

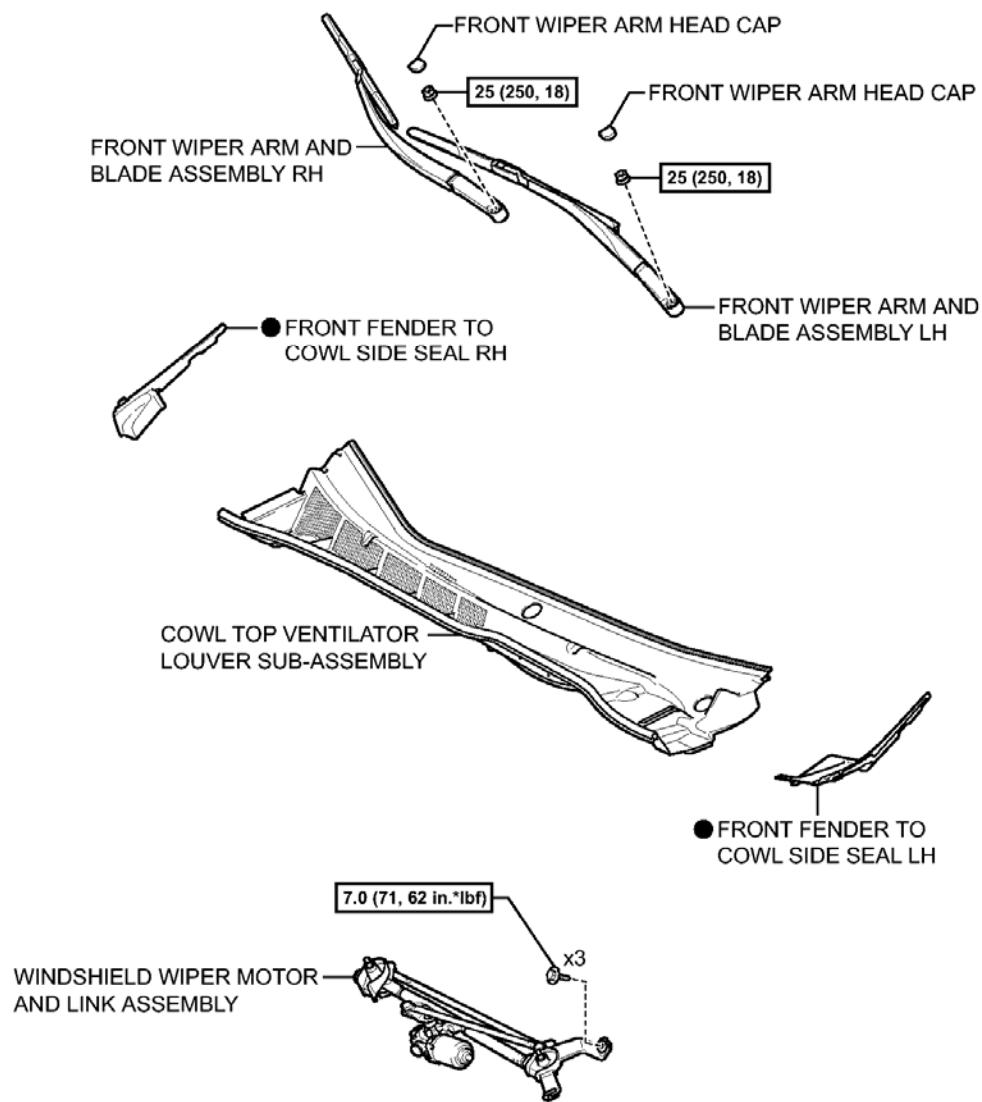
ACCESSORIES & EQUIPMENT

Wiper System / Washer System (Service Information) - Sienna

FRONT WIPER MOTOR

COMPONENTS

ILLUSTRATION



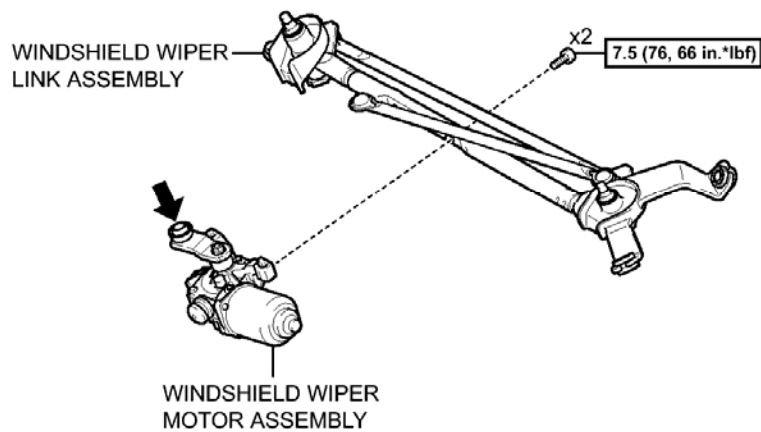
[N*m (kgf*cm, ft.*lbf)]: Specified torque

● Non-reusable part

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Fig. 1: Front Wiper Motor Replacement Components With Torque Specifications (1 of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ILLUSTRATION



$\boxed{\text{N}^*\text{m (kgf}^*\text{cm, ft.}^*\text{lbf)}}$: Specified torque

← MP grease

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Fig. 2: Front Wiper Motor Replacement Components With Torque Specifications (2 of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

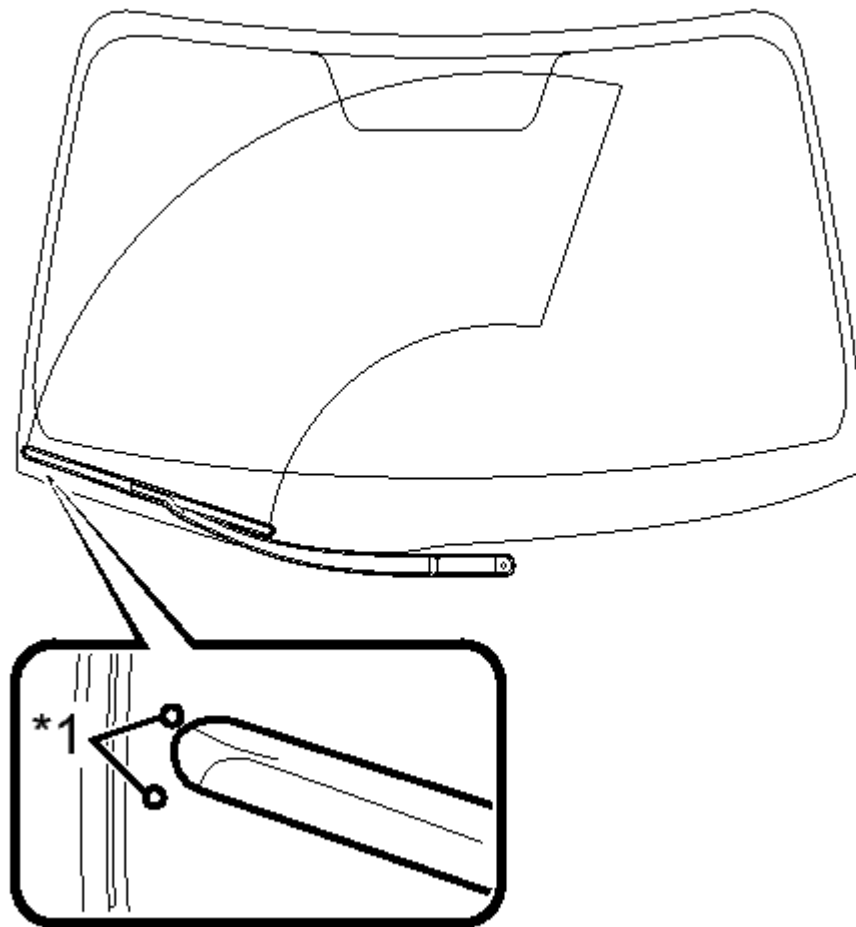
ON-VEHICLE INSPECTION

ON-VEHICLE INSPECTION

1. INSPECT WINDSHIELD WIPER MOTOR ASSEMBLY

a. for RH Side

1. Operate the windshield wiper motor assembly.



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Fig. 3: Inspecting Windshield Wiper Motor Assembly Operation RH
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Ceramic Void
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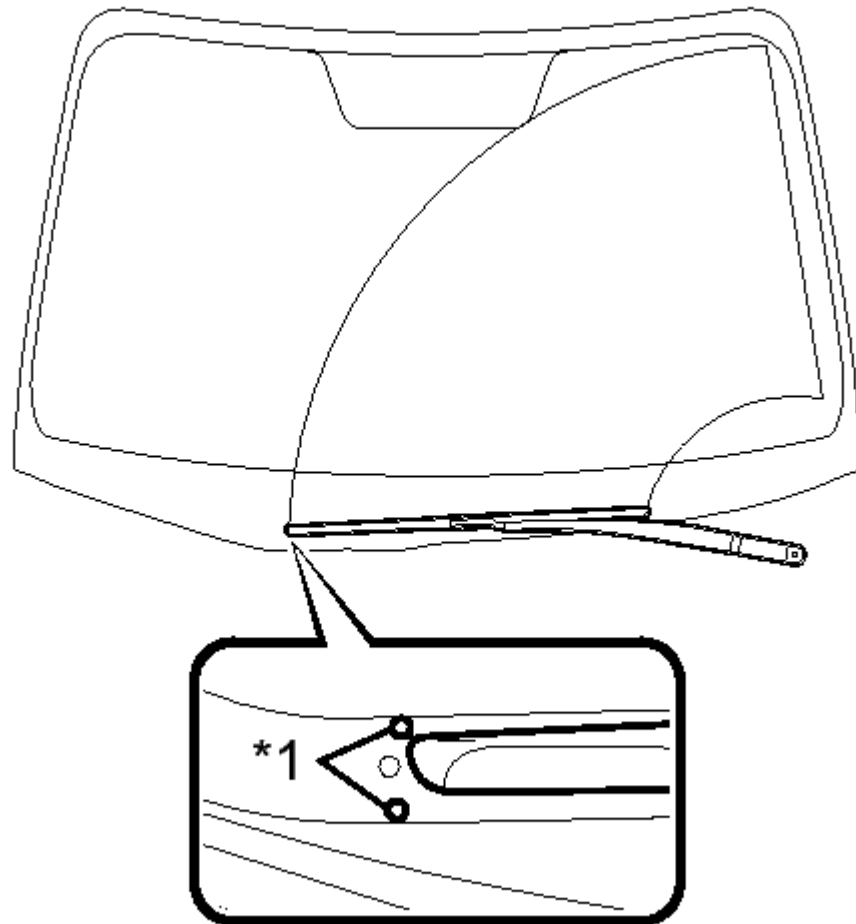
2. Stop the windshield wiper motor assembly operation.
3. Check the automatic stop (park) position.

OK

The front wiper stops at the position shown in the illustration.

b. for LH Side

1. Operate the windshield wiper motor assembly.



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Fig. 4: Inspecting Windshield Wiper Motor Assembly Operation LH
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Ceramic Void
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2. Stop the windshield wiper motor assembly operation.
3. Check the automatic stop (park) position.

OK

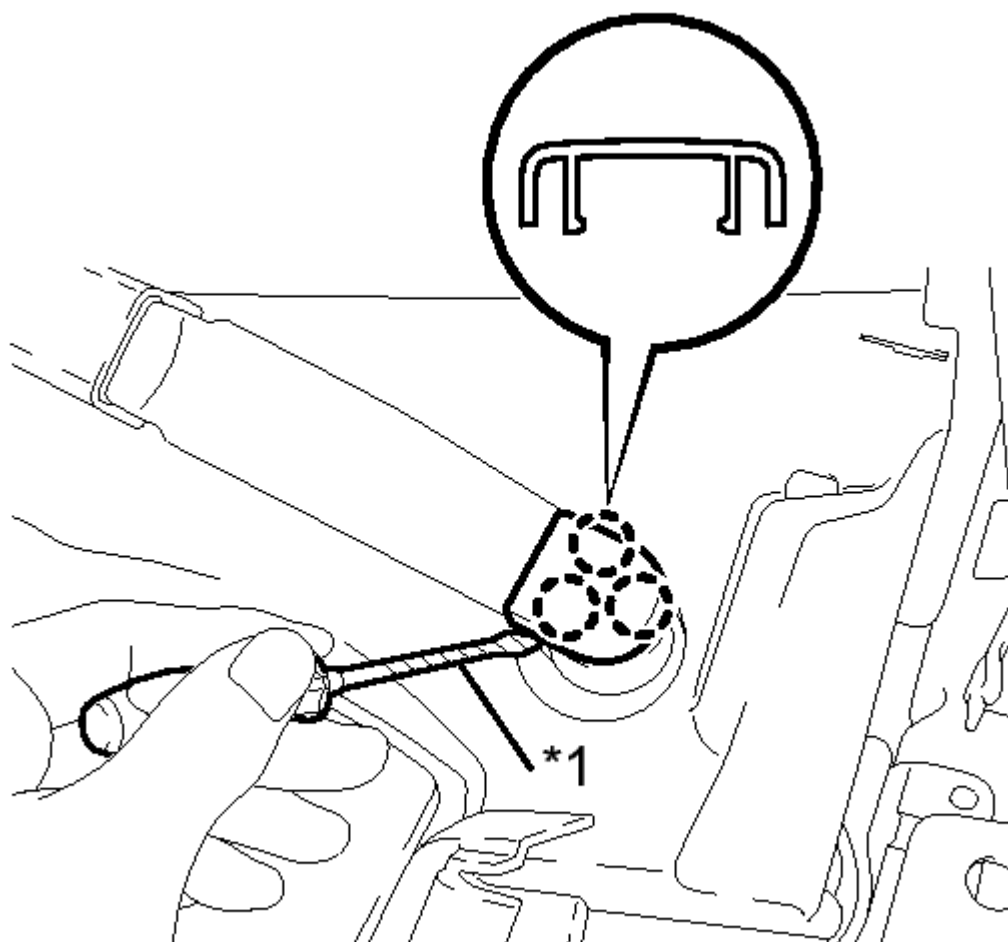
The front wiper stops at the position shown in the illustration.

REMOVAL

REMOVAL

1. REMOVE FRONT WIPER ARM HEAD CAP

- a. Using a screwdriver with its tip wrapped in protective tape, disengage the 3 claws and remove the 2 front wiper arm head caps.



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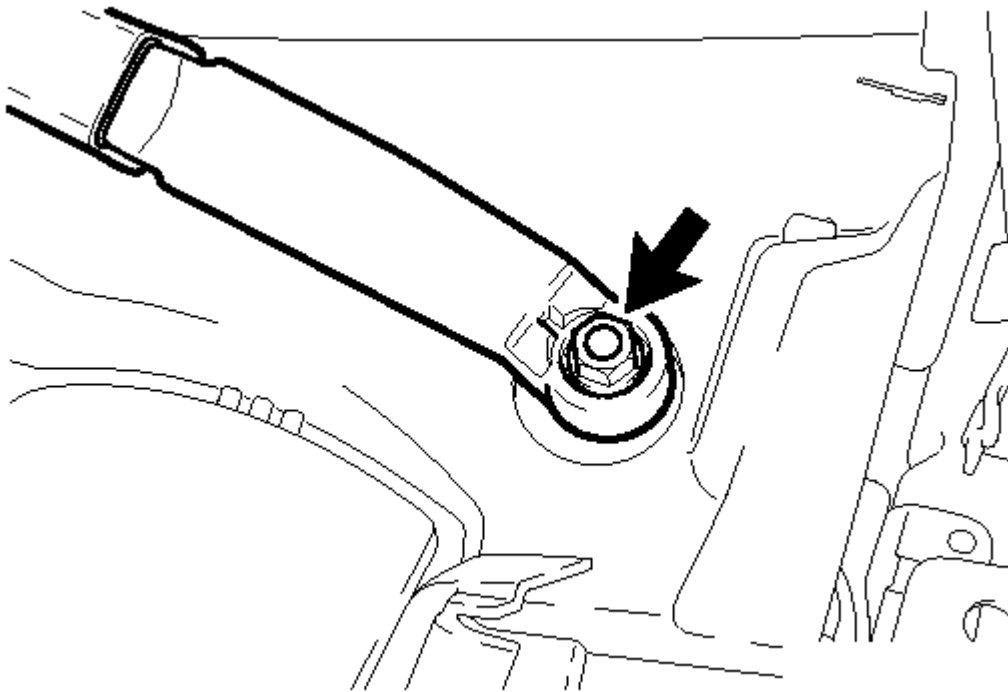
Fig. 5: Removing Front Wiper Arm Head Cap Using Screwdriver
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Protective Tape
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2. REMOVE FRONT WIPER ARM AND BLADE ASSEMBLY LH

- a. Remove the nut and the front wiper arm and blade assembly LH.



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Fig. 6: Identifying Front Wiper Arm/Blade Assembly LH & Fastener
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

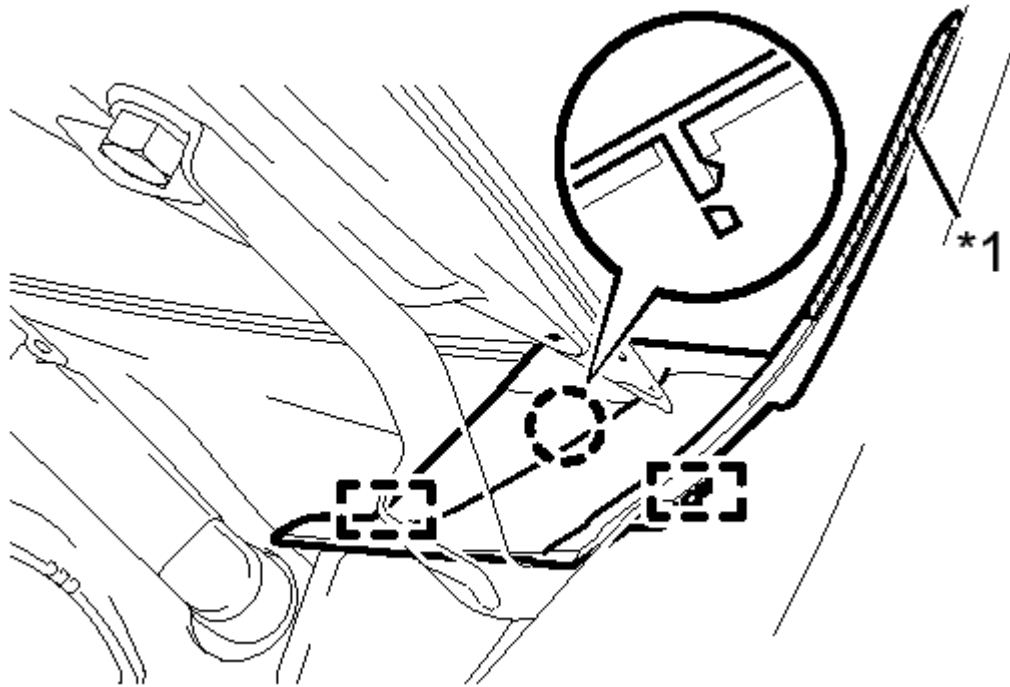
3. REMOVE FRONT WIPER ARM AND BLADE ASSEMBLY RH

HINT:

Use the same procedure as for the LH side.

4. REMOVE FRONT FENDER TO COWL SIDE SEAL LH

- a. Disengage the claw and 2 guides, peel off the double-sided tape, and remove the front fender to cowl side seal LH.



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Fig. 7: Identifying Front Fender To Cowl Side Seal LH & Fasteners
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Double- sided Tape
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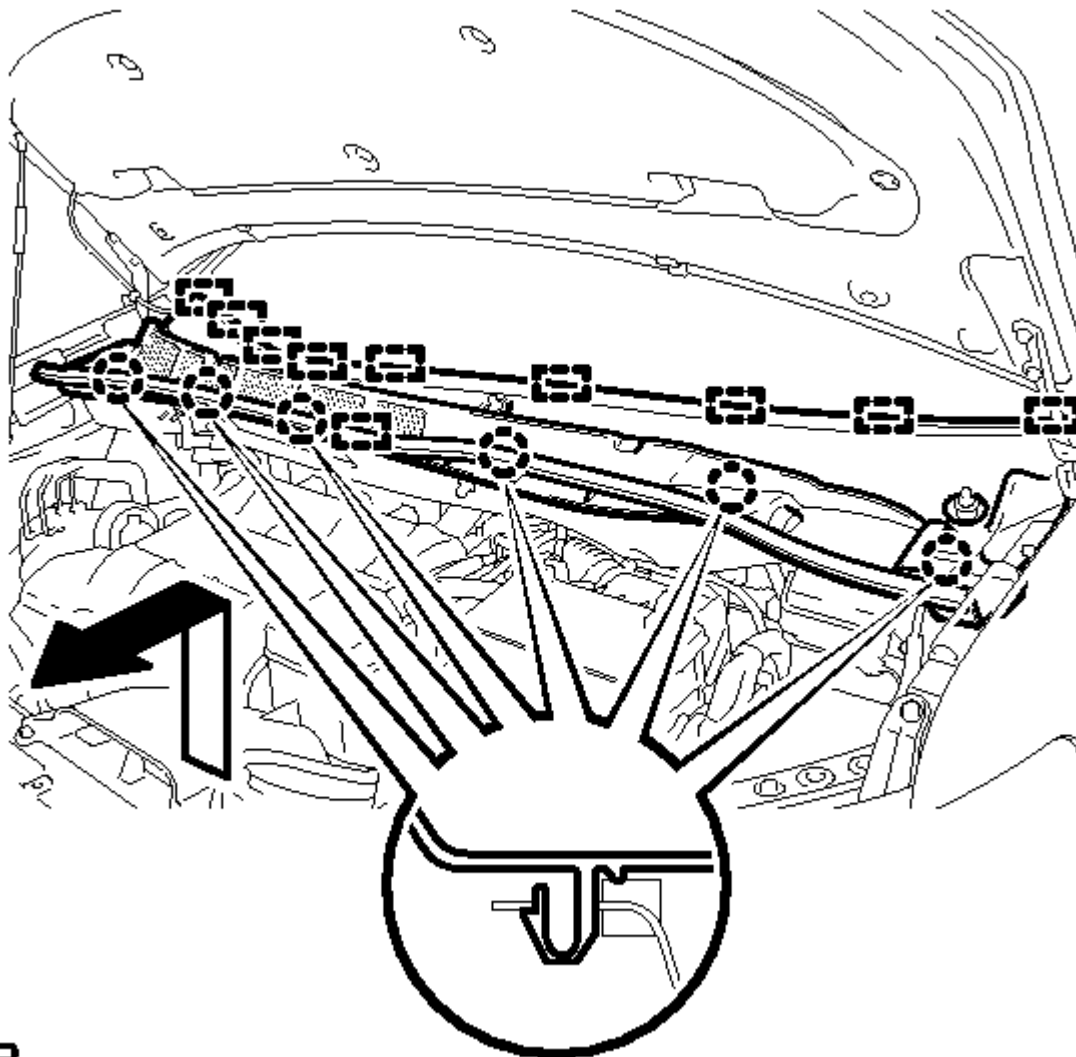
5. REMOVE FRONT FENDER TO COWL SIDE SEAL RH

HINT:

Use the same procedure as for the LH side.

6. REMOVE COWL TOP VENTILATOR LOUVER SUB-ASSEMBLY

- a. Disengage the 6 claws and 10 guides, and pull out the cowl top ventilator louver sub-assembly as shown in the illustration.



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Fig. 8: Removing Cowl Top Ventilator Louver Sub-Assembly & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

7. REMOVE WINDSHIELD WIPER MOTOR AND LINK ASSEMBLY

- a. Disconnect the windshield wiper motor connector.

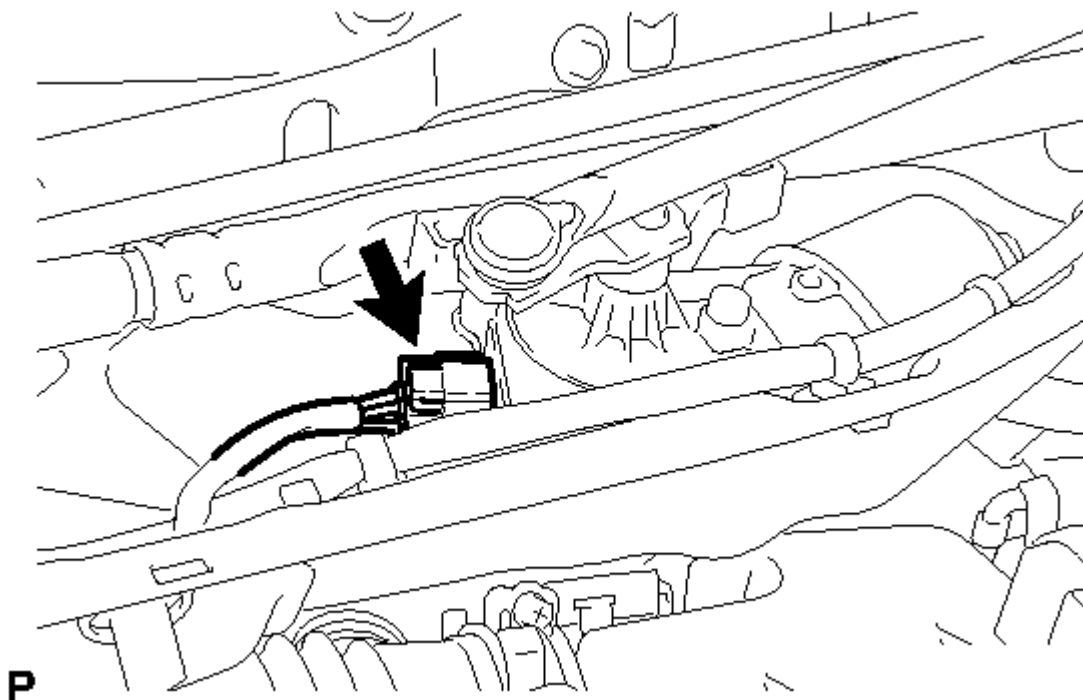
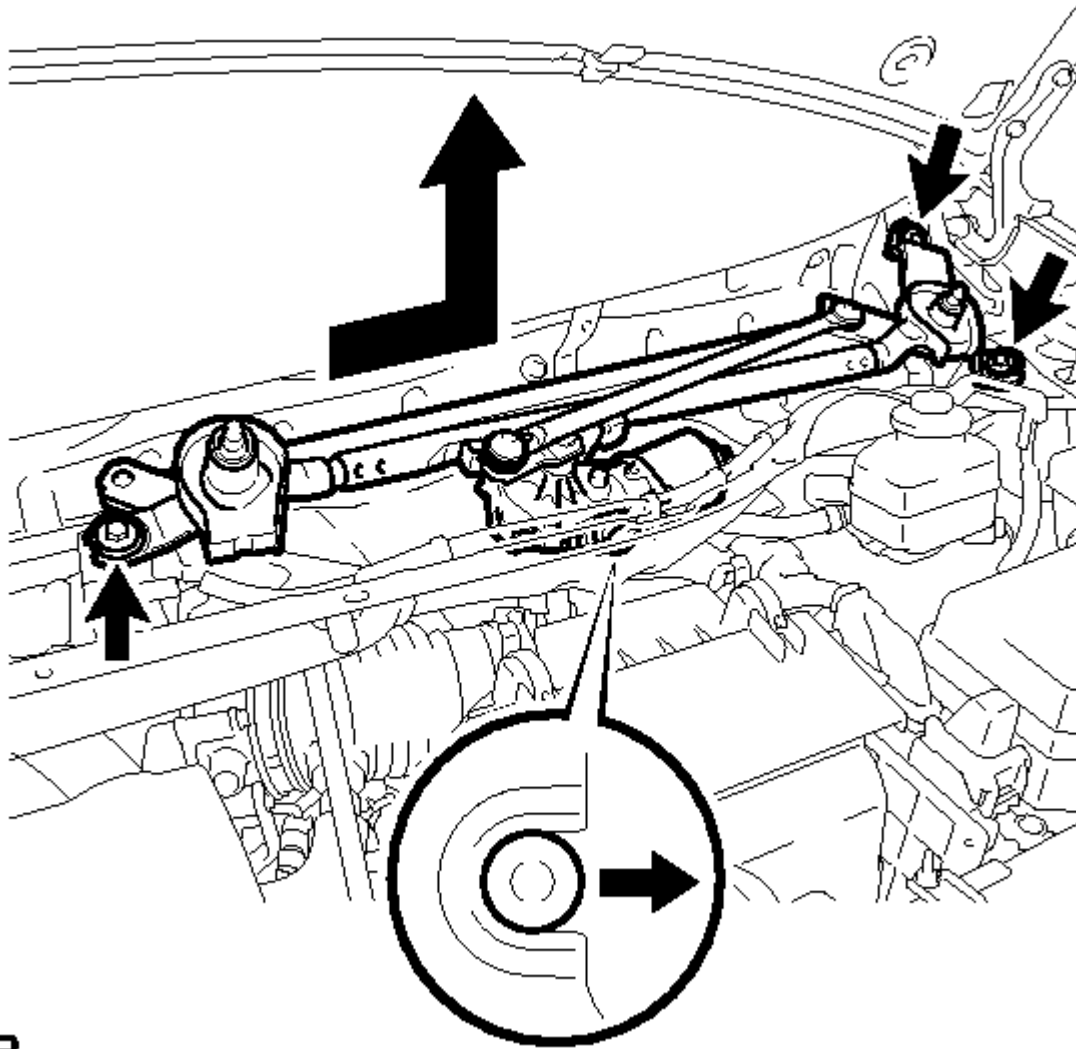


Fig. 9: Identifying Windshield Wiper Motor Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the 3 bolts and the windshield wiper motor and link assembly as shown in the illustration.

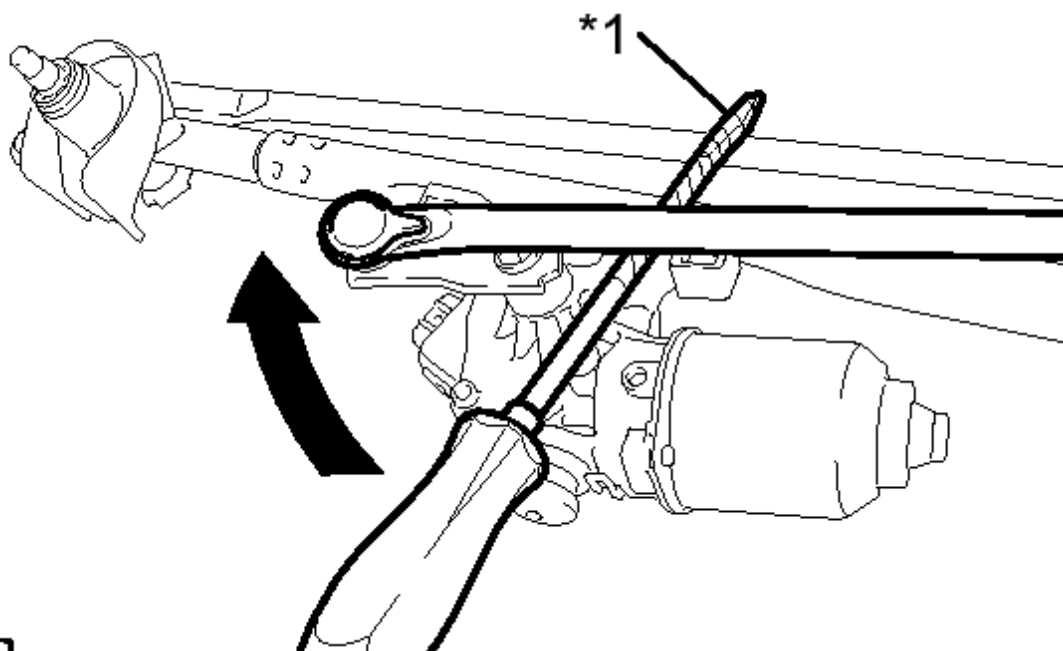


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Fig. 10: Removing Windshield Wiper Motor/Link Assembly & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

8. REMOVE WINDSHIELD WIPER MOTOR ASSEMBLY

- a. Using a screwdriver with its tip wrapped in protective tape, disengage the windshield wiper link rod from the crank arm pivot of the front wiper motor assembly as shown in the illustration.



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Fig. 11: Removing Windshield Wiper Motor From Wiper Link Using Screwdriver
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Protective Tape
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- b. Using a T30 "TORX" socket wrench, remove the 2 bolts and the windshield wiper motor assembly from the windshield wiper link assembly.

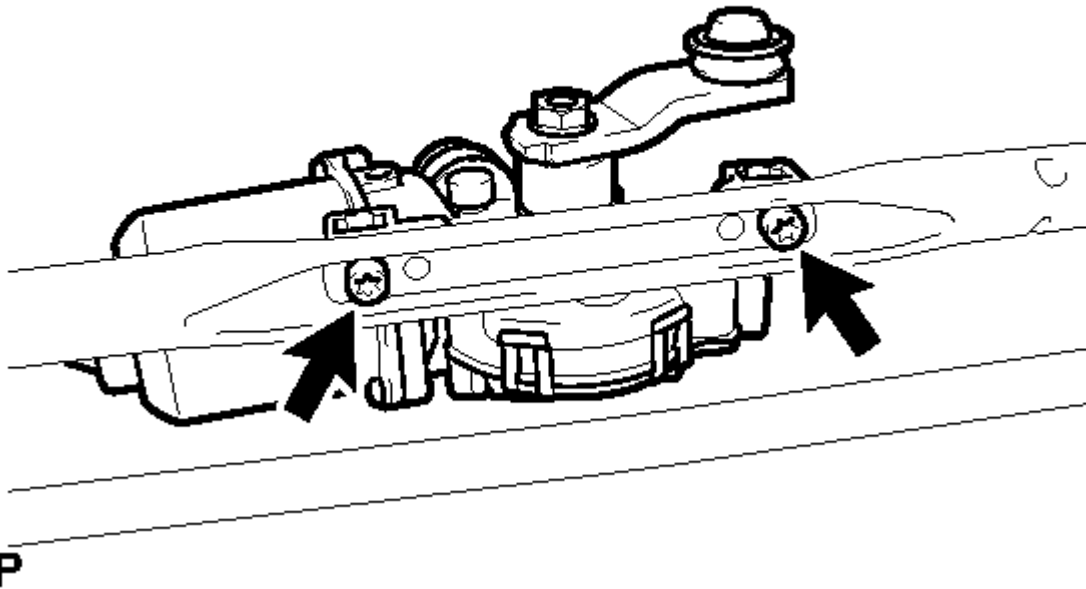


Fig. 12: Identifying Windshield Wiper Motor Assembly To Wiper Link Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

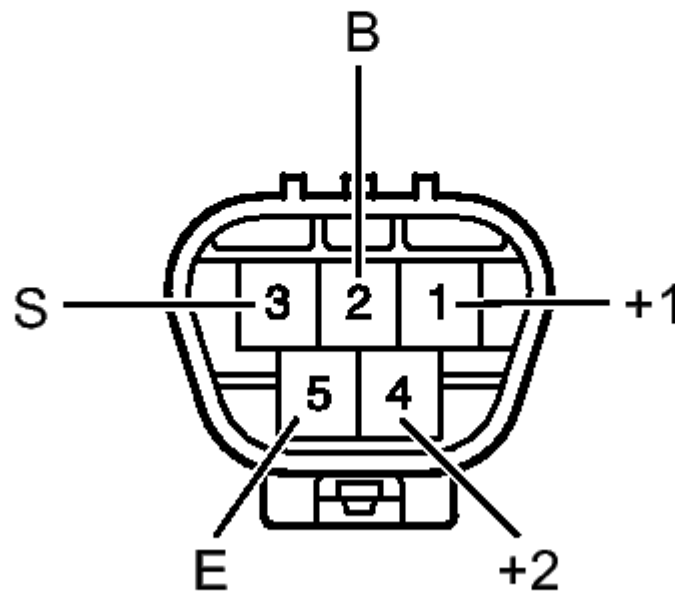
INSPECTION

INSPECTION

NOTE: Ensure that fingers or articles of clothing do not get caught in moving parts when performing this test.

1. **INSPECT WINDSHIELD WIPER MOTOR ASSEMBLY**
 - a. Check the LO operation.

*a



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Fig. 13: Inspecting Windshield Wiper Motor Assembly LO Operation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	Component without harness connected (Windshield Wiper Motor Assembly)
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1. Connect a battery positive (+) lead to terminal 1 (+1) and a negative (-) lead to terminal 5 (E), and check that the motor operates at low speed (LO).

OK

Motor operates at low speed (LO).

b. Check the HI operation.

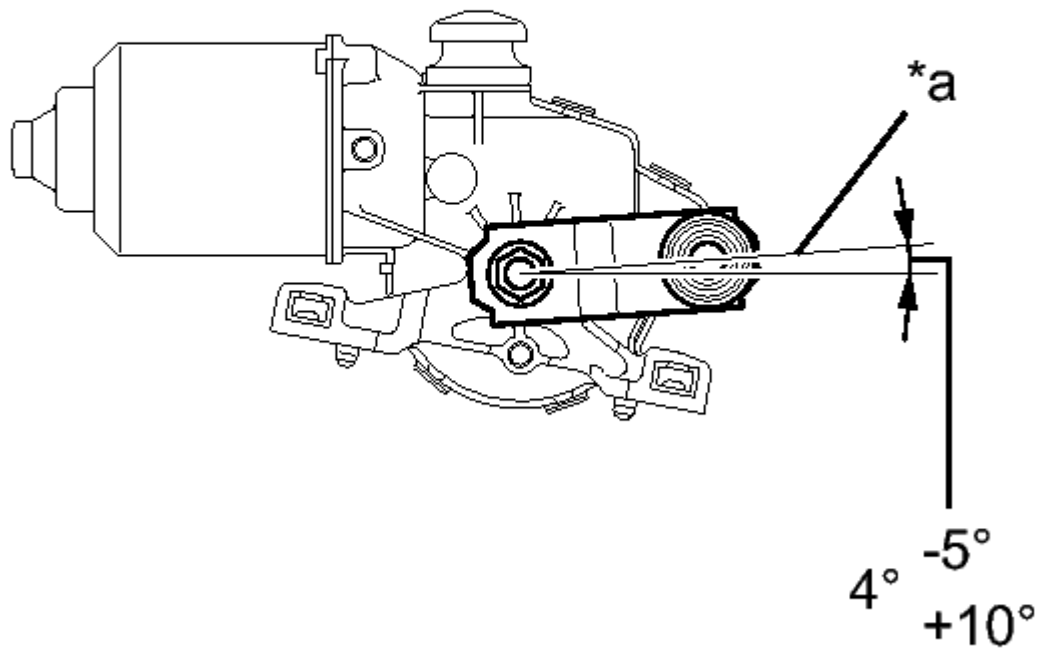
1. Connect a battery positive (+) lead to terminal 4 (+2) and a negative (-) lead to terminal 5 (E), and check that the motor operates at high speed (HI).

OK

Motor operates at high speed (HI).

c. Check the automatic stop (park) operation.

1. Connect a battery positive (+) lead to terminal 1 (+1) and a negative (-) lead to terminal 5 (E). With the motor operating at low speed (LO), disconnect terminal 1 (+1) to stop the wiper motor operation at any position other than the automatic stop (park) position.
2. Using SST, connect terminals 3 (S) and 1 (+1). Then connect a battery positive (+) lead to terminal 2 (B) and a negative (-) lead to terminal 5 (E) to restart the motor operation at low speed (LO).
 - **SST: 09843-18040**
3. Check that the motor stops automatically at the automatic stop (park) position.



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Fig. 14: Checking Windshield Wiper Motor Assembly Position
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

	Automatic
*a	Stop Position

OK

Motor stops automatically at the position.

If the result is not as specified, replace the windshield wiper motor assembly.

INSTALLATION

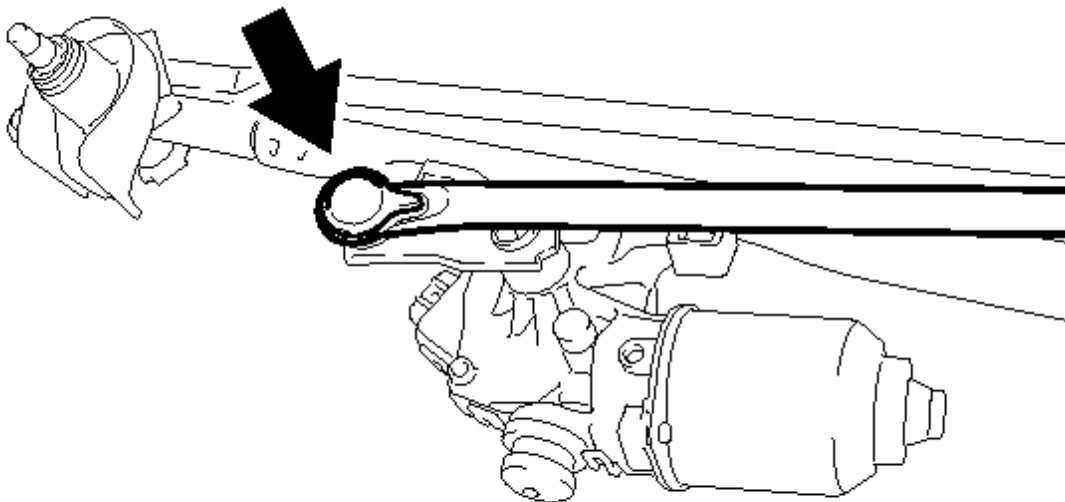
INSTALLATION

1. INSTALL WINDSHIELD WIPER MOTOR ASSEMBLY

- a. Using a T30 "TORX" socket wrench, install the windshield wiper motor assembly with the 2 bolts.

Torque: 7.5 N*m (76 kgf*cm, 66 in.*lbf)

- b. Apply MP grease to the crank arm pivot of the windshield wiper motor assembly.
- c. Install the windshield wiper link rod to the crank arm pivot of the windshield wiper motor assembly.

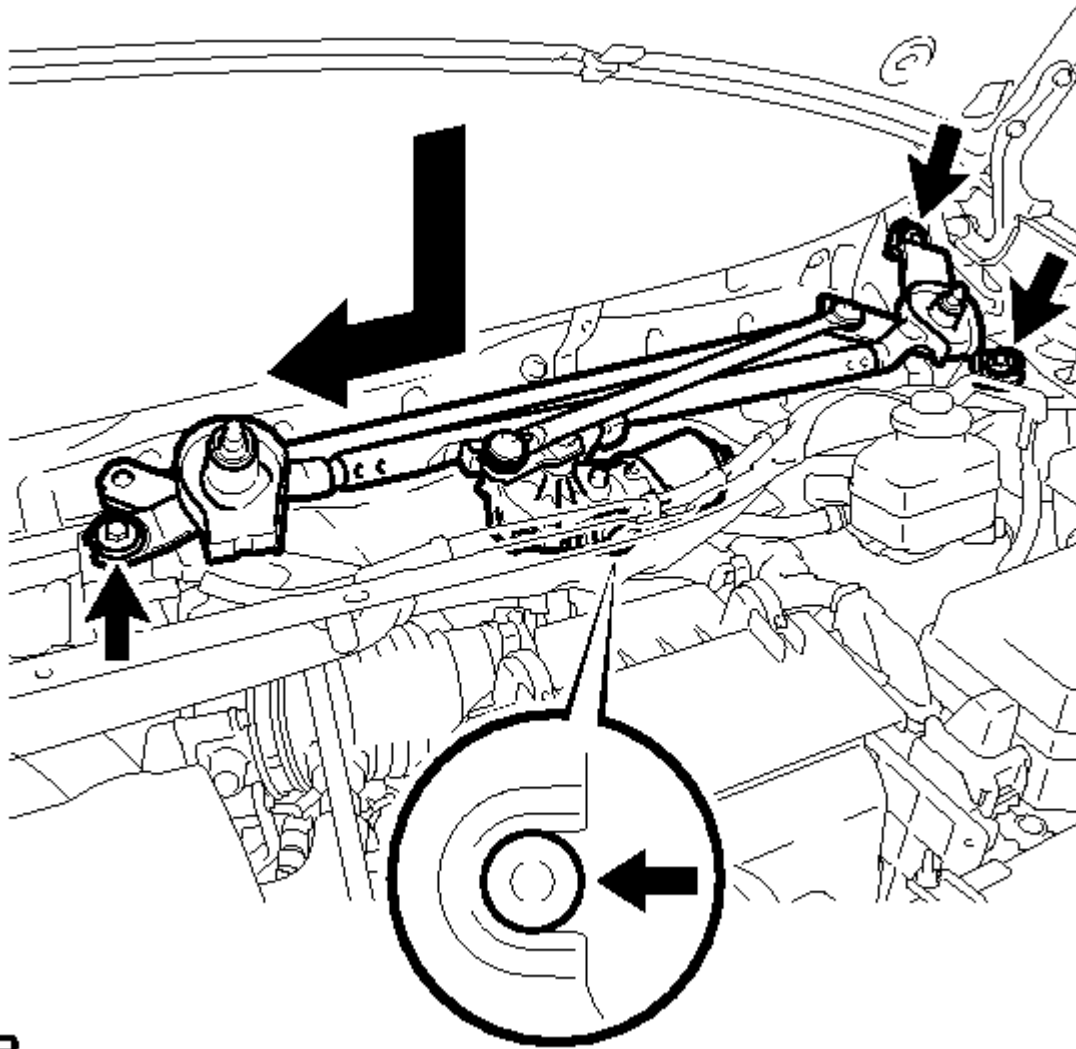


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Fig. 15: Identifying Crank Arm Pivot Of Windshield Wiper Motor Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. INSTALL WINDSHIELD WIPER MOTOR AND LINK ASSEMBLY

- a. Install the windshield wiper motor and link assembly with the 3 bolts as shown in the illustration.

