WINDSHIELD WIPERS

CONTENTS

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INDEX

FRONT WIPERS/WASHERS

GENERAL

Two-speed electric windshield wipers and electric washers are standard equipment. An optional intermittent wiper system provides a pause between wipe cycles for use during conditions of very light precipitation.

The windshield wipers can be operated with the windshield wiper switch only when the ignition switch is in the ON or ACCESSORY position. A circuit breaker located in the fuse block protects the circuitry of the wiper system.

WIPERS

The standard windshield wiper circuit contains three components; wiper/washer switch, motor, and front washer pump. Both standard and intermittent circuits are the same, except that the intermittent circuit requires a module and delay resistance in the wiper switch. Both circuits receive battery feed from, and are protected by a 5.5 amp circuit breaker.

In the standard wiper circuit, the switch connects the motor directly to battery feed for low and high speed operation. In the intermittent circuit, the switch supplies battery feed to the intermittent wiper module, which then supplies the motor. In the delay position, the module is connected with the variable resistor in the wiper switch. The value of the resistance is used by the module to charge a capacitor, which triggers the amount of delay between wipes.

The wiper motor has an arrangement of brushes providing the two wiper speeds. When the wipers are turned off, the park switch maintains current to the motor until the wipers reach the park position on the windshield.

The park arm in the motor assembly is connected to the park switch and is driven by the motor. When the wiper switch is turned off, current flows through the contact and the module to the motor until the wipers reach the park position.

CAUTION: The wiper arms and blades must not be moved manually from side to side or damage may result.

WASHERS

With the washer switch ON, current flows through the washer pump to ground. The front washer pump runs as long as the driver holds the switch ON. On standard wipers, the washer switch automatically moves the wiper switch to LO when the washer is turned on. On intermittent wipers, the wiper module runs the wiper motor on LO. Turning the switch to OFF stops the wipers.

If the washer knob is depressed while the wiper switch is in the OFF position, the wiper control will operate for approximately 3 wipes and automatically turn OFF.

WINDSHIELD WIPER MOTOR

REMOVAL

(1) Remove wiper arm assemblies by lifting blade off windshield and pulling out on the tab (Fig. 1) to lock wiper arm in UP position.

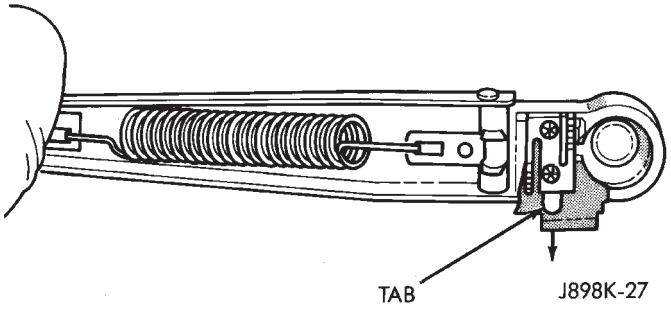


Fig. 1 Wiper Arm Removal

(2) Remove cowl trim panel. Disconnect the washer hose. Remove the cowl mounting bracket attaching nuts (Fig. 2) and pivot pin attaching screws.

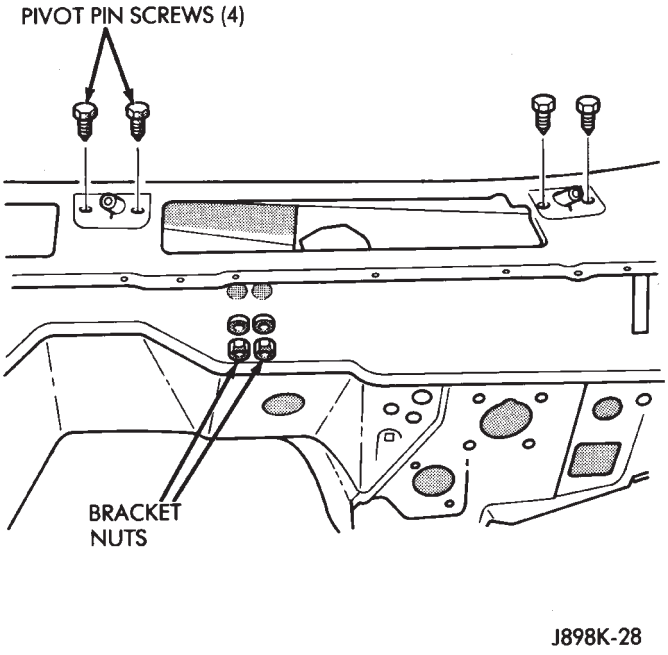


Fig. 2 Pivot Assembly Removal

(3) Disconnect wiring harness and remove the assembly.

(4) Remove the plastic motor cover.

(5) Remove bolts and nuts holding motor to linkage and remove motor.

The wiper motor is shrouded in a protective rubber boot. Care should be taken not to puncture the boot during removal or installation.

INSTALLATION

(1) Install motor to linkage.

(2) Install wiper motor and linkage assembly into the cowl cavity.

(3) Position cowl mounting bracket and install the attaching nuts. Install pivot pin attaching screws. Tighten the screws and nuts to 4 N·m (35 in. lbs.) torque.

(4) Connect the wire harness.

(5) Connect the washer hose and install cowl trim panel.

(6) Install the wiper arm assemblies and position as shown (Fig. 3).

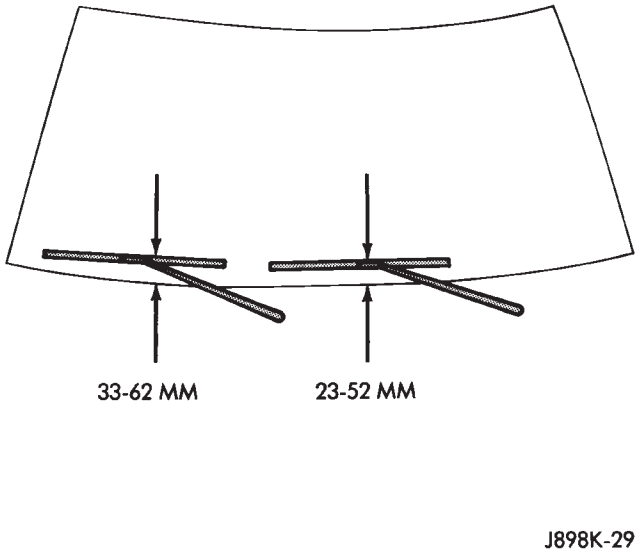


Fig. 3 Windshield Wiper Arm Installation

WASHER PUMP REPLACEMENT—LEFT HAND DRIVE

(1) Remove 2 washer reservoir attaching screws (Fig. 4) and 1 nut (Fig. 5).

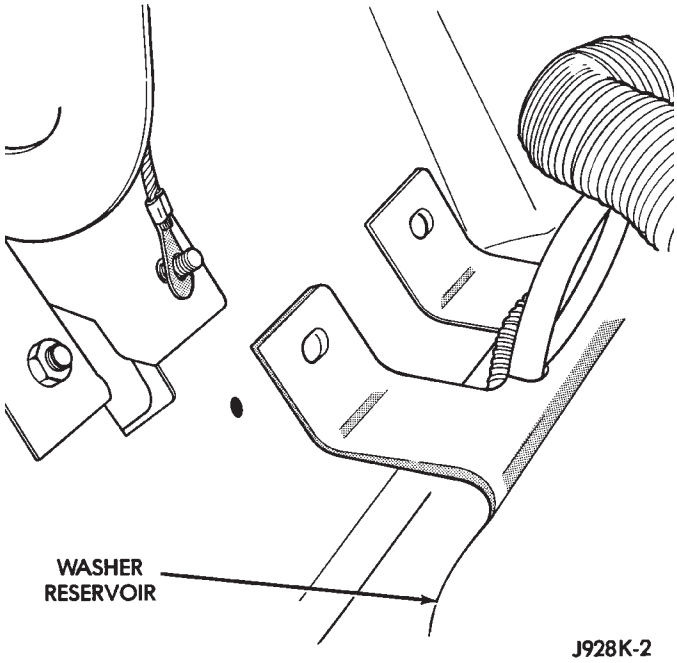


Fig. 4 Washer Reservoir Upper Attaching Screws

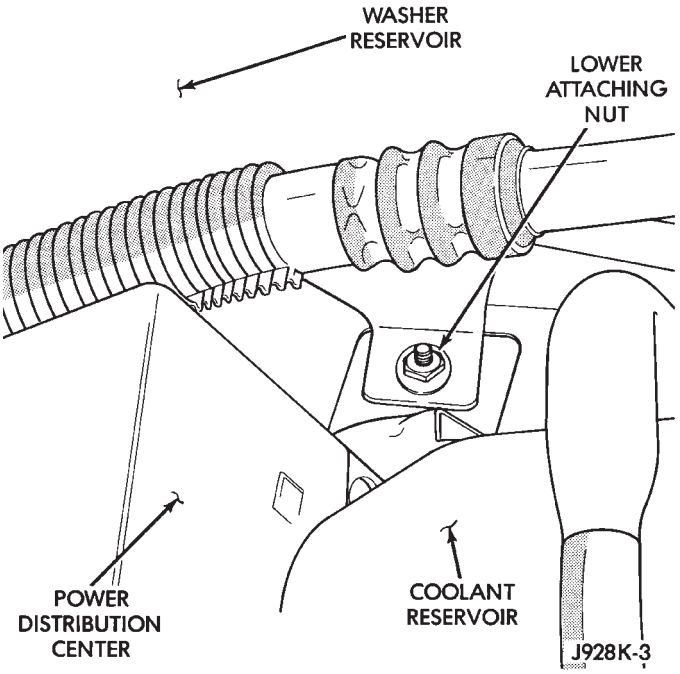


Fig. 5 Washer Reservoir Lower Attaching Nut

(2) Disconnect hose from pump(s) (Fig. 6).

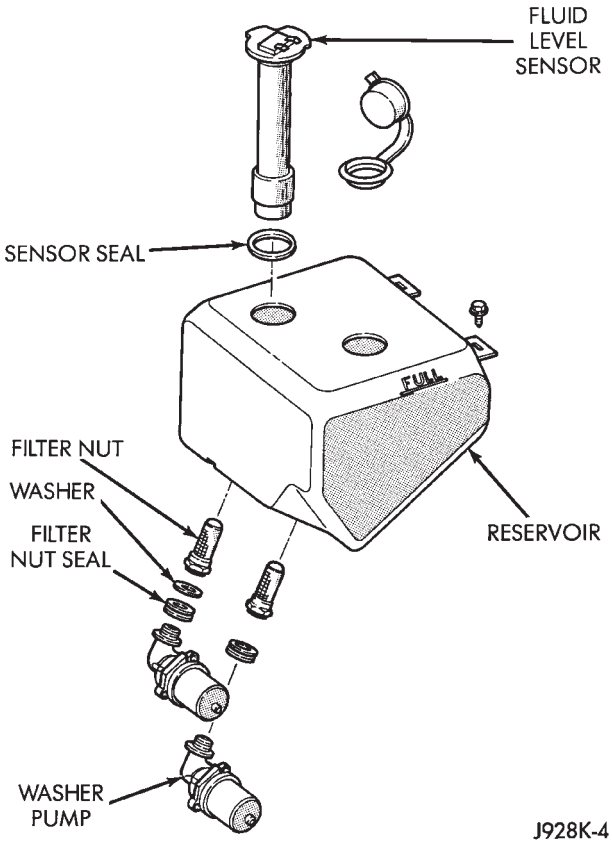


Fig. 6 Washer Reservoir and Pumps—Typical Left Hand Drive

(3) Drain washer reservoir.

(4) Using a deep socket, remove filter nut(s) from bottom inside reservoir and remove pump.

(5) Reverse the removal procedure to install a new pump(s).

WASHER PUMP REPLACEMENT—RIGHT HAND DRIVE

(1) Remove 3 washer reservoir mounting screws (Fig. 7).

