

WIPER AND WASHER SYSTEMS



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GENERAL DESCRIPTION

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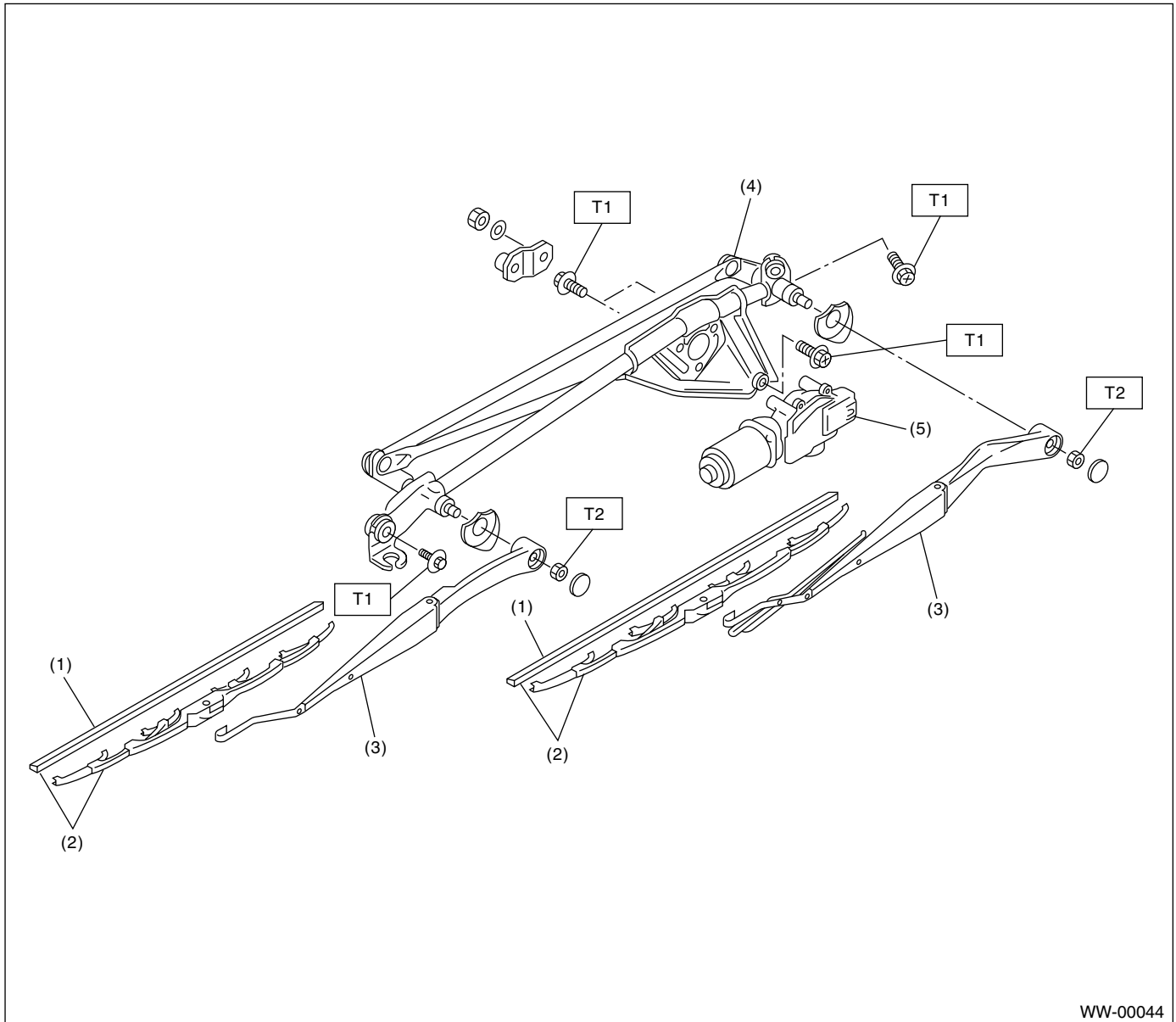
1. General Description

A: SPECIFICATIONS

Front wiper motor	Input	12 V — 72 W or less
Rear wiper motor	Input	12 V — 42 W or less
Front washer motor	Pump type	Centrifugal
	Input	12 V — 36 W or less
Rear washer motor	Pump type	Centrifugal
	Input	12 V — 36 W or less

B: COMPONENT

1. FRONT WIPER



WW-00044

- (1) Wiper rubber
- (2) Wiper blade ASSY
- (3) Wiper arm

- (4) Wiper link
- (5) Wiper motor

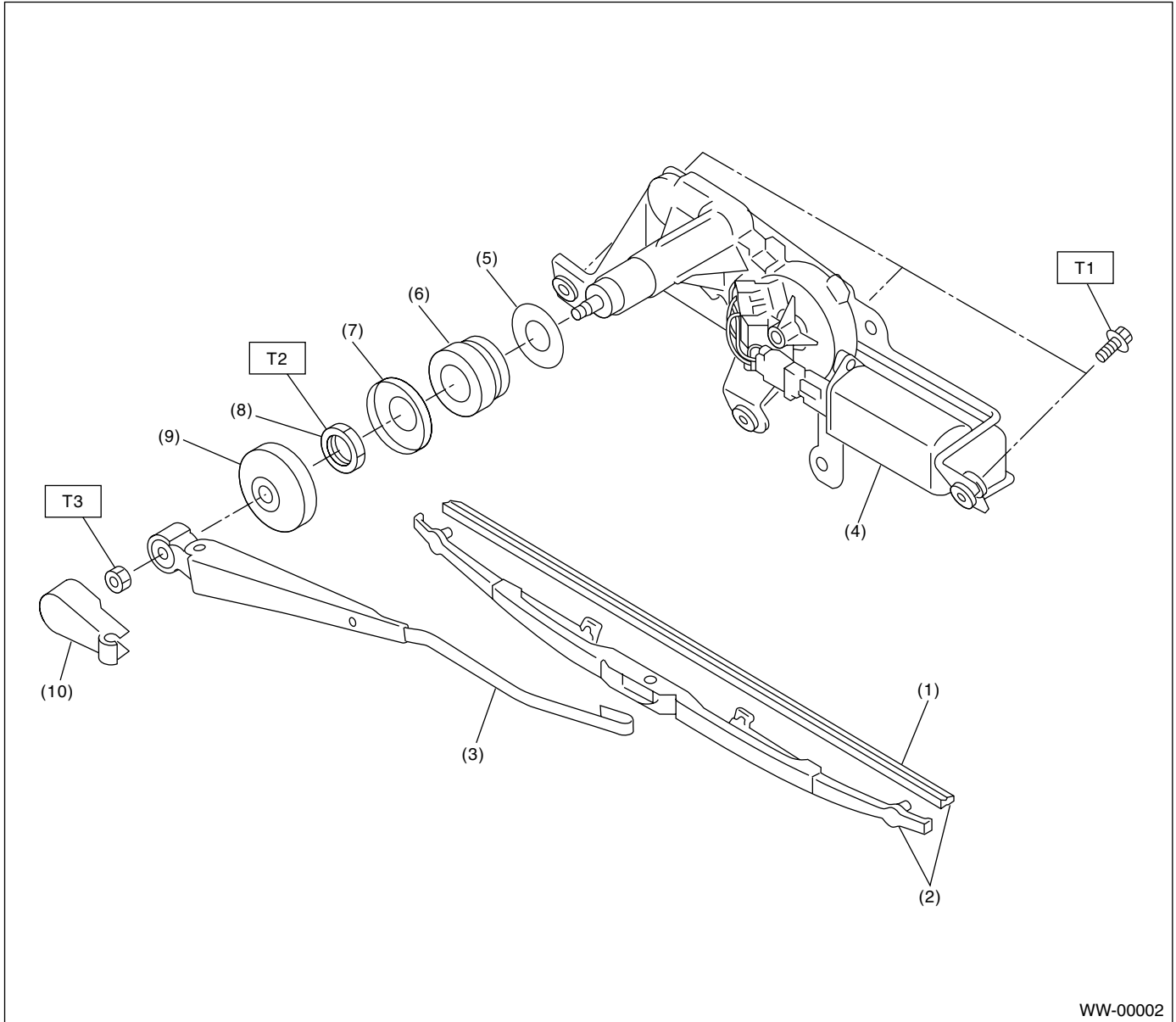
Tightening torque: N·m (kgf·m, ft·lb)