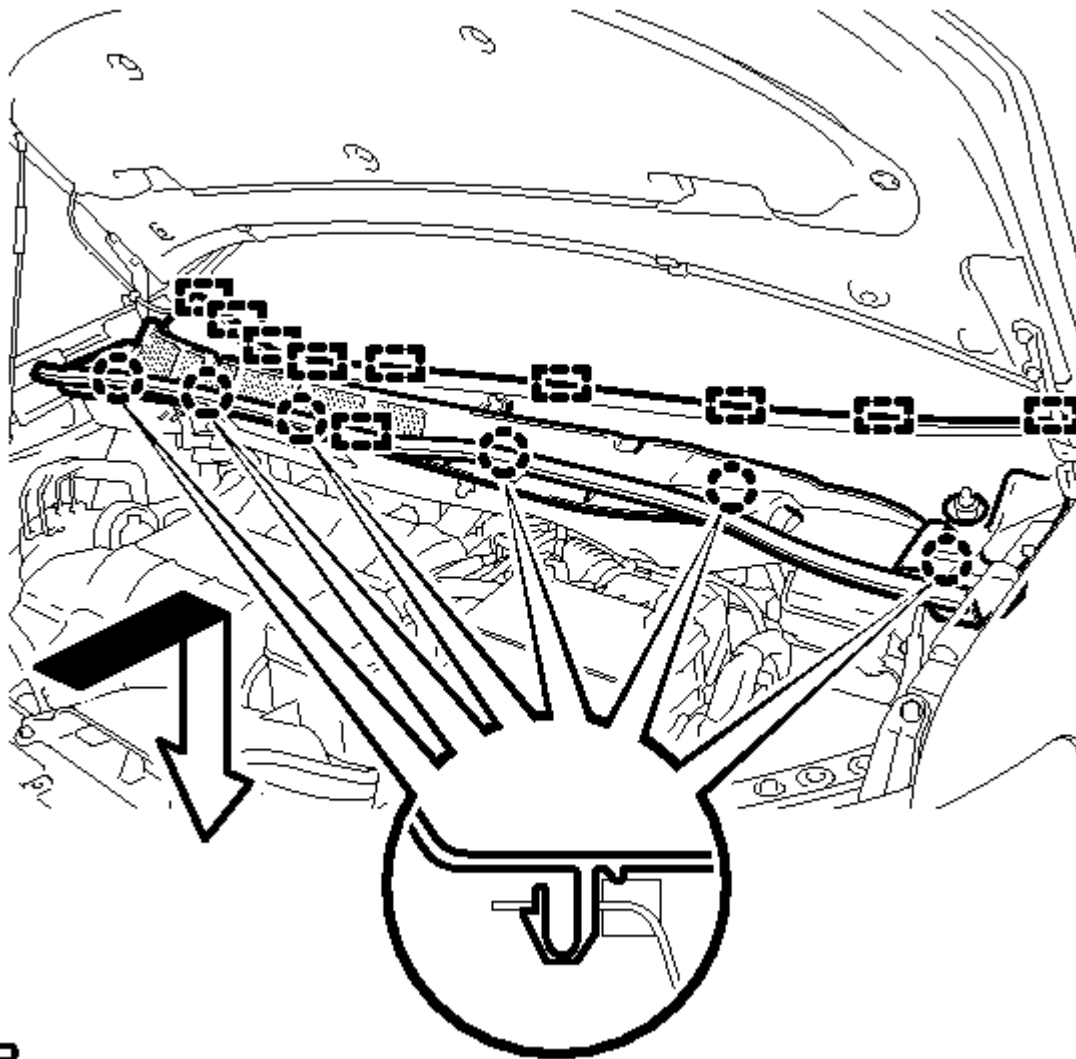


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Fig. 16: Installing Windshield Wiper Motor/Link Assembly & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Torque: 7.0 N*m (71 kgf*cm, 62 in.*lbf)

- b. Connect the windshield wiper motor connector.
- 3. **INSTALL COWL TOP VENTILATOR LOUVER SUB-ASSEMBLY**
 - a. Engage the 10 guides and 6 claws, and install the cowl top ventilator louver sub-assembly as shown in the illustration.



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Fig. 17: Installing Cowl Top Ventilator Louver Sub-Assembly & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

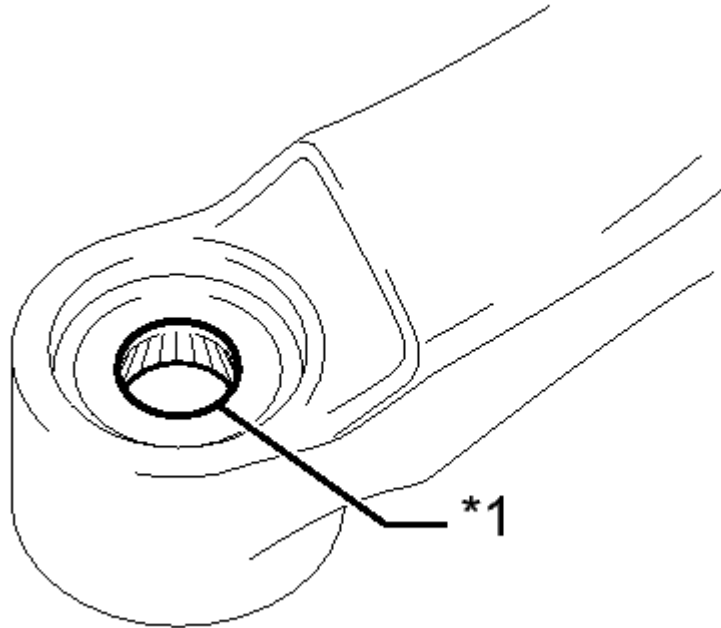
- 4. INSTALL FRONT FENDER TO COWL SIDE SEAL LH**
 - a. Wipe off any tape adhesive residue with cleaner.
 - b. Engage the 2 guides and clip and apply thorough pressure to the sections with double-sided tape to install a new front fender to cowl side seal LH.
- 5. INSTALL FRONT FENDER TO COWL SIDE SEAL RH**

HINT:

Use the same procedure as for the LH side.

- 6. INSTALL FRONT WIPER ARM AND BLADE ASSEMBLY LH**
 - a. Operate the wiper and stop the windshield wiper motor at the automatic stop position.

- b. When reusing the front wiper arm and blade assembly LH:
1. Clean the wiper arm serrations.



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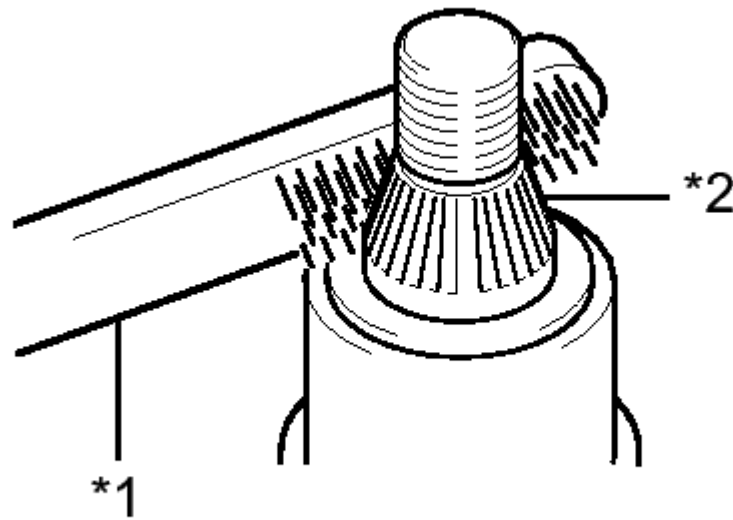
Fig. 18: Identifying Wiper Arm Serrations

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

TEXT IN ILLUSTRATION

	Wiper
*1	Arm
	Serration

- c. When reusing the windshield wiper link assembly:
1. Clean the wiper pivot serrations with a wire brush.



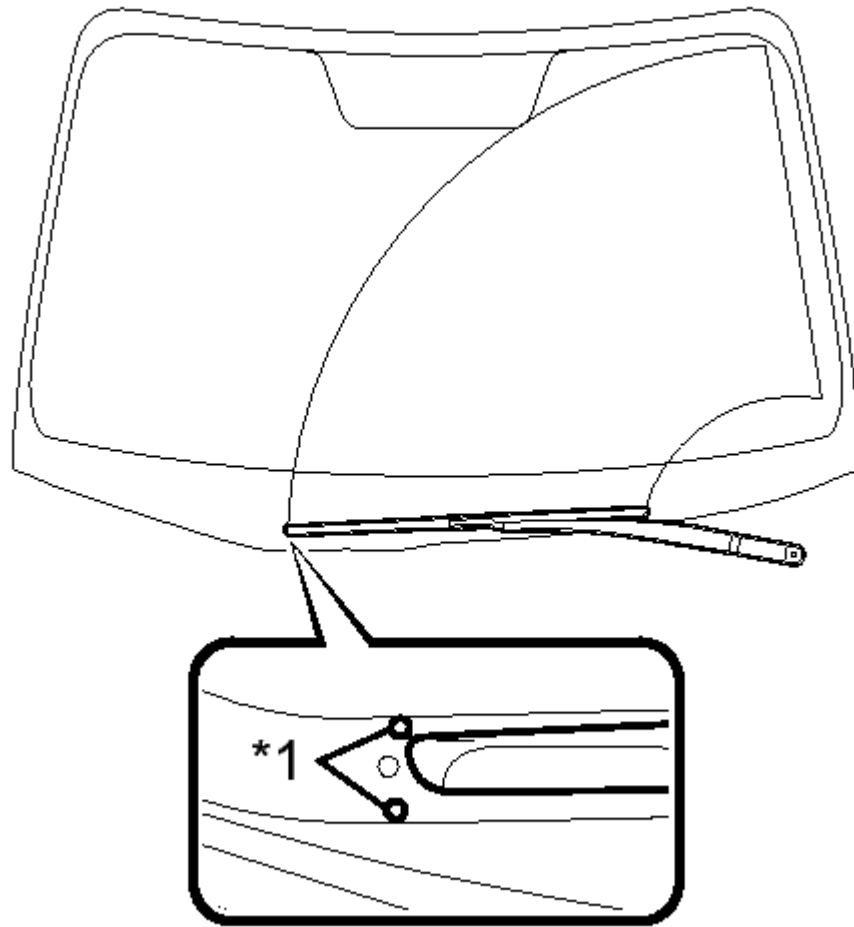
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Fig. 19: Cleaning Wiper Pivot Serrations With Wire Brush
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Wire Brush
*2	Wiper Pivot Serration

- d. Install the front wiper arm and blade assembly LH with the nut to the position shown in the illustration.



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Fig. 20: Inspecting Windshield Wiper Motor Assembly Operation LH
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

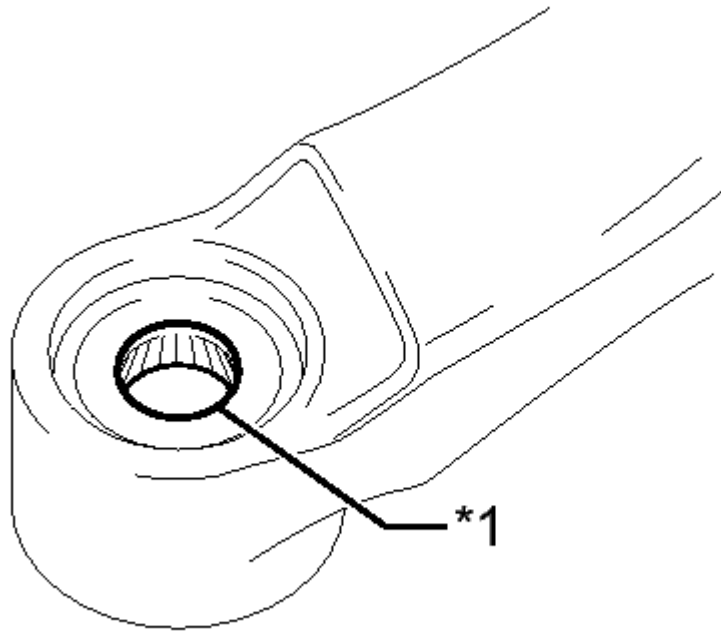
TEXT IN ILLUSTRATION

*1	Ceramic Void
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Torque: 25 N*m (250 kgf*cm, 18 ft.*lbf)

7. INSTALL FRONT WIPER ARM AND BLADE ASSEMBLY RH

- a. Operate the wiper and stop the windshield wiper motor at the automatic stop position.
- b. When reusing the front wiper arm and blade assembly RH:
 1. Clean the wiper arm serrations.



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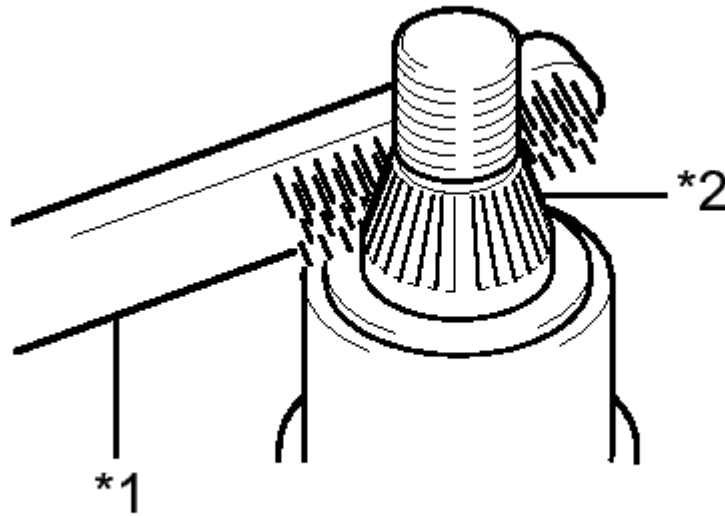
Fig. 21: Identifying Wiper Arm Serration

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

TEXT IN ILLUSTRATION

	Wiper
*1	Arm
	Serration

- c. When reusing the windshield wiper link assembly:
 - 1. Clean the wiper pivot serrations with a wire brush.



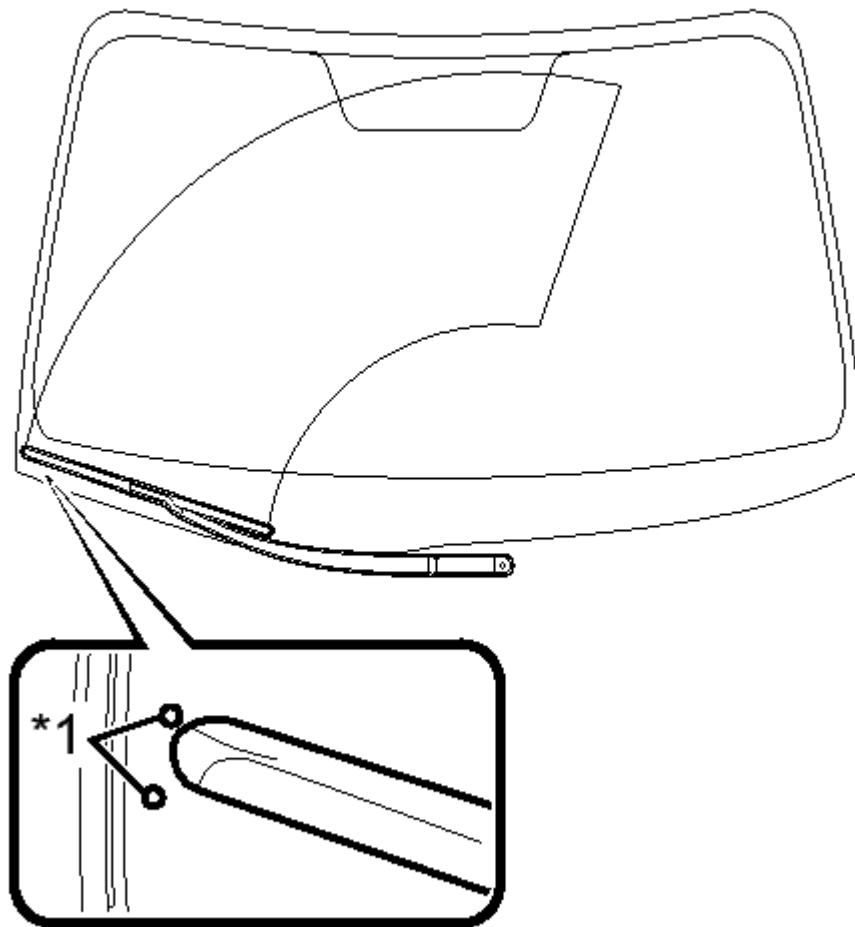
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Fig. 22: Cleaning Wiper Pivot Serrations With Wire Brush
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Wire Brush
*2	Wiper Pivot Serration

- d. Install the front wiper arm and blade assembly RH with the nut to the position shown in the illustration.



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Fig. 23: Inspecting Windshield Wiper Motor Assembly Operation RH
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

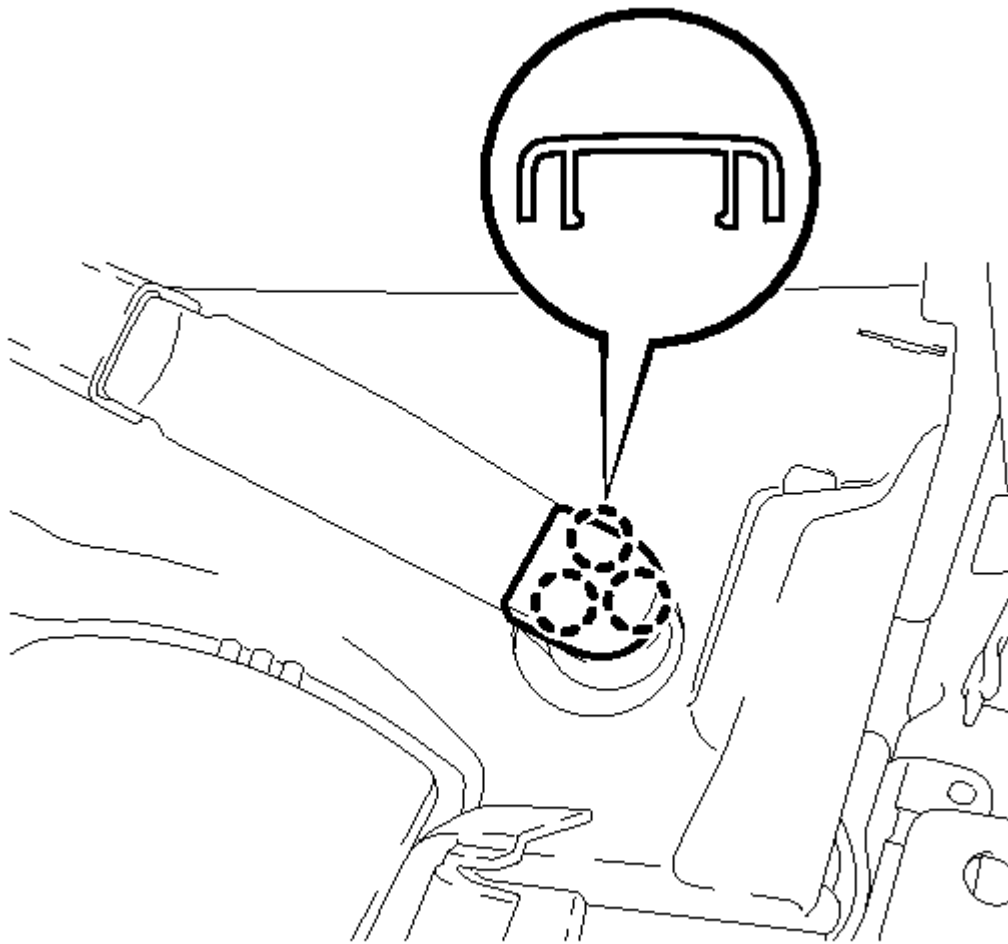
TEXT IN ILLUSTRATION

*1	Ceramic Void
----	-----------------

Torque: 25 N*m (250 kgf*cm, 18 ft.*lbf)

8. INSTALL FRONT WIPER ARM HEAD CAP

- a. Engage the 3 claws and install the 2 front wiper arm head caps.



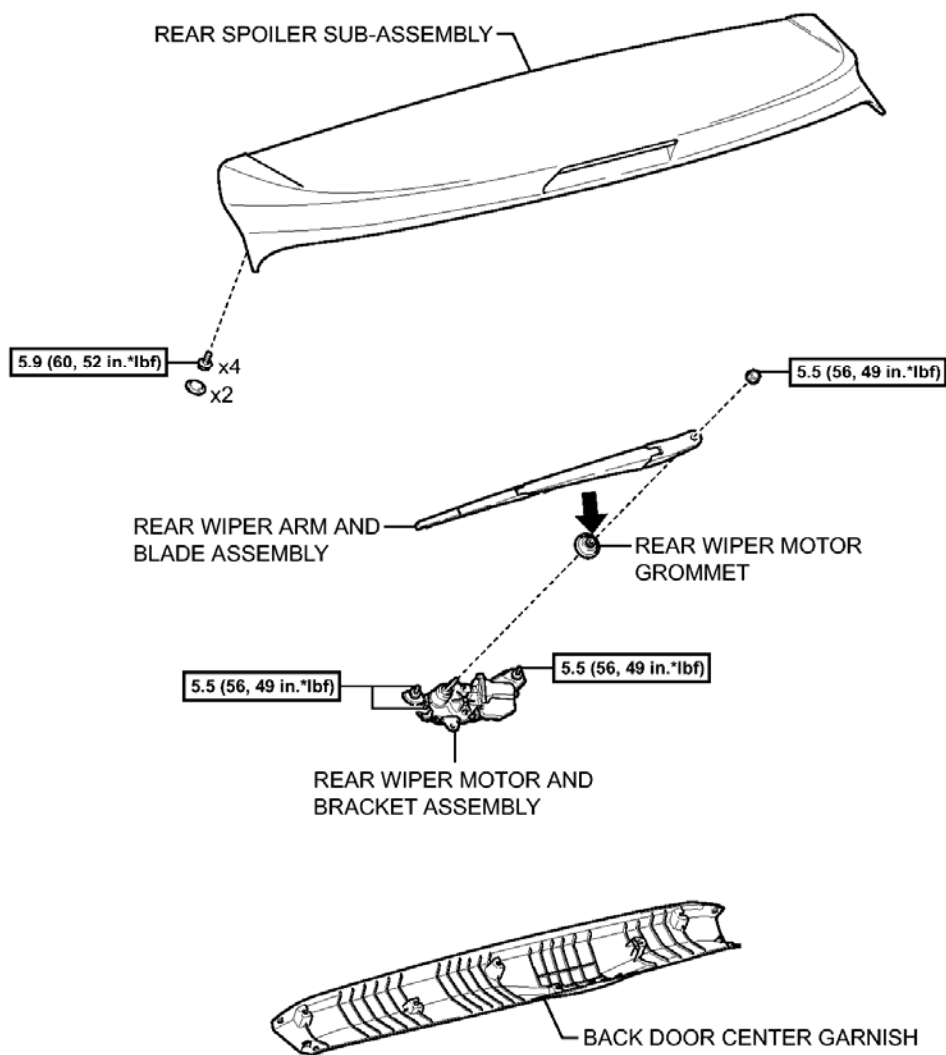
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Fig. 24: Installing Front Wiper Arm Head Caps & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REAR WIPER MOTOR

COMPONENTS

ILLUSTRATION



$\boxed{\text{N*m (kgf*cm, ft.*lbf)}}$: Specified torque

← MP grease

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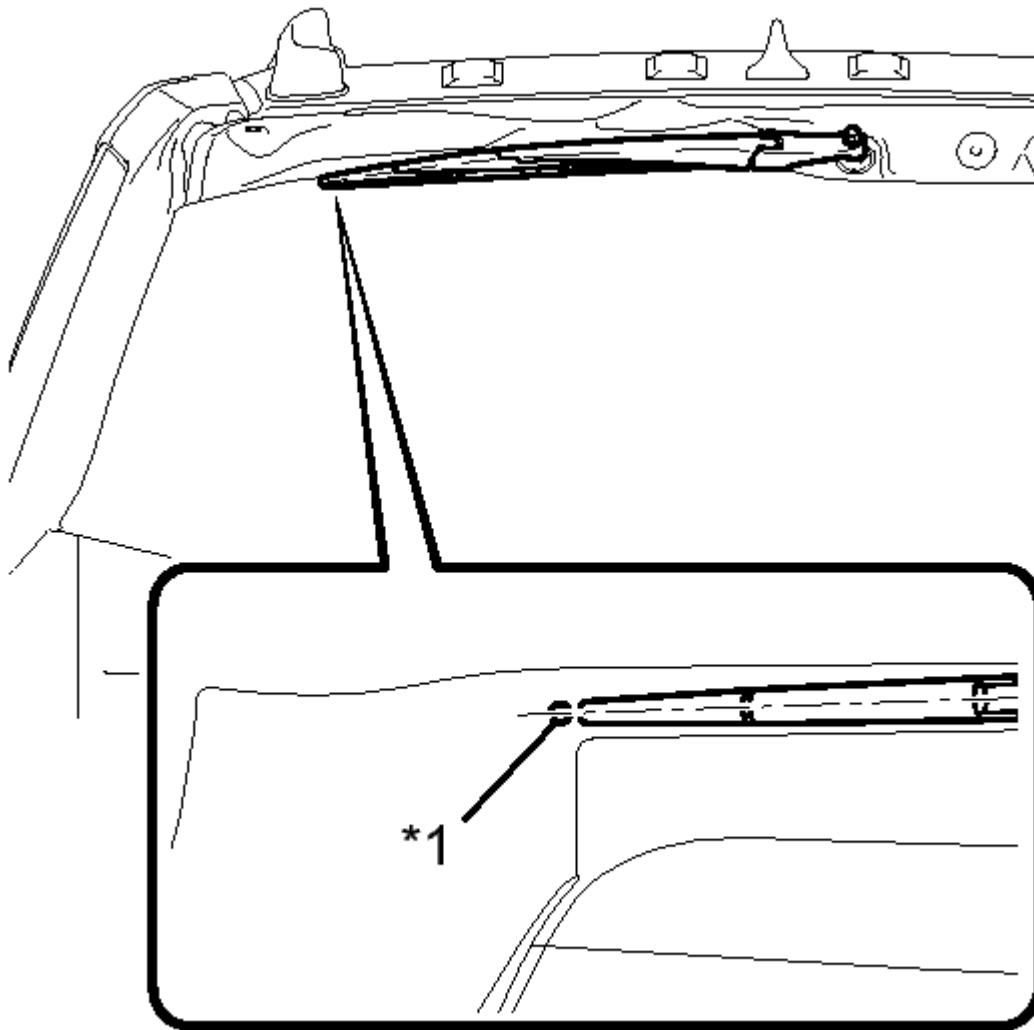
Fig. 25: Rear Wiper Motor Replacement Components With Torque Specifications
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ON-VEHICLE INSPECTION

ON-VEHICLE INSPECTION

1. INSPECT REAR WIPER MOTOR AND BRACKET ASSEMBLY

- a. Operate the rear wiper motor assembly.



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Fig. 26: Installing Rear Wiper Arm/Blade Assembly & Fastener
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Ceramic Void
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- b. Stop the rear wiper motor assembly operation.
c. Check the automatic stop position.

OK

The rear wiper stops at the position shown in the illustration.

REMOVAL

REMOVAL

1. **REMOVE BACK DOOR CENTER GARNISH** . Refer to **DISASSEMBLY - Step 1**
2. **REMOVE REAR SPOILER SUB-ASSEMBLY** . Refer to **REMOVAL - Step 2**
3. **REMOVE REAR WIPER ARM AND BLADE ASSEMBLY**
 - a. Remove the nut and the rear wiper arm and blade assembly.

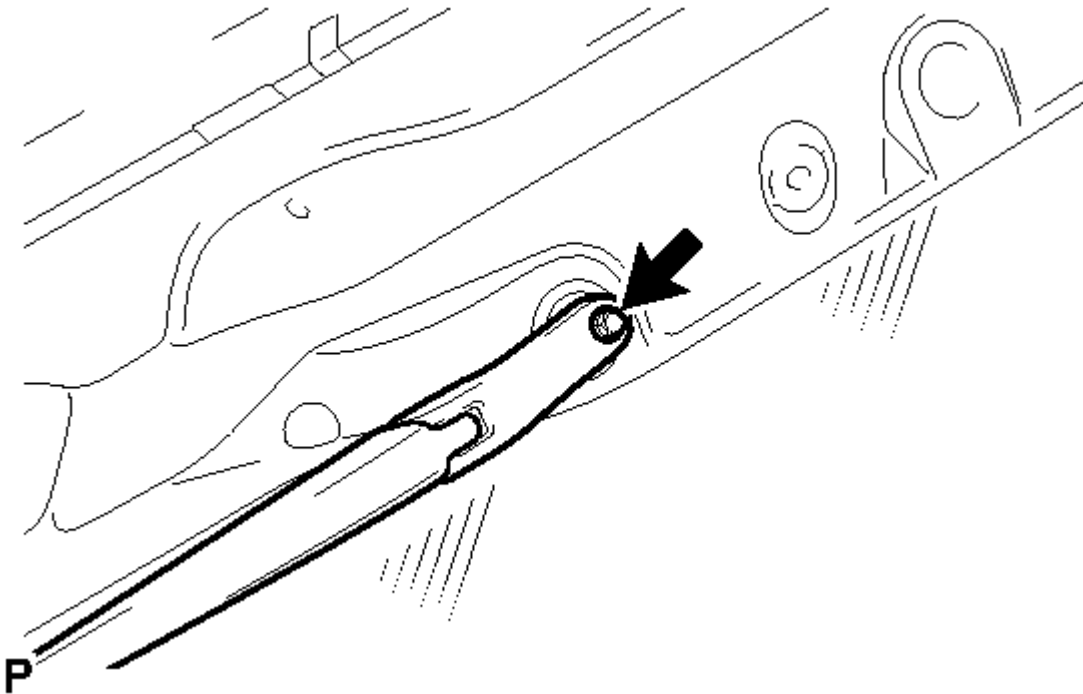
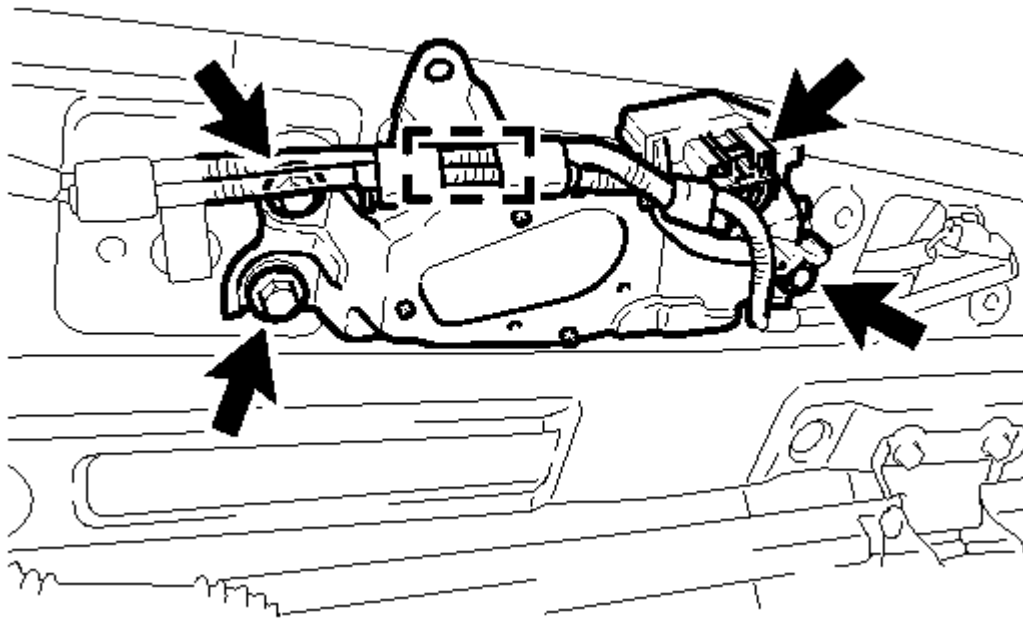


Fig. 27: Identifying Rear Wiper Arm/Blade Assembly & Fastener
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. **REMOVE REAR WIPER MOTOR AND BRACKET ASSEMBLY**
 - a. Disconnect the rear wiper motor connector.

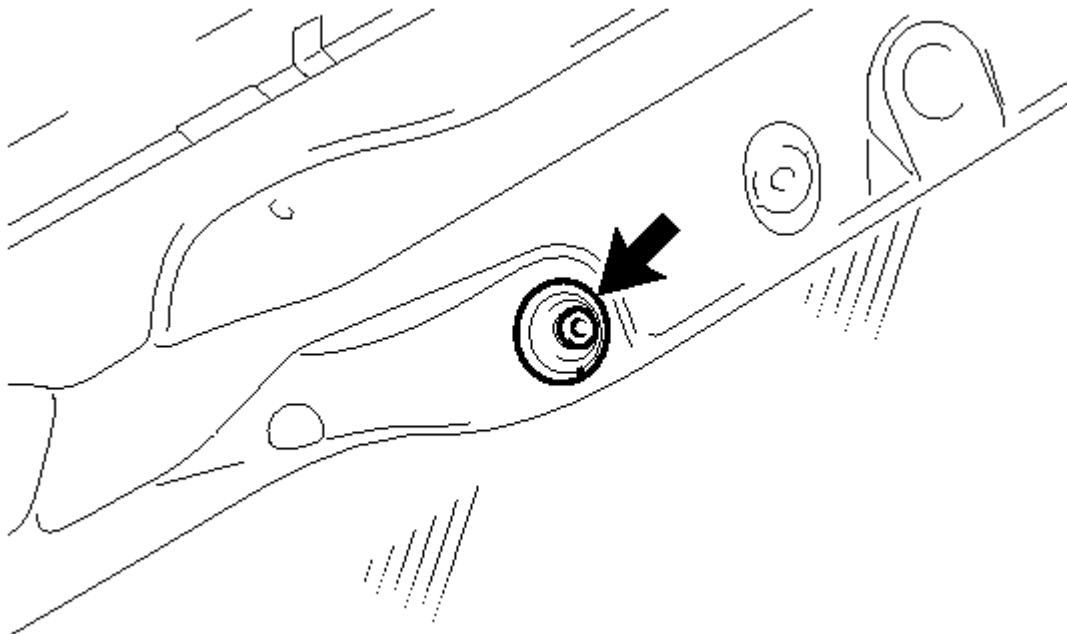


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Fig. 28: Identifying Rear Wiper Motor/Bracket Assembly, Connector, Harness Clamp & Fasteners

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

- b. Disengage the harness clamp.
 - c. Remove the 3 bolts and the rear wiper motor and bracket assembly.
5. **REMOVE REAR WIPER MOTOR GROMMET**
- a. Remove the rear wiper motor grommet.



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Fig. 29: Identifying Rear Wiper Motor Grommet
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION

INSPECTION

- 1. INSPECT REAR WIPER MOTOR AND BRACKET ASSEMBLY**
 - a. Check the wiper intermittent operation.

*a

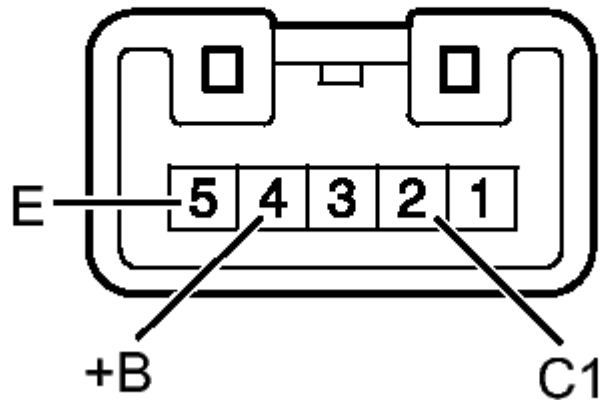


Fig. 30: Checking Wiper Intermittent Operation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

	Component without harness connected
*a	(Rear Wiper Motor and Bracket Assembly)

1. Connect a battery positive (+) lead to terminal 4 (+B), and a negative (-) lead to terminal 2 (C1) and terminal 5 (E), and check that the motor operates.

OK

Motor operates.

If the result is not as specified, replace the rear wiper motor and bracket assembly.

- b. Check the wiper continuous operation.

*a

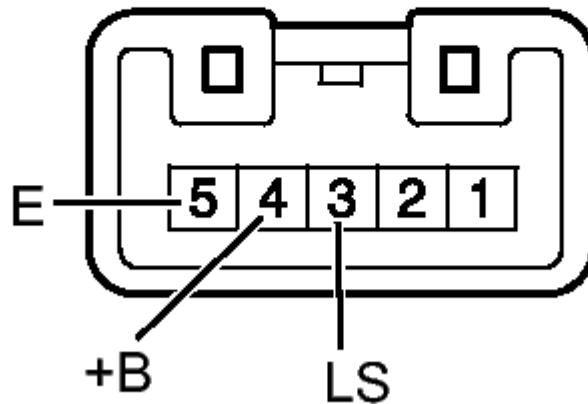


Fig. 31: Checking Wiper Continuous Operation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

	Component without harness connected
*a	(Rear Wiper Motor and Bracket Assembly)

1. Connect a battery positive (+) lead to terminal 4 (+B), and a negative (-) lead to terminal 3 (LS) and terminal 5 (E), and check that the motor operates.

OK

Motor operates.

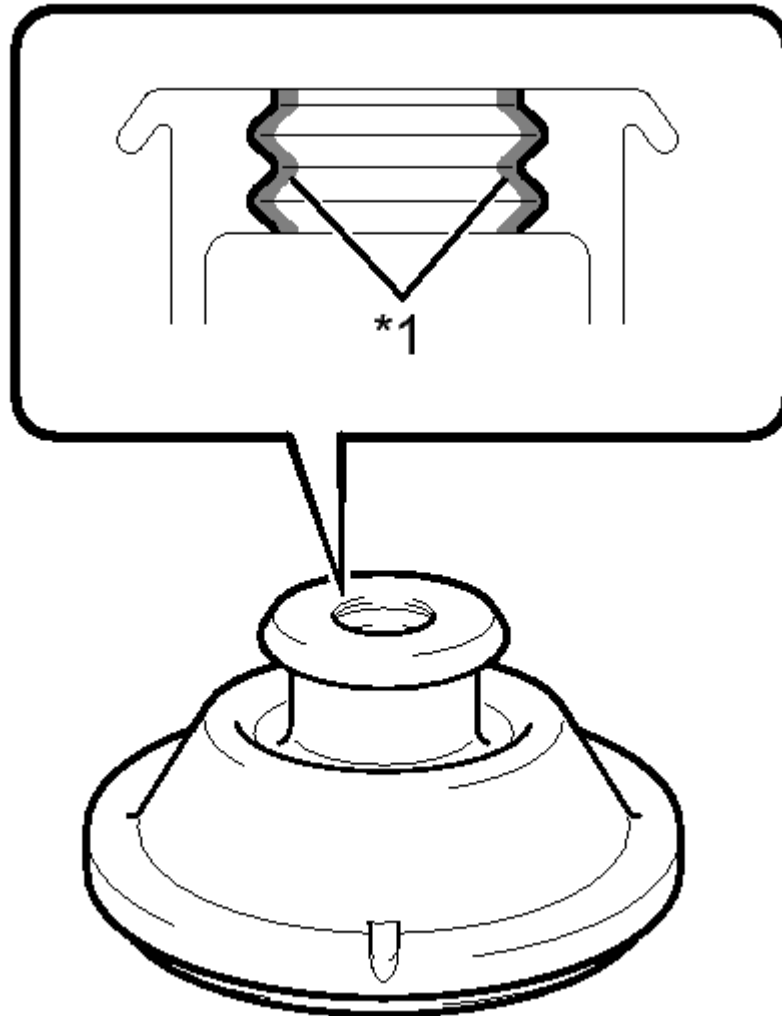
If the result is not as specified, replace the rear wiper motor and bracket assembly.

INSTALLATION

INSTALLATION

1. INSTALL REAR WIPER MOTOR GROMMET

- a. Apply MP grease to the entire surface of the rear wiper motor grommet lip.



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Fig. 32: Identifying Rear Wiper Motor Grommet Greasing Areas
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

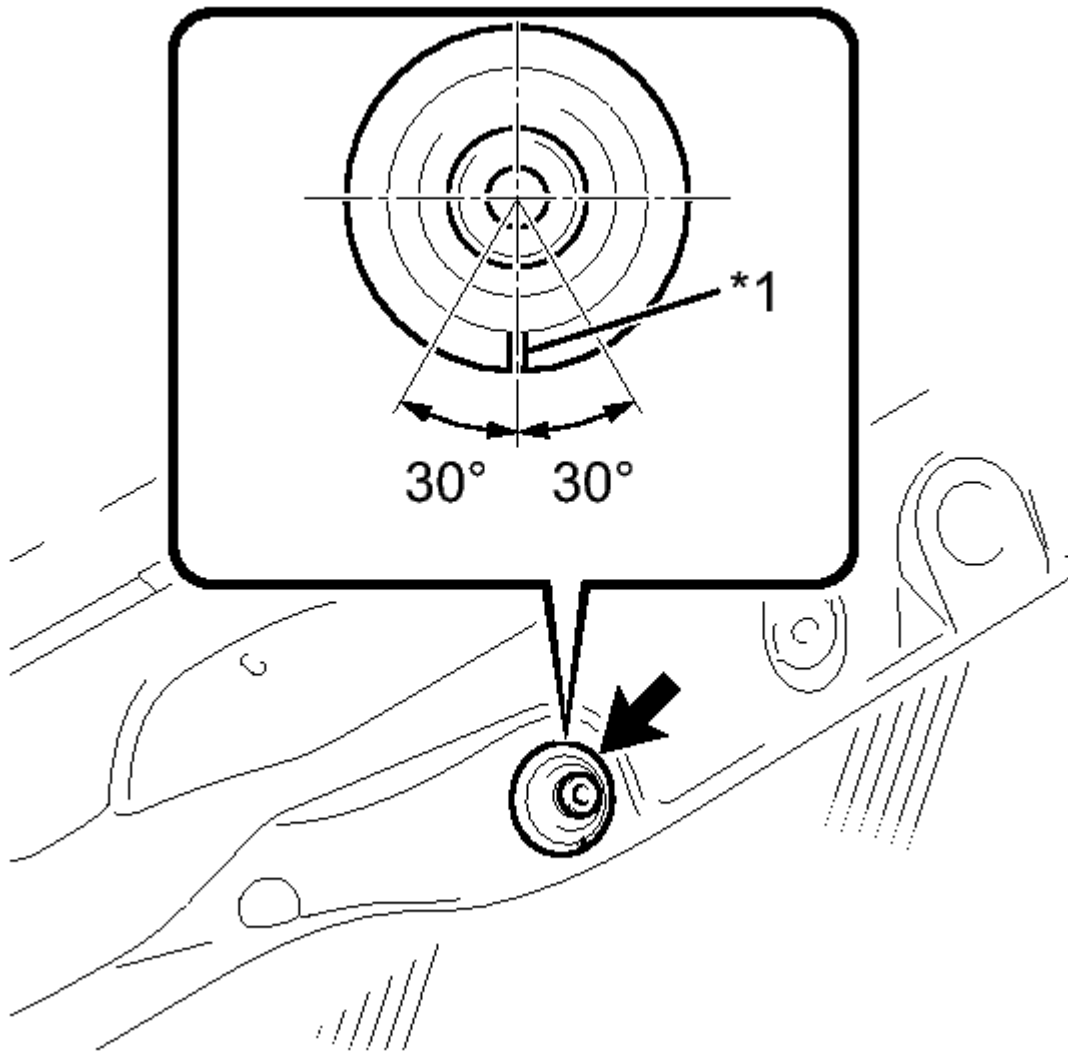
TEXT IN ILLUSTRATION

*1	MP grease
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HINT:

Make sure that the hole does not get clogged with grease and the grooves on the lip are filled with grease.

