SECTION LT
LIGHTING SYSTEM

CONTENTS

SERVICE INFORMATION

DTC INDEX

U1000-U1010

INFOID:0000000004160283

DTC	Items (CONSULT screen terms)	Reference
U1000	CAN COMM CIRCUIT	LT-106, "DTC U1000 CAN COMM CIRCUIT"
U1010	CONTROL UNIT (CAN)	LT-107, "DTC U1010 CONTROL UNIT (CAN)"

B2503-B2521

INFOID:0000000004160284

DTC	Items (CONSULT screen terms)	Reference
B2503	SWIVEL ACTUATOR [RH]	LT-107, "DTC B2503 SWIVEL ACTUATOR RH"
B2504	SWIVEL ACTUATOR [LH]	LT-112, "DTC B2504 SWIVEL ACTUATOR LH"
B2514	HI SEN UNUSUAL [RR]	LT-117, "DTC B2514 HI SEN UNUSUAL RR"
C0126	ST ANG SEN SIG	LT-120, "DTC C0126 ST ANG SEN SIG"
B2516	SIFT SIG [P,R]	LT-120, "DTC B2516 SIFT SIG [P,R]"
B2517	VEHICLE SPEED SIG	LT-121, "DTC B2517 VEHICLE SPEED SIG"
B2519	LEVELIZER CALIB	LT-121, "DTC B2519 LEVELIZER CALIB"
C0428	ST ANGLE SEN CALIB	LT-121, "DTC C0428 ST ANGLE SEN CALIB"
B2521	ECU CIRC	LT-121, "DTC B2521 ECU CIRC"

PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

INFOID:0000000005213935

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. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the “SUPPLEMENTAL RESTRAINT SYSTEM” and “SEAT BELTS” 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 “SUPPLEMENTAL RESTRAINT SYSTEM”.**
- **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.**

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.**
- **When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.**

Precautions For Xenon Headlamp Service

INFOID:0000000004449358

WARNING:

Comply with the following warnings to prevent any serious accident.

- **Disconnect the battery cable (negative terminal) or the power supply fuse before installing, removing, or touching the xenon headlamp (bulb included). The xenon headlamp contains high-voltage generated parts.**
- **Never work with wet hands.**
- **Check the xenon headlamp ON-OFF status after assembling it to the vehicle. Never turn the xenon headlamp ON in other conditions. Connect the power supply to the vehicle-side connector. (Turning it ON outside the lamp case may cause fire or visual impairments.)**
- **Never touch the bulb glass immediately after turning it OFF. It is extremely hot.**

CAUTION:

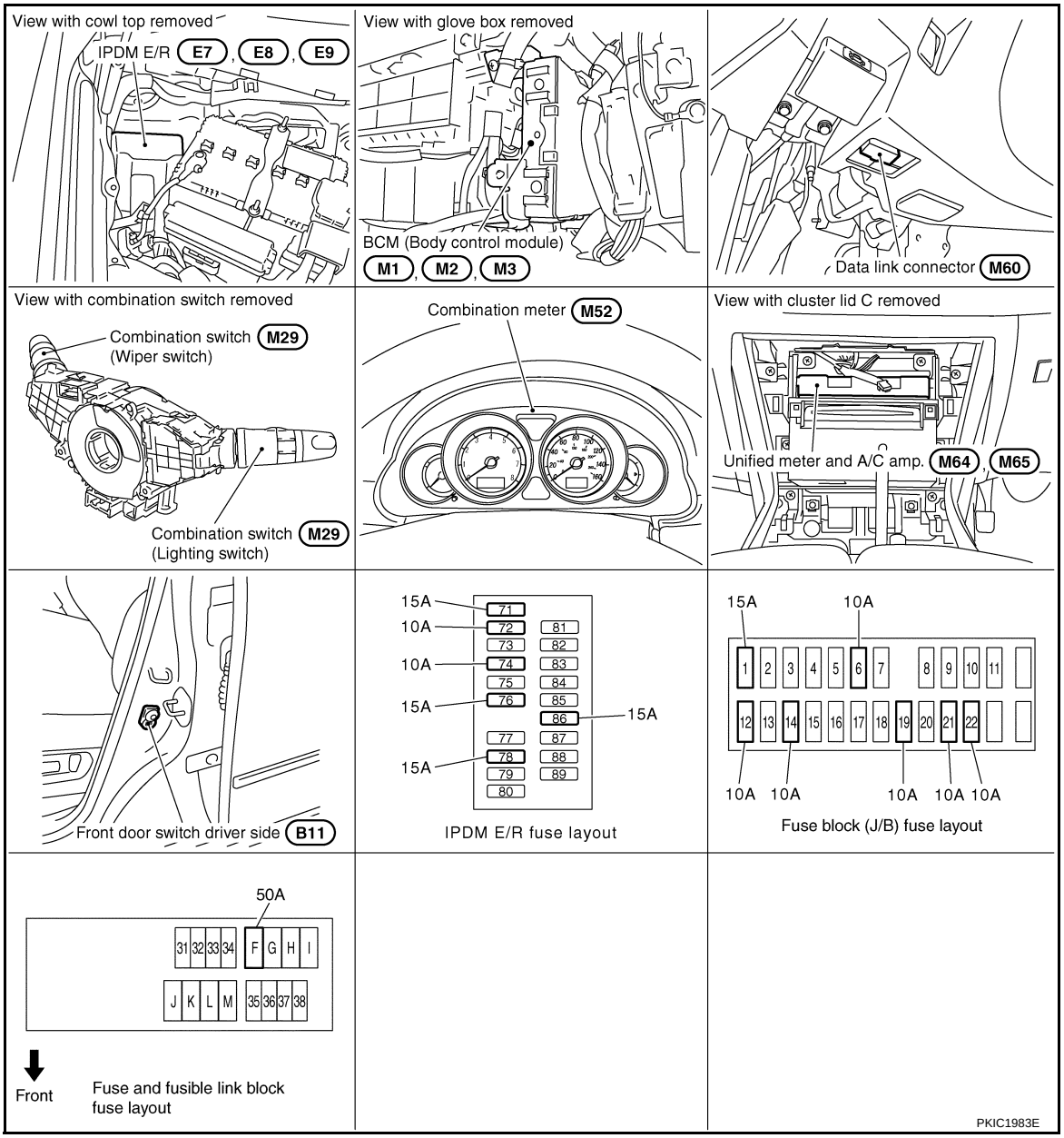
Comply with the following cautions to prevent any error and malfunction.

- **Install the xenon bulb securely. (Insufficient bulb socket installation may melt the bulb, the connector, the housing, etc. by high-voltage leakage or corona discharge.)**
- **Never perform HID circuit inspection with a tester.**
- **Never touch the xenon bulb glass with hands. Never put oil and grease on it.**
- **Dispose of the used xenon bulb after packing it in thick vinyl without breaking it.**
- **Never wipe out dirt and contamination with organic solvent (thinner, gasoline, etc.).**

HEADLAMP (FOR USA) - XENON TYPE -

Component Parts and Harness Connector Location

INFOID:0000000004160309



System Description

INFOID:0000000004160310

The control of the headlamp system operation is dependent upon the position of the combination switch (lighting switch). When the lighting switch is placed in the 2ND position, the BCM (body control module) receives input signal requesting the headlamps (and tail lamps) illuminate. This input signal is communicated to the IPDM E/R (intelligent power distribution module engine room) across the CAN communication lines. The CPU (central processing unit) located in the IPDM E/R controls the headlamp high and headlamp low relay coils. These relays, when energized, direct power to the respective headlamps, which then illuminate.

OUTLINE

Power is supplied at all times
- to headlamp high relay, located in IPDM E/R and
- to headlamp low relay, located in IPDM E/R, from battery direct,
- through 15A fuse (No. 71, located in IPDM E/R)
- to CPU, located in IPDM E/R,
- through 15A fuse (No. 78, located in IPDM E/R)

- to CPU, located in IPDM E/R,
- through 50A fusible link (letter F, located in fuse and fusible link block)
- to BCM terminal 55,
- through 10A fuse [No. 21, located in fuse block (J/B)]
- to BCM terminal 42 and
- to combination meter terminal 23,
- through 10A fuse [No. 19, located in fuse block (J/B)]
- to unified meter and A/C amp. terminal 54,
- through 10A fuse [No. 22, located in fuse block (J/B)]
- to key slot terminal 1.

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

- to CPU, located in IPDM E/R,
- through 15A fuse [No. 1, located in fuse block (J/B)]
- to BCM terminal 38,
- through 10A fuse [No. 14, located in fuse block (J/B)]
- to combination meter terminal 12,
- through 10A fuse [No. 12, located in fuse block (J/B)]
- to unified meter and A/C amp. terminal 53.

When the ignition switch is in the ACC or ON position, power is supplied

- through 10A fuse [No. 6, located in fuse block (J/B)]
- to BCM terminal 11.

Ground is supplied

- to BCM terminal 52
- to combination meter terminals 9, 10, and 11
- to unified meter and A/C amp. terminals 55 and 71
- to push-button ignition switch (push switch) terminal 1
- to key slot terminal 8
- through grounds M16 and M70,
- to IPDM E/R terminals 38 and 51
- through grounds E22 and E43.

HEADLAMP OPERATION

Low Beam Operation

With the lighting switch in 2ND position, the BCM receives input signal requesting the headlamps to illuminate. This input signal is communicated to the IPDM E/R across the CAN communication lines. The CPU located in the IPDM E/R controls the headlamp low relay coil, which when energized, directs power

- through 15A fuse (No. 76, located in IPDM E/R)
- through IPDM E/R terminal 20
- to front combination lamp RH terminal 8,
- through 15A fuse (No. 86, located in IPDM E/R)
- through IPDM E/R terminal 30
- to front combination lamp LH terminal 8.

Ground is supplied

- to front combination lamp RH terminal 4
- to front combination lamp LH terminal 4
- through grounds E22 and E43.

With power and ground supplied, low beam headlamps illuminate.

High Beam Operation/Flash-to-Pass Operation

With the lighting switch in 2ND position and placed in HIGH or PASS position, the BCM receives input signal requesting the headlamp high beams and low beams to illuminate. This input signal is communicated to the IPDM E/R across the CAN communication lines. The CPU located in the IPDM E/R controls the headlamp high relay coil and low relay coil, which when energized, directs power

- through 15A fuse (No. 76, located in IPDM E/R)
- through IPDM E/R terminal 20
- to front combination lamp RH terminal 8,
- through 15A fuse (No. 86, located in IPDM E/R)
- through IPDM E/R terminal 30
- to front combination lamp LH terminal 8,
- through 10A fuse (No. 72, located in IPDM E/R)
- through IPDM E/R terminal 27

- to front combination lamp RH terminal 6,
- through 10A fuse (No. 74, located in IPDM E/R)
- through IPDM E/R terminal 28
- to front combination lamp LH terminal 6.

Ground is supplied

- to front combination lamp RH terminal 4
- to front combination lamp LH terminal 4
- to front combination lamp RH terminal 2
- to front combination lamp LH terminal 2
- through grounds E22 and E43.

With power and ground supplied, the high beam and low beam headlamps illuminate.
The unified meter and A/C amp. that received the high beam request signal by BCM across the CAN communication makes a high beam indicator lamp turn on in the combination meter.

COMBINATION SWITCH READING FUNCTION

Refer to BCS-4, "System Description".

