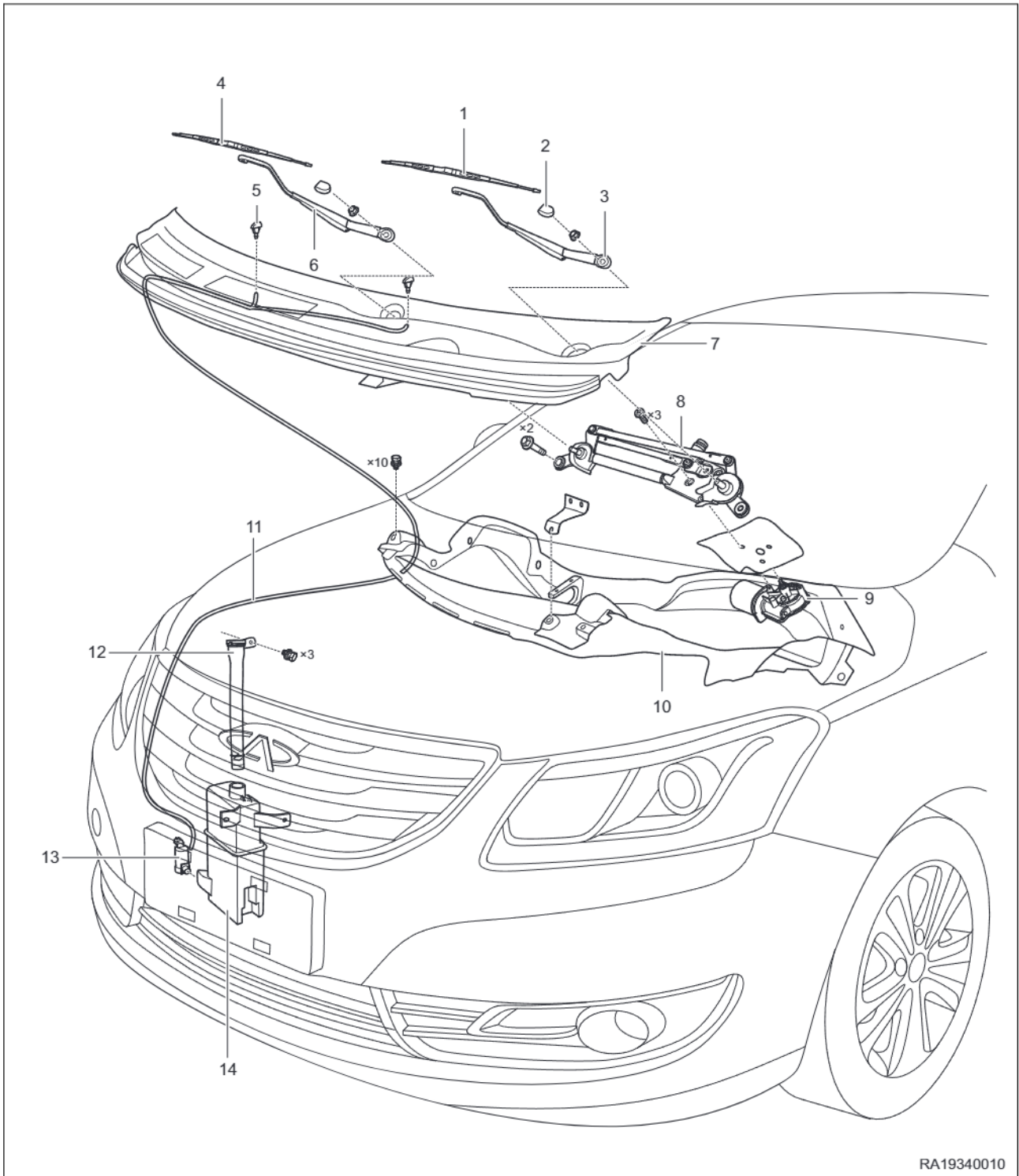


WIPER AND WASHER

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GENERAL INFORMATION

Description



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34 - WIPER AND WASHER

1 - Wiper Arm Main Blade	2 - Wiper Arm Trim Cap
3 - Main Wiper Arm	4 - Wiper Arm Sub Blade
5 - Front Washer Nozzle	6 - Sub Wiper Arm
7 - Front Windshield Lower Garnish Assembly	8 - Wiper Link Rod
9 - Wiper Motor	10 - Rain Gutter Front End Plate Assembly
11 - Front Washer Line Assembly	12 - Guide Pipe Assembly
13 - Washer Pump	14 - Washer Fluid Reservoir

The wiper and washer are the important devices for cleaning the front windshield assembly. The wiper and washer systems are controlled by the wiper and washer switch assembly. The wiper and washer systems can operate only when the ignition switch is turned to ON. The driver controls all the operations of the wiper and washer by moving the switch control lever.

