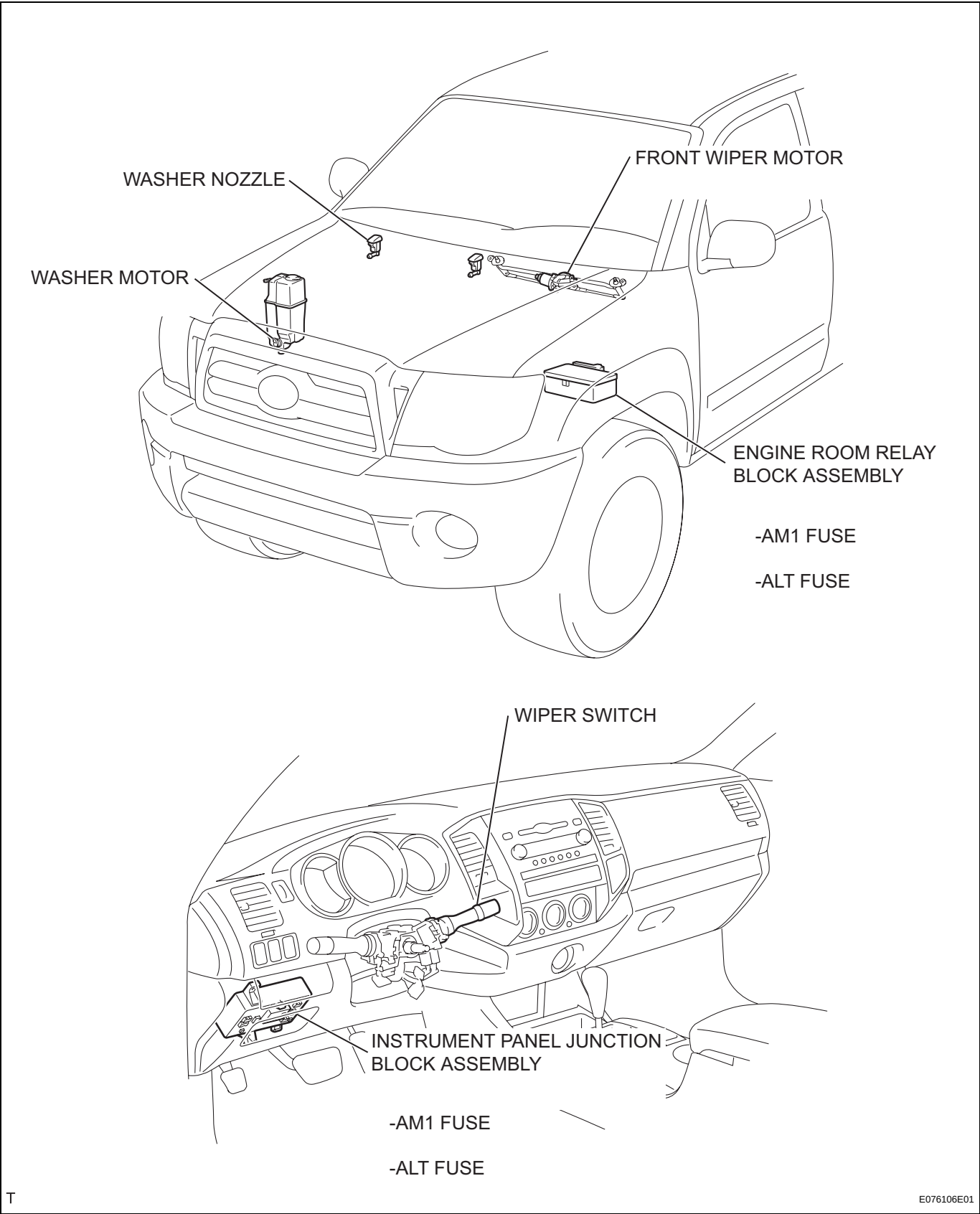


WIPER AND WASHER SYSTEM

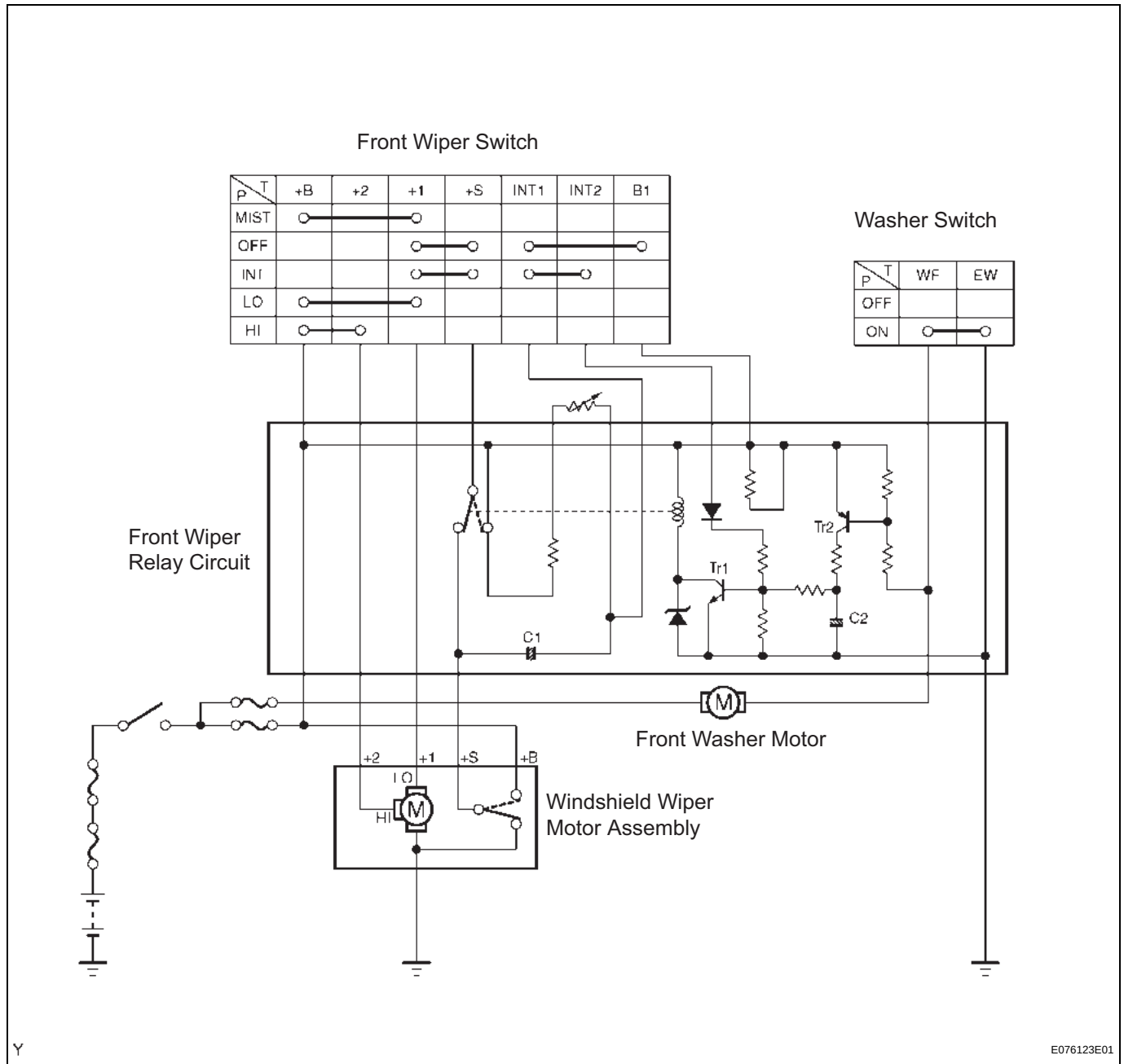
PRECAUTION

1. **PRECAUTION OF WASHER NOZZLE ADJUSTMENT**
 - (a) Do not clean or adjust the washer nozzle with sharp metal objects, such as safety pins because;
 - (1) the washer nozzle tip is made of resin and could be damaged.
 - (2) adjustment is not necessary because it has a spray type nozzle.
 - (b) If the washer nozzle is clogged with materials such as wax, remove the objects and clean the nozzle hole with a soft resin brush, etc.

