

WINDSHIELD—REAR WINDOW—WINDSHIELD WIPER

	Page		Page
Rear Window	17-4	Windshield Washer Pump	17-12
Windshield	17-1	Windshield Wiper	17-5

WINDSHIELD

	Page		Page
Folding Windshield Removal	17-4	Glass Removal	17-1
General	17-1	Rear View Mirror Bracket	17-3
Glass Installation	17-1		

GENERAL

The windshields on all models consist of two sheets of glass, some flat and some curved, laminated together to form a one-piece safety glass.

All windshields are retained in their respective openings by rubber weatherstrips (channels).

The safety type glass is designed with adequate clearance to prevent stress and strains. When replacing cracked glass resulting from causes other than a direct blow or a known instance of temporary misalignment, it is very important that the cause of the breakage be determined and the condition corrected.

The inside rear view mirror bracket for all models is bonded directly to the windshield glass with a polyvinyl-butyl compound, through a heat-induction process.

Service replacement windshield glass may have the rear view mirror bracket bonded to the windshield glass. In this case the mirror is simply transferred from the unserviceable windshield to the bracket on the replacement windshield.

If the replacement windshield does not have the mirror bracket bonded to it, or if on serviceable windshields the bracket bond has been lost, a service kit is available for bracket installation. The kit is available from your local parts distribution center and consists of a replacement bracket and firm-setting, two-component adhesive. Installation instructions are included in this section, as well as in the kit.

NOTE: Do not attempt to remount the original bracket. For best results use a new bracket with the proper adhesive, available as a service kit.

GLASS REMOVAL

CJ Models

- (1) Cover adjoining painted surfaces to protect finish.
- (2) Remove windshield wiper arms using wide blade screwdriver.
- (3) Remove inside rear view mirror from bracket.
- (4) Remove sun visors and defroster ducts.
- (5) Starting at top of windshield frame, pull glass weatherstrip away from flange while gently pushing out on glass.
- (6) Work entire weatherstrip from pinch weld and remove glass.

GLASS INSTALLATION

CJ Models

- (1) Use 3M Auto Bedding and Glazing Compound or equivalent and apply a 1/16-inch bead of sealer completely around weatherstrip in flange cavity.
- (2) Install weatherstrip on glass. Split in weatherstrip should be bottom of glass.
- (3) Beginning at bottom of glass, work weatherstrip over flange using a fibre or wooden wand.
- (4) Use 3M Windshield Sealer or equivalent and apply sealer between weatherstrip and outside of glass around entire perimeter.
- (5) Clean off excess sealer.
- (6) Install inside rear view mirror on bracket.
- (7) Install defroster ducts and sun visors.
- (8) Install windshield wiper arms.
- (9) Test windshield for water leaks.

GLASS REMOVAL

Cherokee-Wagoneer-Truck

An interlocking type lip is part of the weatherstrip. The weatherstrip should be 75°F (24°C) or above before windshield removal is attempted.

- (1) Cover adjoining painted surfaces to protect finish.
- (2) Remove windshield wiper arms using a wide blade screwdriver.
- (3) On vehicles with stainless steel mouldings.
 - (a) Remove moulding screws on the top and bottom of side mouldings.
 - (b) Remove top corner moulding by lifting bottom and pulling outboard.
 - (c) Tip side mouldings toward center of vehicle and lift off.
 - (d) Remove top moulding.
- (4) Slide center moulding clip to left or right and remove bottom mouldings. This will expose the locking type weatherstrip.
- (5) Use a wedge-shaped fiber or hardwood stick or wand as shown in figure 17-1 to unlock the weatherstrip as shown in figures 17-2 and 17-3. The locking type weatherstrip without mouldings is shown in figure 17-3.

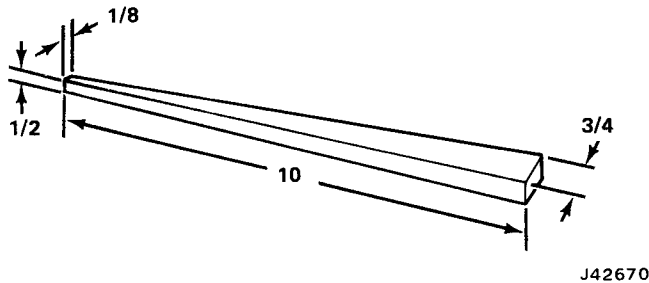


Fig. 17-1 Wooden Wand Dimensions (Inches)

- (6) On units with or without mouldings, unlock the rubber weatherstrip starting at the bottom with a fiber stick or wand (fig. 17-4).
- (7) Remove inside rear view mirror from bracket.
- (8) Use fiber stick to break seal between windshield glass and weatherstrip.
- (9) Use two men to remove windshield from weatherstrip, one man lifting as windshield comes free.
- (10) Remove weatherstrip from opening.
- (11) Inspect weatherstrip and clean off sealer from glass cavity and flange cavity.

