Group Index, Alphabetical

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Windshield Wipers and Washers	82.00

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General Information

VEHICLES WITHOUT INTERMITTENT WIPERS

The windshield wiper and washer are operated by rocker switches. The windshield wiper rocker switch has two speeds: low or high. The windshield washer rocker switch will spray wash fluid on the windshield as long as the switch is depressed.

VEHICLES WITH INTERMITTENT WIPERS WITH ROCKER SWITCH AND SLIDER SWITCH CONTROLS

The windshield wiper and washer are operated by a rocker switch and a slider switch. The windshield wiper rocker switch has two speeds: low or high. The intermittent wipers are turned on by moving the slider switch up to select the desired delay interval between 2 and 10 seconds (2 and 22 seconds on early models). The windshield washer is turned on by pushing the slider switch all the way up.

VEHICLES WITH INTERMITTENT WIPERS WITH A DOUBLE-PADDLE SWITCH

The windshield wiper and washer are operated by a double-paddle switch.

The wipers have five cycles: fast, slow, mist, wash, and delay. There are six delay intervals, three seconds, five seconds (default fast), eight seconds, 12 seconds, 17 seconds (default slow), and 23 seconds. For wiper switch operation, see **Fig. 1**.

The top paddle, when pushed in, turns the wipers on or off. When pushed up, the top paddle switches the wipers to high speed; when it is pushed down, it switches them to low speed.

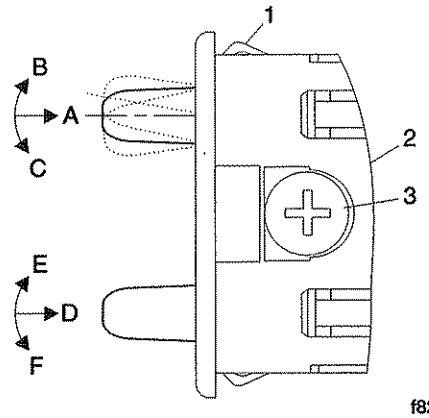
The bottom paddle, when pushed in momentarily (for less than 1/2 second), turns the wipers on mist (one dry cycle at low speed). When pushed in and held in (for at least 1/2 second), the bottom paddle turns on the washers for a minimum of three cycles after release. For more wash cycles, hold the bottom paddle in longer (but it will always cycle three more times after release).

Pushing the bottom paddle up or down controls the delay cycle of the intermittent wipers. If the wipers are not in delay, push up for default fast delay (5 seconds) or down for default slow delay (17 seconds). If the wipers are already in delay, push up for the next fastest delay or push down for the next slowest delay.

A linkage assembly joins both wiper arms to a motor that is mounted under the right-side dash panel inside the cab. See **Fig. 2**.

NOTE: Since January 6, 1995, a redesigned Sprague windshield wiper system is being installed in Business Class models. The new Sprague system has latch-mounted wiper blade arms, a higher operating speed, and slightly longer wiper arms. See **Fig. 3**.

The windshield washer reservoir is located under the cab inside the passenger's side door. See **Fig. 4**. Washer fluid is carried by a tube that runs from the reservoir, along the bottom of the cab, and up the center of each wiper arm; this is known as a wet-arm wiper system. Each tube is attached to a nozzle that is located behind the wiper blade fastening. When the washer pump is turned on, the wash spray at the windshield follows the same arc as the wiper arm. There are four jets of spray per wiper arm on the



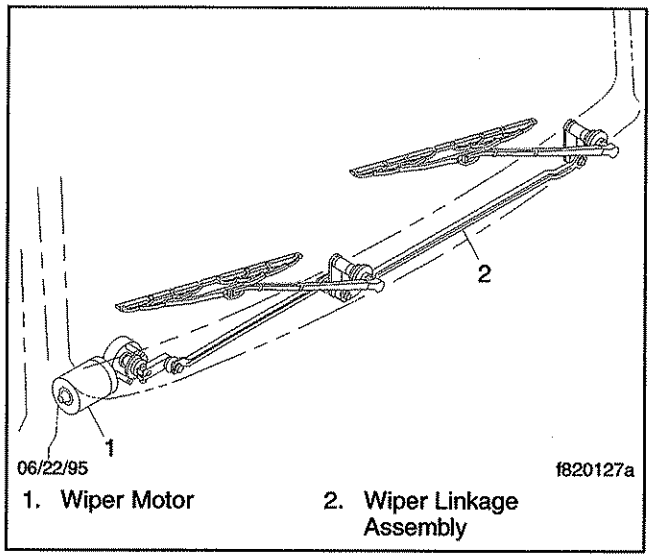
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A. Push in to turn wipers on (low speed) or off.
B. Push up for high speed.
C. Push down for low speed.
D. Push in momentarily for mist cycle. Push in and hold for wash cycle.
E. Push up for fast delay. If already in delay, push up for the next faster delay.
F. Push down for slow delay. If already in delay, push down for the next slower delay.

1. Locking Clip
2. Wiper/Washer Switch
3. Light Bulb Screw

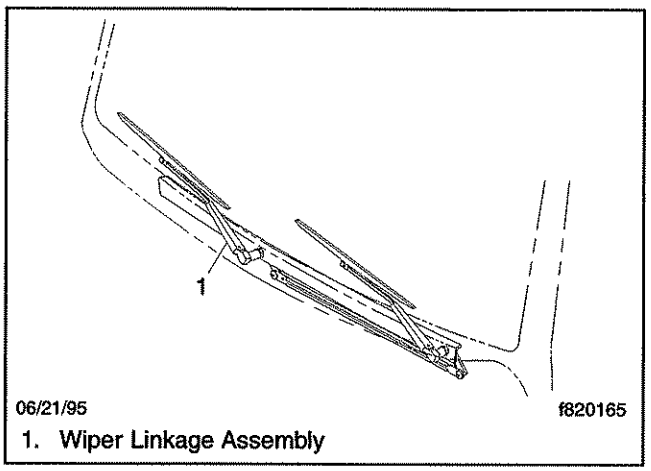
Fig. 1, Wiper/Washer Switch Operation

General Information



1. Wiper Motor
2. Wiper Linkage Assembly

Fig. 2, Wiper System with Nut-Attached Wiper Blade Arms (before January 6, 1995)



1. Wiper Linkage Assembly

Fig. 3, Wiper System with Latch-Mounted Wiper Blade Arms (from January 6, 1995)

older system, and two jets per wiper arm on the newer system.

NOTE: Repair of all electrical parts in the wiper and washer system is by replacement. The parts of the wiper linkage and bracket assembly can be replaced.

On both left-hand drive and right-hand drive vehicles, the wiper motor is installed on the passenger's side. Service procedures are the same for both types.

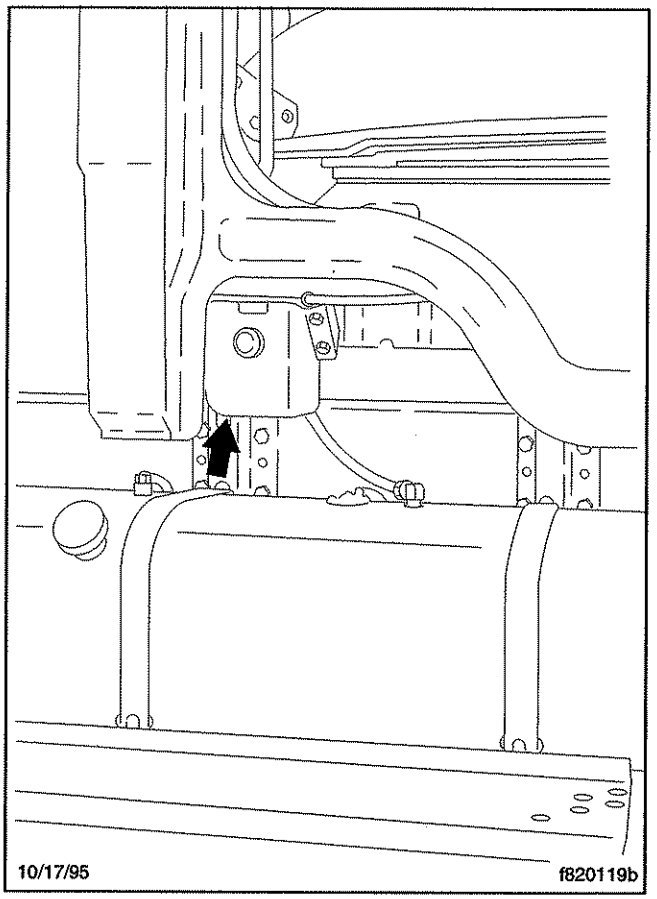


Fig. 4, Windshield Washer Reservoir

Wiper Motor Removal and Installation for Systems with Nut-Attached Wiper Blade Arm

Removal

1. Disconnect the batteries.
2. Remove the passenger's side dash panel to gain access to the wiper motor.
   - 2.1 Pull away the extruded rubber trim from the top of the panel.
   - 2.2 Remove the two retaining screws at the top of the panel.
   - 2.3 Lift the panel from the dash.
3. Unplug the multipin connector from the wiper motor harness.
4. Remove the plastic button plug from the access space, located on the passenger's side of the water trough, on the engine side of the firewall.
5. Loosen the pinch-bolt nut at the end of the crank; then unseat the crank from the wiper motor shaft. **See Fig. 1.**
6. Remove the three nuts from the wiper motor mounting studs.
7. From inside the cab remove the wiper motor.