EXTERIOR LAMP BATTERY SAVER CONTROL

When the combination switch (lighting switch) is in the 2ND position (ON), and the ignition switch is turned from ON or ACC to OFF, the battery saver control function is activated.
Under this condition, the headlamps remain illuminated for 5 minutes, then the headlamps are turned off.
Exterior lamp battery saver control mode can be changed by the function setting of CONSULT-III.

AUTO LIGHT OPERATION

Refer to LT-65, "System Description".

XENON HEADLAMP

Xenon type lamps are used for to the low beam headlamps. Xenon bulbs do not use a filament. Instead, they produce light when a high voltage current is passed between two tungsten electrodes through a mixture of xenon (an inert gas) and certain other metal halides. In addition to strong lighting power, electronic control of the power supply gives the headlamps stable quality and tone color.
Followings are some advantages of the xenon type headlamp.

- The light produced by the headlamps is white color similar to sunlight that is easy to the eyes.
- Light output is nearly double that of halogen headlamps, affording increased area of illumination.
- Counter-reflected luminance increases and the contrast enhances on the wet road in the rain. That makes visibility go up more than the increase of the light volume.
- Power consumption is approximately 25 percent less than halogen headlamps, reducing battery load.

CAN Communication System Description

INFOID:0000000004160311

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

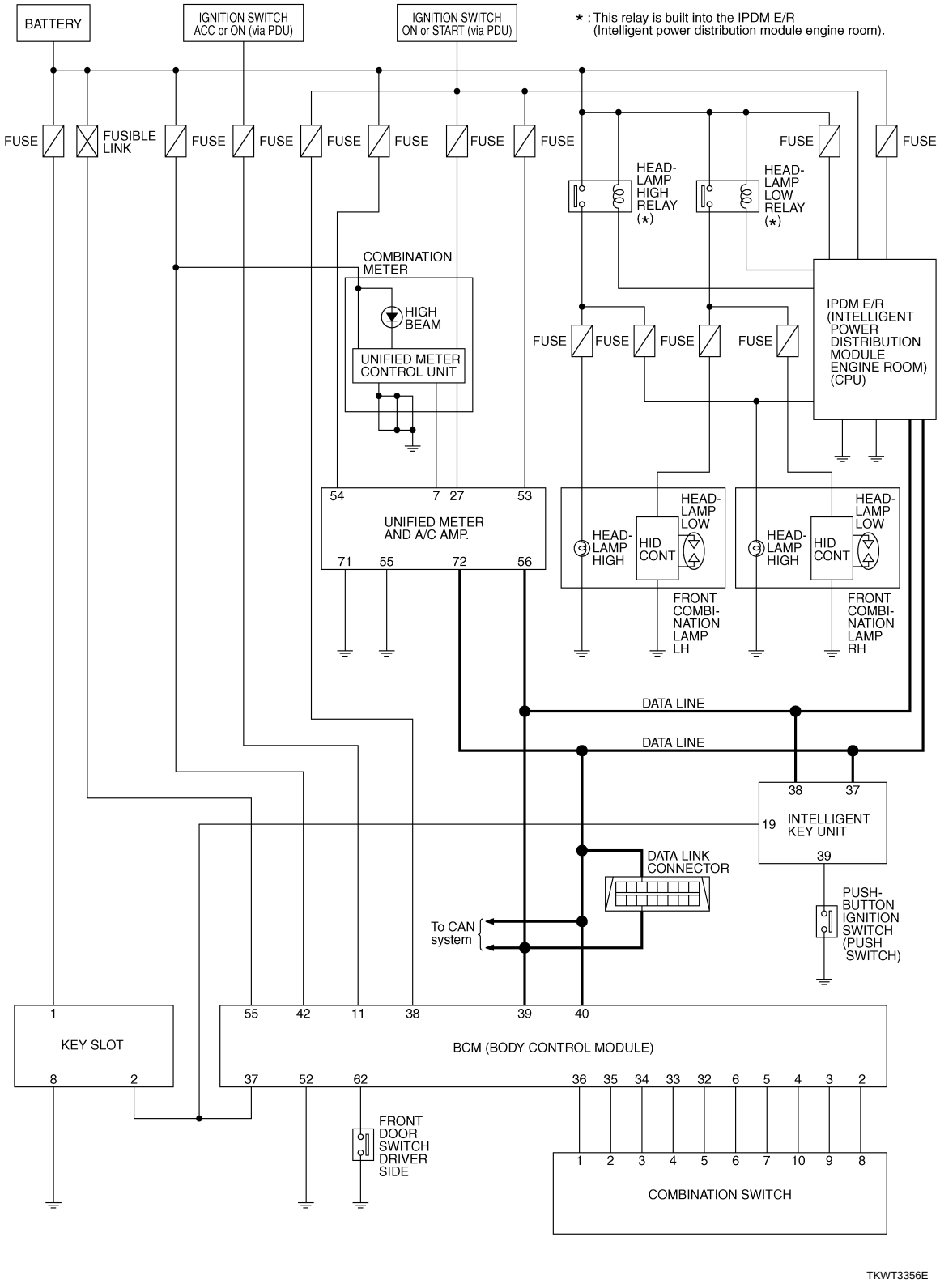
CAN Communication Unit

INFOID:0000000004160312

Refer to LAN-11, "System Description".

