

SEATS - POWER MEMORY

1995 Volvo 850

1995 ACCESSORIES & EQUIPMENT
Volvo Memory Power Seats

850

DESCRIPTION & OPERATION

POWER SEAT

Power seat option is available for driver's and passenger's seat. Seats have a memory function and an integral diagnosis system. Memory function has 3 memory buttons for different seat settings. There is one control for seat cushion and one for backrest. Seat control module, which is located under seat, controls 4 motors. Three motors are under the seat and one is in the backrest. Memory-type control module takes seat position information from 4 position sensors.

Control module contains 9 relays: 2 for each motor and one main on/off relay. Motor No. 1 controls fore and aft movement of the seat. Motor No. 2 controls backrest angle, motor No. 3 controls seat cushion height at the rear, and motor No. 4 controls seat cushion height at the front.

If system detects a broken, shorted, or grounded wire, motors can then only be operated without their memory function. If system detects a broken, shorted, or grounded motor wire, that motor is disabled. Other motors can only be operated without their memory function.

If a control button is pressed for more than 30 seconds, a timer circuit cuts off power supply to motors by disabling main relay. Seat positions are held in an EEPROM which retains information indefinitely in case of power failure.

SYSTEM TESTS

DIAGNOSTIC SYSTEM

Description

Vehicle is equipped with 2 diagnostic units. Both units ("A" and "B") are located in engine compartment behind right headlight. See Fig. 1.

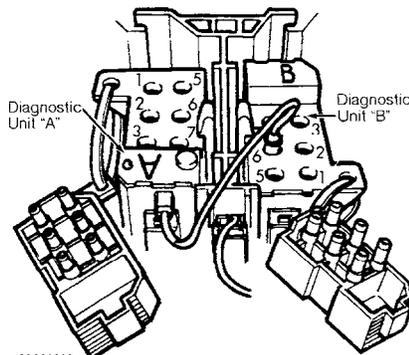


Fig. 1: Locating Diagnostic Units
Courtesy of Volvo Cars of North America.

NOTE: Manufacturer recommends using Volvo Diagnostic Key (998

8670) for diagnosis and especially for calibration. Manual calibration requires 90 key presses and acknowledgments.

Test Mode No. 1

This test mode is used for reading stored faults. Control module can sense 19 different faults, but only retains a record of the last 2. After any repair, it is important to clear codes, activate the seat, and determine whether there are any other faults.

Test Mode No. 4

This test mode is used for calibrating the system and changing transmission rate. Power seat requires recalibration if any of the following components has been replaced: control module, drive gear, any motor, position potentiometer, wire, or side rail.

SELF-DIAGNOSIS

Test Mode No. 1 (Accessing Codes)

1) Power seat diagnostic system is operated via diagnostic unit "B", socket No. 6, using button and test lead from diagnostic unit "A". To access diagnostic system, connect test lead from diagnostic unit "A" to socket No. 6 on diagnostic unit "B". See Fig. 1. Press any button on seat controls for seat to be diagnosed.

2) Hold button down when turning on ignition, and keep holding it down for about one second longer. Ignition must have been off for at least 5 seconds before beginning diagnosis. Press button once to select test mode No. 1 and read codes. See POWER SEAT DIAGNOSTIC TROUBLE CODES table.

POWER SEAT DIAGNOSTIC TROUBLE CODES TABLE

Trouble Code	Possible Fault
1-1-1	No Faults Present
1-1-2	Signal Position Sensor Motor No. 1
1-2-1	Signal Position Sensor Motor No. 2
1-2-2	Signal Position Sensor Motor No. 3
2-1-1	Signal Position Sensor Motor No. 4
1-2-3	Motor No. 1 Functions Although Equivalent Button Not Activated
1-3-1	Motor No. 2 Functions Although Equivalent Button Not Activated
1-3-2	Motor No. 3 Functions Although Equivalent Button Not Activated
1-3-3	Motor No. 4 Functions Although Equivalent Button Not Activated
3-2-3	Fault In Stored Memory Position No. 1
3-2-2	Fault In Stored Memory Position No. 2
3-2-1	Fault In Stored Memory Position No. 3