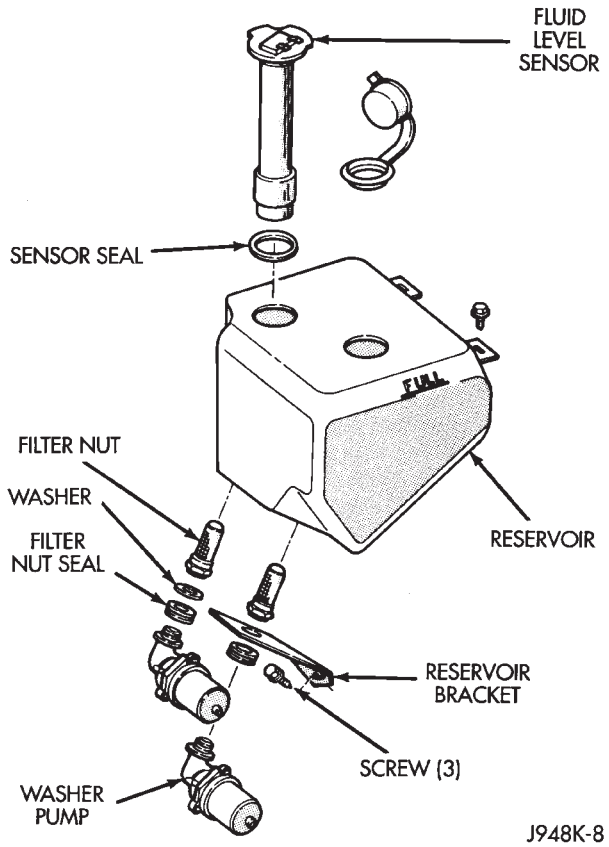


Fig. 7 Washer Reservoir and Pump

(2) Disconnect hose from pumps.

(3) Drain washer reservoir.

(4) Using a deep socket, remove filter nuts from bottom inside of reservoir and remove pump.

(5) Reverse the removal procedures to install a new pump.

DIAGNOSING WINDSHIELD WIPERS

(1) Remove in-line circuit breaker near fuse block and turn ignition switch to ACCESSORY or ON.

- Measure voltage at battery side of circuit breaker cavity. Meter should read battery voltage. If not, repair wiring from ignition switch.
- Measure resistance across circuit breaker terminals. Meter should read zero ohms. If not, replace failed circuit breaker.

(2) Unplug wiper motor side wiring harness connector from wiper switch side harness connector (non-intermittent), or from intermittent wiper module at base of steering column. Turn ignition switch to ACCESSORY or ON.

• Measure voltage at unplugged wiper motor side harness connector terminal D. Meter should read battery voltage. If not, repair wiring from circuit breaker.
• Turn ignition switch to OFF and measure resistance from unplugged wiper motor side harness connector terminal G to ground. Meter should read zero ohms. If not, repair wiring to ground.

(3) Leave ignition switch in OFF, and back probe wiring harness connector at wiper motor (Fig. 8). Measure resistance from terminal 4 of wiper motor side of connector to ground. Meter should read zero ohms. If not, repair wiring to ground.

(4) If equipped with intermittent wipers, turn ignition switch to ACCESSORY or ON. Turn wiper switch to LOW or HIGH. Unplug wiring harness connector (wiper switch side) from intermittent wiper module. Then plug both connectors that have been removed from intermittent wiper module into each other.

CAUTION: DO NOT move the wiper switch to DELAY with the intermittent wiper module removed from the circuit. If the switch is moved to the DELAY position during the next step, the switch will be damaged.

• Test wiper operation in LOW and HIGH speed modes, and test washer operation. If these modes were inoperative, but are OK now, replace failed intermittent wiper module.

(4) To test the wiper/washer switch, see Wiper Switch Testing. Turn ignition switch to OFF. Position the wiper switch as indicated, and back probe switch side of wiper switch connector. If switch tests OK, go to step 5. If not, replace switch and go to step 6.

(5) To further test the wiper/washer switch, turn ignition switch to ACCESSORY or ON. Position the wiper switch as indicated in the tests below, and back probe switch side of wiper switch connector.
• Measure voltage at terminal E with wiper switch in LOW, MIST and with washer switch depressed. Meter should read battery voltage. If not, replace switch.
• Measure voltage at connector terminal C with wiper switch in HIGH. Meter should read battery voltage. If not, replace switch.
• With wiper switch in LOW or HIGH, measure voltage at connector terminal F, then move wiper switch to OFF. Meter shold read battery voltage until wipers park and then zero volts. If OK, go to step 6. If not, check wiring to wiper motor, then go to step 6.

(6) To test the wiper motor, turn the ignition switch to ACCESSORY or ON. Position the wiper switch and back probe the motor connector (Fig. 8) as indicated.

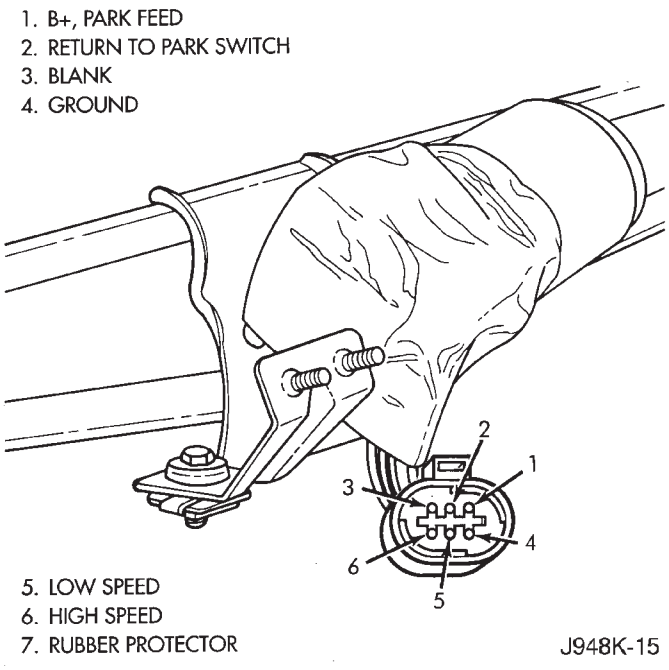


Fig. 1 Windshield Wiper Connector

• Wiper switch in any position, measure voltage at terminal 1. Meter should read battery voltage. If not, repair wiring from circuit breaker.
• Wiper switch in LOW, measure voltage at terminal 5. Meter should read battery voltage. If OK, but wipers do not operate, replace failed wiper motor. If not, repair wiring from switch or intermittent wiper module connector.
• Wiper switch in HIGH, measure voltage at terminal 6. Meter should read battery voltage. If OK, but wipers do not operate, replace failed wiper motor. If not, repair wiring from switch or intermittent wiper module connector.
• Wiper switch in LOW or HIGH, voltmeter connected to terminal 2. Turn wiper switch to OFF and observe meter. Meter should read battery voltage when switch goes to OFF, then zero volts after wipers park. If battery voltage is present, but wipers fail to park; or, if no battery voltage present, replace failed wiper motor.

DIAGNOSING WINDSHIELD WASHER (NON-INTERMITTENT)

(1) Unplug washer pump connector.
• Measure resistance between terminal A at pump and a clean chassis ground. Meter should read zero ohms. If not, repair open to ground.

(2) Turn ignition switch to ACCESSORY and washer switch to ON.
• Measure voltage at washer pump connector terminal B. Meter should read battery voltage. If OK, replace washer pump. If not, go to next step.

• Measure voltage at wiper/washer switch connector terminal B. Meter should read battery voltage. If OK, repair open to washer pump. If not, replace switch.

DIAGNOSING WINDSHIELD WASHER (INTERMITTENT)

(1) Unplug washer pump connector.

• Measure resistance between terminal B at pump and a clean chassis ground. Meter should read zero ohms. If not, repair open to ground.

(2) Turn ignition switch to ACCESSORY and washer switch to ON.

• Measure voltage at wipe module switch connector terminal B (pink wire). Meter should read battery voltage. If not, replace wiper switch.

• Measure voltage at wipe module motor connector terminal B (brown wire). Meter should read battery voltage. If not, replace module.

• Measure voltage at washer pump connector terminal A at pump. Meter should read battery voltage. If OK, replace pump. If not, repair open from wipe module.

INTERMITTENT WIPER MODULE

The intermittent wiper module is non-serviceable. Refer to the wiring schematic for connector call outs.

The intermittent wiper module is attached to the lower instrument panel cover near the steering column with a patch of velcro.

LIFTGATE WIPER

GENERAL

The rear wiper motor contains electronic controls to provide three operating modes.

• Intermittent wipe with a 5 to 8 second delay between sweeps.

• Constant wipe that operates in conjunction with a washer.

• Park mode that operates when ignition or rear wiper switch is turned OFF.

The rear wiper switch is located in the instrument panel and is supplied current when the ignition switch is in the ON position. When the switch is placed in the intermittent wipe position it provides current to the rear wiper motor. When it is held in the wash/wipe position it provides current to both the motor and the rear washer pump. The switch is spring loaded in the wash/wipe position.

REMOVAL

(1) Remove the wiper arm assembly from the pivot pin by depressing the tab (Fig. 1) and pulling straight out.

(2) Slide clip along hose until clip is off hose mounting.

(3) Disconnect the washer hose.

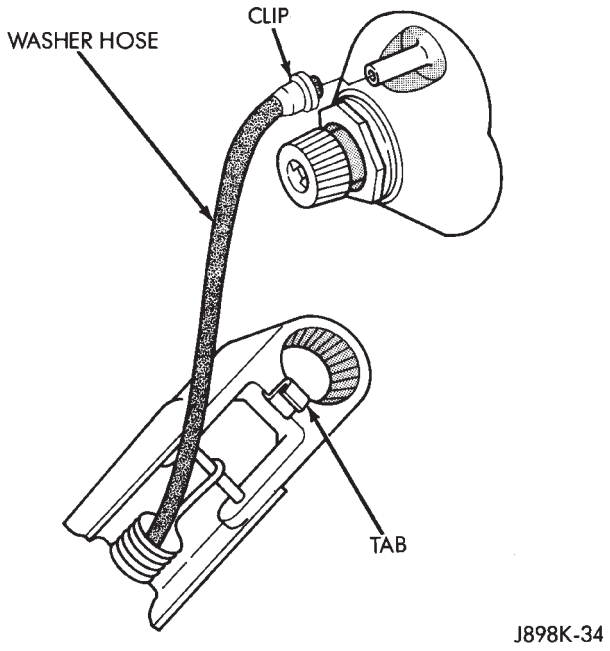


Fig. 1 Rear Wiper Arm Removal

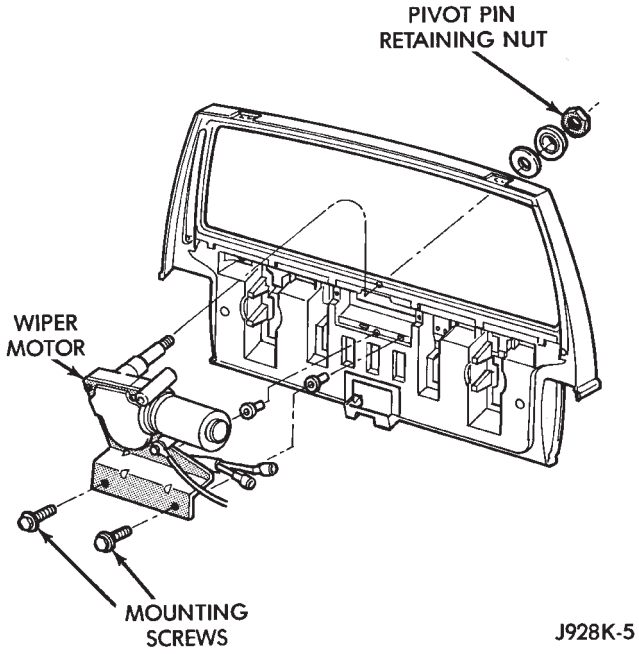


Fig. 2 Rear Wiper Motor Removal/Installation

(4) Remove pivot pin retaining nut.

(5) Remove external bezel and seal.

(6) Remove the liftgate interior trim panel.

(7) Disconnect the wiper motor at the wiring harness.

(8) Remove the wiper motor mounting screws.

(9) Remove the wiper motor.

INSTALLATION

(1) Position the motor (Fig. 2) in the liftgate cavity with the pivot pin protruding through the hole in the liftgate.

(2) Install the mounting screws.
(3) Connect the wiring harness.
(4) Install the pivot pin, seal, bezel and attaching nut (Fig. 2). Torque nut to 4 N·m (32 in. lbs.).
(5) Connect interior washer hose.

Lubricate the bezel nipples with a small amount of water and then install the washer hoses.

(6) Install the liftgate trim panel.
(7) Install the wiper arm assembly and connect the external washer hose to the bezel.
(8) Slide the clip along the hose until it is over hose mount.

The blade should be parallel to window opening and no closer than 5mm to window seal when operated on a wet window (Fig. 3).