T1: 6.0 (0.61, 4.4)

T2: 20 (2.0, 14.5)

GENERAL DESCRIPTION

2. REAR WIPER



- | | |
|----------------------|----------------------|
| (1) Wiper rubber | (6) Cushion |
| (2) Wiper blade ASSY | (7) Spacer B |
| (3) Wiper arm | (8) Nut |
| (4) Wiper motor | (9) Cap |
| (5) Spacer A | (10) Wiper arm cover |

Tightening torque: N-m (kgf-m, ft-lb)

T1: 6.0 (0.61, 4.4)

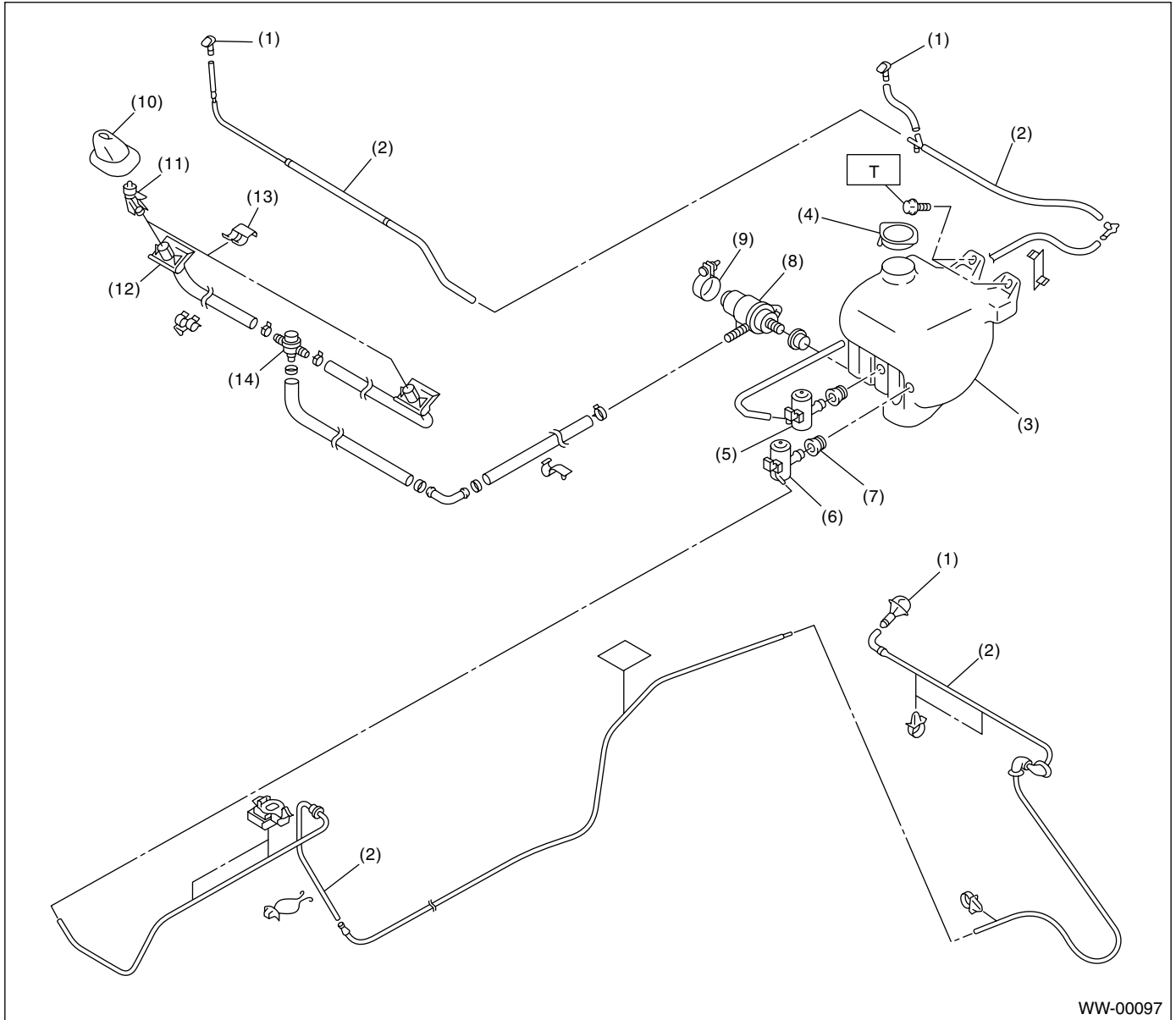
T2: 7.5 (0.76, 5.5)

T3: 8.0 (0.82, 5.9)

GENERAL DESCRIPTION

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3. WASHER TANK



- (1) Washer nozzle
- (2) Washer hose
- (3) Washer tank
- (4) Washer tank cap
- (5) Front washer motor

- (6) Rear washer motor
- (7) Grommet
- (8) Headlight washer motor
- (9) Motor bracket
- (10) Headlight washer case

- (11) Headlight washer upper nozzle
- (12) Headlight washer lower nozzle

Tightening torque: N-m (kgf-m, ft-lb)
T: 6.0 (0.61, 4.4)

C: CAUTION

- Reconnect the connectors and hoses securely. After reconnecting, confirm that each function operates normally.
- Be careful that wire harnesses of airbag system pass near electrical parts and switches.
- Wire harnesses and connectors of all airbag system are yellow color. Do not use a tester on these circuits.
- Care must be taken when installing the piping hose so that no bending, jamming, etc. are caused.
- If even a little oil or grease such as silicon oil gets in the tank and washer passages, an oil film easily forms on the glass, causing the wiper to chatter and judder. Therefore, be careful not to let this happen.