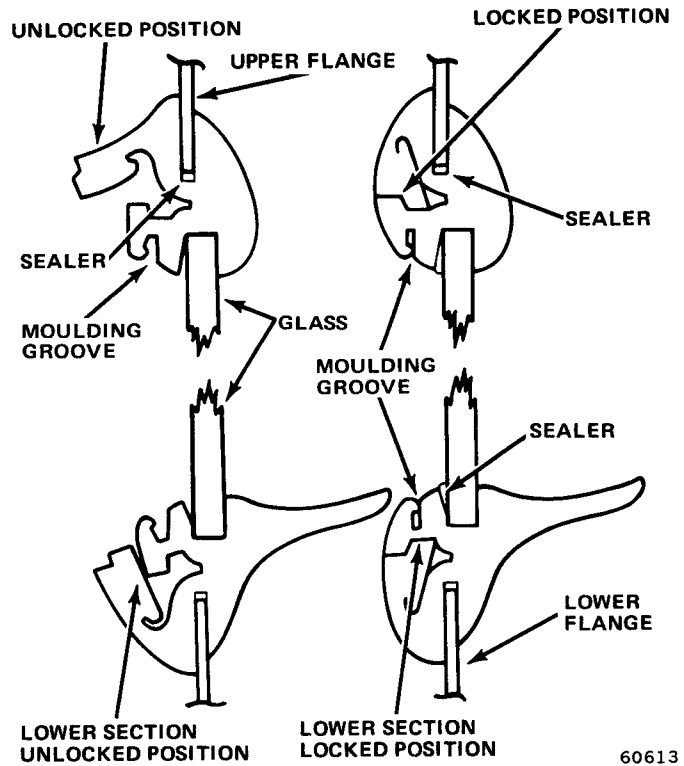


Fig. 17-2 Windshield Weatherstrip Cross Section—Moulding Removed

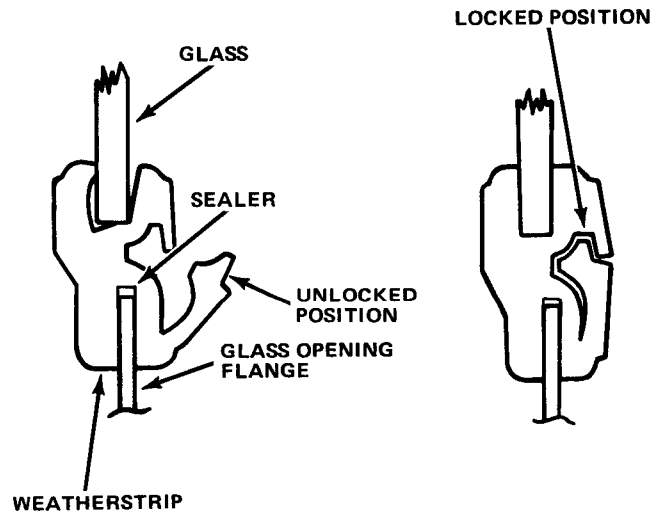


Fig. 17-3 Windshield Weatherstrip Cross Section

NOTE: *Inspect for uneven surfaces or irregularities in the windshield opening flange that could cause stress damage to the windshield glass.*

- (12) If windshield has been removed for reasons other than damaged glass and is to be replaced, clean hardened sealer from edges.

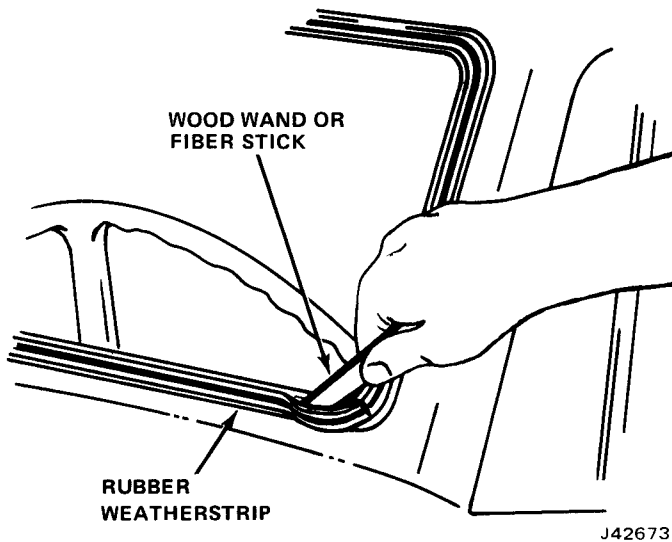


Fig. 17-4 Unlock Rubber Weatherstrip

GLASS INSTALLATION

Cherokee-Wagoneer-Truck

NOTE: Windshield installation should be accomplished in relatively warm surroundings in order that the windshield weatherstrip will remain pliable to make the installation operation easier and reduce the possibility of breaking the windshield.

- (1) Clean old sealer from windshield opening flange.
- (2) If removed weatherstrip is to be reused, be sure glass cavity and flange cavity are clean.
- (3) Use 3M Auto Bedding and Glazing Compound or equivalent and apply a 1/16-inch bead of sealer completely around weatherstrip in flange cavity as shown in figure 17-2.
- (4) Install weatherstrip on windshield opening flange.
- (5) Apply a liberal amount of liquid soap solution in glass cavity of the weatherstrip.
- (6) With two men working on the outside of the vehicle, work windshield into upper glass cavity and into each side. Position wooden wand under bottom of glass and lift windshield up and into lower glass cavity. Check for equal side clearances.
- (7) Use wooden wand to lock weatherstrip as shown in locked position (fig. 17-2 and 17-3).

NOTE: Soap solution should be removed from the weatherstrip and glass before installing sealer.

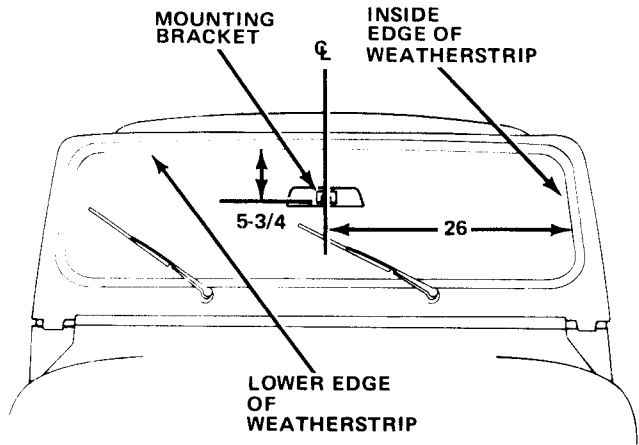
- (8) Use 3M Windshield Sealer or equivalent and apply sealer between the weatherstrip and glass on outside of glass around entire perimeter (fig. 17-2).

NOTE: Excessive soap solution should be removed from the weatherstrip before installing trim moulding.