- b. Install the rear wiper motor grommet with the position mark facing downward as shown in the illustration.



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Fig. 33: Identifying Rear Wiper Motor Grommet Position
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Position Mark
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2. INSTALL REAR WIPER MOTOR AND BRACKET ASSEMBLY

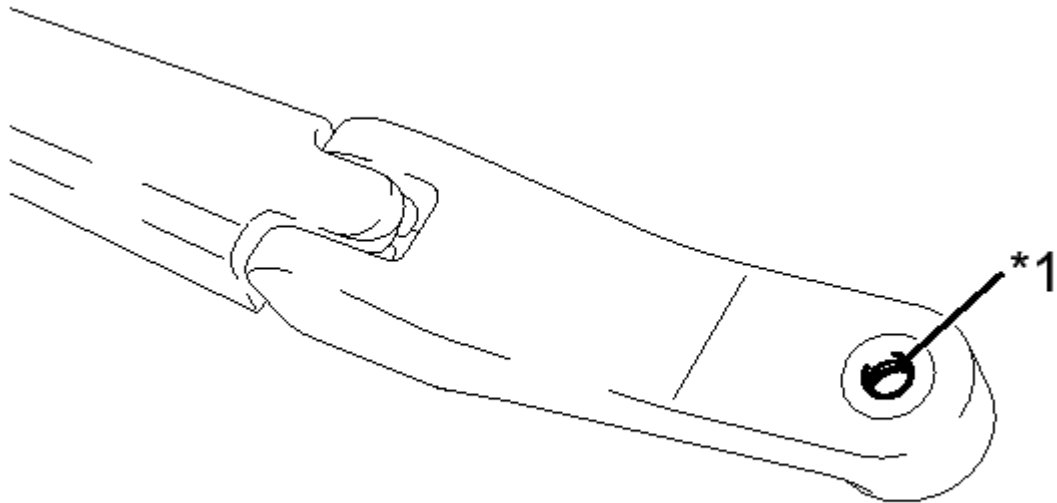
- a. Install the rear wiper motor and bracket assembly with the 3 bolts.

Torque: 5.5 N*m (56 kgf*cm, 49 in.*lbf)

- b. Connect the rear wiper motor connector.
- c. Engage the harness clamp.

3. **INSTALL REAR WIPER ARM AND BLADE ASSEMBLY**

- a. Operate the wiper and stop the rear wiper motor at the automatic stop position.
- b. When reusing the rear wiper arm and blade assembly:
 - 1. Clean the wiper arm serrations.



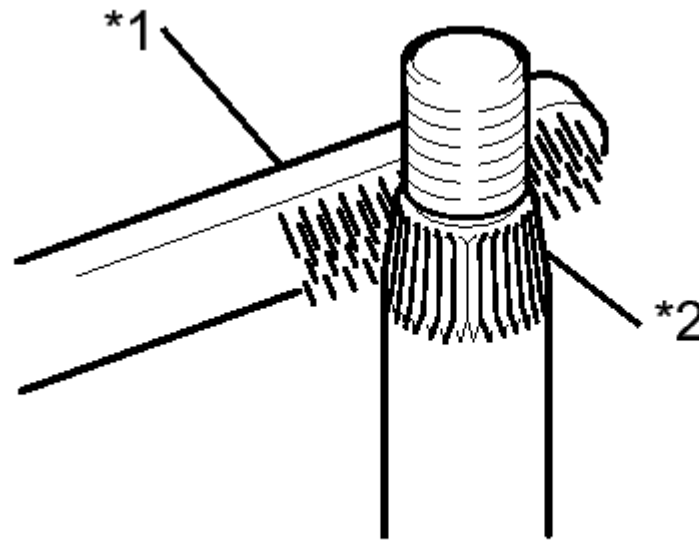
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Fig. 34: Identifying Rear Wiper Arm & Blade Assembly Serrations
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

	Wiper
*1	Arm
	Serrations

- c. When reusing the rear wiper motor assembly:
 - 1. Clean the wiper pivot serrations with a wire brush.



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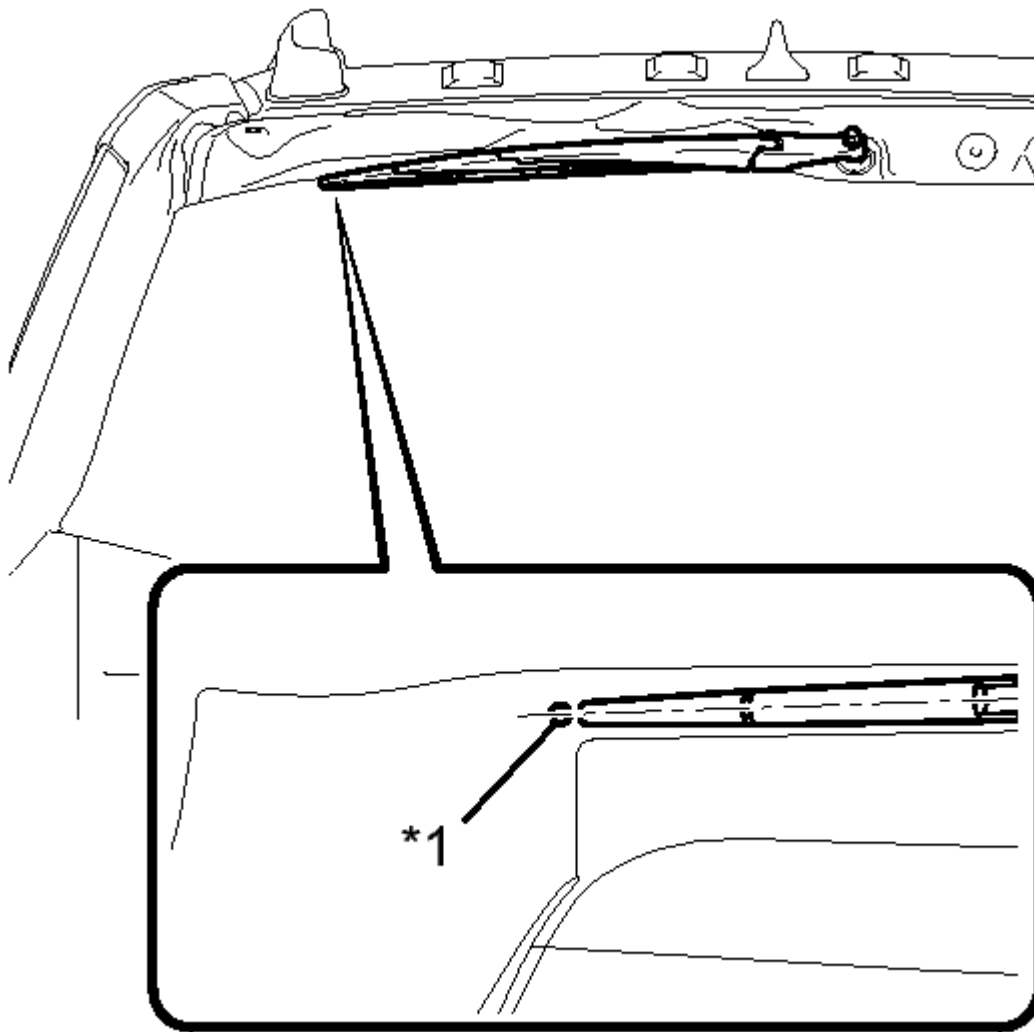
Fig. 35: Cleaning Wiper Pivot Serrations

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

TEXT IN ILLUSTRATION

*1	Wire Brush
*2	Wiper Pivot Serrations

- d. Install the rear wiper arm and blade assembly with the nut to the position shown in the illustration.



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Fig. 36: Installing Rear Wiper Arm/Blade Assembly & Fastener
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Ceramic Void
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Torque: 5.5 N*m (56 kgf*cm, 49 in.*lbf)

HINT:

Hold the wiper arm by hand while tightening the nut.

- e. Operate the rear wiper while spraying washer fluid onto the back door glass. Make sure that the rear wiper functions properly and the wiper does not come into contact with the vehicle body.

4. INSTALL REAR SPOILER SUB-ASSEMBLY . Refer to INSTALLATION - Step 1

5. INSTALL BACK DOOR CENTER GARNISH . Refer to REASSEMBLY - Step 28

FRONT WIPER RUBBER

COMPONENTS

ILLUSTRATION

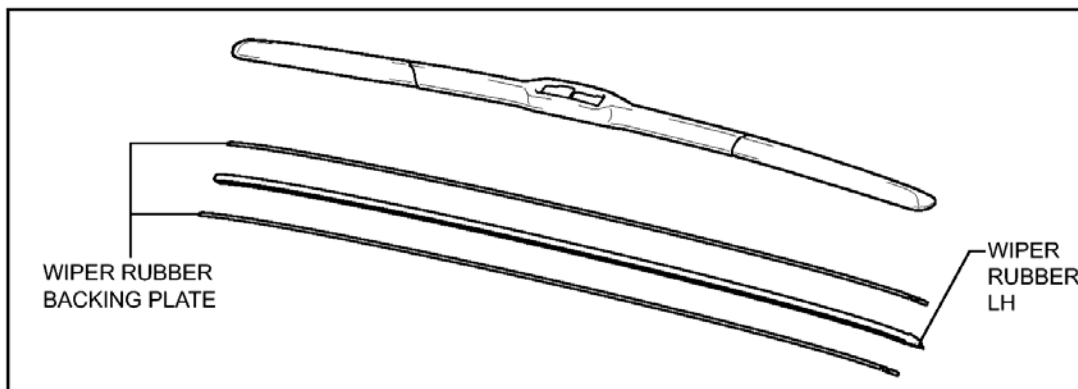
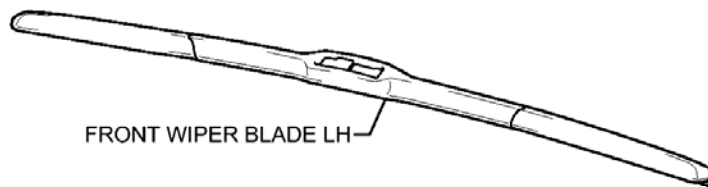
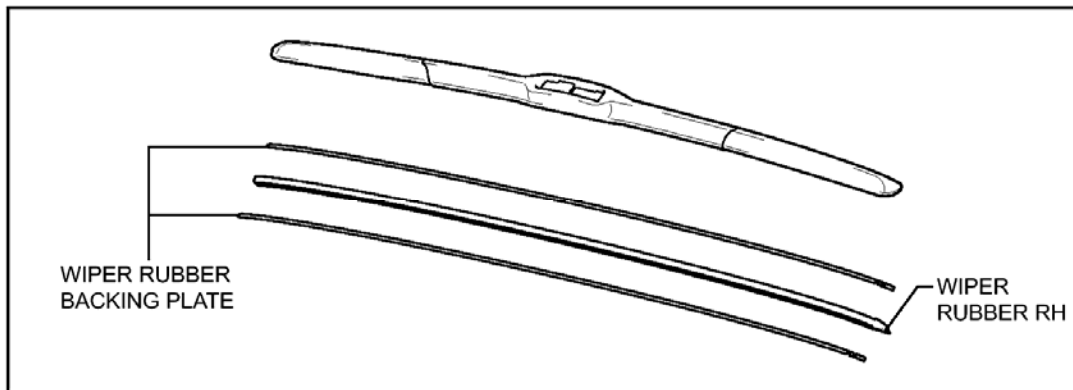
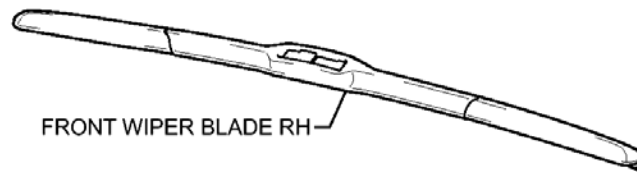


Fig. 37: Identifying Front Wiper Rubber Replacement Components
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REPLACEMENT

REPLACEMENT

- 1. REMOVE FRONT WIPER BLADE LH
 - a. Disengage the front wiper blade holder.
 - b. Remove the front wiper blade from the front wiper arm as shown in the illustration.

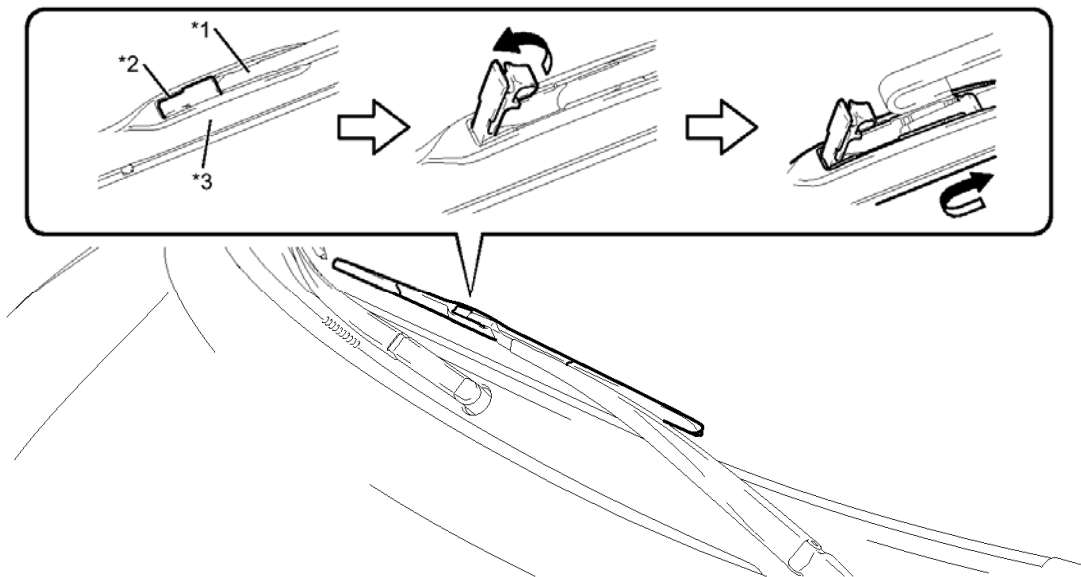


Fig. 38: Removing Front Wiper Blade LH Holder
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Front Wiper Arm	*2	Holder
*3	Front Wiper Blade	-	-

NOTE: Do not fold the wiper arm with the wiper blade removed. The arm tip may damage the windshield surface.

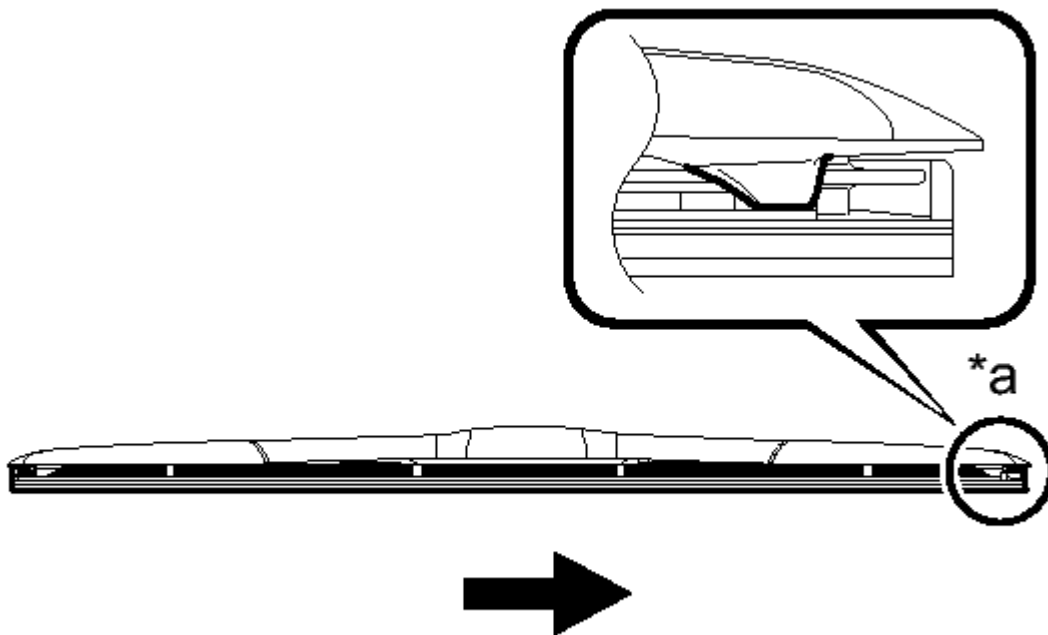
- 2. REMOVE FRONT WIPER BLADE RH

HINT:

Use the same procedure as for the LH side.

3. REMOVE WIPER RUBBER LH

- a. Remove the wiper rubber LH with the wiper rubber backing plates from the front wiper blade LH as shown in the illustration.



P

Fig. 39: Removing Wiper Rubber LH & Backing Plates
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

	Vehicle
*a	LH
	Outside

- b. Remove the wiper rubber LH from the 2 wiper rubber backing plates.

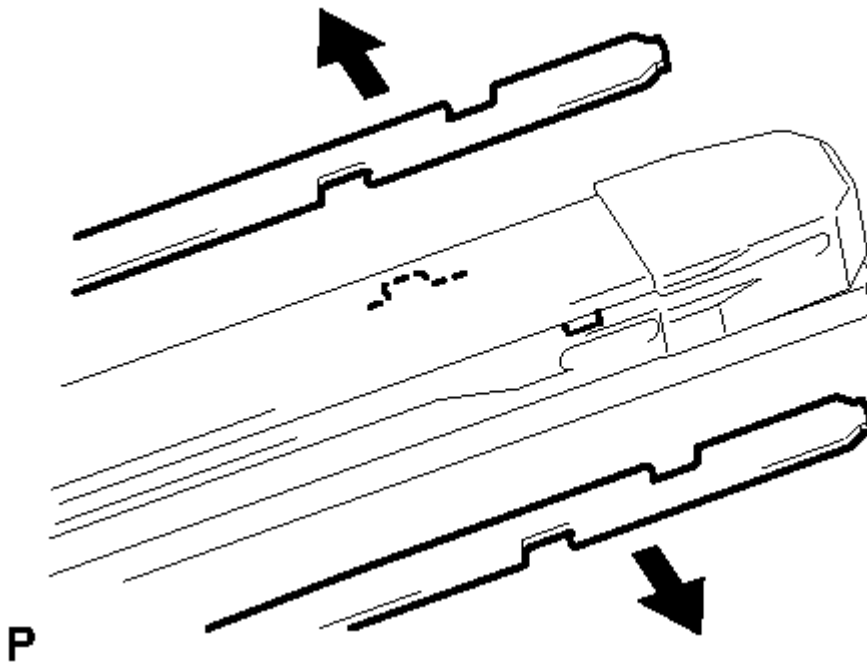


Fig. 40: Removing Wiper Backing Plates From Wiper Rubber LH
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. REMOVE WIPER RUBBER RH

HINT:

Use the same procedure as for the LH side.

5. INSTALL WIPER RUBBER LH

- a. Install the 2 wiper rubber backing plates to the wiper rubber LH.

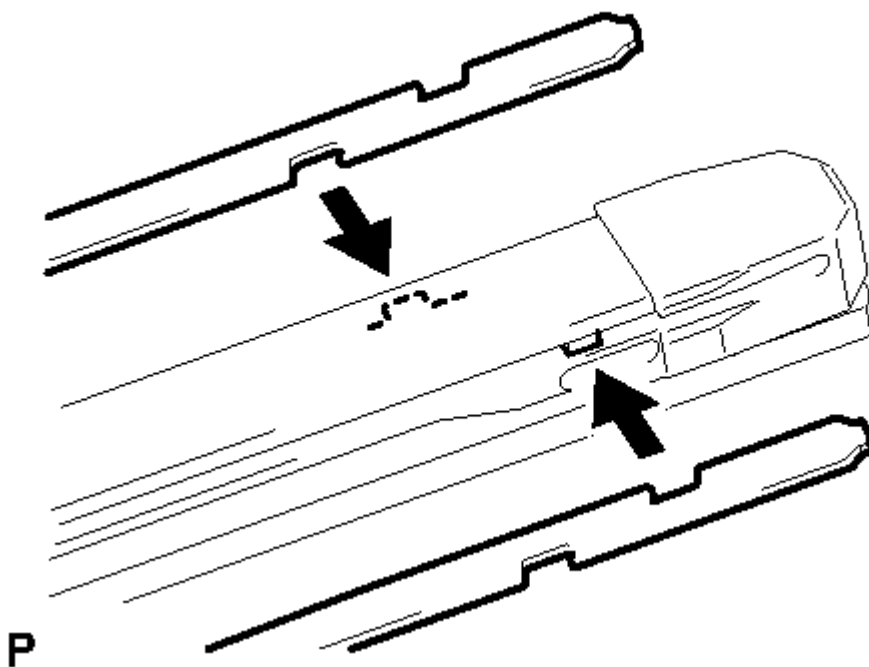
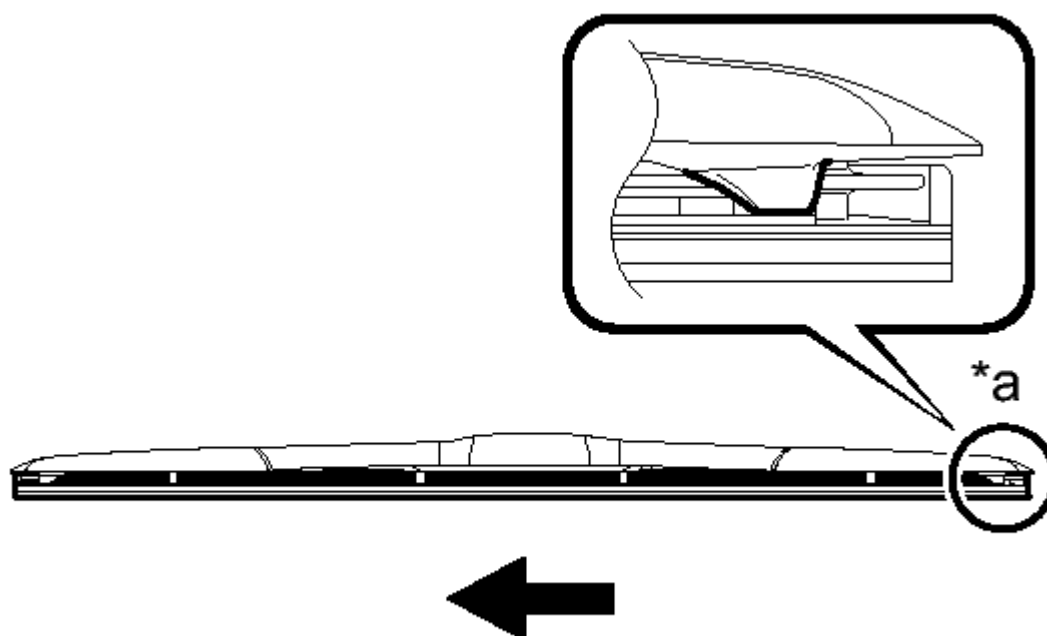


Fig. 41: Install the 2 wiper rubber backing plates

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

NOTE: **Align the protrusions on the wiper rubber LH and the notches of the backing plates.**

- b. Install the wiper rubber LH to the front wiper blade LH as shown in the illustration.



P

Fig. 42: Installing Wiper Rubber LH To Front Wiper Blade LH
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

	Vehicle
*a	LH
	Outside

NOTE: Push the wiper rubber LH into the wiper blade LH strongly to engage them securely.

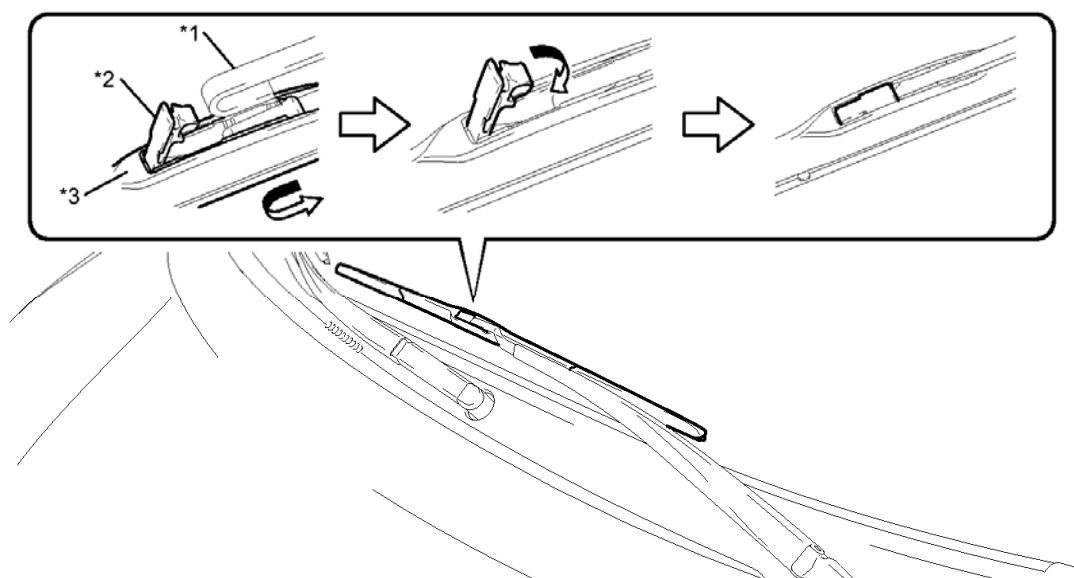
6. INSTALL WIPER RUBBER RH

HINT:

Use the same procedure as for the LH side.

7. INSTALL FRONT WIPER BLADE LH

- a. Install the front wiper blade as shown in the illustration.



P

Fig. 43: Installing Front Wiper Blade LH
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Front Wiper Arm	*2	Holder
*3	Front Wiper Blade	-	-

b. Engage the front wiper blade holder.

8. INSTALL FRONT WIPER BLADE RH

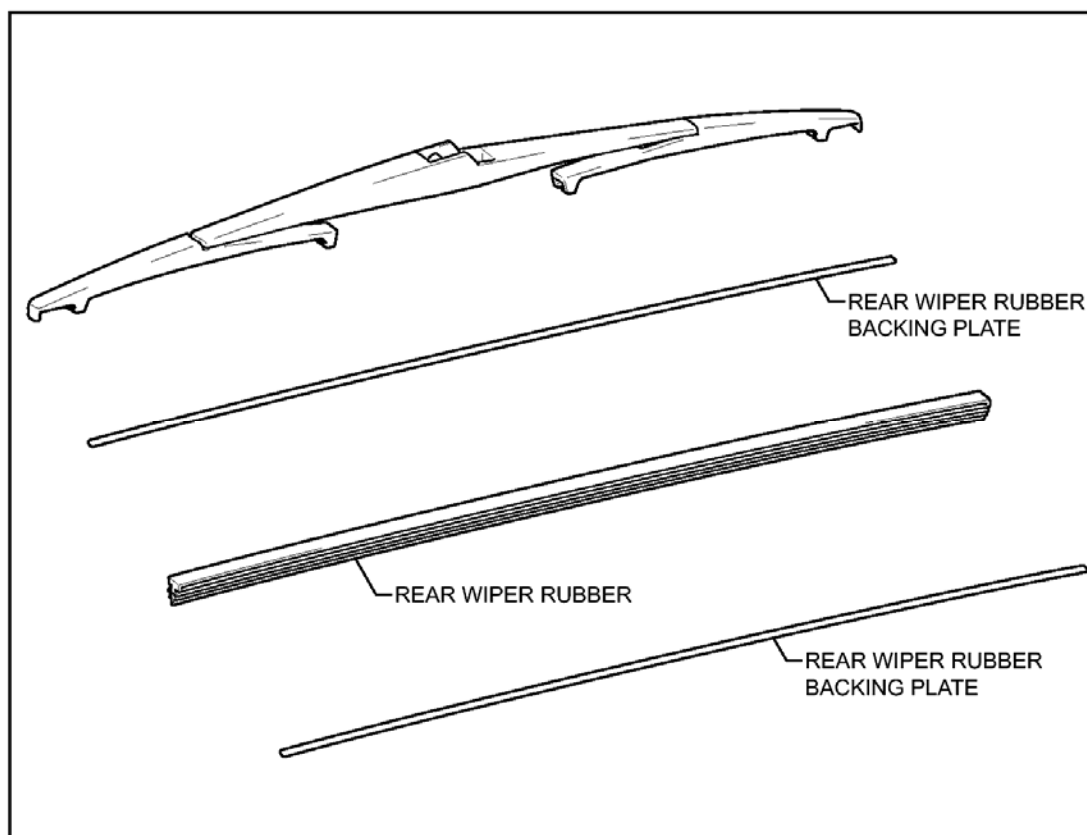
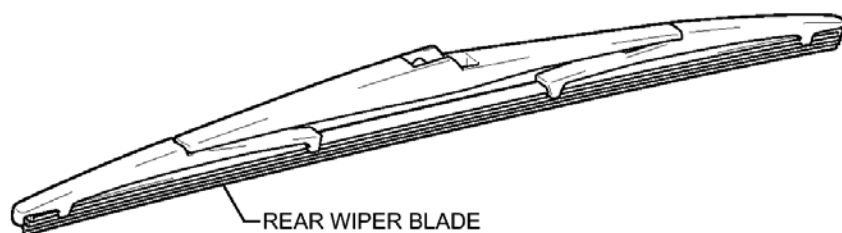
HINT:

Use the same procedure as for the LH side.

REAR WIPER RUBBER

COMPONENTS

ILLUSTRATION



P
Fig. 44: Identifying Rear Wiper Rubber Replacement Components
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REPLACEMENT

REPLACEMENT

1. REMOVE REAR WIPER BLADE

- Turn the ignition switch to ON.
- Turn the rear wiper switch on.
- Turn the ignition switch off when the wiper arm stops at the position shown in the illustration.

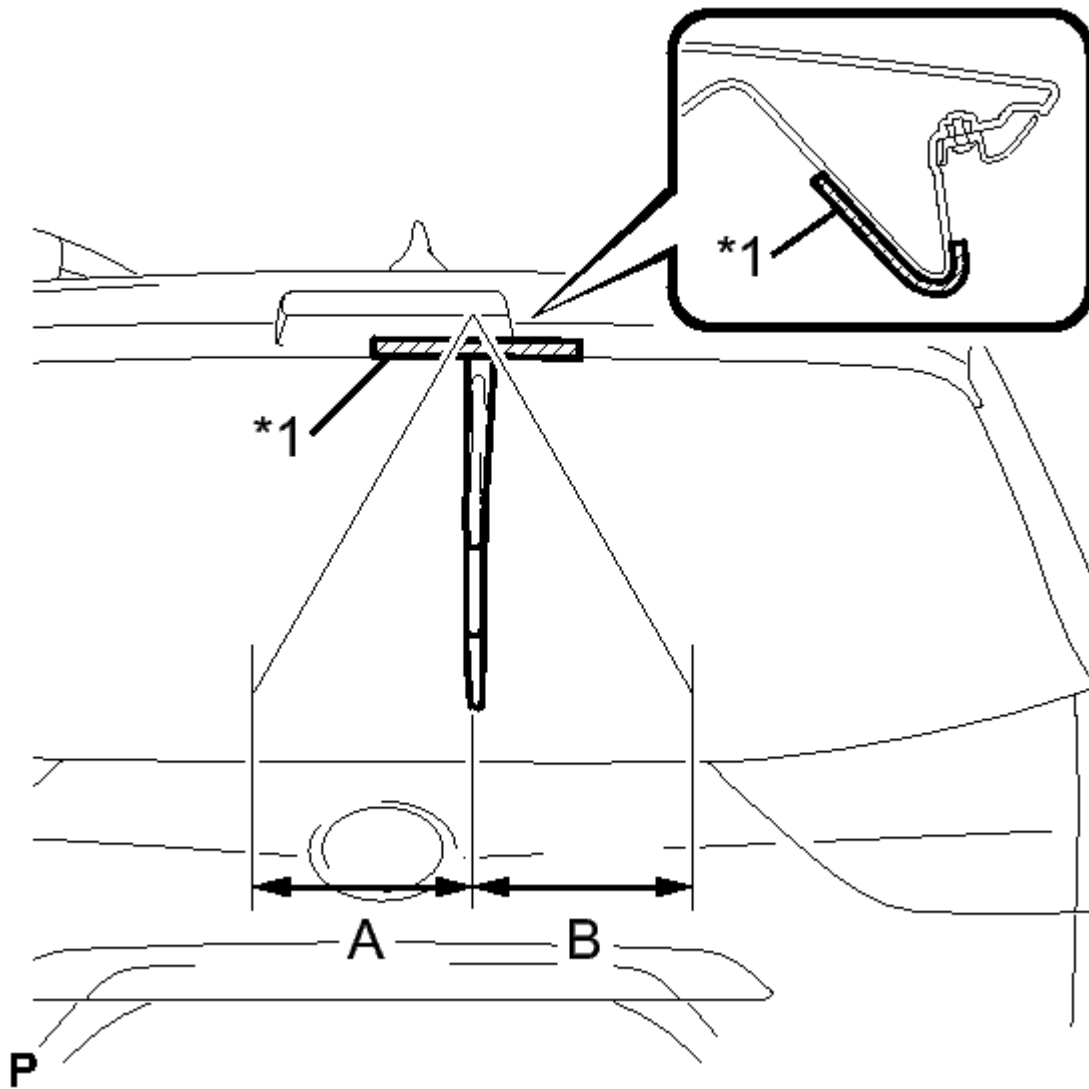


Fig. 45: Identifying Rear Wiper Blade Position

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

TEXT IN ILLUSTRATION

*1	Protective Tape
----	--------------------

Standard Clearance

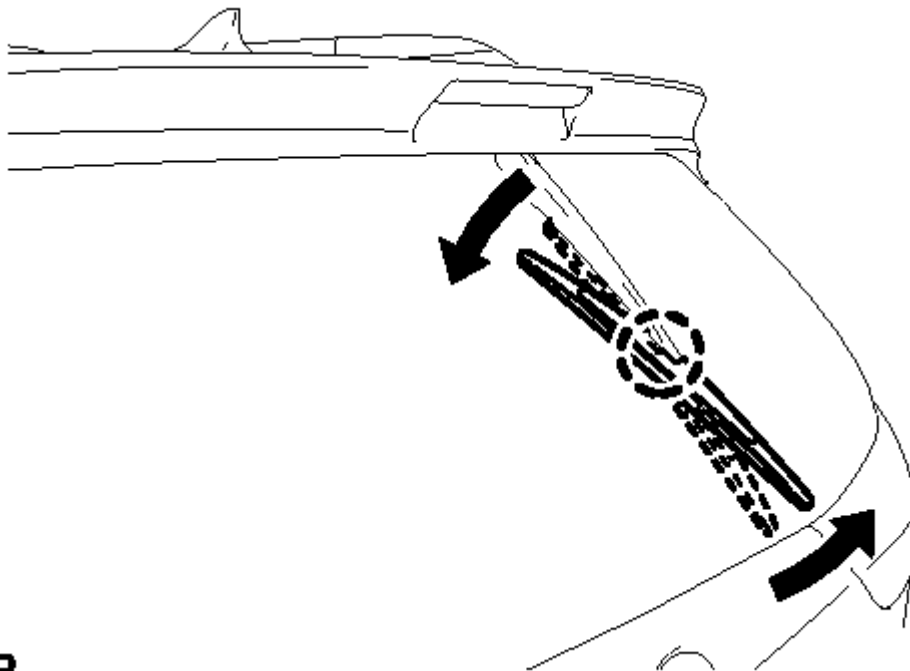
Area	Measurement
	Approximately

A	144 mm (5.67 in.)
B	Approximately 144 mm (5.67 in.)

HINT:

It is easier to stop the wiper blade at the position indicated in the illustration while the wiper blade is returning to the original position.

- d. Apply protective tape to the areas shown in the illustration.
- e. Raise the wiper blade to the position where the claw detaches with a click sound as shown in the illustration.



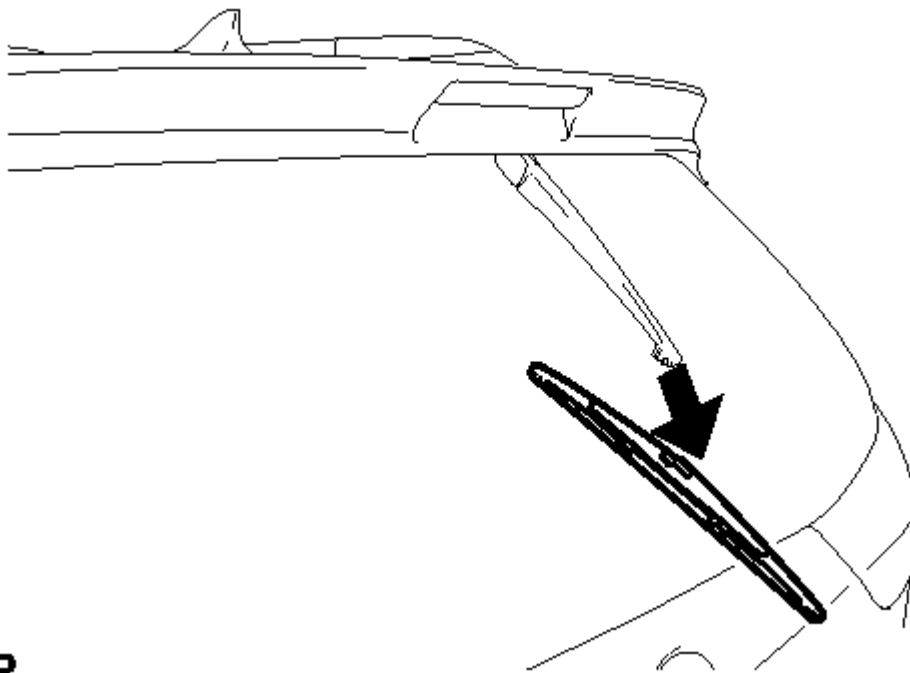
P

Fig. 46: Disengaging Rear Wiper Blade Claw
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE:

- Make sure that the wiper arm does not interfere with the rear spoiler.
- If the wiper arm does interfere with the rear spoiler, perform steps (a) through (c) again, making sure to stop the wiper arm in a near-vertical position.
- Be careful not to damage the claw.

- f. Pull the wiper blade straight toward the left side of the vehicle to remove it from the wiper arm.



P

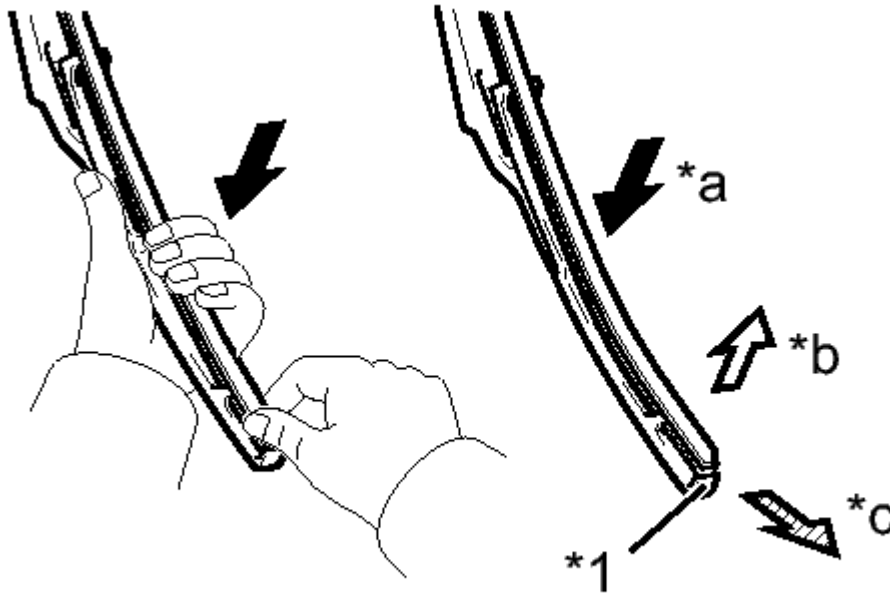
Fig. 47: Removing Rear Wiper Blade

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

NOTE: Do not lower the wiper arm with the wiper blade removed. The arm tip may damage the back door glass surface.

2. REMOVE REAR WIPER RUBBER

- a. Lift and pull the end of the wiper rubber protrusion from the blade stopper as shown in the illustration.



P

Fig. 48: Removing Rear Wiper Rubber

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

TEXT IN ILLUSTRATION

*1	Stopper (Rear End of Blade)
*a	Lightly Push (Grip)
*b	Lift
*c	Pull

NOTE: Do not forcibly pull out the wiper rubber. The backing plates will be deformed or the blade claws will be damaged.

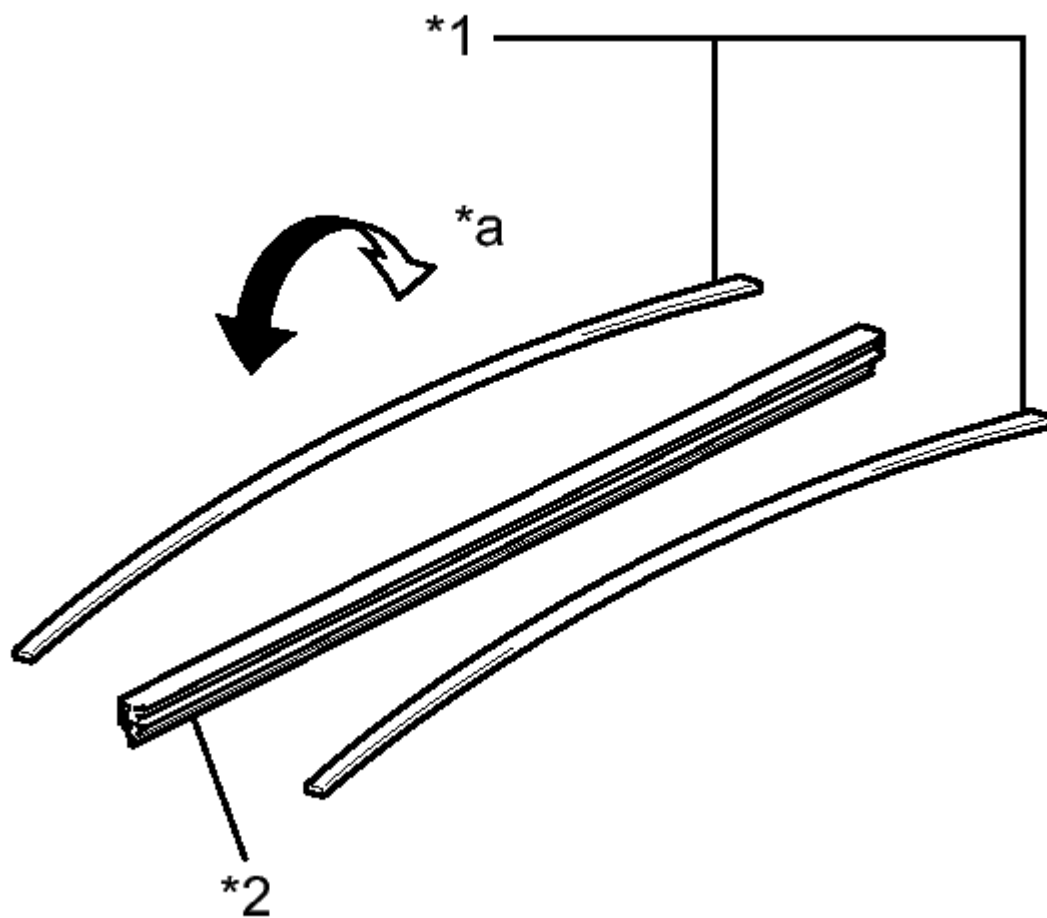
HINT:

Lightly pushing the rubber in the middle will allow it to be removed more easily.

b. Remove the rear wiper rubber backing plates.