WIPER AND WASHER SYSTEM

WIPER AND WASHER SYSTEMS

2. Wiper and Washer System

A: SCHEMATIC

1. WIPER AND WASHER (FRONT)

<Ref. to WI-226, SCHEMATIC, Wiper and Washer System (Front).>

2. WIPER AND WASHER (REAR)

<Ref. to WI-227, SCHEMATIC, Wiper and Washer System (Rear).>

3. HEADLIGHT WASHER

<Ref. to WI-170, SCHEMATIC, Headlight Washer System.>

B: INSPECTION

Symptom	Repair order
Wiper and washers do not operate.	(1) Wiper fuse (F/B No. 14, 15) (2) Combination switch (3) Wiper motor (4) Wire harness
Wipers do not operate in LO or HI.	(1) Combination switch (2) Wiper motor (3) Wire harness
Wipers do not operate in INT.	(1) Combination switch (2) Wiper motor (3) Wire harness
Washer motor does not operate.	(1) Washer switch (2) Washer motor (3) Wire harness
Wipers do not operate when washer switch is ON.	(1) Washer motor (2) Wire harness
Washer fluid spray does not operate.	(1) Washer motor (2) Washer hose and nozzle

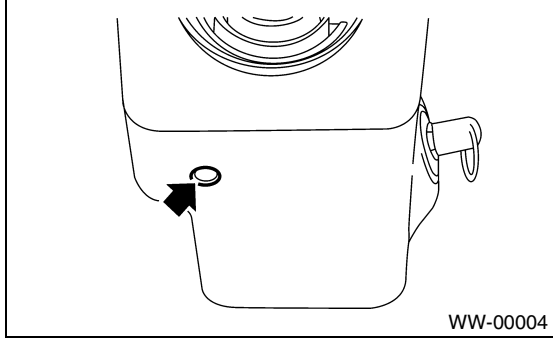
COMBINATION SWITCH (WIPER)

WIPER AND WASHER SYSTEMS

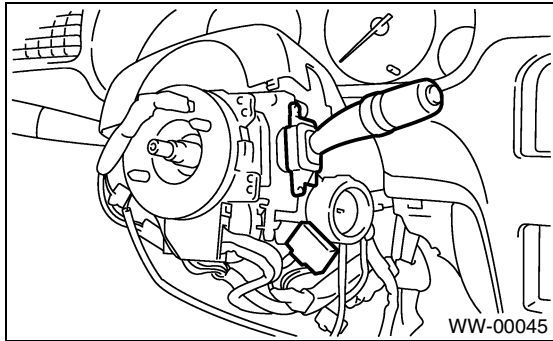
3. Combination Switch (Wiper)

A: REMOVAL

- 1) Disconnect the ground cable from battery.
- 2) Loosen the screw to remove the steering column cover.



- 3) Disconnect the connectors from combination switches.
- 4) Loosen the screw to remove combination switch.

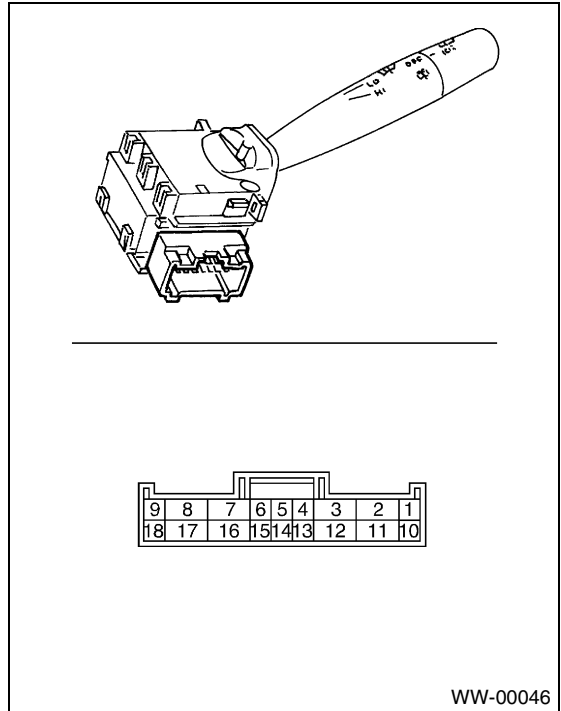


B: INSTALLATION

Install in the reverse order of removal.

C: INSPECTION

- Inspect the continuity between each connector terminal.



LHD model:

	Switch position	Terminal No.	Standard
FRONT	OFF	7 and 16	Less than 1Ω
	INT	7 and 16	Less than 1Ω
	LO	7 and 17	Less than 1Ω
	HI	8 and 17	Less than 1Ω
	Washer ON	2 and 11	Less than 1Ω
REAR	Washer ON	2 and 10 10 and 12 2 and 12	Less than 1Ω
	OFF	—	More than 1MΩ
	INT	2 and 13	Less than 1Ω
	ON	2 and 10	Less than 1Ω
	Washer ON	2 and 10 10 and 12 2 and 12	Less than 1Ω

If continuity is not as specified, replace the switch.

COMBINATION SWITCH (WIPER)

WIPER AND WASHER SYSTEMS

RHD model:

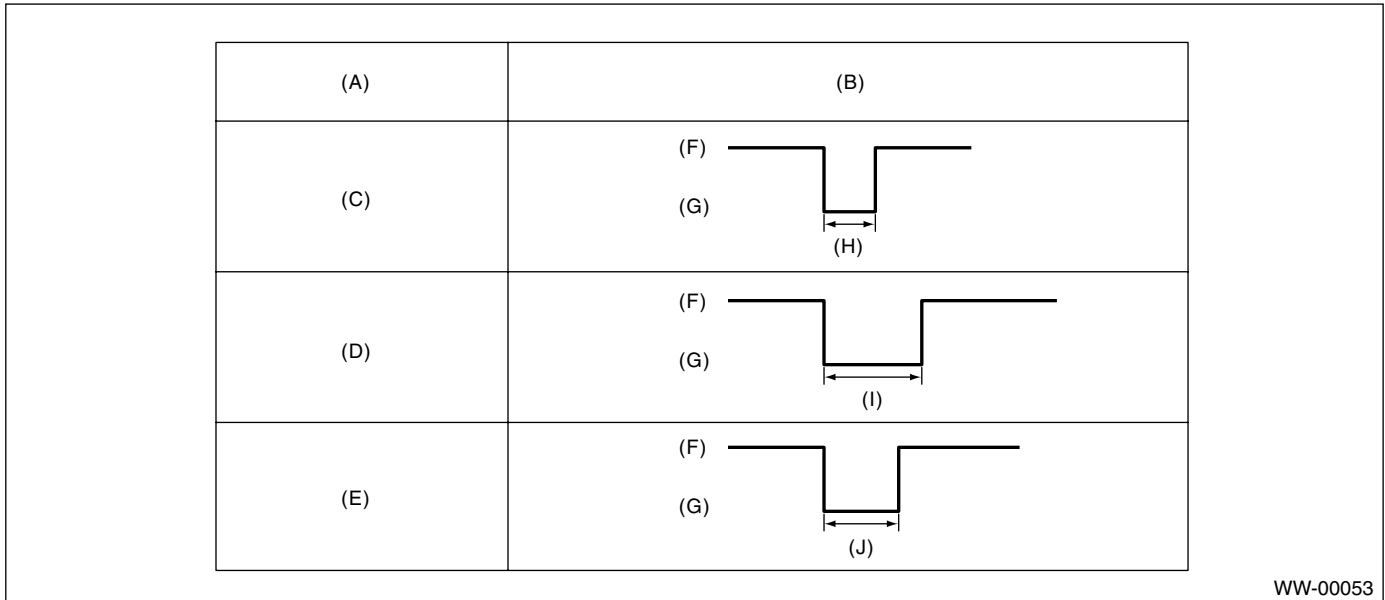
	Switch position	Terminal No.	Standard
FRONT	OFF	3 and 12	Less than 1Ω
	INT	3 and 12	Less than 1Ω
	LO	3 and 11	Less than 1Ω
	HI	2 and 11	Less than 1Ω
	Washer ON	8 and 17	Less than 1Ω
REAR	Washer ON	2 and 10 10 and 12 2 and 12	Less than 1Ω
	OFF	—	More than 1MΩ
	INT	2 and 13	Less than 1Ω
	ON	2 and 10	Less than 1Ω
	Washer ON	2 and 10 10 and 12 2 and 12	Less than 1Ω

If continuity is not as specified, replace the switch.