NOTE: The wiper motor is not a serviceable part.

Installation

1. Position the new wiper motor on the firewall.
2. Install the wiper motor mounting nuts. Tighten them 84 lbf·in (950 N·cm).
3. Plug the multipin connector into the wiper motor harness.
4. Connect the batteries.
5. Run the wiper motor to the park position.
   - 5.1 Turn the key switch on.
   - 5.2 Turn the wiper motor on momentarily then off. The wiper motor should stop in the park position.
   - 5.3 Turn the key switch off.
6. Install the wiper motor crank pointing to the 3 o'clock position as viewed from the engine side of the firewall. **See Fig. 1.**
7. Tighten the crank pinch-bolt nut securely. Install the plastic button plug into the access space.
8. Test the wiper motor for correct operation.
9. Install the dash panel and retaining screws.
10. Install the extruded rubber trim on top of the panel.

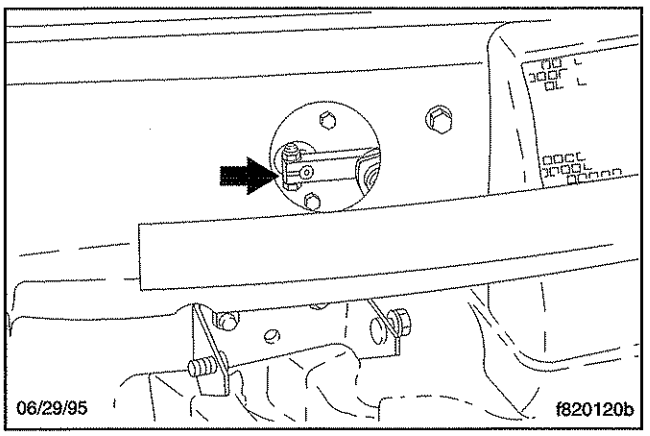


Fig. 1, Pinch Bolt

Wiper Linkage and Support Assembly Removal and Installation for Systems with Nut-Attached Wiper Blade Arm

Removal

1. Lift the wiper arm nut covers for access to the wiper arm nuts.
2. Remove the wiper arm nuts and wiper arms from the splined pivot shafts.

NOTE: Folding the arms out away from the windshield to their over-center position removes the spring tension from the wiper arm hub and eases removal of the wiper arm. **See Fig. 1.**

3. Remove the wiper arm threaded caps from each pivot arm as shown in **Fig. 2** by turning the caps counterclockwise.
4. Disconnect the wiper washer hose and clamps as necessary to allow removal of the water trough.
5. Remove the cab air intake duct mounting screws. Remove the capscrews and sheet metal screws attaching the water trough to the wiper linkage support bracket and to the firewall. Remove the water trough and cab air duct.
6. Loosen the pinch-bolt nut; then disconnect the wiper motor crank from the wiper motor shaft. **See Fig. 3.**
7. Remove the capscrews attaching the linkage support bracket to the cowl. **See Fig. 4.** Remove the wiper linkage assembly. Service as required.

Installation

1. Install the wiper linkage assembly. Tighten the capscrews 16 lbf·ft (21 N·m).
2. Turn the key switch on; then turn the wiper motor on and then off to position motor in the park position. Turn the key switch off.
3. Install the wiper motor crank pointing to the 3 o'clock position as viewed from the engine side of the firewall. **See Fig. 3.**
4. Install the cab air intake duct and water trough but do not tighten the fasteners at this time.
5. Use a smooth hooked tool as shown in **Fig. 5** to slip the windshield molding over the upper edge of the water trough. Be careful not to rip the molding. Tighten the water trough capscrews 16 lbf·ft (21 N·m). Tighten the cab air intake duct fasteners. Install the sheet metal screws attaching the water trough to the firewall.

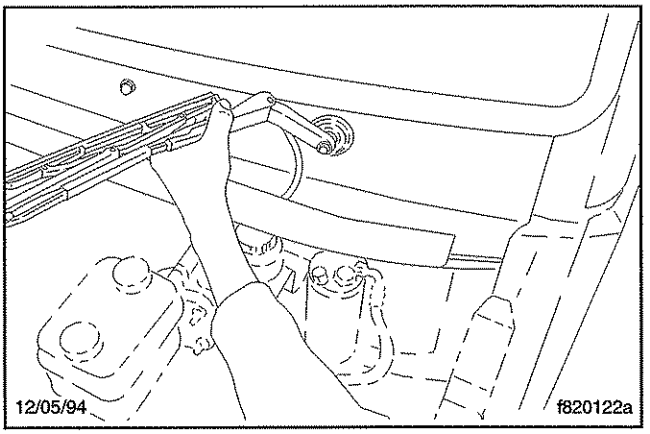


Fig. 1, Wiper Arm Removal

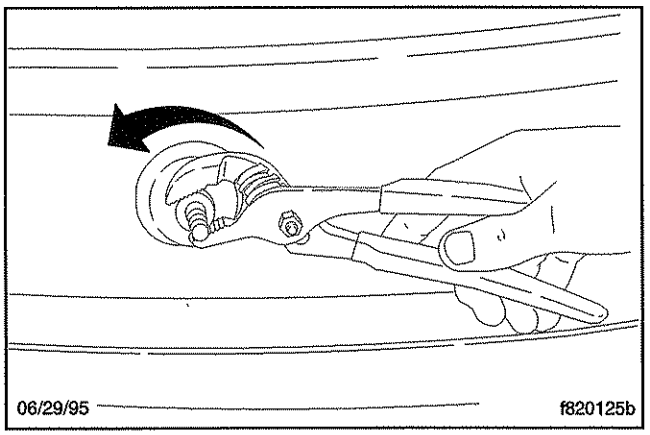


Fig. 2, Turn Caps Counterclockwise

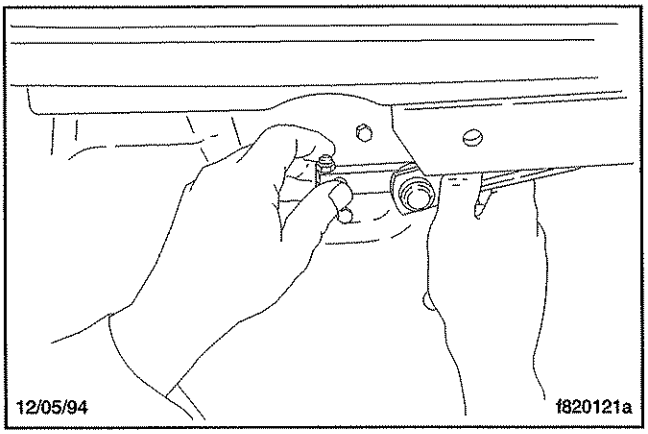


Fig. 3, Disconnect Wiper Motor Crank

Wiper Linkage and Support Assembly Removal and Installation for Systems with Nut-Attached Wiper Blade Arm

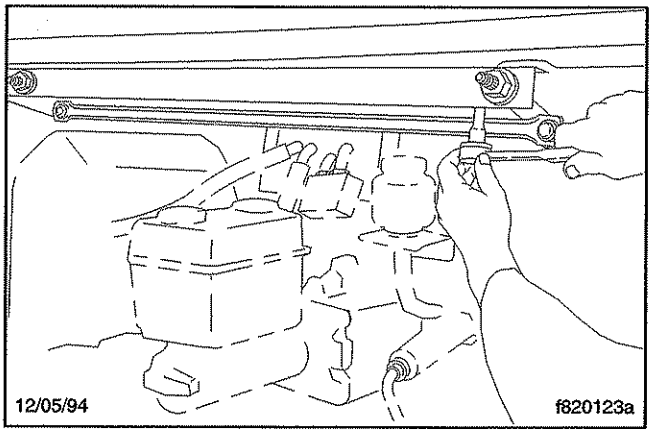


Fig. 4, Capscrew Removal

6. Install the wiper arm caps on the pivot arms.
7. With the wiper motor still in the park position, install the wiper arms so that the tips of the wiper blades are 45–55 mm (1–3/4 to 2–1/4 in) from the windshield molding. **See Fig. 6.** Tighten the nuts 13 lbf·ft (18 N·m).
8. Place the wiper arm nut covers over the wiper arm nuts.