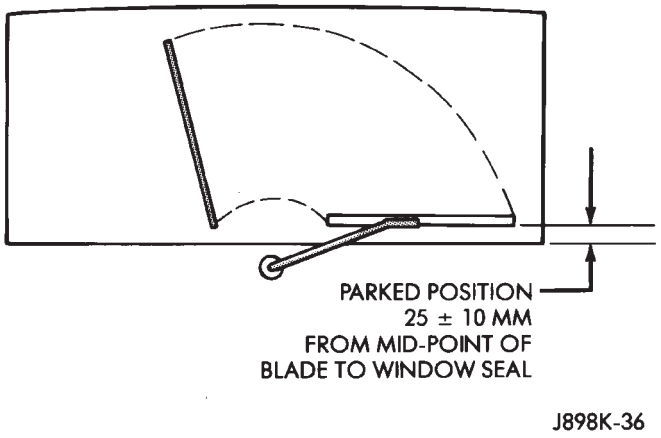


Fig. 3 Rear Wiper Arm Positioning

WASHER PUMP REPLACEMENT

The washer pump for the liftgate is located next to the front washer pump on the washer reservoir in the engine compartment. For replacement refer to the front washer pump replacement procedure.

LIFTGATE WIPER SWITCH REPLACEMENT

(1) Remove the instrument panel bezel; see Instrument Panel and Components Section for the procedure.
(2) Remove the switch housing panel.
(3) Unplug the switch connector. Slightly depress the switch mounting tabs and remove the switch (Fig. 4).

DIAGNOSING REAR WIPER

(1) Remove and inspect 25 amp, #1 fuse. Replace as required.
(2) Turn ignition switch to ACCESSORY and rear wiper switch to WASH.
• Measure voltage at rear wiper switch terminal B. Meter should read battery voltage. If not, repair open to #1 fuse.
• Measure voltage at rear wiper switch terminals A, C and D. Meter should read battery voltage. If not, replace switch.

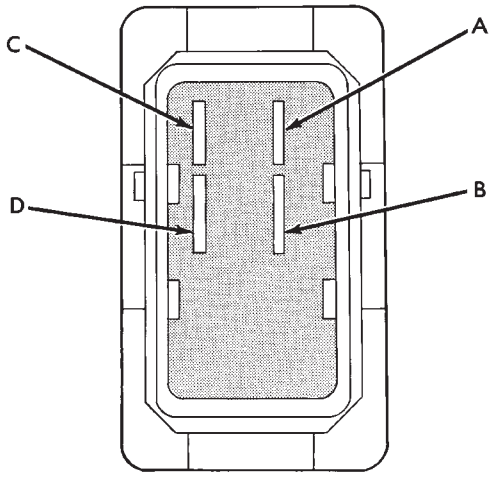


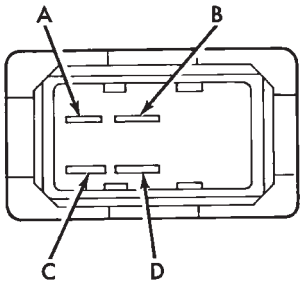
Fig. 4 Rear Wiper Switch

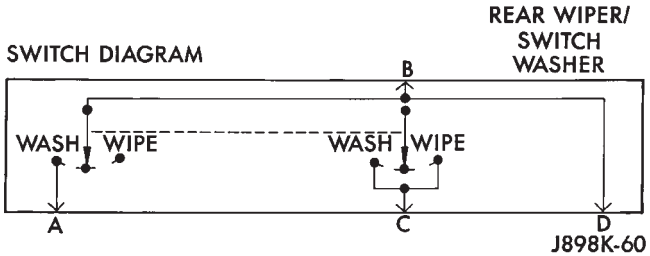
(3) Turn ignition switch to ACCESSORY, place rear wiper switch in WIPE. Measure voltage at rear wiper switch terminal C. Meter should read battery voltage. If not, replace switch.
(4) Remove liftgate cover and measure resistance from rear wiper motor terminal 1 to a good ground. Meter should read zero ohms. If not, repair open to ground splice.
(5) Turn ignition switch to ACCESSORY and rear wiper switch to WASH.
• Measure voltage at motor connector terminals 2, 3 and 4. Meter should read battery voltage. If OK, replace wiper motor. If not, repair open(s) to rear wiper switch.

DIAGNOSING REAR WIPER WASHER

(1) Turn ignition switch to ACCESSORY and place rear wiper/washer switch in WASH.
• Operate rear wiper motor. If motor does not operate check the 25 amp #1 fuse.
(2) Turn ignition switch to ACCESSORY and unplug rear washer pump connector.
• Measure resistance at pump connector terminal B (ignition switch OFF). Meter should read zero ohms. If not, repair open to ground.
• Measure voltage at pump connector terminal A, switch in WASH. Meter should read battery voltage. If OK, replace pump. If not, go to step 3.
(3) Remove switch and reconnect below instrument panel. Backprobe switch connector with ignition switch in ACCESSORY.
• Measure voltage at switch connector terminal B. Meter should read battery voltage. If not, repair open to fuse.
• Measure voltage at switch connector terminal A, switch in WASH. Meter should read battery voltage. If not, replace switch.

REAR WIPER/WASHER SWITCH TESTING





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SWITCH TEST

SWITCH POSITION	TERMINALS	ZERO OHMS
OFF (NORMAL)	B AND A	NO
	B AND C	NO
WIPE	B AND C	YES
	B AND A	NO
WASH	A AND B	YES
	B AND C	YES

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TORQUE SPECIFICATIONS XJ

Component	Torque
Front Window Wiper Pivot Screws and Cowl Bracket Nut	4 N•m (35 in. lbs.)
Rear Window Wiper Pivot – Liftgate	5 N•m (44 in. lbs.)
Rear Window Wiper Motor Mounting Bracket – Liftgate	5 N•m (40 in. lbs.)

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INDEX

FRONT WIPERS/WASHERS GENERAL INFORMATION

The non-intermittent windshield wiper circuit contains three components; control switch, motor and washer pump. The intermittent circuit contains the same components and a wiper module that provides the delay function. Both circuits receive battery feed from and are protected by a 5.3 amp circuit breaker.

In the non-intermittent wiper circuit, the switch connects the motor directly to ignition feed for low and high speed operation. In the intermittent circuit, the switch supplies ignition feed to the delay module, which then supplies the motor. In the delay position, the module is connected with the variable resistor in the wiper switch. The value of the resistance is used by the solid state module to charge a capacitor, which triggers the amount of delay between wipes.

The wiper motor has an arrangement of brushes providing the two wiper speeds. When the wipers are turned off, the park switch maintains current to the motor until the wipers reach the park position on the windshield.

The washer pump receives ignition feed either directly from the wiper switch or from the intermittent module. In either case the electric motor will drive the washer pump.

The wiper motor is mounted on the lower left corner of the windshield.

FRONT WIPER BLADE REPLACEMENT

Rotate the wiper blade release (Fig. 1) clockwise. This will release the wiper blade from the pivot pin.

CAUTION: Take care to ensure that the wiper arm does not strike the windshield after the wiper blade has been removed.

To install, place the blade assembly on the wiper arm and snap the blade assembly into position.

FRONT WIPER ARM REPLACEMENT

(1) Pull the wiper arm forward.

(2) Insert an ice pick type tool into the hole (Fig. 2).

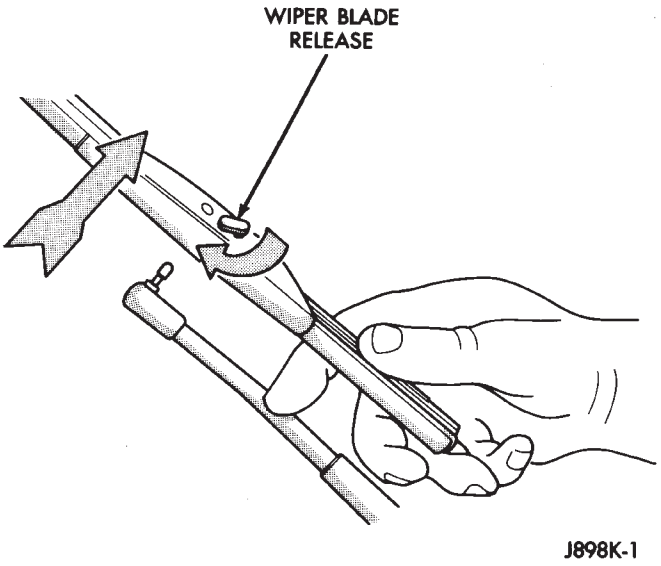


Fig. 1 Wiper Blade Removal

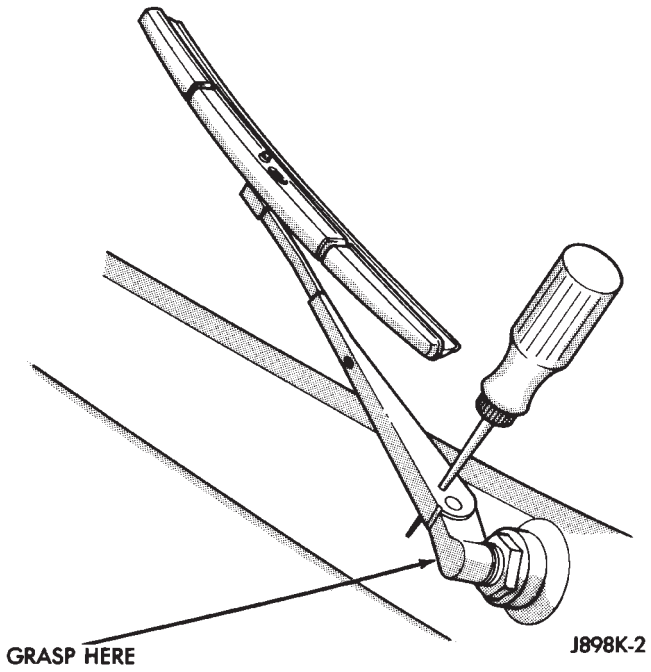


Fig. 2 Wiper Arm Removal/Installation

(3) Grasp the wiper arm above the pivot nut.
(4) Pull and remove the wiper arm assembly.
(5) To install, push the wiper arm over the pivot shaft. Be sure the pivot shaft is in the park position and the wiper arm is positioned correctly on the windshield (Fig. 3).

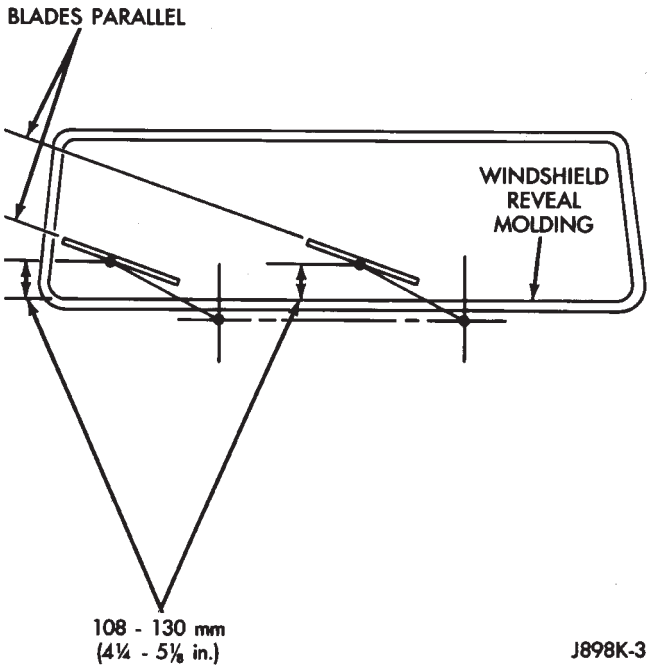


Fig. 3 Wiper Arm Positioning

FRONT WIPER ARM AND PIVOT ASSEMBLY REPLACEMENT

REMOVAL

(1) Remove the left and right wiper arms.
(2) Remove the nuts attaching the pivots to the windshield frame.
(3) Remove the necessary hard or soft top components from the windshield frame.
(4) Remove the windshield holddown bolts in the lower corners of the instrument panel and fold the windshield forward.
(5) Remove wiper motor mounting screws (Fig. 4).
(6) Disconnect wiper linkage drive arm (Fig. 5).
(7) Remove motor wiring clip from base of windshield frame.
(8) Remove 4 inboard screws holding seal to bottom of windshield frame (protruding screw ends interfere with pivot link removal and installation).
(9) Grasp motor and pull motor and drive arm out of access hole (Fig. 6).
(10) Remove pivot shaft assembly through access hole.
(11) Pry drive arm off the motor pivot. DO NOT remove pivot attaching nut (Fig. 7).

