SECTION 8-B
POWER SEAT CIRCUIT AND TROUBLE DIAGNOSIS

CONTENTS OF SECTION 8-B

8-2 ELECTRIC HORIZONTAL SEATS

a. Description

The seat adjusters are actuated by a twelve (12) volt series wound motor located near the center of the seat bottom frame and energized by a control switch installed in the left seat side panel. On the 4729 and 4767 styles the control switch is located in the left front door arm rest. See Figure 8-10 for circuit diagram of electric horizontal seat.

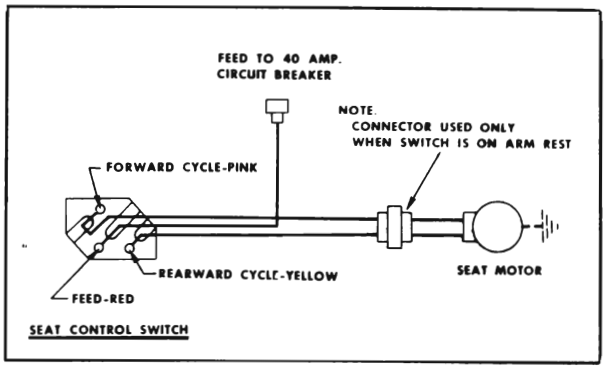


Figure 8-10—Electric Horizontal Seat Diagram

b. Typical Failures and Corrections of Horizontal Seat Circuit

CONDITION AND CAUSE	CORRECTION
a. THE SEAT MOTOR DOES NOT OPERATE IN EITHER THE FORWARD OR REARWARD DIRECTION.	
1. Open or short circuit in feed harness.	1. Connect one light tester lead to feed terminal of switch block and ground other tester lead to body metal. If tester does not light, there is an open or short circuit between switch and power source.
2. Inoperative motor.	2. Check operation of seat control switch with jumper wire. See "Checking Door Window Control Switch" for similar operation.
	3. Check circuit from control switch to motor for short or open circuit and check ground wire attachment at adjuster.
	4. Check operation of motor with #12 gauge jumper wire. Connect one end of jumper wire to power source and the other end to one of the seat motor terminals. Motor should operate. Perform same check at the other motor terminal. If motor does not operate, repair or replace motor as required.

CONDITION AND CAUSE	CORRECTION
b. THE SEAT MOTOR OPERATES IN ONLY ONE DIRECTION.	
1. Defective switch.	1. Check operation of seat control switch with jumper wire.
2. Open or short circuit in motor feed wires.	2. Check circuit from control switch to motor for short or open circuit.
3. Defective seat motor.	3. Check operation of motor with #12 gauge jumper wire. Connect one end of jumper wire to power source and the other end to one of the seat motor terminals. Motor should operate. Perform same check at the other motor terminal. If motor does not operate, repair or replace motor as required.

8-3 ELECTRIC FOUR-WAY SEAT

a. Description

The seat adjusters are actuated by a 12 volt, reversible, series wound motor with a built-in circuit breaker. The motor is installed at the left side of the seat assembly (Figure 8-11). The seat motor is energized by a toggle-type control switch installed in the left seat side panel.

The seat adjuster operating mechanism incorporates a transmission assembly which includes two solenoids and four drive cables leading to the seat adjusters. One solenoid controls the vertical movement of the seat while the other solenoid controls the horizontal movement of the seat. In addition to the four seat adjuster drive cables at the transmission assembly, a main drive cable is installed from the motor to the transmission assembly. When the control switch is actuated, the motor and one of the solenoids are energized simultaneously. Then the solenoid plunger engages the clutch shaft dog with the driving gear dog. The driving gear rotates the clutch shaft which rotates the drive cables and operates both adjusters. When the adjusters reach their limit of travel, the drive cables stop their rotating action due to the "slip clutch" design incorporated in the clutch and gear assembly. When the switch contacts are opened a return spring returns the solenoid plunger to its original position, disengaging the clutch shaft dog from the driving gear dog.

b. Checking Procedure (4-Way Seat)

1. Checking for Current at Circuit Breaker

a. Connect one light tester lead to battery side of circuit breaker located at left front of dash and ground other lead. If tester does not light, there is no current at battery side of circuit breaker.

b. To check circuit breaker, disconnect switch feed wire from breaker, and with a light tester check for current at switch side of circuit breaker. If tester does not light, there is no current flowing through circuit breaker.