PARTS LOCATION



SYSTEM DIAGRAM



SYSTEM DESCRIPTION

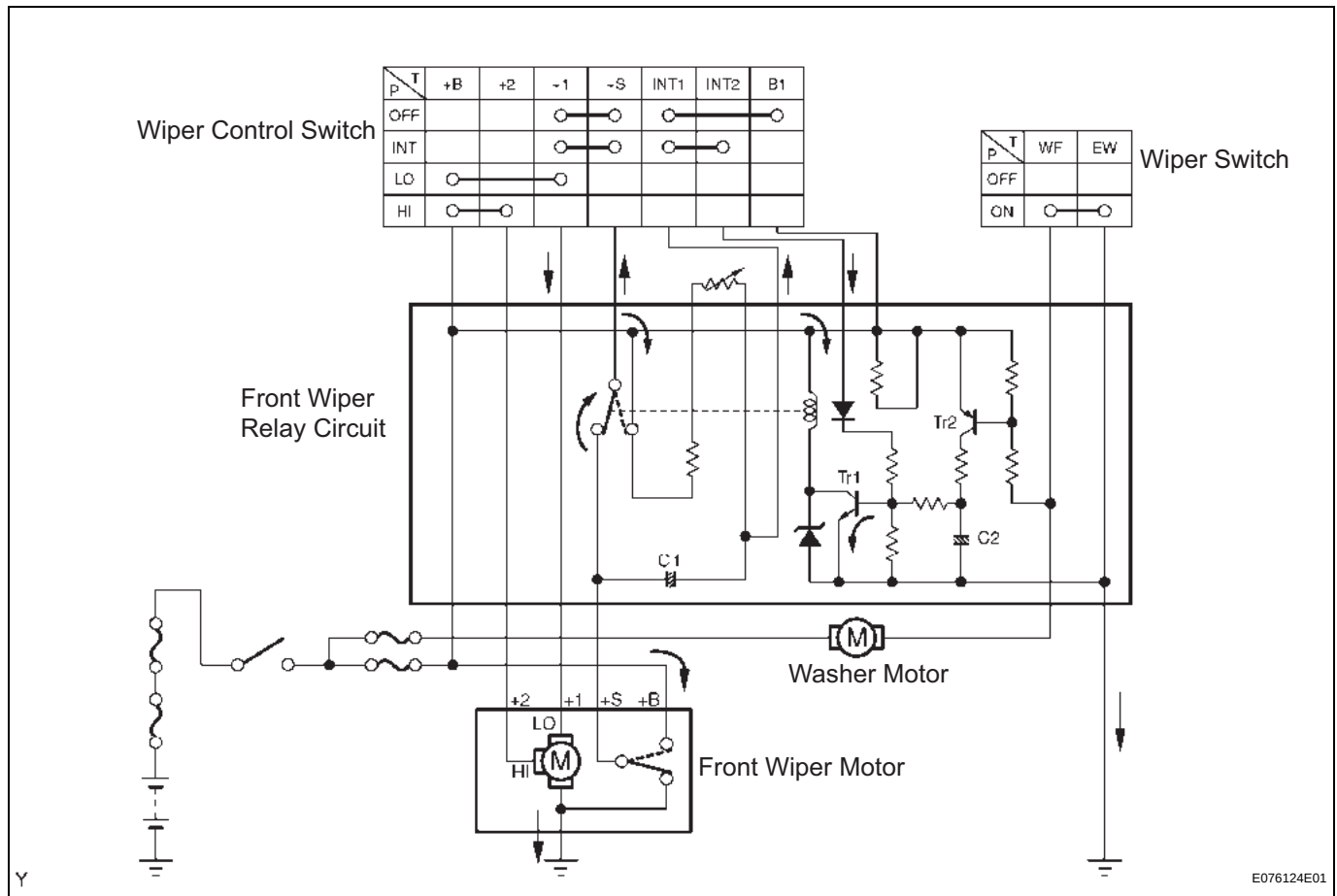
1. WASHER LINKED OPERATION

- (a) This system operates the front wipers at low speed immediately after washer fluid is ejected when the front washer switch is on for 0.3 seconds or more. When the washer switch is pressed for 1.5 seconds or more, the system operates the front wipers at low speed for approximately 2.2 seconds and then stops the operation.

2. INTERMITTENT OPERATION

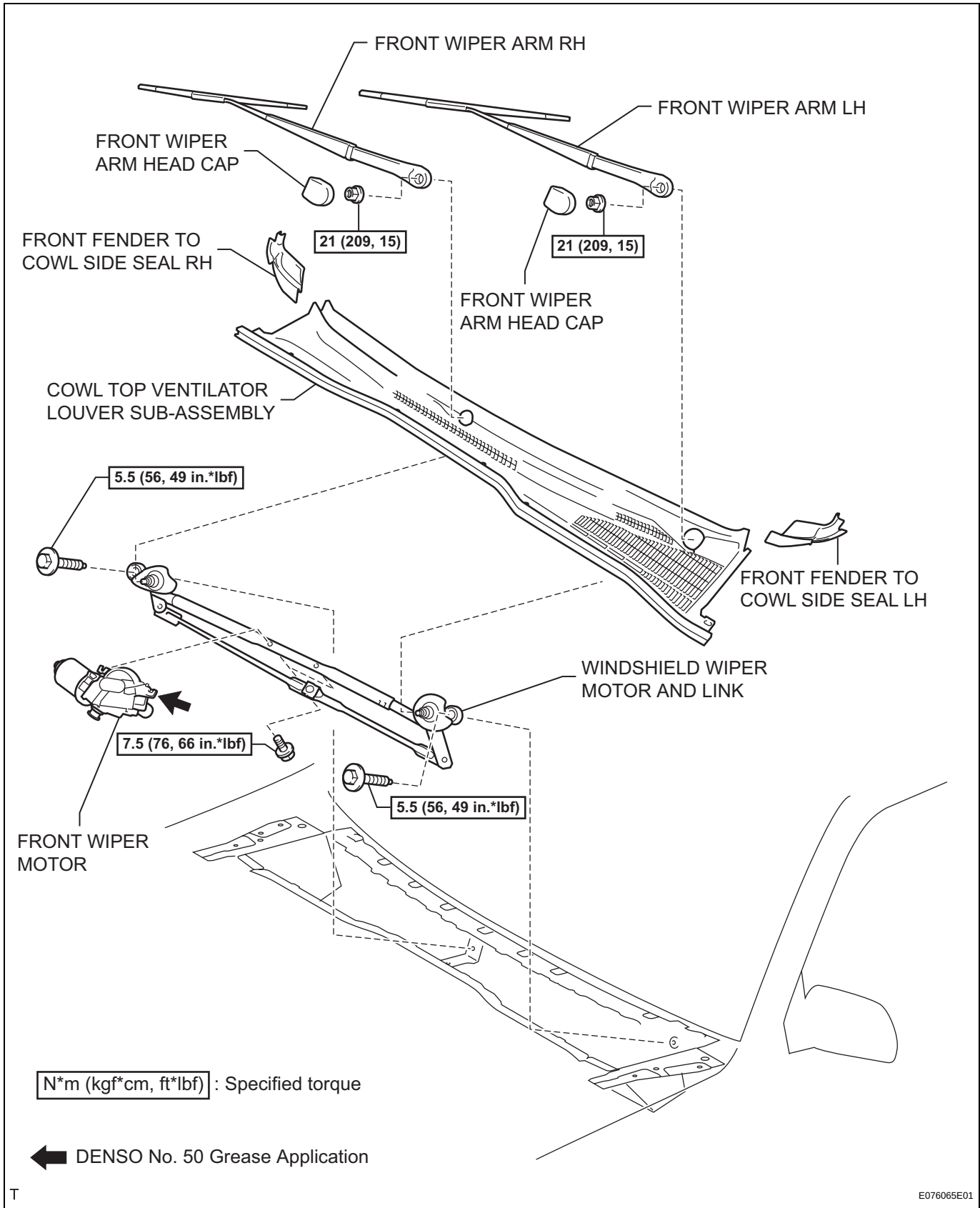
- (a) The system operates the front wipers once every 1.6 to 10.7 seconds when the front wiper switch is turned to the INT position. The intermittent time can be adjusted to between 1.6 and 10.7 seconds by using the intermittent time adjust dial.
- (b) When the wiper control switch is turned to the INT position, current flows from the precharged capacitor C1, through terminals INT1 and INT2 of the wiper control switch, to Tr1 (transistor). When transistor Tr1 is turned on, current flows from terminal +S of the wiper control switch to terminal +1 of the wiper control switch, to terminal +1 of the wiper motor, to the wiper motor and finally to ground, causing the wiper motor to operate. At the same time, current flows from capacitor C1 to terminal INT1 of the wiper control switch and then to INT2. When the current flow from capacitor C1 stops, transistor Tr1 turns off to stop the relay contact point and halts the wiper motor. When the relay contact is off, capacitor C1 begins to charge

