

GENERAL MOTORS – "J" BODY WIPER SYSTEM

Buick Skyhawk
 Cadillac Cimarron
 Chevrolet Cavalier
 Oldsmobile Firenza
 Pontiac J2000

DESCRIPTION

The internal components of the "J" Body wiper system include a field magnet, armature, drive gear, park switch actuator, brush holder assembly and a radio noise suppression capacitor. All of these components are enclosed in a die-cast aluminum housing with a plastic cover. A ground strap is connected to one of the motor mounting bolt holes to provide a ground for the capacitor. The motor is protected by an automatic reset type circuit breaker located on the motor brush holder assembly. The motor has a 4-terminal connector.

The washer pump consists of permanent magnet motor and pump assembly. The washer pump assembly is mounted in the bottom of the solution jar by a nut located inside the solution jar. The washer pump can only be operated with the ignition switch in the "RUN" or "ACCESSORY" position.

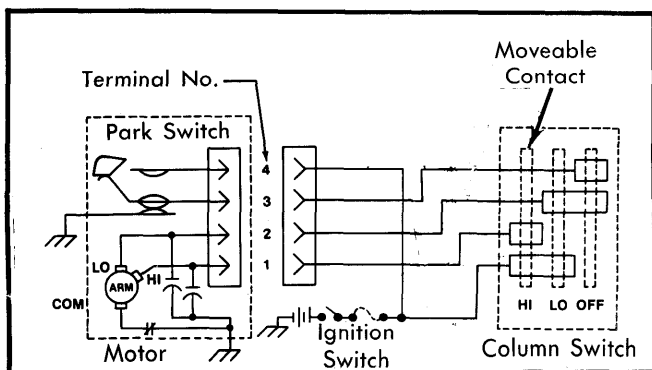


Fig. 1 General Motors "J" Body Wiper System Wiring Diagram

OPERATION

The wiper motor has 3 brushes that are referred to as common, low speed and high speed. When the ignition switch is in the "ON" position, the power feed circuit is completed to both low and high speed fixed contacts in the steering column switch. The low and high speed brushes are connected to the column switch through terminals 1 and 2. The armature is grounded through the common brush via the ground strap.

CONSTANT SPEED OPERATION

When the column switch is in the "LOW" or "HIGH" speed position, the respective brush circuit is completed to 12 volts and the wiper motor runs at that speed.

DELAY OPERATION

When the column switch is in the "DELAY" position, 12 volts is applied to the "Delay Adjust" switch and the wiper pulse module timer. When the timer times out, the timer switch closes and current flows through the wiper pulse module switch to the low speed terminal (terminal 2) of the wiper motor. This causes the motor to start and the park switch to move to the "RUN"

contact. When the wiper finishes one sweep, the park switch moves to the "PARK" contact. Ground is again applied to the timer. The timer delays the start of the next sweep according to the setting of the delay rheostat. The maximum delay between sweeps is 25 seconds.

PARK OPERATION

When the column switch is turned to the "OFF" position, the low speed brush circuit is completed to 12 volts through a park switch located on the brush assembly (terminals 3 and 4). When the blades reach their park position, the large gear moves the park switch actuator that opens the normally closed park switch. This then turns the motor off.

MIST OPERATION

When the column switch is moved to the "MIST" position, the wipers sweep at low speed until the column switch is released. When the control is released, the wipers return to the park position.

WASHER OPERATION

Actuating the washer portion of the column switch completes the washer pump motor circuit to ground. When the column switch is moved to the wash position, the wiper switch is mechanically moved to the "LOW" speed position. This dual function starts the wiper motor and washer operation at the same time. The washer pump runs only when the switch is activated.

TESTING

CAUTION – Wipers are equipped with locking type connectors for attaching vehicle wiring and care should be used when disconnecting wiring from the wiper motor.

The following diagnostic procedures are ones that will help in locating the defective component(s). Before starting a diagnostic procedure, it is very important to confirm the reported problem with a complete operational check. Once the condition is confirmed, match it with the appropriate diagnostic procedure.