Specifications

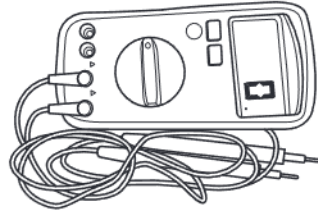
Torque Specifications

Description	Torque (N·m)
Wiper Arm Assembly Fixing Nut	25 ± 4
Wiper Motor and Link Rod Assembly Fixing Bolt	7 ± 1.5
Wiper Motor Fixing Bolt	8 ± 2
Wiper Motor Fixing Nut	8 ± 2
Guide Pipe Assembly Fixing Bolt	7 ± 1.5
Washer Fluid Reservoir Assembly Fixing Bolt	7 ± 1.5
Rain Gutter Front End Plate Assembly Fixing Bolt	10 ± 1.5
ECM (Engine Control Module) Fixing Bolt	7 ± 1

34

Tool

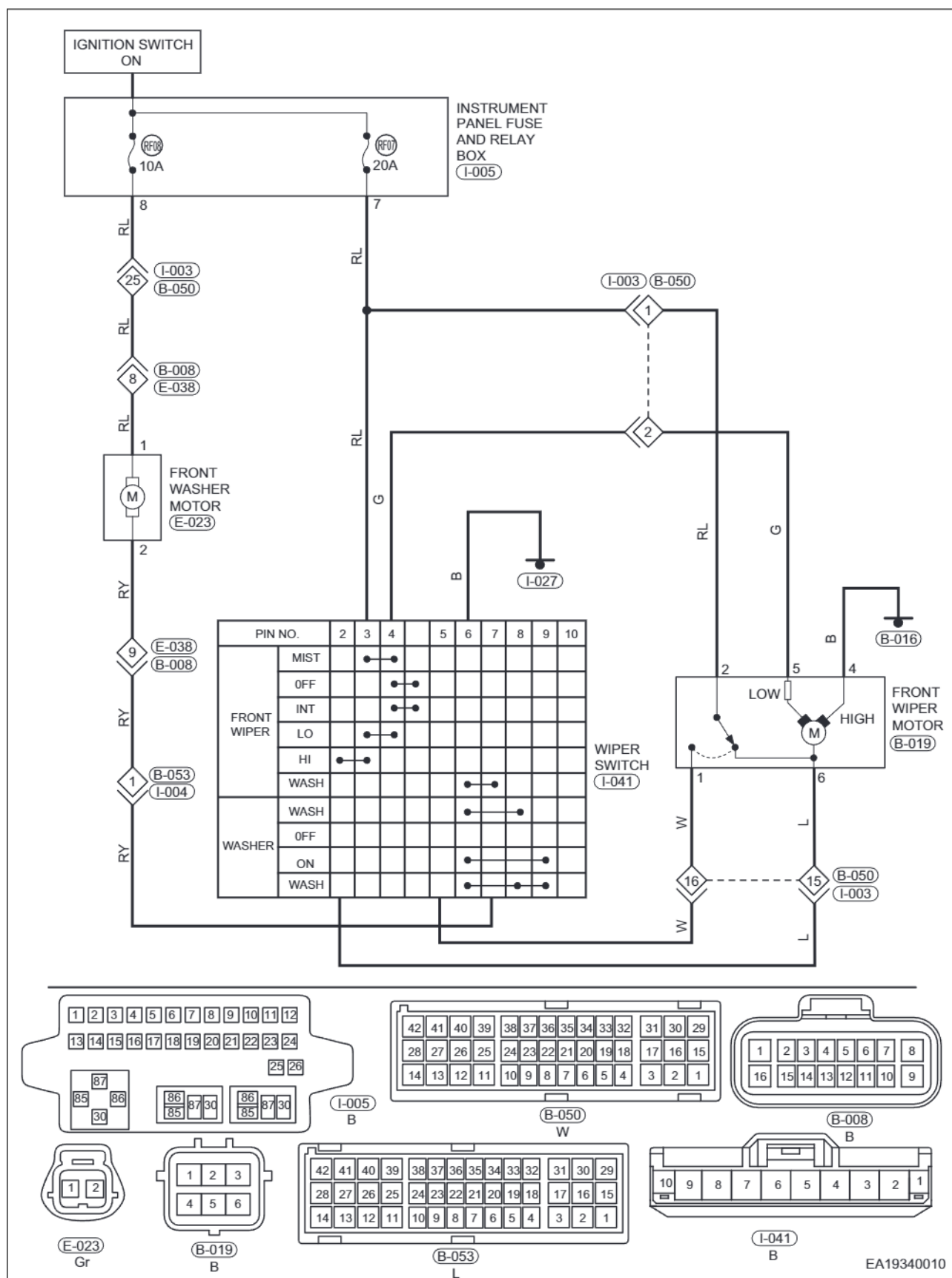
General Tool

Digital Multimeter	 RCH0000002
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Circuit Diagram

Wiper and Washer Systems

34



EA19340010

DIAGNOSIS & TESTING

Problem Symptoms Table

HINT:

Use the table below to help determine the cause of problem symptoms. Check each suspected area in sequence. Repair or replace the faulty components, or adjust them as necessary.

Symptom	Suspected Area	See page
Both wiper and washer systems do not operate	Fuse	49-27
	Wiper switch assembly	34-8
	Wire harness or connector	-
Wiper system does not operate in LO or HI	Wiper switch assembly	34-8
	Wiper motor	34-12
	Wire harness or connector	-
Wiper system does not operate in INT	Wiper switch assembly	34-8
	Wiper motor	34-12
	Wire harness or connector	-
Wiper system does not operate	Fuse	49-27
	Wiper switch assembly	34-8
	Wiper motor	34-12
	Wire harness or connector	-
Washer system does not operate	Fuse	49-27
	Wiper switch assembly	34-8
	Washer pump	34-17
	Wire harness or connector	-
Wiper arm and blade do not return to original position when wiper switch is off	Wiper switch assembly	34-8
	Wiper motor	34-12
	Wire harness or connector	-