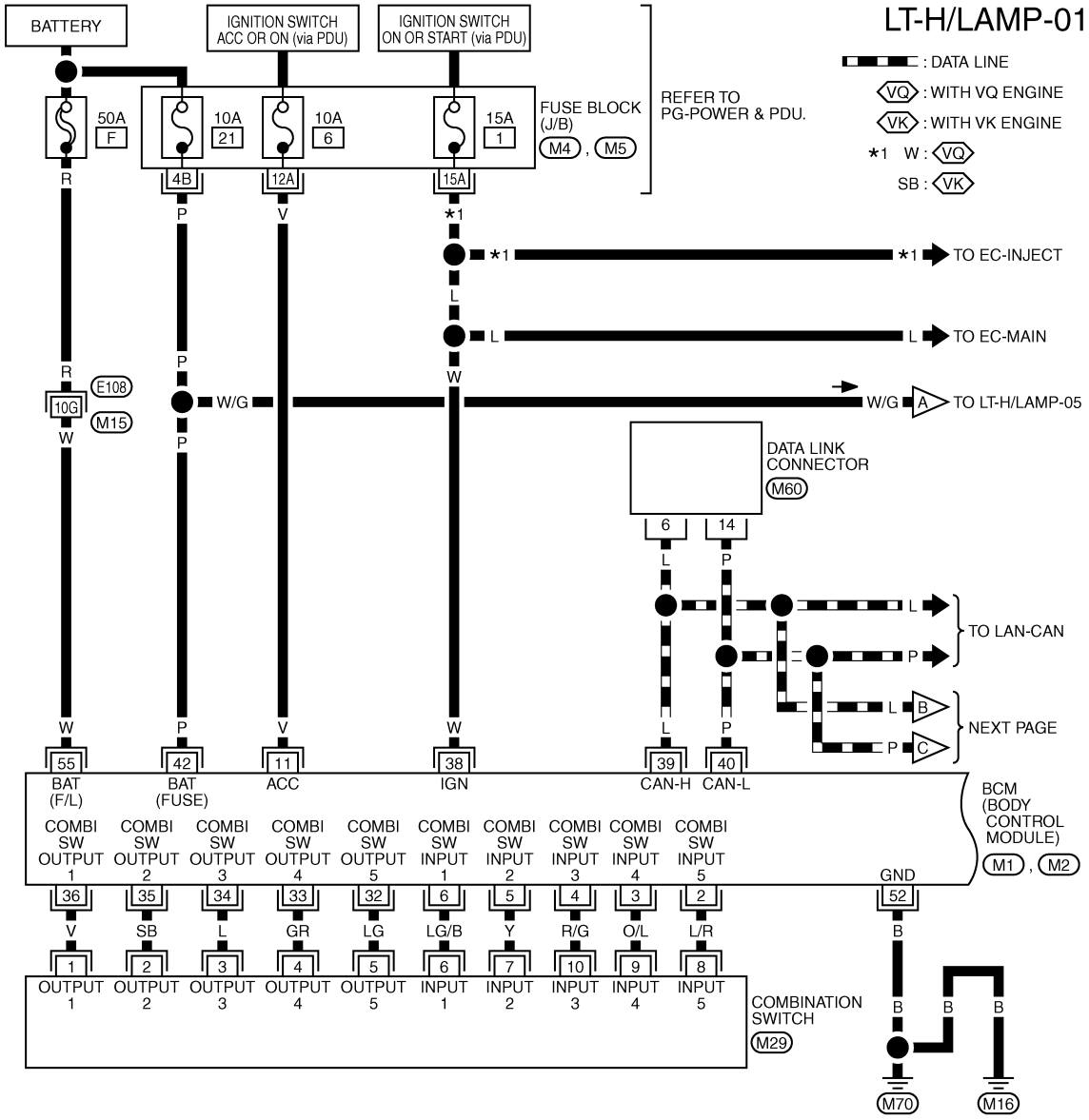
Schematic

INFOID:0000000004160313



Wiring Diagram - H/LAMP -

INFOID:0000000004160314



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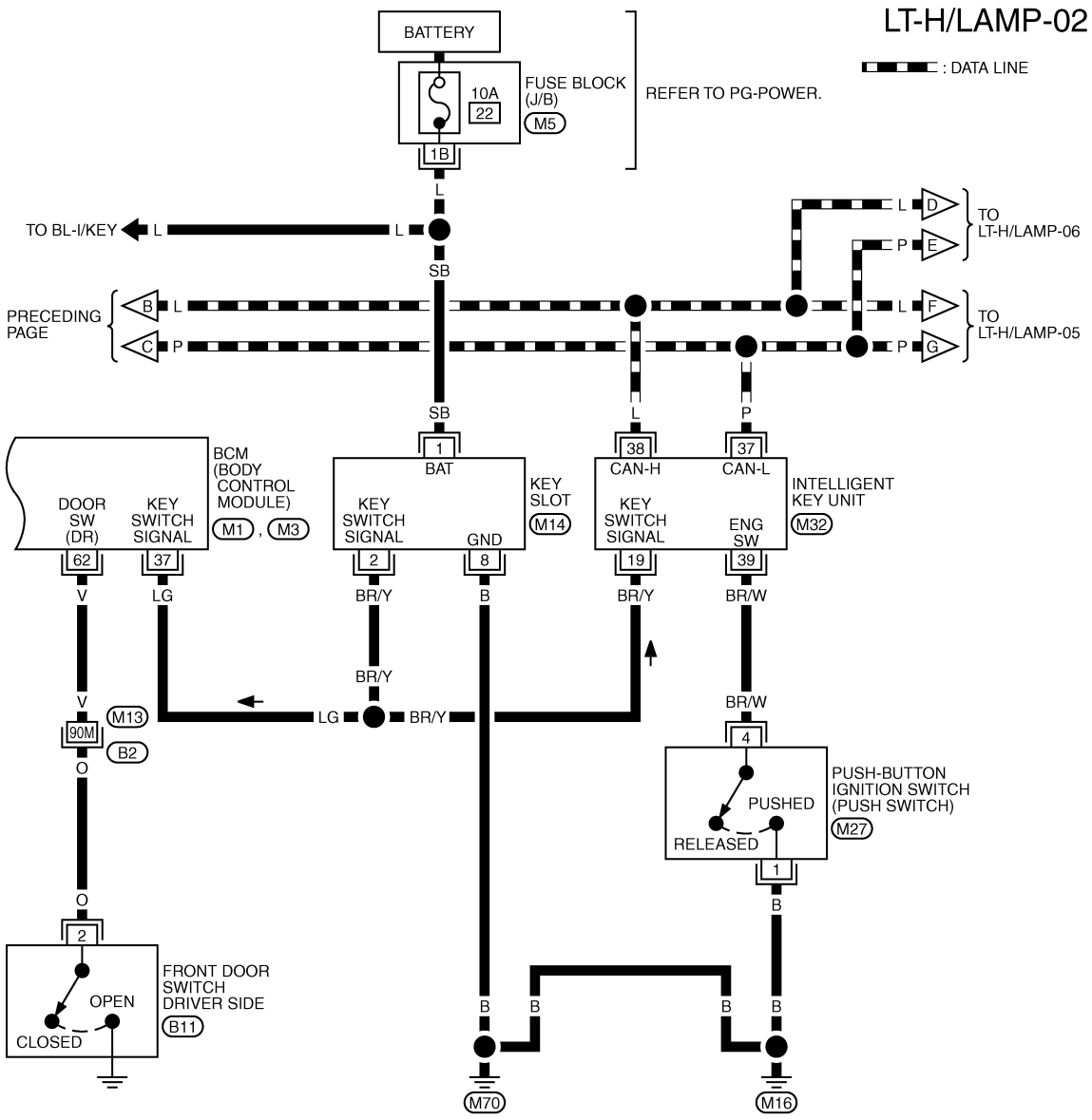
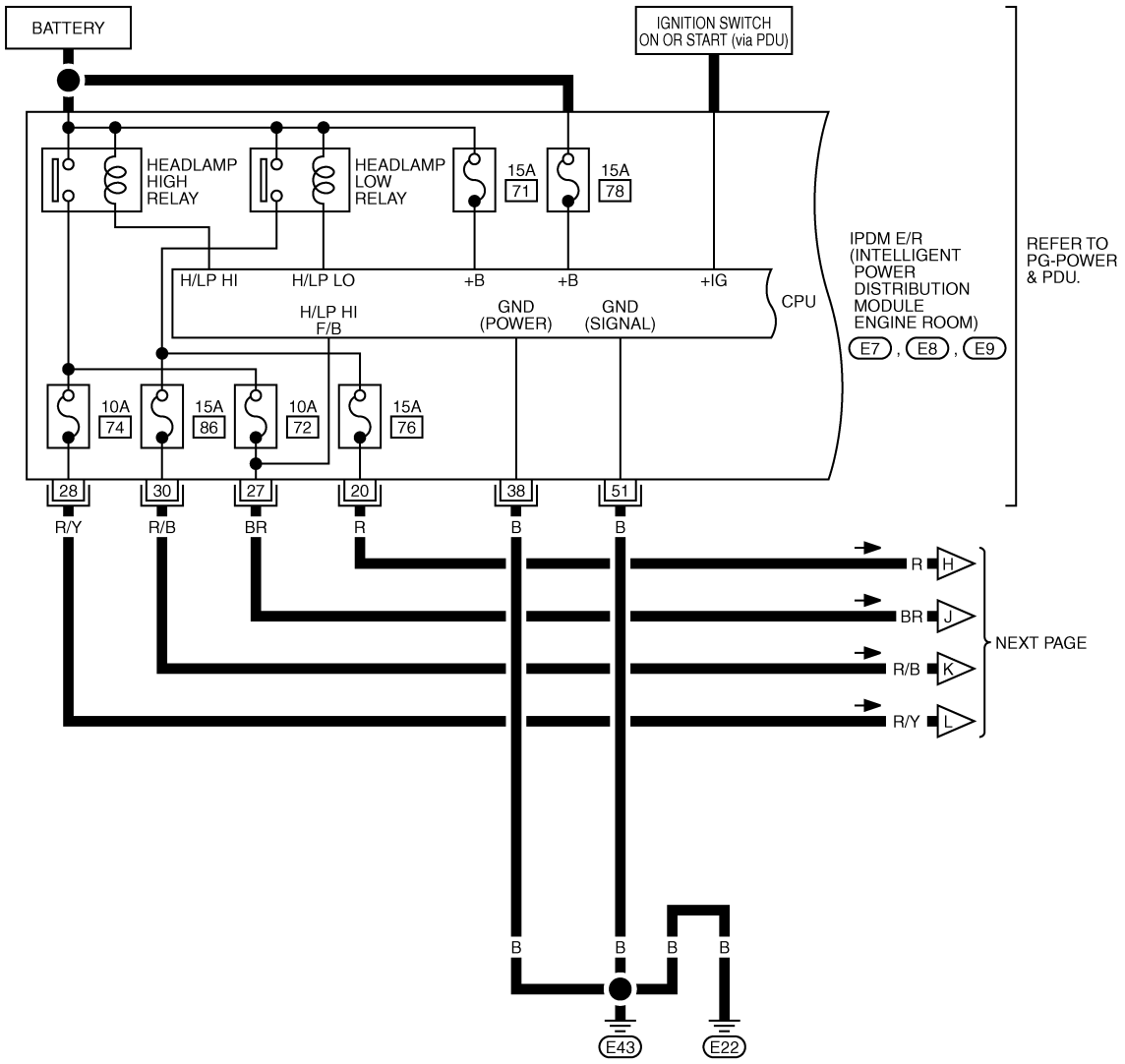
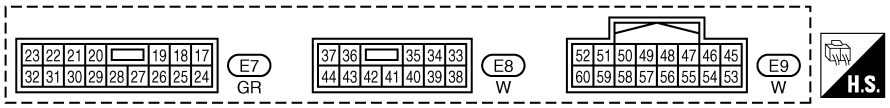

LT-H/LAMP-02
: DATA LINE
BATTERY
10A
22
FUSE BLOCK
(J/B)
M5
1B
REFER TO PG-POWER.
TO BL-I/KEY
L
SB
TO
LT-H/LAMP-06
TO
LT-H/LAMP-05
PRECEDING
PAGE
BCM
(BODY
CONTROL
MODULE)
M1 , M3
DOOR
SW
(DR)
KEY
SWITCH
SIGNAL
62
37
V
LG
BAT
KEY
SLOT
M14
GND
2
8
BR/Y
B
CAN-H
CAN-L
INTELLIGENT
KEY UNIT
M32
ENG
SW
38
37
19
39
BR/W
M13
90M
B2
O
4
PUSH-BUTTON
IGNITION SWITCH
(PUSH SWITCH)
M27
PUSHED
RELEASED
1
2
FRONT DOOR
SWITCH
DRIVER SIDE
B11
OPEN
CLOSED
M70
M16
M14
W
M27
BR
M32
W
H.S.
B11
W
REFER TO THE FOLLOWING.
B2 -SUPER MULTIPLE JUNCTION (SMJ)
M5 -FUSE BLOCK-JUNCTION BOX (J/B)
M1 , M3 -ELECTRICAL UNITS
TKWT8188E

