

# WIPERS/WASHERS

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## WIPERS/WASHERS - ELECTRICAL DIAGNOSTICS

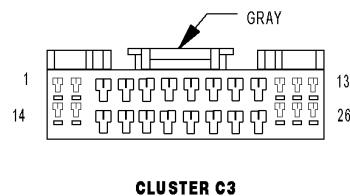
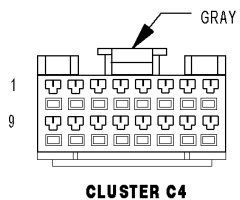
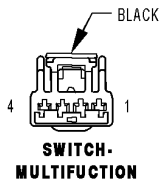
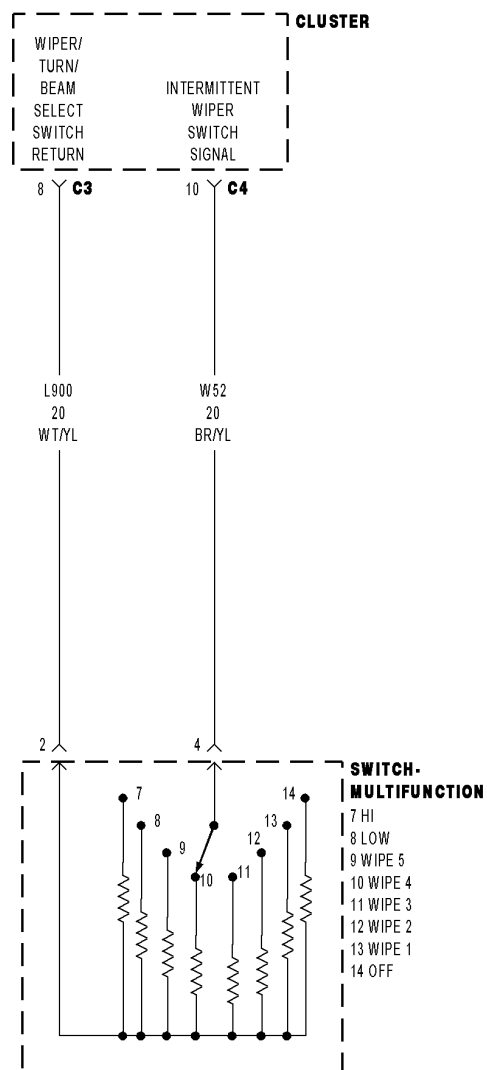
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## **WIPERS/WASHERS - ELECTRICAL DIAGNOSTICS**

### **DIAGNOSIS AND TESTING**

## B2301-WIPER MODE SWITCH INPUT CIRCUIT LOW



- **When Monitored:**
- With the ignition on.
- **Set Condition:**
- When the Instrument Cluster detects a short to ground condition.

| Possible Causes                                                                                                |
|----------------------------------------------------------------------------------------------------------------|
| MULTIFUNCTION SWITCH<br>(W52) INTERMITTENT WIPER SWITCH SIGNAL CIRCUIT SHORTED TO GROUND<br>INSTRUMENT CLUSTER |

Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding.

## Diagnostic Test

### 1. INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all CCN DTC's.

Turn the Wipers ON then OFF.

With the Scan Tool, read the Wiper DTC's.

**Does the scan tool read: B2301-WIPER MODE SWITCH INPUT CIRCUIT LOW?**

**Yes** >> Go To 2

**No** >> The condition that caused the symptom is currently not present. Inspect the related wiring for a possible intermittent condition. Look for any chafed, pierced, pinched, or partially broken wires.  
Perform the BODY VERIFICATION TEST — VER 1.

### 2. MULTIFUNCTION SWITCH

Turn the ignition off.

Disconnect the Multifunction Switch harness connector.

Ensure the Multifunction Switch is in the OFF position.

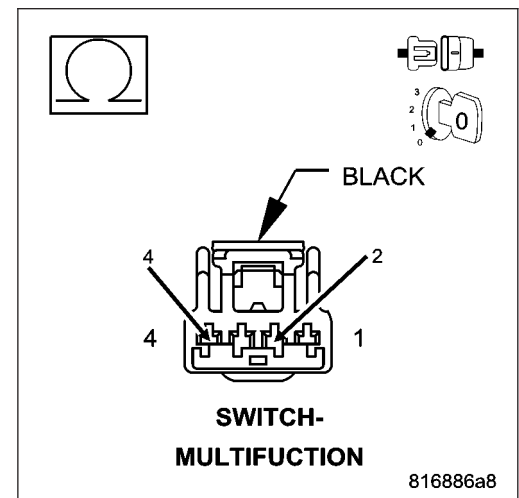
Measure the internal resistance of the Multifunction Switch between the (L900) and (W52) circuits.

**Does the Switch measure more than 5.0 ohms?**

**Yes** >> Replace the Multifunction Switch in accordance with the service information.

Perform the BODY VERIFICATION TEST — VER 1.

**No** >> Go To 3



### 3. INSTRUMENT CLUSTER

Turn the ignition off.

Disconnect the Multifunction Switch connector.

Disconnect the Instrument Cluster C4 harness connector.

Measure the resistance of the (W52) Intermittent Wiper Switch Signal circuit to ground.

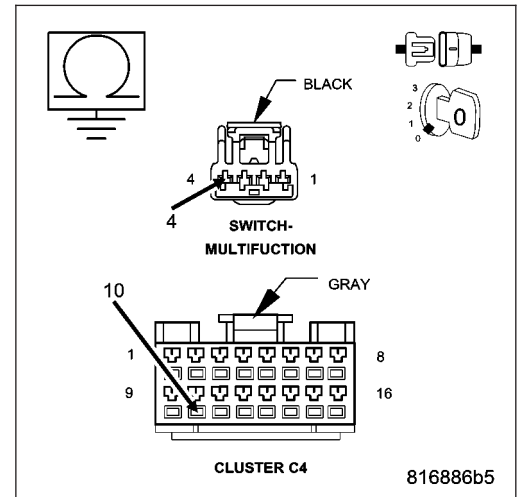
**Is the resistance below 5.0 ohms?**

**Yes** >> Repair the (W52) Intermittent Wiper Switch Signal circuit for a short to ground condition.

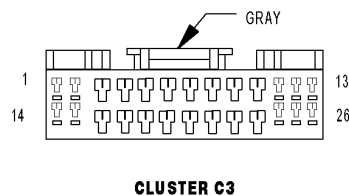
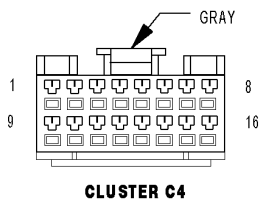
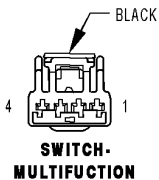
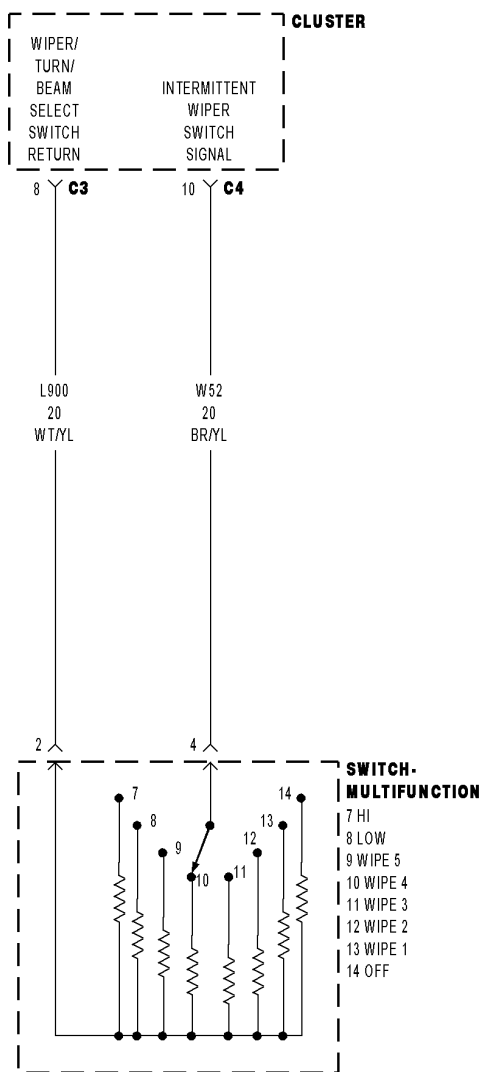
Perform the BODY VERIFICATION TEST — VER 1.

**No** >> Replace the Instrument Cluster in accordance with the service information.

Perform the BODY VERIFICATION TEST — VER 1.



B2302-WIPER MODE SWITCH INPUT CIRCUIT HIGH



- **When Monitored:**
- With the ignition on.
- **Set Condition:**
- When the Instrument Cluster detects a short/HIGH condition.

| Possible Causes                                                                                   |
|---------------------------------------------------------------------------------------------------|
| MULTIFUNCTION SWITCH<br>(W52) INTERMITTENT WIPER SWITCH SIGNAL CIRCUIT OPEN<br>INSTRUMENT CLUSTER |

Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding.

## Diagnostic Test

### 1. INTERMITTENT CONDITION

Turn the ignition on.

With the Scan Tool, clear all CCN DTC's.

Turn the Wipers ON then OFF.

With the Scan Tool, read the Wiper DTC's.

**Does the Scan Tool read: B2302-WIPER MODE SWITCH INPUT CIRCUIT HIGH?**

**Yes** >> Go To 2

**No** >> The condition that caused the symptom is currently not present. Inspect the related wiring for a possible intermittent condition. Look for any chafed, pierced, pinched, or partially broken wires.  
Perform the BODY VERIFICATION TEST — VER 1.

### 2. MULTIFUNCTION SWITCH

Turn the ignition off.

Disconnect the Multifunction Switch harness connector.

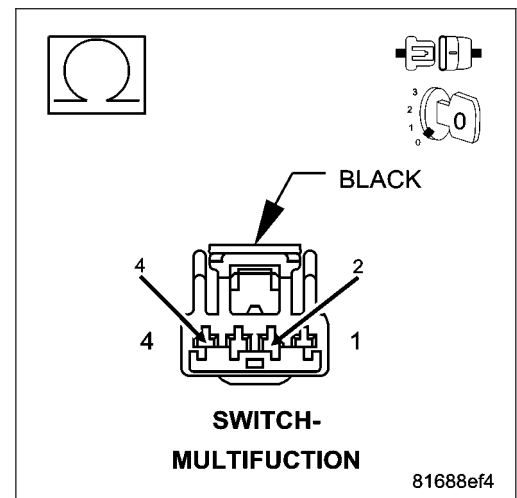
Ensure the Multifunction Switch is in the OFF position.

Measure the internal resistance of the Multifunction Switch between the G902 and W52 circuits.

**Does the Switch measure more than 5.0 ohms?**

**Yes** >> Replace the Multifunction Switch in accordance with the service information.  
Perform the BODY VERIFICATION TEST — VER 1.

**No** >> Go To 3



### 3. INSTRUMENT CLUSTER

Turn the ignition off.

Disconnect the Multifunction Switch connector.

Disconnect the Instrument Cluster C4 harness connector.

Measure the resistance of the (W52) Intermittent Wiper Switch Signal circuit.

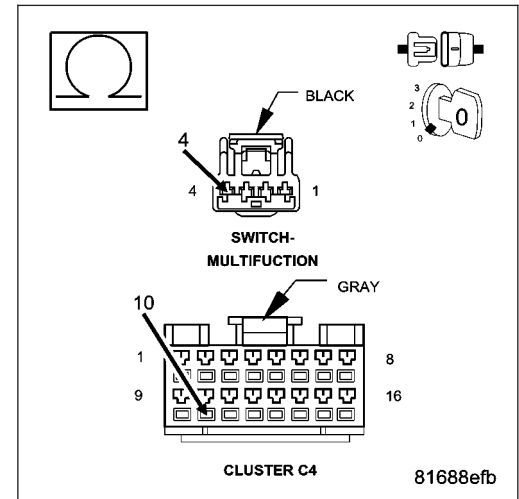
**Is the resistance above 5.0 ohms?**

**Yes** >> Repair the (W52) Intermittent Wiper Switch Signal circuit for an open condition.

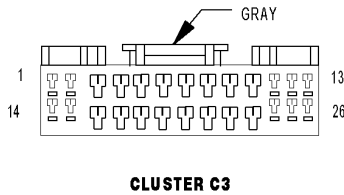
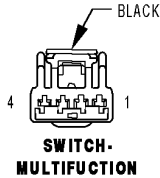
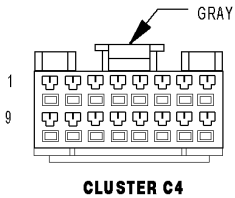
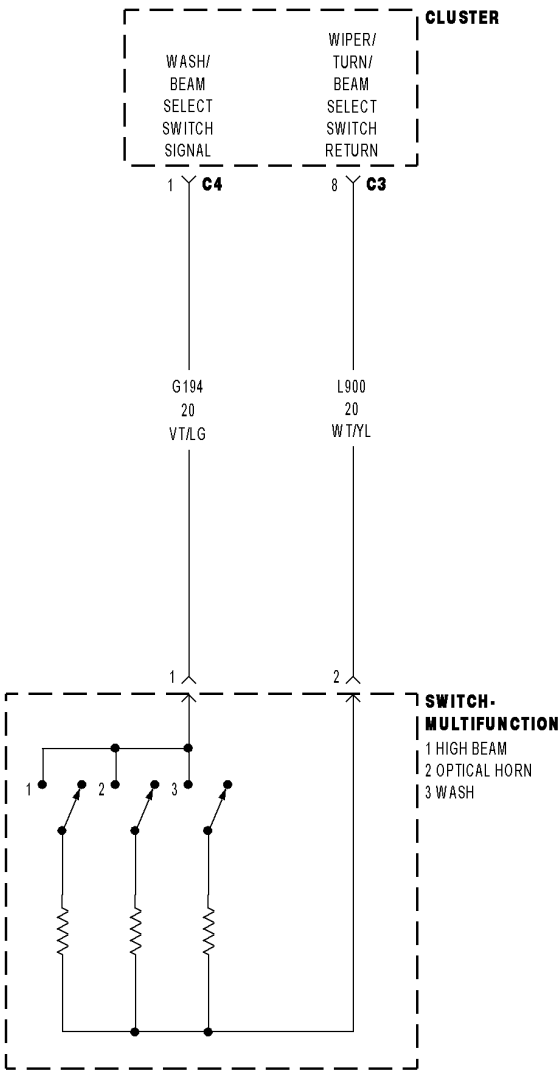
Perform the BODY VERIFICATION TEST — VER 1.

**No** >> Replace the Instrument Cluster in accordance with the service information.

Perform the BODY VERIFICATION TEST — VER 1.



B2307-WASHER SWITCH INPUT CIRCUIT LOW



- **When Monitored:**
- With the ignition on.
- **Set Condition:**
- When the Instrument Cluster detects a short condition.

| Possible Causes                                                                                  |
|--------------------------------------------------------------------------------------------------|
| MULTIFUNCTION SWITCH<br>(G194) WASH/BEAM SELECT SWITCH SIGNAL CIRCUIT OPEN<br>INSTRUMENT CLUSTER |

Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding.

## Diagnostic Test

### 1. INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all CCN DTC's.

Turn the Washers ON then OFF.

With the scan tool, read the Washer DTC's.

**Does the scan tool read: B2307-WIPER MODE SWITCH INPUT CIRCUIT LOW?**

**Yes** >> Go To 2

**No** >> The condition that caused the symptom is currently not present. Inspect the related wiring for a possible intermittent condition. Look for any chafed, pierced, pinched, or partially broken wires.  
Perform the BODY VERIFICATION TEST — VER 1.

### 2. MULTIFUNCTION SWITCH

Turn the ignition off.

Disconnect the Multifunction Switch harness connector.

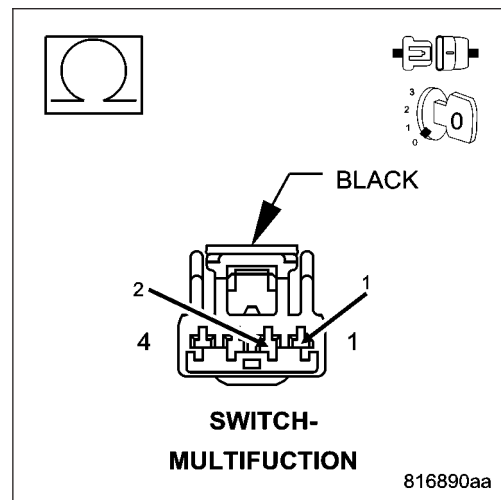
Ensure the Multifunction Switch is in the OFF position.

Measure the internal resistance of the Multifunction Switch between the L900 and G194 circuits.

**Does the Switch measure more than 5.0 ohms?**

**Yes** >> Replace the Multifunction Switch in accordance with the service information.  
Perform the BODY VERIFICATION TEST — VER 1.

**No** >> Go To 3



### 3. INSTRUMENT CLUSTER

Turn the ignition off.

Disconnect the Multifunction Switch connector.

Disconnect the Instrument Cluster C4 harness connector.

Measure the resistance of the (G194) Wash/Beam Select Switch circuit to ground.

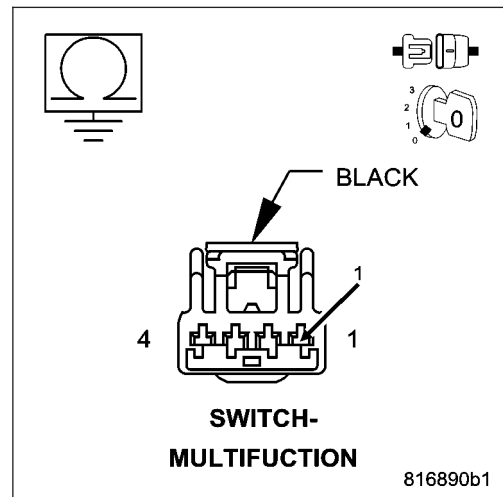
**Is the resistance below 5.0 ohms?**

**Yes** >> Repair the (G194) Wash/Beam Select Switch Signal circuit for a short to ground condition.

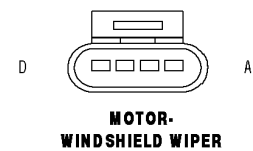
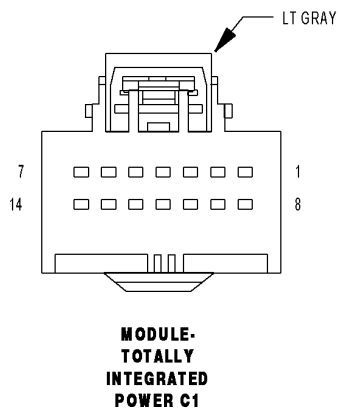
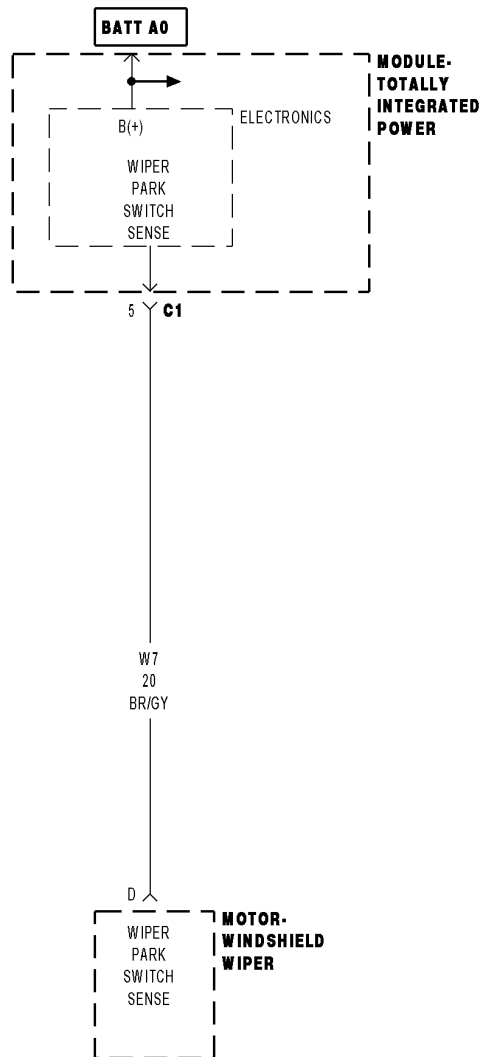
Perform the BODY VERIFICATION TEST — VER 1.

**No** >> Replace the Instrument Cluster in accordance with the service information.

Perform the BODY VERIFICATION TEST — VER 1.



## B2304-WIPER PARK SWITCH INPUT CIRCUIT LOW



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For a complete wiring diagram Refer to Section 8W.

- **When Monitored:**
- With the ignition on.
- **Set Condition:**
- The TIPM detects a short to ground condition.

| Possible Causes                                                                                              |
|--------------------------------------------------------------------------------------------------------------|
| FRONT WIPER MOTOR<br>(W7) WIPER PARK SWITCH SENSE CIRCUIT SHORT TO GROUND<br>TOTALLY INTEGRATED POWER MODULE |

## Diagnostic Test

### 1. INTERMITTENT CONDITION

Turn the ignition on.

With the Scan Tool, clear all TIPM DTC's.

Turn the Wipers on.

With the Scan Tool, read the Wiper DTC's.

**Does the Scan Tool read: B2304-WIPER PARK SWITCH INPUT CIRCUIT LOW?**

**Yes** >> Go To 2

**No** >> The condition that caused the symptom is currently not present. Inspect the related wiring for a possible intermittent condition. Look for any chafed, pierced, pinched, or partially broken wires.  
 Perform the BODY VERIFICATION TEST — VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)

### 2. WIPER MOTOR

With the scan tool, erase DTCs.