ON-VEHICLE SERVICE

Wiper Switch Assembly

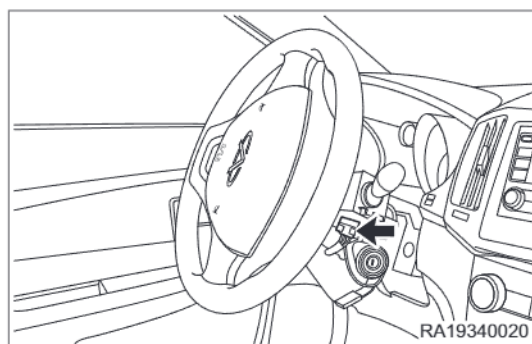
Removal

CAUTION

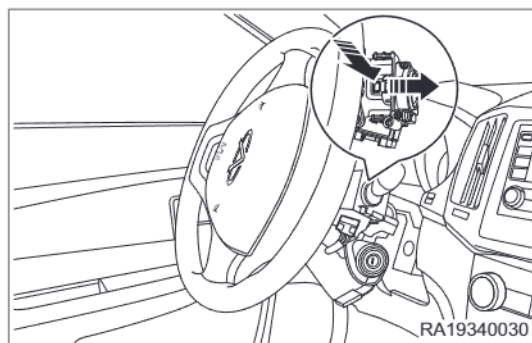
- Be sure to wear the necessary safety equipment to prevent accidents when removing the wiper switch assembly.
- Appropriate force should be applied when removing the wiper switch assembly, and avoid operating roughly.
- Try to prevent the interior and body paint surface from being scratched when removing the wiper switch assembly.

34

1. Turn off all the electrical equipment and ignition switch.
2. Disconnect the negative battery cable.
3. Remove the combination switch cover ([See page 27-12](#)).
4. Remove the wiper switch assembly.
 - a. Disconnect the wiper switch assembly connector (arrow).



- b. Press and hold the claws on the wiper switch assembly with a screwdriver wrapped with protective tape, and slide the wiper switch assembly outward slightly to remove it.

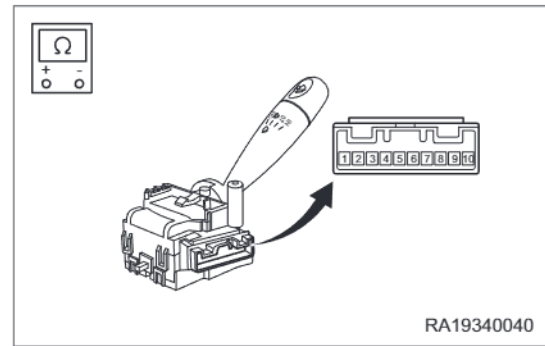


Inspection

1. Check the wiper switch assembly.
 - a. Using the digital multimeter, check for continuity between the terminals of wiper switch assembly according to the table below.

Multimeter Connection	Switch Condition	Specified Condition
Terminal 3 - Terminal 4	MIST	Continuity
Terminal 4 - Terminal 5	OFF	Continuity
Terminal 4 - Terminal 5	INT	Continuity
Terminal 3 - Terminal 4	LO	Continuity
Terminal 2 - Terminal 3	HI	Continuity

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



34

Installation

Installation is in the reverse order of removal.

CAUTION

- Always operate carefully to prevent components from being damaged when installing the wiper switch assembly.
- Install the connector in place when installing the wiper switch assembly.
- Check the wiper switch assembly for proper operation after installation.

Wiper Arm Assembly

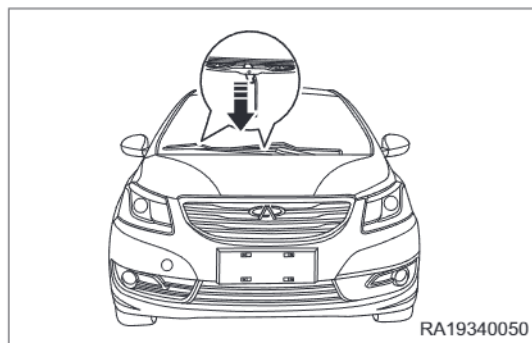
Removal

CAUTION

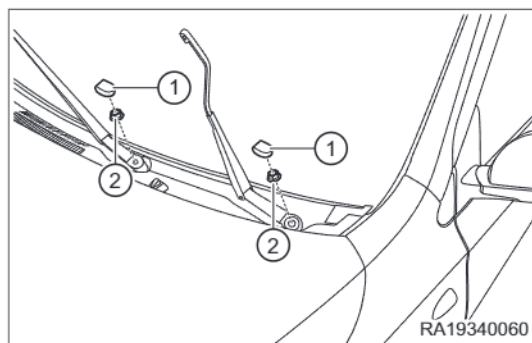
- Be sure to wear the necessary safety equipment to prevent accidents when removing the wiper arm assembly.
- Appropriate force should be applied when removing the wiper arm assembly, and avoid operating roughly.
- Try to prevent the front windshield assembly from being scratched when removing the wiper arm assembly.

34

1. Turn off all the electrical equipment and ignition switch.
2. Disconnect the negative battery cable.
3. Remove the wiper arm blade.
 - a. Lift the wiper arm assembly and make the wiper arm assembly and the wiper arm blade at a right angle.
 - b. Pull out the wiper arm blade from the wiper arm assembly in the direction of arrow as shown in the illustration.



4. Remove the wiper arm assembly.
 - a. Using a screwdriver wrapped with protective tape, remove the wiper arm trim caps (1).
 - b. Remove the fixing nuts (2) from the wiper arm assembly.
(Tightening torque: 25 ± 4 N·m)



- c. Remove the wiper arm assembly.

Installation

Installation is in the reverse order of removal.