COMBINATION SWITCH (WIPER)

- Intermittent operation inspection

- 1) Turn the wiper switch to INT.
- 2) Adjust the intermittent control switch to MAX.
- 3) Apply battery voltage to switch terminals 16 and 2, and inspect the voltage of terminals 7 and 2. (Measure the voltage from after the second time the wiper stops.)



WW-00053

- | | | |
|---------------------|-----------------------|---------------|
| (A) Switch position | (E) Non variable type | (I) 16±6 sec. |
| (B) Voltage | (F) 12 V | (J) 3±1 sec. |
| (C) MIN | (G) 0 V | |
| (D) MAX | (H) Approx. 2 sec. | |

If operation is not as specified, replace the switch.

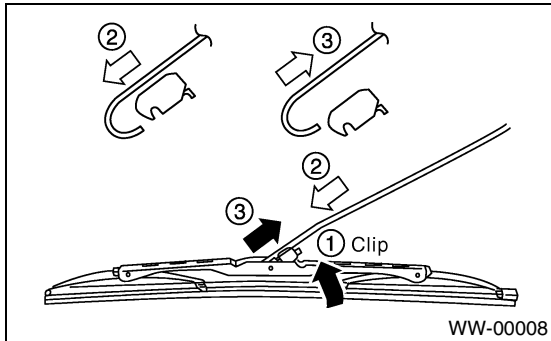
WIPER BLADE

WIPER AND WASHER SYSTEMS

4. Wiper Blade

A: REMOVAL

While pushing the locking clip (A) up, pull out the blade from arm to arrow direction.

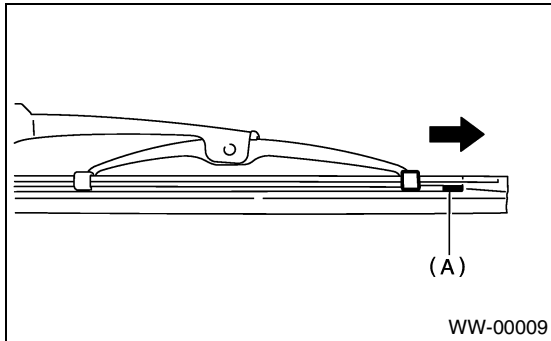


B: INSTALLATION

- 1) Install in the reverse order of removal.
- 2) Confirm that the clip is locked securely.

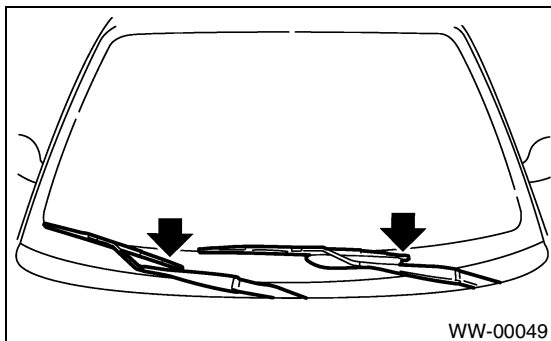
C: DISASSEMBLY

Pull on side (A) of the wiper rubber stopper and remove the rubber from the blade assembly.

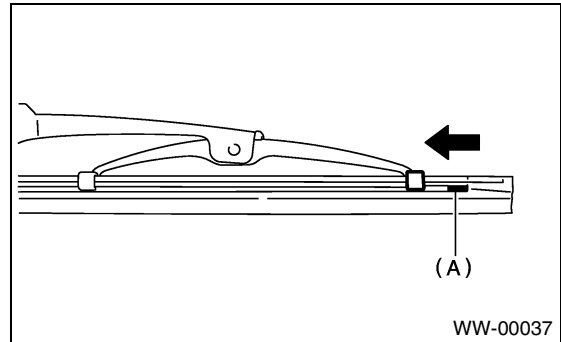


D: ASSEMBLY

- 1) Insert the wiper rubber onto the blade so that the stopper is in the position shown.



- 2) Make sure the wiper rubber is securely fastened to the pull stopper (A).



E: INSPECTION

- 1) When the wiper does not perform well, inspect the following:

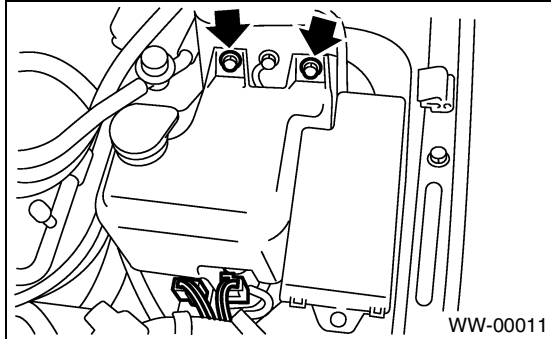
- Make sure the movable part of the blade assembly moves smoothly.
- Make sure the wiper rubber is not deformed or damaged.

- 2) Replace with a new part if damage is found.

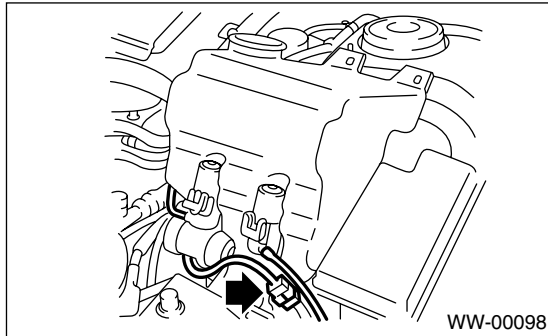
5. Washer Tank and Motor

A: REMOVAL

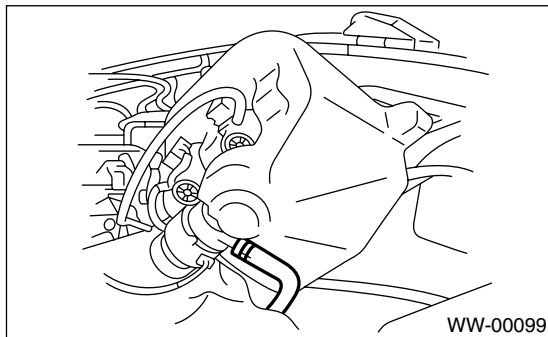
- 1) Open the hood.
- 2) Disconnect the ground cable from battery.
- 3) Remove the two bolts, hose and connector, and then remove the tank.