- (9) Bottom mouldings are installed one at a time. To facilitate installation, place a 1/8-inch diameter cord in weatherstrip moulding retaining groove along entire length of weatherstrip, leaving enough cord hanging out at each end to permit a good grip on cord.
- (10) Working first with either left or right bottom moulding, place moulding in groove.
- (11) Starting at the outside corner of the weatherstrip, pull up on cord while lightly tapping top of moulding with rubber mallet. This will lock the moulding in the weatherstrip retaining groove. Continue to process until moulding is installed in weatherstrip, and then repeat process with the other bottom moulding, again starting at the outside corner.
- (12) Install center moulding clip to cover gap between left and right bottom moulding.
- (13) The one-piece top moulding is installed in the same manner, except that the moulding is tapped upward into retaining groove.
- (14) Side and upper corner mouldings can then be inserted in retaining groove and secured by installing upper and lower screws.
- (15) Fill gap at upper outboard corner between trim moulding and body with black sealer.
- (16) Clean excess sealer from windshield and moulding.
- (17) Install side moulding screws.
- (18) Install windshield wiper arms.
- (19) Install inside rear view mirror on bracket.
- (20) Test windshield for water leaks.

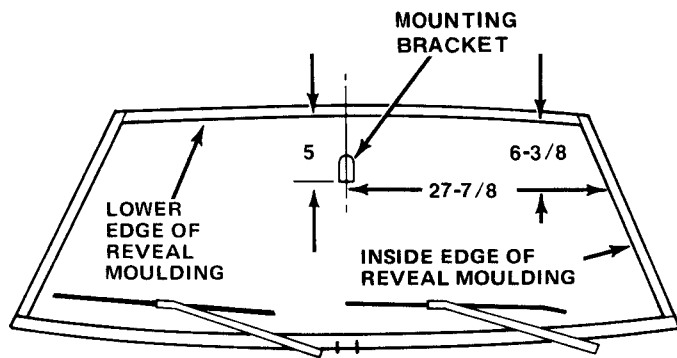
REAR VIEW MIRROR BRACKET INSTALLATION

- (1) Locating windshield mounted rear view mirror bracket can be accomplished as shown in figures 17-5 and 17-6. Use wax pencil on outside of glass to locate mounting bracket.
- (2) If vinyl pad has remained on the windshield glass, apply low heat with an electric heat gun until vinyl softens, then peel pad from glass using care not to scratch or mar the glass surface.
- (3) Clean bracket mounting area of windshield glass thoroughly. Use a mildly abrasive cleaning powder (Ajax, Comet, or equivalent) applied to clean cloth saturated with alcohol.
- (4) Remove all traces of cleanser by wiping area with a paper towel moistened with alcohol.
- (5) Scuff bonding surface (the side without the 3/8-inch circular depression) of the mirror bracket with a clean piece of fine grit sandpaper. Apply alcohol to a clean towel and wipe surface clean.
- (6) Apply a generous amount of the accelerator, supplied with the kit, to mirror bracket mounting surface. Allow five minutes to dry.
- (7) Apply a thin film of accelerator to windshield. Allow one minute to dry.



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Fig. 17-5 Windshield Mounted Rear View Mirror Bracket Location (Inches)—CJ Models



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Fig. 17-6 Windshield Mounted Rear View Mirror Bracket Location (Inches)—Cherokee-Wagoneer-Truck

CAUTION: Do not touch surfaces to which accelerator has been applied - an imperfect bond could result.

(8) Apply one drop of adhesive at the center of the mirror bracket bonding surface. Use bottom of adhesive tube to distribute the adhesive evenly over the entire surface.

(9) Position bottom straightedge of the bracket on the horizontal line (fig. 17-5 and 17-6). Press bracket to glass and hold firmly for one minute. Be sure bracket is properly located as adhesive sets quickly.

FOLDING WINDSHIELD

On CJ models the windshield and frame assembly may be lowered to the hood by removing the knobs at each side of the windshield. When in the lowered position, always secure the windshield by passing the strap at the top of the windshield through the loop on the hood and drawing the strap up firmly.

Removal

- (1) Remove necessary components from windshield frame.
- (2) Disconnect wiper motor wiring harness from switch.
- (3) Remove windshield hinge-to-frame attaching screws using Torx Bit Tool J-25359.
- (4) Remove windshield holddown knobs and remove windshield frame.

Installation

- (1) Position windshield frame on vehicle and install windshield hinge-to-frame attaching screws using Torx Bit Tool J-25359.
- (2) Install windshield holddown knobs.
- (3) Connect wiper motor wiring harness to switch.
- (4) Install necessary top components to windshield frame.

REAR WINDOW

GENERAL

The rear window is a one-piece, tempered glass. The overall size of the glass varies with the different vehicles.

Cherokee-Wagoneer

For service replacement and adjustment of tailgate window glass, refer to Section 16—Tailgate-Luggage Rack.

Truck Models

For service replacement of solid rear glass, refer to Windshield Glass Removal or Installation.

The sliding rear window on J-10 and J-20 cabs, which provides cab ventilation and ease of communication between passengers in the truck cab and camper body, is replaced as an assembly.

WINDSHIELD WIPER

	Page		Page
General	17-5	Wiper and Washer Controls	17-5
Two-Speed Wiper Motor	17-7	Wiper Arm Replacement	17-5
Washer Pump	17-12	Wiper Blades	17-5

GENERAL

All models are equipped with a two-speed, electric wiper motor.

On CJ models, the motor is mounted on the lower left corner of the windshield (fig. 17-7).

Cherokees, Wagoneers, and Trucks are equipped, on the driver's side, with an articulated windshield wiper arm (fig. 17-8).