NOTE: Conduct the following test on wet glass.

9. Run the wipers at the high speed setting to ensure that the arms do not contact the windshield frame at either end of their stroke. Adjust as necessary.

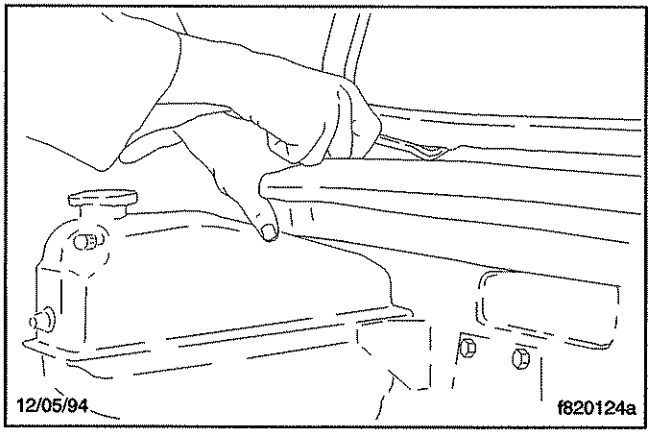


Fig. 5, Installing Windshield Molding

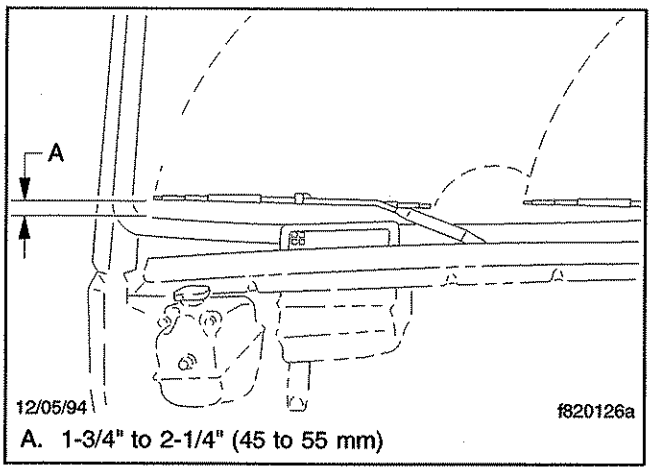


Fig. 6, Adjusting Wiper Arm Placement

Washer Pump Replacement

Replacement

NOTE: To avoid losing washer fluid from the reservoir, you can remove the reservoir and empty it before starting this procedure, or you can place a clean bowl under it before pulling out the pump.

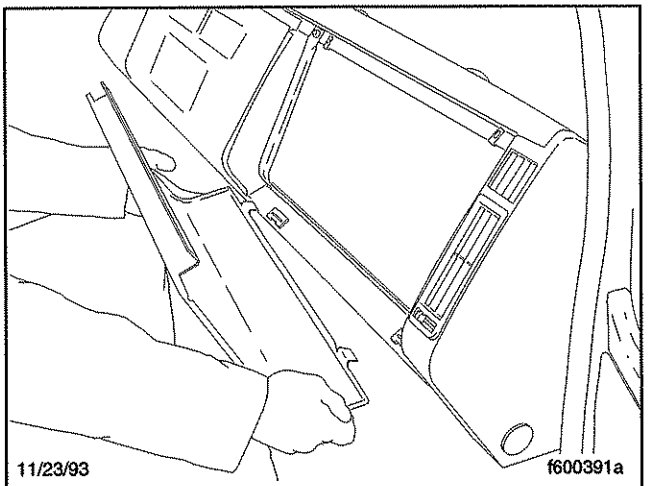
1. Disconnect the electrical connections and washer fluid tubing from the washer pump.
2. Unsnap the pump from the grip of the reservoir body and pull it from the reservoir.
3. Install the new pump.
4. Connect the electrical connections and washer fluid tube.
5. Fill the reservoir.
6. Test the operation of the pump.

Wiper Motor Removal and Installation for Systems with Latch-Mounted Wiper Blade Arms

Removal

1. Disconnect the batteries.
2. Remove the passenger's side dash panel (panel D) to gain access to the wiper motor. See **Fig. 1**.
   - 2.1 Pull away the vinyl extrusion trim from the top of the panel.
   - 2.2 Remove the two mounting screws at the top of the panel.
   - 2.3 Lift the panel from the dash.
3. Unplug the multipin connector from the wiper motor harness.
4. Remove the plastic button plug from the access space, located on the passenger's side of the air intake panel on the engine side of the frontwall.
5. Remove the motor crank nut at the end of the motor shaft; then unseat the crank from the wiper motor shaft. See **Fig. 2**.
6. Remove the three nuts from the wiper motor mounting studs.
7. From inside the cab remove the wiper motor.

NOTE: The wiper motor is not a serviceable part.



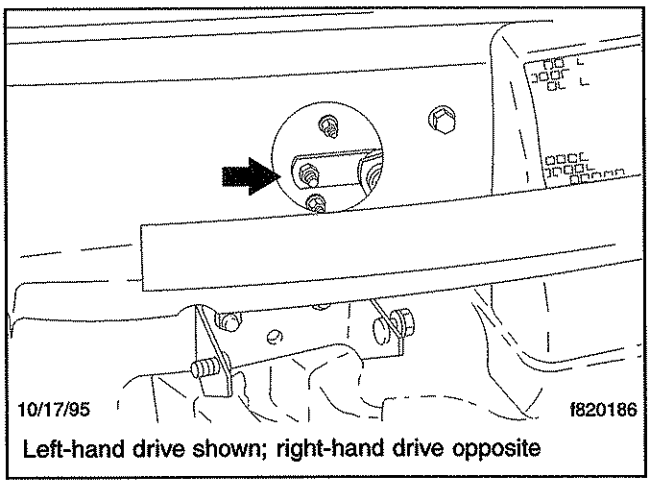
Left-hand drive shown; right-hand drive opposite

Fig. 1, Removing Panel D

Installation

1. Position the new wiper motor on the frontwall.
2. Install the wiper motor mounting nuts. Tighten them 84 lbf·in (950 N·cm).
3. Plug the multipin connector into the wiper motor harness.
4. Connect the batteries.
5. Run the wiper motor to the park position.
   - 5.1 Turn the ignition keyswitch on.

   NOTE: Ensure the batteries are fully charged.
   - 5.2 Turn the wiper motor on momentarily, then off. The wiper motor should stop in the park position.
   - 5.3 Turn the ignition keyswitch off.
6. Install the wiper motor crank pointing to the 3 o'clock position as viewed from the engine side of the frontwall. See **Fig. 2**.
7. Tighten the motor crank nut securely 18 lbf·ft (25 N·m). Install the plastic button plug into the access space.
8. Test the wiper motor for correct operation, and position the wiper arms so that the wiper blades are resting horizontally on the windshield.
9. Install dash panel D and tighten the two mounting screws.