Turn the ignition off.

Disconnect the Front Wiper Motor harness connector.

Turn the ignition on.

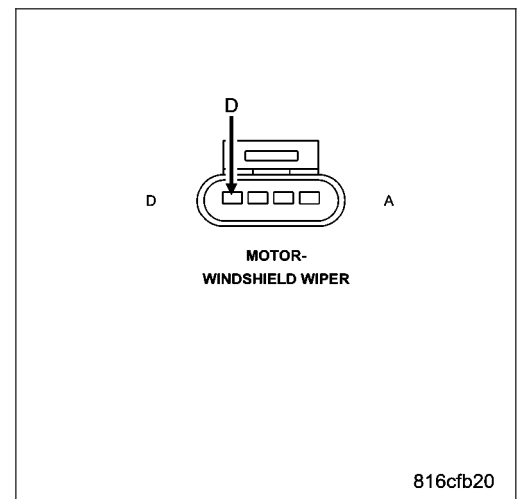
Wait 30 seconds.

With the scan tool, read DTCs.

**Does the Scan Tool read: B2304-WIPER PARK SWITCH INPUT CIRCUIT LOW?**

**Yes** >> Replace the Front Wiper Motor in accordance with the service information.  
 Perform the BODY VERIFICATION TEST — VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)

**No** >> Go To 3



### 3. (W7) WIPER PARK SWITCH SENSE CIRCUIT SHORT TO GROUND

Turn the ignition off.

Disconnect the TIPM C1 harness connector.

Measure the resistance between ground and the (W7) Wiper Park Switch Sense circuit.

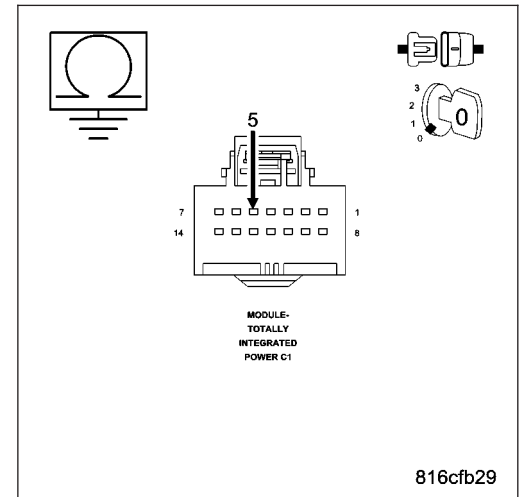
**Is the resistance below 5.0 ohms?**

**Yes** >> Repair the (W7) Wiper Park Switch Sense circuit for a short to ground condition.

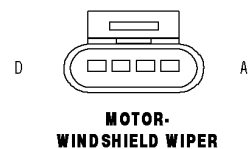
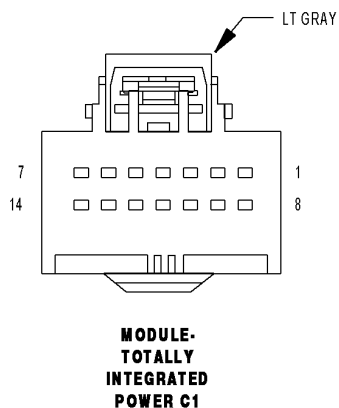
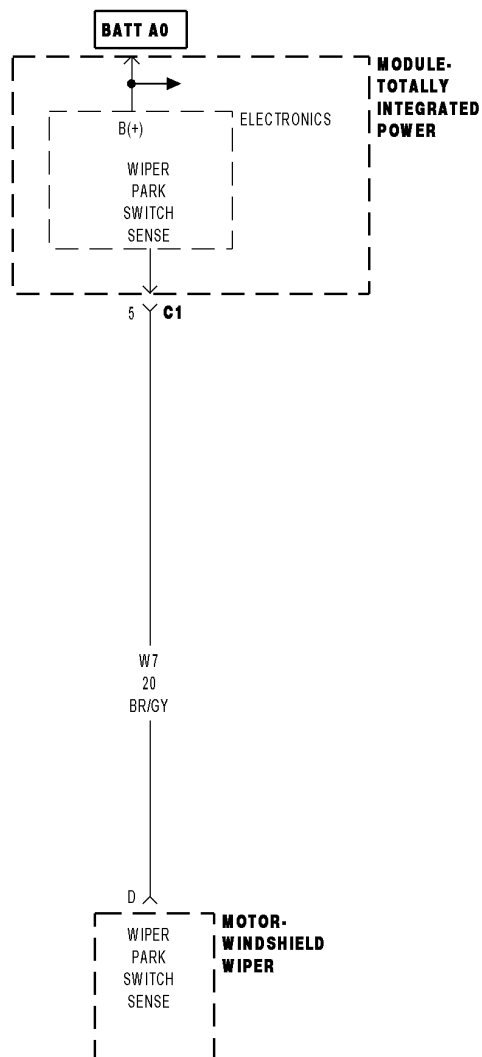
Perform the BODY VERIFICATION TEST — VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)

**No** >> Replace the Totally Integrated Power Module in accordance with the service information.

Perform the BODY VERIFICATION TEST — VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)



## B2305-WIPER PARK SWITCH INPUT CIRCUIT HIGH



- **When Monitored:**
- With the ignition on.
- **Set Condition:**
- The TIPM detects an open condition.

| Possible Causes                                       |
|-------------------------------------------------------|
| (W7) WIPER PARK SWITCH SENSE CIRCUIT SHORT TO VOLTAGE |
| TOTALLY INTEGRATED POWER MODULE                       |

## Diagnostic Test

### 1. INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all TIPM DTC's.

Turn the Front Wipers on.

With the scan tool, read the Front Wiper DTC's.

**Does the scan tool read: B2305-WIPER PARK SWITCH INPUT CIRCUIT HIGH?**

**Yes** >> Go To 2

**No** >> The condition that caused the symptom is currently not present. Inspect the related wiring for a possible intermittent condition. Look for any chafed, pierced, pinched, or partially broken wires.  
Perform the BODY VERIFICATION TEST — VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)

### 2. (W7) WIPER PARK SWITCH SENSE CIRCUIT SHORT TO VOLTAGE

Turn the ignition off.

Disconnect the Front Wiper Motor harness connector.

Disconnect the TIPM C1 harness connector.

Measure the voltage on the (W7) Wiper Park Switch Sense circuit.

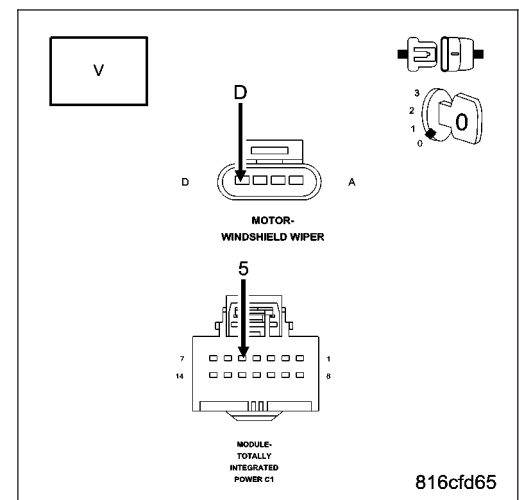
**Is the voltage above 5.0 volts?**

**Yes** >> Repair the (W7) Wiper Park Switch Sense circuit for a short to voltage.

Perform the BODY VERIFICATION TEST — VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)

**No** >> Replace the Totally Integrated Power Module in accordance with the service information.

Perform the BODY VERIFICATION TEST — VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)



**B2324-HEADLAMP WASHER MOTOR CONTROL CIRCUIT HIGH**

For a complete wiring diagram **Refer to Section 8W.**

- **When Monitored:**
- With the ignition on.
- **Set Condition:**
- When the TIPM detects a short/HIGH condition.

| Possible Causes                 |
|---------------------------------|
| TOTALLY INTEGRATED POWER MODULE |

**Diagnostic Test****1. HEADLAMP WASHER RELAY**

Turn the ignition off.

Replace the Wiper relay with and known good relay.

With the scan tool, clear all TIPM DTC's.

Turn the Rear Wipers ON then OFF.

With the scan tool, read the TIPM DTC's.

**Does the scan tool read: B2324-HEADLAMP WASHER MOTOR CONTROL CIRCUIT HIGH?**

- Yes** >> Replace the Totally Integrated Power Module in accordance with the service information.  
Perform the BODY VERIFICATION TEST — VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/FRONT CONTROL MODULE - DIAGNOSIS AND TESTING)
- No** >> Test complete.  
Perform the BODY VERIFICATION TEST — VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/FRONT CONTROL MODULE - DIAGNOSIS AND TESTING)

**B2325-HEADLAMP WASHER MOTOR CONTROL CIRCUIT OPEN**

For a complete wiring diagram **Refer to Section 8W.**

- **When Monitored:**
- With the ignition on.
- **Set Condition:**
- When the TIPM detects a short/HIGH condition.

| Possible Causes                 |
|---------------------------------|
| TOTALLY INTEGRATED POWER MODULE |

**Diagnostic Test****1. TOTALLY INTEGRATED POWER MODULE**

Turn the ignition off.

Replace the Wiper ON/OFF relay with a known good relay.

With the scan tool, clear all TIPM DTC's.

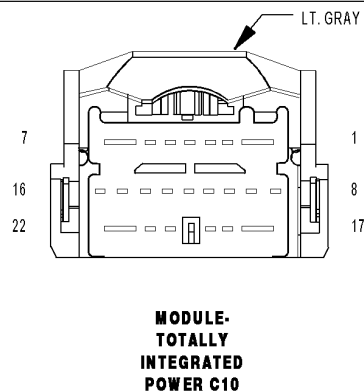
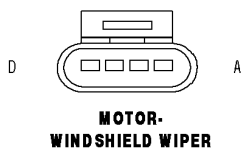
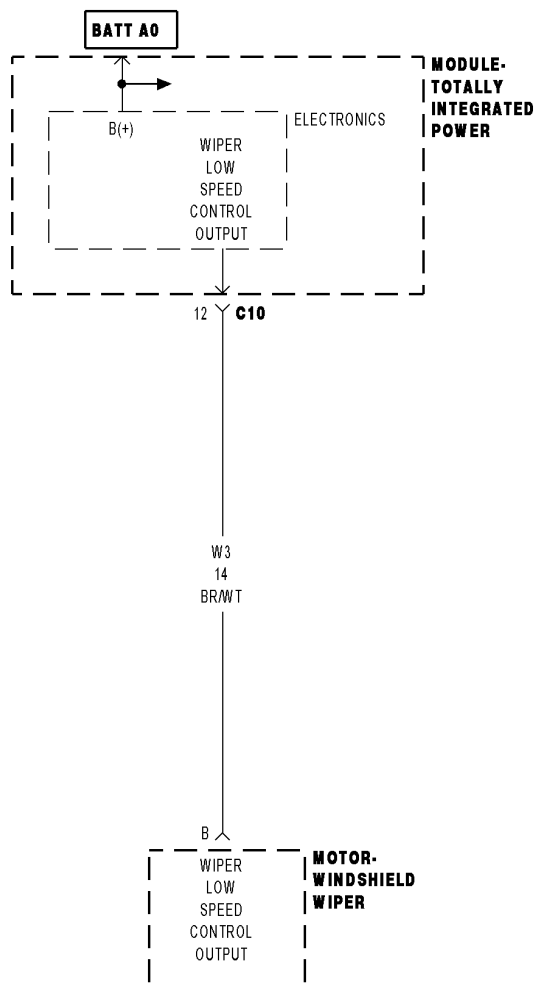
Turn the Wipers ON then OFF.

With the scan tool, read the Wiper DTC's.

**Does the scan tool read: B2325-HEADLAMP WASHER MOTOR CONTROL CIRCUIT OPEN?**

- Yes** >> Replace the Integrated Power Module in accordance with the service information.  
Perform the BODY VERIFICATION TEST — VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/FRONT CONTROL MODULE - DIAGNOSIS AND TESTING)
- No** >> Test complete.  
Perform the BODY VERIFICATION TEST — VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/FRONT CONTROL MODULE - DIAGNOSIS AND TESTING)

## B2346-WIPER MOTOR LOW SPEED CONTROL CIRCUIT LOW



- **When Monitored:**
- With the Windshield Wipers activated.
- **Set Condition:**
- When the TIPM detects a LOW condition.

| Possible Causes                                               |
|---------------------------------------------------------------|
| (W3) WIPER LOW SPEED CONTROL OUTPUT CIRCUIT SHORTED TO GROUND |
| WINDSHIELD WIPER MOTOR                                        |
| TOTALLY INTEGRATED POWER MODULE                               |

## Diagnostic Test

### 1. INTERMITTENT CONDITION

Turn the ignition on.

With the Scan Tool, clear all TIPM DTC's.

Turn the Windshield Wipers on.

With the Scan Tool read the DTC information.

**Does the Scan Tool read: B2346-WIPER MOTOR LOW SPEED CONTROL CIRCUIT LOW?**

**Yes** >> Go To 2

**No** >> The condition that caused the symptom is currently not present. Inspect the related wiring for a possible intermittent condition. Look for any chafed, pierced, pinched, or partially broken wires.  
Perform the BODY VERIFICATION TEST-VER1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)

### 2. (W3) WIPER LOW SPEED CONTROL OUTPUT CONTROL CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Disconnect the TIPM C10 harness connector.

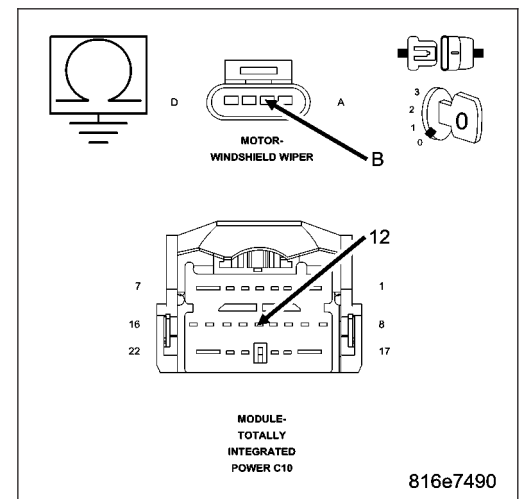
Disconnect the Windshield Wiper Motor harness connector.

Measure the resistance between ground and the (W3) Wiper Low Speed Control Output circuit.

**Is the resistance below 5.0 ohms?**

**Yes** >> Repair the (W3) Wiper Low Speed Control Output circuit for a short to ground.  
Perform the BODY VERIFICATION TEST-VER1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)

**No** >> Go To 3



Diagnostic Test

### 3. WIPER MOTOR

---

Reconnect the TIPM C10 harness connector.

Turn the ignition on.

With the Scan Tool, clear all TIPM DTC's.

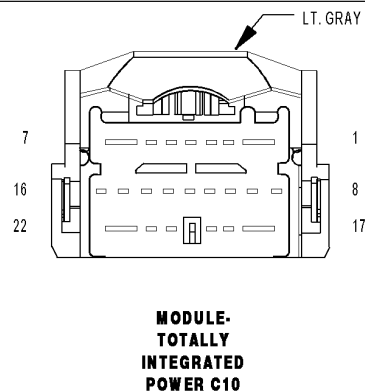
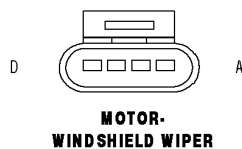
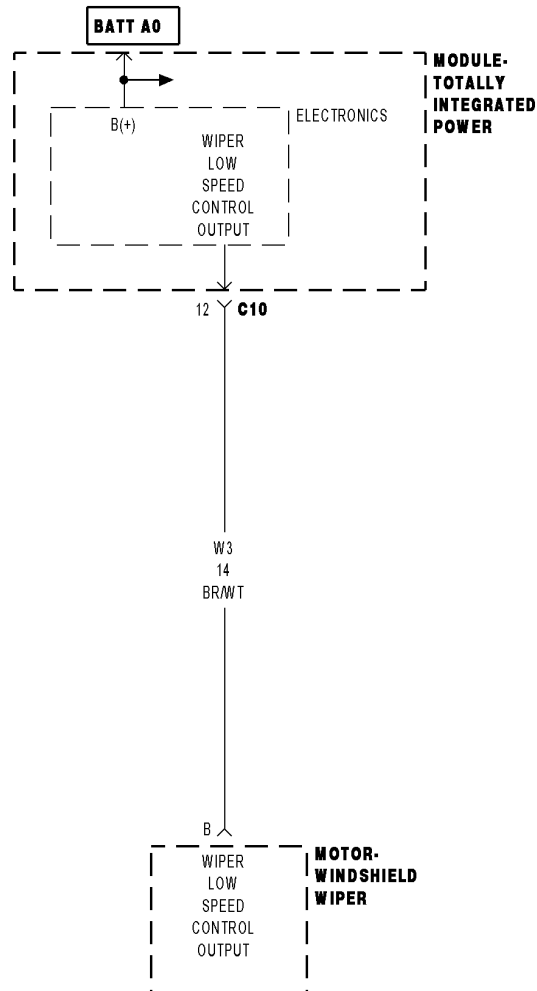
Turn the Front Wipers on.

With the Scan Tool read the DTC information.

**Does the Scan Tool read: B2346-WIPER MOTOR LOW SPEED CONTROL CIRCUIT LOW?**

- Yes** >> Replace the Totally Integrated Power Module (TIPM) in accordance with the service information.  
Perform the BODY VERIFICATION TEST-VER1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)
- No** >> Replace the Windshield Wiper Motor in accordance with the service information.  
Perform the BODY VERIFICATION TEST-VER1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)

## B2347-WIPER MOTOR LOW SPEED CONTROL CIRCUIT HIGH



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For a complete wiring diagram Refer to Section 8W.

- **When Monitored:**
- With the Windshield Wipers are turned on.
- **Set Condition:**
- When the TIPM detects a HIGH condition.

| Possible Causes                                                |
|----------------------------------------------------------------|
| (W3) WIPER LOW SPEED CONTROL OUTPUT CIRCUIT OPEN               |
| (W3) WIPER LOW SPEED CONTROL OUTPUT CIRCUIT SHORTED TO VOLTAGE |
| TOTALLY INTEGRATED POWER MODULE                                |

## Diagnostic Test

### 1. INTERMITTENT CONDITION

Turn the ignition on.

With the Scan Tool, clear all TIPM DTC's.

Turn the Windshield Wipers on.

With the Scan Tool read the DTC information.

**Does the Scan Tool read: B2347-WIPER MOTOR LOW SPEED CONTROL CIRCUIT HIGH?**

**Yes** >> Go To 2

**No** >> The condition that caused the symptom is currently not present. Inspect the related wiring for a possible intermittent condition. Look for any chafed, pierced, pinched, or partially broken wires.

Perform the BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)

### 2. (W3) WIPER LOW SPEED CONTROL OUTPUT CIRCUIT OPEN

Turn the ignition off.

Disconnect the TIPM C10 harness connector.

Disconnect the Windshield Wiper harness connector.

Measure the resistance of the (W3) Wiper Low Speed Control Output circuit.

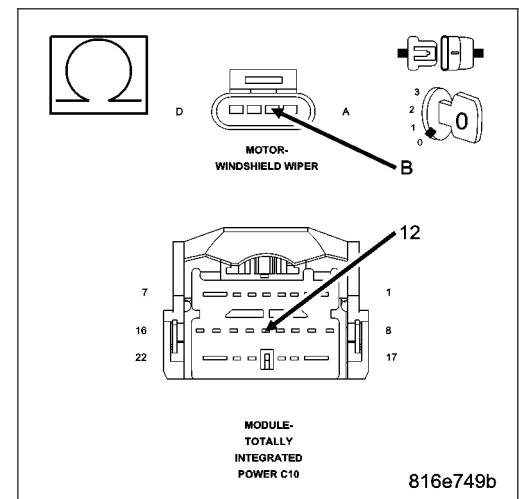
**Is the resistance above 5.0 ohms?**

**Yes** >> Repair the (W3) Wiper Low Speed Control Output circuit for an open condition.

Perform the BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)

**No** >> Replace the Totally Integrated Power Module (TIPM) in accordance with the service information.

Perform the BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)



### 3. (W3) WIPER LOW SPEED CONTROL OUTPUT CIRCUIT SHORTED TO VOLTAGE

Turn the ignition off.

Disconnect the TIPM C10 harness connector.

Disconnect the Windshield Wiper harness connector.

Turn the ignition on.

Measure for voltage on the (W3) Wiper Low Speed Control Output circuit.