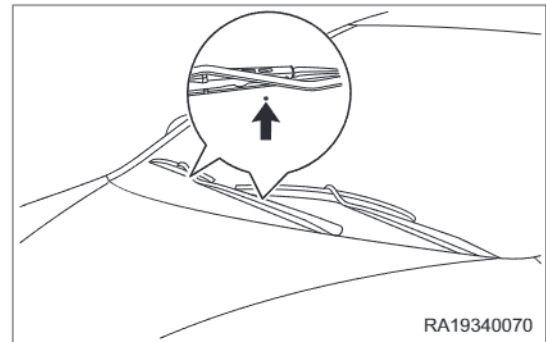
CAUTION

- Always operate carefully to prevent other components from being damaged when installing the wiper arm assembly.
- Make sure to tighten the fixing nuts to the specified torque when installing the wiper arm assembly.
- Check the wiper arm assembly for proper operation after installation.

HINT:

Always adjust the wiper arm assembly to the proper position when installing it.

Pay attention to the locating point on the front windshield assembly when assembling. The wiper arm blade should be pressed against the locating point as shown in the illustration.



Wiper Motor

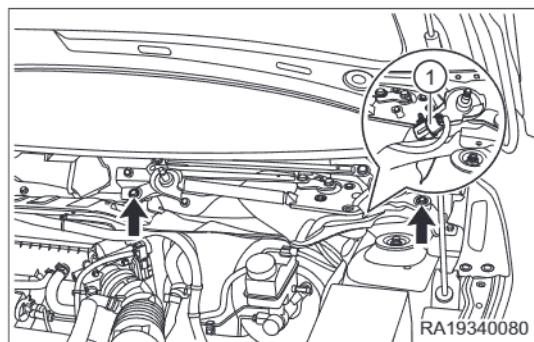
Removal

CAUTION

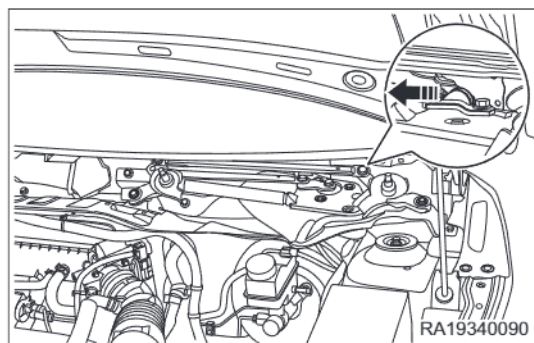
- Be sure to wear the necessary safety equipment to prevent accidents when removing the wiper motor.
- Appropriate force should be applied when removing the wiper motor, and avoid operating roughly.
- Try to prevent the body paint surface from being scratched when removing the wiper motor.

34

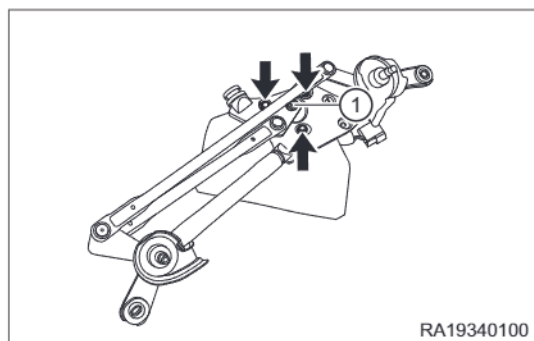
1. Turn off all the electrical equipment and ignition switch.
2. Disconnect the negative battery cable.
3. Remove the wiper arm assembly (See page 34-10).
4. Remove the front windshield lower garnish assembly (See page 46-31).
5. Remove the wiper motor and link rod assembly.
 - a. Using a screwdriver wrapped with protective tape, pry the clip on the wire harness.
 - b. Disconnect the connector (1) from the wiper motor and link rod assembly.
 - c. Remove 2 fixing bolts (arrow) from the wiper motor and link rod assembly.
(Tightening torque: $7 \pm 1.5 \text{ N}\cdot\text{m}$)



- d. Remove the wiper motor and link rod assembly in the direction of arrow as shown in the illustration.



6. Remove the wiper motor.
 - a. Remove 3 fixing bolts (arrow) from the wiper motor.
(Tightening torque: $8 \pm 2 \text{ N}\cdot\text{m}$)
 - b. Remove the fixing nut (1) from the wiper motor.
(Tightening torque: $8 \pm 2 \text{ N}\cdot\text{m}$)



- c. Separate the wiper motor and wiper link rod.

Inspection

1. Check the wiper motor.
 - a. Check the LO operation.

Measurement Condition	Specified Condition
Battery positive (+) → Terminal 5 Battery negative (-) → Terminal 4	Motor low speed (LO) running

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

- b. Check the HI operation.

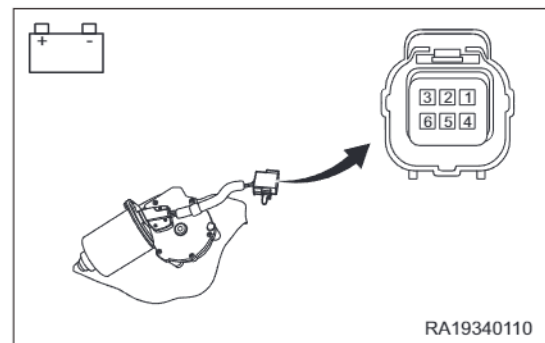
Measurement Condition	Specified Condition
Battery positive (+) → Terminal 6 Battery negative (-) → Terminal 4	Motor high speed (HI) running

