WIPER/WASHER SYSTEM

1991 Chevrolet Camaro

1991 ACCESSORIES & SAFETY EQUIPMENT
General Motors Wiper/Washer Systems

Buick; Century, LeSabre, Park Avenue, Reatta,
Regal, Riviera, Roadmaster, Skylark
Cadillac; Brougham, DeVille, Eldorado, Fleetwood, Seville
Chevrolet; Beretta, Camaro, Caprice, Corsica, Corvette,
Lumina
Oldsmobile; Custom Cruiser, Cutlass Calais, Cutlass Ciera,
Cutlass Cruiser, Cutlass Supreme, Eighty-Eight,
Ninety-Eight, Toronado
Pontiac; Bonneville, Firebird, Grand Am, Grand Prix, 6000

NOTE: Brougham information is not available from manufacturer.

DESCRIPTION

The permanent magnet windshield wiper/washer system uses a depressed park wiper motor with a remote windshield washer pump mounted on washer reservoir. The system is designed to deliver pulse timing and demand wash functions electronically.

Depending on control switch design and whether an integral electronic printed circuit board is used in the wiper cover, the system can function as either a pulse or standard wiper/washer system.

OPERATION

Electronic logic circuits on a pulse wiper system's printed circuit board create the timing and washer commands. Whenever the WASH switch is activated for less than one second, washer solvent is sprayed on the windshield for about 2.5 seconds, activating the wiper cycle for approximately 6 seconds.

If WASH switch is held for more than one second, a demand wash will be performed for as long as switch is held. This wash cycle is followed by the 6-second wiper cycle. When the control switch is in LO or HI speed position, the applicable brush circuit is completed to the power source, and the motor runs at set speed.

Switching the control to PULSE mode operates the wiper motor intermittently. The delay can be varied by adjusting the switch back and forth within the delay mode. An instant wipe is caused by positioning the switch in the MIST selection (if equipped). The wiping action continues until the switch is released.

TESTING

WIPER MOTOR TEST

Before performing following tests, ensure wiper motor-to-dash mounting hardware is secure, washer hoses are not kinked, disconnected or broken, and circuit harness wiring and circuit fuses are okay.

Except Corvette, Eldorado, Reatta, Riviera & Seville

1) Check motor operation before removing wiper assembly from vehicle. Disconnect wiring harness from wiper assembly. Apply a 12-volt source to wiper connector pins. See Figs. 1-5.

2) If wiper motor runs in all operating modes (LO, HI, PARK and PULSE), perform voltage and continuity wiper switch tests. See Fig. 6. If wiper motor does not run in any or all operating modes,

perform appropriate tests.

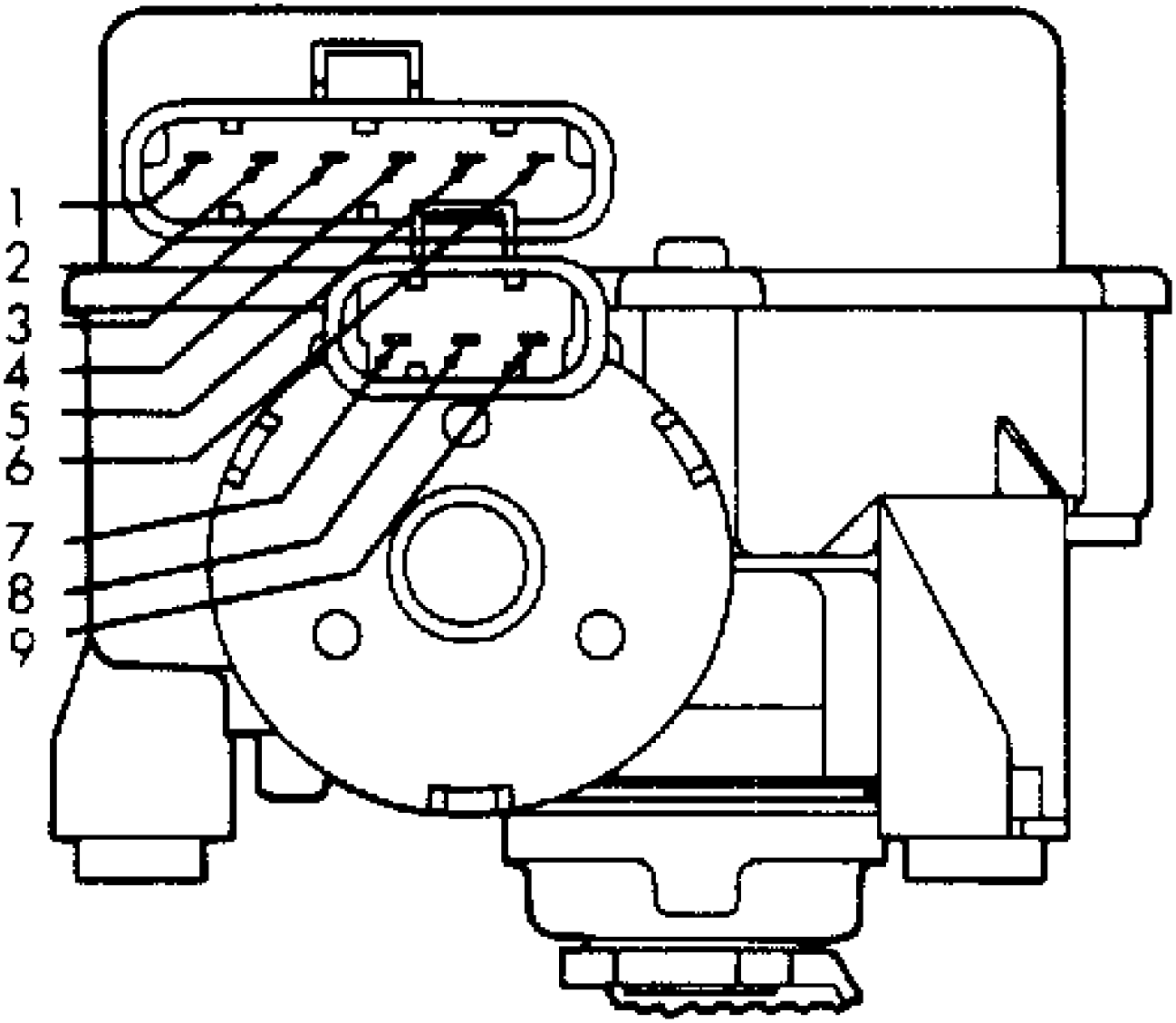


Fig. 1: Testing Wiper Motor Operating Modes (1 of 5)
Courtesy of General Motors Corp.