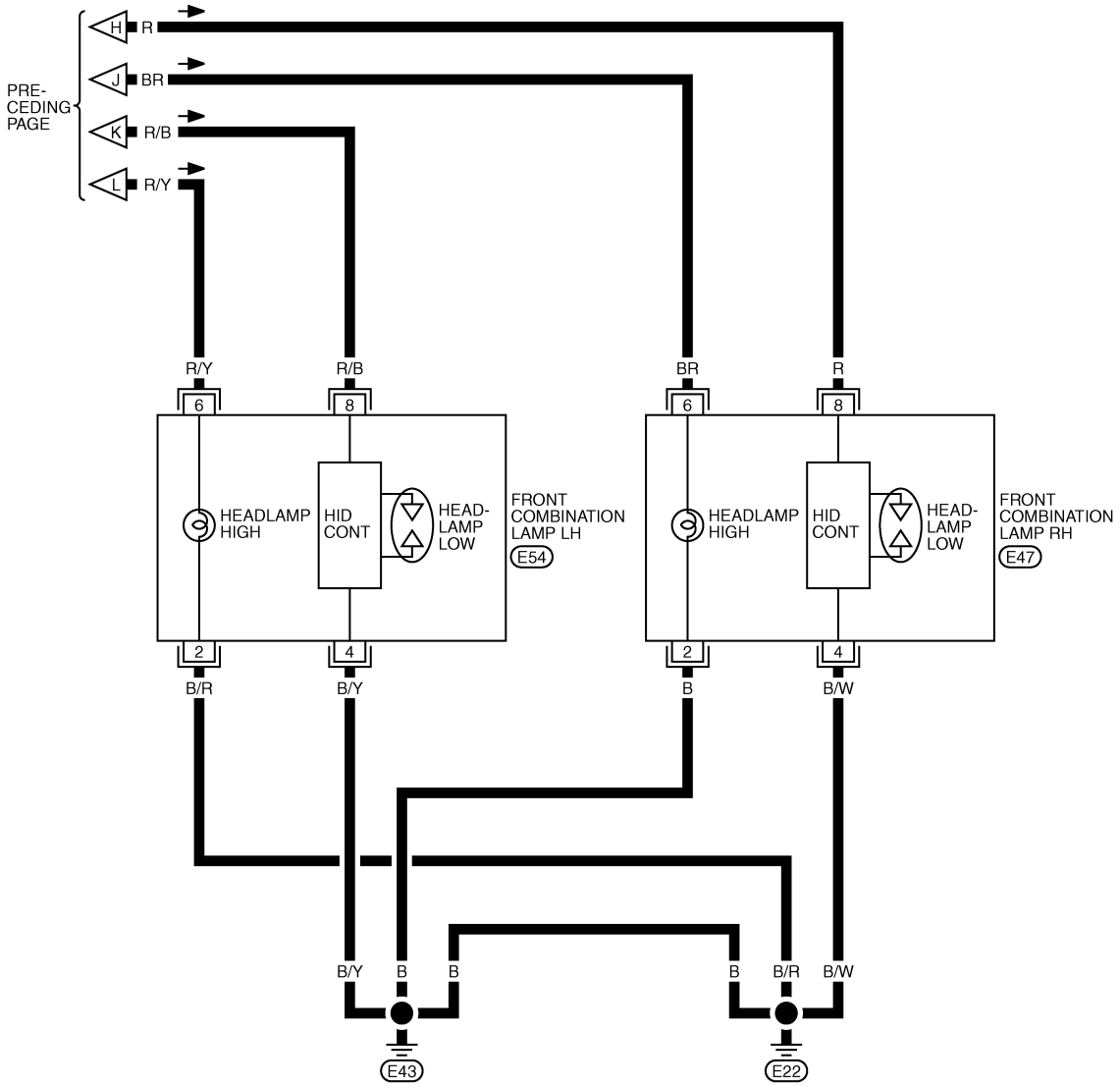
LT-H/LAMP-03

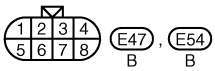




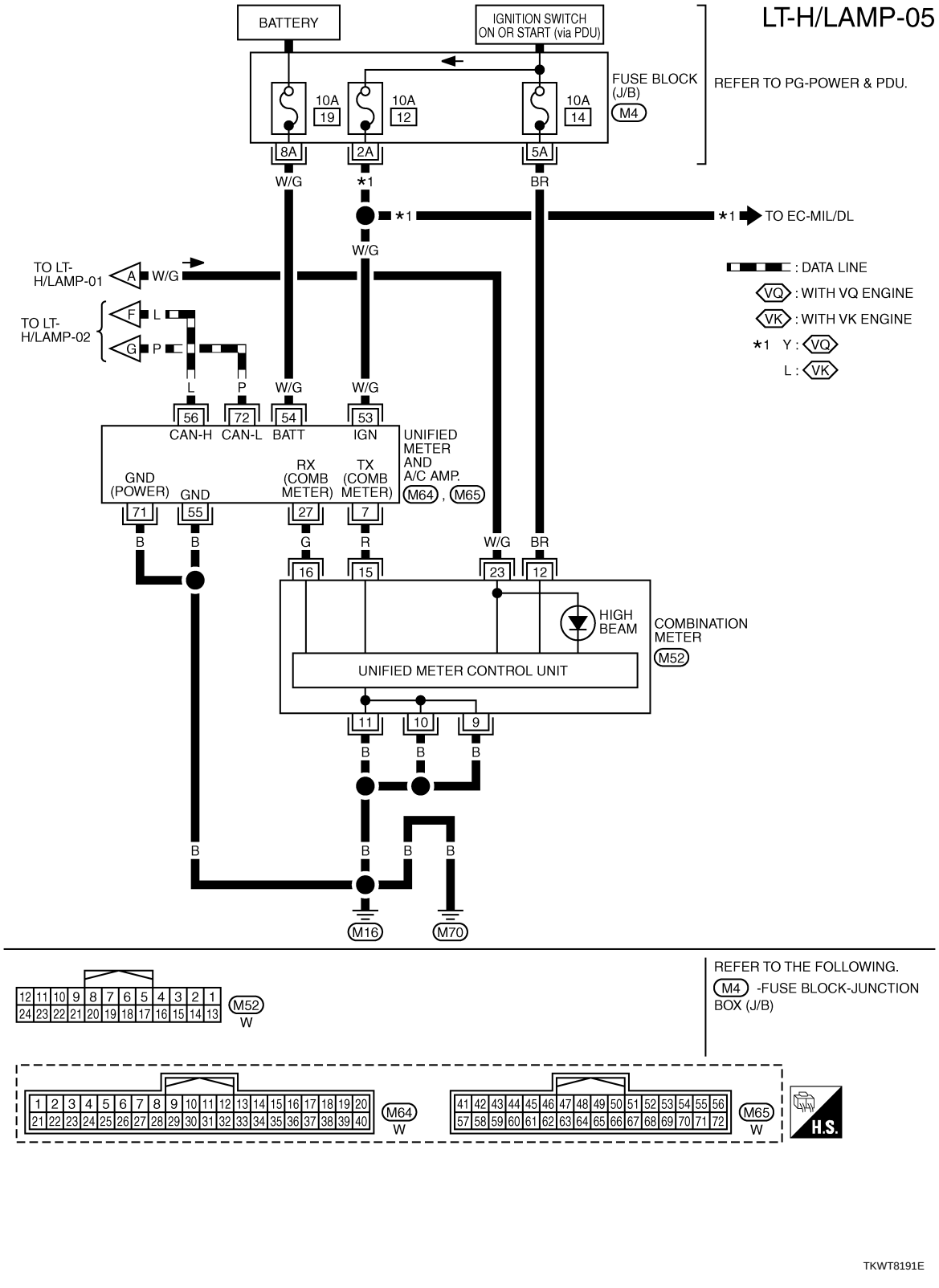
TKWT8189E

LT-H/LAMP-04





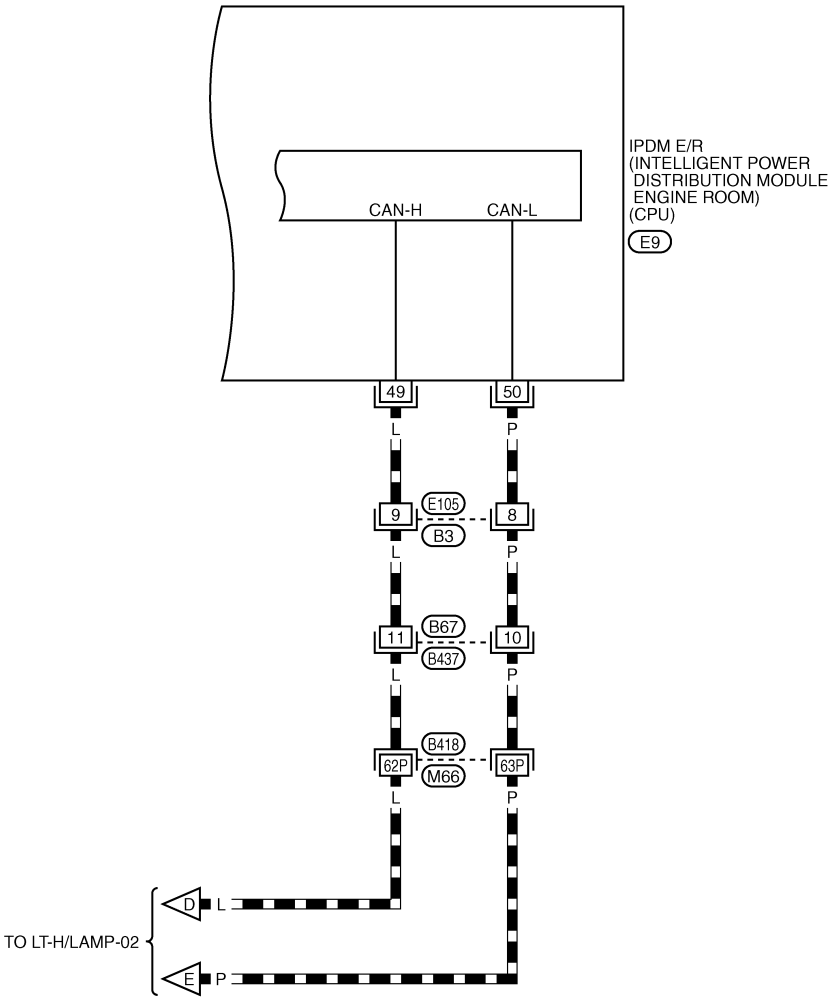
TKWT8190E

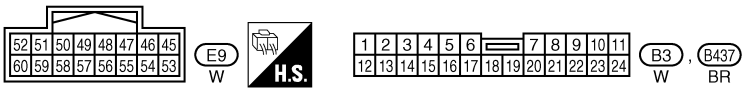

LT-H/LAMP-05
BATTERY
IGNITION SWITCH ON OR START (via PDU)
FUSE BLOCK (J/B) M4
10A 19
10A 12
10A 14
8A
2A
5A
REFER TO PG-POWER & PDU.
W/G
*1
BR
TO EC-MIL/DL
TO LT-H/LAMP-01
TO LT-H/LAMP-02
: DATA LINE
VQ : WITH VQ ENGINE
VK : WITH VK ENGINE
*1 Y : VQ
L : VK
56 CAN-H
72 CAN-L
54 BATT
53 IGN
UNIFIED METER AND A/C AMP. M64, M65
71 GND (POWER)
55 GND
27 RX (COMB METER)
7 TX (COMB METER)
16
15
23
12
HIGH BEAM
COMBINATION METER M52
UNIFIED METER CONTROL UNIT
11
10
9
M16
M70
REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
M52 W
M64 W
M65 W
H.S.

TKWT8191E

LT-H/LAMP-06

: DATA LINE





REFER TO THE FOLLOWING.
B418 -SUPER MULTIPLE JUNCTION (SMJ)

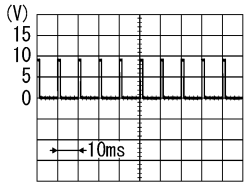
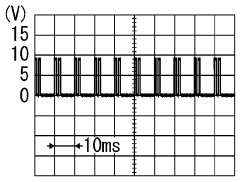
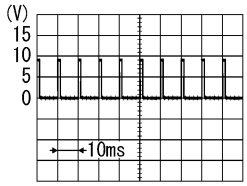
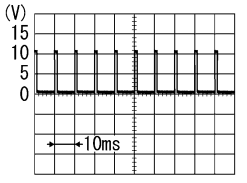
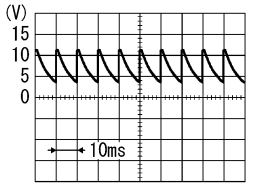
TKWT8192E

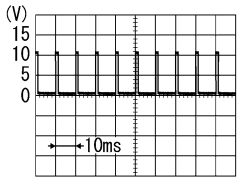
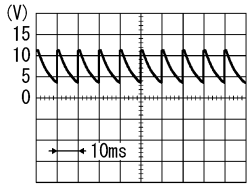
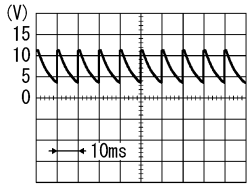
Terminal and Reference Value for BCM

INFOID:0000000004160315

CAUTION:

- **Check combination switch system terminal waveform under the loaded condition with lighting switch, turn signal switch and wiper switch OFF not to be fluctuated by overloaded.**
- **Turn wiper dial position to 4 except when checking waveform or voltage of wiper dial position. Wiper dial position can be confirmed on CONSULT-III. Refer to LT-174, "CONSULT-III Functions (BCM - COMB SW)".**

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
2	L/R	Combination switch input 5	ON	Lighting, turn, wiper switch (Wiper dial position 4)	Lighting switch HI beam (Operates only HI beam switch)	 PKIB4957J Approx. 1.0 V
					Lighting switch 2ND	 PKIB4953J Approx. 2.0 V
					OFF	Approx. 0 V
3	O/L	Combination switch input 4	ON	Lighting, turn, wiper switch (Wiper dial position 4)	Any of several conditions below • Lighting switch 2ND • Lighting switch PASSING (Operates only PASSING switch)	 PKIB4957J Approx. 1.0 V
					OFF	Approx. 0 V
11	V	Ignition switch (ACC)	ACC	—		Battery voltage
34	L	Combination switch output 3	ON	Lighting, turn, wiper switch (Wiper dial position 4)	Any of several conditions below • Lighting switch 2ND • Lighting switch HI beam (Operates only HI beam switch)	 PKIB4958J Approx. 1.2 V
					OFF	 PKIB4960J Approx. 7.0 - 7.5 V

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
35	SB	Combination switch output 2	ON	Lighting, turn, wiper switch (Wiper dial position 4)	Any of several conditions below • Lighting switch 2ND • Lighting switch PASSING (Operates only PASSING switch)	 PKIB4958J Approx. 1.2 V
					OFF	 PKIB4960J Approx. 7.0 - 7.5 V
37	LG	Key switch signal	OFF	Intelligent Key is inserted into key slot.		Battery voltage
38	W	Ignition switch (ON)	ON	—		Battery voltage
				Intelligent Key is removed from key slot.		Approx. 0 V
39	L	CAN – H	—	—		—
40	P	CAN – L	—	—		—
42	P	Battery power supply	OFF	—		Battery voltage
52	B	Ground	ON	—		Approx. 0 V
55	W	Battery power supply	OFF	—		Battery voltage
62	V	Front door switch driver side signal	OFF	Front door switch driver side	ON (open)	Approx. 0 V
					OFF (closed)	 PKIB4960J Approx. 7.5 - 8.0 V

