

Technical Bulletin

Model
928 S4

Group
7

Subject: Troubleshooting Seat and Mirror
Control System

Part Identifier
7293

Number
8803

The troubleshooting guide for the 1987 and 1988 model 928 S4 seat and mirror control system, published in the 928 Workshop Manual V, pages 72-13 through 72-22 and Wiring Diagram Sheet 7 has been clarified. When troubleshooting the seat and mirror control system, use the information from this bulletin. Please make a note to that effect on those pages in the Workshop Manual and the wiring diagrams.

Refer to Workshop Manual Volume V, Repair Group 72 for component locations and principles of system operation.

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SERVICE

Page 1 of 11
December 30, 1988

Technical Bulletin

Model
928 S4

Group
7

Subject: Troubleshooting Seat and Mirror Control System

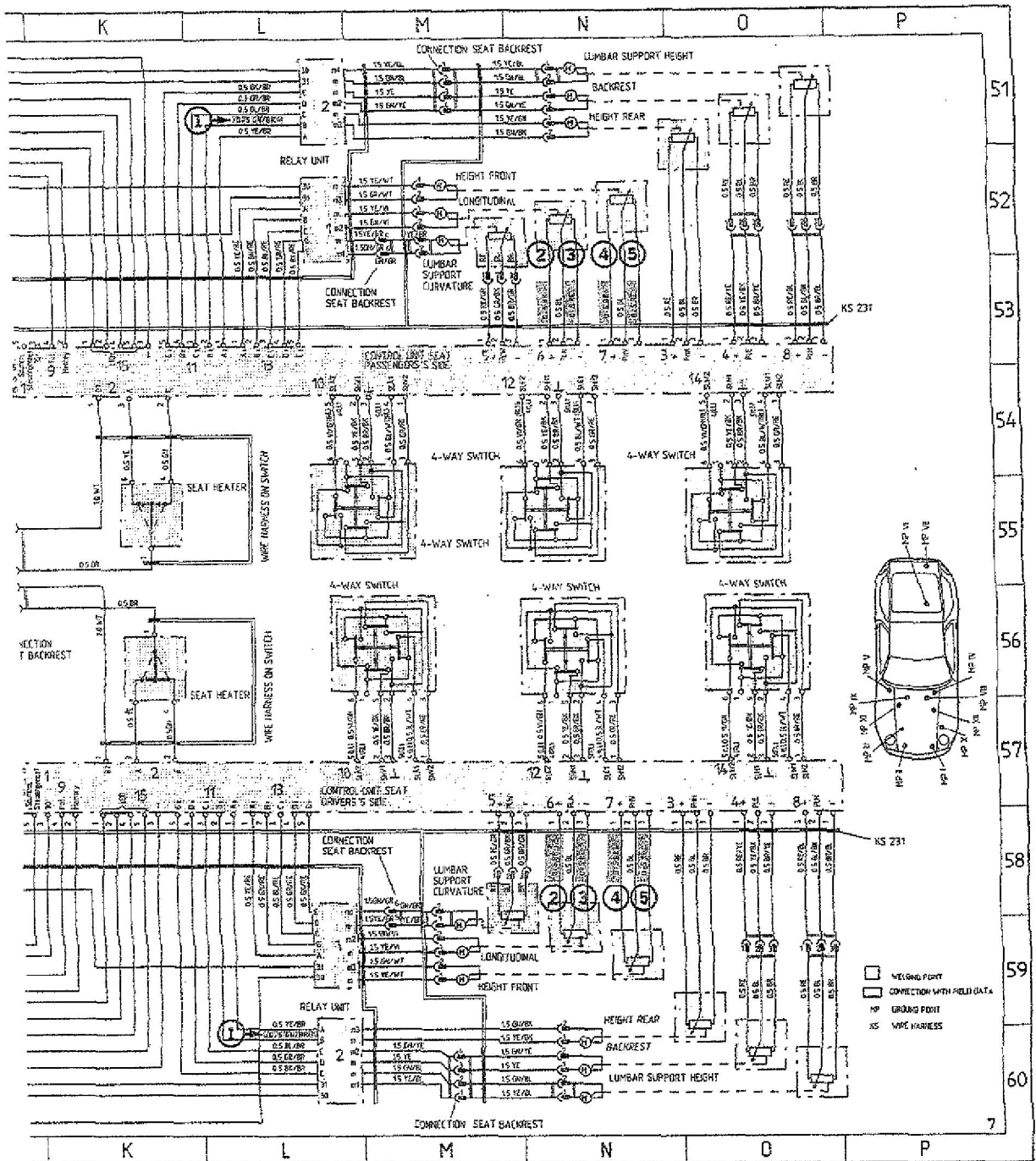
Part Identifier
7293

Number
8803

Updated Wiring Diagram

Corrections:

- | | |
|--------------|-----------|
| 1- 0.5 GN/BR | 4- 0.5 BR |
| 2- 0.5 BR | 5- 0.5 RE |
| 3- 0.5 RE | |



SERVICE

Page 2 of 11
December 30, 1988

Technical Bulletin

Model
928 S4

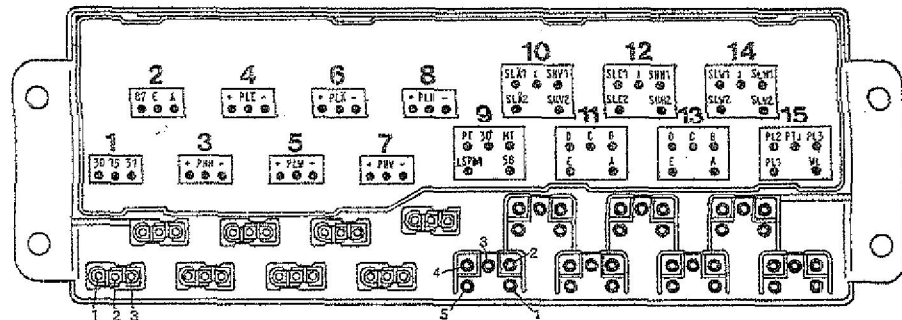
Group
7

Subject: Troubleshooting Seat and Mirror Control System