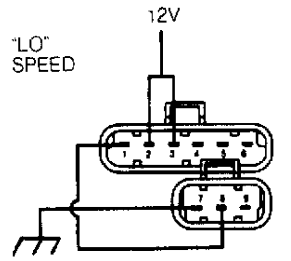


Fig. 2: Testing Wiper Motor Operating Modes (2 of 5)
Courtesy of General Motors Corp.

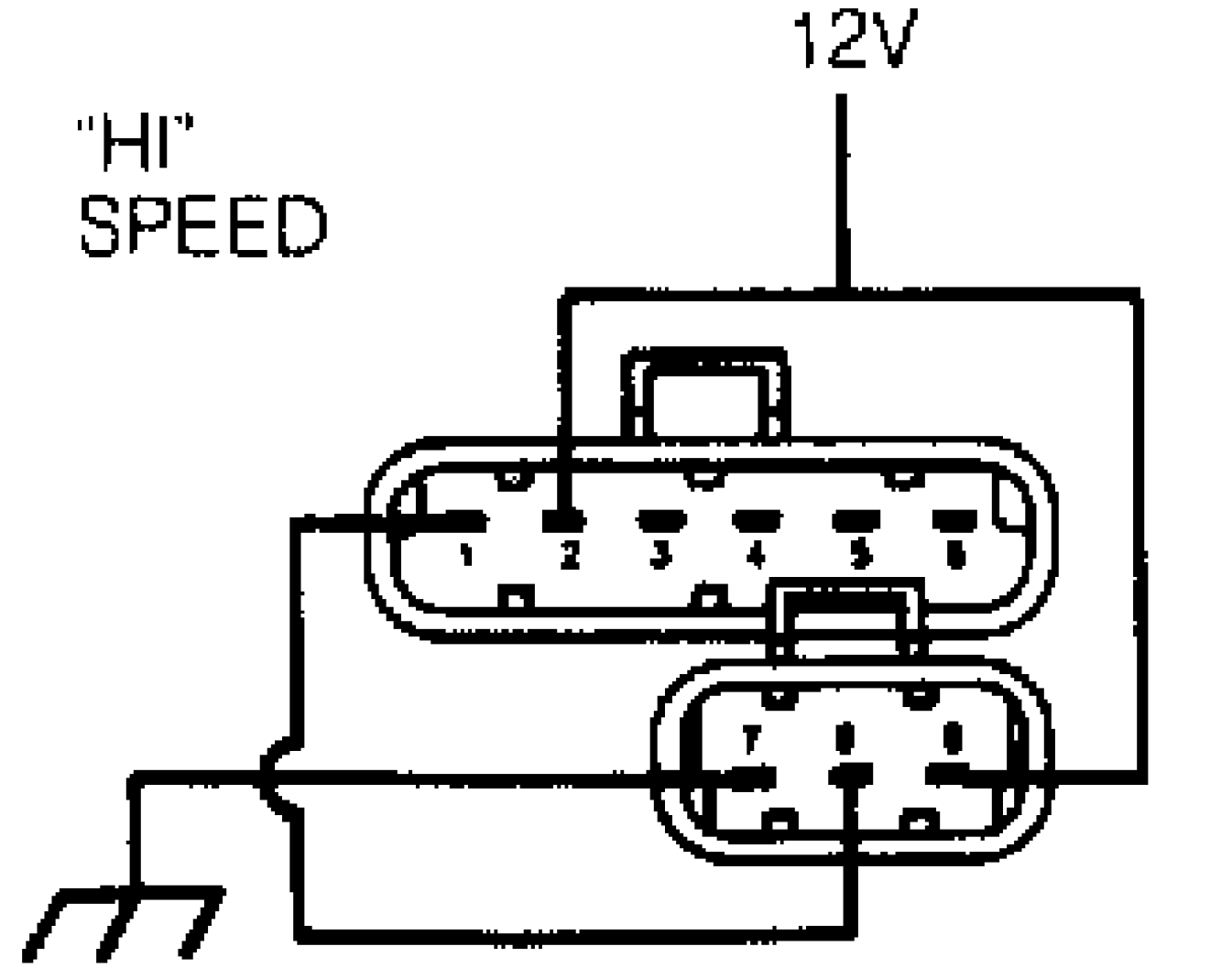


Fig. 3: Testing Wiper Motor Operating Modes (3 of 5)
Courtesy of General Motors Corp.

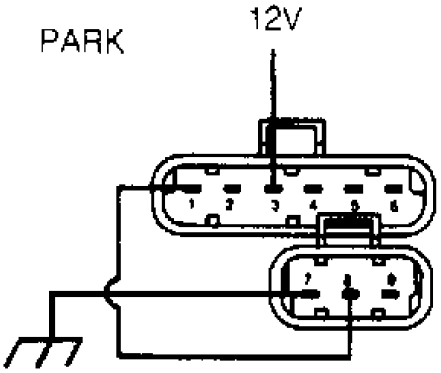


Fig. 4: Testing Wiper Motor Operating Modes (4 of 5)
Courtesy of General Motors Corp.

