

WIPER/WASHER SYSTEM

1993 Jeep Cherokee

1993 ACCESSORIES & EQUIPMENT
Chrysler Corp. Wiper/Washer Systems

Jeep; Cherokee, Grand Cherokee, Grand Wagoneer, Wrangler

DESCRIPTION & OPERATION

All models use a standard wiper system with a 2-speed motor and electric washers. An optional system provides an intermittent cycle. Optional rear wiper/washer system is available.

ADJUSTMENTS

WIPER ARM ADJUSTMENT

Cherokee, Grand Cherokee & Grand Wagoneer

Ensure wiper shafts are in park position. Install driver-side wiper arm onto pivot shafts so that end of wiper arm is .9-2" (23-52 mm) above lower windshield reveal molding. Install passenger-side wiper arm so that its end is 1.3-2.4" (33-62 mm) above reveal molding. Blades should be parallel to lower reveal molding after installation. Install rear wiper arm (if equipped) so that midpoint of blade is .6-1.4" (15-35 mm) above lower window seal.

Wrangler

Ensure wiper shafts are in park position. Install both wiper arms onto pivot shafts so that end of wiper arms are 4 1/4-5 1/8" (108-130 mm) above lower windshield reveal molding. Blades should be parallel to each other after installation.

TESTING

FRONT WIPER MOTOR TEST

Cherokee, Grand Cherokee & Grand Wagoneer

1) Measure resistance between motor connector terminal No. 4 (Black wire) and ground. Resistance should be zero ohms. If resistance is not as specified, repair open in Black wire.

2) Turn ignition switch to ACCY position. Set wiper switch in any position. Using a voltmeter, measure voltage at motor connector terminal No. 1 (Light Green/Black wire). If battery voltage exists but motor is inoperative, replace motor. If battery voltage does not exist, repair open in Light Green/Black wire. Recheck motor operation.

3) Set wiper switch in LO position. Check voltage at motor connector terminal No. 2 (Tan/Red wire). If battery voltage exists but motor is inoperative, replace motor. If battery voltage does not exist, repair open in Tan/Red wire. Recheck motor operation.

4) Set wiper switch in HI position. Check voltage at motor connector terminal No. 2 (Tan/Red wire). If battery voltage exists but motor is inoperative, replace motor. If battery voltage does not exist, repair open in Tan/Red wire. Recheck motor operation.

NOTE: On Cherokee, Brown/White wire at motor connector terminal No. 5 will change to Brown/Tan wire at splice between harness connector and motor connector.

5) Check voltage at motor connector terminal No. 5 (Brown/White wire). Turn wiper switch to OFF position while observing

voltmeter. Battery voltage should exist until wipers park. Voltage should then drop to zero volts. If voltage is as specified, but motor is inoperative, replace motor. If battery voltage is not as specified, repair open in Brown/White wire. Recheck motor operation.

Wrangler

1) Unplug wiper motor connector. Check for continuity between harness connector terminal "E" (Black wire) and ground. If no continuity exists, repair open circuit in Black wire to ground. Reconnect wiring to motor.

2) Turn ignition switch to accessory position. With wiper switch in any position, check for battery voltage at harness connector terminal "B" (Dark Blue wire). If battery voltage is not present, repair open circuit in Dark Blue wire from circuit breaker.

3) Set wiper switch to LO. Check for battery voltage at harness connector terminal "A" (Brown/White wire). If battery voltage is present, replace wiper motor. If battery voltage is not present, repair open circuit in Brown/White wire to wiper switch.

4) Set wiper switch to HI. Check for battery voltage at harness connector terminal "H" (Red/Yellow wire). If battery voltage is present, replace wiper motor. If battery voltage is not present, repair open circuit in Red/Yellow wire to wiper switch.

5) Check for battery voltage at harness connector terminal "D" (Dark Green/Yellow wire). Set wiper switch to OFF. Battery voltage should be present until wipers park, then drop to zero volts. If voltage is as specified, replace motor. If voltage is not as specified, repair open circuit in Dark Green/Yellow wire to wiper switch.

FRONT WIPER SWITCH TEST

NOTE: All terminals specified in this test are on wiper switch connector for vehicles with standard wipers. For vehicles with intermittent wipers, specified terminals are on switch side connector of intermittent module. Module is on lower instrument panel cover, near steering column.