3-3-1	(1) Wire Disconnected, Motor No. 1
3-3-2	(1) Wire Disconnected, Motor No. 2
3-3-3	(1) Wire Disconnected, Motor No. 3
1-1-4	(1) Wire Disconnected, Motor No. 4
1-4-3	Motor No. 1 Turns In Wrong Direction
1-4-4	Motor No. 2 Turns In Wrong Direction
2-1-4	Motor No. 3 Turns In Wrong Direction
2-2-4	Motor No. 4 Turns In Wrong Direction
4-1-4	Faulty End Position Calibration
(1) - These codes may also occur if a motor is prevented from reaching its end position. This could occur if the backrest is stopped by the back seat before it reaches its backward tilt limit. Clear codes and test run motor to see whether code reoccurs.	

Test Mode No. 4 (Setting Transmission Rate & Calibration)

1) Test mode No. 4 is used to calibrate seat end positions and change transmission rates. To access diagnostic system, connect test lead from diagnostic unit "A" to socket No. 6 on diagnostic unit "B". See Fig. 1. Press any button on seat controls for seat to be calibrated. Hold button down when turning on ignition and keep holding it down for about one second longer. Ignition must have been off for at least 5 seconds before this is done. Diagnostic system must now be activated within 30 seconds.

2) Press button 4 times to select test mode No. 4. Control module exits from test mode after about one minute if there is no activity between it and diagnostic unit. Control module will also exit from test mode when ignition is switched off for at least 5 seconds. During diagnosis, seat cannot be operated with positioning buttons or memory buttons. To change seat calibration, go to next step. To change transmission rate, enter input codes. See TRANSMISSION RATE INPUT CODES table.

TRANSMISSION RATE INPUT CODES TABLE

Code	Transmission Rate
3-1-1	Normal Speed
3-1-2	X2 Speed
3-1-3	X10 Speed

3) Calibrating seat end positions is the process of teaching seat the potentiometer output signals that correspond to seat end positions. Seat calibration is necessary after replacement of control module, motor, position sensor, wires, side rails, or drive gear.

4) Before calibration can begin, relevant components must be operated to their respective end positions by repeatedly pressing the control buttons. This is to ensure the potentiometers are within their working range.

5) To calibrate seat end positions, go to test mode No. 1. See TEST MODE NO. 1 (ACCESSING CODES). Access any codes present. Erase all stored codes. See ERASING CODES. Go to test mode No. 4. See TEST

MODE NO. 4 (SETTING TRANSMISSION RATE & CALIBRATION). Enter Code 4-2-3. Wait for confirmation code (code 4-2-3 flashed from LED). Enter Code 4-4-1 and wait for confirmation code.

6) Enter codes for calibrating end positions of various motors, in order. See CALIBRATION CODES ORDER OF ENTRY table. When a calibration code has been entered, seat moves to an end position, and a confirmation code flashes (same code as was entered). Test mode No. 4 must be selected every time a code is entered.

7) To ensure control module stores end positions, enter Code 4-4-4 in test mode No. 4. If calibration has been successful, enter Code 1-1-1. Test seat. Return to test mode No. 1 and check for codes.

CALIBRATION CODES ORDER OF ENTRY TABLE

Code	Specification
4-2-3	Enables Calibration
4-4-1	Set Seat Type To Model 800
4-2-1	Seat To Forward Limit, Front Of Seat Cushion To Upper Limit (Motors No. 1 & 4 On)
4-3-2	Backrest Tilts Back To Limit, Rear Of Seat Cushion To Lower Limit (Motors No. 2 & 3 On)
4-2-2	Backrest Tilts Forward To Limit, Rear Of Seat Cushion To Upper Limit (Motors No. 2 & 3 On)
4-3-1	Seat To Rearward Limit, Front Of Seat Cushion To Lower Limit (Motors No. 1 & 4 On)
4-4-4	Store Calibration

