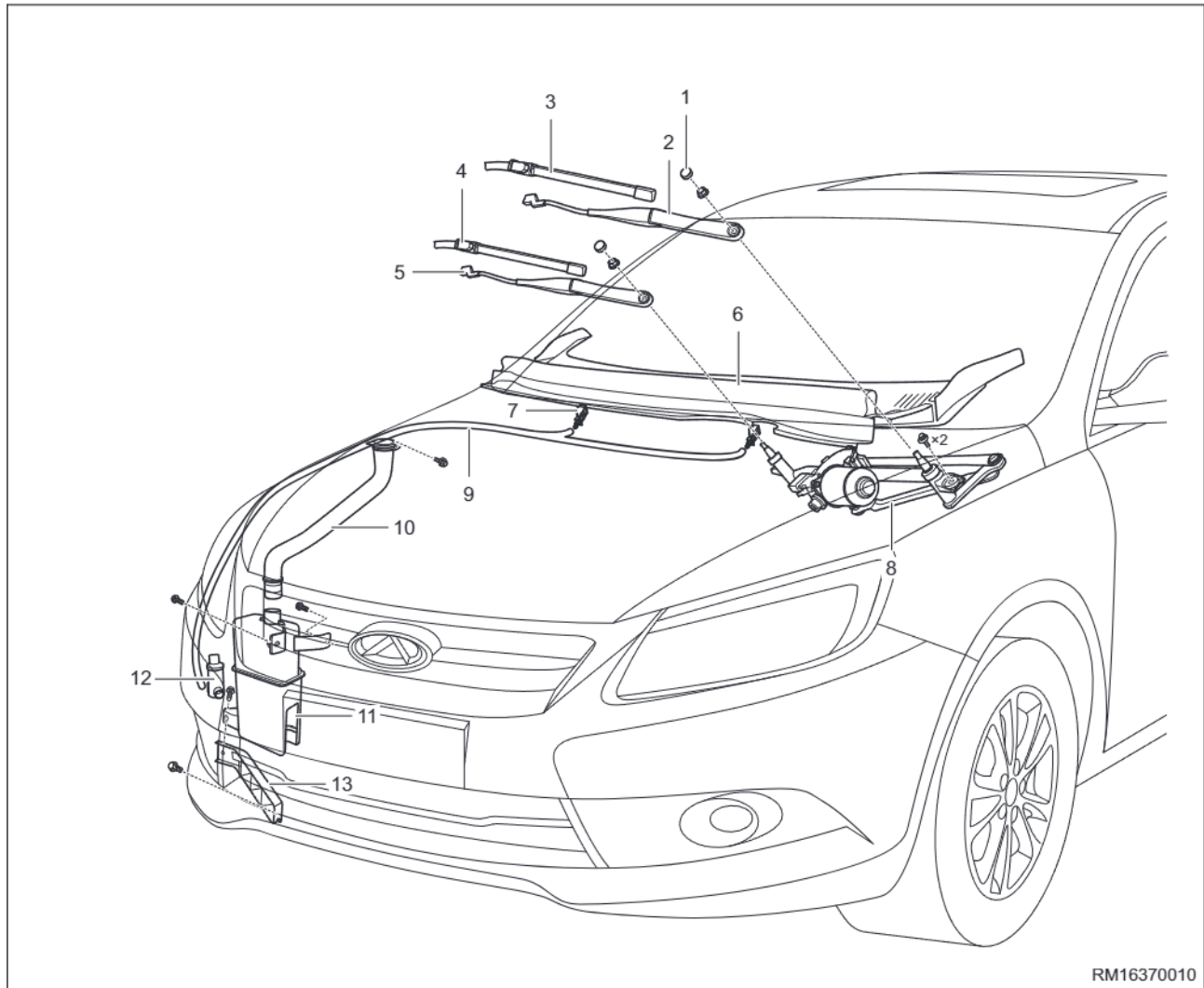


WIPER AND WASHER

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GENERAL INFORMATION

Description



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

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

Specifications

Torque Specifications

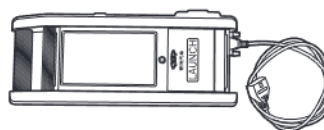
Description	Torque (N·m)
Front Wiper Arm Fixing Nut	15 ± 2.5
Wiper Motor and Link Rod Assembly Fixing Bolt	10 ± 1.5
Guide Pipe Assembly Fixing Bolt	7 ± 1.5
Washer Fluid Reservoir Assembly Upper Fixing Bolt	7 ± 1.5
Washer Fluid Reservoir Assembly Lower Fixing Bolt	5 ± 1.5
Fixing Bolt Between Washer Fluid Reservoir Bracket and Washer Fluid Reservoir Assembly	5 ± 1.5
Fixing Bolt Between Washer Fluid Reservoir Bracket and Body	7 ± 1.5

Tool

Special Tool

37

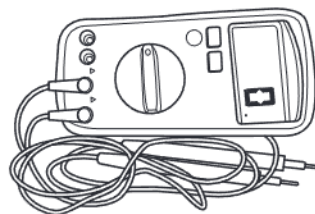
X-431 3G Diagnostic Tester



RCH0000001

General Tool

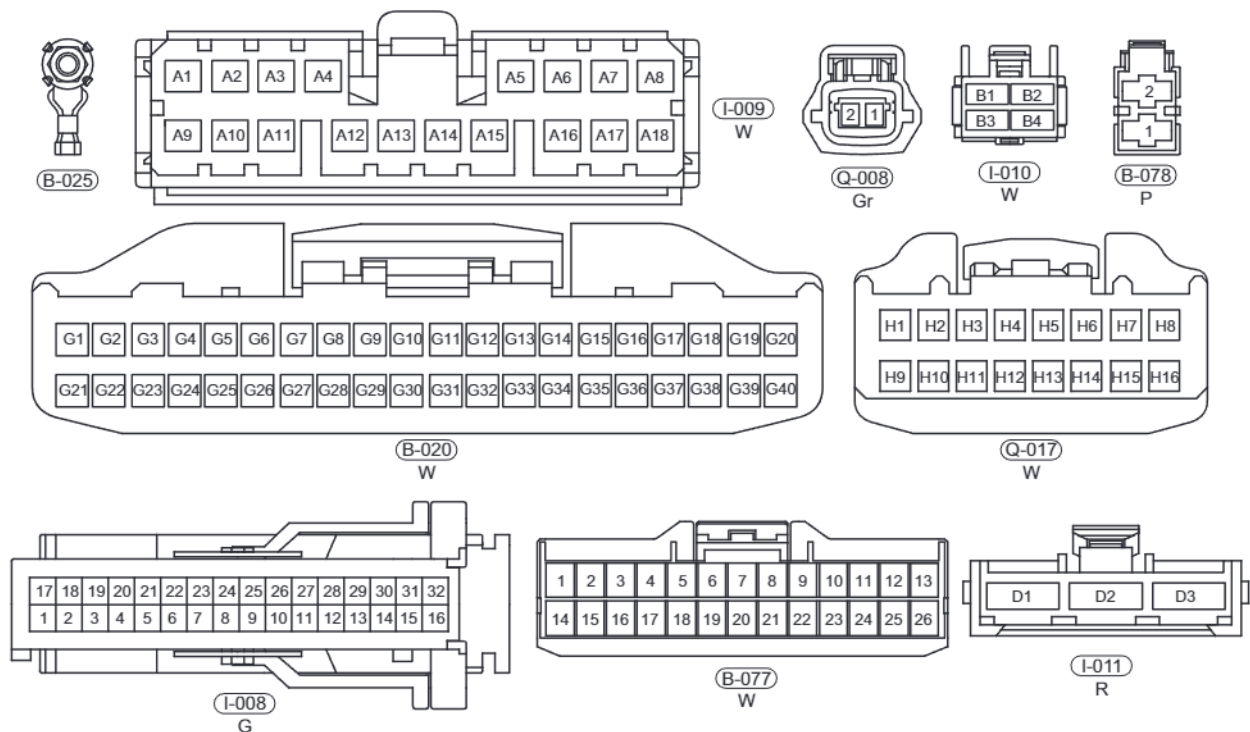
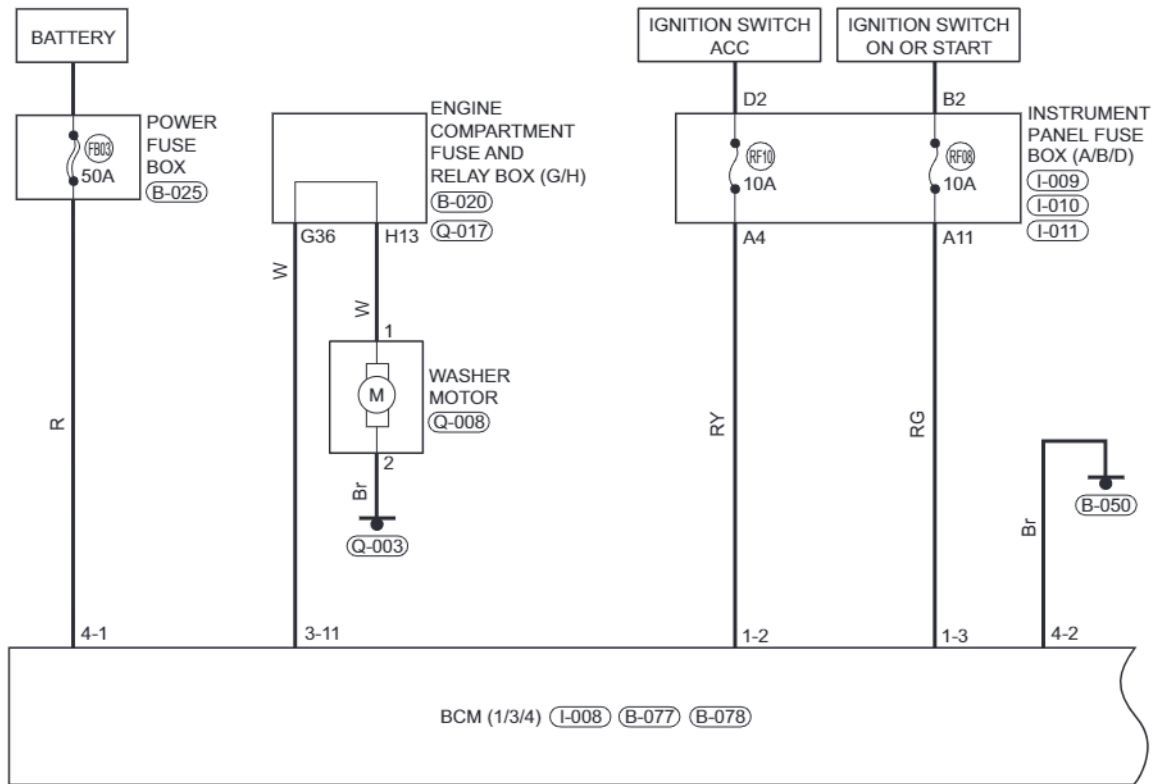
Digital Multimeter