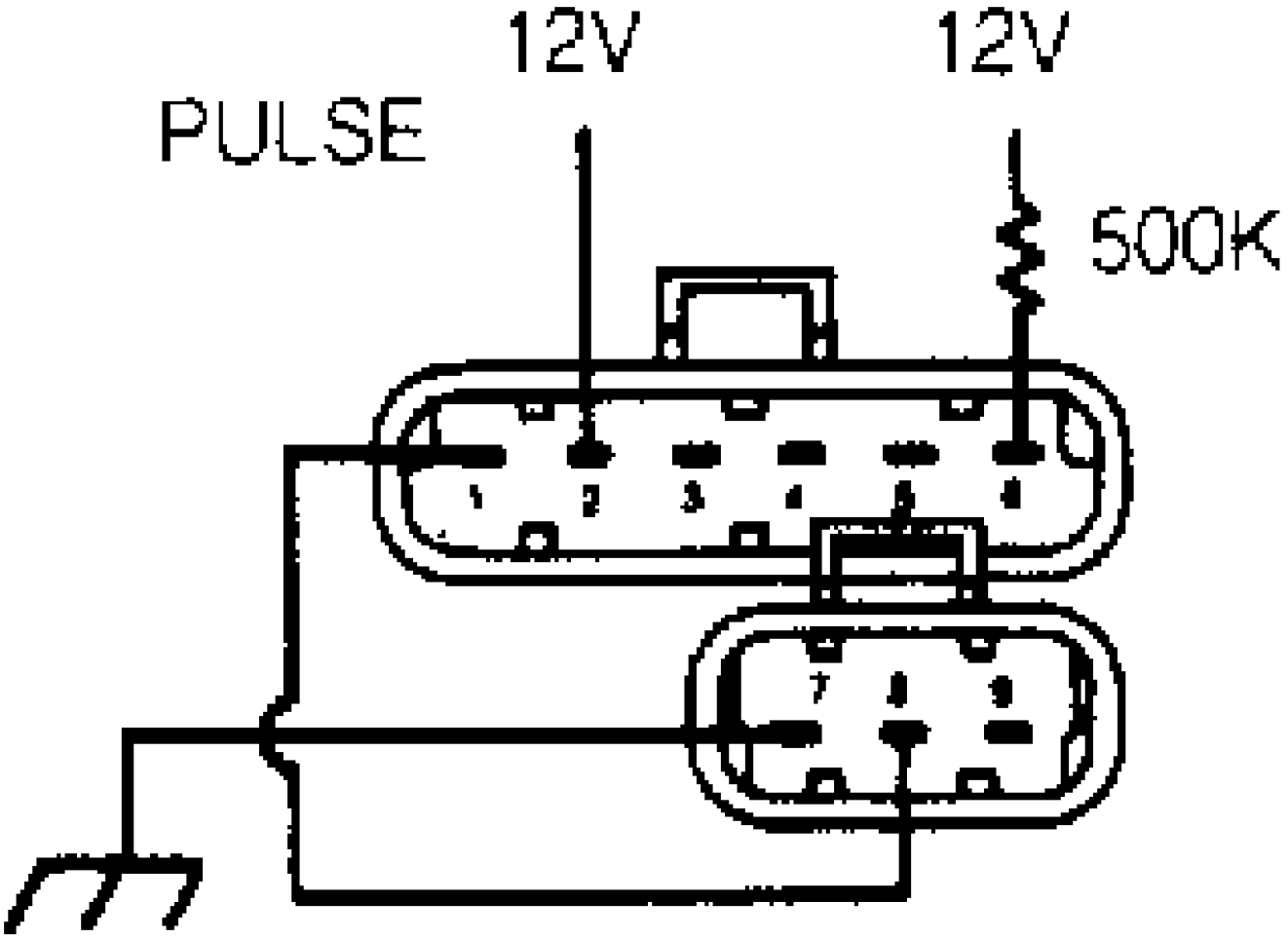


Fig. 5: Testing Wiper Motor Operating Modes (5 of 5)
Courtesy of General Motors Corp.

SWITCH MODE / TERMINAL #		MIST	OFF	PULSE	LO	HI	WASH
PULSE	1	C	C	C	C	C	C
	2	B(+)	—	B(+)	B(+)	—	*B(+)
	3	B(+)	B(+)	—	B(+)	—	*B(+)
	4	—	—	—	—	—	—
	5	—	—	—	—	—	—
	6	10-12V	10-12V	10-12V	10-12V	10-12V	B(+)
	7	GROUND	GROUND	GROUND	GROUND	GROUND	GROUND
	8	C	C	C	C	C	C
	9	—	—	—	—	B(+)	—
STANDARD	1		C		C	C	C
	2		—		B(+)	—	*B(+)
	3		B(+)		B(+)	—	*B(+)
	4		—		—	—	—
	5		—		—	—	—
	6		—		—	—	B(+)
	7		GROUND		GROUND	GROUND	GROUND
	8		C		C	C	C
	9		—		—	B(+)	—

NOTE: C in chart indicates continuity with ohmmeter

Fig. 6: Checking Switch & Harness (On-Vehicle)
Courtesy of General Motors Corp.

NOTE: For terminal and connector reference during wiper tests, see Fig. 7 or appropriate chassis wiring diagram in WIRING

DIAGRAMS.

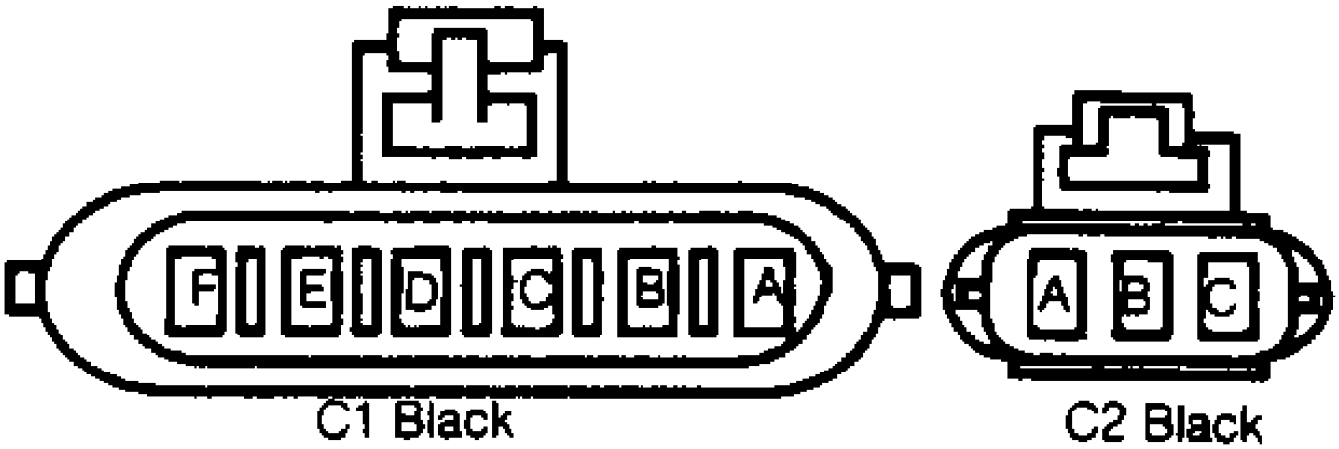


Fig. 7: Identifying Wiper Motor Connectors
Courtesy of General Motors Corp.

WIPER MOTOR INPUT VOLTAGE TEST

Before performing following tests, ensure wiper motor-to-dash mounting hardware is secure, washer hoses are not kinked, disconnected or broken, and circuit harness wiring and circuit fuses are okay.

1) Disconnect wiper motor module connectors C1 and C2. Turn ignition switch to ACCESSORY position, and ensure wiper/washer switch is off. Use a voltmeter to measure voltage between C2 terminal "A" (Purple wire) and C1 terminal "B" (Gray wire) and ground.

2) If readings are zero volts, replace wiper motor module cover. If voltage is present, check associated wiring for short to voltage. If wiring is okay, replace wiper/washer switch. Measure voltage between C1 terminal "C" (Dark Green wire) and C1 terminal "F" (Pink wire) and ground.

3) If battery voltage is present, replace wiper motor module cover. If voltage is not present, check associated wiring to wiper/washer switch for open or short to ground. If wiring is okay, replace wiper/washer switch.

