1971-73 GENERAL MOTORS – SQUARE MOTOR

DESCRIPTION

A two speed wiper motor equipped with a windshield washer system is standard equipment on all models. The non-depressed park system uses a square motor and parks the wiper blades so they are visible above the hood line. The following vehicles use this system: Firebird, Camaro, Nova, Ventura, Omega, Apollo.

ADJUSTMENTS

Wiper Arms – If arm adjustment not proper, remove arm from pivot (transmission) shaft and rotate the arm the required distance and direction and reinstall on shaft.

COMPONENT REPLACEMENT

Wiper Motor

1) Remove cowl screen or grille. Through cowl opening, loosen transmission drive link attaching nuts to motor crankarm.

2) Disconnect – transmission drive link from crankarm, wiring, and washer hoses. Remove motor screws and remove motor, guiding crankarm through hole.

3) To install, reverse removal procedure.

Wiper Transmission

1) After removing cowl vent screen or grille, loosen (do not remove) transmission drive link to crankarm attaching nuts and disconnect link from crankarm.

2) Remove transmission attaching screws and guide transmission and linkage out through cowl plenum chamber opening.

3) To install, reverse removal procedure. Before connecting drive link to crankarm make sure motor is in "park".

TROUBLE SHOOTING & TESTING

Wiper Motor Operation

Preliminary Checks

1) Inspect for the following: Wiring securely connected to wiper and control switch. Motor grounded OK to body. Control switch securely mounted and grounded. Fuse OK.

2) If items in step 1 check out but wiper does not operate correctly in LO, HI and PARK, disconnect wiper wiring harness and connect 12 volts (through an ammeter) as shown in accompanying illustration "Wiper Motor Test Connections".

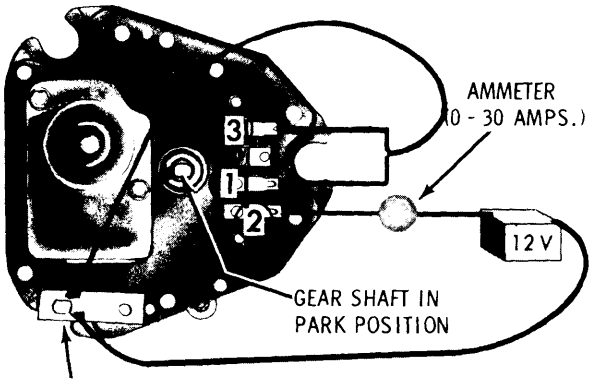
3) If motor operated correctly in step 2, refer to "Trouble Diagnosis – On Car" (see below). If motor did not operate correctly in step 2, disconnect wiper linkage from motor crankarm and again perform step 2. If motor operates correctly when free of linkage, check for cause of binding or lock-up of drive linkage.

4) If motor fails to operate correctly independently of linkage, remove motor and refer to "Trouble Diagnosis – Off Car" (see below).

LO SPEED - AS SHOWN

HI SPEED - DISCONNECT JUMPER WIRE FROM TERMINAL NO. 3.

OFF - LEAVE JUMPER CONNECTED TO NOS. 1 & 3 BUT DISCONNECT IT FROM GRD. STRAP. WIPER SHOULD STOP WITH GEAR SHAFT FLATS AS SHOWN.



WIPER MOTOR TEST CONNECTIONS

Trouble Diagnosis – Wiper On Car

1) If wiper is inoperative or intermittent, check for: Open circuit in feed wire (No. 2 terminal on motor). Loose mounting of wiper control switch. Defective control switch. Open circuit in wire to wiper switch (No. 1 terminal on motor).

2) If wiper will not shut off but has both LO and HI speeds, check for: Grounded wire (No. 1 terminal on motor) to wiper control switch.

3) If wiper will not shut off and has LO speed only, check for: Defective wiper switch. Grounded wire (No. 3 terminal on motor) to control switch.

4) If wiper will not shut off and has HI speed only, check for: Defective wiper switch. Open circuit in wire (No. 3 terminal on motor) to control switch.

5) If wiper has HI speed only, check for: Open circuit in wire (No. 3 terminal on motor) to control switch.

6) If wiper has LO speed only, check for: Grounded wire (No. 3 terminal on motor) to wiper switch. Defective control switch.

7) If wiper blades do not return to full park position, check for: Loose wiper ground strap connection.

Trouble Diagnosis – Wiper Off Car

1) If motor action is intermittent, check for: Poor solder connections at terminal board. Loose splice joints at brush plate. Brushes binding in brush holder. Open circuit in armature.

2) If motor will not shut off but has normal LO and HI speed, check for: Defective park switch. Grounded red lead wire.

3) If motor will not shut off and has LO speed only, check for: Grounded shunt field coil. Grounded black wire.

4) If motor will not shut off and has HI speed only, check for: Open circuit in shunt field coil. Open circuit in black wire.

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5) If wiper shuts off, but not in PARK, check for: Park switch defective or contacts dirty.

6) If speed excessively fast in HI, check for: Defective resistor.

Windshield Washer System

Preliminary Checks – Check the following items: Adequate washer solution. Hoses and connections OK. Screen at end of hose not plugged. Discharge nozzles not plugged. Electrical connections OK at pump and switch. If these items check out OK, proceed as follows:

1) Start wiper motor, push washer button and check for "click" as solenoid pulls in. If solenoid gives no indication of operation, check for power supply at pump wiring connector. No voltage indicates open circuit in feed wiring.

2) If voltage reading was obtained in step **1**, start wiper, then connect 12 volt supply to one washer terminal and ground the other. If washer relay "click" is heard, an inoperative wiper switch is indicated. If relay "click" is not heard, a faulty washer pump relay coil is indicated.

3) If relay "click" was heard in step **2**, listen for the "soft clicking" as pump ratchet wheel is rotated. If "soft clicking" is not heard, pump mechanism is faulty and should be removed from the wiper motor and checked.

Washer Pumps Continuously When Wiper Is ON

1) Disconnect wiring from washer pump. If pump shuts off, trouble is in wiring or switch.

2) If pump did not shut off in step **1**, remove pump from wiper for further checking.

Washer Pump Bench Checks – With washer pump detached from wiper motor, check solenoid and relay coil as follows:

1) Manually actuate solenoid plunger and check for binding condition.

2) Connect 12 volt supply to one washer terminal and ground the other. Failure of solenoid plunger to pull in indicates an open solenoid coil or poor solder connections.

3) If solenoid pulls in correctly, manually actuate the cam follower lower pin and observe if pump now operates. Binds and other types of malfunction can usually be located in this manner.

Wiper Motor Electrical Specifications

Operating Voltage	12 volts.
Current Draw (No load), LO Speed Max.)	4 amps.
HI Speed (Max.)	3.5 amps.
Stall (Cold)	12 amps.