

2002 ACCESSORIES & EQUIPMENT

Wiper & Washer System - RAV4

BODY ELECTRICAL SYSTEM

PRECAUTION

NOTE: Take care to observe the following precautions when performing inspections or removal and replacement of body electrical related parts.

1. Headlight System

Halogen bulbs have pressurized gas inside and require special handling. They can burst if scratched or dropped. Hold a bulb only by its plastic or metal case.

Don't touch the glass part of a bulb with bare hands.

2. SRS (Supplemental Restraint System)

The RAV4 is equipped with an SRS (Supplemental Restraint System) such as the driver airbag and front passenger airbag, failure to carry out service operation in the correct sequence could cause the SRS to unexpectedly deploy during servicing, possibly leading to a serious accident. Before servicing (including removal or installation of parts, inspection or replacement), be sure to read the precautionary notices in **AIR BAG SAFETY PRECAUTIONS**.

3. Audio System

If the negative (-) terminal cable is disconnected from the battery, the preset AM, FM1 and FM2 stations stored in memory are erased, so be sure to note the stations and reset them after the battery terminal is reconnected.

4. Mobile Communication System

If the vehicle is equipped with a mobile communication system, refer to precautions in **IF VEHICLE IS EQUIPPED WITH MOBILE COMMUNICATION SYSTEM**.

TROUBLESHOOTING

PROBLEM SYMPTOMS

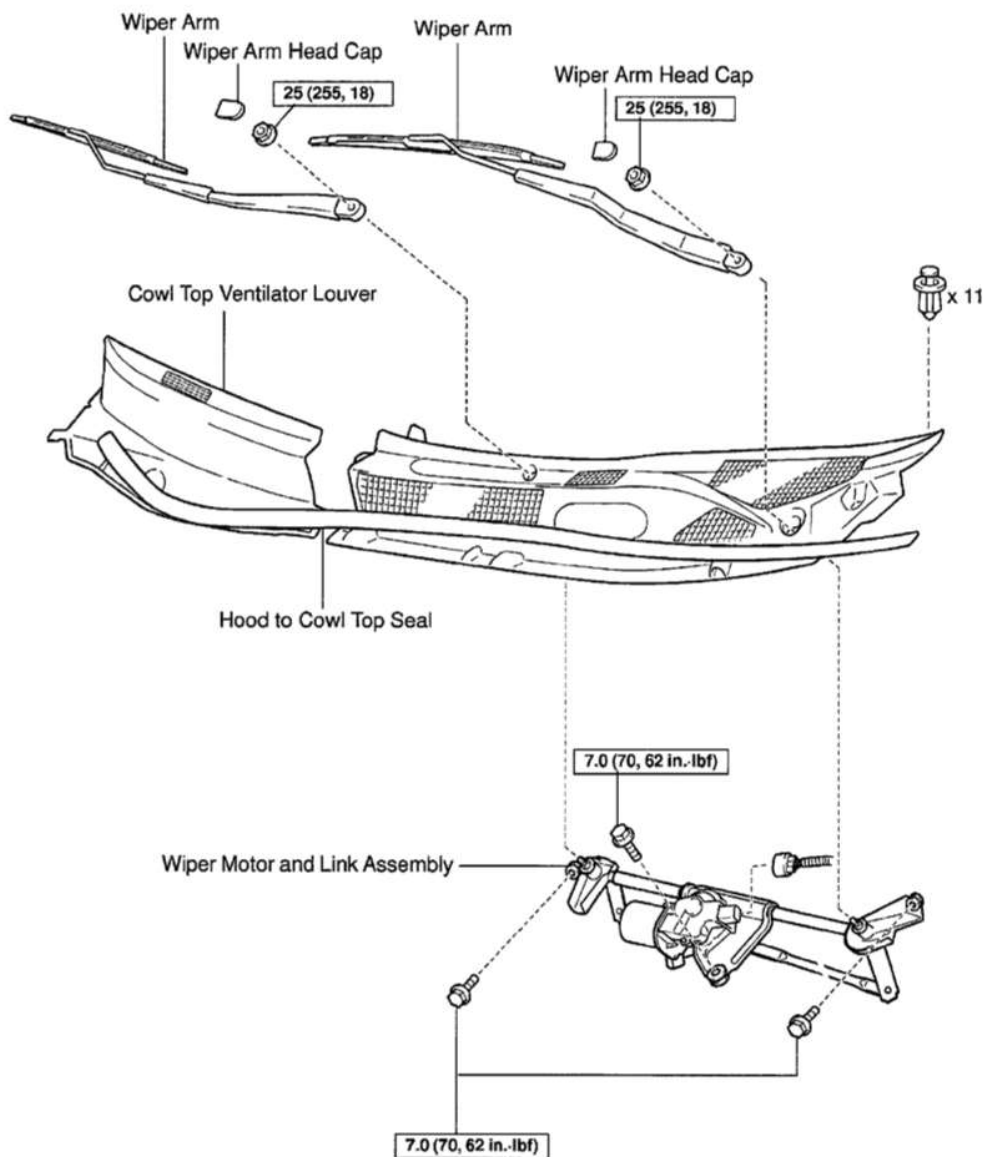
WIPER AND WASHER SYSTEM

Symptom/Suspect Area	See
Wiper & Washer Do Not Operate	
WIP Fuse	FUSES & CIRCUIT BREAKERS

Ignition Switch	<u>INSPECTION</u>
Wiper & Washer Switch	1 & 4 Under INSPECTION.
Wire Harness	
Front Wiper Does Not Operate	
WIP Fuse	<u>FUSES & CIRCUIT BREAKERS</u>
Ignition Switch	<u>INSPECTION</u>
Wiper & Washer Switch	1 & 4 Under INSPECTION.
Wire Harness	
Front Washer Does Not Operate	
WIP Fuse	<u>FUSES & CIRCUIT BREAKERS</u>
Front Wiper And Washer Switch	1
Front Washer Motor	Step 10 Under INSPECTION
Wire Harness	
Rear Wiper Does Not Operate	
RR WIP Fuse	<u>FUSES & CIRCUIT BREAKERS</u>
Rear Wiper And Washer Switch	Step 4 Under INSPECTION
Rear Wiper Motor	Step 10 Under INSPECTION
Wire Harness	
Rear Washer Does Not Operate	
RR WIP Fuse	<u>FUSES & CIRCUIT BREAKERS</u>
Rear Wiper And Washer Switch	Step 4 Under INSPECTION
Rear Washer Motor	Step 10 Under INSPECTION
Wire Harness	

FRONT WIPER AND WASHER

COMPONENTS



N·m (kgf·cm, ft·lbf) : Specified torque

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Fig. 1: Identifying Front Wiper & Washer Components
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. Remove wiper arm head caps and front wiper arms .

2. **Remove cowl top ventilator louver and hood to cowl top seal .**
3. **Remove front wiper motor and link assembly .**
 - a. Disconnect the connector, then unfasten the 3 bolts.
 - b. Remove the wiper motor and link assembly.

INSPECTION

Inspect Front Washer Nozzle

- a. While operating the washer, check that the distance between the point where the washer fluid from the nozzles hits the windshield and the upsurge area is within the range indicated by the hatched line.

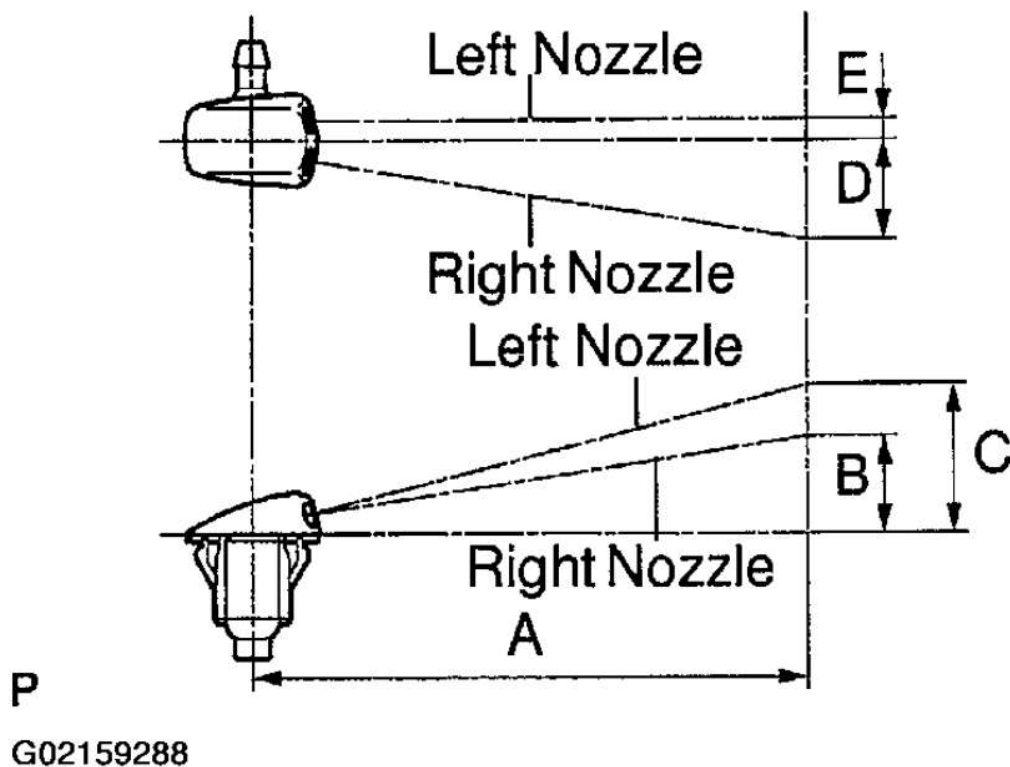


Fig. 2: Ensuring That Upsurge Area Is Within Range
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

A: Approx. 400 mm (15.75 in.)