4) With wiper/washer switch in MIST position, measure voltage between C2 terminal "A" (Purple wire) and ground. If reading is zero volts, replace wiper motor module cover. If voltage is present, check wiring for short to voltage. If wiring is okay, replace wiper/washer switch.

5) Measure voltage between ground and C1 terminal "B" (Gray wire), C1 terminal "C" (Dark Green wire) and C1 terminal "F" (Pink wire). If battery voltage is present, replace wiper motor module cover. If battery voltage is not present, check wiring to wiper/washer switch for open or short to ground. If wiring is okay, replace wiper/washer switch.

6) With wiper/washer switch in PULSE position, measure voltage between C2 terminal "A" (Purple wire) and C1 terminal "C" (

Dark Green wire) and ground. If reading is zero volts, replace wiper motor module cover. If voltage is present, check wiring for short to voltage. If wiring is okay, replace wiper/washer switch.

7) Measure voltage between C1 terminal "B" (Gray wire) and C1 terminal "F" (Pink wire) and ground. If battery voltage is present, replace wiper motor module cover. If battery voltage is not present, check wiring to wiper/washer switch for open or short to ground. If wiring is okay, replace wiper/washer switch.

8) With wiper/washer switch in LO position, measure voltage between C2 terminal "A" (Purple wire) and ground. If reading is zero volts, replace wiper motor module cover. If voltage is present, check wiring for short to voltage. If wiring is okay, replace wiper motor module cover.

9) Measure voltage between ground and C1 terminal "B" (Gray wire), C1 terminal "C" (Dark Green wire) and C1 terminal "F" (Pink wire). If battery voltage is present, replace wiper motor module cover. If battery voltage is not present, check wiring to wiper/washer switch for open or short to ground. If wiring is okay, replace wiper/washer switch.

10) With wiper/washer switch in HI position, measure voltage between C2 terminal "A" (Purple wire) and C1 terminal "F" (Pink wire) and ground. If battery voltage is present, replace wiper motor module cover. If battery voltage is not present, check wiring to wiper/washer switch for open or short to ground. If wiring is okay, replace wiper/washer switch.

11) Measure voltage between C1 terminal "B" (Gray wire) and C1 terminal "C" (Dark Green wire) and ground. If reading is zero volts, replace wiper motor module cover. If voltage is present, check wiring for short to voltage. If wiring is okay, replace wiper/washer switch.

12) With wiper/washer switch off and washer switch on, measure voltage between C2 terminal "A" (Purple wire) and ground. If reading is zero volts, replace wiper motor module cover. If voltage is present, check wiring for short to voltage. If wiring is okay, replace wiper/washer switch.

13) Measure voltage between ground and C1 terminal "B" (Gray wire), C1 terminal "C" (Dark Green wire) and C1 terminal "F" (Pink wire). If battery voltage is present, replace wiper motor module cover. If battery voltage is not present, check wiring to wiper/washer switch for open or short to ground. If wiring is okay, replace wiper/washer switch.

WIPER MOTOR MODULE RESISTANCE TEST

1) Disconnect wiper motor module connectors C1 and C2. Ensure ignition switch is in OFF position and wiper/washer switch is in HI position. Use an ohmmeter to measure resistance between C1 terminal "C" (Dark Green wire) and C1 terminal "B" (Gray wire). If resistance is less than .5 ohms, check park switch latch arm and drive pawl for proper operation.

2) If resistance is more than .5 ohms, check circuits No. 95 (Dark Green wire) and No. 91 (Gray wire) for open or short to ground or each other. If wires are okay, replace wiper/washer switch. With ignition off and wiper/washer switch in PULSE position, check resistance between C1 terminal "C" (Dark Green wire) and C1 terminal "B" (Gray wire).

3) If ohmmeter reads infinite resistance, check park switch latch arm and drive pawl for proper operation. If reading shows measurable resistance, check circuits No. 95 (Dark Green wire) and No. 91 (Gray wire) for open or short to ground or each other. If wires are okay, replace wiper/washer switch.

4) Measure resistance between C1 terminal "A" (Yellow wire) and C2 terminal "B" (Yellow wire). If resistance is .5 ohms or less,

check park switch latch arm and drive pawl for proper operation. If ohmmeter shows infinite resistance, check for open circuit No. 196 (Yellow wire).

5) Measure resistance between C1 terminal "A" (Yellow wire) and ground. If reading is infinite ohms, check park switch latch arm and drive pawl for proper operation. If reading is measurable resistance, check circuit No. 196 (Yellow wire) for short to ground.

WIPER PULSE CONTROL RESISTANCE TEST

1) Perform test with wiper motor module connector C1 and negative battery cable disconnected. Ensure ignition switch is in OFF position and wiper/washer switch is in LO position. Use an ohmmeter to measure resistance between C1 terminal "B" (Gray wire) and C1 terminal "F" (Pink wire). If resistance is approximately 24 k/ohms, replace wiper motor module cover.

2) If reading is infinite ohms, check for open circuits No. 94 (Pink wire) and No. 91 (Gray wire). If wires are okay, replace wiper/washer switch. Move wiper delay switch to maximum delay position. Check resistance between C1 terminal "B" (Gray wire) and C1 terminal "F" (Pink wire).

3) If reading is approximately 1.2 megohms, replace wiper motor module cover. If reading is infinite ohms, check for open circuits No. 94 (Pink wire) and No. 91 (Gray wire). If wires are okay, replace wiper/washer switch.

WIPER MOTOR MODULE CURRENT DRAW TEST

1) Remove wiper fuse. Connect an ammeter (30 amp range or higher) across fuse terminals. Turn ignition switch to RUN position and wiper/washer switch to HI position. Read ammeter, and record lowest reading. If reading is less than 3 amps or cycles between any number and zero, check:

* Motor ground
* Brush/Commutator condition
* Circuit Breaker (should be closed)
* Armature

2) If reading is greater than 6.5 amps, replace wiper blades, and repeat current measurement. If reading is less than 6.5 amps, wiper blades were problem. If reading is more than 6.5 amps, disconnect linkage from motor crank, and repeat current measurement.

3) If reading is less than 6.5 amps, linkage is binding. Repair as necessary. If reading is more than 6.5 amps, remove wiper motor module, and repair as necessary.

WIPERS DO NOT OPERATE IN ANY MODE TEST

Corvette

1) Disconnect wiper/washer switch connector. Connect test light between terminal "B" and ground. Turn ignition switch to RUN position. If test light is on, reconnect wiper/washer connector, and disconnect all 3 connectors at wiper motor module. Go to step 3).

