

SECTION

WW

WIPER, WASHER & HORN

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PRECAUTIONS

PRECAUTIONS

PFP:00011

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

EKS0090P

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

Wiring Diagrams and Trouble Diagnosis

EKS0090Q

When you read wiring diagrams, refer to the following:

- [GI-14, "How to Read Wiring Diagrams"](#) in GI section
- [PG-3, "POWER SUPPLY ROUTING"](#) for power distribution circuit in PG section

When you perform trouble diagnosis, refer to the following:

- [GI-11, "HOW TO FOLLOW TEST GROUPS IN TROUBLE DIAGNOSES"](#) in GI section
- [GI-24, "How to Perform Efficient Diagnosis for an Electrical Incident"](#) in GI section

WW

FRONT WIPER AND WASHER SYSTEM

FRONT WIPER AND WASHER SYSTEM

PFP:28810

System Description WIPER OPERATION

EKS009OR

The wiper switch is controlled by a lever built into the combination switch.
There are three wiper switch positions:

- LO speed
- HI speed
- INT (Intermittent)

With the ignition switch in the ON or START position, power is supplied

- through 20A fuse [No. 25, located in the fuse block (J/B)]
- to front wiper motor terminal 1.

Ground is supplied to wiper and washer switch terminal 17 through body grounds E10 and E58.

LOW AND HIGH SPEED WIPER OPERATION

When the wiper switch is placed in the LO or MIST position, ground is supplied

- through terminal 14 of the front wiper and washer switch
- to front wiper motor terminal 5.

With power and ground supplied, the wiper motor operates at low speed.

When the wiper switch is placed in the HI position, ground is supplied

- through terminal 16 of the front wiper and washer switch
- to wiper motor terminal 3.

With power and ground supplied, the wiper motor operates at high speed.

AUTO STOP OPERATION

With wiper switch turned OFF, wiper motor will continue to operate until wiper arms reach windshield base.

When wiper arms are not located at base of windshield with wiper switch OFF, ground is provided

- from terminal 14 of the front wiper and washer switch
- to front wiper motor terminal 5, in order to continue wiper motor operation at low speed.

Ground is also supplied

- through terminal 13 of the front wiper and washer switch
- to front wiper motor terminal 4
- through terminal 6 of the front wiper motor, and
- through body grounds E10 and E58.

When wiper arms reach base of windshield, front wiper motor terminals 1 and 4 are connected instead of terminals 6 and 4. Wiper motor will then stop wiper arms at the STOP position.

INTERMITTENT OPERATION

The front wiper motor operates the wiper arms one time at low speed at a set interval of approximately 1 to 13 seconds. This feature is controlled by the wiper amplifier (INT SW) combined with front wiper and washer switch.

When the wiper switch is placed in the INT position, ground is supplied to wiper amplifier.

The desired interval time is input to wiper amplifier (INT VR) from wiper volume switch combined with front wiper and washer switch.

Then intermittent ground is supplied

- through wiper amplifier (OUTPUT) and
- through terminal 14 of front wiper and washer switch
- to front wiper motor terminal 5.

The wiper motor operates at low speed at the desired interval.

WASHER OPERATION

With the ignition switch in the ON or START position, power is supplied

- through 15A fuse [No. 26, located in the fuse block (J/B)]
- through front wiper and washer switch terminals 15 and 18

FRONT WIPER AND WASHER SYSTEM

- to washer motor terminal 1.

When the lever is pulled to the MIST position, ground is supplied

- from body grounds E10 and E58
- through terminal 17 of the front wiper and washer switch, and
- through terminal 22 of the wiper switch
- to front washer motor terminal 2.

With power and ground supplied, the washer motor operates.

When the lever is pulled to the MIST position for one second or more, the wiper motor operates at low speed for approximately 3 seconds to clean windshield. This feature is controlled by the wiper amplifier in the same manner as the intermittent operation.

A

B

C

D

E

F

G

H

I

J

WW

L

M

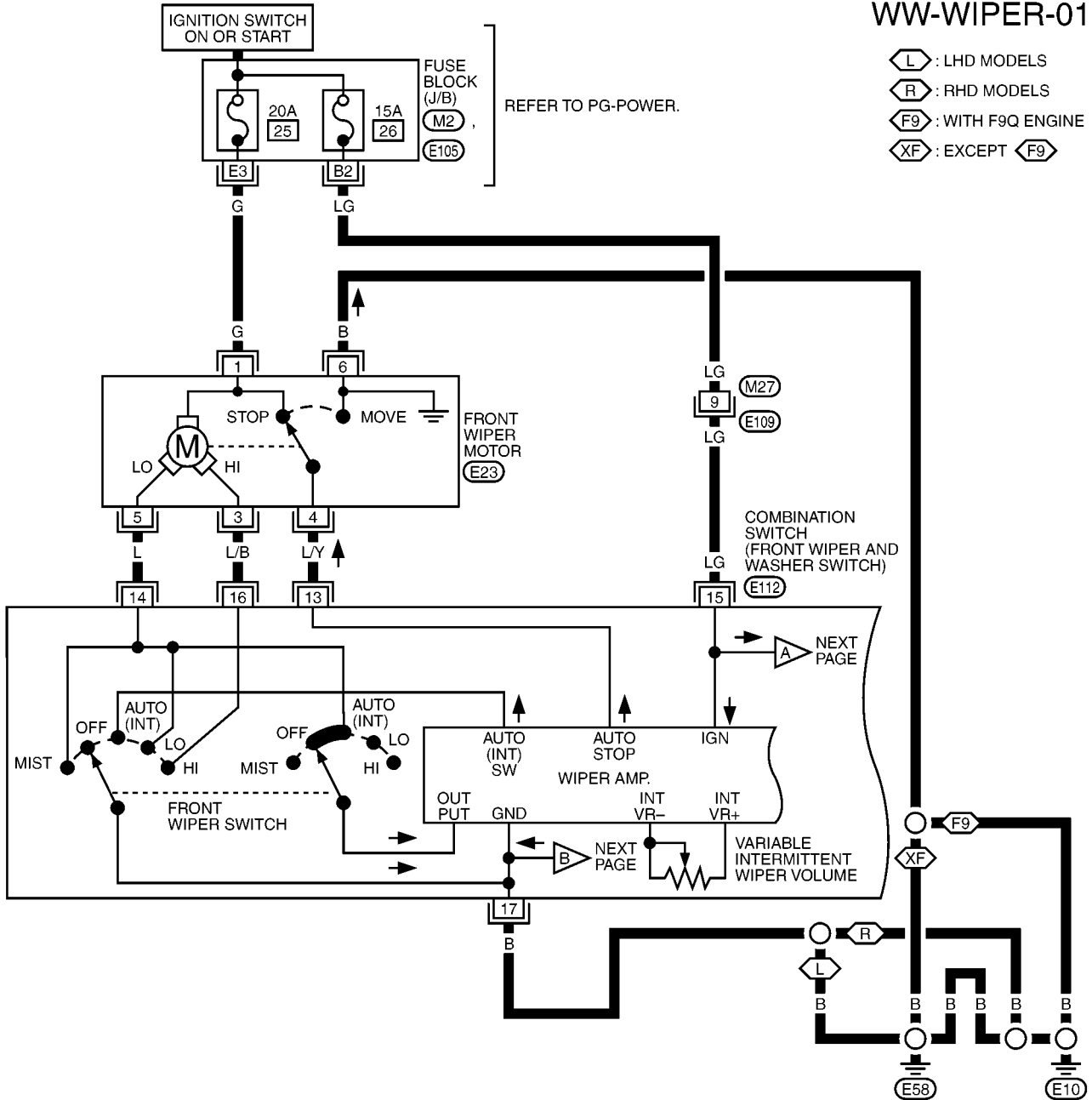
FRONT WIPER AND WASHER SYSTEM

Wiring Diagram — WIPER —

EKS0090S

WW-WIPER-01

- (L) : LHD MODELS
- (R) : RHD MODELS
- (F9) : WITH F9Q ENGINE
- (XF) : EXCEPT (F9)




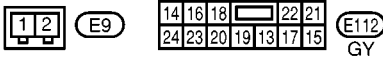
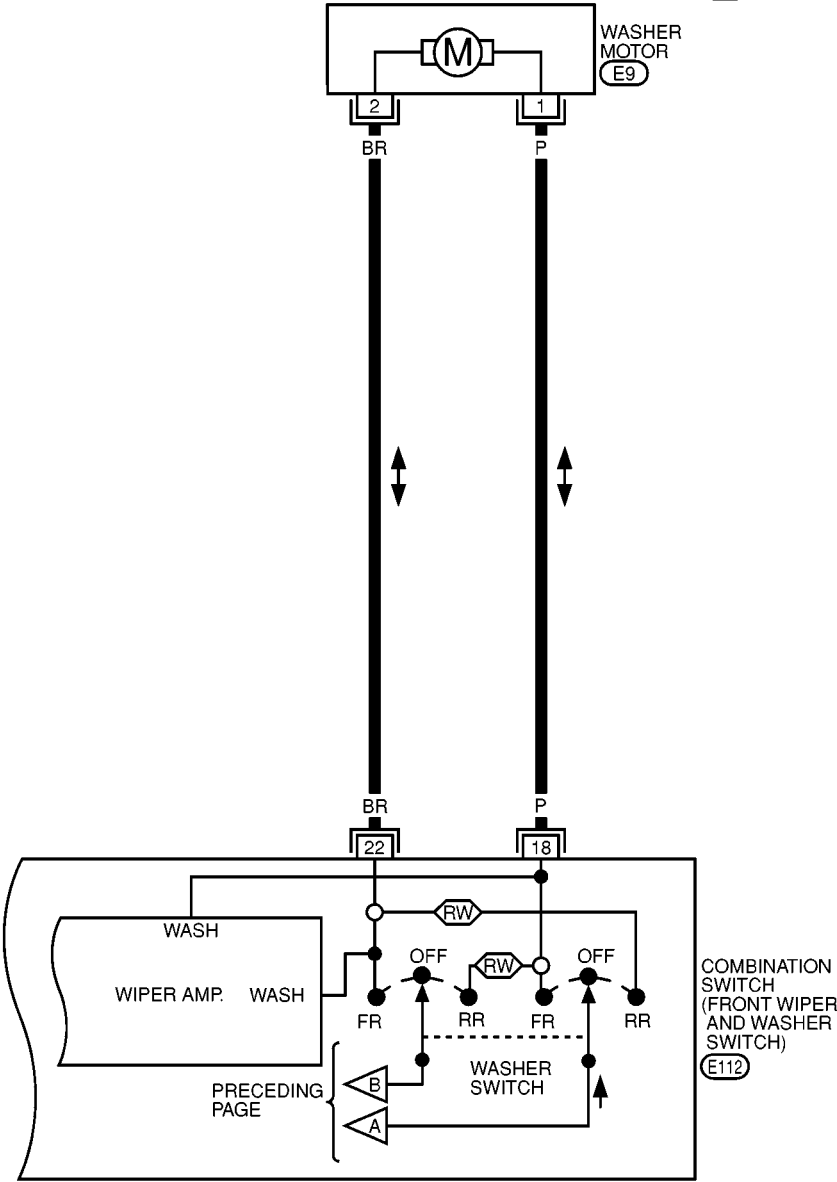
1 3 5 6 4	E23 GY	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	E109 W	14 16 18 22 21 24 23 20 19 13 17 15	E112 GY
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REFER TO THE FOLLOWING.
(M2), (E105) - FUSE BLOCK-
JUNCTION BOX (J/B)

FRONT WIPER AND WASHER SYSTEM

WW-WIPER-02

 : WITH REAR WIPER AND WASHER



FRONT WIPER AND WASHER SYSTEM

Terminal and Reference Values for Combination Switch

EKS0090T

TER- MINAL NO.	WIRE COLOR	ITEM	CONDITION			DATA (DC Voltage)
			IGNI- TION SWITCH	CONDITION OR OPERATION		
13	L/Y	Wiper auto stop signal	ON	Wiper is moving		Approx. 0
				Wiper while the vehicle is stopped		Approx. 12
14	L	Wiper motor operation signal (LO)	ON	Wiper switch	OFF	Approx. 12
					LO	Approx. 0
15	LG	Ignition ON signal	ON	—		Approx. 12
16	L/B	Wiper motor operation signal (HI)	ON	Wiper switch	OFF	Approx. 12
					HI	Approx. 0
17	B	Ground	OFF	—		—
18	P	Washer motor operation signal	ON	Washer switch	WASH (FR)	Approx. 12
22	BR	Washer motor opreation signal	ON	Washer switch	WASH (FR)	Approx. 0

Trouble Diagnosis SYMPTOM CHART

EKS0090U

Symptom	Possible cause	Repair order
Front wiper does not operate.	Power supply and ground circuit	Check power supply and ground circuit (WW-9).
	Wiper motor	Replace wiper motor.
	Front wiper and washer switch	Check front wiper and washer switch (WW-52).
Low speed wiper operation does not operate.	Open or short circuit	Check harness for open or short (WW-10).
	Front wiper and washer switch	Check front wiper and washer switch (WW-52).
High speed wiper operation does not operate.	Open or short circuit	Check harness for open or short (WW-10).
	Front wiper and washer switch	Check front wiper and washer switch (WW-52).
Intermittent wiper operation does not operate.	Front wiper and washer switch	Check front wiper and washer switch (WW-52).
Auto stop wiper operation does not operate.	Open or short circuit	Check harness for open or short (WW-11).
	Front wiper and washer switch	Check front wiper and washer switch (WW-52).
Front washer does not operate.	Open or short circuit	Check harness for open or short (WW-11).
	Front wiper and washer switch	Check front wiper and washer switch (WW-52).
	Washer motor	Replace washer motor.

FRONT WIPER AND WASHER SYSTEM

POWER SUPPLY AND GROUND CIRCUIT CHECK

1. POWER SUPPLY CIRCUIT CHECK

1. Turn ignition switch OFF.
2. Disconnect front wiper and washer switch and front wiper motor harness connector.
3. Check the following.
 - Voltage between front wiper and washer switch harness connector E112 terminal 15 and ground.
 - Voltage between front wiper motor harness connector E23 terminal 1 and ground.

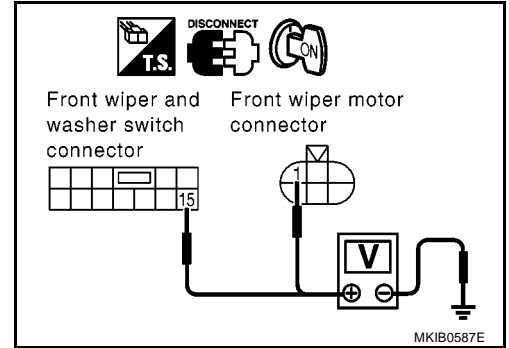
Terminals			Ignition switch position	
(+) (wire color)		(-)	OFF	ON or ATSR
Connector	Terminal			
E112	15 (LG)	Ground	0V	Battery voltage
E23	1 (G)	Ground	0V	Battery voltage

OK or NG

Yes >> GO TO 2.

No >> Check the following.

- 20A fuse [No. 25, located in fuse block (J/B)]
- 15A fuse [No. 26, located in fuse block (J/B)]
- Harness for open or short between fuse and front wiper motor or front wiper and washer switch.



2. GROUND CIRCUIT CHECK

Check the following.

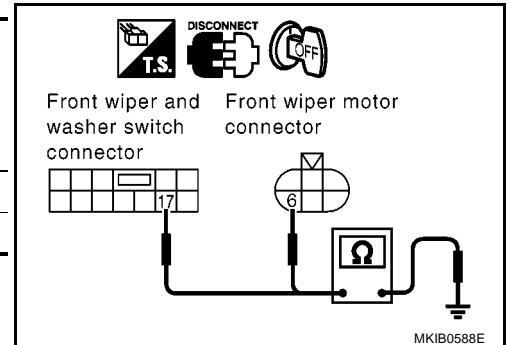
- Continuity between front wiper and washer switch harness connector E112 terminal 17 and ground.
- Continuity between front wiper motor harness connector E23 terminal 6 and ground.

Terminals			Continuity
(+)		(-)	
Connector	Terminal (wire color)		
E112	17 (B)	Ground	Yes
E23	6 (B)	Ground	Yes

OK or NG

OK >> INSPECTION END

NG >> Harness for open ground circuit



FRONT WIPER AND WASHER SYSTEM

LOW SPEED CIRCUIT CHECK

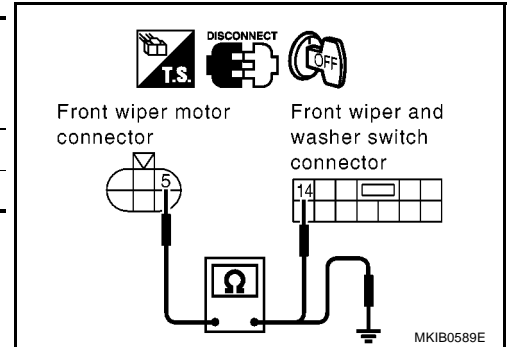
1. CHECK HARNESS FOR OPEN OR SHORT

1. Turn ignition switch OFF.
2. Disconnect front wiper motor and front wiper and washer switch harness connector.
3. Check the following.
 - Continuity between front wiper motor harness connector E23 terminal 5 and front wiper and washer switch harness connector E112 terminal 14.
 - Continuity between front wiper motor harness connector E23 terminal 5 and body ground.

Terminal				Continuity
Connector	Terminal (wire color)	Connector	Terminal (wire color)	
E23	5 (L)	E112	14 (L)	Yes
		Ground		No

OK or NG

- OK >> INSPECTION END
NG >> Repair or replace harness.



HIGH SPEED CIRCUIT CHECK

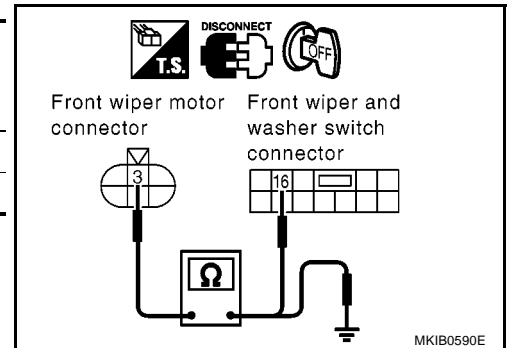
1. CHECK HARNESS FOR OPEN OR SHORT

1. Turn ignition switch OFF.
2. Disconnect front wiper motor and front wiper and washer switch harness connector.
3. Check the following.
 - Continuity between front wiper motor harness connector E23 terminal 3 and front wiper and washer switch harness connector E112 terminal 16.
 - Continuity between front wiper motor harness connector E23 terminal 3 and body ground.

Terminal				Continuity
Connector	Terminal (wire color)	Connector	Terminal (wire color)	
E23	3 (L/B)	E112	16 (L/B)	Yes
		Ground		No

OK or NG

- OK >> INSPECTION END
NG >> Repair or replace harness.



FRONT WIPER AND WASHER SYSTEM

AUTO STOP CIRCUIT CHECK

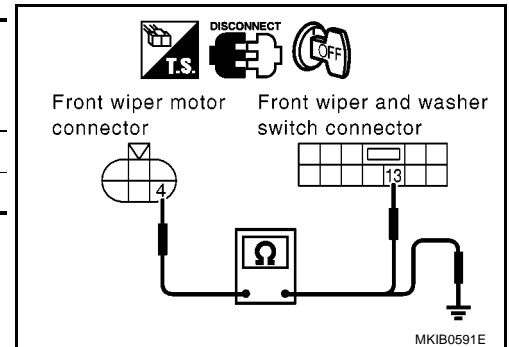
1. CHECK HARNESS FOR OPEN OR SHORT

1. Turn ignition switch OFF.
2. Disconnect front wiper motor and front wiper and washer switch harness connector.
3. Check the following.
 - Continuity between front wiper motor harness connector E23 terminal 4 and front wiper and washer switch harness connector E112 terminal 13.
 - Continuity between front wiper motor harness connector E23 terminal 4 and body ground.

Terminal				Continuity
Connector	Terminal (wire color)	Connector	Terminal (wire color)	
E23	4 (L/Y)	E112	13 (L/Y)	Yes
		Ground		No

OK or NG

- OK >> INSPECTION END
 NG >> Repair or replace harness.



WASHER MOTOR CIRCUIT CHECK

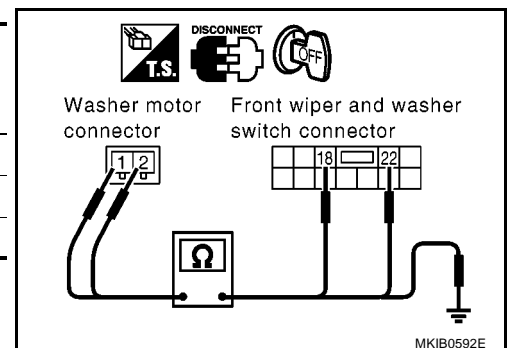
1. CHECK HARNESS FOR OPEN OR SHORT

1. Turn ignition switch OFF.
2. Disconnect washer motor and front wiper and washer switch harness connector.
3. Check the following.
 - Continuity between washer motor harness connector E9 terminal 1 and front wiper and washer switch harness connector E112 terminal 18.
 - Continuity between washer motor harness connector E9 terminal 2 and front wiper and washer switch harness connector E112 terminal 22.
 - Continuity between washer motor harness connector E9 terminals 1, 2 and body ground.

