
BODY ELECTRICAL

43.1	Wiper and Washer	1682
1	Warning and Precaution	1682
1.1	Warning.....	1682
2	System Overview	1682
2.1	System Description	1682
2.2	System Components Diagram.....	1682
3	DIAGNOSIS & TEST.....	1683
3.1	Problem Symptoms Table	1683
3.2	Diagnostic Help	1684
3.3	Diagnosis Procedure.....	1684
3.4	Intermittent DTC Troubleshooting	1685
3.5	Ground Inspection	1686
3.6	Diagnostic Trouble Code (DTC) Chart	1686
3.7	DTC Diagnosis Procedure	1687
4	ON-VEHICLE SERVICE	1692
4.1	Tools	1692
4.2	Replacement of Wiper Switch Assembly	1692
4.3	Replacement of Front Wiper Blade Assembly	1694
4.4	Replacement of Front Wiper Arm Assembly.....	1695
4.5	Replacement of Front Wiper Motor and Link Rod Assembly	1696
4.6	Replacement of Front Nozzle Assembly.....	1698
4.7	Replacement of Rear Wiper Arm Blade Assembly	1699
4.8	Replacement of Rear Wiper Motor Assembly	1700
4.9	Replacement of Washer Pump Assembly.....	1701
4.10	Replacement of Washer Fluid Reservoir Assembly	1703
4.11	Replacement of Front Washer Line Assembly	1705
4.12	Replacement of Rain Sensor Assembly	1707

43.1 Wiper and Washer

1 Warning and Precaution

1.1 Warning

Be sure to observe following instructions before servicing any parts in this section to avoid possible asset loss, personal injury or even death.

- (1) When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.
- (2) Be sure to wear safety equipment to prevent accidents, when removing.
- (3) Operate carefully to avoid damaging front/rear windshield to prevent accidents, when removing.

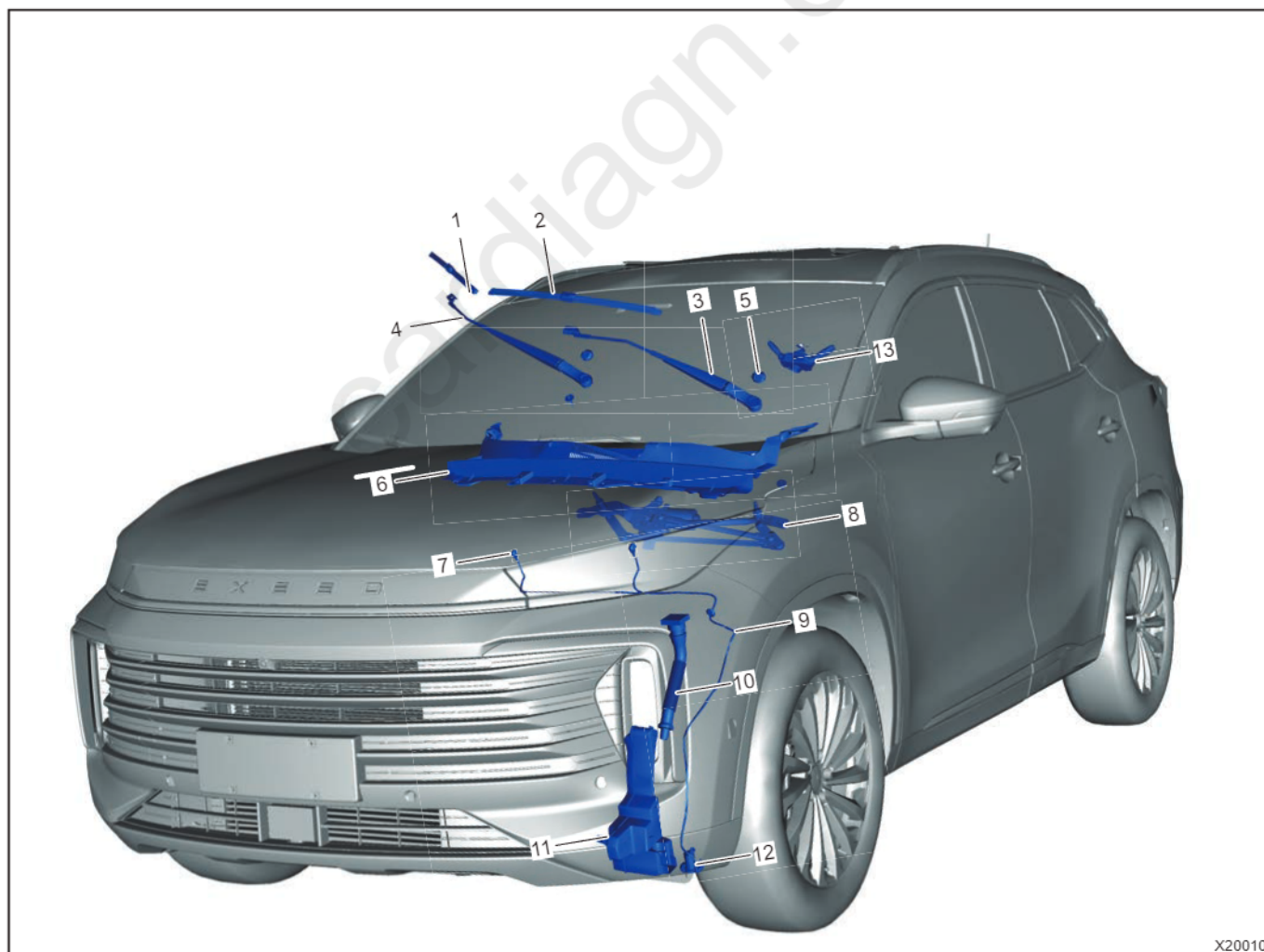
2 System Overview

2.1 System Description

Wiper and washer are important equipment for cleaning the front windshield assembly, which can operate only with ENGINE START STOP switch ON. Driver can control all operations of wiper and washer by moving switch control lever.