Cherokee & Wrangler

1) Turn ignition on. Check for battery voltage on terminal "D" (White wire). If no voltage exists, repair open circuit in White wire from circuit breaker.

2) Set wiper switch to LO. Measure voltage at terminal "E" (Gray wire). If meter does not indicate battery voltage, replace switch.

3) Set wiper switch to HI. Measure voltage at terminal "C" (Purple wire). If meter does not indicate battery voltage, replace switch.

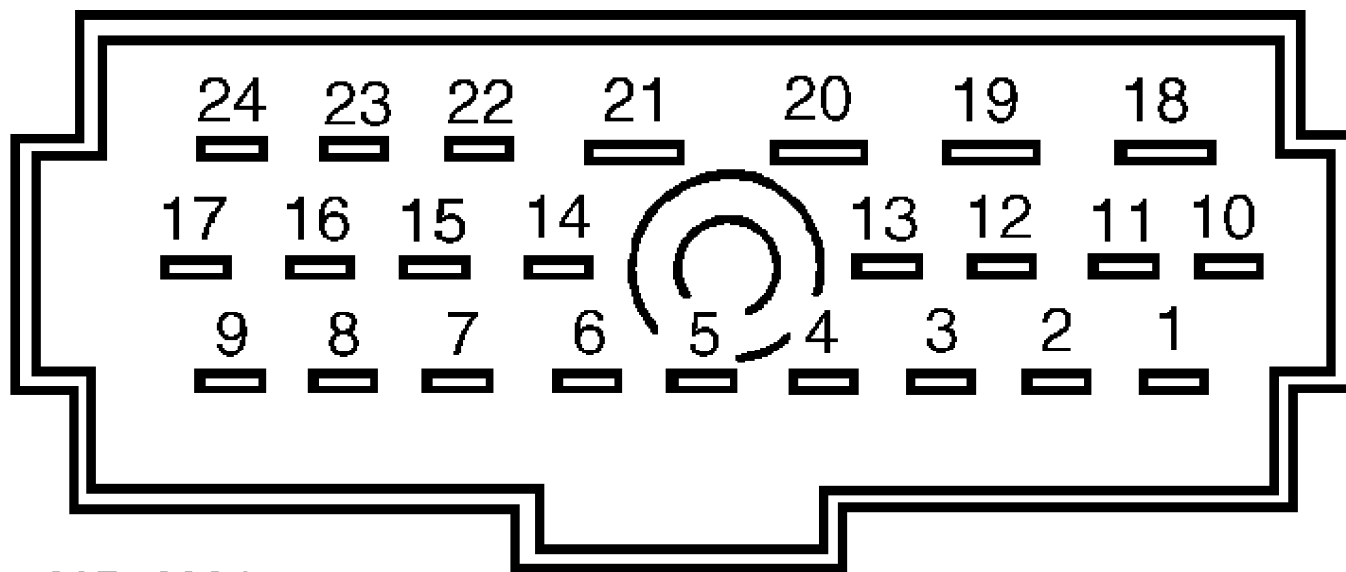
4) Measure voltage at terminal "F" (Yellow wire). Meter should indicate battery voltage. Set wiper switch to OFF. Meter should indicate battery voltage until wipers park, then drop to zero volts. If voltage is not as specified, replace switch.

5) For models with intermittent wipers, disconnect switch side connector from module. With an ohmmeter, measure resistance between terminals "A" (Dark Green wire) and "D" (White wire) while rotating switch from minimum to maximum delay. If resistance does not vary smoothly between 0-500,000 ohms, replace switch.

6) For models with intermittent wipers, disconnect switch side connector from module. With an ohmmeter, measure resistance between terminals "A" (Dark Green wire) and "G" (Brown wire) while rotating switch from minimum to maximum delay. If resistance does not vary smoothly between 0-500,000 ohms, replace switch.

Grand Cherokee & Grand Wagoneer

Disconnect multifunction switch harness connector. See FRONT WIPER SWITCH under REMOVAL & INSTALLATION. Using ohmmeter, check for continuity in wiper/washer terminals of multifunction switch with turned to listed wiper/washer positions. See Fig. 1. See WIPER SWITCH CONTINUITY (Grand Cherokee) table. If continuity is not as specified, multifunction switch must be replaced as an assembly.



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Fig. 1: Multifunction Switch Pin ID (Grand Cherokee & Grand Wagoneer)
 Courtesy of Chrysler Corp.