RCH0000002

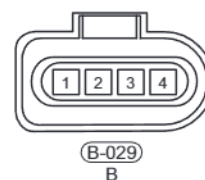
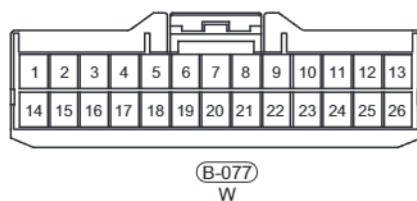
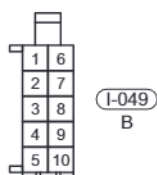
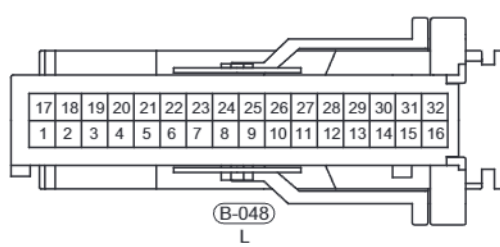
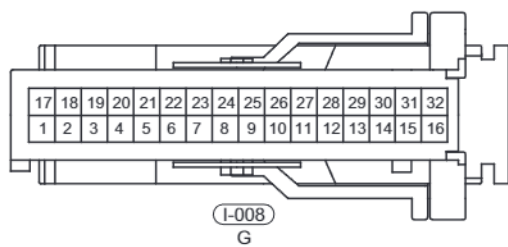
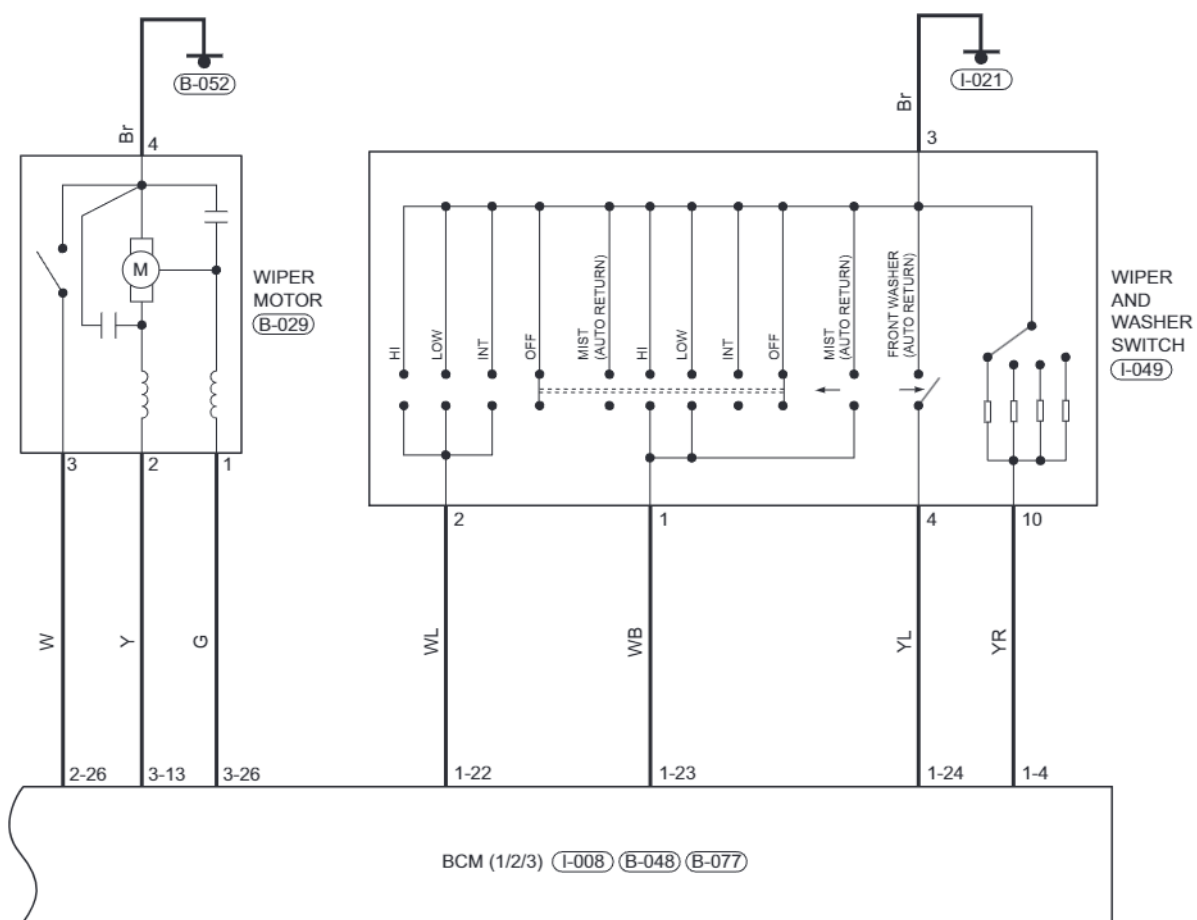
Circuit Diagram

Wiper and Washer Systems (Page 1 of 2)



EM16370010

Wiper and Washer Systems (Page 2 of 2)



EM16370020

DIAGNOSIS & TESTING

Problem Symptoms Table

HINT:

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

Symptom	Suspected Area	See page
Both front wiper and washer systems do not operate	Fuse	53-36
	Wiper switch assembly	37-23
	Wiper motor and link rod assembly	37-27
	Front washer pump assembly	37-31
	BCM	-
	Wire harness or connector	-
Front wiper system does not operate in LO or HI	Wiper switch assembly	37-23
	Wiper motor and link rod assembly	37-27
	BCM	-
	Wire harness or connector	-
Front wiper system does not operate in INT	Wiper switch assembly	37-23
	Wiper motor and link rod assembly	37-27
	BCM	-
	Wire harness or connector	-
Front wiper system does not operate	Fuse	53-36
	Wiper switch assembly	37-23
	Wiper motor and link rod assembly	37-27
	BCM	-
	Wire harness or connector	-
Front wiper arm and blade do not return to original position when front wiper switch is off	Wiper motor and link rod assembly	37-27
	BCM	-
	Wire harness or connector	-

Diagnosis Tools

X-431 3G Diagnostic Tester

When connecting X-431 3G diagnostic tester:

- Connect X-431 3G diagnostic tester (the latest software) to Data Link Connector (DLC) for communication with vehicle.
- DLC is located on the driver side instrument panel crossmember.
- DLC uses a trapezoidal design which can hold 16 terminals.

Digital Multimeter

When using digital multimeter:

- Troubleshoot electrical malfunctions and wire harness system.
- Look for basic fault.
- Measure voltage, current and resistance.

Diagnostic Help

1. Connect X-431 3G diagnostic tester (the latest software) to 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 DTC cannot be detected, the malfunction is current.
4. Only use a digital multimeter to measure the voltage of electronic system.
5. Refer to any Technical Bulletin that may apply to the malfunction.
6. Visually check the related wire harness.
7. Check and clean all wiper and washer systems grounds related to the latest DTCs.
8. If multiple trouble codes were set, refer to the circuit diagrams to look for any common ground circuit or power supply circuit applied to the DTC.