Terminal				Continuity
Connector	Terminal (wire color)	Connector	Terminal (wire color)	
E9	1 (P)	E112	18 (P)	Yes
	2 (BR)		22 (BR)	Yes
	1 (P), 2 (BR)	Ground		No

OK or NG

- OK >> INSPECTION END
 NG >> Repair or replace harness.

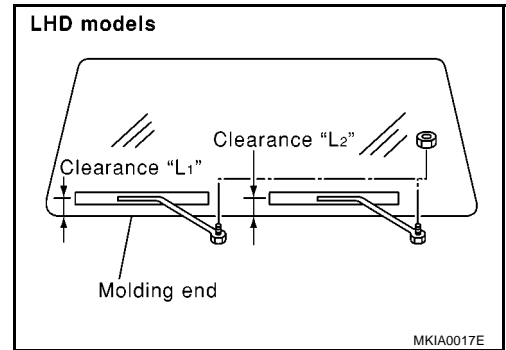


FRONT WIPER AND WASHER SYSTEM

Removal and Installation for Front Wiper Arms, Adjustment for Wiper Arms Stop Location

EKS0090V

1. Prior to wiper arm installation, turn on wiper switch to operate wiper motor and then turn it "OFF" (Auto Stop).
2. Lift the blade up and then set it down onto glass surface to set the blade center to clearance "L1" & "L2" immediately before tightening nut.
3. Eject washer fluid. Turn on wiper switch to operate wiper motor and then turn it "OFF".



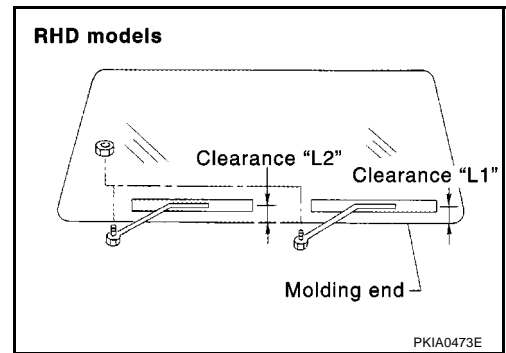
4. Ensure that wiper blades stop within clearance "L1" & "L2".

Clearance "L1": 23.3 - 38.3 mm (0.917 - 1.508 in)

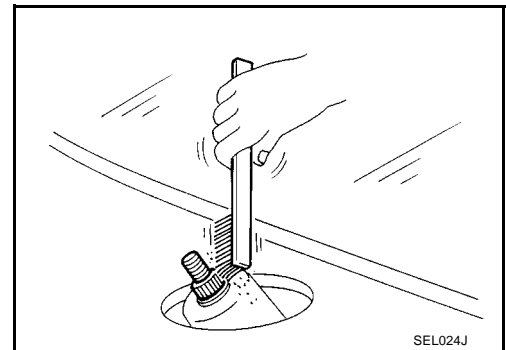
Clearance "L2": 21.8 - 36.8 mm (0.858 - 1.449 in)

- Tighten wiper arm nuts to specified torque.

Front wiper: 21.4 - 26.5 N·m (2.2 - 2.7 kg-m, 16 - 20 ft-lb)

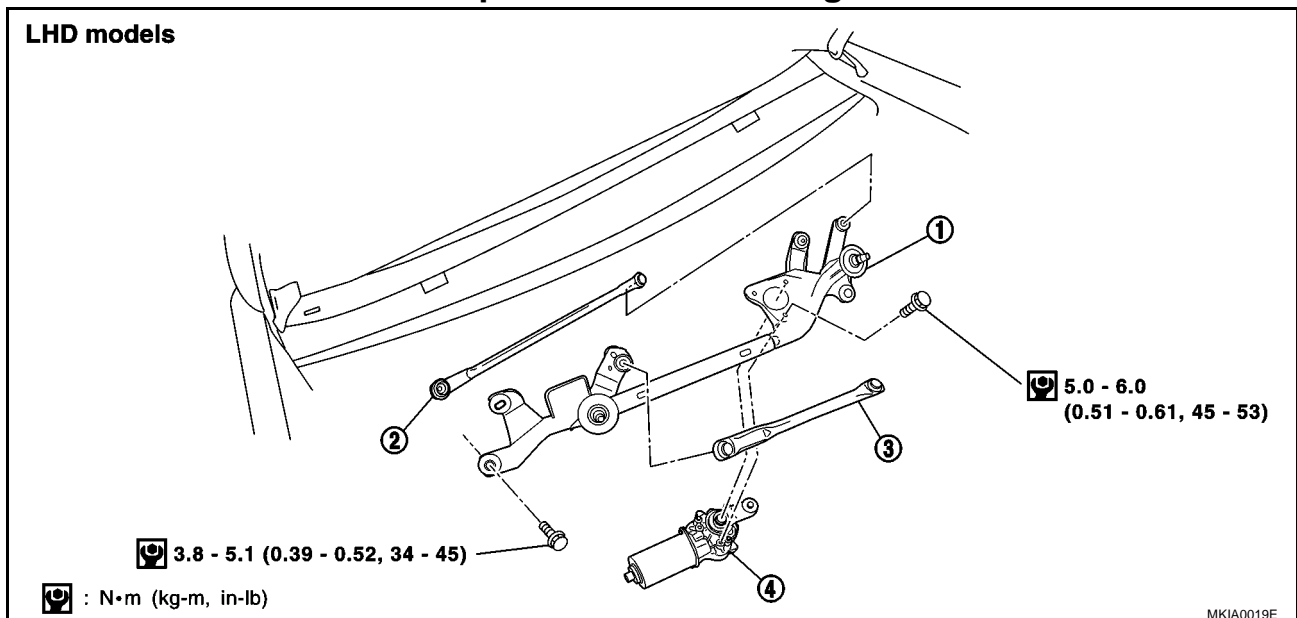


- Before reinstalling wiper arm, clean up the pivot area as illustrated. This will reduce possibility of wiper arm looseness.



Removal and Installation for Wiper Motor and Linkage

EKS0090W

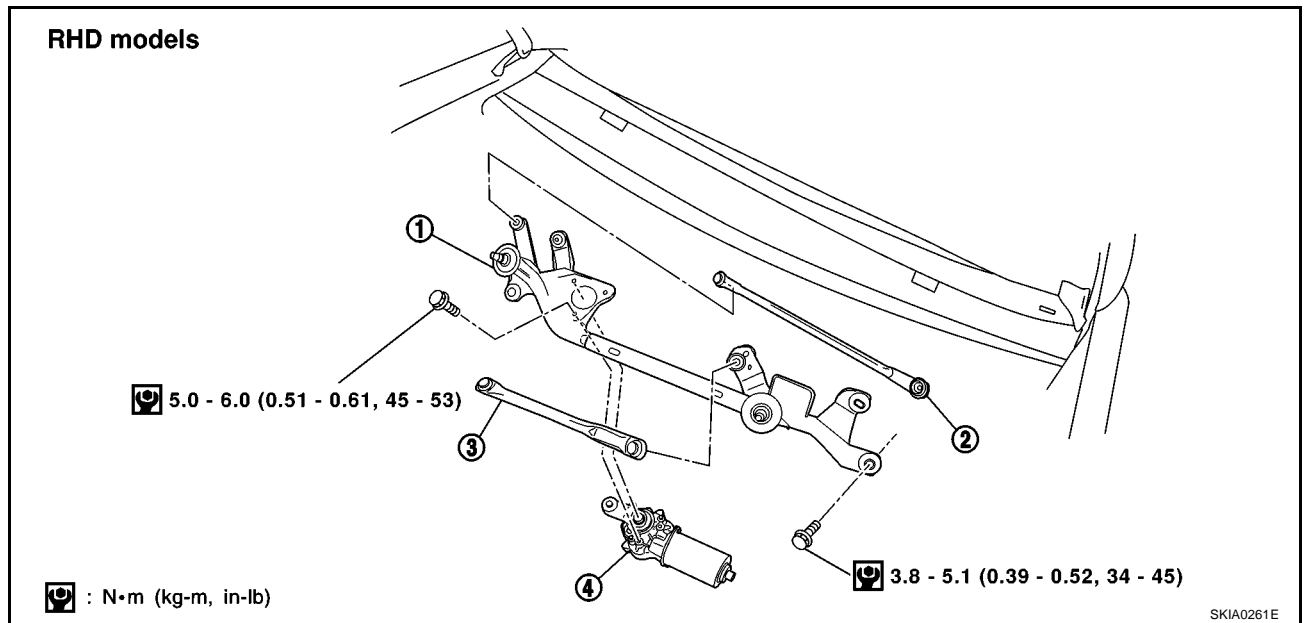


FRONT WIPER AND WASHER SYSTEM

1. Wiper frame
4. Wiper motor

2. Wiper link

3. Wiper link



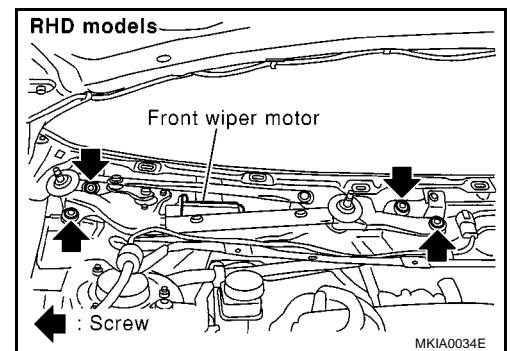
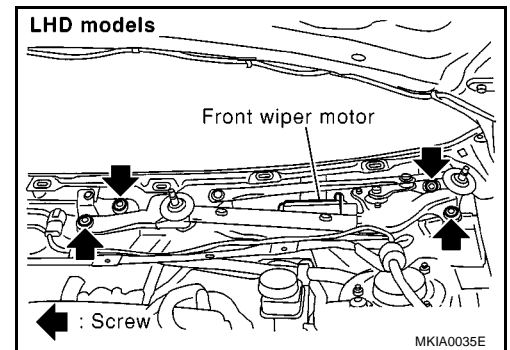
1. Wiper frame
4. Wiper motor

2. Wiper link

3. Wiper link

REMOVAL

1. Operate the wiper motor, and stop it at the auto stop position.
2. Remove wiper arm from the vehicle.
3. Remove the cowl top cover. Refer to EI section in P12 ESM (SM2E00-1P12E0E).
4. Remove 4 screws and remove wiper motor assembly from the vehicle.
5. Disconnect wiper motor connector.
6. Remove wiper link from wiper frame.
7. Remove wiper motor from wiper frame.



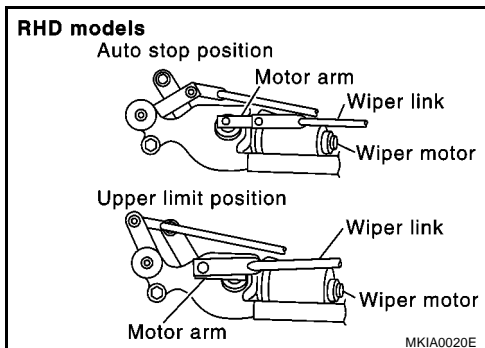
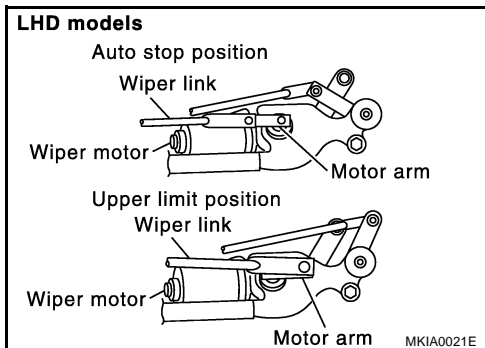
FRONT WIPER AND WASHER SYSTEM

INSTALLATION

1. Connect wiper motor to connector. Turn the wiper switch ON to operate wiper motor, then turn the wiper switch OFF (auto stop).
2. Disconnect wiper motor connector.
3. Install wiper motor to the wiper frame.
4. Install wiper motor assembly to the vehicle.
5. Install wiper link to the wiper motor arm.
6. Connect wiper motor connector. Turn the wiper switch ON to operate the wiper motor, then turn wiper switch OFF (auto stop)
7. Rotate motor arm to the upper limit position.
8. Install wiper motor assembly to the vehicle.
9. Turn the wiper switch ON to operate the wiper motor, then turn wiper switch OFF (auto stop)
10. Install cowl top cover. Refer to EI section in P12 ESM (SM2E00-1P12E0E).
11. Install wiper arm to the vehicle.

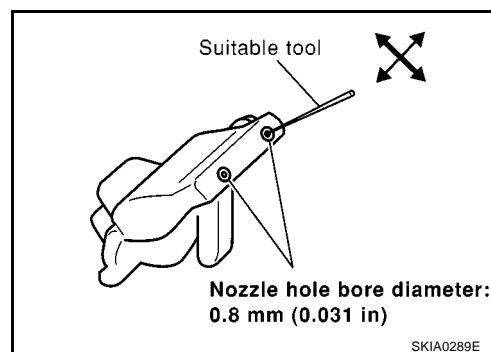
CAUTION:

- Do not drop the wiper motor or cause it to contact other parts.
- Check the grease conditions of the motor arm and wiper link joint (at retainer). Apply grease if necessary.



Washer Nozzle Adjustment

Adjust washer nozzle with suitable tool as shown in the figure at right.

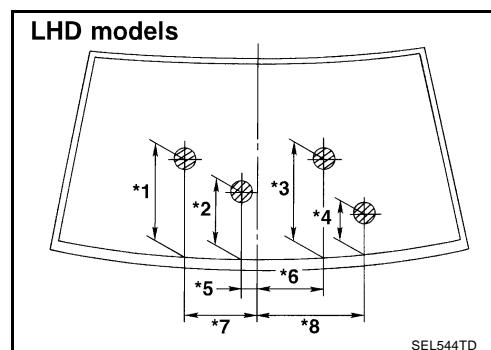


Unit: mm (in)

*1	385 (15.16)	*5	120 (4.72)
*2	245 (9.65)	*6	207 (8.15)
*3	314 (12.36)	*7	295 (11.61)
*4	212 (8.35)	*8	454 (17.87)

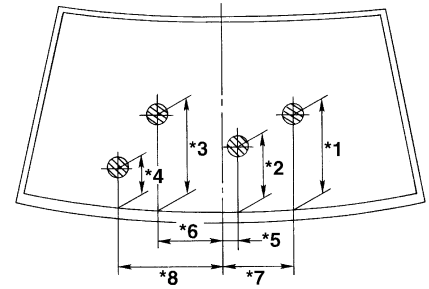
NOTE:

- *: The diameters of these circles are less than 80 mm (3.15 in).



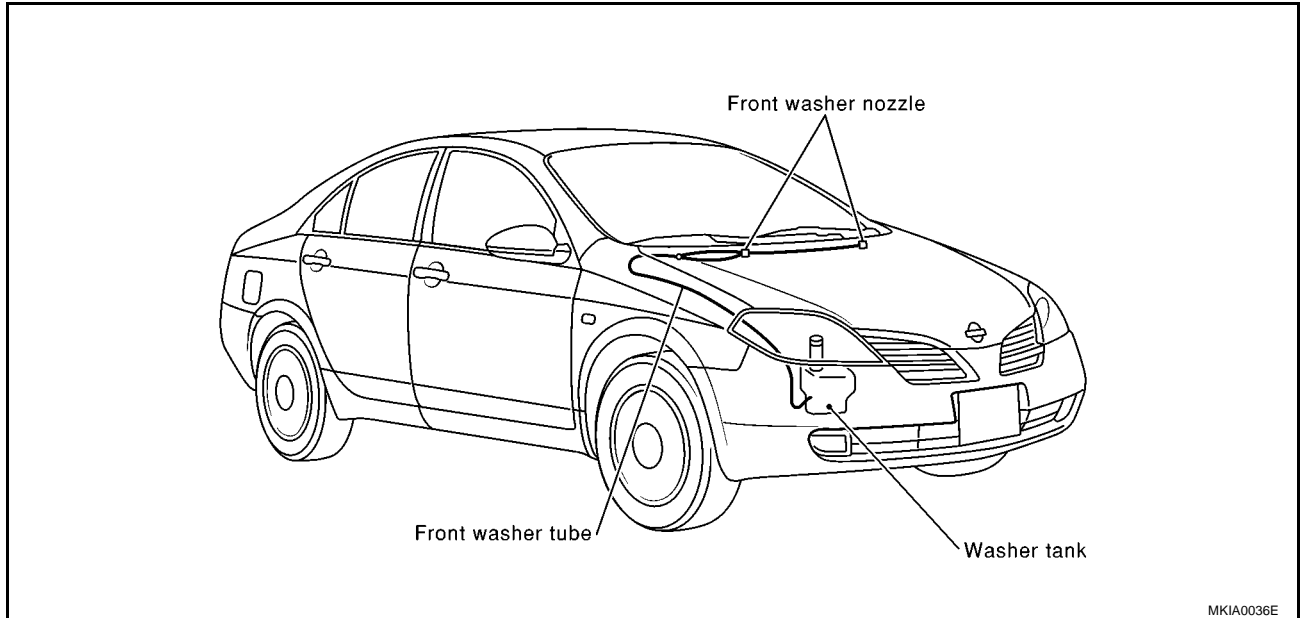
FRONT WIPER AND WASHER SYSTEM

RHD models



Washer Tube Layout

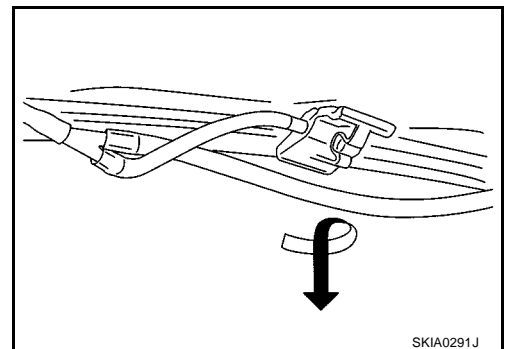
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Removal and Installation for Washer Nozzle

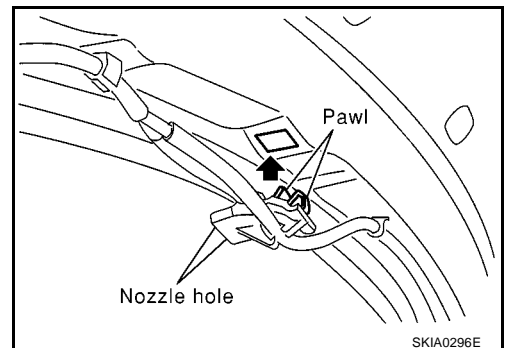
EKS009OZ

- REMOVAL**
1. Push and turn washer nozzle pawl toward engine hood to pull out.



INSTALLATION

1. After connecting washer hose, press hit nozzle at engine hood.
2. Adjust nozzle injection position.

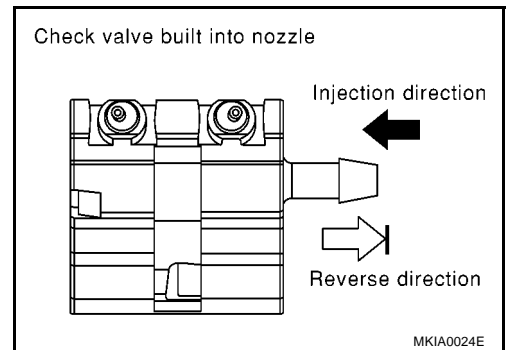


FRONT WIPER AND WASHER SYSTEM

Inspection for Washer Nozzle CHECK VALVE

EKS009P0

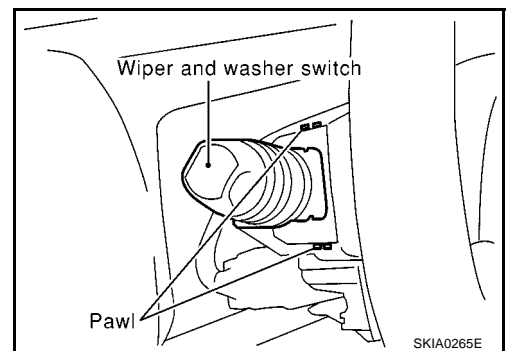
- Blow air in the injection direction, and check that air flows only one way. Make sure that the reverse direction (inhale) is not possible.



Removal and Installation for Wiper and Washer Switch REMOVAL

EKS009P1

1. Remove steering column cover. Refer to [PS-9, "STEERING COLUMN"](#).
2. Remove wiper washer switch connector.
3. Push two pawl then remove wiper washer switch from the base.



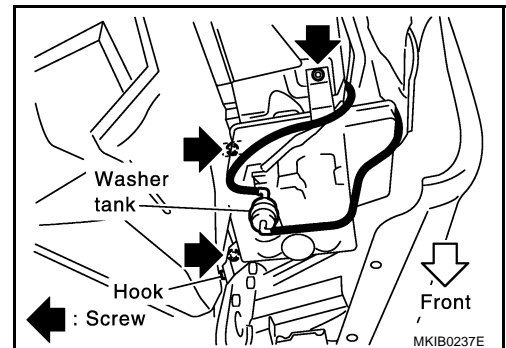
INSTALLATION

Installation is in the reverse order of removal.

