

WIPER AND WASHER SYSTEM**SPECIFICATIONS****GENERAL SPECIFICATIONS****WINDSHIELD WIPERS AND WASHER**

N08KB--

Items	Specifications
Windshield wiper motor	
Type	Permanent-magnet type
Speed control system	Third brush system
Braking system	Dynamic brake system
Revolution no load rpm	
Low speed	50±5
High speed	75±13
Nominal torque Nm (ft.lbs.)	13 (9)
Windshield wiper blade	
Wiping angle	
Driver's side	85.5°
Passenger's side	114°
Wiper blade length mm (in.)	396–401 (15.6–15.8)
Window washer motor and pump	
Motor type	Direct current ferrite magnet type
Pump type	Centrifugal type
Power consumption A	3.5 or less
Allowable period of continuous use sec.	
With washer fluid	Max. 20
Nozzle jet pressure kPa (psi)	70 (12.8) or more
Tank capacity lit. (qts.)	1.5 (1.6) or more
Intermittent wiper relay	
Intermittent time sec.	1.5±0.7–10.5±3
Delay time in washer moving sec.	0.4–1.2
Working load W	60

HEADLIGHT WASHER

Items	Specifications
Washer motor and pump	
Motor type	Ferrite magnet type
Pump type	Centrifugal type
Power consumption A	21 or less
Nozzle injection pressure kPa (psi)	180 (25.6) or more
Tank capacity lit. (qts.)	3.5 (3.7)
Headlight washer control unit	
Time setting sec.	0.52
Check valve	
Valve opening and closing pressure kPa (psi)	49–108 (7.1–15.6)

COLUMN SWITCH

Items	Specifications
Wiper-washer switch	
Wiper switch	
Rated load A	
Low	3.5
Intermittent	0.17–0.27
High	4.5
Lock	18
Voltage drop (at 12V and the rated load) V	0.2 or less
Washer switch	
Rated load A	3
Voltage drop (at 12V and the rated load) V	0.5 or less
Headlight washer switch	
Rated load A	0.5
Voltage drop (at 12V and the rated load) V	0.2 or less

REAR WIPER AND WASHER

Items	Specifications
Wiper motor	
Motor type	Ferrite magnet type
Braking system	Dynamic braking system
Revolution under no-load rpm	40±5
Nominal torque Nm (ft.lbs.)	8 (6)
Wiper blade	
Wiping angle	108°
Blade length mm (in.)	380–385 (15.0–15.2)
Window washer motor and pump	
Motor type	Direct current ferrite magnet type
Pump type	Centrifugal type
Power consumption A	3.5 or less
Allowable period of continuous use sec.	
With washer fluid	Max. 60
Empty operation	Max. 20
Nozzled jet-spray pressure kPa (psi)	78 (11.4) or more
Tank capacity lit. (qts.)	1.1 (1.2) or more

REAR WIPER AND WASHER SWITCH

Items	Specifications
Rated load A	
Wiper switch	3
Washer switch	5
Voltage drop (at 12V and the rated load) V	0.1 or less

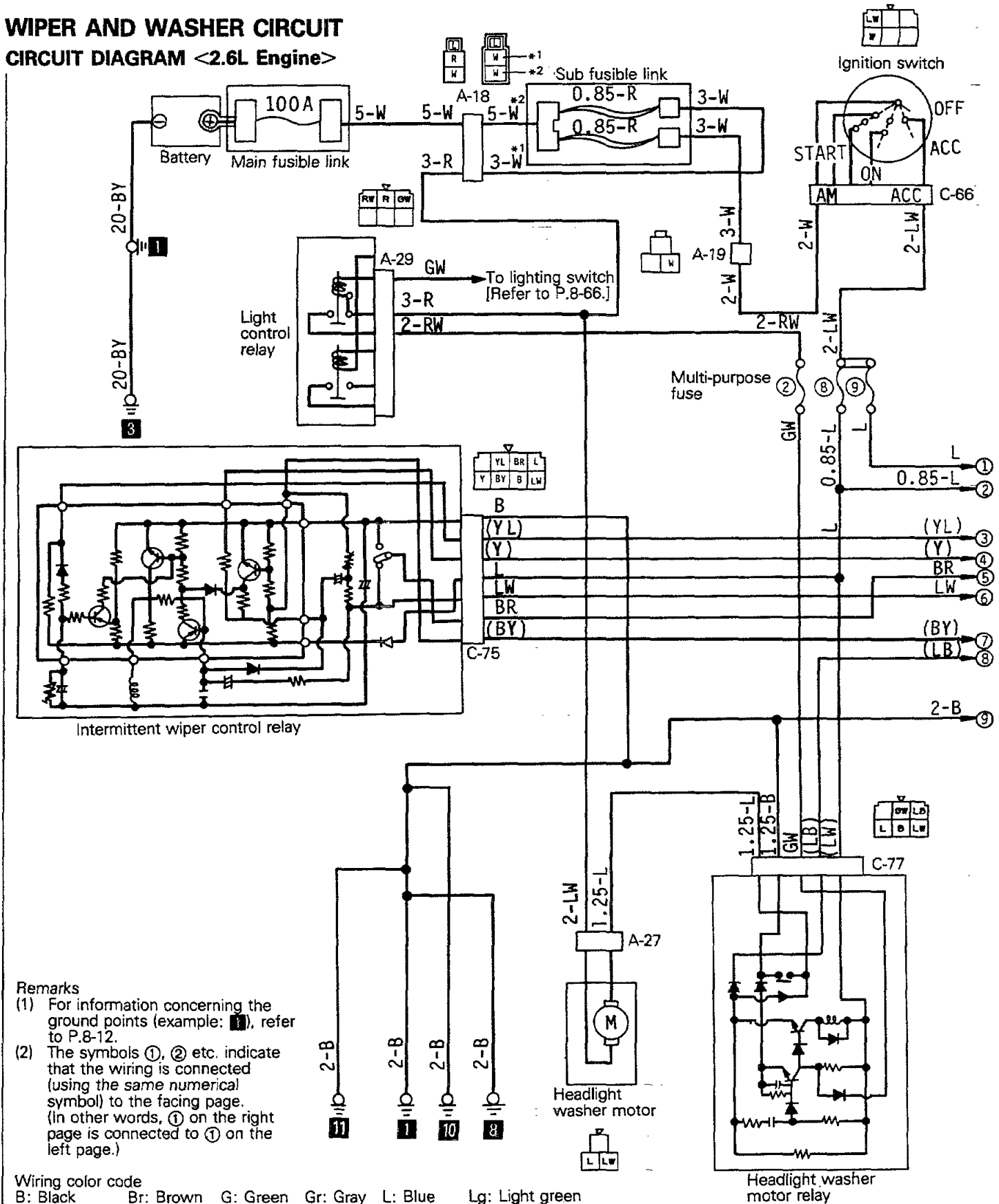
TORQUE SPECIFICATIONS

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Items	Nm	ft.lbs.
Windshield wiper pivot shaft installing nut	10–16	7–12
Windshield wiper arm locking nut	10–16	7–12
Windshield wiper motor	7–10	5–7
Steering wheel lock nut	35–45	25–33
Rear wiper pivot shaft installing nut	8–12	6–9
Rear wiper arm locking nut	7–10	5–7
Rear wiper motor	7–10	5–7