2) If test light is off, check for blown wiper fuse or open circuit No. 93 (White wire). If fuse and circuit are okay, check for open wiper fuse feed in circuit No. 4 (Brown wire).

3) Connect a test light between C2 terminal "C" and ground. If test light is off, check for open circuit No. 191 (Gray wire). If circuit is okay, replace wiper/washer switch.

4) If test light is on, connect test light between C2 terminal "B" and ground. Turn wiper/washer switch to LO position. If test light is on, go to step 5). If test light is off, check for open

circuit No. 97 (Light Blue). If circuit is okay, replace wiper/washer switch.

5) Reconnect wiper motor module connectors C1 and C2. Leave 2-wire connector C3 disconnected. With wiper/washer switch still in LO position, connect test light between C3 terminal "B" and ground. If test light is on, go to step 6). If test light is off, check for open circuit No. 191 (Gray wire). If circuit is okay, repair or replace wiper motor module.

6) Connect test light between C3 terminal "A" and ground. Move wiper/washer switch to HI position. If test light is on, check for open or short to battery voltage in ground circuit No. 150 (Black wire). If okay, repair or replace wiper motor module. If test light is off, check for open circuit No. 92 (Purple wire). If circuit is okay, replace wiper/washer switch.

Caprice, Custom Cruiser & Roadmaster

1) Disconnect wiper/washer switch connector. Turn ignition switch to RUN position. Connect a test light between C216 terminal "B" and ground. If test light is on, go to step 2). If test light is off, check for open in fuse 10 or circuit No. 93 (White wire). If circuit is okay, check for open power feed circuit No. 4 (Brown wire).

2) Disconnect wiper motor module connector C2. Connect a test light between C2 terminal "C" and battery voltage. If test light is on, go to test 3). If test light is off, check for open ground circuit No. 150 (Black wire).

3) Reconnect connector C216. Disconnect wiper motor module connector C1. Connect a test light between C1 terminal "C" and ground. If test light is on, go to step 4). If test light is off, check for poor connection at connector C216, and check connector C204 for an open circuit No. 95 (Dark Green wire). If connections and circuit are okay, replace wiper/washer switch.

4) Turn wiper/washer switch to LO position. Connect a test light between C1 terminal "B" and ground. If test light is on, go to step 5). If test light is off, check for poor connections at connectors C216 and C204. Also check for open circuit No. 91 (Gray wire). If connections and circuit are okay, replace wiper/washer switch.

5) Use an ohmmeter to check for continuity from wiper motor module C1 terminal "A" to C2 terminal "B". If continuity is found, check for poor connections at wiper motor module connectors. If connections are okay, replace wiper motor module. If no continuity is found, check for open circuit No. 196 (Yellow wire).

WIPERS RUN AT HIGH SPEED ONLY TEST

Corvette

1) Disconnect wiper motor module connectors C2 and C3. Turn ignition switch to RUN or ACCESSORY position. Move wiper/washer switch to LO position. Connect test light between C2 terminal "C" and ground. If test light is off, check for open circuit No. 191 (Gray wire). If circuit is okay, replace wiper/washer switch.

2) If test light is on, connect test light between C2 terminal "B" and ground. If test light is on again, reconnect C2. If test light is off, check for open circuit No. 97 (Light Blue wire). If circuit is okay, replace wiper/washer switch.

3) Connect test light between C3 terminal "B" and ground. If test light is on, repair or replace wiper motor module. If test light is off, check for open circuit No. 191 (Gray wire). If circuit is okay, repair or replace wiper motor module.

Caprice, Custom Cruiser & Roadmaster

1) Disconnect wiper motor module connector C1. Turn ignition switch to RUN position. Turn wiper/washer switch to LO position.

Connect a test light between C1 terminal "B" and ground. If test light is on, go to step 2). If test light is off, check for open circuit No. 91 (Gray wire) or poor connections at connectors C216 and C204. If circuit and connections are okay, replace wiper/washer switch.

2) Check for poor connection at wiper motor module connector C1. If connection is okay, replace wiper motor module.

WIPERS RUN AT LOW SPEED ONLY TEST

Corvette

Disconnect wiper motor module connector C3. Turn ignition switch to RUN or ACCESSORY position. Move wiper/washer switch to HI position. Connect a test light between C3 terminal "A" and ground. If test light is on, repair or replace wiper motor module. If test light is off, check for open circuit No. 92 (Purple wire). If circuit is okay, replace wiper/washer switch.

Caprice, Custom Cruiser & Roadmaster

1) Disconnect wiper motor module connector C2. Turn ignition switch to RUN position. Turn wiper/washer switch to HI position. Connect a test light between C2 terminal "A" and ground. If test light is on, check for poor connection at C2 terminal "A." If connection is okay, replace wiper motor module.

2) If test light is off, check for open circuit No. 92 (Purple wire) or poor connections at C216 and C204 connectors. If circuit and connections are okay, replace wiper/washer switch.

WIPERS WILL NOT SHUT OFF TEST

Corvette

1) Disconnect 3 wiper motor module connectors. Turn ignition switch to RUN or ACCESSORY position. Turn wiper/washer switch to OFF position. Connect a test light between C1 terminal "A" and ground. If test light is on, check for short to battery voltage in circuit No. 96 (Brown wire).

2) If circuit is okay, replace wiper/washer switch. If test light is off, connect test light between C2 terminal "B" and ground. If test light is on, check for short to battery voltage in circuit No. 97 (Light Blue wire). If circuit is okay, replace wiper/washer switch.

3) If test light is off, reconnect connectors C1 and C2. Connect test light between C3 terminal "B" and ground. If test light is on, check for short to battery voltage in circuit No. 191 (Gray wire). If circuit is okay, repair or replace wiper motor module. If test light is off, connect test light between C3 terminal "A" and ground.

4) If test light is on, check for short to battery voltage in circuit No. 92 (Purple wire). If circuit is okay, replace wiper/washer switch. If test light is off, repair or replace wiper motor module.

Caprice, Custom Cruiser & Roadmaster

1) Disconnect wiper motor module connector C1. Turn ignition switch to RUN position. Turn wiper/washer switch to OFF position. Use a digital voltmeter to measure voltage between C1 terminal "B" and ground. If voltage is not present, go to step 2). If voltage is present, check for short to battery voltage in circuit No. 91 (Gray wire). If circuit is okay, replace wiper/washer switch.

2) Disconnect wiper motor module connector C2. Use a digital voltmeter to measure voltage between C2 terminal "A" and ground. If voltage is not present, repair/replace wiper motor module. If voltage is present, check for short to battery voltage in circuit No. 92 (Purple wire). If circuit is okay, replace wiper/washer switch.