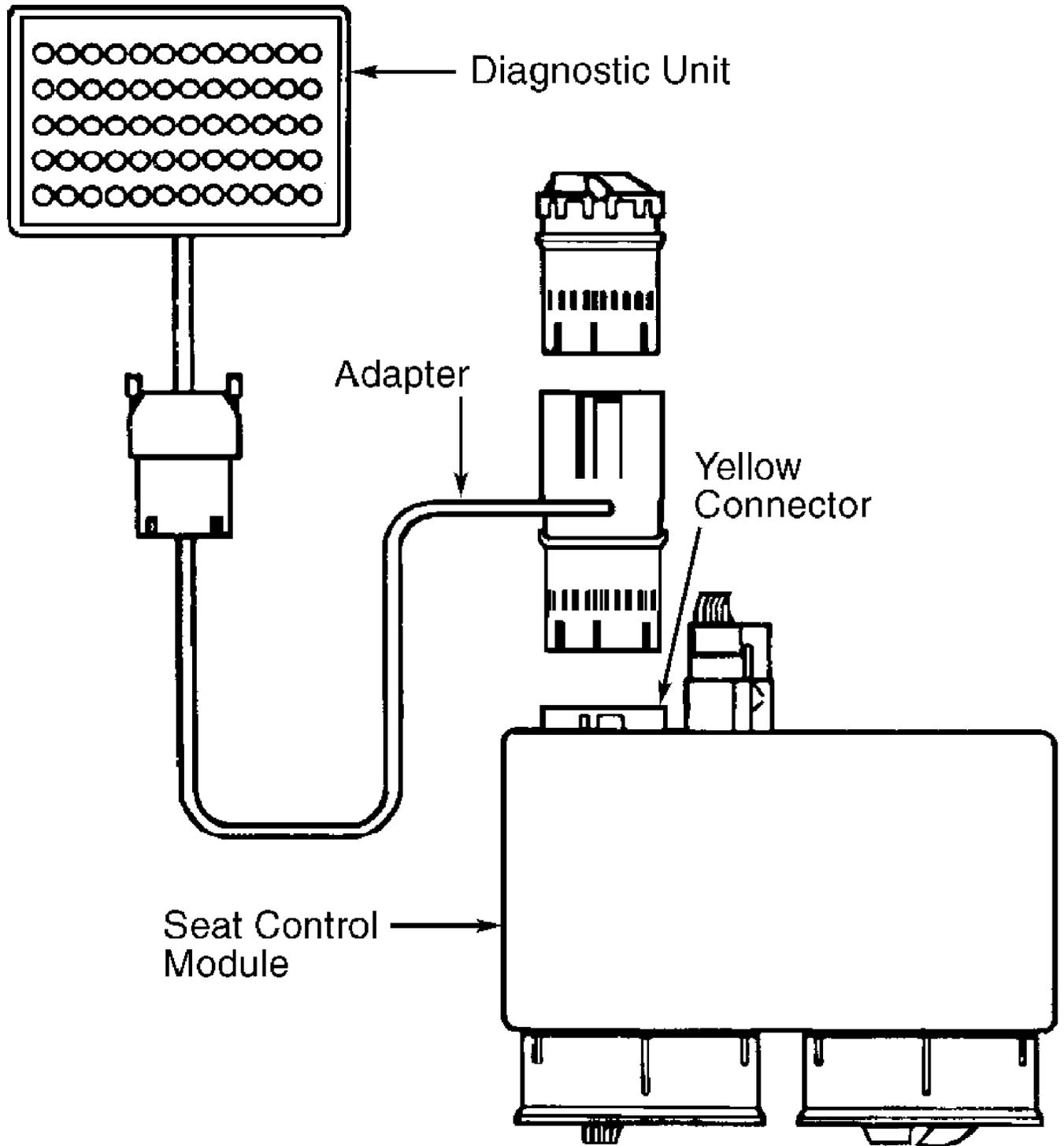
ERASING CODES

1) All codes must be displayed at least once before they can be erased. To erase codes, press and hold diagnostic button for at least 5 seconds. Three seconds after button is released, LED should illuminate. Press and hold diagnostic button for a minimum of 5 seconds more.

2) When button is released, LED should go out. Ensure codes have been erased by pressing diagnostic button once. If the display shows 1-1-1, codes have been erased.