2.2 System Components Diagram

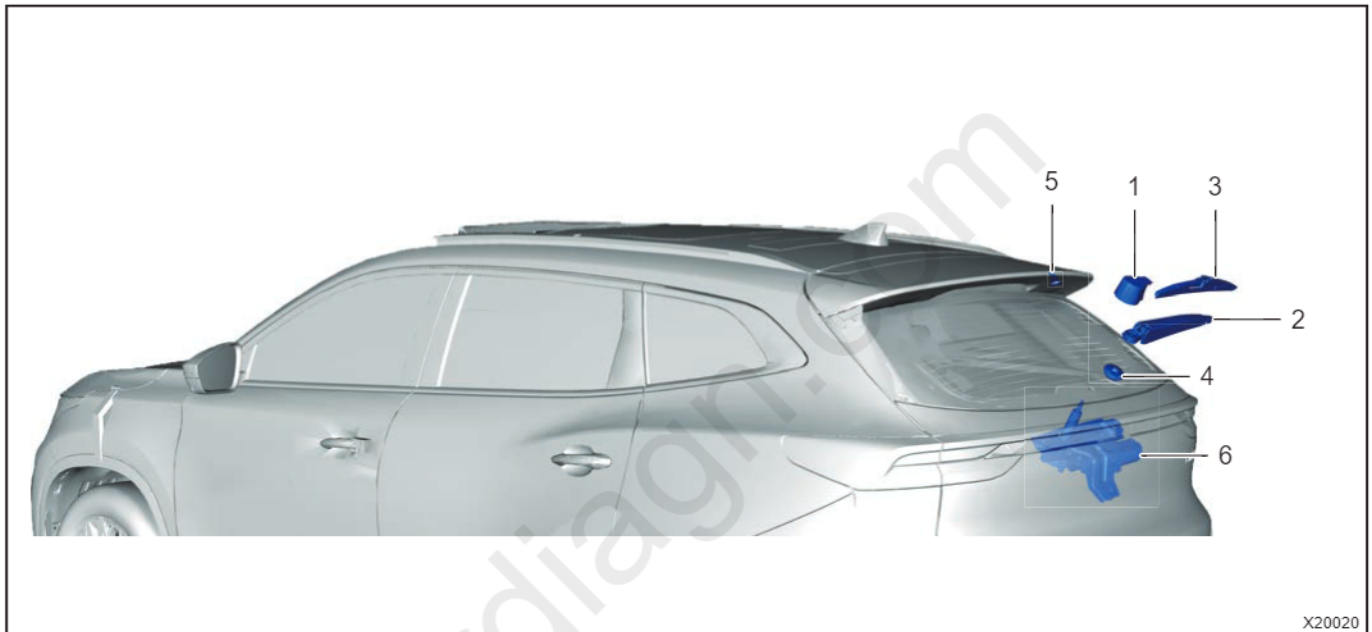
■ Front Wiper Assembly



X20010

1	Sub Wiper Blade	2	Main Wiper Blade
3	Main Wiper Arm	4	Sub Wiper Arm
5	Wiper Arm Trim Cap	6	Front Windshield Lower Support Assembly
7	Front Wiper Nozzle	8	Front Wiper Motor and Link Rod
9	Washer Line Assembly	10	Guide Pipe
11	Washer Fluid Reservoir Assembly	12	Washer Motor
13	Wiper Switch (Integrated in SCM Module)		

■ Rear Wiper Assembly



X20020

1	Rear Wiper Arm Trim Cap	2	Rear Wiper Arm Assembly
3	Rear Wiper Blade	4	Waterproof Bush Rubber
5	Rear Wiper Nozzle	6	Rear Wiper Motor

3 DIAGNOSIS & TEST

3.1 Problem Symptoms Table

⚠ Caution

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

Symptom	Possible Cause
Both front wiper and washer systems do not operate	Fuse
	Wiper switch assembly
	Washer pump
	BCM

Symptom	Possible Cause
Front wiper system does not operate in LO or HI	Wire harness or connector
	Wiper switch assembly
	Front wiper motor assembly
	BCM
	Wire harness or connector
Front wiper system does not operate	Fuse
	Wiper switch assembly
	Front wiper motor assembly
	BCM
	Wire harness or connector
Front wiper arm and blade do not return to original position when front wiper switch is turned off	Front wiper motor assembly
	BCM
	Wire harness or connector
Both rear wiper and washer systems do not operate	Fuse
	Wiper switch assembly
	Rear Wiper Motor Assembly
	Washer pump
	BCM
	Wire harness or connector
Washer system does not operate	Nozzle assembly
	Wiper switch assembly
	Washer pump
	BCM
	Wire harness or connector

3.2 Diagnostic Help

- (1) Connect PAD diagnostic tester (the latest software) with a Data Link Connector (DLC), and make it communicate with vehicle electronic module through data network.
- (2) Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
- (3) If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
- (4) Only use a digital multimeter to measure voltage of electronic system.
- (5) Refer to any Technical Bulletin that may apply to this malfunction.
- (6) Visually check related wire harness and connector.
- (7) Check and clean all system grounds related to the latest DTCs.
- (8) If numerous trouble codes are set, refer to circuit diagram and look for any common ground circuit or power supply circuit applied to DTC.

3.3 Diagnosis Procedure

Hint:

Use following procedures to troubleshoot the control system.

1 Vehicle brought to workshop

Next

2 Check battery voltage

Standard voltage: Not less than 12 V

NG

Replace battery

OK

3 Customer problem analysis

Next

4 Read DTCs

Result

Result	Go to
History DTC	A
Current DTC	B

A

Troubleshoot according to intermittent DTCs malfunction procedures

B

5 Repair according to Diagnostic Trouble Code (DTC) chart

Next

6 Adjust, repair or replace

Next

7 Conduct test and confirm malfunction has been repaired

Next

End

3.4 Intermittent DTC Troubleshooting

If malfunction is intermittent, perform the followings:

- Check if connector is loose.
- Check if wire harness is worn, pierced, pinched or partially broken.
- Monitor diagnostic tester (the latest software) data that is related to this circuit.

- Wiggle related wire harnesses and connectors and observe if signal is interrupt in related circuit.
- If possible, try to duplicate the conditions under which DTC was set.
- Look for data that has changed or DTC to reset during wiggle test.
- Look for broken, bent, protruded or corroded terminals.
- Check and clean all wire harness connectors and ground parts related to DTC.
- If multiple trouble codes were set, refer to circuit diagrams to look for any common ground circuit or power supply circuit applied to DTC.
- Refer to any Technical Bulletin that may apply to this malfunction.

3.5 Ground Inspection

Ground points are very important to the proper operation of circuits. Ground points are often exposed to moisture, dirt and other corrosive environments. Corrosion (rust) may increase load resistance. This situation may change the way in which a circuit operates. Circuits are very sensitive to proper grounding. A loose or corroded ground can seriously affect the control circuit. Check the ground points as follows:

- (1) Remove ground bolt or nut.
- (2) Check all contact surfaces for tarnish, dirt and rust, etc.
- (3) Clean as necessary to ensure that contact is in good condition.
- (4) Reinstall ground bolt or nut securely.
- (5) Check if any additional accessories interfere with ground circuit.
- (6) If several wire harnesses are crimped into one ground terminal, check for proper crimp condition. Make sure that all wire harnesses are clean and securely fastened while providing a proper ground path.

3.6 Diagnostic Trouble Code (DTC) Chart

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
B101571	Rear Wiper Built-in Relay Stuck Failure	When output is OFF and ignition switch is OFF, output voltage > 7V. (Deviation is within 10%, duration is more than 100 MS, software performs test once per 10 MS. Test for at least 3 times before confirmation. Starts to test after 2 seconds. Load outputs regardless of key position when load operation condition is met.) Store as current DTC.	Relay fault	1. Internal relay; 2. Check BCM.
B101671	Rear Washer Built-in Relay Stuck Failure			
B101771	Front Washer Built-in Relay Stuck Failure			
B102111	Front Wiper High/Low Speed Relay Short to GND or Open	When output is OFF and ignition switch is OFF, output voltage is > 7 V, stores as current fault. (Deviation is within 10%, duration is more than 100 MS, software performs test once per 10 MS. Test for at least 3 times before confirmation. Starts to test after 2 seconds. Load outputs regardless of key position when load operation condition is met.)	Relay or Wire Harness Problem	1. Check wire harness connector; 2. Relay; 3. Check BCM.
B102511	Front Wiper Enable Relay Short to GND or Open			

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
B102112	Front Wiper High/Low Speed Relay Short to Power Supply	Output current is > 5A (- Deviation is more than 100 MS, software performs test once per 20 MS. Test for at least 3 times before confirmation. Starts to test after 2 seconds. Turn light outputs regardless of key position when the turn light operation condition is met.) Store current DTC.		
B102512	Front Wiper Enable Relay Short to Power Supply			

3.7 DTC Diagnosis Procedure

■ Front Wiper Enable Relay Short to Power Supply Failure

DTC	B1025-12	Front Wiper Enable Relay Short to Power Supply
-----	----------	--

■ DTC Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing the following procedures.

- Turn ENGINE START STOP switch to OFF.
- Connect the diagnostic tester (the latest software).
- Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
- If DTC is not detected, malfunction is intermittent.

Hint:

When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	Check the wiper relay
---	-----------------------

- (a) Turn off all electrical equipment and ENGINE START STOP switch.
- (b) Disconnect the negative battery cable.
- (c) Remove the wiper relay and check wiper relay for damage.

