

**1999-2000 ACCESSORIES & EQUIPMENT****Wiper/Washer Systems - Corvette****DESCRIPTION & OPERATION**

**WARNING:** Vehicles are equipped with air bag supplemental restraint system. Before attempting ANY repairs involving steering column, instrument panel or related components, see **SERVICE PRECAUTIONS** and **DISABLING & ACTIVATING AIR BAG SYSTEM** in appropriate **AIR BAG RESTRAINT SYSTEMS** article.

**CAUTION:** To prevent scratching, wet the windshield before turning on wipers.

Wipers use a depressed-park system (wipers park below bottom of windshield). System uses a 2-speed wiper motor. A washer motor is attached to the washer fluid reservoir. A circuit board on the wiper motor cover controls power to the washer motor and delay function.

**ADJUSTMENTS**

Check wiper arm tip pressure (force needed to lift wiper arm perpendicular to windshield) at tip of arm with wipers at mid-wipe position and wiper blade assemblies removed. Force needed to lift wiper arms should be 30-36 oz. (8.3-10.1 N). If force required to lift wiper arm is not as specified, replace wiper arm. See **WIPER ARMS** under **REMOVAL & INSTALLATION**.

**TROUBLE SHOOTING****PRELIMINARY INSPECTION**

Before performing any test on wiper/washer system, check the following items to eliminate common problems:

- Check wiper/washer-related fuses.
- Check washer reservoir level.
- Check for kinked or damaged washer hoses.
- Check for damaged washer pump.
- Check for damaged, loose or corroded connections.
- Check for damaged wiring harness.
- Ensure washer nozzles are not plugged.
- Check for binding or damaged wiper arm linkage.

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Correct any obvious problems before continuing testing. Perform **SYSTEM OPERATION CHECK**.

#### SYSTEM OPERATION CHECK

1. Turn ignition switch to RUN position. With wiper/washer switch off, press washer switch for 2-4 seconds and release. Washer should spray as long as switch is held in ON position. Wipers should run at low speed. After switch is released, washer stops, and wipers return to Park position after 2-4 sweeps.
2. Move wiper/washer switch to INT position. Move wiper/washer switch through delay range. Wipers should make one complete sweep, and then pause for 1-22 seconds (depending on delay setting) before making next sweep. With wiper/washer switch in INT position, depress washer switch. Washer should spray as long as switch is held. Wipers should run at low speed while spraying and continue 2-4 sweeps after switch is released. Wipers should then return to pulse operation.
3. Move wiper/washer switch to LOW position. Wipers should operate continuously at low speed. Move wiper/washer switch to HIGH position. Wipers should operate continuously at high speed.
4. Move wiper/washer switch to OFF position. Wipers should return to Park position at low speed. Move wiper/washer switch to MIST position and release. Wipers should make one complete sweep and return to Park position. If wiper system does not function properly, diagnose by symptom. See **SYMPTOM TESTS**.

#### SYMPTOM TESTS

**NOTE:** Before testing, see **PRELIMINARY INSPECTION** under **TROUBLESHOOTING**. For circuit, terminal and wire color identification, see **WIRING DIAGRAMS**.