TROUBLESHOOTING

**WIPER AND WASHER CIRCUIT
CIRCUIT DIAGRAM <2.6L Engine>**



Remarks

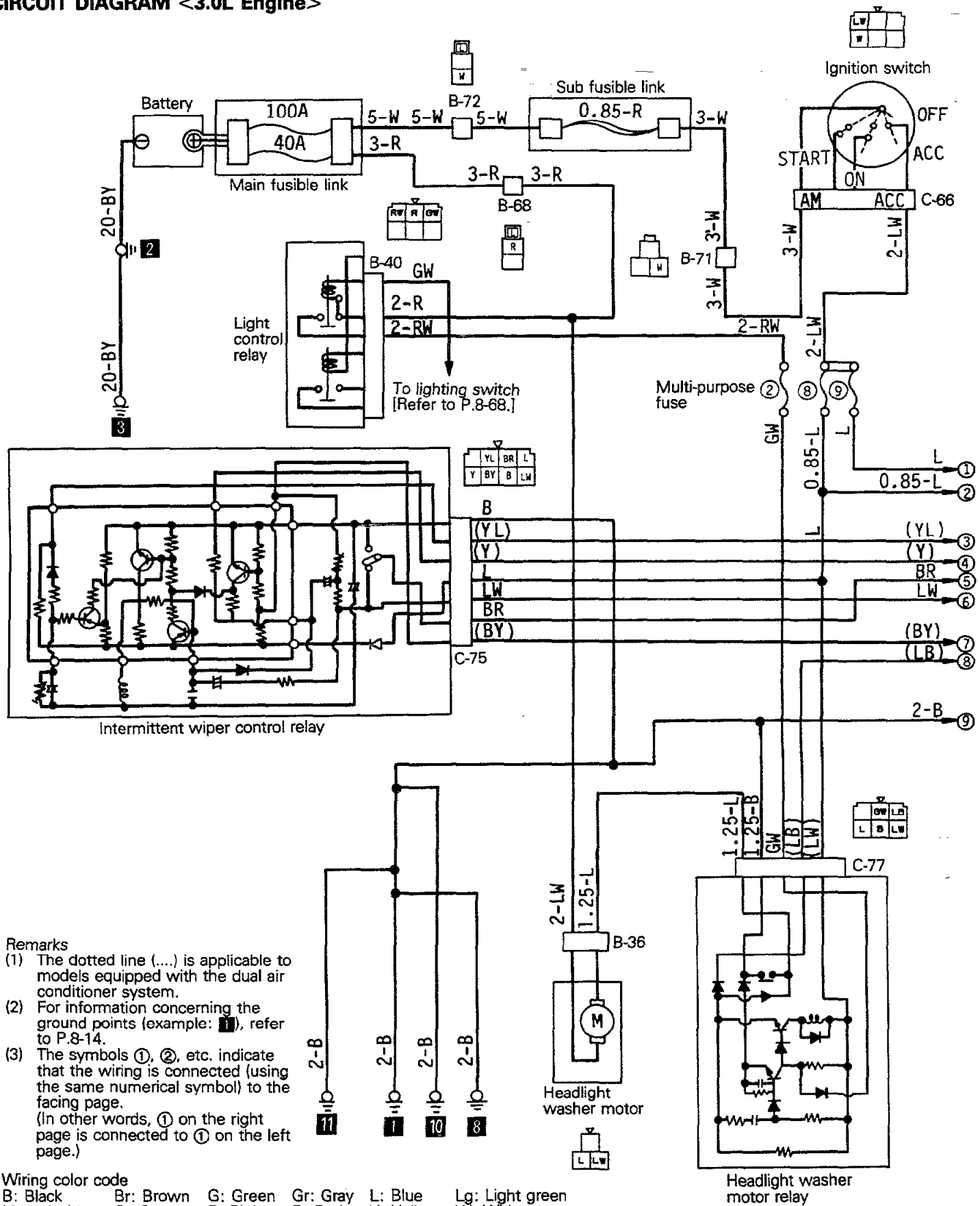
- (1) For information concerning the ground points (example: 11), refer to P.8-12.
- (2) The symbols ①, ② etc. indicate that the wiring is connected (using the same numerical symbol) to the facing page. (In other words, ① on the right page is connected to ① on the left page.)

Wiring color code

B: Black Br: Brown G: Green Gr: Gray L: Blue Lg: Light green
 Ll: Light blue O: Orange P: Pink R: Red Y: Yellow W: White

WIPER AND WASHER CIRCUIT

CIRCUIT DIAGRAM <3.0L Engine>



Remarks

- (1) The dotted line (...) is applicable to models equipped with the dual air conditioner system.
- (2) For information concerning the ground points (example: 11), refer to P.8-14.
- (3) The symbols ①, ②, etc. indicate that the wiring is connected (using the same numerical symbol) to the facing page.
(In other words, ① on the right page is connected to ① on the left page.)

Wiring color code

B: Black Br: Brown G: Green Gr: Gray L: Blue Lg: Light green
 Ll: Light blue O: Orange P: Pink R: Red Y: Yellow W: White

WINDSHIELD WIPERS AND WASHER**OPERATION****Wiper Operation**

- When the wiper switch is at "ON" with the ignition switch at either "ACC" or "ON", current flows through fuse No. 9, rear wiper motor, rear wiper switch and ground; the wiper operate.

Wiper Low-speed and High-speed Operation

- When the front wiper switch is at "LO" with the ignition switch at either "ACC" or "ON", current flows through fuse No. 8, front wiper motor (low-speed brush), front wiper switch and ground; the wipers operate at low speed.
- When the front wiper switch is at "HI", current flows through fuse NO. 8, front wiper motor (high-speed brush), front wiper switch, and ground; the wipers operate at high speed.

Wiper Automatic Stopping Operation

- When the front wiper switch is set at "OFF" to stop the wipers, current flows through the front wiper motor (low-speed brush), front wiper switch, intermittent wiper control relay (contacts), front wiper motor (cam contacts), and ground, causing the front wiper motor to continue operation until the wiper blades return to their park positions.
- Once the wiper blades have reached park positions, the front wiper motor cam moves to open its contacts. This interrupts flow of current to ground, and the front wiper motor stops.

Wiper Intermittent operation

- With the ignition switch at "ACC" or "ON", battery voltage is applied to the intermittent wiper control relay through fuse No. 8.
- When the front wiper switch is at "INT", current flows through the intermittent wiper control relay, front wiper switch, and ground, and the intermittent wiper control relay internal contacts close and open repeatedly.
- While the contacts are closed, current flows through the front wiper motor (low-speed brush), front wiper switch, intermittent wiper control relay (contacts), and ground, causing the front wiper motor to operate.
- When the front wiper motor starts operating, the relay internal contacts open, causing current to flow through the front wiper motor (cam contacts), and ground. This keeps the front wiper motor operating until the wiper blades return to their park positions.
- Once the wiper blades have reached park positions, the front wiper motor cam moves to open its contacts. This interrupts flow of current to ground so the front wiper motor stops.