3. INSTALL REAR WIPER RUBBER

a. Install the rear wiper rubber backing plates as shown in the illustration.



P

Fig. 49: Installing Rear Wiper Rubber

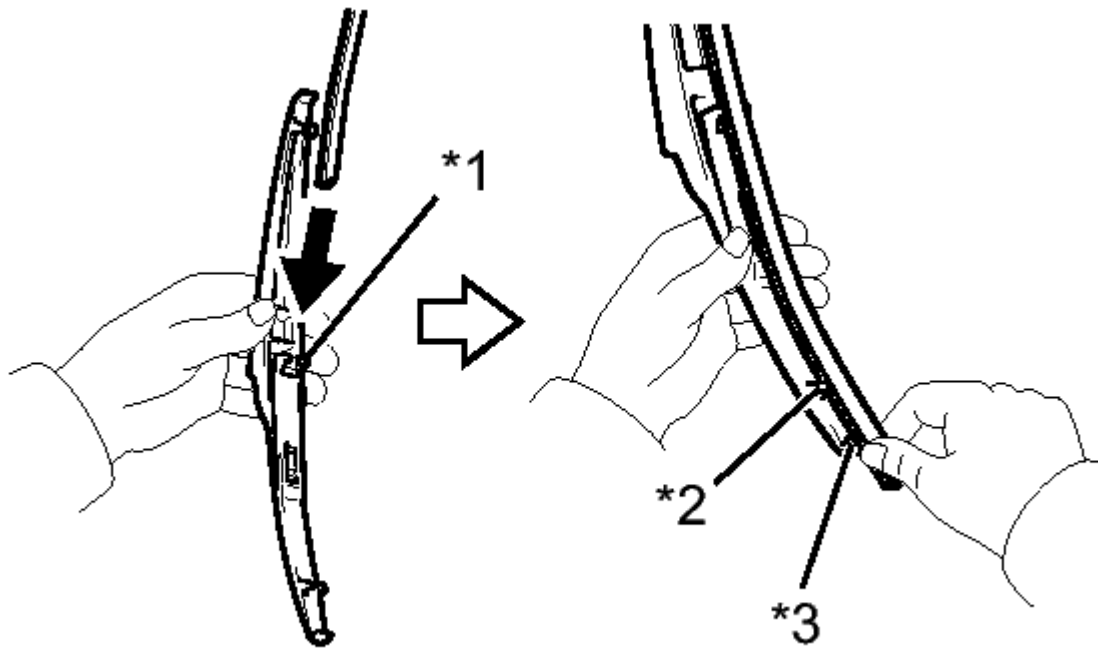
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Rear Wiper Rubber Backing Plate
*2	Rear Wiper Rubber
*a	Curve

NOTE: Install the backing plates facing the correct direction.

- b. Insert the wiper rubber from the front end of the wiper blade to the rear end through the second claw.
- c. After pushing the wiper rubber through the rear end claw, allow it to stick out from the rear end stopper.



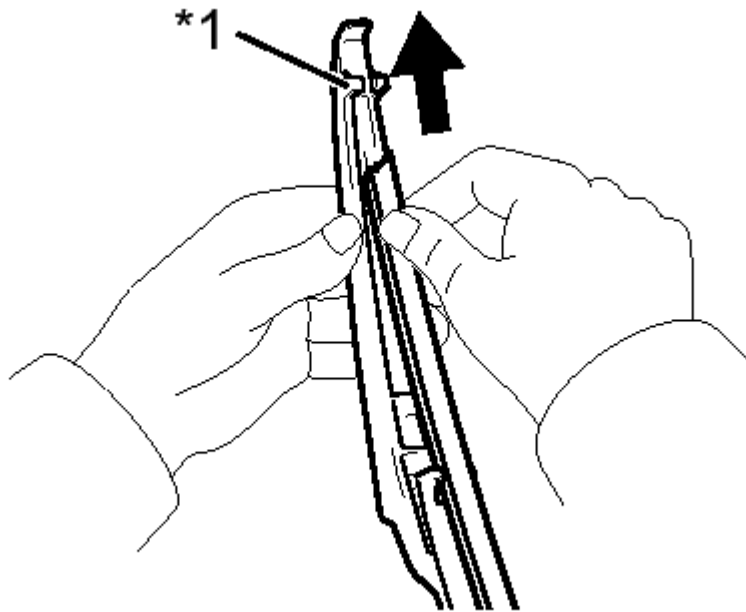
P

Fig. 50: Installing Wiper Rubber To Wiper Blade
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Second Claw
*2	Rear End Claw
*3	Rear End Stopper

- d. Slide the wiper rubber through the front end claw.



P

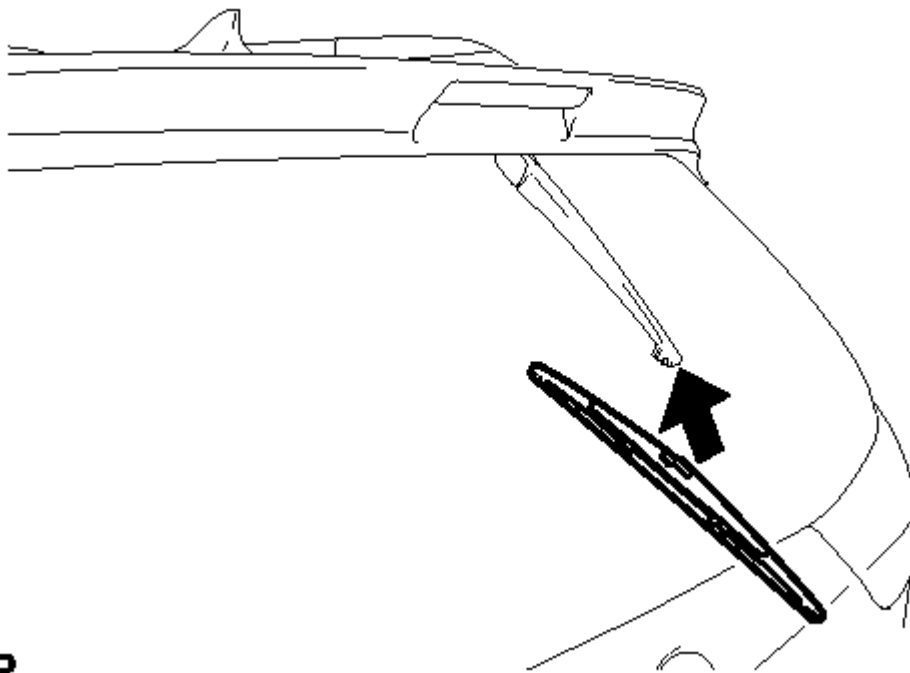
Fig. 51: Installing Wiper Rubber To Front End Claw
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

	Front
*1	End
	Claw

4. INSTALL REAR WIPER BLADE

- a. Push the wiper blade straight toward the right side of the vehicle to install it to the wiper arm.

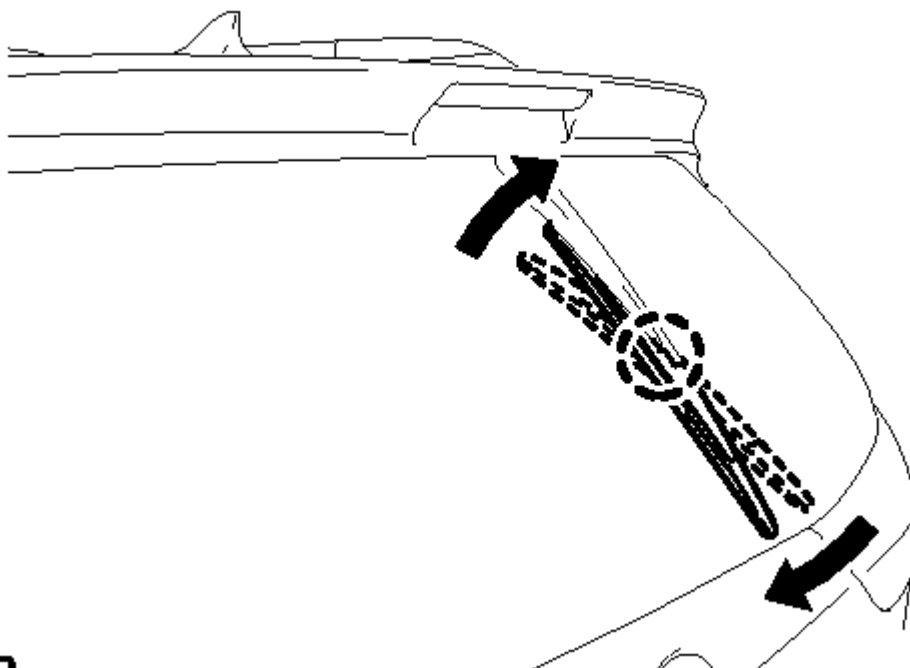


P

Fig. 52: Installing Rear Wiper Blade To Wiper Arm
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: Make sure that the wiper arm does not interfere with the rear spoiler.

- b. Engage the claw to install the rear wiper blade as shown in the illustration.



P

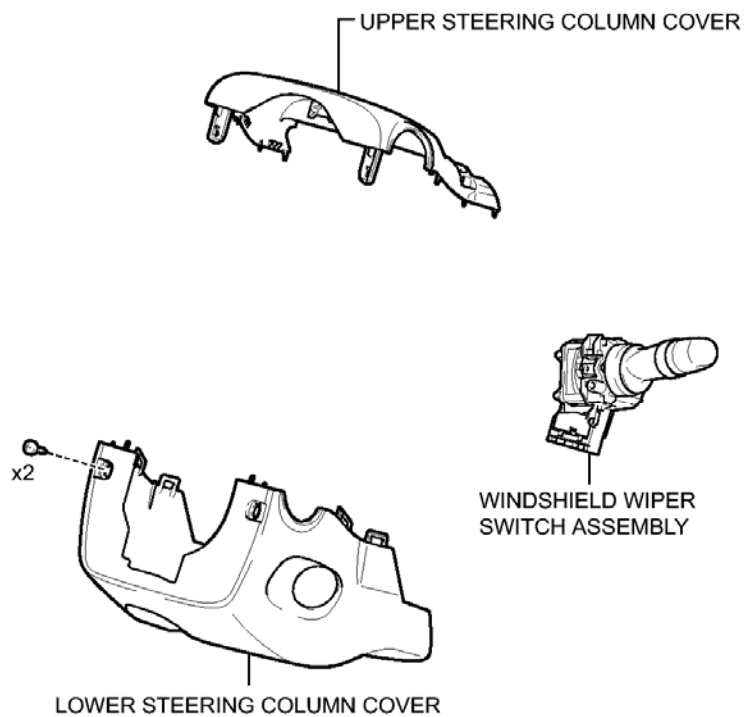
Fig. 53: Engaging Rear Wiper Blade Claw
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: Be careful not to damage the claw.

WIPER SWITCH

COMPONENTS

ILLUSTRATION



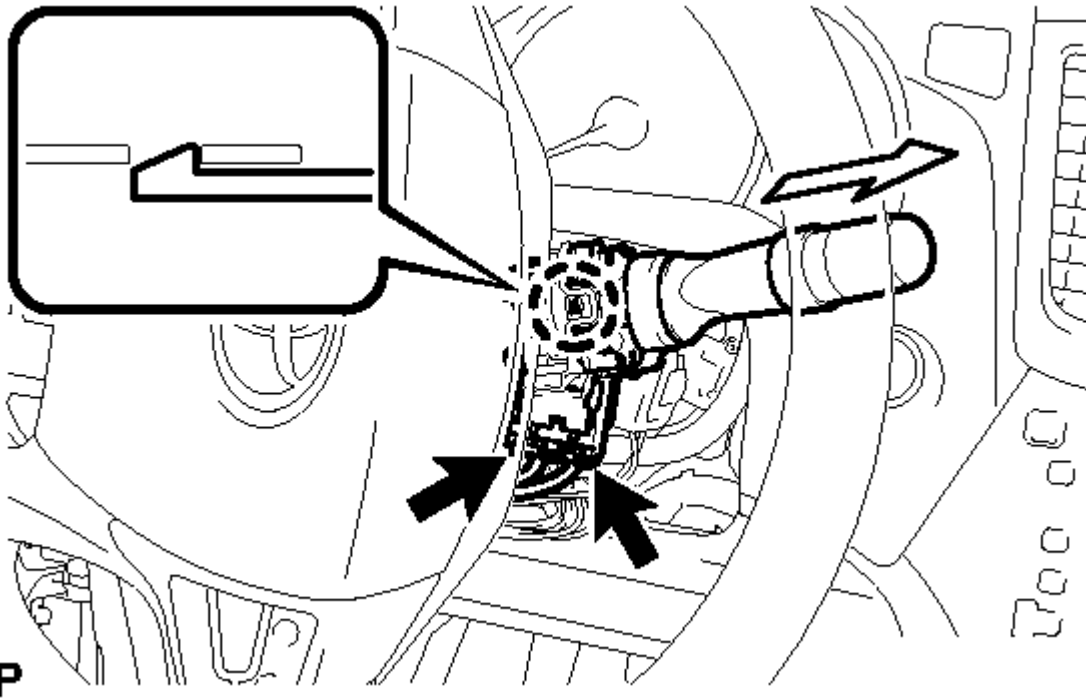
P

Fig. 54: Identifying Wiper Switch Replacement Components
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

REMOVAL

1. **REMOVE LOWER STEERING COLUMN COVER** . Refer to **REMOVAL - Step 1**
2. **REMOVE UPPER STEERING COLUMN COVER** . Refer to **REMOVAL - Step 2**
3. **REMOVE WINDSHIELD WIPER SWITCH ASSEMBLY**
 - a. Disconnect the 2 windshield wiper switch connectors.



P

Fig. 55: Removing Windshield Wiper Switch Assembly, Connectors & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Disengage the claw and remove the windshield wiper switch assembly as shown in the illustration.

NOTE: If the claw is pushed with excessive force, it may break.

INSPECTION

INSPECTION

1. **INSPECT WINDSHIELD WIPER SWITCH ASSEMBLY (w/ Rain Sensor)**
 - a. Check the front wiper switch.

*a

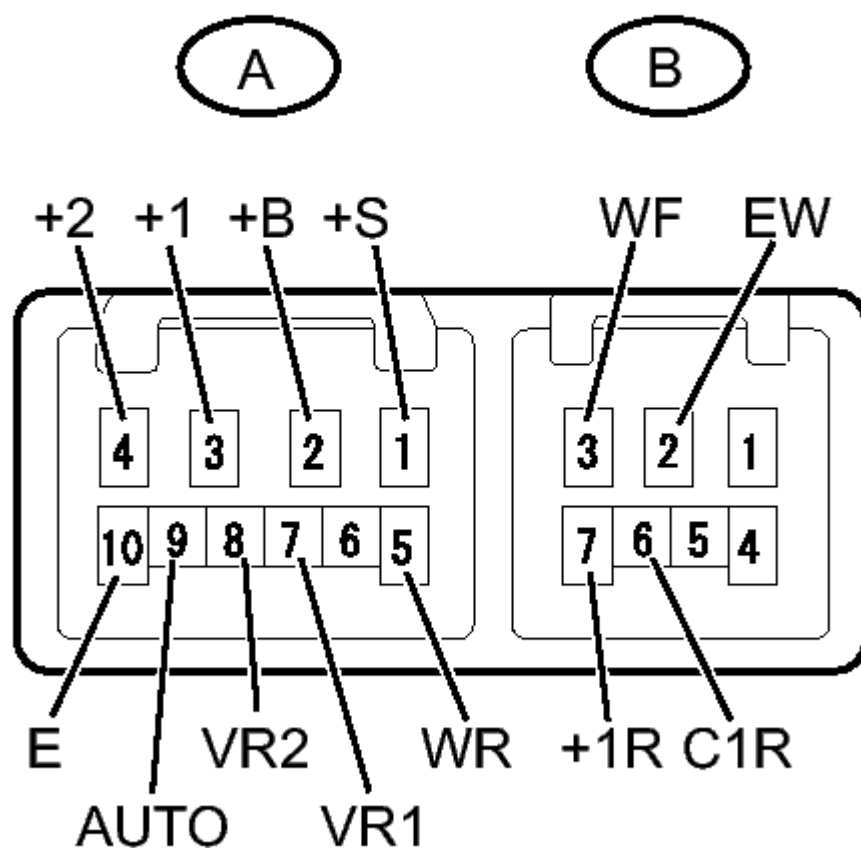


Fig. 56: Inspecting Windshield Wiper Switch Assembly Operation (w/ Rain Sensor)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	Component without harness connected (Windshield Wiper Switch Assembly)
----	--

1. Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Switch Condition	Specified Condition
A-1 (+S) - A-3 (+1)	OFF	Below 1 ohms
A-9 (AUTO) - A-10 (E)	AUTO	
A-1 (+S) - A-3 (+1)		
A-2 (+B) - A-3 (+1)	MIST	
A-2 (+B) - A-3 (+1)	LO	
A-2 (+B) - A-4 (+2)	HI	

If the result is not as specified, replace the windshield wiper switch assembly.

b. Check the front washer switch.

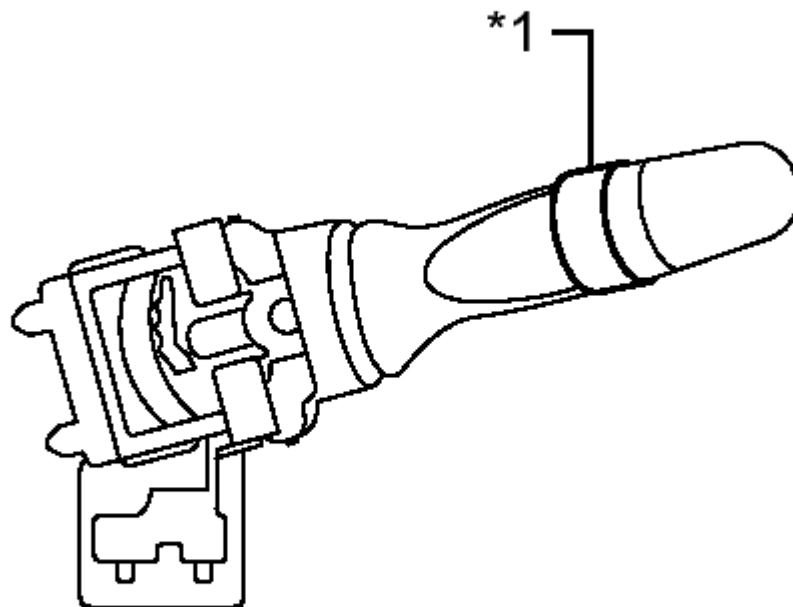
1. Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Switch Condition	Specified Condition
B-2 (EW) - B-3 (WF)	ON	Below 1 ohms
	OFF	10 kohms or higher

If the result is not as specified, replace the windshield wiper switch assembly.

c. Check the rain sensor adjust switch.



H

Fig. 57: Checking Rain Sensor Adjust Switch Operation
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Rain Sensor Adjust Switch
----	------------------------------------

1. Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Switch Condition	Specified Condition

A-7 (VR1) - A-8 (VR2)	Rain sensor adjust switch maximum to minimum position	0 to 2.7 Kohms
-----------------------------	--	-------------------

If the result is not as specified, replace the windshield wiper switch assembly.

d. Check the rear wiper switch.

1. Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Switch Condition	Specified Condition
B-2 (EW) - B-6 (C1R)	OFF	10 kohms or higher
B-2 (EW) - B-7 (+1R)		
B-2 (EW) - B-6 (C1R)	LO	Below 1 ohms
B-2 (EW) - B-7 (+1R)	HI	

If the result is not as specified, replace the windshield wiper switch assembly.

e. Check the rear washer switch.

1. Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Switch Condition	Specified Condition
A-5 (WR) - B-2 (EW)	OFF	10 kohms or higher
B-2 (EW) - B-7 (+1R)		
A-5 (WR) - B-2 (EW)	WASH	Below 1 ohms
A-5 (WR) - B-2 (EW)	ON + WASH	
B-2 (EW) -		

B-7 (+1R)		
-----------	--	--

If the result is not as specified, replace the windshield wiper switch assembly.

2. INSPECT WINDSHIELD WIPER SWITCH ASSEMBLY (w/o Rain Sensor)

- a. Check the front wiper switch.

*a

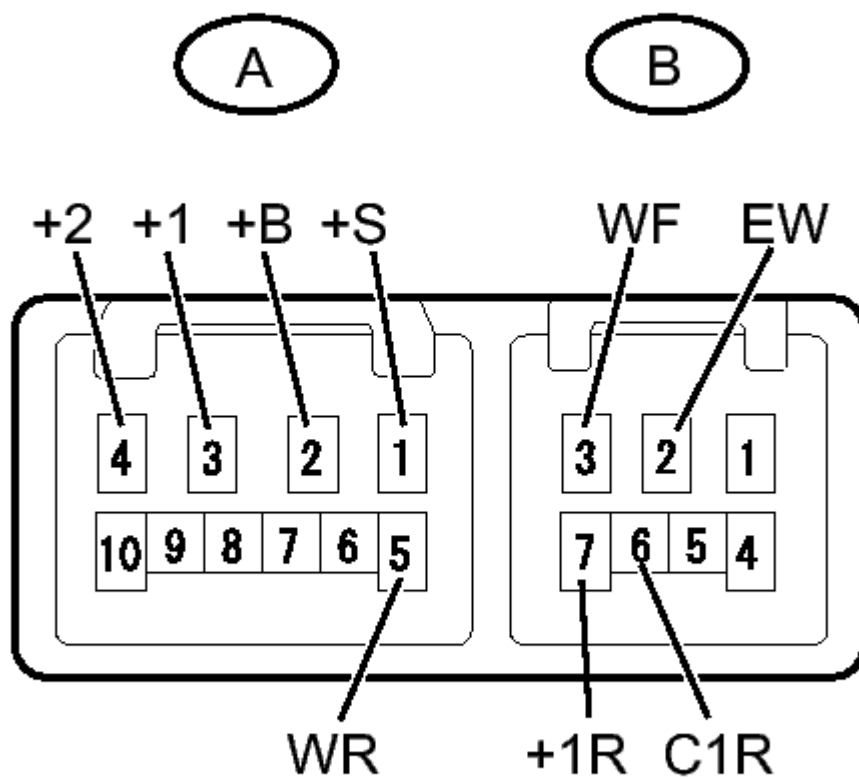


Fig. 58: Inspecting Windshield Wiper Switch Assembly Operation (w/o Rain Sensor)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	Component without harness connected
----	-------------------------------------

(Windshield Wiper Switch Assembly)

1. Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Switch Condition	Specified Condition
A-1 (+S) - A-3 (+1)	OFF	Below 1 ohms
A-1 (+S) - A-3 (+1)	INT	
A-2 (+B) - A-3 (+1)	MIST	
A-2 (+B) - A-3 (+1)	LO	
A-2 (+B) - A-4 (+2)	HI	

If the result is not as specified, replace the windshield wiper switch assembly.

- b. Check the front washer switch.

1. Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Switch Condition	Specified Condition
B-2 (EW) - B-3 (WF)	ON	Below 1 ohms
	OFF	10 kohms or higher

If the result is not as specified, replace the windshield wiper switch assembly.

- c. Check the intermittent operation.

1. Connect the voltmeter positive (+) lead to terminal A-3 (+1) and the negative (-) lead to terminal B-2 (EW).
2. Connect the battery positive (+) lead to terminal A-2 (+B) and the negative (-) lead to terminal B-2 (EW) and A-1 (+S).
3. Turn the wiper switch to the INT position.

4. Connect the battery positive (+) lead to terminal A-1 (+S) for 5 seconds.
5. Connect the battery negative (-) lead to terminal A-1 (+S). Operate the intermittent wiper relay and check the voltage between terminals A-3 (+1) and B-2 (EW).

OK

Refer to the illustration below.

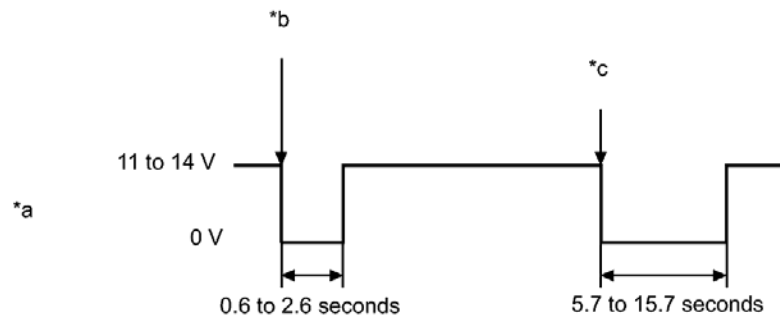


Fig. 59: Checking Intermittent Operation

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

TEXT IN ILLUSTRATION

*a	Voltage between terminals A-3 (+1) and B-2 (EW)	*b	FAST: Connect battery negative lead to terminal A-1 (+S)
*c	SLOW: Connect battery negative lead to terminal A-1 (+S)	-	-

If the result is not as specified, replace the windshield wiper switch assembly.

- d. Check the front washer operation.
 1. Turn the wiper switch OFF.
 2. Connect the positive (+) battery lead to terminal A-2 (+B) and the negative (-) battery lead to terminals A-1 (+S) and B-2 (EW).

3. Connect the positive (+) voltmeter terminal to terminal A-3 (+1) and the negative (-) voltmeter terminal to terminal B-2 (EW). Turn the washer switch on and off, and check the voltage between terminals A-3 (+1) and B-2 (EW).

OK

Refer to the illustration below.

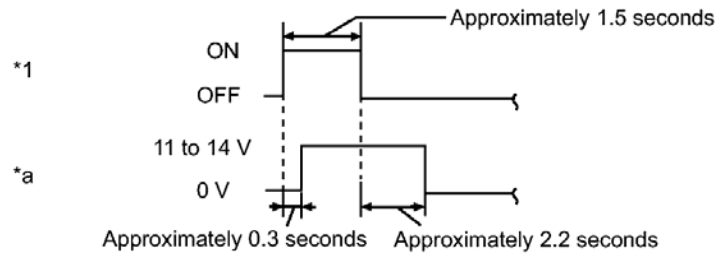


Fig. 60: Checking Front Washer Operation
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Washer Switch	--
*a	Voltage between terminals A-3 (+1) and B-2 (EW)	--

If the result is not as specified, replace the windshield wiper switch assembly.

- e. Check the rear wiper switch.
 1. Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Switch Condition	Specified Condition
B-2 (EW) - B-6 (C1R)	OFF	10 kohms or higher
B-2 (EW) - B-7 (+1R)		
B-2 (EW) - B-6 (C1R)	LO	Below 1 ohms
B-2 (EW) - B-7 (+1R)	HI	

If the result is not as specified, replace the windshield wiper switch assembly.

f. Check the rear washer switch.

1. Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Switch Condition	Specified Condition
A-5 (WR) - B-2 (EW)	OFF	10 kohms or higher
B-2 (EW) - B-7 (+1R)		
A-5 (WR) - B-2 (EW)	WASH	Below 1 ohms
A-5 (WR) - B-2 (EW)	ON + WASH	
B-2 (EW) - B-7 (+1R)		

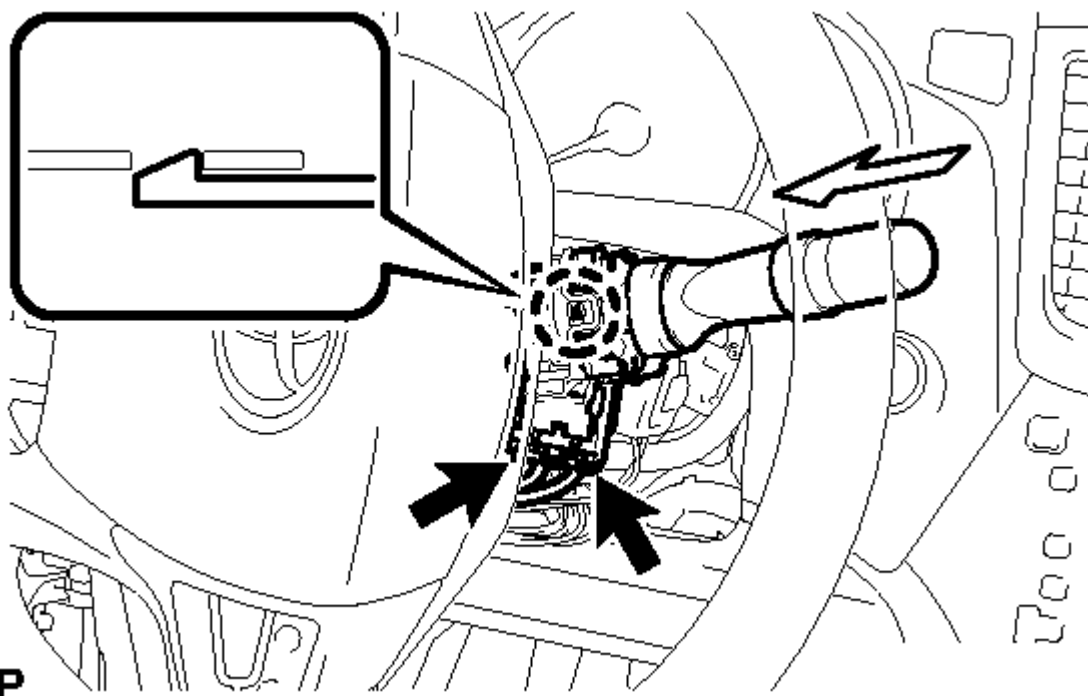
If the result is not as specified, replace the windshield wiper switch assembly.

INSTALLATION

INSTALLATION

1. INSTALL WINDSHIELD WIPER SWITCH ASSEMBLY

a. Engage the claw to install the windshield wiper switch assembly as shown in the illustration.



P

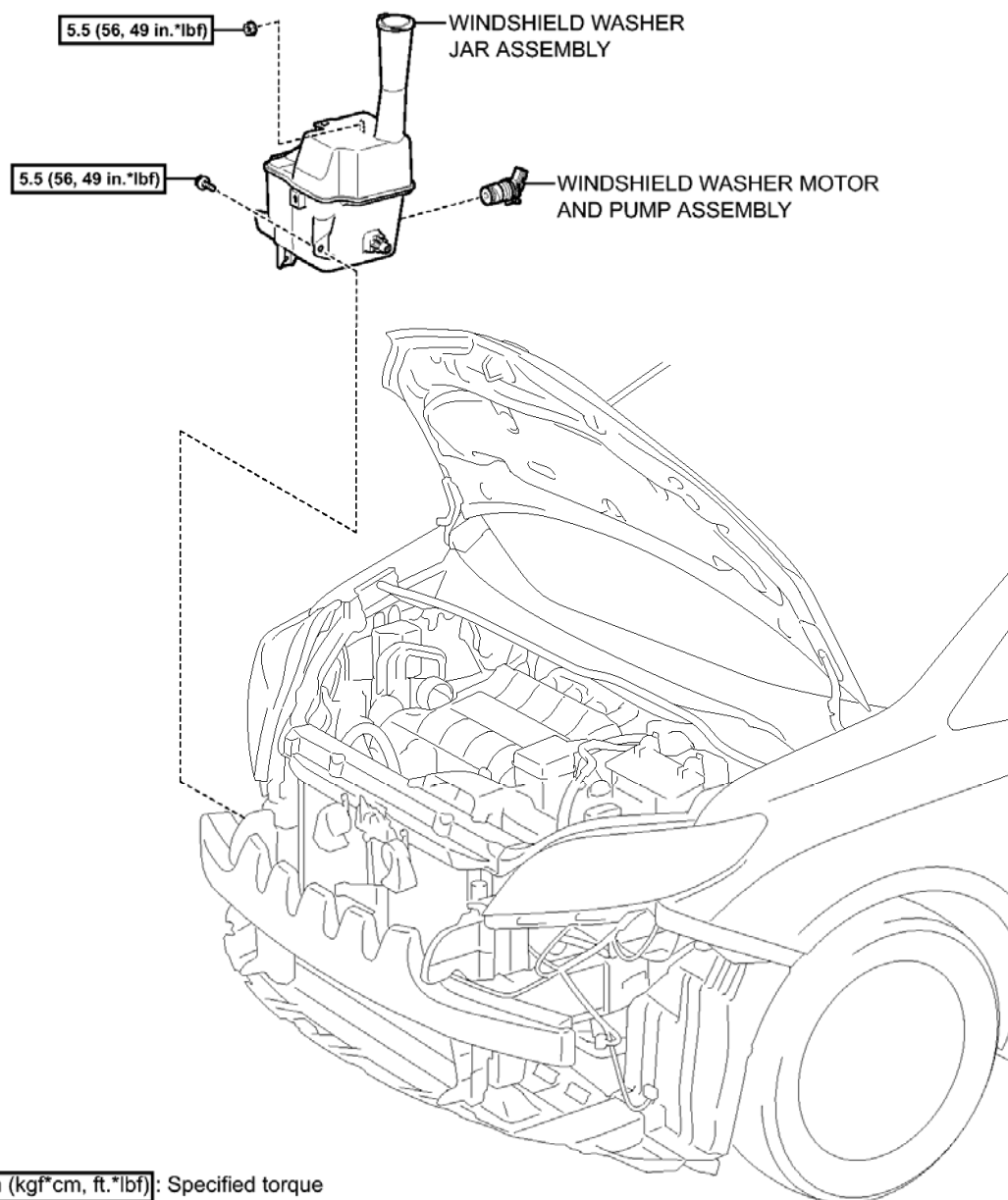
Fig. 61: Installing Windshield Wiper Switch Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Connect the 2 windshield wiper switch connectors.
- 2. **INSTALL UPPER STEERING COLUMN COVER** . Refer to **INSTALLATION - Step 3**
- 3. **INSTALL LOWER STEERING COLUMN COVER** . Refer to **INSTALLATION - Step 4**

WASHER MOTOR (FOR FRONT SIDE)

COMPONENTS

ILLUSTRATION



[N*m (kgf*cm, ft.*lbf)]: Specified torque

P

Fig. 62: Identifying Washer Motor Replacement Components
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

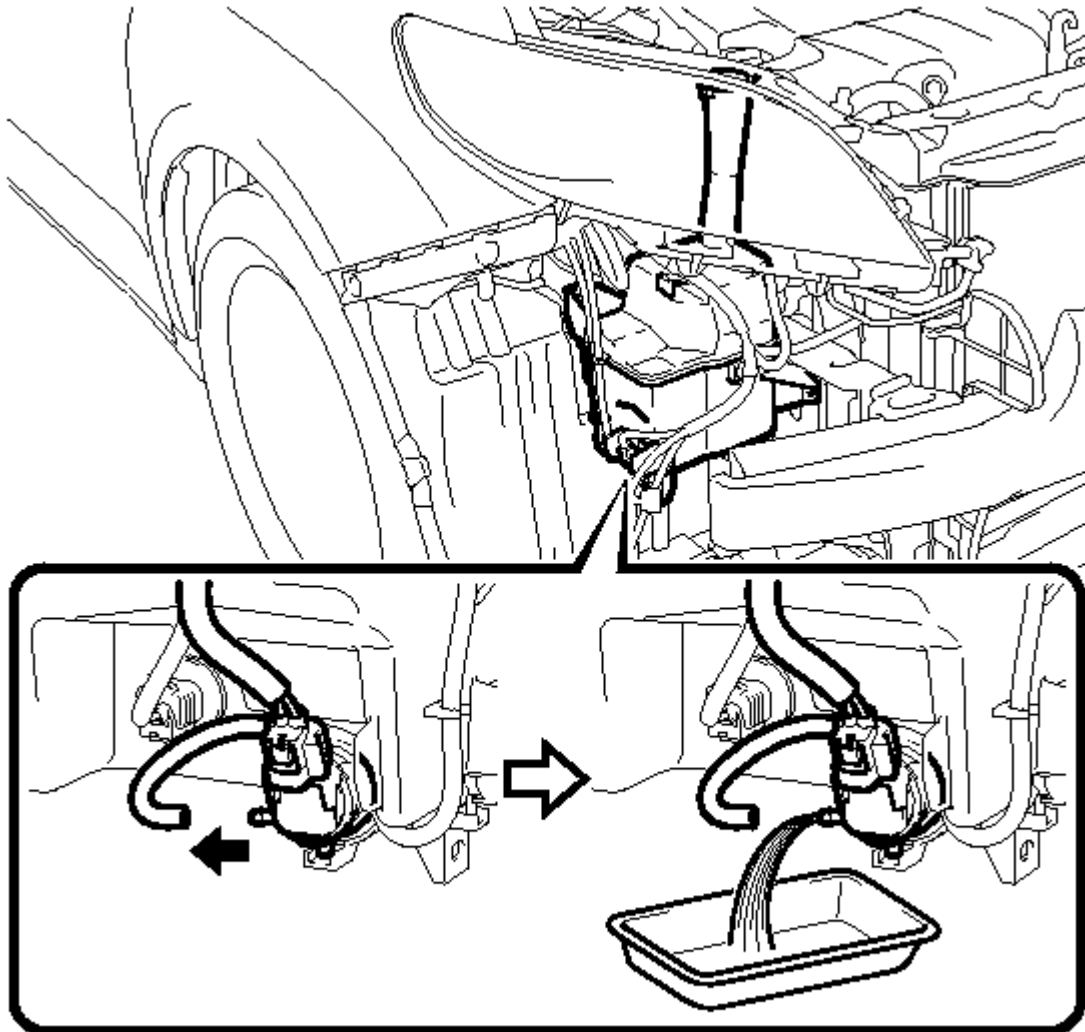
REMOVAL

1. REMOVE FRONT BUMPER COVER

Refer to **REMOVAL**

2. DRAIN WASHER FLUID

- a. Disconnect the washer hose from the windshield washer motor and pump, and drain the washer fluid.



P

Fig. 63: Removing Drain Washer Fluid Hose

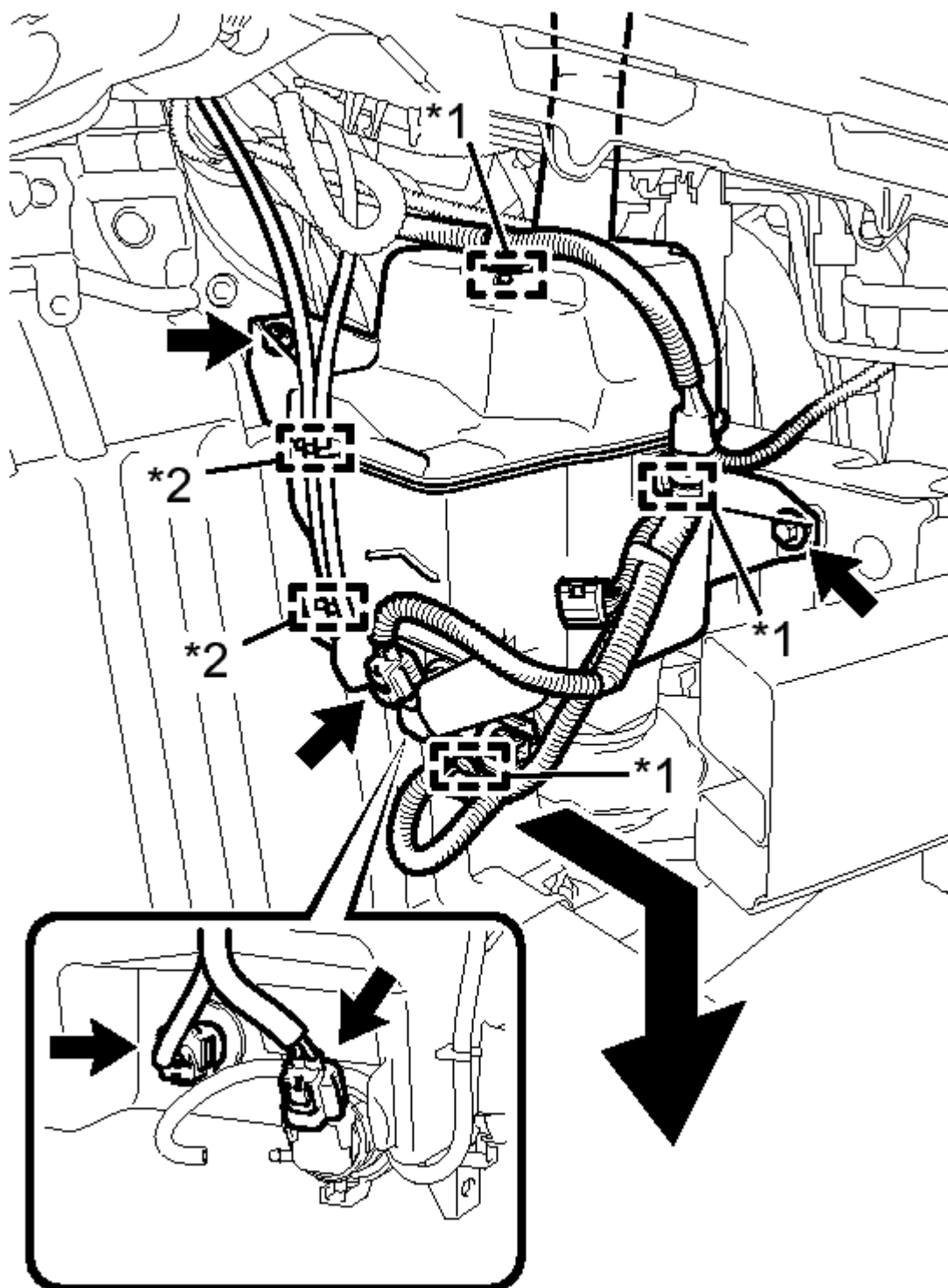
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

Use a container to collect the washer fluid.

3. REMOVE WINDSHIELD WASHER JAR ASSEMBLY

- a. Disengage the 3 clamps and separate the wire harness.



P

Fig. 64: Removing Windshield Washer Jar Assembly, Connectors & Fasteners
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

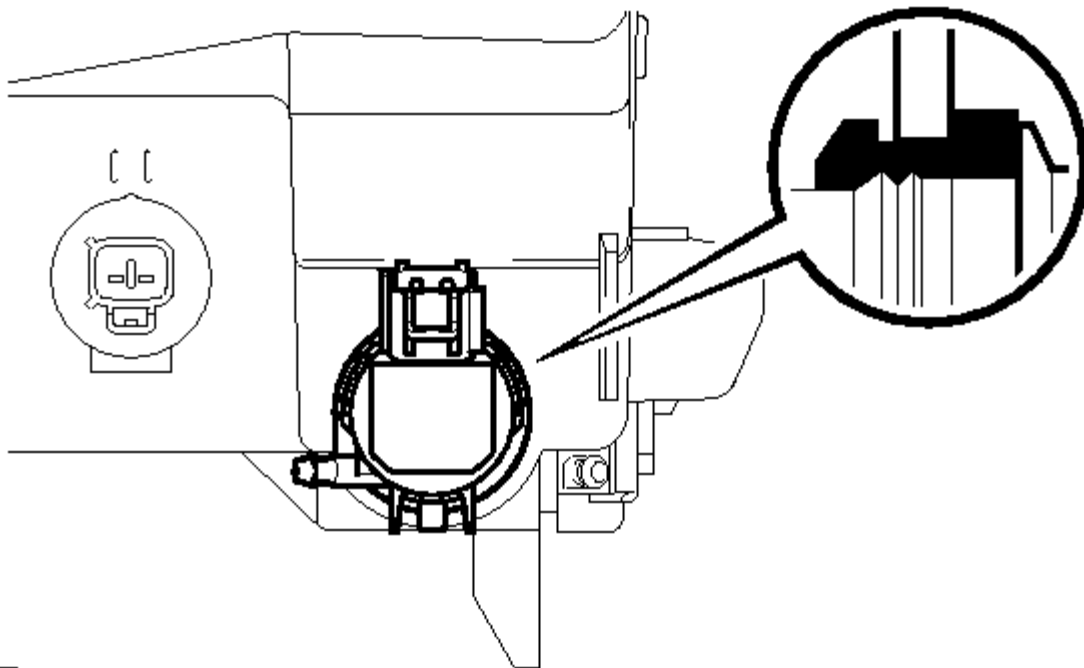
*1	Clamp
----	-------

- b. Disengage the 2 guides and separate the 2 washer hoses.
- c. Disconnect the 3 connectors.
- d. Remove the bolt and nut.
- e. Remove the guide and remove the washer jar as shown by the arrow.