PULSE DELAY INOPERATIVE OR INCORRECT TEST

Corvette

1) Disconnect wiper motor module connectors C1 and C2. Turn ignition switch off. Move wiper/washer switch to LO position. Using a Digital Volt Ohmmeter (DVOM), measure resistance between C1 terminal "A" and C2 terminal "B".

2) If resistance reading shows open circuit, check for open circuit No. 96 (Brown wire). If circuit is okay, replace wiper/washer switch. If resistance is approximately 24 k/ohms with DVOM still across terminals, move wiper/washer switch through full pulse delay range.

3) If resistance increases to approximately 1224 k/ohms, repair or replace wiper motor module. If resistance does not increase to this value, replace wiper/washer switch.

Caprice, Custom Cruiser & Roadmaster

1) Turn ignition switch to OFF position. Disconnect connector C216. Turn wiper/washer switch to PULSE position. Use an ohmmeter to measure resistance through wiper/washer switch at connector C216 from terminal "B" to terminal "F". Move wiper/washer switch through entire delay range.

2) If resistance varies from approximately 1224 k/ohms to 24 k/ohms, check circuit No. 94 (Pink wire) for open or poor connection. If circuit is okay, replace wiper motor module. If resistance does not vary to these values, replace wiper/washer switch.

WASHER MOTOR VOLTAGE TEST

1) Disconnect washer motor connector. Turn ignition switch to ACCESSORY position, and hold washer switch in ON position. Use a voltmeter to measure voltage between terminal "A" (Red wire) and terminal "B" (Dark Blue wire). If reading is battery voltage, replace washer pump.

2) If no voltage is present, check for open circuits No. 228 (Red wire) and No. 227 (Dark Blue wire). If wires are okay, check terminal contact between park switch and cover assembly. If contact is good, replace cover assembly. With washer switch in OFF position, measure voltage between terminal "A" (Red wire) and terminal "B" (Dark Blue wire).

3) If reading is zero volts, replace washer motor. If voltage is present, check circuit No. 228 (Red wire) for short to battery. If wire is okay, replace cover assembly.

WASHER WILL NOT OPERATE TEST

Corvette

1) Disconnect washer pump connector. Turn ignition switch to RUN or ACCESSORY position. Connect test light between terminals "A" and "B" of washer pump connector. Activate washer switch while observing test light. If test light comes on, replace washer pump. If test light stays off, connect test light between terminal "A" and ground. Activate washer switch.

2) If test light comes on, repair open ground circuit No. 150 (Black wire), terminal "B" of pump connector. If test light stays off, disconnect wiper motor module connectors C1 and C2. Connect test light between C1 terminal "C" and ground. Activate washer switch. If test light comes on, repair open circuit No. 94 (Pink wire).

3) If test light stays off, connect test light between C1 terminal "A" and ground. Activate washer switch. If test light stays off, check for open circuit No. 96 (Brown wire). If circuit is okay, replace wiper/washer switch. If test light comes on, connect test light between C2 terminal "B" and ground.

4) Activate washer switch. If test light comes on, repair or

replace wiper motor module. If test light stays off, check for open circuit No. 97 (Light Blue wire). If circuit is okay, replace wiper/washer switch.

Caprice, Custom Cruiser & Roadmaster

1) Disconnect washer pump connector. Turn ignition switch to RUN position. Connect test light between terminals "A" and "B" of washer pump connector. Activate washer switch while observing test light. If test light comes on, check for poor connection at washer motor connector. If connection is okay, replace washer pump. If test light stays off, connect test light between terminal "A" and ground. Activate washer switch.

2) If test light is on, check for open or poor connection in circuit No. 227 (Dark Blue wire). If connection is okay, replace wiper motor module. If test light is off, use a digital voltmeter to backprobe connector C216 between terminal "F" and ground with ignition switch in RUN position. Activate washer switch.

3) If voltage is present, check for poor connections at connectors C216 and C204 and wiper motor module. Also check for open circuit No. 94 (Pink wire). If okay, repair/replace wiper motor module. If voltage is not present, check for open or poor connection in circuit No. 94 (Pink wire). If circuit is okay, replace wiper/washer switch.

WIPER/WASHER SWITCH VOLTAGE TEST

Eldorado & Seville

1) Disconnect right switch connector, and turn ignition switch to ACCESSORY position. Use a voltmeter to measure voltage between BC3 and ground. If battery voltage is present, ensure C2 terminal "C" is grounded. If grounded, reconnect right switch connector, and go to WIPER MOTOR INPUT VOLTAGE TEST.

2) If no voltage is present, check wiper fuse No. 12 and circuit No. 93 (White wire) for open or short to ground. Measure voltage between BC4 and ground.

3) If battery voltage is present, ensure C2 terminal "C" is grounded. If grounded, reconnect right switch connector, and go to WIPER MOTOR INPUT VOLTAGE TEST. If no voltage is present, check wiper fuse No. 12 and circuit No. 93 (White wire) for open or short to ground.

Except Eldorado & Seville

1) Disconnect electrical connectors at wiper motor, and perform continuity, voltage and ground tests using a DVOM. Disconnect 8-wire wiper switch connector, located under dash on right side of brake pedal support. Turn ignition switch to ACCESSORY position.

2) Measure voltage between terminal "D" (White wire) and ground. If battery voltage is present, go to appropriate wiper motor test. If battery voltage is not present, check for open wiper fuse or open circuit No. 93 (White wire).

REMOVAL & INSTALLATION

WIPER MOTOR MODULE

Eldorado & Seville

Remove harness connectors. Remove wiper motor module screws. Remove wiper motor module. To install, reverse removal procedure.

Reatta & Riviera

Remove A/C pipe shroud. Remove harness connectors, cover and wiper motor module screws. Remove wiper motor module. To install,

reverse removal procedure.

WIPER MOTOR

Corvette

Raise hood, and remove negative battery cable. Disconnect upper electrical harness connectors. Remove left plenum screen. Remove right and left transmission link nuts and sockets. Remove vacuum booster supply hose. Remove wiper motor mounting bolts. Remove wiper motor, and disconnect lower electrical connector. To install, reverse removal procedure.

Reatta & Riviera

Remove A/C pipe shroud. Remove cowl cover and wiper arm drive link from crank arm. Disconnect harness connectors, and remove wiper motor mounting bolts. Remove wiper motor. To install, reverse removal procedure.

Caprice, Custom Cruiser & Roadmaster

Remove right side wiper arm and hose. To prevent windshield damage, remove left side cowl vent first. Remove right side cowl vent. Remove linkage access hole cover screws and covers. Remove motor drive link from crank arm. Disconnect electrical connectors. Remove wiper motor mounting bolts and wiper motor. To install, reverse removal procedure.