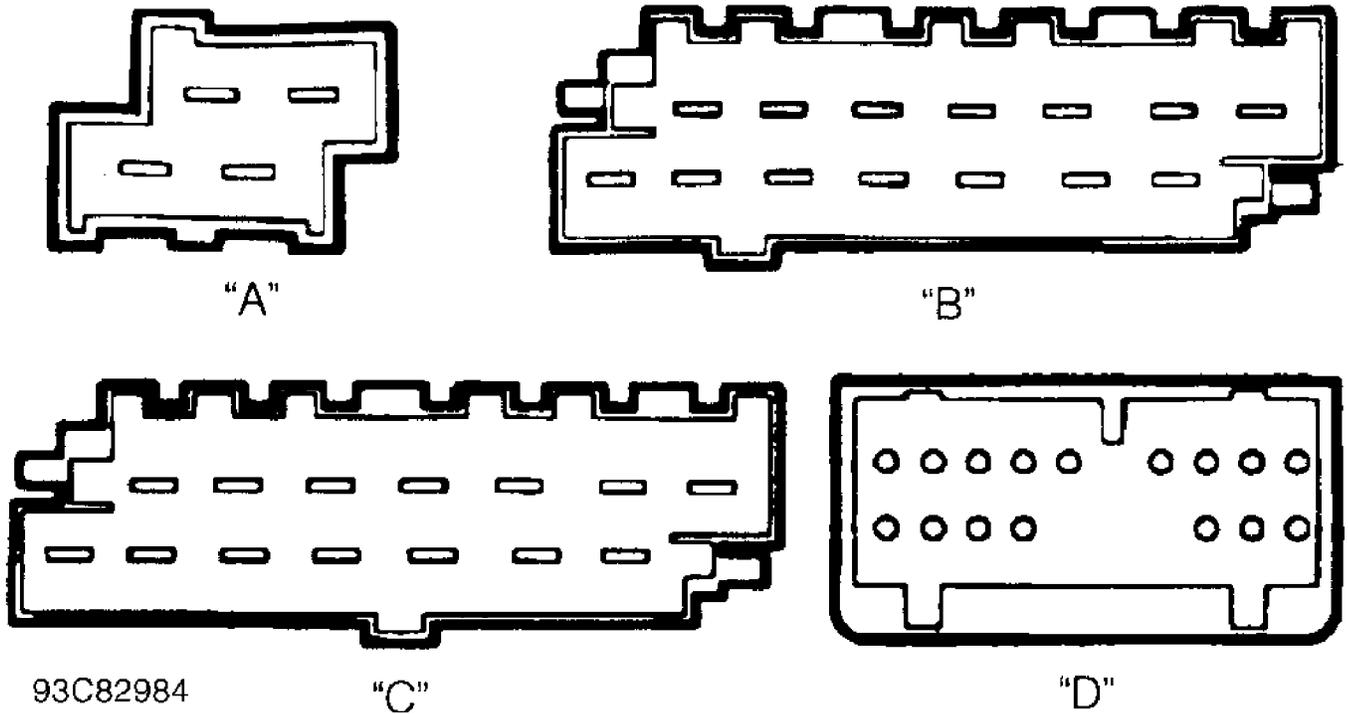
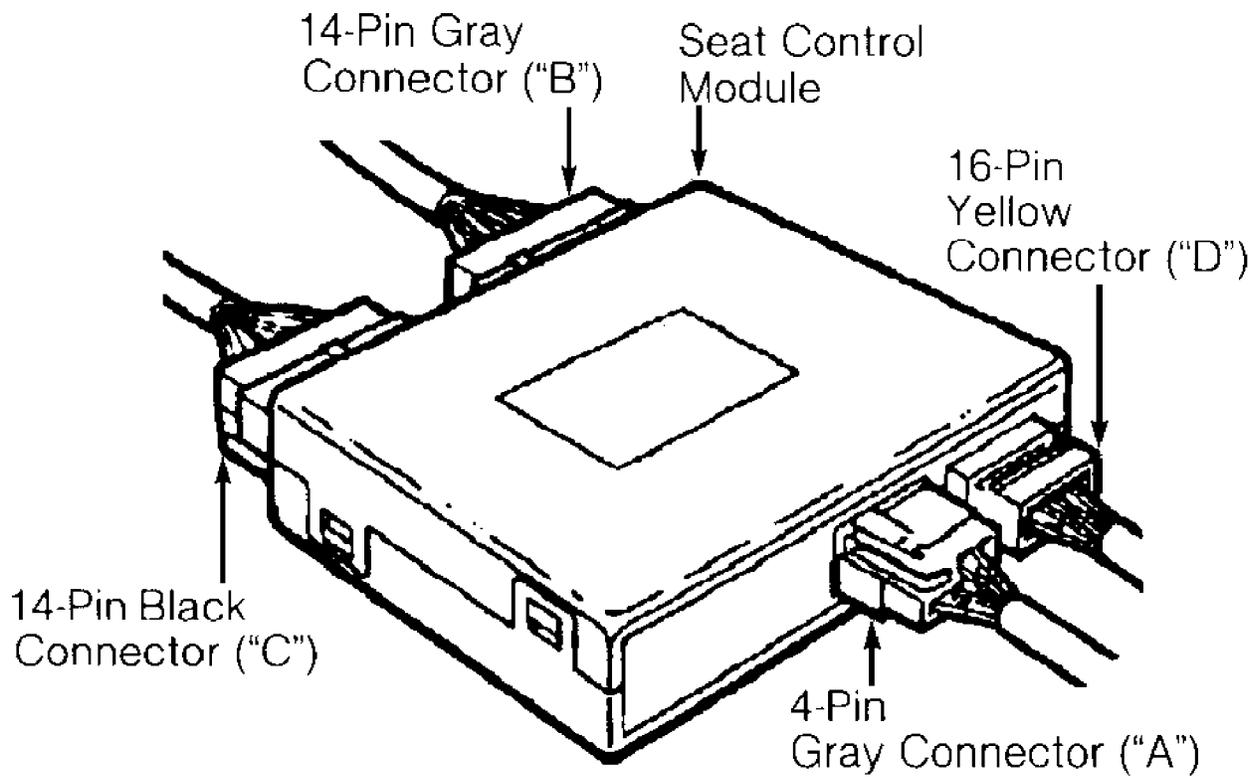
DIAGNOSTIC UNIT VOLTAGE & GROUND TEST