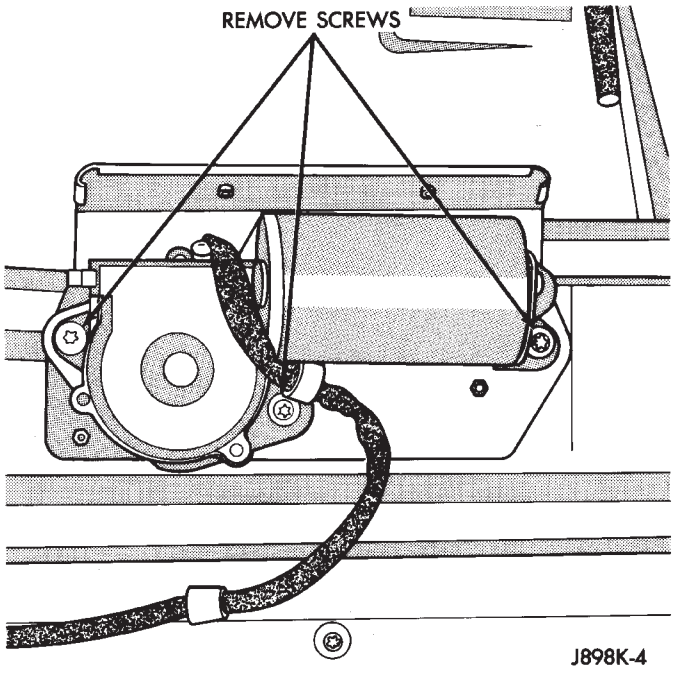


Fig. 4 Remove Wiper Motor Mounting Screws

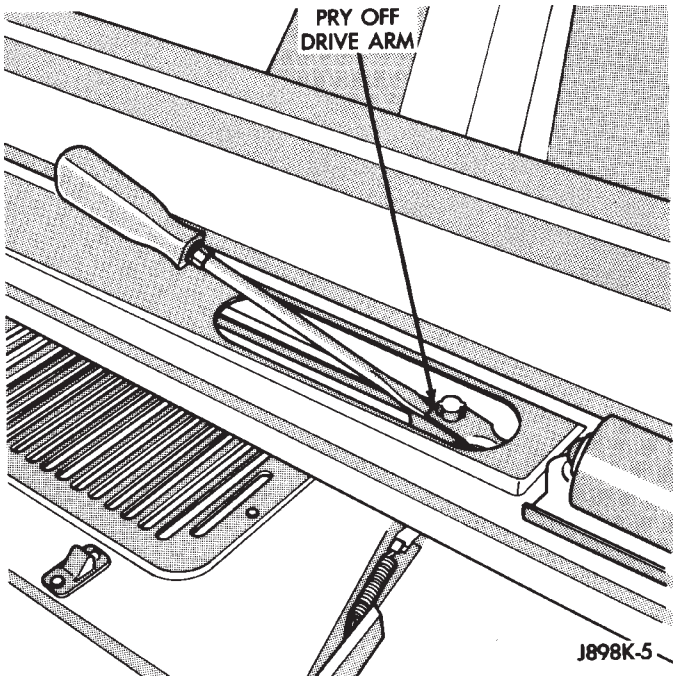


Fig. 5 Disconnect Drive Arm

INSTALLATION

(1) Install wiper linkage drive arm onto motor (Fig. 8).
(2) Install pivot shaft assembly in windshield frame.
(3) Install motor and drive arm in windshield frame.
(4) Install weatherstrip screws.
(5) Connect wiper linkage drive arm to pivot shaft (Fig. 9).

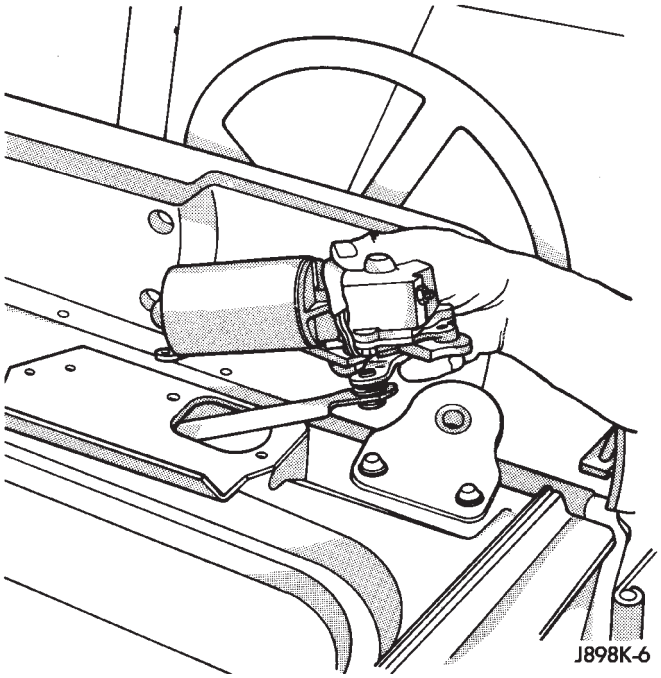


Fig. 6 Remove Wiper Motor and Drive Arm

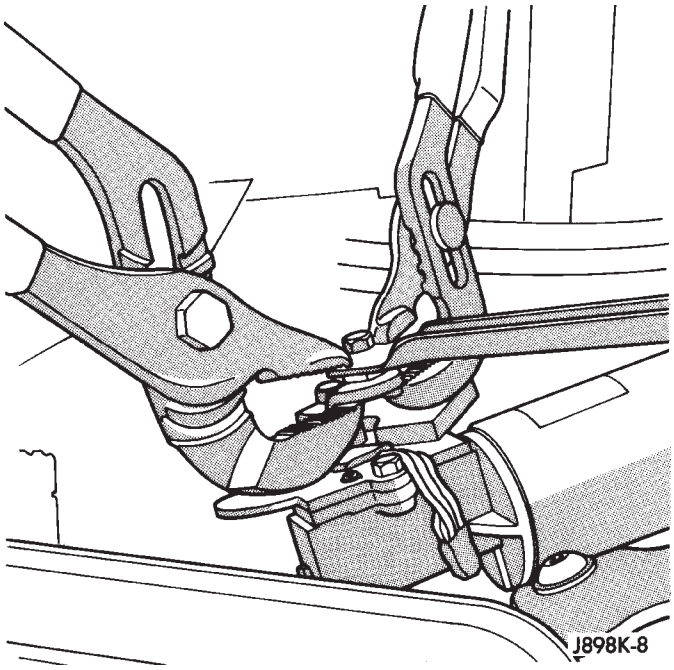


Fig. 8 Install Drive Arm On Motor

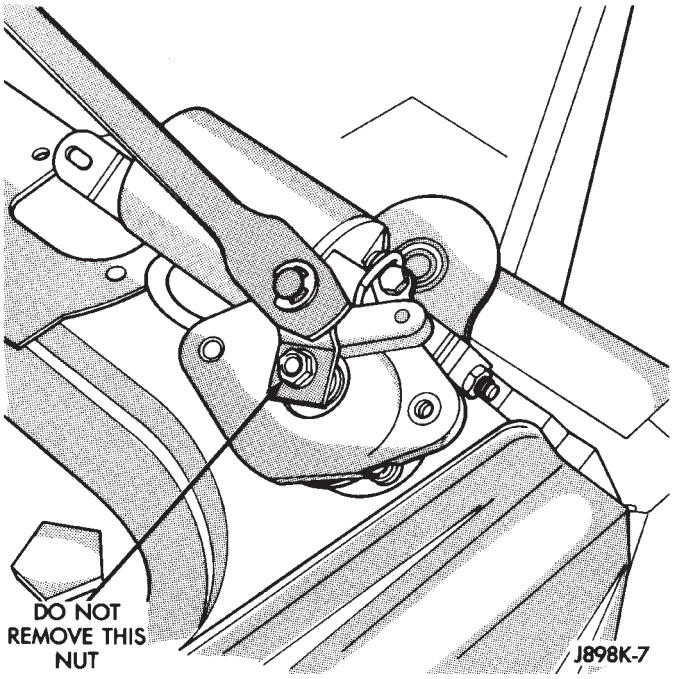


Fig. 7 Drive Arm Removal

(6) Install motor mounting screws. Tighten screws to 10.5 N·m (96 in. lbs.).

Be sure wire harness is not pinched or cut when windshield frame is rotated to upright position.

(7) Raise windshield to upright position and install left and right windshield holddown bolts.

(8) Install nuts attaching pivots to windshield frame. Tighten nuts to 10 N·m (7.5 ft. lbs.).

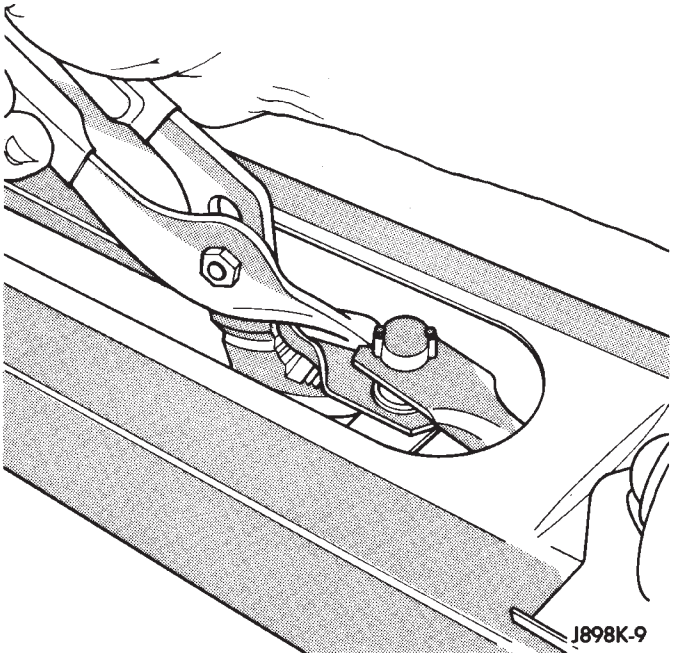


Fig. 9 Connect Drive Arm To Pivot Shaft

(9) Turn wipers on to allow motor to cycle to park position.

(10) Install left and right wiper arms (Fig. 3).

(11) Install necessary top components on windshield frame.

FRONT WIPER MOTOR

REMOVAL

(1) Remove the necessary hard or soft top components from the windshield frame.

(2) Remove the windshield holddown bolts in the lower corners of the instrument panel.
(3) Remove wiper motor mounting screws (Fig. 4).
(4) Remove wiper motor harness retaining clip located on bottom of windshield.
(5) Disconnect the wiper linkage drive arm (Fig. 5)
(6) Grasp the motor and pull the motor and drive arm out of the access hole (Fig. 6).
(7) Pry the drive arm off the motor pivot. DO NOT remove the pivot attaching nut (Fig. 7).
(8) Remove 2 screws holding intermittent wipe module bracket to bottom of instrument panel.
(9) Reach up behind instrument panel and disconnect wiper motor harness.
(10) Remove wiper motor.

INSTALLATION

(1) Install wire harness through hole in top of instrument panel.
(2) Connect wiper motor connector behind instrument panel.
(3) Install intermittent wipe module bracket to bottom of instrument panel.
(4) Turn wipers on to allow motor to cycle to park position.
(5) Install wiper linkage drive arm onto motor (Fig. 8).
(6) Install motor and drive arm in the windshield frame.
(7) Connect wiper linkage drive arm to pivot shaft (Fig. 9).
(8) Install motor mounting screws. Tighten screws to 10.5 N·m (96 in. lbs.).
(9) Install wire harness retaining clip on bottom of windshield.

Be sure wire harness is not pinched or cut when windshield frame is rotated to upright position.

(10) Raise windshield to upright position and install left and right windshield holddown bolts.
(11) Install the necessary top components on windshield frame.

WASHER PUMP REPLACEMENT

(1) Remove 3 washer reservoir mounting screws (Fig. 10).
(2) Disconnect hose(s) from pump.
(3) Drain washer reservoir.
(4) Using a deep socket, remove filter nut from bottom inside reservoir and remove pump.
(5) Reverse the removal procedure to install a new pump.

DIAGNOSING WINDSHIELD WIPERS

(1) Remove in-line circuit breaker near fuse block and turn ignition switch to ACCESSORY or ON.