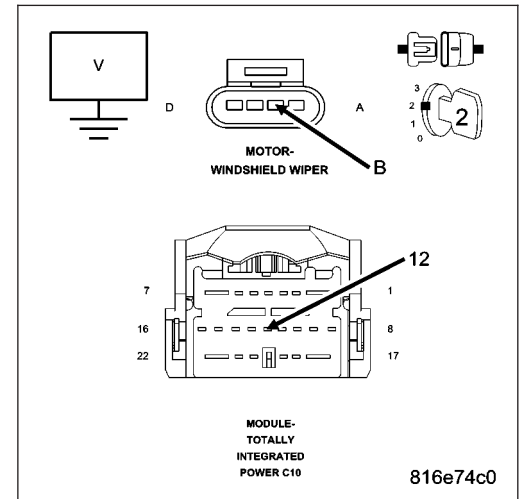
**Is the voltage above 10.0 volts?**

**Yes** >> Repair the (W3) Wiper Low Speed Output circuit for a short to voltage condition.

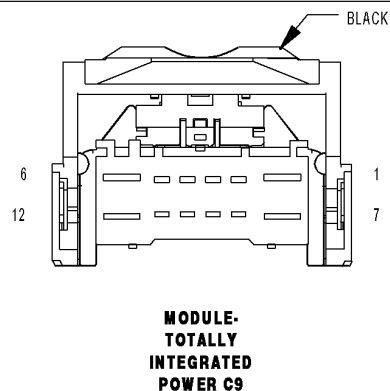
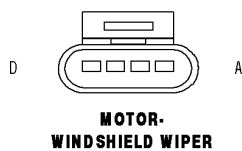
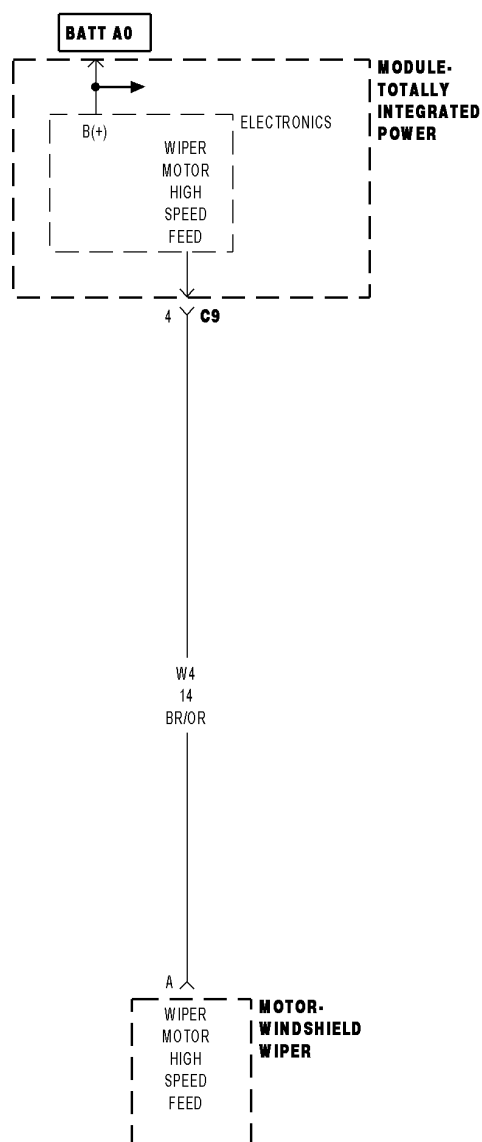
Perform the BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)

**No** >> Replace the Totally Integrated Power Module (TIPM) in accordance with the service information.

Perform the BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)



## B234A-WIPER MOTOR HIGH SPEED CONTROL CIRCUIT LOW



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For a complete wiring diagram Refer to Section 8W.

- **When Monitored:**
- With the Windshield Wipers on.
- **Set Condition:**
- When the TIPM detects a LOW condition.

| Possible Causes                                            |
|------------------------------------------------------------|
| (W4) WIPER MOTOR HIGH SPEED FEED CIRCUIT SHORTED TO GROUND |
| WIPER MOTOR                                                |
| TOTALLY INTEGRATED POWER MODULE                            |

## Diagnostic Test

### 1. INTERMITTENT CONDITION

Turn the ignition on.

With the Scan Tool, clear all TIPM DTC's.

Turn the Windshield Wipers on.

With the Scan Tool read the DTC information.

**Does the Scan Tool read: B234A—WIPER MOTOR HIGH SPEED CONTROL CIRCUIT LOW?**

**Yes** >> Go To 2

**No** >> The condition that caused the symptom is currently not present. Inspect the related wiring for a possible intermittent condition. Look for any chafed, pierced, pinched, or partially broken wires.  
Perform the BODY VERIFICATION TEST-VER1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)

### 2. (W4) WIPER MOTOR HIGH SPEED FEED CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Disconnect the TIPM C9 harness connector.

Disconnect the Windshield Wiper Motor harness connector.

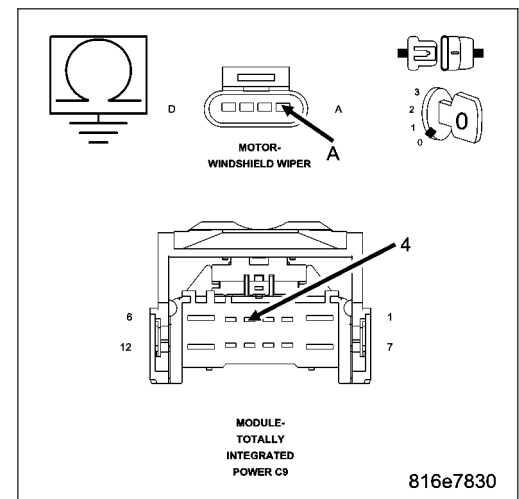
Measure the resistance between ground and the (W4) Wiper Motor High Speed Feed circuit.

**Is the resistance below 5.0 ohms?**

**Yes** >> Repair the (W4) Wiper Motor High Speed Feed circuit for a short to ground.

Perform the BODY VERIFICATION TEST-VER1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)

**No** >> Go To 3 Diagnostic Test



### 3. WIPER MOTOR

---

Reconnect the TIPM C9 harness connector.

Turn the ignition on.

With the Scan Tool, clear all TIPM DTC's.

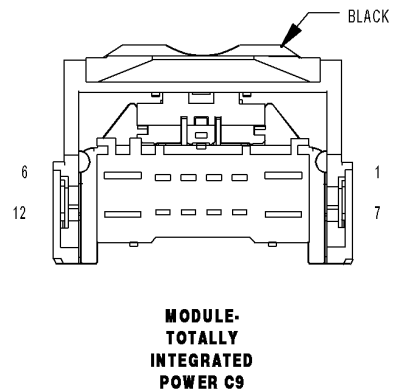
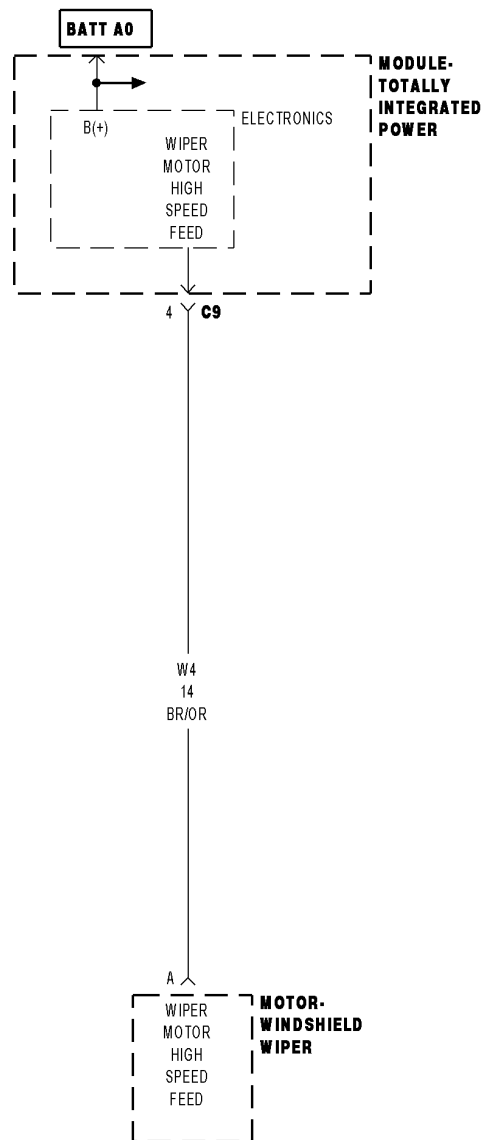
Turn the Windshield Wipers on.

With the Scan Tool read the DTC information.

**Does the Scan Tool read: B234A-WIPER MOTOR HIGH SPEED CONTROL CIRCUIT LOW?**

- Yes** >> Replace the Totally Integrated Power Module (TIPM) in accordance with the service information.  
Perform the BODY VERIFICATION TEST-VER1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)
- No** >> Replace the Windshield Wiper Motor in accordance with the service information.  
Perform the BODY VERIFICATION TEST-VER1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)

## B234B-WIPER MOTOR HIGH SPEED CONTROL CIRCUIT HIGH



81667829

For a complete wiring diagram Refer to Section 8W.

- **When Monitored:**
- With the Windshield Wipers on.
- **Set Condition:**
- When the TIPM detects a HIGH condition.

| Possible Causes                                             |
|-------------------------------------------------------------|
| (W4) WIPER MOTOR HIGH SPEED FEED CIRCUIT OPEN               |
| (W4) WIPER MOTOR HIGH SPEED FEED CIRCUIT SHORTED TO VOLTAGE |
| TOTALLY INTEGRATED POWER MODULE                             |

## Diagnostic Test

### 1. INTERMITTENT CONDITION

Turn the ignition on.

With the Scan Tool, clear all TIPM DTC's.

Turn the Windshield Wipers on.

With the Scan Tool read the DTC information.

**Does the Scan Tool read: B234B—WIPER MOTOR HIGH SPEED CONTROL CIRCUIT HIGH?**

**Yes** >> Go To 2

**No** >> The condition that caused the symptom is currently not present. Inspect the related wiring for a possible intermittent condition. Look for any chafed, pierced, pinched, or partially broken wires.

Perform the BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)

### 2. (W4) WIPER MOTOR HIGH SPEED FEED CIRCUIT OPEN

Turn the ignition off.

Disconnect the TIPM C9 harness connector.

Disconnect the Windshield Wiper Motor harness connector.

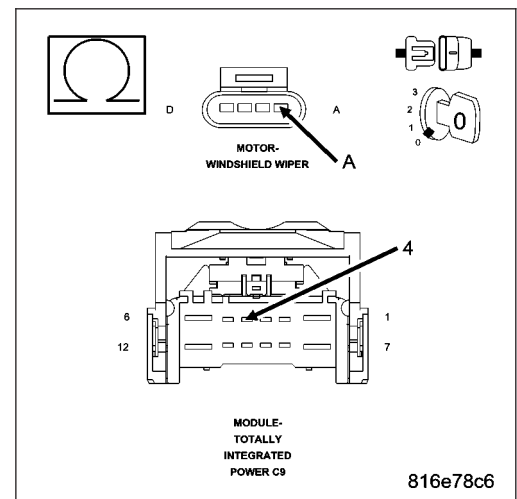
Measure the resistance of the (W4) Wiper Motor High Speed Feed circuit.

**Is the resistance above 5.0 ohms?**

**Yes** >> Repair the (W4) Wiper Motor High Speed Feed circuit for an open condition.

Perform the BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)

**No** >> Go To 3



816e78c6

### 3. (W4) WIPER MOTOR HIGH SPEED FEED CIRCUIT SHORTED TO VOLTAGE

Turn the ignition off.

Disconnect the TIPM C9 harness connector.

Disconnect the Windshield Wiper Motor harness connector.

Turn the ignition on.

Measure for voltage on the (W4) Wiper Motor High Speed Feed circuit.

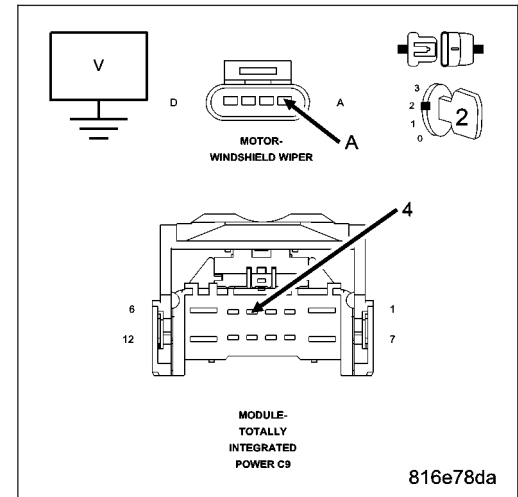
#### Is the voltage above 10.0 volts?

**Yes** >> Repair the (W4) Wiper Motor High Speed Feed circuit for a short to voltage condition.

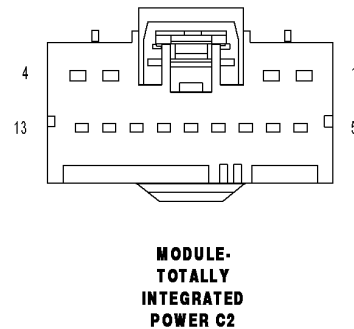
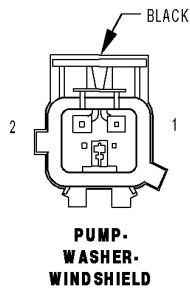
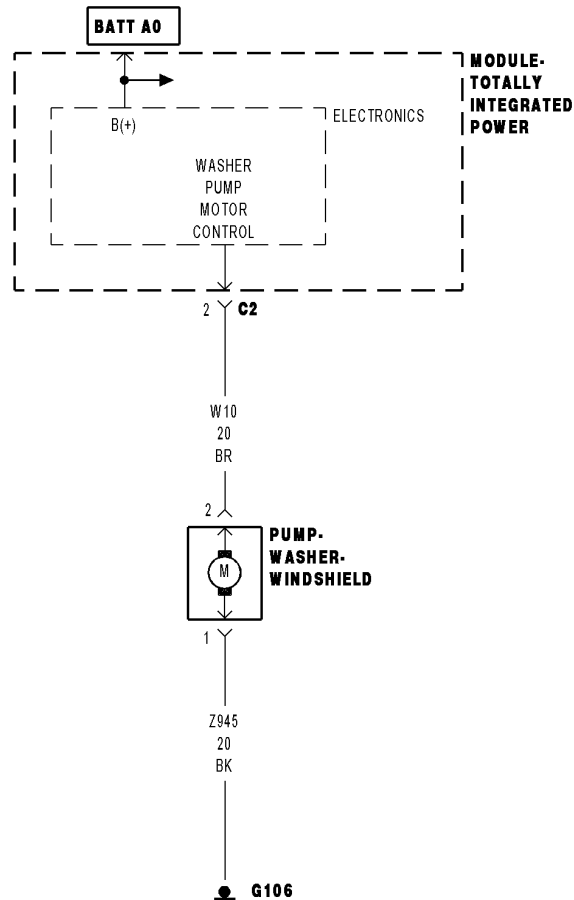
Perform the BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)

**No** >> Replace the Totally Integrated Power Module (TIPM) in accordance with the service information.

Perform the BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)



## B2368-WINDOW WASHER MOTOR 1 CONTROL CIRCUIT LOW



816e7816

For a complete wiring diagram Refer to Section 8W.

- **When Monitored:**
- With the Fog Lamps activated.
- **Set Condition:**
- When the TIPM detects a LOW condition.

| Possible Causes                                           |
|-----------------------------------------------------------|
| (W10) WASHER PUMP MOTOR CONTROL CIRCUIT SHORTED TO GROUND |
| WASHER PUMP MOTOR                                         |
| TOTALLY INTEGRATED POWER MODULE                           |

## Diagnostic Test

### 1. INTERMITTENT CONDITION

Turn the ignition on.

With the Scan Tool, clear all TIPM DTC's.

Turn the Washer Pump Motor on.

With the Scan Tool read the DTC information.

**Does the Scan Tool read: B2368-WINDOW WASHER MOTOR 1 CONTROL CIRCUIT LOW?**

**Yes** >> Go To 2

**No** >> The condition that caused the symptom is currently not present. Inspect the related wiring for a possible intermittent condition. Look for any chafed, pierced, pinched, or partially broken wires.  
Perform the BODY VERIFICATION TEST-VER1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)

### 2. (W10) WASHER PUMP MOTOR CONTROL CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Disconnect the TIPM C2 harness connector.

Disconnect the Washer Pump Motor harness connector.

Measure the resistance between ground and the (W10) Washer Pump Motor Control circuit.

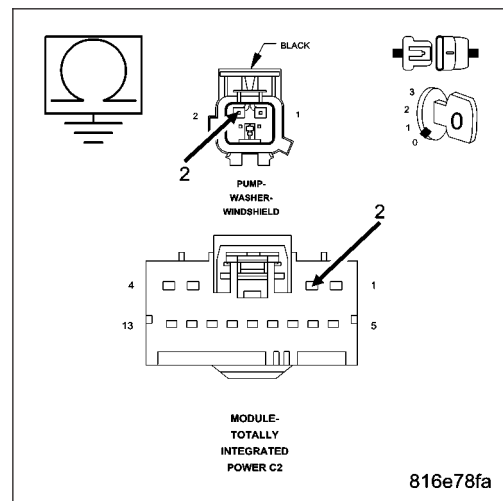
**Is the resistance below 5.0 ohms?**

**Yes** >> Repair the (W10) Washer Pump Motor Control Output circuit for a short to ground.

Perform the BODY VERIFICATION TEST-VER1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)

**No** >> Go To 3

Diagnostic Test



### 3. WASHER PUMP MOTOR

---

Reconnect the TIPM C2 harness connector.

Turn the ignition on.

With the Scan Tool, clear all TIPM DTC's.

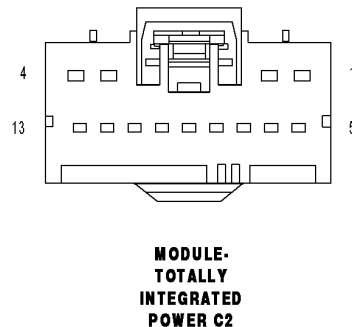
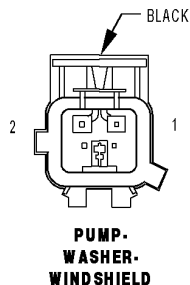
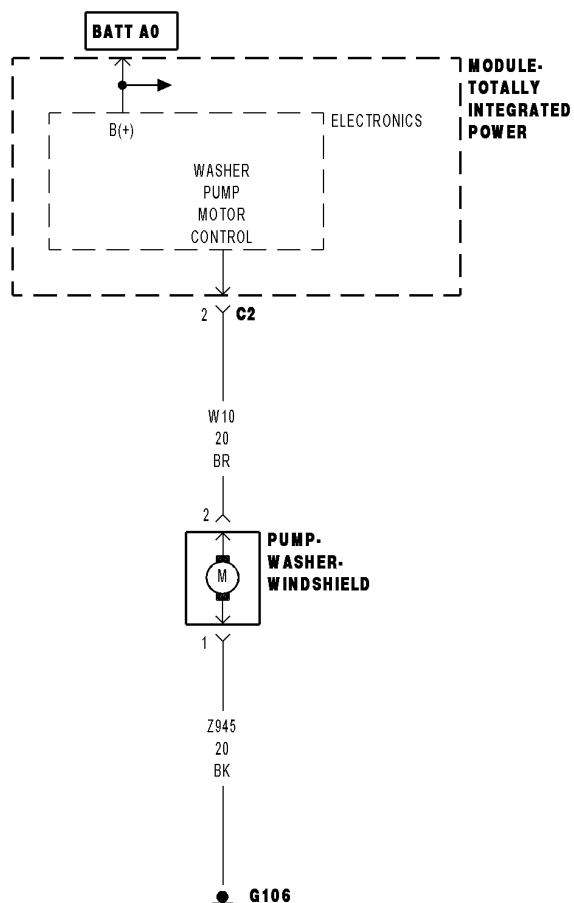
Turn the Washer Pump Motor on.

With the Scan Tool read the DTC information.

**Does the Scan Tool read: B2368-WINDOW WASHER MOTOR 1 CONTROL CIRCUIT LOW?**

- Yes** >> Replace the Totally Integrated Power Module (TIPM) in accordance with the service information.  
Perform the BODY VERIFICATION TEST-VER1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)
- No** >> Replace the Washer Pump Motor in accordance with the service information.  
Perform the BODY VERIFICATION TEST-VER1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)

## B2369-WINDOW WASHER MOTOR 1 CONTROL CIRCUIT HIGH



- **When Monitored:**
- With the Washer Pump Motor turned on.
- **Set Condition:**
- When the TIPM detects a HIGH condition.

| Possible Causes                                            |
|------------------------------------------------------------|
| (W10) WASHER PUMP MOTOR CONTROL CIRCUIT OPEN               |
| (W10) WASHER PUMP MOTOR CONTROL CIRCUIT SHORTED TO VOLTAGE |
| TOTALLY INTEGRATED POWER MODULE                            |

## Diagnostic Test

### 1. INTERMITTENT CONDITION

Turn the ignition on.

With the Scan Tool, clear all TIPM DTC's.

Turn the Wiper Pump Motor on.

With the Scan Tool read the DTC information.

**Does the Scan Tool read: B2369-WINDOW WASHER MOTOR 1 CONTROL CIRCUIT HIGH?**

**Yes** >> Go To 2

**No** >> The condition that caused the symptom is currently not present. Inspect the related wiring for a possible intermittent condition. Look for any chafed, pierced, pinched, or partially broken wires.  
Perform the BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)

### 2. (W10) WASHER PUMP MOTOR CONTROL CIRCUIT OPEN

Turn the ignition off.

Disconnect the TIPM C2 harness connector.

Disconnect the Washer Pump Motor harness connector.

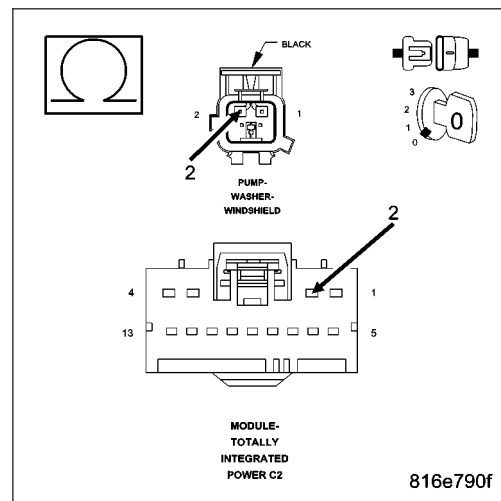
Measure the resistance of the (W10) Washer Pump Motor Control circuit.