2. Checking for Current at Seat Control Switch

a. Connect one light tester lead to feed terminal of switch block and ground other light tester lead to body metal (Figure 8-12).

b. If tester does not light, there is no current at switch block. Failure is caused by an open or short circuit between switch block and power source.

3. Checking the Seat Control Switch

In the following operations which specify the seat control switch to be actuated, a switch that has been checked for proper operation may be connected to the switch block. If a switch is not available, a three-way jumper wire can be made to perform the switch function. The method of making the jumper wire and the switch locations to be connected to obtain a specific movement of the seat are shown in Figure 8-12. If a jumper wire is

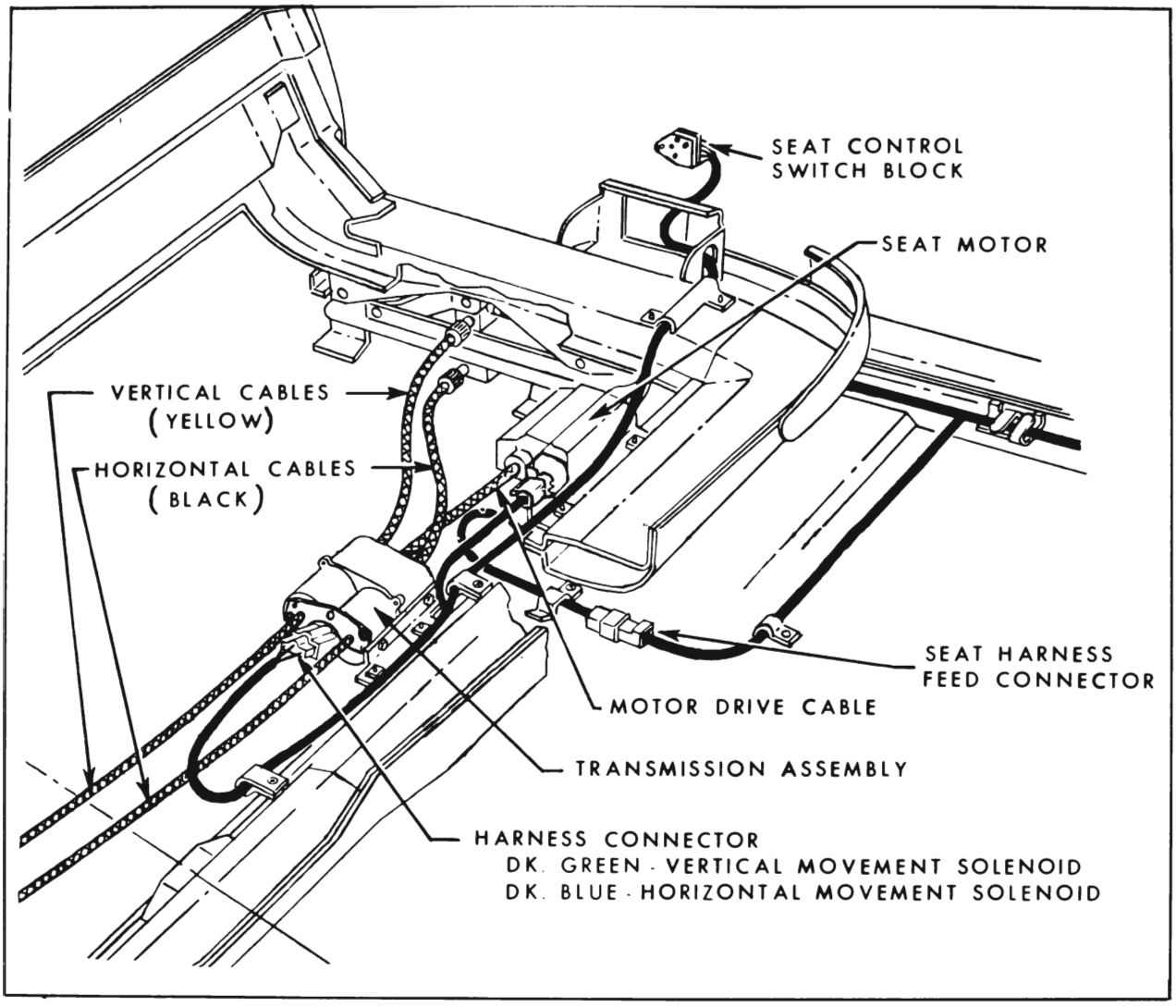


Figure 8-11—Four-Way Seat Installation

used, number the locations on the switch block as indicated in the illustration.