Removal and Installation for Washer Tank

EKS009P2

1. Pull out washer tank inlet.
2. Remove fender protector. Refer to EI section in P12 ESM (SM2E00-1P12E0E).
3. Remove washer pump connector.
4. Remove washer tank installation screw and pawl.




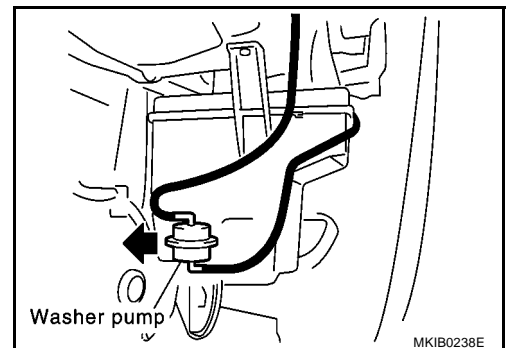
5. Remove washer hose, and remove the washer tank from the vehicle.

CAUTION:

After installation, add water up to the upper level of the washer tank inlet, and check for water leaks.

Washer tank installation screw

 : 3.8 - 5.1 N-m (0.39 - 0.52 kg-m, 34 - 45 in-lb)



Removal and Installation for Washer Pump

EKS009P3

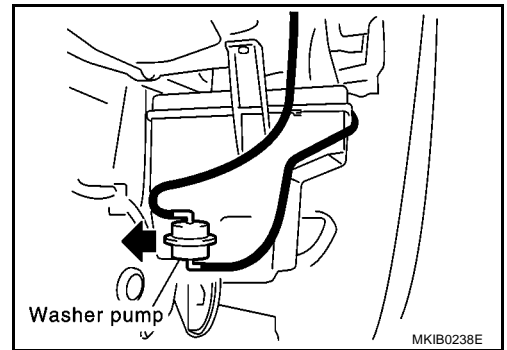
1. Remove fender protector. Refer to EI section in P12 ESM (SM2E00-1P12E0E).
2. Remove washer pump connector and hose.

FRONT WIPER AND WASHER SYSTEM

3. Pull out washer pump in the direction of the arrow in the figure, and remove the washer pump from the washer tank.

CAUTION:

When installing washer pump, there should be no packing twists, etc.



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WW

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M

FRONT WIPER AND WASHER SYSTEM (WITH RAIN SENSOR)

FRONT WIPER AND WASHER SYSTEM (WITH RAIN SENSOR)

PFP:28536

System Description WIPER OPERATION

EKS009P4

The wiper switch is controlled by a lever built into the combination switch.
There are three wiper switch positions:

- LO (MIST) speed
- HI speed
- AUTO (INT)

With the ignition switch in the ON or START position, power is supplied

- through 20A fuse [No. 25, located in the fuse block (J/B)]
- to front wiper motor terminal 1.
- through 15A fuse [No. 26, located in the fuse block (J/B)]
- to front wiper and washer switch terminal 15.
- through 10A fuse [No. 10, located in the fuse block (J/B)]
- to rain sensor terminal 4.

Ground is supplied to wiper and washer switch terminal 17 through body grounds E10 and E58.
Ground is supplied to rain sensor terminal 3 through body grounds M16, M50, and M70.

LOW AND HIGH SPEED WIPER OPERATION

When the wiper switch is placed in the LO or MIST position, ground is supplied

- through terminal 14 of the front wiper and washer switch
- to front wiper motor terminal 5.

With power and ground supplied, the wiper motor operates at low speed.

When the wiper switch is placed in the HI position, ground is supplied

- through terminal 16 of the front wiper and washer switch
- to wiper motor terminal 3.

With power and ground supplied, the wiper motor operates at high speed.

AUTO STOP OPERATION

With wiper switch turned OFF, wiper motor will continue to operate until wiper arms reach windshield base.
When wiper arms are not located at base of windshield with wiper switch OFF, ground is provided

- from terminal 14 of the front wiper and washer switch
- to front wiper motor terminal 5, in order to continue wiper motor operation at low speed.

Ground is also supplied

- through terminal 13 of the front wiper and washer switch
- to front wiper motor terminal 4
- through terminal 6 of the front wiper motor, and
- through body grounds E10 and E58.

When wiper arms reach base of windshield, front wiper motor terminals 1 and 4 are connected instead of terminals 6 and 4. Wiper motor will then stop wiper arms at the STOP position.

AUTO WIPER OPERATION

When the wiper switch is placed in the AUTO (INT) position, then the rain sensor detection of rain drop.
Rain sensor send wiper request signal

- from rain sensor terminal 1
- to combination switch terminal 20.

Change the wiper speed by rainfall

The rain sensor sensitivity is controlled by the wiper volume switch combined with front wiper and washer switch.

WASHER OPERATION

- through front wiper and washer switch terminals 15 and 18
- to washer motor terminal 1.

FRONT WIPER AND WASHER SYSTEM (WITH RAIN SENSOR)

When the lever is pulled to the MIST position, ground is supplied

- from body grounds E10 and E58
- through terminal 17 of the front wiper and washer switch, and
- through terminal 22 of the wiper switch
- to front washer motor terminal 2.

With power and ground supplied, the washer motor operates.

When the lever is pulled to the MIST position for one second or more, the wiper motor operates at low speed for approximately 3 seconds to clean windshield. This feature is controlled by the wiper amplifier in the same manner as the intermittent operation.

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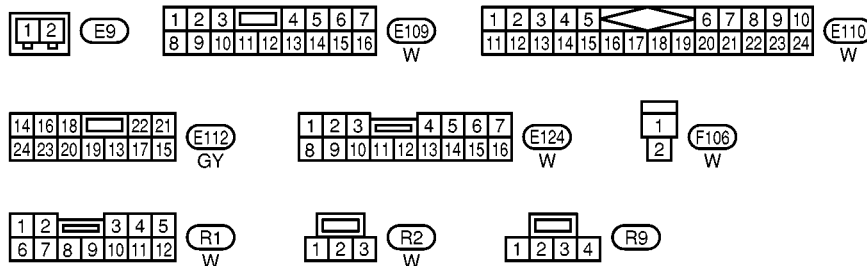
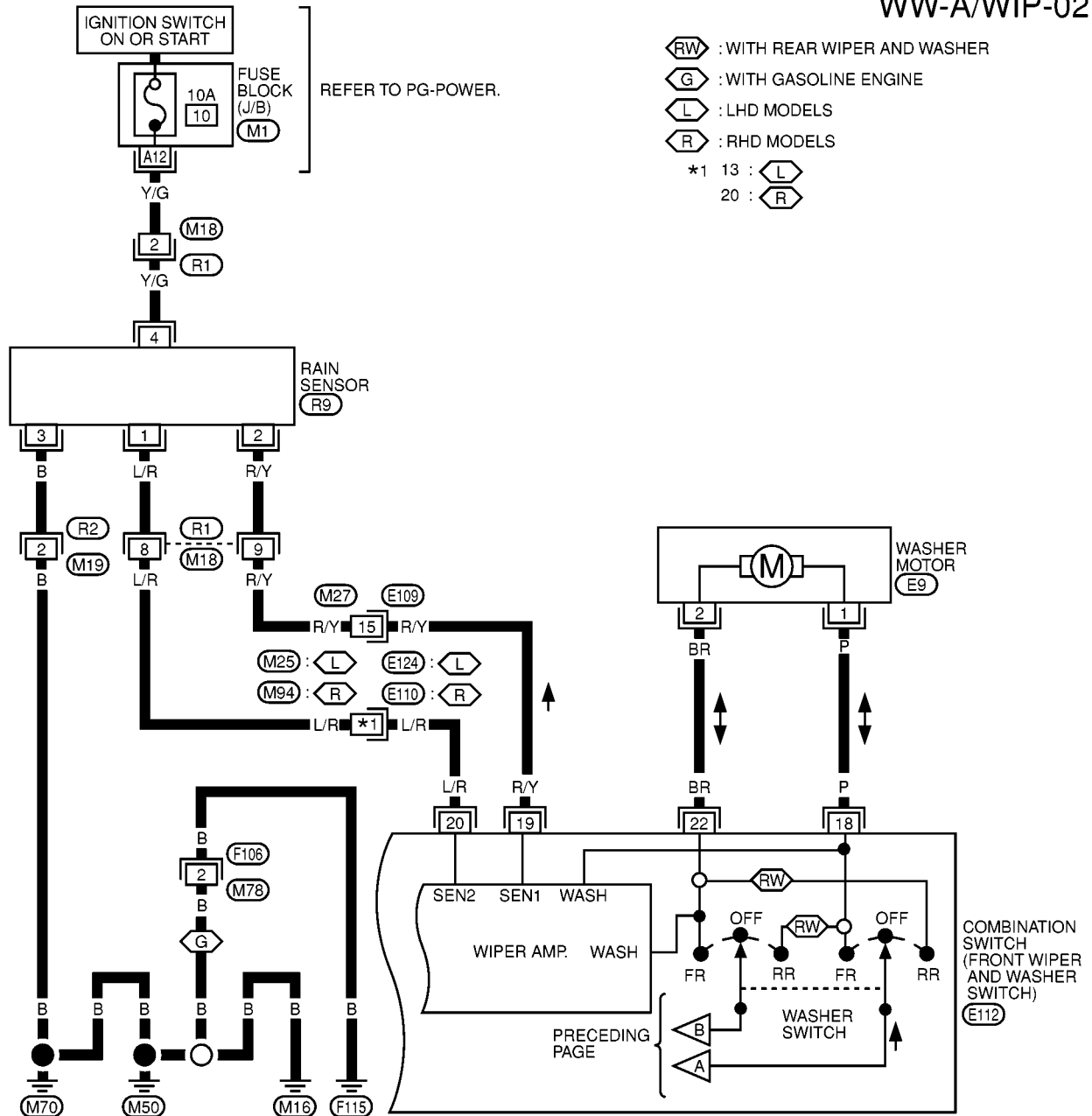
WW

L

M

FRONT WIPER AND WASHER SYSTEM (WITH RAIN SENSOR)

WW-A/WIP-02



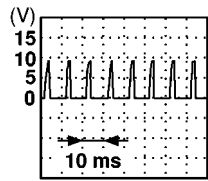
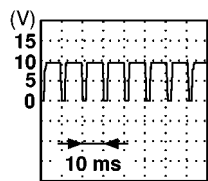
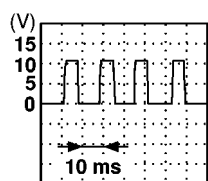
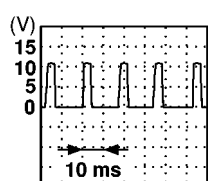
REFER TO THE FOLLOWING.

(M1) - FUSE BLOCK-JUNCTION BOX (J/B)

FRONT WIPER AND WASHER SYSTEM (WITH RAIN SENSOR)

Terminal and Reference Values for Combination Switch

EKS009P6

TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION			DATA (DC Voltage)
			IGNI-TION SWITCH	CONDITION OR OPERATION		
13	L/Y	Wiper auto stop signal	ON	Wiper is moving		Approx. 0
				Wiper while the vehicle is stopped		Approx. 12
14	L	Wiper motor operation signal (LO)	ON	Wiper switch	OFF	Approx. 12
					LO	Approx. 0
15	LG	Ignition ON signal	ON	—		Approx. 12
16	L/B	Wiper motor operation signal (HI)	ON	Wiper switch	OFF	Approx. 12
					HI	Approx. 0
17	B	Ground	OFF	—		—
18	P	Washer motor operation signal	ON	Washer switch	WASH (FR)	Approx. 12
19	R/Y	Rain sensor signal (INPUT)	ON	Wiper switch AUTO (INT) position	Wiper is stopped	 MKIB0171E
					Wiper is moving (Apply a few drops of water to detection attachment)	 MKIB0172E
20	L/R	Rain sensor signal (OUTPUT)	ON	Wiper switch AUTO (INT) position	Wiper is stopped	 MKIB0173E
					Wiper is moving (Apply a few drops of water to detection attachment)	 MKIB0174E
22	BR	Washer motor operation signal	ON	Washer switch	WASH (FR)	Approx. 0

FRONT WIPER AND WASHER SYSTEM (WITH RAIN SENSOR)

Trouble Diagnosis SYMPTOM CHART

EKS009P7

Symptom	Possible cause	Repair order
Front wiper does not operate.	Power supply and ground circuit	Check power supply and ground circuit(WW-24).
	Wiper motor	Replace wiper motor.
	Front wiper and washer switch	Check front wiper and washer switch (WW-52).
Low speed wiper operation does not operate.	Open or short circuit	Check harness for open or short (WW-25).
	Front wiper and washer switch	Check front wiper and washer switch (WW-52).
High speed wiper operation does not operate.	Open or short circuit	Check harness for open or short (WW-26).
	Front wiper and washer switch	Check front wiper and washer switch (WW-52).
Auto stop wiper operation does not operate.	Open or short circuit	Check harness for open or short (WW-26).
	Rain sensor	Check rain sensor 1 (WW-29).
	Front wiper and washer switch	Check front wiper and washer switch (WW-52).
Front washer does not operate.	Open or short circuit	Check harness for open or short (WW-29).
	Front wiper and washer switch	Check front wiper and washer switch (WW-52).
	Washer motor	Replace washer motor.
Auto wiper does not operate in wet weather.	Rain sensor	Check rain sensor 1 (WW-29).
	Power supply and ground circuit	Check power supply and ground circuit for rain sensor (WW-24).
	Open or short circuit	Check harness for open or short (WW-27).
	Front wiper and washer switch	Check front wiper and washer switch (WW-52).
Auto wiper operate in the fair weather	Rain sensor	Check rain sensor 2 (WW-31).
	Front wiper and washer switch	Check front wiper and washer switch (WW-52).

FRONT WIPER AND WASHER SYSTEM (WITH RAIN SENSOR)

POWER SUPPLY AND GROUND CIRCUIT CHECK

1. POWER SUPPLY CIRCUIT CHECK

1. Turn ignition switch OFF.
2. Disconnect front wiper and washer switch and front wiper motor harness connector.
3. Check the following.
 - Voltage between front wiper and washer switch harness connector E112 terminal 15 and ground.
 - Voltage between front wiper motor harness connector E23 terminal 1 and ground.

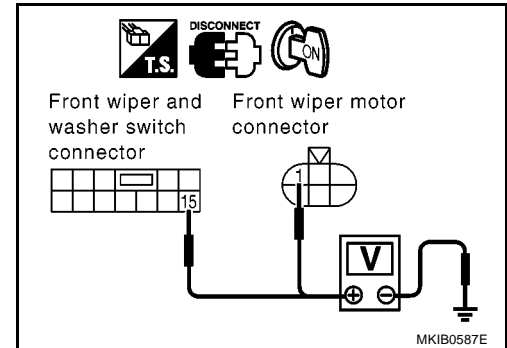
Terminals		Ignition switch position		
(+)		(-)	OFF	ON or ATSR
Connector	Terminal (wire color)			
E112	15 (LG)	Ground	0V	Battery voltage
E23	1 (G)		0V	Battery voltage

OK or NG

Yes >> GO TO 2.

No >> Check the following.

- 20A fuse [No. 25, located in fuse block (J/B)]
- 15A fuse [No. 26, located in fuse block (J/B)]
- Harness for open or short between fuse and front wiper motor or front wiper and washer switch.



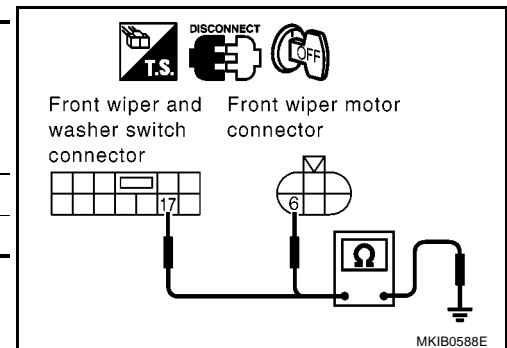
2. GROUND CIRCUIT CHECK

Terminals			Continuity
(+)		(-)	
Connector	Terminal (wire color)		
E112	17 (B)	Ground	Yes
E23	6 (B)	Ground	Yes

OK or NG

OK >> INSPECTION END

NG >> Harness for open ground circuit



CHECK RAIN SENSOR POWER SUPPLY AND GROUND CIRCUIT

1. POWER SUPPLY CIRCUIT CHECK

Check voltage between rain sensor harness connector R9 terminal 4 and ground.

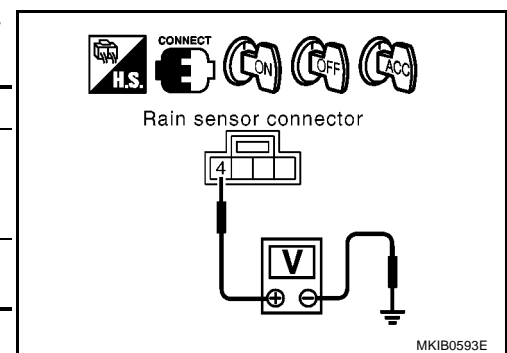
Terminals			Ignition switch position		
(+)		(-)	OFF	ACC	ON
Connector	Terminal (wire color)				
R9	4 (Y/G)	Ground	0V	0V	Battery voltage

OK or NG

OK >> GO TO 2.

NG >> Check the following.

- 10A fuse [No. 10, located in fuse block (J/B)]
- Harness for open and short between rain sensor and fuse



FRONT WIPER AND WASHER SYSTEM (WITH RAIN SENSOR)

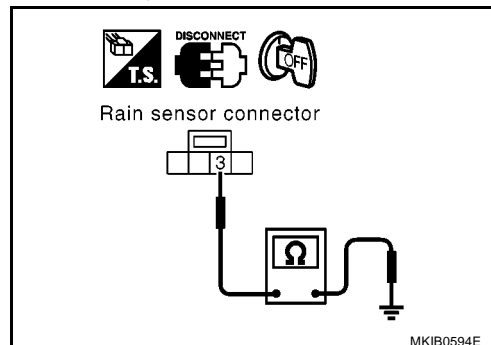
2. GROUND CIRCUIT CHECK

1. Turn ignition switch OFF.
2. Disconnect rain sensor harness connector.
3. Check continuity between rain sensor harness connector R9 terminal 3 and ground.

Continuity should exist.

OK or NG

- OK >> INSPECTION END
NG >> Repair or replace harness.



LOW SPEED CIRCUIT CHECK

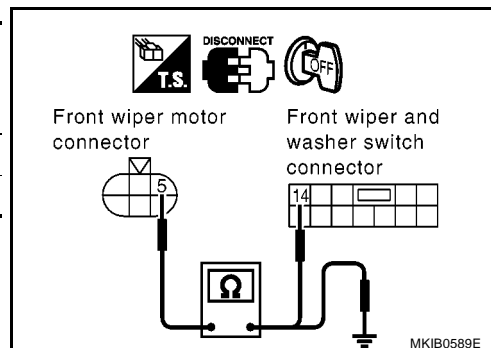
1. CHECK HARNESS FOR OPEN OR SHORT

1. Turn ignition switch OFF.
2. Disconnect front wiper motor and front wiper and washer switch harness connector.
3. Check the following.
 - Continuity between front wiper motor harness connector E23 terminal 5 and front wiper and washer switch harness connector E112 terminal 14.
 - Continuity between front wiper motor harness connector E23 terminal 5 and body ground.

Terminal				Continuity
Connector	Terminal (wire color)	Connector	Terminal (wire color)	
E23	5 (L)	E112	14 (L)	Yes
		Ground		No

OK or NG

- OK >> INSPECTION END
NG >> Repair or replace harness.



FRONT WIPER AND WASHER SYSTEM (WITH RAIN SENSOR)

HIGH SPEED CIRCUIT CHECK

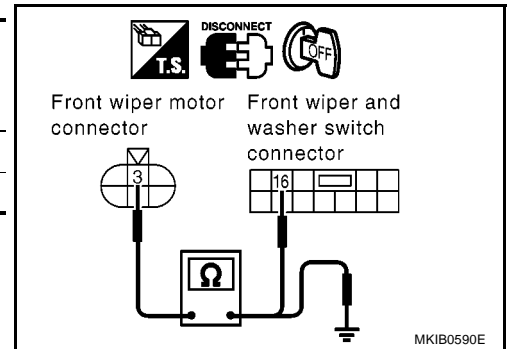
1. CHECK HARNESS FOR OPEN OR SHORT

1. Turn ignition switch OFF.
2. Disconnect front wiper motor and front wiper and washer switch harness connector.
3. Check the following.
 - Continuity between front wiper motor harness connector E23 terminal 3 and front wiper and washer switch harness connector E112 terminal 16.
 - Continuity between front wiper motor harness connector E23 terminal 3 and body ground.

Terminal				Continuity
Connector	Terminal (wire color)	Connector	Terminal (wire color)	
E23	3 (L/B)	E112	16 (L/B)	Yes
		Ground		No

OK or NG

- OK >> INSPECTION END
NG >> Repair or replace harness.