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Intermittent DTC Troubleshooting

If malfunction is intermittent, perform the followings:

- Check if connectors are loose.
- Check if wire harnesses are worn, pierced, pinched or partially broken.
- Wiggle related wire harnesses and connectors and observe if signal is interrupted in related circuit.
- If possible, try to duplicate the conditions under which the DTC was set.
- Look for the data that has changed or the DTC to reset during wiggle test.
- Look for broken, bent, protruded or corroded terminals.
- Inspect the mounting areas of wiper motor assembly, wire harness or wire harness connector and so on for damage, foreign matter, etc.
- Check and clean all wire harness connectors and grounding parts related to the current DTC.
- Remove the Body Control Module (BCM) from malfunctioning vehicle and install it to a new vehicle and perform a test. If DTC cannot be cleared, the Body Control Module (BCM) is malfunctioning. If DTC can be cleared, reinstall the Body Control Module (BCM) to original vehicle.
- If multiple trouble codes were set, refer to the circuit diagrams to look for any common ground circuit or power supply circuit applied to the DTC.
- Refer to Technical Bulletin that is applied to the malfunction.

Ground Inspection

Groundings are very important to entire circuit system, which are normal or not can seriously affect the entire circuit system. Ground points are often exposed to moisture, dirt and other corrosive environments. Corrosion (rust) and oxidation may increase load resistance. This situation will seriously affect the normal operation of circuit. Operations to check the ground points are as follows:

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

Diagnosis Procedure

HINT:

Use following procedures to troubleshoot the wiper and washer systems.

1	Vehicle brought to workshop
----------	------------------------------------

NEXT

37

2	Check battery voltage
----------	------------------------------

Standard voltage: 11 to 14 V

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

NEXT

3	Customer problem analysis
----------	----------------------------------

NEXT

4	Check for DTCs (current DTC and history DTC)
----------	---

DTC
occurs

For current DTC, go to step 6

No
DTC

For history DTC, go to step 7

5	Problem repair (no DTC), then go to step 8
----------	---

NEXT



6	Troubleshoot according to Diagnostic Trouble Code (DTC) chart, then go to step 8
----------	--

NEXT

7	Troubleshoot according to Problem Symptoms Table, then go to step 8
----------	---

NEXT

8	Adjust, repair or replace
----------	---------------------------

NEXT

9	Conduct test and confirm malfunction has been repaired
----------	--

NEXT

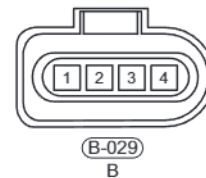
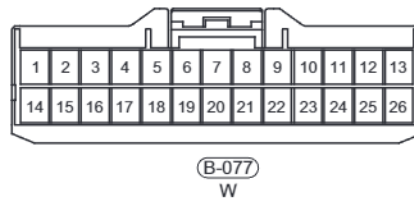
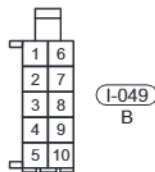
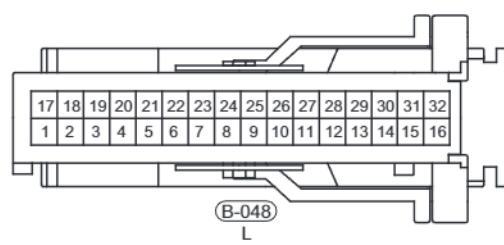
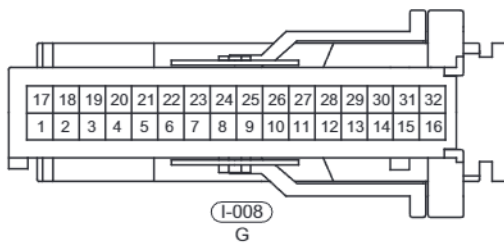
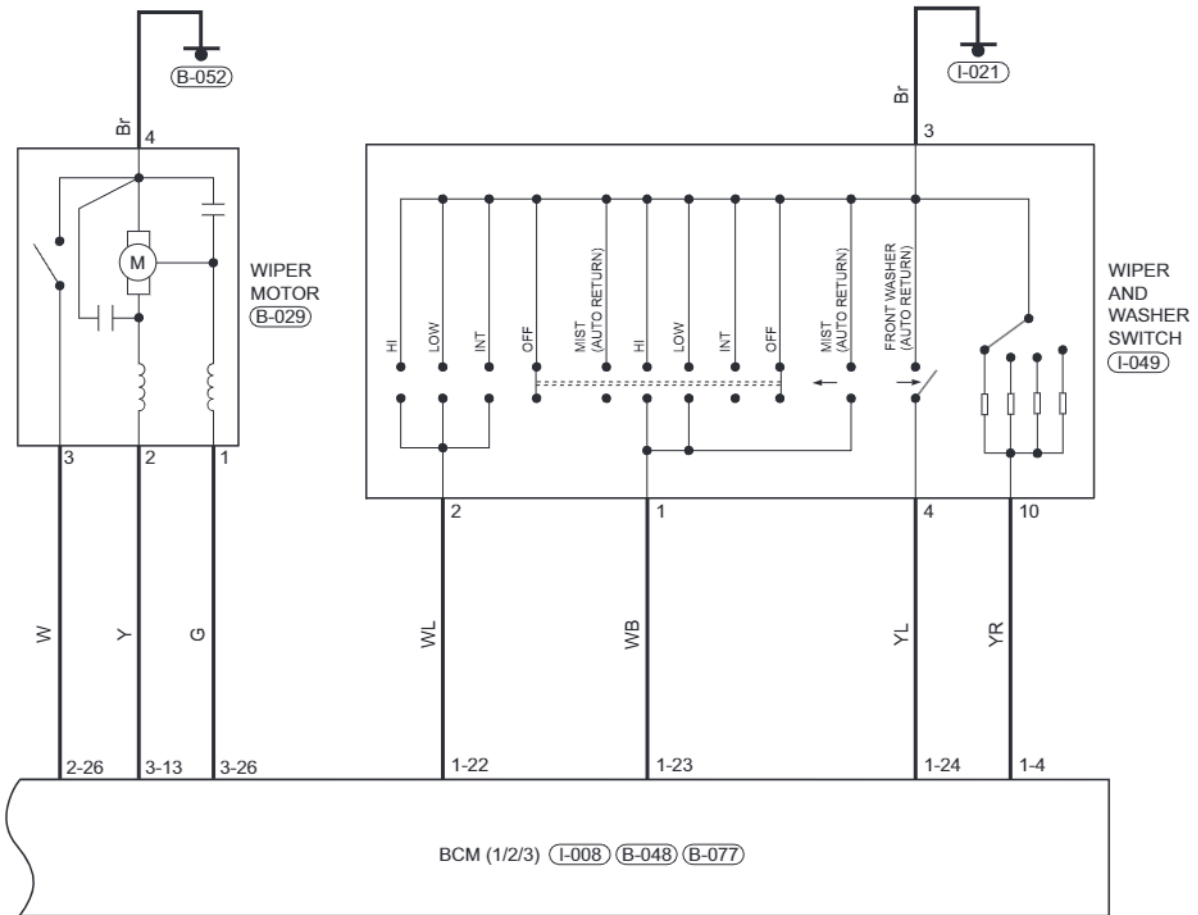
37

10	End
-----------	-----

Diagnostic Trouble Code (DTC) Chart

DTC Code	DTC Definition
B1014-11	Front Wiper Control Circuit Current Below Threshold
B1014-13	Front Wiper Control Circuit Current Above Threshold
B1014-71	Front Wiper Control Circuit Actuator Stuck
B1015-11	Front Wiper High Control Circuit Current Below Threshold
B1015-13	Front Wiper High Control Circuit Current Above Threshold
B1015-71	Front Wiper High Control Circuit Actuator Stuck
B1017-18	Front Washer Control Circuit Current Below Threshold
B1017-19	Front Washer Control Circuit Current Above Threshold

DTC	B1014-11	Front Wiper Control Circuit Current Below Threshold
DTC	B1014-13	Front Wiper Control Circuit Current Above Threshold
DTC	B1014-71	Front Wiper Control Circuit Actuator Stuck
DTC	B1015-11	Front Wiper High Control Circuit Current Below Threshold
DTC	B1015-13	Front Wiper High Control Circuit Current Above Threshold
DTC	B1015-71	Front Wiper High Control Circuit Actuator Stuck



EM16370020

Self-diagnosis Detection Logic

DTC Code	DTC Definition	DTC Detection Condition	Possible Cause
B1014-11	Front Wiper Control Circuit Current Below Threshold	Ignition switch ON	• Wiper switch assembly • Wiper motor and link rod assembly • Wire harness or connector • Body Control Module (BCM)
B1014-13	Front Wiper Control Circuit Current Above Threshold		
B1014-71	Front Wiper Control Circuit Actuator Stuck		
B1015-11	Front Wiper High Control Circuit Current Below Threshold		
B1015-13	Front Wiper High Control Circuit Current Above Threshold		
B1015-71	Front Wiper High Control Circuit Actuator Stuck		

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DTC Confirmation Procedure

Confirm that battery voltage is 11 to 14 V before performing the following procedures.