again and Tr1 remains off until the charging is complete. This period corresponds to the time interval between wiper operations. When capacitor C1 is fully charged, Tr1 turns on and then the relay contact point turns on, causing the motor to operate again. This is the cycle of the intermittent wiper operation. The time interval can be adjusted by using the intermittent time adjust dial (variable resistor) to change the charging time of capacitor C1.



FRONT WIPER MOTOR

COMPONENTS



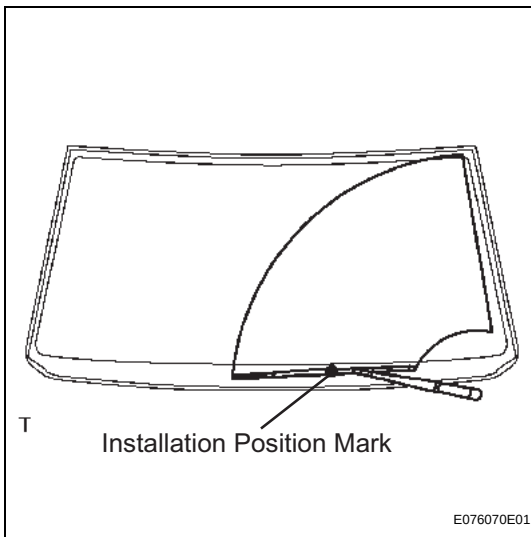
ON-VEHICLE INSPECTION

1. INSPECT FRONT WIPER MOTOR (for Driver Side)

- (a) Check the automatic stop position.
 - (1) Operate the windshield wiper motor assembly, then stop the operation.
 - (2) Check the automatic stop position when stopping the windshield wiper motor assembly operation.

Standard:

Front wiper arm stops at the position shown in the illustration.

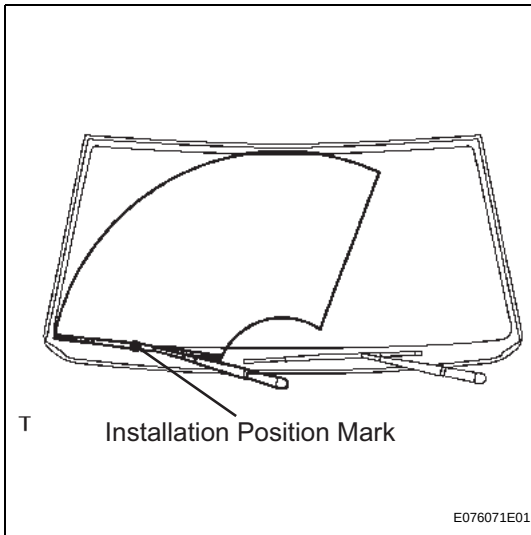


2. INSPECT FRONT WIPER MOTOR (for Front Passenger Side)

- (a) Check the automatic stop position.
 - (1) Operate the windshield wiper motor assembly, then stop the operation.
 - (2) Check the automatic stop position when stopping the windshield wiper motor assembly operation.

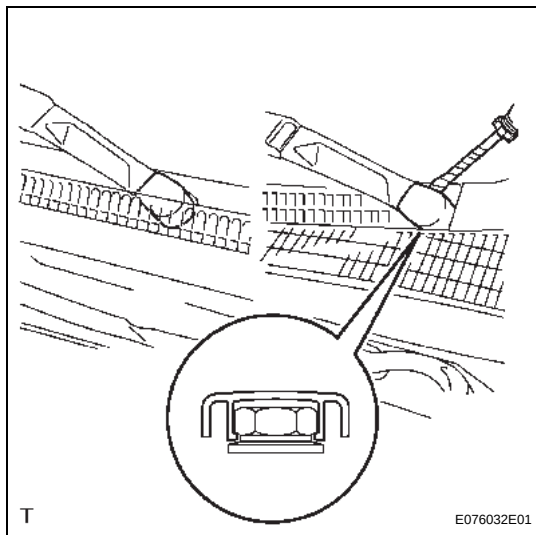
Standard:

Front wiper arm stops at the position shown in the illustration.

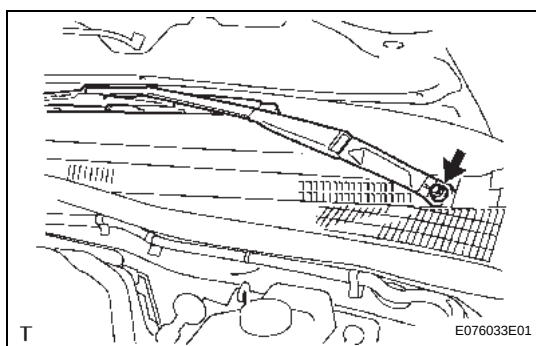


REMOVAL

1. **DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL**
2. **REMOVE FRONT WIPER ARM HEAD CAP**
 - (a) Using a screwdriver wrapped with protective tape, remove the 2 front wiper arm head caps.



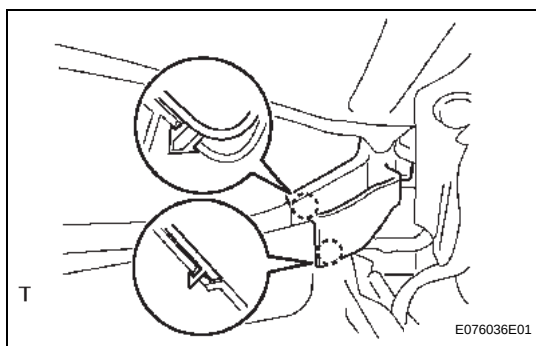
3. **REMOVE FRONT WIPER ARM LH**
 - (a) Operate the wiper, then stop the windshield wiper motor assembly at the automatic stop position.
 - (b) Remove the nut and front wiper arm LH.



4. **REMOVE FRONT WIPER ARM RH**

HINT:
Perform the same procedure as above on the opposite side.

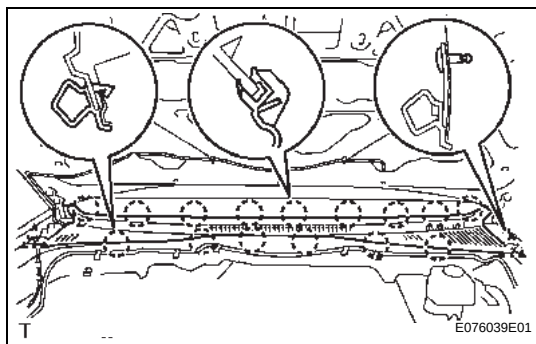
5. **REMOVE FRONT FENDER TO COWL SIDE SEAL LH**
 - (a) Disengage the 2 claws and remove the front fender to cowl side seal LH.