Terminal and Reference Value for IPDM E/R

INFOID:0000000004160316

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
20	R	Headlamp low (RH)	ON	Lighting switch 2ND position	OFF	Approx. 0 V
					ON	Battery voltage

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
27	BR	Headlamp high (RH)	ON	Lighting switch HIGH or PASSING position	OFF	Approx. 0 V
					ON	Battery voltage
28	R/Y	Headlamp high (LH)	ON	Lighting switch HIGH or PASSING position	OFF	Approx. 0 V
					ON	Battery voltage
30	R/B	Headlamp low (LH)	ON	Lighting switch 2ND position	OFF	Approx. 0 V
					ON	Battery voltage
38	B	Ground	ON	—		Approx. 0 V
49	L	CAN – H	—	—		—
50	P	CAN – L	—	—		—
51	B	Ground	ON	—		Approx. 0 V

How to Perform Trouble Diagnosis

INFOID:0000000004160317

1. Confirm the symptom or customer complaint.
2. Understand operation description and function description. Refer to LT-6, "System Description".
3. Perform the Preliminary Check. Refer to LT-18, "Preliminary Check".
4. Check symptom and repair or replace the cause of malfunction.
5. Does the headlamp operate normally? If YES, GO TO 6. If NO, GO TO 4.
6. INSPECTION END

Preliminary Check

INFOID:0000000004160318

CHECK POWER SUPPLY AND GROUND CIRCUIT

1.CHECK FUSES AND FUSIBLE LINK

Check for blown fuses and fusible link.

Unit	Power source	Fuse and fusible link No.
BCM	Battery	F
		21
	Ignition switch ON or START position	1
	Ignition switch ACC or ON position	6
IPDM E/R	Battery	71
		72
		74
		76
		78
		86

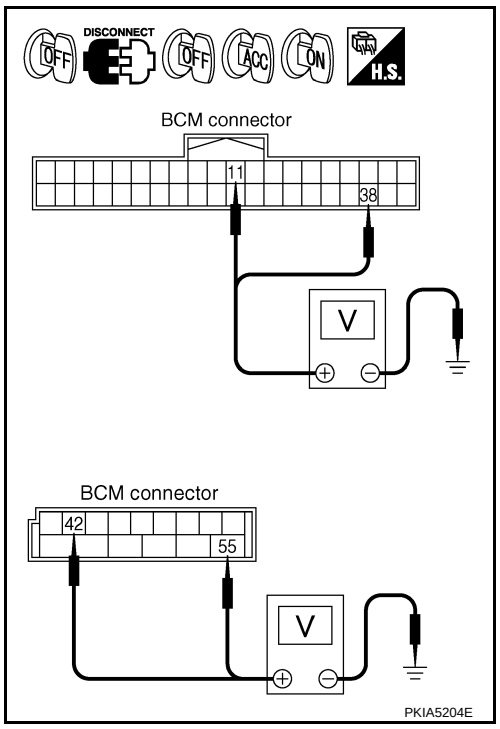
Refer to LT-10, "Wiring Diagram - H/LAMP -".

OK or NG

OK >> GO TO 2.
NG >> If fuse or fusible link is blown, be sure to eliminate cause of malfunction before installing new fuse or fusible link. Refer to PG-4.

2.CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM harness connector and ground.



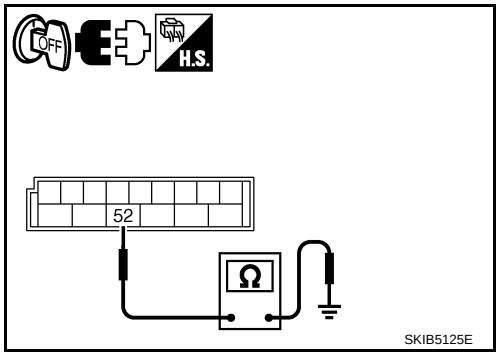
Terminal			Ignition switch position		
(+)		(–)	OFF	ACC	ON
BCM connector	Terminal				
M1	11	Ground	Approx. 0 V	Battery voltage	Battery voltage
	38		Approx. 0 V	Approx. 0 V	Battery voltage
M2	42		Battery voltage	Battery voltage	Battery voltage
	55		Battery voltage	Battery voltage	Battery voltage

OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK GROUND CIRCUIT

Check continuity between BCM harness connector and ground.



BCM connector	Terminal	Ground	Continuity
M2	52		Yes

OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.

CONSULT-III Functions (BCM - HEAD LAMP)

INFOID:0000000004160319

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

Diagnosis mode	Description
Wort Support	Changes the setting for each function.NOTE
Data Monitor	Displays BCM input data in real time.
Active Test	Operation of electrical loads can be checked by sending drive signal to them.
Self-Diag Results	BCM performs self-diagnosis of CAN communication.
Can Diag Support Monitor	The result of transmit/receive diagnosis of CAN communication can be read.

NOTE:
Cannot change the setting for headlamp.

DATA MONITOR

Display Item List

Monitor item		Contents
IGN ON SW	“On/Off”	Displays “IGN position (ON)/OFF, ACC position (OFF)” judged from the ignition switch signal.
ACC ON SW	“On/Off”	Displays “ACC (ON)/OFF, Ignition OFF (OFF)” status judged from ignition switch signal.

Monitor item		Contents
KEY ON SW	“On/Off”	Displays “Intelligent Key inserted into key slot (ON)/Intelligent Key removed from key slot (OFF)” status judged from the key switch signal.
TURN SIGNAL R	“On/Off”	Displays status (turn right: ON/others: OFF) as judged from lighting switch signal.
TURN SIGNAL L	“On/Off”	Displays status (turn left: ON/others: OFF) as judged from lighting switch signal.
HI BEAM SW	“On/Off”	Displays status (high beam switch: ON/others: OFF) of high beam switch judged from lighting switch signal.
HEAD LAMP SW 1	“On/Off”	Displays status (headlamp switch 1: ON/others: OFF) of headlamp switch 1 judged from lighting switch signal.
HEAD LAMP SW 2	“On/Off”	Displays status (headlamp switch 2: ON/others: OFF) of headlamp switch 2 judged from lighting switch signal.
TAIL LAMP SW	“On/Off”	Displays status (lighting switch 1ST or 2ND position: ON/others: OFF) of lighting switch judged from lighting switch signal.
AUTO LIGHT SW	“On/Off”	Displays status of the lighting switch as judged from the lighting switch signal. (AUTO position: ON/other than AUTO position: OFF)
PASSING SW	“On/Off”	Displays status (flash-to-passing switch: ON/others: OFF) of flash-to-passing switch judged from lighting switch signal.
FR FOG SW	“On/Off”	Displays status (front fog lamp switch: ON/others: OFF) of front fog lamp switch judged from lighting switch signal.
DOOR SW - DR	“On/Off”	Displays status of the driver door as judged from the driver door switch signal. (door is open: ON/door is closed: OFF)
DOOR SW - AS	“On/Off”	Displays status of the passenger door as judged from the passenger door switch signal. (door is open: ON/door is closed: OFF)
DOOR SW - RR	“On/Off”	Displays status of the rear door as judged from the rear door switch (RH) signal. (door is open: ON/door is closed: OFF)
DOOR SW - RL	“On/Off”	Displays status of the rear door as judged from the rear door switch (LH) signal. (door is open: ON/door is closed: OFF)
BACK DOOR SW NOTE	“Off”	—
I - KEY LOCK	“On/Off”	Displays “locked (ON)/other (OFF)” status, determined from lock signal.
OPTICAL SENSOR	“0 - 5V”	Displays “outside brightness (close to 5 V when light/close to 0 V when dark)” judged from optical sensor signal.
VEHICLE SPEED	“km/h”	Displays vehicle speed as judged from vehicle speed signal.

NOTE:

This item is displayed, but cannot be monitored.

ACTIVE TEST

Display Item List

Test item	Description
TAIL LAMP	Allows tail lamp relay to operate by switching ON-OFF.
FR FOG LAMP	Allows front fog lamp relay to operate by switching ON-OFF.
DAYTIME RUNNING LIGHT NOTE	—
HEAD LAMP (HI, LO)	Allows headlamp relay to operate by switching ON-OFF.

NOTE:

This item is displayed, but cannot be tested.

CONSULT-III Functions (IPDM E/R)

INFOID:0000000004160320

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

Diagnosis Mode	Description
Self-Diagnostic Results	Refer to PG-20, "CONSULT-III Function (IPDM E/R)".
Data Monitor	The input/output data of IPDM E/R is displayed in real time.
Can Diag Support Monitor	The result of transmit/receive diagnosis of CAN communication can be read.
Active Test	IPDM E/R sends a drive signal to electronic components to check their operation.

DATA MONITOR

All Signals, Main Signals, Selection From Menu

Item name	CONSULT-III screen display	Display or unit	Monitor item selection			Description
			ALL SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
Position lights request	TAIL&CLR REQ	On/Off	×	×	×	Signal status input from BCM
Headlamp low beam request	HL LO REQ	On/Off	×	×	×	Signal status input from BCM
Headlamp high beam request	HL HI REQ	On/Off	×	×	×	Signal status input from BCM
Front fog lights request	FR FOG REQ	On/Off	×	×	×	Signal status input from BCM

NOTE:
Perform monitoring of IPDM E/R data with the ignition switch ON. When the ignition switch is at ACC, the display may not be correct.

ACTIVE TEST

Test item	CONSULT-III screen display	Description
Tail lamp relay output	TAIL LAMP	Allows tail lamp relay to operate by switching operation ON-OFF at your option.
Headlamp relay (HI, LO) output	LAMPS	Allows headlamp relay (HI, LO) to operate by switching operation (OFF, HI ON, LO ON) at your option (Headlamp high beam repeats ON-OFF every 1 second).
Front fog lamp relay output		Allows fog lamp relay to operate by switching operation ON-OFF at your option.

Headlamp High Beam Does Not Illuminate (Both Sides)

INFOID:0000000004160321

1. CHECK COMBINATION SWITCH INPUT SIGNAL

CONSULT-III DATA MONITOR
1. Select “HI BEAM SW” of BCM (HEAD LAMP) data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is HIGH position : HI BEAM SW ON

CHECK THE COMBINATION SWITCH
Refer to LT-175, "Combination Switch Inspection".

OK or NG

OK >> GO TO 2.
NG >> Check combination switch (lighting switch). Refer to LT-175, "Combination Switch Inspection".

2. HEADLAMP ACTIVE TEST

CONSULT-III ACTIVE TEST
1. Select “LAMPS” of IPDM E/R active test item.
2. With operating the test item, check the headlamp high beam operation.

HI : Headlamp high beam ON
Off : Headlamp high beam OFF

NOTE:
Headlamp high beam repeats ON-OFF every 1 second.

IPDM E/R AUTO ACTIVE TEST
1. Activate auto active test. Refer to PG-22, "Auto Active Test".
2. Make sure headlamp high beam operation.

Headlamp high beam should operate.

OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3. CHECK IPDM E/R

CONSULT-III DATA MONITOR
1. Select “HL LO REQ” and “HL HI REQ” of IPDM E/R data monitor item.
2. With operating the lighting switch is in HI position, check the monitor status.