- Turn ignition switch to LOCK.
- Connect X-431 3G diagnostic tester (the latest software) to Data Link Connector (DLC), and make it communicate with vehicle electronic module through data network.
- Turn ignition switch to ON.
- Using X-431 3G diagnostic tester to record and clear the DTCs stored in Body Control Module (BCM).
- Turn ignition switch to LOCK and wait for a few seconds.
- Turn ignition switch to ON, and then select Read Code.
- If DTC is detected, the malfunction indicated by the DTC is current. Go to the diagnosis procedure - Step 1.
- If no DTC is detected, the malfunction indicated by the DTC is intermittent ([See page 37-8](#)).

CAUTION

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

Diagnosis Procedure

1 Check wiper switch assembly

- Remove the wiper switch assembly from malfunctioning vehicle, and install it to a new vehicle to perform a test.
- Connect all connectors.
- Connect the negative battery cable and turn ignition switch to ON.
- Check the operation condition of wiper switch assembly.

NG

Replace wiper switch assembly

OK

2 Check wiper motor and link rod assembly

- Remove the wiper motor and link rod assembly from malfunctioning vehicle, and install it to a new vehicle to perform a test.
- Connect all connectors.
- Connect the negative battery cable and turn ignition switch to ON.
- Check the operation condition of wiper motor and link rod assembly.

NG

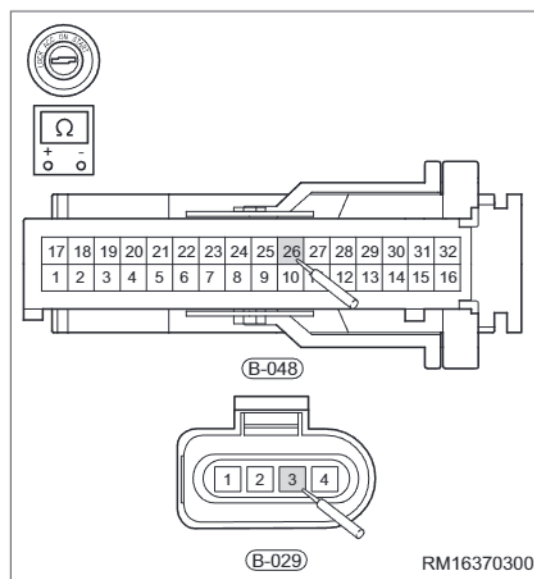
Replace wiper motor and link rod assembly

OK

3 Check body wire harness and connector

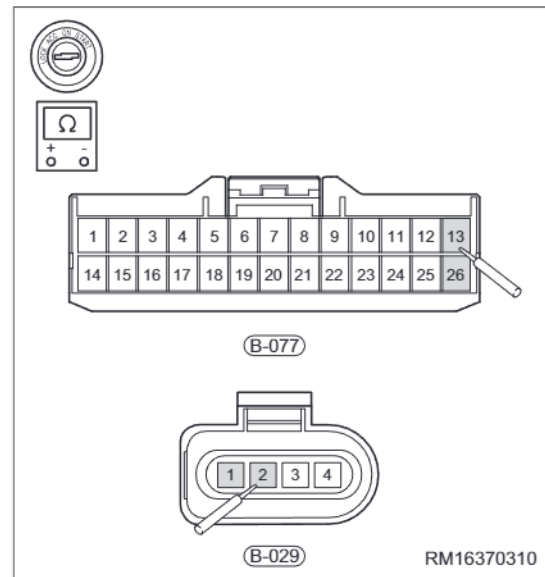
- Turn ignition switch to LOCK.
- Disconnect the negative battery cable.
- Disconnect the body wire harness connectors B-048 and B-029.
- Using a digital multimeter, check for continuity between body wire harness connectors B-048 and B-029 according to the table below.

Multimeter Connection	Condition	Specified Condition
B-048 (26) - B-029 (3)	Always	Continuity



- e. Disconnect the body wire harness connectors B-077 and B-029.
- f. Using a digital multimeter, check for continuity between body wire harness connectors B-077 and B-029 according to the table below.

Multimeter Connection	Condition	Specified Condition
B-077 (13) - B-029 (2)	Always	Continuity
B-077 (26) - B-029 (1)	Always	Continuity

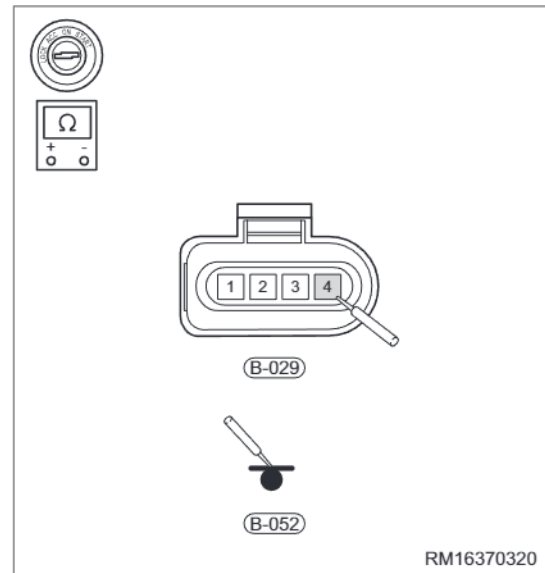


- g. Disconnect the body wire harness connector B-029 and ground point B-052.
- h. Using a digital multimeter, check for continuity between body wire harness connector B-029 and ground point B-052 according to the table below.

Multimeter Connection	Condition	Specified Condition
B-029 (4) - B-052	Always	Continuity

NG

Repair or replace body wire harness and connector



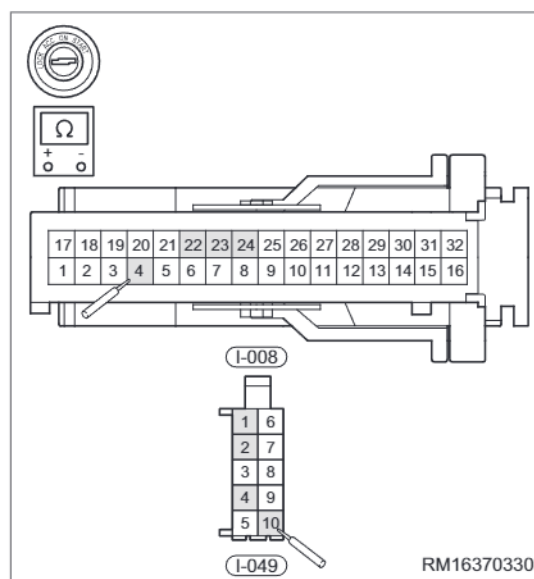
OK

37

4 Check instrument panel wire harness and connector

- Turn ignition switch to LOCK.
- Disconnect the negative battery cable.
- Disconnect the instrument panel wire harness connectors I-008 and I-049.
- Using a digital multimeter, check for continuity between instrument panel wire harness connectors I-008 and I-049 according to the table below.

Multimeter Connection	Condition	Specified Condition
I-008 (4) - I-049 (10)	Always	Continuity
I-008 (22) - I-049 (2)	Always	Continuity
I-008 (23) - I-049 (1)	Always	Continuity
I-008 (24) - I-049 (4)	Always	Continuity



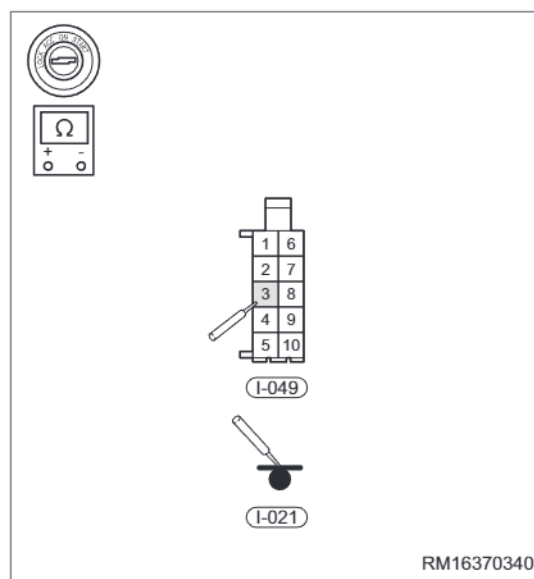
37

- Disconnect the instrument panel wire harness connector I-049 and ground point I-021.
- Using a digital multimeter, check for continuity between instrument panel wire harness connector I-049 and ground point I-021 according to the table below.

Multimeter Connection	Condition	Specified Condition
I-049 (3) - I-021	Always	Continuity

NG

Repair or replace instrument panel wire harness and connector



OK

5 Reconfirm DTCs

- Connect all connectors.
- Connect the negative battery cable.
- Turn ignition switch to ON.
- Use X-431 3G diagnostic tester (the latest software) to record and clear the DTCs stored in Body Control Module (BCM).
- Turn ignition switch to LOCK and wait for a few seconds.
- Turn ignition switch to ON.