Wiper Operation Coordinated with Washer

- With the ignition key at the "ACC" or "ON" position, voltage is supplied, through fuse No. 8 and the front washer motor, to the front washer switch.
- When the front washer switch is switched ON, current flows to fuse No.8, the front washer motor, the front washer switch, and ground, and, at the same time that the front washer operates, the intermittent wiper control relay is switched ON, and current flows to fuse No. 8, the front wiper motor (low-speed brushes), the front wiper switch, the intermittent wiper control relay, and ground, and the front wiper motor is activated.

TROUBLESHOOTING HINTS

1. Wipers do not operate
 - (1) Washer also does not operate
 - Check fuse.
 - Check for ground connection.
2. Wipers do not operate at low speed (or high speed)
 - Check front wiper switch.
3. Wipers do not operate in intermittent mode
 - Check intermittent wiper control relay terminal voltage with relay energized.

Terminal	Voltage	Check location
3	0V	Front wiper switch
	12V	Intermittent wiper control relay
	Changes between 0V and 12V repeatedly	– (Normal)

4. Wipers fail to stop
 - Check front wiper motor.
5. Wipers do not operate coordinated with washer
 - Check intermittent wiper control relay.

REAR WIPERS AND WASHER

OPERATION

Wiper Automatic Stopping Operation

- When the rear wiper switch is set at "OFF" to stop the wiper, current flows through the rear wiper motor, rear wiper switch, intermittent rear wiper relay (contacts), rear wiper motor (cam contacts), and ground, causing the rear wiper motor to continue operation until the wiper blade return to its park positions.
- Once the wiper blade has reached park positions, the rear wiper motor cam moves to open its contacts. This interrupts flow of current to ground, and the rear wiper motor stops.

Wiper Intermittent Operation

- With the ignition switch at "ACC" or "ON", battery voltage is applied to the intermittent rear wiper relay through fuse No. 9.
- When the rear wiper switch is at "INT", current flows through the intermittent rear wiper relay, rear wiper switch, and ground, and the intermittent rear wiper relay internal contacts close and open repeatedly.
- While the contacts are closed, current flows through the rear wiper motor, rear wiper switch, intermittent rear wiper relay (contacts), and ground, causing the rear wiper motor to operate.
- When the rear wiper motor starts operating, the relay internal contacts open, causing current to flow through the rear wiper motor (cam contacts), and ground. This keeps the rear wiper motor operating until the wiper blade return to their park positions.
- Once the wiper blade has reached park positions, the rear wiper motor cam moves to open its contacts. This interrupts flow of current to ground so the wiper motor stops.

Rear washer operation

- With the ignition key at the "ACC" or "ON" position, voltage is applied, through fuse No. 9 and the rear washer motor, to the rear washer switch.
- When the rear washer switch is switched ON, current flows to fuse No. 9, the rear washer motor, the rear washer switch, and ground, and the rear washer begins operation.

TROUBLESHOOTING HINTS

1. Wipers do not operate
 - (1) Washer also does not operate
 - Check fuse.
 - Check for ground connection.
2. Wipers do not operate in intermittent mode
 - Check intermittent wiper relay terminal voltage with relay energized.

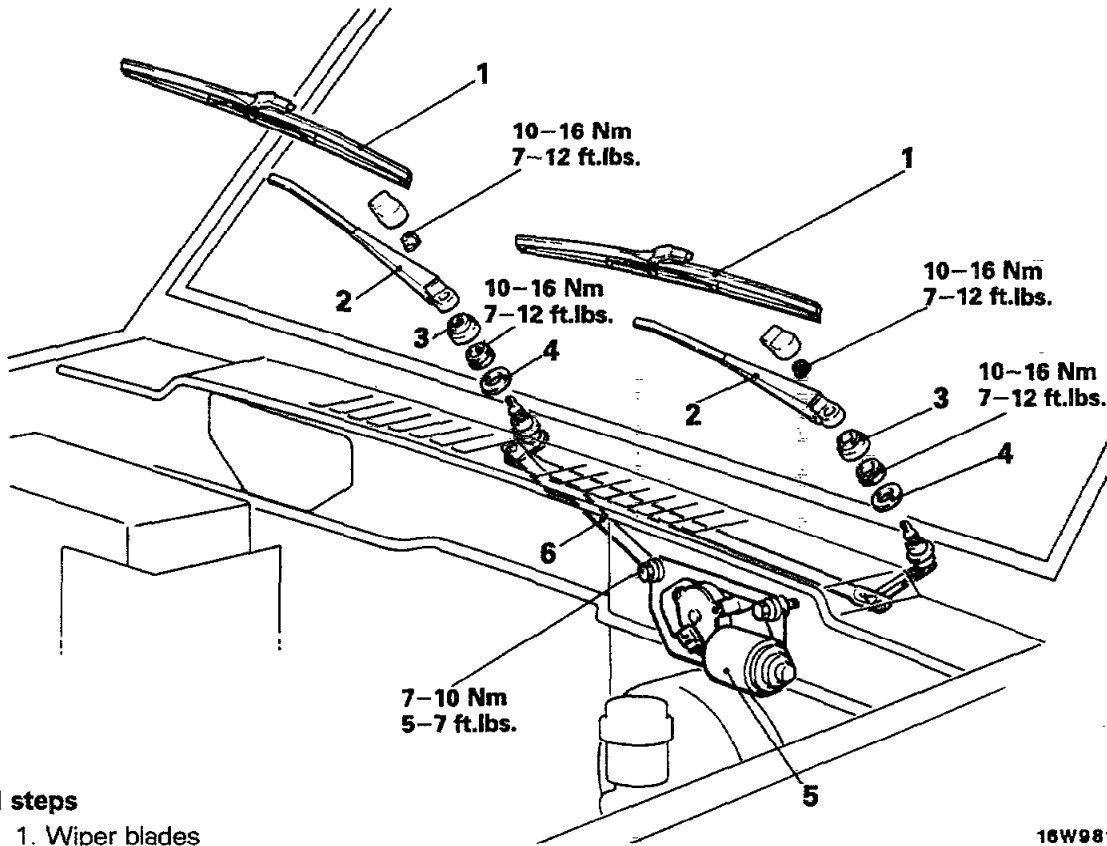
Terminal	Voltage	Check location
3	0V 12V Changes between 12V repeatedly	Rear wiper switch Intermittent wiper relay –(Normal)

3. Wipers fail to stop
 - Check wiper motor.

WINDSHIELD WIPERS

REMOVAL AND INSTALLATION

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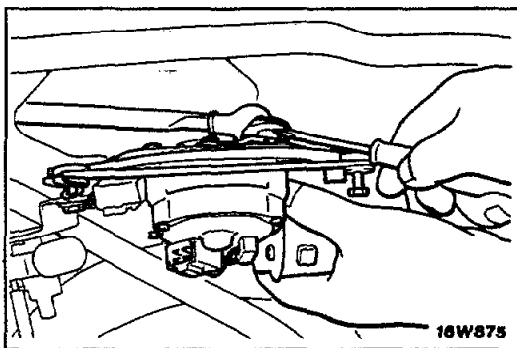
Removal steps

- ◆◆ 1. Wiper blades
- ◆◆ 2. Wiper arms
- ◆◆ 3. Wiper pivot shield caps
- ◆◆ 4. Wiper pivot collars
- ◀▶ 5. Wiper motor
- ◀▶ 6. Wiper link

NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ◆◆ : Refer to "Service Points of Removal".
- (3) ▶◆ : Refer to "Service Points of Installation".