NG

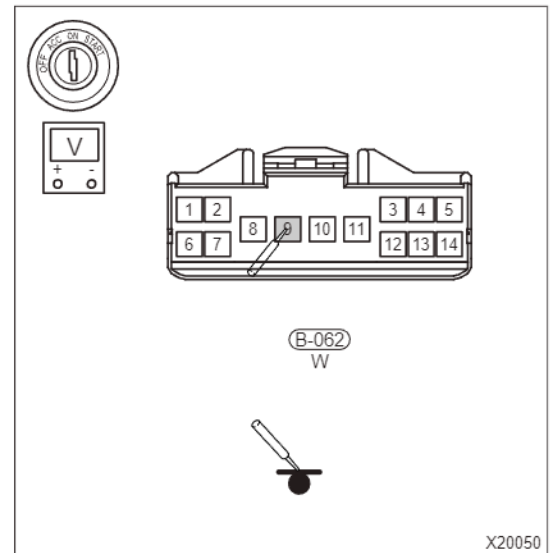
Replace the relay.

OK

2	Check wiper relay power supply voltage
---	--

- (a) Turn ENGINE START STOP switch to ON. Turn on front wiper switch.
- (b) Using a digital multimeter, check if voltage between connector B-062(9) terminal and GND is normal.

Multimeter Connection	Specified Condition
B - 062 (9) - Ground	Not less than 12 V



NG

Repair or replace related wire harness.

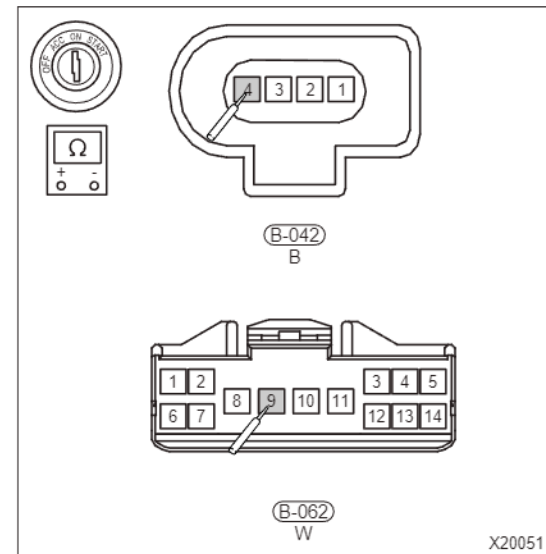
OK

3

Check the wiper circuit wire harness

- (a) Using a digital multimeter, measure the resistance between connector B-062(9) and B-042(4) wire harness according to table below. Check if it is normal.

Multimeter Connection	Condition	Specified Condition
B-062 (9) to B-042 (4)	Always	$\leq 1 \Omega$



NG

Check or replace wire harness or connector.

OK

4

Reconfirm DTCs

- (a) Use diagnostic tester to clear DTCs.
- (b) Start the engine.
- (c) Check if the same DTCs are still output.

NG

Replace BCM module.

OK

System operates normally.

■ Washer actuator stuck failure

DTC	B1017-71	Front Actuator Stuck
DTC	B1016-71	Rear Actuator Stuck

■ DTC Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing the following procedures.

- Turn ENGINE START STOP switch to OFF.
- Connect the diagnostic tester (the latest software).
- Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
- If DTC is not detected, malfunction is intermittent.

Hint:

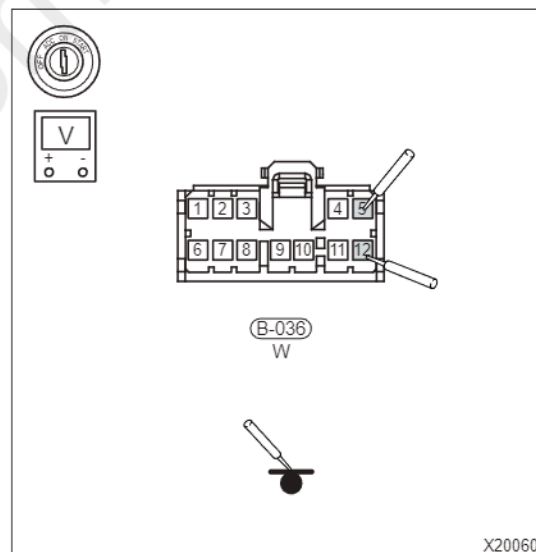
When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1

Check washer control circuit output voltage

- (a) Turn ENGINE START STOP switch to ON position.
- (b) Using a multimeter, check output voltage of front washer circuit and rear washer circuit according to table below.

Multimeter Connection	Condition	Specified Condition
B-036 (5) to body ground	Turn off front washer switch	0 V
B-036 (12) to vehicle ground	Turn off rear washer switch	0 V



X20060

NG

Replace BCM with a new one.

OK

Check washer motor and wire harness.

■ Rear Wiper Control Actuator Stuck Malfunction

DTC	B1015-71	Rear Wiper Control Actuator Stuck
-----	----------	-----------------------------------

■ DTC Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing the following procedures.

- Turn ENGINE START STOP switch to OFF.
- Connect the diagnostic tester (the latest software).
- Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
- If DTC is not detected, malfunction is intermittent.

Hint:

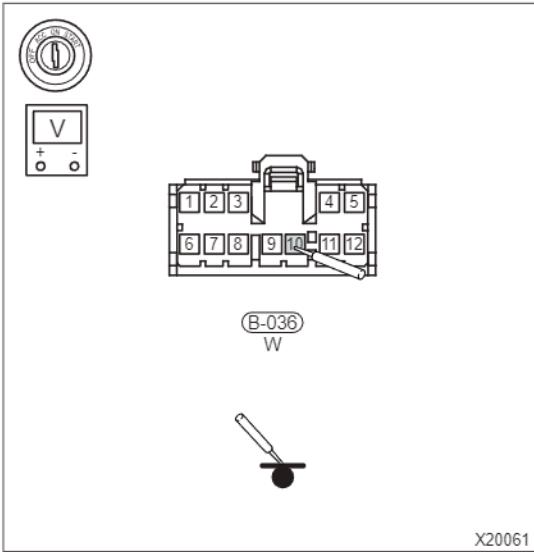
When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1

Check output voltage of rear wiper control circuit

- (a) Turn ENGINE START STOP switch to ON position.
- (b) Using a multimeter, check output voltage of rear washer circuit according to table below.

Multimeter Connection	Condition	Specified Condition
B-036 (10) to vehicle ground	Turn off rear wiper switch	0 V



OK

Check the rear wiper motor and wire harness.

NG

Replace BCM with a new one.

■ LIN Communication Timeout between BCM and Rain Sensor

DTC	U1008-87	LIN Communication Timeout between BCM and Rain Sensor
-----	----------	---

■ DTC Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing the following procedures.

- Turn ENGINE START STOP switch to OFF.
- Connect the diagnostic tester (the latest software).
- Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
- If DTC is not detected, malfunction is intermittent.

Hint:

When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	Check rain sensor connector
---	-----------------------------

- (a) Check if rain sensor connector is infirmly connected or poorly contacted.

NG

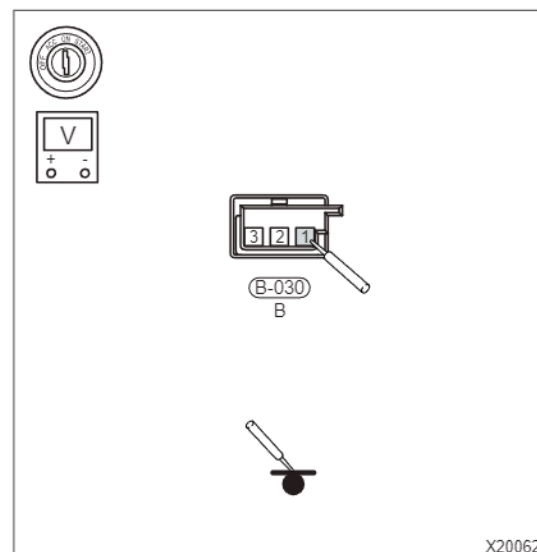
Check the rear wiper motor and wire harness.

OK

2	Check rain sensor power supply voltage
---	--

- (a) Turn ENGINE START STOP switch to ON position.
- (b) Check rain sensor terminal B-030 (1) and power supply voltage of body ground.