**Is the resistance above 5.0 ohms?**

**Yes** >> Repair the (W10) Washer Pump Motor Control circuit for an open condition.

Perform the BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)

**No** >> Go To 3



### 3. (W10) WASHER PUMP MOTOR CONTROL CIRCUIT SHORTED TO VOLTAGE

Turn the ignition off.

Disconnect the TIPM C2 harness connector.

Disconnect the Washer Pump Motor harness connector.

Turn the ignition on.

Measure for voltage on the (W10) Washer Pump Motor Control circuit.

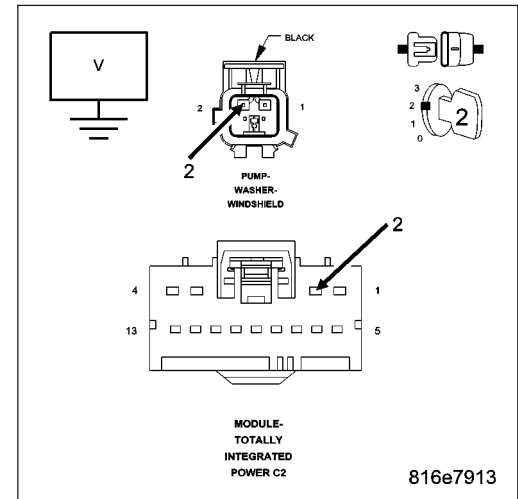
#### Is the voltage above 10.0 volts?

**Yes** >> Repair the (W10) Washer Pump Motor Control circuit for a short to voltage condition.

Perform the BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)

**No** >> Replace the Totally Integrated Power Module (TIPM) in accordance with the service information.

Perform the BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - STANDARD PROCEDURE)

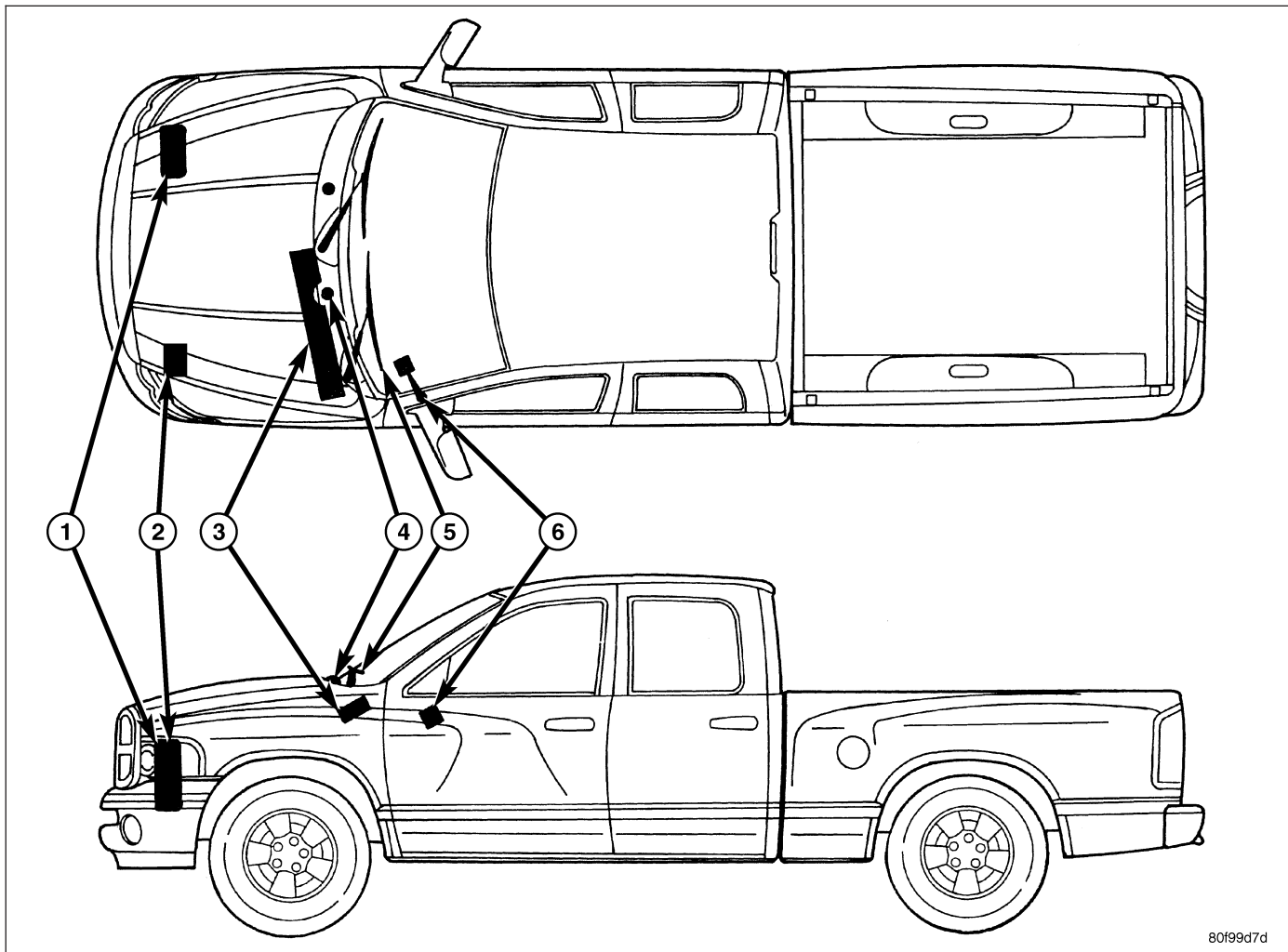


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## WIPERS/WASHERS - SERVICE INFORMATION

### DESCRIPTION



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An electrically operated intermittent wiper and washer system is standard factory-installed safety equipment on this model. The wiper and washer system includes the following major components, which are described in further detail elsewhere in this service information:

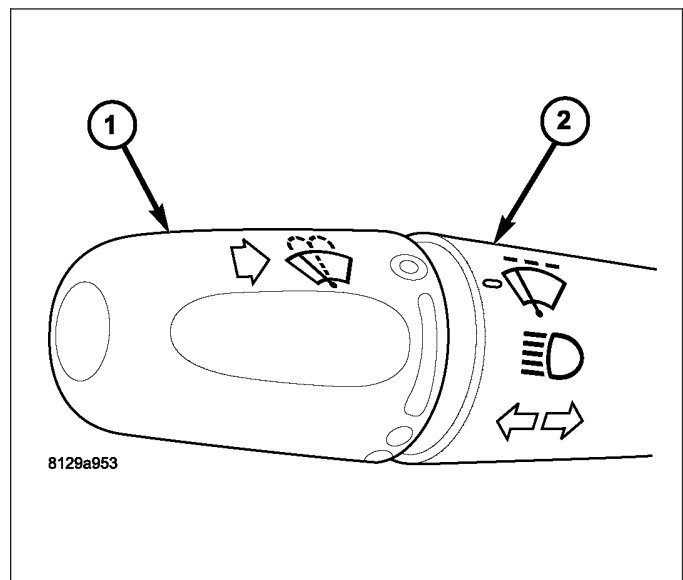
- **Check Valve** - The washer system check valve is integral to the wye fitting located in the washer plumbing between the cowl plenum washer hose and the washer nozzles, and is concealed beneath the cowl plenum cover/grille panel at the base of the windshield.
- **Totally Integrated Power Module** - The Totally Integrated Power Module (TIPM) is located in the engine compartment, near the battery. (Refer to 8 - ELECTRICAL/POWER DISTRIBUTION/TOTALLY INTEGRATED POWER MODULE - DESCRIPTION).
- **Instrument Cluster** - The ElectroMechanical Instrument Cluster (EMIC) is also referred to as the Cab Control Node (CCN) in this vehicle. The EMIC/CCN is located in the instrument panel above the steering column opening, directly in front of the driver. (Refer to 8 - ELECTRICAL/INSTRUMENT CLUSTER - DESCRIPTION).
- **Multi-Function Switch (6)** - The multi-function switch is located on the top of the steering column, just below the steering wheel. A control stalk that extends from the left side of the switch has a control knob on the end that is dedicated to providing all of the driver controls for the wiper and washer systems. (Refer to 8 - ELECTRICAL/LAMPS/LIGHTING - EXTERIOR/MULTI-FUNCTION SWITCH - DESCRIPTION).
- **Washer Fluid Level Switch** - The washer fluid level switch is located in a dedicated hole on the lower, rearward facing surface of the washer reservoir in the engine compartment.
- **Washer Nozzle (4)** - Two fluidic washer nozzles are secured with integral latch features to dedicated openings in the cowl plenum cover/grille panel located near the base of the windshield.

- **Washer Plumbing** - The plumbing for the washer system consists of rubber hoses and molded plastic fittings. The plumbing is routed along the right side of the engine compartment from the washer reservoir, and through a trough near the right end of the cowl plenum cover/grille panel into the cowl plenum to the washer nozzle fittings on the underside of the cowl plenum cover/grille panel.
- **Washer Pump/Motor** - The electric washer pump/motor unit is located in a dedicated hole on the lower, rearward facing surface of the washer reservoir in the engine compartment.
- **Washer Reservoir (1 or 2)** - On all models except the SRT10 and those with an optional diesel engine, the washer reservoir is combined with the engine coolant reserve bottle secured by integral mounting tabs and screws to the right side of the cooling module shroud in the engine compartment. This combined reservoir has separate, clearly identified washer fluid and engine coolant filler caps that are accessed from the right front corner of the engine compartment. On SRT10 models and those with an optional diesel engine, the washer reservoir is separate from the engine coolant reserve bottle and is secured by screws to the back of the upright left vertical member of the radiator support in the engine compartment. This washer reservoir filler cap is accessed from the left front corner of the engine compartment.
- **Wiper Arm & Blade (5)** - The two wiper arms are secured with integral latches to the serrated ends of the two wiper pivot shafts, which extend through the cowl plenum cover/grille panel located near the base of the windshield. The two wiper blades are secured to the two wiper arms with an integral latch, and are parked on the glass near the bottom of the windshield when the wiper system is not in operation.
- **Wiper Module (3)** - The wiper pivot shafts are the only visible components of the wiper module. The remainder of the module is concealed within the cowl plenum area beneath the cowl plenum cover/grille panel. The wiper module includes the wiper module bracket, three rubber-isolated wiper module mounts, the wiper motor, the wiper motor crank arm, the two wiper drive links, and the two wiper pivots.

Hard wired circuitry connects the wiper and washer system components to the electrical system of the vehicle. These hard wired circuits are integral to several wire harnesses, which are routed throughout the vehicle and retained by many different methods. These circuits may be connected to each other, to the vehicle electrical system and to the wiper and washer system components through the use of a combination of soldered splices, splice block connectors, and many different types of wire harness terminal connectors and insulators. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, further details on wire harness routing and retention, as well as pin-out and location views for the various wire harness connectors, splices and grounds.

## OPERATION

The wiper and washer system is designed to provide the vehicle operator with a convenient, safe, and reliable means of maintaining visibility through the windshield glass. The various components of this system are designed to convert electrical energy produced by the vehicle electrical system into the mechanical action of the wiper blades to wipe the outside surface of the glass, as well as into the hydraulic action of the washer system to apply washer fluid stored in an on-board reservoir to the area of the glass to be wiped. When combined, these components provide the means to effectively maintain clear visibility for the vehicle operator by removing excess accumulations of rain, snow, bugs, mud, or other minor debris from the outside windshield glass surface that might be encountered while driving the vehicle under numerous types of inclement operating conditions.



The vehicle operator initiates all wiper and washer system functions with the control knob (1) on the end of the control stalk (2) of the multi-function switch that extends from the left side of the steering column, just below the steering wheel. Rotating the control knob on the end of the control stalk, selects the Off, Delay, Low, or High wiper system operating modes. In the Delay mode, the control knob also allows the vehicle operator to select from one of five intermittent wipe Delay intervals. Depressing the control knob towards the steering column actuates the momen-

tary washer system switch, which selects the Wash, Wipe-After-Wash Modes depending upon when and how long the switch is held closed.

The multi-function switch provides hard wired resistor multiplexed inputs to the ElectroMechanical Instrument Cluster (EMIC) for all of the wiper and washer system functions. The EMIC then sends electronic messages to the Totally Integrated Power Module (TIPM) over the Controller Area Network (CAN) data bus requesting the appropriate wiper and washer system operating modes.

Wiper and washer system operation are completely controlled by the instrument cluster and TIPM logic circuits, and that logic will only allow these systems to operate when the ignition switch is in the Accessory or On positions. The TIPM uses intelligent, high current, self-protected high side switches to control wiper system operation by energizing or de-energizing the wiper motor low and high speed brushes. The TIPM uses a high side driver to control the operation of the washer pump/motor unit. The multi-function switch circuitry receives a clean ground output from the instrument cluster on a multi-function switch return circuit, then provides resistor multiplexed inputs to the instrument cluster on an intermittent wipe mux circuit to indicate the selected wiper system mode and on a wash/beam select mux circuit to indicate the selected washer system mode.

The hard wired circuits and components of the wiper and washer system may be diagnosed and tested using conventional diagnostic tools and methods. However, conventional diagnostic methods may not prove conclusive in the diagnosis of the EMIC, the TIPM, or the electronic message inputs to or outputs from the EMIC or the TIPM that control the wiper and washer system operating modes. The most reliable, efficient, and accurate means to diagnose the EMIC or the TIPM inputs and outputs related to the various wiper and washer system operating modes requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

## **OPERATING MODES**

Following are paragraphs that briefly describe the operation of each of the wiper and washer system operating modes.

### **CONTINUOUS WIPE MODE**

When the Low position of the control knob on the control stalk of the multi-function switch is selected the EMIC sends an electronic wiper switch low message to the TIPM, then the TIPM directs battery current to the low speed brush of the wiper motor, causing the wipers to cycle at low speed. When the High position of the control knob is selected the EMIC sends an electronic wiper switch high message to the TIPM, then the TIPM directs battery current to the high speed brush of the wiper motor, causing the wipers to cycle at high speed.

When the Off position of the multi-function switch control knob is selected, the EMIC sends an electronic wiper switch off message to the TIPM. If the wiper motor was operating at high speed, the TIPM immediately de-energizes the wiper motor high speed brush and energizes the low speed brush causing the wiper motor to return to low speed operation. Then one of two events will occur, which depends upon the position of the wiper blades on the windshield at the moment that the control knob Off position is selected.

If the wiper blades are in the down position on the windshield when the Off position is selected, the park switch that is integral to the wiper motor is closed to ground and provides a hard wired park switch sense input to the TIPM. The TIPM then de-energizes the wiper motor low speed brush and the wiper motor ceases to operate. If the wiper blades are not in the down position on the windshield at the moment the Off position is selected, the park switch is an open circuit and the TIPM keeps the wiper low speed brush energized, which causes the wiper motor to continue running at low speed until the wiper blades are in the down position on the windshield and the park switch input to the TIPM is again closed to ground.

### **INTERMITTENT WIPE MODE**

When the control knob on the control stalk of the multi-function switch is moved to one of the Delay interval positions the EMIC sends an electronic wiper switch delay message to the TIPM, then the TIPM electronic intermittent wipe logic circuit responds by calculating the correct length of time between wiper sweeps based upon the selected delay interval input. The TIPM monitors the changing state of the wiper motor park switch through a hard wired park switch sense input. This input allows the TIPM to determine the proper intervals at which to energize and de-energize the wiper motor low speed brush to operate the wiper motor intermittently for one low speed cycle at a time.

The TIPM logic is also programmed to provide vehicle speed sensitivity to the selected intermittent wipe delay intervals. In order to provide this feature the TIPM monitors electronic vehicle speed messages from the Powertrain Control Module (PCM) and doubles the selected delay interval whenever the vehicle speed is about sixteen kilometers-per-hour (ten miles-per-hour) or less.

## **WASH MODE**

When the control knob on the control stalk of the multi-function switch is depressed to the momentary Wash position for more than about one-half second, the EMIC sends an electronic washer switch message to the TIPM, then the TIPM directs battery current to the washer pump/motor unit. This will cause the washer pump/motor unit to be energized for as long as the Wash switch is held closed up to about thirty seconds, and to de-energize when the Wash switch is released.

When the control knob is depressed to the momentary Wash position while the wiper system is operating in one of the Delay interval positions, the washer pump/motor operation is the same. However, the TIPM also overrides the selected delay interval and operates the wiper motor in a continuous low speed mode for as long as the control knob is held depressed, then reverts to the selected delay mode interval several wipe cycles after the control knob is released. If the control knob is held depressed for more than about ten seconds, the TIPM will suspend washer pump/motor operation until the knob is released for about two seconds, then cycled back to the Wash position.

## **WIPE-AFTER-WASH MODE**

When the control knob on the control stalk of the multi-function switch is depressed to the momentary Wash position for more than about one-half second while the wiper system is not operating, the EMIC sends an electronic washer switch message to the TIPM, then the TIPM directs battery current to the washer pump/motor unit and energizes the wiper motor low speed brush. This will cause the washer pump/motor unit to be energized and operate the wiper motor in a continuous low speed mode for as long as the Wash switch is held closed up to about ten seconds. When the control knob is released, the TIPM de-energizes the washer pump/motor unit, but allows the wiper motor to operate for several additional wipe cycles before it de-energizes the wiper motor low speed brush and parks the wiper blades near the base of the windshield.

If the control knob is held depressed for more than about ten seconds, the TIPM will suspend washer pump/motor operation until the knob is released for about two seconds, then cycled back to the Wash position; however, the wipers will continue to operate for as long as the Wash switch is held closed. The TIPM monitors the changing state of the wiper motor park switch through a hard wired wiper park switch sense circuit input. This input allows the TIPM to count the number of wipe cycles that occur after the Wash switch is released, and to determine the proper interval at which to de-energize the wiper low speed brush to complete the wipe-after-wash mode cycle.

## **DIAGNOSIS AND TESTING**

### **WIPER & WASHER SYSTEM**

**WARNING:** To avoid personal injury or death, on vehicles equipped with airbags, disable the supplemental restraint system before attempting any steering wheel, steering column, airbag, seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the supplemental restraint system. Failure to take the proper precautions could result in accidental airbag deployment.

If the wiper motor operates, but the wipers do not move on the windshield, replace the faulty wiper module. If the washer pump/motor operates, but no washer fluid is dispensed on the glass; or, if the wipers operate, but chatter, lift, or do not clear the glass, clean and inspect the wiper and washer system components as required. (Refer to 8 - ELECTRICAL/WIPERS/WASHERS - CLEANING) and (Refer to 8 - ELECTRICAL/WIPERS/WASHERS - INSPECTION).

The hard wired wiper and washer system circuits and components may be diagnosed and tested using conventional diagnostic tools and methods. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

However, conventional diagnostic methods may not prove conclusive in the diagnosis of the ElectroMechanical Instrument Cluster (EMIC), the Totally Integrated Power Module (TIPM), the Controller Area Network (CAN) data bus, or the electronic message inputs or outputs used to provide wiper and washer system service or many of the electronic features of the wiper and washer systems. The most reliable, efficient, and accurate means to diagnose the EMIC, the TIPM, the CAN data bus and the electronic message inputs and outputs for the wiper and washer system requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

## CLEANING - WIPER & WASHER SYSTEM

### WIPER SYSTEM

**CAUTION:** Protect the rubber squeegees of the wiper blades from any petroleum-based cleaners, solvents, or contaminants. These products can rapidly deteriorate the rubber squeegees.

The squeegees of wiper blades exposed to the elements for a long time tend to lose their wiping effectiveness. Periodic cleaning of the squeegees is suggested to remove any deposits of salt or road film. The wiper blades, arms, and windshield glass should only be cleaned using a sponge or soft cloth and windshield washer fluid, a mild detergent, or a non-abrasive cleaner. If the wiper blades continue to leave streaks, smears, hazing, or beading on the glass after thorough cleaning of the squeegees and the glass, the entire wiper blade assembly must be replaced.

### WASHER SYSTEM

**CAUTION:** Never introduce petroleum-based cleaners, solvents, or contaminants into the washer system. These products can rapidly deteriorate the rubber seals and hoses of the washer system, as well as the rubber squeegees of the wiper blades.

**CAUTION:** Never use compressed air to flush the washer system plumbing. Compressed air pressures are too great for the washer system plumbing components and will result in further system damage. Never use sharp instruments to clear a plugged washer nozzle or damage to the nozzle orifice and improper nozzle spray patterns will result.

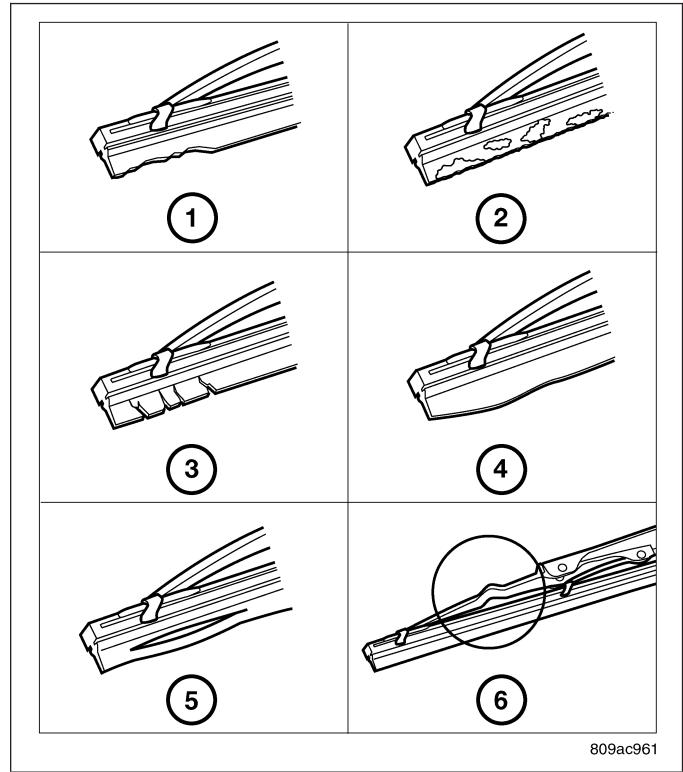
If the washer system is contaminated with foreign material, drain the washer reservoir by removing the washer pump/motor from the reservoir. Clean foreign material from the inside of the washer pump inlet filter screen and the washer reservoir using clean washer fluid, a mild detergent, or a non-abrasive cleaner. Flush foreign material from the washer system plumbing by first disconnecting the washer hoses from the washer nozzles, then running the washer pump/motor to run clean washer fluid or water through the system. Plugged or restricted washer nozzles should be carefully back-flushed using compressed air. If the washer nozzle obstruction cannot be cleared, replace the washer nozzle.