NOTE: To make jumper wire, obtain two (2) pieces of #12 gauge wire, each 4-1/2" long. Join one end of each wire as shown in Figure 8-17. The joined end can be inserted in the feed location in the switch block; one of the remaining ends can be inserted into one of the solenoid locations.

a. Obtain switch or jumper wire and connect to switch block.

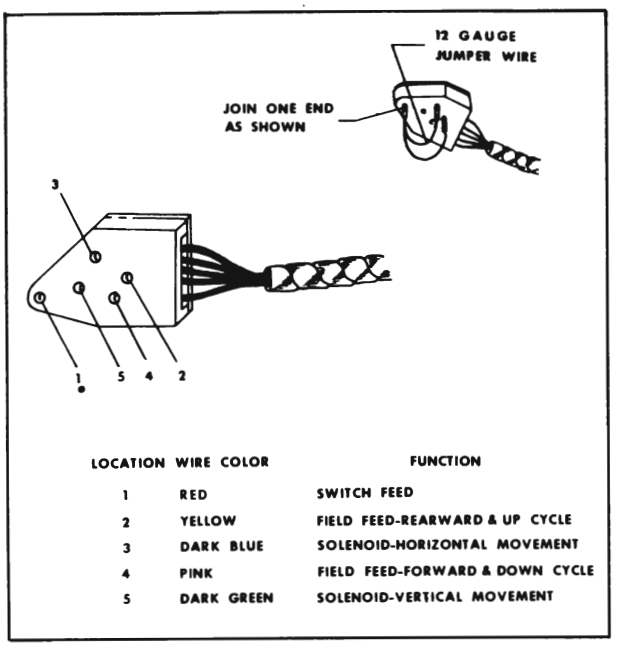
b. Operate switch if used. If adjusters operate with new switch or jumper wire but did not operate with original switch, the original switch is defective.

IMPORTANT: To obtain a seat movement using a 3-way jumper wire at the switch block, the switch feel location, one of the motor field wire locations and one of the solenoid locations have to be connected simultaneously.

The switch locations to be connected to obtain a specific seat movement are outlined as follows:

c. To raise seat, place jumper wire in locations 1, 2 and 5.

d. To lower seat, place jumper wire in locations 1, 4 and 5.



LOCATION	WIRE COLOR	FUNCTION
1	RED	SWITCH FEED
2	YELLOW	FIELD FEED-REARWARD & UP CYCLE
3	DARK BLUE	SOLENOID-HORIZONTAL MOVEMENT
4	PINK	FIELD FEED-FORWARD & DOWN CYCLE
5	DARK GREEN	SOLENOID-VERTICAL MOVEMENT

Figure 8-12—Four-Way Switch Block

e. To operate seat forward, place jumper wire in locations 1, 3 and 4.

f. To operate seat rearward, place jumper wire in locations 1, 2 and 3.

4. Checking the Wires Between Switch and Motor

a. Disconnect motor field feed wires from motor assembly.

b. Connect one light tester lead to field feed connector and ground other light tester lead to body metal, then actuate switch. If tester does not light, there is a short or open circuit between switch block and motor feed connector. Check the remaining motor field wire in the same manner.

5. Checking the Motor Assembly

a. Disconnect motor field feed wires from motor.

b. Connect one end of a #12 gauge jumper wire to battery positive pole and other end to one of the motor field feed wires.

c. If motor does not operate, motor is defective. Check the remaining motor field wire in the same manner.

6. Checking Wires Between Switch and Solenoids

a. Disconnect harness connector from transmission assembly.

b. Connect one light tester lead to one terminal of power feed and ground other light tester lead to body metal.

c. Operate switch to wire being tested. If tester does not light, there is no current at end of harness wire. Failure is caused by an open or short circuit between end of wire and switch.

d. Check other wire in same manner.

NOTE: One wire in connector is a blank. Check wiring diagram for colors of wires actually used.

7. Checking the Solenoid

a. Check solenoid ground strip attachment for proper ground.

b. Connect one end of a #12 gauge jumper wire to the battery positive pole and the other end of the lead of the solenoid being checked.

CAUTION: To prevent damaging the solenoid, do not energize solenoid for more than one minute.

c. Operate switch to actuate adjuster motor and solenoid being checked.

d. If adjusters do not operate and there is no mechanical failure of the adjusters, the solenoid is defective.

NOTE: If solenoid is functioning properly, a "click" may be heard when solenoid plunger operates.