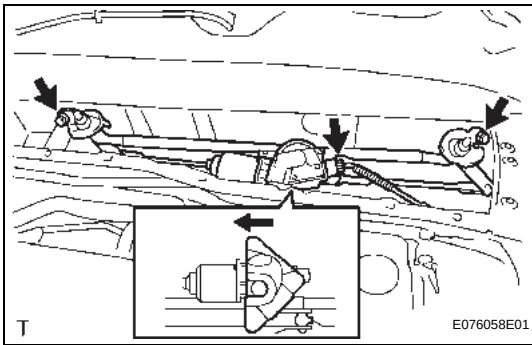


6. **REMOVE FRONT FENDER TO COWL SIDE SEAL RH**

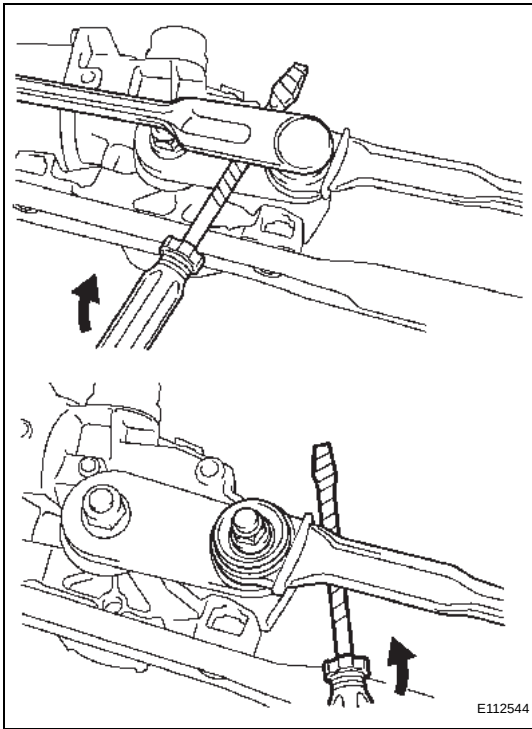
HINT:
Perform the same procedure as above on the opposite side.

7. **REMOVE COWL TOP VENTILATOR LOUVER SUB-ASSEMBLY**
 - (a) Disengage the 2 clips.
 - (b) Disengage the 15 claws, then remove the cowl top ventilator louver sub-assembly.

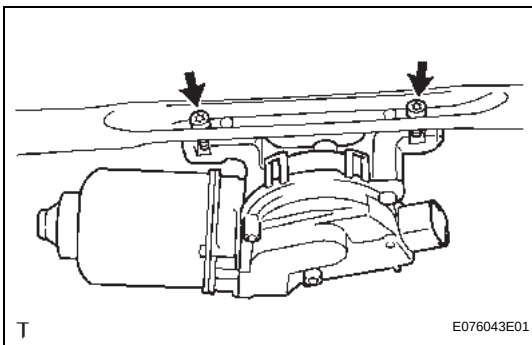


**8. REMOVE WINDSHIELD WIPER MOTOR AND LINK**

- (a) Disconnect the connector, then remove the 2 bolts.
- (b) Slide the wiper link assembly to the passenger side seat side. Disengage the meshing of the rubber pin, then remove the windshield wiper motor & link assembly.

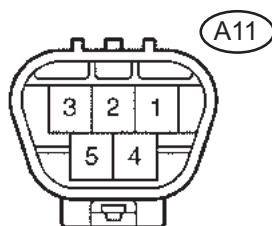
**9. REMOVE FRONT WIPER MOTOR**

- (a) Using a screwdriver wrapped with protective tape, disengage the meshing of the 2 rods at the crank arm pivot of the windshield wiper motor assembly.



- (b) Using a "Torx" socket wrench (T30), remove the 2 screws and windshield wiper motor assembly.

Windshield Wiper Motor Assembly
Connector Front View:



P

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INSPECTION

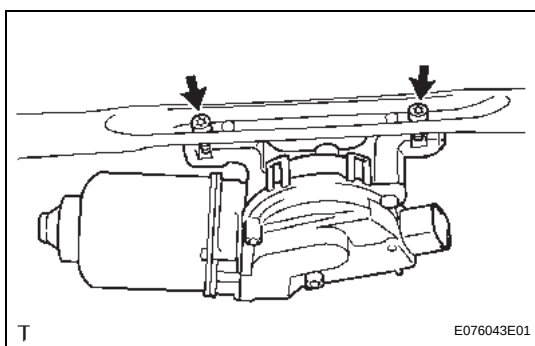
1. INSPECT FRONT WIPER MOTOR

- (a) Check the LO operation.
 - (1) Connect the battery positive (+) lead to terminal 1 (+1) of the connector and the battery negative (-) lead to terminal 5 (E), then check that the windshield wiper motor assembly operates at low speed (LO).
If the motor does not operate, replace the windshield wiper motor assembly.
- (b) Check the HI operation.
 - (1) Connect the battery positive (+) lead to terminal 4 (+2) of the connector and the battery negative (-) lead to terminal 5 (E), then check that the motor operates at high speed (HI).

INSTALLATION

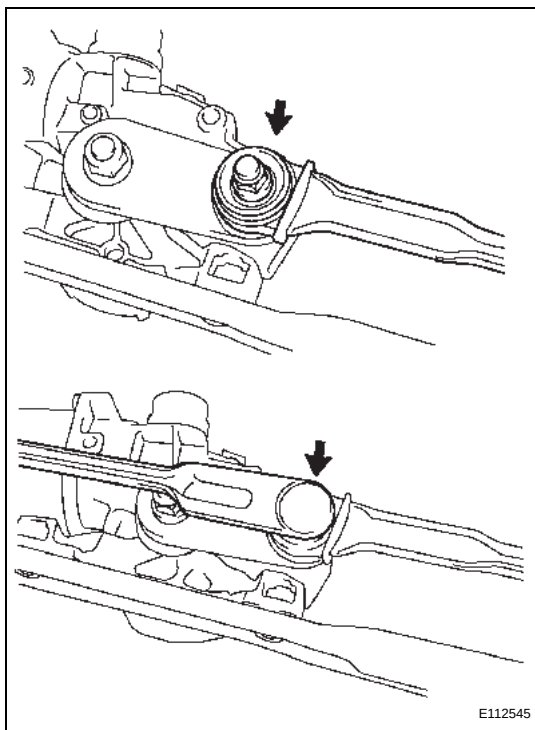
1. INSTALL FRONT WIPER MOTOR

- (a) Apply DENSO No. 50 grease to the crank arm pivot of the windshield wiper motor assembly.
- (b) Using a "Torx" socket wrench (T30), install the windshield wiper motor assembly with the 2 screws.
Torque: 7.5 N*m (76 kgf*cm, 66 in.*lbf)
- (c) Install the 2 rods onto the crank arm pivot of the windshield wiper motor assembly.

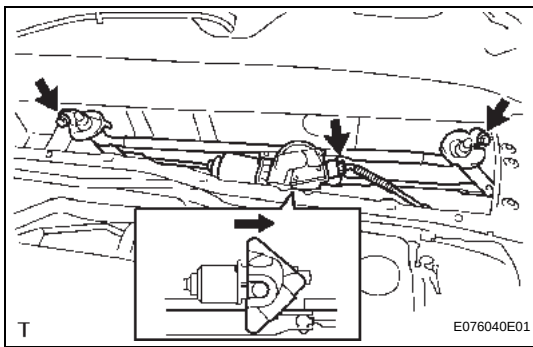


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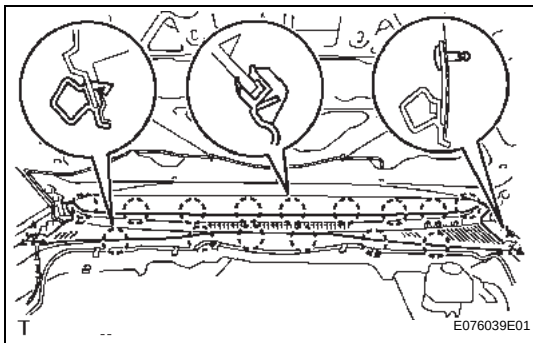


2. INSTALL WINDSHIELD WIPER MOTOR AND LINK

- Slide the wiper motor assembly to the driver side seat side as shown in the illustration and engage the rubber pin with the body.
- Install the windshield wiper link assembly with the 2 bolts.