- 4) For the vehicle with headlight washer, proceed to step 5) and 6).
- 5) Lift the washer tank, and then disconnect the connector from headlight washer motor. Disconnect washer hoses.



- 6) Disconnect the washer hose from the motor, and then detach the washer tank.



B: INSTALLATION

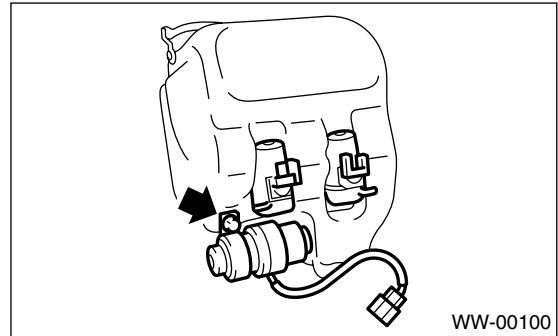
Install in the reverse order of removal.

Tightening torque:

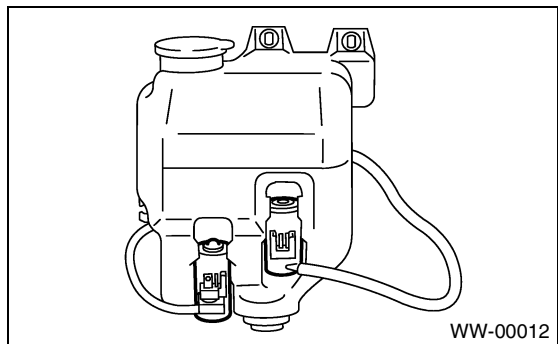
6.0 N·m (0.61 kgf-m, 4.4 ft-lb)

C: DISASSEMBLY

- 1) Remove bolt, and then pull out washer motor from tank. (with headlight washer)



- 2) Pull out the washer motor from tank.

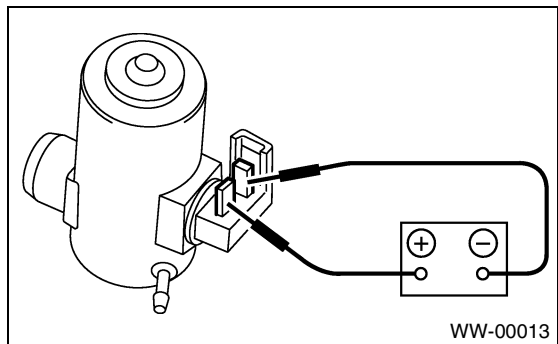


D: ASSEMBLY

- 1) Assemble in the reverse order of disassembly.
- 2) Confirm that water does not leak from installation area of motor.

E: INSPECTION

Apply battery voltage to the connector terminal of the washer motor and make sure the motor operates.



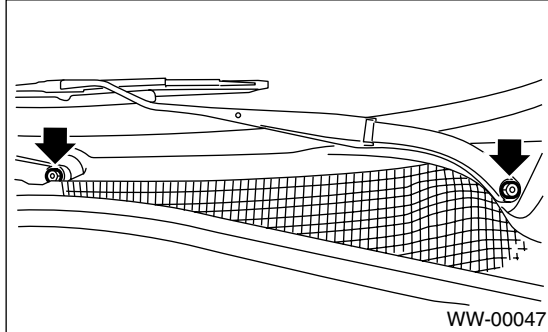
FRONT WIPER ARM

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6. Front Wiper Arm

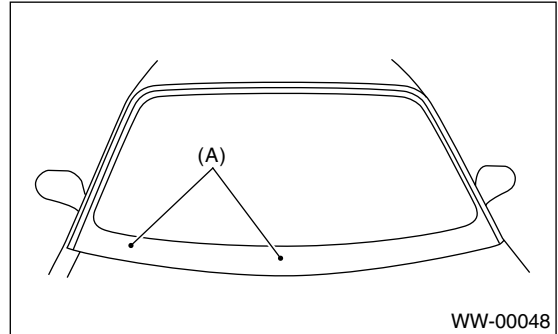
A: REMOVAL

- 1) Open the hood.
- 2) Remove the cap.
- 3) Loosen the nut to remove arm.



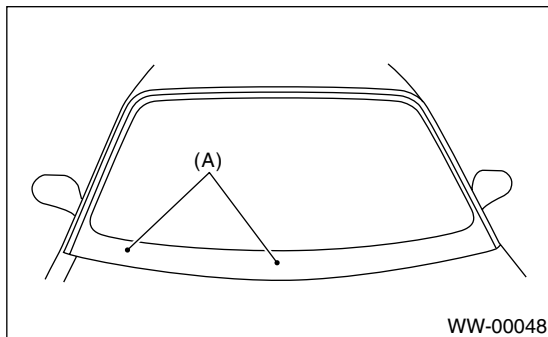
C: ADJUSTMENT

Operate the wiper once. Align the wiper blade to ceramic print point mark (A) of front window pane.



B: INSTALLATION

- 1) Install in the reverse order of removal.
- 2) Operate the wiper once.
- 3) Align the wiper blade to ceramic print point mark (A) of front window pane.



Tightening torque:

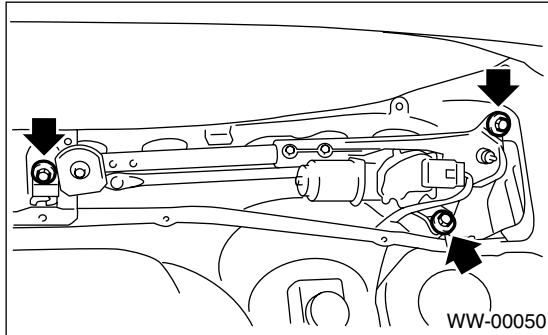
Refer to **COMPONENT** in **General Description**.

<Ref. to WW-2, FRONT WIPER, COMPONENT, General Description.>

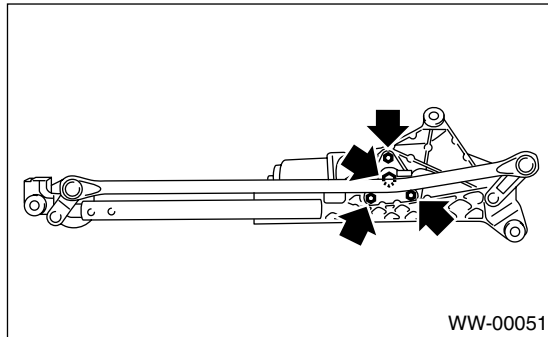
7. Front Wiper Motor and Link

A: REMOVAL

- 1) Disconnect the ground cable from battery.
- 2) Remove the cowl panel. <Ref. to EI-32, REMOVAL, Cowl Panel.>
- 3) Disconnect the connector of motor.
- 4) Loosen the bolts and nuts to remove wiper link.