NOTE: Do not damage the washer jar hose when removing the washer jar.

4. REMOVE WINDSHIELD WASHER MOTOR AND PUMP ASSEMBLY

- a. Pull the windshield washer motor and pump out of the packing of the washer jar.



P

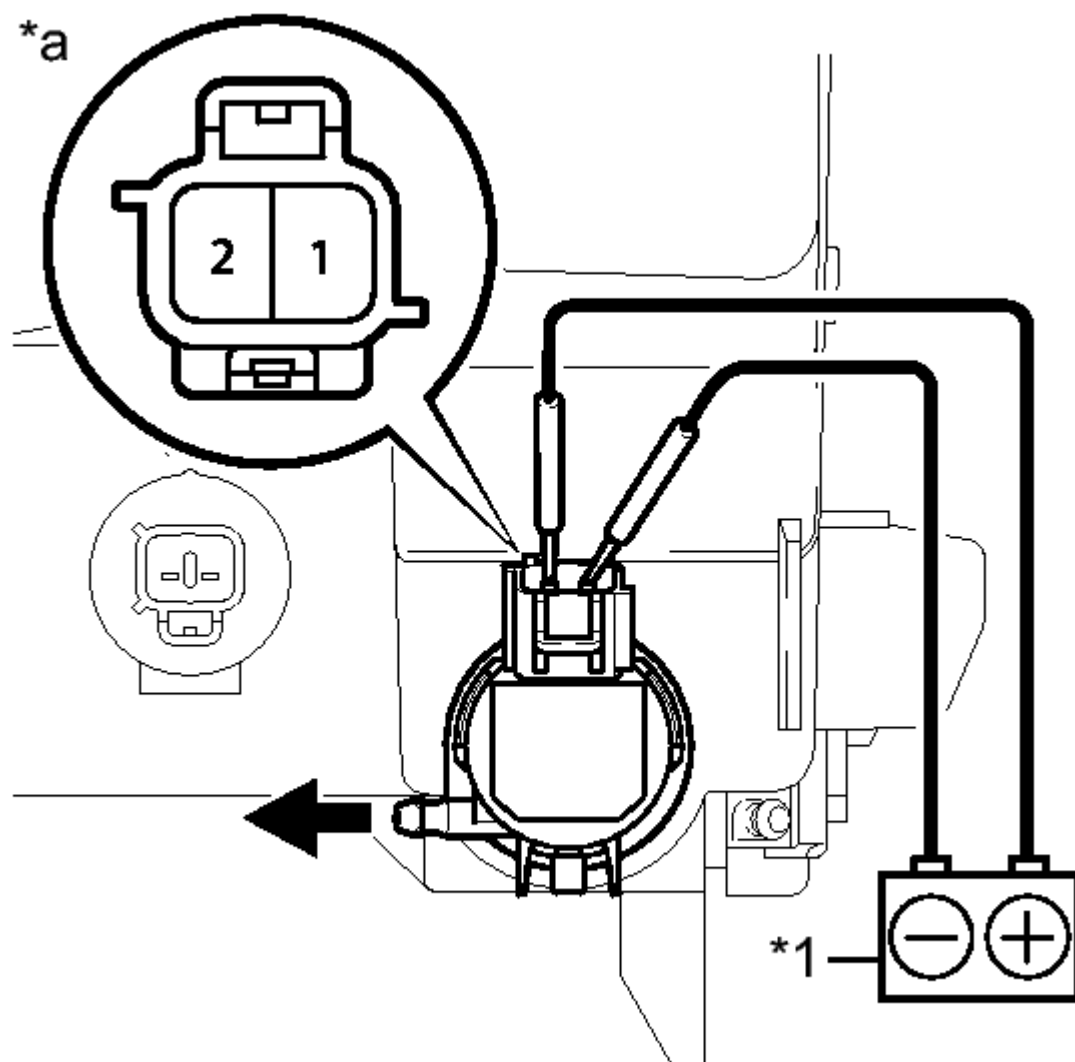
Fig. 65: Identifying Windshield Washer Motor & Pump Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION

INSPECTION

1. INSPECT WINDSHIELD WASHER MOTOR AND PUMP ASSEMBLY

- a. Fill the washer jar with washer fluid.
- b. Connect a battery positive (+) lead to terminal 1 of the windshield washer motor and pump, and a negative (-) lead to terminal 2.



P

Fig. 66: Inspecting Windshield Washer Motor & Pump Assembly Operation
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Battery
	Component without harness connected
*a	(Windshield Washer Motor and Pump Assembly)

- c. Check that washer fluid flows from the washer jar.

OK

Washer fluid flows from the washer jar.

If the result is not as specified, replace the windshield washer motor and pump assembly.

INSTALLATION

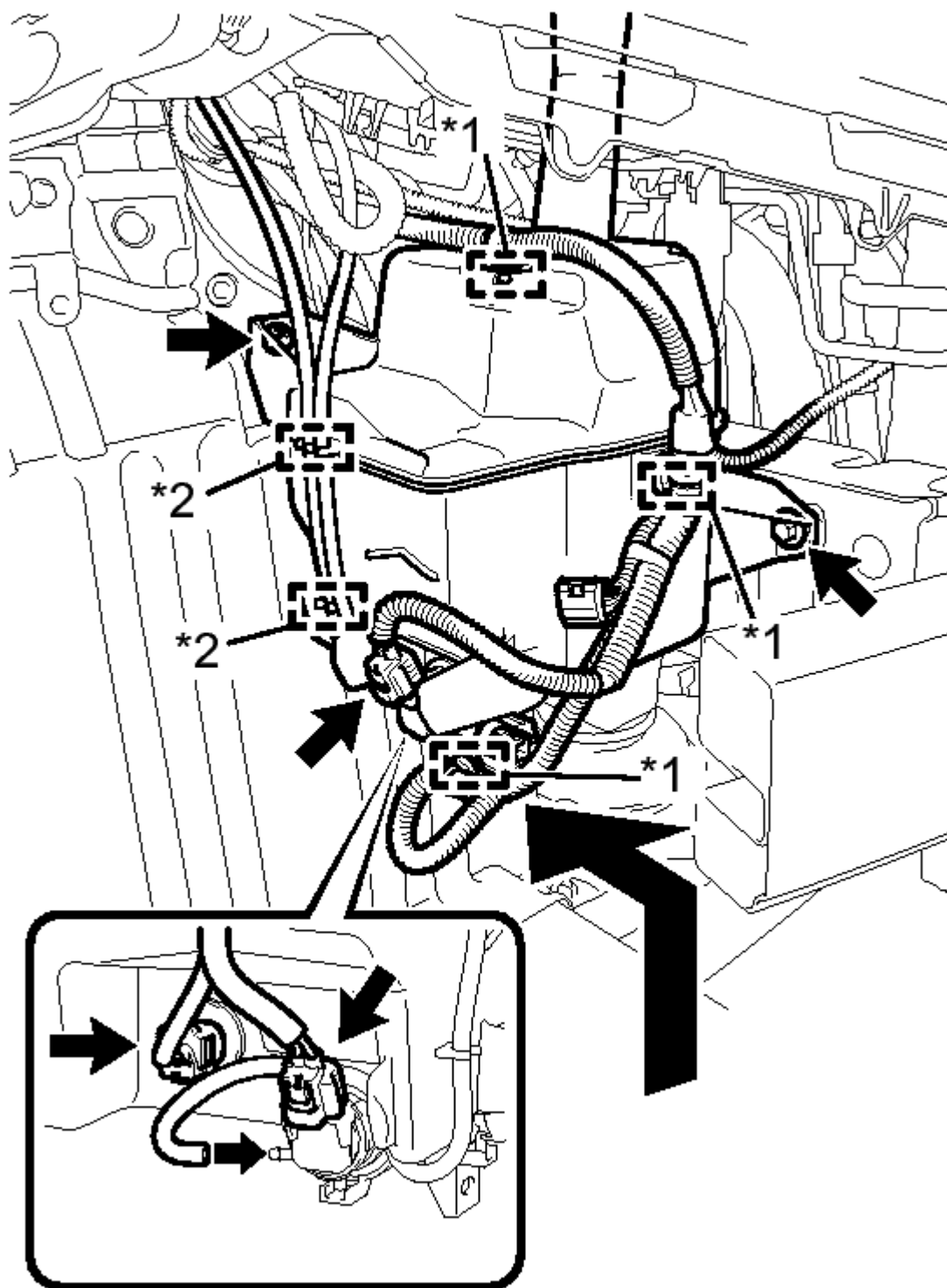
INSTALLATION

1. INSTALL WINDSHIELD WASHER MOTOR AND PUMP ASSEMBLY

- a. Install the windshield washer motor and pump onto the packing of the washer jar.

2. INSTALL WINDSHIELD WASHER JAR ASSEMBLY

- a. Install the guide and install the washer jar as shown by the arrow.



P

Fig. 67: Installing Windshield Washer Jar Assembly, Connectors & Fasteners
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Clamp
----	-------

*2|Guide|

- b. Install the bolt and nut.

Torque: 5.5 N*m (56 kgf*cm, 49 in.*lbf)

- c. Connect the 3 connectors.
- d. Engage the 2 guides and install the 2 washer hoses
- e. Engage the 3 clamps and install the wire harness.

3. FILL UP WASHER JAR WITH WINDSHIELD WASHER FLUID

- a. Fill the washer jar with washer fluid.

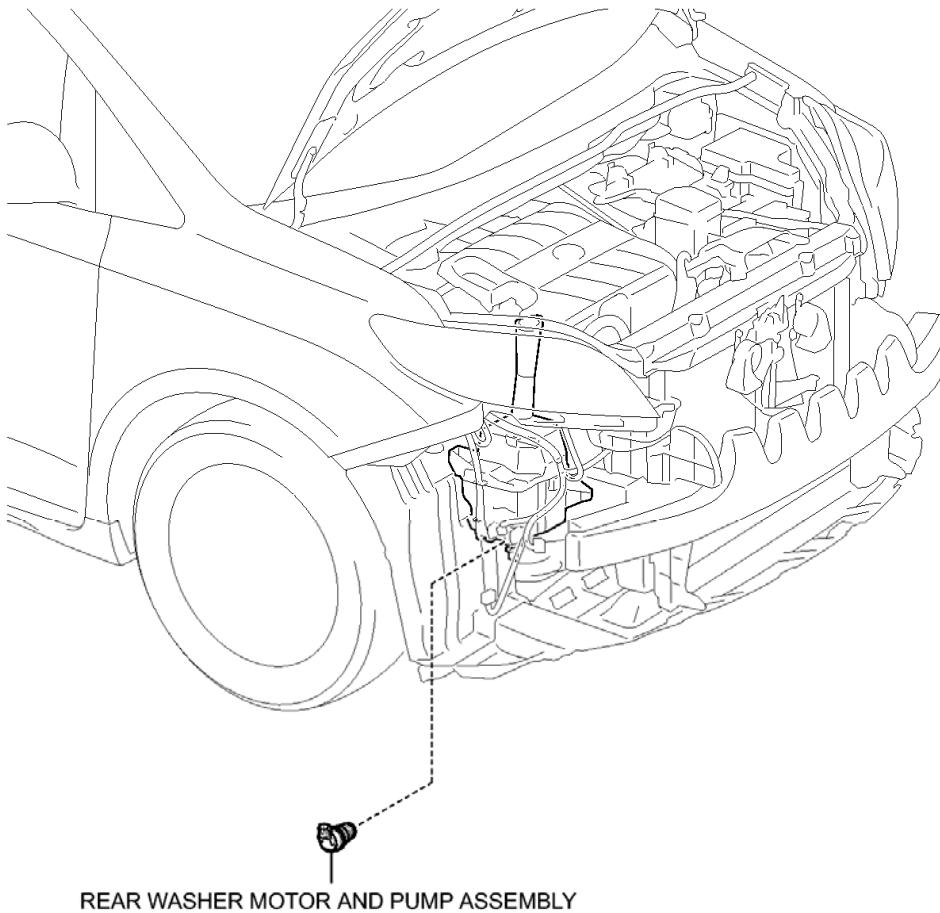
4. INSTALL FRONT BUMPER COVER

Refer to **INSTALLATION**

WASHER MOTOR (FOR REAR SIDE)

COMPONENTS

ILLUSTRATION



P

Fig. 68: Identifying Washer Motor Replacement Components
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

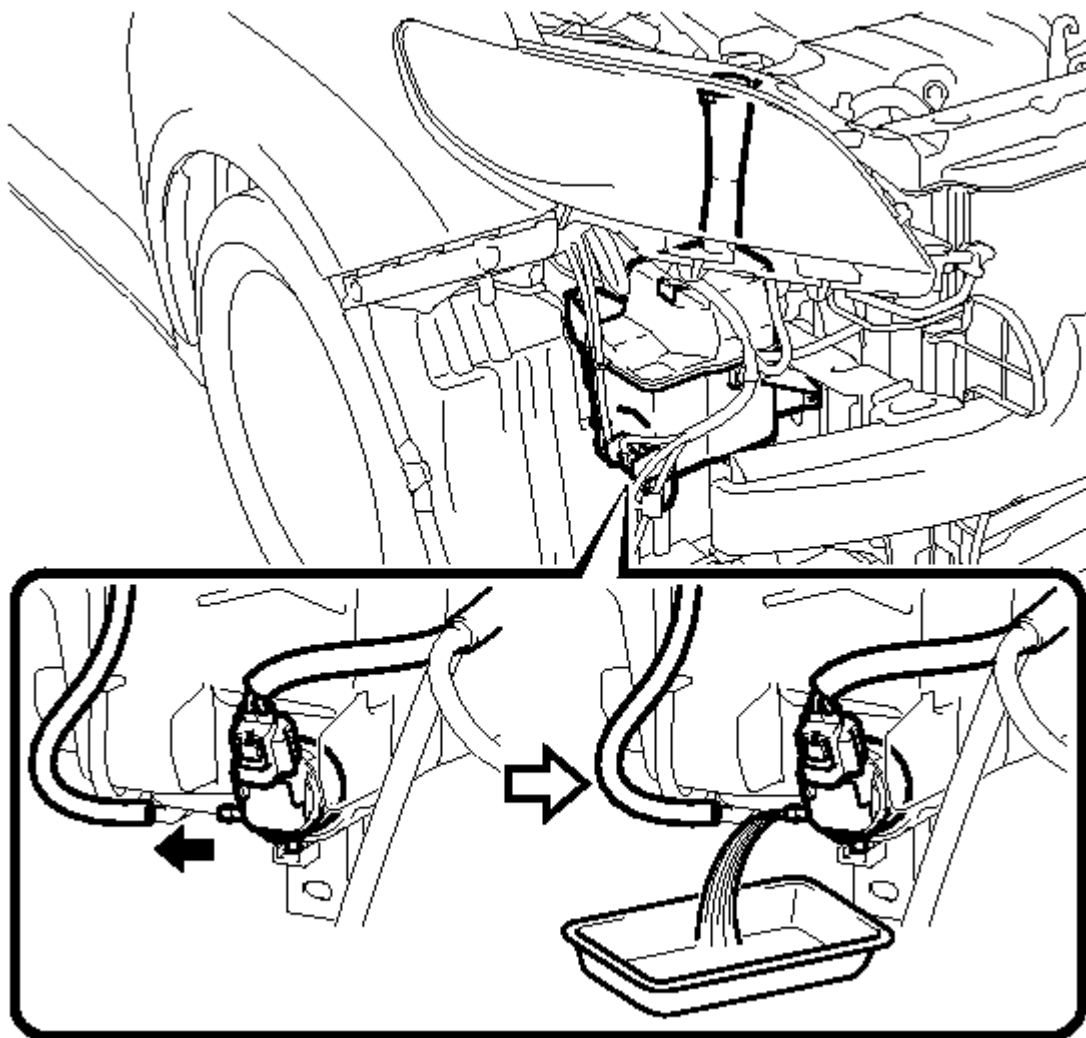
REMOVAL

1. REMOVE FRONT BUMPER COVER

Refer to **REMOVAL**

2. DRAIN WASHER FLUID

- a. Disconnect the washer hose from the rear washer motor and pump, and drain the washer fluid.



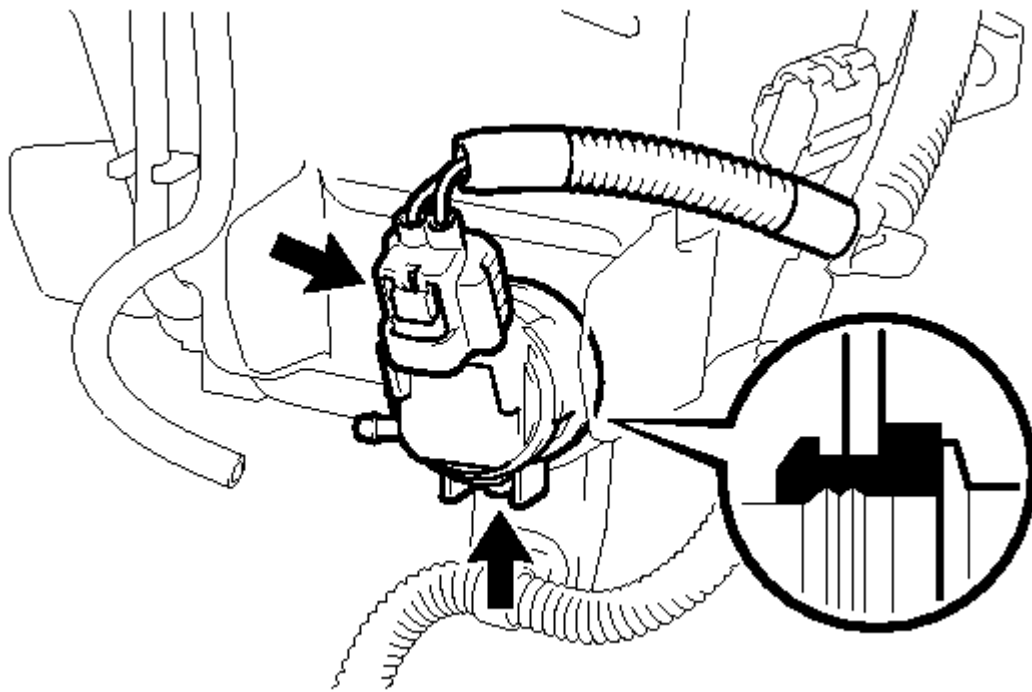
P

Fig. 69: Removing Drain Washer Fluid Hose
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

Use a container to collect the washer fluid.

- 3. REMOVE REAR WASHER MOTOR AND PUMP ASSEMBLY**
 - a. Disconnect the rear washer motor and pump connector.



P

Fig. 70: Identifying Rear Washer Motor/Pump Assembly & Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

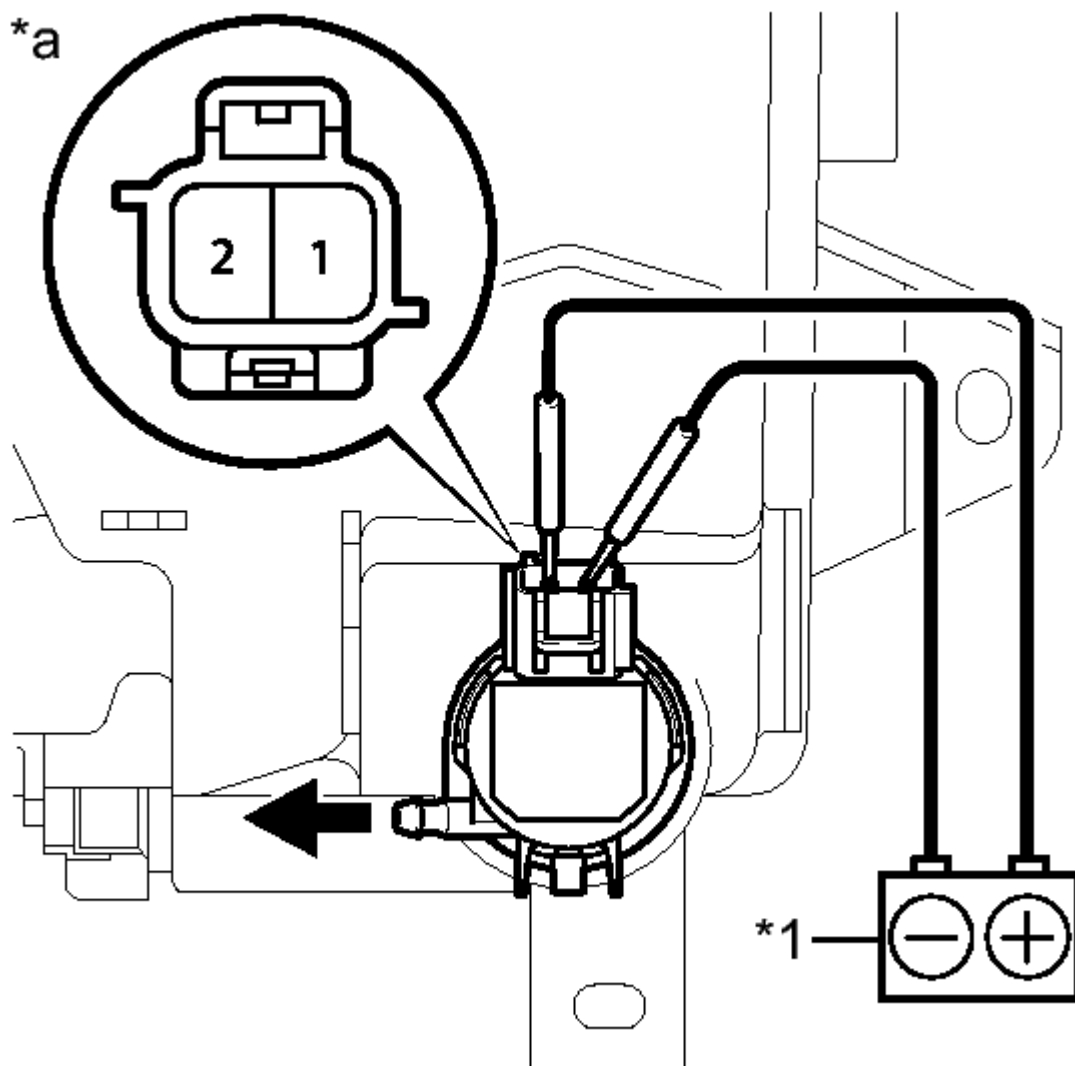
- b. Pull the rear washer motor and pump out of the packing of the washer jar.

INSPECTION

INSPECTION

1. INSPECT REAR WASHER MOTOR ASSEMBLY

- a. Fill the washer jar with washer fluid.
- b. Connect a battery positive (+) lead to terminal 1 of the rear washer motor and pump, and a negative (-) lead to terminal 2.



P

Fig. 71: Inspecting Rear Washer Motor Assembly Operation
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Battery
	Component without harness connected
*a	(Rear Washer Motor and Pump Assembly)

- c. Check that washer fluid flows from the washer jar.

OK

Washer fluid flows from the washer jar.

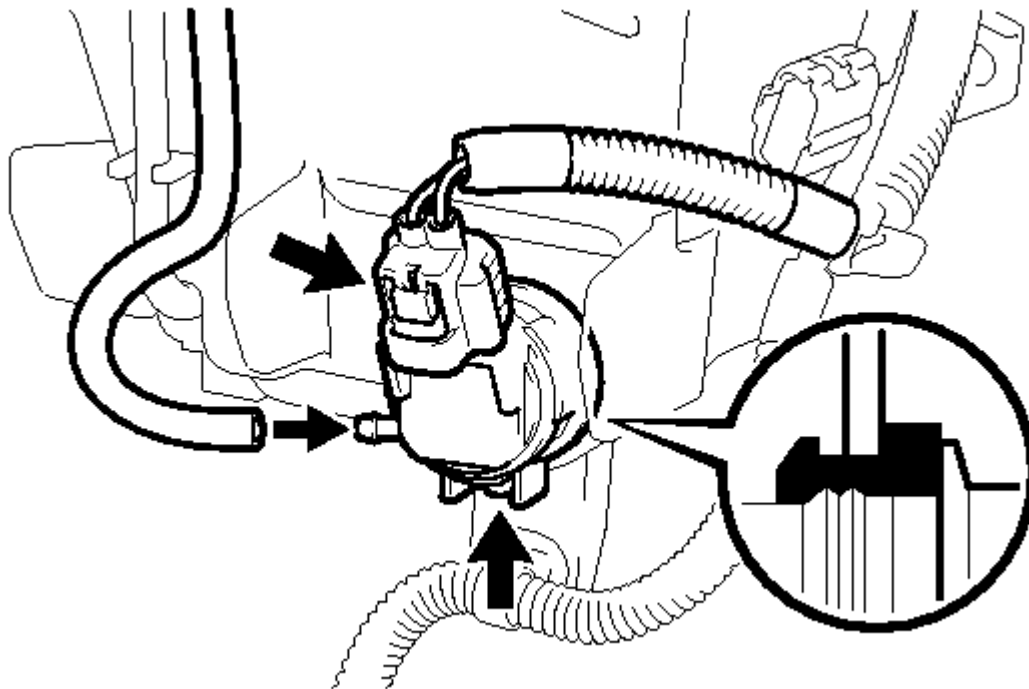
If the result is not as specified, replace the rear washer motor and pump assembly.

INSTALLATION

INSTALLATION

1. INSTALL REAR WASHER MOTOR AND PUMP ASSEMBLY

- a. Install the rear washer motor and pump onto the packing of the washer jar.



P

Fig. 72: Installing Rear Washer Motor/Pump Assembly, Connector & Hose
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

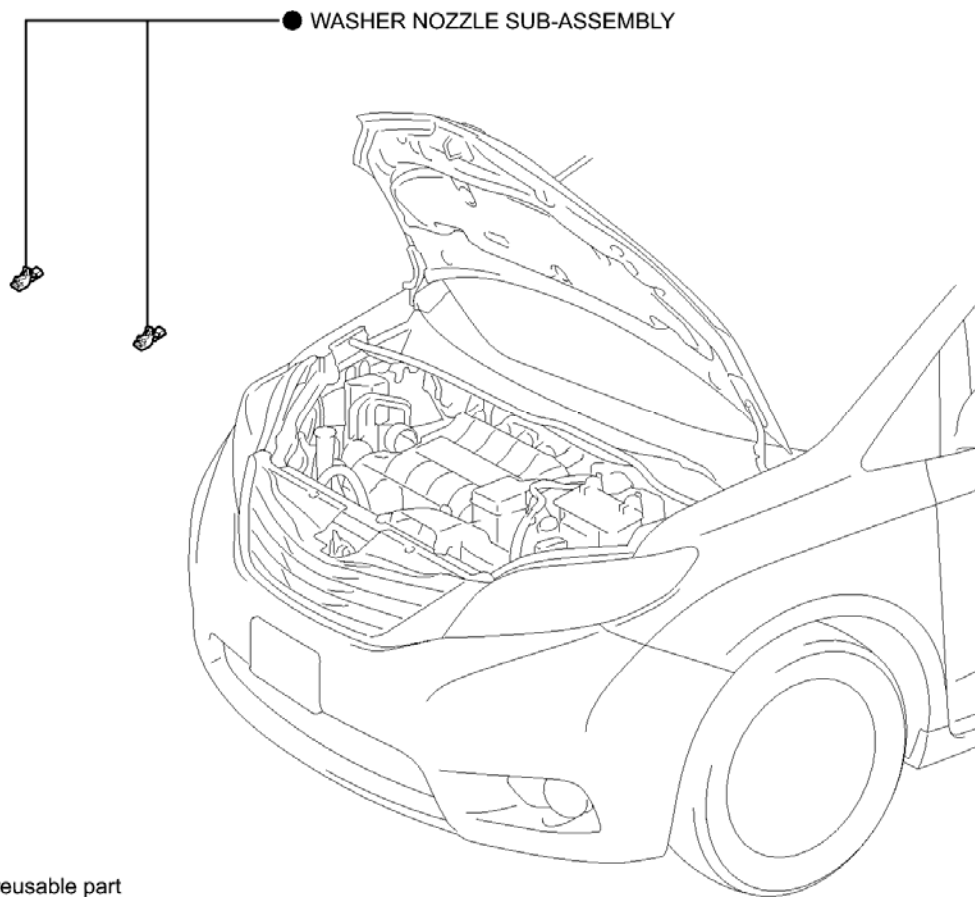
- b. Connect the rear washer motor and pump connector.
 - c. Connect the washer hose.
2. **FILL UP WASHER JAR WITH WINDSHIELD WASHER FLUID** See step 3
 3. **INSTALL FRONT BUMPER COVER**

Refer to **INSTALLATION**

WASHER NOZZLE (FOR FRONT SIDE)

COMPONENTS

ILLUSTRATION



P

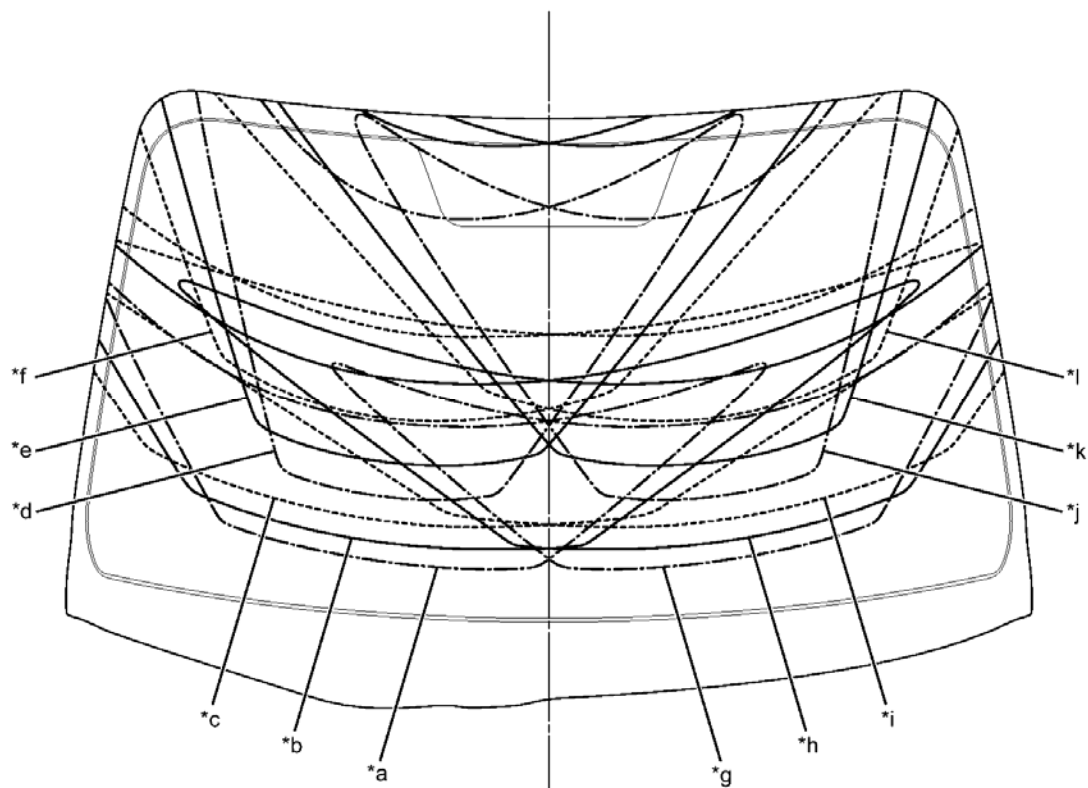
Fig. 73: Identifying Washer Nozzle Replacement Components
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ON-VEHICLE INSPECTION

ON-VEHICLE INSPECTION

1. INSPECT WASHER NOZZLE SUB-ASSEMBLY

- a. With the engine running, check the position that the washer fluid hits the windshield.



P

Fig. 74: Inspecting Washer Nozzle Sub-Assembly Operation
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	Passenger Side Lower Minimum Spray	*b	Passenger Side Lower Nominal Spray
*c	Passenger Side Lower Maximum Spray	*d	Passenger Side Upper Minimum Spray
*e	Passenger Side Upper	*f	Passenger Side Upper

	Nominal Spray		Maximum Spray
*g	Driver Side Lower Minimum Spray	*h	Driver Side Lower Nominal Spray
*i	Driver Side Lower Maximum Spray	*j	Driver Side Upper Minimum Spray
*k	Driver Side Upper Nominal Spray	*l	Driver Side Upper Maximum Spray

OK

Washer fluid hits the windshield in the areas shown in the illustration.

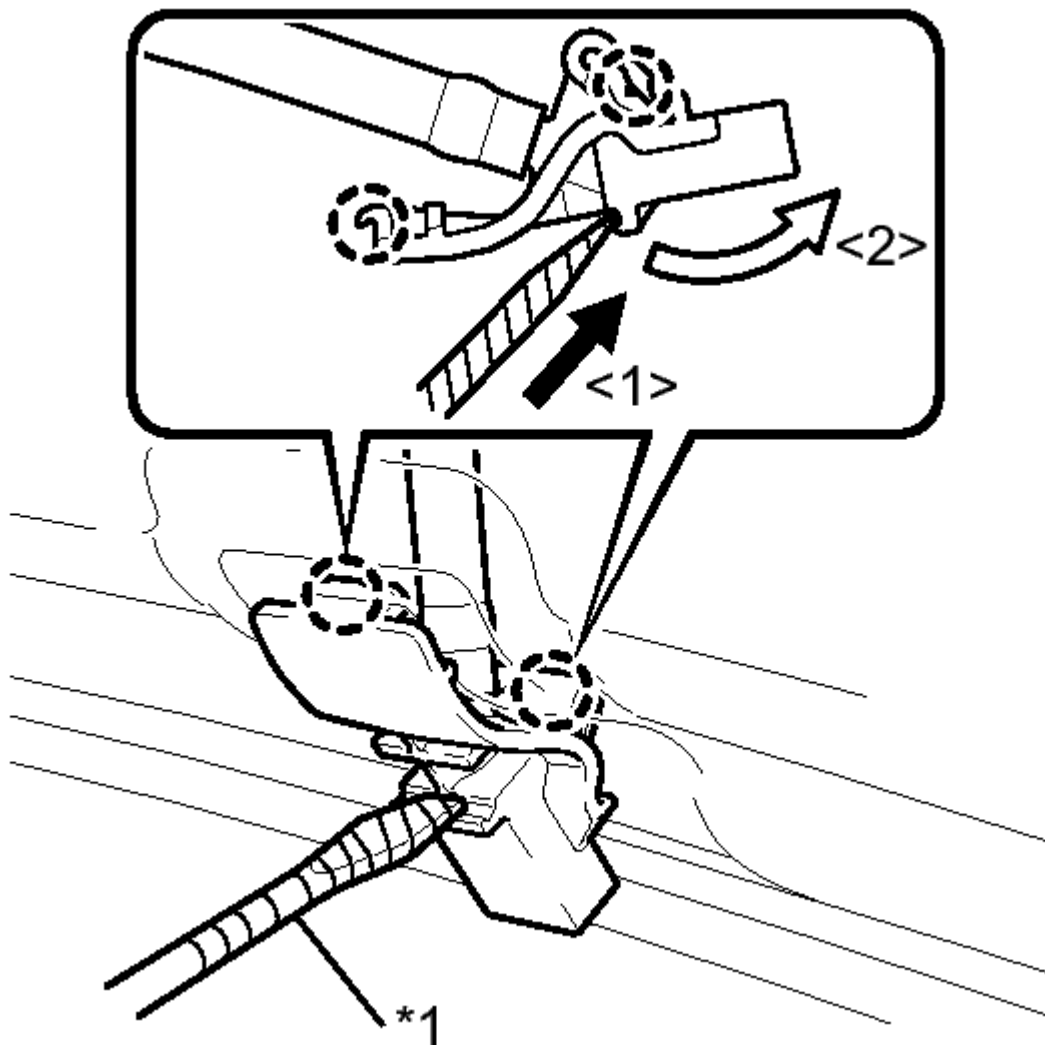
If the result is not as specified, replace the malfunctioning washer nozzle sub-assembly.

REMOVAL

REMOVAL

1. REMOVE WASHER NOZZLE SUB-ASSEMBLY

- a. Using a screwdriver with its tip wrapped in protective tape, disengage the 2 claws and separate the washer nozzle sub-assembly as shown in the illustration.



P

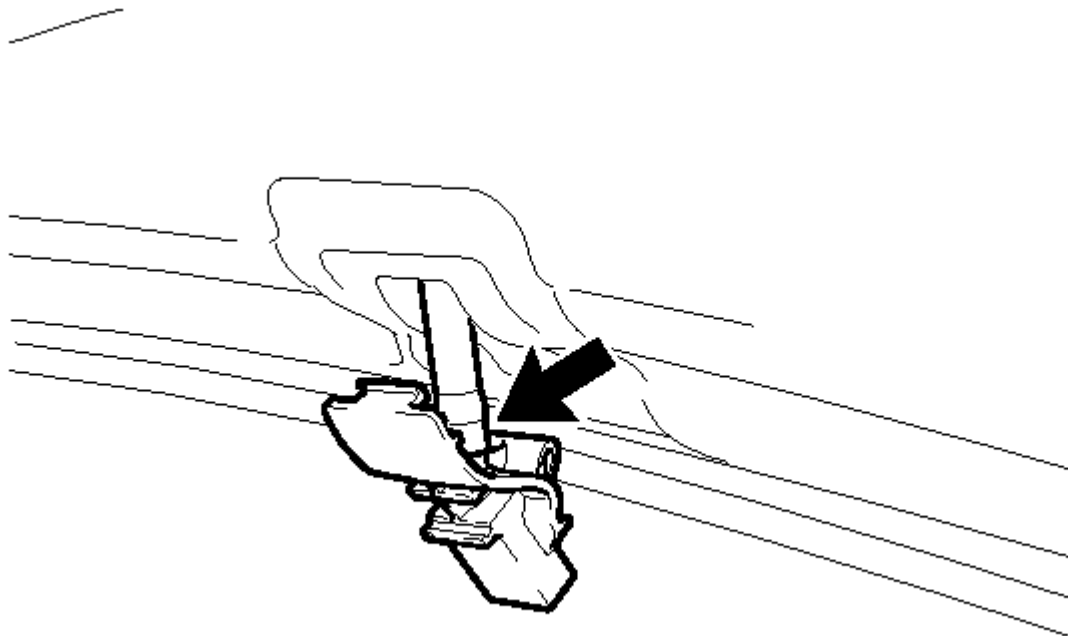
Fig. 75: Removing Washer Nozzle Sub-Assembly Using Screwdriver
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Protective Tape
----	--------------------

NOTE: **Be careful not to damage the windshield.**

- b. Remove the washer nozzle sub-assembly from the washer hose.



P

Fig. 76: Identifying Washer Nozzle Sub-Assembly Washer Hose
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

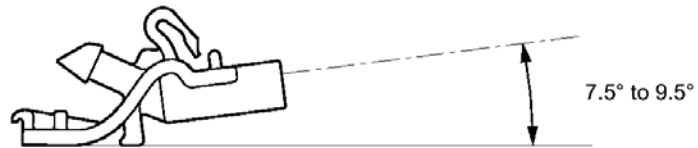
NOTE: Washer nozzles cannot be reused.

ADJUSTMENT

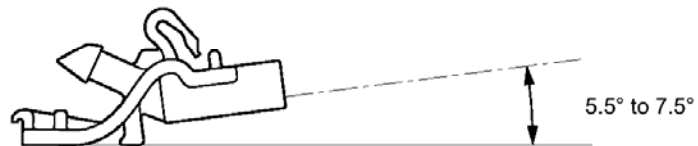
ADJUSTMENT

1. **REMOVE WASHER NOZZLE SUB-ASSEMBLY** See step 1
2. **ADJUST WASHER NOZZLE SUB-ASSEMBLY**
 - a. Select a washer nozzle so that the contact area is within the standard. Replace the washer nozzle with the selected one.

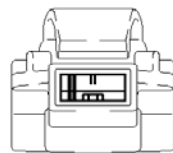
*a



*b



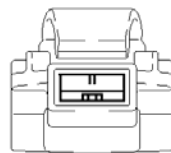
85381-0T030



*c

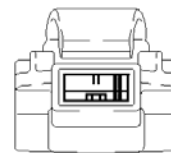
-1°

85381-0T010



0°

85381-0T020



+1°

P

Fig. 77: Checking Washer Nozzle Sub-Assembly Standard
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	Upper Aim Angle	*b	Lower Aim Angle
*c	Spray Angle	-	-

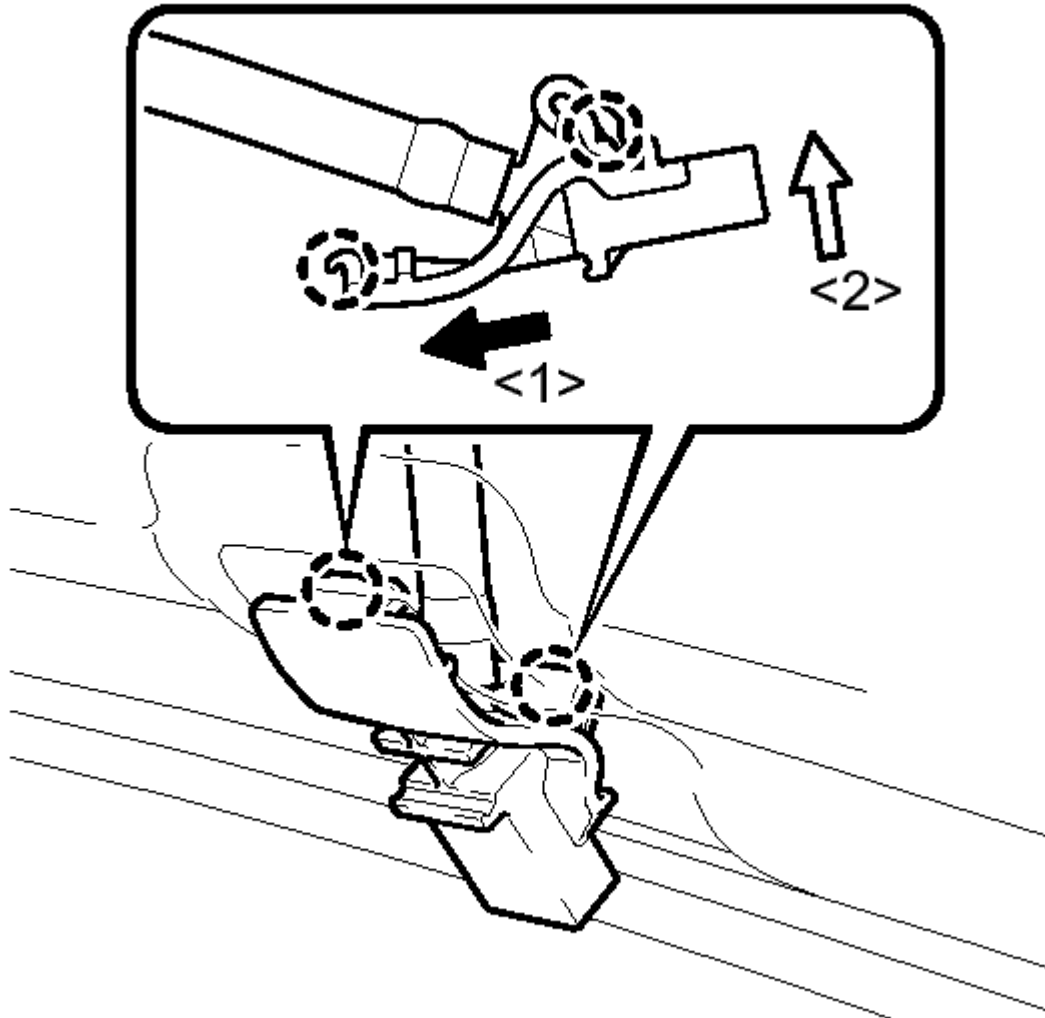
3. **INSTALL WASHER NOZZLE SUB-ASSEMBLY** See step 1

INSTALLATION

INSTALLATION

1. **INSTALL WASHER NOZZLE SUB-ASSEMBLY**

- a. Connect a new washer nozzle sub-assembly to the washer hose.
- b. Engage the 2 claws and install the washer nozzle sub-assembly as shown in the illustration.