Multimeter Connection	Condition	Specified Condition
B-030 (1) to body ground	ENGINE START STOP switch ON	Not less than 12 V



NG

Check wire harness between B-030 (1) and instrument panel fuse and relay box.

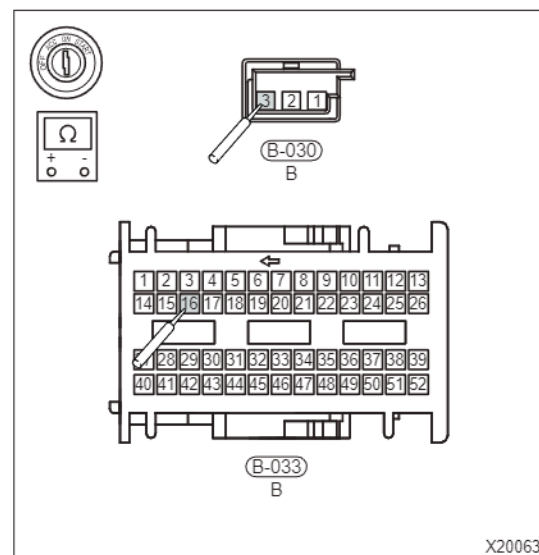
OK

3

Check wire harness between rain sensor B-030 (3) and connector B-033 (16).

- (a) Using a digital multimeter, check if continuity of connector terminal is normal according to the table below.

Multimeter Connection	Condition	Specified Condition
B-030 (3) and B-033 (16)	ENGINE START STOP switch OFF	$\leq 1 \Omega$



NG

Replace or repair the wire harness.

OK

4

Check the rain sensor

- (a) Turn ENGINE START STOP switch to OFF.
- (b) Disconnect the negative battery cable.
- (c) Install new rain sensor and check if malfunction still exists.

NG

Check wire harness between rain sensor and BCM.

OK

5

Reconfirm DTCs

- (a) Connect the negative battery cable.
- (b) Turn ENGINE START STOP switch to ON.
- (c) Using a diagnostic tester, read ECU DTC.
- (d) Check if DTC still exists.

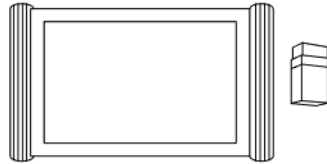
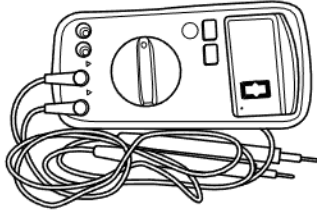
NG

Replace with a new BCM to check if fault reoccurs.

OK

System is normal

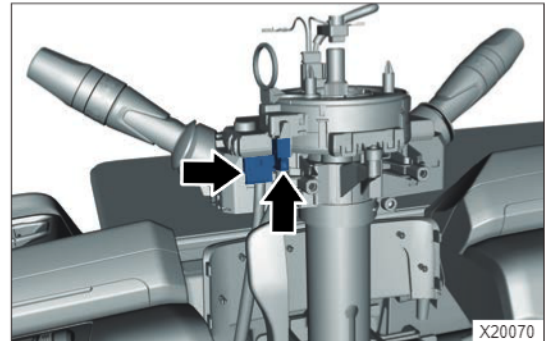
4 ON-VEHICLE SERVICE**4.1 Tools****■ General Tool**

Tool Name	Tool Drawing
Digital Multimeter	 RCH0001006
X-431 PAD Diagnostic Tester	 RCH000206

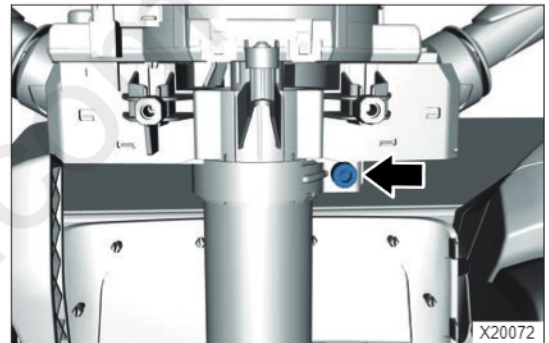
4.2 Replacement of Wiper Switch Assembly**■ Removal****HINT**

- Be sure to wear safety equipment to prevent accidents, when removing wiper switch assembly.
- Appropriate force should be applied, when removing wiper switch assembly. Be careful not to operate roughly.
- Try to prevent interior and body paint surface from being scratched, when removing wiper switch assembly.

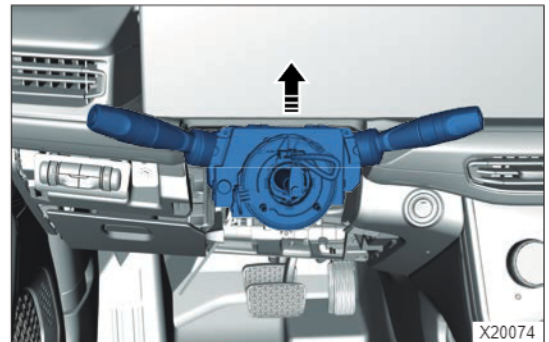
- (1) Turn off all electrical equipment and the ignition switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the driver airbag.
- (4) Remove the steering wheel.
- (5) Remove the combination switch cover assembly.
- (6) Disconnect wiper switch connector and angle sensor connector.



- (7) Loosen 1 fixing screw of SCM module.



- (8) Remove wiper switch assembly (integrated on SCM module) from steering column in the direction of arrow.



■ Installation

Caution

- Always install correctly according to specified operating instructions.
- Check that horn operates normally after installation.
- Check SRS warning light after installation, and make sure that supplemental restraint system operates normally.

- (1) Install SCM module with coil spring to steering column.
- (2) Install and tighten fixing screw of coil spring.

Installation torque: $6 \pm 0.5 \text{ N}\cdot\text{m}$

- (3) Connect SCM module wire harness connector and angle sensor connector.
- (4) Install the combination switch cover assembly.

- (5) Install the steering wheel assembly.
- (6) Install the driver airbag.

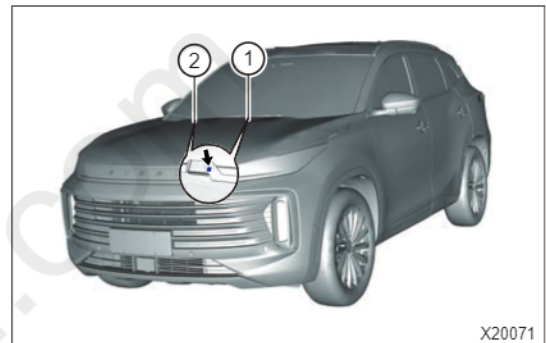
4.3 Replacement of Front Wiper Blade Assembly

■ Removal

Caution

- **Be sure to wear safety equipment to prevent accidents, when removing front wiper blade assembly.**
- **Appropriate force should be applied when removing front wiper blade assembly. Be careful not to operate roughly.**

- (1) Turn off all electrical equipment and ENGINE START STOP switch, move up wiper switch rapidly on the right side of steering wheel.
- (2) Disconnect the negative battery cable.
- (3) As shown in illustration, press the button in the direction of arrow, slightly pull it outwards to remove front wiper main blade (1) and front wiper sub blade (2).

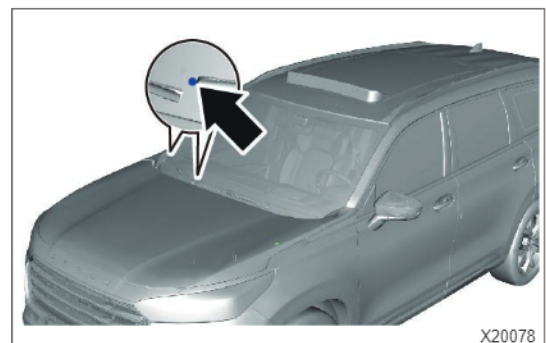


■ Installation

Caution

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

- (1) Place the wiper arm in vertical position.
- (2) Insert wiper blade into slot of wiper arm, then pull it securely. It is installed in place until a click sound is heard.
- (3) Pay attention to locating points on front windshield assembly during installation. Wiper arm blade should be pressed against locating points.