WIPER SWITCH CONTINUITY TABLE (GRAND CHEROKEE & GRAND WAGONEER)

Switch Position	Continuity Between Pins
Off	6 & 7
Delay (1) (2)	1 & 2, 1 & 4, 2 & 4, 4 & 9
Low	4 & 6
High	4 & 5
Wash	3 & 4

- (1) - Resistance at maximum delay position should be 270,000-330,000 ohms.
- (2) - Resistance at minimum delay position is zero ohms with ohmmeter set on high ohm scale.

INTERMITTENT WIPER MODULE TEST

NOTE: DO NOT move switch to intermittent mode during following test. Damage to switch rheostat will result.

1) Test operation of all wiper functions. If any malfunction is found, remove intermittent wiper module. Connect harness connectors together. This will remove intermittent feature from system, for test purposes. Turn ignition switch to ACCY position.

2) Move wiper switch through all positions EXCEPT intermittent. If wiper system functions normally, replace intermittent wiper module. Retest wiper system. If wiper system does not function properly, see FRONT WIPER MOTOR TEST and/or FRONT WIPER SWITCH TEST.

FRONT WASHER MOTOR TEST

1) Unplug washer pump connector, under washer reservoir in engine compartment. Check for continuity between harness connector terminal "B" (Black wire) and ground. See Fig. 2. If no continuity exists, repair open circuit in Black wire to ground.

2) Connect a jumper wire between terminal "B" on washer pump and a known good ground. Using jumper wire with 15-amp in-line fuse, supply battery voltage to washer pump terminal "A" (Brown wire on Cherokee and Wrangler; Brown/Tan wire on Grand Cherokee and Grand Wagoneer). Replace pump if it does not operate.

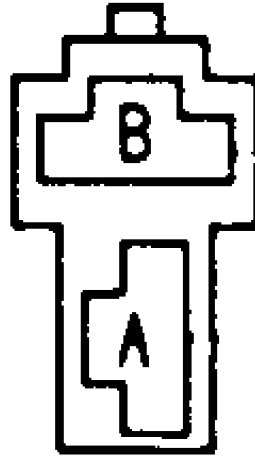


Fig. 2: Identifying Windshield Washer Pump Terminals (Typical)
Courtesy of Chrysler Corp.

REAR WIPER MOTOR TEST

On Cherokee, Grand Cherokee and Grand Wagoneer, disconnect wiper/washer harness at tailgate connector. On Wrangler, disconnect harness connector to lift-off top. Connect jumper wire from Black wire to good ground on motor harness connector. Using jumper wire with in-line 15-amp fuse, apply battery voltage to power feed terminal (Black/White wire on Cherokee; Brown/Light Green wire on Grand Cherokee, Grand Wagoneer and Wrangler). Wiper motor should operate.

Replace motor if inoperative.

REAR WIPER SWITCH TEST

Cherokee

1) Turn ignition on. Check for battery voltage at terminal "B" (Light Blue/Red wire) at rear wiper switch harness connector. If no voltage exists, repair open circuit in Light Blue/Red wire to fuse panel.

2) With rear wiper switch in any position, check for battery voltage at terminal "D" (White wire). If no voltage is indicated at terminal "D" (White wire), replace switch.

3) With switch in WASH position, check for battery voltage at terminal "C" (Brown/Red wire). Repeat test with switch in WIPE position. If no voltage is indicated in each position, replace switch.

4) With switch in WASH position, check for battery voltage at terminal "A" (Black/White wire). If no voltage is indicated, replace switch.

Grand Cherokee & Grand Wagoneer

1) Disconnect rear wiper switch and reconnect below dash where terminals can be tested with voltmeter. See REAR WIPER SWITCH under REMOVAL & INSTALLATION. Turn ignition switch to ON position. Check for battery voltage at switch connector terminal No. 1 (Brown/Pink wire). If no voltage exists, check 30-amp fuse No. 9 in fuse box. Replace fuse, if necessary.

2) With switch in WASH position, check for battery voltage at switch connector terminal No. 4 (Black/White wire). Replace switch if battery voltage is not present.

3) With switch in ON position, check for battery voltage at switch connector terminal No. 3 (Brown/Light Green wire). Replace switch if battery voltage is not present.

4) With switch in DELAY position, check for battery voltage at switch connector terminal No. 2 (Brown/Orange wire). Replace switch if battery voltage is not present.