Part Identifier
7293

Number
8803

Terminal Designation Chart for Seat Adjustment



Plug	Terminal Designation	Pin
1	30 - Ter. 30	1
	15 - Ter. 15	2
	31 - Ter. 31	3
2	87 - Ter. 87, seat heating relay	1
	E - Tip switch, seat heating on	2
	A - Tip switch, seat seating off	3
3	+ - Potentiometer height rear +	1
	PHH - Potentiometer, height rear, pick-off	2
	- - Potentiometer, height rear -	3
4	+ - Potentiometer, backrest +	1
	PLE - Potentiometer, backrest, pick-off	2
	- - Potentiometer, backrest -	3
5	+ - Potentiometer, lumbar support shape +	1
	PLW - Potentiometer, lumbar support pick-off	2
	- - Potentiometer, lumbar support shape -	3
6	+ - Potentiometer, fore-and-aft adjustment +	1
	PLA - Potentiometer, fore-and-aft adj., pick-off	2
	- - Potentiometer, fore-and-aft adjustment -	3
7	+ - Potentiometer, height, front +	1
	PHV - Potentiometer, height, front, pick-off	2
	- - Potentiometer, height, front -	3
8	+ - Potentiometer, lumbar support, height +	1
	PLH - Potentiometer, lum. sup. height pick-off	2
	- - Potentiometer, lumbar support, height -	3
9	58 - Ter. 58	1
	MT - Memory key	2
	30' - Ter. 30 for mirror memory control unit	3
	PT - Position key	4
	-SPM - Ter. 31 for mirror memory control unit	5