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SERVICE POINTS OF REMOVAL

5. WIPER MOTOR

Uncouple the linkage and motor (with the wiper motor pulled slightly outward).

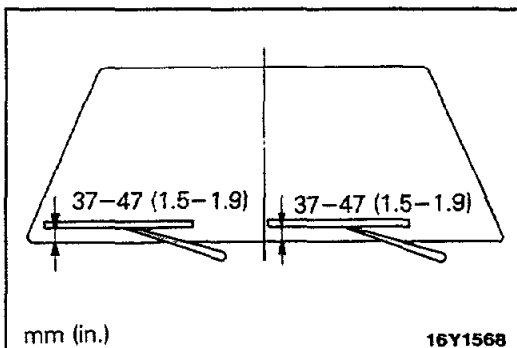
Caution

Because the installation position of the crank arm and the motor determine the wiper auto stop angle, do not disassemble them unless it is necessary to do so. If the crank arm must be removed from the motor, remove it only after marking their mounting positions.

SERVICE POINTS OF INSTALLATION

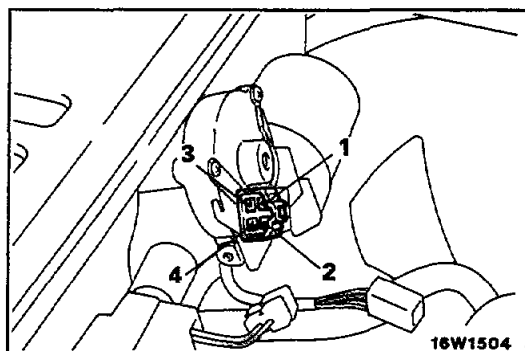
2. INSTALLATION OF WIPER ARMS

Install the wiper arm to the pivot shaft so that the wiper blade's stop position is the position shown in the illustration.



mm (in.)

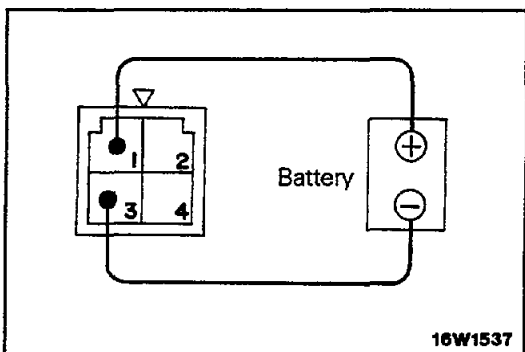
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INSPECTION

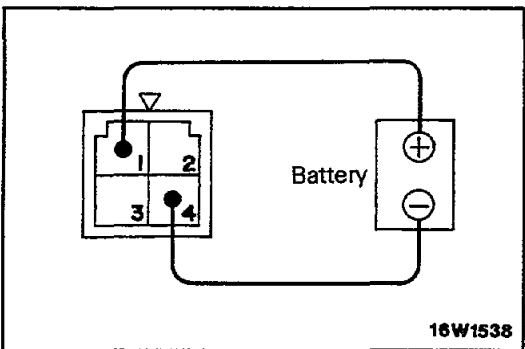
WIPER MOTOR

Disconnect the wiring connector from the wiper motor and connect battery to the wiper motor connector to check that the wiper motor runs.



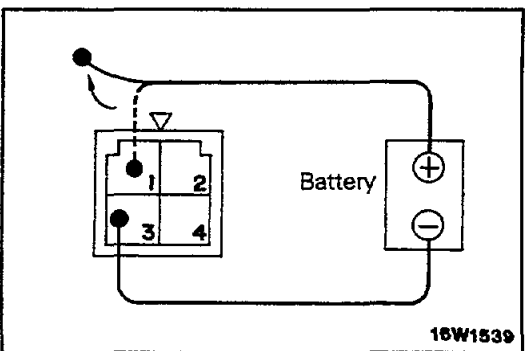
LOW SPEED OPERATION CHECK

Connect battery (+) to terminal 1 and battery (-) to terminal 3 and check that the motor runs at low speed.



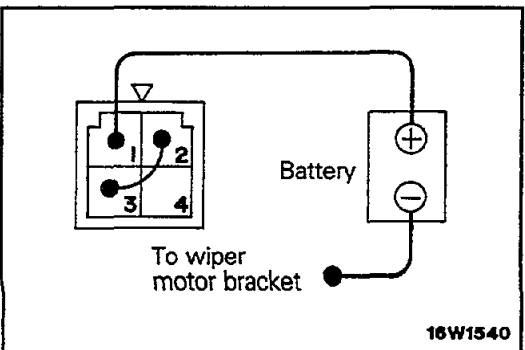
HIGH SPEED OPERATION CHECK

Connect battery (+) to terminal 1 and battery (-) to terminal 4 and check that the motor runs at high speed.

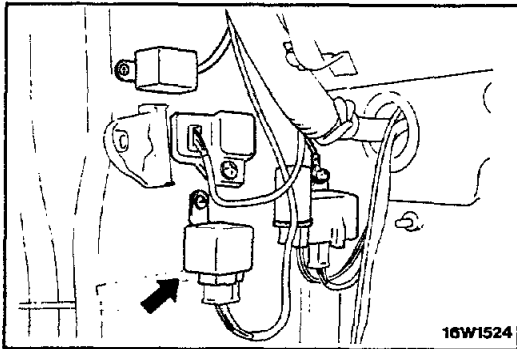


AUTOMATIC STOP OPERATION CHECK

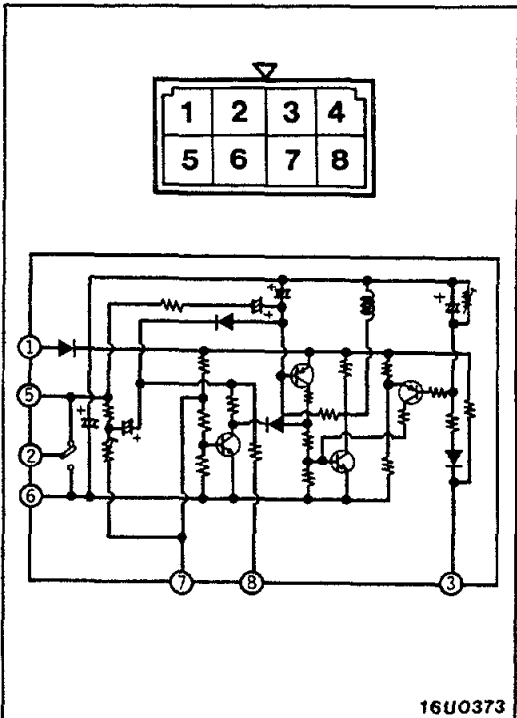
- (1) Connect battery (+) to terminal 1 and battery (-) to terminal 3 to run the motor at low speed.
- (2) Disconnect terminal 1 during operation to stop the motor.