B: Approx. 65.1 mm (2.56 in.)

C: Approx. 101.5 mm (3.99 in.)

D: Approx. 68.2 mm (2.69 in.)

E: Approx. 4.5 mm (0.18 in.)

- b. Check if the lower point where the washer fluid hits the windshield is within the range of the wiping pattern (the area of the glass which is wiped by the wiper blades).

ADJUSTMENT

Adjust Front Washer Nozzle

Using a tool like the one shown in **Fig. 3** , change the direction of the nozzle hole to adjust the point where washer fluid hits the windshield.

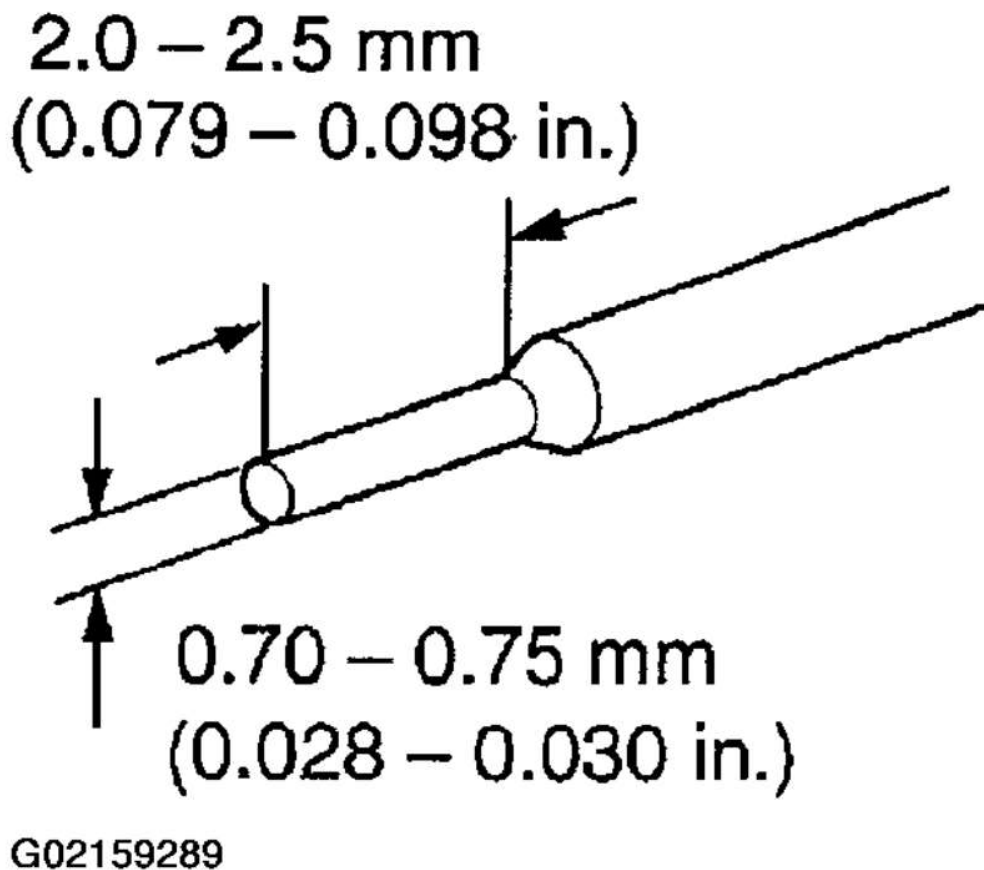
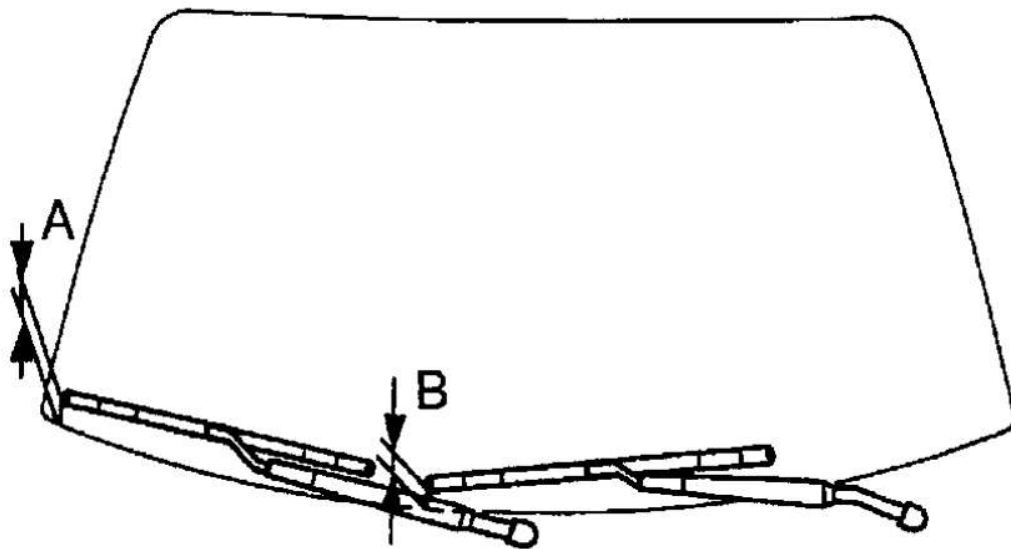


Fig. 3: Front Washer Nozzle Adjustment Tool
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

1. **Install wiper motor and link assembly .**
 - a. Install the wiper motor and link assembly, then torque the 3 bolts.
Torque: 7.0 N.m (70 kgf.cm, 62 in..lbf)
 - b. Connect the connector.
2. **Install cowl top ventilator louver and hood to cowl top seal .**
3. **Install wiper arms .**
 - a. Operate the wipers once and turn the wiper switch OFF.

- b. Install the wiper arms and torque the 2 nuts by hand.
- c. Adjust the installation positions of the wiper arms to the positions as shown in the illustration.



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Fig. 4: Adjusting Wiper Arm Installation Positions
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

A: Approx. 25 mm (0.98 in.)

B: Approx. 30 mm (1.18 in.)