Plug	Terminal Designation	Pin
10	SHV2 - Seat switch, height, front downward	1
	SHV1 - Seat switch, height, front upward	2
	+ - Ter. 31 for seat switch 1	3
	SLA1 - Seat switch, fore-and-aft adjustment, toward rear	4
	SLA2 - Seat switch, fore-and-aft adjustment, toward front	5
11	A - Relay unit 2	1
	B - Relay unit 2	2
	C - Relay unit 2	3
	D - Relay unit 2	4
	E - Relay unit 2	5
12	SHH2 - Seat switch, height, rear downward	1
	SHH1 - Seat switch, height, rear upward	2
	- - Ter. 31 for seat switch 2	3
	SLA1 - Seat switch, backrest, toward rear	4
	SLA2 - Seat switch, backrest, toward front	5
13	A - Relay unit 1	1
	B - Relay unit 1	2
	C - Relay unit 1	3
	D - Relay unit 1	4
	E - Relay unit 1	5
14	SLH2 - Seat switch, lum. sup. height, downward	1
	SLH1 - Seat switch, lum. sup. height, upward	2
	+ - Ter. 31 for switch 3	3
	SLW1 - Seat switch, lumbar support shape retract	4
	SLW2 - Seat switch, lumbar support shape extend	5
15	WL - Pilot lamp	1
	PL3 - Lamp for position key 3	2
	PT- - Ter. 31 for operating switch	3
	PL2 - Lamp for position key 2	4
	PL1 - Lamp for position key 1	5



SERVICE

Page 3 of 11
December 30, 1988

Technical Bulletin	928 S4	7
Subject: Troubleshooting Seat and Mirror Control System	Part Identifier 7293	Number 8803

Group
7

Part Identifier
7293

Number
8803

Make sure battery is fully charged before testing is started. Check and record voltage reading for future reference.



1. Remove seat.
2. Lay seat on a protected surface near the car.
3. Connect adaptor cable (Special Tool 9269) (Fig. 1) between disconnected wiring harness plugs on car and seat. Terminal 30 (battery plus) and Terminal 31 (ground) can be picked off the 2 pole plug for some test steps. Use a voltmeter to identify + and - terminals.

4. Store a seat position into memory with position key 1.
5. Detach control unit from seat frame and open flap.

6. Disconnect plug 1. Connect Voltmeter (+) to terminal 1 and (-) to terminal 3 in plug receptacle.

If no reading check:

If fuses are okay, check wiring.

Switch on ignition.

Reading: Battery voltage.

If no reading check:

Fuse 7 (Terminal 15) 1987 model year
Fuse 8 (Terminal 15) 1988 model year.

If fuses are okay check wiring.

Switch off ignition and reconnect plug.



Technical Bulletin

Model
928 S4

Group
7

Subject: Troubleshooting Seat and Mirror
Control System

Part Identifier
7293

Number
8803

Checking Seat Heating

7. Remove cover of plug 2.

Leave plug connected:

Connect Voltmeter to ground on 2 pole
plug of adaptor cable and terminal 1 of
plug 2.

Switch on ignition and seat heating.

Reading: Battery voltage.

Switch off seat heating.

Reading: 0 Volt

If readings are not correct, check seat
heating switch and wiring.

Switch off ignition.

Checking Potentiometers

8. Disconnect plug 3.

Connect Voltmeter (+) to pin 1 and (-) to pin
3 of control unit.

Press position key 1.

Reading: approx. 5 volts

NOTE: Voltage is applied only for
approximately 30 to 60 seconds.

9. Connect ohmmeter to plug 3 terminal 1
and terminal 3.

Reading: 2.2-3.2 K ohm

Connect ohmmeter to plug 3 terminal 2
and 3.

Reading: 0-3 K ohms, depending on set
position.

10. Check plugs 4 through 8 in exactly the
same way as described in steps 8 and 9.

If values are not reached, check wiring.

If okay, replace Potentiometer.

Refer to Terminal designation chart on
page 3 of this bulletin for plug-
potentiometer application.

Checking Memory Switch and Wiring

11. Remove plug cover from plug 9.

Leave plug connected.

Connect Voltmeter (+) to terminal 3 and (-)
to terminal 5

Press position key 1.

Reading: Battery voltage.