#### SYMPTOM INDEX

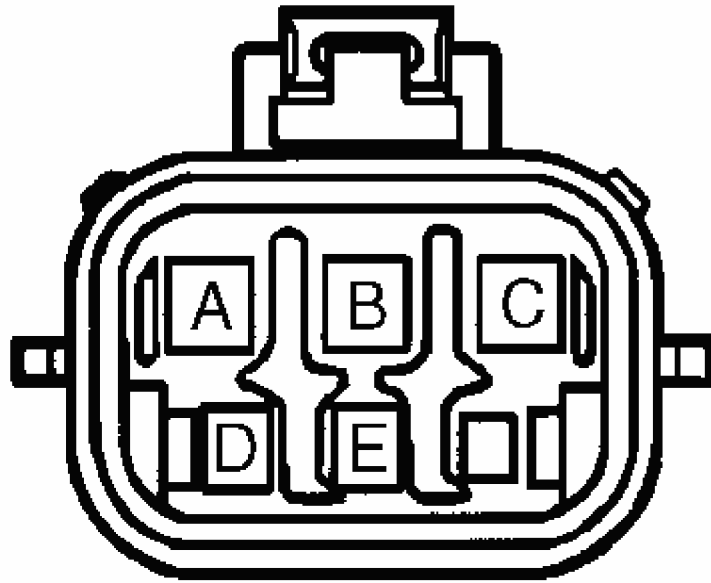
Symptom	Perform Test
Wipers Inoperative In Any Mode	<b><u>1</u></b>
Wipers Will Not Turn Off	<b><u>2</u></b>
Wipers Operate At High Speed Only	<b><u>3</u></b>
Wiper Intermittent Mode Inoperative	<b><u>4</u></b>
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Washer Motor Inoperative	<b><u>6</u></b>

#### TEST 1: WIPERS INOPERATIVE IN ANY MODE

1. Disconnect wiper/washer switch 6-pin connector C219 at base of steering column. Turn ignition switch to RUN position. Using DVOM, measure voltage between ground and wiper/washer switch connector terminal "C" (Yellow wire leading toward instrument

panel electrical center). If reading is 10-14 volts, go to step 3 . If reading is not 10-14 volts, go to next step.

2. Check for open WSW fuse (25-amp) located in instrument panel electrical center. If fuse is okay, check for open in Yellow wire between wiper motor connector terminal "B" and instrument panel electrical center. If fuse is open, go to step 6 .
3. Disconnect wiper motor connector. Turn ignition switch to RUN position. Turn wiper/washer switch to LOW position. Measure voltage between wiper motor connector terminal "B" (Yellow wire) and ground. See **Fig. 1** . If reading is 10-14 volts, go to next step. If reading is not 10-14 volts, repair open in Yellow wire between wiper motor connector terminal "B" and instrument panel electrical center. See **WIRING DIAGRAMS** .
4. Turn ignition switch to OFF position. Using ohmmeter, check for continuity between ground and wiper motor connector terminal "A" (Black wire). See **Fig. 1** . If resistance is less than 0.5 ohms, go to next step. If resistance is more than 0.5 ohms, repair open in Black wire between ground and wiper motor connector terminal "A". See **WIRING DIAGRAMS** .
5. Reconnect wiper motor connector. Connect 30-amp fused jumper between wiper/washer switch connector C219, terminals "B" (Gray wire) and "C" (Yellow wire). Connect an additional 30-amp fused jumper between wiper/washer switch connector terminals "A" (Dark Green wire) and "C" (Yellow wire). Turn ignition switch to RUN position. If wiper motor operates at low speed, replace wiper/washer switch. See **STEERING COLUMN SWITCHES - CORVETTE** article. If wiper motor does not operate at low speed, check wiper motor linkage for binding or damage. Repair as necessary. If wiper motor linkage is okay, replace wiper motor. See **WIPER MOTOR** under REMOVAL & INSTALLATION.
6. Disconnect wiper motor connector. Ensure wiper/washer switch connector C219 is disconnected. Remove WSW fuse (25-amp) from instrument panel electrical center. Using ohmmeter, check for continuity between ground and wiper/washer switch connector C219, terminal "C" (Yellow wire leading toward instrument panel electrical center). If continuity does not exist, go to next step. If continuity exists, check for short to ground in Yellow wire between wiper motor connector terminal "B" and instrument panel electrical center. See **WIRING DIAGRAMS** .
7. Reconnect wiper motor connector. Reconnect wiper/washer switch connector C219. Connect ammeter (0-30-amp) across WSW fuse terminals in instrument panel electrical center. Operate wiper motor. If amperage draw is 0-25 amps, go to next step. If amperage draw is more than 25 amps, check wiper motor linkage for binding or damage. Repair as necessary. If wiper motor linkage is okay, replace wiper motor. See **WIPER MOTOR** under REMOVAL & INSTALLATION.
8. Check Yellow wire between wiper motor connector terminal "B" and instrument panel electrical center for intermittent short to ground. See **WIRING DIAGRAMS** . Replace WSW fuse (25-amp) and retest system.