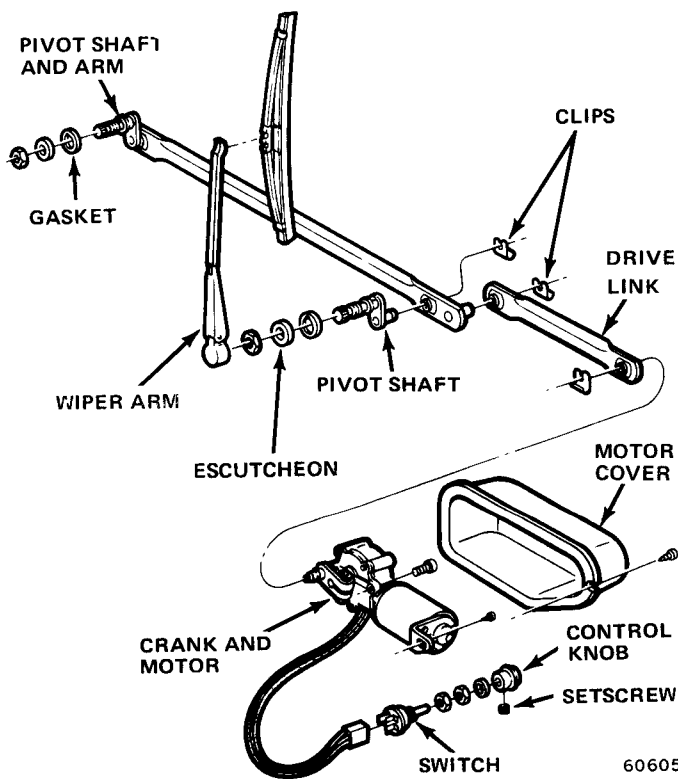


Fig. 17-7 Windshield Wiper Components—CJ Models

WIPER AND WASHER CONTROLS

The control switches are mounted on the instrument panel. The switch for CJ Models is a through-type multiposition switch which does not require grounding for proper operation. The switch for

Cherokee-Wagoneer, and Truck vehicles is a grounding-type switch and must be grounded for proper operation or diagnosis.

The two-speed wiper motor is energized for continuous wiping action by turning the control knob in a clockwise direction.

The electric washer pump is operated by depressing the wiper control knob or, on some models, the push-button in the center of the control knob.

Wiper Control Removal

- (1) Remove control knob.
- (2) Remove nut and switch.
- (3) Mark the wire color locations on switch and disconnect wires.

WIPER BLADES

Replacement—CJ Models

The wiper blade assembly is removed from the wiper arm by holding the blade away from the windshield, and pushing it firmly against the tip of the arm to compress the locking spring and disengage the retaining pin. At the same time, pivot the blade clockwise to unhook it from the end of the arm.

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

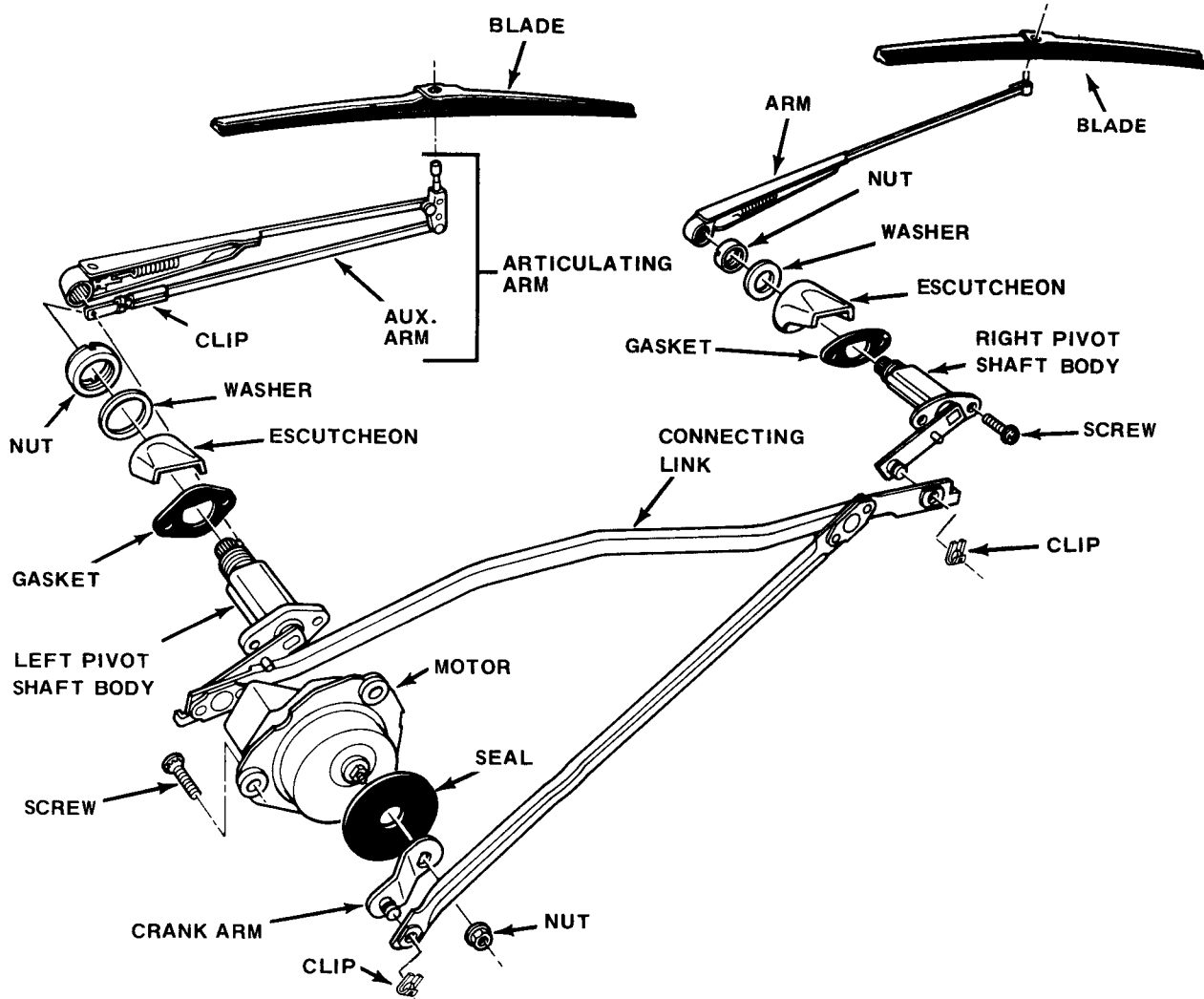
Replacement—Cherokee-Wagoneer-Truck

- (1) To remove wiper blade from mounting pin on wiper arm, insert a screwdriver into spring release opening of blade saddle and depress spring clip. Pull blade from arm (fig. 17-9).
- (2) To install, push blade saddle onto mounting pin so that spring clip engages pin. Be sure blade is securely attached to arm.