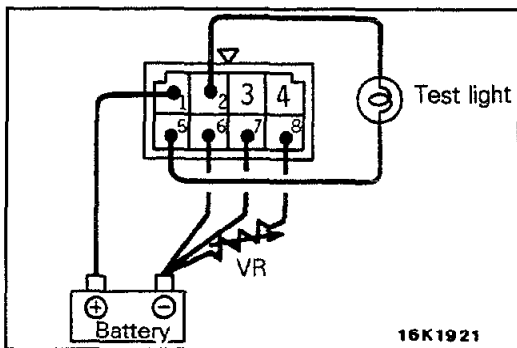
- (3) Connect terminal 2 to terminal 3 and connect battery (+) to terminal 1 and battery (-) to the wiper motor bracket to check that the motor starts to run at low speed and then stops.

**INTERMITTENT WIPER RELAY**

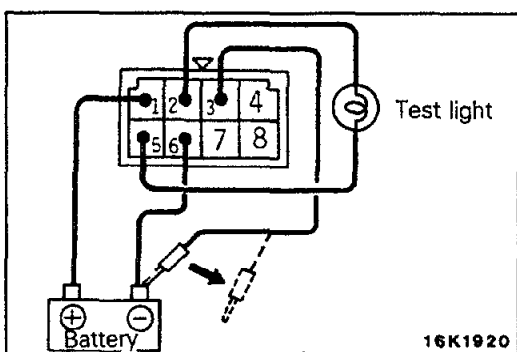
Remove the intermittent wiper relay (located at the upper part of the left side cowl side trim).

**CONTINUITY CHECK**

Check to see that there is continuity between terminals 2 and 5.

**INTERMITTENT OPERATION CHECK**

- (1) Connect the battery and the test light to the relay, as shown in the figure.
- (2) Insert a variable resistance between terminal 8 and battery (-) ($VR = 0-50\text{ k}\Omega$)
- (3) The condition is normal if, when the battery's negative (-) terminal is connected to terminal 7, the test light illuminates at the same time, and thereafter, in accordance with the value of the variable resistance, stops illumination (approx. 1.5 sec. – approx. 10.5 sec.) and then illuminates (approx. 1 sec.) over and over again.

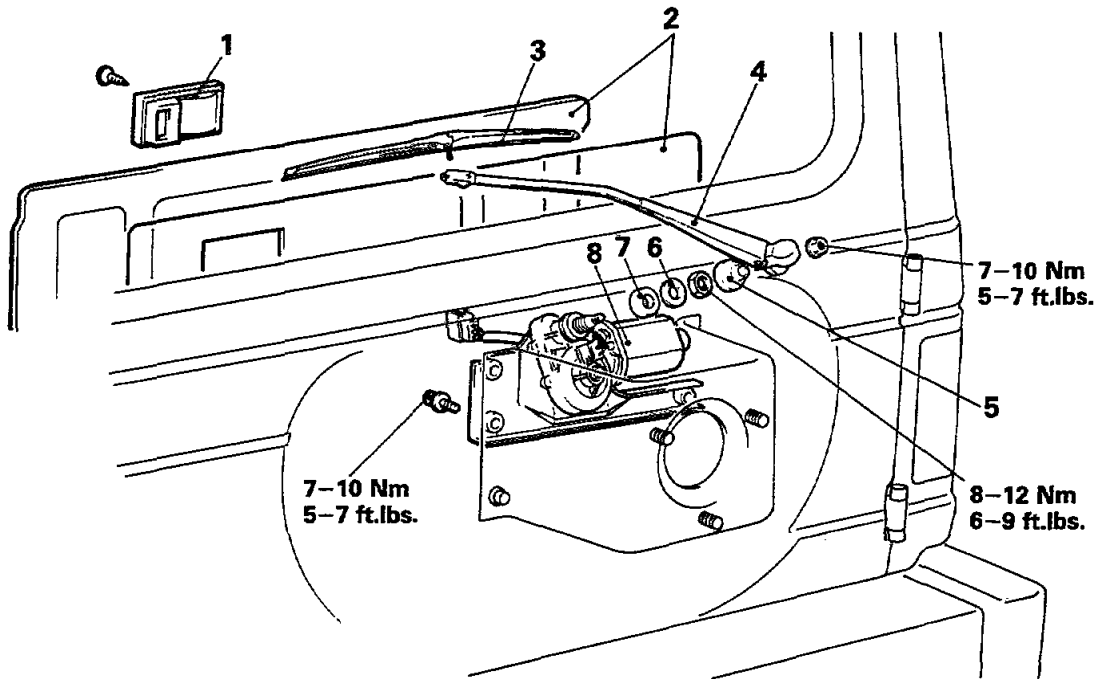
**WASHER INTERLOCK OPERATION CHECK**

- (1) Connect the battery and the test light to the relay, as shown in the figure.
- (2) When terminal 3 is connected to the battery's negative (-) terminal, the test light will illuminate approximately 1 second thereafter, and then there will be a release for about seconds after connecting to the battery's negative (-) terminal.
- (3) The condition is normal if about 3 seconds thereafter the test light stops illumination.

REAR WIPER

REMOVAL AND INSTALLATION

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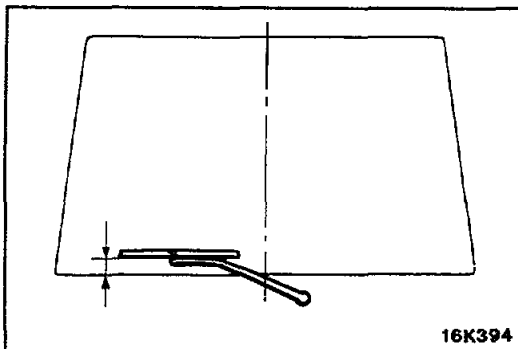
Removal steps

- 1. Inside handle cover
- ◄◄►► 2. Back door trim and waterproof film
- ◄◄ 3. Wiper blade
- 4. Wiper arm
- 5. Wiper pivot cap
- 6. Wiper pivot washer
- 7. Wiper pivot packing
- 8. Wiper motor

NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ◄◄ : Refer to "Service Points of Removal"
- (3) ◄◄ : Refer to "Service Points of Installation"

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SERVICE POINTS OF REMOVAL

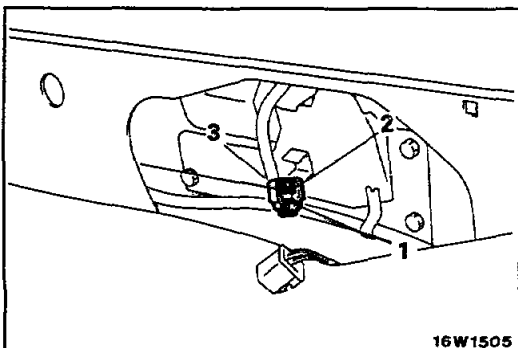
2. REMOVAL OF BACK DOOR TRIM AND WATERPROOF FILM

Refer to GROUP 23 – Back Door Trim and Waterproof Film.

SERVICE POINTS OF INSTALLATION

3. INSTALLATION OF WIPER BLADE

Install the wiper arm so that the wiper blade is parallel to the lower edge of the window glass.



