Securing Screws	2.5 - 3.0

5. SPECIAL TOOLS

TOOL NO. REF IN TEXT	TOOL DESCRIPTION	COMMENTS
J39200	<p data-bbox="624 212 911 235">DIGITAL MULTIMETER</p> 	<p data-bbox="1066 212 1444 392">TOOL NO. J39200 PREVIOUSLY RELEASED, OR USE COMMERCIALY AVAILABLE EQUIVALENT. MUST HAVE 10 MEG OHM INPUT IMPEDANCE</p>
KM-609	<p data-bbox="655 571 879 593">ELECTRONIC KIT</p> 	<p data-bbox="1066 571 1444 750">USED IN CONJUNCTION WITH A MULTIMETER FOR MEASURING VOLTAGES AND RESISTANCE'S WITHOUT DAMAGING WIRING HARNES CONNECTORS</p>