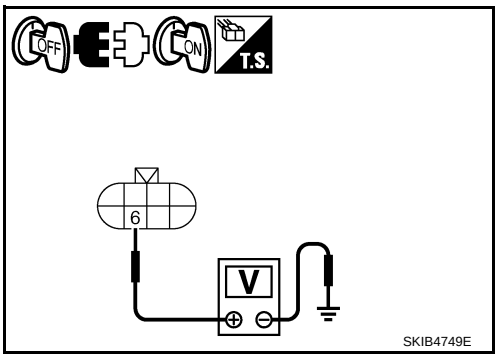
When lighting switch is HIGH position : HL LO REQ ON / : HL HI REQ ON

OK or NG

OK >> Replace IPDM E/R. Refer to PG-27, "Removal and Installation of IPDM E/R".
NG >> Replace BCM. Refer to BCS-14, "Removal and Installation of BCM".

4. CHECK HEADLAMP INPUT SIGNAL

CONSULT-III ACTIVE TEST
1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Select “LAMPS” of IPDM E/R active test item.
4. Touch “HI” screen.
5. With operating the test item, check voltage between front combination lamp (RH and LH) harness connector and ground. (Headlamp high beam repeats ON-OFF every 1 second.)



Terminal				
(+)			(–)	Voltage (Approx.)
Front combination lamp connector		Terminal		
RH	E47	6	Ground	Battery voltage
LH	E54	6		

IPDM E/R AUTO ACTIVE TEST
1. Turn ignition switch OFF.
2. Disconnect front combination lamp connector.
3. Activate auto active test. Refer to PG-22, "Auto Active Test".
4. When headlamp high beam is operating, check voltage between front combination lamp (RH and LH) harness connector and ground.

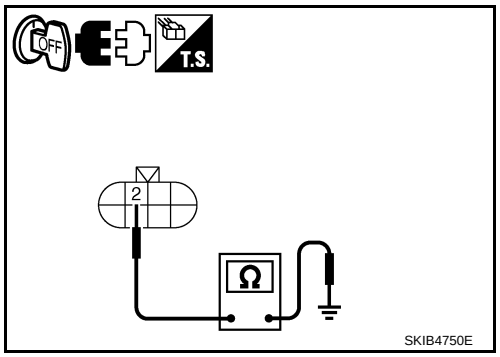
Terminal				
(+)			(–)	Voltage (Approx.)
Front combination lamp connector		Terminal		
RH	E47	6	Ground	Battery voltage
LH	E54	6		

OK or NG

OK >> GO TO 5.
NG >> GO TO 7.

5. CHECK HEADLAMP GROUND

1. Turn ignition switch OFF.
2. Check continuity between front combination lamp (RH and LH) harness connector and ground.



Front combination lamp connector		Terminal	Ground	Continuity
RH	E47	2		Yes
LH	E54	2		

OK or NG

OK >> GO TO 6.
NG >> Repair harness or connector.

6.CHECK BULB

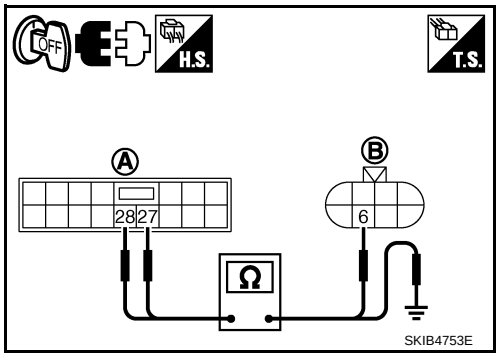
Check bulbs of lamp (both side).

OK or NG

OK >> Check connecting condition headlamp harness connector.
NG >> Replace headlamp bulb.

7.CHECK CIRCUIT BETWEEN IPDM E/R AND FRONT COMBINATION LAMP

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector (A) and front combination lamp (RH and LH) harness connector (B).



Circuit	A		B		Continuity
	Connector	Terminal	Connector	Terminal	
RH	E7	27	E47	6	Yes
LH		28	E54	6	

4. Check continuity between IPDM E/R harness connector (A) and ground.

A			Ground	Continuity
Connector		Terminal		
RH	E7	27		No
LH		28		

OK or NG

OK >> Replace IPDM E/R. Refer to PG-27, "Removal and Installation of IPDM E/R".
NG >> Repair harness or connector.

Headlamp High Beam Does Not Illuminate (One Side)

INFOID:0000000004160322

1.CHECK BULB

Check bulb of lamp which does not illuminate.

OK or NG

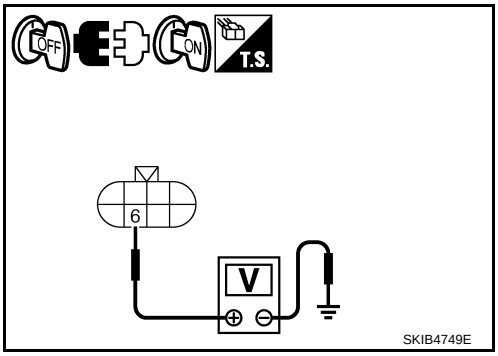
OK >> GO TO 2.
NG >> Replace headlamp bulb.

2.CHECK HEADLAMP INPUT SIGNAL

CONSULT-III ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH or LH connector.
3. Select “LAMPS” of IPDM E/R active test item.
4. Touch “HI” screen.

5. With operating the test item, check voltage between front combination lamp RH or LH harness connector and ground. (Headlamp high beam repeats ON-OFF every 1 second.)



Terminal				
(+)			(–)	Voltage (Approx.)
Front combination lamp connector		Terminal		
RH	E47	6	Ground	Battery voltage
LH	E54	6		

⊗IPDM E/R AUTO ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH or LH connector.
3. Activate auto active test. Refer to PG-22, "Auto Active Test".
4. When headlamp high beam is operating, check voltage between front combination lamp RH or LH harness connector and ground.

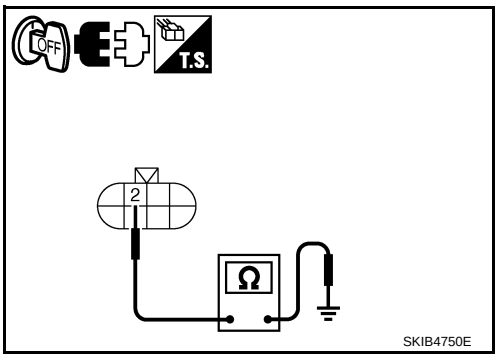
Terminal				
(+)			(–)	Voltage (Approx.)
Front combination lamp connector		Terminal		
RH	E47	6	Ground	Battery voltage
LH	E54	6		

OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3.CHECK HEADLAMP GROUND

1. Turn ignition switch OFF.
2. Check continuity between front combination lamp RH or LH harness connector and ground.



Front combination lamp connector		Terminal	Ground	Continuity
RH	E47	2		Yes
LH	E54	2		

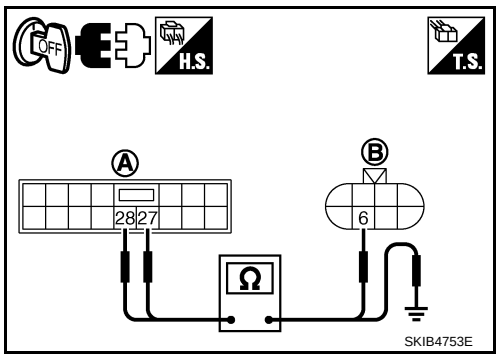
OK or NG

OK >> Check connecting condition headlamp harness connector.
NG >> Repair harness or connector.

4.CHECK CIRCUIT BETWEEN IPDM E/R AND FRONT COMBINATION LAMP

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and front combination lamp RH or LH connector.

3. Check continuity between IPDM E/R harness connector (A) and front combination lamp RH or LH harness connector (B).



Circuit	A		B		Continuity
	Connector	Terminal	Connector	Terminal	
RH	E7	27	E47	6	Yes
LH		28	E54	6	

4. Check continuity between IPDM E/R harness connector (A) and ground.

A			Ground	Continuity
Connector		Terminal		
RH	E7	27		No
LH		28		

OK or NG

OK >> Replace IPDM E/R. Refer to PG-27, "Removal and Installation of IPDM E/R".
NG >> Repair harness or connector.

High Beam Indicator Lamp Does Not Illuminate

INFOID:0000000004160323

1.CHECK UNIFIED METER AND A/C AMP.

CONSULT-III SELF-DIAGNOSIS
1. Perform self-diagnosis for “METER A/C AMP” on CONSULT-III.
2. Check if malfunction is indicated.

Is malfunction indicated?

YES >> Repair or replace malfunctioning parts.
NO >> GO TO 2.

2.CHECK COMBINATION METER INPUT SIGNAL

CONSULT-III DATA MONITOR
1. Select “HI–BEAM IND” of METER A/C AMP data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is in the HIGH BEAM position : HI–BEAM IND ON

OK or NG

OK >> Replace combination meter. Refer to DI-25, "Disassembly and Assembly of Combination Meter".
NG >> Replace unified meter and A/C amp. Refer to DI-34, "Removal and Installation of Unified Meter and A/C Amp".

Headlamp Low Beam Does Not Illuminate (Both Sides)

INFOID:0000000004160324

1.CHECK COMBINATION SWITCH INPUT SIGNAL

CONSULT-III DATA MONITOR
1. Select “HEAD LAMP SW 1” and “HEAD LAMP SW 2” of BCM (HEAD LAMP) data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is 2ND position : HEAD LAMP SW 1 ON
: HEAD LAMP SW 2 ON

CHECK THE COMBINATION SWITCH
Refer to LT-175, "Combination Switch Inspection".

OK or NG

OK >> GO TO 2.

NG >> Check combination switch (lighting switch). Refer to LT-175, "Combination Switch Inspection".

2. HEADLAMP ACTIVE TEST

CONSULT-III ACTIVE TEST
1. Select “LAMPS” of IPDM E/R active test item.
2. With operating the test item, check the headlamp low beam operation.

LO : Headlamp low beam ON
Off : Headlamp low beam OFF

IPDM E/R AUTO ACTIVE TEST
1. Activate auto active test. Refer to PG-22, "Auto Active Test".
2. Make sure headlamp low beam operation.

Headlamp low beam should operate.

OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3. CHECK IPDM E/R

CONSULT-III DATA MONITOR
1. Select “HL LO REQ” of IPDM E/R data monitor item.
2. With operating the lighting switch is in 2ND position, check the monitor status.

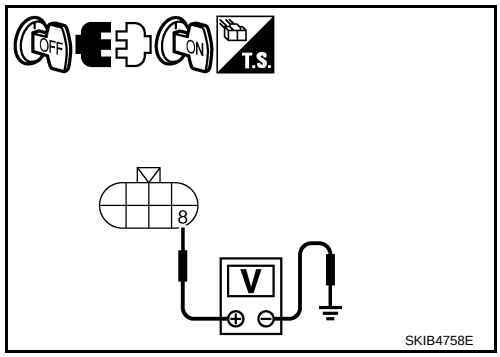
When lighting switch is 2ND position : HL LO REQ ON

OK or NG

OK >> Replace IPDM E/R. Refer to PG-27, "Removal and Installation of IPDM E/R".
NG >> Replace BCM. Refer to BCS-14, "Removal and Installation of BCM".