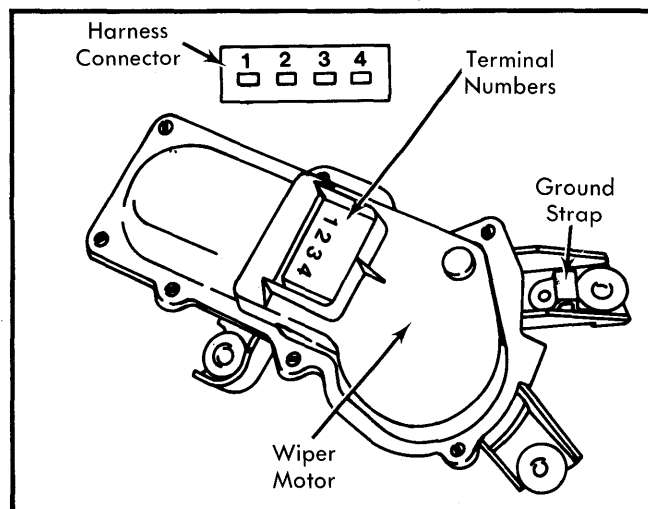


Fig. 2 "J" Body Wiper Motor & Harness Connector Pin Location

GENERAL MOTORS – "J" BODY WIPER SYSTEM (Cont.)

WIPERS COMPLETELY INOPERATIVE

1) Turn ignition switch to "ON" position and wiper switch to "HIGH". Ground a 12 volt test lamp and touch probe to wiper terminal 1. If lamp lights, proceed to next step. If lamp does not light, check for a blown fuse. If fuse is okay, repair open in feed circuit between fuse block and wiper motor. If fuse is blown, replace fuse and check for short in wire or for high amperage draw of wiper motor.

2) With wiper switch in "LOW", connect a jumper wire from ground to wiper motor housing. If wipers run, repair open in ground strap. If wipers do not run, problem is in internal mechanisms of wiper motor.

WIPER HAS LOW SPEED ONLY

With ignition switch in "ON" position and wiper switch in "HIGH" position, remove harness connector from wiper motor. Connect a jumper wire from a 12 volt source to terminal 1 of wiper motor. If wipers run, check for an open in wire from terminal 1 to column switch. If wire is okay, replace column switch. If wiper did not run, check for a hung or grounded high speed brush.

WIPER HAS HIGH SPEED ONLY

With ignition switch in "ON" position and wiper switch in "LOW" position, remove harness connector from wiper motor. Connect a jumper wire from a 12 volt source to terminal 2 of wiper motor. If wiper runs in low speed, check for an open in wire from terminal 2 to column switch. If wire is okay, replace column switch. If wiper motor did not run, check for a hung or grounded low speed brush.

WIPER RUNS AT ONE SPEED
IN BOTH HIGH & LOW

With ignition switch in "ON" position and wiper switch in "HIGH" or "LOW" position, remove harness connector from wiper motor. Connect a jumper wire from a 12 volt source to either terminal 1 or 2 of wiper motor. If wipers run in high and low speeds, check for opens in wires from terminals 1 and 2 to column switch. If wires are okay, replace switch. If wipers ran at one speed only, check for low and high speed brush leads shorting together internally.

WIPER WON'T SHUT OFF

Disconnect both connectors from delay module and plug connectors together (this removes module from wiper circuit). Turn ignition switch to "ON" and wiper switch to "OFF". Remove harness connector from wiper motor. Connect jumper wire from 12 volt source to terminal 4 of wiper motor. Connect another jumper between terminals 2 and 3 of motor. If wipers park, replace column switch. If wipers still run, check park switch actuator and brush holder assembly.

BLADES DON'T RETURN TO PARK POSITION
WHEN WIPER IS SHUT OFF

1) With ignition switch in "ON" position and wiper switch in "OFF" position, remove harness connector from wiper motor. Connect a jumper wire from a 12 volt source to terminal 4 of wiper motor. Connect another jumper wire between terminals 2 and 3 of wiper motor. If wipers run and park properly, proceed to next step. If wipers are inoperative or do not park, check park switch actuator and brush holder assembly.

2) With ignition switch in "OFF" position, check for current flow between terminal 2 and 3 of harness connector. If continuity is present, check for an open in wire from terminal 4 to fuse block. If continuity is not present, check for an open from terminal 3 to column switch. If wire is okay, replace column switch.

WIPER STOPS INTERMITTENTLY IN HIGH OR LOW

Remove wiper fuse from fuse block and connect an ammeter across fuse block terminals. Operate wipers in high speed with windshield dry. If current draw is below 5 amps, replace brush holder assembly. If current draw is higher than 5 amps, replace wiper blades, check linkage for binding or sticking, and repair wiper motor if necessary.