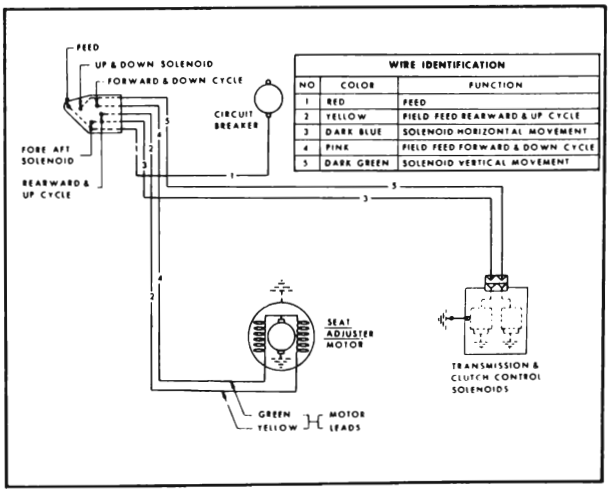


Figure 8-13—Four-Way Seat Circuit Diagram

c. Typical Electrical Failures of Four-Way Power Seats

CONDITION AND CAUSE	CORRECTION
a. SEAT ADJUSTER MOTOR DOES NOT OPERATE.	
1. Short or open circuit between power source or switch and motor.	1. Check circuit from power source and switch to motor to locate failure.
2. Defective motor.	2. Check motor. If defective, repair or replace as required.
b. SEAT ADJUSTER MOTOR OPERATES IN BOTH DIRECTIONS BUT SEAT ADJUSTERS ARE NOT ACTUATED.	
1. Short or open circuit between switch and affected solenoid.	1. Check circuit from switch to solenoid to locate failure.
2. Defective solenoid.	2. Check solenoid. If defective, repair or replace as required.
c. SEAT ADJUSTER MOTOR OPERATES IN ONE DIRECTION ONLY, SEAT MOVES DOWN AND FORWARD, BUT DOES NOT MOVE UP AND REARWARD.	
1. Short or open circuit between one of the motor field wires and seat control switch.	1. Check circuit between affected motor field wire and seat switch.
2. Defective field coil in motor.	2. Check motor. If defective, repair or replace as required.

8-4 ELECTRIC SIX-WAY SEATS

a. Description

The seat adjusters are actuated by a 12 volt motor installed at the left side of the seat assembly (see Figure 8-14). The motor is energized by a three (3) button-type control switch located in the left seat side panel. On 4729 and 4767 styles the control switch is installed in the left front door arm rest.

The electrical portion of the seat operates as follows: See circuit diagram, Figure 8-15