Left-hand drive shown; right-hand drive opposite

Fig. 2, Motor Crank Nut

Wiper Motor Removal and Installation for Systems with Latch-Mounted Wiper Blade Arms

10. Install the vinyl extrusion trim on top of the panel.

Wiper Linkage and Support Assembly Removal and Installation for Systems with Latch-Mounted Wiper Blade Arms

Removal

1. Unlatch the wiper arm assembly from the splined pivot shafts.

NOTE: Moving the wiper arms into an unlatched position eases removal of the wiper arms. **See Fig. 1.**

2. Remove the weather covers from each pivot shaft by turning the weather covers counterclockwise.
3. Disconnect the wiper washer hose and clamps as necessary to allow removal of the air intake panel.
4. Remove the cab air intake duct mounting screws, the capscrews, and the sheet metal screws attaching the air intake panel to the wiper linkage support bracket and to the firewall. Remove the air intake panel and cab air duct.
5. Remove the motor crank nut; then pry the wiper motor crank from the wiper motor shaft. **See Fig. 2.**
6. Remove the hex capscrews attaching the linkage support bracket to the cowl. **See Fig. 3.** Remove the wiper linkage assembly. Service as required.

Installation

1. Install the wiper linkage assembly. Tighten the capscrews 16 lbf·ft (21 N·m). **See Fig. 3.**
2. Turn the key switch on; then turn the wiper motor on and then off to position motor in the park position. Turn the key switch off.

NOTE: Ensure the battery is fully charged.

3. Install the wiper motor crank pointing to the 3 o'clock position as viewed from the engine side of the firewall. **See Fig. 2.** Tighten the motor crank nut 18 lbf·ft (25 N·m).
4. Install the cab air intake duct and air intake panel but do not tighten the fasteners at this time.
5. Use a smooth hooked tool as shown in **Fig. 4** to slip the windshield molding over the upper edge of the air intake panel. Be careful not to rip the molding. Tighten the air intake panel capscrews 16 lbf·ft (21 N·m). Tighten the cab air intake duct fasteners. Install the sheet metal screws attaching the air intake panel to the firewall.
6. Install the weather covers on the pivot shafts.
7. With the wiper motor still in the park position, install the wiper arms so that the wiper blades are resting horizonally on the windshield.

NOTE: Conduct the following test on wet glass.

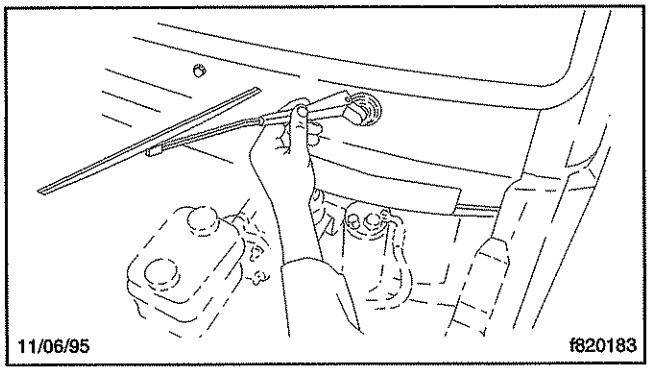


Fig. 1, Wiper Arm Removal

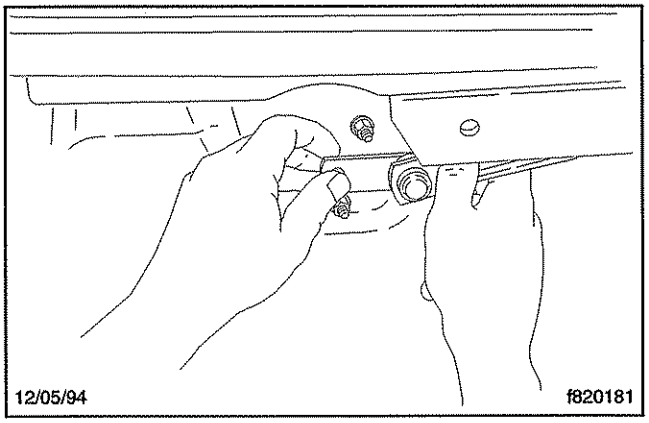


Fig. 2, Disconnect Wiper Motor Crank

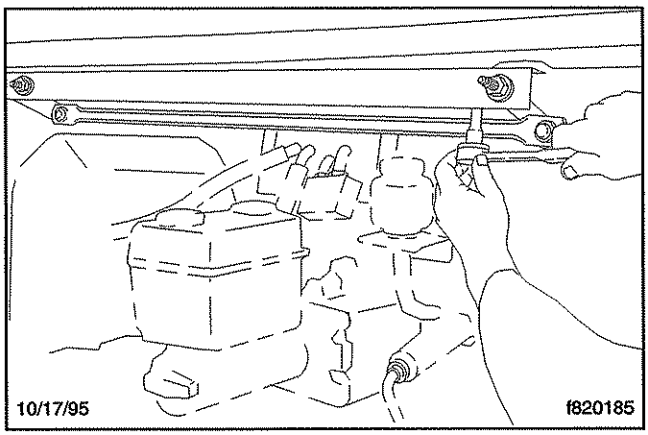


Fig. 3, Capscrew Removal

Wiper Linkage and Support Assembly Removal and Installation for Systems with Latch-Mounted Wiper Blade Arms

8. Run the wipers at the high speed setting to ensure that the blades do not contact the windshield moulding or gasket at either end of their stroke. Adjust as necessary.

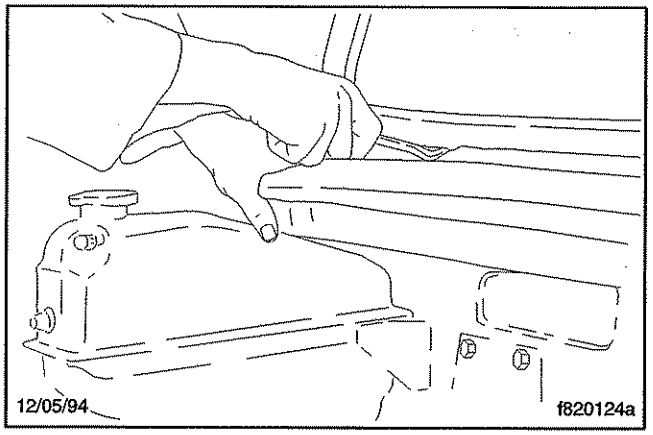


Fig. 4, Installing Windshield Molding

Troubleshooting Tables

VEHICLES WITHOUT INTERMITTENT WIPERS OR VEHICLES WITH INTERMITTENT WIPERS WITH ROCKER SWITCH AND SLIDER SWITCH CONTROLS

Problem—Wipers and Washers Do Not Operate

Problem—Wipers and Washers Do Not Operate	
Possible Cause	**Remedy**
Fuse is blown.	Check fuse. Replace if blown.
Open circuit in power supply (circuits 315 and 305).	With key on, check voltage at wiper and washer switches (circuit 315). If voltage reading is zero, take voltage readings along circuits 315 and 305 back towards ignition switch until open is located. Repair as necessary.

Problem—Washer Motor Inoperable

Problem—Washer Motor Inoperable	
Possible Cause	**Remedy**
Open circuit in switch or between switch and motor.	Make sure there is battery voltage at switch (circuit 315). At motor, check circuit 320 with washer switch closed. Battery voltage should be present. If voltage is not present, locate and repair open circuit or faulty switch.
Faulty motor.	Make sure motor has proper ground; then apply battery voltage to motor (circuit 320). If motor does not work, replace motor.

Problem—Fuses Blow Repeatedly

Problem—Fuses Blow Repeatedly	
Possible Cause	**Remedy**
Incorrect fuse.	Make sure correct fuse is being used. See **Group 54** for circuit breaker and fuse table.
Wiring or switch shorted to ground.	Remove fuse. Unplug wiper motor harness and washer motor power wire. At fuse holder, check continuity between circuit 315 and ground. Check with wiper switch in OFF, LOW and HIGH positions, and with washer switch in OFF and ON positions. Ohmmeter should read infinite in all switch positions. If ohmmeter shows continuity in any switch position, replace grounded component.
Washer motor shorted.	If the above tests reveal no problem, and if fuse blows only when using washers, replace washer motor.
Bind in linkage causing drag on wiper motor.	Disconnect wiper crank from wiper motor. Swing wiper blades away from windshield to their over-center position. Operate wiper linkage by hand. Linkage should operate freely without binding or drag. Repair or replace as necessary.
Wiper motor shorted.	Make sure motor has proper ground. If the above tests reveal no problem, and fuse still blows, replace wiper motor.