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**Fig. 1: Identifying Wiper Motor Connector Terminals**  
Courtesy of GENERAL MOTORS CORP.

**TEST 2: WIPERS WILL NOT TURN OFF**

1. Turn ignition switch to RUN position. Turn wiper/washer switch to OFF position. Disconnect wiper/washer switch 6-pin connector C219 located at base of steering column. If wiper motor is still operating, go to next step. If wiper motor stops operating, check for short to battery voltage in Yellow wire between wiper motor connector terminal "B" and instrument panel electrical center. See **WIRING DIAGRAMS** . If no faults are found, replace wiper/washer switch. See **STEERING COLUMN SWITCHES - CORVETTE** article.
2. Disconnect wiper motor connector. Turn ignition switch to RUN position. Connect voltmeter between chassis ground and wiper/washer switch 6-pin connector C219, terminal "A" (Dark Green wire). If voltage is less than one volt, go to next step. If voltage is one volt or more, repair short to voltage in Dark Green wire between wiper/washer switch connector terminal "A" and wiper motor connector terminal "E". See **WIRING DIAGRAMS** .
3. Ensure wiper motor and wiper/washer switch connectors are disconnected. Ensure ignition switch is in RUN position. Using DVOM connected to ground, measure voltage at wiper/washer switch connector C219, terminal "B" (Gray wire). If voltage is

one volt or more, repair short to battery voltage in Gray wire between wiper/washer switch connector terminal "B" and wiper motor connector terminal "D". See **WIRING DIAGRAMS** . If voltage is less than one volt, go to next step.

4. Ensure wiper motor and wiper/washer switch connectors are disconnected. Ensure ignition switch is in RUN position. Using DVOM connected to ground, measure voltage at wiper/washer switch connector C219, terminal "D" (Purple wire). If voltage is one volt or more, repair short to battery voltage in Purple wire between wiper/washer switch connector terminal "D" and wiper motor connector terminal "C". See **WIRING DIAGRAMS** . If voltage is less than one volt, replace wiper motor. See **WIPER MOTOR** under REMOVAL & INSTALLATION.

### **TEST 3: WIPERS OPERATE AT HIGH SPEED ONLY**

1. Disconnect wiper/washer switch connector C219 located at base of steering column. Turn wiper/washer switch to LOW position. Using ohmmeter, check for continuity between wiper/washer switch connector C219, terminal "A" (Dark Green wire) and terminal "C" (Yellow wire). If continuity does not exist, replace wiper/washer switch. See **STEERING COLUMN SWITCHES - CORVETTE** article. If continuity exists, go to next step.
2. Ensure wiper/washer switch is in LOW position. Using ohmmeter, check for continuity between wiper/washer switch connector C219, terminal "C" (Yellow wire) and terminal "B" (Gray wire). Resistance should be 23-25 k/ohms. If resistance is not as specified, replace wiper/washer switch. See **STEERING COLUMN SWITCHES - CORVETTE** article. If resistance is as specified, go to next step.
3. Reconnect wiper/washer switch connector C219. Disconnect wiper motor connector. Turn ignition switch to RUN position. Ensure wiper/washer switch is in LOW position. Using DVOM connected to ground, measure voltage at wiper motor connector terminal "E" (Dark Green wire). See **Fig. 1** . If voltage is 10-14 volts, go to next step. If voltage is not 10-14 volts, repair open in Dark Green wire between wiper/washer switch connector terminal "A" and wiper motor connector terminal "E". See **WIRING DIAGRAMS** .
4. Ensure wiper/washer switch is in LOW position and ignition switch is in RUN position. Using DVOM connected to ground, measure voltage at wiper motor connector terminal "D" (Gray wire). See **Fig. 1** . If voltage is not 10-14 volts, repair open in Gray wire between wiper/washer switch connector terminal "B" and wiper motor connector terminal "D". See **WIRING DIAGRAMS** . If voltage is 10-14 volts, replace wiper motor. See **WIPER MOTOR** under REMOVAL & INSTALLATION.