P

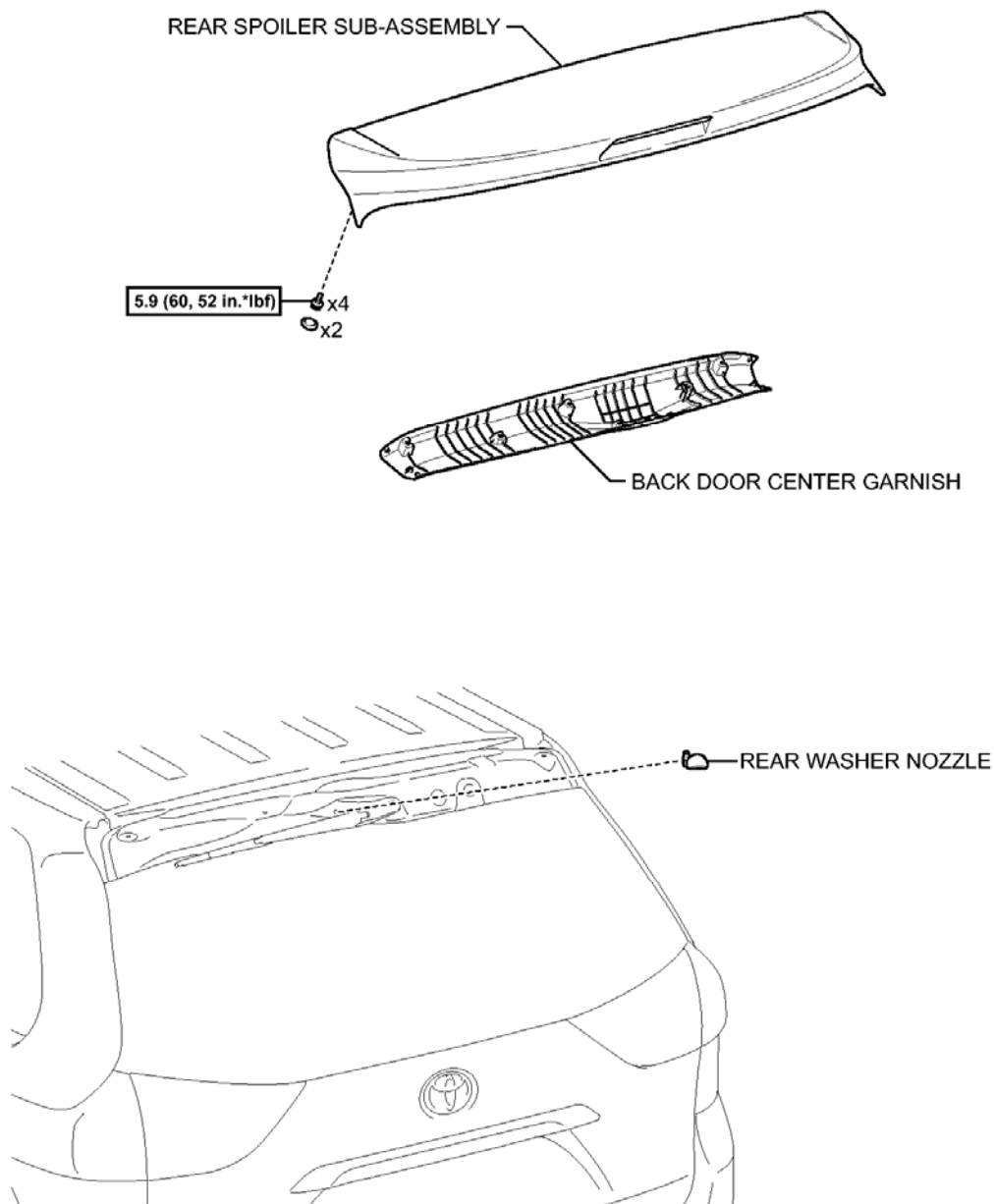
Fig. 78: Installing Washer Nozzle Sub-Assembly & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. **INSPECT WASHER NOZZLE SUB-ASSEMBLY** See step 1
3. **ADJUST WASHER NOZZLE SUB-ASSEMBLY** See step 2

WASHER NOZZLE (FOR REAR SIDE)

COMPONENTS

ILLUSTRATION



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

P

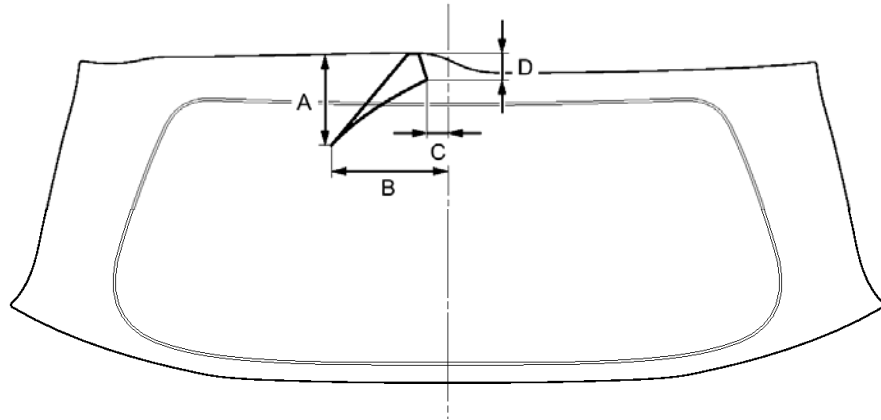
Fig. 79: Identifying Washer Nozzle Replacement Components
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ON-VEHICLE INSPECTION

ON-VEHICLE INSPECTION

1. INSPECT REAR WASHER NOZZLE

- a. With the engine running, check that the center stream of washer fluid sprays on the windshield within the area shown in the illustration.



P

Fig. 80: Inspecting Rear Washer Nozzle Operation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard Clearance

Area	Measurement
A	158.8 mm (6.251 in.)
B	206.9 mm (8.146 in.)
C	37.5 mm (1.476 in.)
D	44.3 mm (1.744 in.)

OK

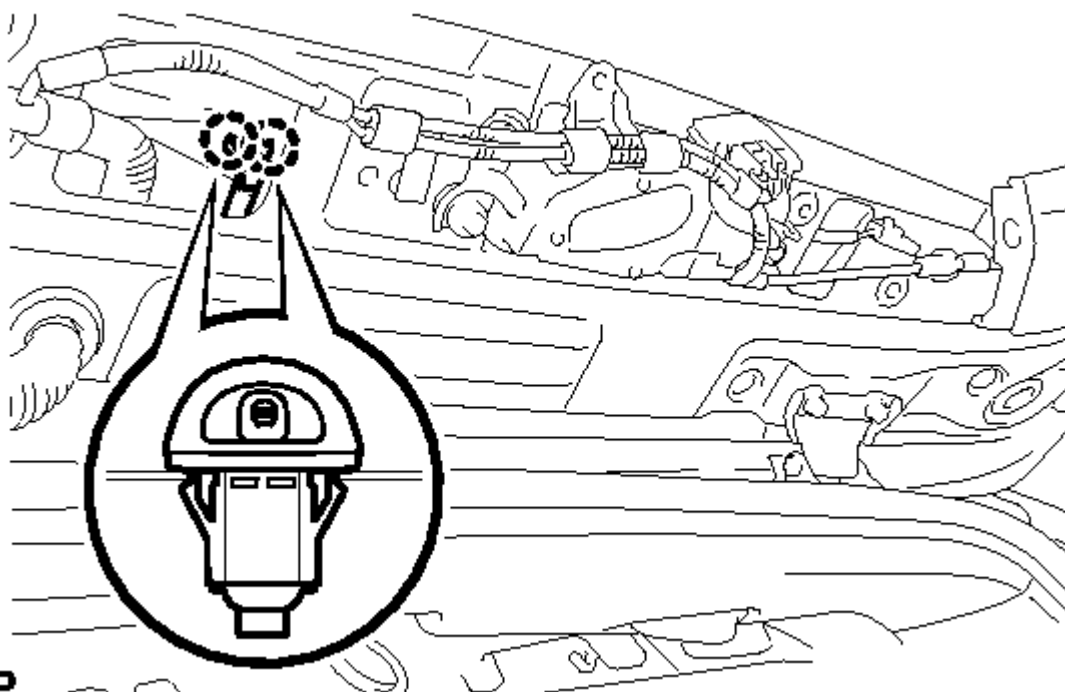
Washer fluid hits the windshield in the area shown in the illustration.

If the result is not as specified, adjust the rear washer nozzle.

REMOVAL

REMOVAL

1. **REMOVE BACK DOOR CENTER GARNISH** . Refer to **DISASSEMBLY - Step 1**
2. **REMOVE REAR SPOILER SUB-ASSEMBLY** . Refer to **REMOVAL - Step 2**
3. **REMOVE REAR WASHER NOZZLE**
 - a. Disengage the 2 claws.



P

Fig. 81: Identifying Rear Washer Nozzle & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Disconnect the washer hose and remove the rear washer nozzle.

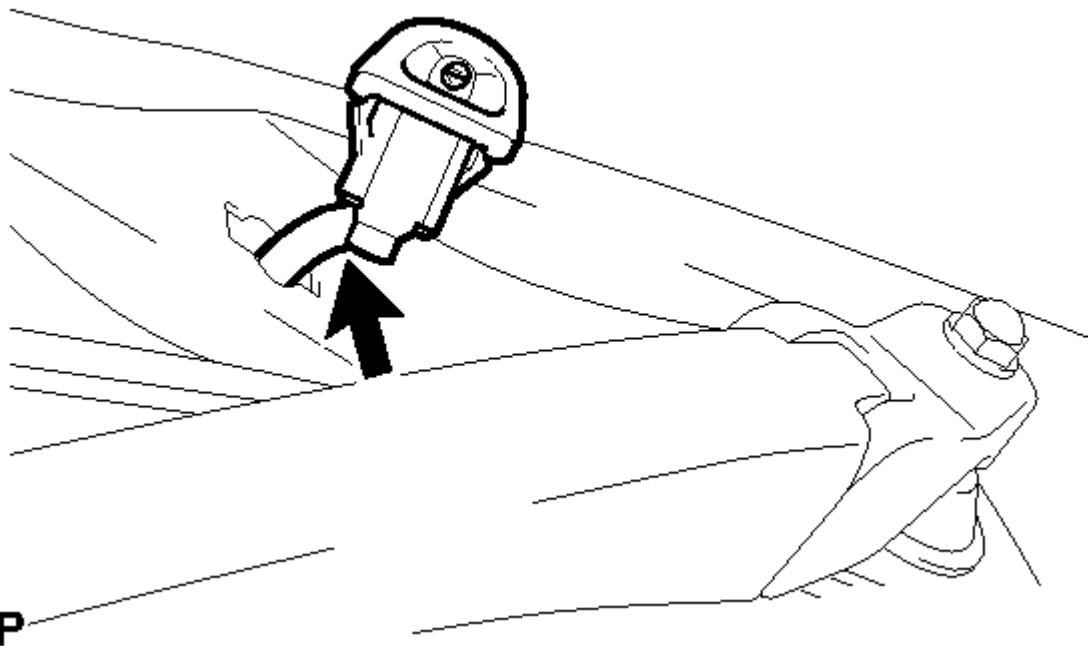


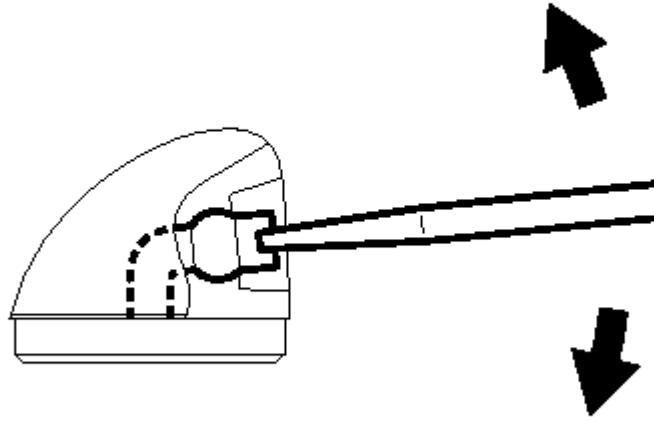
Fig. 82: Identifying Rear Washer Nozzle Hose
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ADJUSTMENT

ADJUSTMENT

1. ADJUST REAR WASHER NOZZLE

- a. Using a screwdriver, adjust the direction of the rear washer nozzle.



P

Fig. 83: Adjusting Rear Washer Nozzle

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

NOTE: Do not use a safety pin or other pointed tools. Doing so may damage the inside of the washer nozzle.

HINT:

Use a thin-bladed screwdriver with an approximately 1 mm (0.0394 in.) thick tip.

INSTALLATION

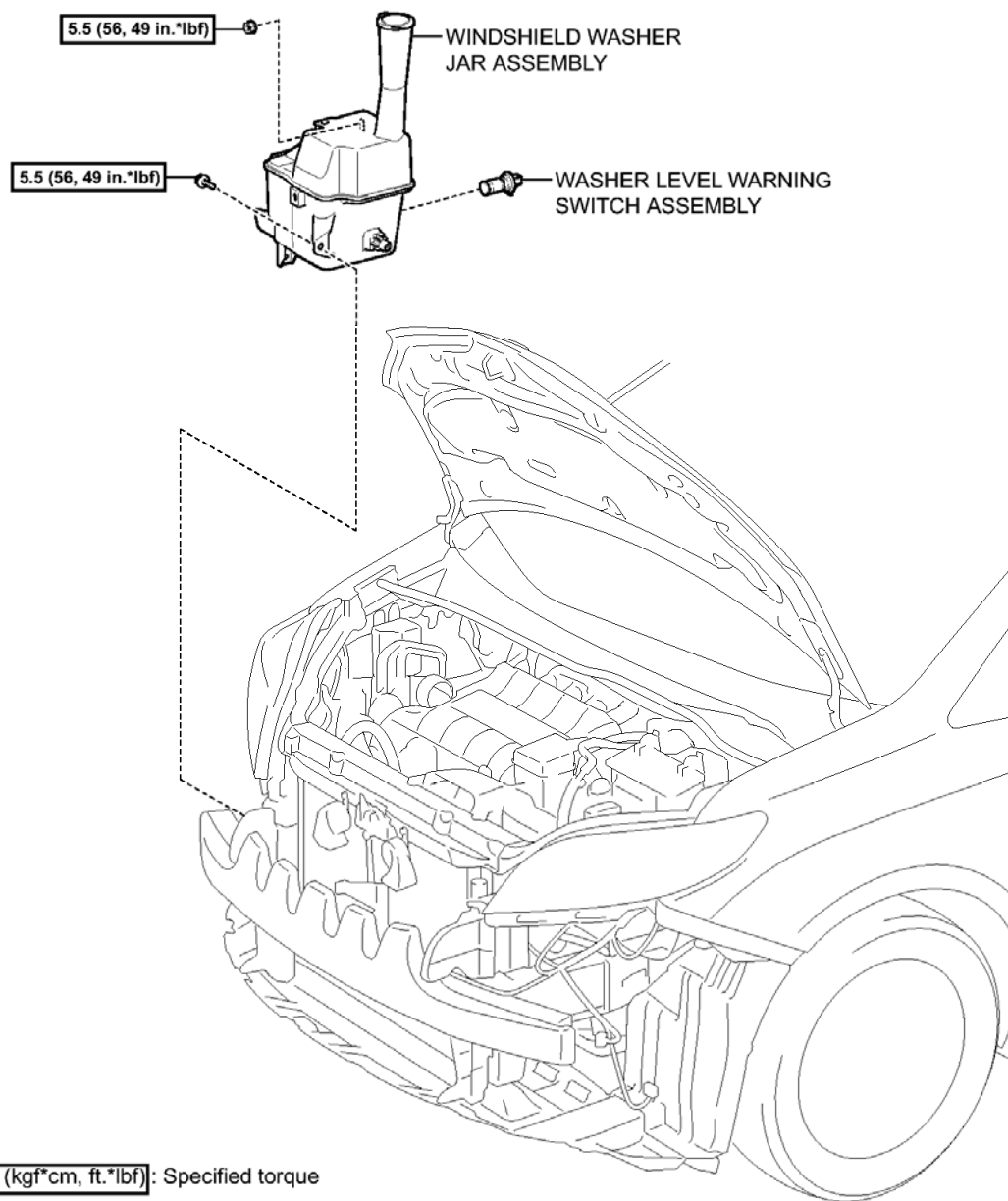
INSTALLATION

1. **INSTALL REAR WASHER NOZZLE**
 - a. Connect the washer hose.
 - b. Engage the 2 claws to install the rear washer nozzle.
2. **INSPECT REAR WASHER NOZZLE** See step 1
3. **ADJUST REAR WASHER NOZZLE** See step 1
4. **INSTALL REAR SPOILER SUB-ASSEMBLY** . Refer to **INSTALLATION - Step 1**
5. **INSTALL BACK DOOR CENTER GARNISH** . Refer to **REASSEMBLY - Step 28**

WASHER LEVEL WARNING SWITCH

COMPONENTS

ILLUSTRATION



[N*m (kgf*cm, ft.*lbf)]: Specified torque

P

Fig. 84: Identifying Washer Level Warning Switch Replacement Components With Torque Specifications
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

REMOVAL

1. REMOVE FRONT BUMPER COVER

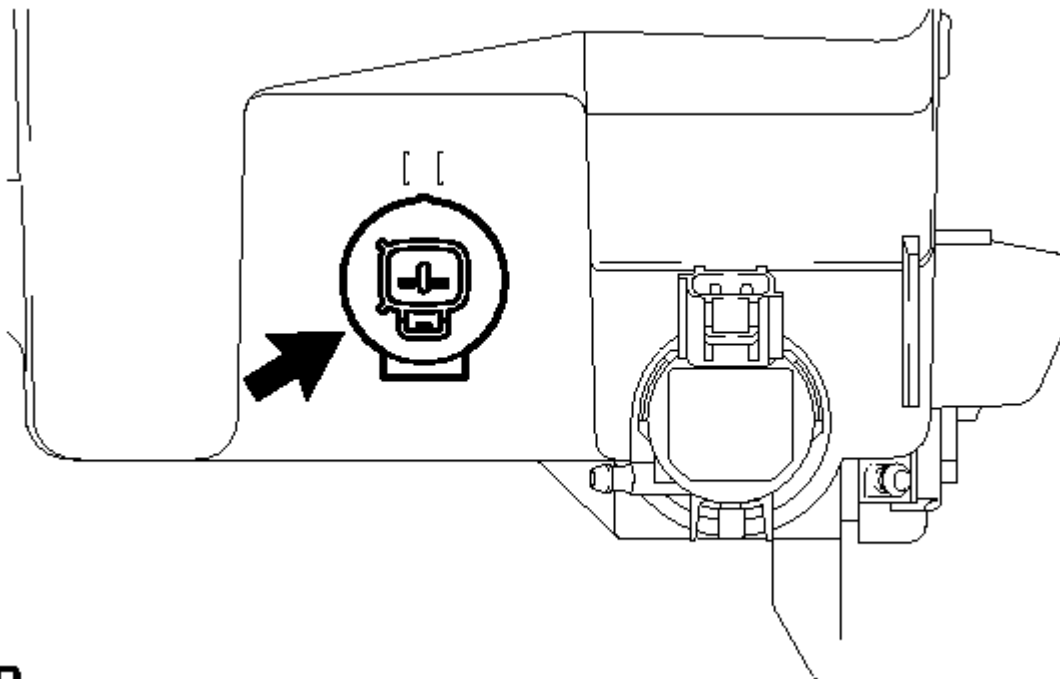
Refer to **REMOVAL**

2. DRAIN WASHER FLUID See step 2

3. REMOVE WINDSHIELD WASHER JAR ASSEMBLY See step 3

4. REMOVE WASHER LEVEL WARNING SWITCH ASSEMBLY

- a. Pull the washer level warning switch out of the packing of the washer jar.



P

Fig. 85: Identifying Washer Level Warning Switch Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION

INSPECTION

1. INSPECT WASHER LEVEL WARNING SWITCH ASSEMBLY

HINT:

The following check should be performed with the windshield washer motor and pump installed to the washer jar.

- a. Fill the washer jar with washer fluid.
- b. Measure the resistance according to the value(s) in the table below.

*a

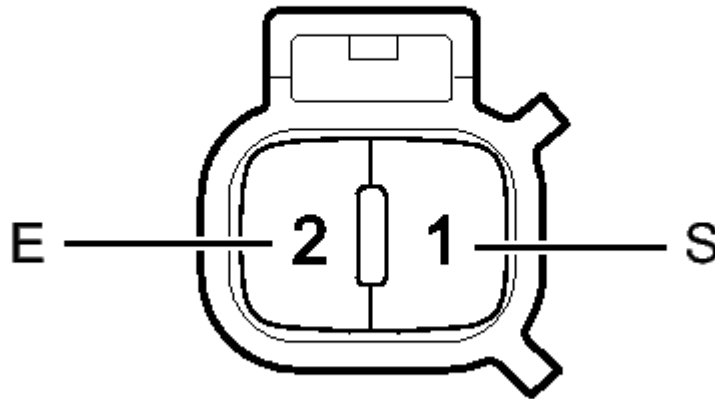


Fig. 86: Measuring Washer Level Warning Switch Assembly Resistance
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

	Component without harness connected
*a	(Washer Level Warning Switch Assembly)

Standard Resistance

Tester Connection	Condition	Specified Condition
1 (S) - 2 (E)	Fluid volume is more than 600 to 800 ml	10 kohms or higher
1 (S) - 2 (E)	Fluid volume is less than 600 to 800	Below 1 ohms



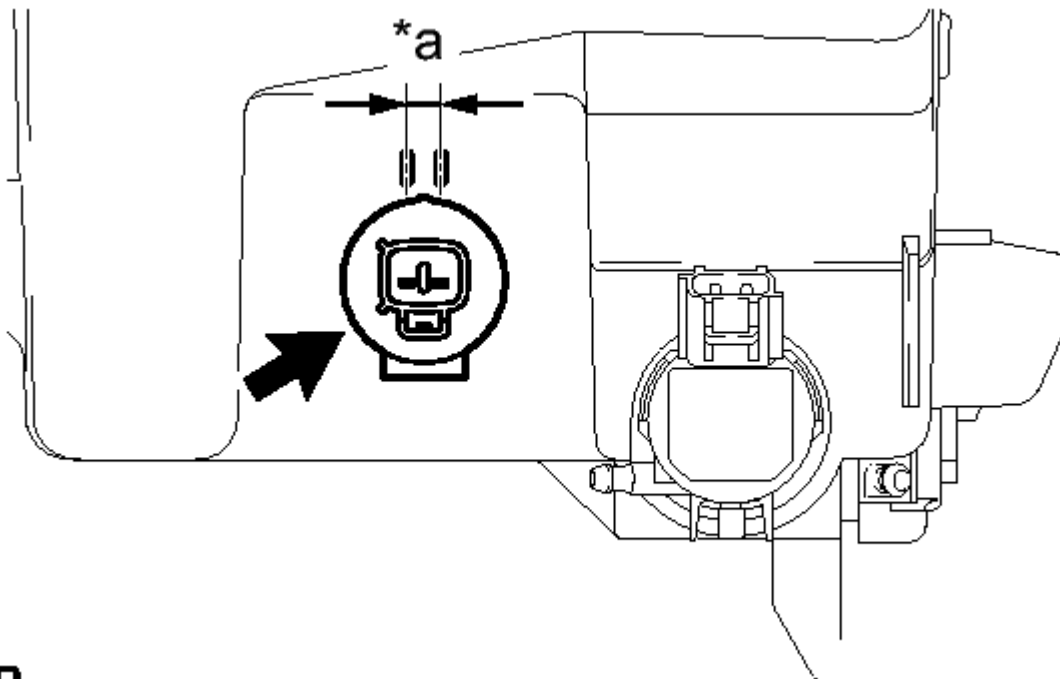
If the result is not as specified, replace the washer level warning switch assembly.

INSTALLATION

INSTALLATION

1. INSTALL WASHER LEVEL WARNING SWITCH ASSEMBLY

- a. Install the washer level warning switch onto the packing of the washer jar.



P

Fig. 87: Installing Washer Level Warning Switch Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	Dimension
A	

HINT:

When washer level warning switch is assembled, projection should be set up within dimension A.

2. **INSTALL WINDSHIELD WASHER JAR ASSEMBLY** See step 2
3. **FILL UP WASHER JAR WITH WINDSHIELD WASHER FLUID** See step 3
4. **INSTALL FRONT BUMPER COVER**

Refer to **INSTALLATION**

WIPER ECU

COMPONENTS

ILLUSTRATION

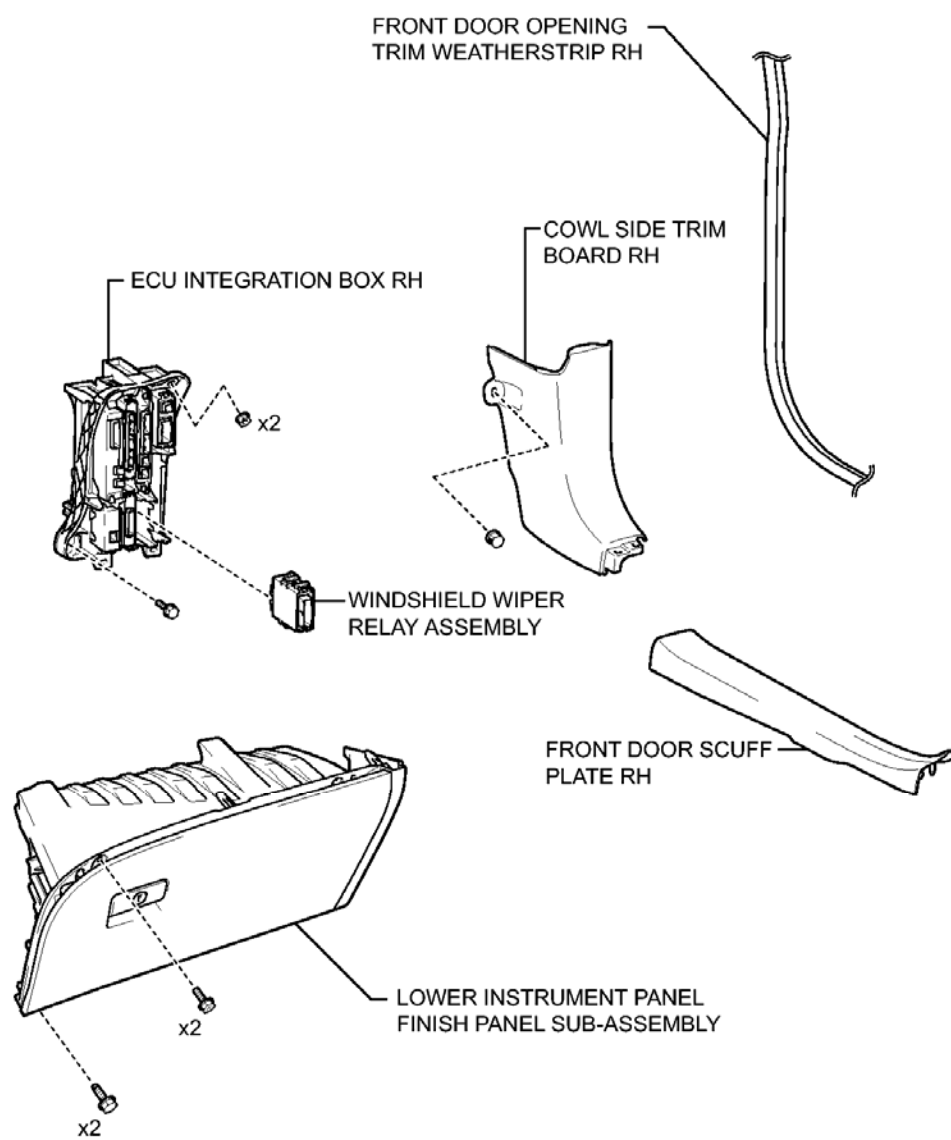


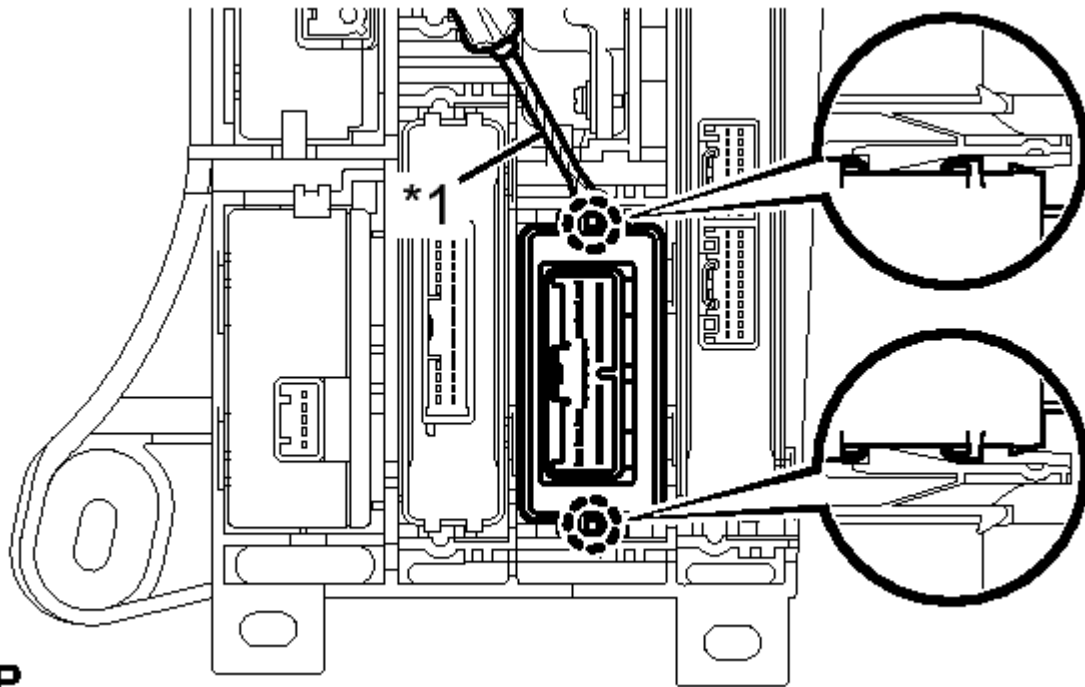
Fig. 88: Identifying Wiper ECU Replacement Components

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

REMOVAL

REMOVAL

1. **REMOVE FRONT DOOR SCUFF PLATE RH** . Refer to **REMOVAL - Step 3**
2. **REMOVE COWL SIDE TRIM BOARD RH** . Refer to **REMOVAL - Step 5**
3. **SEPARATE FRONT DOOR OPENING TRIM WEATHERSTRIP RH**
4. **REMOVE LOWER INSTRUMENT PANEL FINISH PANEL SUB-ASSEMBLY** . Refer to **REMOVAL - Step 34**
5. **REMOVE ECU INTEGRATION BOX RH** . Refer to **REMOVAL - Step 6**
6. **REMOVE WINDSHIELD WIPER RELAY ASSEMBLY**
 - a. Using a screwdriver with its tip wrapped in protective tape, disengage the 2 claws and remove the windshield wiper relay assembly.



P

Fig. 89: Removing Windshield Wiper Relay Assembly & Fasteners Using Screwdriver

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

TEXT IN ILLUSTRATION

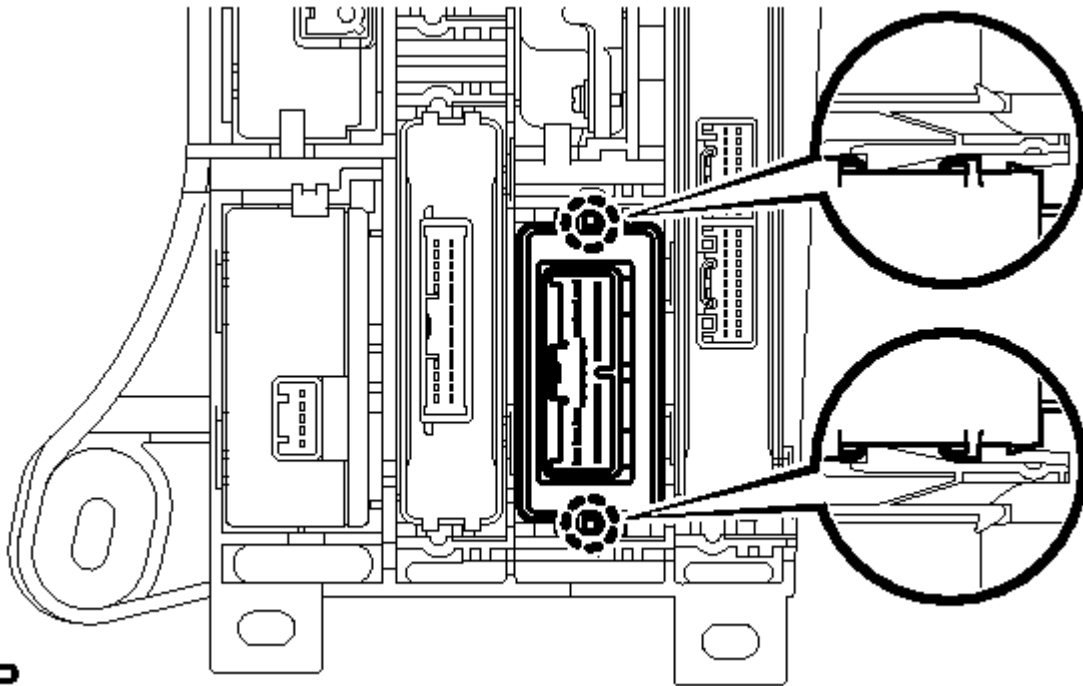
*1	Protective Tape
----	--------------------

INSTALLATION

INSTALLATION

1. INSTALL WINDSHIELD WIPER RELAY ASSEMBLY

- a. Engage the 2 claws and install the windshield wiper relay assembly.



P

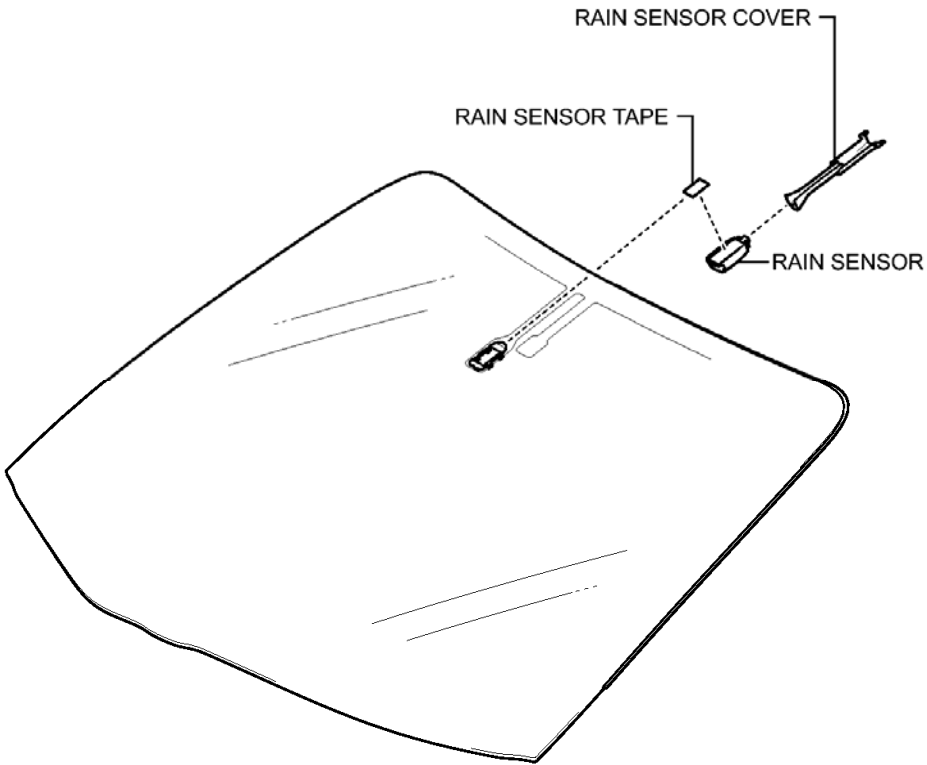
Fig. 90: Installing Windshield Wiper Relay Assembly & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. INSTALL ECU INTEGRATION BOX RH . Refer to INSTALLATION - Step 2
3. INSTALL LOWER INSTRUMENT PANEL FINISH PANEL SUB-ASSEMBLY . Refer to INSTALLATION - Step 24
4. INSTALL FRONT DOOR OPENING TRIM WEATHERSTRIP RH
5. INSTALL COWL SIDE TRIM BOARD RH . Refer to INSTALLATION - Step 35
6. INSTALL FRONT DOOR SCUFF PLATE RH . Refer to INSTALLATION - Step 37

RAIN SENSOR

COMPONENTS

ILLUSTRATION



P

Fig. 91: Identifying Rain Sensor Replacement Components
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ON-VEHICLE INSPECTION

ON-VEHICLE INSPECTION

1. INSPECT RAIN SENSOR

- a. Disconnect the T3 rain sensor connector.

*a

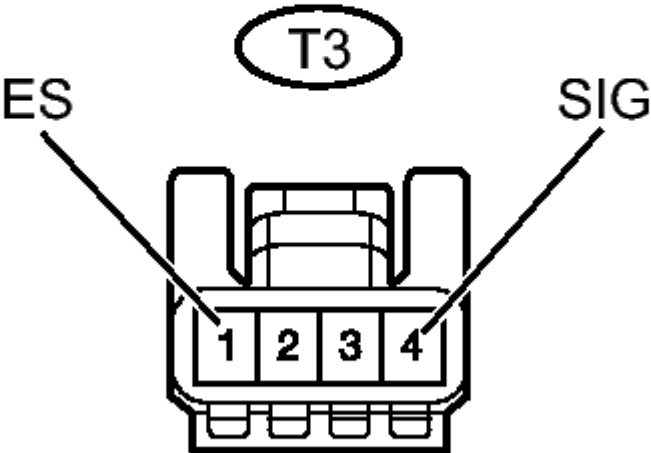


Fig. 92: Measuring Rain Sensor Resistance
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	Front
	view of
	wire
	harness
	connector
	(to Rain
	Sensor)

b. Measure the resistance according to the value(s) in the table below.

Standard Resistance

--	--	--	--

Tester Connection	Condition	Specified Condition
T3-1 (ES) - Body ground	Always	Below 1 ohms

If the result is not as specified, repair or replace the harness or connector.

- c. Measure the voltage according to the value(s) in the table below.

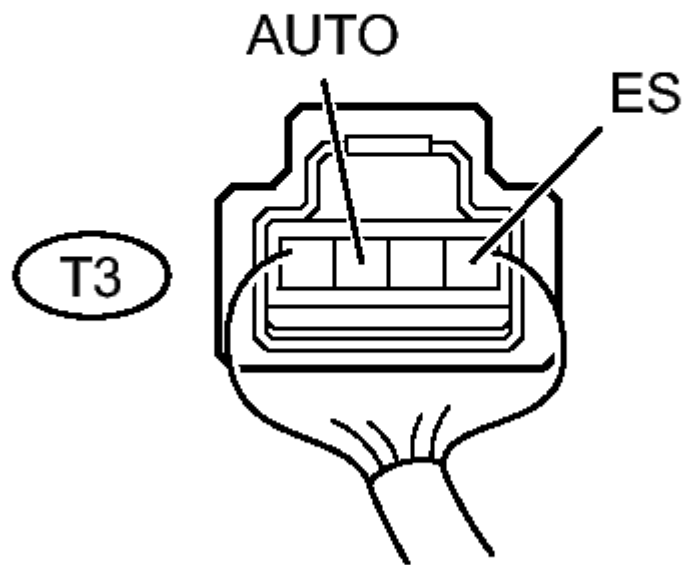
Standard Voltage

Tester Connection	Switch Condition	Specified Condition
T3-4 (SIG) - Body ground	Ignition switch ON	11 to 14 V

If the result is not as specified, repair or replace the harness or connector.

- d. Reconnect the rain sensor connector.

*a



N

Fig. 93: Checking Rain Sensor Operation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	Component with harness connected (Rain Sensor)
----	---

- e. Connect an oscilloscope to the rain sensor connector.
- f. Check for pulses.

OK

Tester Connection	Switch Condition	Specified Condition
T3-3 (AUTO) - T3-1 (ES)	Ignition switch ON	Pulse generation

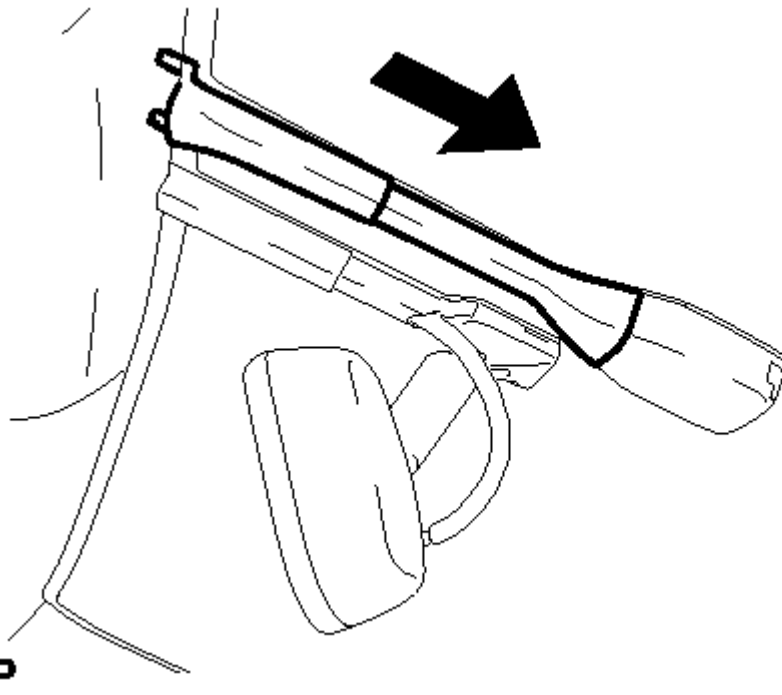
If the result is not as specified, replace the rain sensor.

REMOVAL

REMOVAL

1. REMOVE RAIN SENSOR COVER

- a. Slide the rain sensor cover.

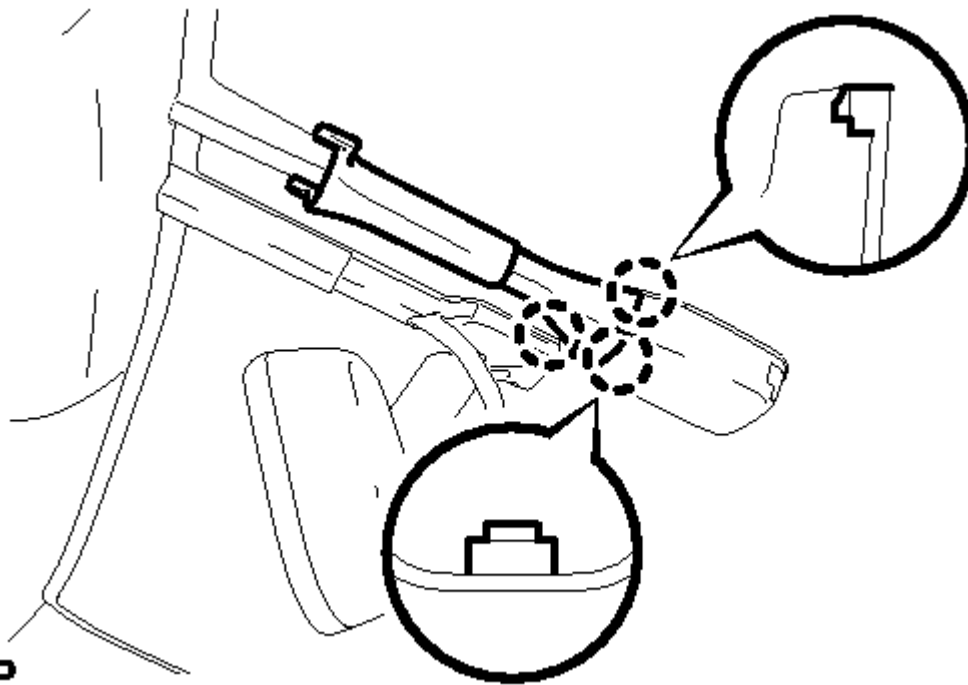


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Fig. 94: Sliding Rain Sensor Cover

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

- b. Disengage the 3 claws and remove the rain sensor cover.