Disconnect 16-pin Yellow connector at seat control module. Connect Diagnostic Unit (981 3190) and Adapter (981 3194) to seat control module. Reconnect 16-pin Yellow connector. See Figs. 2 and 3. Check voltage and ground output at diagnostic unit terminals. See DIAGNOSTIC UNIT VOLTAGE & GROUND PIN CHECK table.



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Fig. 2: Connecting Diagnostic Unit & Adapter To Seat Control Module
Courtesy of Volvo Cars of North America.



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Fig. 3: Identifying Control Module Connectors
 Courtesy of Volvo Cars of North America.

DIAGNOSTIC UNIT VOLTAGE & GROUND PIN CHECK TABLE

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Pin No. (Normal Output)	Diagnosis
31 (Battery Voltage)	Press Memory Button No. 2; Voltage Should Approach Zero Volts
32 (Battery Voltage)	Press Memory Button No. 1; Voltage Should Approach Zero Volts
33 (Battery Voltage)	Press Programming Button; Voltage Should Approach Zero Volts
34 & 35	Not Used
36 & 37 (Ground)	
38 (Battery Voltage)	Run Seat Fully Forward; Voltage Should Approach Zero Volts
39 (Battery Voltage)	Run Seat Fully Back; Voltage Should Approach Zero Volts
40 (Battery Voltage)	Run Backrest Fully Forward; Voltage Should Approach Zero Volts
41 (Battery Voltage)	Run Backrest Fully Back; Voltage Should Approach Zero Volts
42 (Battery Voltage)	Raise Rear Edge Of Seat; Voltage Should Approach Zero Volts
43 (Battery Voltage)	Lower Rear Edge Of Seat; Voltage Should Approach Zero Volts
44 (Battery Voltage)	Raise Front Edge Of Seat; Voltage Should Approach Zero Volts
45 (Battery Voltage)	Lower Front Edge Of Seat; Voltage Should Approach Zero Volts
46 (Battery Voltage)	Press Memory Button No. 3; Voltage Should Approach Zero Volts