### **TEST 4: WIPER INTERMITTENT MODE INOPERATIVE**

1. Turn ignition off. Disconnect wiper/washer switch connector C219 located at base of steering column. Disconnect wiper/washer switch harness connector C219. Turn wiper/washer switch to DELAY position. Connect ohmmeter between wiper/washer switch connector C219, terminals "A" (Dark Green wire) and "C" (Yellow wire).

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2. Move wiper/washer switch through entire delay range, one notch at a time. Resistance should change smoothly from about 39 k/ohms to 690 k/ohms. If resistance is not as specified, replace wiper/washer switch. See **STEERING COLUMN SWITCHES - CORVETTE** article. If resistance is as specified, go to next step.
3. Ensure wiper/washer switch is in DELAY position. Using ohmmeter, measure resistance between wiper/washer switch connector C219, terminals "B" (Gray wire) and "C" (Yellow wire). If resistance is not 23-25 ohms, replace wiper/washer switch. See **STEERING COLUMN SWITCHES - CORVETTE** article. If resistance is 23-25 ohms, go to next step.
4. Reconnect wiper/washer switch connector C219. Disconnect wiper motor connector. Turn ignition switch to RUN position. Ensure wiper/washer switch is in DELAY position. Measure voltage between ground and wiper motor connector terminal "E" (Dark Green wire) while turning wiper/washer switch through entire delay range, one notch at a time. See **Fig. 1** . If voltage is 10-14 volts and exists throughout entire delay range, replace wiper motor. See **WIPER MOTOR** under REMOVAL & INSTALLATION. If voltage is not 10-14 volts and/or does not exist throughout entire delay range, repair open in Dark Green wire between wiper motor connector terminal "E" and wiper/washer switch connector terminal "A". See **WIRING DIAGRAMS** .

#### TEST 5: WIPERS DO NOT PARK WHEN TURNED OFF

1. Turn ignition switch to RUN position. Turn wiper/washer switch to OFF position. Disconnect wiper/washer switch connector C219 located at base of steering column. If wipers do not park, go to next step. If wipers park, replace wiper/washer switch. See **STEERING COLUMN SWITCHES - CORVETTE** article.
2. Disconnect wiper motor connector. Using DVOM connected to ground, measure voltage at wiper/washer switch connector terminal "B" (Gray wire). If voltage is less than one volt, go to next step. If voltage is one volt or more, repair short to voltage in Gray wire between wiper/washer switch connector terminal "B" and wiper motor connector terminal "D". See **WIRING DIAGRAMS** .
3. Ensure wiper motor connector and wiper/washer switch connector C219 are disconnected. Measure voltage between ground and wiper/washer switch connector C219, terminal "A" (Dark Green wire). If voltage is one volt or more, repair short to battery voltage in Dark Green wire between wiper/washer switch connector terminal "A" and wiper motor connector terminal "E". See **WIRING DIAGRAMS** . If voltage is less than one volt, replace wiper motor. See **WIPER MOTOR** under REMOVAL & INSTALLATION.

#### TEST 6: WASHER MOTOR INOPERATIVE

1. Disconnect washer motor connector. Turn ignition switch to RUN position. Connect test light between terminals "A" and "B" of washer motor connector. While observing test light, activate washer switch. If test light is off, go to next step. If test light is on, check for poor connection at washer motor. If connection is okay, replace washer

motor. See **WASHER MOTOR** under REMOVAL & INSTALLATION.