WIPER ARM REPLACEMENT

CJ Models

- (1) To remove the windshield wiper arms from the pivot body shaft, first mark the pivot shaft and arm



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Fig. 17-8 Windshield Wiper Components—Cherokee-Wagoneer-Truck

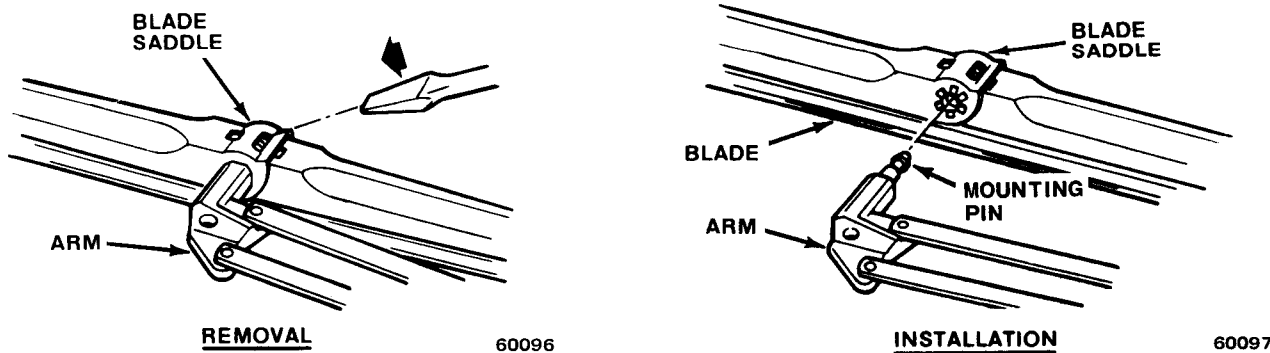


Fig. 17-9 Wiper Blade Replacement

so that the wiper arm can be installed in the same position, and then pry up carefully on the wiper arm as shown in figure 17-10.

(2) Push wiper arm over pivot shaft. Be sure pivot shaft is in park position and wiper arm is positioned as shown in figure 17-11.

Cherokee-Wagoneer-Truck

(1) Raise blade end of arm from windshield and move spring tab away from pivot shaft. Disengage auxiliary arm retainer clip (driver's side only) from

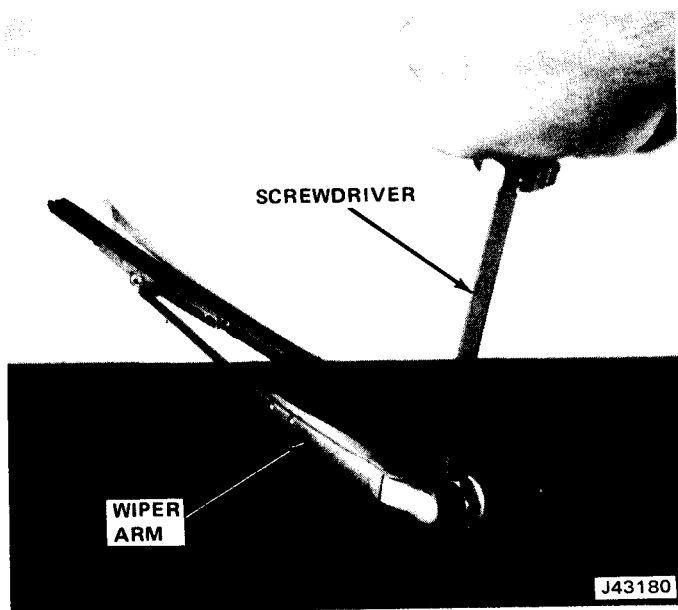


Fig. 17-10 Wiper Arm Removal

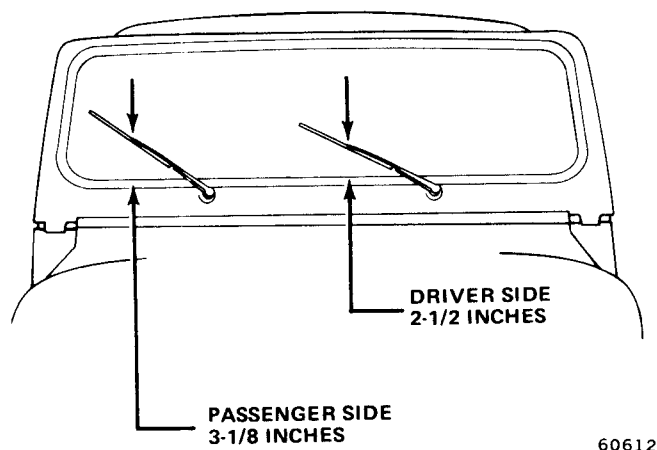


Fig. 17-11 Wiper Arm Park Position—CJ Models

pivot pin and pull wiper arm from pivot shaft (fig. 17-9).

(2) To install, position auxiliary (if equipped) over pivot pin and engage retainer clip. Push wiper arm over pivot shaft. Be sure that pivot shaft is in park position and wiper arm is positioned as shown in figure 17-12.

TWO-SPEED WIPER MOTOR—CJ MODELS

General

The wiper motor is protected by a 10-amp fuse in the fuse panel.

When the wiper switch is moved to the low speed position, current flows from the fuse panel to terminal

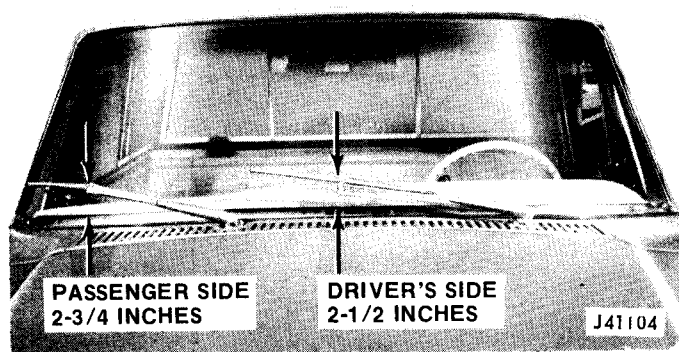


Fig. 17-12 Wiper Arm Park Position—Cherokee-Wagoneer-Truck

B (fig. 17-13) of the wiper switch, through the wiper switch to terminal 2, then through the green wire to the motor low-speed brush and through the armature to ground.