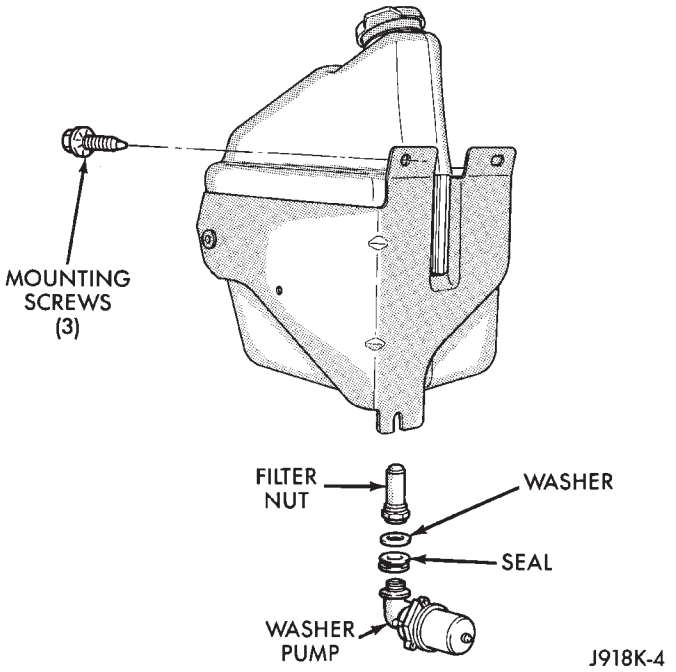


Fig. 10 YJ Washer Reservoir and Pump

- Measure voltage at battery side of circuit breaker cavity. Meter should read battery voltage. If not, repair wiring from ignition switch.
- Measure resistance across circuit breaker terminals. Meter should read zero ohms. If not, replace failed circuit breaker.

(2) Unplug wiper motor side wiring harness connector from wiper switch side harness connector (non-intermittent), or from intermittent wiper module at base of steering column. Turn ignition switch to ACCESSORY or ON.

- Measure voltage at unplugged wiper motor side harness connector terminal D. Meter should read battery voltage. If not, repair wiring from circuit breaker.
- Turn ignition switch to OFF and measure resistance from unplugged wiper motor side harness connector terminal G to ground. Meter should read zero ohms. If not, repair wiring to ground.

(3) Leave ignition switch in OFF, and back probe wiring harness connector at wiper motor. Measure resistance from terminal E of wiper motor side of connector to ground. Meter should read zero ohms. If not, repair wiring to ground.
(4) If equipped with intermittent wipers, turn ignition switch to ACCESSORY or ON. Turn wiper switch to LOW or HIGH. Unplug wiring harness connector (wiper switch side) from intermittent wiper module. Then plug both connectors that have been removed from intermittent wiper module into each other.

CAUTION: DO NOT move the wiper switch to DELAY with the intermittent wiper module removed from the circuit. If the switch is moved to the DELAY position during the next step, the switch will be damaged.

• Test wiper operation in LOW and HIGH speed modes, and test washer operation. If these modes were inoperative, but are OK now, replace failed intermittent wiper module.

(4) To test the wiper/washer switch, see Wiper Switch Testing. Turn ignition switch to OFF. Position the wiper switch as indicated, and back probe switch side of wiper switch connector. If switch tests OK, go to step 5. If not, replace switch and go to step 6.

(5) To further test the wiper/washer switch, turn ignition switch to ACCESSORY or ON. Position the wiper switch as indicated in the tests below, and back probe switch side of wiper switch connector.

• Measure voltage at terminal E with wiper switch in LOW, MIST and with washer switch depressed. Meter should read battery voltage. If not, replace switch.

• Measure voltage at connector terminal C with wiper switch in HIGH. Meter should read battery voltage. If not, replace switch.

• With wiper switch in LOW or HIGH, measure voltage at connector terminal F, then move wiper switch to OFF. Meter shold read battery voltage until wipers park and then zero volts. If OK, go to step 6. If not, check wiring to wiper motor, then go to step 6.

(6) To test the wiper motor, turn the ignition switch to ACCESSORY or ON. Position the wiper switch and back probe the motor connector as indicated.

• Wiper switch in any position, measure voltage at terminal B. Meter should read battery voltage. If not, repair wiring from circuit breaker.

• Wiper switch in LOW, measure voltage at terminal A. Meter should read battery voltage. If OK, but wipers do not operate, replace failed wiper motor. If not, repair wiring from switch or intermittent wiper module connector.

• Wiper switch in HIGH, measure voltage at terminal H. Meter should read battery voltage. If OK, but wipers do not operate, replace failed wiper motor. If not, repair wiring from switch or intermittent wiper module connector.

• Wiper switch in LOW or HIGH, voltmeter connected to terminal D. Turn wiper switch to OFF and observe meter. Meter should read battery voltage when switch goes to OFF, then zero volts after wipers park. If battery voltage is present, but wipers fail to park; or, if no battery voltage present, replace failed wiper motor.

DIAGNOSING NON-INTERMITTENT WINDSHIELD WASHER

Refer to Group 8W - Wiring Diagrams.

(1) Measure resistance from washer pump connector terminal B to a clean chassis ground. Meter should read zero ohms. If not, repair open between terminal B and ground.

(2) Turn ignition switch to ON and press washer switch.

• Measure voltage at switch connector terminal B. Meter should read battery voltage. If not, replace wiper/washer switch.

• Measure voltage at washer pump connector terminal A. Meter should read battery voltage. If OK, replace pump. If not, repair open between switch connector and pump connector.

DIAGNOSING INTERMITTENT WINDSHIELD WASHER

Refer to Group 8W - Wiring Diagrams.

(1) Measure resistance from washer pump connector terminal B to a clean chassis ground. Meter should read zero ohms. If not, repair open between terminal B and ground.

(2) Turn ignition switch to ON and rotate washer switch tab forward.

• Measure voltage at wiper/washer switch connector terminal B located at intermittent wipe module. Meter should read battery voltage. If not, replace wiper switch.

• Measure voltage at intermittent wipe module connector terminal B (to washer pump). Meter should read battery voltage. If not, replace intermittent wipe module.

• Measure voltage at washer pump connector terminal A. Meter should read battery voltage. If OK, replace pump. If not, repair open from intermittent wipe module connector terminal B.

REAR WIPER ARM REPLACEMENT

(1) Install wiper arm remover, Snap On A192 or equivalent, on wiper arm (Fig. 11). Lift arm and then remove from pivot shaft.

CAUTION: Do not use a screwdriver or other prying tool to remove an arm. This may distort it in a way that will allow it to come off the pivot shaft in the future, despite how carefully it is installed. NEVER push or bend the spring clip in the base of the arm in an attempt to release the arm. This clip is self releasing.

(2) To install, reverse the removal procedure.

(3) Wet the window and check the park position by operating the wiper motor several times.

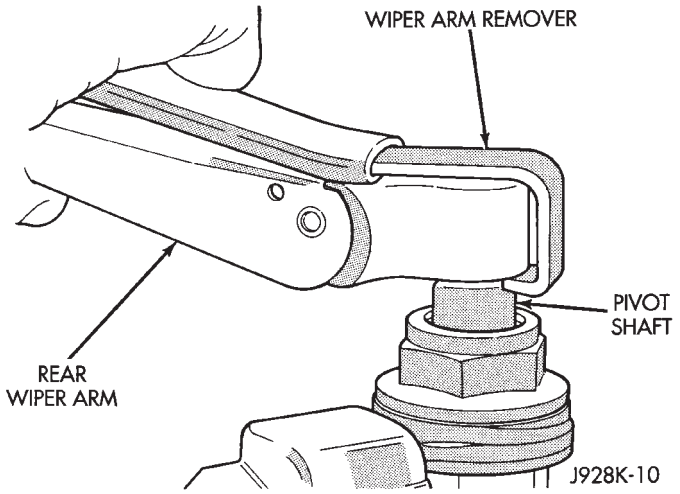


Fig. 11 Removing Liftgate Wiper Arm

REAR WASHER PUMP REPLACEMENT

The washer pump for the rear window is located next to the front washer pump on the washer reservoir in the engine compartment (Fig. 12). For replacement refer to the front washer pump replacement procedure.

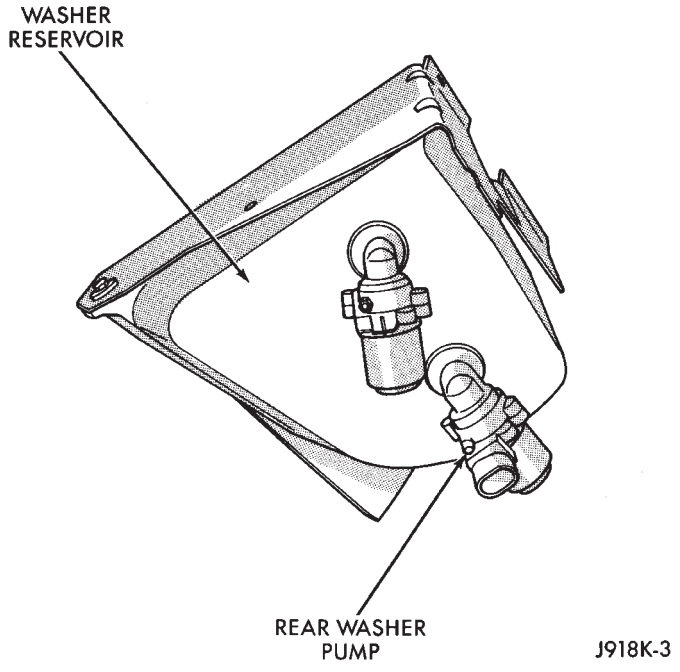


Fig. 12 Rear Washer Pump

REAR WIPER SWITCH REPLACEMENT

(1) Remove the instrumentation shroud; see Instrument Panel, Indicator Bezel Replacement.

(2) Remove the switch housing panel.

(3) Unplug the switch connector. Slightly depress the switch mounting tabs and remove the switch (Fig. 13).

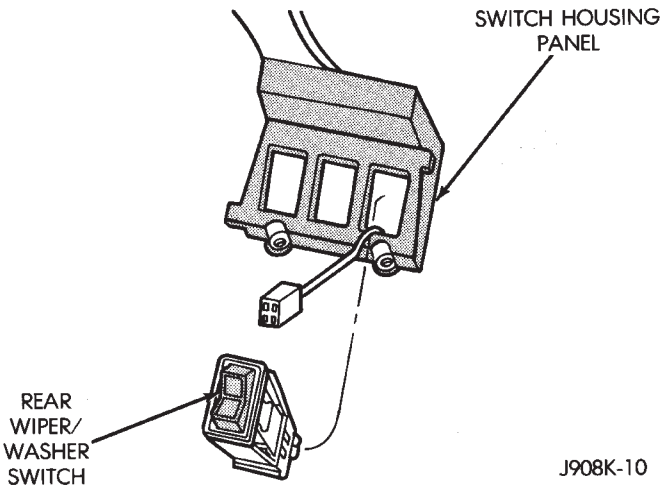


Fig. 13 Rear Wiper Switch

REAR WIPER MOTOR REPLACEMENT

(1) Remove wiper arm from motor (refer to Wiper Arm Replacement).

(2) Remove pivot shaft retaining nut.

(3) Remove motor trim cover (Fig. 14).

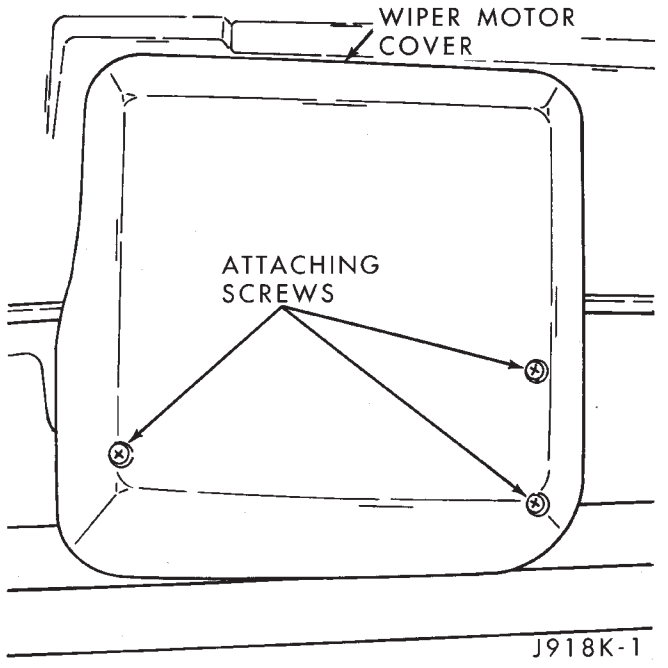


Fig. 14 Rear Wiper Motor Cover

(4) Disconnect electrical connector (Fig. 15).