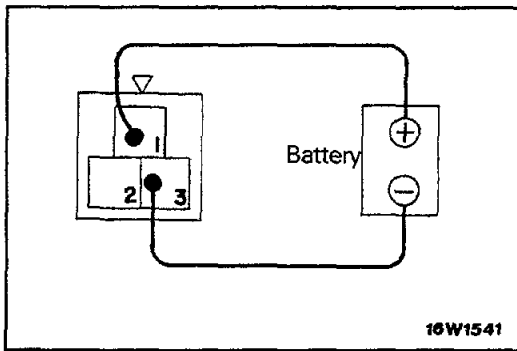
2. INSTALLATION OF BACK DOOR TRIM AND WATERPROOF FILM

Refer to GROUP 23 – Back Door Trim and Waterproof Film.

INSPECTION

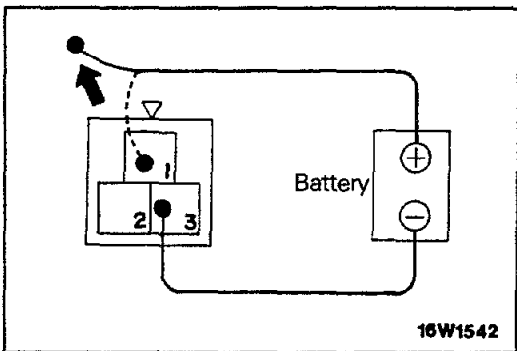
WIPER MOTOR

Disconnect the wiring connector from the wiper motor and connect battery to the wiper motor connector to check that the wiper motor runs.



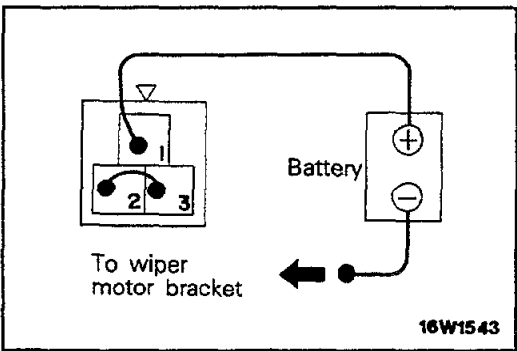
OPERATION CHECK

Connect battery (+) to terminal 1 and battery (-) to terminal 3 to check that the motor runs.



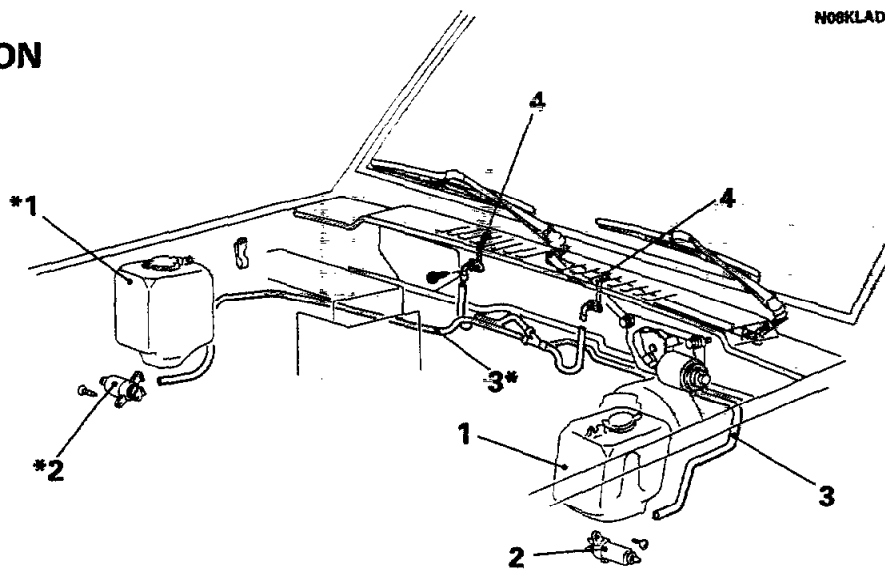
AUTOMATIC OPERATION CHECK

- (1) Connect battery (+) to terminal 1 and battery (-) to terminal 3 to run the motor.
- (2) While the motor is running, disconnect terminal 1 to stop the motor.



- (3) Connect terminal 2 to terminal 3 and connect battery (+) to terminal 1 and battery (-) to wiper motor bracket to check that the motor starts to run again and then stops.

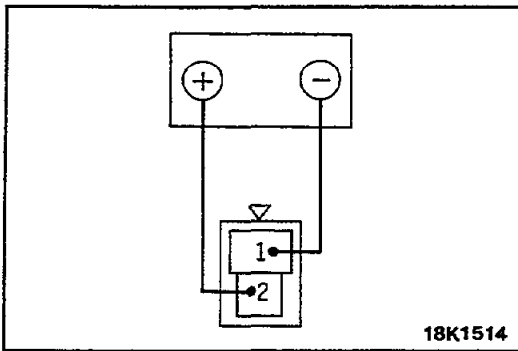
**WINDSHIELD WASHER
REMOVAL AND INSTALLATION**



1. Windshield washer tank
2. Washer motor and pump
3. Washer tube
4. Washer nozzle

NOTE

* indicates vehicles with 2.6L engine.



INSPECTION

WASHER MOTOR AND PUMP

Make the check while the motor is installed to the washer tank.

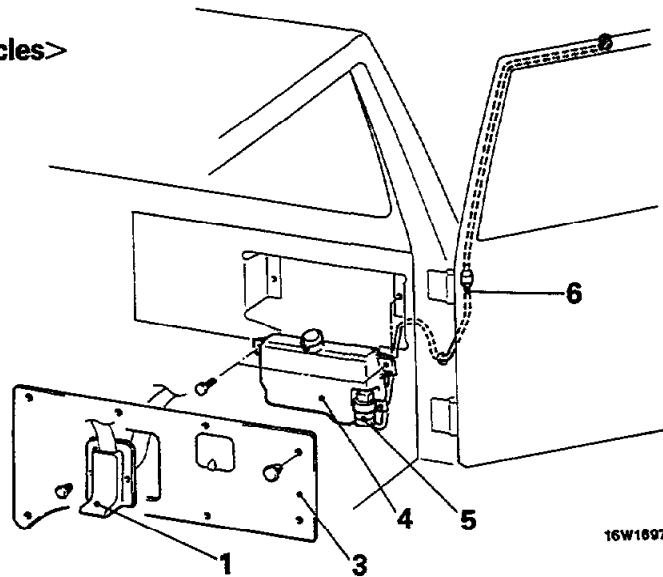
- (1) Check to be sure that there is washer fluid in the washer tank.
- (2) Check to be sure that the washer motor operates and the fluid is forced out under pressure when the battery's positive (+) terminal is connected to terminal 2 and the negative (-) terminal is connected to terminal 1.