AUTO STOP CIRCUIT CHECK

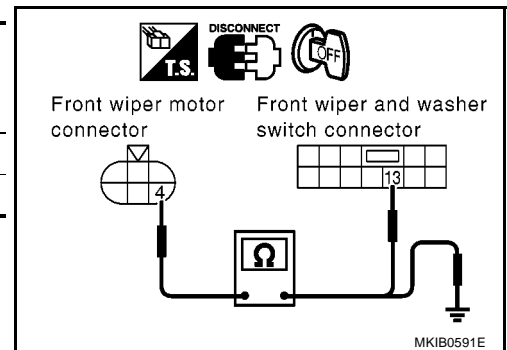
1. CHECK HARNESS FOR OPEN OR SHORT

1. Turn ignition switch OFF.
2. Disconnect front wiper motor and front wiper and washer switch harness connector.
3. Check the following.
 - Continuity between front wiper motor harness connector E23 terminal 4 and front wiper and washer switch harness connector E112 terminal 13.
 - Continuity between front wiper motor harness connector E23 terminal 4 and body ground.

Terminal				Continuity
Connector	Terminal (wire color)	Connector	Terminal (wire color)	
E23	4 (L/Y)	E112	13 (L/Y)	Yes
		Ground		No

OK or NG

- OK >> INSPECTION END
NG >> Repair or replace harness.



FRONT WIPER AND WASHER SYSTEM (WITH RAIN SENSOR)

AUTO WIPER CIRCUIT CHECK

1. CHECK HARNESS OPEN OR SHORT

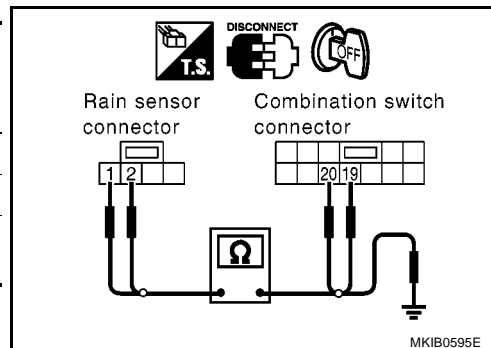
1. Turn ignition switch OFF.
2. Disconnect rain sensor and front wiper and washer switch harness connector.
3. Check the following.
 - Continuity between rain sensor harness connector R9 terminal 1 and front wiper and washer switch harness connector E112 terminal 20
 - Continuity between rain sensor harness connector R9 terminal 2 and front wiper and washer switch harness connector E112 terminal 19
 - Continuity between rain sensor harness connector R9 terminal 1, 2 and ground.

Terminal				Continuity
Connector	Terminal (wire color)	Connector	Terminal (wire color)	
R9	1 (L/R)	E112	20 (L/R)	Yes
	2 (R/Y)		19 (R/Y)	Yes
	1 (L/R), 2 (R/Y)	Ground		No

OK or NG

OK >> INSPECTION END

NG >> Repair or replace harness.

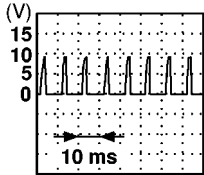
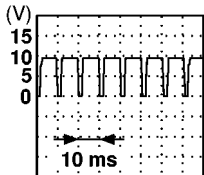
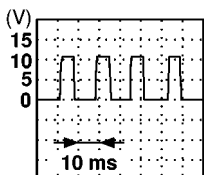
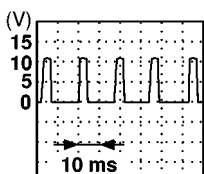


FRONT WIPER AND WASHER SYSTEM (WITH RAIN SENSOR)

AUTO WIPER SIGNAL CHECK

1. CHECK AUTO WIPER SIGNAL

1. Turn ignition switch OFF.
2. Disconnect wiper and washer switch harness connector.
3. Turn ignition switch ON.
4. Check front wiper and washer switch connector E112 terminals 19 and 20 with oscilloscope or CONSULT-II.

Terminal			Condition		Signal
(+)		(-)			
Connector	Terminal (wire color)				
E112	19 (R/Y)	Ground	Wiper switch AUTO (INT) position	Wiper is stopped	 MKIB0171E
				Wiper is moving	 MKIB0172E
	2 (R/Y)		Wiper switch AUTO (INT) position	Wiper is stopped	 MKIB0173E
				Wiper is moving	 MKIB0174E

OK or NG

OK >> INSPECTION END
 NG >> Check the following.

- Harness for open or short between rain sensor and combination switch
- Replace rain sensor

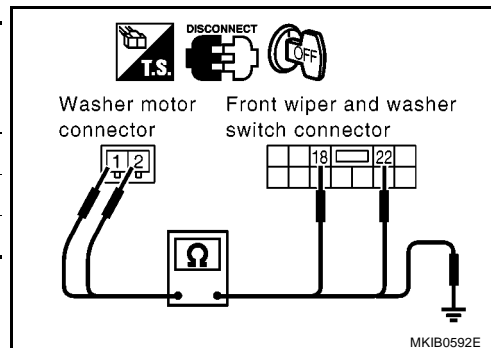
FRONT WIPER AND WASHER SYSTEM (WITH RAIN SENSOR)

WASHER MOTOR CIRCUIT CHECK

1. CHECK HARNESS FOR OPEN OR SHORT

1. Turn ignition switch OFF.
2. Disconnect washer motor and front wiper and washer switch harness connector.
3. Check the following.
 - Continuity between washer motor harness connector E9 terminal 1 and front wiper and washer switch harness connector E112 terminal 18.
 - Continuity between washer motor harness connector E9 terminal 2 and front wiper and washer switch harness connector E112 terminal 22.
 - Continuity between washer motor harness connector E9 terminals 1, 2 and body ground.

Terminal				Continuity
Connector	Terminal (wire color)	Connector	Terminal (wire color)	
E9	1 (P)	E112	18 (P)	Yes
	2 (BR)		22 (P)	Yes
	1 (P), 2 (BR)	Ground		No



OK or NG

- OK >> INSPECTION END
NG >> Repair or replace harness.

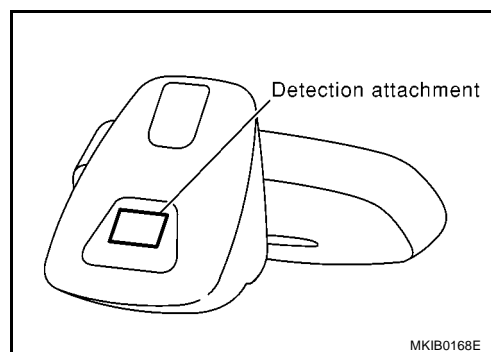
CHECK RAIN SENSOR 1

1. CHECK SENSOR CONDITION

Check temperature the detection attachment within rain sensor, into the windshield.

Condition : More than 70°C

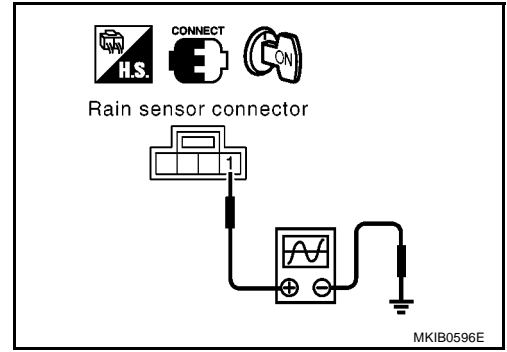
- Yes >> Wait to cool off windshield condition.
No >> GO TO 2.

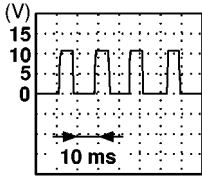
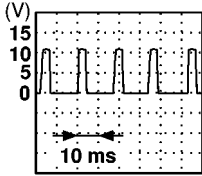


FRONT WIPER AND WASHER SYSTEM (WITH RAIN SENSOR)

2. CHECK RAIN SENSOR OUTPUT SIGNAL

1. Turn ignition switch ON.
2. Turn the AUTO (INT) position with wiper and washer switch.
3. Check output signal of rain sensor harness connector R9 terminal 1 with oscilloscope or CONSULT-II.



Terminal			Condition		Signal
(+)		(-)			
Connector	Terminal (wire color)				
R9	1 (L/R)	Ground	Wiper switch AUTO (INT) position	Wiper is stopped	 MKIB0173E
				Wiper is moving	 MKIB0174E

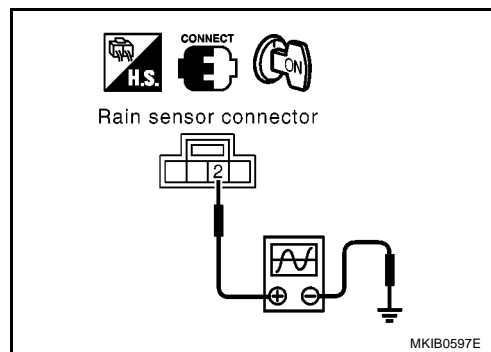
OK or NG

- OK >> GO TO 3.
 NG >> Replace rain sensor.

FRONT WIPER AND WASHER SYSTEM (WITH RAIN SENSOR)

3. CHECK RAIN SENSOR INPUT SIGNAL

Check input signal rain sensor harness connector R9 terminal 2 with oscilloscope or CONSULT-II.



Terminal		(-)	Condition		Signal
(+)					
Connector	Terminal (wire color)				
R9	2 (R/Y)	Ground	Wiper switch AUTO (INT) position	Wiper is stopped	 MKIB0171E
				Wiper is moving	 MKIB0172E

OK or NG

- OK >> INSPECTION END
- NG >> Replace combination switch.

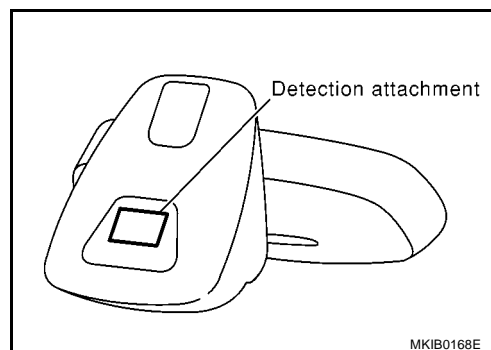
CHECK RAIN SENSOR 2

1. CHECK RAIN SENSOR CONDITION

Check clean condition the detection attachment within rain sensor, into the windshield.

Condition : Adhesion or dirt?

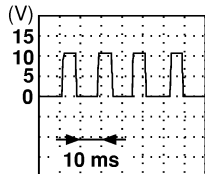
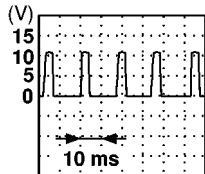
- Yes >> Clean up the windshield.
- No >> GO TO 2.



FRONT WIPER AND WASHER SYSTEM (WITH RAIN SENSOR)

2. CHECK RAIN SENSOR OUTPUT SIGNAL

1. Turn ignition switch ON.
2. Turn the AUTO (INT) position with wiper and washer switch.
3. Check output signal of rain sensor harness connector R9 terminal 1 with oscilloscope or CONSULT-II.

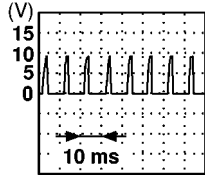
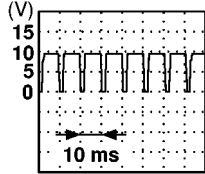
Terminal			Condition	Signal
(+)		(-)		
Connector	Terminal (wire color)			
R9	1 (L/R)	Ground	Wiper switch AUTO (INT) position	 MKIB0173E
			Wiper is moving	 MKIB0174E

OK or NG

- OK >> GO TO 3.
 NG >> Replace rain sensor.

3. CHECK RAIN SENSOR INPUT SIGNAL

Check input signal rain sensor harness connector R9 terminal 2 with oscilloscope or CONSULT-II.

Terminal			Condition		Signal
(+)		(-)			
Connector	Terminal (wire color)				
R9	2 (R/Y)	Ground	Wiper switch AUTO (INT) position	Wiper is stopped	 MKIB0171E
				Wiper is moving	 MKIB0172E

OK or NG

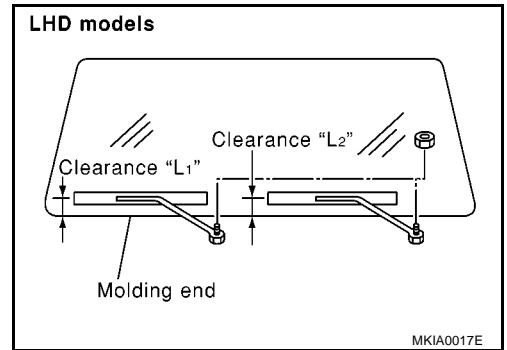
- OK >> INSPECTION END
 NG >> Replace combination switch.

FRONT WIPER AND WASHER SYSTEM (WITH RAIN SENSOR)

Removal and Installation for Front Wiper Arms, Adjustment for Wiper Arms Stop Location

EKS009P8

1. Prior to wiper arm installation, turn on wiper switch to operate wiper motor and then turn it "OFF" (auto stop).
2. Lift the blade up and then set it down onto glass surface to set the blade center to clearance "L1" & "L2" immediately before tightening nut.
3. Eject washer fluid. Turn on wiper switch to operate wiper motor and then turn it "OFF".



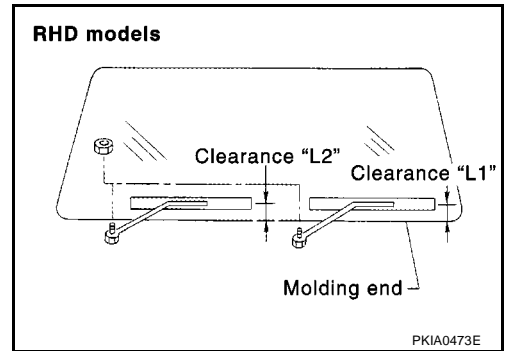
4. Ensure that wiper blades stop within clearance "L1" & "L2".

Clearance "L1": 23.3 - 38.3 mm (0.917 - 1.508 in)

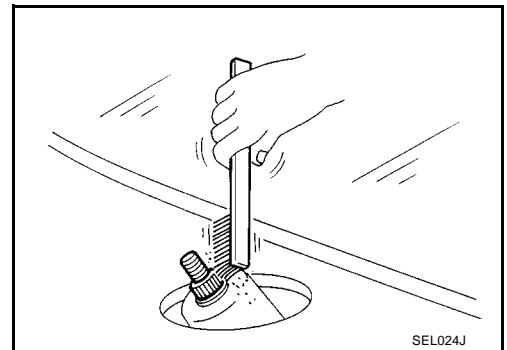
Clearance "L2": 21.8 - 36.8 mm (0.858 - 1.449 in)

- Tighten wiper arm nuts to specified torque.

Front wiper: 21.6 - 26.5 N·m (2.2 - 2.7 kg·m, 16 - 19 ft·lb)



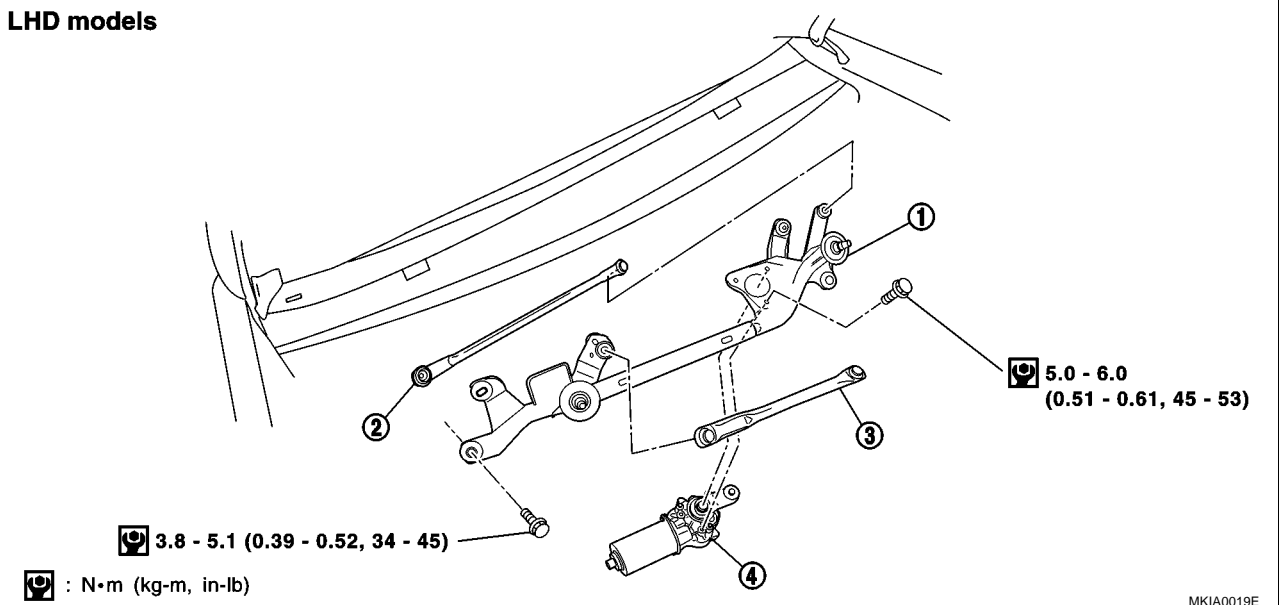
- Before reinstalling wiper arm, clean up the pivot area as illustrated. This will reduce possibility of wiper arm looseness.



Removal and Installation for Wiper Motor and Linkage

EKS009P9

LHD models

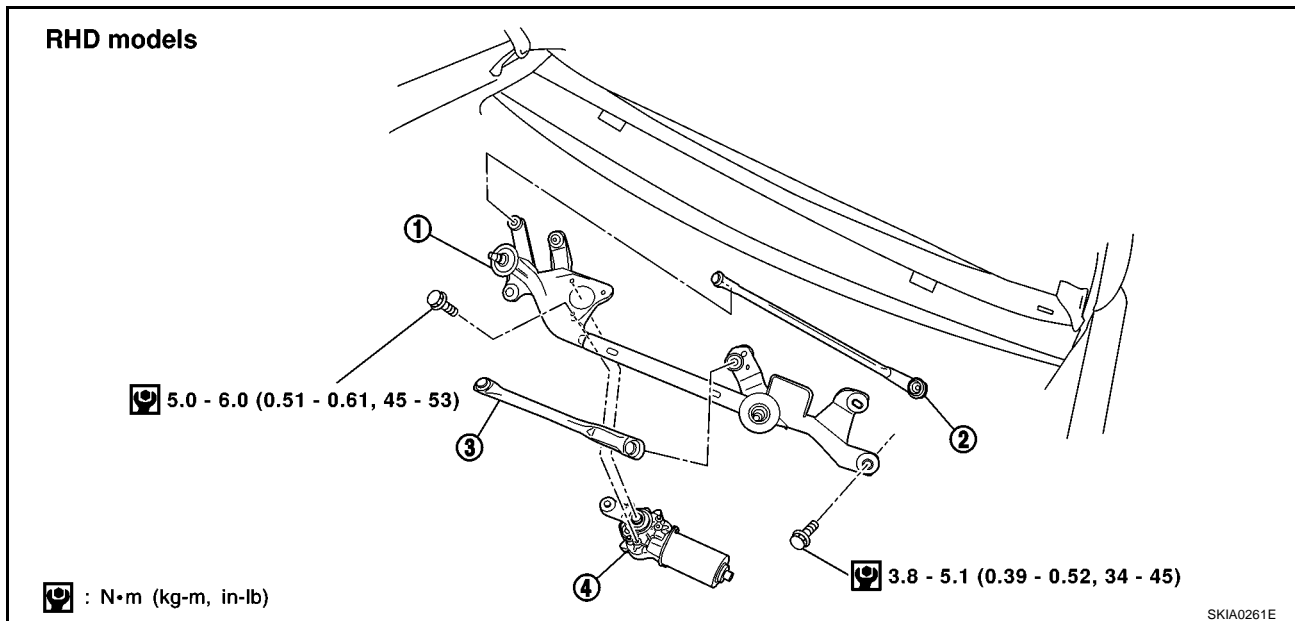


FRONT WIPER AND WASHER SYSTEM (WITH RAIN SENSOR)

1. Wiper frame
4. Wiper motor

2. Wiper link

3. Wiper link



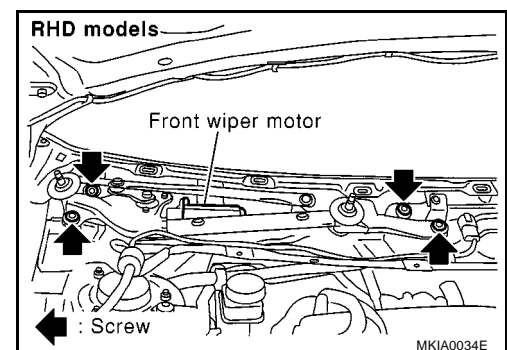
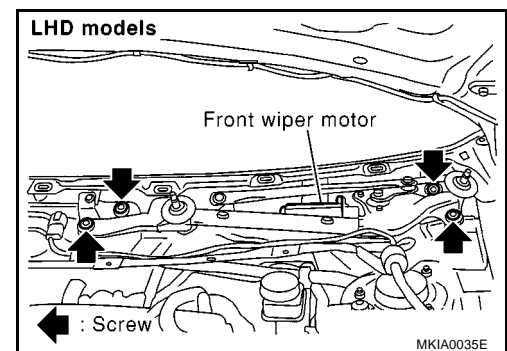
1. Wiper frame
4. Wiper motor

2. Wiper link

3. Wiper link

REMOVAL

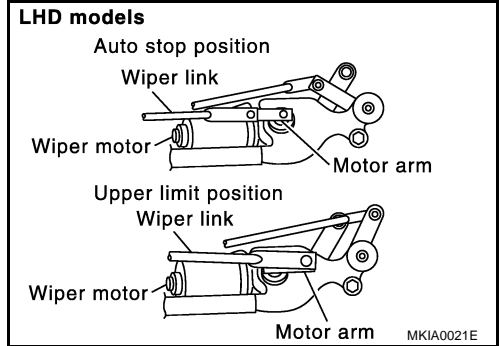
1. Operate the wiper motor, and stop it at the auto stop position.
2. Remove wiper arm from the vehicle.
3. Remove the cowl top cover. Refer to EI section in P12 ESM (SM2E00-1P12E0E).
4. Remove 4 screws and remove wiper motor assembly from the vehicle.
5. Disconnect wiper motor connector.
6. Remove wiper link from wiper frame.
7. Remove wiper motor from wiper frame.