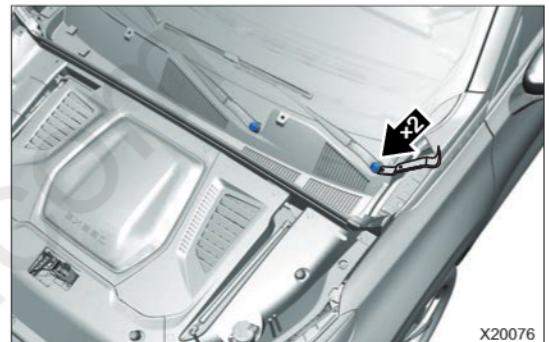
4.4 Replacement of Front Wiper Arm Assembly

■ Removal

Caution

- Be sure to wear safety equipment to prevent accidents, when removing front wiper arm assembly.
- Appropriate force should be applied, when removing front wiper arm assembly. Be careful not to operate roughly.
- Try to prevent front windshield assembly from being scratched, when removing front wiper arm assembly.

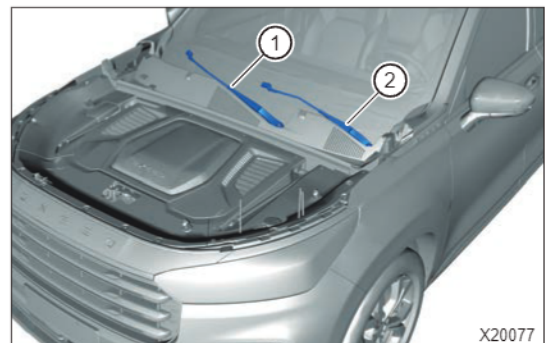
- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Using an interior crow plate, remove the front wiper arm trim cap.
- (4) Remove 2 fixing nuts from front wiper arm assembly.



- (5) Remove 2 fixing nuts from front wiper arm assembly.



- (6) Remove front main wiper arm (1) and front sub wiper arm (2).



■ Installation

Hint:

Adjust front wiper arm assembly to proper position when installing.

Caution

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

- (1) Install front main wiper arm and front sub wiper arm in order.
- (2) Install 2 fixing nuts to front wiper arm assembly.

Installation torque: $24 \pm 2 \text{ N}\cdot\text{m}$

- (3) Secure front wiper arm trim cap to nut.

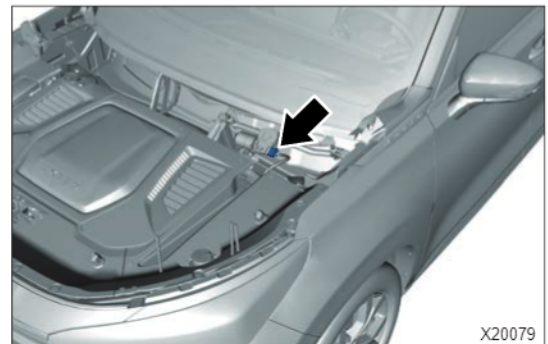
4.5 Replacement of Front Wiper Motor and Link Rod Assembly

■ Removal

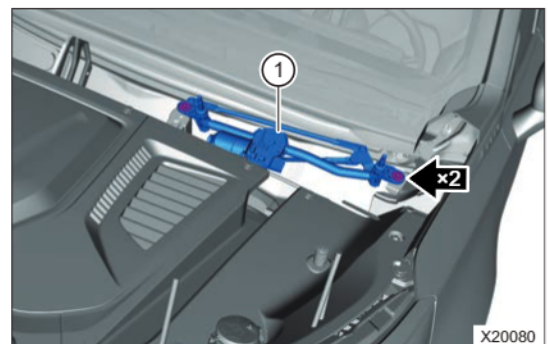
Caution

- Be sure to wear safety equipment to prevent accidents, when removing front wiper motor assembly.
- Appropriate force should be applied, when removing front wiper motor assembly. Be careful not to operate roughly.
- Try to prevent body paint surface from being scratched, when removing front wiper motor assembly.

- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Remove front wiper arm and blade assembly.
- (4) Remove the front windshield lower support assembly.
- (5) Disconnect connector from wiper motor and link rod assembly.



- (6) Remove 2 fixing bolts from wiper motor and link rod assembly and then remove wiper motor and link rod assembly (1).



■ Inspection

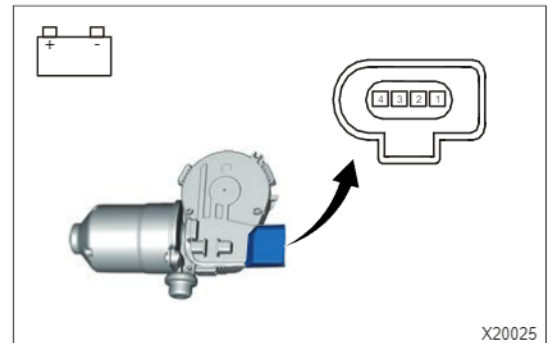
- (1) Check the wiper link rod.

- 1) Check pivot for looseness or falling off, link rod for deformation or breakage, and shaft sleeve for sticking. Replace the wiper link rod if necessary.
- (2) Check the front wiper motor assembly.

- 1) Check the LO operation.

Measurement Condition	Specified Condition
Battery negative (-) → Terminal 4	Motor running at low speed (LO)
Battery positive (+) → Terminal 2	

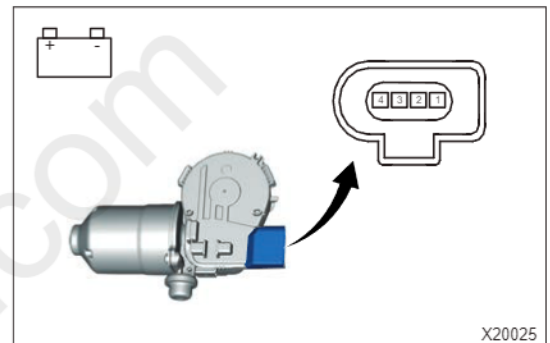
If result is not as specified, replace front wiper motor assembly.



X20025

- 2) Check the HI operation.

Measurement Condition	Specified Condition
Battery negative (-) → Terminal 4	Motor running at low speed (HI)
Battery positive (+) → Terminal 1	



X20025

- 3) Check the auto reset function.

- Connect positive (+) battery lead to terminal 2 or 1, and connect negative (-) battery lead to terminal 4. When motor runs at low speed (LO) or high speed (HI), disconnect battery positive (+) to stop front wiper motor at any position other than the original position.
- Connect terminal 4 and terminal 3 with a lead and then connect another to middle of positive (+) battery, and connect negative (-) battery lead to terminal 2 to make motor operate to original position at low speed (LO) again.
- Check whether the front wiper motor assembly can stop automatically after it operates to original position. OK: Motor operates to original position and stops automatically, that is, motor can reset automatically. If result is not as specified, replace front wiper motor assembly.

■ Installation

Caution

- Always operate carefully to prevent other components from being damaged, when installing front wiper motor assembly.
- Adjust and make sure wiper motor and link rod are at original position, before installing front wiper motor assembly, otherwise, wiper system cannot operate normally.
- Install connector in place and tighten fixing bolts and nuts to the specified torque when installing front wiper motor.
- Check wiper system for proper operation after installing front wiper motor assembly.

- (1) Place wiper motor and link rod assembly to its fixing position.
- (2) Secure 2 fixing bolts connected between wiper motor and link rod assembly and vehicle body.