2. Connect test light between ground and washer motor connector terminal "A" (Pink wire). Activate washer switch. If test light is off, go to next step. If test light is on, check for open circuit in Black wire between washer motor connector terminal "B" and ground. See **WIRING DIAGRAMS** . If wire is okay, replace wiper motor. See **WIPER MOTOR** under REMOVAL & INSTALLATION.
3. Using test light connected to ground, backprobe washer switch connector terminal "E" (Pink wire). Activate washer switch. If test light is off, replace wiper/washer switch. See **STEERING COLUMN SWITCHES - CORVETTE** article. If test light is on, check for open circuit in Pink wire between washer motor connector terminal "A" and wiper/washer switch connector terminal "E". See **WIRING DIAGRAMS** .

## REMOVAL & INSTALLATION

**WARNING:** Vehicles are equipped with air bag supplemental restraint system. Before attempting ANY repairs involving steering column, instrument panel or related components, see **SERVICE PRECAUTIONS and DISABLING & ACTIVATING AIR BAG SYSTEM** in appropriate **AIR BAG RESTRAINT SYSTEMS** article.

**CAUTION:** When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle. See **COMPUTER RELEARN PROCEDURES** article in **GENERAL INFORMATION** before disconnecting battery.

### WASHER MOTOR

#### Removal & Installation

Drain washer fluid reservoir. Disconnect electrical connectors from washer motor and fluid level sensor. Disconnect washer hose from reservoir. Remove reservoir mounting screws and reservoir. Remove washer motor from reservoir. To install, reverse removal procedure. Tighten mounting screws to specification. See **TORQUE SPECIFICATIONS** .

### WIPER ARMS

#### Removal & Installation

Raise hood. Turn ignition switch to RUN position. Turn wiper/washer switch to DELAY position. Turn ignition off when wipers are in inner-wipe position. Place a piece of masking tape on windshield at tip of each wiper blade for reassembly reference. Remove retaining nut

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cover and nut. Disconnect washer hose from nozzle. Separate wiper arm from wiper transmission shaft. To install, reverse removal procedure. Tighten wiper arm nut to specification. See **TORQUE SPECIFICATIONS** .

#### WIPER DRIVE MODULE ASSEMBLY

##### Removal & Installation

Raise hood. Disconnect negative battery cable. Remove wiper arms. See **WIPER ARMS** . Remove cowl vent screen. Remove bolts and wiper motor module mounting screws. Disconnect wiper motor electrical connector and module assembly. To install, reverse removal procedure. Tighten mounting screws to specification. See **TORQUE SPECIFICATIONS** . Check wiper operation.

#### WIPER MOTOR

##### Removal & Installation

Disconnect negative battery cable. Disconnect electrical connectors from wiper motor. Remove wiper arms. See **WIPER ARMS** . Remove left cowl vent screen. Remove wiper motor module. See **WIPER DRIVE MODULE ASSEMBLY** . Disconnect wiper transmission linkage from crank arm. Remove bolts and wiper motor from wiper module. Remove crank arm. To install, reverse removal procedure. When installing crank arm to wiper motor, ensure position of park latch is .157-197" (4-5 mm) from park tab. Tighten fasteners to specification. See **TORQUE SPECIFICATIONS** . Check wiper operation.

#### WIPER/WASHER SWITCH

**NOTE:** Wiper/washer switch is an integral part of multifunction switch. See **STEERING COLUMN SWITCHES - CORVETTE** article.