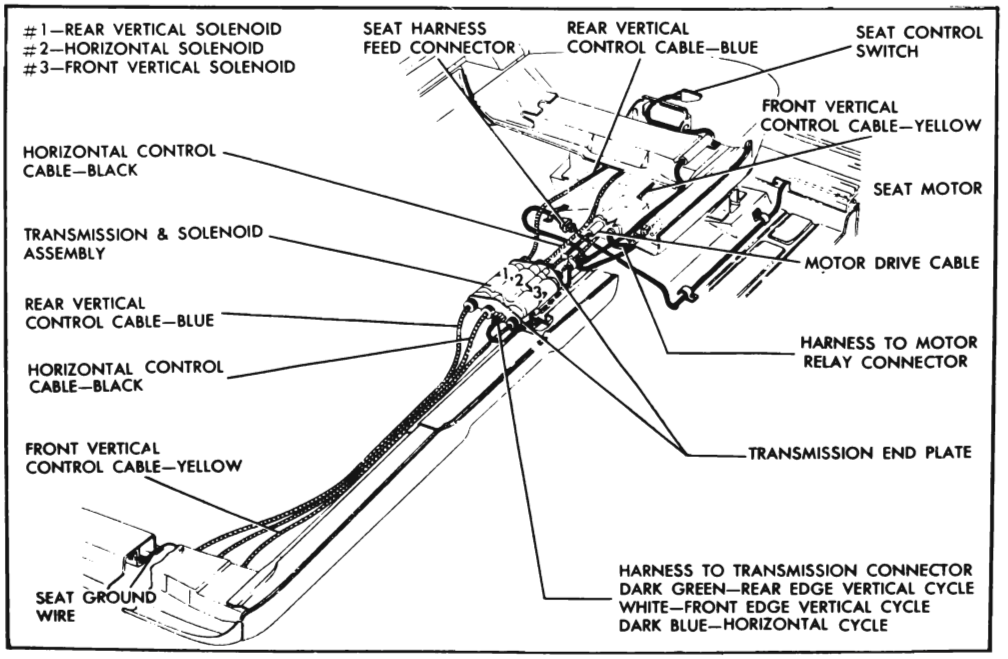
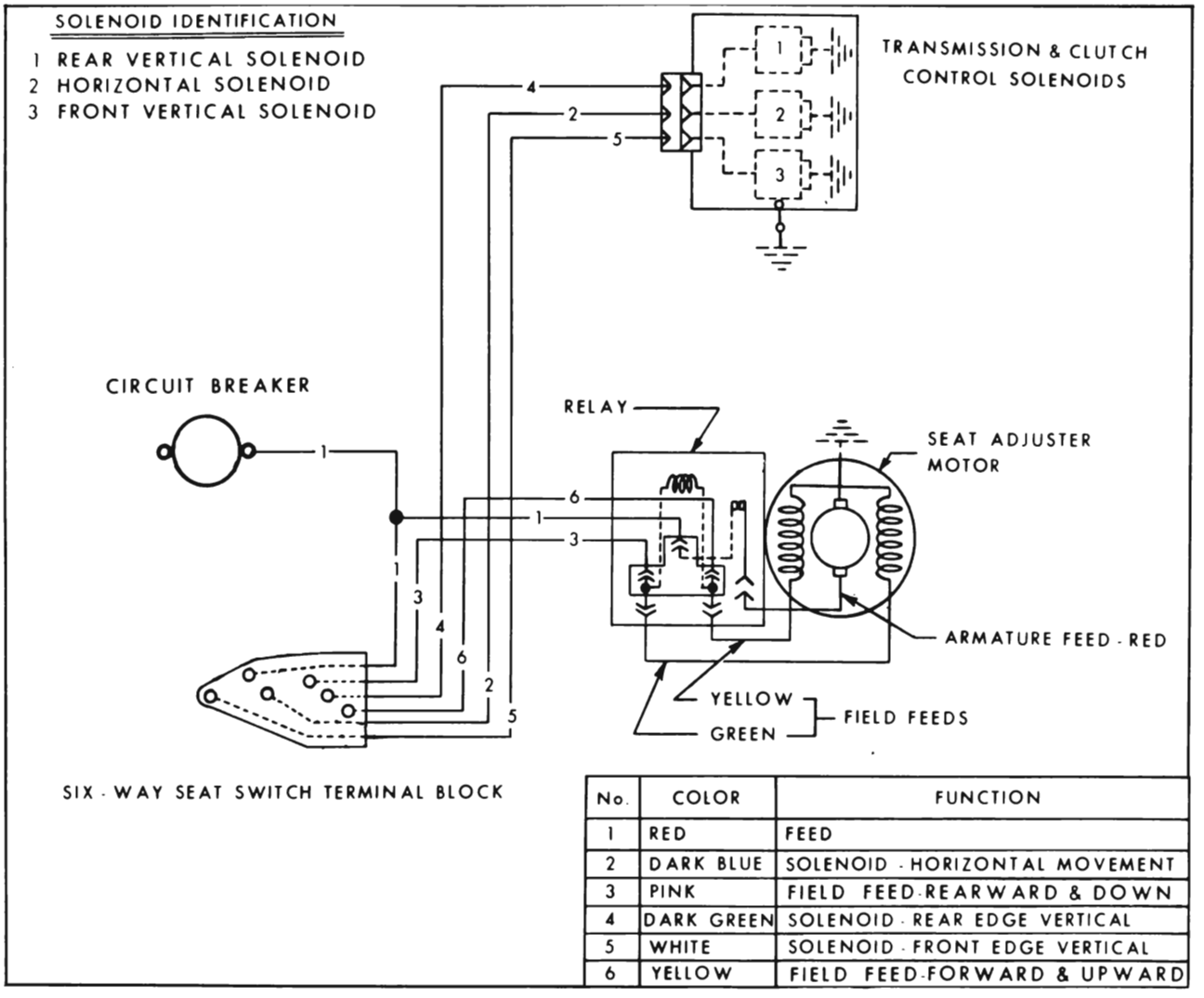


Figure 8-14—Six-Way Seat Installation



No.	COLOR	FUNCTION
1	RED	FEED
2	DARK BLUE	SOLENOID - HORIZONTAL MOVEMENT
3	PINK	FIELD FEED-REARWARD & DOWN
4	DARK GREEN	SOLENOID - REAR EDGE VERTICAL
5	WHITE	SOLENOID - FRONT EDGE VERTICAL
6	YELLOW	FIELD FEED-FORWARD & UPWARD