Wrangler

1) Unplug harness connector at rear wiper switch. Check for continuity between terminal "C" (Black wire) at harness connector and ground. If no continuity exists, repair open circuit in Black wire to ground.

2) Turn wiper switch off. Check for continuity between terminal "B" (Brown/Light Green wire) and terminal "C" (Black wire) at switch connector. If no continuity exists, replace switch. Reconnect wiring to switch.

3) Turn ignition on. Check for battery voltage at terminal "P" (Brown/Yellow wire) at harness connector. If no voltage exists, replace fuse or repair open circuit in Brown/Yellow wire to fuse panel.

4) With switch in WASH position, check for battery voltage at terminal "B" (Brown/Light Green wire) at harness connector. Repeat test with switch in WIPER position. If no voltage exists, replace switch.

5) With switch in WASH position, check for battery voltage at terminal "A" (Brown/White wire) at harness connector. If no voltage exists, replace switch.

REAR WASHER MOTOR TEST

1) Unplug washer pump connector, under washer reservoir in engine compartment. Check for continuity between harness connector terminal "A" (Black wire) and ground. If no continuity exists, repair open circuit in Black wire to ground.

2) Connect a jumper wire between terminal "A" on washer pump and a good ground. Supply battery voltage to washer pump terminal "B", using a jumper wire with a 15-amp in-line fuse. See Fig. 2. Pump should operate. If pump is inoperative, replace pump.

REMOVAL & INSTALLATION

FRONT WIPER MOTOR

Removal & Installation (Except Wrangler)

Remove wiper arms. Remove cowl trim. Disconnect washer hose. Remove cowl mounting bracket nuts and pivot pin screws. Disconnect wiring. Remove wiper motor. To install, reverse removal procedure. Adjust wiper blades. See WIPER ARM ADJUSTMENT under ADJUSTMENTS.

Removal & Installation (Wrangler)

1) Remove top, if installed. Remove windshield hold-down bolts from lower corners of instrument panel. Remove wiper motor mounting screws. Disconnect wiper linkage drive arm. Remove wiper motor wire harness retaining clip. Pull motor and drive arm out through access hole.

2) Pry drive arm from motor pivot. DO NOT remove pivot attaching nut. Remove intermittent module bracket screws. Reach behind instrument panel to disconnect wiper motor harness. Remove wiper motor. To install, reverse removal procedure. Adjust wiper blades. See WIPER ARM ADJUSTMENT under ADJUSTMENTS.

FRONT WIPER SWITCH

Removal (Cherokee & Wrangler)

1) Disconnect negative battery cable. For vehicles with optional steering wheel, push and turn horn button to remove it. Remove retaining screws, bushing, receiver, flexplate and insulator. On all models, remove 3 retaining screws and steering wheel cover.

2) Disconnect horn wiring. Remove grounding pin by pulling it out gently. Remove steering wheel retaining nut and vibration damper. Mark steering shaft and steering wheel for reassembly reference. Using steering wheel puller, remove steering wheel.

CAUTION: Lock plate is retained by a high pressure spring. DO NOT remove snap ring without using a compressor tool.

3) Remove lock plate cover. Compress lock plate with Lock Plate Compressor (C-4156). Remove lock plate retaining ring, lock plate, canceling cam and spring. On vehicles with optional steering wheel, remove horn button components from canceling cam. Discard lock plate retaining ring.

4) Remove hazard warning switch knob, dimmer switch actuating arm screw and turn signal switch attaching screws. On Cherokee, remove lower instrument panel trim panel. On Wrangler, remove steering column shroud screws. Slide shroud toward steering wheel. On all models, apply pressure upward to shroud and downward to instrument panel to free holding tabs.

5) Remove cover under steering column. Remove PRNDL clip (if equipped). Remove 2 nuts and 4 bolts from steering column bracket. Loosen steering column brace nut at kick panel. Ease steering column downward.

6) Unplug wiper switch connector. Tape wires to wiper connector to ease harness removal. Remove wiring harness cover from column. Pull turn signal switch out from column far enough for access to retaining screws.

7) Turn ignition switch on. Insert paper clip below key

warning buzzer retainer to flatten retainer. Remove key warning buzzer and retaining clip as an assembly. DO NOT try to remove warning buzzer and retaining clip separately; clip could fall into column jacket.