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

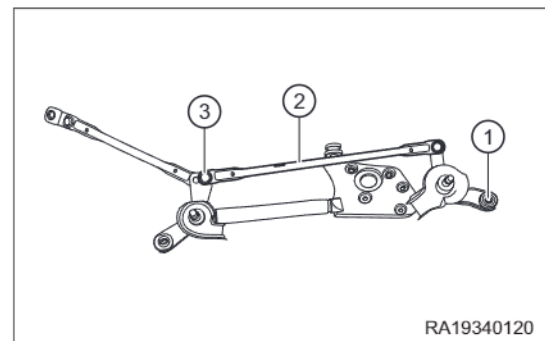
- c. Check the automatic return function.
 - Connect the positive (+) battery lead to terminal 5 or 6 and the negative (-) battery lead to terminal 4. When the motor is running at low speed (LO) or high speed (HI), disconnect the positive (+) battery to stop the wiper motor at any position other than the original position.
 - Connect terminals 1 and 5 with a lead, and connect the positive (+) battery lead to terminal 2, and the negative (-) battery lead to terminal 4 to run the motor to the original position at low speed.
 - Check if the wiper motor can stop automatically after running to the original position.

OK: The motor stops automatically after running to the original position, which indicates that the motor can return automatically.

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



2. Check the wiper link rod.
 - a. Check the link pin (1) for looseness or falling off, link rod (2) for deformation or break, and rotation shaft (3) for sticking. If necessary, replace the wiper link rod.



Installation

Installation is in the reverse order of removal.

CAUTION

- Always operate carefully to prevent other components from being damaged when installing the wiper motor.
- Apply grease to the crank arm pivot when installing the wiper motor.
- Adjust and make sure the wiper motor and wiper link rod are at the original position before installing the wiper motor. Otherwise, the wiper system will not operate normally.
- Install the connector in place and tighten the fixing bolts and nuts to the specified torque when installing the wiper motor.
- Check the wiper system for proper operation after installing the wiper motor.

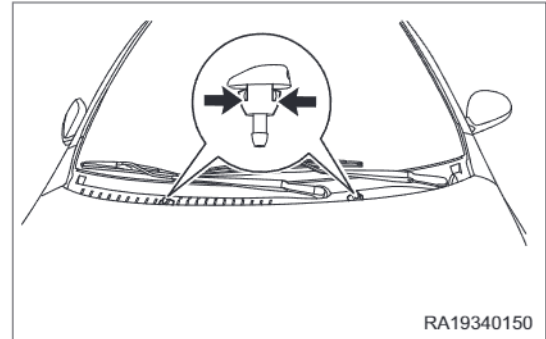
Front Washer Nozzle

Removal

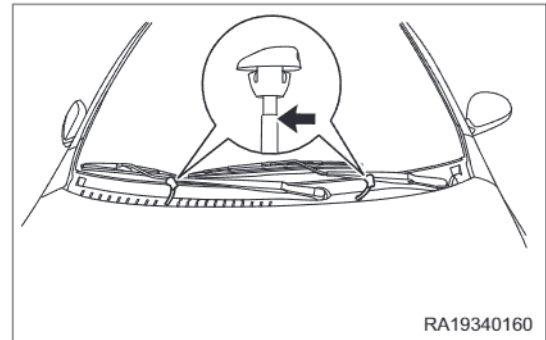
CAUTION

- Be sure to wear the necessary safety equipment to prevent accidents when removing the front washer nozzle.
- Appropriate force should be applied when removing the front washer nozzle, and avoid operating roughly.
- Try to prevent the front windshield lower garnish surface from being scratched when removing the front washer nozzle.

1. Turn off all the electrical equipment and ignition switch.
2. Disconnect the negative battery cable.
3. Remove the front windshield lower garnish assembly ([See page 46-31](#)).
4. Remove the front washer nozzle.
 - a. Using a screwdriver wrapped with protective tape, pry the clips (arrow) on the front washer nozzle.

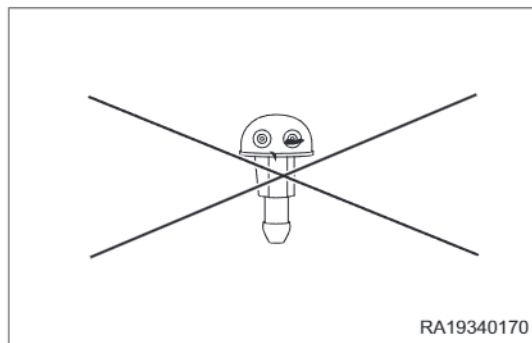


- b. Disconnect the front washer line and front washer nozzle joint (arrow) to separate the front washer nozzle.



Inspection

1. Check the front washer nozzle.
 - a. Check the front washer nozzle for blockage, deformation or damage. If necessary, replace the front washer nozzle.



Installation

Installation is in the reverse order of removal.

34

CAUTION

- Always operate carefully to prevent other components from being damaged when installing the front washer nozzle.
- Install the washer line port in place when installing the front washer nozzle.
- Check the front washer nozzle for proper operation after installation.

Washer Pump

Removal

CAUTION

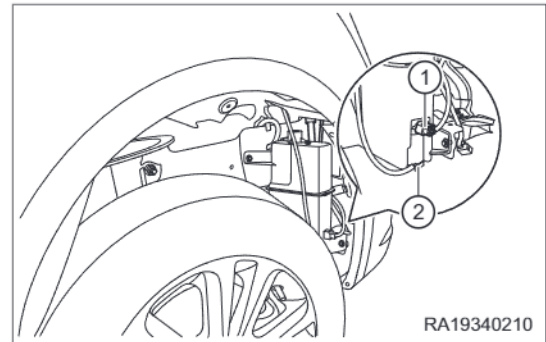
- Be sure to wear the necessary safety equipment to prevent accidents when removing the washer pump.
- Appropriate force should be applied when removing the washer pump, and avoid operating roughly.
- Try to prevent the body paint surface from being scratched when removing the washer pump.