Figure 8-15—Six-Way Seat Switch Terminal Block

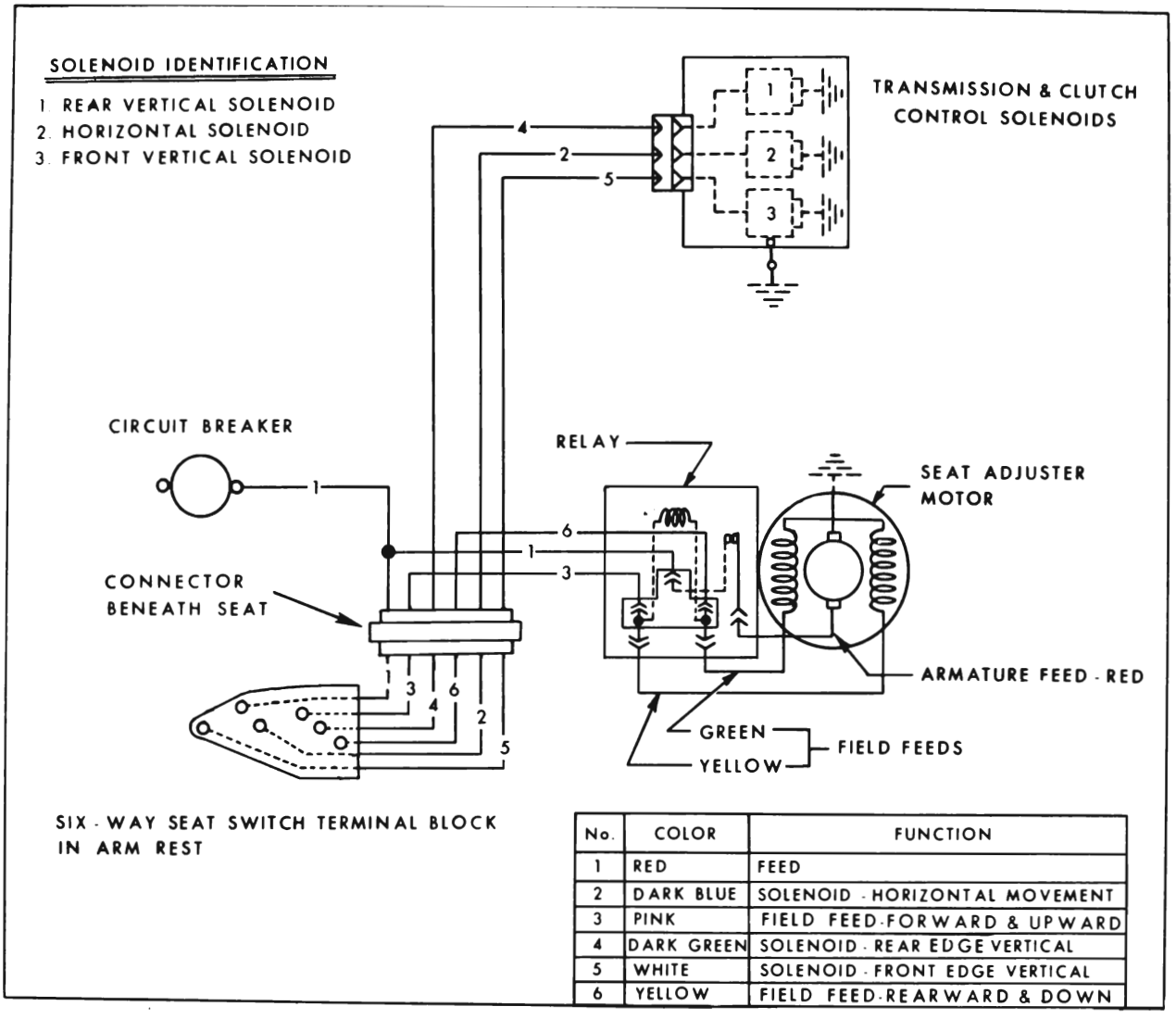
(with seat switch in seat side panel) and Figure 8-16 (with switch in arm rest). When one of the control switch buttons is actuated, current flows to the transmission solenoid which controls the desired seat movement. The energizing of the solenoid coil results in the solenoid plunger action engaging the gear mechanism to rotate the control cable. The same switch action which energized the solenoid produces a current flow through the motor control relay to one of the motor field coils. The current flow through the relay closes the contacts between the relay power source and the armature motor lead wire, and results in the operation of the seat motor.

b. Circuit Checking Procedures

It may be necessary to use only one or all of the procedures outlined to locate an electrical failure in the circuit. If the location of the failure is evident, follow only the steps required to check the affected wire or component. If the location of the failure is not evident, follow the procedure as outlined. Before performing any extensive check procedures, check the seat adjuster drive cables for proper attachment. In addition, study the seat circuit diagrams to become familiar with the seat circuit.