(5) Remove hinge nut holding motor to top.

(6) To install, reverse the removal procedures.

WASHER NOZZLE REPLACEMENT

(1) From inside the vehicle remove the motor trim cover.

(2) Remove the washer hose from the back of the washer nozzle.

(3) Remove the nut holding the nozzle to the glass.

(4) Install the new washer nozzle.

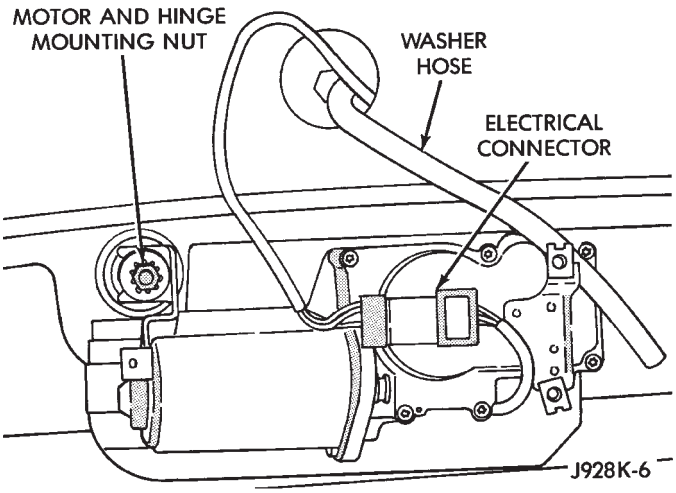


Fig. 15 Rear Wiper Motor

DIAGNOSING REAR WIPER/WASHER

Refer to Group 8W - Wiring Diagrams.

(1) Turn ignition switch to ON and rear wiper/ washer switch to WASH.

- Measure voltage at switch connector terminal P. Meter should read battery voltage. If not, check 20 amp, fuse #1.
- Measure voltage at switch connector terminal B. Meter should read battery voltage. If not, replace switch.
- Measure voltage at switch connector terminal A. Meter should read battery voltage. If not, replace switch.

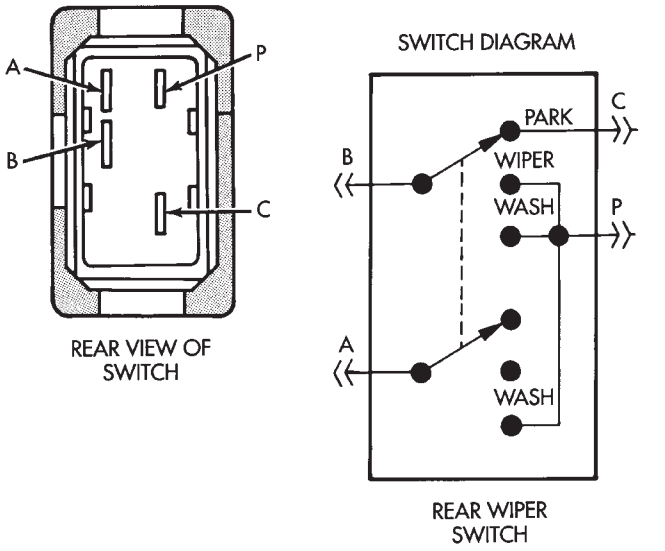
(2) Turn ignition switch to ON and unplug rear washer pump connector.

- Measure resistance at pump connector black wire to ground. Meter should read zero ohms (ignition OFF). If not, repair open to ground.
- Measure voltage at pump connector brown/white wire, switch in WASH. Meter should read battery voltage. If OK, replace pump. If not, check wiring.

(3) Turn ignition switch to ON, unplug rear wiper motor connector and place wiper switch in WIPE.

- Measure resistance at motor connector terminal B to ground. Meter should read zero ohms. If not, repair open to ground.
- Measure voltage at motor connector terminal A. Meter should read battery voltage. If not, check wiring to fuse.
- Measure voltage at motor connector terminal C. Meter should read battery voltage. If OK, replace motor. If not, repair open to switch.

REAR WIPER/WASHER SWITCH TESTING



SWITCH TEST

SWITCH POSITION	TERMINALS	ZERO OHMS
OFF (NORMAL)	P AND B	NO
	P AND A	NO
WIPE	P AND B	YES
	P AND A	NO
WASH	P AND B	YES
	P AND A	YES

J928K-8

WIPER CONTROL SWITCH REPLACEMENT

(1) Disconnect negative cable from battery.
(2) Remove horn button with a push and turn motion.
(3) Remove horn button components (Fig. 1).

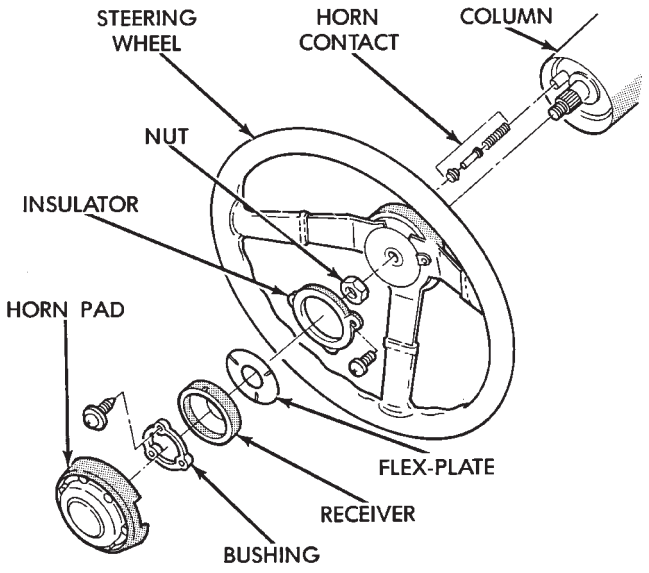


Fig. 1 Steering Wheel Removal/Installation

(4) Turn ignition switch to the LOCK position and remove the steering wheel nut and washer.
(5) Scribe an alignment mark on the steering in line with the mark already existing on the end of the steering column.
(6) Remove vibration damper from the steering column hub, if equipped.
(7) Remove steering wheel using a steering wheel puller. DO NOT hammer on puller or end of steering shaft.

WARNING: TO REMOVE THE STEERING SHAFT SNAP RING IN THE FOLLOWING STEP, THE LOCKPLATE MUST BE COMPRESSED. DO NOT ATTEMPT TO REMOVE THE LOCKPLATE WITHOUT COMPRESSOR TOOL C4156 AS THE LOCKPLATE IS UNDER HEAVY SPRING TENSION.

(8) Compress lockplate with compressor tool C4156.
(9) Remove steering shaft snap ring (Fig. 2). Discard snap ring. It is not reusable.
(10) Remove compressor tool.
(11) Remove lockplate, cancelling cam, and upper bearing preload spring.
(12) Remove horn button components from canceling cam.

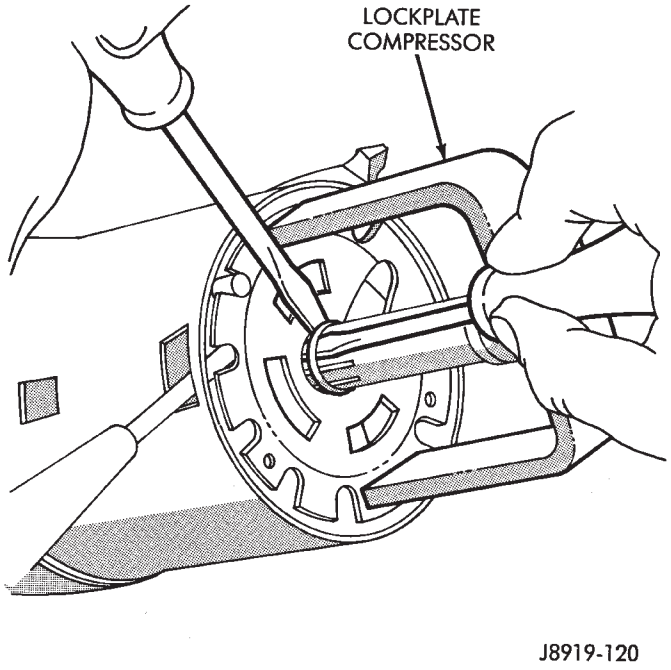


Fig. 2 Lockplate Removal

(13) Remove screw and hazard warning switch knob.
(14) Remove dimmer switch actuator arm attaching screw (Fig. 3).

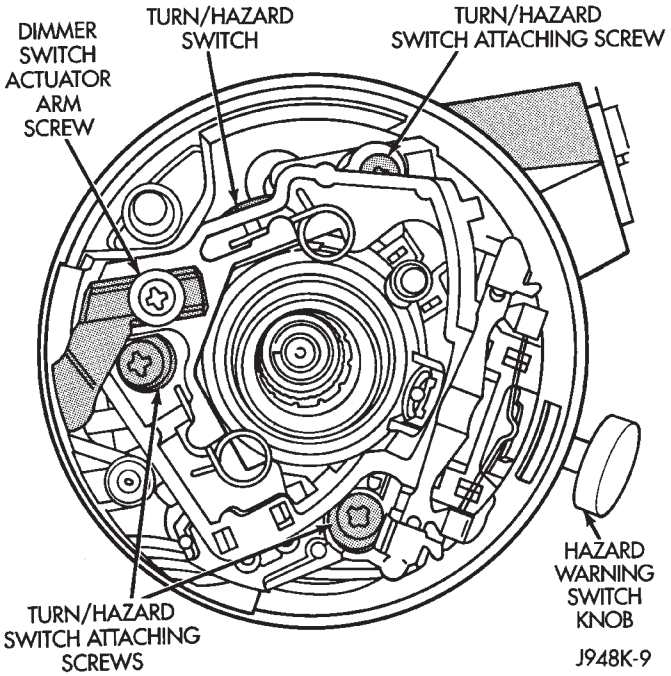


Fig. 3 Turn/Hazard Switch And Dimmer Actuating Arm Screws

(15) Remove turn/hazard switch attaching screws (Fig. 3).
(16) **XJ** Remove lower instrument panel cover trim panel.

(17) **YJ**

(a) Remove 6 shroud screws (Fig. 4).

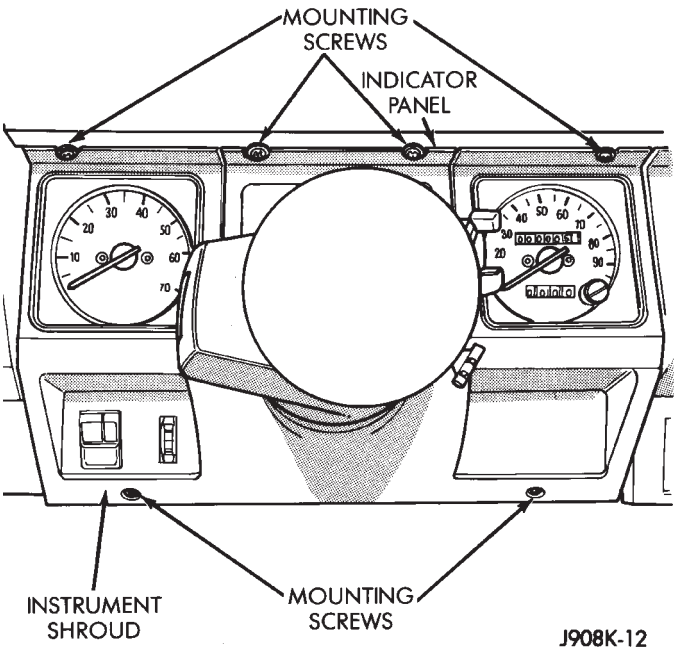


Fig. 4 Instrument Shroud Removal/Installation—YJ

(b) Slide shroud toward steering wheel.

(18) Remove cover under column.

(19) If vehicle is equipped with a column shift, remove PRNDL cable clip (Fig. 5).