With the wiper switch in the high speed position, current flows from the fuse panel to terminal B of the wiper switch, through the wiper switch to terminal 3, then through the red wire to the motor high speed brush and through the armature to ground.

When the wiper switch is turned off, current flows from the fuse panel to terminal B of the wiper switch, through the wiper switch to terminal 1, then through the black wire to the park contact points to the motor low speed brush and through the armature to ground. When the cam on the wiper drive gear opens the park contact points, the feed circuit to the motor low speed brush is interrupted and the motor is in park.

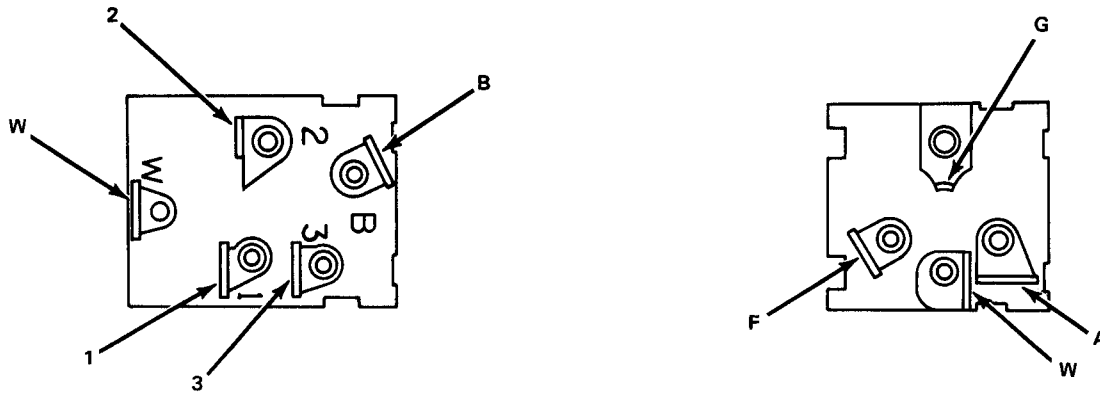
TWO-SPEED WIPER MOTOR—CHEROKEE-WAGONEER-TRUCK

General

The wiper motor is protected by a 10-amp fuse in the fuse panel. When the dash switch is moved to the low-speed position, the circuit between terminals A and F on the motor are connected and (G) ground through the switch. Current from the battery flows through a series field coil and is divided. One part passes through the shunt field coil to ground at the dash switch; the other part passes through the armature to ground at the dash switch.

Moving the dash switch to the high-speed position opens the shunt field circuit to ground at the dash switch and keeps the armature circuit closed to ground. The shunt field current must then pass through a 20-ohm resistor located on the back of the wiper terminal board and then through terminal A that connects the armature circuit to (G) ground through the dash switch.

Moving the dash switch to the OFF position opens both the armature and shunt field circuits to ground



SELECTOR POSITION	CJ MODELS	CHEROKEE-WAGONEER-TRUCK MODELS
OFF OR PARK	B-1	A-F
LOW SPEED	B-2	A-F-G
HIGH SPEED	B-3	A-G
WASH	B-W	W-G

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Fig. 17-13 Continuity Test for Wiper Switches

at the dash switch. However, both of these circuits are still closed to ground through the parking switch. When the cam on the wiper output gear opens the park switch contacts, the ground circuit is broken and the wiper blades are in the parked position.

NOTE: The shunt field is connected directly to ground by passing the resistor with the switch in the off position. This results in low speed operation during the park operation.

Troubleshooting Procedures—CJ Models

The wiper motor may be operated independently of the switch to aid in determining defective components.

NOTE: The wiper motor must be grounded for proper operation and during all wiper tests.

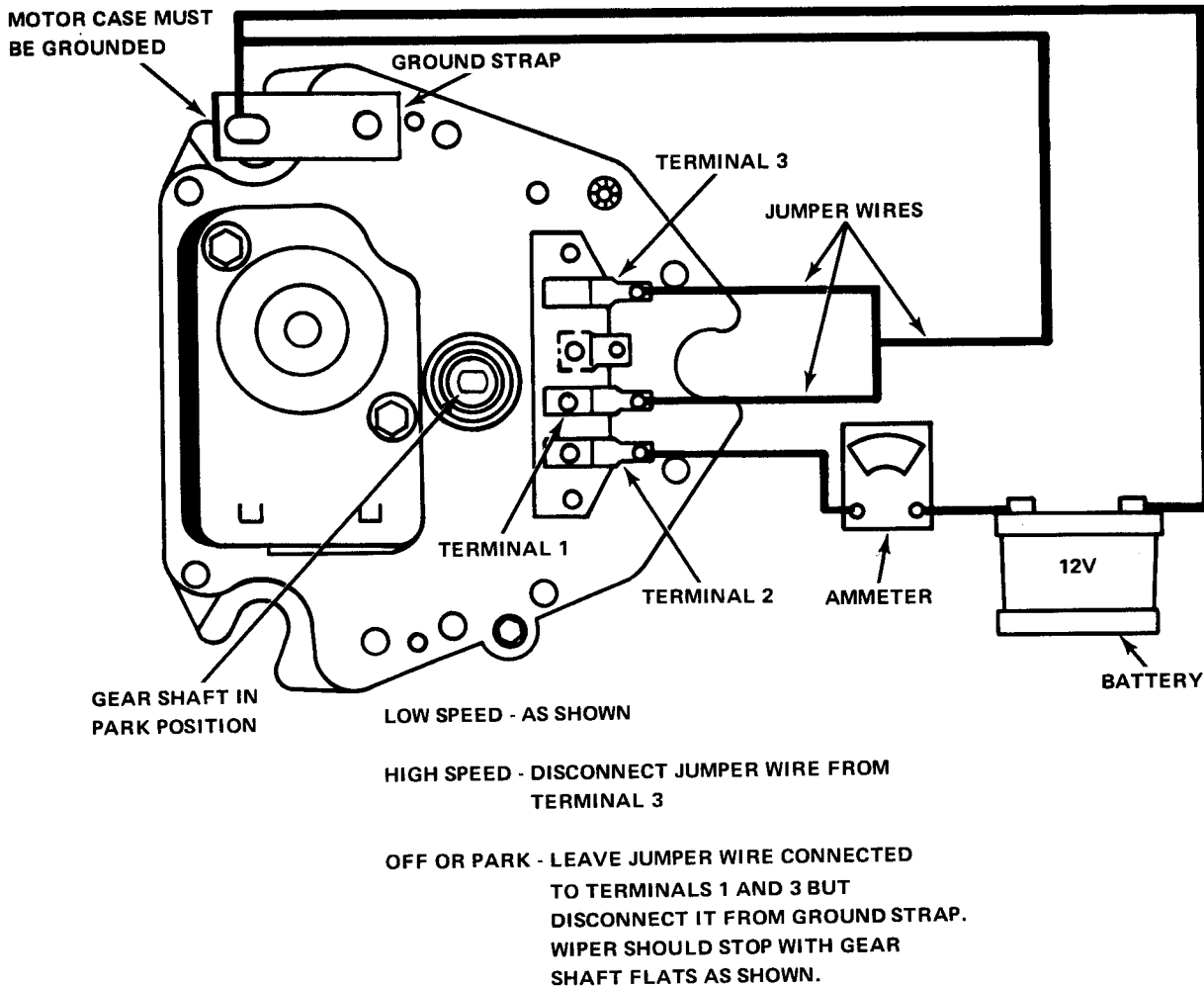
With ignition switch on, check for 12 volts at switch terminal B (fig. 17-3) (switch need not be grounded). If 12-volt test lamp lights but wiper motor does not operate, connect a jumper wire from ground strap on