1. Turn off all the electrical equipment and ignition switch.
2. Disconnect the negative battery cable.
3. Remove the front wheel house protector assembly ([See page 46-15](#)).
4. Remove the washer pump.

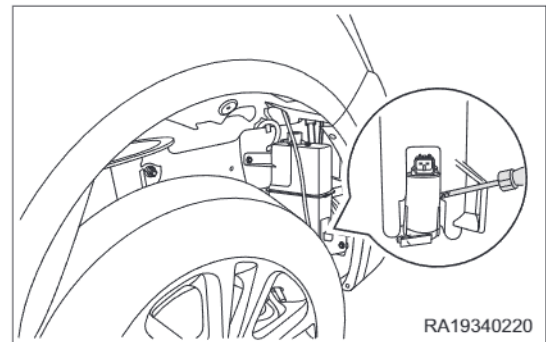
CAUTION

- Put a container under the washer pump to collect the washer fluid before removing the washer pump.

- a. Disconnect the washer pump connector (1).
- b. Disconnect the port (2) between washer line and washer pump, and collect the washer fluid with a container.



- c. Using a screwdriver wrapped with protective tape, remove the washer pump.



Installation

Installation is in the reverse order of removal.

CAUTION

- Always operate carefully to prevent the components from being damaged when installing the washer pump.
- Install the washer line port in place when installing the washer pump.
- Install the connector in place and tighten the fixing bolts to the specified torque when installing the washer pump.
- Check the washer system for proper operation after installing the wiper pump.

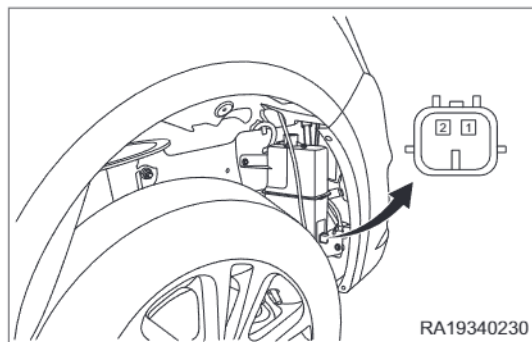
Inspection

1. Check the washer pump.

- a. Fill the washer fluid reservoir assembly with washer fluid.
- b. Connect the positive (+) battery lead to terminal 1 of the washer pump and the negative (-) battery lead to terminal 2.
- c. Check that the washer fluid flows out of the washer pump.

OK: Washer fluid flows out of the front washer pump.

If the result is not as specified, replace the washer pump.



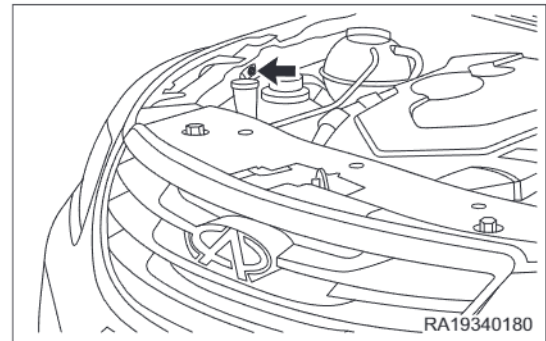
Washer Fluid Reservoir Assembly

Removal

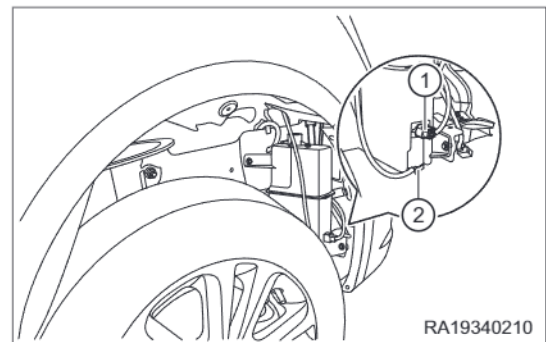
CAUTION

- Be sure to wear the necessary safety equipment to prevent accidents when removing the washer fluid reservoir assembly.
- Appropriate force should be applied when removing the washer fluid reservoir assembly, and avoid operating roughly.
- Try to prevent the body paint surface from being scratched when removing the washer fluid reservoir assembly.

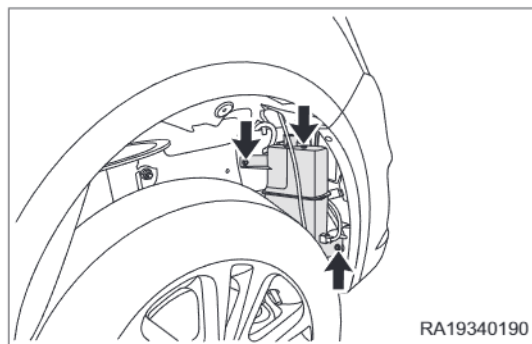
1. Turn off all the electrical equipment and ignition switch.
2. Disconnect the negative battery cable.
3. Remove the front wheel house protector assembly ([See page 46-15](#)).
4. Collect the washer fluid with a container.
5. Remove the washer pump ([See page 34-17](#)).
6. Remove the guide pipe assembly.
 - a. Remove the fixing bolt (arrow) from the guide pipe assembly.
(Tightening torque: $7 \pm 1.5 \text{ N}\cdot\text{m}$)



- b. Remove the guide pipe assembly from the washer fluid reservoir assembly.
7. Remove the washer fluid reservoir assembly.
 - a. Disconnect the washer pump connector (1).
 - b. Disconnect the port (2) between washer line and front washer pump, and collect the washer fluid with a container.