NOTE: Voltage is applied only for
approximately 30 to 60 seconds.

Install plug cover and disconnect plug.

Connect Voltmeter (+) to Terminal 1 of
plug receptacle and (-) to ground.

Switch on parking lights.

Reading: Battery voltage.

12. Connect ohmmeter to terminal 2 and
ground.

Press memory key.

Reading: 0-2 ohm.

Connect ohmmeter to terminal 4 and
ground.

Press position key 1.

Reading: 0-1 ohm.

Press position key 2.

Reading: approx. 240 ohm.

Press position key 3.

Reading: approx. 820 ohm.

If values are not reached, check wiring
and memory switch.



SERVICE

Page 5 of 11
December 30, 1988

Subject: Troubleshooting Seat and Mirror Control System

Model
928 S4

Group
7

Part Identifier
7293

Number
8803

Checking Relay Units

13. Disconnect plug 10.
Connect voltmeter to terminal 3 of control unit and plus (+) on 2 pole plug of adaptor cable.
Reading: Battery voltage.
14. Connect ohmmeter to terminal 1 and terminal 3 of plug receptacle.
Press seat switch 1 down.
Reading: 0.0-0.3 ohms.
Connect ohmmeter to terminal 2 and terminal 3.
Press seat switch 1 up.
Reading: 0.0-0.3 ohms.
Connect ohmmeter to terminal 3 and terminal 4.
Press seat switch 1 toward rear.
Reading: 0.0-0.3 ohm.
Connect ohmmeter to terminal 3 and terminal 5.
Press seat switch 1 forward.
Reading: 0.0-0.3 ohms.
If values are not reached, check wiring.
If wiring is okay, replace switch.
15. Check plug 12 for switch 2 and plug 14 for switch 3 exactly the same way as described in step 13 and 14.
Refer to terminal designation chart on page 3 of this bulletin for plug/switch applications.

16. Disconnect plug 11.
Connect voltmeter (+) to plus on 2 pole plug of adaptor cable and . . .
- a. (-) to terminal 1 of control unit. Press switch 3 up, press switch 2 up, press switch 2 toward rear sequentially.
Reading: Battery voltage in each case.
 - b. (-) to terminal 2 of control unit. Press switch 3 down, switch 2 down, switch 2 forward sequentially.
Reading: Battery voltage in each case.
 - c. (-) to terminal 3 of control unit. Press switch 3 up, switch 3 down sequentially.
Reading: Battery voltage in each case.
 - d. (-) to terminal 4 of control unit. Press switch 2 forward, switch 2 toward rear sequentially.
Reading: Battery voltage in each case.
 - e. (-) to terminal 5 of control unit. Press switch 2 up, switch 2 down sequentially.
Reading: Battery voltage in each case.



SERVICE

Page 6 of 11
December 30, 1988

Technical Bulletin

Model
928 S4

Group
7

Subject: Troubleshooting Seat and Mirror
Control System

Part Identifier
7293

Number
8803

Checking Relay Units (continued)

17. Disconnect plug 13

Connect Voltmeter (+) to plus on 2 pole plug of adaptor cable and . . .

- a. (-) to terminal 1 of control unit. Press switch 1 up, switch 1 toward rear, switch 3 forward sequentially.
Reading: Battery voltage in each case.
- b. (-) to terminal 2 of control unit. Press switch 1 forward, switch 1 down, switch 3 toward rear sequentially.
Reading: Battery voltage in each case.
- c. (-) to terminal 3 of control unit. Press switch 3 forward, switch 3 toward rear sequentially.
Reading: Battery voltage in each case.
- d. (-) to terminal 4 of control unit. Press switch 1 forward, switch 1 toward rear sequentially.
Reading: Battery voltage in each case.
- e. (-) to terminal 5 of control unit. Press switch 1 up, switch 1 down sequentially.
Reading: Battery voltage in each case.

If values are not reached check wiring.

If wiring is okay replace relay unit. Refer to terminal designation chart on page 3 of this bulletin for plug-relay unit application

Checking Control Unit

18. Remove cover of plug 15.

Leave plug connected.