- g. Use X-431 3G diagnostic tester (the latest software) to read the DTCs stored in Body Control Module (BCM) again.
- h. Read DTCs.

Result	Proceed to
DTCs B1014-11, B1014-13, B1014-71, B1015-11, B1015-13, and B1015-71 are output	NG
No DTC is output	OK

NG

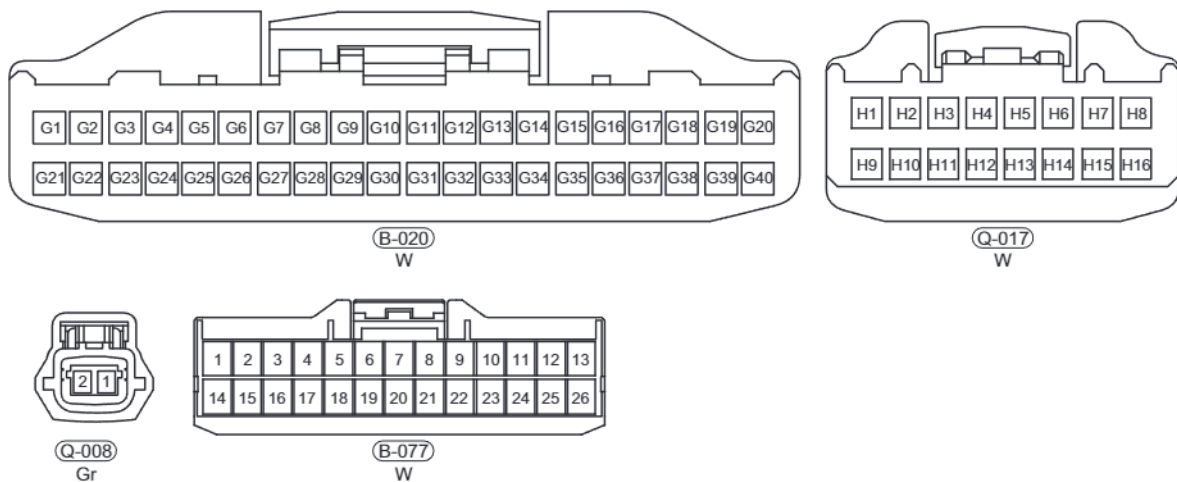
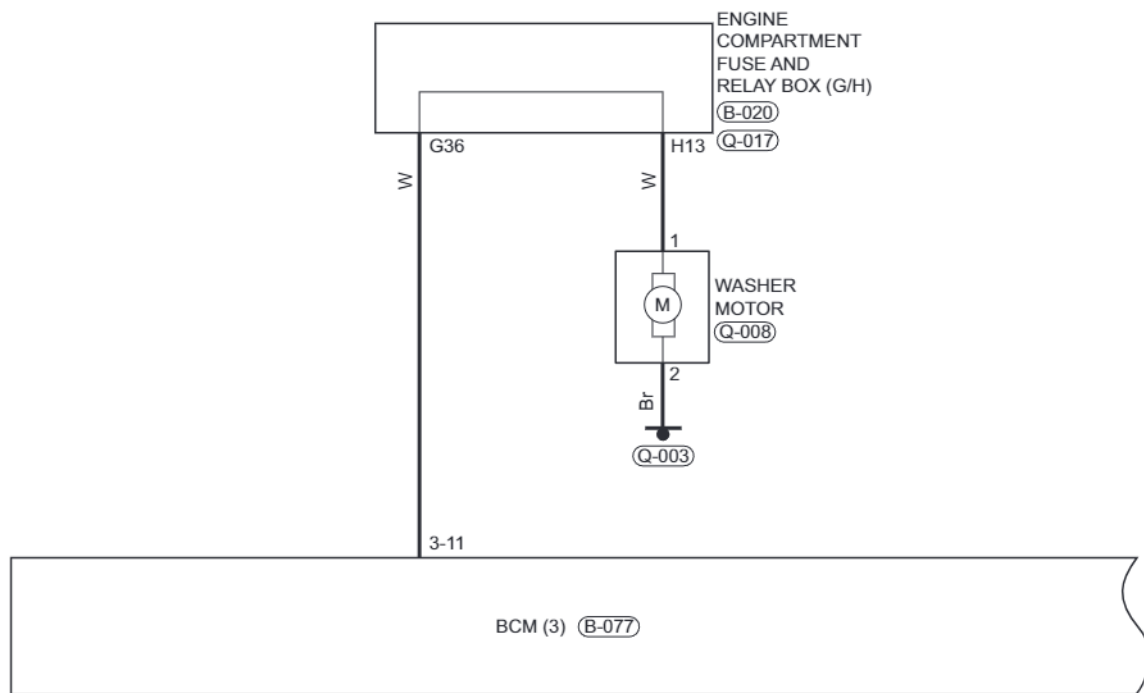
Replace Body Control Module (BCM)

OK

System is normal

DTC	B1017-18	Front Washer Control Circuit Current Below Threshold
-----	----------	--

DTC	B1017-19	Front Washer Control Circuit Current Above Threshold
-----	----------	--



EM16370030

Self-diagnosis Detection Logic

DTC Code	DTC Definition	DTC Detection Condition	Possible Cause
B1017-18	Front Washer Control Circuit Current Below Threshold	Ignition switch ON	• Front washer pump assembly • Wire harness or connector • Body Control Module (BCM)
B1017-19	Front Washer Control Circuit Current Above Threshold		

DTC Confirmation Procedure

Confirm that battery voltage is 11 to 14 V before performing the following procedures.

- Turn ignition switch to LOCK.
- Connect X-431 3G diagnostic tester (the latest software) to Data Link Connector (DLC), and make it communicate with vehicle electronic module through data network.
- Turn ignition switch to ON.
- Using X-431 3G diagnostic tester to record and clear the DTCs stored in Body Control Module (BCM).
- Turn ignition switch to LOCK and wait for a few seconds.
- Turn ignition switch to ON, and then select Read Code.
- If DTC is detected, the malfunction indicated by the DTC is current. Go to the diagnosis procedure - Step 1.
- If no DTC is detected, the malfunction indicated by the DTC is intermittent ([See page 37-8](#)).

CAUTION

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

Diagnosis Procedure

1 Check front washer pump assembly

- Remove the front washer pump assembly from malfunctioning vehicle, and install it to a new vehicle to perform a test.
- Connect all connectors.
- Connect the negative battery cable and turn ignition switch to ON.
- Check the condition of front washer pump assembly.

NG

Replace front washer pump assembly

OK

2 Check body wire harness and connector

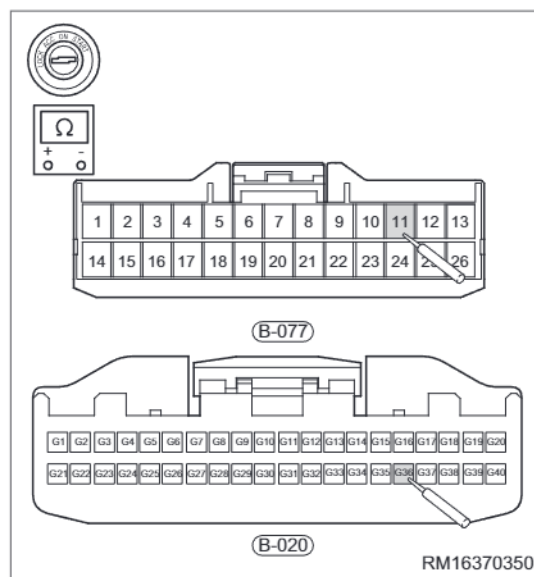
- Turn ignition switch to LOCK.
- Disconnect the negative battery cable.
- Disconnect the body wire harness connectors B-020 and B-077.
- Using a digital multimeter, check for continuity between body wire harness connectors B-020 and B-077 according to the table below.

37

Multimeter Connection	Condition	Specified Condition
B-020 (G36) - B-077 (11)	Always	Continuity

NG

Repair or replace body wire harness and connector

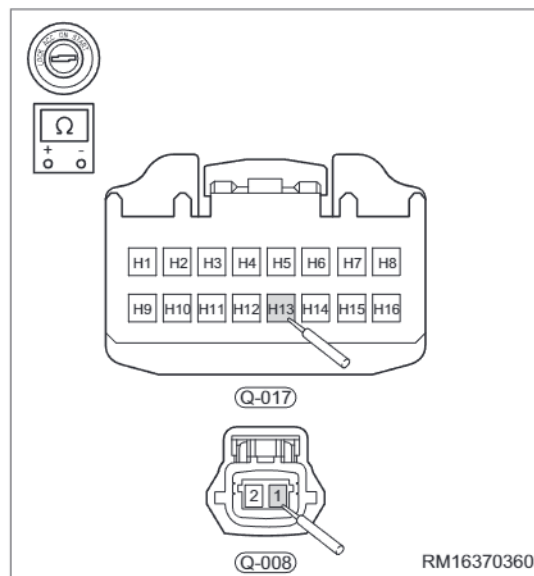


OK

3 Check front bumper wire harness and connector

- Turn ignition switch to LOCK.
- Disconnect the negative battery cable.
- Disconnect the front bumper connectors Q-008 and Q-017.
- Using a digital multimeter, check for continuity between front bumper connectors Q-008 and Q-017 according to the table below.