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

- Connect the connector.



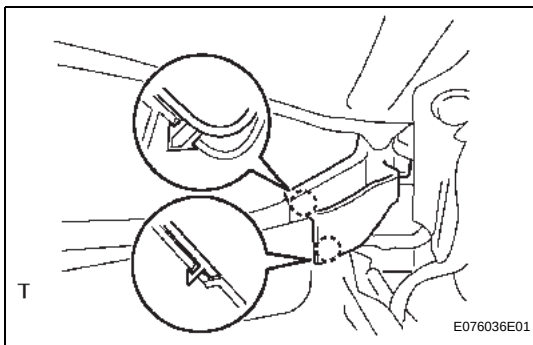
3. INSTALL COWL TOP VENTILATOR LOUVER SUB-ASSEMBLY

- Engage the 15 claws and install the cowl top ventilator louver sub-assembly.
- Engage the 2 clips

4. INSTALL FRONT FENDER TO COWL SIDE SEAL RH

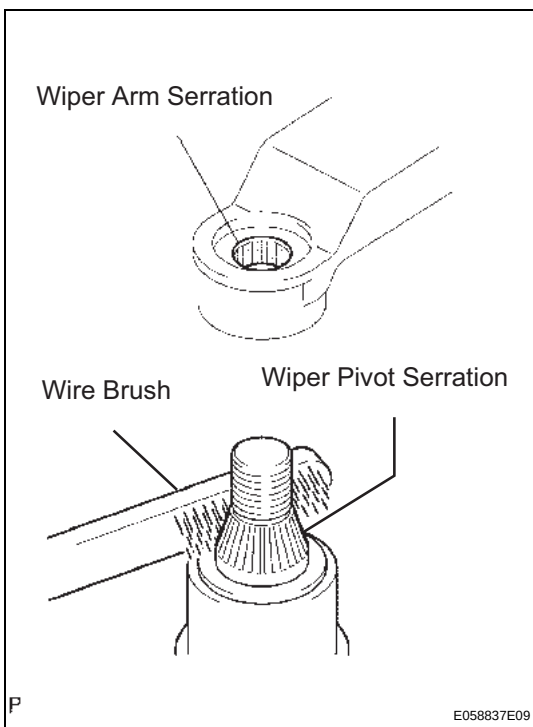
HINT:

Perform the same procedure as above on the opposite side.



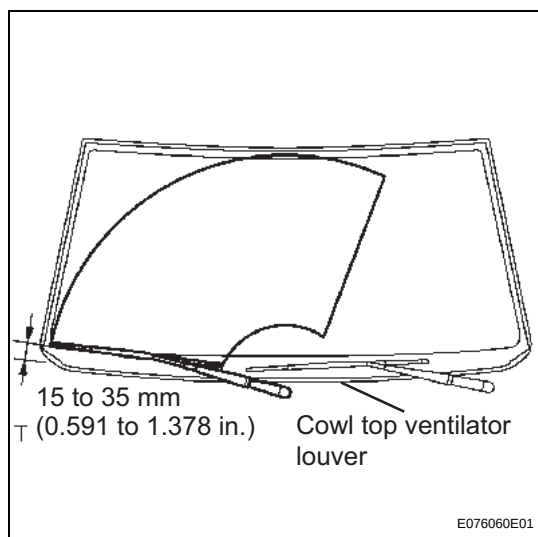
5. INSTALL FRONT FENDER TO COWL SIDE SEAL LH

- Engage the 2 claws and install the front fender onto cowl side seal LH.



6. INSTALL FRONT WIPER ARM RH

- Scrape any metal powder off the serration part of the wiper arm with a round file or equivalent (when reinstalling).
- Clean the wiper pivot serration with a wire brush.
- Operate the wiper, then stop the windshield wiper motor assembly at the automatic stop position.



- (d) Install the front wiper arm RH onto the position with the nut as shown in the illustration.

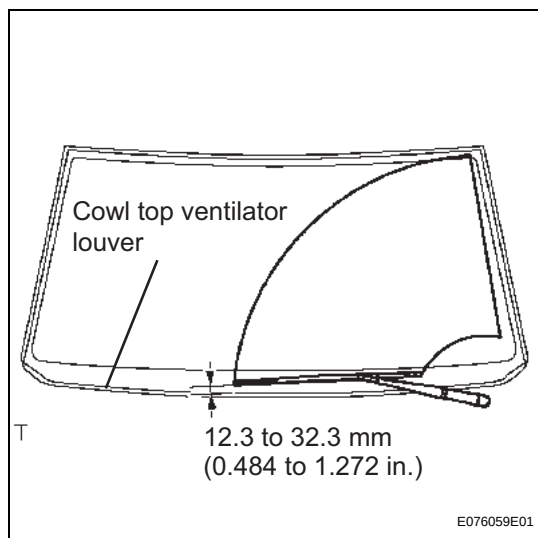
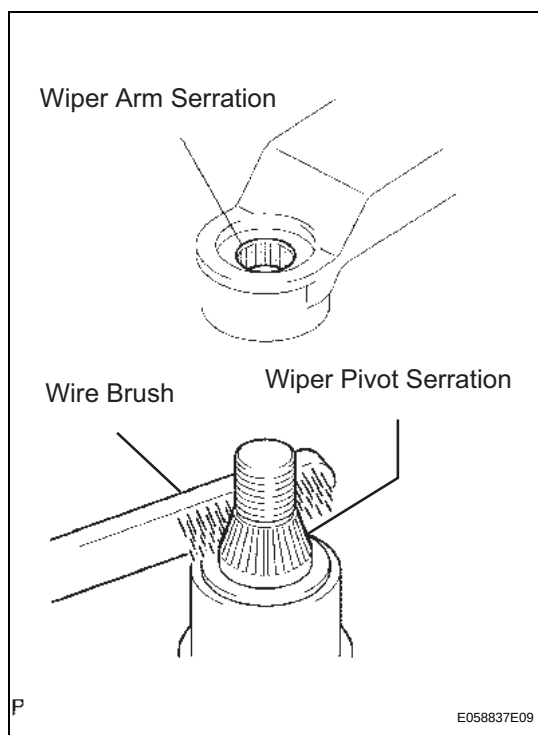
Torque: 21 N*m (209 kgf*cm, 15 ft.*lbf)

HINT:

Hold down the arm hinge by hand to fasten the nut.

7. INSTALL FRONT WIPER ARM LH

- (a) Scrape any metal powder off the serration part of the wiper arm with a round file or equivalent (when reinstalling).
- (b) Clean the wiper pivot serration with a wire brush.



- (c) Install the front wiper arm LH onto the position with the nut as shown in the illustration.

Torque: 21 N*m (209 kgf*cm, 15 ft.*lbf)

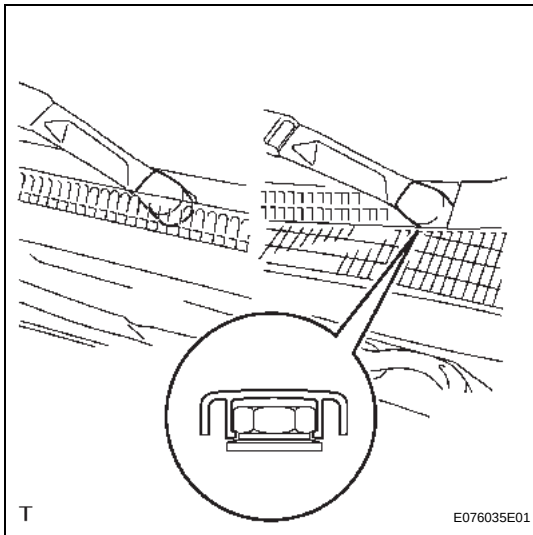
HINT:

Hold down the arm hinge by hand to fasten the nut.