Troubleshooting

Problem—Wiper Motor Does Not Work On Low Speed

Problem—Wiper Motor Does Not Work On Low Speed	
Possible Cause	**Remedy**
Open circuit in switch or between switch and motor, or faulty motor.	At motor, check circuit 316 with switch on low speed. Battery voltage should be present. If voltage is not present, locate and repair open circuit or faulty switch. If voltage is present, replace motor.

Problem— Wiper Motor Does Not Work On High Speed

Problem—Wiper Motor Does Not Work On High Speed	
Possible Cause	**Remedy**
Open circuit in switch or between switch and motor, or faulty motor.	At motor, check circuit 318 with switch on high speed. Battery voltage should be present. If voltage is not present, locate and repair open circuit or faulty switch. If voltage is present, replace motor.

Problem—Wiper Motor Inoperable

Problem—Wiper Motor Inoperable	
Possible Cause	**Remedy**
Open in circuit 315 wire or in wiper switch.	At wiper switch, check circuit 315 for battery voltage. Battery voltage should be present. If voltage is not present, locate and repair open circuit. Check circuit 316 (low speed) or 318 (high speed) for voltage with switch in corresponding position. If no voltage, replace wiper switch.
Faulty motor.	Make sure motor has proper ground; then apply battery voltage to motor (circuit 316 for low speed, circuit 318 for high speed). If either speed is not operational, replace motor.

VEHICLES WITH INTERMITTENT WIPERS WITH ROCKER SWITCH AND SLIDER SWITCH CONTROLS

Problem—Wipers Do Not Park and Intermittent Feature Does Not Work Properly

Problem—Wipers Do Not Park and Intermittent Feature Does Not Work Properly	
Possible Cause	**Remedy**
Open circuit in wire 319.	Disconnect the wiper motor connector and check for battery voltage at pin 319. If no voltage, repair the 319 wire.
Open circuit in wire 317, intermittent wiper relay or wiper switch.	Disconnect the wiper motor connector and check for continuity between pin 316 and pin 317 at the harness side of the wiper motor connector. If no continuity, check the 317 wires, wiper switch and the intermittent wiper relay for an open.
Open circuit in wiper motor park switch.	With the wipers at mid stroke, turn the wiper switch and key switch to off. Disconnect the wiper motor connector and check for continuity between pin 317 and pin 319 at the wiper motor. If no continuity, replace the wiper motor.

Troubleshooting

Problem—Wiper Motor Does Not Work On Low Speed

Problem—Wiper Motor Does Not Work On Low Speed	
Possible Cause	**Remedy**
Open circuit in switch or between switch and motor, or faulty motor.	At motor, check circuit 316 with switch on low speed. Battery voltage should be present. If voltage is not present, locate and repair open circuit or faulty switch. If voltage is present, replace motor.

Problem— Wiper Motor Does Not Work On High Speed

Problem—Wiper Motor Does Not Work On High Speed	
Possible Cause	**Remedy**
Open circuit in switch or between switch and motor, or faulty motor.	At motor, check circuit 318 with switch on high speed. Battery voltage should be present. If voltage is not present, locate and repair open circuit or faulty switch. If voltage is present, replace motor.

Problem—Wiper Motor Inoperable

Problem—Wiper Motor Inoperable	
Possible Cause	**Remedy**
Open in circuit 315 wire or in wiper switch.	At wiper switch, check circuit 315 for battery voltage. Battery voltage should be present. If voltage is not present, locate and repair open circuit. Check circuit 316 (low speed) or 318 (high speed) for voltage with switch in corresponding position. If no voltage, replace wiper switch.
Faulty motor.	Make sure motor has proper ground; then apply battery voltage to motor (circuit 316 for low speed, circuit 318 for high speed). If either speed is not operational, replace motor.

VEHICLES WITH INTERMITTENT WIPERS WITH ROCKER SWITCH AND SLIDER SWITCH CONTROLS

Problem—Wipers Do Not Park and Intermittent Feature Does Not Work Properly

Problem—Wipers Do Not Park and Intermittent Feature Does Not Work Properly	
Possible Cause	**Remedy**
Open circuit in wire 319.	Disconnect the wiper motor connector and check for battery voltage at pin 319. If no voltage, repair the 319 wire.
Open circuit in wire 317, intermittent wiper relay or wiper switch.	Disconnect the wiper motor connector and check for continuity between pin 316 and pin 317 at the harness side of the wiper motor connector. If no continuity, check the 317 wires, wiper switch and the intermittent wiper relay for an open.
Open circuit in wiper motor park switch.	With the wipers at mid stroke, turn the wiper switch and key switch to off. Disconnect the wiper motor connector and check for continuity between pin 317 and pin 319 at the wiper motor. If no continuity, replace the wiper motor.

Problem—Wiper Intermittent Feature Does Not Work Properly, But the Wipers Park Normally

Problem—Wiper Intermittent Feature Does Not Work Properly, But the Wipers Park Normally	
Possible Cause	**Remedy**
Open circuit in wire 319.	Disconnect the intermittent wiper relay and check for battery voltage at pin 319. If no voltage, repair the 319 wire.
Open circuit in wire 315.	Operate the washer switch to prove the 315 wire is good. If the washer does not operate, disconnect the intermittent wiper/washer switch and check for battery voltage at pin 315. If no voltage, repair the 315 wire.
Open circuit in ground wire at the intermittent wiper/washer switch.	Disconnect the intermittent wiper/washer switch and check for continuity to ground at the switch ground terminal. If no continuity, repair the ground wire.
Inoperative intermittent wiper relay or open intermittent wiper relay ground or inoperative intermittent wiper/washer switch.	Perform the above steps before this one. Disconnect the intermittent wiper/ washer switch; and with the key switch on, momentarily jumper wire 315A to wire 315 (battery voltage). If the wipers do make one pass, replace the intermittent wiper/washer switch. If the wipers do not make one pass, check the 315 wire and the intermittent wiper relay ground wire for an open; and then check the intermittent wiper relay for proper operation.

VEHICLES WITHOUT INTERMITTENT WIPERS

Problem—Wipers Do Not Park at Bottom of Stroke

Problem—Wipers Do Not Park at Bottom of Stroke	
Possible Cause	**Remedy**
Wiper crank incorrectly positioned on wiper motor shaft (wipers park in same position each time wiper switch is opened).	Disconnect wiper crank from motor shaft. Turn key switch on; then momentarily turn wiper motor on then off. Wiper motor should be at park position. Turn key switch off. Install wiper crank onto motor shaft pointing to the 3 o'clock position.
Wiper park circuit inoperable (wipers stop immediately when wiper switch is opened).	With wipers at mid-stroke, turn wiper switch and key switch off. Unplug the wiper motor wiring harness. At the wiper motor connector, connect the ground pin to ground and jump pin 316 to 317. Apply battery voltage from fused circuit to pin 319. If motor returns to park, repair open in circuit 319, or circuit 317 or replace switch as necessary. If motor does not return to park, replace motor.

Troubleshooting

VEHICLES WITH INTERMITTENT WIPERS WITH DOUBLE-PADDLE SWITCH

Problem—Wipers and Washer Not Working

Problem—Wipers and Washer Not Working	
Possible Cause	**Remedy**
The wiring is loose.	Check for and tighten any loose wiring connections.
An open or short circuit.	Check circuits 315, 315H, 315L, and 315P, the ignition circuit breaker, and both high-speed and low-speed relays. For a wiring diagram, refer to **Specifications 400.**
	Tighten loose wiring connection(s).
	Check and replace the switch.
	Check and replace broken wire(s).
The system is binding.	Free or replace the linkage.
	Free or replace the arm or blade.
The motor does not work.	Replace the motor.

Problem—The Wiper Motor Shaft Turns, But the Wiper Arms Do Not Move

Problem—The Wiper Motor Shaft Turns, But the Wiper Arms Do Not Move	
Possible Cause	**Remedy**
The drive crank is loose or disconnected.	Check the drive crank. If it's loose at the wiper motor drive shaft, clean the drive shaft splines. Replace the crank if necessary. If the crank is disconnected from the drive pivot bar, connect it and line it up correctly. For instructions, refer to **Subject 110.** If the problem persists, replace or repair parts as needed.
The linkage is loose or disconnected.	Check all the linkage connections. Repair or replace parts as needed.