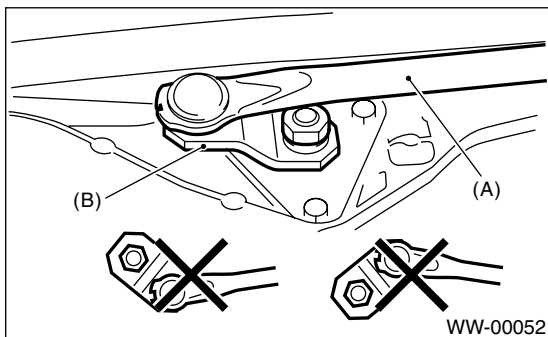


- 5) Loosen the bolts and nuts to remove motor.



B: INSTALLATION

- 1) Install the wiper link to vehicle, and then connect the motor connector.
- 2) Connect the battery ground cable to battery.
- 3) To confirm that the motor is at auto stop position, turn the wiper switch ON/OFF once.
- 4) Disconnect the ground cable from battery.
- 5) Tighten the nut where rod (A) and link plate (B) is aligned in a straight line.



- 6) Install in the reverse order of removal.

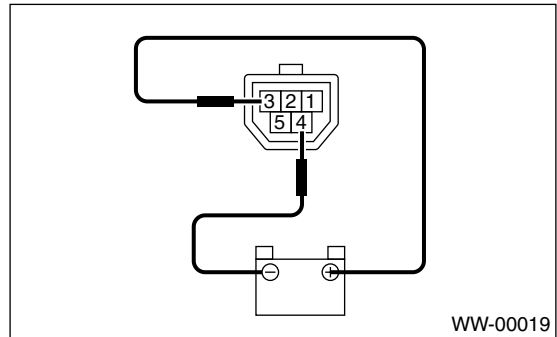
Tightening torque:

Refer to **COMPONENT** in *General Description*.

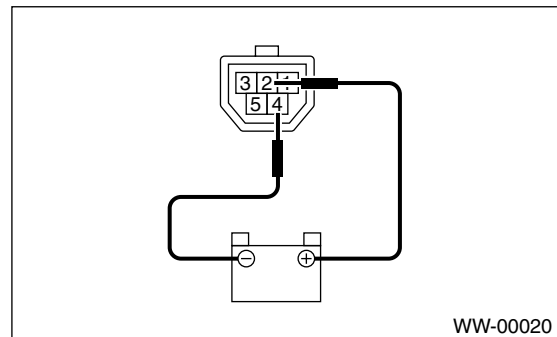
<Ref. to **WW-2, FRONT WIPER, COMPONENT, General Description.**>

C: INSPECTION

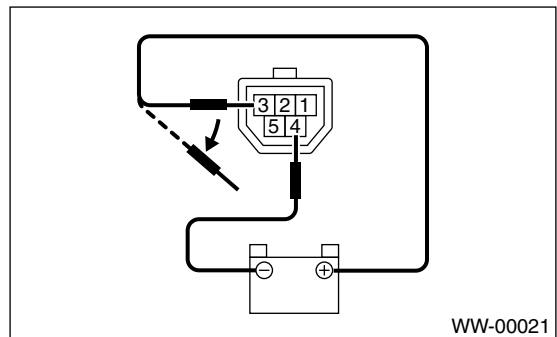
- 1) Connect the battery to wiper motor connectors and confirm that motor operates at low speed.



- 2) Connect the battery to terminal of connectors and confirm that motor operates at high speed.



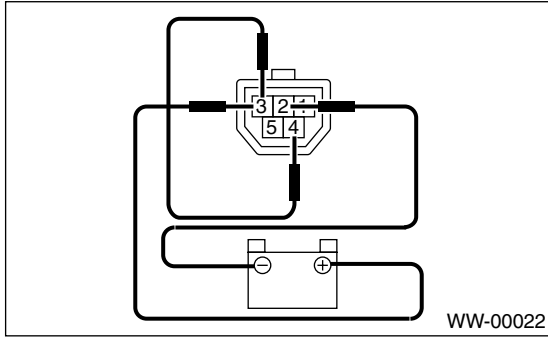
- 3) Connect the battery to terminals of connector, and remove the terminal connection with motor rotated at low speed, and stop the wiper motor through operation.



FRONT WIPER MOTOR AND LINK

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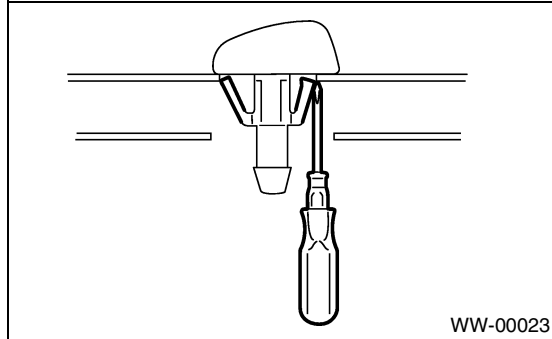
4) Connect the battery and confirm that the motor stops at automatic stop position after the motor operates at low speed again.



8. Front Washer Nozzle

A: REMOVAL

- 1) Remove the washer hose from the washer nozzle.
- 2) Open the clips on the underside of the hood with a thin screwdriver or other tool, and remove the washer nozzle.



B: INSTALLATION

- 1) Install in the reverse order of removal.
- 2) Adjust the position of the washer liquid sprayer.
<Ref. to WW-15, ADJUSTMENT, Front Washer Nozzle.>

C: INSPECTION

- Make sure the nozzle and hose are not clogged.
- Make sure the hose is not bent.

D: ADJUSTMENT

- 1) Turn the wiper switch to OFF position.
- 2) When the vehicle stops, adjust the washer injection position as shown in the figure.

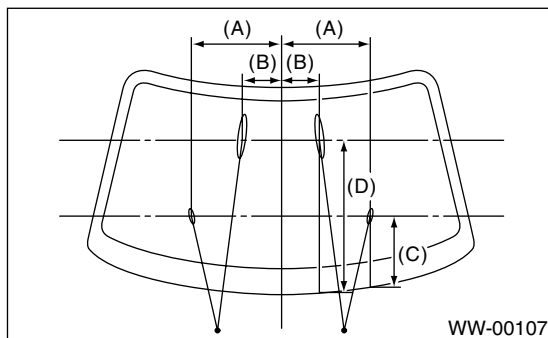
Injection position:

A: 350 mm (13.78 in)

B: 150 mm (5.91 in)

C: 275 mm (10.83 in)

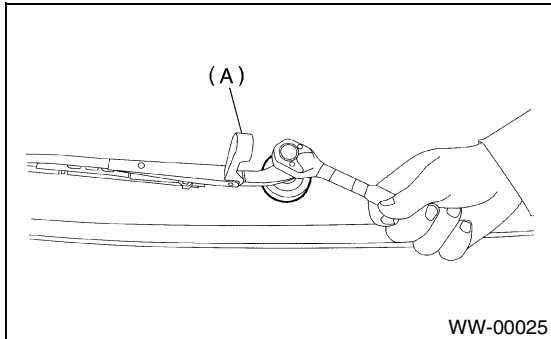
D: 600 mm (23.62 in)



9. Rear Wiper Arm

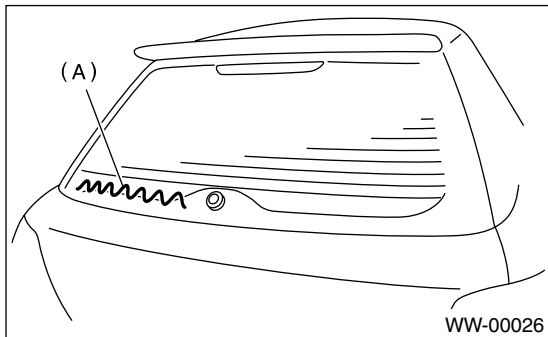
A: REMOVAL

- 1) Raise the wiper arm cover (A).
- 2) Loosen the nut to remove wiper arm.