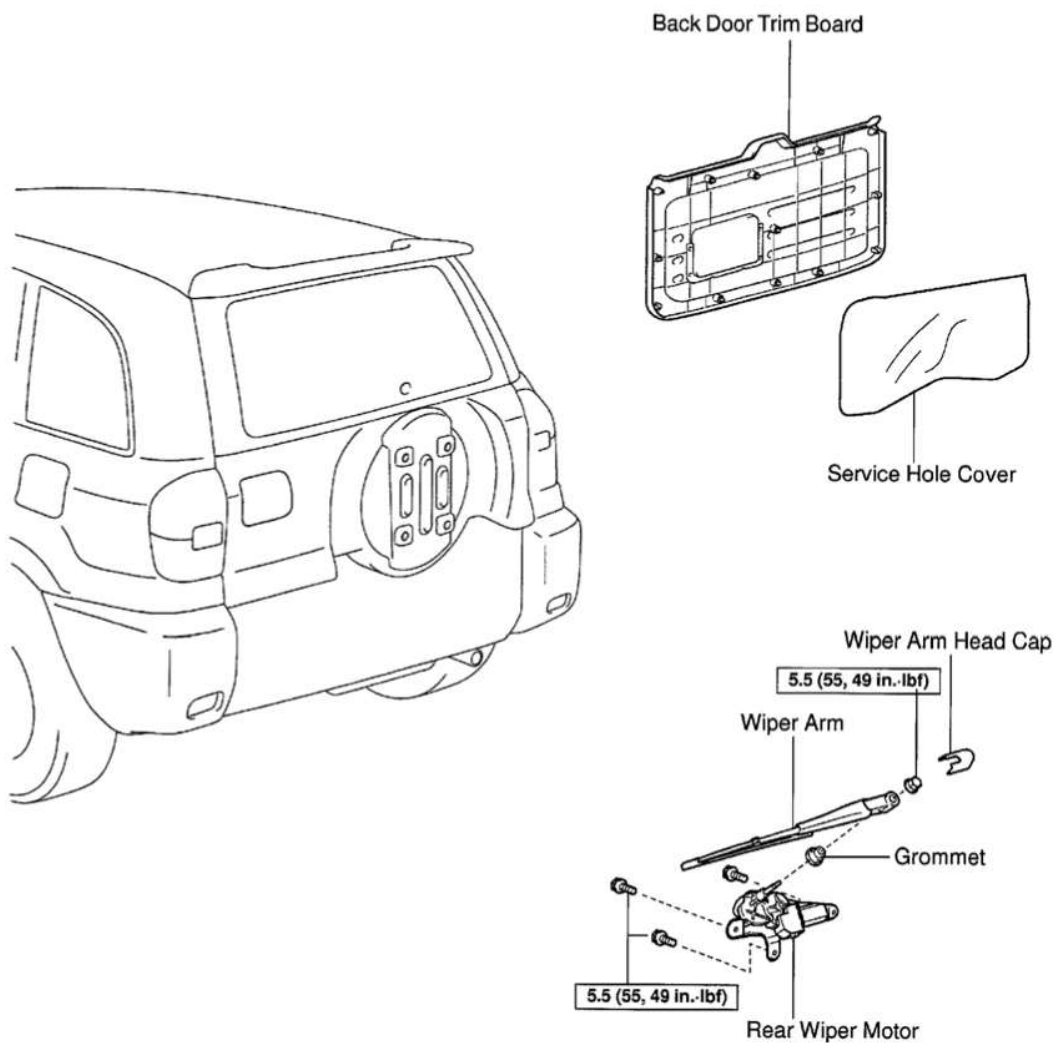
- d. Torque the 2 nuts.

Torque: 25 N.m (255 kgf.cm, 18 ft..lbf)

- e. Install the wiper arm head caps.

REAR WIPER AND WASHER

COMPONENTS



N·m (kgf·cm, ft·lbf) : Specified torque

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Fig. 5: Displaying Rear Wiper & Washer Components
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. Remove rear wiper arm .

Remove the wiper arm head cap, nut and rear wiper arm.

2. Remove back door trim board .

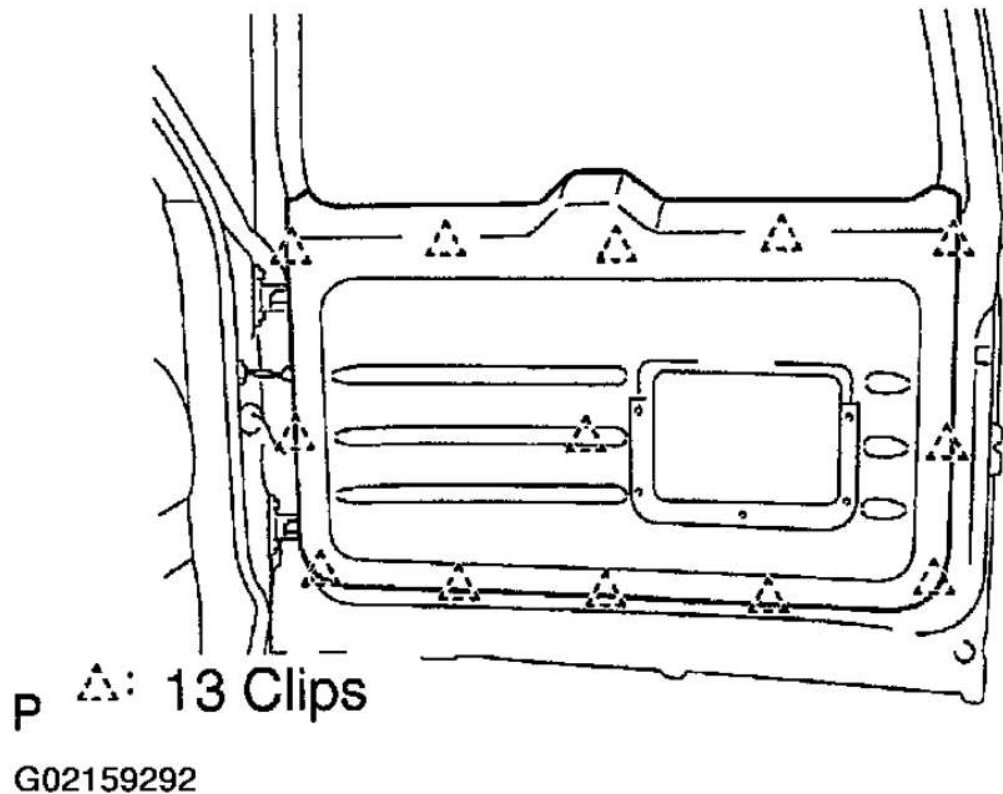


Fig. 6: Displaying Back Door Trim Board

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Using a screwdriver, remove the back door trim board.

NOTE: **Tape the screwdriver tip before use**

3. **Remove service hole cover .**
4. **Remove rear wiper motor .**
 - a. Remove the grommet.
 - b. Disconnect the connector, then unfasten the 3 bolts.
 - c. Remove the rear wiper motor.

INSPECTION

Inspect Rear Washer Nozzle

- a. While operating the washer, check that the point where the washer fluid hits the back door glass and the upsurge area are within the range indicated by the circle.

A: Approx. 400 mm (15.75 in.)

B: Approx. 133 mm (5.24 in.)

C: Approx. 0 mm (0 in.)

- b. Check if the lower point where the washer fluid hits the windshield is within the range of the wiping pattern (the area of the glass which is wiped by the wiper blades).

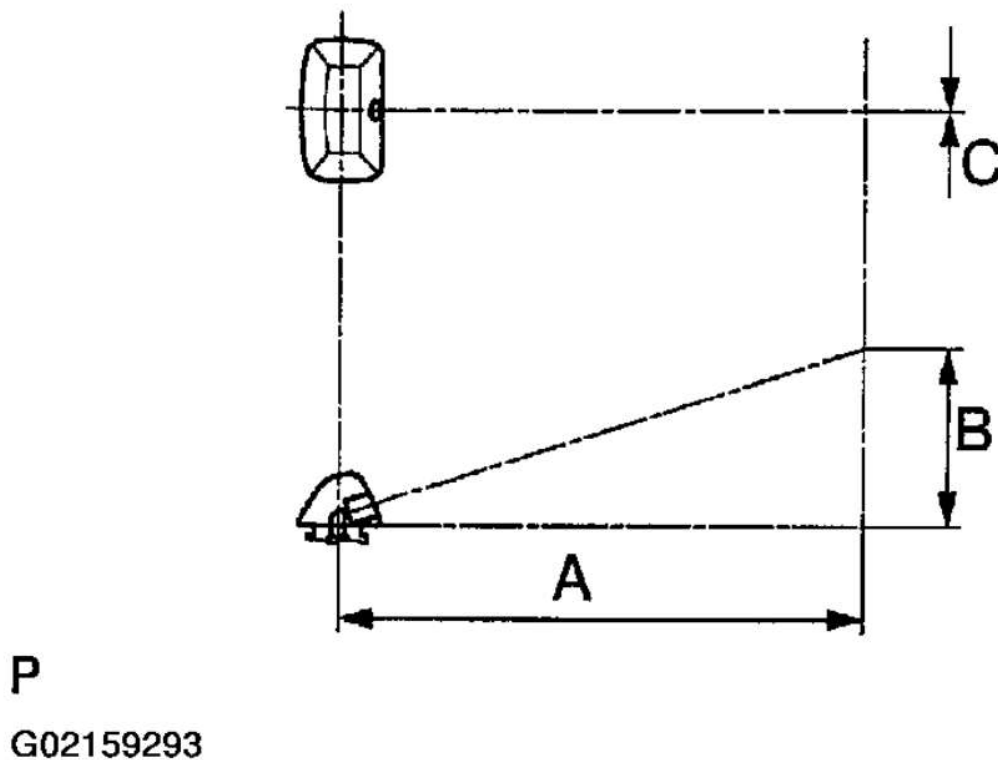


Fig. 7: Displaying Back Door Washer Fluid Range
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

1. Install rear wiper motor .

- a. Install the rear wiper motor.
- b. Torque the 3 bolts.