Problem—Wiper Motor High Speed Not Working

Problem—Wiper Motor High Speed Not Working	
Possible Cause	**Remedy**
An open circuit.	Check circuits 315H and 315B for continuity. For a wiring diagram, refer to **Specifications 400.**

Problem—Wiper Motor Low Speed Not Working

Problem—Wiper Motor Low Speed Not Working	
Possible Cause	**Remedy**
An open circuit	Check circuits 315L and 315A for continuity. For a wiring diagram, refer to **Specifications 400.**

Troubleshooting

VEHICLES WITH INTERMITTENT WIPERS WITH DOUBLE-PADDLE SWITCH

Problem—Wipers and Washer Not Working

Problem—Wipers and Washer Not Working	
Possible Cause	**Remedy**
The wiring is loose.	Check for and tighten any loose wiring connections.
An open or short circuit.	Check circuits 315, 315H, 315L, and 315P, the ignition circuit breaker, and both high-speed and low-speed relays. For a wiring diagram, refer to **Specifications 400.**
	Tighten loose wiring connection(s).
	Check and replace the switch.
	Check and replace broken wire(s).
The system is binding.	Free or replace the linkage.
	Free or replace the arm or blade.
The motor does not work.	Replace the motor.

Problem—The Wiper Motor Shaft Turns, But the Wiper Arms Do Not Move

Problem—The Wiper Motor Shaft Turns, But the Wiper Arms Do Not Move	
Possible Cause	**Remedy**
The drive crank is loose or disconnected.	Check the drive crank. If it's loose at the wiper motor drive shaft, clean the drive shaft splines. Replace the crank if necessary. If the crank is disconnected from the drive pivot bar, connect it and line it up correctly. For instructions, refer to **Subject 110.** If the problem persists, replace or repair parts as needed.
The linkage is loose or disconnected.	Check all the linkage connections. Repair or replace parts as needed.

Problem—Wiper Motor High Speed Not Working

Problem—Wiper Motor High Speed Not Working	
Possible Cause	**Remedy**
An open circuit.	Check circuits 315H and 315B for continuity. For a wiring diagram, refer to **Specifications 400.**

Problem—Wiper Motor Low Speed Not Working

Problem—Wiper Motor Low Speed Not Working	
Possible Cause	**Remedy**
An open circuit	Check circuits 315L and 315A for continuity. For a wiring diagram, refer to **Specifications 400.**

Problem—Washers Not Working

Problem—Washers Not Working	
Possible Cause	**Remedy**
Washer tubing disconnected.	Check the washer tubing between the washer pump and the wipers.
An open circuit.	Check circuits 320 and 320A for continuity. Check the ground wire on the switch. For a wiring diagram, refer to **Specifications 400.**

Problem—Circuit Breaker Keeps Tripping

Problem—Circuit Breaker Keeps Tripping	
Possible Cause	**Remedy**
Incorrect circuit breaker installed.	Make sure correct amperage circuit breaker is installed. For the correct amperage, refer to **Specifications 400.**
Wiring is shorted to ground.	Check the wiring and the motor for shorts to ground. For a wiring diagram, refer to **Specifications 400.**
The wiper linkage is binding.	Check the linkage.

Problem—Wipers Do Not Park

Problem—Wipers Do Not Park	
Possible Cause	**Remedy**
The park circuit is not working	Check circuits 315 and 315P (blue) for continuity. Check the ground wire on the switch. For a wiring diagram, refer to **Specifications 400.**

Problem—Intermittent (Delay) Feature Not Working; High and Low Speeds are O.K.

Problem—Intermittent (Delay) Feature Not Working; High and Low Speeds are O.K.	
Possible Cause	**Remedy**
The wiper switch ground circuit is open.	Check the ground wire on the switch. For a wiring diagram, refer to **Specifications 400.**

Problem—Wipers Oversweeping

Problem—Wipers Oversweeping	
Possible Cause	**Remedy**
Worn or broken linkage component.	Replace linkage components as required.
Worn or broken pivot assembly.	Replace the pivot assembly.
Worn or broken wiper arm.	Replace the wiper arm.
The motor assembly is loose.	Secure the motor assembly.
Vehicle voltage too high.	Repair the vehicle electrical system.

Troubleshooting

Problem—Wipers Oversweeping (for Vehicles With Intermittent Wipers Built From December 5, 1997)

Problem—Wipers Oversweeping (for Vehicles With Intermittent Wipers Built From December 5, 1997)	
Possible Cause	**Remedy**
The motor assembly is loose.	Secure the motor assembly.
Vehicle voltage too high.	Repair the vehicle electrical system.

Troubleshooting

Problem—Wipers Oversweeping (for Vehicles With Intermittent Wipers Built From December 5, 1997)

Problem—Wipers Oversweeping (for Vehicles With Intermittent Wipers Built From December 5, 1997)	
Possible Cause	**Remedy**
The motor assembly is loose.	Secure the motor assembly.
Vehicle voltage too high.	Repair the vehicle electrical system.

Specifications

For a schematic of the wiring on non-intermittent wipers, see **Fig. 1**.

For a schematic of the wiring on intermittent wipers for vehicles built before December 5, 1997, see **Fig. 2**.

For a schematic of the wiring on intermittent wipers for vehicles built from December 5, 1997, see **Fig. 3**

For circuit protector identification in the electrical power center, see **Fig. 4**.

For a diagram of the wiper park position for vehicles with left-hand drive, see **Fig. 5**.

For a diagram of the wiper park position for vehicles with right-hand drive, see **Fig. 6**.

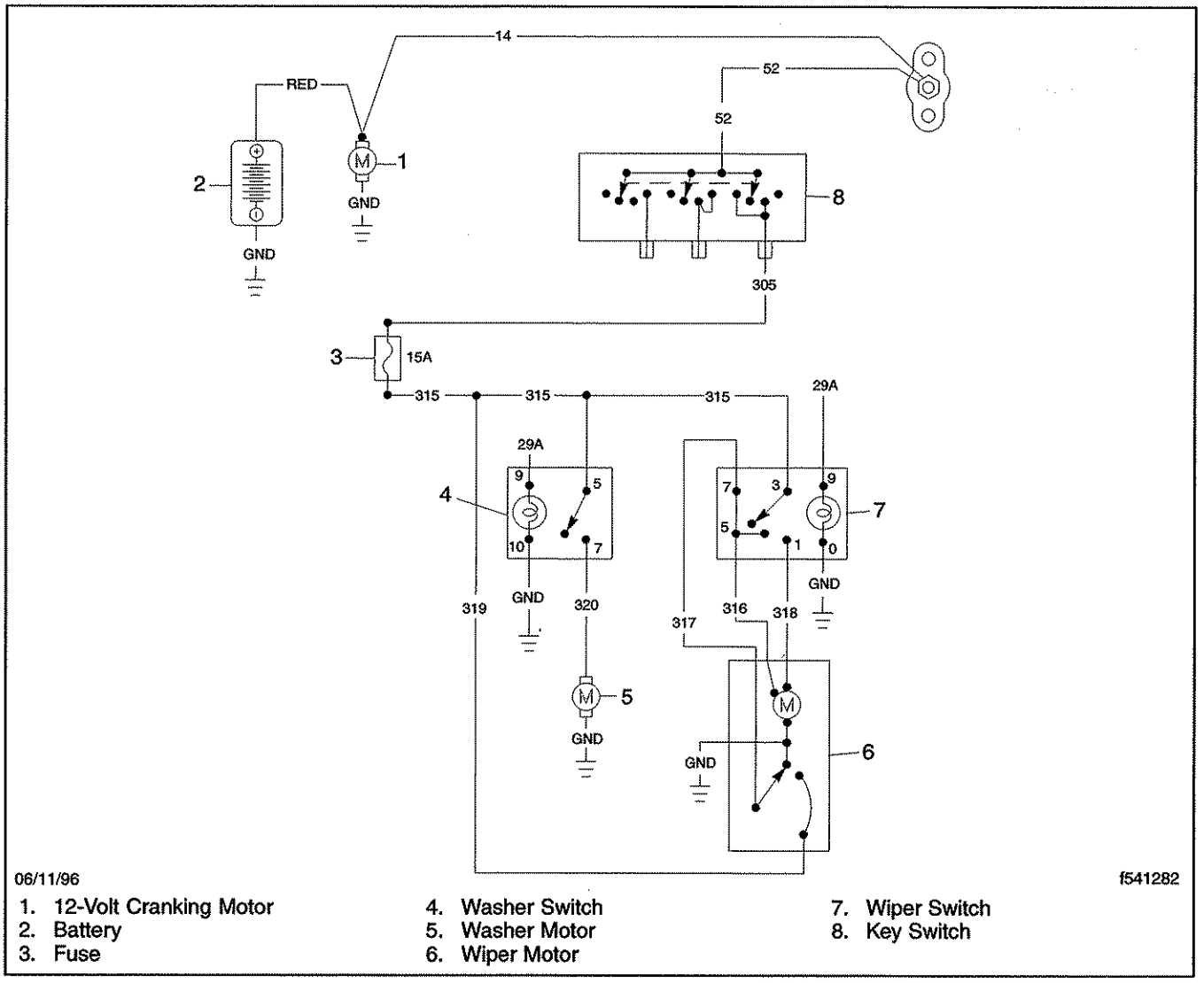
Fastener Torques for Nut-Attached Arm Systems			
Description	**Size**	**Torque**	
		lbf.in (N.cm)	**lbf.ft (N.m)**
Wiper Motor Mounting Nuts	M6	84 (950)	—
Wiper Linkage Assembly Capscrews	M8 x 20	—	16 (21)
Water Trough Capscrews	M8 x 20	—	16 (21)
Wiper Arm Nuts	M8	—	13 (18)