FRONT WIPER AND WASHER SYSTEM (WITH RAIN SENSOR)

INSTALLATION

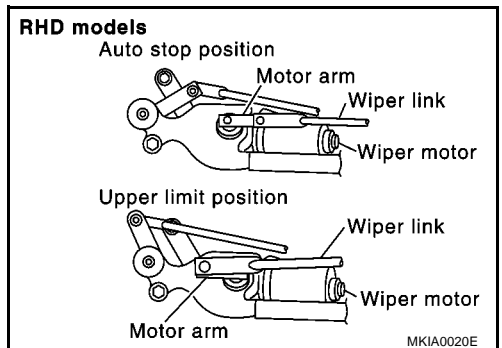
1. Connect wiper motor to connector. Turn the wiper switch ON to operate wiper motor, then turn the wiper switch OFF (auto stop).
2. Disconnect wiper motor connector.
3. Install wiper motor to the wiper frame.
4. Install wiper motor assembly to the vehicle.
5. Install wiper link to the wiper motor arm.
6. Connect wiper motor connector. Turn the wiper switch ON to operate the wiper motor, then turn wiper switch OFF (auto stop).
7. Rotate motor arm to the upper limit position.



8. Install wiper motor assembly to the vehicle.
9. Turn the wiper switch ON to operate the wiper motor, then turn wiper switch OFF (auto stop)
10. Install cowl top cover. Refer to EI section in P12 ESM (SM2E00-1P12E0E).
11. Install wiper arm to the vehicle.

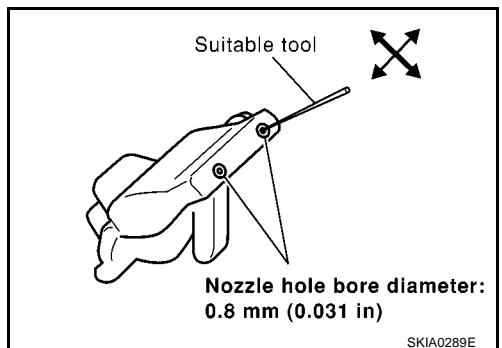
CAUTION:

- Do not drop the wiper motor or cause it to contact other parts.
- Check the grease conditions of the motor arm and wiper link joint (at retainer). Apply grease if necessary.



Washer Nozzle Adjustment

Adjust washer nozzle with suitable tool as shown in the figure at right.

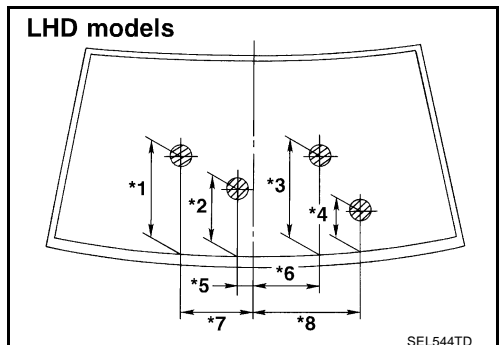


Unit: mm (in)

*1	385 (15.16)	*5	120 (4.72)
*2	245 (9.65)	*6	207 (8.15)
*3	314 (12.36)	*7	295 (11.61)
*4	212 (8.35)	*8	454 (17.87)

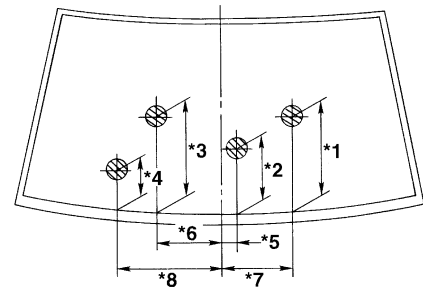
NOTE:

- *: The diameters of these circles are less than 80 mm (3.15 in).



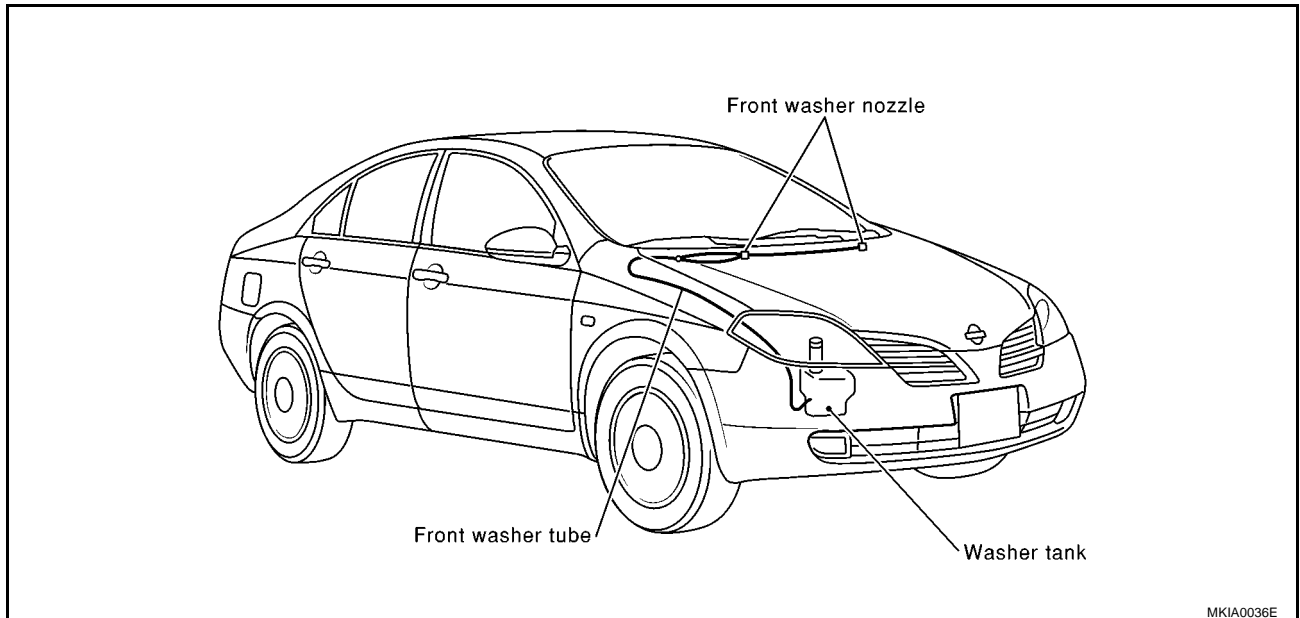
FRONT WIPER AND WASHER SYSTEM (WITH RAIN SENSOR)

RHD models



Washer Tube Layout

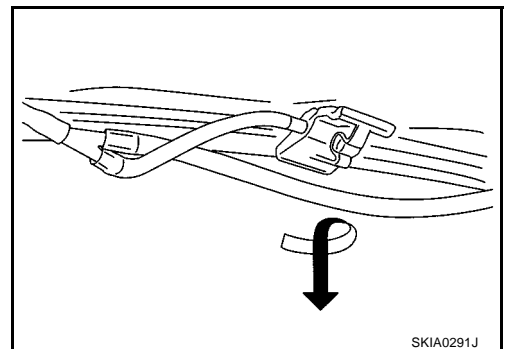
EKS009PB



Removal and Installation for Washer Nozzle

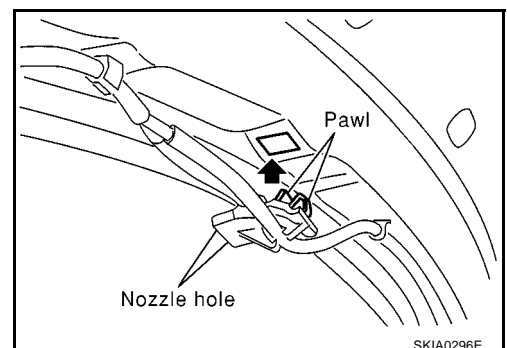
EKS009PC

1. Push and turn washer nozzle pawl toward engine hood to pull out.



INSTALLATION

1. After connecting washer hose, press hit nozzle at engine hood.
2. Adjust nozzle injection position.



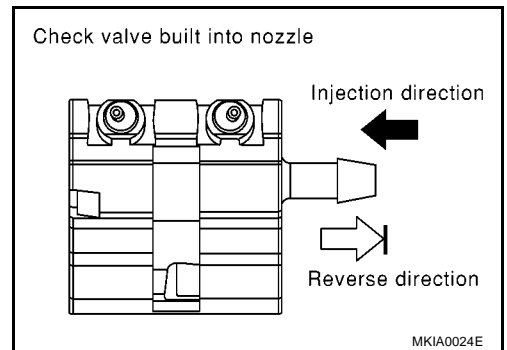
FRONT WIPER AND WASHER SYSTEM (WITH RAIN SENSOR)

Inspection for Washer Nozzle

CHECK VALVE

EKS009PD

- Blow air in the injection direction, and check that air flows only one way. Make sure that the reverse direction (inhale) is not possible.

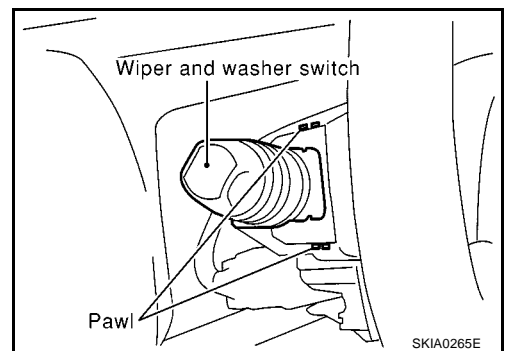


Removal and Installation for Wiper and Washer Switch

EKS009PE

REMOVAL

1. Remove steering column cover. Refer to [PS-9, "STEERING COLUMN"](#).
2. Remove wiper washer switch connector.
3. Push two pawl then remove wiper washer switch from the base.



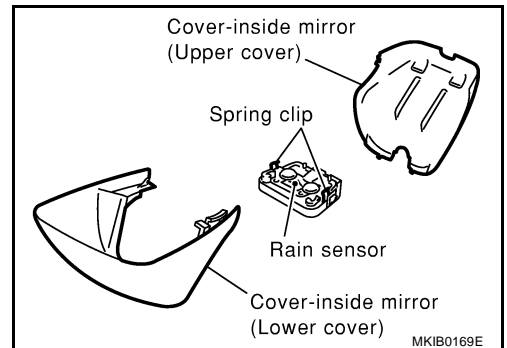
INSTALLATION

Installation is in the reverse order of removal.

Removal and Installation for Rain Sensor

EKS009PF

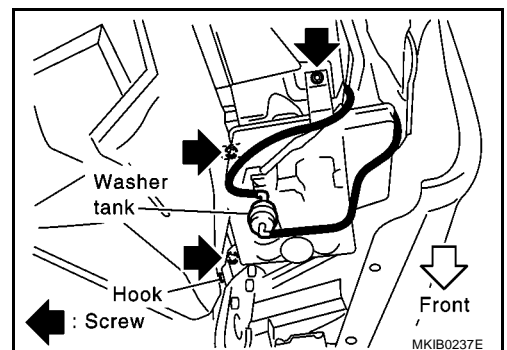
1. Remove the cover inside mirror.
2. Pull and remove spring clip of the rain sensor.
3. Remove the rain sensor and disconnect rain sensor connector.



Removal and Installation for Washer Tank

EKS009PG

1. Pull out washer tank inlet.
2. Remove fender protector. Refer to EI section in P12 ESM (SM2E00-1P12E0E).
3. Remove washer pump connector.
4. Remove washer tank installation screw and pawl.



FRONT WIPER AND WASHER SYSTEM (WITH RAIN SENSOR)

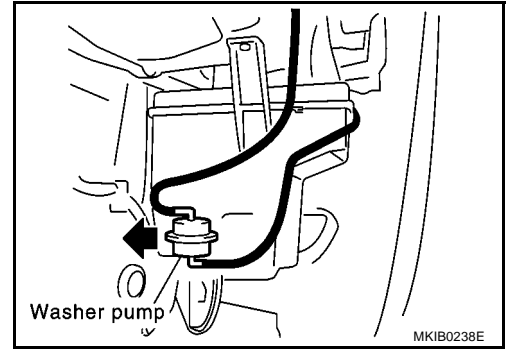
5. Remove washer hose, and remove the washer tank from the vehicle.

CAUTION:

After installation, add water up to the upper level of the washer tank inlet, and check for water leaks.

Washer tank installation screw

 : 3.8 - 5.1 N-m (0.39 - 0.52 kg-m, 34 - 45 in-lb)



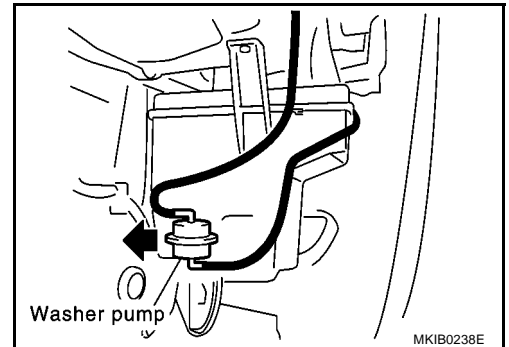
EKS009PH

Removal and Installation for Washer Pump

1. Remove fender protector. Refer to EI section in P12 ESM (SM2E00-1P12E0E) .
2. Remove washer pump connector and hose.
3. Pull out washer pump in the direction of the arrow in the figure, and remove the washer pump from the washer tank.

CAUTION:

When installing washer pump, there should be no packing twists, etc.



REAR WIPER AND WASHER SYSTEM

REAR WIPER AND WASHER SYSTEM

PPF:28710

System Description

EKS009PI

WIPER OPERATION

The wiper switch is controlled by a lever built into the combination switch. There are two wiper switch positions:

- ON
- INT (Intermittent)

With the ignition switch in the ON or START position, power is supplied

- through 10A fuse [No. 28, located in the fuse block (J/B)]
- to rear wiper motor terminal 2 and
- to rear wiper and washer switch terminal 23.

Ground is supplied to wiper and washer switch terminals 17 and 24 through body grounds E10 and E58.

WIPER OPERATION

When the wiper switch is placed in the ON position, power is supplied

- through rear wiper and washer switch terminal 21
- to rear wiper motor terminal 3.

Ground is supplied

- through body grounds B17, B24 and D94 (Wagon models) or B17, B24 and B55 (Hatchback models)
- to rear wiper motor terminal 1.

With power and ground supplied, the wiper motor operates.

AUTO STOP OPERATION

When the rear wiper switch is turned OFF, the rear wiper motor will continue to operate at low speed until wiper blades reach windshield base.

When wiper blades are not located at base of windshield with rear wiper switch OFF and ignition switch "ON", power is supplied

- through 10A fuse [No. 28, located in the fuse block (J/B)]
- to wiper motor terminal 2.

Ground is also supplied

- to rear wiper motor terminal 1
- through body grounds B17, B24 and D94 (Wagon models) or B17, B24 and B55 (Hatchback models).

When wiper arms reach base of windshield, rear motor terminals 3 and 1 are connected instead of terminals 2 and 1. Wiper motor will then stop wiper arms at STOP position.

INTERMITTENT OPERATION

The rear wiper motor operates the wiper arms one time at a set interval of approximately 25 seconds. This feature is controlled by the wiper amplifier (INT SW) combined with rear wiper and washer switch.

When the wiper switch is placed in the INT position, ground is supplied to wiper amplifier.

Then intermittent ground is supplied

- through wiper amplifier (GND and INT) and
- through terminal 21 of rear wiper and washer switch
- to rear wiper motor terminal 3.

The wiper motor operates at the set interval.

WASHER OPERATION

With the ignition switch in the ON or START position, when the lever is pulled to WASH position power is supplied

- through 15A fuse [No. 26, located in the fuse block (J/B)]
- to rear wiper and washer switch terminal 15
- to washer motor terminal 2.

Ground is supplied

- from body grounds E10 and E58

A

B

C

D

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H

I

J

WW

L

M

REAR WIPER AND WASHER SYSTEM

- through terminal 17 of the rear wiper and washer switch, and
- through terminal 18 of the wiper switch
- to front washer motor terminal 1.

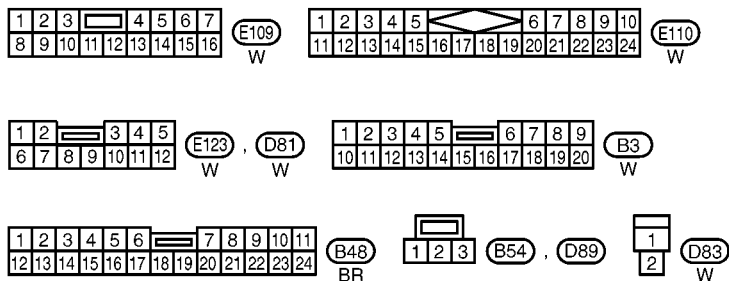
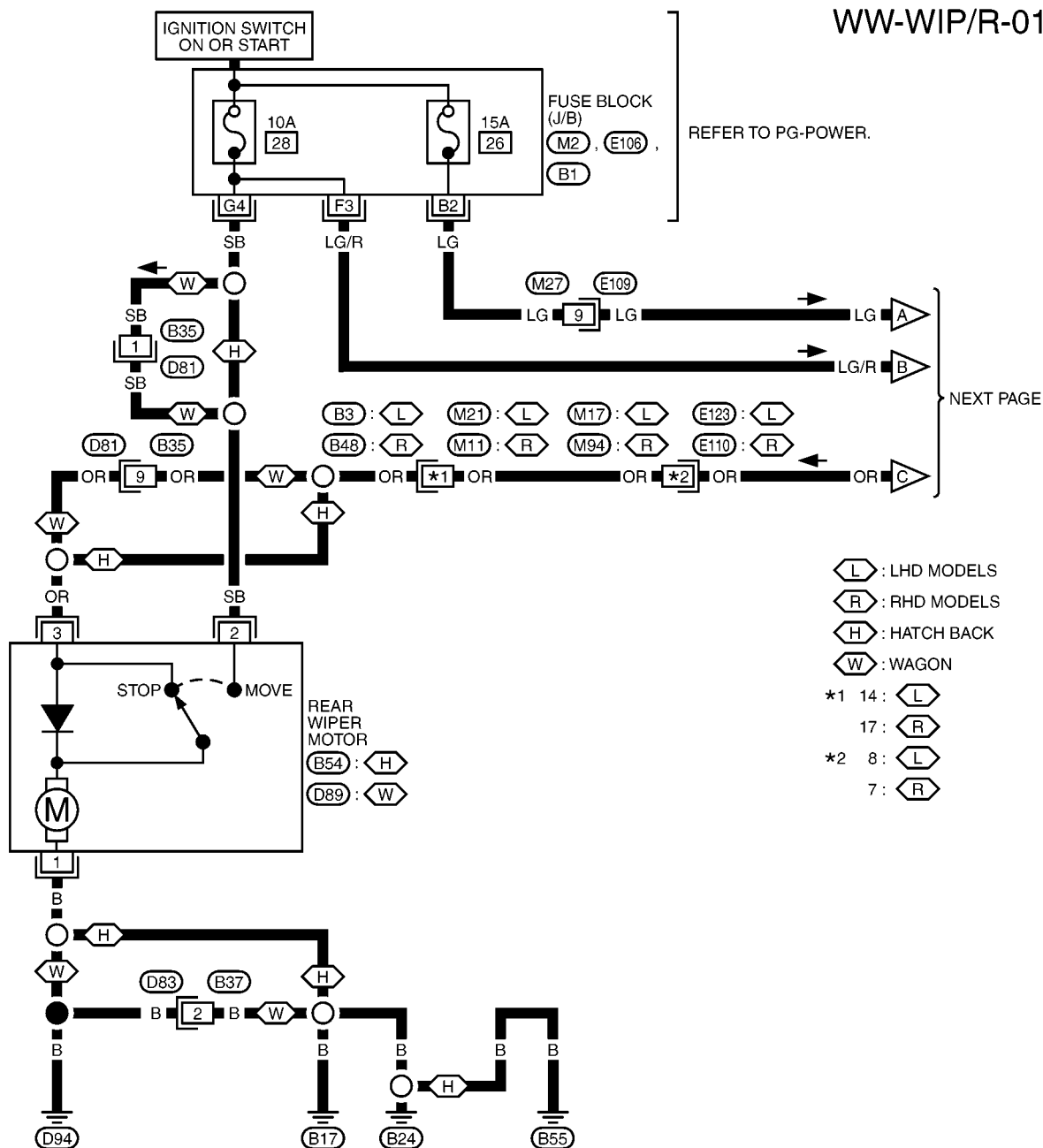
With power and ground supplied, the washer motor operates.