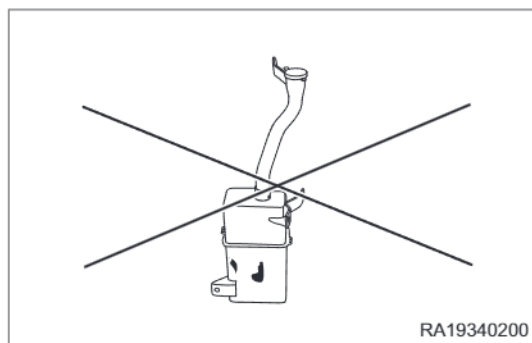


- c. Remove 3 fixing bolts (arrow) from the washer fluid reservoir, and remove the washer fluid reservoir.
(Tightening torque: $7 \pm 1.5 \text{ N}\cdot\text{m}$)



Inspection

1. Check the washer fluid reservoir assembly.
 - a. Check the washer fluid reservoir assembly for leakage, deformation or damage. Replace the washer fluid reservoir assembly if necessary.
 - b. Check the internal and external sides of washer fluid reservoir for dirt. Remove the dirt or replace the washer fluid reservoir assembly if necessary.
 - c. Check the grommet for damage. Replace the grommet if necessary.



Installation

Installation is in the reverse order of removal.

CAUTION

- Always operate carefully to prevent the components from being damaged when installing the washer fluid reservoir assembly.
- Tighten the fixing bolts to the specified torque when installing the washer fluid reservoir assembly.
- Install the washer line port in place when installing the washer fluid reservoir assembly.

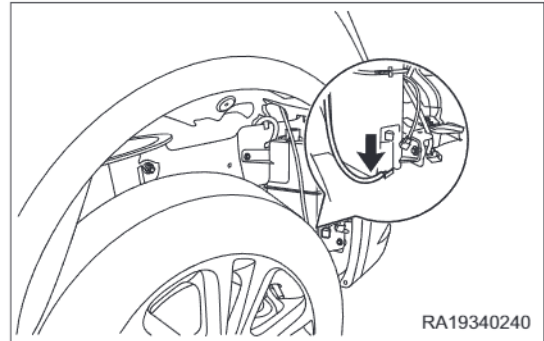
Front Washer Line Assembly

Removal

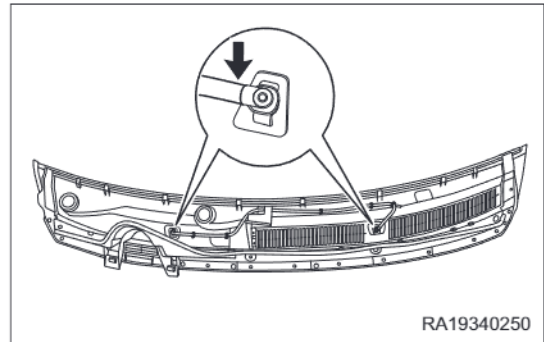
CAUTION

- Be sure to wear the necessary safety equipment to prevent accidents when removing the front washer line assembly.
- Appropriate force should be applied when removing the front washer line assembly, and avoid operating roughly.
- Try to prevent the body paint surface from being scratched when removing the front washer line assembly.

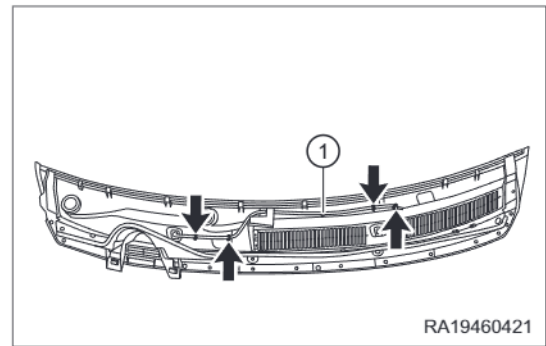
1. Turn off all the electrical equipment and ignition switch.
2. Disconnect the negative battery cable.
3. Remove the front wheel house protector assembly ([See page 46-15](#)).
4. Remove the wiper arm assembly ([See page 34-10](#)).
5. Remove the front windshield lower garnish assembly ([See page 46-31](#)).
6. Remove the front washer line assembly.
 - a. Disconnect the port (arrow) between front washer line and washer pump, and collect the washer fluid with a container.



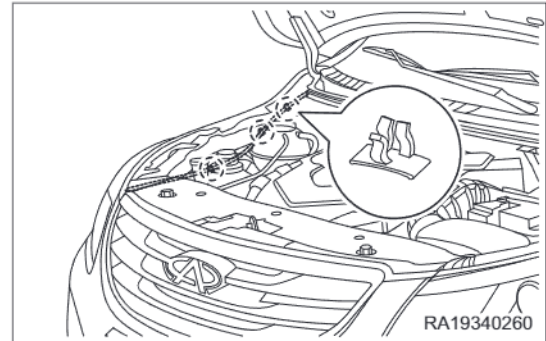
- b. Disconnect the front washer line from the nozzle (arrow).



- c. Remove the front washer line from the clips (arrow) and pull it out of the clip (1).



- d. Using a screwdriver wrapped with protective tape, remove the clips from the front washer line.



- e. Remove the front washer line assembly.

Installation

Installation is in the reverse order of removal.

CAUTION

- Always operate carefully to prevent the components from being damaged when installing the front washer line assembly.
- Install the washer line port in place when installing the front washer line assembly.
- Check the washer system for proper operation after installing the front washer line assembly.