## INSPECTION - WIPER & WASHER SYSTEM

### WIPER SYSTEM

The wiper blades and wiper arms should be inspected periodically, not just when wiper performance problems are experienced. This inspection should include the following points:

1. Carefully inspect the wiper blades for any indications of worn or uneven edges (1), foreign material deposits (2), hardening or cracking (3), deformation or fatigue (4), or splitting (5). Inspect the wiper blade support components and the wiper arms for damage (6) or corrosion. If the wiper arms and blades are contaminated with any foreign material, clean them and the glass as required. (Refer to 8 - ELECTRICAL/WIPERS/WASHERS - CLEANING). If a wiper blade or arm is damaged, or if corrosion is evident, replace the affected wiper arm or blade with a new unit. Do not attempt to repair a wiper arm or blade that is damaged or corroded.
2. Carefully lift the wiper blade off of the glass. Note the action of the wiper arm hinge. The wiper arm should pivot freely at the hinge, but with no lateral looseness evident. If there is any binding evident in the wiper arm hinge, or there is evident lateral play in the wiper arm hinge, replace the wiper arm.



**CAUTION:** Do not allow the wiper arm to spring back against the glass without the wiper blade in place or the glass may be damaged.

3. Once proper hinge action of the wiper arm is confirmed, check the hinge for proper spring tension. Remove the wiper blade from the wiper arm. Either place a small postal scale between the blade end of the wiper arm and the glass, or carefully lift the blade end of the arm away from the glass using a small fish scale. Compare the scale readings between the right and left wiper arms. Replace a wiper arm if it has comparatively lower spring tension, as evidenced by a lower scale reading.
4. After cleaning and inspecting the wiper components and the glass, if the wiper blade still fails to clear the glass without smearing, streaking, chattering, hazing, or beading, replace the wiper blade.

### WASHER SYSTEM

The washer system components should be inspected periodically, not just when washer performance problems are experienced. This inspection should include the following points:

1. Check for ice or other foreign material in the washer reservoir. If contaminated, clean and flush the washer system. (Refer to 8 - ELECTRICAL/WIPERS/WASHERS - CLEANING).
2. Inspect the washer plumbing for pinched, leaking, deteriorated, or incorrectly routed hoses and damaged or disconnected hose fittings. Replace damaged or deteriorated hoses and hose fittings. Leaking washer hoses can sometimes be repaired by cutting the hose at the leak and splicing it back together using an in-line connector fitting. Similarly, sections of deteriorated hose can be cut out and replaced by splicing in new sections of hose using in-line connector fittings. Whenever routing a washer hose or a wire harness containing a washer hose, it must be routed away from hot, sharp, or moving parts. Also, sharp bends that might pinch the washer hose must be avoided.

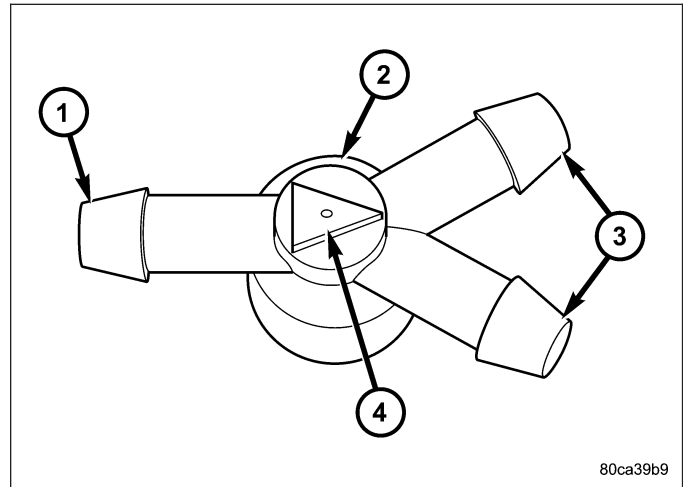
**SPECIFICATIONS****WIPER/WASHER SYSTEMS****TORQUE SPECIFICATIONS**

| <b>DESCRIPTION</b>                                              | <b>N·m</b> | <b>Ft. Lbs.</b> | <b>In. Lbs.</b> |
|-----------------------------------------------------------------|------------|-----------------|-----------------|
| Washer Reservoir<br>Mounting Screws (Except<br>SRT10 or Diesel) | 7          | -               | 60              |
| Washer Reservoir<br>Mounting Screws (SRT10<br>or Diesel)        | 10         | -               | 85              |
| Wiper Module Mounting<br>Screws                                 | 8          | -               | 75              |

## CHECK VALVE

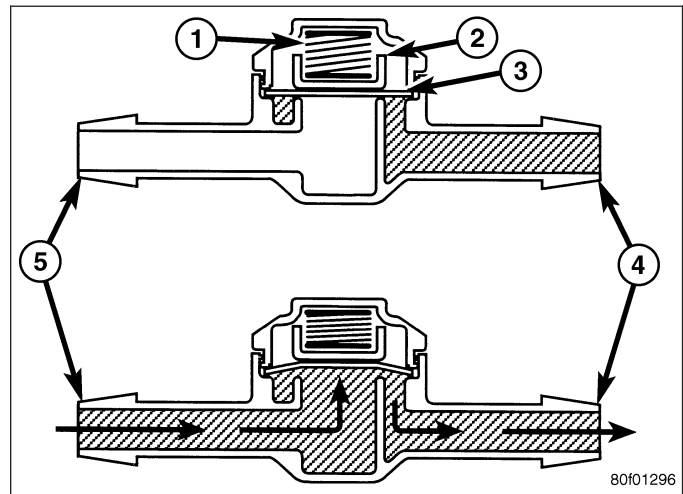
### DESCRIPTION

A single washer system check valve is standard equipment on this model, and is installed in the washer system plumbing. The check valve is integral to the washer nozzle plumbing wye fitting (2) located in the cowl plenum area beneath the cowl plenum cover/grille panel near the base of the windshield. The check valve consists of a molded plastic body with a raised arrowhead (4) molded into its center section that indicates the direction of the flow through the valve, and three barbed hose nipples (1 and 3) formed in a wye configuration on the outside circumference of the center section of the valve body. The check valve cannot be adjusted or repaired and, if faulty or damaged, it must be replaced.



### OPERATION

The check valve provides more than one function in this application. It serves as a wye connector fitting between the engine compartment and washer nozzle sections of the washer supply hose. It prevents washer fluid from draining out of the washer supply hoses back to the washer reservoir. This drain-back would result in a lengthy delay from when the washer switch is actuated until washer fluid was dispensed through the washer nozzles, because the washer pump would have to refill the washer plumbing from the reservoir to the nozzles.

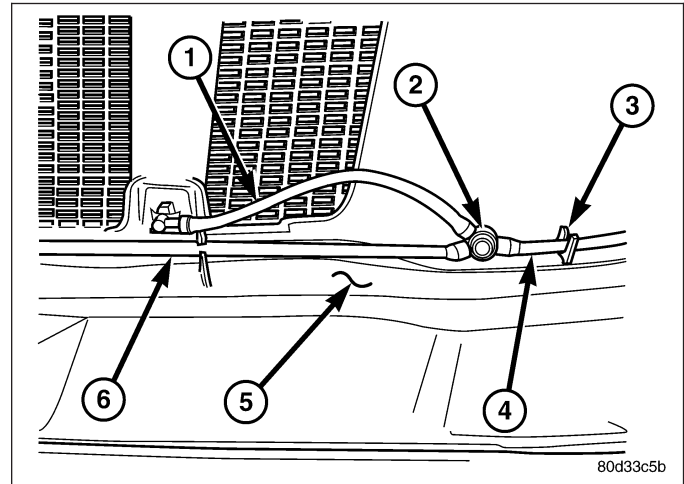


Such a drain-back condition could also result in water, dirt, or other outside contaminants being siphoned into the washer system through the washer nozzle orifice. This water could subsequently freeze and plug the nozzle, while other contaminants could interfere with proper nozzle operation and cause improper nozzle spray patterns. In addition, the check valve prevents washer fluid from siphoning through the washer nozzles after the washer system is turned Off.

When the washer pump pressurizes and pumps washer fluid from the reservoir through the washer plumbing, the fluid pressure (5) unseats a diaphragm (3) from over a sump well within the valve by overriding the pressure applied to a piston (2) by a spring (1). With the diaphragm unseated, washer fluid is allowed to flow toward the two washer nozzles (4). When the washer pump stops operating, the spring pressure on the piston seats the diaphragm over the sump well in the valve and fluid flow in either direction within the washer plumbing is prevented. The check valve cannot be adjusted or repaired and, if faulty or damaged, it must be replaced.

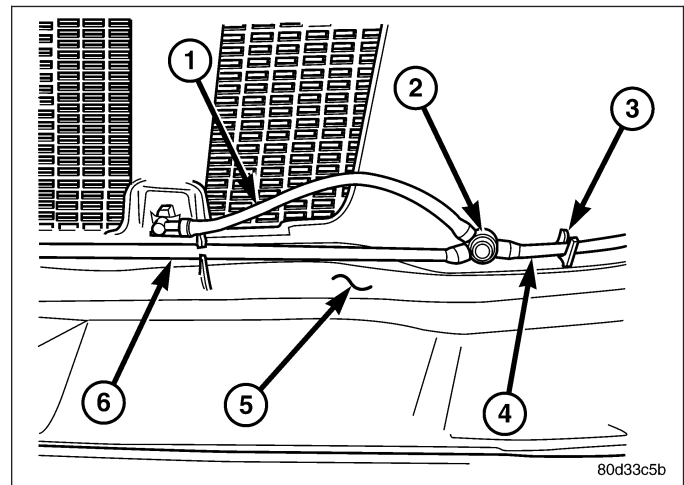
## REMOVAL

1. Remove both wiper arms from the wiper pivots. (Refer to 8 - ELECTRICAL/WIPERS/WASHERS/ WIPER ARM - REMOVAL).
2. Unlatch and open the hood.
3. Remove the cowl plenum cover/grille panel from over the cowl plenum. (Refer to 23 - BODY/EXTE-RIOR/COWL GRILLE - REMOVAL).
4. From the underside of the cowl plenum cover/grille panel (5), disconnect the cowl plenum (4) and washer nozzle hoses (1 and 6) from the three barbed nipples of the check valve (2).
5. Remove the check valve from the underside of the cowl plenum cover/grille panel.



## INSTALLATION

1. Position the check valve (2) to the underside of the cowl plenum cover/grille panel (5). Be certain that the flow direction arrow molded into the check valve body is oriented towards the washer nozzles.
2. From the underside of the cowl plenum cover/grille panel, reconnect the cowl plenum (4) and washer nozzle hoses (1 and 6) to the three barbed nipples of the check valve.
3. Reinstall the cowl plenum cover/grille panel over the cowl plenum. (Refer to 23 - BODY/EXTERIOR/ COWL GRILLE - INSTALLATION).
4. Close and latch the hood.
5. Reinstall both wiper arms onto the wiper pivots. (Refer to 8 - ELECTRICAL/WIPERS/WASHERS/ WIPER ARM - INSTALLATION).

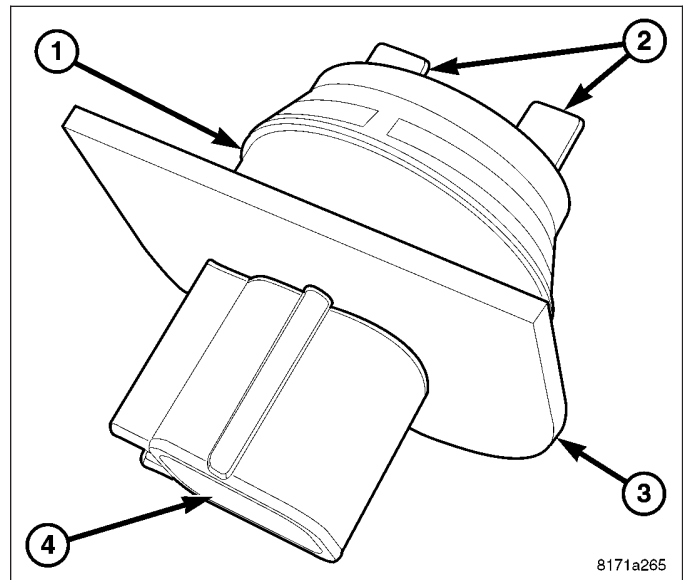


## SENSOR-WASHER FLUID LEVEL

### DESCRIPTION

The washer fluid level switch (3) is a two-pin conductivity sensor with no moving parts mounted on the rearward facing side of the washer reservoir adjacent to the washer pump/motor unit in the engine compartment. Only the molded plastic switch mounting flange and the integral connector receptacle (4) are visible when the switch is installed in the reservoir. A short nipple formation (1) extends from the inner surface of the switch mounting flange, and a barb on the nipple is pressed through a rubber grommet seal installed in the mounting hole of the reservoir. Two over-molded pins or electrodes (2) extend from the back of the nipple formation.

The washer fluid level switch cannot be adjusted or repaired. If ineffective or damaged, the switch must be replaced.



### OPERATION

The washer fluid level switch uses fluid conductivity to monitor the level of the washer fluid in the washer reservoir. Electricity is conducted between the two switch pins or electrodes only when they are immersed in the washer fluid, which closes the switch circuit. When the fluid level in the washer reservoir falls below the pins, electrical current cannot be conducted and the switch becomes an open circuit, which signals a low fluid condition.

In order to prevent an electrical charge from accumulating in the electrical leads of the switch, the switch receives current that is pulsed from the Totally Integrated Power Module (TIPM) located in the engine compartment near the battery. The TIPM monitors the switch return signal and is programmed to respond to three consecutive open switch readings by sending an electronic washer fluid indicator lamp-on message to the instrument cluster over the Controller Area Network (CAN) data bus. The instrument cluster responds to this message by illuminating the washer fluid indicator and by sounding an audible chime tone warning.

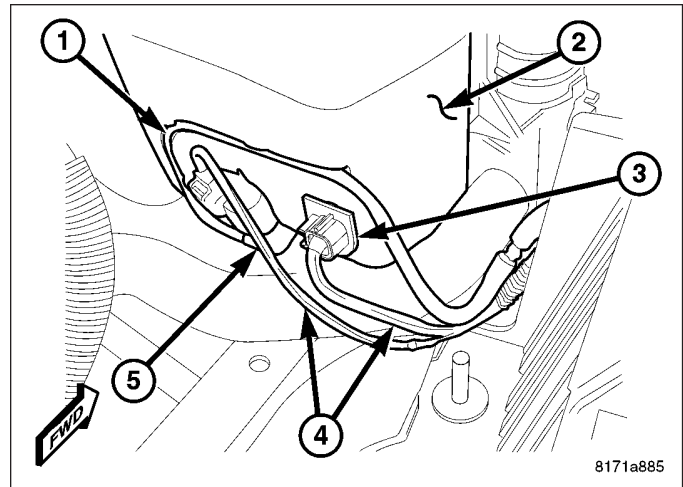
The washer fluid level switch is connected to the vehicle electrical system through a dedicated take out and connector of the right (except SRT10 and diesel engines) or left (SRT10 and diesel engines only) headlamp and dash wire harness. The switch is connected in series between a sensor return circuit and the washer fluid switch sense input to the TIPM. The washer fluid level switch circuits may be diagnosed and tested using conventional diagnostic tools and procedures. However, conventional diagnostic methods may not prove conclusive in the diagnosis of the instrument cluster, the TIPM, the CAN data bus, or the electronic message inputs to or outputs from the instrument cluster and the TIPM that control the operation of the washer fluid visual and audible indications. The most reliable, efficient, and accurate means to diagnose the washer fluid level indicator, the instrument cluster, the TIPM, the CAN data bus or the electronic message inputs and outputs related to the washer fluid indicator requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

### REMOVAL

#### EXCEPT SRT10 OR DIESEL ENGINE

**NOTE:** The washer fluid level switch can be removed from the washer reservoir without removing the reservoir from the vehicle.

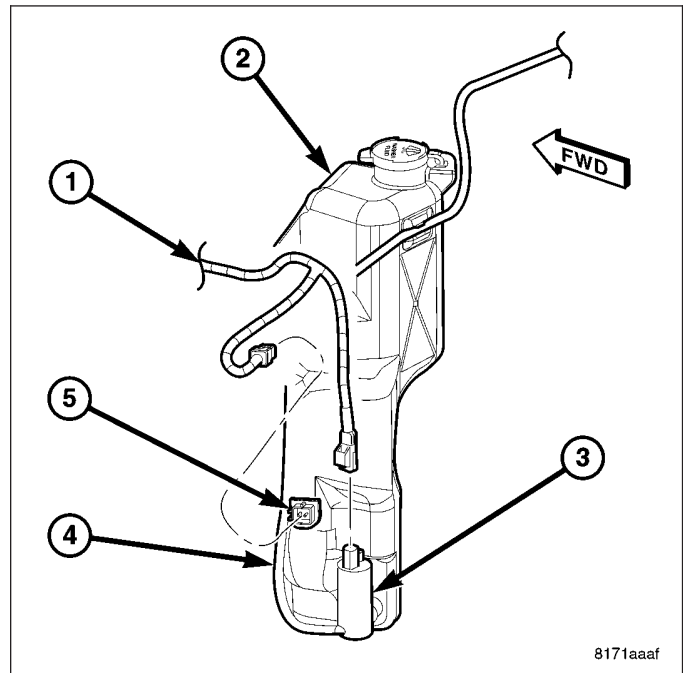
1. Disconnect and isolate the battery negative cable.
2. Disconnect the washer hose (1) from the barbed outlet nipple of the washer pump/motor unit (5) and allow the washer fluid to drain into a clean container for reuse.
3. Disconnect the right headlamp and dash wire harness (4) connector for the washer fluid level switch (3) from the switch connector receptacle.
4. Using a trim stick or another suitable wide flat-bladed tool, gently pry the barbed nipple of the washer fluid level switch out of the rubber grommet seal in the washer reservoir sump (2). Care must be taken not to damage the reservoir.
5. Remove the switch from the reservoir.
6. Remove the rubber grommet seal from the mounting hole in the washer reservoir and discard.



### SRT10 OR DIESEL ENGINE ONLY

**NOTE:** The washer fluid level switch can be removed from the washer reservoir without removing the reservoir from the vehicle.

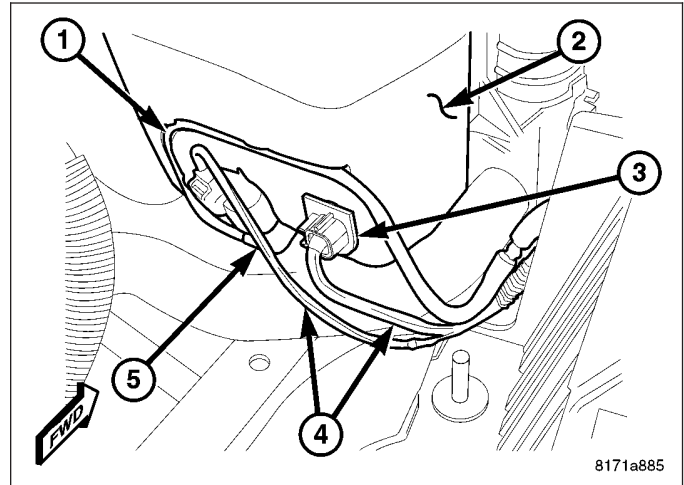
1. Disconnect and isolate the battery negative cable.
2. Disconnect the washer hose (4) from the barbed outlet nipple of the washer pump/motor unit (3) and allow the washer fluid to drain into a clean container for reuse.
3. Disconnect the left headlamp and dash wire harness (1) connector for the washer fluid level switch (5) from the switch connector receptacle.
4. Using a trim stick or another suitable wide flat-bladed tool, gently pry the barbed nipple of the washer fluid level switch out of the rubber grommet seal in the washer reservoir sump (2). Care must be taken not to damage the reservoir.
5. Remove the switch from the reservoir.
6. Remove the rubber grommet seal from the mounting hole in the washer reservoir and discard.