All Others

Remove wiper arms. Remove top vent screen shroud. Remove wiper arm drive link from crank arm. Remove electrical connectors. Remove wiper motor mounting bolts and wiper motor. Remove crank arm from motor. To install, reverse removal procedure.

WIPER MOTOR COVER

Remove wiper motor from vehicle (if necessary). See WIPER MOTOR under REMOVAL & INSTALLATION. Remove wiper motor cover screws. Remove cover. To install, reverse removal procedure.

WIPER PARK SWITCH

Eldorado, Reatta, Riviera & Seville

Remove wiper motor module. See WIPER MOTOR MODULE under REMOVAL & INSTALLATION. If wiper motor is in PARK position, operate motor to remove lock pawl from relay slot. Remove park switch. To install, reverse removal procedure. See Figs. 6 and 7.

Except Eldorado, Reatta, Riviera & Seville

Remove wiper motor cover. See WIPER MOTOR COVER under REMOVAL & INSTALLATION. If wiper motor is in PARK position, operate motor to remove lock pawl from relay slot. Remove park switch. To install, reverse removal procedure. See Figs. 6 and 7.

WASHER PUMP

Drain washer reservoir. Remove necessary braces to gain access to reservoir. Remove washer pump electrical connector. Remove pump retaining screws and pump. To install, reverse removal procedure.

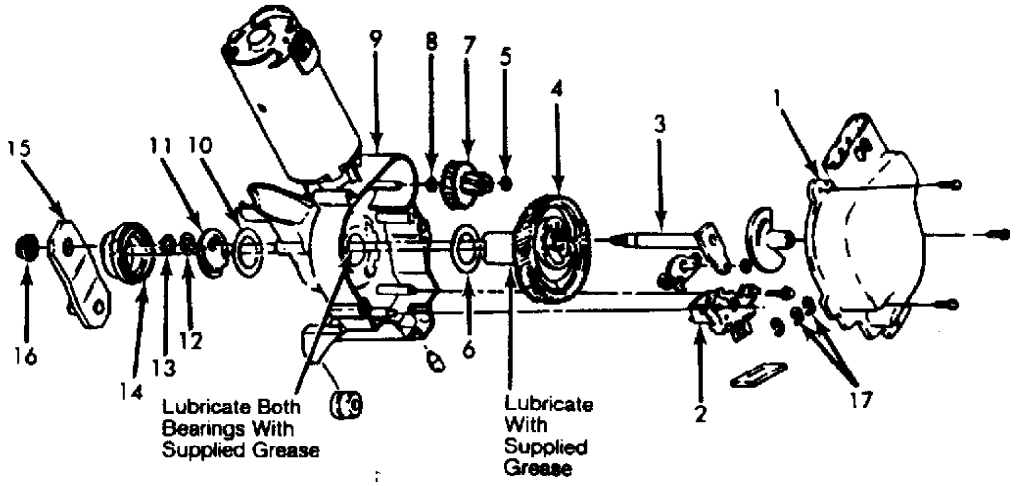
OVERHAUL

GEAR BOX

Disassembly

1) With wiper motor removed from vehicle, remove crank arm retaining nut. Disconnect crank arm. Remove rubber seal cap and thrust collar or retaining ring. See Figs. 8 and 9.

2) Remove shim washers, shield and spacer washer. Remove park switch assembly. Remove large gear, inner spacer washer, intermediate gear retainer and intermediate gear. When removing large gear, latch arm must be out of way. See Fig. 10. Disassemble drive plate and shaft assembly.



1. Wiper Cover
2. Park Switch Assembly
3. Drive Plate & Shaft Assembly
4. Gear & Tube Assembly
5. Retainer
6. Inner Spacer Washer
7. Intermediate Gear
8. Washer
9. Housing
10. Spacer Washer
11. Shield
12. Shim Washers
13. Retaining Clip
14. Seal Cap
15. Crank Arm
16. Retaining Nut
17. Park Switch Pulse Terminals

Fig. 8: Exploded View of Wiper Motor Assembly
Courtesy of General Motors Corp.

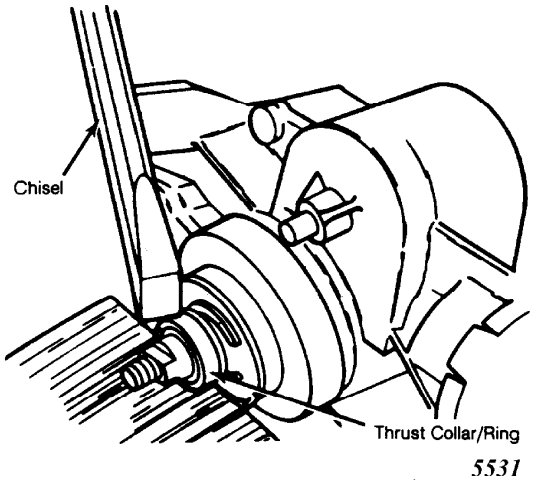


Fig. 9: Removing Thrust Collar/Ring
Courtesy of General Motors Corp.