Torque: 5.5 N.m (55 kgf.cm, 49 in..lbf)

- c. Install the grommet.
- d. Connect the connector.
2. **Install service hole cover .**
3. **Install back door trim board .**

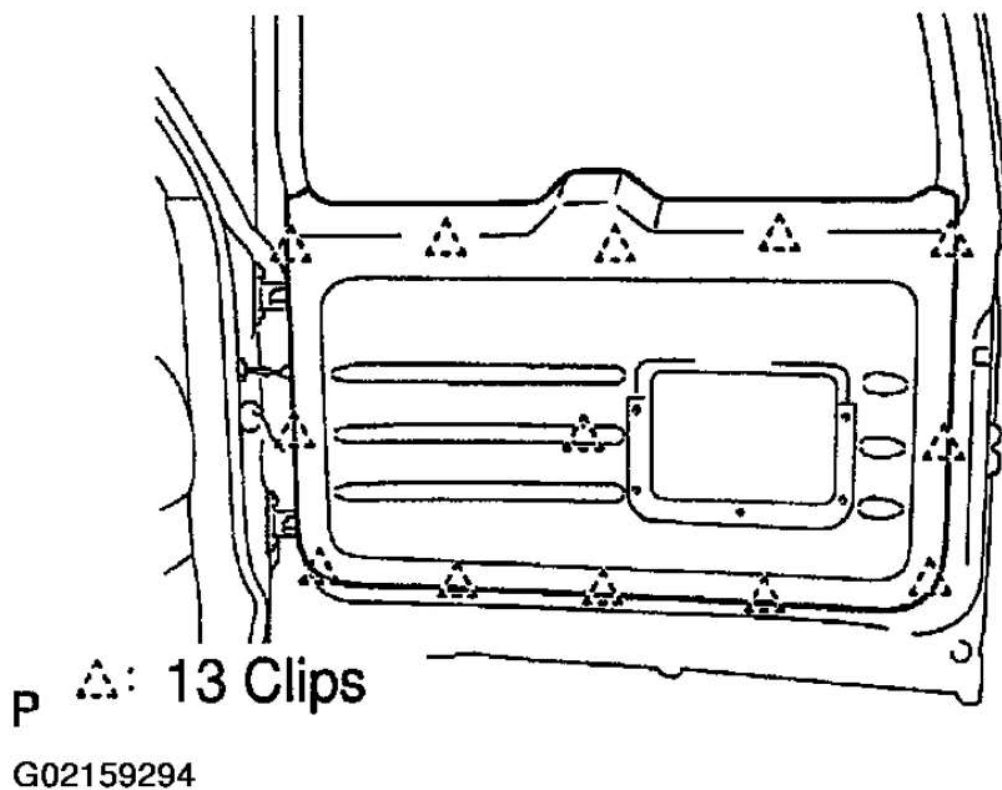


Fig. 8: Displaying Back Door Trim Board
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. **Install rear wiper arm .**

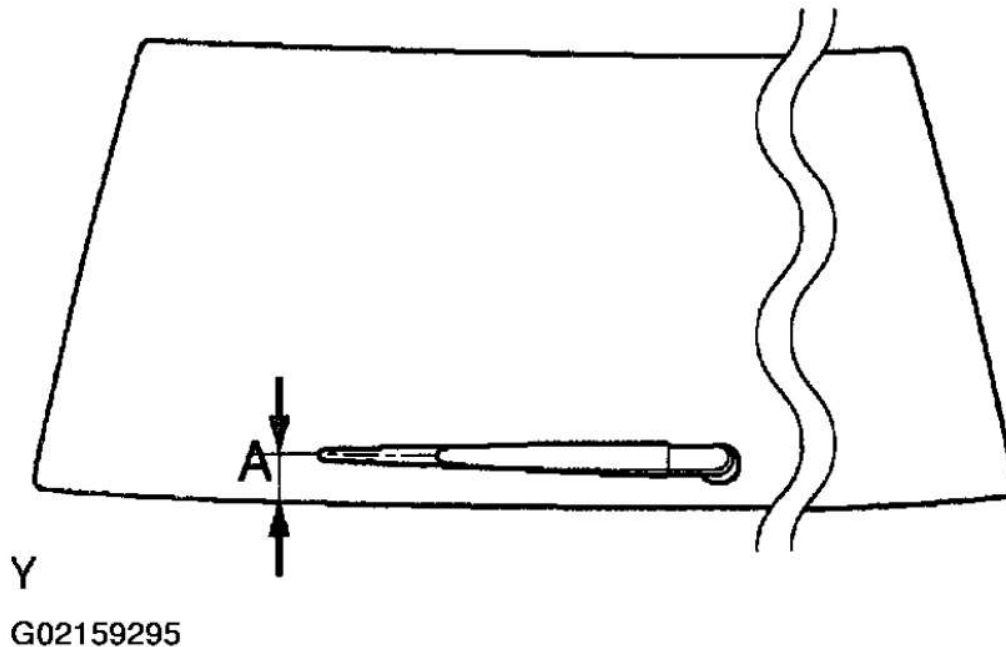


Fig. 9: Installing Rear Wiper Arm

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- Install the wiper arm.
- Operate the wiper once and turn the wiper switch OFF.
- Install the nut.

Torque: 5.5 N.m (55 kgf.cm, 49 in..lbf)

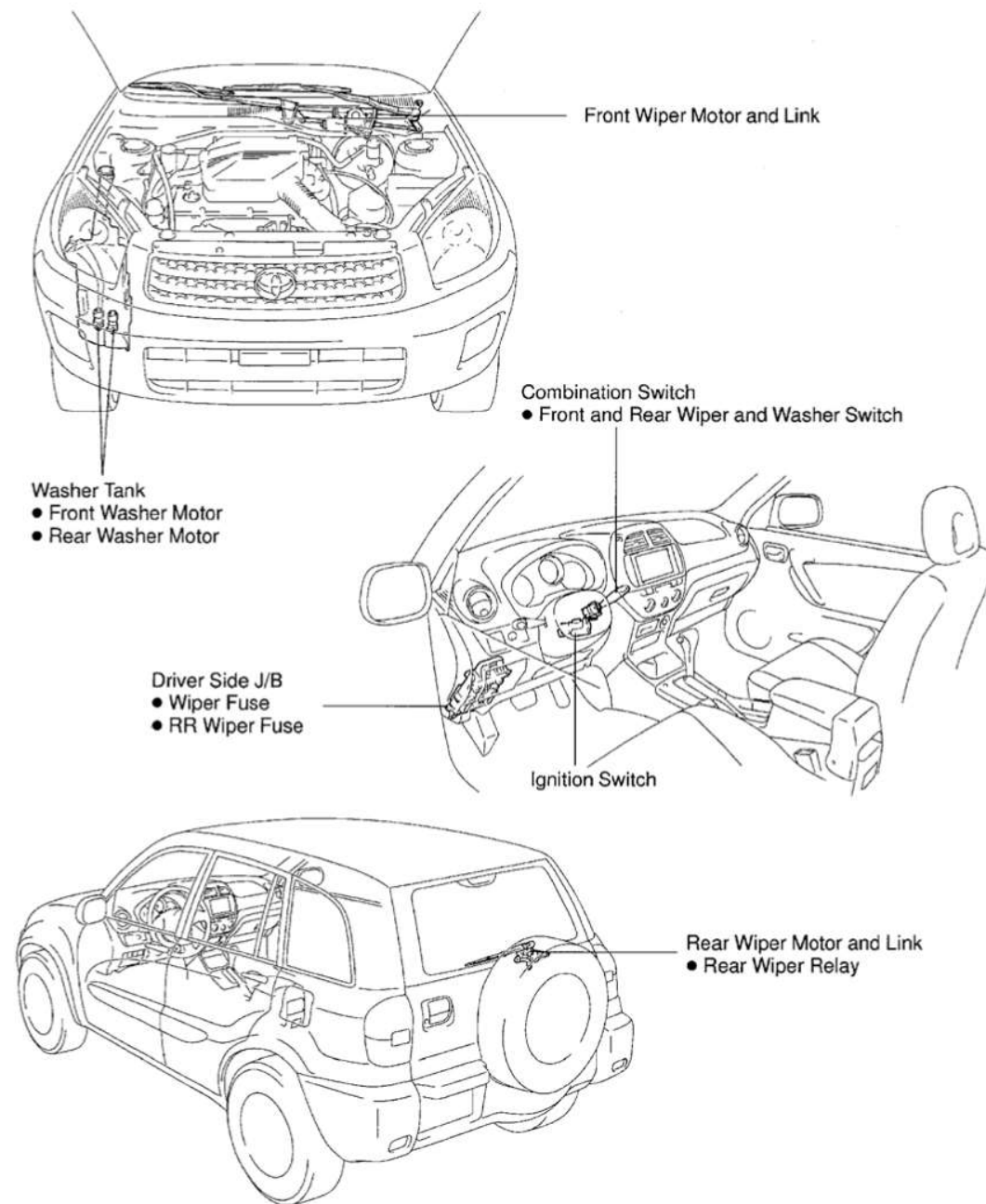
- Adjust the installation position of the wiper arm to the position as shown in the illustration.