- (d) Operate the front wipers while spraying water or washer fluid on the windshield. Ensure that there is no interference between the blades and pillar.

8. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

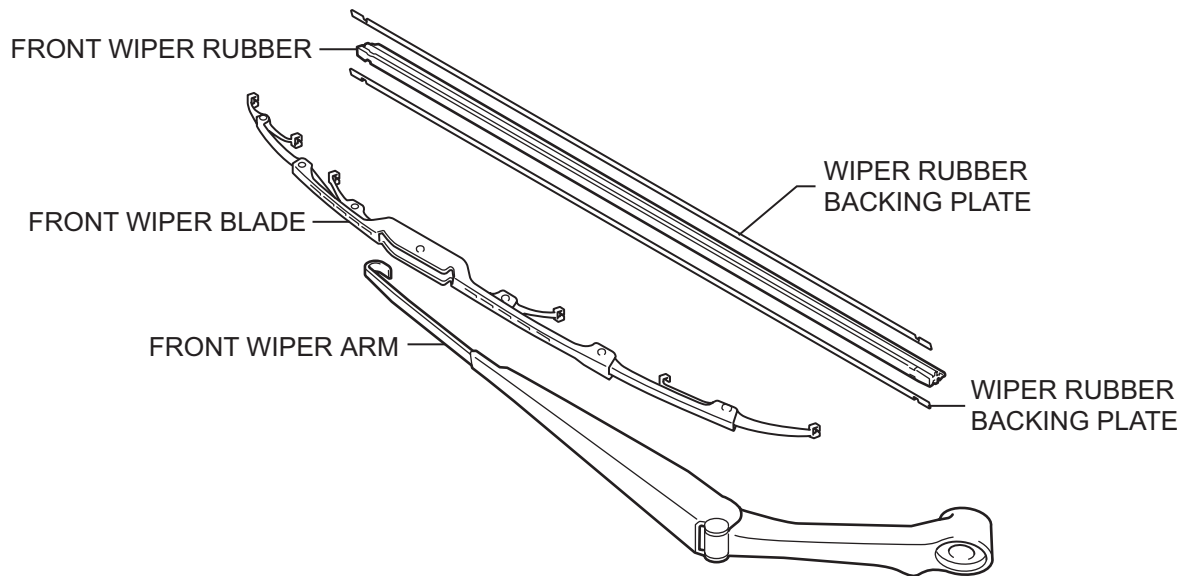
Torque: 3.9 N*m (40 kgf*cm, 35 in.*lbf)

**9. INSTALL FRONT WIPER ARM HEAD CAP**

- (a) Engage the claw and install the 2 front wiper arm head caps.

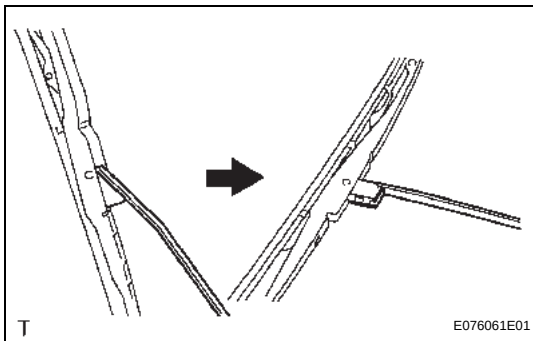
FRONT WIPER RUBBER

COMPONENTS



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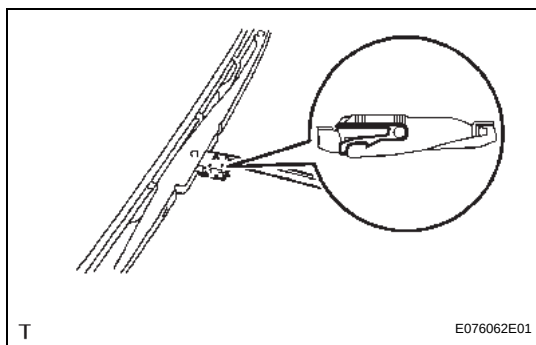
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REMOVAL

1. REMOVE FRONT WIPER BLADE

- (a) Raise the front wiper blade to the position as shown in the illustration.



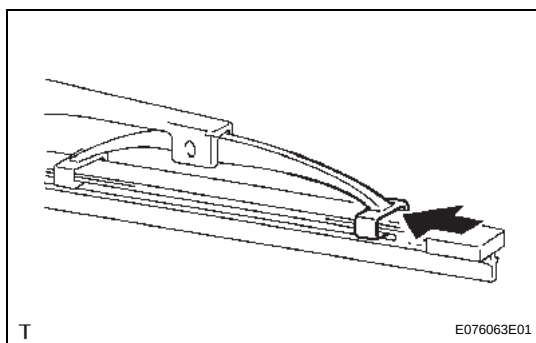
- (b) Disengage the claw and remove the front wiper blade LH from the front wiper arm LH.

NOTICE:

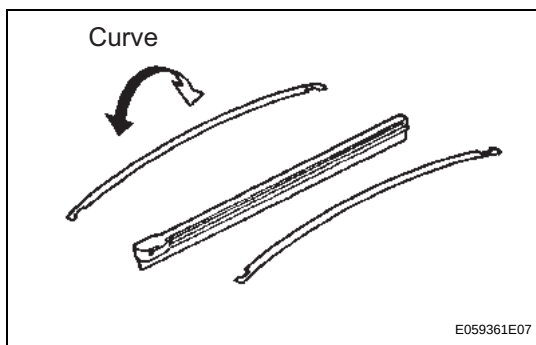
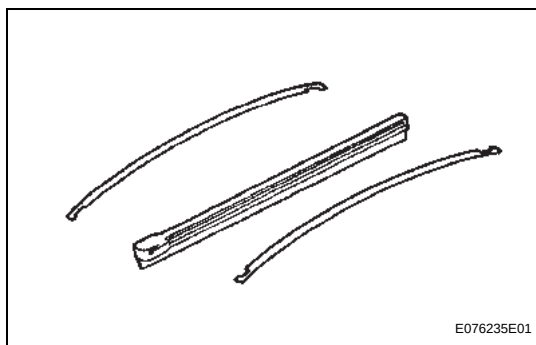
Do not bend the front wiper arm with the front wiper blade LH removed, as the arm tip could damage the windshield surface.

2. REMOVE FRONT WIPER RUBBER

- (a) Remove the front wiper rubber LH from the front wiper blade.



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



INSTALLATION

1. REMOVE FRONT WIPER RUBBER

- (a) Install the 2 wiper rubber backing plates onto the wiper rubber LH.

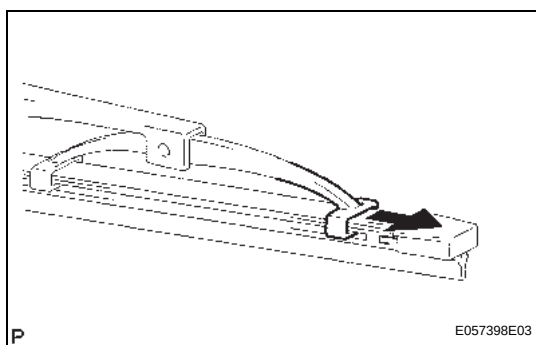
NOTICE:

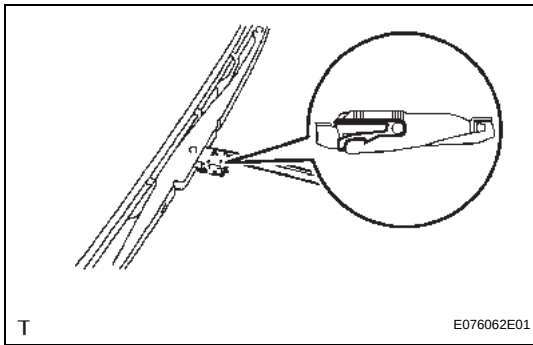
Be sure to install the wiper rubber backing plates in the correct direction.