8) Remove ignition lock cylinder retaining screw and lock cylinder. Remove attaching screws, housing and shroud. Ensure dimmer switch rod, lock pin and lock rack do not fall out. Remove turn signal/wiper switch lever from housing. Remove wiper switch cover from rear of housing. Remove pivot screw and wiper switch.

Installation (Cherokee & Wrangler)

1) Install NEW switch. Push dimmer switch rod to ensure it is connected. Position housing to column. Ensure nylon spring retainer is forward of lock rack retaining slot. Position first tooth of gear so that it engages with first tooth of lock rack.

2) Install housing attaching screws and key lock cylinder. Carefully tighten screws while mating housing to column. Turn key to ensure lock pin extends fully when ignition switch is locked.

3) To complete installation, reverse removal procedure. Install NEW lock plate retaining ring. Ensure wires are flat against inside column. Ensure PRNDL cable clip is installed so that pointer aligns properly. Reinstall steering wheel and tighten nut to 25 ft. lbs. (34 N.m).

Removal & Installation (Grand Cherokee & Grand Wagoneer)

1) Disconnect negative battery cable. Remove tilt lever (if equipped). Remove upper and lower steering column trim covers. Remove knee blocker. Remove steering column mounting nuts.

2) Lower steering column to gain access to rear of multifunction switch. Using Remover (TTXR20B2), remove tamper-proof mounting screws. Gently pull multifunction switch away from steering column. Loosen connector screw sufficiently to remove connector. Screw will remain in connector. Remove connector. To install, reverse removal procedure. Install NEW tamper-proof switch mounting screws. Tighten multifunction switch mounting screws to 17 INCH lbs. (2 N.m).

FRONT WASHER MOTOR

Removal & Installation

Remove reservoir mounting screws and reservoir. Disconnect hose from pump. Drain reservoir. Remove filter nuts from inside reservoir. Remove washer pump motor. To install, reverse removal procedure.

REAR WIPER MOTOR

Removal & Installation (Except Wrangler)

Remove wiper arm. Slide clip along hose to remove it from hose mounting. Disconnect hose. Remove pivot pin retaining nut. Remove liftgate trim panel. Disconnect wiring harness. Remove hinge nut securing motor to top. Remove wiper motor. To install, reverse removal procedure.

Removal & Installation (Wrangler)

Remove wiper arm. Remove pivot shaft retaining nut and trim cover. Unplug electrical connector. Remove mounting screws and wiper motor. To install, reverse removal procedure.

REAR WIPER SWITCH

Removal & Installation (Cherokee)

Disconnect negative battery cable. Remove 4 instrument bezel retaining screws. Pull bezel away from snap attachments. Remove switch housing panel. Unplug switch connector. Press mounting tabs and remove

switch. To install, reverse removal procedure.

Removal & Installation (Grand Cherokee & Grand Wagoneer)

1) Disconnect negative battery cable. Remove ash tray. Remove screws securing center cluster bezel. Remove cluster center bezel. Remove dash pad retaining screws behind top of center bezel. Gently pry defroster grille out of dash pad. Unplug sensors from grille (if equipped). Set defroster grille aside.

2) Remove screws holding defroster duct, instrument cluster and glove box to dash pad. Pulling up and out to unsnap end clips, remove dash pad. With driver's door open, remove left side trim cover, steering column cover and knee bolster. Remove steering column retaining nuts.

3) Remove screws securing bottom of end bezel and switch pod bezel. Remove screws retaining top of end bezel and switch pod bezel. Remove end bezel. Starting on the left side, remove remaining switch pod bezel retaining screws. Pull switch pod bezel out sufficiently to disconnect switch connectors.

4) Disconnect switch connectors. Remove switch pod bezel. Remove switch retaining screws. Remove switch. To install, reverse removal procedure.

Removal & Installation (Wrangler)

Disconnect negative battery cable. Remove 6 instrument panel shroud screws. Slide shroud toward steering wheel. Pull bulb socket from bulb retainer. Press shroud upward and indicator panel downward to release holding tabs. Place shroud under steering column. Remove switch housing panel. Press switch mounting tabs and remove switch. To install, reverse removal procedure.

REAR WASHER MOTOR

Removal & Installation

Rear washer pump is located next to front washer pump. See FRONT WASHER MOTOR.

WIRING DIAGRAMS

See appropriate chassis wiring diagram in WIRING DIAGRAMS.