A: Approx. 6.2 mm (0.244 in.)

- Install the wiper arm head cap.

WIPER AND WASHER SYSTEM

LOCATION

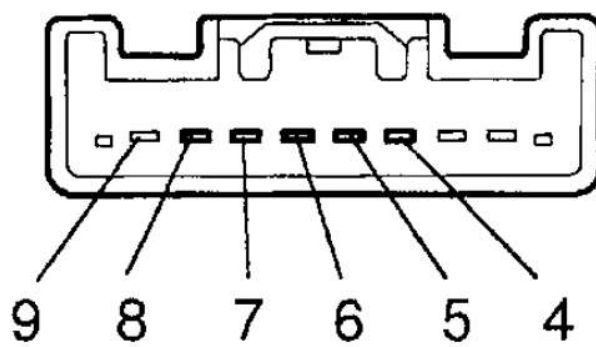
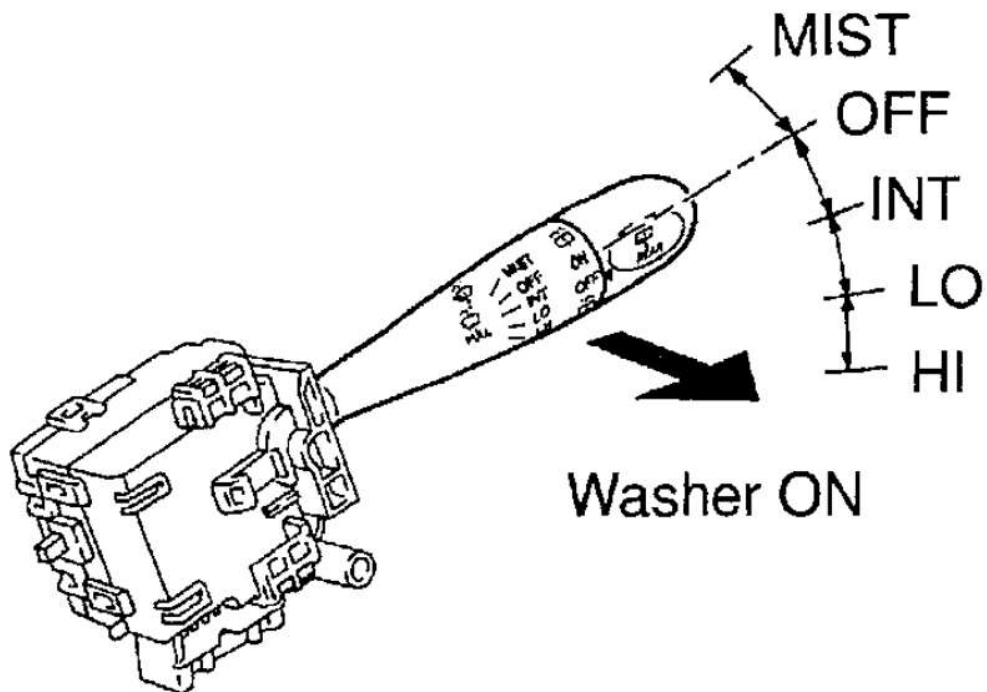


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Fig. 10: Displaying Wiper & Washer System Component Locations
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION

1. Inspect front wiper and washer switch continuity .



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Fig. 11: Displaying Front Wiper & Washer Switch & Terminals
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Switch position	Tester connection	Specified condition
MIST	7 – 8	Continuity
OFF	6 – 7	Continuity
INT	6 – 7	Continuity
LO	7 – 8	Continuity
HI	8 – 9	Continuity
Washer ON	4 – 5	Continuity

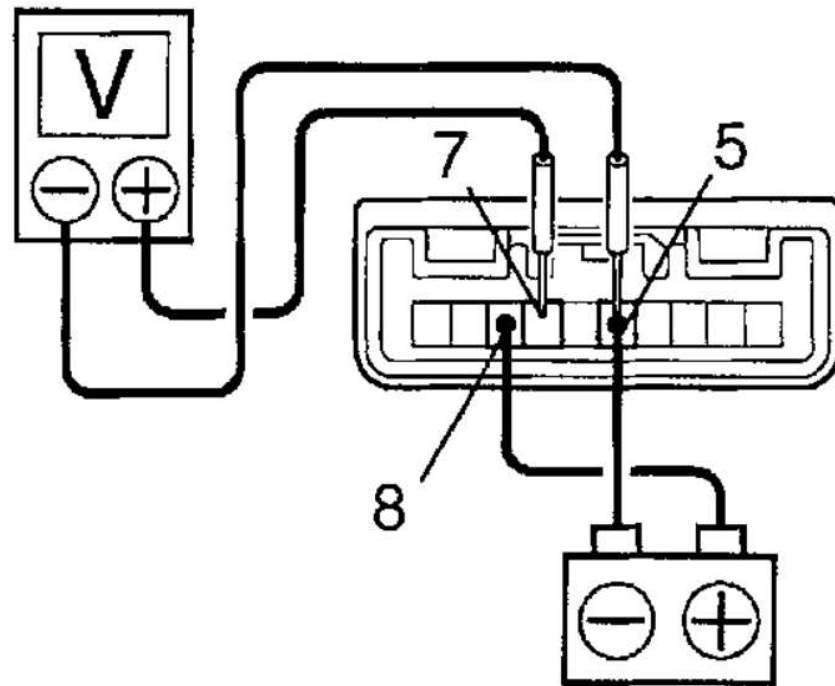
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Fig. 12: Inspecting Wiper & Washer Switch Continuity
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If continuity is not as specified, replace the switch.

2. Inspect front wiper intermittent operation .

- a. Turn the wiper switch to INT position.
- b. Turn the intermittent time control switch to FAST position.
- c. Connect the positive (+) lead from the battery to terminal 8 and the negative (-) lead to terminal 5.
- d. Connect the positive (+) lead from the voltmeter to terminal 7 and the negative (-) lead to terminal 5, check that the meter needle indicates battery voltage.

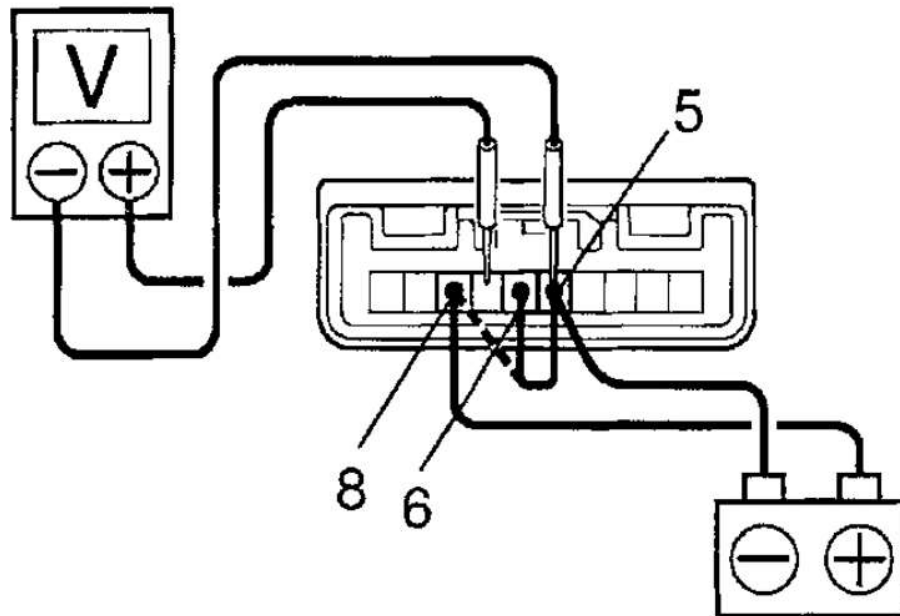


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Fig. 13: Checking Battery Voltage (Terminals 5, 7 & 8)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. After connecting terminal 6 to terminal 8, connect to terminal 8 to terminal 5, check the voltage rises from 0 volts to battery voltage with in the times, as shown in the chart.



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Fig. 14: Checking Battery Voltage (Terminals 5, 6 & 8)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INT time control switch position	Voltage
FAST	Approx. 1 ± 3 sec.
SLOW	Approx. 10 ± 15 sec.