- (b) Install the wiper rubber LH so that the head part (Larger side) of the wiper rubber faces the arm axle side.

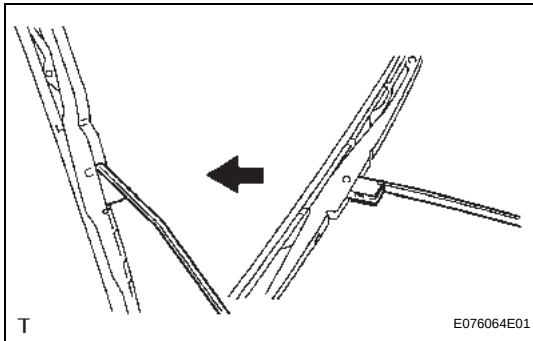
NOTICE:

Push the front wiper blade into the grooves of the wiper rubber to engage them completely.



**2. REMOVE FRONT WIPER BLADE**

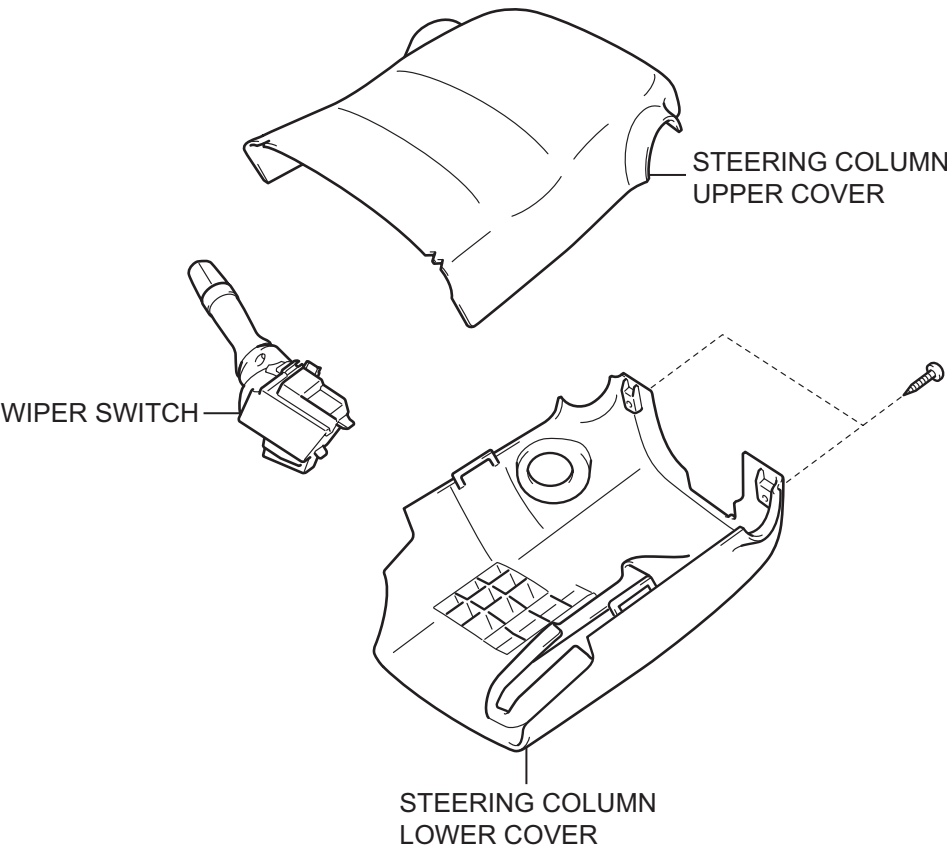
- (a) Engage the claw and install the front wiper blade LH onto the front wiper arm LH.



- (b) Hold down the front wiper blade LH as shown in the illustration.

WIPER SWITCH

COMPONENTS

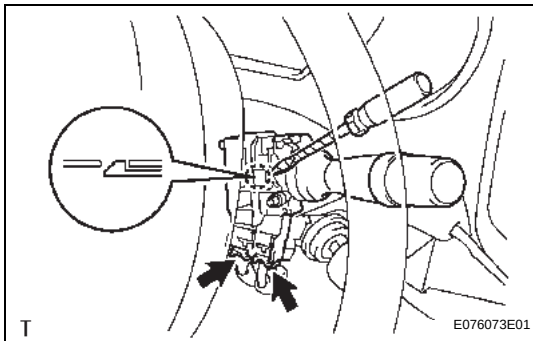


REMOVAL

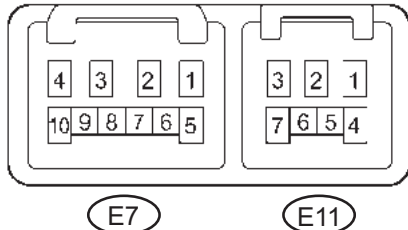
1. **DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL**
Wait for at least 90 seconds after disconnecting the cable to prevent the airbag from working.
2. **REMOVE STEERING COLUMN LOWER COVER** (See page [SR-9](#))
3. **REMOVE STEERING COLUMN UPPER COVER** (See page [SR-10](#))
4. **REMOVE WIPER SWITCH**
 - (a) Disconnect the 2 connectors.
 - (b) Using a screwdriver wrapped with protective tape, disengage the claw and remove the windshield wiper switch assembly.

NOTICE:

The claw will break if pressed too hard.



**Windshield Wiper Switch Assembly
Connector Front View:**



H

E113070E01

INSPECTION

1. **INSPECT WIPER SWITCH**
 - (a) Check the resistance.
 - (1) Measure the resistance and check the results in accordance with the value(s) in the table below.

Standard:

Wiper Switch

Tester connection	Condition	Specified condition
+B(E7-2) - +1(E7-3)	MIST	Below 1 Ω
+S(E7-1) - +1(E7-3)	OFF	Below 1 Ω
+S(E7-1) - +1(E7-3)	INTO	Below 1 Ω
+B(E7-2) - +1(E7-3)	LO	Below 1 Ω
+B(E7-2) - +2(E7-4)	HI	Below 1 Ω

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

Standard:

Washer Switch

Tester connection	Condition	Specified condition
EW(E11-2) - WF(E11-3)	OFF	10 k Ω or higher
EW(E11-2) - WF(E11-3)	ON	Below 1 Ω

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

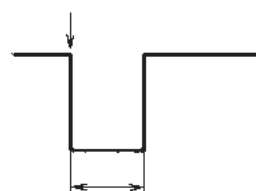
- (b) Check the intermittent operation.
 - (1) Connect the voltmeter positive terminal to terminal 3 (+1) of the E7 connector and the voltmeter negative terminal to terminal 2 (EW) of the E11 connector.

- (2) Connect the battery positive (+) lead to terminal 2 (+B) of the E7 connector and the battery negative (-) lead to terminals 2 (EW) of the E11 connector and 1 (+S) of the E7 connector.
- (3) Turn the wiper switch to the INT position.
- (4) Connect the battery positive (+) lead to terminal 1 (+S) of the E7 connector for 5 seconds.
- (5) Connect the battery negative lead to terminal 1 (+S) of the E7 connector. Operate the intermittent wiper relay and check the voltage between terminals 3 (+1) of the E7 connector and 2 (EW) of the E11 connector.

