1968 Corvette: Service Bulletin: Windshield Wiper System - Operation and Diagnosis

Model Year: 1968
Subject: 1968 Corvette Windshield Wiper System - Operation and Diagnosis
Source: Chevrolet Dealer Technical Service Bulletin
Number: 68-T-34
Date: Mar. 11, 1968

To: All Chevrolet Dealers

This bulletin is being published as an aid to understand and to easily diagnose 1968 Corvette windshield wiper system.

The system is a double articulating, overlapping type in which the blades park under a concealing vacuum operated lid. The wiper motor is electric and the lid is vacuum operated. The movements of each are programmed to prevent damage to system components.

Vacuum components for wiper door operation are as follows:

1. The vacuum reserve tank and check valve, to store vacuum for door operation, is located under rear of left fender near cowl.
2. The vacuum relay valve, to route vacuum to proper side of door actuator for opening or closing cycle, is located under rear of right front fender. This valve is operated by vacuum on a spring loaded diaphragm.
3. A vacuum control valve solenoid, used to activate or deactivate the vacuum relay when the wiper switch is turned on or off, is mounted on the tachometer housing under the dash.
4. A manual valve in series with the solenoid is used to open the door for service procedure. This switch should also be used to keep the door open when frequent but intermittent wiper use is desirable.

5. Reserve tank, check valve and hoses, constitute the remainder of the vacuum system components. The tank and check valve are common with the headlamp vacuum system.

Electrical components of the wiper system are:

1. Wiper motor - with an integral relay. The motor has separate leads to external ground for completing the armature and field circuits.
2. Wiper switch on dash is sued to provide the wiper system with off, low and high speed conditions. This switch is a ground switch.
3. A limit switch, operated by the wiper door as it reaches open position is mounted on the engine side of the cowl near the wiper motor. This switch is used to interrupt the motor armature ground circuit until the wiper door is fully open. When limit switch completed this circuit, the motor will operate.
4. A rotary Service switch mounted under the dash in steering column area is used to stop the wiper blades in a serviceable position on the windshield. This switch should never be left open for more than short service periods because it does not allow the motor to come to a park position. This can result in a dead battery even with the ignition switch turned off.
5. An external relay completed the motor field circuit to ground at the wiper switch or through a ground wire. This relay is used to return the wipers to slow speed and allow the blades to park for door closing if the ignition is turned of while the wiper switch is in high speed position.
   This relay is mounted under the front of the floor console and is accessible after removing the slide out trim at the right front side.
6. Vacuum motor solenoid is an electrically controlled vacuum switch as outlined under vacuum components.
7. Windshield wiper fuse in fuse panel -- controls the feed circuit for the external relay, the motor relay and the washer solenoid. The yellow wires are protected by this fuse and are hot any time the ignition switch is on.

8. Fuse link at horn relay protects feed (red) wire to wiper. This lead is always hot.
9. Refer to 1968 New Product Training Program Booklet, Page 58-60 or to the September-October Service News for detailed electrical theory of operation.

Wiper Motor and Switch Operation Check -

1. Open wiper doors using the vacuum over-ride switch or manually at the actuator.
2. Install a test prod in wiper terminal #6 and connect a jumper wire from test prod to ground. (This bypasses limit switch and service switch).
3. Disconnect harness connector from terminals #1, #2, and #3.
4. Connect a jumper lead from junction block at horn relay to terminal #2 at wiper motor. If suspicious of ground lead (-) to wiper, connect a separate jumper from wiper motor to engine block.
5. "LO" speed operation - connect wiper terminal #1 and #3 to ground.
6. "HI" speed operation - Leave wiper terminal #1 connected to ground but disconnect #3 from ground.
7. Shut off and/or park - Reconnect terminal #3 to ground and disconnect terminal #1 from ground. Wiper motor should run until blades reach full park position.
8. If wiper motor fails to operate, wiper motor is malfunctioning.
9. Remove test prod ground (step 2) and repeat steps 5 and 6 above to check continuity through limit and service switches.
10. Using jumper wire, connect it individually across the terminals of each suspected switch until defective switch is located.

Note:

An interim change will incorporate a telltale light into

instrument cluster below the door ajar light which will glow when the service switch is left open or if the wiper door doesn't operate the limit switch fully. **There is a constant drain on the battery with the service switch in the "ON" position (even with ignition "OFF").**

11. Check dash switch or external relay. (Refer to figure 4)
    a. To by-pass external relay contacts, disconnect wiring from relay and connect a jumper wire between terminals as shown.
    b. Reconnect wiring to wiper motor and operate wiper with dash switch thru "LO", "HI" speeds and park. **If wiper operates correctly, external relay is defective.**
    c. Wiper does not operate correctly (any malfunction), dash switch and/or wiring to switch is defective.