Table 1, Fastener Torques for Nut-Attached Arm Systems

Fastener Torques for Latch-Mounted Arm Systems			
Description	**Size**	**Torque**	
		lbf.in (N.cm)	**lbf.ft (N.m)**
Air Intake Panel Capscrews	M8 x 20	—	16 (21)
Motor Crank Nut	M8	—	18 (25)
Wiper Linkage Assembly Capscrews	M8 x 20	—	16 (21)
Wiper Motor Mounting Nuts	M6	84 (950)	—

Table 2, Fastener Torques for Latch-Mounted Arm Systems

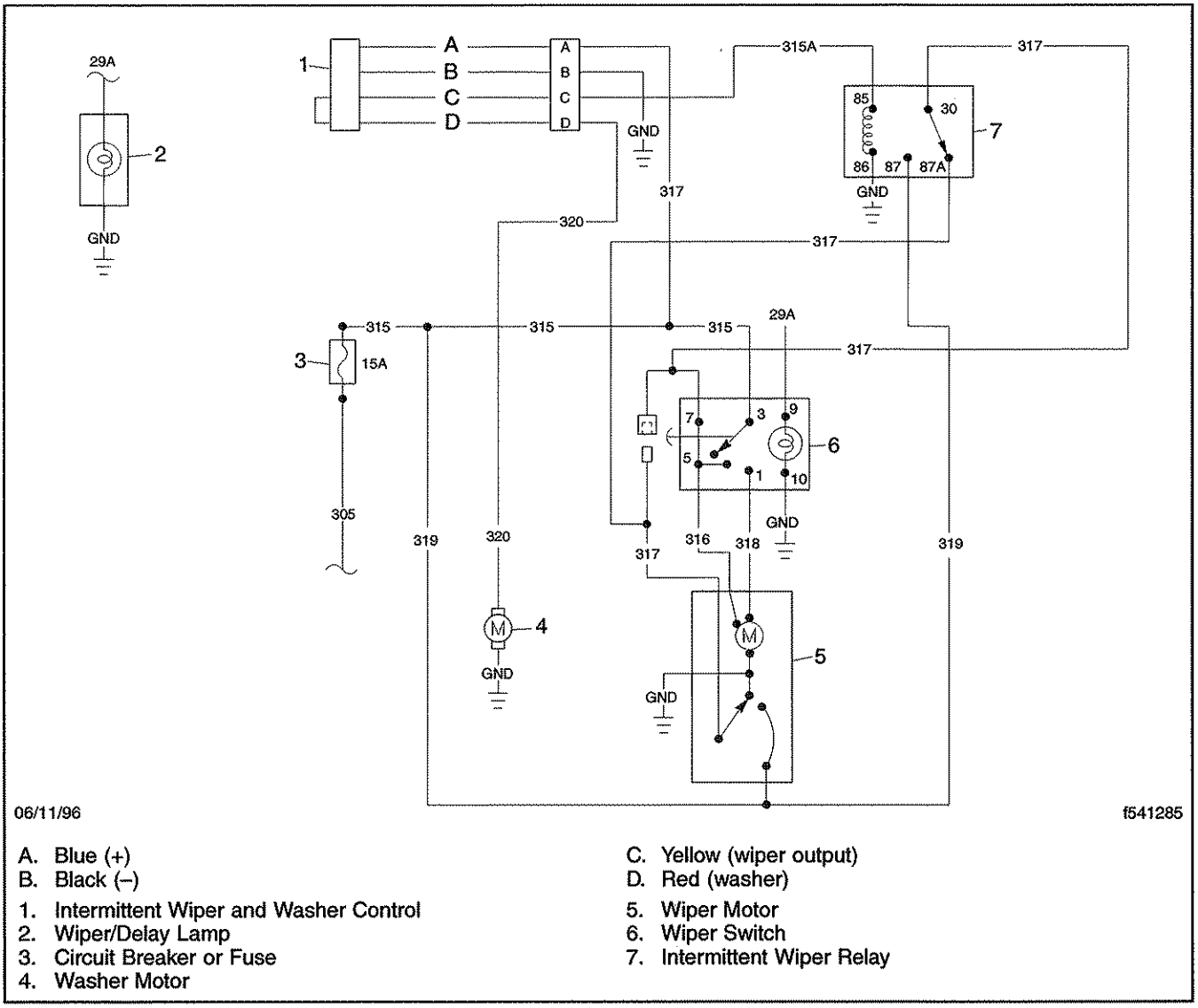
Specifications



1. 12-Volt Cranking Motor
2. Battery
3. Fuse
4. Washer Switch
5. Washer Motor
6. Wiper Motor
7. Wiper Switch
8. Key Switch