Tightening torque: 7 ± 1 N·m

- (3) Connect wiper motor connector.
- (4) Install the front windshield lower trim board assembly.
- (5) Install the front wiper arm assembly.
- (6) Install the negative battery cable.
- (7) Turn the ENGINE START STOP switch to ON and performing running test.

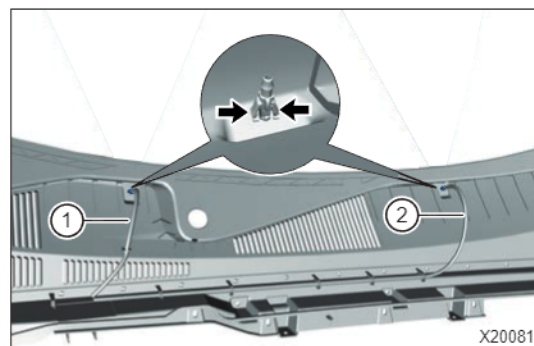
4.6 Replacement of Front Nozzle Assembly

■ Removal

WARNING

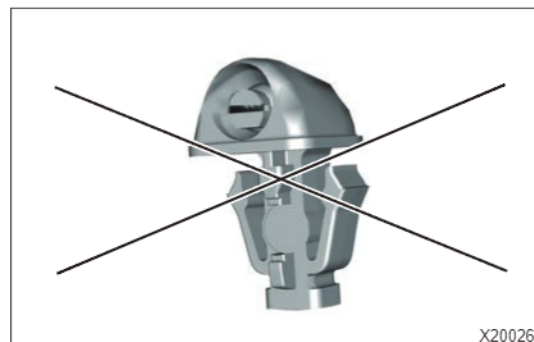
- **Be sure to wear safety equipment to prevent accidents, when removing front nozzle assembly.**
- **Appropriate force should be applied, when removing front nozzle assembly. Be careful not to operate roughly.**

- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Open the engine compartment cover.
- (4) Using an interior crow plate, pry off front nozzle assembly from engine compartment cover and disconnect spray hose (1), (2).



■ Inspection

- (1) Check front nozzle for blockage, deformation or damage. Replace front nozzle if necessary.



■ Installation

Caution

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

- (1) Connect spray hose to front nozzle assembly.
- (2) Secure front nozzle assembly to engine compartment cover.

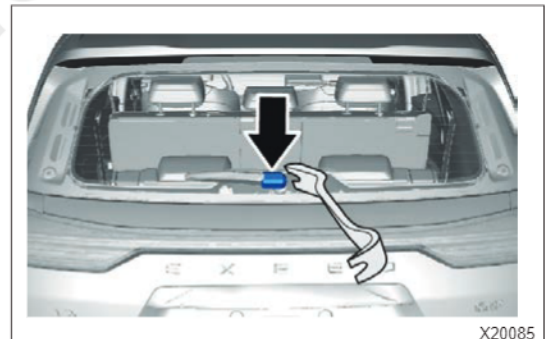
4.7 Replacement of Rear Wiper Arm Blade Assembly

■ Removal

WARNING

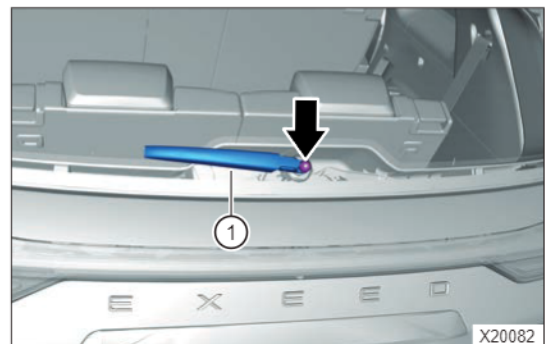
- Be sure to wear safety equipment to prevent accidents, when removing rear wiper arm blade assembly.
- Appropriate force should be applied, when removing rear wiper arm blade assembly. Be careful not to operate roughly.
- Try to prevent rear windshield assembly from being scratched, when removing rear wiper arm blade assembly.

- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Use an interior crow plate to pry up trim cap.



X20085

- (4) Remove fixing nut from rear wiper arm blade assembly and disconnect rear wiper arm blade assembly (1).



X20082

■ Installation

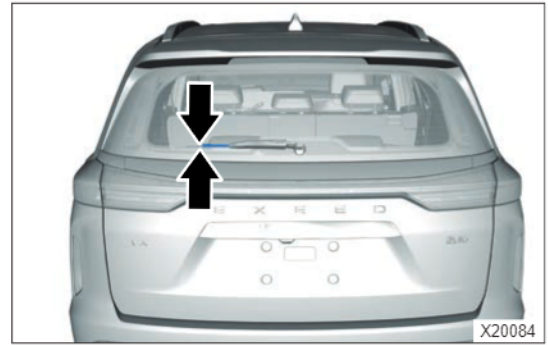
WARNING

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

- (1) Install rear wiper arm blade assembly to a proper position.

Caution

Blade end is located between the lowest electric heat wire and glass black edge.



- (2) Install 1 fixing nut to rear wiper arm blade assembly.

Tightening torque: $10 \pm 1.5 \text{ N}\cdot\text{m}$

- (3) Install the rear wiper arm trim cap.

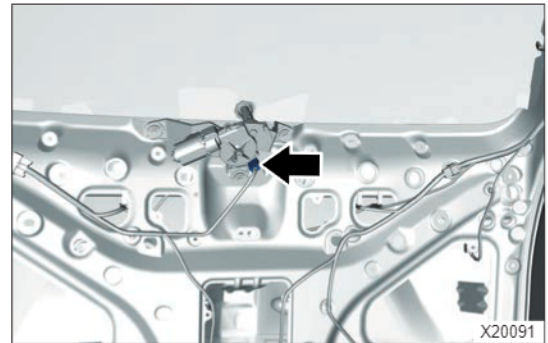
4.8 Replacement of Rear Wiper Motor Assembly

■ Removal

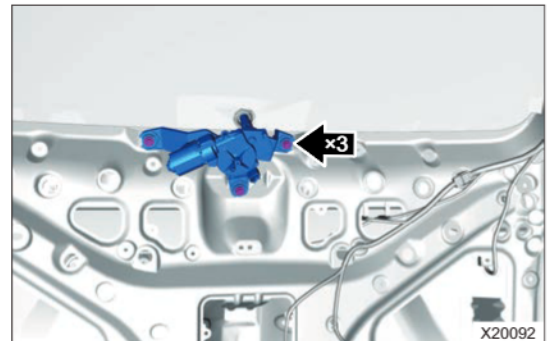
Caution

- Be sure to wear safety equipment to prevent accidents, when removing rear wiper motor assembly.
- Appropriate force should be applied when removing rear wiper motor assembly. Be careful not to operate roughly.
- Try to prevent rear windshield assembly from being scratched, when removing rear wiper motor assembly.

- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the rear wiper arm blade assembly.
- (4) Remove the back door protector assembly.
- (5) Disconnect the rear wiper motor assembly connector.



- (6) Remove 3 fixing bolts from rear wiper motor assembly.



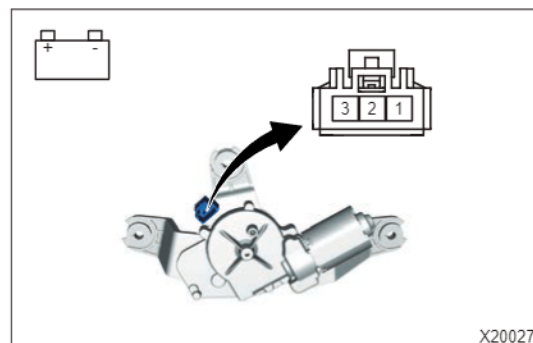
- (7) Remove the rear wiper motor assembly.

■ Inspection

- (1) Check the rear wiper motor assembly operation.

Measurement Condition	Specified Condition
Battery negative (-) → Terminal 3	Motor runs normally
Battery positive (+) → Terminal 1	

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



- (2) Check the auto reset function.