#### TORQUE SPECIFICATIONS

##### TORQUE SPECIFICATIONS

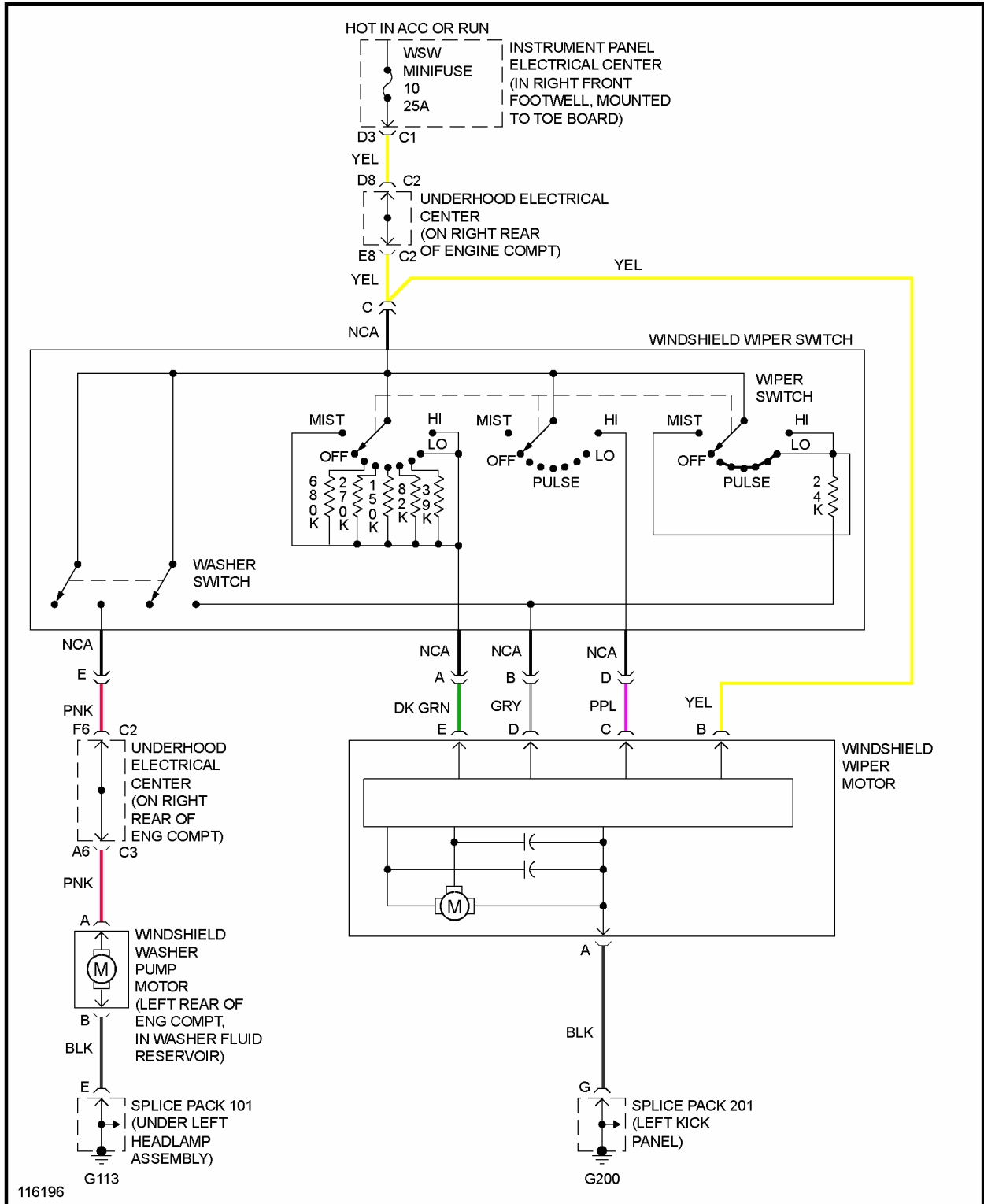
Application	Ft. Lbs. (N.m)
Wiper Arm Assembly-To-Shaft Nut	18 (25)
Wiper Motor Crank Arm Screw	11 (15)
INCH Lbs. (N.m)	
Washer Reservoir Mounting Screws	66 (7.5)
Wiper Drive Module Screw	88 (10)
Wiper Motor-To-Bracket Screw	88 (10)
Wiper Transmission-To-Frame Screws	88 (10)