Wiper Door Locks - Not Full Open Positions

1. Check to see that door actuator rod is adjusted to allow full open position.
2. Check the Windshield Wiper access Door Linkage Bolt for binding action with bushing under the head of the bolt.
    a. Back-off on bolt torque
    b. If binding sill pronounced, remove bolt from assembly. Shave away busing flash and reassemble bolt after lubricating the bolt-bushing mating surface with waterproof lubricant.
    c. If binding is still evident, replace bolt with new bolt #3945216 inserting a spring washer #3940537 (this spring to be coded in warehouse 4/1/68) behind the bolt head.

Door Closes Too Fast - (Up Stops - Fig 5)

Check door height above grille in fully open position. If the dimension from underside of door-top of grille (center of door) is less than 3/16 inch, and washers behind door bumper assemblies to shim to required height.

Door Hits Windshield When Closed - (Down Stops - Fig. 5)

Adjust stops to obtain 1/16 inch clearance between door and windshield when door is in closed position.

Wiper Arm Adjustment (Early Units)

When over-travel of the windshield wipers occurs and they hit the pillar and/or they hit each other at center of wipe pattern on a **wet** windshield and the side arm adjusting screws will not correct, initiate the following:

1. Remove plenum vent grille as outlined in Chassis Shop Manual (Page 12-54).
2. Adjust windshield wiper transmission rods inboard at wiper motor adapter adjustment provisions and set R.H. & LH arm adjusting screws to center position.
3. With wiper arms in "park" position remove arms from serrated transmission heads.
4. Grind existing keys off L.H. and R.H. serrated transmission heads.
5. Install L.H. wiper arm 1.5" below park stop, then lift wiper blade over park stop to normal park position.
6. Install R.H. wiper blade 1.0" above L.H. blade in its park position.
7. Do not use any blades other than Trico or equivalent which is regular service release.
8. Connect washer hoses to nozzles and install plenum vent grille.
9. Now test windshield wiper operation on a **wet** windshield. If any fine adjustment is still necessary use adjusting screws on side of arms.
10. If problem cannot be corrected by adjustment, remove (right hand)

transmission assembly and wiper arm rod assembly and replace with new transmission assembly (#4919036) and rod assembly (#3942736).

11. Adjust as outlined above omitting steps 3 and 4.

Chevrolet Motor Division
General Motors Corporation

c: Dealer List
Chevrolet List

DIAGNOSIS PROCEDURE

Start with engine running to be sure there is adequate vacuum in the supply tank.

WIPER SWITCH IS OFF

Wiper door opens, then closes. Air leak in vacuum control hose to vacuum relay or leaky relay diaphragm—as vacuum builds up, relay moves and door shuts.

Wiper door remains shut, and wiper motor stays off. This is normal.

TURN WIPER SWITCH ON LOW

Wiper door does not open. Pull vacuum door manual over-ride switch.

Door opens and Motor runs.

Vacuum Motor Control Solenoid not operating—
1. Not grounded.
2. No circuit from wiper motor to solenoid.
3. Bad solenoid.
4. Solenoid filter plugged—relay cannot move.
5. Hose between relay and solenoid pinched.

Wiper door does not open. Look for problem in vacuum system or door linkage—Pull manual headlamp vacuum over-ride switch.

Door opens but motor does not run.

1. Wiper fuse is out—relay won't energize.
2. No feed circuit at wiper red wire.
3. Bad ground at wiper switch.
4. Open circuit between wiper terminal 1 and wiper switch.
5. Gear box relay inoperative.

Wiper door opens but wiper motor does not run—
1. Service switch open.
2. Limit switch not closed—rod needs adjustment.
3. Open circuit in wire from wiper motor terminal 6 to ground through above switches.
4. Motor circuit breaker open (replace motor).
5. On late vehicles, the warning lamp should be on for 1 and 2.

Definite time lag before door moves or wiper door opens slowly—
1. Hose between relay and actuator pinched.
2. Leaky hose on open side of actuator.
3. Dirty filter at vacuum relay.
4. Plugged filter on vacuum solenoid causes relay valve to move very slowly.
5. Hose between solenoid and relay pinched almost shut.
6. Linkage binding.

Headlamps do not revolve to up position—
1. Check reserve tank to manifold vacuum hose for pinch closed or plugged.
2. Check the vacuum check valve—Plugged or backwards.
3. Check all vacuum hoses for substantial leak.