When the lever is pulled to the WASH position for one second or more, the wiper motor operates at low speed for approximately 3 seconds to clean windshield. This feature is controlled by the wiper amplifier in the same manner as the intermittent operation.

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EKS009PJ

WW-WIP/R-01

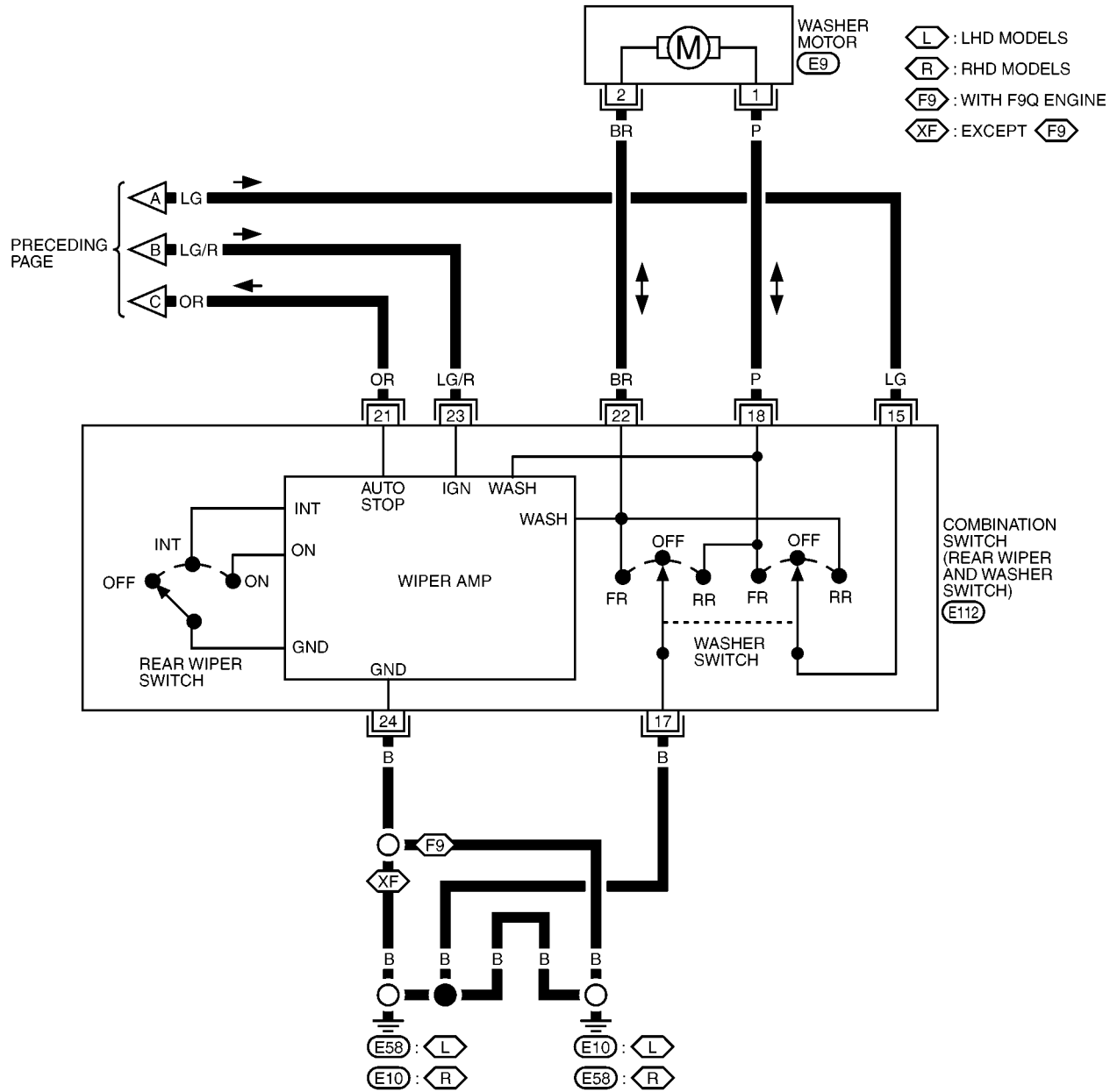


REFER TO THE FOLLOWING.

**(M2) , (E106) , (B1) -FUSE BLOCK-
JUNCTION BOX (J/B)**

REAR WIPER AND WASHER SYSTEM

WW-WIP/R-02

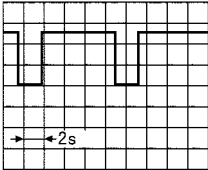


MKWA1014E

REAR WIPER AND WASHER SYSTEM

Terminal and Reference Values for Combination Switch

EKS009PK

TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION			DATA (DC Voltage)
			IGNI-TION SWITCH	CONDITION OR OPERATION		
18	P	Washer motor operation signal	ON	Washer switch	WASH (RR)	Approx.0
21	OR	Wiper motor operation signal	ON	Wiper switch: INT		<div><div><div>(V)</div><div>15</div><div>10</div><div>5</div><div>0</div></div><div></div><div>SKIA0083J</div></div>
22	BR	Washer motor operation signal	ON	Washer switch	WASH (RR)	Approx. 12
23	LG/R	Wiper motor operation signal (ON)	ON	—		Approx. 12
24	B	Ground	OFF	—		—

Trouble Diagnosis SYMPTOM CHART

EKS009PL

Symptom	Possible cause	Repair order
Rear wiper does not operate.	Power supply and ground circuit	Check power supply and ground circuit (WW-44).
	Open or short circuit	Check harness for open or short (WW-45).
	Wiper motor	Replace wiper motor.
	Front wiper and washer switch	Check front wiper and washer switch (WW-52).
Auto stop wiper operation does not operate.	Rear wiper and washer switch	Check front wiper and washer switch (WW-52).
Rear washer does not operate.	Open or short circuit	Check harness for open or short (WW-45).
	Rear wiper and washer switch	Check front wiper and washer switch (WW-52).
	Washer motor	Replace washer motor.

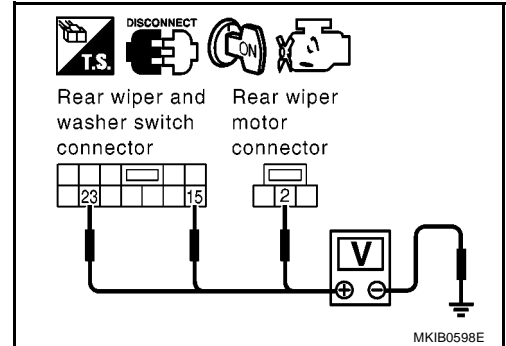
REAR WIPER AND WASHER SYSTEM

POWER SUPPLY AND GROUND CIRCUIT CHECK

1. POWER SUPPLY CIRCUIT CHECK

1. Turn ignition switch OFF.
2. Disconnect rear wiper and washer switch and rear wiper motor harness connector.
3. Check the following.
 - Voltage between rear wiper and washer switch harness connector E112 terminal 15 and ground.
 - Voltage between rear wiper and washer switch harness connector E112 terminal 23 and ground.
 - Voltage between rear wiper motor harness connector B54 (Hatchback) or D89 (Wagon) terminal 2 and ground.

Terminals		Ignition switch position		
(+)		(-)	OFF	ON or ATSRT
Connector	Terminal (wire color)			
E112	15 (LG)	Ground	0V	Battery voltage
	23 (LG/R)		0V	Battery voltage
B54 (HATCH BACK) D89 (WAGON)	2 (SB)		0V	Battery voltage



OK or NG

OK >> GO TO 2.

NG >> Check the following.

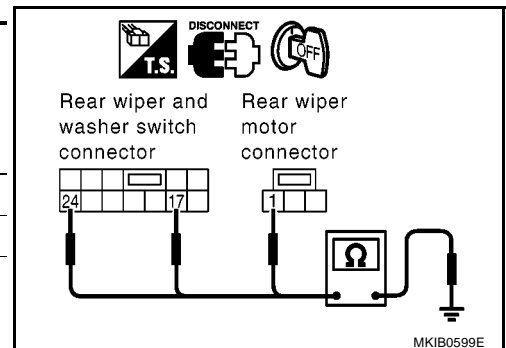
- 10A fuse [No. 28, located in fuse block (J/B)]
- 15A fuse [No. 26, located in fuse block (J/B)]
- Harness for open or short between fuse and rear wiper motor or rear wiper and washer switch.

2. GROUND CIRCUIT CHECK

Check the following.

- Continuity between rear wiper and washer switch harness connector E112 terminal 17, 24 and ground.
- Continuity between rear wiper motor harness connector B54 (Hatchback) or D89(Wagon) terminal 1 and ground.

Terminals			Continuity
(+)		(-)	
Connector	Terminal (wire color)		
E112	17 (B)	Ground	Yes
	24 (B)		Yes
B54 (HATCH BACK) D89 (WAGON)	1 (B)		



OK or NG

OK >> INSPECTION END

NG >> Harness for open ground circuit

REAR WIPER AND WASHER SYSTEM

CHECK REAR WIPER CIRCUIT CHECK

1. CHECK HARNESS FOR OPEN OR SHORT

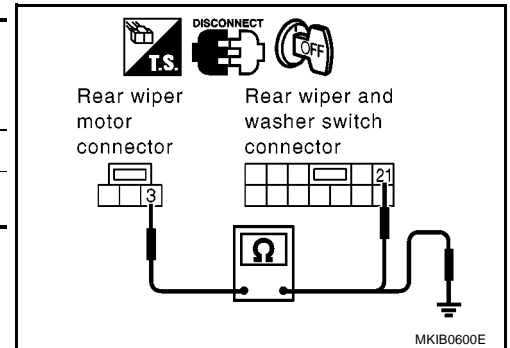
1. Turn ignition switch OFF.
2. Disconnect rear wiper motor harness connector and rear wiper and washer switch harness connector.
3. Check the following.
 - Continuity between rear wiper motor harness connector D89 (Wagon) or B54 (Hatch back) terminal 3 and rear wiper and washer switch harness connector E112 terminal 21.
 - Continuity between front wiper motor harness connector D89 (Wagon) or B54 (Hatch back) terminal 3 and body ground.

Terminal				Continuity
Connector	Terminal (wire color)	Connector	Terminal (wire color)	
B54 (Hatch Back) / D89 (Wagon)	3 (OR)	E112	21 (OR)	Yes
		Ground		No

OK or NG

OK >> INSPECTION END

NG >> Repair or replace harness.



WASHER MOTOR CIRCUIT CHECK

1. CHECK HARNESS FOR OPEN OR SHORT

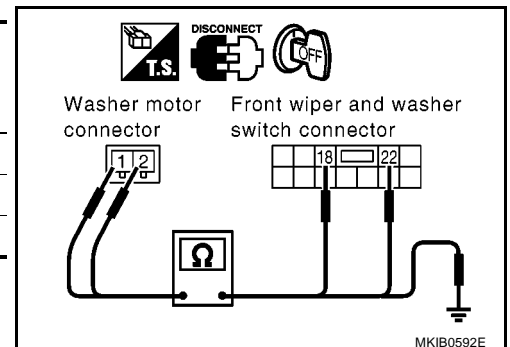
1. Turn ignition switch OFF.
2. Disconnect washer motor harness connector and rear wiper and washer switch harness connector.
3. Check the following.
 - Continuity between washer motor harness connector E9 terminal 1 and front wiper and washer switch harness connector E112 terminal 18.
 - Continuity between washer motor harness connector E9 terminal 2 and rear wiper and washer switch harness connector E112 terminal 22.
 - Continuity between washer motor harness connector E9 terminals 1, 2 and body ground.

Terminal				Continuity
Connector	Terminal (wire color)	Connector	Terminal (wire color)	
E9	1 (P)	E112	18 (P)	Yes
	2 (BR)		22 (BR)	Yes
	1 (P), 2 (BR)	Ground		No

OK or NG

OK >> INSPECTION END

NG >> Repair or replace harness.



REAR WIPER AND WASHER SYSTEM

Removal and Installation for Rear Wiper Arms WIPER ARMS

EKS009PM

1. Turn on wiper switch to operate wiper motor and then turn it "OFF" (auto stop).
2. Lift the blade up and then set it down onto glass surface. Set the black center to clearance "L" immediately before tightening the nut.
3. Eject washer fluid. Turn on wiper switch to operate wiper motor and then turn it "OFF".
4. Ensure that wiper blades stop on the lowest heat wire.

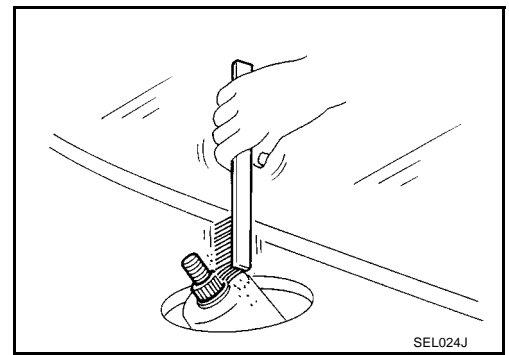
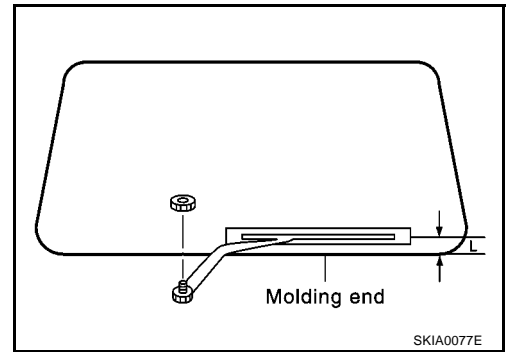
- Center to clearance "L".

"L" : 48.5 - 63.5 mm (1.909 - 2.5 in)

- Tighten windshield wiper arm nuts to specified torque.

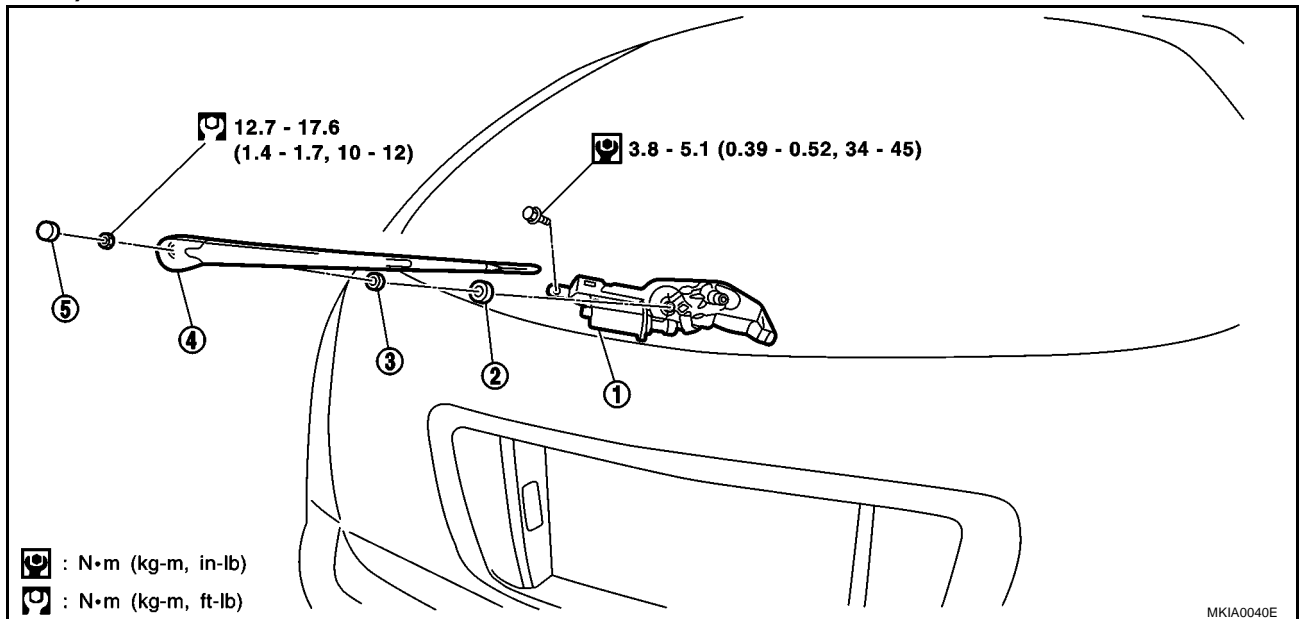
 : 12.7 - 17.6 N·m (1.3 - 1.8 kg·m, 10 - 13 ft·lb)

- Before reinstalling wiper arm, clean up the pivot area as illustrated. This will reduce possibility of wiper arm looseness.



Removal and Installation for Wiper Motor and Linkage (WAGON)

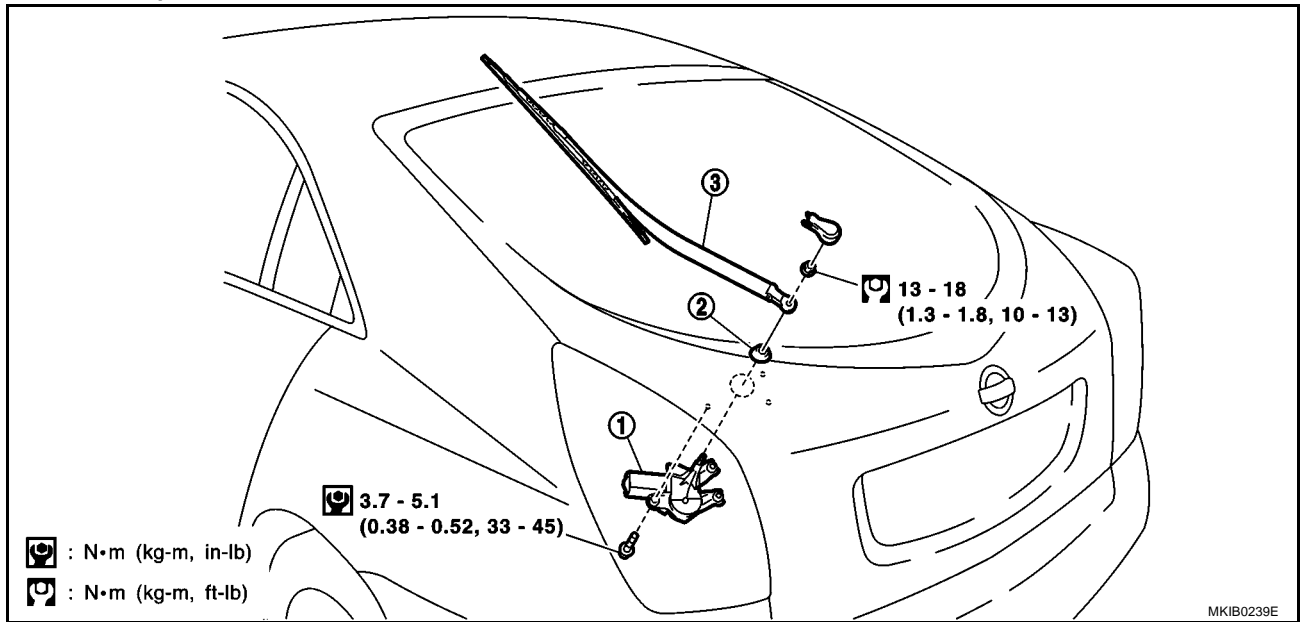
EKS009PN



- | | | |
|----------------|----------------|--------------|
| 1. Wiper motor | 2. Rubber | 3. Nut cover |
| 4. Wiper arm | 5. Wiper blade | |

REAR WIPER AND WASHER SYSTEM

(HATCH BACK)



1. Wiper motor

2. Rubber

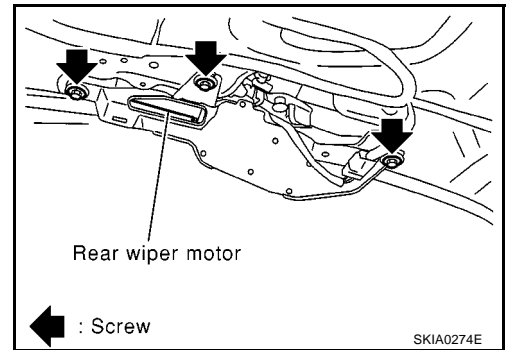
3. Wiper arm

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REAR WIPER AND WASHER SYSTEM

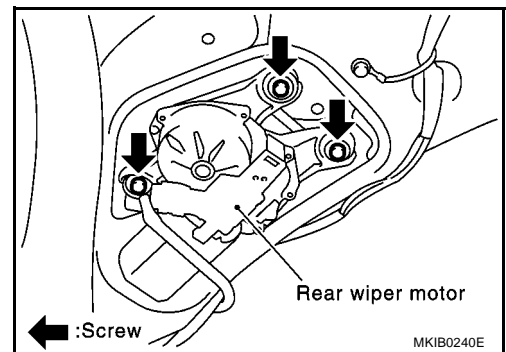
REMOVAL (WAGON)

1. Remove the back door finisher. Refer to EI section in P12 ESM (SM2E00-1P12E0E).
2. Operate the wiper motor, and stop it at the auto stop position.
3. Disconnect wiper motor connector.
4. Remove wiper arm from the vehicle.
5. Remove wiper motor from the vehicle.
6. Remove rubber from the vehicle.