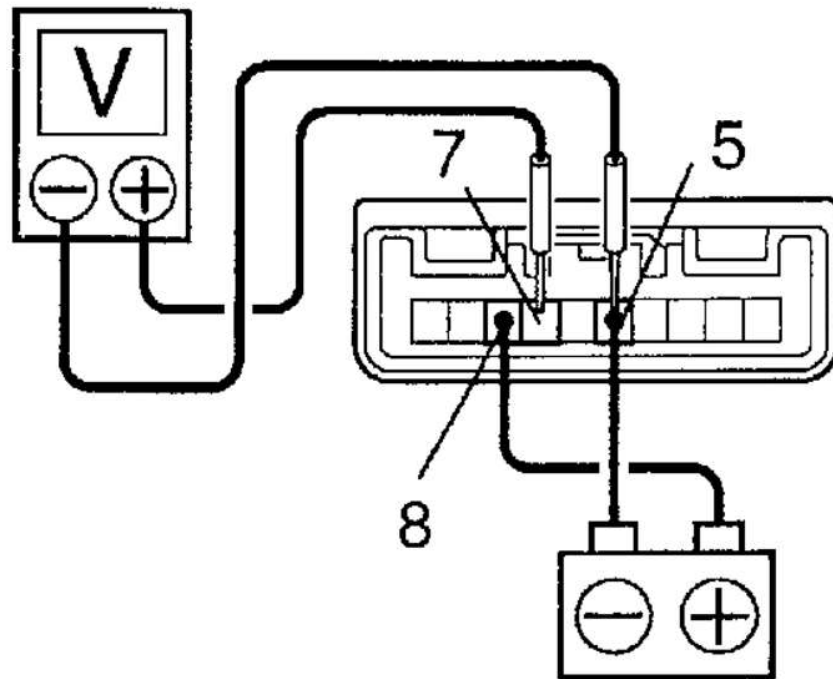
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Fig. 15: Displaying Specified Times For Voltage Rising
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If operation is not as specified, replace the wiper and washer switch.

3. Inspect front washer linked operation .

- Connect the positive (+) lead from the battery to terminal 8 and the negative (-) lead to terminal 5.
- Connect the positive (+) lead from the voltmeter to terminal 7 and the negative (-) lead to terminal 5.
- Push in the washer switch, and check that the voltage changes, as shown in the chart.



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Fig. 16: Inspecting Front Washer Linked Operation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

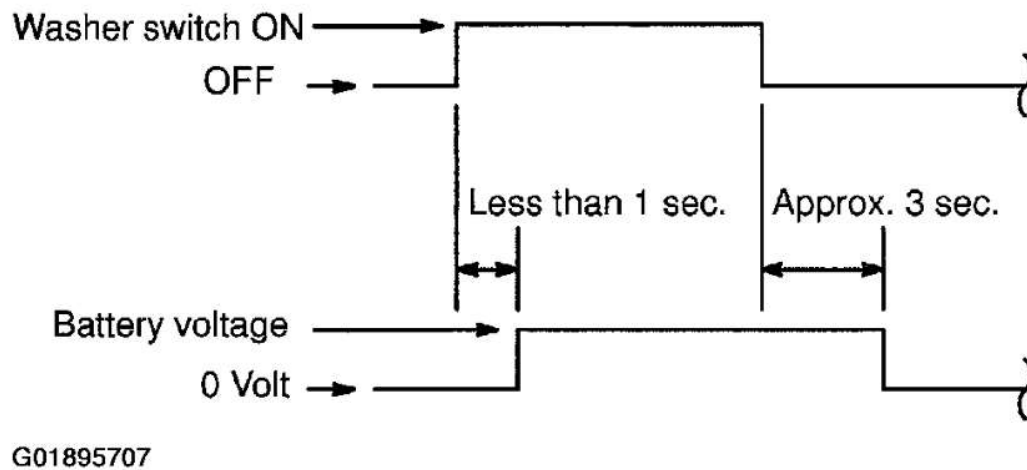
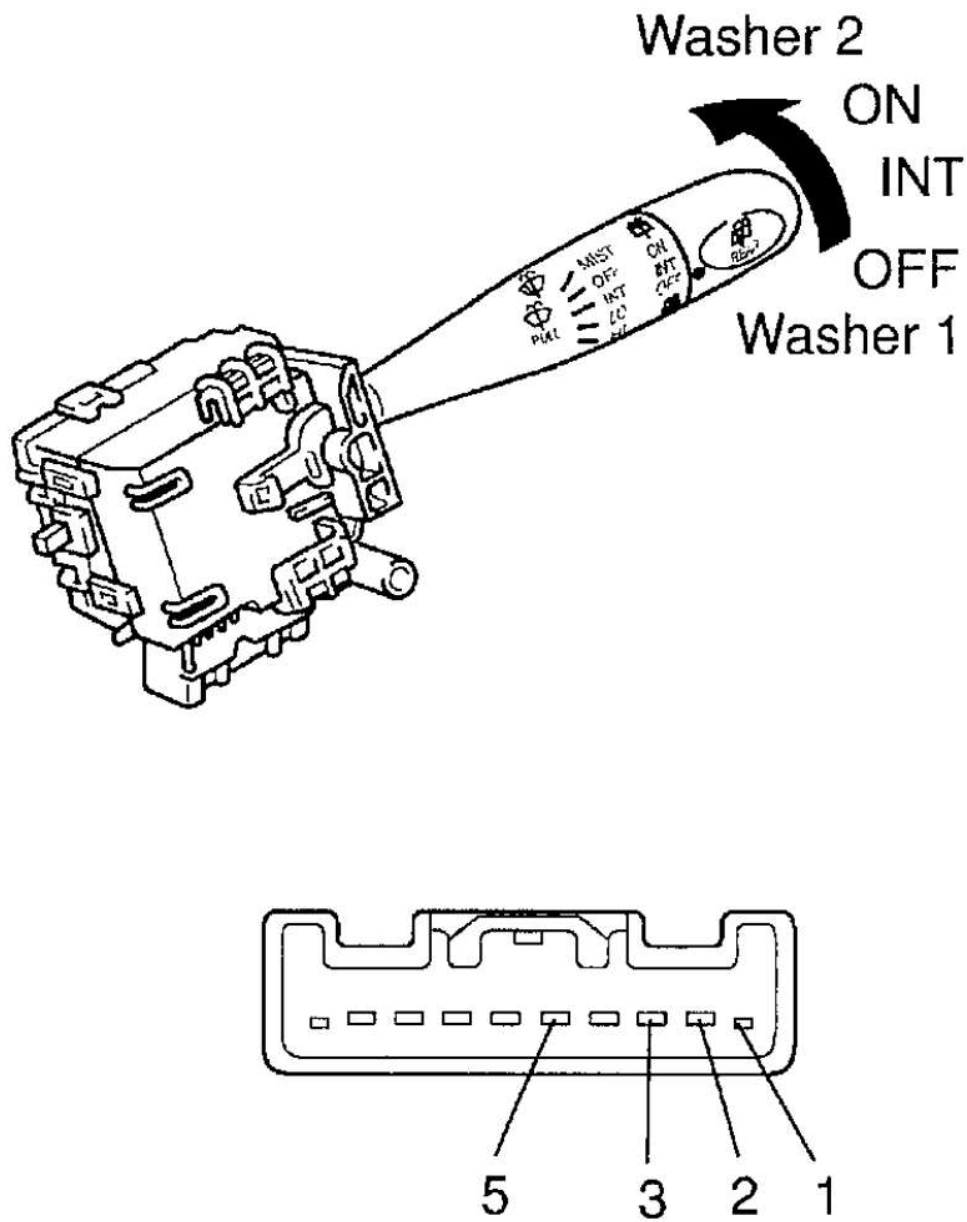


Fig. 17: Checking Voltage Changes

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If operation is not as specified, replace the wiper and washer switch.

4. **Inspect rear wiper and washer switch continuity .**



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Fig. 18: Displaying Rear Wiper & Washer Switch & Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

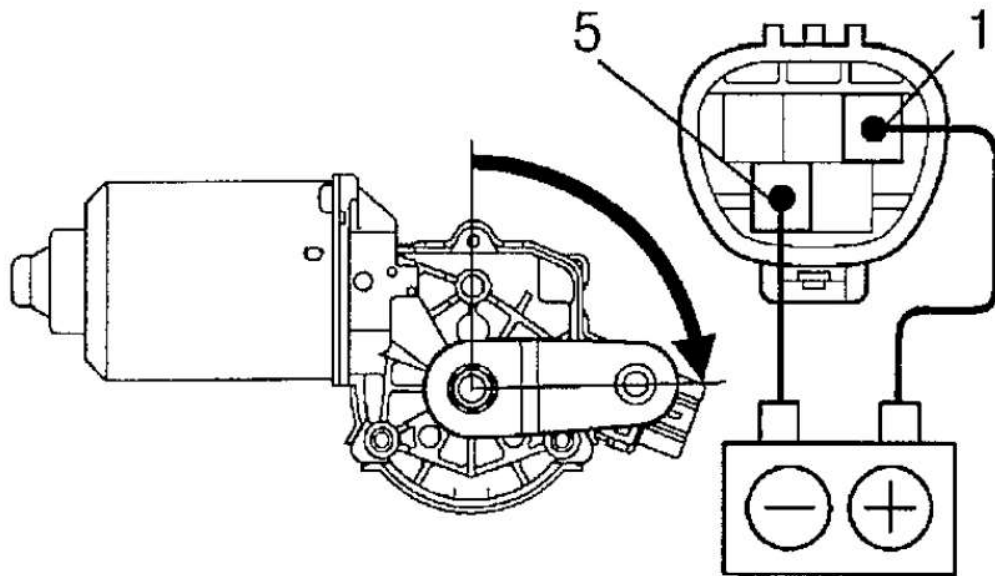
Switch position	Tester connection	Specified condition
Washer 1	3 – 5	Continuity
OFF	–	No continuity
INT	1 – 5	Continuity
ON	2 – 5	Continuity
Washer 2	2 – 3 – 5	Continuity

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Fig. 19: Displaying Wiper & Washer Switch Specifications
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If continuity is not as specified, replace the switch.