#### WIRING DIAGRAMS



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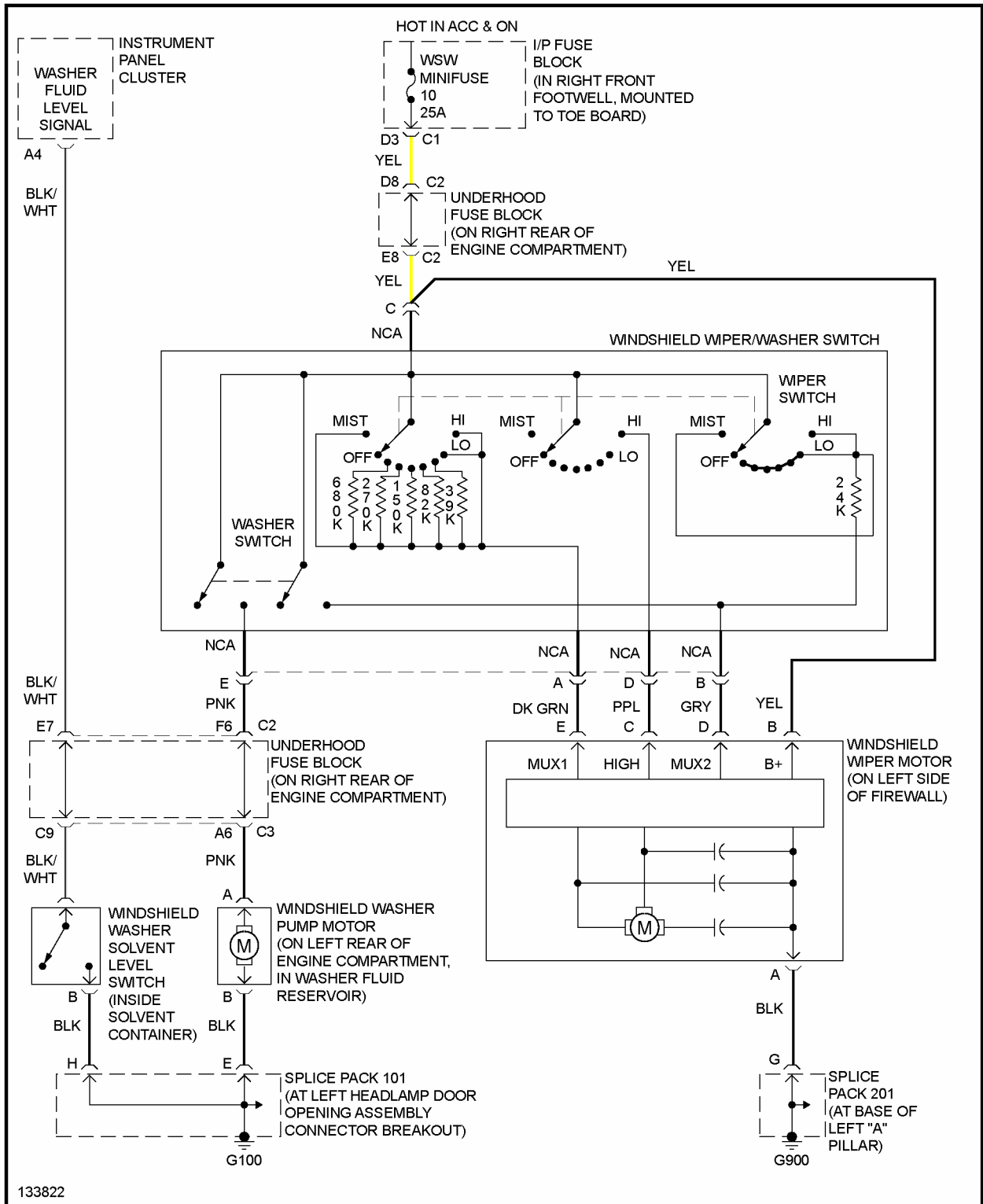
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**Fig. 2: Wiper/Washer System Wiring Diagram (Corvette - 1999)**

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**Fig. 3: Wiper/Washer System Wiring Diagram (Corvette - 2000)**