Headlamps revolve to open position—Wiper system vacuum or linkage bind

Wiper System Vacuum—
1. Check vacuum relay by disconnecting small hose at relay diaphragm—Vaccum should now be available at actuator opening side and door should open.
2. Leaky, pinched or plugged wiper door vacuum hoses.
3. Check vacuum at center hose of relay valve—No vacuum on this hose indicates pinched or plugged hose to tank.

Door Linkage Mechanism—
1. Remove plug from rear of vacuum cylinder in actuator. Reaching through the hole with a screwdriver, push the piston forward. Check for hang-up in door. **Replace the plug after test.**
2. If door requires great effort to open or will not move, check linkage (SEE WIPER DOOR LOCKS —NOT FULL OPEN).

TURN WIPER SWITCH TO HI

Wipers go to Highspeed—
System normal.

Wipers stay at low speed—
1. Block wire between dash switch and external relay is shorted—
2. Short in wire between external relay and motor terminal 3.
3. External relay defective.
4. Internal motor short.

Wipers park and doors close—
1. Defective dash switch causing intermittent contact condition for relay ground circuit.

TURN WIPER SWITCH OFF

Wipers park and door closes—This is normal.

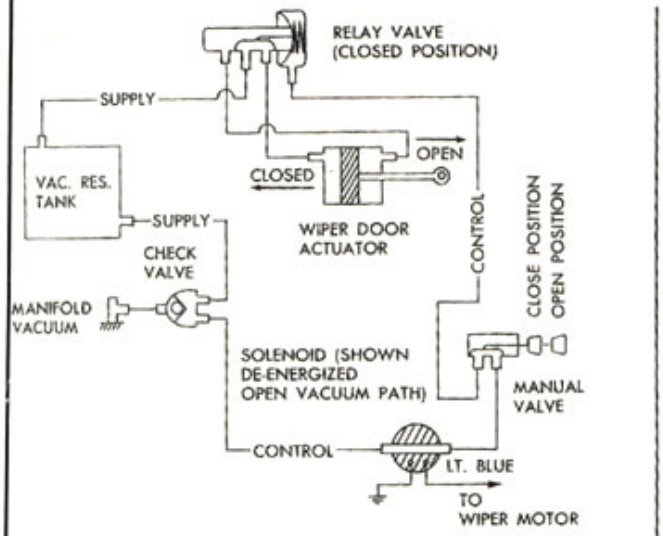
Wiper stay on at high speed only.
2. Triple connector off at external relay.
3. External relay defective.
4. Open wire between external relay and motor terminal 3.

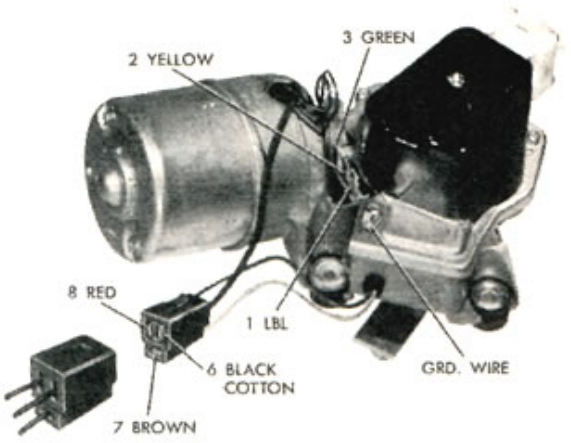
Wipers park but doors do not go close.
1. Manual override switch is pulled.
2. Plug may be out at front of actuator—
3. Hose obstruction between vacuum relay and actuator.
4. Relay valve stuck or vacuum solenoid fails in energized position—Remove hose at relay diaphragm.