5. Low speed: Inspect front wiper motor operation



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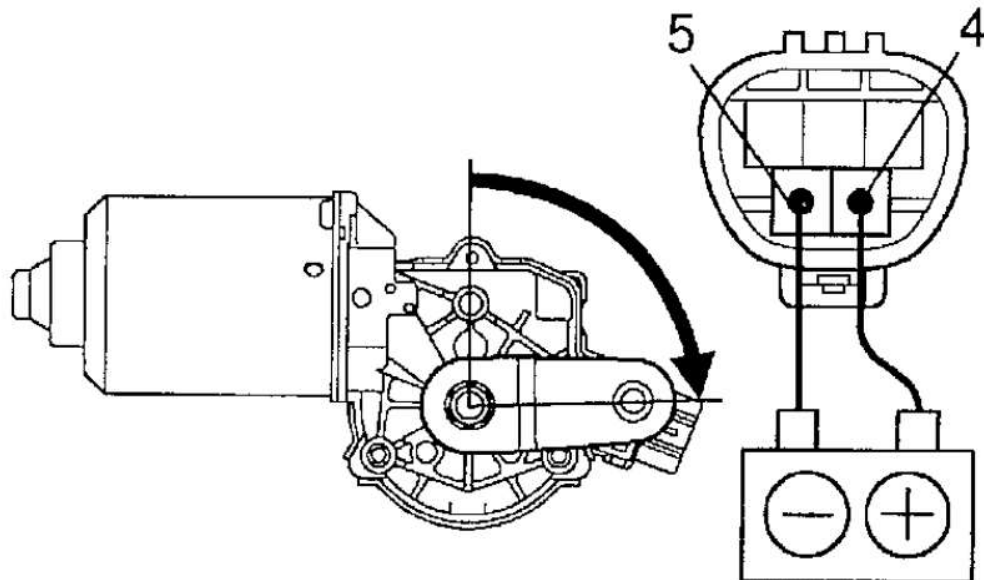
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Fig. 20: Displaying Front Wiper Motor Low Speed Inspection
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Connect the positive (+) lead from the battery to terminal 1 and the negative (-) lead to terminal 5, check that the motor operates at low speed.

If operation is not as specified, replace the motor.

6. High speed: Inspect front wiper motor operation .



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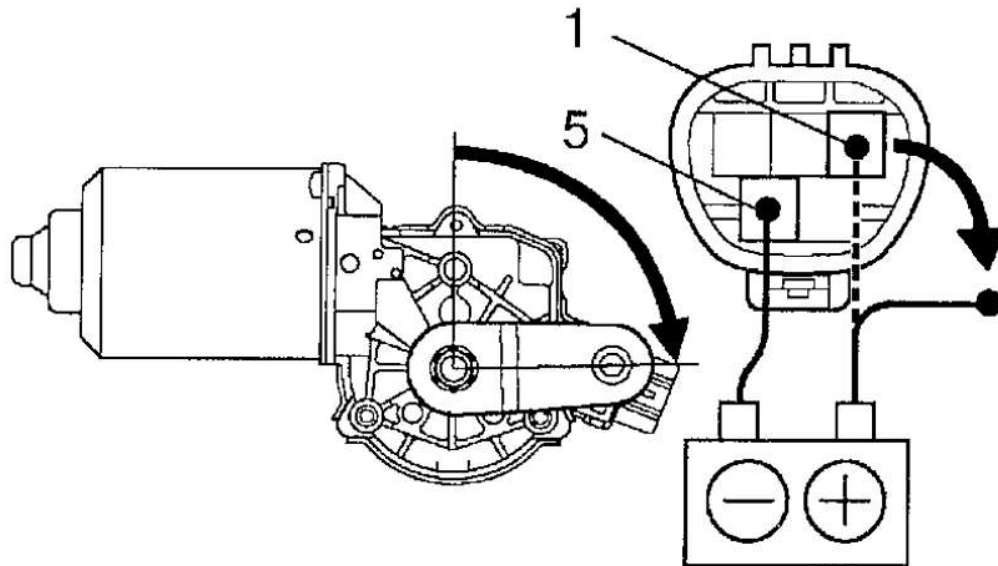
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Fig. 21: Displaying Front Wiper Motor High Speed Inspection
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Connect the positive (+) lead from the battery to terminal 4 and the negative (-) lead to terminal 5, check that the motor operates at high speed.

If operation is not as specified, replace the motor.

7. **Stopping at stop position: Inspect front wiper motor operation .**
 - a. Operate the motor at low speed and stop the motor operation anywhere except at the stop position by disconnecting positive (+) lead from terminal 1.

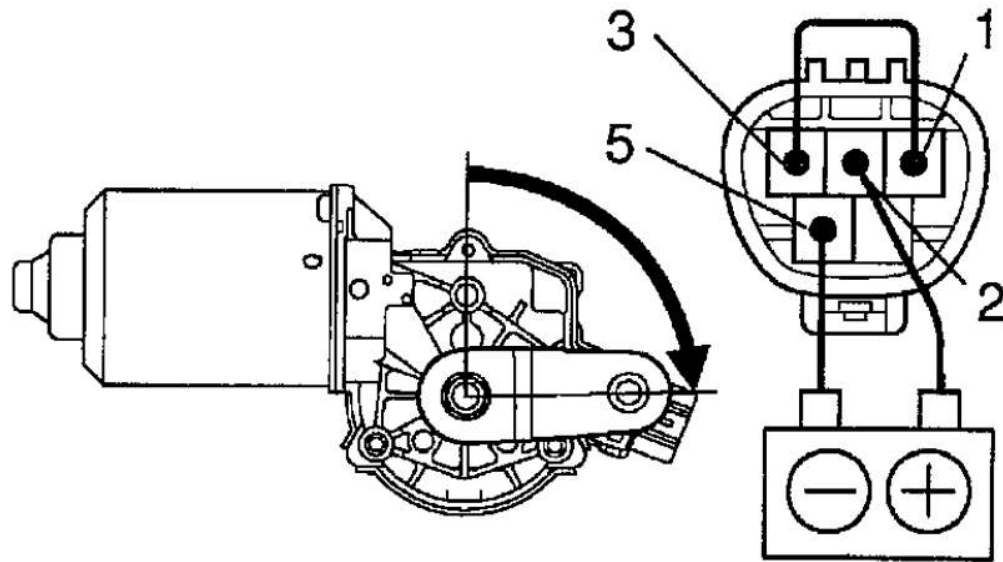


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Fig. 22: Inspect Front Wiper Motor Operation (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Connect terminals 1 and 3.
- c. Connect the positive (+) lead from the battery to terminal 2 and negative (-) lead to terminal 5, check that the motor stops running at the stop position after the motor operates again.



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Fig. 23: Inspect Front Wiper Motor Operation (2 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If operation is not as specified, replace the motor.

8. Inspect rear wiper motor and relay operation .

- a. Connect the positive (+) lead from the battery to terminal 1, and the negative (-) lead to terminal 3 and the motor body, check that the motor operates.