motor to a good body ground. If motor still does not operate, disconnect wiring from switch. Using a jumper wire, connect switch terminals 2 and B. This connection should give low speed operation. If wiper motor does not operate in low speed, there is an open in the green wire, a defective internal motor connection or a stuck low speed brush.

To obtain high speed, connect a jumper wire between terminals 3 and B. If wiper motor fails to operate, there is an open in the red wire, a defective internal motor connection, or a stuck high speed brush.

With the wiper blades in a position other than park, connect a jumper wire between terminals 1 and B. The wiper blades should run on low speed and stop in the park position. If, after making the jumper connection, the motor does not run, there is an open in the black wire, a defective internal motor connection, a misaligned or damaged set of contact points or a bad connection through the park point set to the low speed brush. If the wiper motor runs but does not park, the cam on the drive gear is not sufficiently breaking the contact points.

If wiper motor operation is intermittent, a defective solder joint, wiring connection, body ground or worn brush may cause the condition.



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Fig. 17-14 Two-Speed Wiper Test Connections—Cherokee-Wagoneer-Truck

Troubleshooting Procedure—Cherokee-Wagoneer-Truck

Figure 17-14 illustrates the method of connecting leads to the two-speed wiper either for bench operation or to run wiper independently of dash switch and vehicle wiring when installed in vehicle.

Typical wiper troubles are as follows: wiper inoperative; wiper will not shut off; wiper operates only on fast speed; wiper shuts off with dash switch in high-speed position; blades do not return to park position when wiper is turned OFF; wiper speed normal at low but too fast in high; intermittent operation during normal wiping cycle.

Troubleshooting procedures are divided into two categories: wiper troubleshooting in vehicle; wiper troubleshooting on bench.

Troubleshooting in Vehicle

If wiper is inoperative check the following items:

- Fuse
- Wiring harness to motor connections
- Dash switch connection and ground
- Wiper ground strap

With ignition switch on, check for 12 volts at harness terminal that connects to wiper terminal. To determine if dash switch or wiring is at fault, disconnect harness from wiper motor and try operating wiper as shown in figure 17-14. If wiper fails to operate, remove body parts as required, disconnect transmissions from wiper crank arm, and recheck wiper motor operation. If wiper motor still fails to perform correctly, remove wiper motor from vehicle and check wiper motor according to procedure under Troubleshooting on Bench.

If wiper motor will not shut off, determine if wiper motor has both low and high speeds, slow speed only or high speed only. It is important that the wiper operates at low speed during parking cycle. High speed motor momentum may carry cam past normal park position, allowing park contact points to close.

Disconnect wiring harness from wiper motor and try operating wiper independently of dash switch as shown in figure 17-14.

If wiper shuts off correctly with crank arm in park position and wiper has both speeds after performing tests, check the lead between terminal 1 and dash

switch ground, and check for defective dash switch. If wiper shuts off correctly but wiper has low speed only, check lead between wiper terminal 3 and dash switch ground and check for defective dash switch. If wiper shuts off correctly but has high speed only, check lead between wiper terminal 1 and dash switch for open circuit and check for defective dash switch. If wiper still fails to operate correctly, remove it from vehicle and check it according to instructions under Wiper Troubleshooting on bench.

If wiper has slow speed only and shuts off with dash switch in high-speed position, reverse harness leads that connect to wiper terminals 1 and 3 (fig. 17-15).

If blades do not return to park position when wiper is turned off, check wiper ground strap connection to vehicle body. Remove wiper from vehicle and check for dirty, bent, or broken park switch contacts.

If wiper speed is normal in slow, but too excessive in fast speed, remove wiper motor from vehicle and check for an defective resistor.

If wiper motor operates erratically, check for loose wiper motor ground strap connection or loose dash switch mounting.

Troubleshooting on Bench

Using ammeter capable of reading at least 30 amperes, check feed wire circuit shown in figure 17-14 for open circuit.

The low speed amp draw with no load should be 4 amps; high speed amp draw 3.5 amps; motor stalled (cold) 12 amps.

If wiper motor is inoperative, connect wiper motor to operate in low speed and observe current draw. If the reading is zero amps, check for loose solder connection at feed terminal or loose splice joints. If reading is 1 to 1.5 amps, check for open armature, sticking brushes, or loose splice joint. If reading is 11 amps, check for broken gear, seized shaft, or some other condition that will stall the wiper.