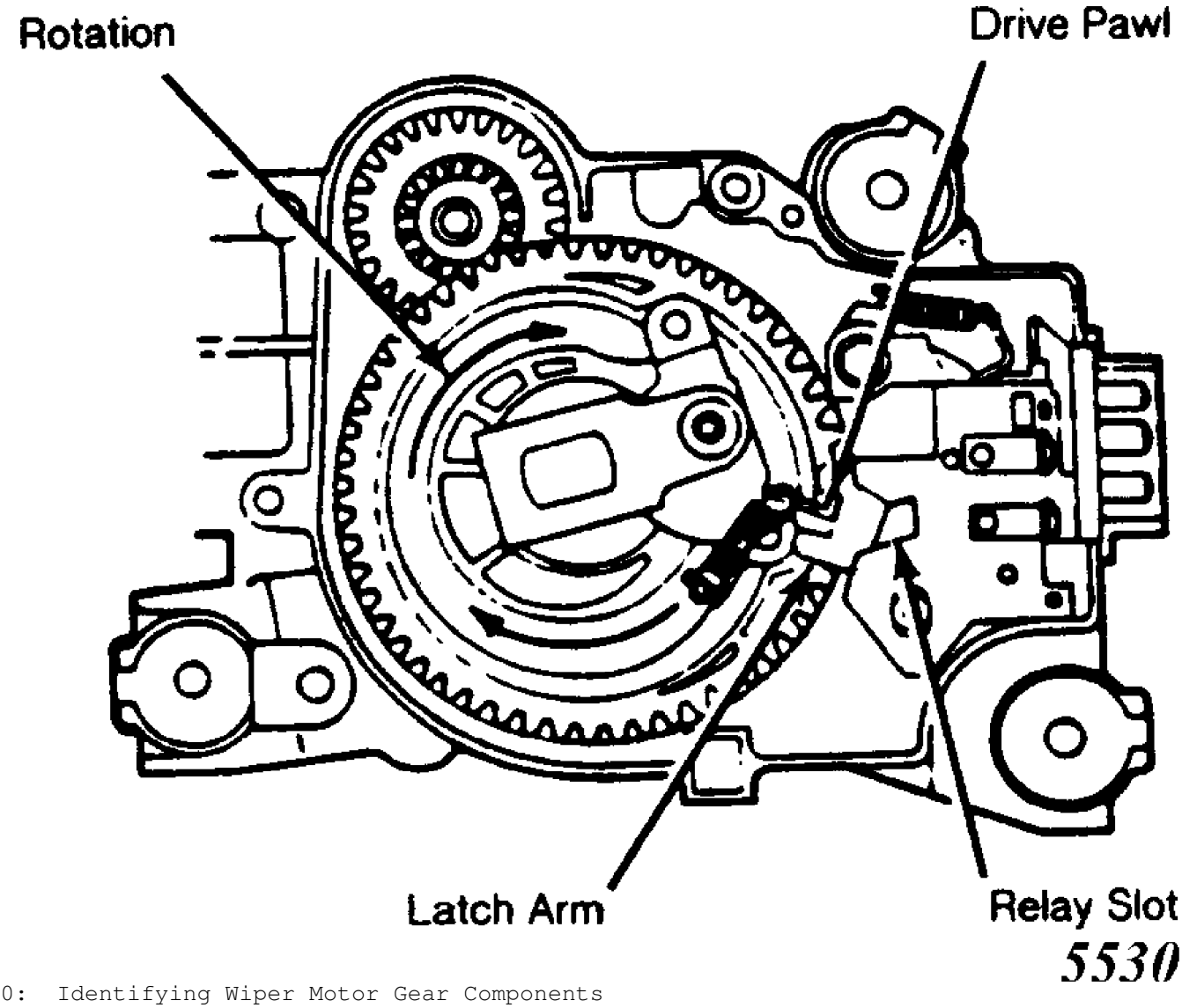


Fig. 10: Identifying Wiper Motor Gear Components
Courtesy of General Motors Corp.

Reassembly

1) Install intermediate gear and new intermediate gear retainer. Install inner spacer washer onto large gear tube. Install large gear, spacer washer and shield. Use shim washers to obtain .001-.010" (.03-.26 mm) end play.

NOTE: Move drive and lock pawls as required to fit respective pins in gear pockets. Ensure drive plate is firmly against gear.

2) Install retaining ring (in place of thrust collar on original motor). Install rubber seal cap. Install crank arm (check crank arm for proper position in park position). See Fig. 11. Tighten crank arm nut to 31 ft. lbs. (42 N.m).

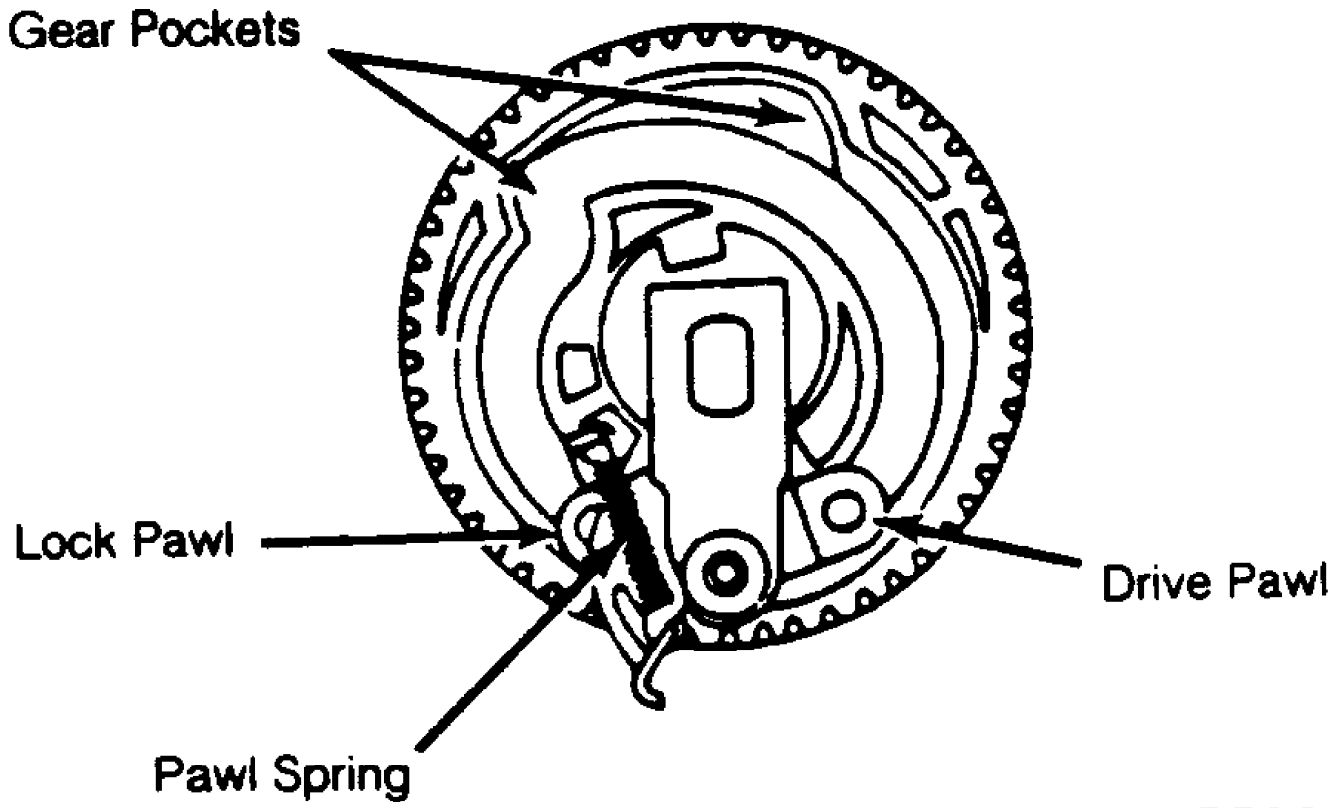


Fig. 11: Examining Gear Pawl Alignment In Park Position
Courtesy of General Motors Corp.

WIRING DIAGRAMS

See appropriate chassis wiring diagram in WIRING DIAGRAMS.