REAR WASHER

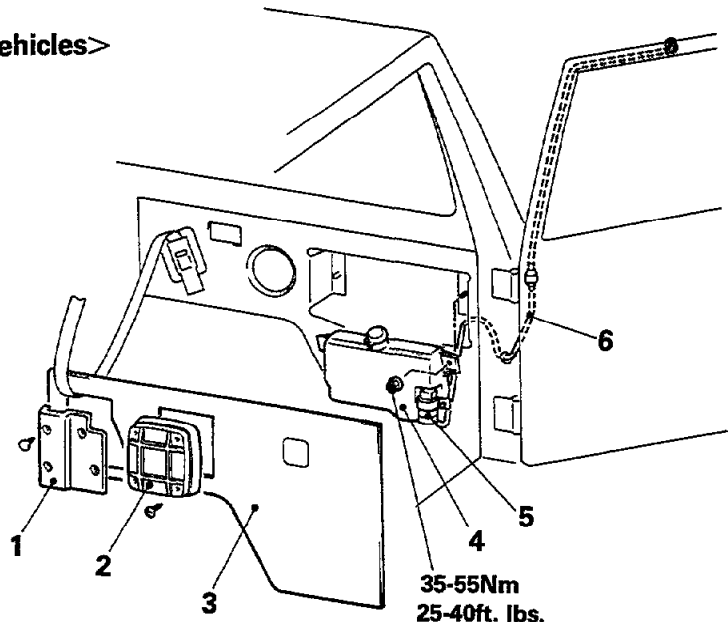
REMOVAL AND INSTALLATION

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<2-door vehicles>



<4-door vehicles>



Removal steps

1. Retractor cover
 2. Speaker
 3. Quarter trim
 4. Rear washer tank
 5. Washer motor and pump
 6. Washer tube, nozzle and tube
- ◀▶▶▶

NOTE

- (1) The rear washer tank for models equipped with the dual air conditioner is installed at the left side.
- (2) Reverse the removal procedures to reinstall.
- (3) ◀▶▶ : Refer to "Service Points of Removal".
- (4) ▶▶▶ : Refer to "Service Points of Installation".

SERVICE POINTS OF REMOVAL**3. REMOVAL OF QUARTER TRIM**

Refer to GROUP 23 – Trims.

INSPECTION**WASHER MOTOR AND PUMP**

Refer to P.8-217.

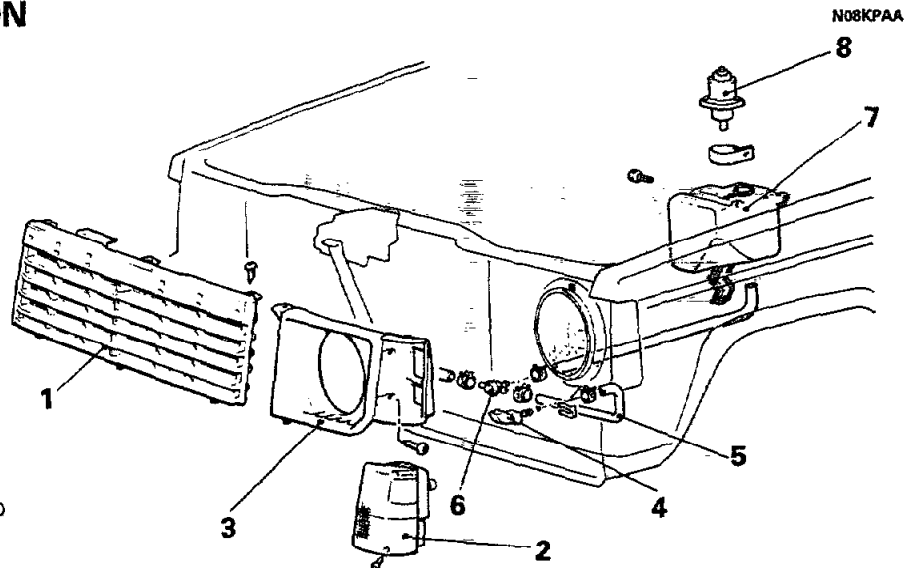
SERVICE POINTS OF INSTALLATION**3. INSTALLATION OF QUARTER TRIM**

Refer to GROUP 23 – Trims.

HEADLIGHT WASHER REMOVAL AND INSTALLATION

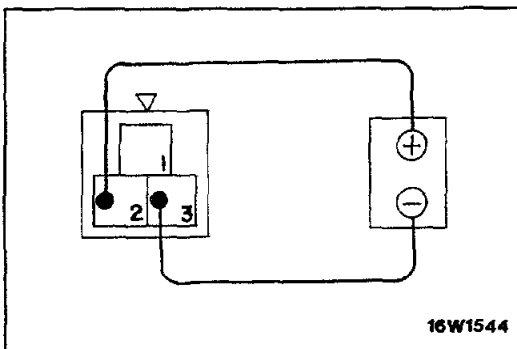
Removal steps

1. Radiator grille
2. Front combination light
3. Headlight bezel
4. Headlight washer nozzle
5. Washer tube
6. Check valve
7. Headlight washer tank
8. Washer motor and pump



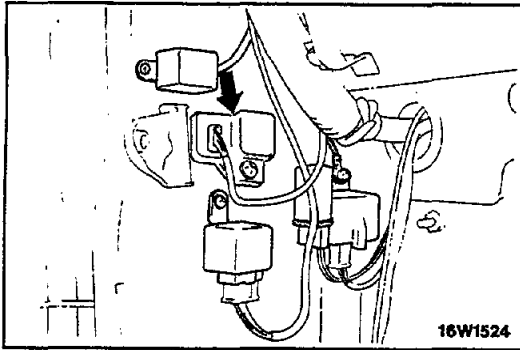
NOTE
Reverse the removal procedures to reinstall.

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**INSPECTION****WASHER MOTOR AND PUMP**

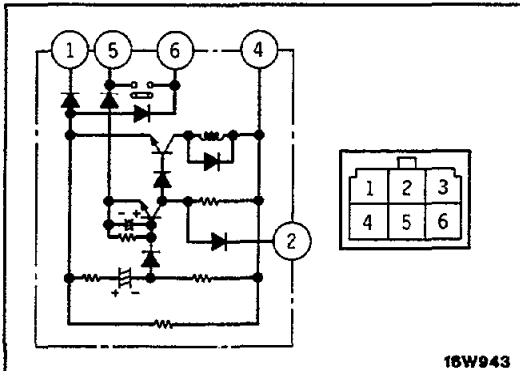
Make the check while the motor is installed to the washer tank.

- (1) Check to be sure that there is washer fluid in the washer tank.
- (2) Check to be sure that the washer motor operates and the fluid is forced out under pressure when the battery's positive (+) terminal is connected to terminal 2 and the negative (-) terminal is connected to terminal 3.



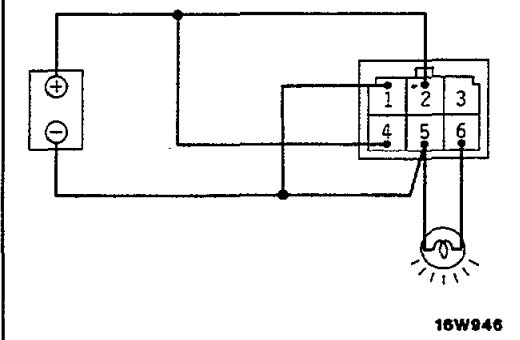
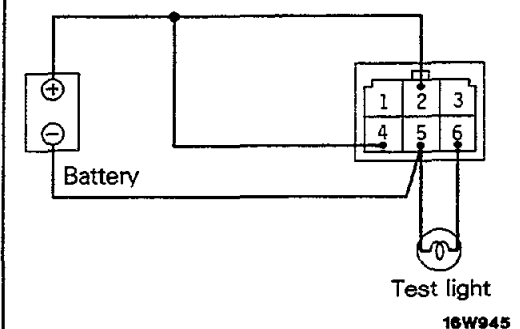
HEADLIGHT WASHER RELAY

Remove the headlight washer relay (located at the upper part of the left side cowl side trim).