REMOVAL (HATCH BACK)

1. Remove the back door finisher. Refer to EI section in P12 ESM (SM2E00-1P12E0E).
2. Operate the wiper motor, and stop it at the auto stop position.
3. Disconnect wiper motor connector.
4. Remove wiper arm from the vehicle.
5. Remove wiper motor from the vehicle.
6. Remove rubber from the vehicle.




INSTALLATION

1. Install rubber to the vehicle.
 2. Install wiper motor to the vehicle.
 3. Connect wiper motor to connector. Turn the wiper switch ON to operate wiper motor, then turn the wiper switch OFF (auto stop).
 4. Install wiper arm to the vehicle.
 5. Install back door finisher. Refer to EI section in P12 ESM (SM2E00-1P12E0E).
- **Tighten windshield wiper arm nuts to specified torque.**

 : 12.7 - 17.6 N-m (1.3 - 1.8 kg-m, 10 - 13 ft-lb)

- **Tighten windshield wiper motor nuts to specified torque.**

 : 3.8 - 5.1 N-m (0.39 - 0.52 kg-m, 34 - 45 in-lb)

CAUTION:

- Do not drop the wiper motor or cause it to contact other parts.
- Check the grease conditions of the motor arm and wiper link joint (at retainer). Apply grease if necessary.

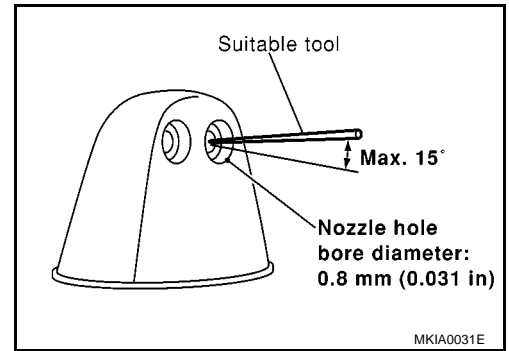
REAR WIPER AND WASHER SYSTEM

Washer Nozzle Adjustment

EKS009PO

- Adjust washer nozzle with suitable tool as shown in the figure at right.

Adjustable range : $\pm 15^\circ$ (In any direction)

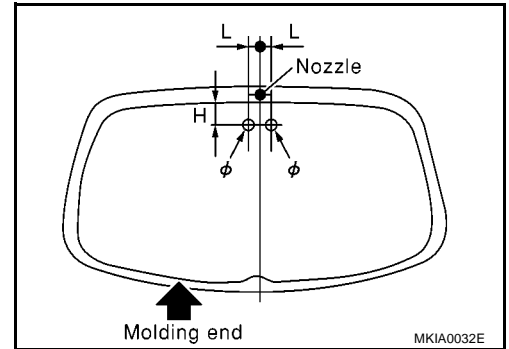


(WAGON)

Unit: mm (in)

*H	113 (4.45)
*L	22.7 (0.894)

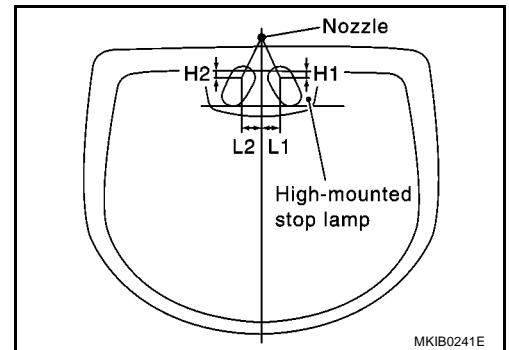
*: The diameter of this circle is less than 30 mm (1.18 in).



(HATCH BACK)

Unit: mm (in)

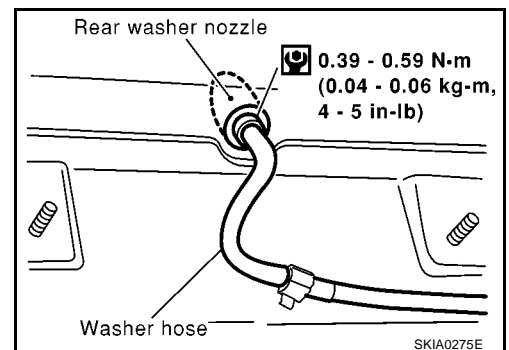
H1	16 (0.63)
H2	20 (0.79)
L1	65 (2.56)
L2	69 (2.72)



Removal and Installation for Rear Washer Nozzle

- Remove washer hose from washer nozzle.
- Remove washer nozzle installation nut and remove washer nozzle.

EKS009PP



REAR WIPER AND WASHER SYSTEM

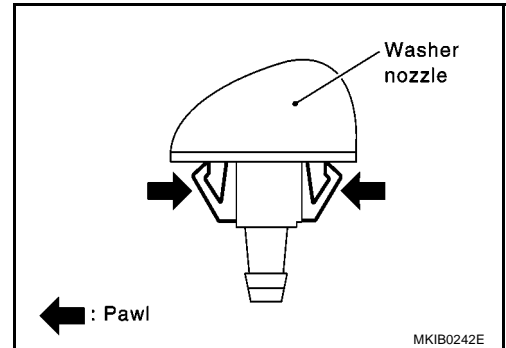
REMOVAL (HATCH BACK)

1. Push washer nozzle pawl toward to pullout.

NOTE:

When removing or installing the washer nozzle, carefully handle it to keep avoid damage.

2. Remove washer hose from washer nozzle.



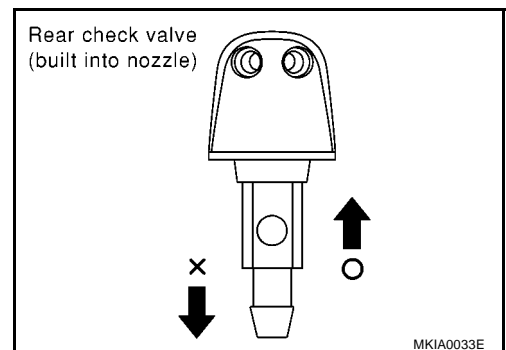
INSTALLATION

1. Installation is in the reverse order of removal.
2. Adjust nozzle injection position.

Inspection for Washer Nozzle CHECK VALVE

- Blow air in the injection direction, and check that air flows only one way. Make sure that the reverse direction (inhale) is not possible.

EKS009PQ



Removal and Installation for Wiper and Washer Switch

EKS009PR

Refer to [WW-16, "Removal and Installation for Wiper and Washer Switch"](#) .

Removal and Installation for Washer Tank

EKS009PS

Refer to [WW-16, "Removal and Installation for Washer Tank"](#) .

Removal and Installation for Washer Pump

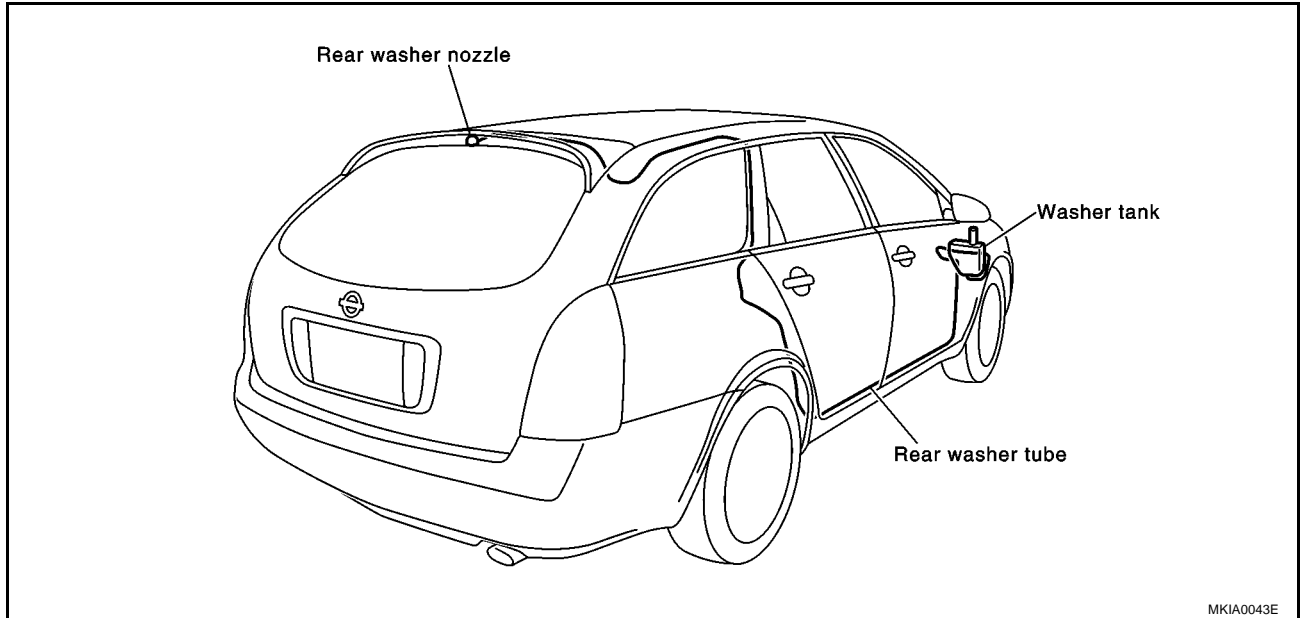
EKS009PT

Refer to [WW-16, "Removal and Installation for Washer Pump"](#) .

REAR WIPER AND WASHER SYSTEM

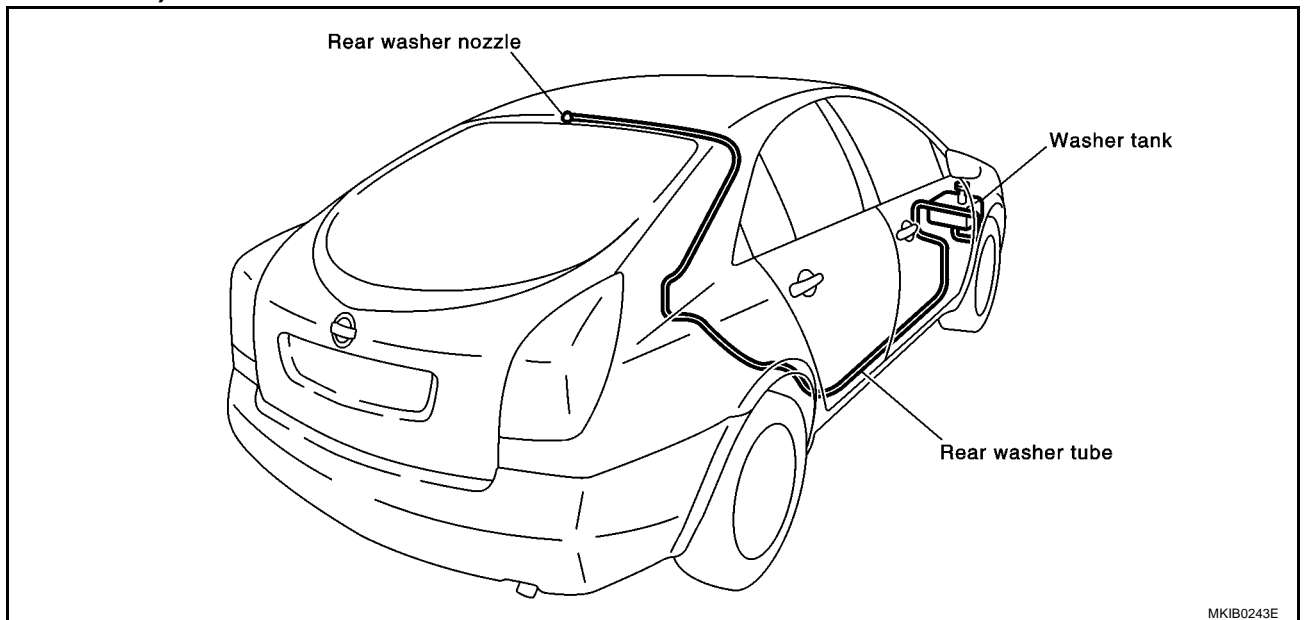
Washer Tube Layout (WAGON)

EKS009PU



MKIA0043E

(HATCH BACK)



MKIB0243E

A

B

C

D

E

F

G

H

I

J

WW

L

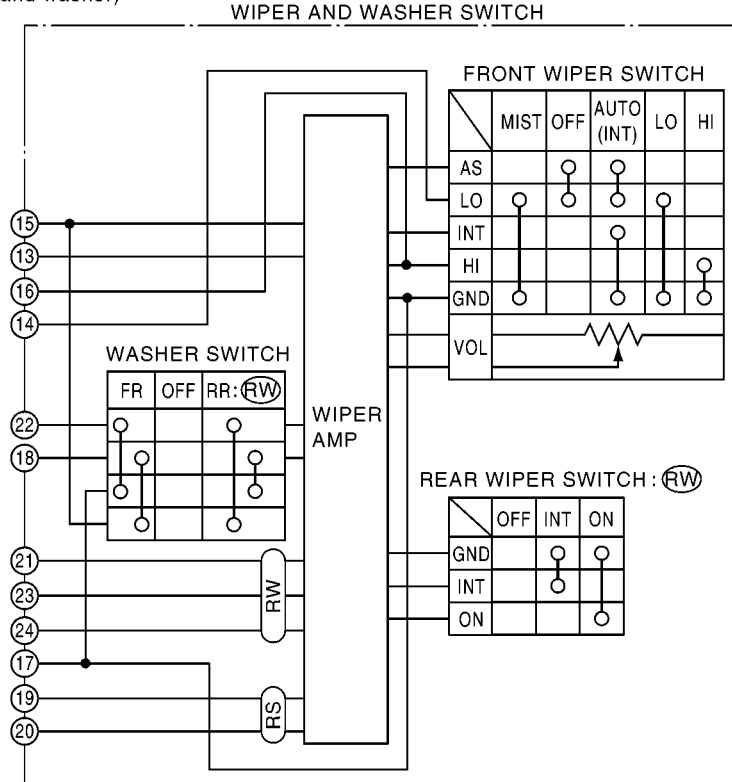
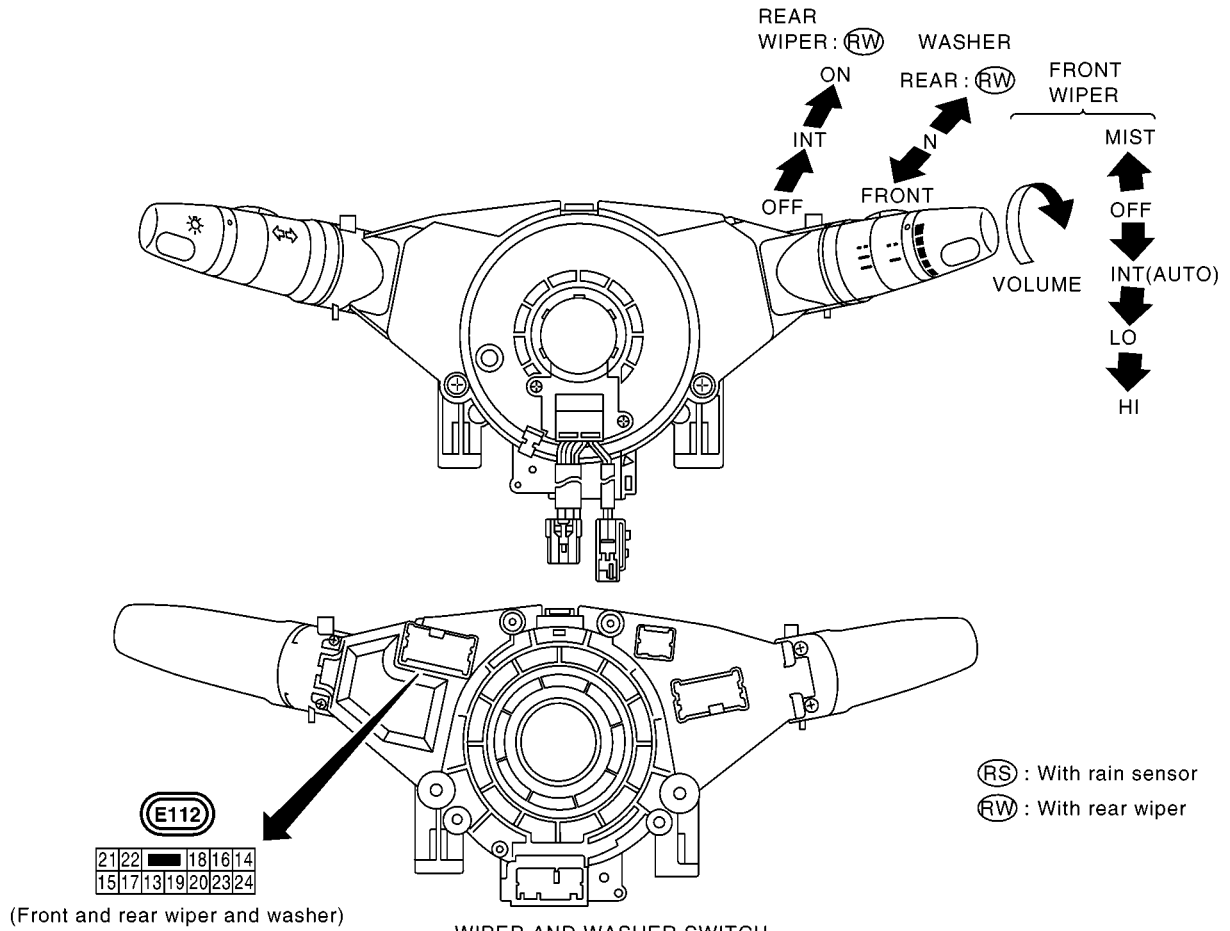
M

COMBINATION SWITCH

COMBINATION SWITCH Switch Circuit Inspection

PFP:25567

EKS009PV



MKWA1017E

HEADLAMP WASHER

PFP:28620

System Description

EKS009PW

The headlamp washer is controlled by the smart entrance control unit and ground supplied, the headlamp washer motor operates.

Power is supplied at all times.

- through 30A fusible link (letter **E** , located in fuse and fusible link box)
- to headlamp washer motor terminal 2, and
- through 10A fuse (No. 32, located in fuse and fusible link box)
- to lighting switch terminal 11
- through 10A fuse [No. 10, located in fuse block (J/B)]
- to smart entrance control unit terminal 29.

Ground is supplied to smart entrance control unit terminal 53 through body grounds M16, M50, M70 and F115. When headlamp washer switch is pushed during lighting switch is in 1ST or 2ND position, ground is supplied

- to smart entrance control unit terminal 24
- through headlamp washer switch and body grounds E10 and E58, and
- to headlamp washer motor terminal 1
- through smart entrance control unit terminal 62.

With ignition switch in the ON or START position and lighting switch is in 1ST or 2ND position, power is supplied, the headlamp washer motor operates.