## INSTALLATION

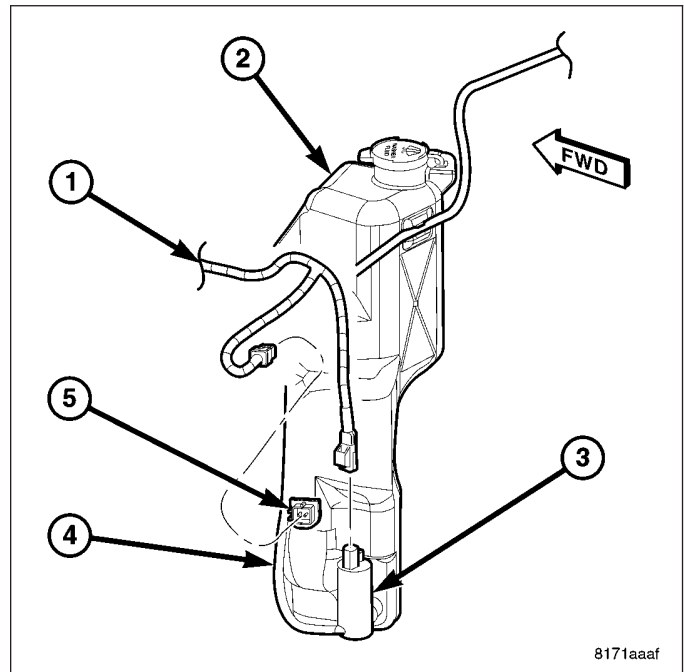
### EXCEPT SRT10 OR DIESEL ENGINE

1. Install a new rubber grommet seal into the washer fluid level switch mounting hole in the washer reservoir (2). Always use a new rubber grommet seal on the reservoir.
2. Insert the nipple formation of the switch (3) through the rubber grommet seal in the reservoir.
3. Using hand pressure, press firmly and evenly on the switch mounting flange until the barbed nipple is fully seated in the rubber grommet seal in the reservoir. The flat edge of the switch mounting flange should be pointed upward.
4. Reconnect the right headlamp and dash wire harness (4) connector to the switch connector receptacle.
5. Reconnect the removed washer hose (1) to the barbed outlet nipple of the washer pump/motor unit (5).
6. Refill the washer reservoir with the washer fluid drained from the reservoir during the removal procedure.
7. Reconnect the battery negative cable.



### SRT10 OR DIESEL ENGINE ONLY

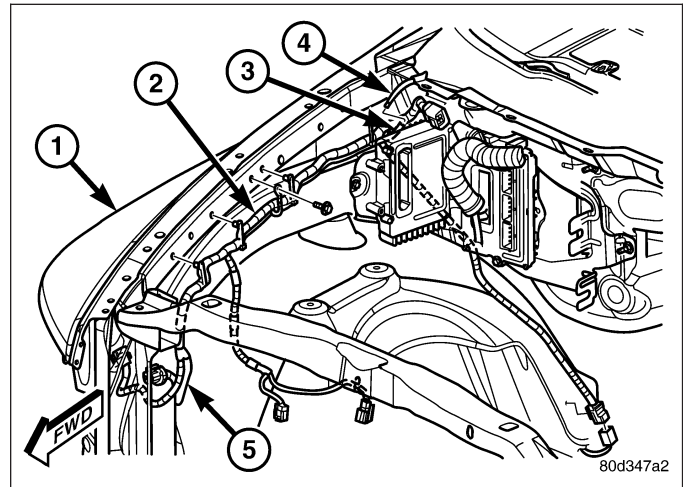
1. Install a new rubber grommet seal into the washer fluid level switch mounting hole in the washer reservoir (2). Always use a new rubber grommet seal on the reservoir.
2. Insert the nipple formation of the switch (5) through the rubber grommet seal and in the reservoir.
3. Using hand pressure, press firmly and evenly on the switch mounting flange until the barbed nipple is fully seated in the rubber grommet seal in the reservoir. The flat edge of the switch mounting flange should be pointed upward.
4. Reconnect the left headlamp and dash wire harness (1) connector for the switch to the switch connector receptacle.
5. Reconnect the removed washer hose (4) to the barbed outlet nipple of the washer pump/motor unit (3).
6. Refill the washer reservoir with the washer fluid drained from the reservoir during the removal procedure.
7. Reconnect the battery negative cable.



## WASHER HOSES/TUBES

### DESCRIPTION

The washer plumbing consists of a small diameter rubber reservoir washer hose that is routed from the barbed outlet nipple of the electric washer pump/motor unit on the washer reservoir through a trough molded into the back of the reservoir above the washer pump to the engine compartment washer hose to the right side of the engine cooling module. On SRT10 models or those equipped with an optional diesel engine, the reservoir washer hose is routed through routing clips on the top of the radiator fan shroud from the washer reservoir on the left side of the radiator to the engine compartment washer hose on the right side of the radiator.



The engine compartment washer hose is contained within the right headlamp and dash wire harness (2), which is routed through the engine compartment along the top of the right front fender wheel house to the dash panel. This hose is connected to the washer reservoir washer hose at one end (5) and to the cowl plenum washer hose at the other end (3) with molded plastic in-line fittings that have a barbed nipple on each end.

The cowl plenum washer hose (4) is routed from the engine compartment into the cowl plenum area through a trough formation located near the right end of the cowl plenum cover/grille panel. The cowl plenum washer hose is connected to the washer system check valve/wye fitting on the underside of the cowl plenum cover/grille panel. The cowl plenum washer hose and the two washer nozzle hoses are routed through integral routing clips on the underside of the cowl plenum cover/grille panel. The cowl plenum washer hose is connected to one nipple on the wye fitting and the two washer nozzle hoses are connected to the other two nipples. The washer nozzle hoses are then routed along the underside of the cowl plenum cover/grille panel to the two washer nozzles.

Washer hose is available for service only as roll stock, which must then be cut to length. The molded plastic washer hose fittings cannot be repaired. If these fittings are faulty or damaged, they must be replaced.

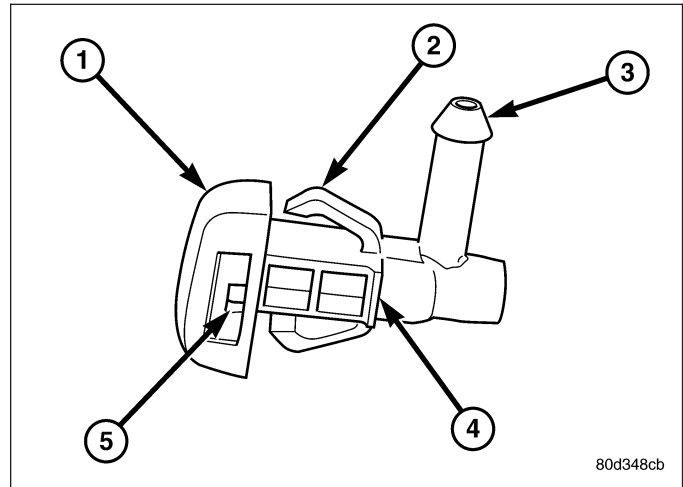
### OPERATION

Washer fluid in the washer reservoir is pressurized and fed by the washer pump/motor through the washer system plumbing and fittings to the two washer nozzles. Whenever routing the washer hose or a wire harness containing a washer hose, it must be routed away from hot, sharp, or moving parts; and, sharp bends that might pinch the hose must be avoided.

## WASHER NOZZLE

### DESCRIPTION

The fluidic washer nozzles (1) are constructed of molded plastic. Each nozzle has two integral latches (2) and an anti-rotation tab (4) that secure them in dedicated holes in the cowl plenum cover/grille panel located near the base of the windshield. The domed upper surface of the washer nozzle is visible on the top of the plenum cover/grille panel, and the nozzle orifice (5) is oriented towards the windshield glass. The washer plumbing fittings (3) for the washer nozzles extend below the cowl plenum cover/grille panel. The cowl plenum cover/grille panel must be removed from the vehicle to access the nozzles for service. The washer nozzles cannot be adjusted or repaired. If faulty or damaged, they must be replaced.

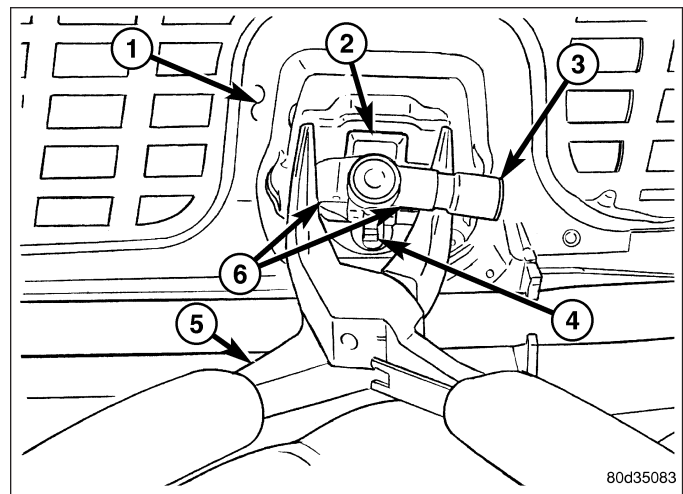


### OPERATION

The two washer nozzles are designed to dispense washer fluid into the wiper pattern area on the outside of the windshield glass. Pressurized washer fluid is fed to each nozzle from the washer reservoir by the washer pump/motor unit through a single hose, which is attached to a barbed nipple on each washer nozzle below the cowl plenum cover/grille panel. A fluidic matrix within the washer nozzle causes the pressurized washer fluid to be emitted from the nozzle orifice as an oscillating stream to more effectively cover a larger area of the glass to be cleaned.

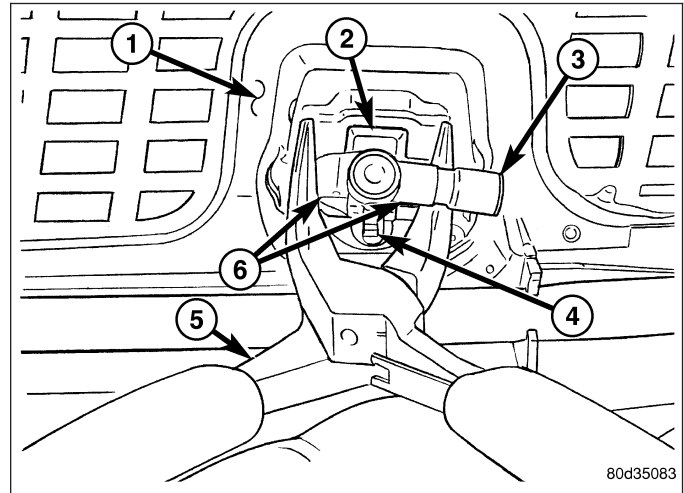
### REMOVAL

1. Remove both wiper arms from the wiper pivots. (Refer to 8 - ELECTRICAL/WIPERS/WASHERS/ WIPER ARM - REMOVAL).
2. Unlatch and open the hood.
3. Remove the cowl plenum cover/grille panel from over the cowl plenum. (Refer to 23 - BODY/EXTERIOR/COWL GRILLE - REMOVAL).
4. From the underside of the cowl plenum cover/grille panel (1), disconnect the washer nozzle hose from the barbed nipple (3) of the washer nozzle.
5. From the underside of the cowl plenum cover/grille panel, release the integral latch features (6) of the washer nozzle and push the nozzle out through the mounting hole toward the top side of the cowl plenum cover/grille panel.
6. Remove the washer nozzle from the top of the cowl plenum cover/grille panel.



## INSTALLATION

1. From the top of the cowl plenum cover/grille panel, position the nipple end of the washer nozzle through the mounting hole and engage the anti-rotation tabs (2 and 4) of the nozzle into the anti-rotation notches in the mounting hole.
2. Using hand pressure, push firmly and evenly on the top of the washer nozzle until the integral latch features (6) lock into place on the underside of the cowl plenum cover/grille panel (1).
3. From the underside of the cowl plenum cover/grille panel, reconnect the washer hose to the barbed nipple (3) of the washer nozzle.
4. Reinstall the washer nozzle hose into its routing clips on the underside of the cowl plenum cover/grille panel.
5. Reinstall the cowl plenum cover/grille panel over the cowl plenum. (Refer to 23 - BODY/EXTERIOR/COWL GRILLE - INSTALLATION).
6. Close and latch the hood.
7. Reinstall both wiper arms onto the wiper pivots. (Refer to 8 - ELECTRICAL/WIPERS/WASHERS/WIPER ARM - INSTALLATION).

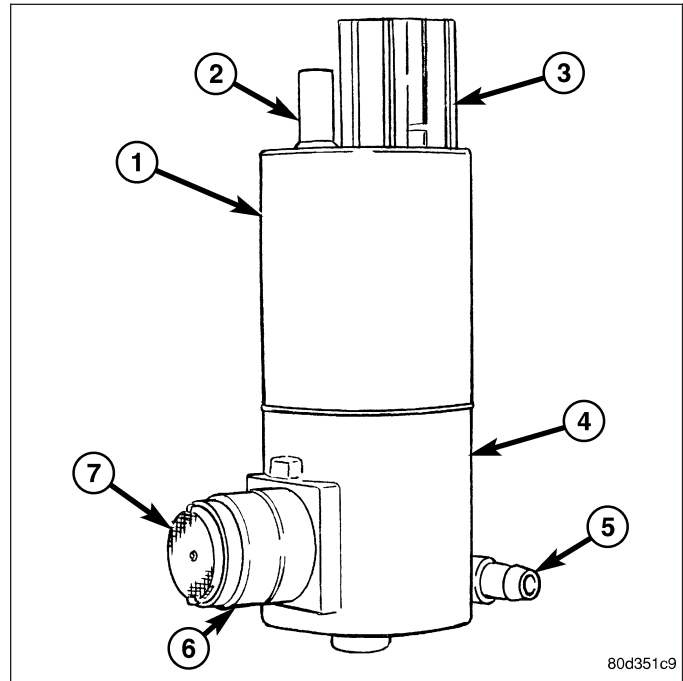


## PUMP-WASHER-WINDSHIELD

### DESCRIPTION

The washer pump/motor unit (1) is located on the rearward facing surface of the washer reservoir, in the right (except SRT10 and diesel) or left (SRT10 and diesel only) front corner of the engine compartment. A small permanently lubricated and sealed electric motor is coupled to the rotor-type washer pump.

A seal flange with a barbed inlet nipple (6) on the pump housing passes through a rubber grommet seal installed in a dedicated mounting hole of the washer reservoir. A removable molded plastic filter screen (7) inserted into the inlet nipple prevents most debris from entering the pump housing. When the pump is installed in the reservoir a barbed outlet nipple (5) on the pump housing connects the unit to the washer system through a short washer reservoir hose.



The washer pump/motor unit is retained on the reservoir by the interference fit between the barbed pump inlet nipple and the grommet seal, which is a light press fit. The top of the washer pump is also secured to the washer reservoir by the use of a snap post (2) on the motor housing and a snap post receptacle molded into the reservoir that allows for mounting of the washer pump without the use of fasteners. An integral connector receptacle (3) on the top of the motor housing connects the unit to the vehicle electrical system.

The washer pump/motor unit cannot be repaired. If faulty or damaged, the entire washer pump/motor unit must be replaced.

### OPERATION

The washer pump/motor unit features a small Direct Current (DC) electric motor. The motor is connected to the vehicle electrical system through a single take out and two-cavity connector of the right (except SRT10 and diesel) or left (SRT10 and diesel only) headlamp and dash wire harness. The motor is grounded at all times through another take out of the right (except SRT10 and diesel) or left (SRT10 and diesel only) headlamp and dash wire harness. On models except SRT10 or diesel, a single eyelet terminal connector is secured by a nut to a ground stud located on the right front fender inner shield in the engine compartment. On SRT10 or diesel models, an eyelet terminal connector is secured by a ground screw to the left front fender inner shield in the engine compartment.

The motor receives battery current on a washer pump/motor control circuit. The washer pump/motor control circuit is energized through a high side driver within the Totally Integrated Power Module (TIPM) whenever the TIPM receives an electronic message requesting washer system operation from the ElectroMechanical Instrument Cluster (EMIC) over the Controller Area Network (CAN) data bus. The EMIC monitors a resistor multiplexed hard wired input from the momentary washer switch contacts within the multi-function switch on the steering column to determine when it should issue the electronic message requesting washer system operation.

Washer fluid is gravity-fed from the washer reservoir to the inlet side of the washer pump. When the pump motor is energized, the motor spins the rotor within the washer pump. The spinning pump rotor pressurizes the washer fluid and forces it through the pump outlet nipple, the washer plumbing, and the washer nozzles onto the windshield glass.

The washer pump/motor unit and the hard wired motor control circuit from the TIPM may be diagnosed using conventional diagnostic tools and methods. However, conventional diagnostic methods may not prove conclusive in the diagnosis of the EMIC, the TIPM, the CAN data bus or the electronic messages used to control the operation of the washer pump/motor unit. The most reliable, efficient, and accurate means to diagnose the washer pump/motor unit,

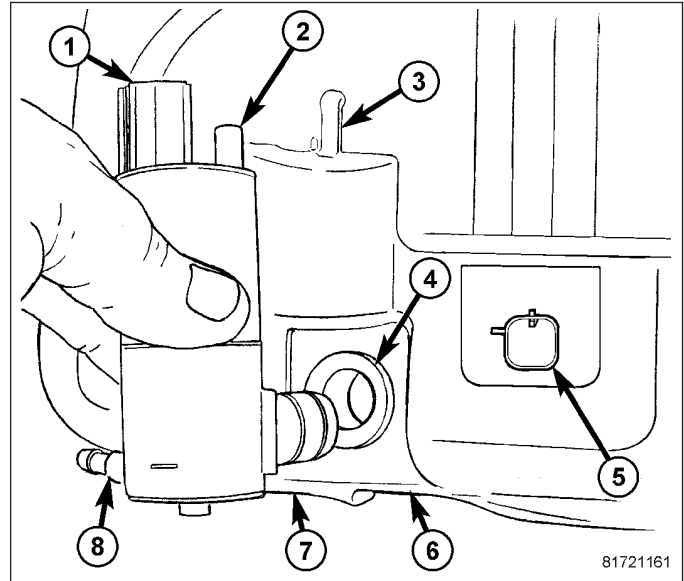
the EMIC, the TIPM, the CAN data bus, and the electronic messages for washer pump/motor unit control requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

## REMOVAL

### EXCEPT SRT10 OR DIESEL ENGINE

**NOTE:** The washer pump/motor unit can be removed from the washer reservoir without removing the reservoir from the vehicle.

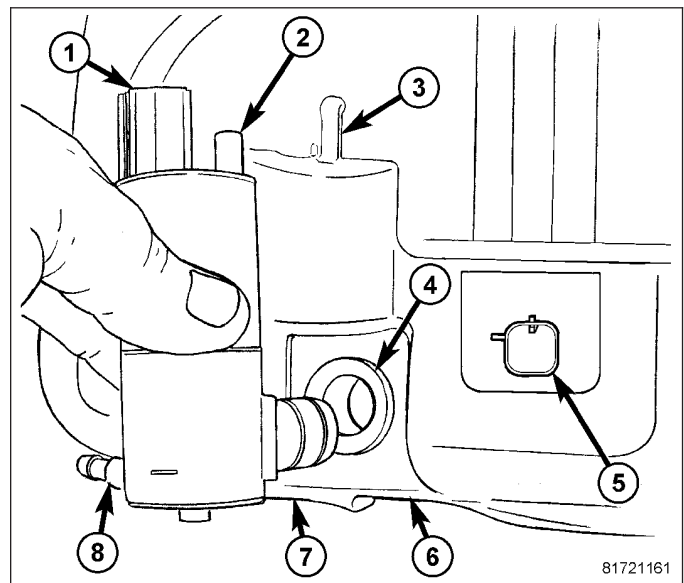
1. Disconnect and isolate the battery negative cable.
2. Disconnect the washer hose from the barbed outlet nipple (8) of the washer pump/motor unit and allow the washer fluid to drain into a clean container for reuse.
3. Disconnect the right headlamp and dash wire harness connector from the washer pump/motor unit connector receptacle (1).
4. Firmly grasp the top of the washer pump/motor housing.
5. Pull lightly outward on the top of the washer pump/motor housing, away from the washer reservoir (6) far enough to disengage the snap post (2) on the top of the motor from the receptacle (3) in the reservoir.
6. Pull the washer pump/motor unit straight out from the washer reservoir far enough to disengage the barbed pump inlet nipple (7) from the rubber grommet seal (4) in the reservoir.
7. Remove the washer pump/motor unit from behind the washer reservoir.
8. Remove the rubber grommet seal from the washer pump mounting hole in the reservoir and discard.



### SRT10 OR DIESEL ENGINE ONLY

**NOTE:** The washer pump/motor unit can be removed from the washer reservoir without removing the reservoir from the vehicle.

1. Disconnect and isolate the battery negative cable.
2. Disconnect the washer hose from the barbed outlet nipple (8) of the washer pump/motor unit and allow the washer fluid to drain into a clean container for reuse.
3. Disconnect the left headlamp and dash wire harness connector from the washer pump/motor unit connector receptacle (1).
4. Firmly grasp the top of the washer pump/motor housing.
5. Pull lightly outward on the top of the washer pump/motor housing, away from the washer reservoir (6) far enough to disengage the snap post (2) on the top of the motor from the receptacle (3) in the reservoir.
6. Pull the washer pump/motor unit straight out from the washer reservoir far enough to disengage the barbed pump inlet nipple (7) from the rubber grommet seal (4) in the reservoir.

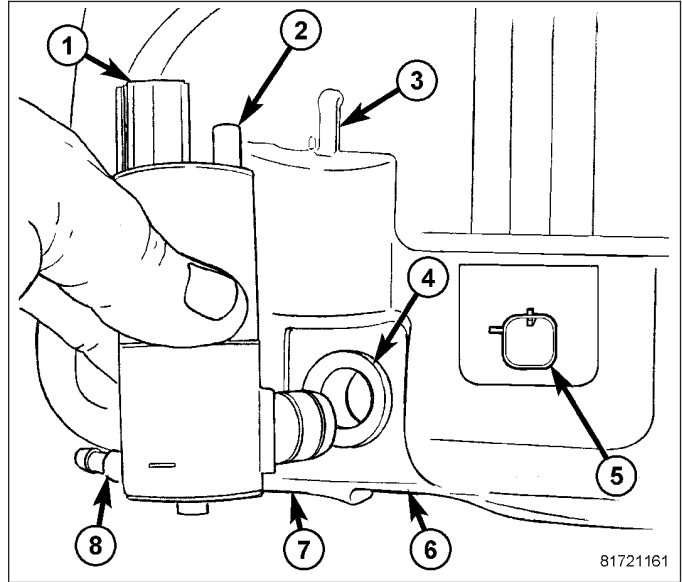


7. Remove the washer pump/motor unit from behind the washer reservoir.
8. Remove the rubber grommet seal from the pump mounting hole in the reservoir and discard.