WASHER OPERATION CHECK

- (1) Connect the battery and the test light to the relay as shown in the figure.
- (2) If, when terminal 1 is connected to the negative (-) terminal of the battery, the light illuminates (for about 0.5 second), the unit is operating normally.



COLUMN SWITCH

REMOVAL AND INSTALLATION

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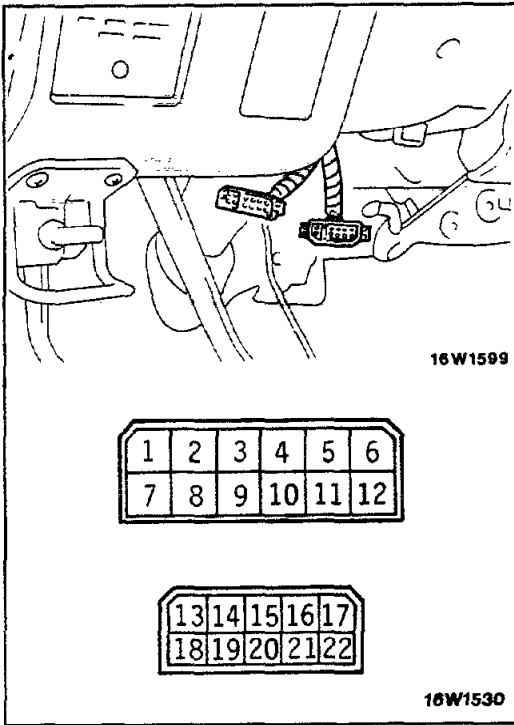
Refer to P. 8-200.

SERVICE POINTS OF REMOVAL

Refer to P. 8-200.

INSPECTION

Remove the steering lower cover, and then detach the connector of the column switch from the wiring harness. Operate the switch and check the continuity between the terminals.



WIPER AND WASHER SWITCH

Terminal	20	18	15	14	19	13
Switch position						
OFF	○—○			○—○	○—○	○—○
INT	○—○			○—○	○—○	○—○
LO	○—○			○—○	○—○	○—○
HI		○—○		○—○	○—○	○—○

NOTE
 (1) ○—○ indicates that there is continuity between the terminals.
 (2) The dotted lines indicate that the washer switch ON.

HEADLIGHT WASHER

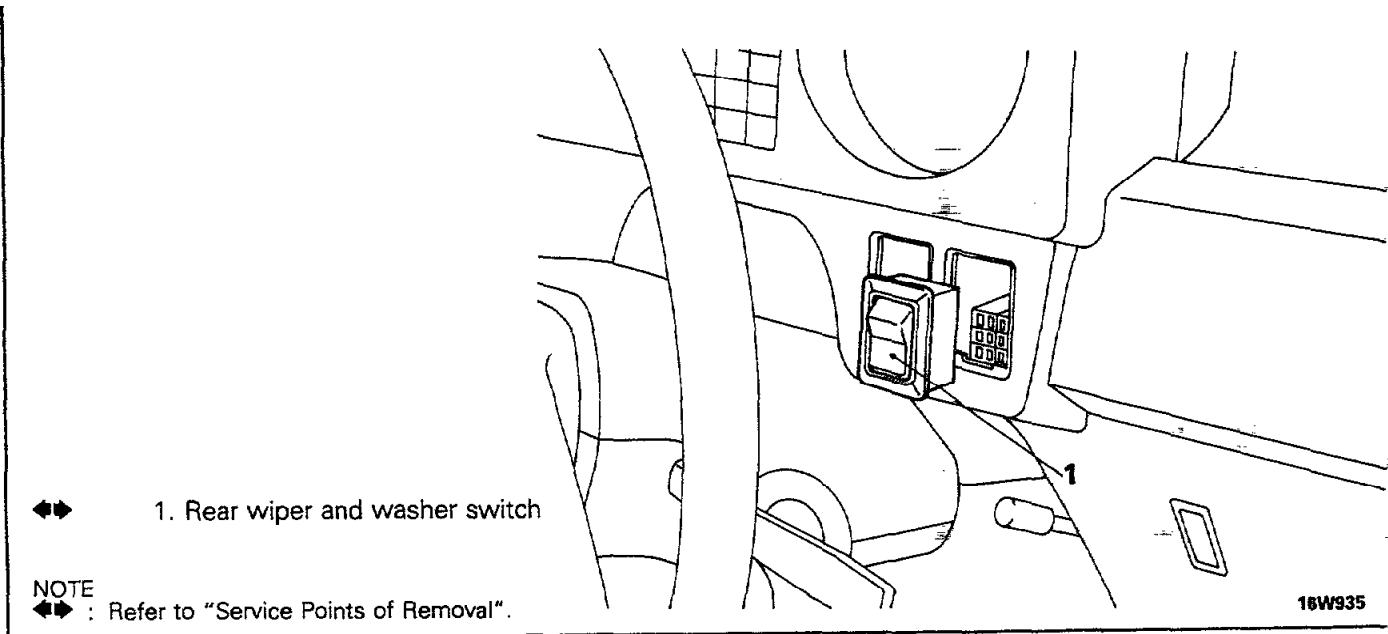
Terminal	12	5
Switch Position		
OFF		
ON	○—○	

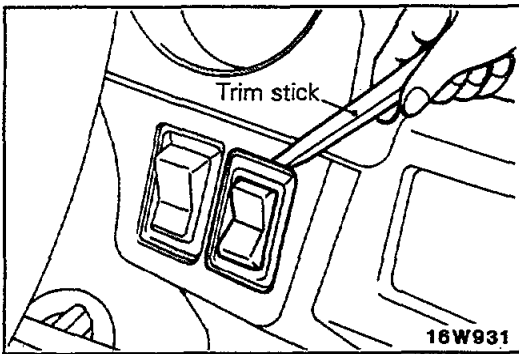
NOTE
 ○—○ indicates that there is continuity between the terminals.

REAR WIPER AND WASHER SWITCH

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REMOVAL AND INSTALLATION

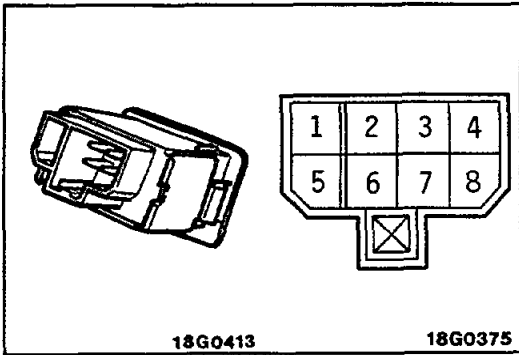




SERVICE POINTS OF REMOVAL

1. REMOVAL OF REAR WIPER AND WASHER SWITCH

Insert the trim stick into the switch and pry the switch to remove it from the instrument panel.



INSPECTION

Operate the switch, and check the continuity between the terminals.

Terminal		Terminal					
		7	5	3	8	2	6
Switch position							
Wiper switch	ON	○				○	
	OFF		○			○	
	INT		○		○	○	
Washer switch	ON	○					○
	OFF						

NOTE

○—○ indicates that there is continuity between the terminals.