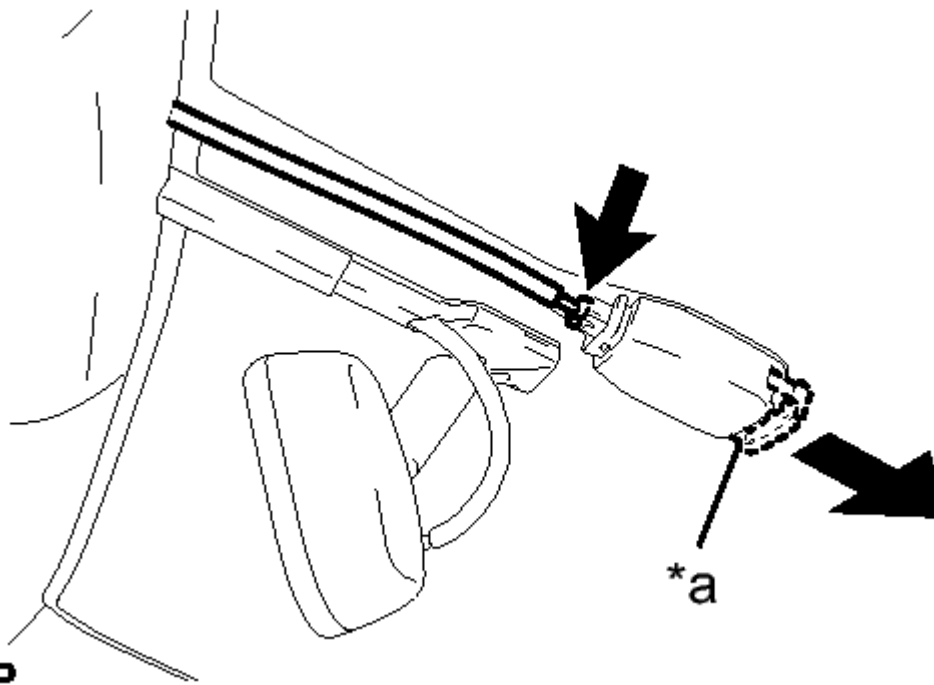


P

Fig. 95: Removing Rain Sensor Cover & Fasteners
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. REMOVE RAIN SENSOR

- a. Disconnect the rain sensor connector.



P

Fig. 96: Removing Rain Sensor Connector

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

TEXT IN ILLUSTRATION

*a Stopper

- b. Slide the stopper as shown in the illustration.
- c. Disengage the 4 claws and remove the rain sensor as shown in the illustration.

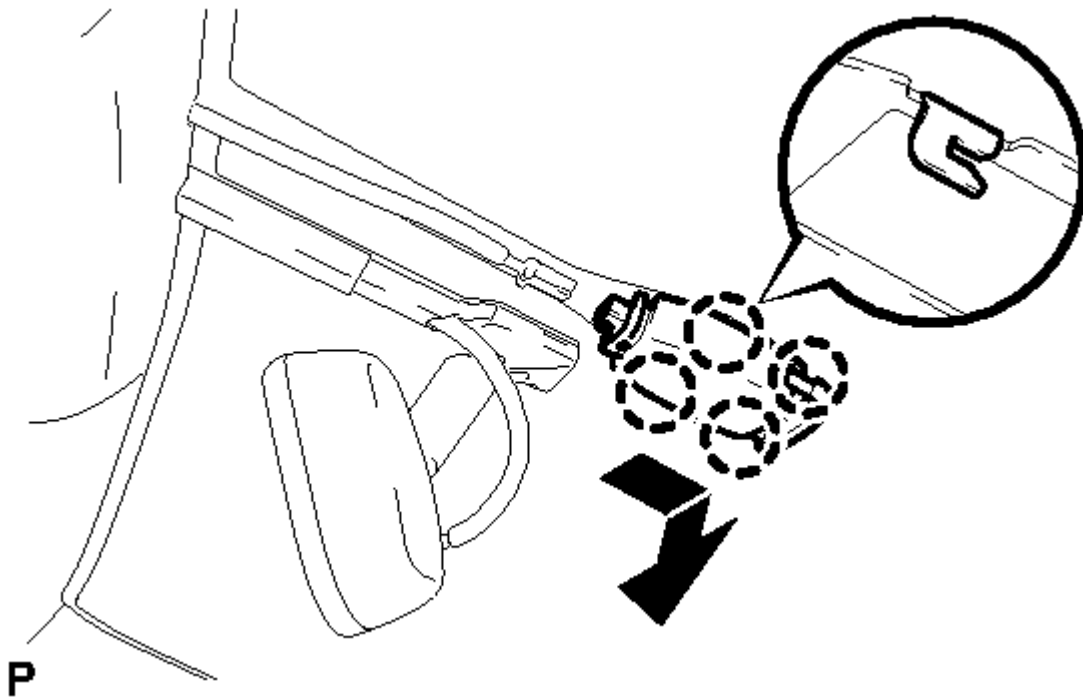
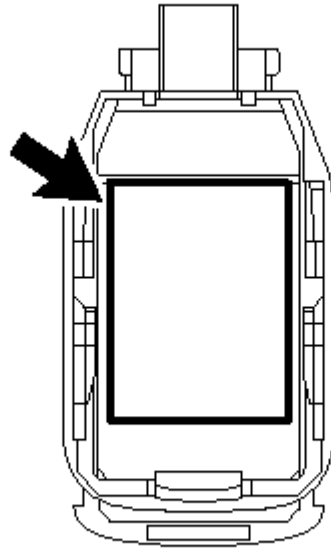


Fig. 97: Removing Rain Sensor & Fasteners

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

3. REMOVE RAIN SENSOR TAPE



P

Fig. 98: Identifying Rain Sensor Tape
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

This step should be performed only when the rain sensor tape needs to be replaced.

- a. Remove the rain sensor tape.

INSTALLATION

INSTALLATION

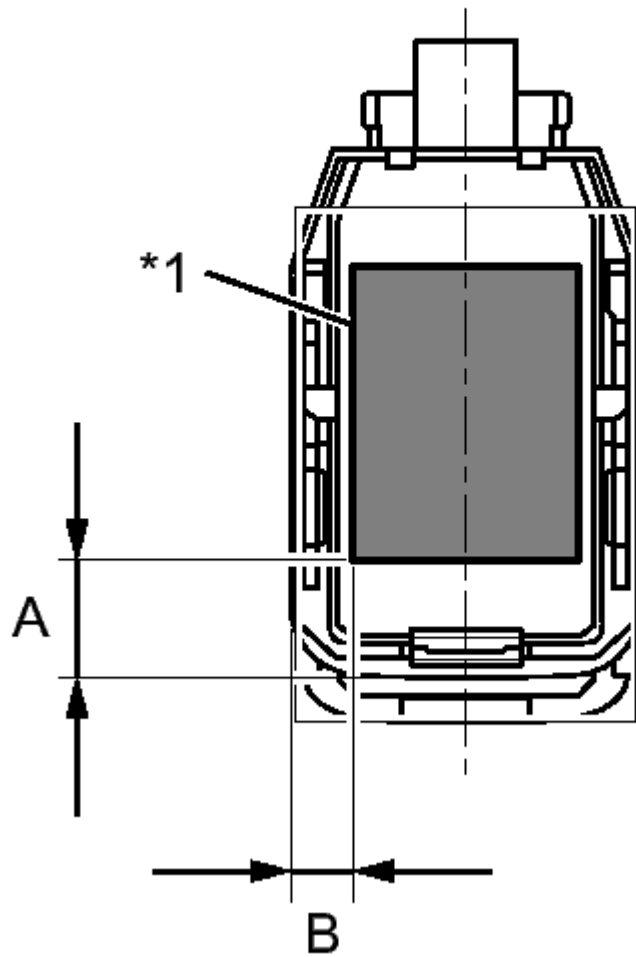
1. INSTALL RAIN SENSOR TAPE

NOTE: **The rain sensor tape can be reused. However, replace it with a new one if it is dirty or damaged.**

HINT:

This step should be performed only when the rain sensor tape needs to be replaced.

- a. Remove the release sheet (sensor side) from new rain sensor tape and apply the tape to the position indicated in the illustration (the sensing part of the rain sensor) while pushing out air bubbles with your fingers.



P

B

Fig. 99: Identifying Rain Sensor Tape And Rain Sensor Sensing Portion
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Rain Sensor Tape
----	------------------------

Standard Clearance

Dimension	Measurement
A	13.5 mm (0.532 in.)
B	7.5 mm (0.295 in.)

- b. Remove the release sheet (glass side) from the rain sensor tape.

NOTE:

- Check that the old rain sensor tape is not left on the windshield glass. If the tape is still on the windshield glass, remove it before installing the rain sensor.
- Do not touch the sensor tape surface or the glass surface directly with your fingers.
- Clean up dirt on the glass with a piece of cloth, etc.

2. INSTALL RAIN SENSOR

NOTE:

- Do not touch the sensor tape surface or the glass surface directly with your fingers.
- Clean up dirt on the glass with a piece of cloth, etc.
- After installing the rain sensor, there should be no air bubbles between the windshield glass and the rain sensor tape.

- a. Engage the 4 claws and install the rain sensor as shown in the illustration.

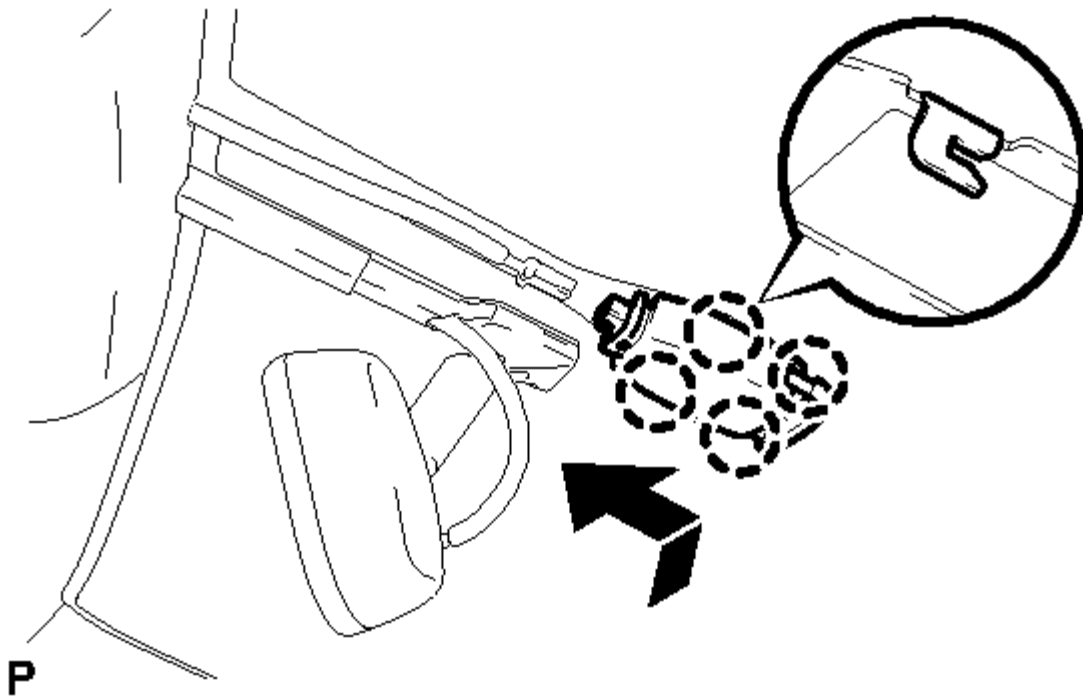
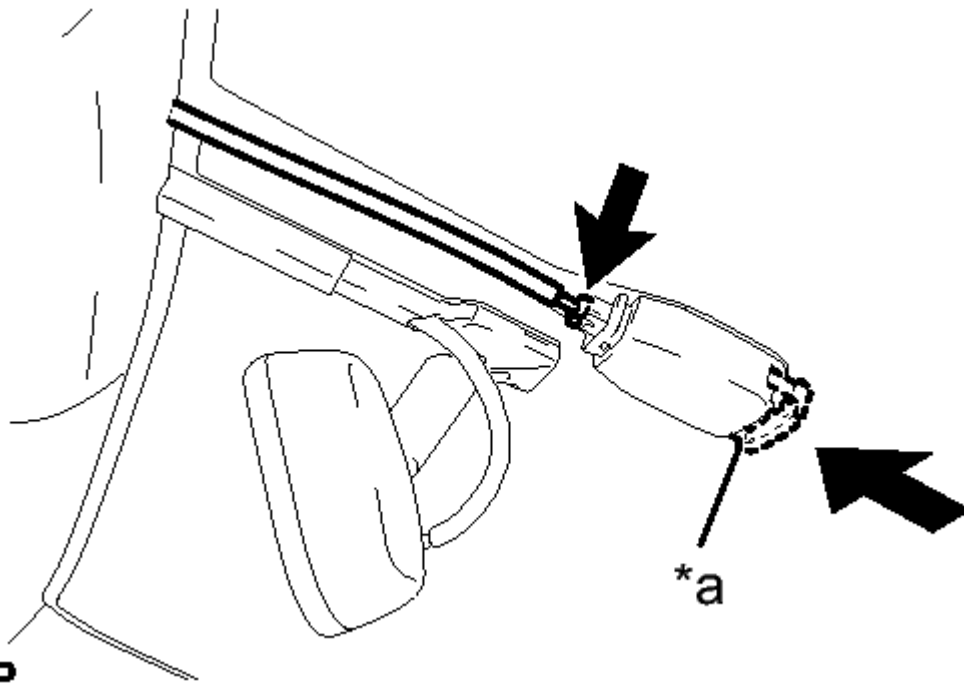


Fig. 100: Installing Rain Sensor & Fasteners

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

- b. Connect the rain sensor connector.



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Fig. 101: Installing Rain Sensor Connector

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

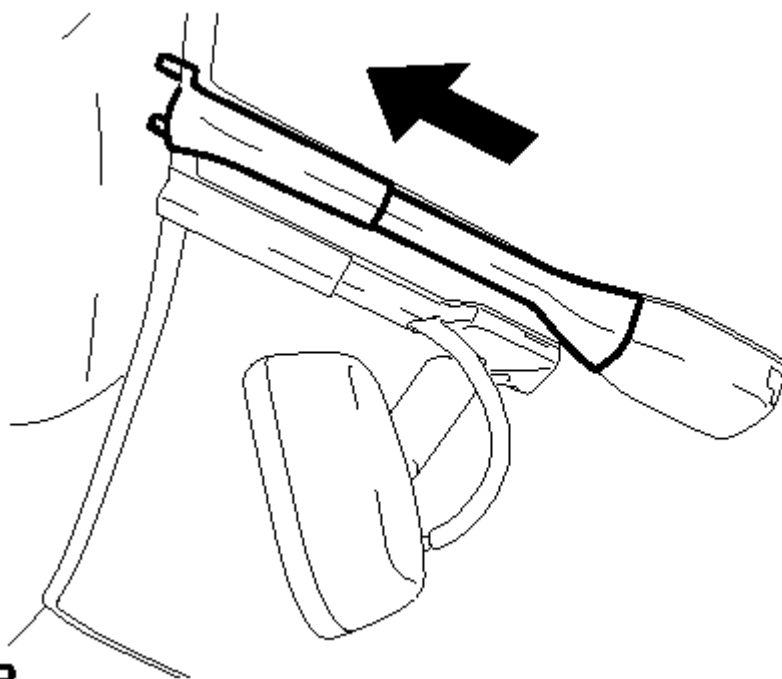
TEXT IN ILLUSTRATION

***a** Stopper

- c. Gradually attach the rain sensor to the glass surface to prevent air bubbles from forming between them.
- d. Push in the stopper.

3. INSTALL RAIN SENSOR COVER

- a. Engage the 3 claws to install the rain sensor cover.
- b. Slide the rain sensor cover as shown in the illustration.



P

Fig. 102: Sliding Rain Sensor Cover

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

ACCESSORIES & EQUIPMENT

Wiper System / Washer System (Service Specifications) - Sienna

WIPER / WASHER

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Front wiper arm and blade assembly LH x Windshield wiper motor and link assembly	25	250	18
Front wiper arm and blade assembly RH x Windshield wiper motor and link assembly	25	250	18
Windshield wiper motor and link assembly x Body	7.0	71	62 in.*lbf
Windshield wiper link assembly x Windshield wiper motor assembly	7.5	76	66 in.*lbf
Rear wiper arm and blade assembly x Rear wiper motor assembly	5.5	56	49 in.*lbf
Rear wiper motor assembly x Back door	5.5	56	49 in.*lbf
Windshield washer jar assembly x Body	5.5	56	49 in.*lbf

ACCESSORIES & EQUIPMENT

Wiper System / Washer System (w/o Rain Sensor) (Inspection) - Sienna

WIPER AND WASHER SYSTEM (W/O RAIN SENSOR)

PRECAUTION

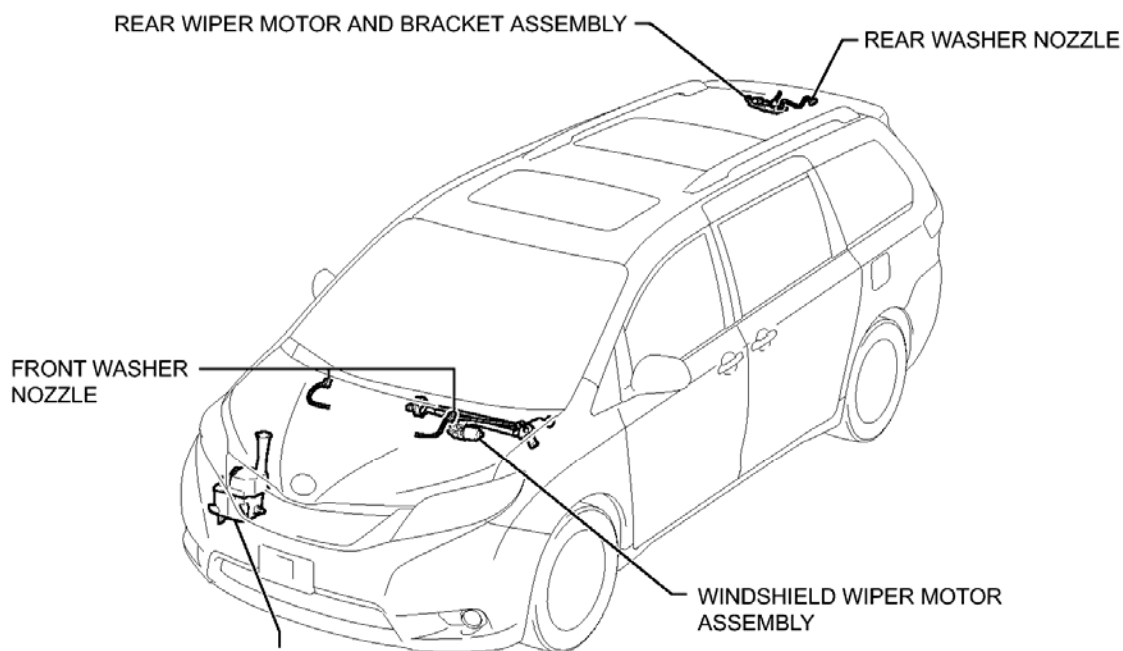
PRECAUTION

1. WASHER NOZZLE ADJUSTMENT PRECAUTION

- a. Do not clean or adjust the washer nozzle using objects such as needles or safety pins, because:
 1. The washer nozzle tip is made of resin and could be damaged.
 2. Adjustment is not necessary as the washer nozzle is a spray type.
- b. If the washer nozzle is clogged with substances such as car wax, remove it and clean the nozzle hole with a soft resin brush or similar tool.

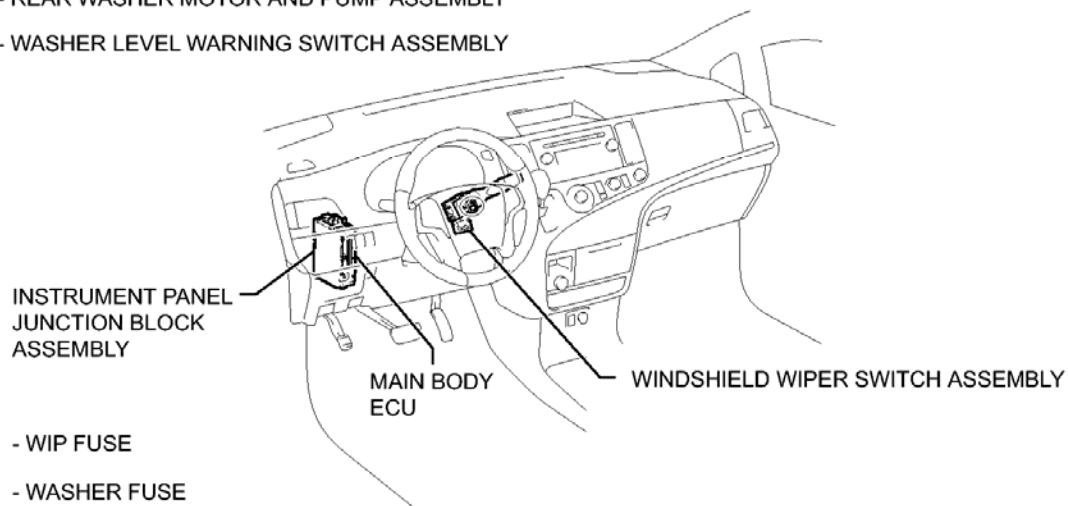
PARTS LOCATION

ILLUSTRATION



WINDSHIELD WASHER JAR ASSEMBLY

- WINDSHIELD WASHER MOTOR AND PUMP ASSEMBLY
- REAR WASHER MOTOR AND PUMP ASSEMBLY
- WASHER LEVEL WARNING SWITCH ASSEMBLY



- WIP FUSE
- WASHER FUSE
- WASHER RR FUSE
- WIP RR FUSE

P

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

SYSTEM DIAGRAM

SYSTEM DIAGRAM

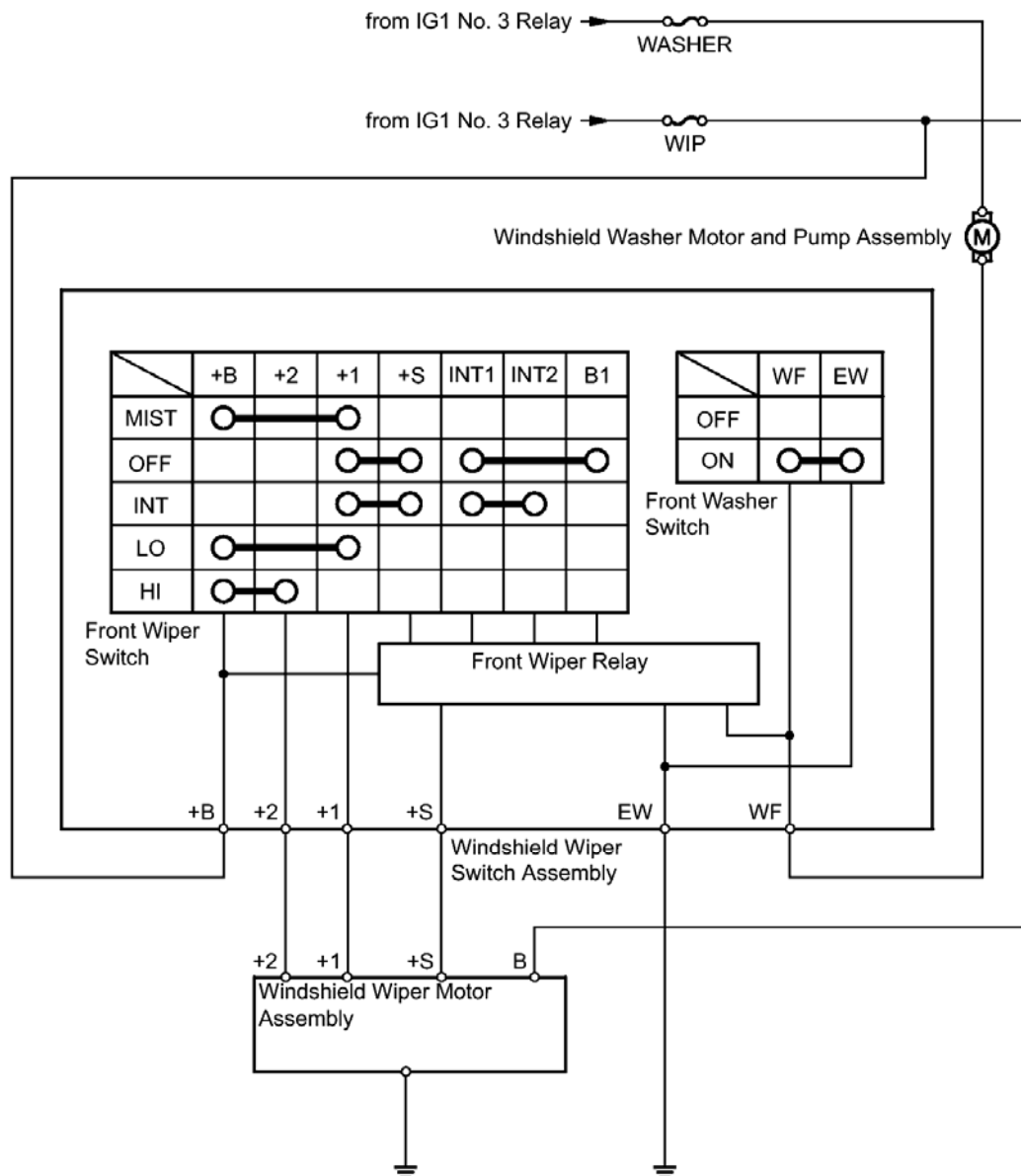


Fig. 2: Wiper & Washer System Diagram (1 Of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Rear Wiper and Washer System

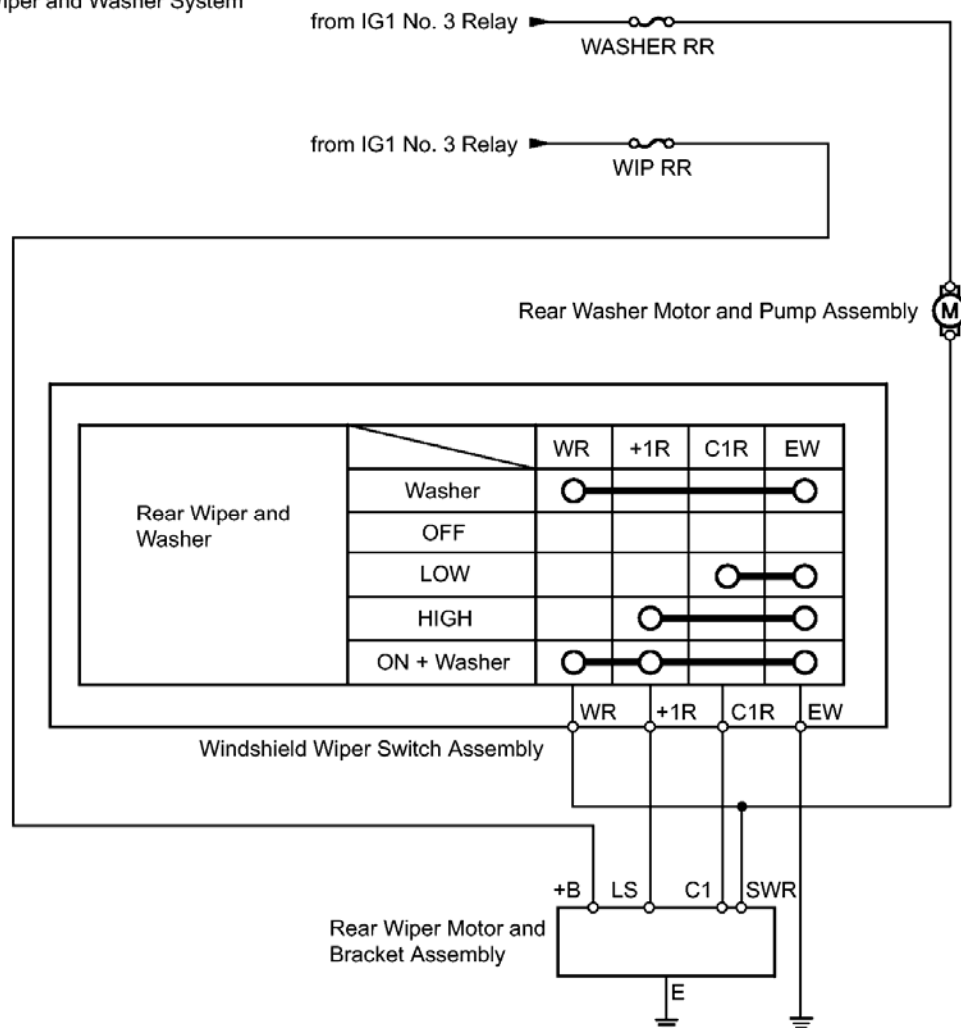


Fig. 3: Wiper & Washer System Diagram (2 Of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

PROBLEM SYMPTOMS TABLE

PROBLEM SYMPTOMS TABLE

HINT:

Use the table below to help determine the cause of the problem symptom. The potential causes of the symptoms are listed in order of probability in the "Suspected Area" column of the table. Check each symptom by checking the suspected areas in the order they are listed. Replace parts as necessary.

FRONT WIPER AND WASHER SYSTEM

Symptom	Suspected Area	See
Front wiper and washer	Windshield wiper switch assembly	Refer to INSPECTION

system does not operate	Wire harness or connector	-
Front wiper system does not operate in LO or HI	WIP fuse	Refer to <u>PARTS LOCATION</u>
	Windshield wiper switch assembly	Refer to <u>INSPECTION</u>
	Front wiper motor assembly	Refer to <u>INSPECTION</u>
	Wire harness or connector	-
Front wiper system does not operate in INT	WIP fuse	Refer to <u>PARTS LOCATION</u>
	Windshield wiper switch assembly	Refer to <u>INSPECTION</u>
	Front wiper motor assembly	Refer to <u>INSPECTION</u>
	Wire harness or connector	-
Front washer system does not operate	WASHER fuse	Refer to <u>PARTS LOCATION</u>
	Windshield wiper switch assembly	Refer to <u>INSPECTION</u>
	Windshield washer motor and pump assembly	Refer to <u>INSPECTION</u>
	Wire harness or connector	-
Front wiper arms do not return to their original positions when wiper switch is turned off	Front wiper motor assembly	Refer to <u>INSPECTION</u>
	Wire harness or connector	-

REAR WIPER AND WASHER SYSTEM

Symptom	Suspected Area	See
Rear wiper and washer system does not operate	Windshield wiper switch assembly	Refer to <u>INSPECTION</u>
	Wire harness or connector	-
Rear wiper system does not operate	WIP RR fuse	Refer to <u>PARTS LOCATION</u>
	Windshield wiper switch assembly	Refer to <u>INSPECTION</u>
	Rear wiper motor assembly	Refer to <u>INSPECTION</u>
	Wire harness or connector	-
Rear washer system does not operate	WASHER RR fuse	Refer to <u>PARTS LOCATION</u>
	Windshield wiper switch assembly	Refer to <u>INSPECTION</u>
	Rear washer motor and pump assembly	Refer to <u>INSPECTION</u>
	Wire harness or connector	-
Rear wiper arms do not return to their original positions when wiper switch is turned off	Rear wiper motor assembly	Refer to <u>INSPECTION</u>
	Wire harness or connector	-

WASHER FLUID LEVEL WARNING SYSTEM

Symptom	Suspected Area	See
Washer fluid level warning system does not operate	Washer fluid level warning switch	Refer to <u>INSPECTION</u>
	Combination meter assembly	Refer to <u>PROBLEM SYMPTOMS TABLE</u>

ACCESSORIES & EQUIPMENT

Wiper System / Washer System (w/Rain Sensor) (Diagnostics & Circuit Tests) - Sienna

WIPER AND WASHER SYSTEM (W/ RAIN SENSOR)

PRECAUTION

PRECAUTION

1. IGNITION SWITCH EXPRESSIONS

- a. The type of ignition switch used on this model differs according to the specifications of the vehicle. The expressions listed in the table below are used in this information.

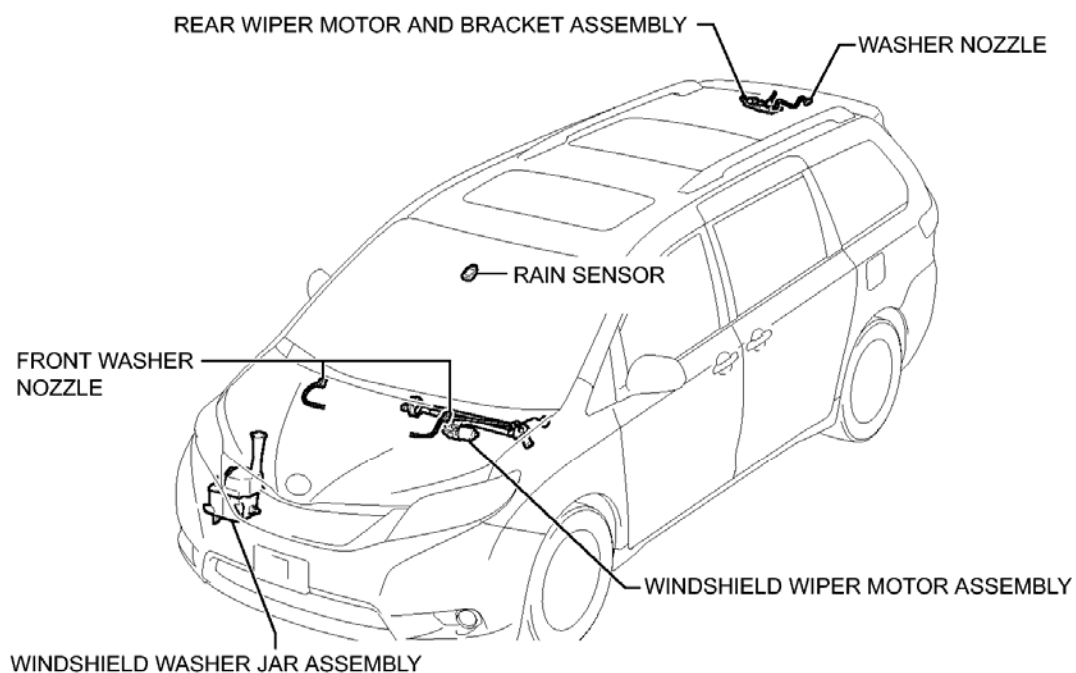
Expression	Ignition Switch (Position)	Engine Switch (Condition)
Ignition Switch off	LOCK	Off
Ignition Switch ON	ON	On (IG)
Ignition Switch ACC	ACC	On (ACC)
Engine Start	START	Start

2. PRECAUTION OF WASHER NOZZLE ADJUSTMENT

- a. Do not clean or adjust the washer nozzle with a safety pin, etc. because:
 1. the washer nozzle tip is made of resin and could be damaged.
 2. adjustment is not necessary for this spray type washer nozzle. If it is necessary to change the nozzle angle, replace the washer nozzle with one that has a different nozzle angle.
- b. If the washer nozzle is clogged with wax, etc., remove it and clean the nozzle hole with a soft resin brush or other cleaning tool.

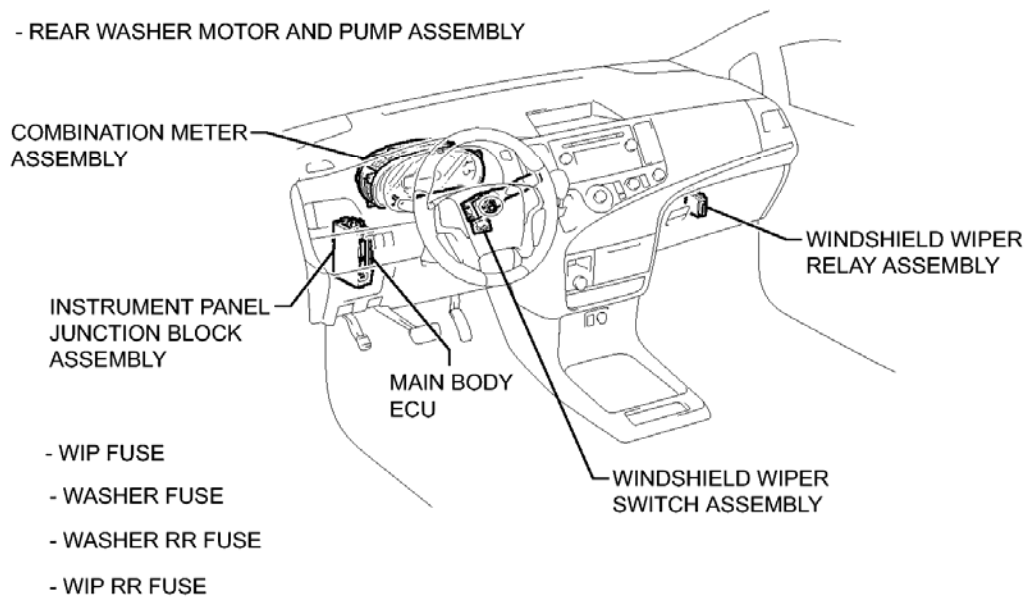
PARTS LOCATION

ILLUSTRATION



WINDSHIELD WASHER JAR ASSEMBLY

- WASHER LEVEL WARNING SWITCH ASSEMBLY
- FRONT WASHER MOTOR AND PUMP ASSEMBLY
- REAR WASHER MOTOR AND PUMP ASSEMBLY



- WIP FUSE
- WASHER FUSE
- WASHER RR FUSE
- WIP RR FUSE

P
Fig. 1: Wiper And Washer System (w/ Rain Sensor) Components Location
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

SYSTEM DIAGRAM

SYSTEM DIAGRAM

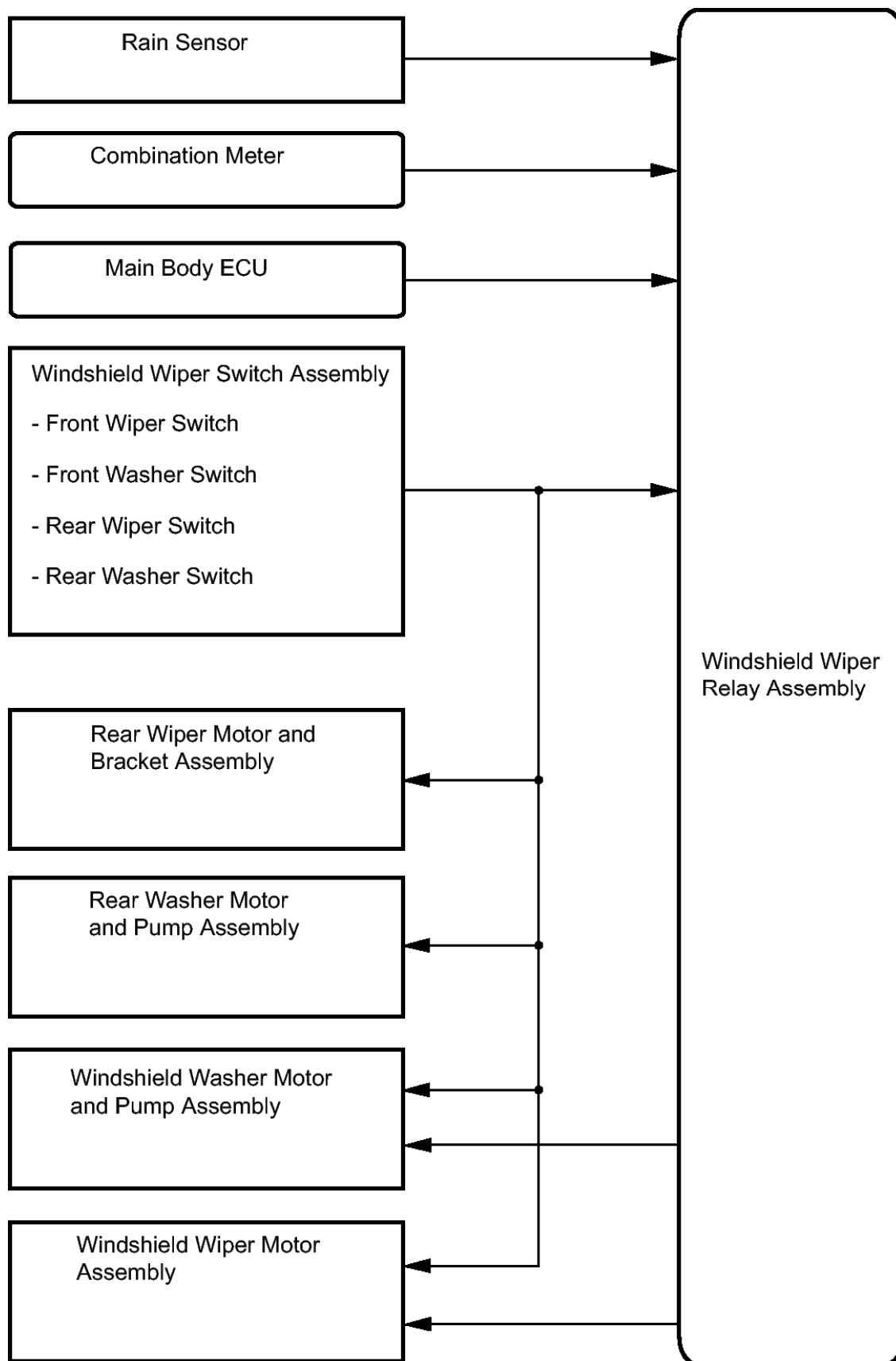


Fig. 2: Wiper And Washer System Diagram
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

SYSTEM DESCRIPTION

SYSTEM DESCRIPTION

The wiper and washer system has the following functions:

	Function	Outline
Wiper	Rain sensing	Controls the wiping interval and speed in accordance with the amount of rain and vehicle speeds when the wiper switch is in AUTO.
	Washer-linked wiper	Wipers are operated in unison with the washer.

1. RAIN SENSING FUNCTION

a. General

- The rain sensing function controls the wiper timing in accordance with the amount of rain that strikes the windshield when the wiper switch is in AUTO.
- The windshield wiper relay assembly controls the timing based on the signal from the rain sensor.

b. Rain Sensor

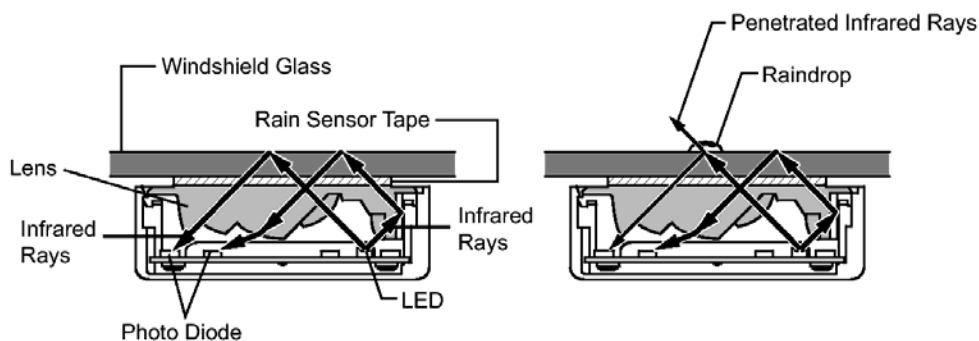


Fig. 3: Rain Sensing Function
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

1. The rain sensor consists of two LEDs (Light Emitting Diodes) that emit infrared rays, 3 photo diodes that can receive those rays, a lens, and rain sensor tape.