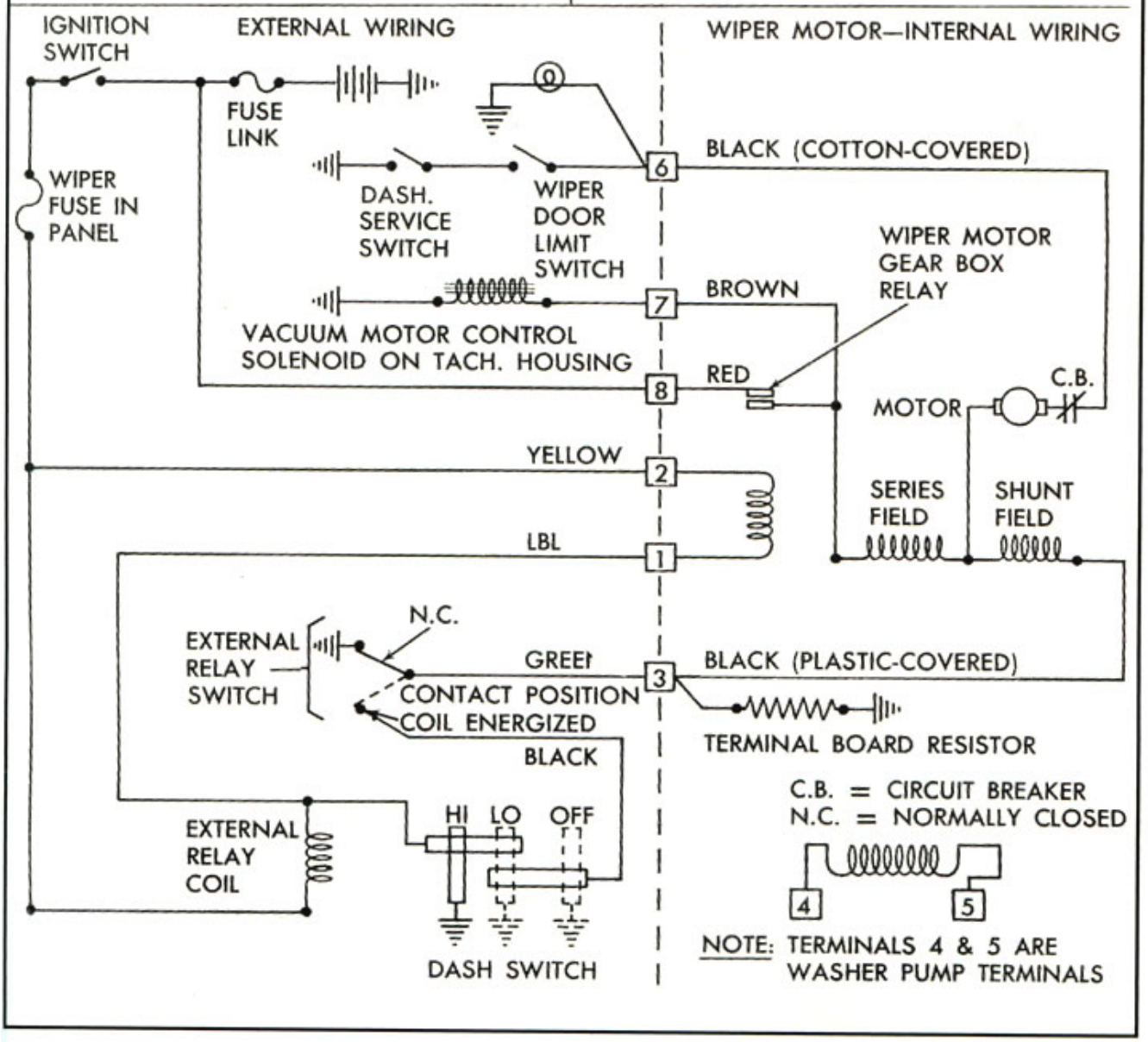
Wipers do not park but speed is slow—turn ignition to off.