If wiper motor will not shut off, this condition may exist if wiper motor has one or both speeds. If wiper motor has both speeds, check for park switch contacts not opening or internal wiper motor lead that connects to wiper terminal 1 being grounded. If wiper motor has low speed only, check for grounding of internal wiper motor lead that connects to wiper terminal 3 and check shunt field coil for grounding. If wiper motor has high speed only, check for open in internal wiper motor lead that connects to wiper terminal 3 and check for shunt field open circuit.

If wiper crank arm does not return to park position when wiper motor is turned off, check for dirty, bent, or broken park switch contacts.

If wiper speed is normal in low, but too excessive in high speed, check for open circuit in the 20-ohm resistor on back of wiper terminal board.

If wiper motor operates erratically, check for sticky brushes or loose splice joints.

If the wiper motor will not shut off or wiper crank arm fails to stop in park position when jumper wire is removed from ground 1, check that park switch contacts are opening. Also check for ground in internal motor lead that connects to terminal 3.

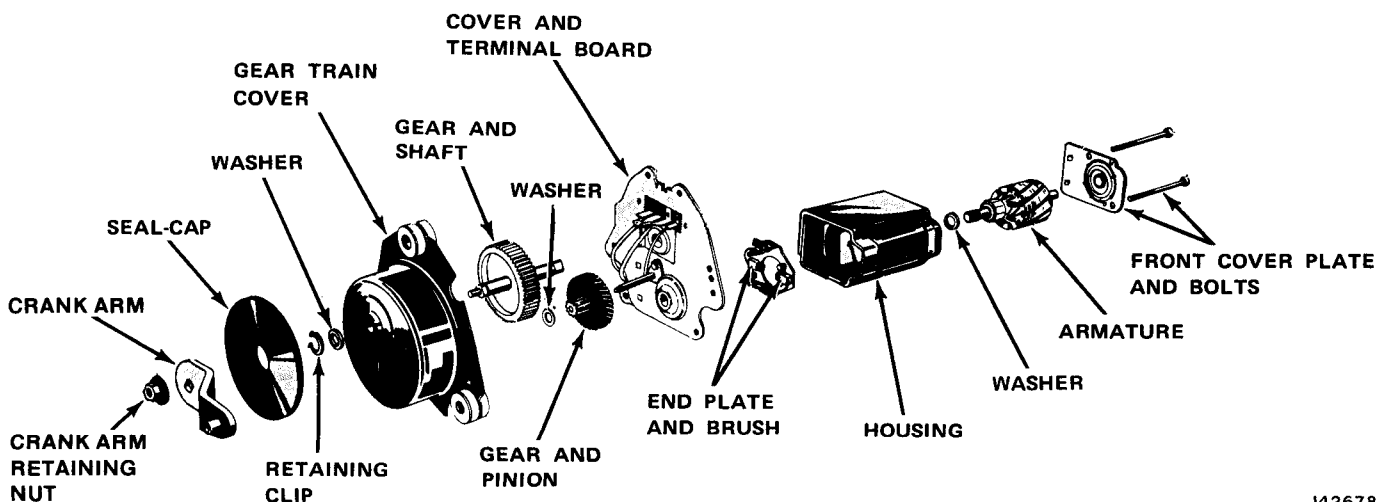


Fig. 17-15 Two-Speed Wiper Motor—Cherokee-Wagoneer-Truck

WIPER MOTOR

CJ Models

Removal With Crash Pad

NOTE: Without crash pad, remove wiper motor cover.

- (1) Remove necessary top components from windshield frame.
- (2) Remove right and left windshield holddown knobs and fold windshield down.
- (3) Remove left access hole cover.
- (4) Disconnect drive link from left wiper pivot.
- (5) Disconnect wiper motor wire harness from switch.
- (6) Remove attaching screws and remove wiper motor.

Installation With Crash Pad

- (1) Position wiper motor on windshield frame and install attaching screws.
- (2) Connect wiper motor wire harness to switch.
- (3) Connect drive link to left wiper pivot.
- (4) Install left access hole cover.
- (5) Raise windshield to upright position and install right and left windshield holddown knobs.
- (6) Install necessary top components on windshield frame.

Cherokee-Wagoneer-Truck

Removal

- (1) Disconnect wiper drive link from crank under instrument panel.
- (2) Disconnect motor wires at motor under hood.
- (3) Remove motor-to-dash mounting screws and remove motor.

Disassembly

Refer to figure 17-15.

- (1) Clamp crank arm in vise and loosen crank arm retaining nut.
- (2) Remove seal cap, retaining ring, and end plate washer. Seal cap should be cleaned and repacked with a waterproof grease before assembly.
- (3) Punch out the gear box cover retaining rivets and remove cover from gear train. Mark ground strap location for assembly purposes.
- (4) Remove output gear and shaft, then slide intermediate gear and pinion off shaft.

Assembly

- (1) When assembling the gear box cover, be sure cover is located properly over locating dowel pins.
- (2) Also be sure to install ground strap.
- (3) When assembling the crank arm, operate wiper to park position and install crank arm on output shaft so that identification marks line up with those in cover.
- (4) Clamp crank in vise before securing retaining nut.

Installation

- (1) Position motor on dash and install mounting screws.
- (2) Connect motor wires to motor.
- (3) Connect wiper drive link to motor crank.

WIPER PIVOT SHAFT AND LINKAGE

CJ Models

Removal

- (1) Remove right and left wiper arms.
- (2) Remove nuts attaching pivots to windshield frame.
- (3) Remove necessary top components from windshield frame.
- (4) Remove right and left windshield holddown knobs and fold windshield down.
- (5) Remove right and left access hole covers.
- (6) Disconnect wiper motor drive link from left wiper pivot.
- (7) Remove wiper pivot shafts and linkage from access hole.

Installation

- (1) Install wiper pivot shafts and linkage in windshield frame.
- (2) Connect wiper motor drive link to left wiper pivot.
- (3) Install right and left access hole covers.
- (4) Raise windshield to upright position and install right and left windshield holddown knobs.
- (5) Install nuts attaching pivots to windshield frame.
- (6) Install right and left wiper arms.
- (7) Install necessary top components on windshield frame.

Cherokee-Wagoneer-Truck

Removal

- (1) Remove wiper arms, pivot shaft nuts, washers, escutcheons, and gaskets.
- (2) Disconnect drive arm from motor crank.