HINT:

If the windshield glass is being replaced, make sure to use new rain sensor tape. Failure to do so will lead to a system malfunction.

- If no rain is present in the detection area, the infrared rays emitted by the LEDs are all reflected from the outer surface of the windshield glass and are received by the photo diode.
- If any rain is present in the detection area, a portion of the emitted infrared rays penetrate the windshield glass due to the change in the difference of the index of refraction between the glass and the area outside the windshield (difference between air and water). The ability of the windshield glass to reflect all light back inside changes due to the presence of rain. This change of internal reflection due to the presence of water reduces the amount of infrared rays that are received by the photo diode. The amount of this reduction is then used to determine the amount of rain. Thus, the INT, LO, or HI wiper operation will be selected in order to operate the wipers at an optimal speed and timing.

2. WASHER-LINKED WIPER

- When the wiper switch is set to OFF or AUTO and the washer switch is turned on for approximately 0.3 seconds or more, the wipers start operating at low speed at the same time as the washer fluid is sprayed.
- The wipers operate three times at low speed after the washer switch is turned off.

HOW TO PROCEED WITH TROUBLESHOOTING

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

Use the following procedure to troubleshoot the wiper and washer system.

1. VEHICLE BROUGHT TO WORKSHOP

NEXT: Go to next step

2. CUSTOMER PROBLEM ANALYSIS AND SYMPTOM CHECK

NEXT: Go to next step

3. INSPECT BATTERY VOLTAGE

Standard voltage

11 to 14 V

If the voltage is below 11 V, recharge or replace the battery before proceeding to the next step.

NEXT: Go to next step

4. PROBLEM SYMPTOMS TABLE

RESULT

Result	Proceed to
Fault is not listed in Problem Symptoms Table	A
Fault is listed in Problem Symptoms Table	B

B --> Go to step 6

A: Go to next step

5. OVERALL ANALYSIS AND TROUBLESHOOTING

- Terminals of ECU. Refer to **TERMINALS OF ECU**
- Fail-safe chart. Refer to **FAIL-SAFE CHART**
- Inspection
- On-vehicle inspection

NEXT: Go to next step

6. ADJUST, REPAIR OR REPLACE

NEXT: Go to next step

7. CONFIRMATION TEST

NEXT --> END

PROBLEM SYMPTOMS TABLE

PROBLEM SYMPTOMS TABLE

HINT:

Use the table below to help determine the cause of the problem symptom. The potential causes of the symptoms are listed in order of probability in the "Suspected Area" column of the table. Check each symptom by checking the suspected areas in the order they are listed. Replace parts as necessary.

FRONT WIPER AND WASHER

Symptom	Suspected Area	See
Front wipers and washer do not operate	WIP fuse	-
	Windshield wiper relay assembly	Refer to <u>REMOVAL</u>
	Harness or connector	-
Front wipers do not operate at all	Power source circuit	Refer to <u>Power Source Circuit</u>
	Front wiper motor circuit	Refer to <u>Front Wiper Motor Circuit</u>
	Windshield wiper relay assembly	Refer to <u>REMOVAL</u>
Front wipers do not operate in AUTO	Rain sensor tape*1	-
	Wiper and washer switch circuit	Refer to <u>Wiper and Washer Switch Circuit</u>
	Rain sensor circuit	Refer to <u>Rain Sensor Circuit</u>
	Speed signal circuit	Refer to <u>Speed Signal Circuit</u>
	Windshield wiper relay assembly	Refer to <u>REMOVAL</u>
Front wipers do not operate in LO	Wiper and washer switch circuit	Refer to <u>Wiper and Washer Switch Circuit</u>
	Front wiper motor circuit	Refer to <u>Front Wiper Motor Circuit</u>
	Windshield wiper relay assembly	Refer to <u>REMOVAL</u>
Front wipers do not operate in HI	Wiper and washer switch circuit	Refer to <u>Wiper and Washer Switch Circuit</u>
	Front wiper motor circuit	Refer to <u>Front Wiper Motor Circuit</u>
	Windshield wiper relay assembly	Refer to <u>REMOVAL</u>
Front washer motor does not operate	Windshield washer motor and pump assembly	Refer to <u>INSPECTION</u>
	Windshield wiper switch assembly	Refer to <u>INSPECTION</u>
	Harness or connector	-
Washer fluid does not flow	Washer hose and nozzle	-
Front wipers do not operate when front washer switch is ON	Wiper and washer switch circuit	Refer to <u>Wiper and Washer Switch Circuit</u>
	Windshield wiper relay assembly	Refer to <u>REMOVAL</u>
When the front wiper switch is OFF, the wiper blades do not park or park in the wrong position	Front wiper arm installation position	-
	Windshield wiper motor assembly	Refer to <u>INSPECTION</u>

HINT:

*1: Before inspecting the rain sensor, first check if the rain sensor tape is correctly installed.

REAR WIPER AND WASHER

Symptom	Suspected Area	See
Rear wiper and washer do not operate	WASHER RR fuse	-
	Windshield wiper switch assembly	Refer to <u>INSPECTION</u>
	Harness or connector	-
Rear wiper does not operate in LO or HI	Windshield wiper switch assembly	Refer to <u>INSPECTION</u>
	Rear wiper motor assembly	Refer to <u>INSPECTION</u>
	Harness or connector	-
Rear washer motor does not operate	Windshield wiper switch assembly	Refer to <u>INSPECTION</u>
	Rear washer motor assembly	Refer to <u>INSPECTION</u>
	Harness or connector	-
Washer fluid does not flow	Washer hose and nozzle	-
When the rear wiper switch is OFF, the wiper blade does not park or parks in the wrong position	Rear wiper arm installation position	-
	Rear wiper motor assembly	Refer to <u>INSPECTION</u>

WASHER FLUID LEVEL WARNING SYSTEM

Symptom	Suspected Area	See
Washer fluid level warning system does not operate	Washer fluid level warning switch	Refer to <u>INSPECTION</u>
	Combination meter assembly	Refer to <u>PROBLEM SYMPTOMS TABLE</u>

TERMINALS OF ECU

TERMINALS OF ECU

1. CHECK WINDSHIELD WIPER RELAY ASSEMBLY

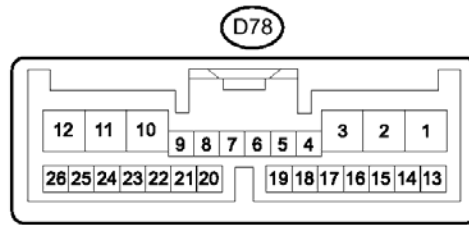


Fig. 4: ECU Connector Terminal Identification - Windshield Wiper Relay Assembly
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- Disconnect the D78 windshield wiper relay assembly connector.
- Measure the voltage and resistance according to the value(s) in the table below.

Terminal No. (Symbol)	Wiring Color	Terminal Description	Condition	Specified Condition
D78-4 (W) - Body ground	P - Body ground	Front washer switch circuit	Front washer switch on	Below 1 ohms
			Front washer switch off	10 kohms or higher
D78-6 (VR2) - D78-7 (VR1)	V - L	Adjusting volume circuit	Windshield wiper switch adjusting ring changed from (+) side to (-) side	0 to 2.7 kohms
D78-12 (IG) - Body ground	L - Body ground	Power source circuit	Ignition switch ON	11 to 14 V
			Ignition switch off	Below 1 V
D78-23 (WIG) - Body ground	L - Body ground	Power source circuit	Ignition switch ON	11 to 14 V
			Ignition switch off	Below 1 V
D78-26	W-B -			

(E) - Body ground	Body ground	Body ground	Always	Below 1 ohms
-------------------------	----------------	----------------	--------	-----------------

If the result is not as specified, there may be a malfunction in the wire harness.

- c. Reconnect the D78 windshield wiper relay assembly connector.
- d. Measure the voltage according to the value(s) in the table below.

Terminal No. (Symbol)	Wiring Color	Terminal Description	Condition	Specified Condition
D78-8 (SIG) - Body ground	W - Body ground	Power source circuit	Ignition switch ON	11 to 14 V
			Ignition switch off	Below 1 V
D78-1 (+2S) - Body ground	V - Body ground	Front wiper LO speed signal circuit	Ignition switch ON, front wiper switch LO	11 to 14 V
			Ignition switch ON, front wiper switch except LO	Below 1 V
D78-2 (+1) - Body ground	B - Body ground	Front wiper motor LO speed signal circuit	Front wiper motor in LO operation	11 to 14 V
			Front wiper motor off	Below 1 V
D78-3 (+2) - Body ground	GR - Body ground	Front wiper motor HI speed signal circuit	Front wiper motor in HI operation	11 to 14 V
			Front wiper motor off	Below 1 V
D78-4		Front	Front washer	Below 1

(W) - Body ground	P - Body ground	washer motor circuit	switch on	V
			Front washer switch off	11 to 14 V
D78-10 (+SM) - Body ground	R - Body ground	Front wiper motor operation signal	Front wiper motor is in LO or HI operation	11 to 14 V
			Front wiper motor off	Below 1 V
D78-11 (+SSW) - Body ground	R - Body ground	Front wiper motor operation signal	Ignition switch ON, front wiper switch off or in AUTO, front wiper motor operates	11 to 14 V
			Front wiper motor off	Below 1 V
D78-14 (PA1) - Body ground	SB - Body ground	Rain sensor signal	Ignition switch ON	Pulse generation
D78-17 (C1) - D78-16 (C0)	W - B	IG signal circuit	Ignition switch ON	11 to 14 V
			Ignition switch off	Below 1 V
D78-18 (TAIL) - Body ground	GR - Body ground	Light control Switch TAIL Signal input	-	-
D78-19 (SPD) - Body ground	LG - Body ground	Speed signal	Vehicle running	Pulse generation

If the result is not as specified, the windshield wiper relay assembly may have a malfunction.

FAIL-SAFE CHART

FAIL-SAFE CHART

1. FRONT WIPER SYSTEM

The following measures are taken as fail-safe operations when any malfunction is detected by the windshield wiper relay.

Trouble Area	Fail-safe Control
Wiper Motor	The operation of the rain sensing function stops.
Communication Signal	Rain sensing function: • The wiper operation continues at the speed that it was operating at prior to the malfunction. • Switches to the intermittent operation if a malfunction of the rain sensor is detected when the power source is switched from IG-OFF to IG-ON or the wiper switch is in AUTO position.

	Wiper switch operation: • The wiper operation continues at the speed that it was operating at prior to the malfunction.
--	--

CIRCUIT TESTS

Front Wiper Motor Circuit

DESCRIPTION

The windshield wiper relay assembly controls the windshield wiper motor assembly.

WIRING DIAGRAM

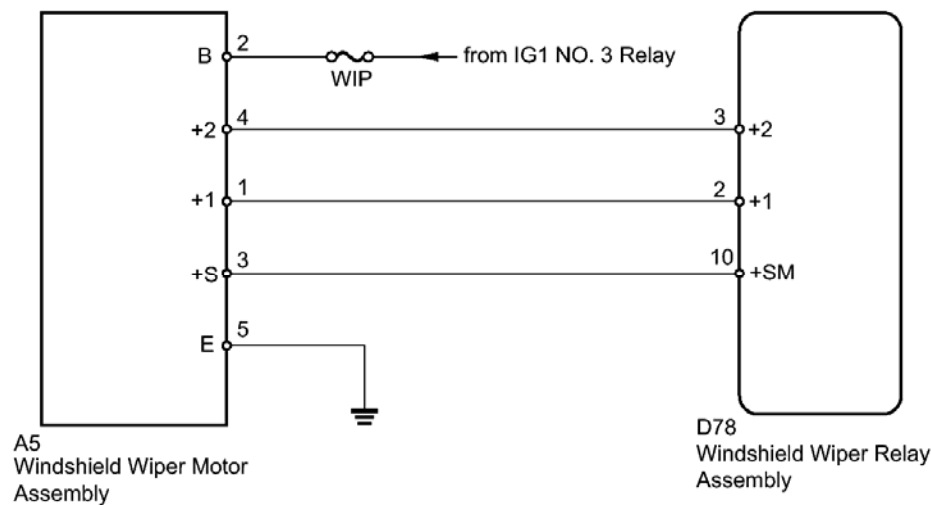


Fig. 5: Front Wiper Motor Circuit - Wiring Diagram
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

NOTE: Inspect the fuses for circuits related to this system before performing the following inspection procedure.

PROCEDURE

1. INSPECT WINDSHIELD WIPER MOTOR ASSEMBLY

- Remove the windshield wiper motor assembly. Refer to **REMOVAL** .
- Check LO operation.

*a

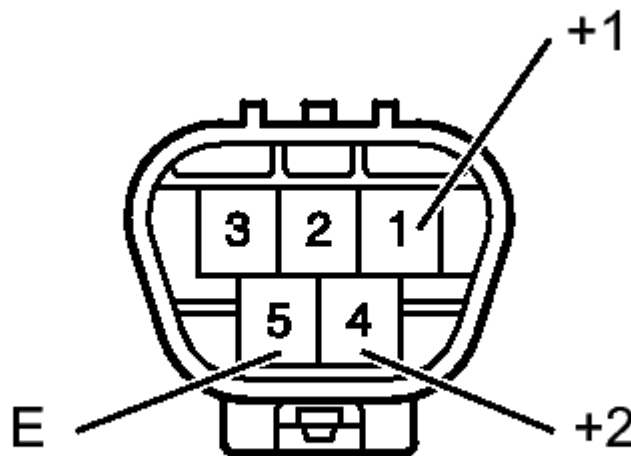


Fig. 6: Inspecting Windshield Wiper Motor Assembly With Connector End View
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

OK

Motor operates at low speed (LO).

- Check HI operation.

1. Connect a battery positive (+) lead to terminal 4 (+2) and a negative (-) lead to terminal 5 (E), and check that the motor operates at high speed (HI).

OK

Motor operates at high speed (HI).

TEXT IN ILLUSTRATION

Component without harness

*a	connected (Windshield Wiper Motor Assembly)
----	---

NG --> See step 5

OK: Go to next step

2. **CHECK HARNESS AND CONNECTOR (WINDSHIELD WIPER MOTOR ASSEMBLY - BATTERY AND BODY GROUND)**

- a. Disconnect the A5 windshield wiper motor connector.

*a

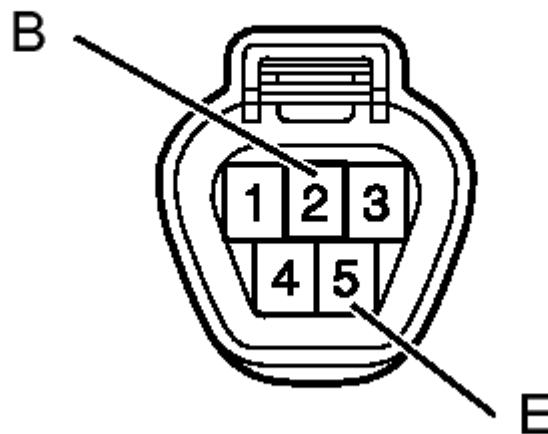


Fig. 7: Checking Harness And Connector (Windshield Wiper Motor Assembly - Battery And Body Ground) With Connector End View
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Measure the voltage and resistance according to the value(s) in the table below.

Standard Voltage

Tester Connection	Switch Condition	Specified Condition
A5-2 (B) - Body	Ignition switch	11 to 14 V

ground	ON	
--------	----	--

Standard Resistance

Tester Connection	Condition	Specified Condition
A5-5 (E) - Body ground	Always	Below 1 ohms

TEXT IN ILLUSTRATION

*a	Front view of wire harness connector (to Windshield Wiper Motor Assembly)
----	---

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: Go to next step

3. CHECK HARNESS AND CONNECTOR (WINDSHIELD WIPER MOTOR - WINDSHIELD WIPER RELAY)

- Disconnect the D78 windshield wiper relay assembly connector.
- Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Condition	Specified Condition
A5-1 (+1) - D78-2 (+1)	Always	Below 1 ohms
A5-1 (+1) - Body ground	Always	10 kohms or higher
A5-4 (+2) - D78-3 (+2)	Always	Below 1 ohms
A5-4 (+2) - Body ground	Always	10 kohms or higher
A5-3 (+S) -		

D78-10 (+SM)	Always	Below 1 ohms
A5-3 (+S) - Body ground	Always	10 kohms or higher

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK --> See step 4

- 4. PROCEED TO NEXT SUSPECTED AREA SHOWN IN PROBLEM SYMPTOMS TABLE. Refer to PROBLEM SYMPTOMS TABLE**
- 5. REPLACE WINDSHIELD WIPER MOTOR ASSEMBLY. Refer to REMOVAL**

Wiper and Washer Switch Circuit

DESCRIPTION

This circuit detects the state of the windshield wiper switch assembly (front wiper switch and front washer switch) and sends it to the windshield wiper relay assembly.

WIRING DIAGRAM

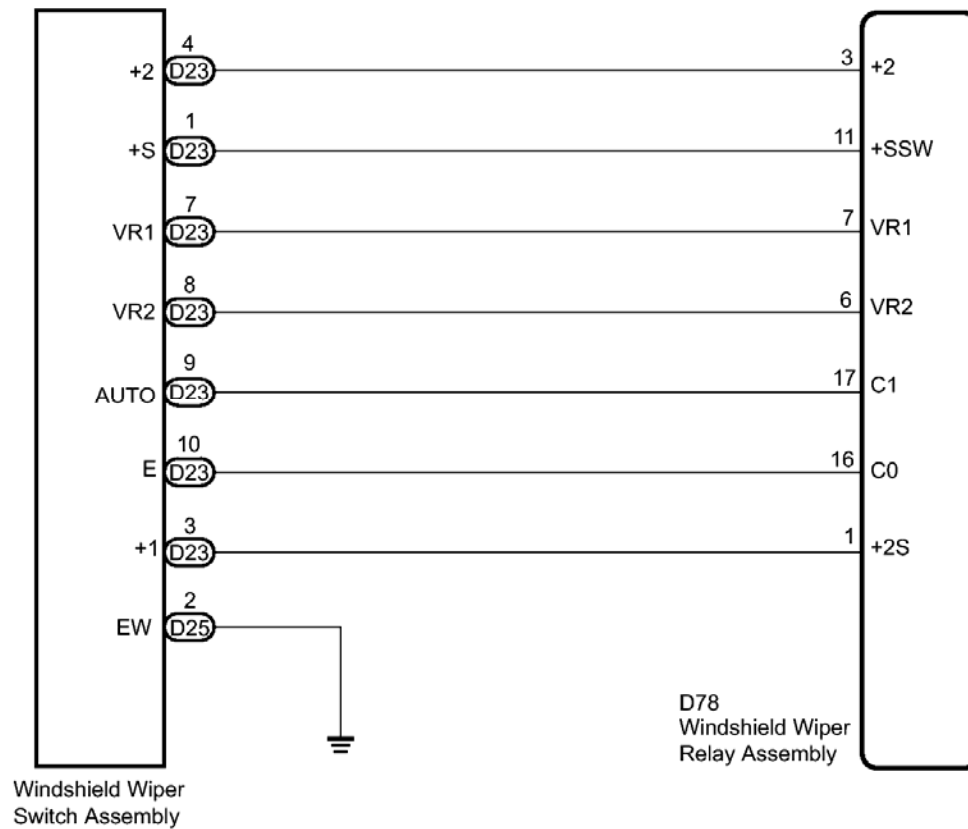


Fig. 8: Wiper and Washer Switch Circuit - Wiring Diagram
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

PROCEDURE

1. **INSPECT WINDSHIELD WIPER SWITCH ASSEMBLY**
 - a. Remove the windshield wiper switch assembly. Refer to **REMOVAL** .

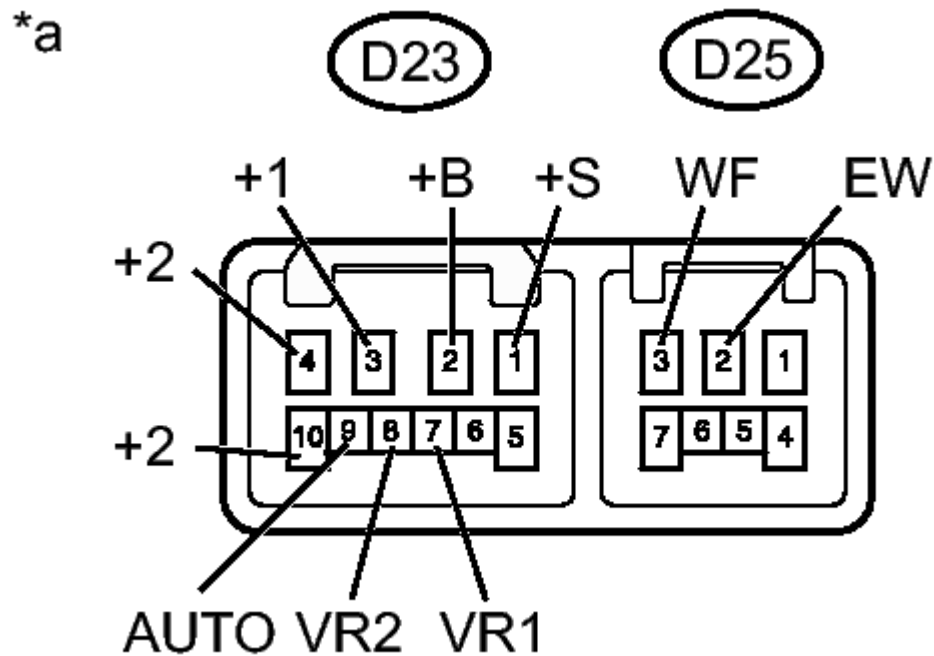


Fig. 9: Inspecting Windshield Wiper Switch Assembly With D23 & D25 Connector End View
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Measure the resistance according to the value(s) in the table below.

Standard Resistance

Front Wiper Switch

Front Washer Switch

Adjusting Ring*1

Tester Connection	Switch Condition	Specified Condition
D23-3 (+1) - D23-1 (+S)	OFF	Below 1 ohms
D23-3 (+1) - D23-2 (+B)	MIST	
	LO	
D23-2 (+B) - D23-4 (+2)	HI	
D23-9 (AUTO) - D23-10 (E)		

D23-3 (+1) - D23-1 (+S)	AUTO	
-------------------------------	------	--

Tester Connection	Switch Condition	Specified Condition
D25-2 (EW) - D25-3 (WF)	ON	Below 1 ohms
	OFF	10 kohms or higher

Tester Connection	Condition	Specified Condition
D23-7 (VR1) - D23-8 (VR2)	Adjusting ring changed from (+) side to (-) side	0 to 2.7 kohms

HINT:

*1: The rain sensor sensitivity can be adjusted by the windshield wiper switch adjusting ring.

TEXT IN ILLUSTRATION

*a	Component without harness connected (Windshield Wiper Switch Assembly)
----	--

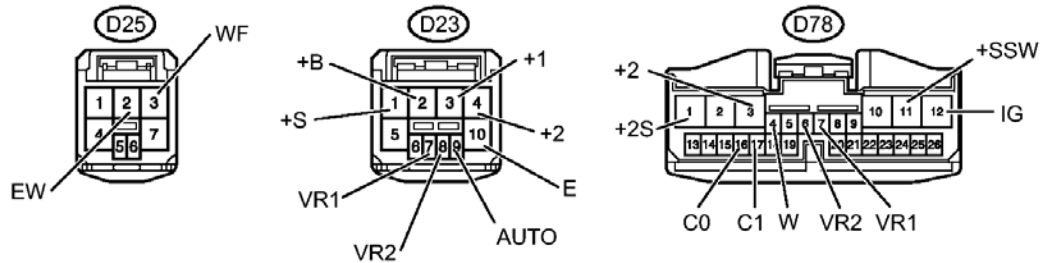
NG --> See step 3

OK: Go to next step

2. CHECK HARNESS AND CONNECTOR (WIPER SWITCH - WIPER RELAY AND BODY GROUND)

- a. Disconnect the D23 and D25 windshield wiper switch assembly connectors.

*b



N

Fig. 10: Checking Harness And Connector (Wiper Switch - Wiper Relay And Body Ground)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	Front view of wire harness connector (to Windshield Wiper Switch Assembly)	*b	Front view of wire harness connector (to Windshield Wiper Relay Assembly)
----	--	----	---

- b. Disconnect the D78 windshield wiper relay assembly connector.
- c. Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Condition	Specified Condition
D23-3 (+1) - D78-1 (+2S)	Always	Below 1 ohms
D23-3 (+1) - Body ground	Always	10 kohms or higher
D23-4 (+2) - D78-3 (+2)	Always	Below 1 ohms
D23-4 (+2) - Body ground	Always	10 kohms or higher
D23-1 (+S)		

- D78-11 (+SSW)	Always	Below 1 ohms
D23-1 (+S) - Body ground	Always	10 kohms or higher
D23-9 (AUTO) - D78-17 (C1)	Always	Below 1 ohms
D23-9 (AUTO) - Body ground	Always	10 kohms or higher
D23-10 (E) - D78-16 (C0)	Always	Below 1 ohms
D23-10 (E) - Body ground	Always	10 kohms or higher
D23-7 (VR1) - D78-7 (VR1)	Always	Below 1 ohms
D23-7 (VR1) - Body ground	Always	10 kohms or higher
D23-8 (VR2) - D78-6 (VR2)	Always	Below 1 ohms
D23-8 (VR2) - Body ground	Always	10 kohms or higher
D25-2 (EW) - Body ground	Always	Below 1 ohms

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK --> See step 4

- 3. REPLACE WINDSHIELD WIPER SWITCH ASSEMBLY. Refer to REMOVAL**
- 4. PROCEED TO NEXT SUSPECTED AREA SHOWN IN PROBLEM SYMPTOMS TABLE. Refer**

to **PROBLEM SYMPTOMS TABLE**

Rain Sensor Circuit

DESCRIPTION

The windshield wiper relay assembly receives a signal from the rain sensor to control the auto wiper system.

WIRING DIAGRAM



N

Fig. 11: Rain Sensor Circuit - Wiring Diagram

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

INSPECTION PROCEDURE

PROCEDURE

1. **CHECK HARNESS AND CONNECTOR (WINDSHIELD WIPER RELAY ASSEMBLY - RAIN SENSOR)**
 - a. Disconnect the D78 windshield wiper relay assembly connector.
 - b. Disconnect the T3 rain sensor connector.
 - c. Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Condition	Specified Condition
D78-8 (SIG) - T3-4 (SIG)	Always	Below 1 ohms

T3-4 (SIG) - Body ground	Always	10 kohms or higher
D78-14 (PA1) - T3- 3 (AUTO)	Always	Below 1 ohms
T3-3 (AUTO) - Body ground	Always	10 kohms or higher
D78-25 (E) - T3-1 (ES)	Always	Below 1 ohms
T3-1 (ES) - Body ground	Always	10 kohms or higher

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: Go to next step

2. INSPECT WINDSHIELD WIPER RELAY ASSEMBLY

- a. Reconnect the windshield wiper relay assembly connector.

*a

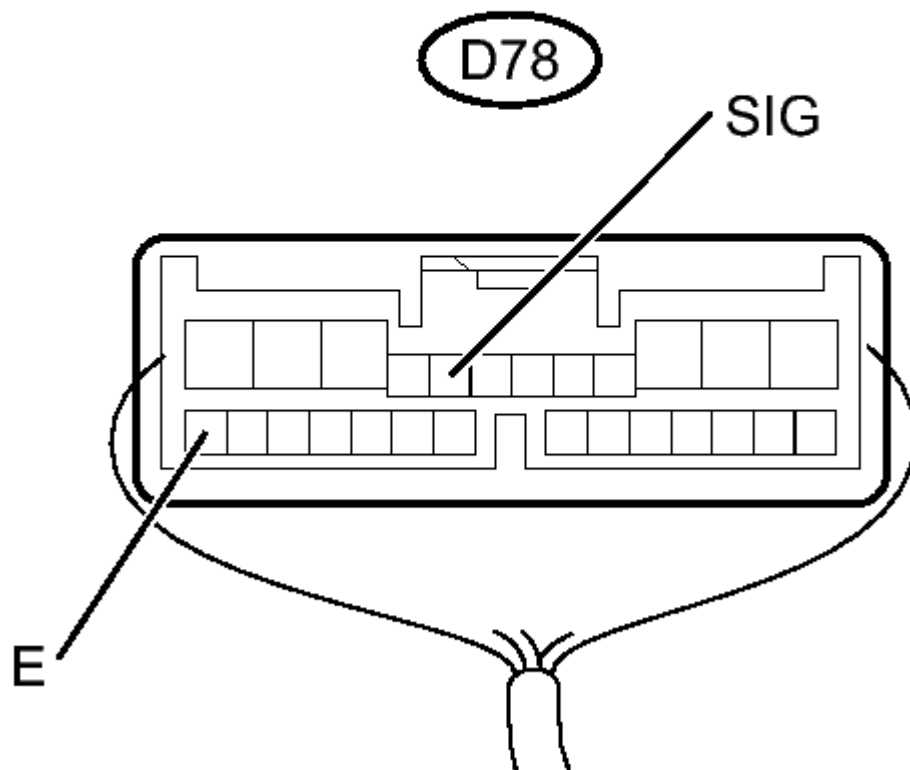


Fig. 12: Inspecting Windshield Wiper Relay Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Measure the voltage according to the value(s) in the table below.

Standard Voltage

Tester Connection	Switch Condition	Specified Condition
D78-8 (SIG) - D78-25 (E)	Ignition switch ON	7.7 to 8.3V

TEXT IN ILLUSTRATION

Component

with harness connected *a (Windshield Wiper Relay Assembly)

NG --> See step 6

OK: Go to next step

3. INSPECT RAIN SENSOR

- a. Reconnect the rain sensor connector.

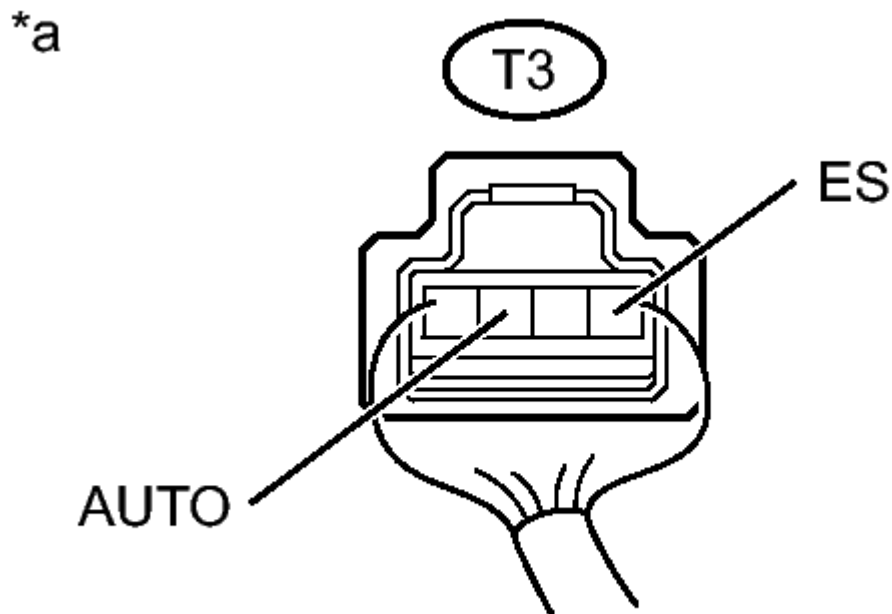


Fig. 13: Inspecting Rain Sensor

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

- b. Connect an oscilloscope to the rain sensor connector.
- c. Check for pulses.

OK

Tester Connection	Switch Condition	Specified Condition
T3-3	Ignition	Pulse

(AUTO) - T3-1 (ES)	switch ON	generation
-----------------------	--------------	------------

TEXT IN ILLUSTRATION

*a	Component with harness connected (Rain Sensor)
----	---

NG --> See step 5

OK --> See step 4

4. **PROCEED TO NEXT SUSPECTED AREA SHOWN IN PROBLEM SYMPTOMS TABLE. Refer to PROBLEM SYMPTOMS TABLE**
5. **REPLACE RAIN SENSOR. Refer to REMOVAL**
6. **REPLACE WINDSHIELD WIPER RELAY ASSEMBLY. Refer to REMOVAL**

Speed Signal Circuit

DESCRIPTION

The windshield wiper relay assembly receives a vehicle speed signal from the combination meter to control the automatic windshield wiper system.

A voltage of 12 V or 5 V is output from the combination meter assembly and then input to the skid control ECU.

A voltage of 12 V or 5 V is output from each ECU or relay and then input to the combination meter assembly.

The signal is changed to a pulse signal at the transistor in the combination meter assembly.

Each ECU controls the respective system based on the pulse signal.

If a short occurs in any of the ECUs or in the wire harness connected to an ECU, all systems in the diagram below will not operate normally.

WIRING DIAGRAM

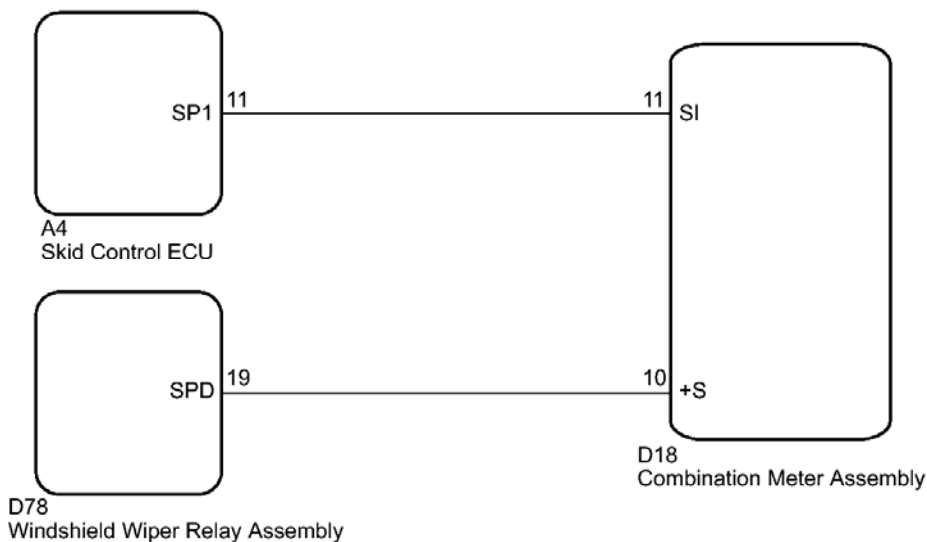


Fig. 14: Speed Signal Circuit - Wiring Diagram
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

PROCEDURE

1. CHECK COMBINATION METER SYSTEM

- The circuit that sends vehicle speed signals to the combination meter system is inspected in the meter information. Refer to **Speed Signal Circuit** .

NEXT: Go to next step

2. CHECK HARNESS AND CONNECTOR (WINDSHIELD WIPER RELAY ASSEMBLY - COMBINATION METER)

- Disconnect the D78 windshield wiper relay assembly connector and D18 combination meter connector.
- Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Condition	Specified Condition
D78-19 (SPD) - D18-10 (+S)	Always	Below 1 ohms
D78-19 (SPD) or D18-10	Always	10 kohms

(+S) - Body ground		or higher
-----------------------	--	-----------

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: Go to next step

3. INSPECT COMBINATION METER (SPEED SENSOR SIGNAL)

- a. Check the output waveform.

*a

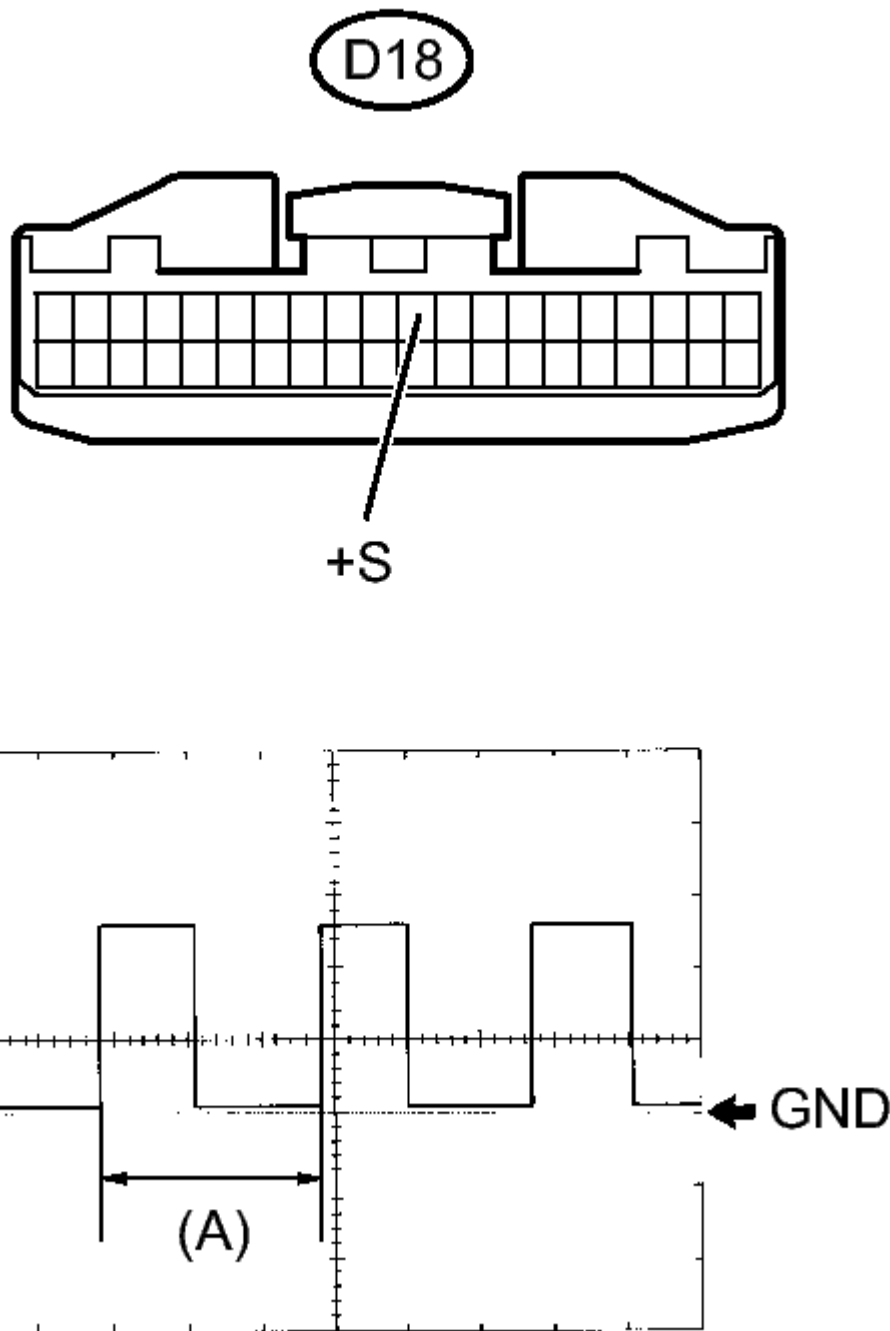


Fig. 15: Inspecting Combination Meter (Speed Sensor Signal) With Waveform
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

1. Remove the combination meter assembly with the connector still connected. Refer to **REMOVAL** .

2. Connect an oscilloscope to terminal D18-10 (+S) and body ground.
3. Turn the ignition switch to ON.
4. Turn a wheel slowly.
5. Check the signal waveform according to the condition(s) in the table below.

Item	Condition
Tool setting	5 V/DIV., 20 ms./DIV.
Vehicle condition	Driving at approx. 20 km/h (12 mph)

OK

The waveform is displayed as shown in the illustration.

HINT:

When the system is functioning normally, one wheel revolution generates 4 pulses. As the vehicle speed increases, the width indicated by (A) in the illustration narrows.

TEXT IN ILLUSTRATION

*a	Component with harness connected (Combination Meter Assembly)
----	--

NG --> See step 5

OK --> See step 4

4. **PROCEED TO NEXT SUSPECTED AREA SHOWN IN PROBLEM SYMPTOMS TABLE. Refer to PROBLEM SYMPTOMS TABLE**
5. **REPLACE COMBINATION METER. Refer to REMOVAL**

Power Source Circuit

DESCRIPTION

This circuit provides power to the windshield wiper relay assembly.

WIRING DIAGRAM

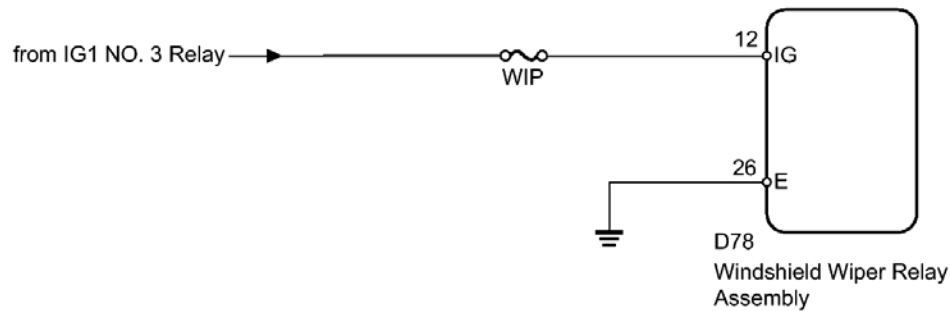


Fig. 16: Power Source Circuit - Wiring Diagram

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

INSPECTION PROCEDURE

NOTE: Inspect the fuses for circuits related to this system before performing the following inspection procedure.

PROCEDURE

1. **CHECK HARNESS AND CONNECTOR (WINDSHIELD WIPER RELAY ASSEMBLY - BATTERY AND BODY GROUND)**
 - a. Disconnect the D78 windshield wiper relay assembly connector.

*a

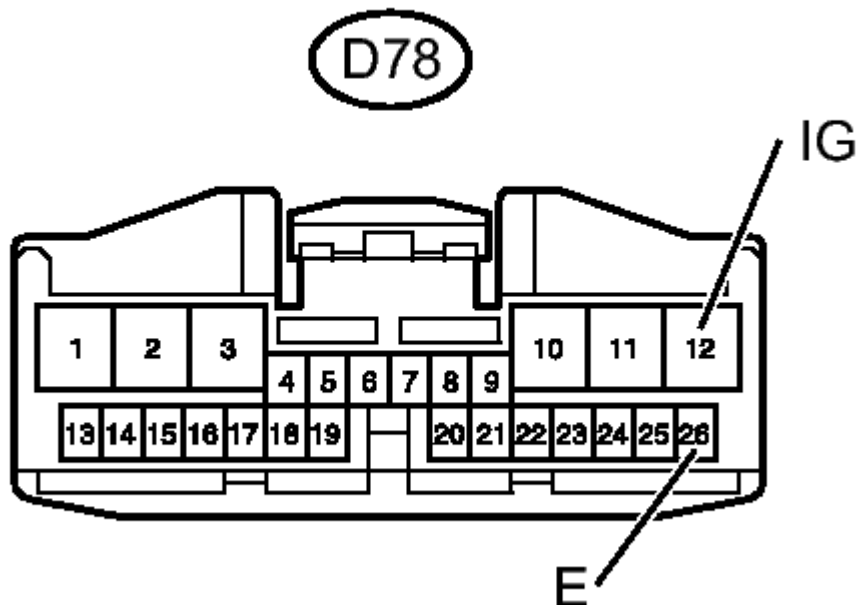


Fig. 17: Checking Harness And Connector (Windshield Wiper Relay Assembly - Battery And

Body Ground) With D78 Connector End View
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Measure the voltage according to the value(s) in the table below.

Standard Voltage

Tester Connection	Switch Condition	Specified Condition
D78-12 (IG) - Body ground	Ignition switch ON	11 to 14 V

- c. Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Condition	Specified Condition
D78-26 (E) - Body ground	Always	Below 1 ohms

TEXT IN ILLUSTRATION

*a	Front view of wire harness connector (to Windshield Wiper Relay Assembly)
----	---

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK --> See step 2

2. **PROCEED TO NEXT SUSPECTED AREA SHOWN IN PROBLEM SYMPTOMS TABLE. Refer to PROBLEM SYMPTOMS TABLE**