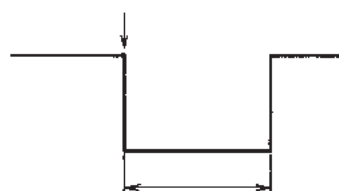
FAST: Connect the negative battery cable to terminal 1 (+S) of the E7 connector

SLOW: Connect the negative battery cable to terminal 1 (+S) of the E7 connector

Voltage between terminals 3 (+1) of the E7 connector and 2 (EW) of the E11 connector



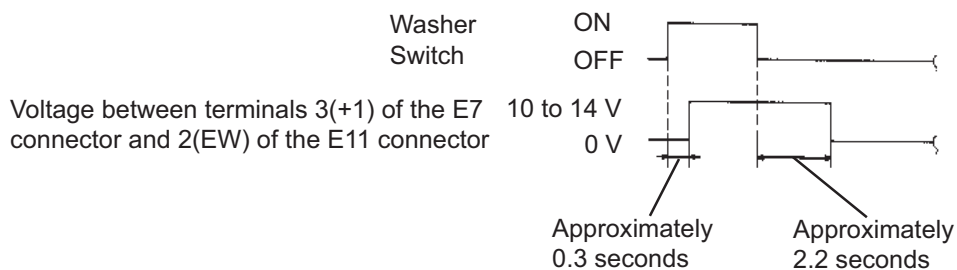
0.6 to 2.6 second



10.2 to 11.2 second

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(c) Check the operation



Voltage between terminals 3(+1) of the E7 connector and 2(EW) of the E11 connector

10 to 14 V

0 V

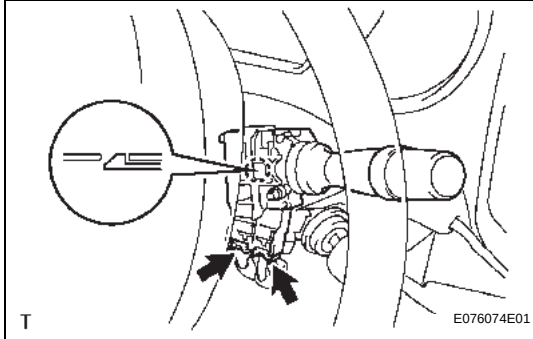
Approximately
0.3 seconds

Approximately
2.2 seconds

E113072E01

- (1) Turn the wiper switch off.
- (2) Connect the battery positive lead to terminal 2 (+B) of the E7 connector and the battery negative lead to terminals 1 (+S) of the E7 connector and 2 (EW) of the E11 connector.

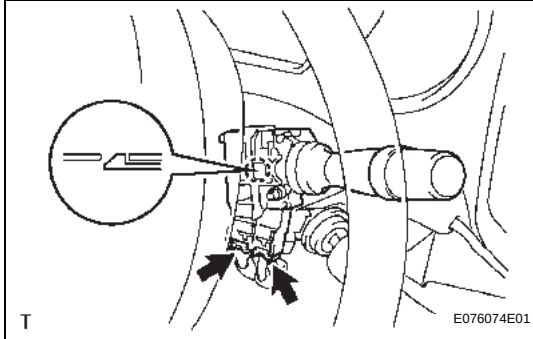
- (3) Connect the voltmeter positive terminal to terminal 3 (+1) of the E7 connector and the voltmeter negative terminal to terminal 2 (EW) of the E11 connector. Turn the washer switch on and off, and check the voltage between terminals 3 (+1) of the E7 connector and 2 (EW) of the E11 connector.



INSTALLATION

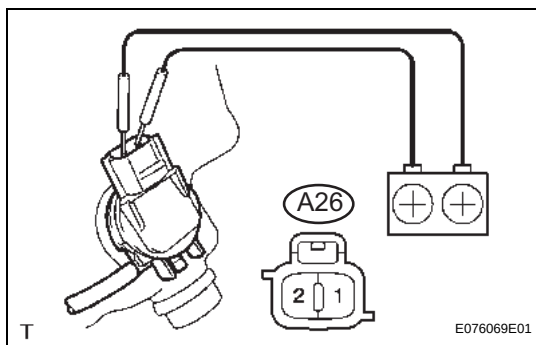
1. **INSTALL WIPER SWITCH**
 - (a) Engage the claw and install the windshield wiper switch assembly.
 - (b) Connect the 2 connectors.
2. **CONNECT CABLE TO NEGATIVE BATTERY TERMINAL**
Torque: 3.9 N*m (40 kgf*cm, 35 in.*lbf)
3. **INSTALL STEERING COLUMN UPPER COVER** (See page [SR-18](#))
4. **INSTALL STEERING COLUMN LOWER COVER** (See page [SR-18](#))

- (3) Connect the voltmeter positive terminal to terminal 3 (+1) of the E7 connector and the voltmeter negative terminal to terminal 2 (EW) of the E11 connector. Turn the washer switch on and off, and check the voltage between terminals 3 (+1) of the E7 connector and 2 (EW) of the E11 connector.



INSTALLATION

1. **INSTALL WIPER SWITCH**
 - (a) Engage the claw and install the windshield wiper switch assembly.
 - (b) Connect the 2 connectors.
2. **CONNECT CABLE TO NEGATIVE BATTERY TERMINAL**
Torque: 3.9 N*m (40 kgf*cm, 35 in.*lbf)
3. **INSTALL STEERING COLUMN UPPER COVER** (See page [SR-18](#))
4. **INSTALL STEERING COLUMN LOWER COVER** (See page [SR-18](#))



WASHER MOTOR

ON-VEHICLE INSPECTION

1. INSPECT WASHER MOTOR

(a) Check the operation.

- (1) Fill the washer jar with washer fluid.

HINT:

Operation should be performed with the windshield washer motor and pump assembly installed onto the washer jar assembly.

- (2) Connect the positive battery (+) lead to terminal 1 of the windshield washer motor and pump assembly, then the negative battery (-) lead to terminal 2. Check that washer fluid flows from the washer jar.

Standard:

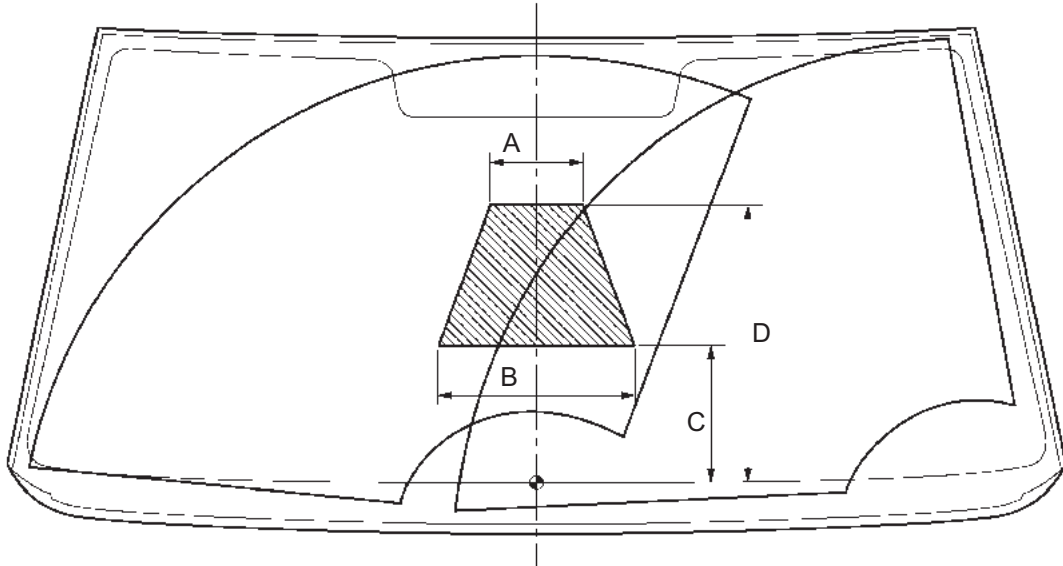
Washer fluid flows from the washer jar.

WASHER NOZZLE

INSPECTION

1. INSPECT WASHER NOZZLE

- (a) With the engine running, check that the washer fluid hits in the range indicated by the hatched lines on the windshield.



Standard: The washer fluid intersects within the range above.

A: 173.7 mm (6.83 in.)

B: 273 mm (10.75 in.)

C: 191.1 mm (7.52 in.)

D: 397.5 mm (15.65 in.)

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HINT:

This washer nozzle does not have an adjustment function because it has a spray type nozzle.