- Connect negative (-) battery lead to terminal 3, and connect positive (+) battery lead to terminal 1. Disconnect positive (+) battery lead when motor is operating to stop rear wiper motor on a position except for automatic stop position.
- Connect positive (+) battery lead to terminal 1, and connect negative (-) battery lead to terminal 2 in order to run motor again.
- Check that motor can return to original position automatically.

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

■ Installation

Caution

- **Always operate carefully to prevent other components from being damaged, when installing rear wiper motor assembly.**
- **Be sure to tighten fixing nuts to specified torque, when installing rear wiper motor assembly.**
- **Check wiper arm assembly for proper operation, after installing rear wiper motor assembly.**

- (1) Install and fasten 3 bolts those secure rear wiper motor assembly to vehicle.

Tightening torque: 7 ± 1 N·m

- (2) Connect and fasten rear wiper motor connector.
 (3) Install rear back door protector assembly.
 (4) Install the rear wiper arm blade assembly.
 (5) Install the negative battery cable.

4.9 Replacement of Washer Pump Assembly

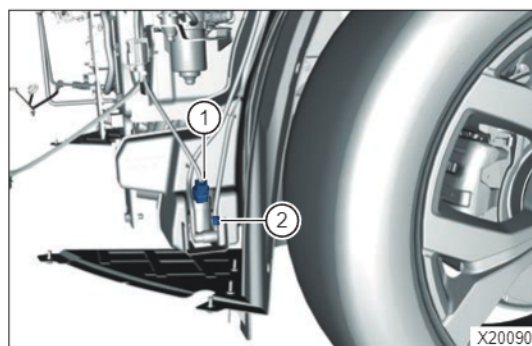
■ Removal

Caution

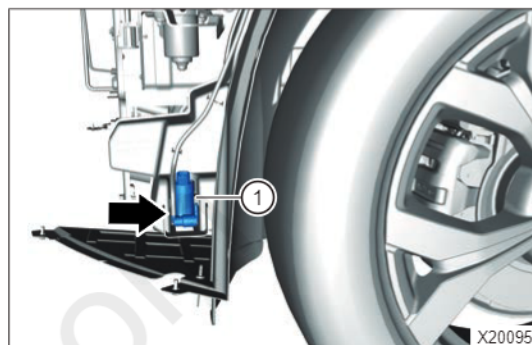
- **Be sure to wear safety equipment to prevent accidents, when removing washer pump assembly.**
- **Appropriate force should be applied, when removing washer pump assembly. Be careful not to operate roughly.**
- **Try to prevent body paint surface from being scratched, when removing washer pump assembly.**

- (1) Turn off all electrical equipment and ENGINE START STOP switch.
 (2) Disconnect the negative battery cable.
 (3) Remove the front bumper assembly.

- (4) Disconnect washer pump connector (1), and disconnect joint (2) between rear washer line and washer pump.



- (5) Disconnect joint between front washer line and washer pump, and remove washer pump assembly (1).



■ Inspection

- (1) Fill washer fluid reservoir assembly with washer fluid.
- (2) Connect positive (+) battery lead to terminal 1 of washer pump, and connect negative (-) battery lead to terminal 2.



- (3) Check that washer fluid flows out of front washer pump. If result is not as specified, replace the washer pump assembly.
- (4) Connect positive (+) battery lead to terminal 1 of washer pump, and connect negative (-) battery lead to terminal 2.



- (5) Check that washer fluid flows out of rear washer pump. If result is not as specified, replace the washer pump assembly.

■ Installation

Caution

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

- (1) Secure the washer pump assembly.
- (2) Connect joint between rear washer line and washer pump and joint between front washer line and washer pump.
- (3) Connect the front and rear washer pump connectors.
- (4) Install the front bumper assembly.
- (5) Connect the negative battery cable.
- (6) Turn the ENGINE START STOP switch to ON and performing running test.

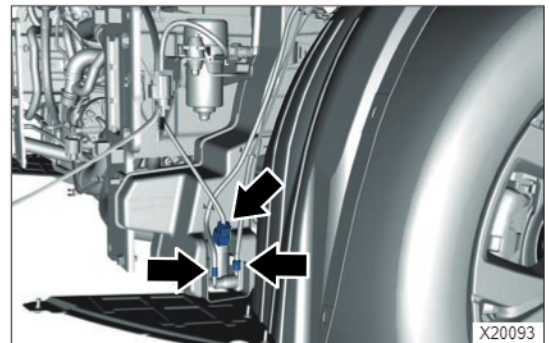
4.10 Replacement of Washer Fluid Reservoir Assembly

■ Removal

Caution

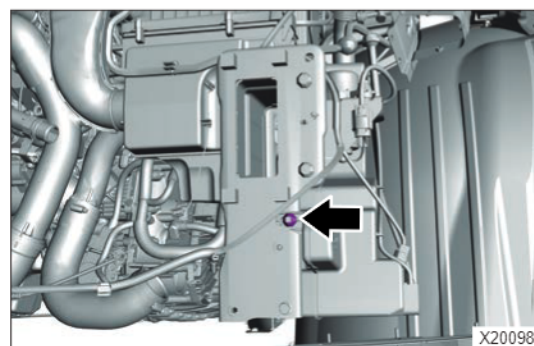
- Be sure to wear safety equipment to prevent accidents, when removing washer fluid reservoir assembly.
- Appropriate force should be applied, when removing washer fluid reservoir assembly. Be careful not to operate roughly.
- Try to prevent body paint surface from being scratched, when removing washer fluid reservoir assembly.

- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the engine compartment trim cover assembly.
- (4) Remove the front bumper assembly.
- (5) Remove the front left wheel assembly.
- (6) Remove the front left wheel house protector assembly.
- (7) Disconnect washer pump front/rear spraying pipe and connector, and remove spraying pipe from washer fluid reservoir.

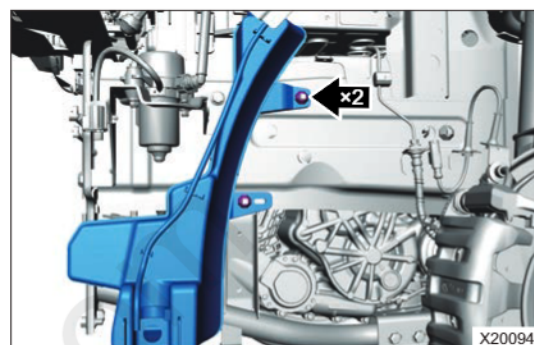


X20093

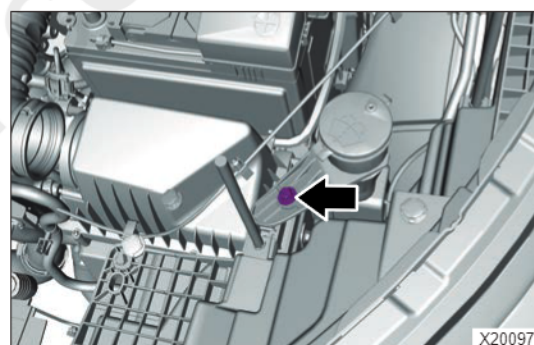
- (8) Remove the washer reservoir fixing bolt.



- (9) Remove 2 fixing bolts from rear side of the washer reservoir.



- (10) Remove 1 fixing bolt from washer fluid reservoir filler pipe mounting bracket, and remove the washer fluid reservoir assembly.



■ Inspection

- (1) Check washer fluid reservoir assembly for leakage, deformation or damage. Replace washer fluid reservoir assembly if necessary.
- (2) Check internal and external sides of washer fluid reservoir for dirt. Remove dirt or replace washer fluid reservoir assembly if necessary.
- (3) Check grommet for damage. Replace grommet if necessary.



■ Installation

Caution

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

- (1) Install washer fluid reservoir assembly, install and tighten 3 nuts between washer fluid reservoir assembly and vehicle body.