A

B

C

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E

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WW

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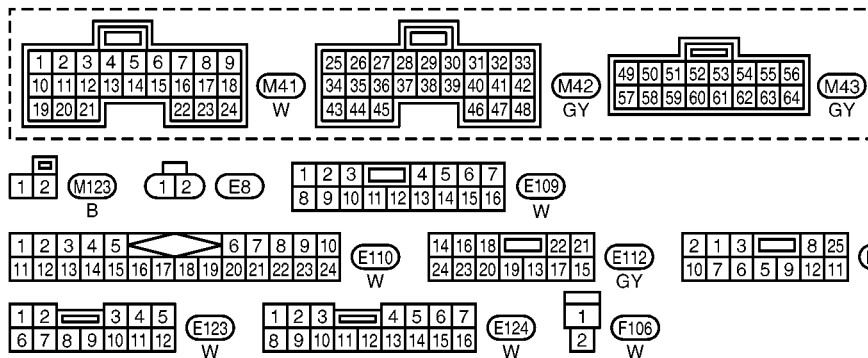
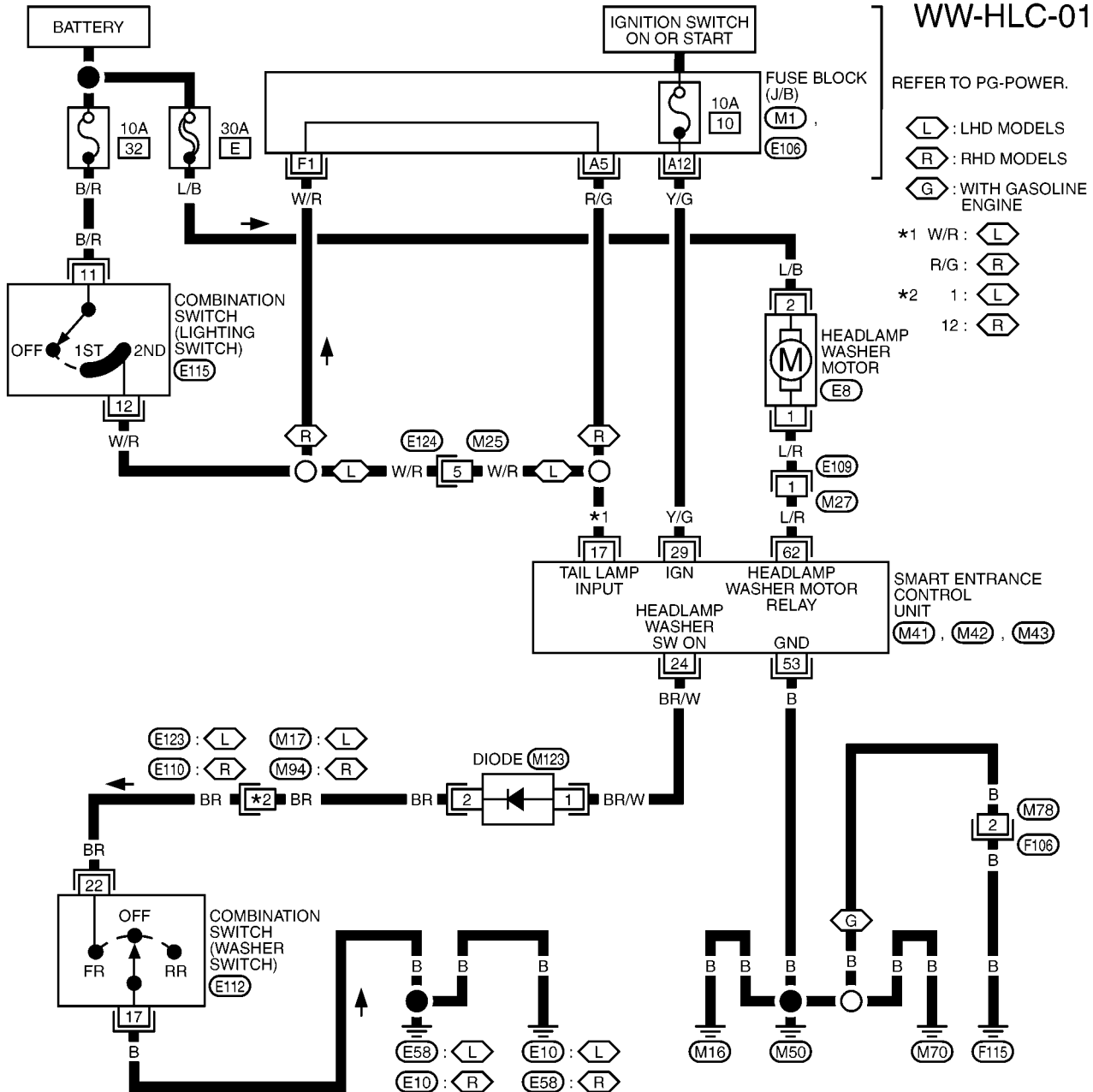
M

HEADLAMP WASHER

Wiring Diagram —HLC—

EKS009PX

WW-HLC-01



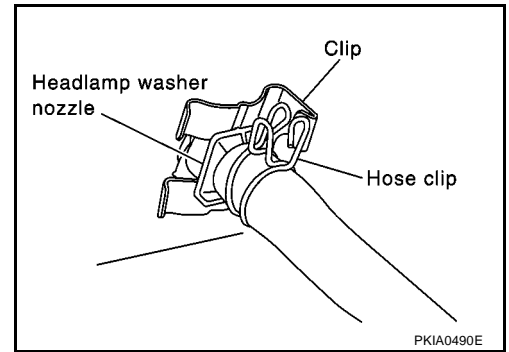
MKWA1015E

HEADLAMP WASHER

Removal and Installation for Washer Nozzle

REMOVAL

1. Remove front bumper. Refer to EI section in P12 ESM (SM2E00-1P12E0E)
2. Remove hose clip and washer nozzle metal clip.
3. Remove washer nozzle from front bumper.



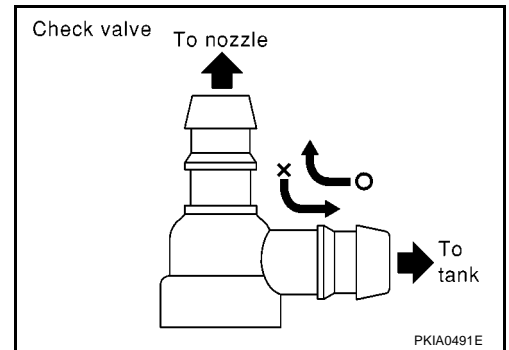
INSTALLATION

Installation is in the reverse order of removal.

Inspection for Washer Nozzle

CHECK VALVE

- Blow air in the injection direction, and check that air flows only one way. Make sure that the reverse direction is not possible.



Removal and Installation for Washer Tank

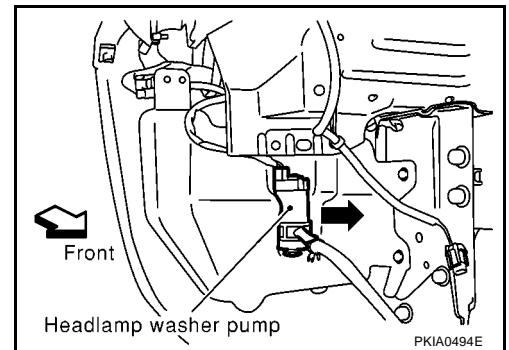
Refer to [WW-16, "Removal and Installation for Washer Tank"](#) ,

Removal and Installation for Washer Pump

1. Remove front bumper. Refer to EI section in P12 ESM (SM2E00-1P12E0E)
2. Remove washer pump connector and hose.
3. Pull out washer pump in the direction of the arrow in the figure, and remove the washer pump from the washer tank.

CAUTION:

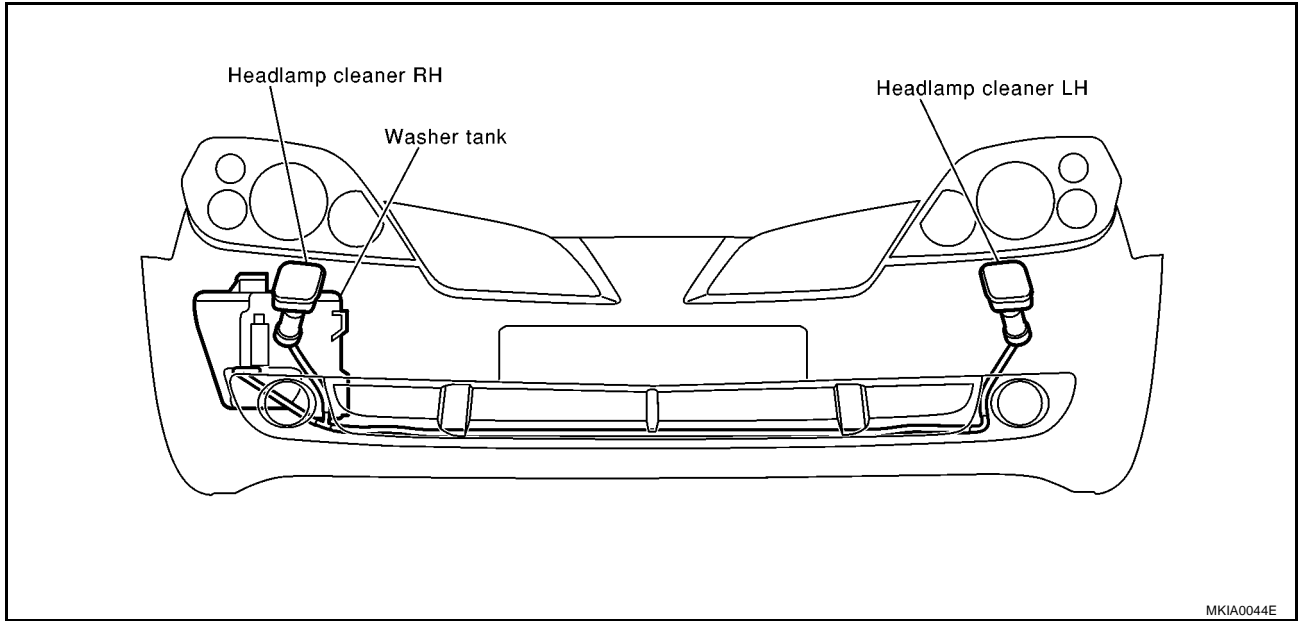
When installing washer pump, there should be no packing twist, etc.



HEADLAMP WASHER

Washer Tube Layout

EKS009Q2



HORN

PFP:25610

Wiring Diagram — HORN —

EKS009Q3

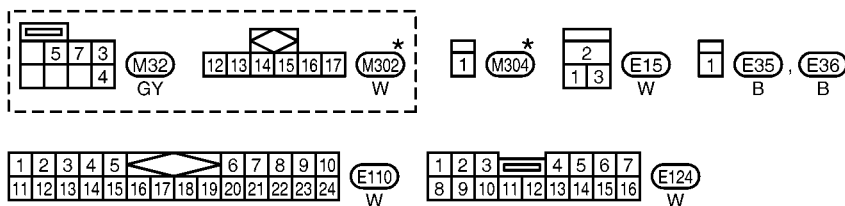
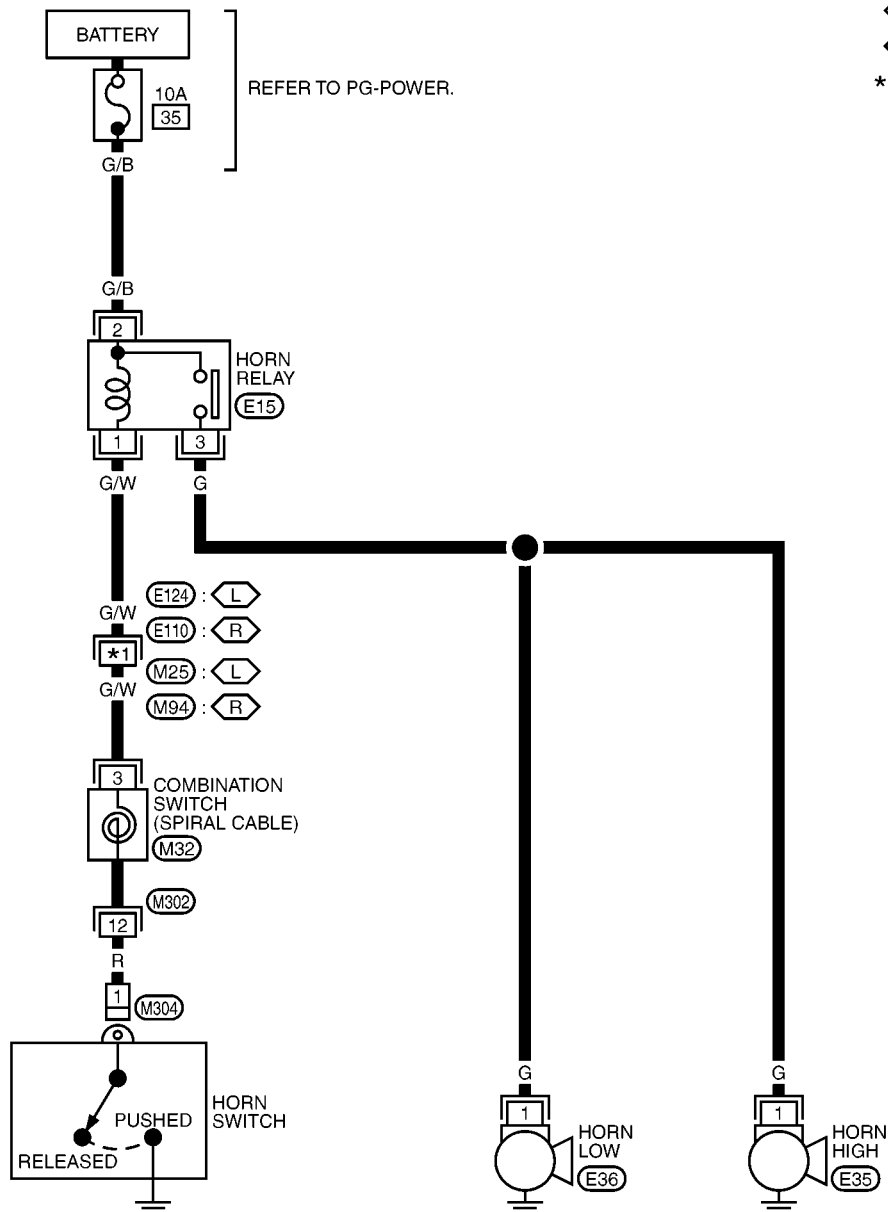
WW-HORN-01

⬡ : LHD MODELS

⬢ : RHD MODELS

*1 12 : ⬡

19 : ⬢



*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

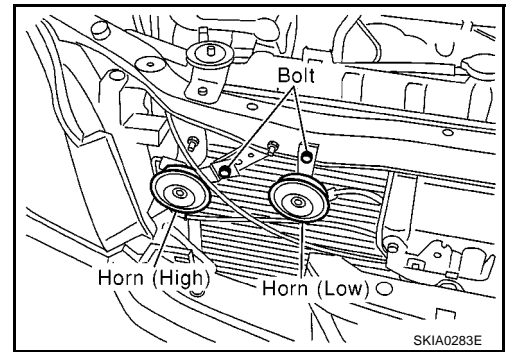
HORN

Removal and Installation

EKS009Q4

REMOVAL

1. Remove the front grille. Refer to EI section in P12 ESM (SM2E00-1P12E0E).
2. Disconnect horn connector.
3. Remove horn.



INSTALLATION

Tighten horn bolt to specified torque.

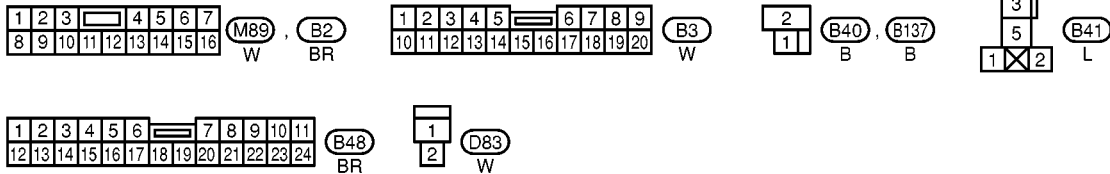
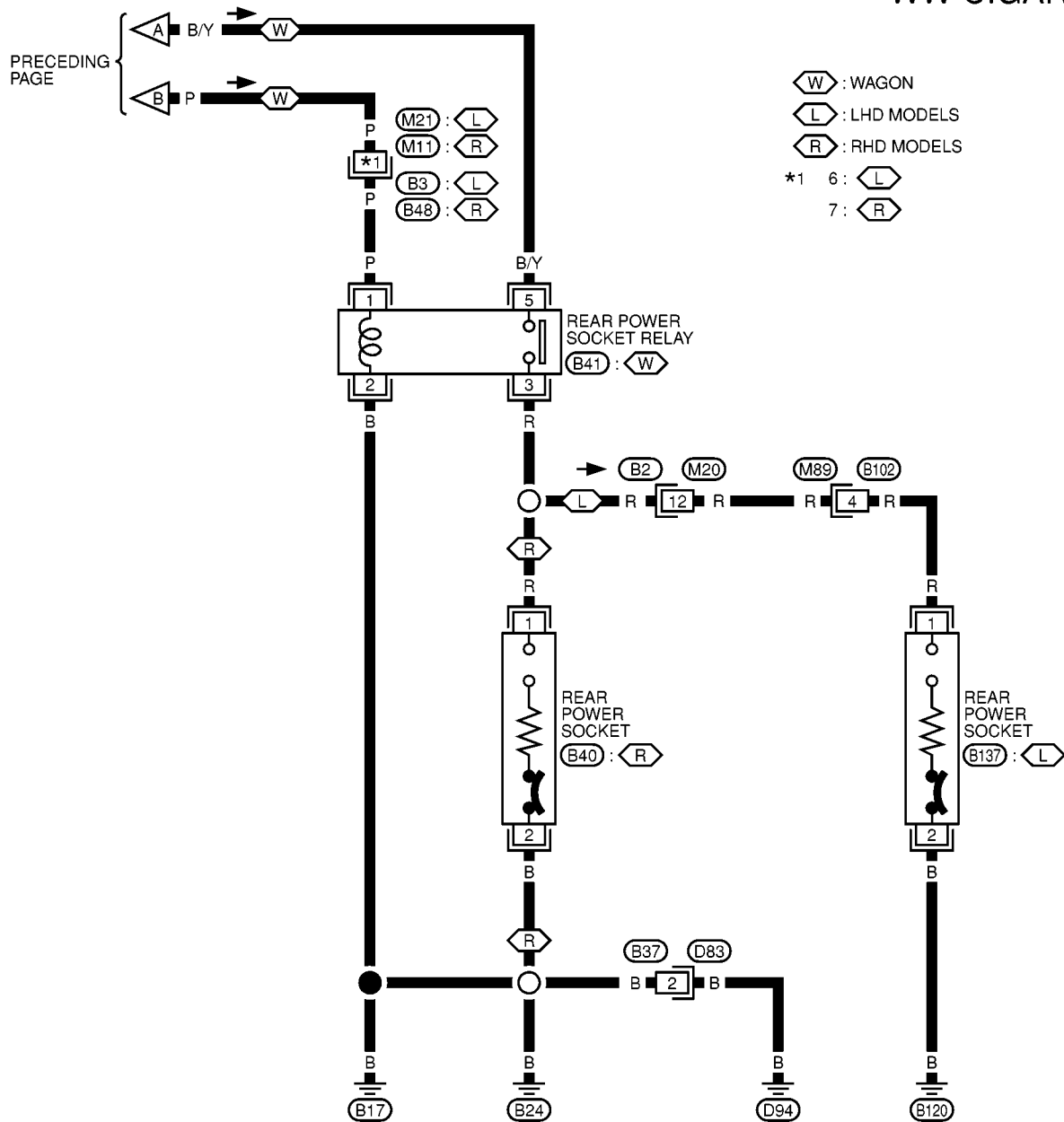
Horn bolt : 16 - 18 N·m (1.6 - 1.8 kg-m, 12 - 13 ft-lb)

CIGARETTE LIGHTER

Wiring Diagram —POWER SOCKET—

EKS009Q6

WW-CIGAR-02



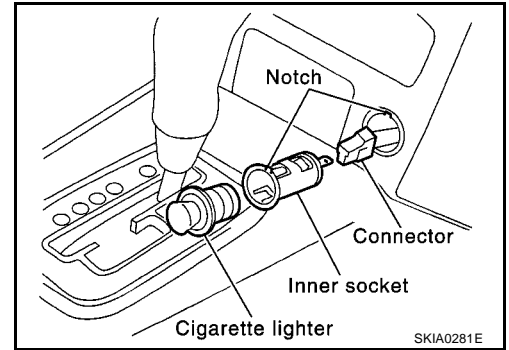
MKWA0520E

CIGARETTE LIGHTER

Removal and Installation for Cigarette lighter

REMOVAL

1. Remove ashtray from instrument lower center panel. Refer to [AV-35, "Removal and Installation of Audio Unit"](#) .
2. Remove the cigarette lighter assembly.



3. Disconnect cigarette lighter connector, and remove cigarette lighter ring and socket.

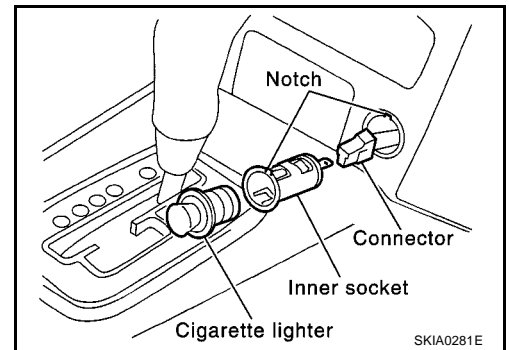
INSTALLATION

Install in the reverse order of removal aligning notches of cigarette lighter ring and instrument lower center panel.

Removal and Installation for Front Power Socket

REMOVAL

1. Remove the Pocket. Refer to IP section in P12 ESM (SM2E00-1P12E0E).
2. Disconnect power socket connector.
3. Pull out inner socket from inner case.



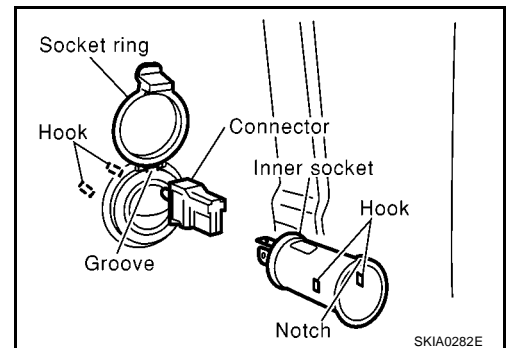
INSTALLATION

Install in the reverse order of removal aligning notches of power socket and inner case.

Removal and Installation for Rear Power Socket

REMOVAL

1. Remove luggage side lower finisher. Refer to IP section in P12 ESM (SM2E00-1P12E0E).
2. Disconnect power socket connector.
3. Pull out inner socket from luggage side lower finisher.



INSTALLATION

Install in the reverse order of removal aligning notches of power socket and installation hole.

CIGARETTE LIGHTER