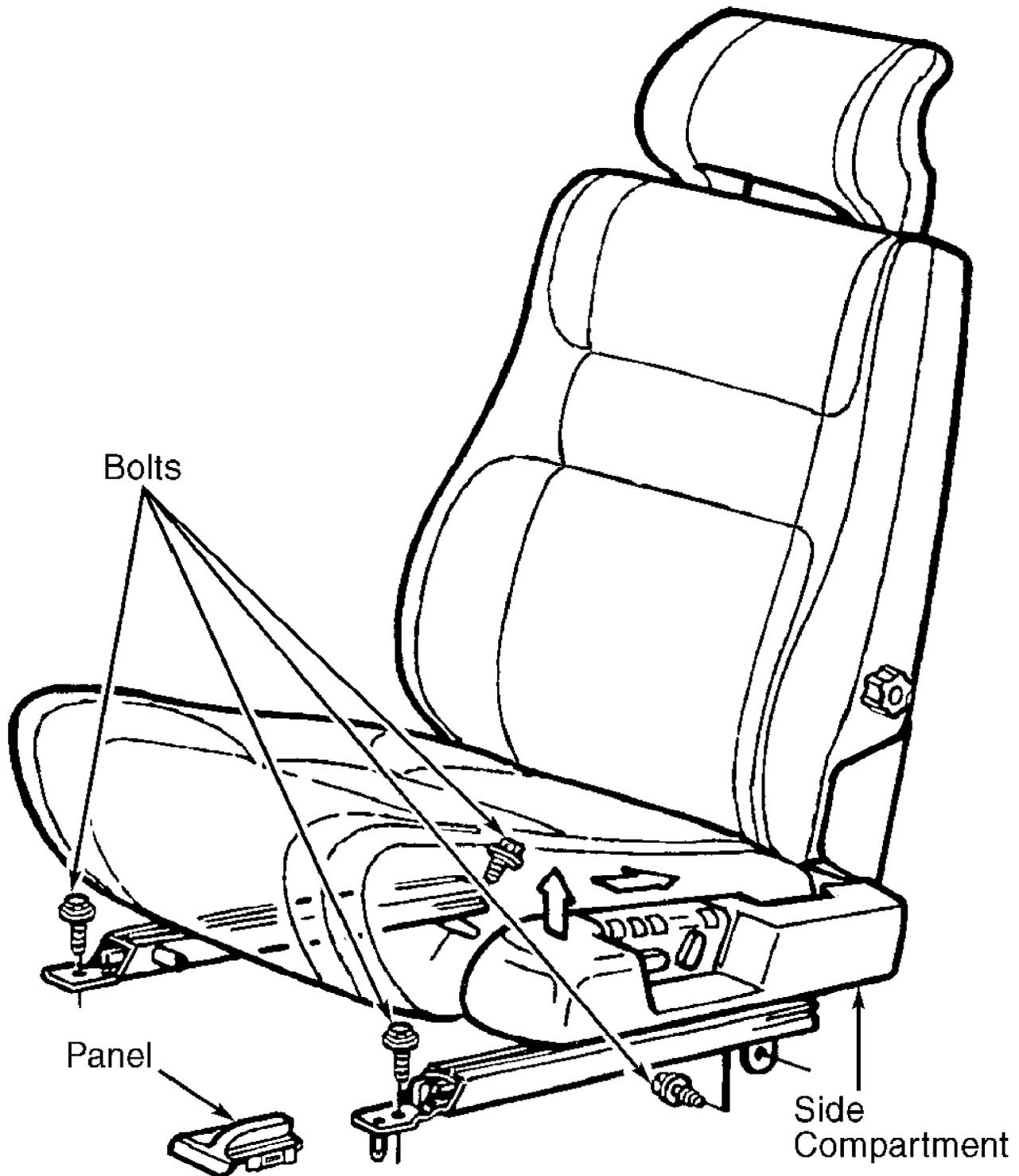
REMOVAL & INSTALLATION

SEAT

Removal & Installation

1) Disconnect negative battery cable. Remove backrest. Raise forward end of side compartment, then push side compartment rearward. Remove side compartment. Remove seat belt and panels over slide rails.

2) Remove 4 slide rail bolts. See Fig. 4. Disconnect control module and heating element electrical connectors. Lift seat straight up and remove. To install, reverse removal procedure. To avoid misaligning seat, tighten rear inner bolt first, then front 2 bolts, and finally rear outer bolt. Tighten seat bolts to 30 ft. lbs. (40 N. m).