Tightening torque: 4 ± 1 N·m

- (2) Install and tighten 1 fixing bolt to washer fluid reservoir filler pipe mounting bracket.

Tightening torque: 6 ± 1 N·m

- (3) Connect the washer pump connector.
- (4) Install the washer pump front/rear spraying pipe.
- (5) Install the front left wheel house protector assembly.
- (6) Install the front left wheel assembly.
- (7) Install the front bumper assembly.
- (8) Install the engine compartment trim cover assembly.
- (9) Connect the negative battery cable.
- (10) Turn the ENGINE START STOP switch to ON and performing running test.

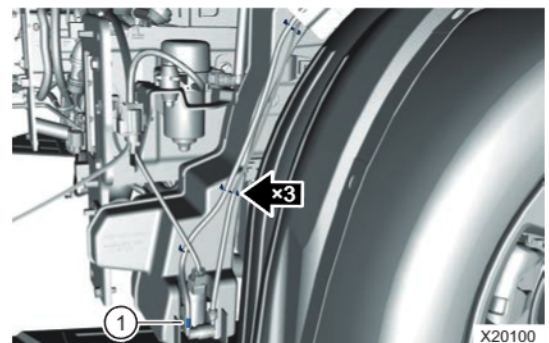
4.11 Replacement of Front Washer Line Assembly

■ Removal

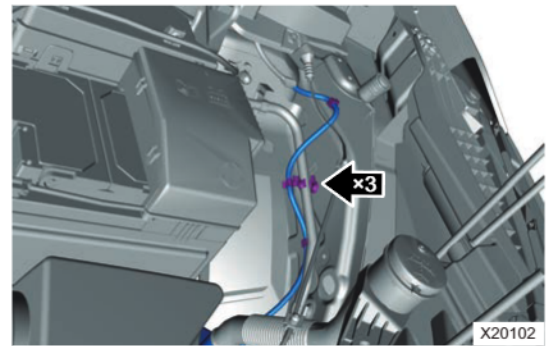
Caution

- **Be sure to wear safety equipment to prevent accidents, when removing washer line assembly.**
- **Appropriate force should be applied, when removing washer line assembly. Be careful not to operate roughly.**
- **Try to prevent body paint surface from being scratched, when removing washer line assembly.**

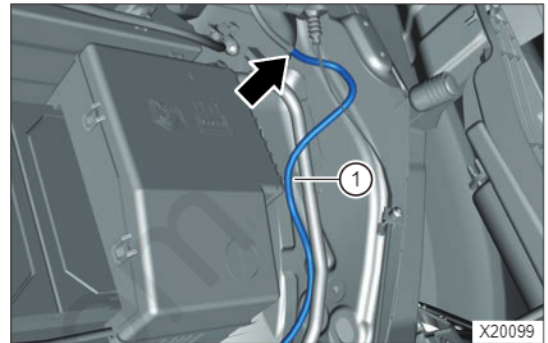
- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the front windshield lower support assembly.
- (4) Remove the front nozzle assembly.
- (5) Remove the front bumper assembly.
- (6) Remove the front left wheel assembly.
- (7) Remove the front left wheel house protector assembly.
- (8) Disconnect joint (1) between front washer line and front washer pump, and disconnect 3 fixing clips from washer reservoir.



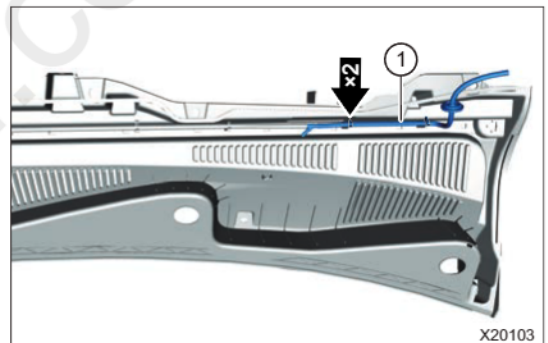
- (9) Remove 3 fixing clips from washer line on the inner side of wing, and remove washer line 2.



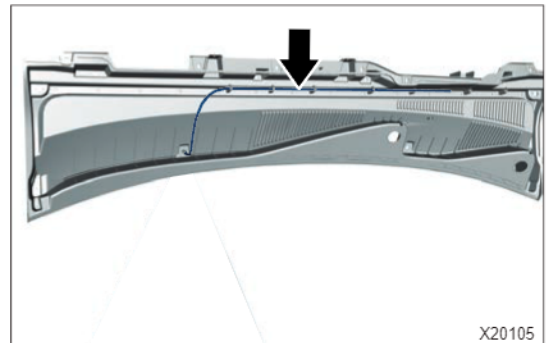
- (10) Disconnect connection between washer line 2 and washer line 1, and remove washer line 1.



- (11) Disconnect 2 fixing clips from front washer nozzle pipe with three way rubber plug assembly and remove front washer nozzle pipe with three way rubber plug assembly (1). Disconnect left nozzle pipe assembly and remove it.



- (12) Disconnect right nozzle pipe assembly and remove it.



■ Installation

Caution

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

- (1) Install the right nozzle pipe assembly.
- (2) Install the left nozzle pipe assembly.

- (3) Install the front washer nozzle pipe with three way rubber plug assembly.
- (4) Connect washer line 2 and washer line 1.
- (5) Install washer line 2 and secure 3 fixing clips.
- (6) Install joint (1) between front washer line and front washer pump, and secure 3 fixing clips on washer reservoir.
- (7) Install the front left wheel house protector assembly.
- (8) Install the front left tire assembly.
- (9) Install the front nozzle assembly.
- (10) Install the front windshield lower trim board assembly.
- (11) Install the front bumper assembly.
- (12) Connect the negative battery cable.
- (13) Turn the ENGINE START STOP switch to ON and performing running test.

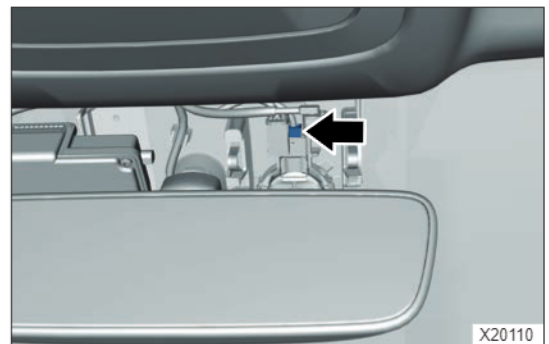
4.12 Replacement of Rain Sensor Assembly

■ Removal

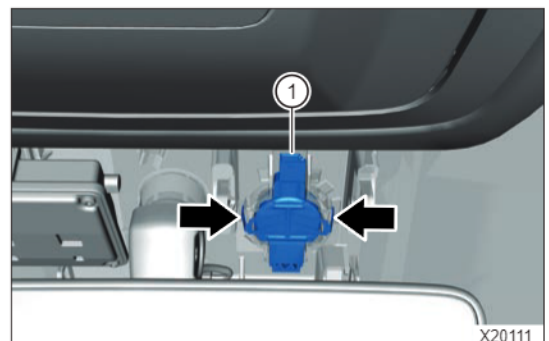
Caution

- **Be sure to wear safety equipment to prevent accidents, when removing rain sensor assembly.**
- **Appropriate force should be applied, when removing the rain sensor assembly. Be careful not to operate roughly.**
- **Try to prevent rain sensor from being scratched, when removing front wiper arm assembly.**

- (1) Turn off all electrical equipment and ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the driving recorder assembly.
- (4) Disconnect the rain sensor assembly connector.



- (5) Press rain sensor fixing clip and remove rain sensor assembly.



■ Installation

Caution

- **Always operate carefully to prevent other components from being damaged, when installing rain sensor assembly.**
- **Install the sensor in place when installing rain sensor assembly.**

- (1) Install rain sensor assembly to proper position and tighten fixing clip.
- (2) Install the rain sensor assembly connector.
- (3) Install the driving recorder assembly.
- (4) Install the negative battery cable.

cardiagn.com