## INSTALLATION

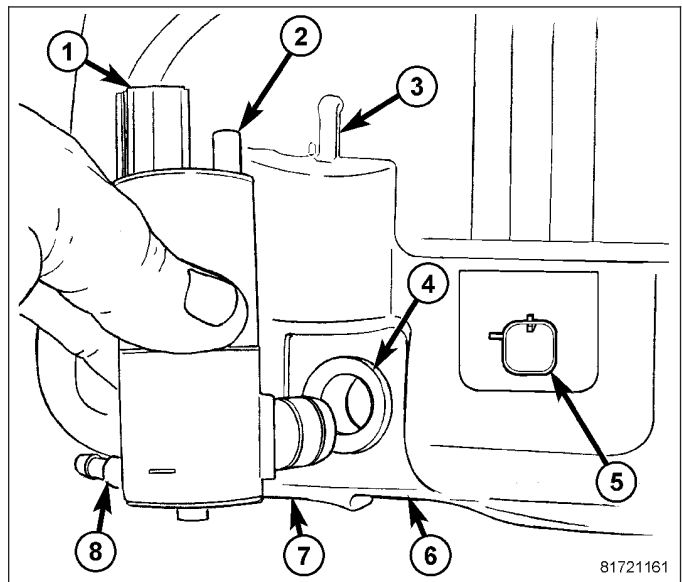
### EXCEPT SRT10 OR DIESEL ENGINE

1. Install a new rubber grommet seal (4) into the washer pump mounting hole in the washer reservoir (6). Always use a new rubber grommet seal on the reservoir.
2. Position the barbed inlet nipple (7) of the washer pump to the rubber grommet seal in the reservoir.
3. Using hand pressure, press firmly and evenly on the washer pump/motor unit until the barbed inlet nipple is fully seated in the rubber grommet seal in the pump mounting hole of the reservoir.
4. Align the snap post (2) on the top of the pump motor housing with the snap post receptacle (3) in the washer reservoir.
5. Using hand pressure, press firmly and evenly on the top of washer pump/motor unit until the snap post snaps into the receptacle.
6. Reconnect the reservoir washer hose to the barbed pump outlet nipple (8).
7. Reconnect the right headlamp and dash wire harness connector to the washer pump/motor unit connector receptacle (1).
8. Refill the washer reservoir with the washer fluid drained from the reservoir during the removal procedure.
9. Reconnect the battery negative cable.



### SRT10 OR DIESEL ENGINE ONLY

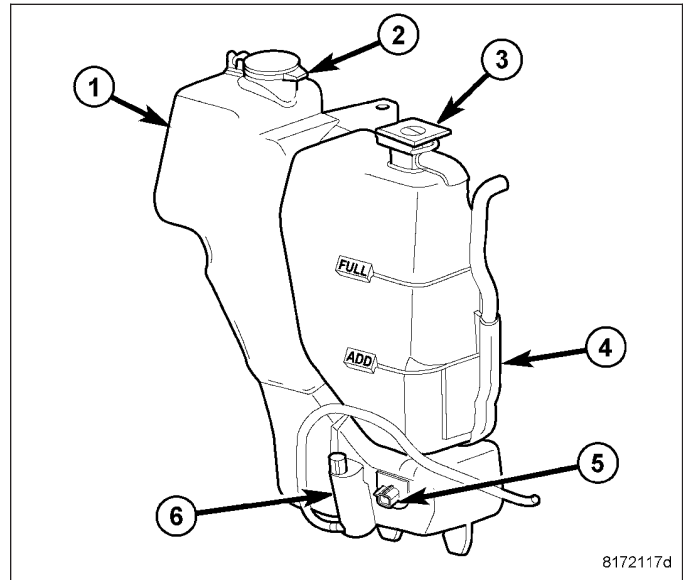
1. Install a new rubber grommet seal (4) into the washer pump mounting hole in the washer reservoir (6). Always use a new rubber grommet seal on the reservoir.
2. Position the barbed inlet nipple (7) of the washer pump to the rubber grommet seal in the reservoir.
3. Using hand pressure, press firmly and evenly on the washer pump/motor unit until the barbed inlet nipple is fully seated in the rubber grommet seal in the pump mounting hole of the reservoir.
4. Align the snap post (2) on the top of the pump motor housing with the snap post receptacle (3) in the washer reservoir.
5. Using hand pressure, press firmly and evenly on the top of washer pump/motor unit until the snap post snaps into the receptacle.
6. Reconnect the washer reservoir hose to the barbed pump outlet nipple (8).
7. Reconnect the left headlamp and dash wire harness connector to the washer pump/motor unit connector receptacle (1).
8. Refill the washer reservoir with the washer fluid drained from the reservoir during the removal procedure.
9. Reconnect the battery negative cable.



## WASHER RESERVOIR

### DESCRIPTION

Except on SRT10 and diesel models, the molded plastic washer fluid reservoir (1) is integral to the engine coolant overflow bottle (4) located on the right rearward facing surface of the engine cooling module shroud in the right front corner of the engine compartment. On SRT10 and diesel models, the molded plastic washer fluid reservoir is separate from the engine coolant overflow bottle and is mounted on the rearward facing surface of the left vertical member of the radiator support in the engine compartment. These reservoirs are constructed of a translucent plastic that allows the fluid level to be inspected without removing the reservoir caps.



A bright yellow plastic filler cap (2) with a rubber seal snaps over the open end of the washer reservoir filler neck and can be easily distinguished from the coolant overflow bottle cap (3) by an International Control and Display Symbol icon for "Windshield Washer" and the text "Washer Fluid Only" molded into it. The cap hinges on and is secured to a molded-in hook formation on the top of the reservoir just behind the filler neck when it is removed for inspecting or adjusting the fluid level in the reservoir.

Except on SRT10 and diesel models, the washer reservoir is secured to the cooling module radiator shroud with two integral tabs at the bottom, and through two integral mounting brackets with two screws at the top. The two bottom tabs are inserted into two slots near the bottom of the shroud, while the two screws secure the mounting brackets to integral mounting points near the top of the shroud. On SRT10 and diesel models, the washer reservoir is secured with two screws through integral mounting brackets to the left vertical member of the radiator support.

There are separate, dedicated holes on the lower rearward facing side of either reservoir provided for the mounting of the washer/pump motor unit (6) and the washer fluid level switch (5). A snap post receptacle for the washer pump and a routing trough for the washer hose are molded into both reservoirs to allow for mounting of the washer pump/motor unit without the use of fasteners.

Except on SRT10 and diesel models, the washer reservoir is serviced only as a unit with the engine coolant reserve bottle. A washer reservoir cannot be repaired and, if faulty or damaged, the unit must be replaced. The washer pump/motor unit, the washer fluid level switch, their rubber grommet seals, as well as the reservoir filler cap are each available for individual service replacement.

### OPERATION

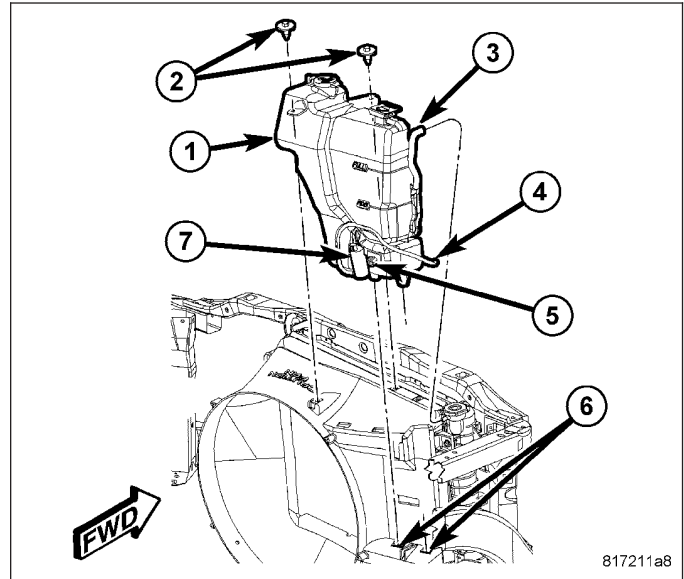
The washer fluid reservoir provides a secure, on-vehicle storage location for a large reserve of washer fluid for operation of the washer system. The washer reservoir filler neck provides a clearly marked and readily accessible point from which to add washer fluid to the reservoir.

The washer/pump motor unit is located in a sump area near the bottom of the reservoir to be certain that washer fluid will be available to the pump as the fluid level in the reservoir becomes depleted. The washer fluid level switch is mounted just above the washer pump inlet nipple in the sump area of the reservoir so that there will be adequate warning to the vehicle operator that the washer fluid level is low, well before the washer system will no longer operate.

## REMOVAL

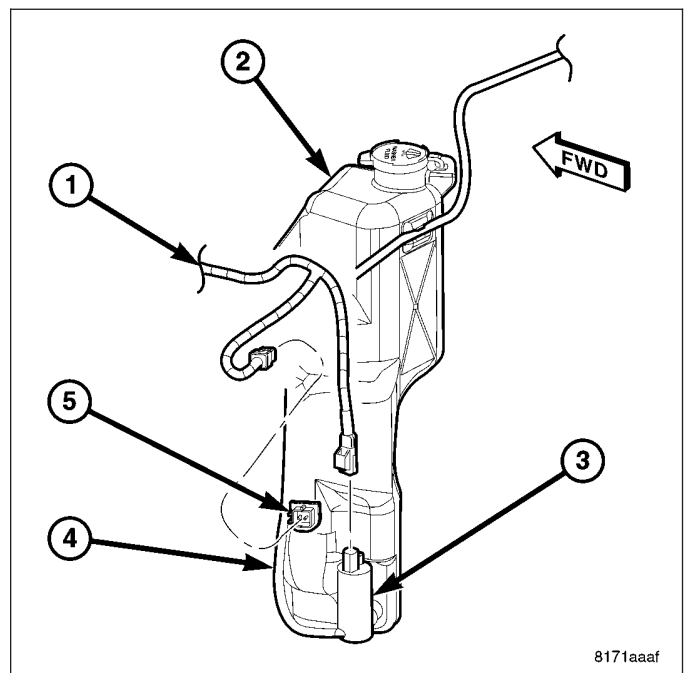
### EXCEPT SRT10 OR DIESEL ENGINE

1. Disconnect and isolate the battery negative cable.
2. Disconnect the coolant overflow hose (3) from the nipple on the radiator filler neck. It is not necessary to open or drain the engine cooling system. (Refer to 7 - COOLING/ENGINE/COOLANT RECOVERY CONTAINER - REMOVAL).
3. Disconnect the reservoir washer hose (4) from the barbed nipple of the inline fitting at the engine compartment washer hose in the right headlamp and dash wire harness and allow the washer fluid to drain from the reservoir into a clean container for reuse.
4. Disconnect the right headlamp and dash wire harness connector from the washer fluid level switch connector receptacle (5).
5. Disconnect the right headlamp and dash wire harness connector from the washer pump/motor unit connector receptacle (7).
6. Remove the two screws (2) that secure the reservoir mounting brackets to the top of the radiator shroud.
7. Grasp the bottom of the washer reservoir (1) firmly with both hands and pull the unit sharply upward to disengage the locking feature on the washer reservoir from the depression in the radiator shroud.
8. Continue lifting the washer reservoir upward far enough to disengage the two mounting tabs at the bottom from the two slots (6) at the bottom of the radiator shroud.
9. Remove the washer reservoir from the right side of the engine compartment.

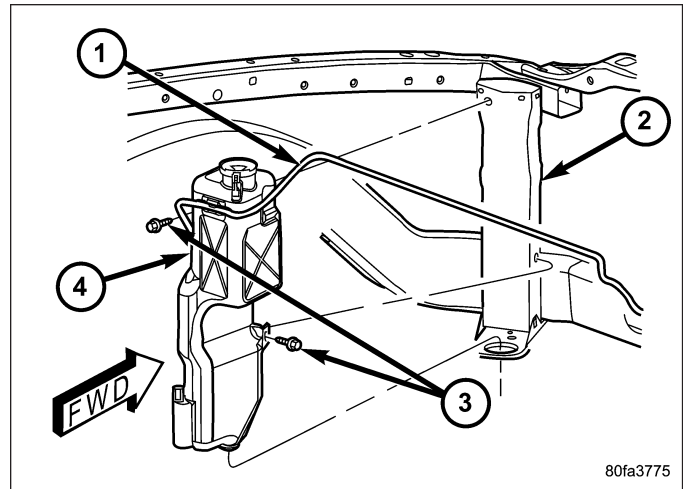


### SRT10 OR DIESEL ENGINE ONLY

1. Disconnect and isolate the battery negative cable.
2. Disengage the reservoir washer hose (4) from the integral routing clips on the top of the radiator fan shroud.
3. Disconnect the reservoir washer hose from the barbed nipple of the inline fitting at the engine compartment washer hose in the right headlamp and dash wire harness and allow the washer fluid to drain from the reservoir into a clean container for reuse.
4. Disconnect the left headlamp and dash wire harness (1) connector from the washer fluid level switch connector receptacle (5).
5. Disconnect the left headlamp and dash wire harness connector from the washer pump/motor unit connector receptacle (3).



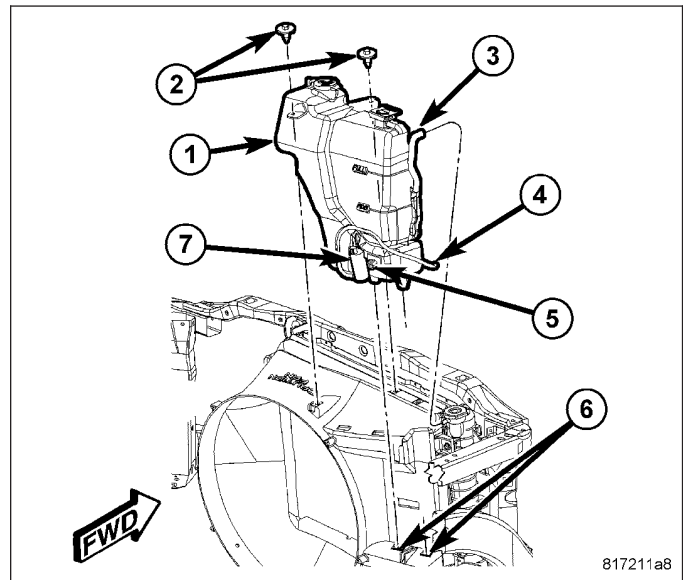
6. Remove the two screws (3) that secure the washer reservoir (4) to the left vertical member of the radiator support (2).
7. Remove the washer reservoir from the left side of the engine compartment.



## INSTALLATION

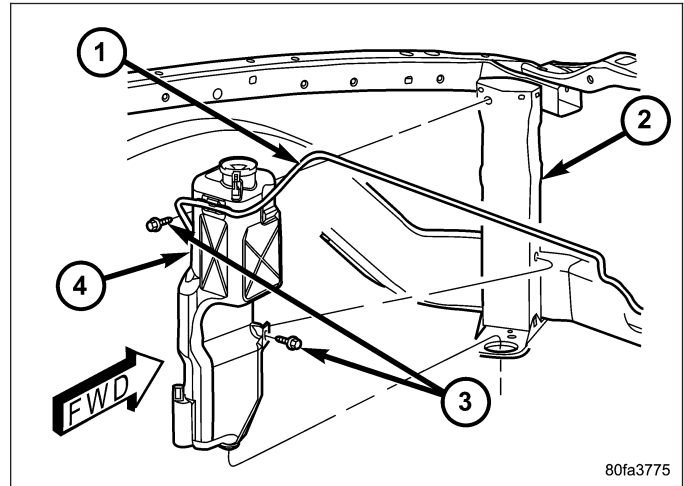
### EXCEPT SRT10 OR DIESEL ENGINE

1. Position the washer reservoir (1) into the right side of the engine compartment.
2. Align and insert the two mounting tabs at the bottom of the reservoir into the two slots (6) at the bottom of the radiator shroud.
3. Place both hands on the top of the washer reservoir and push the unit downward far enough for the locking feature on the washer reservoir to snap into the depression in the radiator shroud.
4. Install and tighten the two screws (2) that secure the mounting brackets at the top of the reservoir to the mounting provisions at the top of the radiator shroud. Tighten the screws to 7 N·m (60 in. lbs.).
5. Reconnect the right headlamp and dash wire harness connector to the washer pump/motor unit connector receptacle (7).
6. Reconnect the right headlamp and dash wire harness connector to the washer fluid level switch connector receptacle (5).
7. Reconnect the reservoir washer hose (4) to the barbed nipple of the inline fitting at the engine compartment washer hose in the right headlamp and dash wire harness.
8. Reconnect the coolant overflow hose (3) to the nipple on the radiator filler neck. (Refer to 7 - COOLING/ENGINE/COOLANT RECOVERY CONTAINER - INSTALLATION).
9. Refill the washer reservoir with the washer fluid drained from the reservoir during the removal procedure.
10. Reconnect the battery negative cable.
11. Check and adjust the coolant level in the coolant overflow bottle as necessary. (Refer to 7 - COOLING - STANDARD PROCEDURE - REFILLING COOLING SYSTEM).

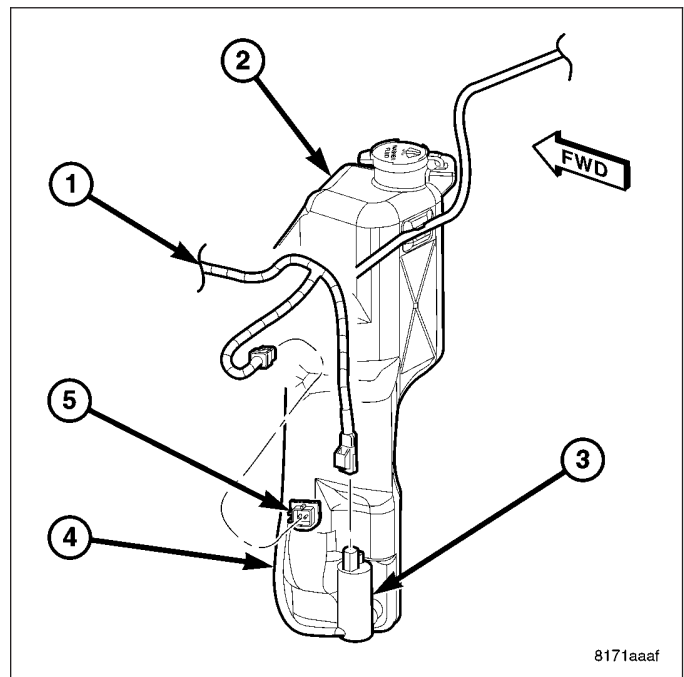


## SRT10 OR DIESEL ENGINE ONLY

1. Position the washer reservoir (4) to the left vertical member of the radiator support (2) on the left side of the engine compartment.
2. Install and tighten the two screws (3) that secure the washer reservoir to the radiator support. Tighten the screws to 10 N·m (85 in. lbs.).



3. Reconnect the left headlamp and dash wire harness (1) connector to the washer pump/motor unit connector receptacle (3).
4. Reconnect the left headlamp and dash wire harness connector to the washer fluid level switch connector receptacle (5).
5. Reconnect the reservoir washer hose (4) to the barbed nipple of the inline fitting at the engine compartment washer hose in the right headlamp and dash wire harness.
6. Engage the reservoir washer hose into the integral routing clips on the top of the radiator fan shroud.
7. Refill the washer reservoir (2) with the washer fluid drained from the reservoir during the removal procedure.
8. Reconnect the battery negative cable.

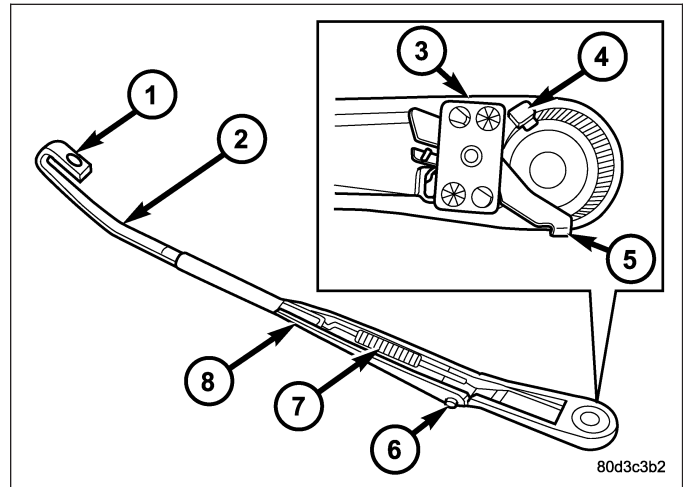


## WIPER ARM

### DESCRIPTION

The wiper arms are the rigid members located between the wiper pivots protruding from the cowl plenum cover/grille panel near the base of the windshield and the wiper blades on the windshield glass. Both wiper arms feature an over-center hinge that allows easy access to the windshield glass for cleaning.

The wiper arms each have a die cast metal pivot end (3) with a large internally serrated socket formation at one end. A key (4) within the socket formation indexes the wiper arm to a keyway in the pivot shaft to provide wiper alignment, and a spring-loaded latch (5) on the underside of the pivot end locks the unit to the pivot shaft when it is fully installed.