Multimeter Connection	Condition	Specified Condition
Q-008 (1) - Q-017 (H13)	Always	Continuity

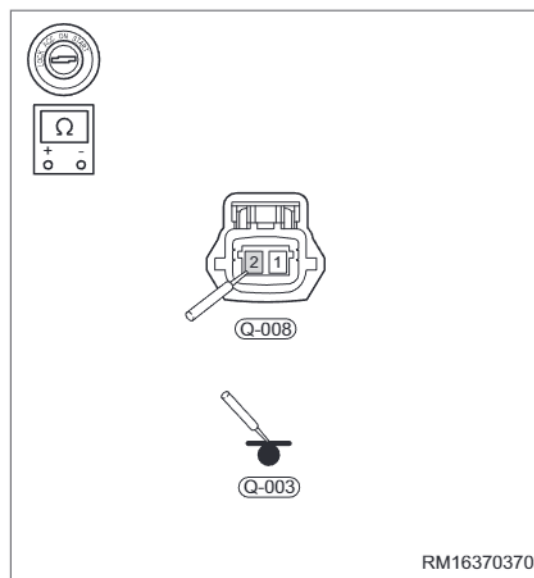


- Disconnect the front bumper connector Q-008 and ground point Q-003.
- Using a digital multimeter, check for continuity between front bumper connector Q-008 and ground point Q-003 according to the table below.

Multimeter Connection	Condition	Specified Condition
Q-008 (2) - Q-003	Always	Continuity

NG

Repair or replace front bumper wire harness and connector



OK

4 Reconfirm DTCs

- Connect all connectors.
- Connect the negative battery cable.
- Turn ignition switch to ON.
- Use X-431 3G diagnostic tester (the latest software) to record and clear the DTCs stored in Body Control Module (BCM).
- Turn ignition switch to LOCK and wait for a few seconds.
- Turn ignition switch to ON.
- Use X-431 3G diagnostic tester (the latest software) to read the DTCs stored in Body Control Module (BCM) again.



h. Read DTCs.

Result	Proceed to
DTCs B1017-18 and B1017-19 are output	NG
No DTC is output	OK

NG

Replace Body Control Module (BCM)

OK

System is normal

ON-VEHICLE SERVICE

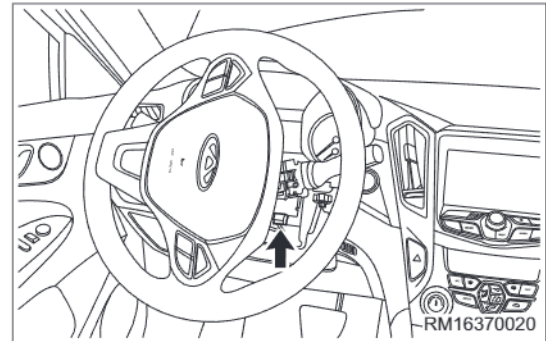
Wiper Switch Assembly

Removal

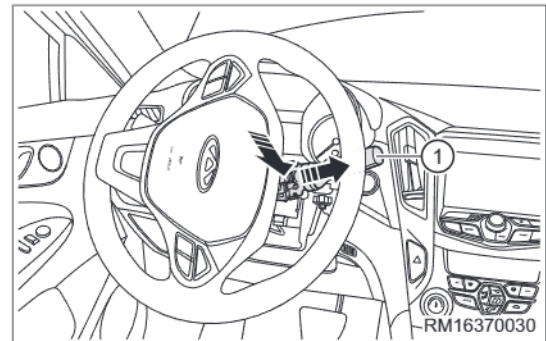
CAUTION

- 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 combination switch cover ([See page 28-28](#)).
4. Remove the wiper switch assembly.
 - a. Disconnect the wiper switch assembly connector (arrow).



- b. As shown in the illustration, press the claws on wiper switch assembly and remove the wiper switch assembly (1) by gently sliding it outward.



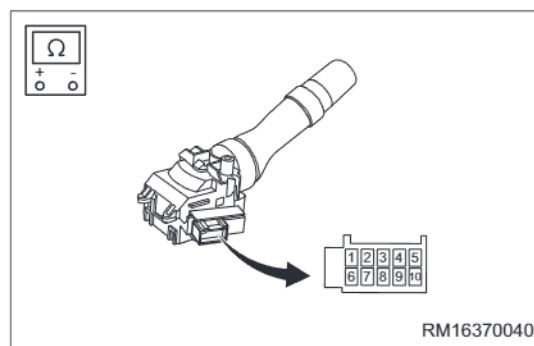
37

Inspection

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

Multimeter Connection	Switch Condition	Specified Condition
Terminal 1 - Terminal 3	MIST	Continuity
Terminal 2 - Terminal 3	INT	Continuity
Terminal 1 - Terminal 3	LO	Continuity
Terminal 1, 2 - Terminal 3	HI	Continuity
Terminal 3 - Terminal 4	FRONT WASHER	Continuity

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



37

Installation

Installation is in the reverse order of removal.

CAUTION

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

Front Wiper Arm Assembly

Removal

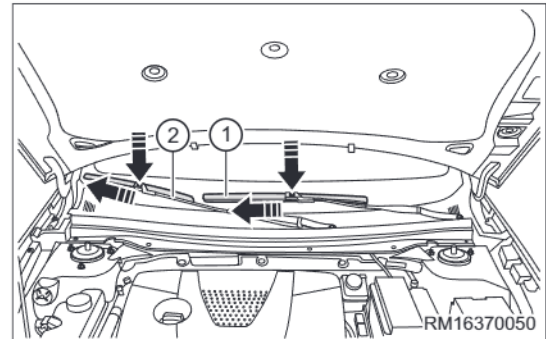
CAUTION

- 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.

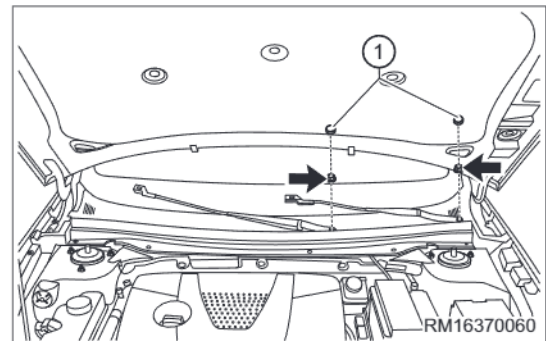
HINT:

- Enter the wiper repair mode only when replacing wiper blade: turn key to other positions from ON, turn wiper switch to MIST, LO, HI within 10 seconds, and the wiper will stop near the full stroke position, so as to replace wiper blade.
- Exit wiper repair mode: turn key to ON, turn wiper switch to MIST again, and the wiper will return to its original position.

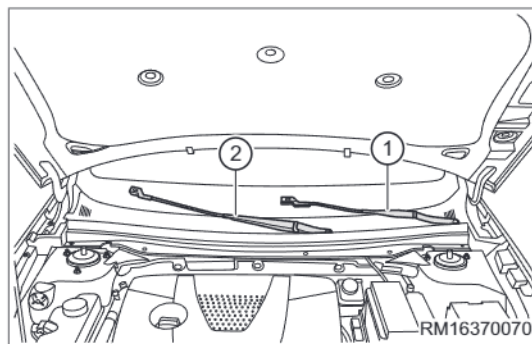
1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Open the hood.
4. Remove the front wiper arm blade.
 - a. As shown in the illustration, press the claws on front wiper arm blade, and remove the front wiper arm main blade (1) and front wiper arm sub blade (2) by gently sliding them outward.



5. Remove the front wiper arm.
 - a. Using a screwdriver wrapped with protective tape, remove the front wiper arm trim caps (1).
 - b. Remove 2 fixing nuts (arrow) from front wiper arm. (Tightening torque: $15 \pm 2.5 \text{ N}\cdot\text{m}$)



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



Installation

Installation is in the reverse order of removal.

CAUTION

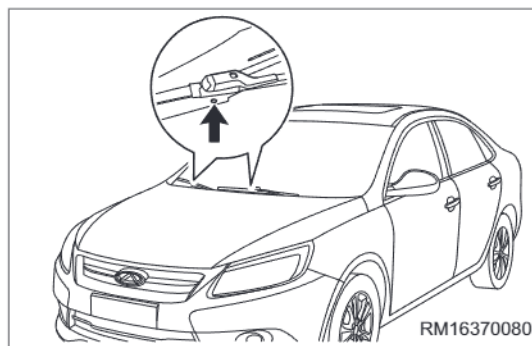
- Always operate carefully to prevent other components from being damaged, when installing front wiper arm assembly.
- Be sure to tighten fixing nuts to the specified torque, when installing front wiper arm assembly.
- Check front wiper arm assembly for proper operation after installation.