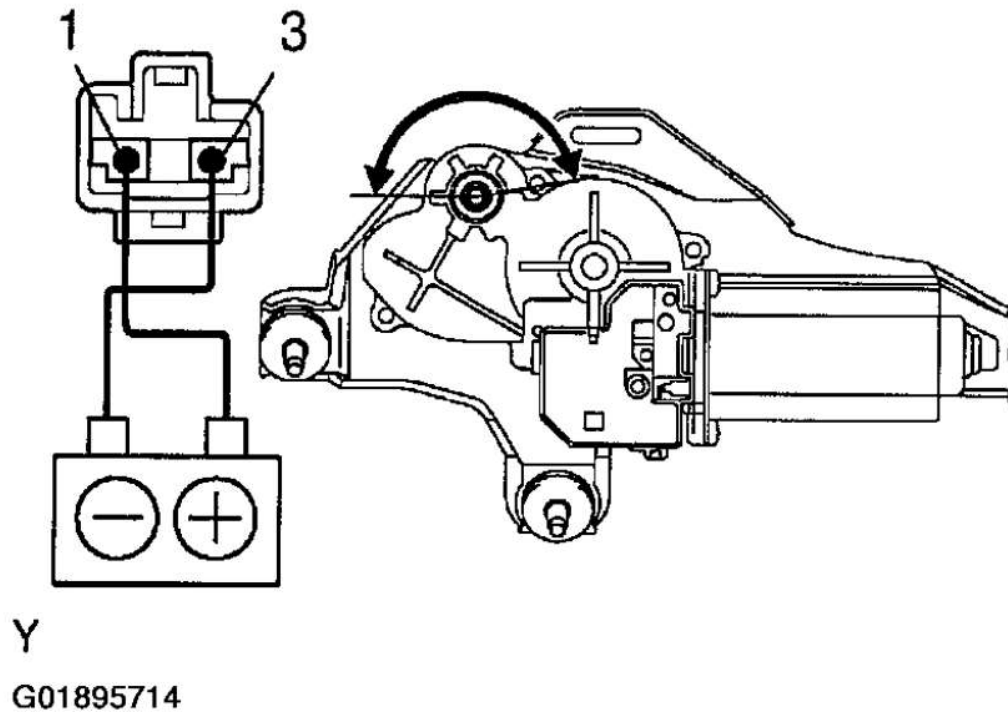


Fig. 24: Inspecting Rear Wiper Motor & Relay Operation (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Disconnect the negative (-) lead from terminal 3, check that the motor stops running at the stop position.

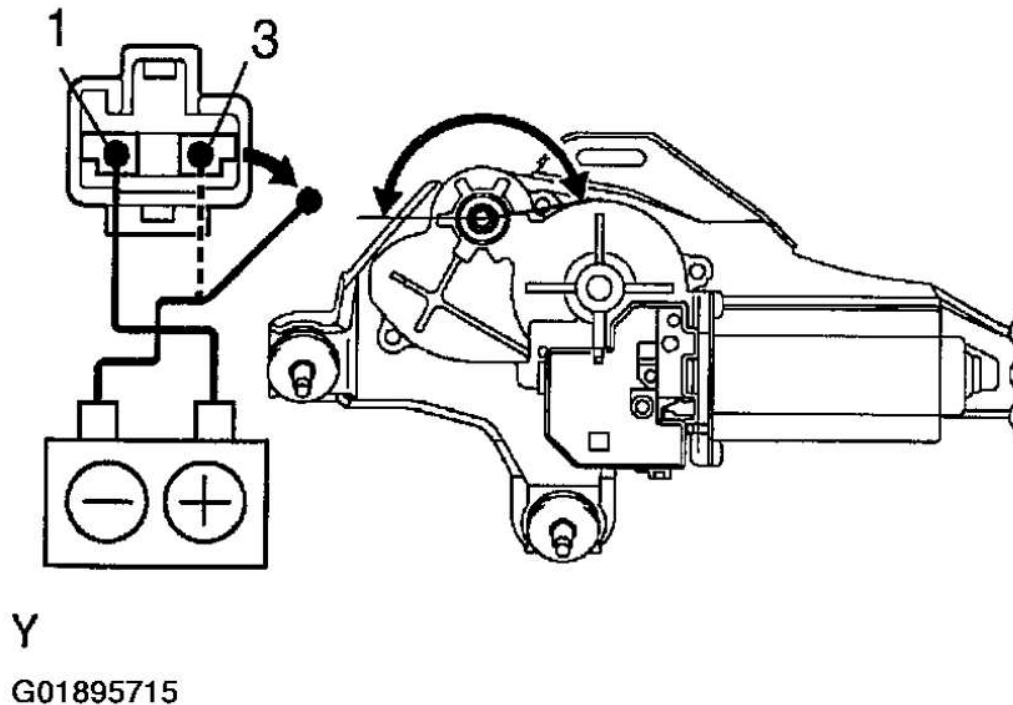


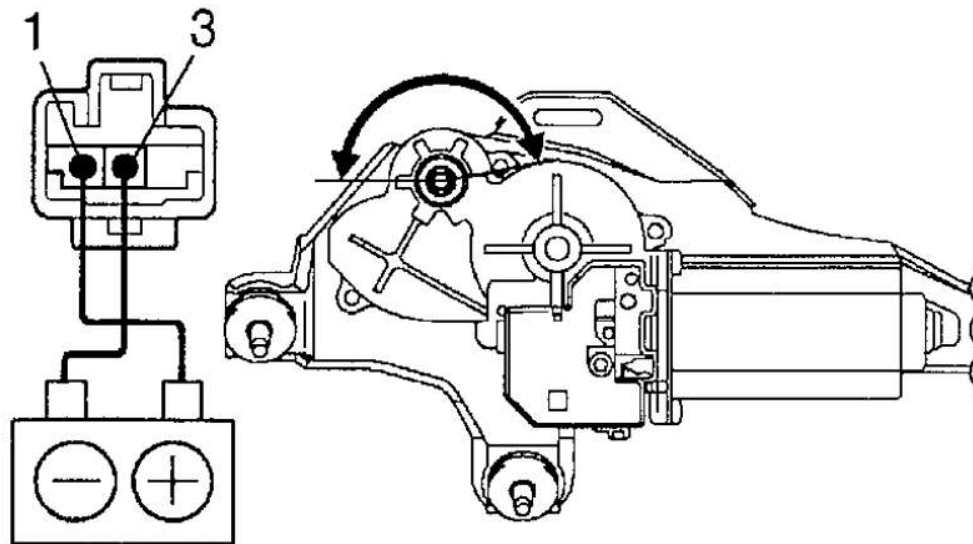
Fig. 25: Inspecting Rear Wiper Motor & Relay Operation (2 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If operation is not as specified, replace the motor and relay.

9. Intermittent Inspect rear wiper motor and relay operation .

Connect the positive (+) lead from the battery to terminal 1, and the negative (-) lead to terminal 2 and the motor body, check that the motor operates intermittently for 9 - 15 seconds.

If operation is not as specified, replace the motor and relay.



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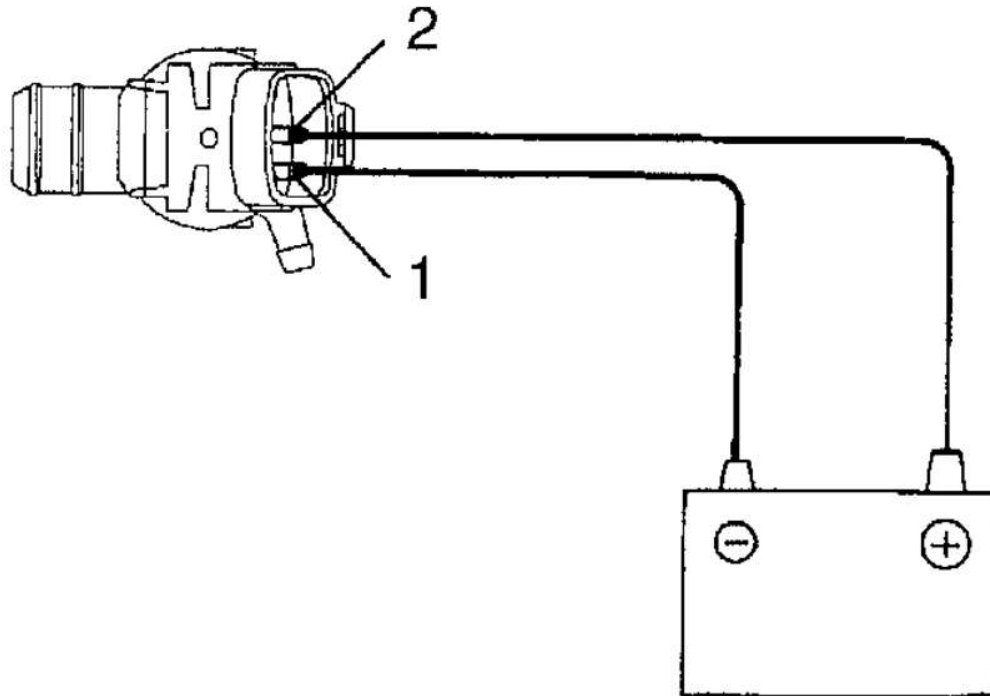
Fig. 26: Inspecting Rear Wiper Motor & Relay Operation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

10. Inspect front and rear washer motor operation .

Connect the positive (+) lead from the battery to terminal 2, and the negative (-) lead to terminal 1, check that the motor operates.

NOTE: **These tests must be performed quickly (within 20 seconds) to prevent the coil from burning out.**

If operation is not as specified, replace the motor.



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Fig. 27: Checking That Motor Operates
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.