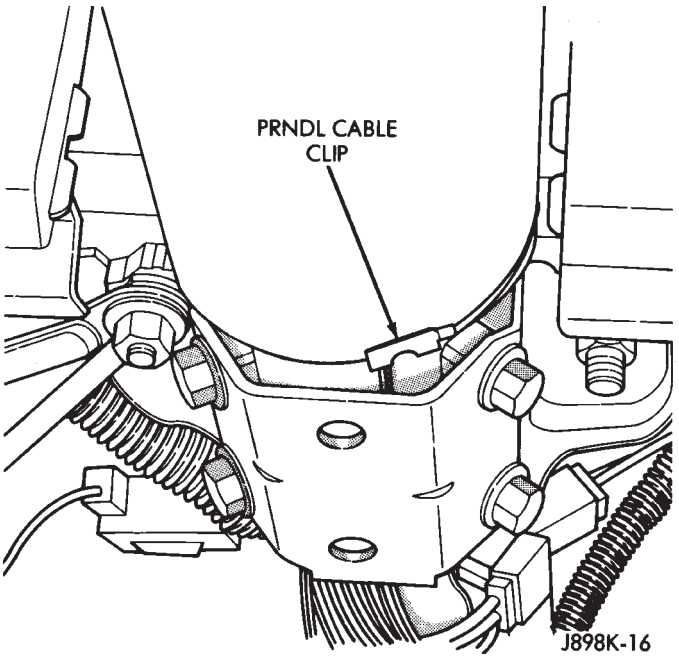


Fig. 5 PRNDL Cable Clip Removal/Installation

(20) Remove 2 nuts holding steering column bracket to brake sled (Fig. 6).

(21) Remove 4 bolts holding steering column brace to column.

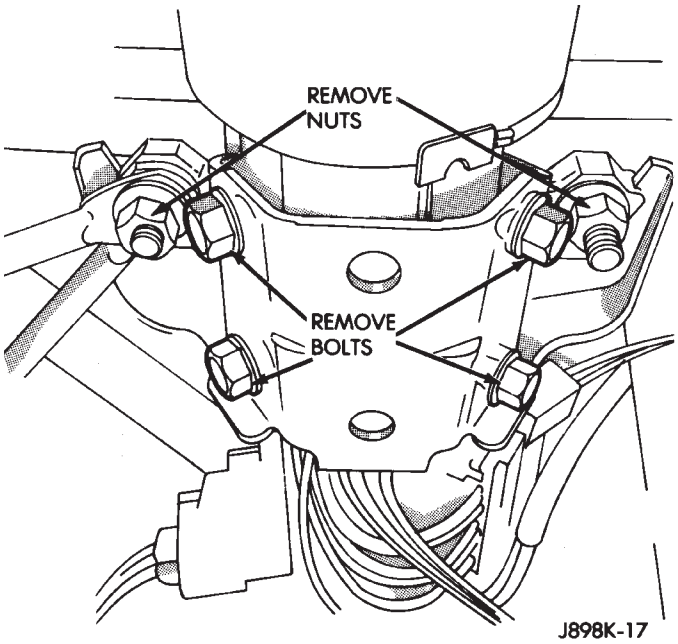


Fig. 6 Lower Steering Column Mounting

(22) Loosen column brace mounting nut at drivers side kick panel. This will allow column to drop.

(23) Unplug wiper switch connector.

(24) Tape connector to wires (Fig. 7).

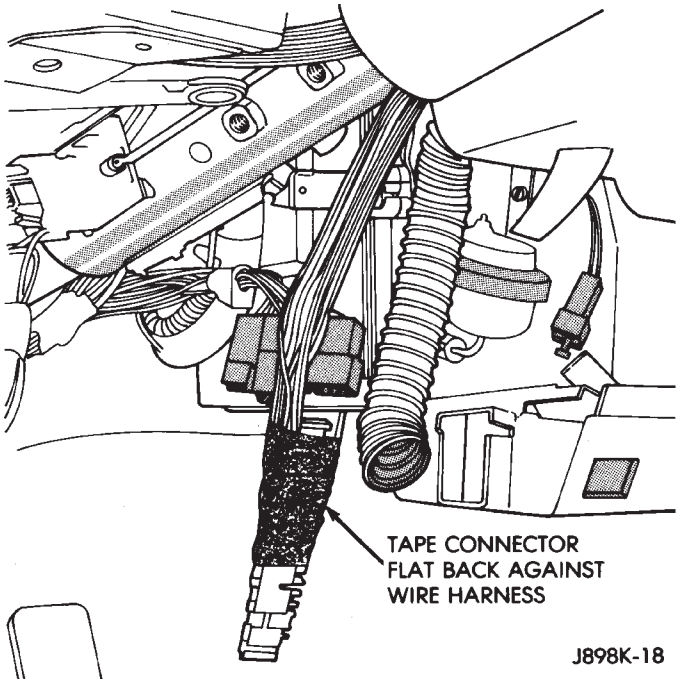


Fig. 7 Tape Wiper Switch Connector

(25) Push turn/hazard connector up and out of steering column connector (Fig. 8).

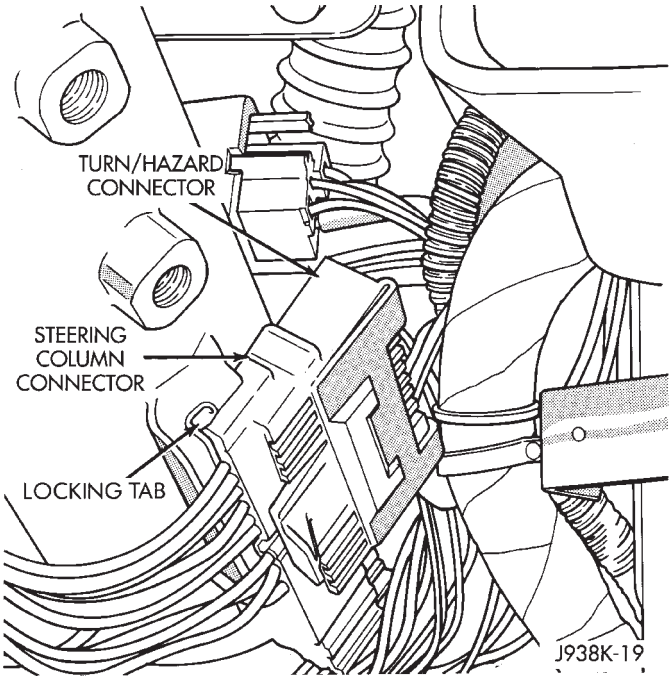


Fig. 8 Turn/Hazard Switch And Steering Column Connectors

(26) Pry up locking tabs of steering column connector and remove connector from column bracket.

(27) Remove plastic harness cover by pulling it up and over weld nuts then open and slide the cover off harness (Fig. 9).

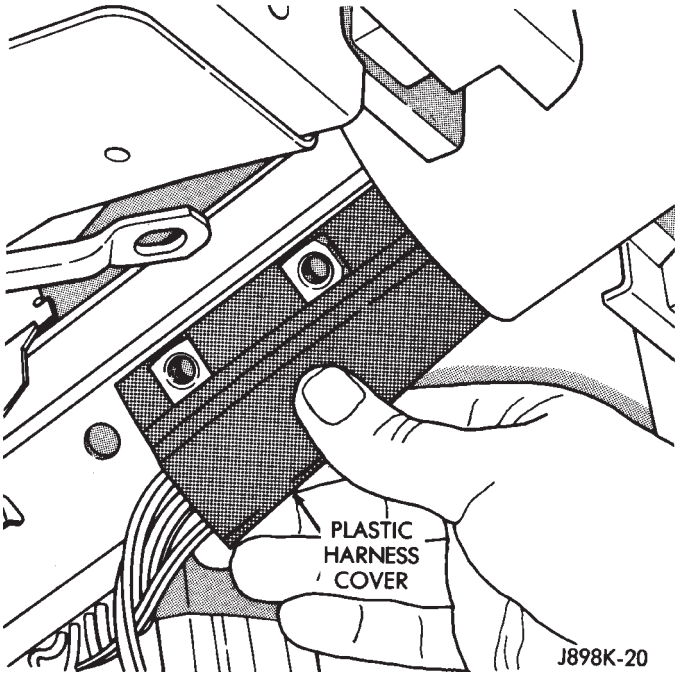


Fig. 9 Remove Plastic Harness Cover

(28) Pull turn/hazard switch out of column far enough to allow access to remaining screws.

(29) Insert ignition key in lock cylinder and turn ignition switch to ON position.

(30) Remove key warning buzzer switch and retaining clip with a paper clip inserted below retainer so that retainer is flattened (Fig. 10).

Do not attempt to remove buzzer switch and clip separately. The clip could fall into the column jacket.

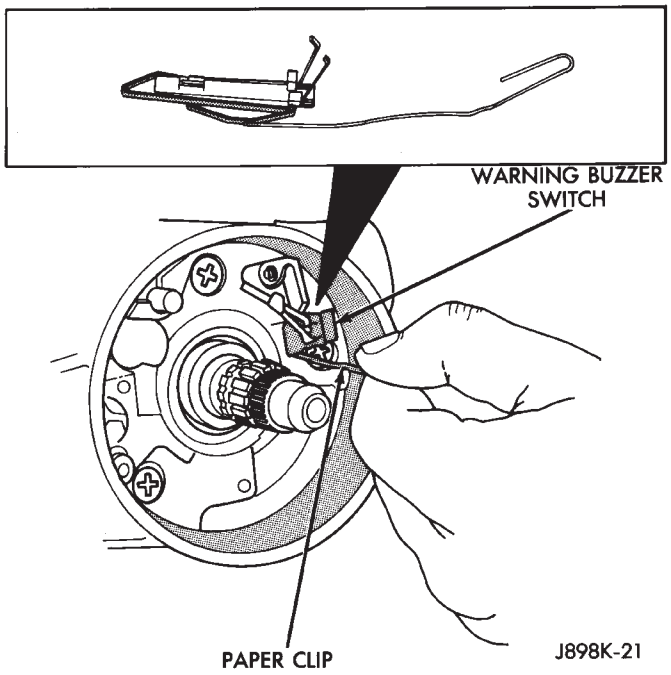


Fig. 10 Buzzer Switch Removal

(31) Remove ignition lock cylinder retaining screw and pull lock cylinder out of column housing (Fig. 11).

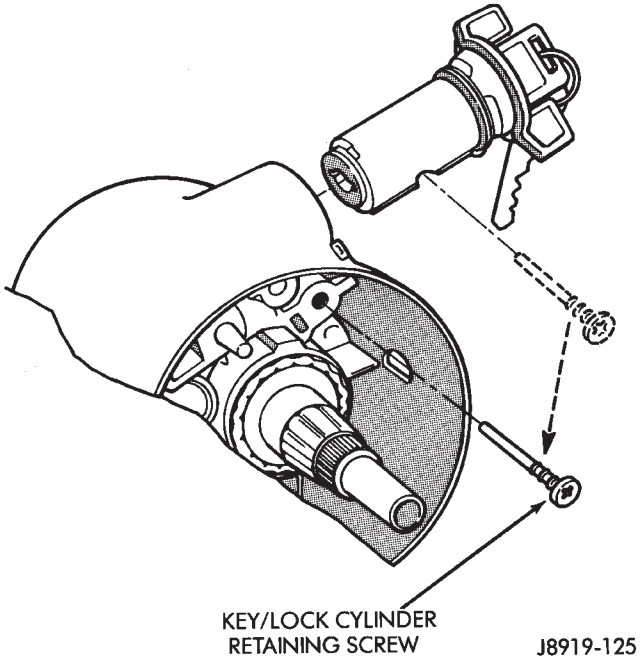


Fig. 11 Lock Cylinder Removal/Installation

(32) Remove screws that attach housing and shroud assembly to column jacket and carefully remove housing and shroud assembly (Fig. 12).

DO NOT let dimmer switch rod, lock pin or lock rack fall out.

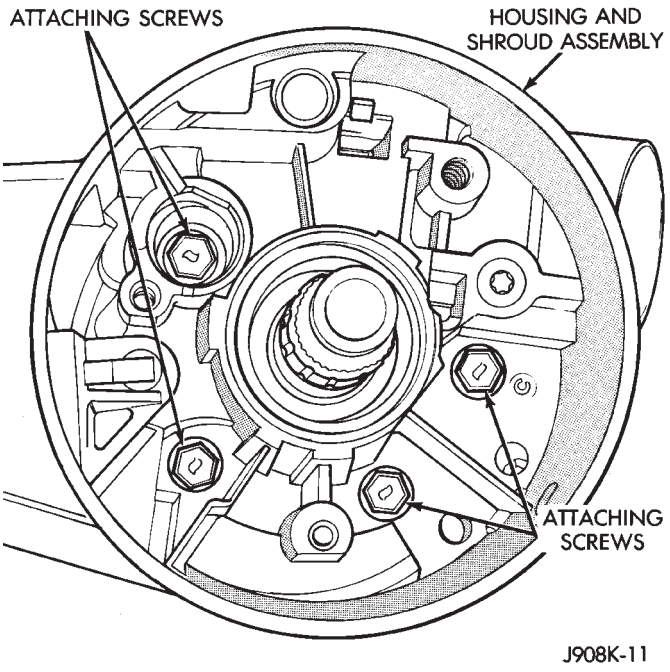


Fig. 12 Steering Column Housing Removal/Installation

(33) Remove turn/hazard/wiper lever by pulling it straight out of column.