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HINT:

Always adjust the front wiper arm assembly to a proper position during installation.

Pay attention to the locating points on front windshield assembly during installation. Wiper arm blade should be pressed against the locating points as shown in the illustration.



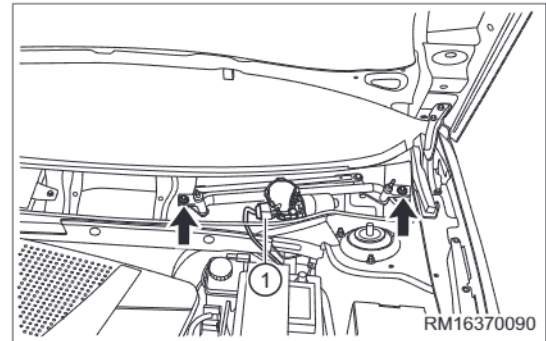
Wiper Motor and Link Rod Assembly

Removal

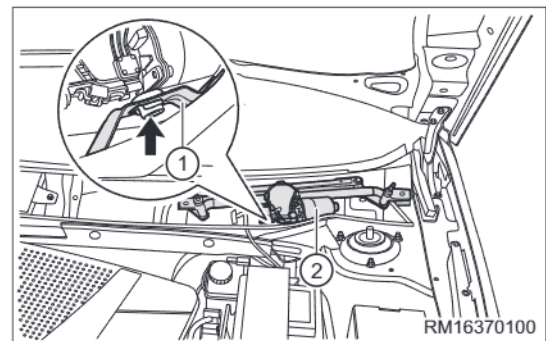
CAUTION

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

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the front wiper arm assembly (See page 37-25).
4. Remove the front windshield lower garnish assembly (See page 49-33).
5. Remove the wiper motor and link rod assembly.
 - a. Disconnect the connector (1) from wiper motor and link rod assembly.
 - b. Remove 2 fixing bolts (arrow) from wiper motor and link rod assembly.
(Tightening torque: $10 \pm 1.5 \text{ N}\cdot\text{m}$)



- c. Separate the rubber dowel pin (arrow) from bracket (1), and remove the wiper motor and link rod assembly (2).



Inspection

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

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

If result is not as specified, replace wiper motor and link rod assembly.

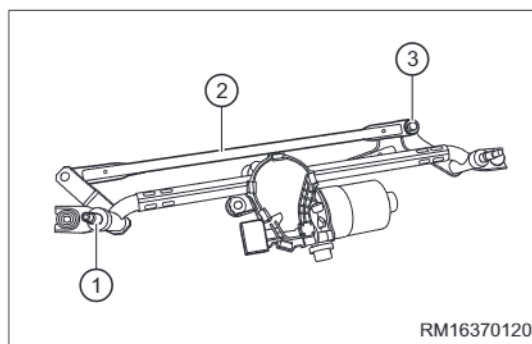
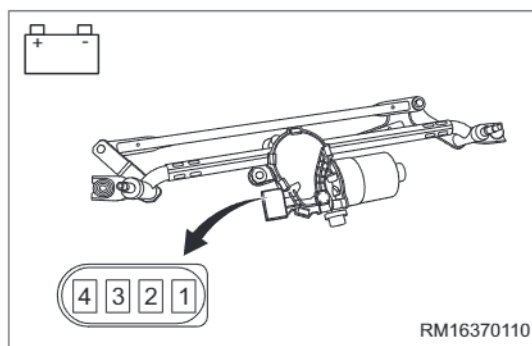
- b. Check HI operation.

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

If result is not as specified, replace wiper motor and link rod assembly.

2. Check the wiper link rod.

- a. Check the pivot (1) for looseness or falling off, link rod (2) for deformation or break, and shaft sleeve (3) for seizing. Replace the wiper motor and link rod assembly if necessary.



Installation

Installation is in the reverse order of removal.

CAUTION

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

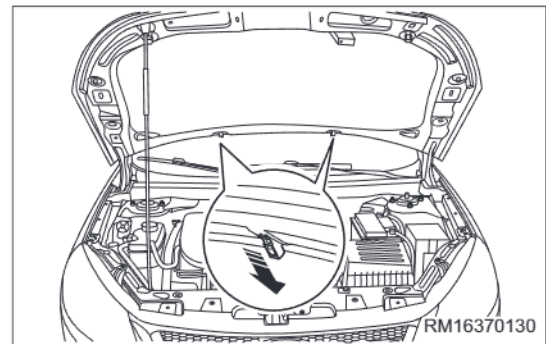
Front Washer Nozzle Assembly

Removal

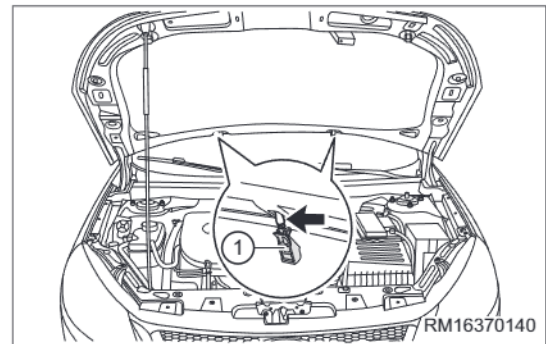
CAUTION

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

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the front washer nozzle assembly.
 - a. Loosen the front washer nozzle assembly in the direction of arrow as shown in the illustration.

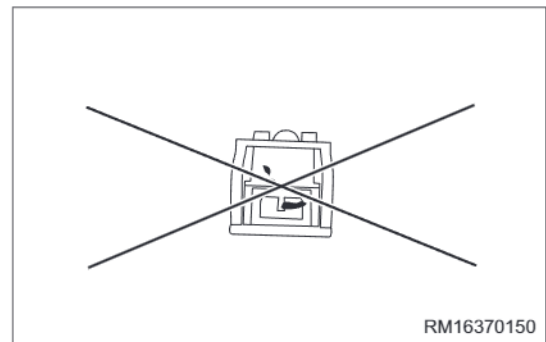


- b. Disconnect the joints (arrow) between washer line and front washer nozzle assembly, and remove the front washer nozzle assembly (1).



Inspection

1. Check the front washer nozzle assembly.
 - a. Check front washer nozzle for blockage, deformation or damage. Replace the front washer nozzle if necessary.



Installation

Installation is in the reverse order of removal.

CAUTION

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

Front Washer Pump Assembly

Removal

CAUTION

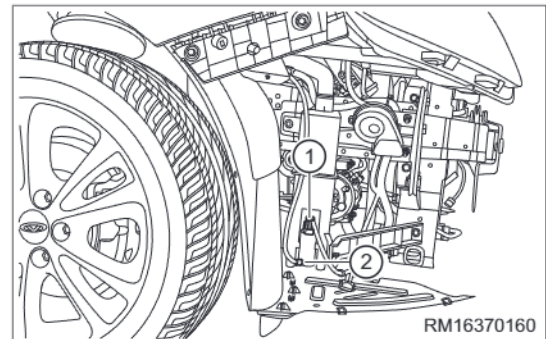
- Be sure to wear safety equipment to prevent accidents, when removing front washer pump assembly.
- Appropriate force should be applied when removing front washer pump assembly. Be careful not to operate roughly.
- Try to prevent body paint surface from being scratched, when removing front washer pump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

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the front bumper assembly (See page 49-8).
4. Remove the front washer pump assembly.

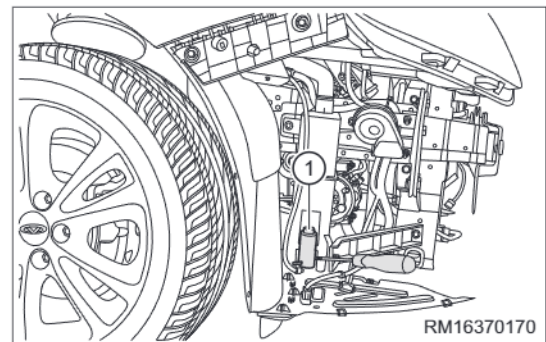
CAUTION

- Put a container under washer pump to collect washer fluid, before removing front washer pump assembly.

- a. Disconnect the front washer pump connector (1).
- b. Disconnect the joint (2) between washer line and front washer pump.



- c. Using a screwdriver wrapped with protective tape, remove the front washer pump assembly (1).



Installation

Installation is in the reverse order of removal.

CAUTION

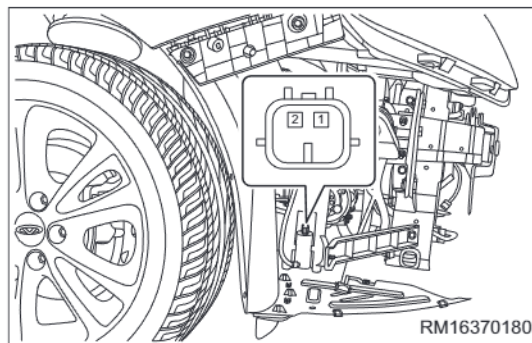
- Always operate carefully to prevent components from being damaged, when installing front washer pump assembly.
- Install washer line joint in place, when installing front washer pump assembly.
- Check washer system for proper operation, after installing front washer pump assembly.