Connect Voltmeter (-) to ground on 2 pole plug of adaptor cable and (+) to terminal 1 of plug 15.

Press position key 2 or 3 briefly.

Reading: Battery voltage.

Connect Voltmeter to plus (+) on 2 pole plug of adaptor cable and terminal 3 of plug 15.

Reading: Battery voltage

19. Switch on lights.

Connect Voltmeter (-) to ground on 2 pole plug of adaptor cable and (+) to terminal 2 of plug 15.

Press position key 3 and move seat to position stored in memory.

Reading: Approximately 1.8 V

20. Connect Voltmeter (-) to ground on 2 pole plug of adaptor cable and (+) to terminal 4 of plug 15.

Press position key 2 and move seat to position stored in memory.

Reading: approximately 1.8 V

21. Connect Voltmeter (-) to ground on 2 pole plug of adaptor cable and (+) to terminal 5 of plug 15.

Press position key 1 and move seat to position stored in memory.

Reading: approximately 1.8 V

Switch off lights.

If values are not reached check wiring. If wiring is okay replace control unit.



SERVICE

Page 7 of 11
December 30, 1988

Technical Bulletin

Model

928 S4

Group

7

Subject: Troubleshooting Seat and Mirror Control System

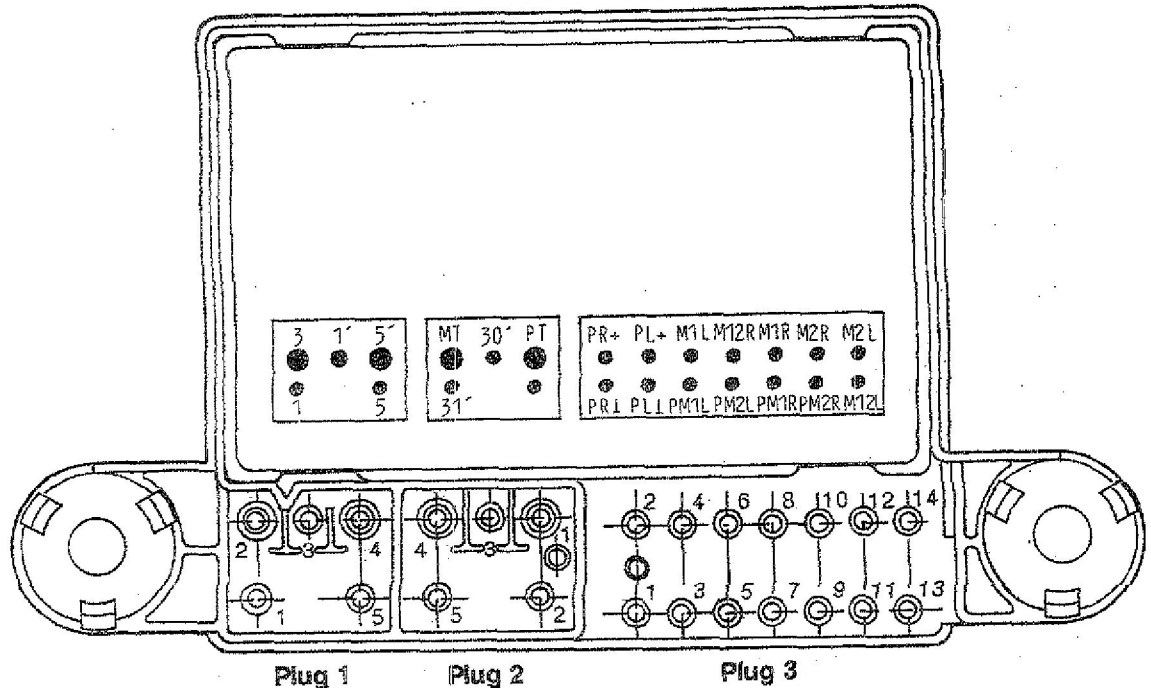
Part Identifier

7293

Number

8803

PLUG ASSIGNMENT, CONTROL UNIT FOR MIRROR ADJUSTMENT



Plug	Terminal Designation	Pin
1	1 - Driver's side mirror left/right	1
	3 - Polarity, motor 1/2	2
	1' - Passenger-side mirror, left/right	3
	5' - Passenger-side mirror, up/down	4
	5 - Driver's mirror, up/down	5
2	PT - Position keys	1
	not occupied	2
	30' - Ter. 30 from seat memory control unit	3
	MT - Memory key	4
	31' - Ter. 31 from seat memory control unit	5