1. Check Feed Circuit Continuity at Circuit Breaker

a. Connect one light tester lead to battery side of circuit breaker and ground other lead. Circuit breaker is located at left shroud. If tester does not light, there is an open or short circuit in feed circuit to breaker.



No.	COLOR	FUNCTION
1	RED	FEED
2	DARK BLUE	SOLENOID - HORIZONTAL MOVEMENT
3	PINK	FIELD FEED-FORWARD & UPWARD
4	DARK GREEN	SOLENOID - REAR EDGE VERTICAL
5	WHITE	SOLENOID - FRONT EDGE VERTICAL
6	YELLOW	FIELD FEED-REARWARD & DOWN

Figure 8-16—Six-Way Seat Circuit Diagram

b. To check circuit breaker, disconnect the output feed wire (the wire opposite the power source feed to the breaker) from the breaker and with light tester check terminal from which wire was disconnected. If tester does not light, circuit breaker is inoperative.

2. Checking Relay Assembly at Shroud

a. With light tester, check relay feed (dark blue wire terminal). If tester does not light, there is an open or short circuit between relay and circuit breaker.

b. Turn ignition switch on and with light tester check output terminal of relay (red wire terminal). If tester does not light, the relay is inoperative or there is a short or open circuit between ignition switch (white wire) and relay assembly. (Check fuse at dash panel.)

3. Checking Feed Circuit Continuity at Seat Control Switch

a. Connect one light tester lead to feed terminal of switch block and ground other test lead to body metal. See Figure 8-17.

b. If tester does not light, there is an open or short circuit between switch and power source.

4. Checking Feed Circuit Continuity at Relay on Seat Motor

a. Disengage 3-wire connector body from the seat motor relay terminal.

LOCATION	WIRE COLOR	FUNCTION
1	RED	SWITCH FEED
2	DARK BLUE	SOLENOID-HORIZONTAL MOVEMENT
3	PINK*	FIELD FEED-REARWARD & DOWN CYCLE
4	DARK GREEN	SOLENOID-REAR EDGE VERTICAL CYCLE
5	WHITE	SOLENOID-FRONT EDGE VERTICAL CYCLE
6	YELLOW*	FIELD FEED-FORWARD & UP CYCLE

* ON STYLES WITH SWITCH IN ARM REST-
PINK FIELD CONTROLS FORWARD & UP CYCLE
YELLOW FIELD CONTROLS REARWARD & DOWN CYCLE

Figure 8-17—Six-Way Seat Control Switch Block

b. Insert one light tester lead into the relay power feed (red wire) connector slot on the harness, and ground the other light tester lead.

c. If tester does not light, there is no current at end of feed wire. Failure is caused by an open or short in feed circuit.

NOTE: In the following operations which specify the seat control switch to be actuated, a switch that has been checked for proper operation may be connected to the switch block. If a switch is not available, a three-way jumper wire can be made to perform the switch function. The jumper wire and the switch locations to be connected to obtain a specific movement of the seat are shown in Figure 8-17. If a jumper wire is used, number the locations on the switch block as indicated in the illustration. Details outlining the making, and use of the jumper wire follow the checking procedures.

5. Checking the Seat Control Switch

a. Obtain switch or jumper wire and connect to switch block.

b. Operate switch. If adjusters operate with new switch or jumper wire, but did not operate with original switch, the original switch is defective.

c. Check all six movements of seat adjuster.

6. Checking Wires Between Control Switch and Motor Relay

a. Disengage 3-wire harness connector from relay at motor.

b. Insert one light tester lead into the motor field connector slot on harness and ground the other lead.

c. Actuate seat switch to energize field wire being tested.

d. If tester does not light, there is no current at end of wire. Failure is caused by an open or short circuit between end of wire and switch. Check other motor field wire in the same manner.

7. Check the Relay Assembly

a. Disconnect three (3) motor leads from relay assembly. These are the wires leading from the motor to the relay.

b. Connect one end of a jumper wire to one of the motor field feed studs on the relay and ground the other end of the jumper wire.

c. Connect one end of light tester to motor armature feed stud on relay and ground other light tester lead.

d. With a jumper wire, energize the field stud which is not grounded. If tester does not light, the relay is defective.