Inspection

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

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

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



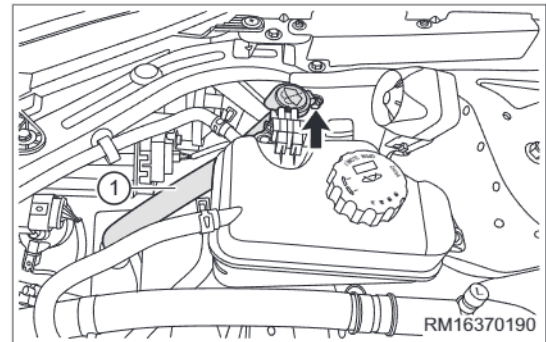
Washer Fluid Reservoir Assembly

Removal

CAUTION

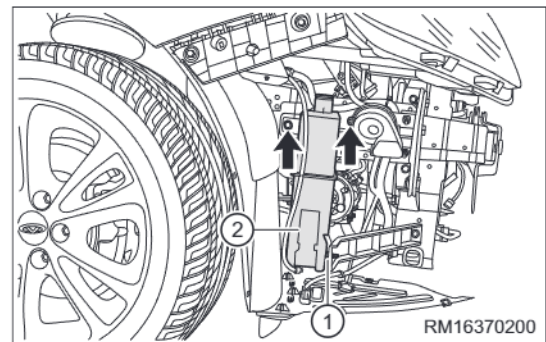
- Be sure to wear necessary safety equipment to prevent accidents, when removing washer fluid reservoir assembly.
- Appropriate force should be applied when removing washer fluid reservoir assembly. Be careful not to operate roughly.
- Try to prevent body paint surface from being scratched, when removing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

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the front bumper assembly (See page 49-8).
4. Remove the front washer pump assembly (See page 37-31).
5. Remove the guide pipe assembly.
 - a. Remove the fixing bolt (arrow) from guide pipe assembly.
(Tightening torque: $7 \pm 1.5 \text{ N}\cdot\text{m}$)
 - b. Remove the guide pipe assembly (1) from washer fluid reservoir assembly.



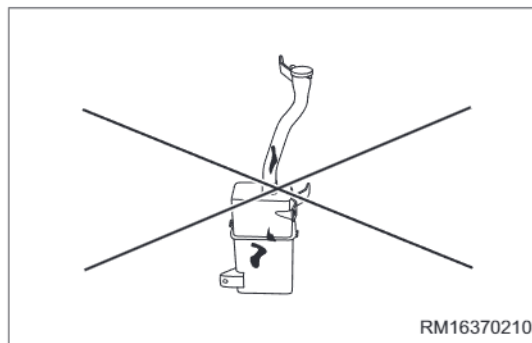
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6. Remove the washer fluid reservoir assembly.
 - a. Remove 2 fixing bolts (arrow) from washer fluid reservoir assembly.
(Tightening torque: $7 \pm 1.5 \text{ N}\cdot\text{m}$)
 - b. Remove the fixing bolt (1) from the lower part of washer fluid reservoir assembly, and remove the washer fluid reservoir assembly (2).
(Tightening torque: $5 \pm 1.5 \text{ N}\cdot\text{m}$)



Inspection

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



Installation

Installation is in the reverse order of removal.

CAUTION

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

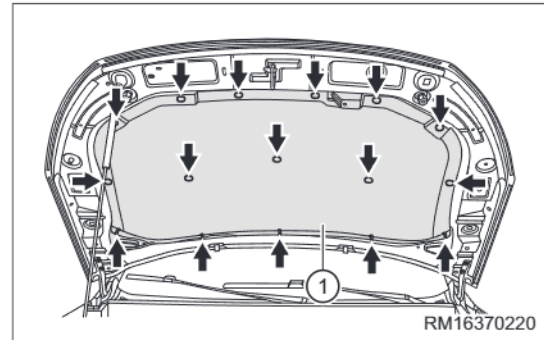
Washer Line Assembly

Removal

CAUTION

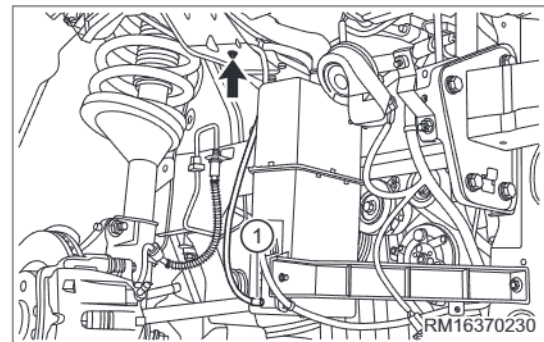
- Be sure to wear safety equipment to prevent accidents, when removing washer line assembly.
- Appropriate force should be applied when removing washer line assembly. Be careful not to operate roughly.
- Try to prevent body paint surface from being scratched, when removing washer line assembly.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the front bumper assembly (See page 49-8).
4. Remove the front wheel house protector (See page 49-17).
5. Remove the front washer nozzle assembly (See page 37-29).
6. Remove the hood sound-absorbing pad.
 - a. Remove the clips (arrow) from hood sound-absorbing pad, and remove the hood sound-absorbing pad (1).

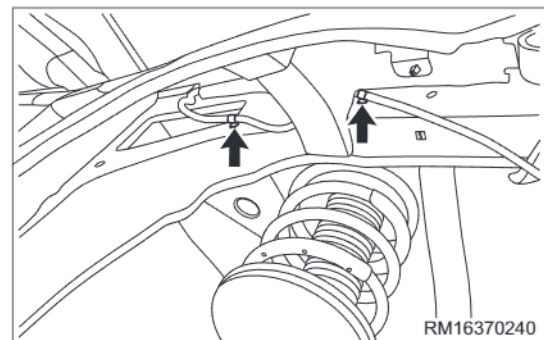


37

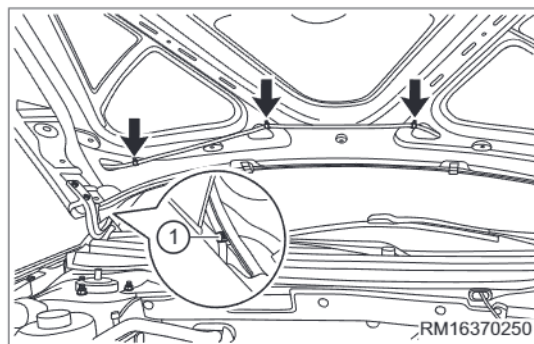
7. Remove the washer line assembly.
 - a. Disconnect the joint (1) between washer line and front washer pump.
 - b. Detach the clip (arrow) from washer line on the lower part of front combination light.



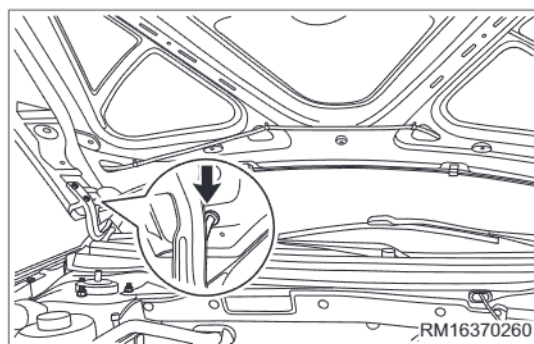
- c. Remove the clips (arrow) from washer line on the inner side of wing.



- d. Remove 3 clips (arrow) from washer line on the upper part of hood.
- e. Remove the clip (1) from washer line on the inner side of engine right hinge.



- f. Using a screwdriver wrapped with protective tape, pry up the rubber pad (arrow), and remove the washer line assembly.

**37****Installation**

Installation is in the reverse order of removal.

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.

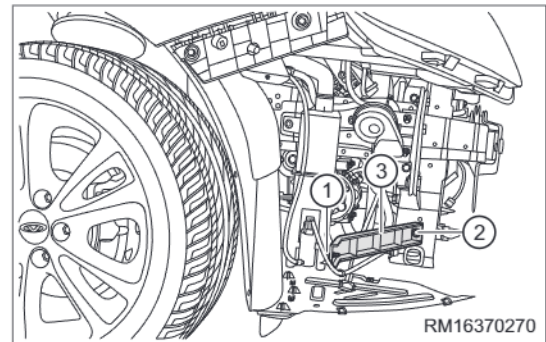
Washer Fluid Reservoir Bracket

Removal

CAUTION

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

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the front bumper assembly (See page 49-8).
4. Remove the washer fluid reservoir bracket.
 - a. Remove the fixing bolt (1) between washer fluid reservoir bracket and washer fluid reservoir assembly. (Tightening torque: $5 \pm 1.5 \text{ N}\cdot\text{m}$)
 - b. Remove the fixing bolt (2) between washer fluid reservoir bracket and body, and remove the washer fluid reservoir bracket (3). (Tightening torque: $7 \pm 1.5 \text{ N}\cdot\text{m}$)



37

Installation

Installation is in the reverse order of removal.