Plug	Terminal Designation	Pin
3	PR + - Potentiometer right -	1
	PR + - Potentiometer right +	2
	PL + - Potentiometer left -	3
	PL + - Potentiometer left +	4
	PL1L - Potentiometer, motor 1 left	5
	M1L - Motor 1 left	6
	PM2L - Potentiometer, motor 2 left	7
	M12R - Motor 1/2, right	8
	PM1R - Potentiometer, motor 1 right	9
	M1R - Motor 1, right	10
	PM2R - Potentiometer, motor 2 right	11
	M2R - Motor 2, right	12
	M12L - Motor 1/2, left	13
	M2L - Motor 2, left	14

left - driver's-side mirror

right - passenger-side mirror

motor 1 - vertical travel

motor 2 - horizontal travel



SERVICE

Page 8 of 11
December 30, 1988

Technical Bulletin

Model

928 S4

Group

7

Subject: Troubleshooting Seat and Mirror Control System

Part Identifier

7293

Number

8803

Checking Mirror Control System

1. Store mirror position into memory with position key 1.
2. Detach mirror control.

The mirror control unit is mounted on the side wall in the driver's side footwell beside the ABS control unit.

Checking Mirror Control Switches

3. Disconnect plug 1.
4. Set mirror selector switch to driver side mirror.
5. Connect Voltmeter (+) to terminal 1 and (-) to terminal 2 of plug receptacle.
Push mirror adjuster switch to left.
Reading: Battery voltage.
Connect Voltmeter (-) to terminal 1 and (+) to terminal 2.
Push mirror adjuster switch to right.
Reading: Battery voltage.
6. Connect Voltmeter (+) to terminal 5 and (-) to terminal 2.
Push mirror adjuster switch up.
Reading: Battery voltage.
Connect Voltmeter (-) to terminal 5 and (+) to terminal 2.
Push mirror adjuster switch down.
Reading: Battery voltage.
7. Set mirror selector switch to passenger side mirror.
8. Connect Voltmeter (+) to terminal 3 and (-) to terminal 2.
Push mirror adjuster switch to left.
Reading: Battery voltage.

Connect Voltmeter (-) to terminal 3 and (+) to terminal 2.

Push mirror adjuster switch to right.

Reading: Battery voltage.

9. Connect Voltmeter (+) to terminal 4 and (-) to terminal 2.

Push mirror adjuster switch up.

Reading: Battery voltage.

Connect Voltmeter (-) to terminal 4 and (+) to terminal 2.

Push mirror adjuster switch down.

Reading: Battery voltage.

If values are not reached, check wiring and mirror selector and adjuster switches.

Reconnect plug 1.

Checking Memory Switch and Power Supply

10. Disconnect plug 2 from mirror control unit.
Disconnect plug 9 from seat memory control unit.
Connect ohmmeter to ground and terminal 1 of plug receptacle.
Press position key 1.
Reading: 0-2 ohms.
Press position key 2.
Reading: approximately 240 ohms.
Press position key 3.
Reading: approximately 820 ohms.
Reconnect plug 9 on seat memory control unit.
11. Connect ohmmeter to ground and terminal 4.
Press memory key.
Reading: 0-2 ohms.