4. CHECK HEADLAMP INPUT SIGNAL

CONSULT-III ACTIVE TEST
1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Select “LAMPS” of IPDM E/R active test item.
4. Touch “LO” screen.
5. With operating the test item, check voltage between front combination lamp (RH and LH) harness connector and ground.



Terminal				Voltage (Approx.)
(+)			(–)	
Front combination lamp connector		terminal		
RH	E47	8	Ground	Battery voltage
LH	E54	8		

IPDM E/R AUTO ACTIVE TEST
1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Activate auto active test. Refer to PG-22, "Auto Active Test".
4. When headlamp low beam is operating, check voltage between front combination lamp (RH and LH) harness connector and ground.

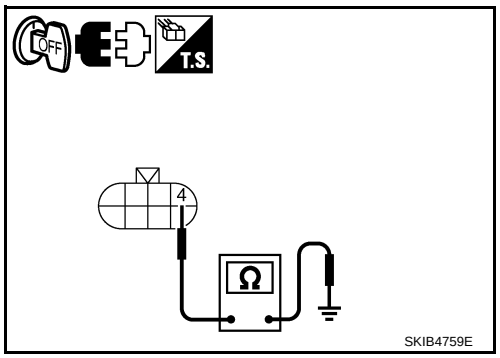
Terminal				Voltage (Approx.)
(+)			(–)	
Front combination lamp connector		terminal		
RH	E47	8	Ground	Battery voltage
LH	E54	8		

OK or NG

OK >> GO TO 5.
NG >> GO TO 6.

5.CHECK HEADLAMP GROUND

1. Turn ignition switch OFF.
2. Check continuity between front combination lamp (RH and LH) harness connector and ground.



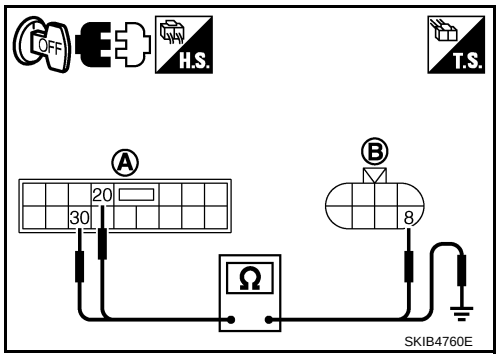
Front combination lamp connector		Terminal	Ground	Continuity
RH	E47	4		Yes
LH	E54	4		

OK or NG

OK >> Check headlamp harness and connectors, ballasts (HID control unit), and xenon bulbs. Refer to LT-30, "Xenon Headlamp Trouble Diagnosis".
NG >> Repair harness or connector.

6.CHECK CIRCUIT BETWEEN IPDM E/R AND FRONT COMBINATION LAMP

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector (A) and front combination lamp (RH and LH) harness connector (B).



Circuit	A		B		Continuity
	Connector	Terminal	Connector	Terminal	
RH	E7	20	E47	8	Yes
LH		30	E54	8	

4. Check continuity between IPDM E/R harness connector (A) and ground.

A			Ground	Continuity
Connector		Terminal		
RH	E7	20		No
LH		30		

OK or NG

OK >> Replace IPDM E/R. Refer to PG-27, "Removal and Installation of IPDM E/R".
NG >> Repair harness or connector.

Headlamp Low Beam Does Not Illuminate (One Side)

INFOID:0000000004160325

1.CHECK BULB

Check ballast (HID control unit) and xenon bulb of lamp which does not illuminate. Refer to LT-30, "Xenon Headlamp Trouble Diagnosis".

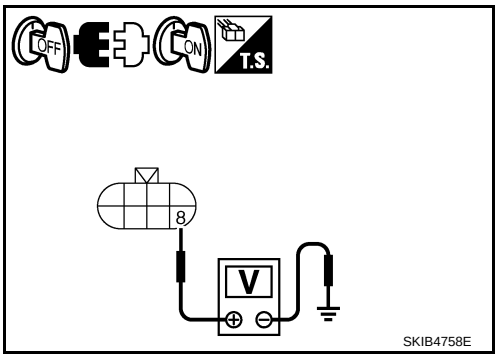
OK or NG

OK >> GO TO 2.
NG >> Repair malfunctioning part.

2.CHECK HEADLAMP INPUT SIGNAL

CONSULT-III ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH or LH connector.
3. Select “LAMPS” of IPDM E/R active test item.
4. Touch “LO” screen.
5. With operating the test item, check voltage between front combination lamp RH or LH harness connector and ground.



Terminal				Voltage (Approx.)
(+)			(–)	
Front combination lamp connector		terminal		
RH	E47	8	Ground	Battery voltage
LH	E54	8		

IPDM E/R AUTO ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH or LH connector.
3. Activate auto active test. Refer to PG-22, "Auto Active Test".
4. When headlamp low beam is operating, check voltage between front combination lamp RH or LH harness connector and ground.

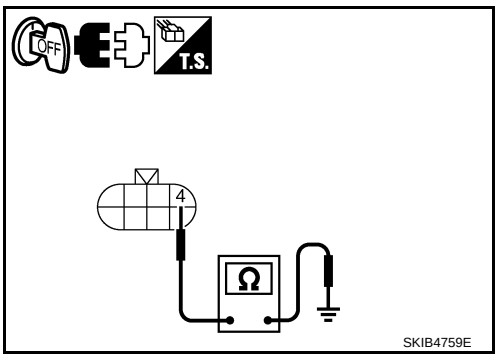
Terminal				Voltage (Approx.)
(+)			(–)	
Front combination lamp connector		terminal		
RH	E47	8	Ground	Battery voltage
LH	E54	8		

OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3.CHECK HEADLAMP GROUND

1. Turn ignition switch OFF.
2. Check continuity between front combination lamp RH or LH harness connector and ground.



Front combination lamp connector		Terminal	Ground	Continuity
RH	E47	4		Yes
LH	E54	4		

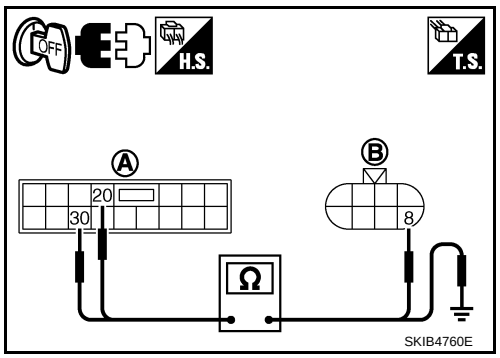
OK or NG

OK >> Check headlamp harness and connectors.
NG >> Repair harness or connector.

4.CHECK CIRCUIT BETWEEN IPDM E/R AND FRONT COMBINATION LAMP

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.

3. Check continuity between IPDM E/R harness connector (A) and front combination lamp RH or LH harness connector (B).



Circuit	A		B		Continuity
	Connector	Terminal	Connector	Terminal	
RH	E7	20	E47	8	Yes
LH		30	E54	8	

4. Check continuity between IPDM E/R harness connector (A) and ground.

A			Ground	Continuity
Connector		Terminal		
RH	E7	20		No
LH		30		

OK or NG

OK >> Replace IPDM E/R. Refer to PG-27, "Removal and Installation of IPDM E/R".
NG >> Repair harness or connector.

Headlamps Do Not Turn OFF

INFOID:0000000004160326

1.CHECK HEADLAMP TURN OFF

Make sure that lighting switch is OFF. And make sure headlamp turns off when ignition switch is turned OFF.

OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2.CHECK COMBINATION SWITCH INPUT SIGNAL

CONSULT-III DATA MONITOR
1. Select “HEAD LAMP SW 2” of BCM (HEAD LAMP) data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is OFF position : HEAD LAMP SW 1 OFF
: HEAD LAMP SW 2 OFF

OK or NG

OK >> Replace IPDM E/R. Refer to PG-27, "Removal and Installation of IPDM E/R".
NG >> Check combination switch (lighting switch). Refer to LT-175, "Combination Switch Inspection".

3.CHECK CAN COMMUNICATIONS BETWEEN BCM AND IPDM E/R

CONSULT-III SELF-DIAGNOSIS
Perform self-diagnosis for “BCM”.

Display of self-diagnosis results

NO DTC>> Replace IPDM E/R. Refer to PG-27, "Removal and Installation of IPDM E/R".
CAN COMM CIRCUIT>> Refer to LAN-17, "CAN Diagnosis with CONSULT-III".

General Information for Xenon Headlamp Trouble Diagnosis

INFOID:0000000004160327

In most cases, malfunction of xenon headlamp - "does not illuminate", "flickers" or "dark" - is caused by a malfunctioning xenon bulb. A HID control unit or lamp housing, however, may be a cause of malfunction. Be sure to perform trouble diagnosis following the steps described below.

Caution:

INFOID:0000000004160328

- Installation or removal of connector must be done with lighting switch OFF.
- Disconnect the battery cable from the negative terminal or remove power fuse.

- When the lamp is illuminated (when lighting switch is ON), never touch harness, HID control unit, inside of lamp, or lamp metal parts.
- To check illumination, temporarily install lamp in vehicle. Be sure to connect power at vehicle side connector.
- If error can be traced directly to electrical system, first check for items such as blown fuses and fusible links, broken wires or loose connectors, dislocated terminals, and improper connections.
- Never work with wet hands.
- Using a tester for HID control unit circuit trouble diagnosis is prohibited.
- Disassembling HID control unit or harnesses (bulb socket harness, ECM harness) is prohibited.
- Immediately after illumination, light intensity and color will fluctuate, but there is nothing wrong.
- When bulb has come to end of its life, brightness will drop significantly, it will flash repeatedly, or light color will turn reddish.

Xenon Headlamp Trouble Diagnosis

INFOID:0000000004160329

1.CHECK 1: XENON HEADLAMP LIGHTING

Install normal xenon bulb to corresponding xenon bulb headlamp, and check if lamp lights up.

OK or NG

OK >> Replace xenon bulb.
NG >> GO TO 2.

2.CHECK 2: XENON HEADLAMP LIGHTING

Install normal HID control unit to corresponding xenon headlamp, and check if lamp lights up.

OK or NG

OK >> Replace HID control unit.
NG >> GO TO 3.