Rain Gutter Front End Plate Assembly

Removal

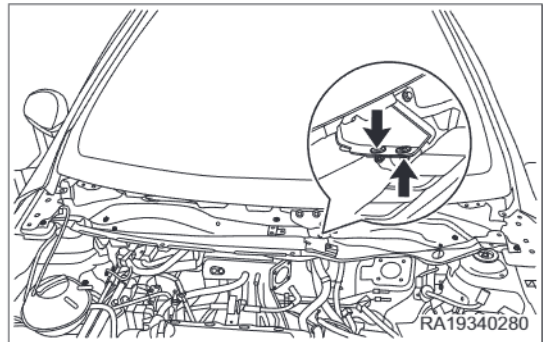
CAUTION

- Be sure to wear the necessary safety equipment to prevent accidents when removing the rain gutter front end plate assembly.
- Try to prevent the body paint surface from being scratched when removing the rain gutter front end plate assembly.

1. Turn off all the electrical equipment and ignition switch.
2. Disconnect the negative battery cable.
3. Remove the wiper arm assembly (See page 34-10).
4. Remove the front windshield lower garnish assembly (See page 46-31).
5. Remove the wiper motor (See page 34-12).
6. Remove the right sealing block.
 - a. Remove 2 plastic clamps (arrow) from the right sealing block.



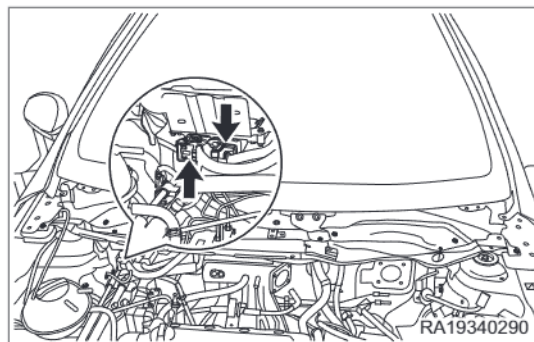
- b. Remove the right sealing block.
7. Remove the middle sealing block.
 - a. Remove 2 plastic clamps (arrow) from the middle sealing block.



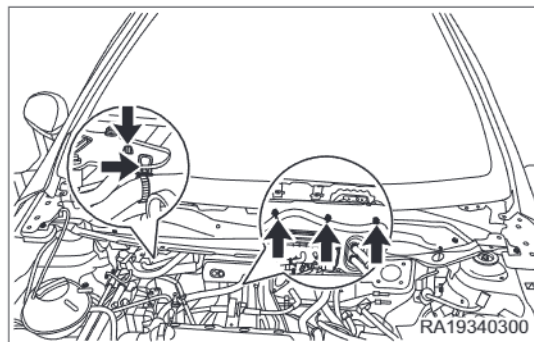
- b. Remove the middle sealing block.

8. Remove the rain gutter front end plate assembly.

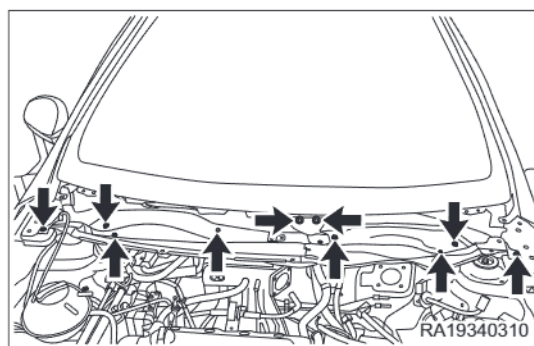
- a. Disconnect the ECM connectors (arrow).



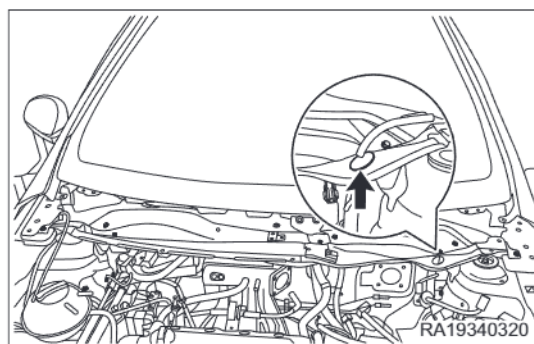
- b. Disconnect the clips (arrow) between body wire harness and engine wire harness.



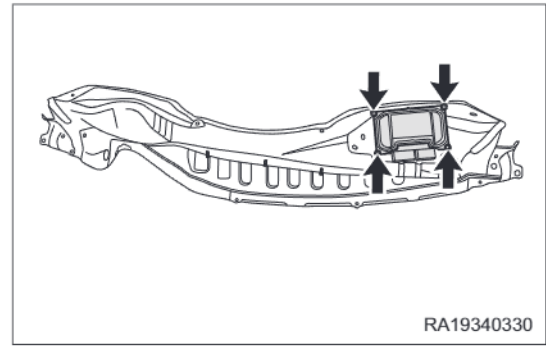
- c. Remove 10 fixing bolts (arrow) from the rain gutter front end plate assembly.
(Tightening torque: $10 \pm 1.5 \text{ N}\cdot\text{m}$)



- d. Loosen the rubber bush (arrow) with a screwdriver wrapped with protective tape, and remove the rain gutter front end plate assembly.



- e. Remove 4 fixing bolts (arrow) from the ECM.
(Tightening torque: 7 ± 1 N·m)



- f. Separate the ECM from the rain gutter front end plate assembly.

Installation

Installation is in the reverse order of removal.

CAUTION

- Always operate carefully to prevent other components from being damaged when installing the rain gutter front end plate assembly.
- Install the connector in place and tighten the fixing bolts to the specified torque when installing the rain gutter front end plate assembly.