Fig. 1, Non-intermittent Wiper Wiring Diagram

Specifications

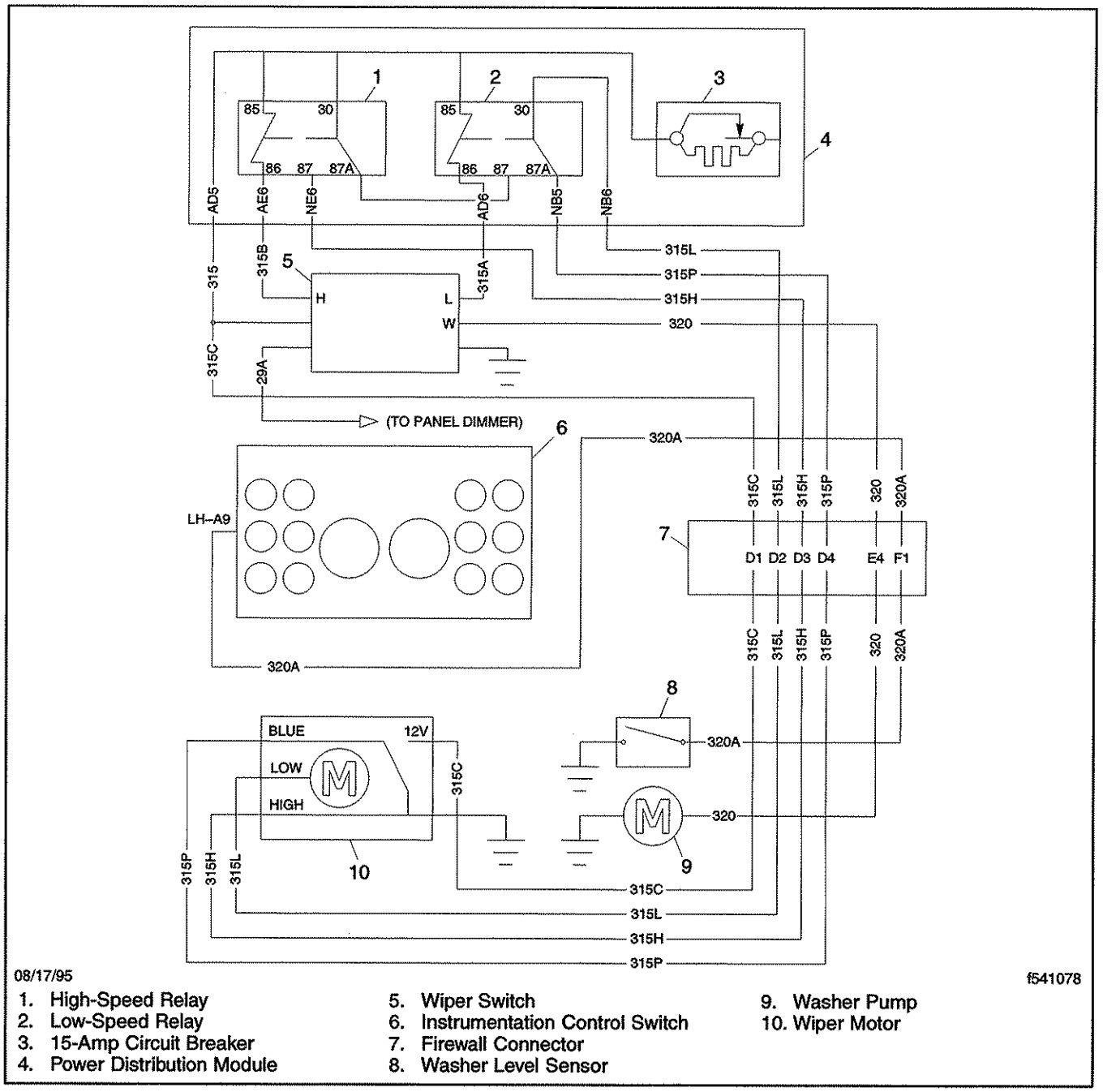


A. Blue (+)
B. Black (–)
C. Yellow (wiper output)
D. Red (washer)

1. Intermittent Wiper and Washer Control
2. Wiper/Delay Lamp
3. Circuit Breaker or Fuse
4. Washer Motor
5. Wiper Motor
6. Wiper Switch
7. Intermittent Wiper Relay

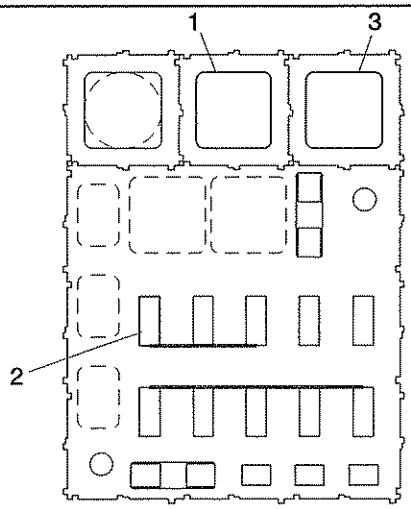
Fig. 2, Intermittent Wiper Wiring Diagram for Vehicles Built Before December 5, 1997

Specifications



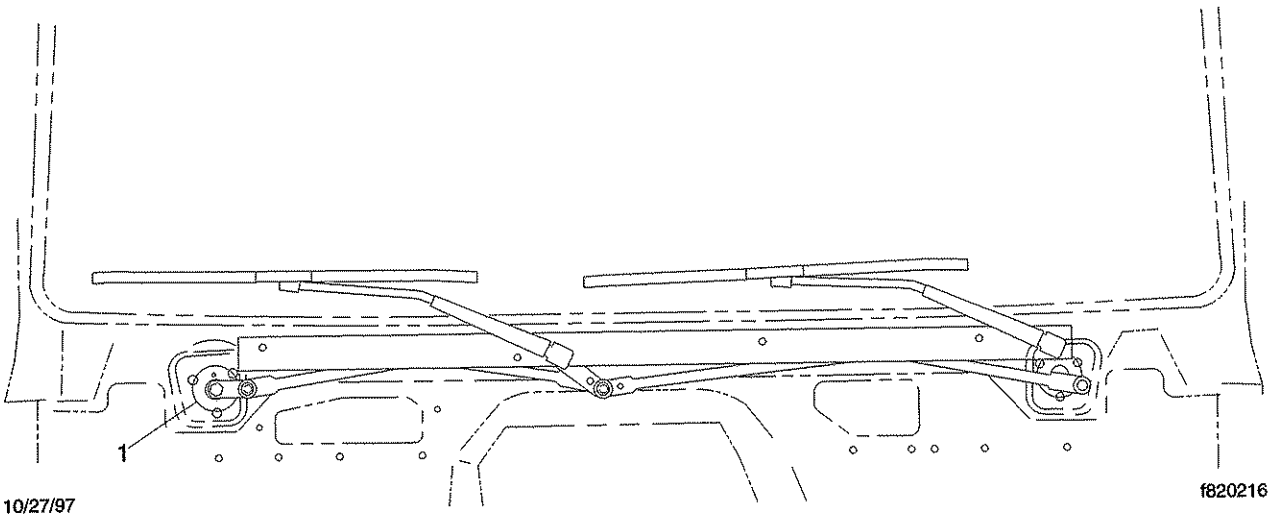
1. High-Speed Relay
2. Low-Speed Relay
3. 15-Amp Circuit Breaker
4. Power Distribution Module
5. Wiper Switch
6. Instrumentation Control Switch
7. Firewall Connector
8. Washer Level Sensor
9. Washer Pump
10. Wiper Motor

Fig. 3, Intermittent Wiper and Washer Wiring Diagram for Vehicles Built From December 5, 1997



1. Intermittent Wiper Relay
2. Washer and Wiper Accessory-Controlled Circuit Breaker or Fuse
3. Intermittent Wiper Relay (for Vehicles Built From December 5, 1997)

Fig. 4, Electrical Power Center, A-Panel

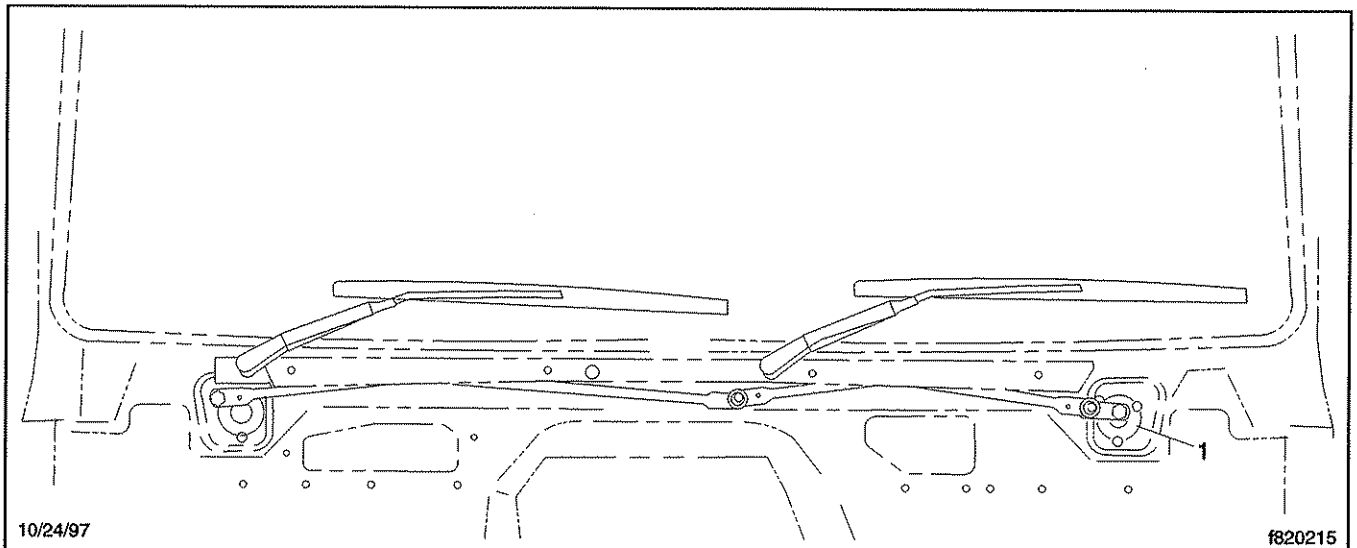


Position the wiper arms so that the wiper blades are resting horizontally on the windshield.

1. Motor

Fig. 5, Wiper Park Position, Left-Hand Drive

Specifications



Position the wiper arms so that the wiper blades are resting horizontally on the windshield.

1. Motor

Fig. 6, Wiper Park Position, Right-Hand Drive