The wide end of a tapered, stamped steel channel (8) hinges on and is secured with a hinge pin (6) to the blade end of both the right and left wiper arm pivot ends. One end of a long, rigid, stamped steel strap (2), with a small hole near its pivot end, is riveted and crimped within the narrow end of the stamped steel channel. The tip of the wiper blade end of this strap is bent back under itself to form a small hook (1). Concealed within the stamped steel channel, one end of a long spring (7) is engaged with a wire hook on the underside of the die cast pivot end, while the other end of the spring is hooked through the small hole in the steel strap. The entire wiper arm has a satin black finish applied to all of its visible surfaces.

The right and left wiper arms are unique and are not interchangeable. A wiper arm cannot be adjusted or repaired. If damaged or faulty, the entire wiper arm unit must be replaced.

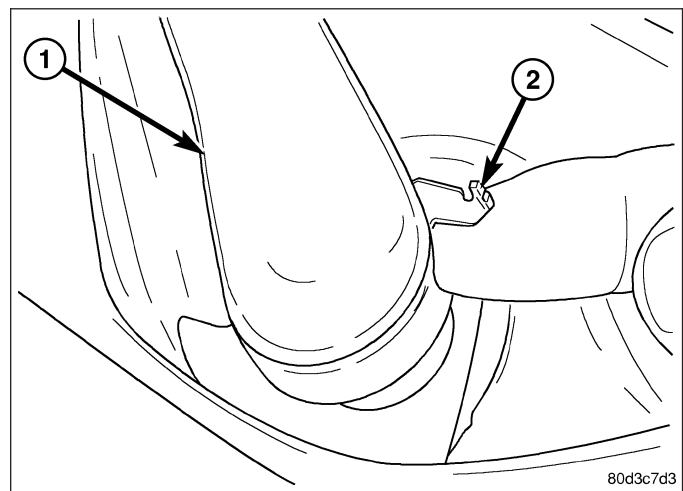
### OPERATION

The wiper arms are designed to mechanically transmit the motion from the wiper pivots to the wiper blades. The wiper arm must be properly indexed to the wiper pivot in order to maintain the proper wiper blade travel on the glass. The serrated and keyed socket formation in the wiper arm pivot end interlocks with the serrations and keyway on the outer circumference of the wiper pivot shaft, providing positive engagement and alignment of this connection. The latch positively locks the wiper arm to the wiper pivot shaft when the arm is fully installed.

The spring-loaded wiper arm hinge controls the down-force applied through the tip of the wiper arm to the wiper blade on the glass. The hook formation on the tip of the wiper arm provides a cradle for securing and latching the wiper blade pivot block to the wiper arm.

### REMOVAL

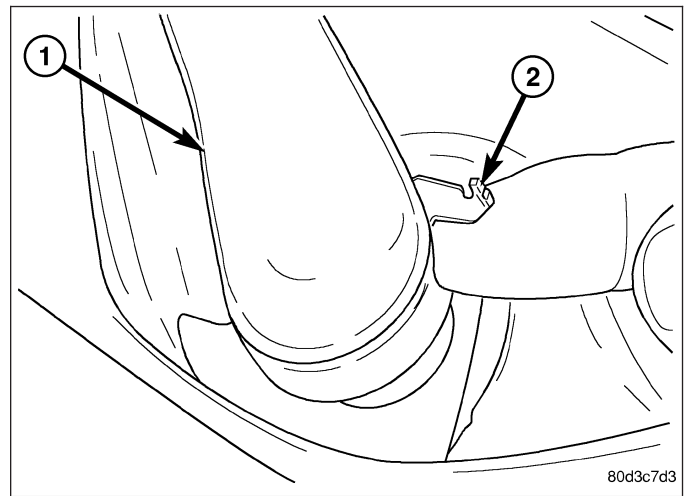
1. Lift the wiper arm to its over-center position to hold the wiper blade off of the glass and relieve the spring tension on the wiper arm to wiper pivot shaft connection.
2. Pull the latch (2) on the pivot end (1) of the wiper arm outward.
3. Using a slight rocking action, disengage and remove the wiper arm pivot end from the wiper pivot shaft.



## INSTALLATION

**NOTE:** The right and left wiper arms are not interchangeable. The right wiper arm is slightly longer than the left. Be certain that each wiper arm is installed on the proper wiper pivot.

1. Place the wiper arm hinge in its over-center position prior to attempting installation.
2. The wiper arms are indexed to the wiper pivot shafts with integral keys in the wiper arm pivot ends (1) and keyways in the wiper pivot shafts. Align the key of the wiper arm to the keyway on the wiper pivot shaft.
3. Once the wiper blade is aligned, push the pivot end of the wiper arm down firmly and evenly over the wiper pivot shaft until it is fully engaged. When the wiper arm is fully engaged on the wiper pivot, the spring-loaded latch (2) will snap back into place against the wiper arm pivot end.
4. Gently lower the wiper arm until the wiper blade is in position on the windshield glass.

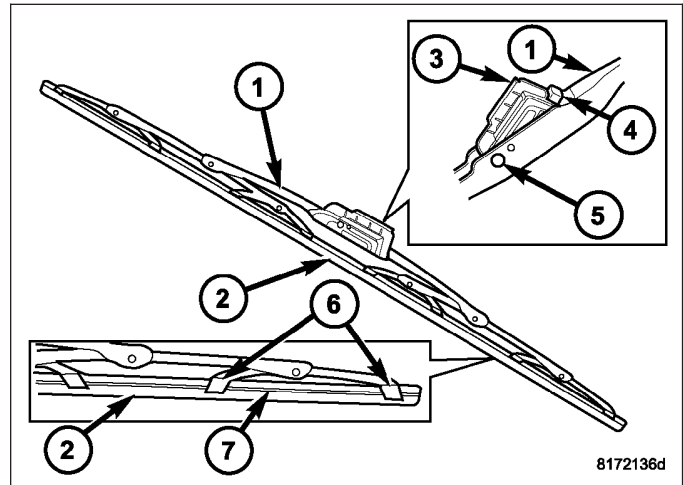


## WIPER BLADE

### DESCRIPTION

Each wiper blade is secured by an integral latching pivot block (3) to the hook formation on the tip of each wiper arm, and rests on the glass near the base of the windshield when the wipers are not in operation. The wiper blade consists of the following components:

- **Superstructure (1)** - The superstructure includes several stamped steel bridges and links with claw formations that grip the wiper blade element. Also included in this unit is the latching, molded plastic pivot block that secures the superstructure to the wiper arm. All of the metal components of the wiper blade have a satin black finish applied.
- **Element (2)** - The wiper element or squeegee is the resilient rubber member of the wiper blade that contacts the glass.
- **Flexor (7)** - The flexor is a rigid metal component running along the length of each side of the wiper element where it is gripped by the claws (6) of the superstructure.



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The right and left wiper blades are 60.00 centimeters (23.62 inches) long, and are interchangeable. They have non-replaceable rubber elements (squeegees). The wiper blades cannot be adjusted or repaired. If faulty, worn, or damaged the entire wiper blade unit must be replaced.

### OPERATION

The wiper blades are moved back and forth across the glass by the wiper arms when the wipers are being operated. The wiper blade superstructure is the flexible frame that grips the wiper blade element and evenly distributes the force of the spring-loaded wiper arm along the length of the element. The combination of the wiper arm force and the flexibility of the superstructure makes the element conform to and maintain proper contact with the glass, even as the blade is moved over the varied curvature that may be encountered across the glass surface.

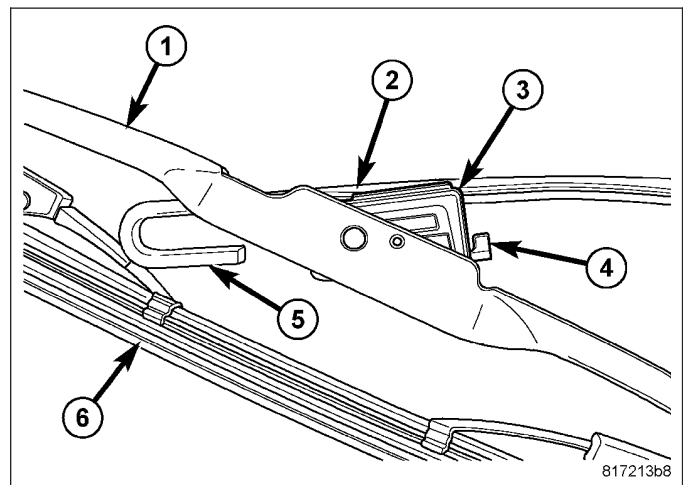
The wiper element flexor provides the claws of the blade superstructure with a rigid, yet flexible component on the element which can be gripped. The rubber element is designed to be stiff enough to maintain an even cleaning edge as it is drawn across the glass, yet resilient enough to conform to the glass surface and flip from one cleaning edge to the other each time the wiper blade changes directions.

### REMOVAL

**CAUTION:** Do not allow the wiper arm to spring back against the glass without the wiper blade in place or the glass may be damaged.

**NOTE:** The notched end of the wiper element flexor should always be oriented towards the end of the wiper blade that is nearest to the wiper pivot.

1. Lift the wiper arm (2) to raise the wiper blade and element (6) off of the glass, until the wiper arm hinge is in its over-center position.
2. To remove the blade from the arm, depress the latch release tab (4) on the pivot block (3) under the tip of the arm downward (toward the wiper element and away from the wiper arm) and slide the blade away from the tip towards the pivot end of the arm far enough to disengage the pivot block from the hook formation (5) on the end of the arm.



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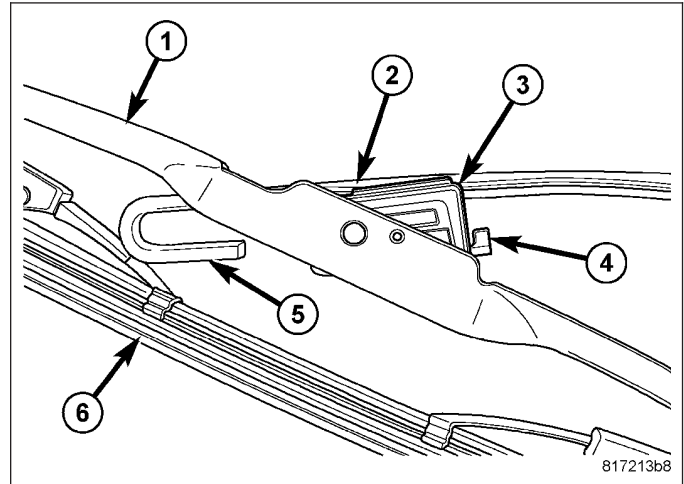
3. Extract the hook formation on the tip of the wiper arm through the opening in the wiper blade superstructure (1) just ahead of the pivot block.
4. Gently lower the tip of the wiper arm onto the glass.

## INSTALLATION

**CAUTION:** Do not allow the wiper arm to spring back against the glass without the wiper blade in place or the glass may be damaged.

**NOTE:** The notched end of the wiper element flexor should always be oriented towards the end of the wiper blade that is nearest to the wiper pivot.

1. Lift the wiper arm (2) off of the windshield glass, until the wiper arm hinge is in its over-center position.
2. Position the wiper blade near the hook formation (5) on the tip of the arm with the notched end of the wiper element flexor oriented towards the end of the wiper arm that is nearest to the wiper pivot.
3. Insert the hook formation on the tip of the arm through the opening in the blade superstructure (1) ahead of the pivot block (3) far enough to engage the pivot block into the hook.
4. Slide the pivot block up into the hook formation on the tip of the wiper arm until the latch release tab (4) snaps into its locked position. Latch engagement will be accompanied by an audible click.
5. Gently lower the wiper blade and element (6) onto the glass.

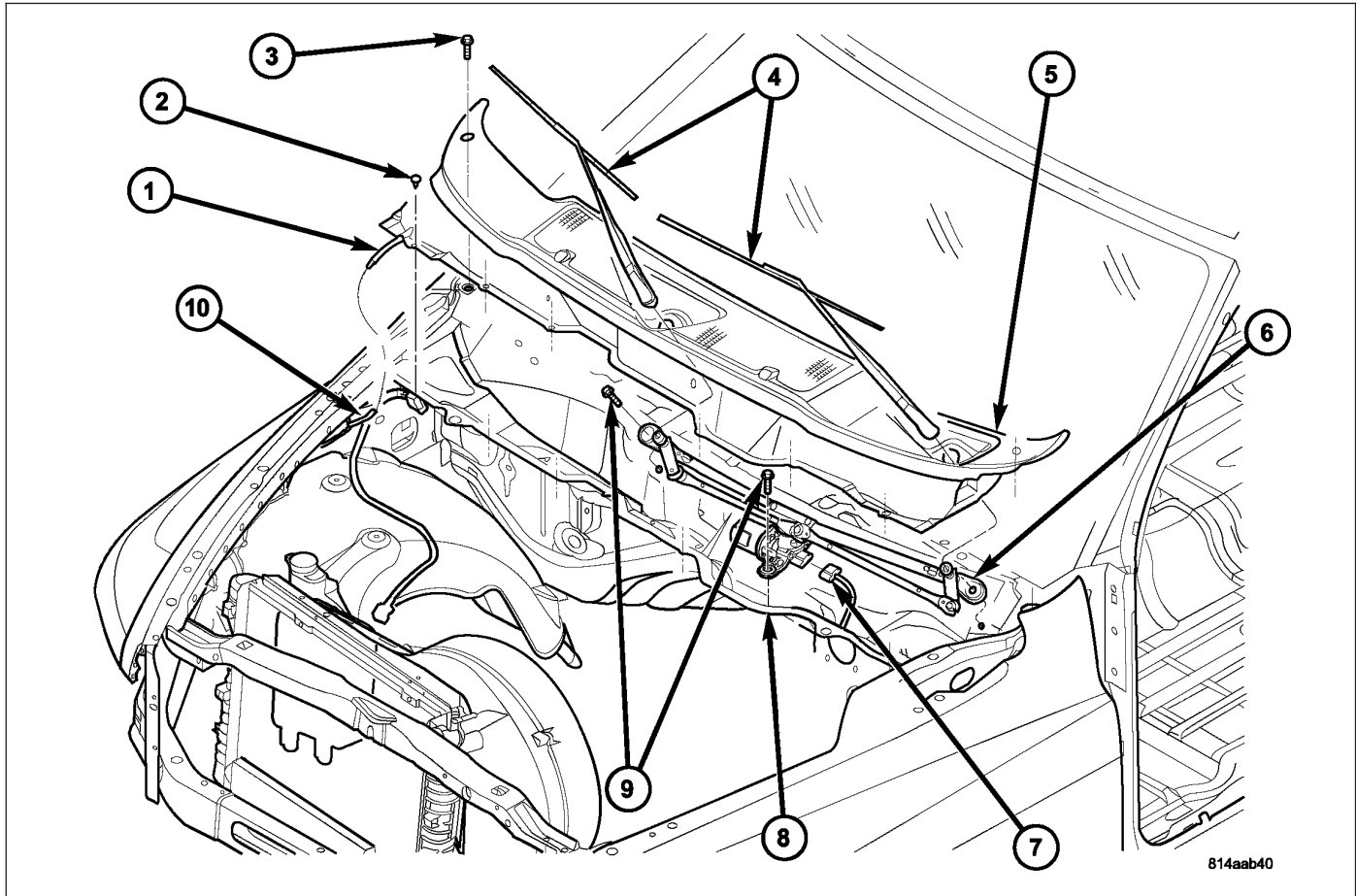


The wiper module operation is controlled by the battery current inputs received by the wiper motor through the wiper on/off and wiper high/low relays. The wiper motor speed is controlled by current flow to either the low speed or the high speed set of brushes. The park switch is a single pole, single throw, momentary switch within the wiper motor that is mechanically actuated by the wiper motor transmission components. The park switch alternately opens and closes the wiper park switch sense circuit to ground, depending upon the position of the wipers on the glass. This feature allows the motor to complete its current wipe cycle after the wiper system has been turned Off, and to park

the wiper blades in the lowest portion of the wipe pattern. The automatic resetting circuit breaker protects the motor from overloads.

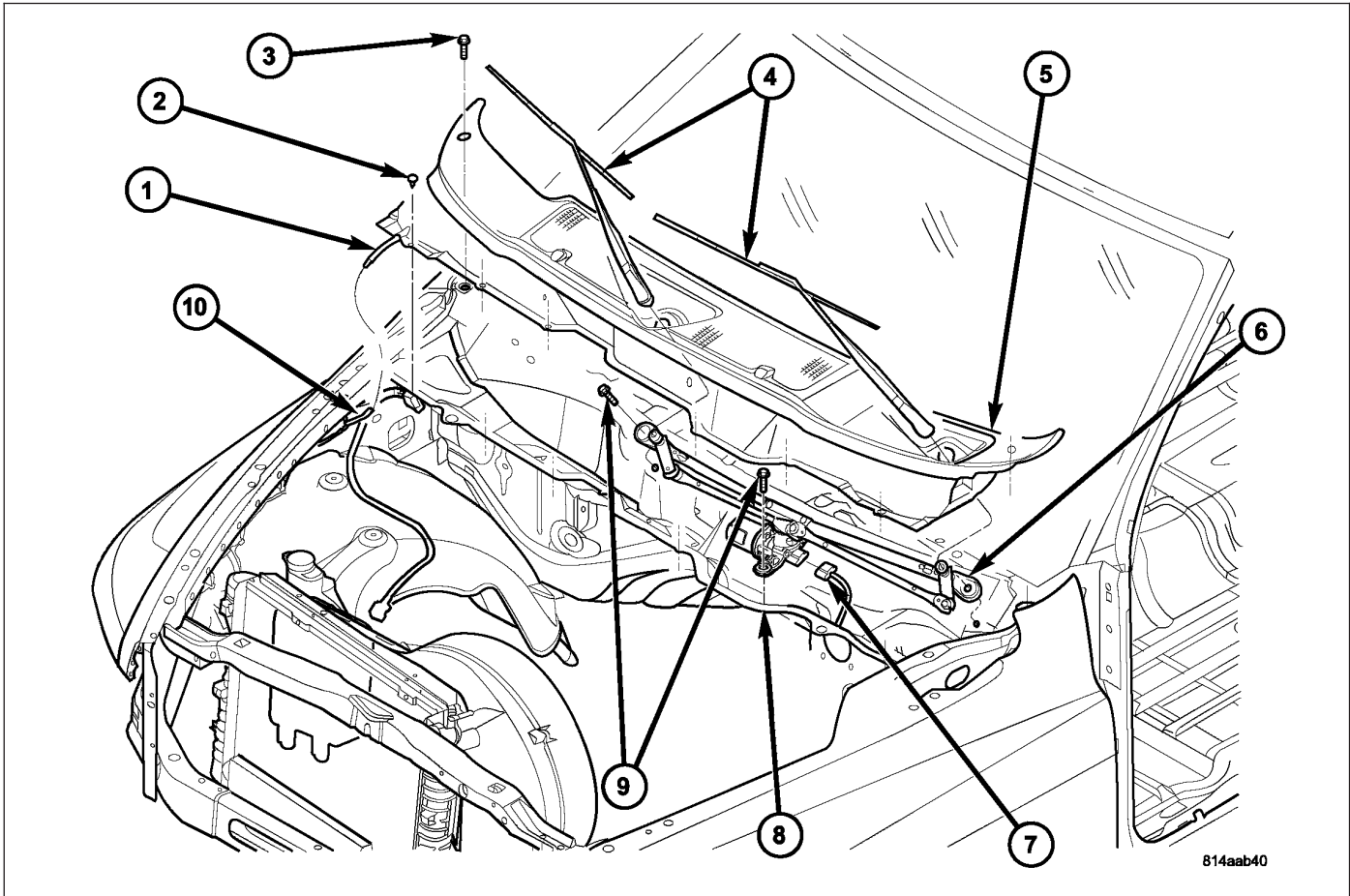
The wiper motor crank arm, the two wiper linkage members, and the two driven wiper pivots mechanically convert the rotary output of the wiper motor to the back and forth wiping motion of the wiper arms and blades on the glass.

## REMOVAL



1. Remove both wiper arms (4) from the wiper pivots. (Refer to 8 - ELECTRICAL/WIPERS/WASHERS/WIPER ARM - REMOVAL).
2. Unlatch and open the hood.
3. Disconnect and isolate the battery negative cable.
4. Remove the cowl plenum cover/grille panel (5) from over the cowl plenum (8). (Refer to 23 - BODY/EXTERIOR/COWL GRILLE - REMOVAL).
5. Disconnect the left headlamp and dash wire harness connector (7) from the wiper motor pigtail wire connector.
6. Remove the two screws (9) that secure the wiper module (6) to the top of the cowl plenum panel at the pivot brackets.
7. Remove the screw that secures the wiper module to the bottom of the cowl plenum panel.
8. Remove the wiper module from the cowl plenum panel as a unit.

## INSTALLATION



1. Position the wiper module (6) into the cowl plenum (8) as a unit.
2. Install the two screws (9) that secure the wiper module to the top of the cowl plenum panel at the pivot brackets. Tighten the screw on the driver side, followed by the screw on the passenger side. Tighten the screws to 8 N·m (75 in. lbs.).
3. Install and tighten the screw that secures the wiper module to the bottom of the cowl plenum panel. Tighten the screw to 8 N·m (75 in. lbs.).
4. Reconnect the left headlamp and dash wire harness connector (7) to the wiper motor pigtail wire connector.
5. Reinstall the cowl plenum cover/grille panel (5) over the cowl plenum. (Refer to 23 - BODY/EXTERIOR/COWL GRILLE - INSTALLATION).
6. Reconnect the battery negative cable.
7. Close and latch the hood.
8. Reinstall both wiper arms (4) onto the wiper pivots. (Refer to 8 - ELECTRICAL/WIPERS/WASHERS/WIPER ARMS - INSTALLATION).