SERVICE

Page 9 of 11
December 30, 1988

Technical Bulletin

Model
928 S4

Group
7

Subject: Troubleshooting Seat and Mirror Control System

Part Identifier
7293

Number
8803

Checking Memory Switch and Power Supply (continued)

12. Connect Voltmeter (+) to terminal 3 and (-) to terminal 5.
Press position key 1.
Reading: Battery voltage.
Reconnect plug 2 on mirror control unit.
If values are not reached check wiring and memory switch.
- NOTE: Voltage is applied for approximately 30 seconds after position keys are pressed.

Checking Mirror Control Unit

13. Open plug cover of plug 3.
Leave plug connected.
14. Connect Voltmeter (-) to terminal 1 and (+) to terminal 2.
Press position key 1.
Reading: approximately 4.7 volts
15. Connect Voltmeter (-) to terminal 3 and (+) to terminal 4.
Press position key 1.
Reading: approximately 4.7 volts.
16. Connect Voltmeter (+) to terminal 4 and (-) to terminal 5.
Press position key 1.
Reading: 0.3-4.5 volts.
17. Connect Voltmeter (+) to terminal 4 and (-) to terminal 7.
Press position key 1.
Reading: 0.3-4.5 volts.

18. Connect Voltmeter (+) to terminal 2 and (-) to terminal 9.
Press position key 1.
Reading: 0.3-4.5 volts.
19. Connect Voltmeter (+) to terminal 2 and (-) to terminal 11.
Press position key 1.
Reading: 0.3-4.5 volts.
NOTE: Voltage is applied for approximately 30 seconds after position keys are pressed.
20. Set mirror selector switch to driver side mirror.
21. Connect Voltmeter (+) to terminal 6 and (-) to terminal 13.
Push mirror adjuster switch up.
Reading: approximate battery voltage.
22. Connect Voltmeter (-) to terminal 6 and (+) to terminal 13.
Push mirror adjuster switch down.
Reading: approximate battery voltage.
23. Connect Voltmeter (-) to terminal 13 and (+) to terminal 14.
Push mirror selector switch to left.
Reading: approximate battery voltage.
24. Connect Voltmeter (+) to terminal 13 and (-) to terminal 14.
Push mirror adjuster switch to right.
Reading: approximate battery voltage.
25. Set mirror selector switch to passenger side mirror.
26. Connect Voltmeter (-) to terminal 8 and (+) to terminal 10.
Push mirror adjuster switch up.
Reading: approximate battery voltage.



SERVICE

Page 10 of 11
December 30, 1988

Technical Bulletin

Model
928 S4

Group
7

Subject: Troubleshooting Seat and Mirror
Control System

Part Identifier
7293

Number
8803

Checking Mirror Control Unit (continued)

27. Connect Voltmeter (+) to terminal 8 and (-) to terminal 10.

Push mirror adjuster switch down.

Reading: approximate battery voltage.

28. Connect Voltmeter (-) to terminal 8 and (+) to terminal 12.

Push mirror adjuster switch to left.

Reading: approximate battery voltage.

29. Connect Voltmeter (+) to terminal 8 and (-) to terminal 12.

Push mirror adjuster switch to right.

Reading: approximate battery voltage.

If values are not reached, check wiring.

If wiring is okay, replace mirror control unit.
Reinstall plug cover.

NOTE: approximate battery voltage can be somewhat lower than actual battery voltage.

Checking Memory Switch and Wiring

1. Remove memory switch panel.

2. Disconnect plug.

3. Connect Voltmeter (+) to terminal 1 and (-) to terminal 4 of plug receptacle in harness.

Reading: Battery voltage.

If no reading, check wiring to seat control unit.

4. Connect ohmmeter to terminal 1 and terminal 4 of disconnected switch.

Reading: infinite ohms.

Press key 1.

Reading: approximately 0 ohms.

Press key 2.

Reading: approximately 240 ohms.

Press key 2.

Reading: approximately 820 ohms.

5. Connect ohmmeter to terminal 2 and terminal 4 of disconnected switch.

Reading: infinite ohms.

Press memory key.

Reading: approximately 0 ohms.

If values are not reached, replace memory switch.

Reinstall seat and control units.

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SERVICE

Page 11 of 11
December 30, 1988