WIPER MOTOR RUNS BUT BLADES DON'T MOVE

Check connection between wiper arm linkage and wiper motor crank arm. If linkage is connected, repair wiper motor, wiper gear is stripped. If linkage is not connected, reconnect linkage and check system.

WIPER BLADES PARK ABOVE NORMAL POSITION

With ignition switch in "ON" position and wiper switch in "OFF" position, remove harness connector from wiper motor. Connect a test lamp between terminal 3 of harness connector and ground. If test lamp lights, repair open in motor or replace brush holder assembly. If test lamp did not light, check crank arm and linkage for proper alignment.

REMOVAL & INSTALLATION

WIPER MOTOR

Removal – Loosen, but do not remove, transmission drive link to motor crank arm attaching nuts. Remove drive link from motor crank arm. Disconnect harness connector from wiper motor. Remove bolts that attach wiper motor to firewall. Rotate wiper motor up and outward to remove.

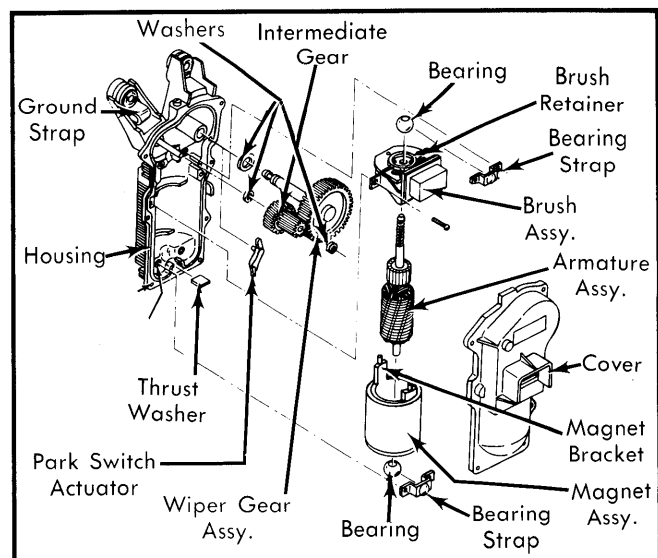


Fig. 3 Exploded View of General Motors "J" Body Wiper Motor

GENERAL MOTORS – "J" BODY WIPER SYSTEM (Cont.)

Installation – Reverse removal procedure and tighten wiper motor attaching screws to 51-73 INCH lbs. (6-8 N·m).

WIPER MOTOR COVER

Removal – Remove wiper motor from vehicle. Drill off the ends of the 7 rivets (from housing side), that hold cover to housing, with a $\frac{1}{16}$ " drill bit. Remove cover.

Installation – Attach cover to housing using (7) $\frac{5}{32}$ " x $\frac{3}{8}$ " self-tapping screws. Reinstall wiper motor on vehicle.

WIPER MOTOR HOUSING

Removal – 1) Remove wiper motor from vehicle. Remove wiper motor cover. Remove crank arm lock nut, crank arm, shaft seal, thrust collar and washer.

2) Push end of gear shaft through housing and remove gear assembly and washer. To prevent scoring of bearing, file burr from retaining ring groove and where the crank arm seats on the shaft. Remove intermediate gear and washers.

3) Drill off ends of 4 rivets, holding bearings and bearing straps, with a $\frac{1}{64}$ " drill bit. Be careful not to get metal chips in motor. Remove the 2 6-lobed socket-head screws holding brush assembly in place.

4) Remove armature, brush and magnet as an assembly to avoid realignment of brushes onto commutator.

Installation – Reverse removal procedures using parts supplied in service package. After wiper motor is fully assembled, place thrust pin in casting with insert about $\frac{1}{32}$ " above rear of pin.

NOTE – Use "Wiper Motor Housing" removal and installation procedures for replacing the following components: Wiper gear assembly, intermediate gear assembly, wiper magnet assembly, park switch actuator, brush holder assembly and motor armature.

WIPER MOTOR SPECIFICATIONS

Application	Specification
Operating Voltage	12 Volts
Current Draw (No Load)	
Low Speed	3.5 Amps Max.
High Speed	5.0 Amps Max.
Crank Arm Rotation	Counterclockwise