B: INSTALLATION

- 1) Install in the reverse order of removal.
- 2) Operate the rear wiper once.
- 3) Align the blade to center of rear defogger heat wire (A).



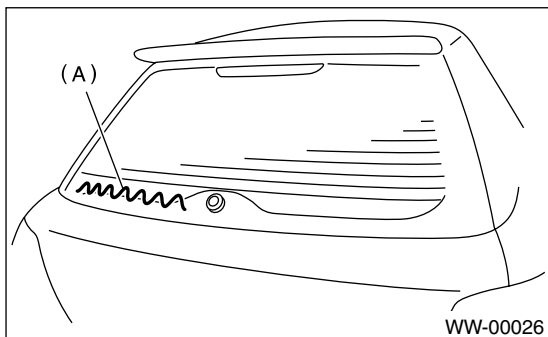
Tightening torque:

Refer to COMPONENT in General Description.

<Ref. to WW-3, REAR WIPER, COMPONENT, General Description.>

C: ADJUSTMENT

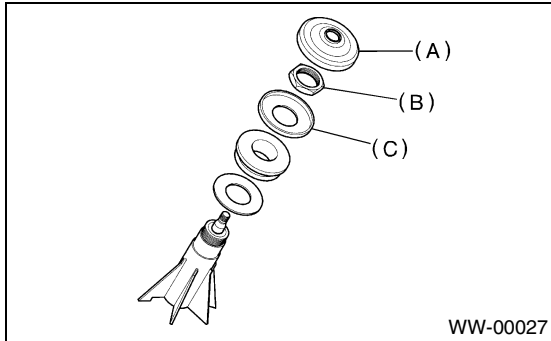
- 1) Operate the rear wiper once.
- 2) Align the blade to center of rear defogger heat wire (A).



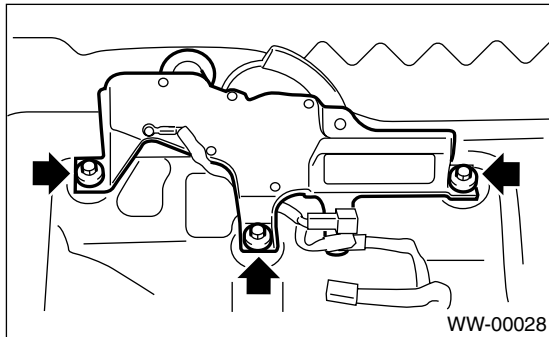
10.Rear Gate Garnish

A: REMOVAL

- 1) Disconnect the ground cable from battery.
- 2) Remove the rear wiper arm.
- 3) Remove the cap (A), nut (B), and spacer (C) from rear wiper shaft.

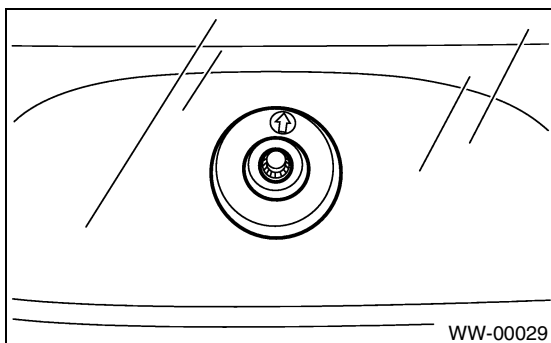


- 4) Remove the rear gate lower trim. <Ref. to EI-48, REMOVAL, Rear Gate Panel Trim.>
- 5) Unclip the clip of harness and disconnect the connector of wiper motor.
- 6) Loosen the bolts to remove the wiper motor assembly (A).



B: INSTALLATION

- 1) Install in the reverse order of removal.
- 2) Install the rear wiper cushion with the arrow mark facing up, as shown in the figure.



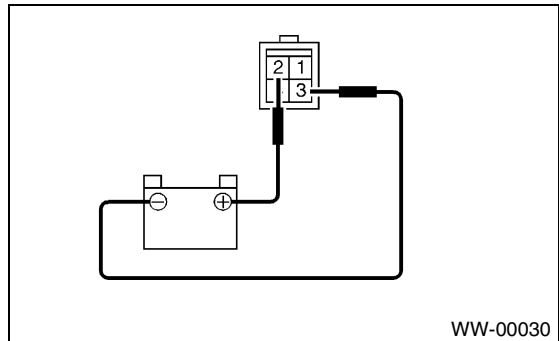
Tightening torque:

Refer to **COMPONENT** in *General Description*.

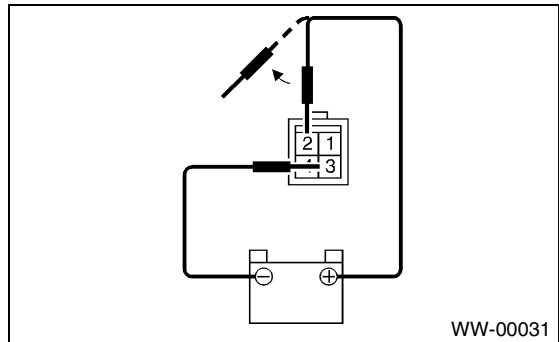
<Ref. to WW-3, **REAR WIPER, COMPONENT, General Description.**>

C: INSPECTION

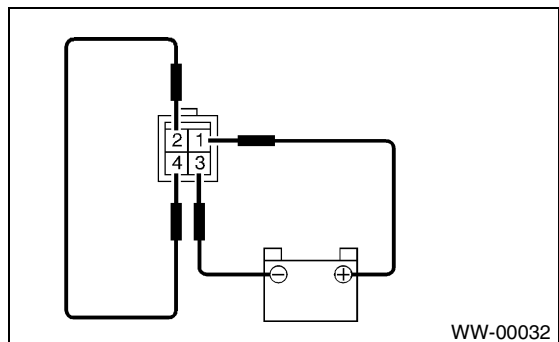
- 1) Connect the battery to wiper motor connector and confirm that the wiper motor operates.



- 2) Connect the battery to terminal of connector and remove the terminal connections with motor rotated, and stop the wiper motor through operation.



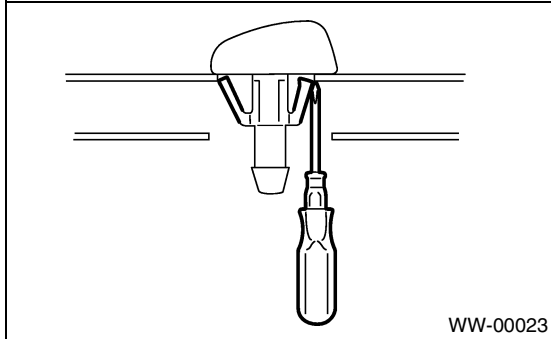
- 3) Connect the battery and confirm that the motor stops at automatic stop position after the motor operates at low speed again.