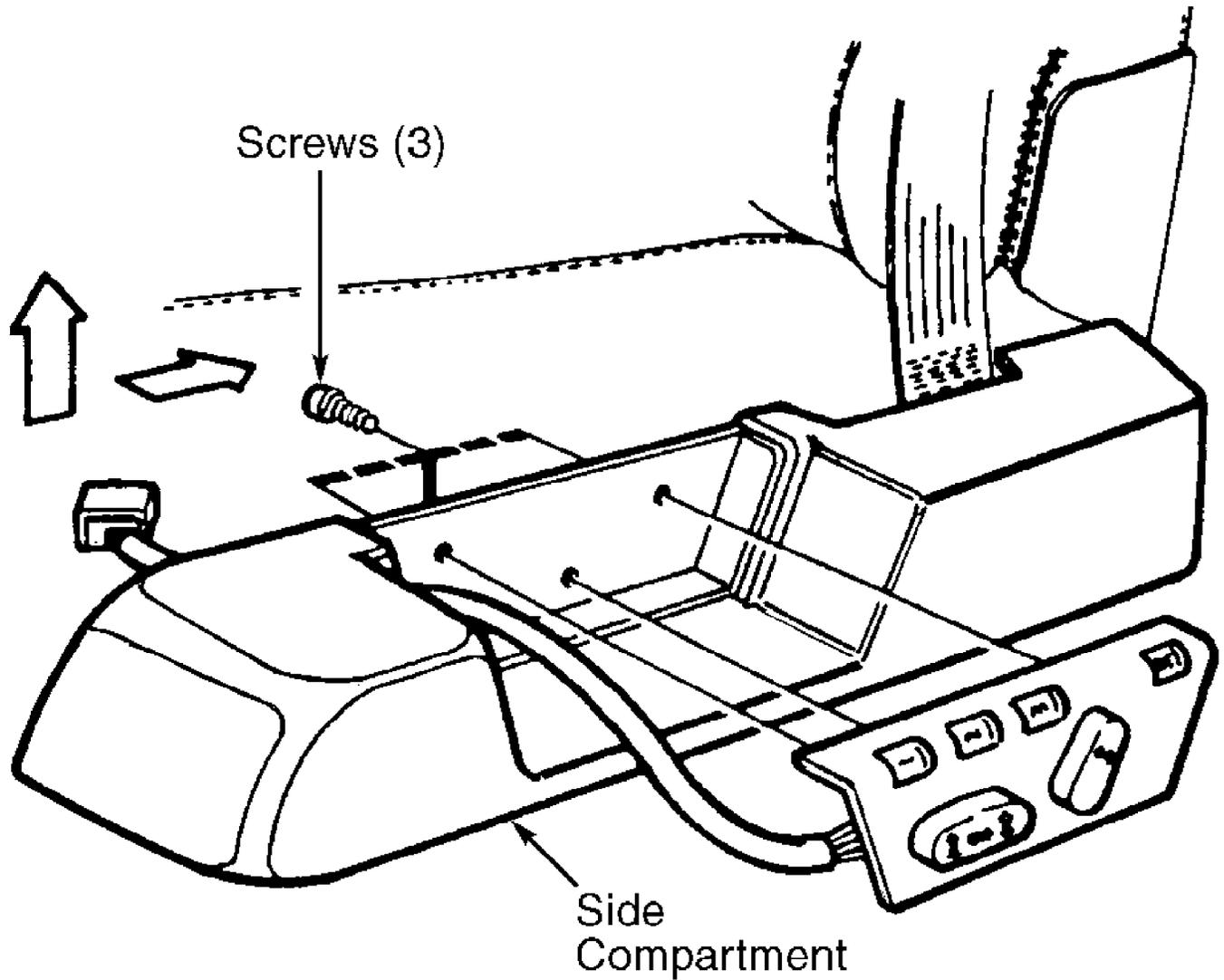
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Fig. 4: Removing Seat
Courtesy of Volvo Cars of North America.

SEAT CONTROL MODULE

Removal & Installation

Disconnect negative battery cable. Disconnect Yellow connector from under-seat control module. Remove side compartment from seat by raising front end and pushing back. Remove 3 screws at rear of side compartment. See Fig. 5. Remove seat control module. To install, reverse removal procedure.