8. Check the Motor Assembly

a. Disconnect the motor armature feed lead and one of the motor field feeds from the relay assembly.

b. With a jumper wire, energize the armature feed and one of the field feeds.

c. If motor does not operate, it is defective. Check the other motor field feed in the same manner.

9. Checking the Wire Between the Solenoid and Switch

a. Disengage harness connector from transmission.

b. Connect one light tester lead to end of harness wire being tested and ground other lead.

c. Operate switch to energize wire being tested. If tester does not light, there is no current at end of wire. Failure is caused by an open or short circuit between end of wire and switch.

10. Checking the Solenoid

a. Check solenoid ground strap attachment for proper ground.

b. Energize solenoid being checked with jumper wire.

NOTE: If solenoid is functioning, a "click" should be heard when solenoid plunger operates "in" and "out".

CAUTION: To prevent damaging the solenoid, do not energize solenoid for more than one minute.

c. With solenoid energized, actuate seat control switch to energize adjuster motor.

d. If adjusters do not operate, and there is no mechanical failure in the seat unit, the solenoid is defective.

c. Three-Way Jumper Wire for Checking Seat Switch

To make jumper wire, obtain two (2) pieces of #12 gauge wire, each 4-1/2" long. Join one end of each wire as shown in Figure 8-17. The joined end can be inserted in the feed location in the switch block; one of the remaining ends can be inserted into one of the field locations in the switch block; the other end can be inserted into one of the solenoid locations.

IMPORTANT: To obtain a seat movement using a 3-way jumper wire at the switch block, the switch feed location, one of the motor field wire locations and one of the solenoid locations must be connected.

1. On Bodies with Switch in Seat Side Panel:

a. To raise front edge of seat, place jumper in locations 1, 6 and 5.

b. To lower front edge of seat, place jumper in locations 1, 3 and 5.

c. To raise rear edge of seat, place jumper in locations 1, 6 and 4.

d. To lower rear edge of seat, place jumper in locations 1, 3 and 4.

e. To move seat forward, place jumper in locations 1, 6 and 2.

f. To move seat rearward, place jumper in locations 1, 3 and 2.

2. On Bodies with Switch in Arm Rest:

a. To raise front edge of seat, place jumper in locations 1, 3 and 5.

b. To lower front edge of seat, place jumper in locations 1, 6 and 5.

c. To raise rear edge of seat, place jumper in locations 1, 3 and 4.

d. To lower rear edge of seat, place jumper in locations 1, 6 and 4.

e. To move seat forward, place jumper in locations 1, 3 and 2.

f. To move seat rearward, place jumper in locations 1, 6 and 2.

d. Typical Electrical Failures of Six-Way Seat Circuits

CONDITION AND CAUSE	CORRECTION
a. SEAT ADJUSTER MOTOR DOES NOT OPERATE.	
1. Short or open circuit between power source or switch and motor.	1. Check circuit from power source and switch to motor to locate failure.
2. Defective motor.	2. Check motor. If defective, repair or replace as required.
b. SEAT ADJUSTER MOTOR OPERATES, BUT SEAT ADJUSTERS ARE NOT ACTUATED -- OR -- SEAT ADJUSTER MOTOR OPERATES, FRONT EDGE OF SEAT MOVES UP AND DOWN AND SEAT MOVES FORWARD AND REARWARD. THE REAR EDGE OF SEAT CANNOT BE OPERATED.	
1. Short or open circuit between switch and affected solenoid.	1. Check circuit from switch to solenoid to locate failure.
2. Defective solenoid.	2. Check solenoid. If defective, repair or replace as required.

CONDITION AND CAUSE	CORRECTION
c. SEAT ADJUSTER MOTOR OPERATES AND SEAT ADJUSTERS MOVE FRONT AND REAR EDGE OF SEAT UP AND FORWARD, BUT WILL NOT MOVE THE SEAT DOWN AND REARWARD OR SEAT ADJUSTER MOTOR OPERATES AND SEAT ADJUSTERS MOVE FRONT AND REAR OF SEAT DOWN AND REARWARD, BUT WILL NOT MOVE THE SEAT UP AND FORWARD.	
1. Short or open circuit between one of the motor field wires and seat control switch.	1. Check circuit between affected motor field wire and seat switch.
2. Defective field coil in motor.	2. Check motor. If defective, repair or replace as required.