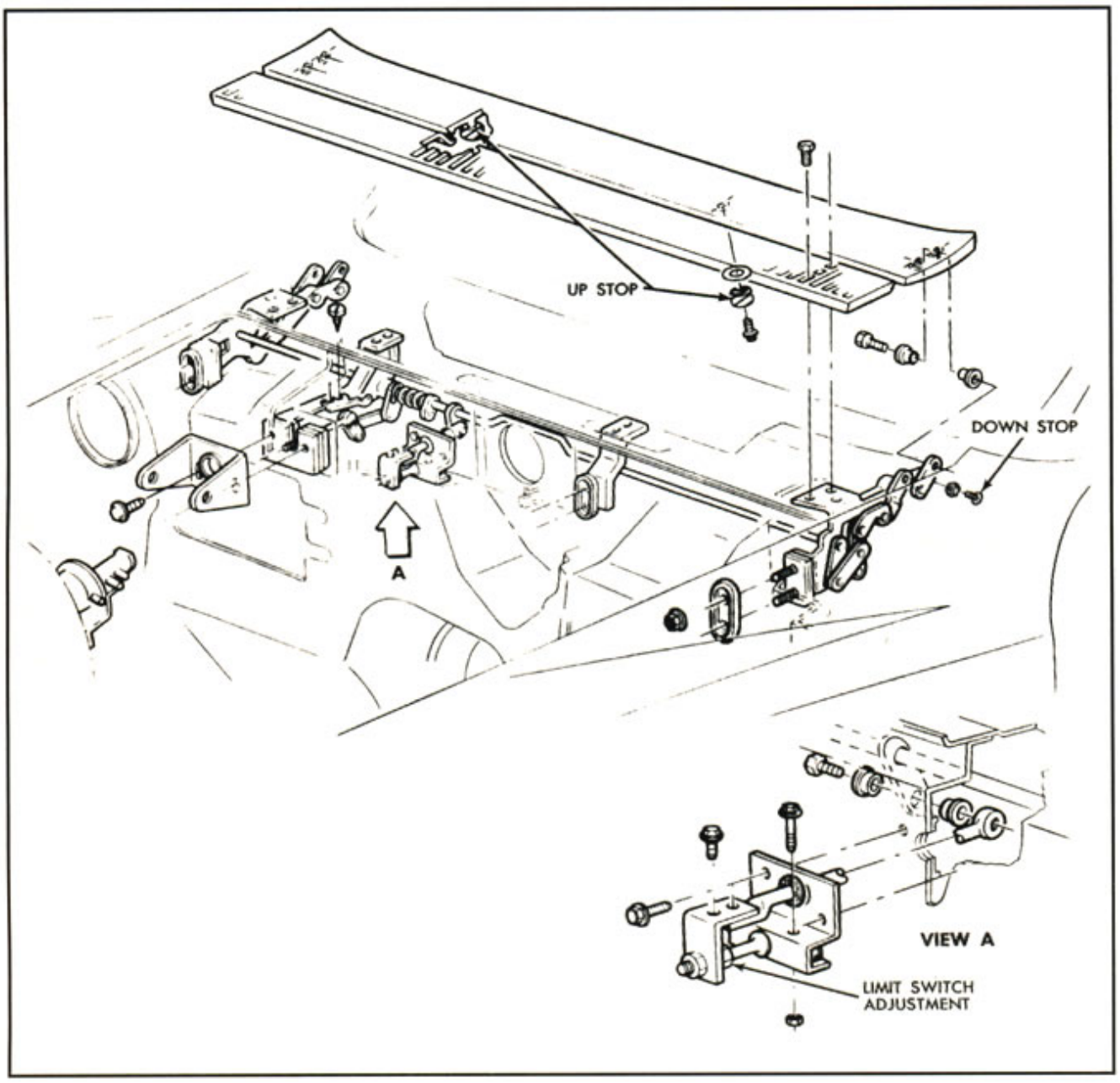
Wipers park and door closes.
1. Dash switch defective—
2. Short in wire from dash switch to motor terminal 1.

Wipers continue to run—
1. Defective motor relay—stays closed. Refer to motor operation check.


RELAY VALVE
(CLOSED POSITION)
SUPPLY
OPEN
CLOSED
VAC. RES.
TANK
SUPPLY
WIPER DOOR
ACTUATOR
CONTROL
CLOSE POSITION
OPEN POSITION
CHECK
VALVE
MANIFOLD
VACUUM
SOLENOID (SHOWN
DE-ENERGIZED
OPEN VACUUM PATH)
MANUAL
VALVE
CONTROL
LT. BLUE
TO
WIPER MOTOR


3 GREEN
2 YELLOW
8 RED
1 LBL
6 BLACK
COTTON
GRD. WIRE
7 BROWN


IGNITION
SWITCH
EXTERNAL WIRING
WIPER MOTOR—INTERNAL WIRING
FUSE
LINK
WIPER
FUSE IN
PANEL
DASH.
SERVICE
SWITCH
WIPER
DOOR
LIMIT
SWITCH
6
BLACK (COTTON-COVERED)
WIPER MOTOR
GEAR BOX
RELAY
7
BROWN
VACUUM MOTOR CONTROL
SOLENOID ON TACH. HOUSING
8
RED
C.B.
MOTOR
YELLOW
2
SERIES
FIELD
SHUNT
FIELD
LBL
1
N.C.
EXTERNAL
RELAY
SWITCH
GREEN
3
BLACK (PLASTIC-COVERED)
CONTACT POSITION
COIL ENERGIZED
TERMINAL BOARD RESISTOR
BLACK
C.B. = CIRCUIT BREAKER
N.C. = NORMALLY CLOSED
HI
LO
OFF
EXTERNAL
RELAY
COIL
4
5
NOTE: TERMINALS 4 & 5 ARE
WASHER PUMP TERMINALS
DASH SWITCH



Custom Fields

- **Source:** Vette Vues - December 2001

Online URL:
https://www.corvetteactioncenter.com/tech/knowledgebase/article/1968-corvette-service-bulletin-windshield-wiper-system-operation-and-diagnosis-697.html