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Fig. 5: Removing Side Compartment
Courtesy of Volvo Cars of North America.

WIRING DIAGRAM

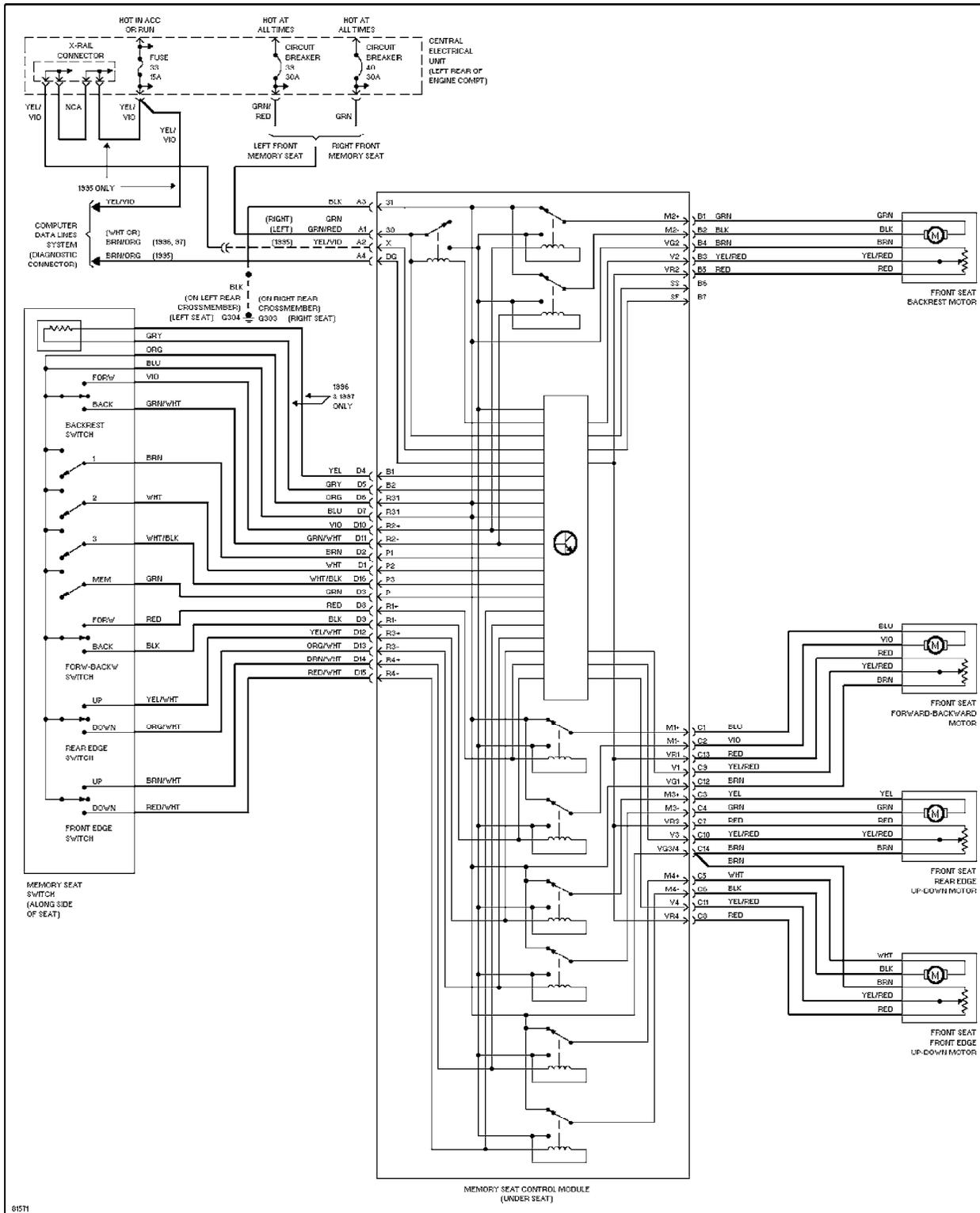


Fig. 6: Memory Power Seat System Wiring Diagram (1995-96)