11.Rear Washer

A: REMOVAL

- 1) Remove the washer hose from the washer nozzle.
- 2) Open the clips on the underside of the hood with a thin screwdriver or other tool, and remove the washer nozzle.



B: INSTALLATION

- 1) Install in the reverse order of removal.
- 2) Adjust the position of the washer liquid sprayer.
<Ref. to WW-18, ADJUSTMENT, Rear Washer.>

C: INSPECTION

- Make sure the nozzle and hose are not clogged.
- Make sure the hose is not bent.

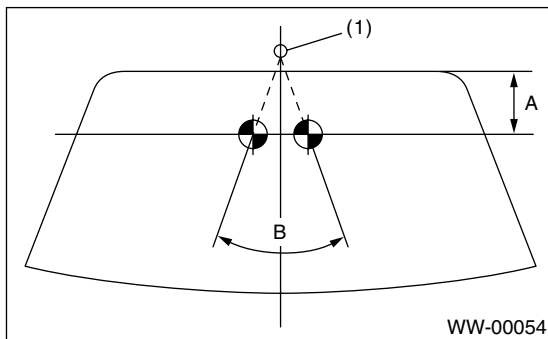
D: ADJUSTMENT

- 1) Turn the wiper switch to OFF position.
- 2) When the vehicle stops, adjust the washer injection position as shown in the figure.

Injection position:

A: 36 mm (1.42 in)

B: 72°

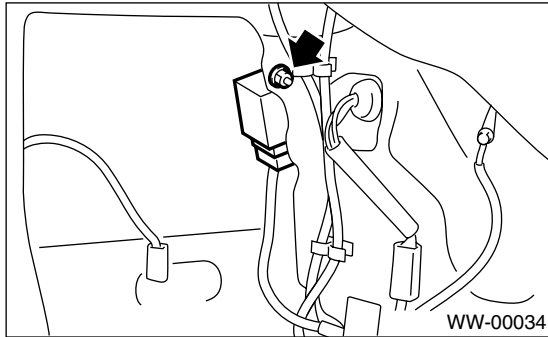


(1) Nozzle

12. Wiper Control Relay

A: REMOVAL

- 1) Disconnect the ground cable from battery.
- 2) Remove the right quarter lower trim. <Ref. to EI-45, REMOVAL, Rear Quarter Trim.>
- 3) Loosen the nut to remove control unit.

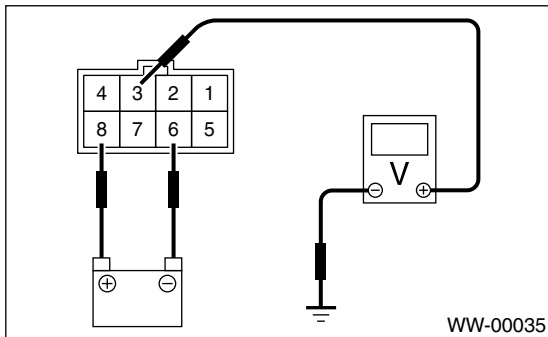


B: INSTALLATION

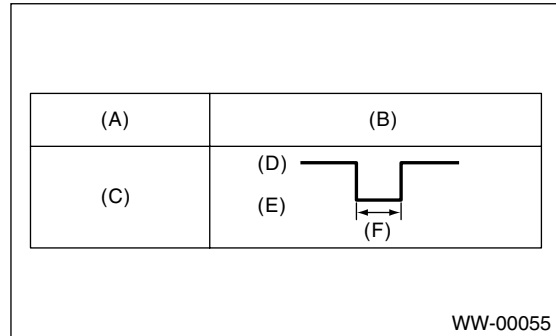
Install in the reverse order of removal.

C: INSPECTION

- 1) Disconnect the connector from the wiper control relay.
- 2) Connect the positive (+) lead from the battery to terminal 8 and the negative (-) lead to terminal 6. Connect the positive (+) lead from the voltmeter to terminal 3 and the negative (-) lead to ground.



- 3) Measure the voltage when the wiper relay is operated.



- (A) Switch position
- (B) Voltage
- (C) ON
- (D) 12 V
- (E) 0 V
- (F) 9±2 sec.

If operation is not as specified, replace the switch.

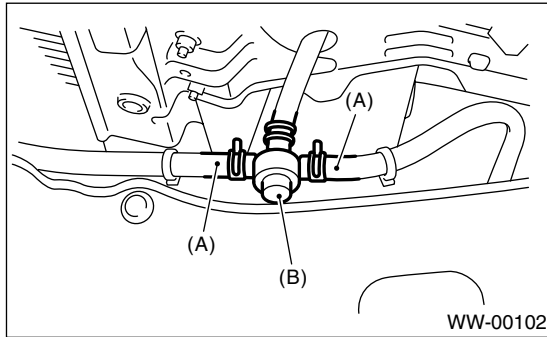
13. Headlight Washer

A: REMOVAL

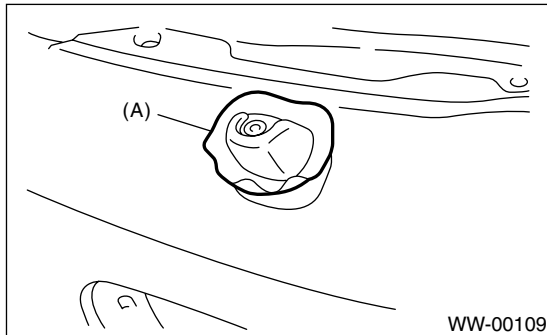
- 1) Disconnect the ground cable from the battery.
- 2) Remove the front grille. <Ref. to EI-18, REMOVAL, Front Grille.>
- 3) Remove the headlight. <Ref. to LI-13, REMOVAL, Headlight Assembly.>
- 4) Draw out headlight washer hose.
- 5) Disconnect hose (A) from valve (B).

NOTE:

Washer fluid may drain from valve. Put a pan under the valve, then disconnect valve from hose while pinching the hose edge.



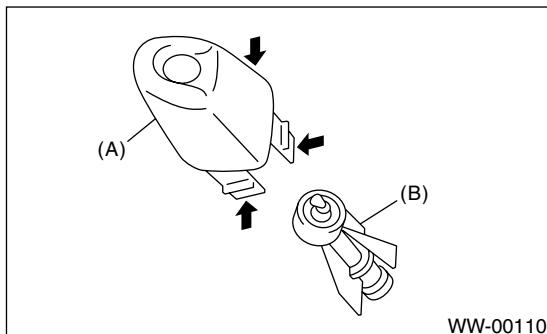
- 6) Remove nozzle cover (A).



- 7) Push the three pawls to remove outer nozzle (A). Then pull out inner nozzle (B).

NOTE:

Before pushing the outer nozzle pawls, cover the bumper to avoid scratches.



B: INSTALLATION

Install in the reverse order of removal.