(34) Remove wiper switch cover from back of housing and shroud assembly (Fig. 13). If equipped with column shift, remove screw holding the cover on.

(35) Remove pivot screw from housing and remove wiper switch.

(36) Install a new switch and switch cover.

(37) Push on dimmer switch rod to make sure it is connected then carefully position housing and shroud assembly to column (Fig. 14).

Make sure nylon spring retainer on lock pin is positioned forward of the retaining slot of lock rack (Fig. 14).

Position first tooth of gear (farthest from the block tooth) with the most forward tooth of lock rack.

(38) Install screws that attach housing and shroud assembly to column jacket and carefully mate housing and shroud assembly.

(39) Insert key and lock cylinder and test that lock pin extends fully when key is moved to lock position.

(40) To install remaining parts, reverse removal procedures.

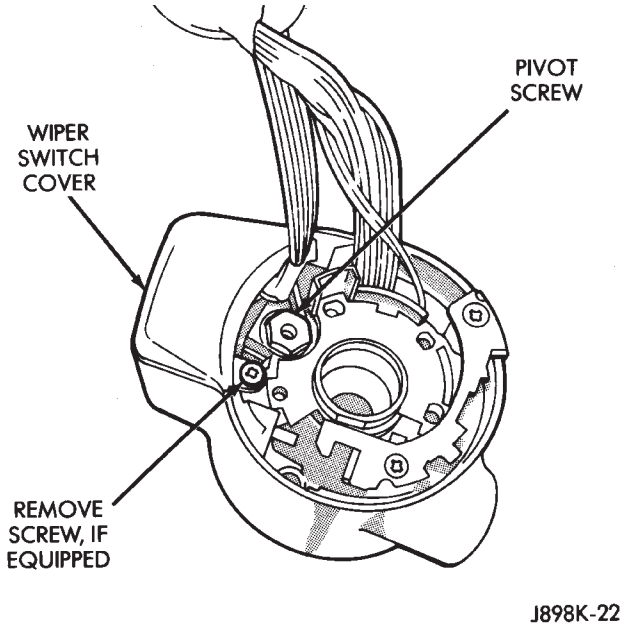


Fig. 13 Remove Pivot Screw

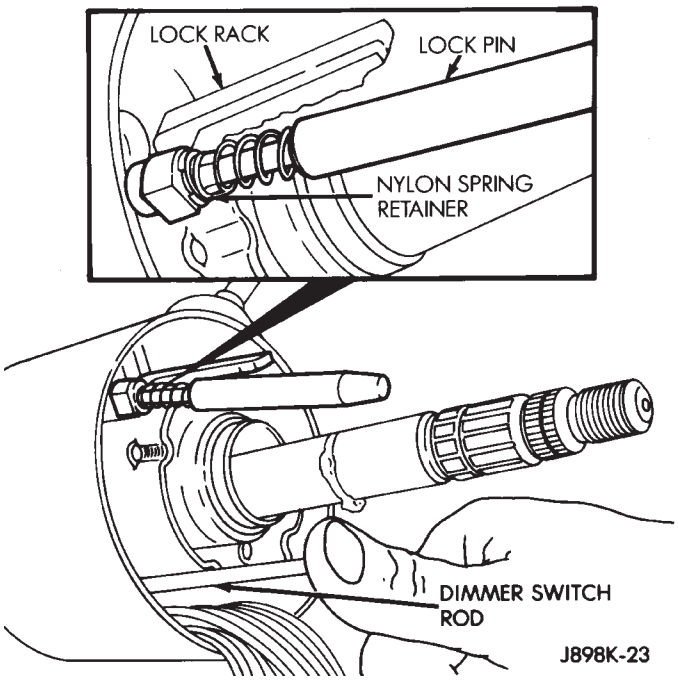


Fig. 14 Check Dimmer Switch Rod and Lock Pin

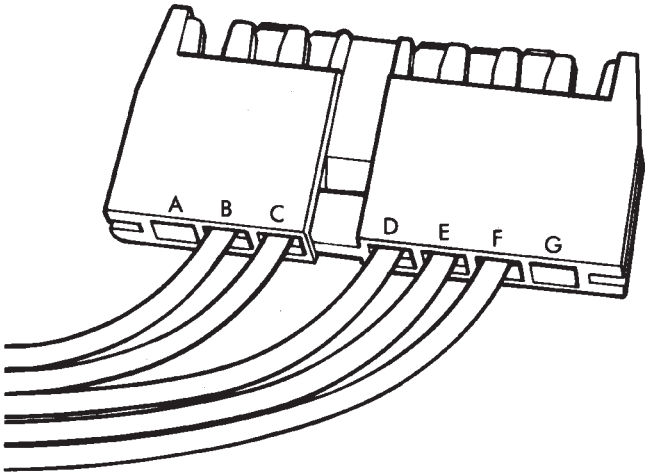
CAUTION: When installing a wiper switch, make sure wires are laying flat on bottom inside of column.

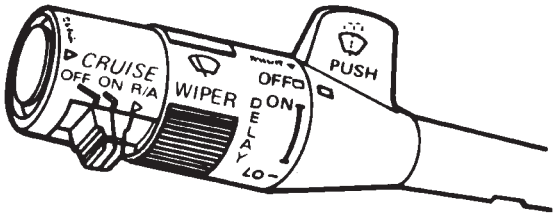
On vehicles equipped with column shift, install PRNDL cable clip with shift indicator on N (neutral). Move selector through the range and make sure it lines up with each letter.

(41) Install steering wheel. Tighten steering wheel nut to 34 N·m (25 ft. lbs.) torque.

WIPER SWITCH TESTING

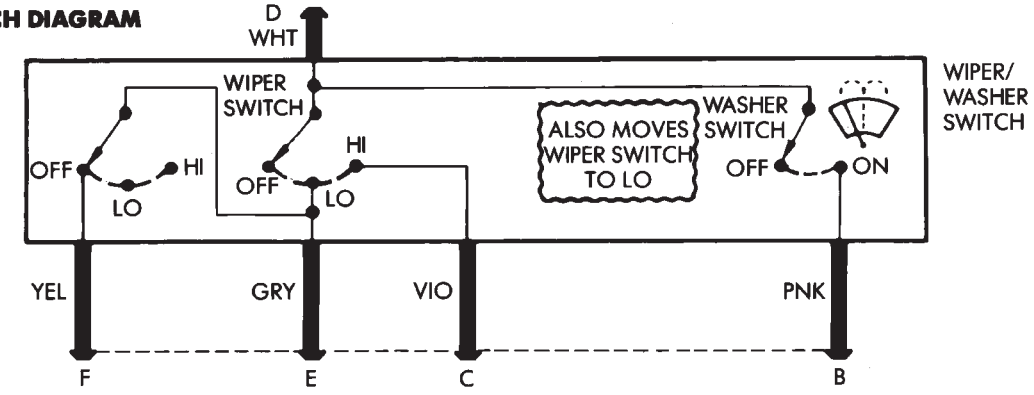
STANDARD WIPER WASHER





B - WASHER PINK
C - HI VIOLET
D - IGNITION WHITE
E - LO/PARK GRAY
F - OFF/PARK YELLOW

SWITCH DIAGRAM

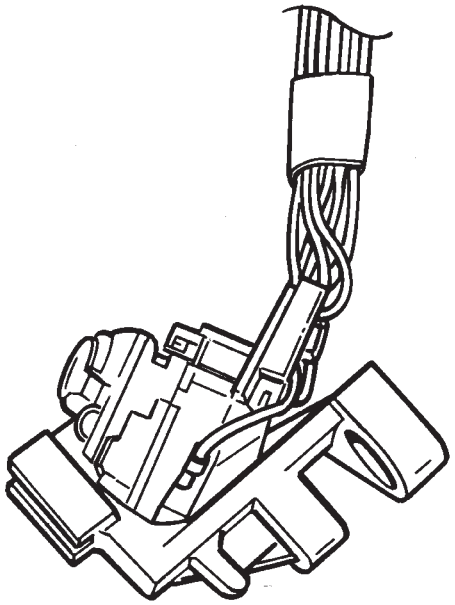


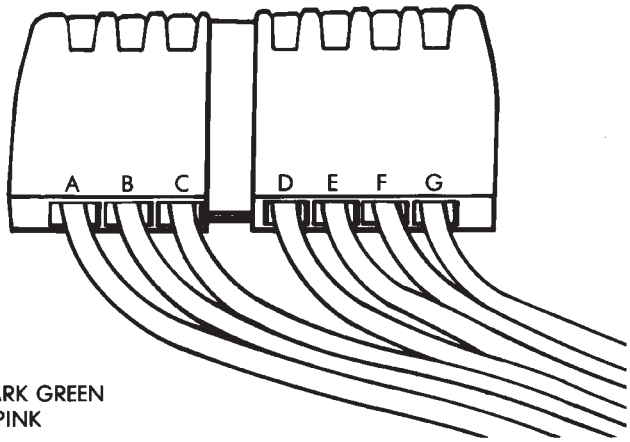
SWITCH TEST

SWITCH POSITION	TERMINALS	ZERO OHMS
Off	E and F	Yes
	All Others	No
Lo	D and E	Yes
	All Others	No
Hi	C and D	Yes
	All Others	No
Wash	B and D	Yes
	D and E	Yes
	All Others	No

J898K-49

INTERMITTENT WIPER WASHER

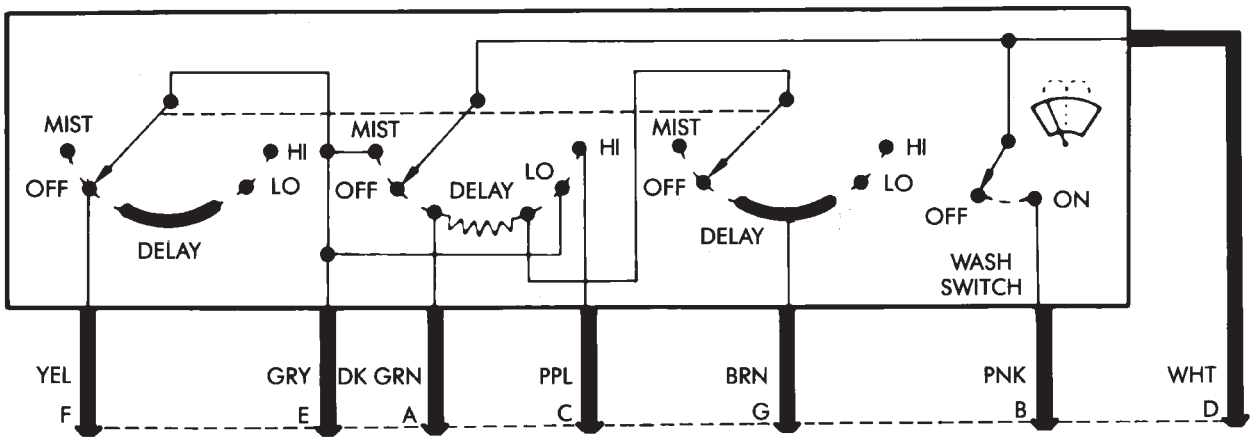




A - DELAY DARK GREEN
B - WASHER PINK
C - HI VIOLET
D - IGNITION WHITE
E - LO/MIST PARK GRAY
F - OFF/PARK YELLOW
G - DELAY BROWN

SWITCH DIAGRAM

WIPER/WASHER SWITCH



SWITCH TEST

SWITCH POSITION	TERMINALS	ZERO OHMS
Off	E and F	Yes
	All Others	No
Lo	D and E	Yes
	All Others	No
Hi	C and D	Yes
	All Others	No
Wash/Mist	B and D	Yes
	D and E	Yes
	All Others	No
Delay	A and G	152-480K ohms

J898K-50