3.CHECK 3: XENON HEADLAMP LIGHTING

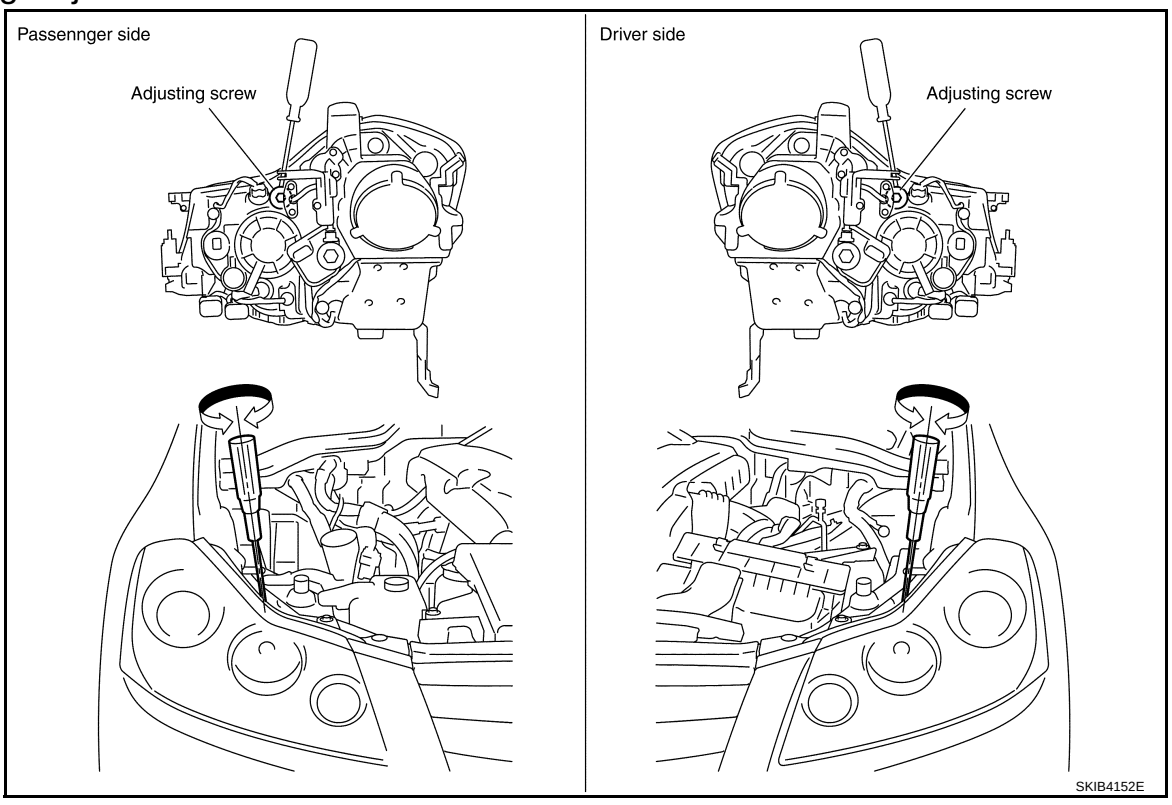
Install normal xenon lamp housing assembly to corresponding xenon headlamp, and check if lamp lights up.

OK or NG

OK >> Replace xenon headlamp housing assembly.
NG >> INSPECTION END (Check the headlamp control system.)

Aiming Adjustment

INFOID:0000000004160330



PREPARATION BEFORE ADJUSTING

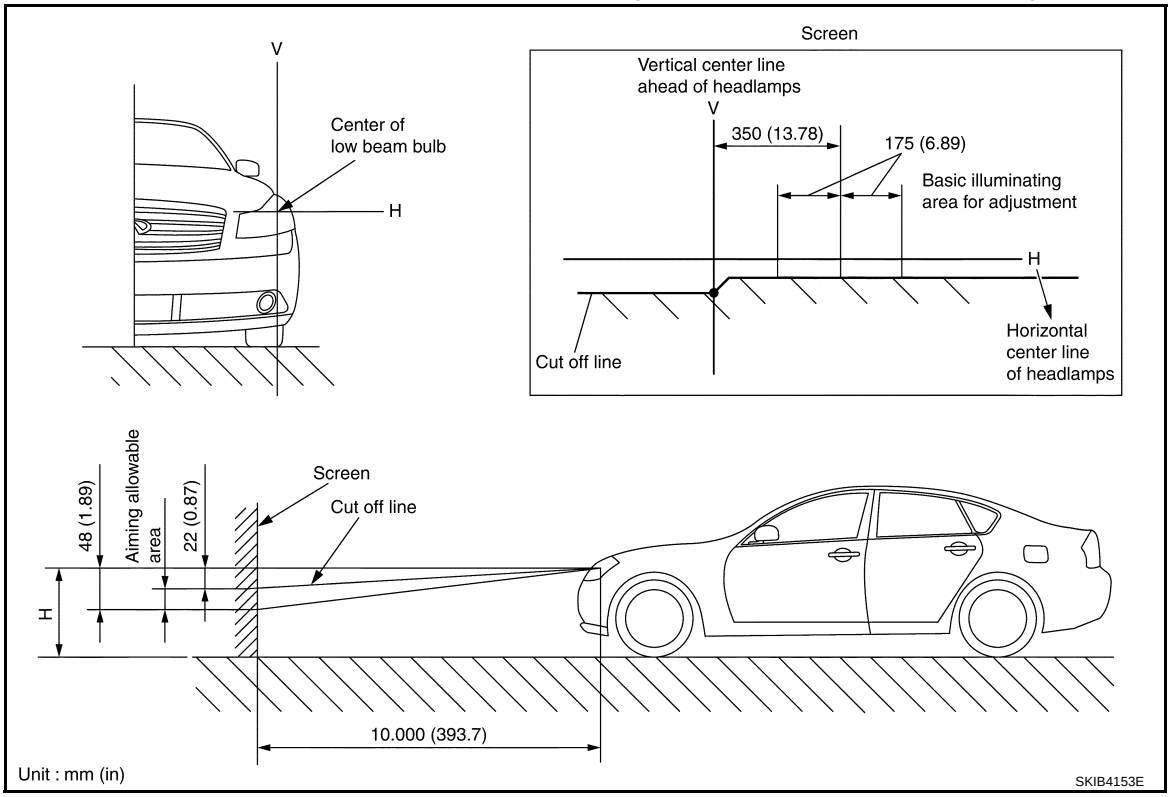
For details, refer to the regulations in your own country.
Before performing aiming adjustment, check the following.

1. Keep all tires inflated to correct pressures.
2. Place vehicle on flat surface.
3. Set that there is no-load in vehicle other than the driver (or equivalent weight placed in driver's position). Coolant, engine oil filled up to correct level and full fuel tank.

LOW BEAM AND HIGH BEAM

1. Turn headlamp low beam ON.
2. Use adjusting screws to perform aiming adjustment.

ADJUSTMENT USING AN ADJUSTMENT SCREEN (LIGHT/DARK BORDERLINE)



If the vehicle front body has been repaired and/or the headlamp assembly has been replaced, check aiming. Use the aiming chart shown in the figure.

- Basic illumination area for adjustment should be within the range shown on the aiming chart. Adjust headlamp accordingly.

Bulb Replacement

INFOID:0000000004160331

CAUTION:

- **Disconnect the battery negative terminal or remove the fuse.**
- **Never touch the glass of bulb directly by hand. Keep grease and other oily matters away from it. Never touch bulb by hand while it is lit or right after being turned off.**
- **Never leave bulb out of lamp reflector for a long time because dust, moisture smoke, etc. may affect the performance of lamp. When replacing bulb, be sure to replace it with new one.**

HEADLAMP (INNER) HIGH BEAM

1. Remove air cleaner case when replacing bulb LH. Refer to EM-17, "Removal and Installation" (VQ35HR) or EM-172, "Removal and Installation" (VK45DE).
2. Remove washer tank inlet when replacing bulb RH. Refer to WW-35, "Removal and Installation of Washer Tank".
3. Turn plastic cap counterclockwise and unlock it.

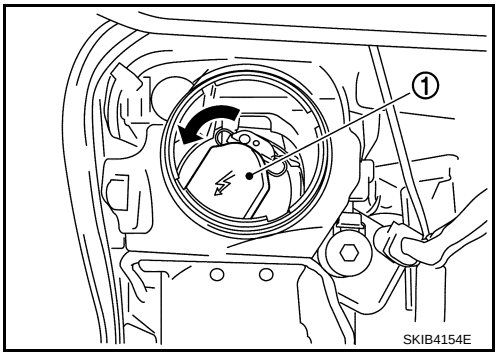
4. Turn bulb socket counterclockwise and unlock it.
5. Disconnect connector, and remove bulb.

Headlamp (inner) high beam : 12V - 60W (HB3)

HEADLAMP (OUTER) LOW BEAM

1. Remove fender protector (front). Refer toEI-32, "FENDER PROTECTOR : Component Parts Location".
2. Turn plastic cap counterclockwise and unlock it.
3. Turn bulb socket (1) counterclockwise and unlock it.
4. Unlock retaining spring and remove bulb from headlamp.

Headlamp (outer) low beam : 12V - 35W (D2S)



PARKING LAMP

1. Turn bulb socket counterclockwise and unlock it.
2. Remove bulb from its socket.

Parking lamp : 12V - 5W

FRONT TURN SIGNAL LAMP

1. Remove washer tank inlet when replacing bulb RH. Refer to WW-35, "Removal and Installation of Washer Tank".
2. Remove air cleaner case when replacing bulb LH. Refer to EM-17, "Removal and Installation" (VQ35HR) or EM-172, "Removal and Installation" (VK45DE).
3. Turn bulb socket counterclockwise and unlock it.
4. Remove bulb from its socket.

Front turn signal lamp : 12V - 21W (amber)

FRONT SIDE MARKER LAMP

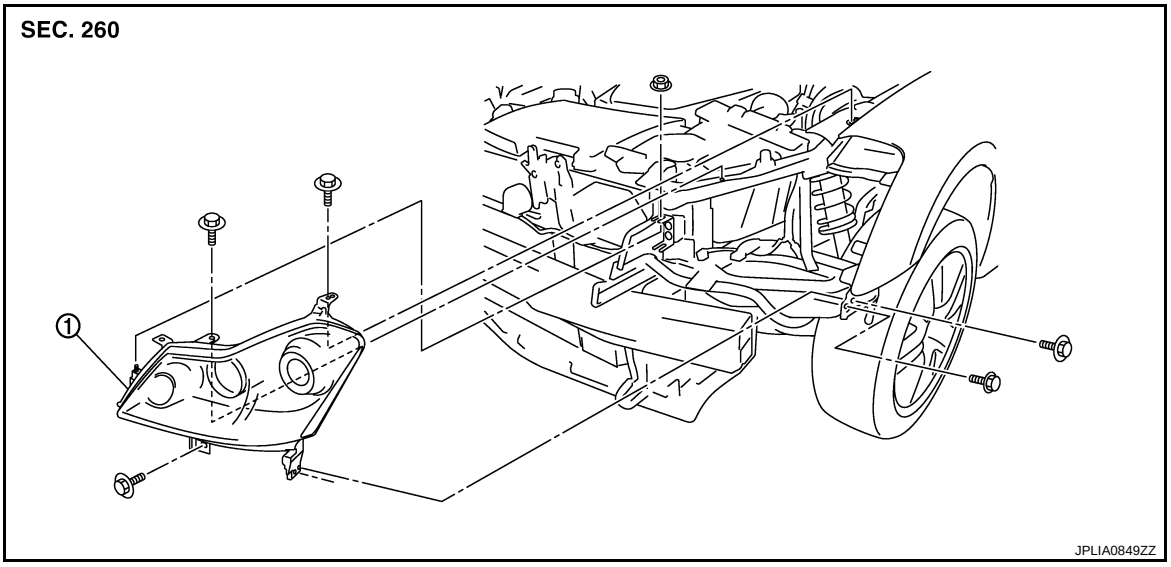
1. Turn off the fender protector (front) to obtain work space between the fender protector and fender.
2. Turn bulb socket counterclockwise and unlock it.
3. Remove bulb from its socket.

Front side marker lamp : 12V - 5W

CAUTION:
After installing bulb, be sure to install plastic cap and bulb socket securely to insure watertightness.

Removal and Installation

INFOID:0000000004160332



1. Headlamp assembly

REMOVAL

CAUTION:

Disconnect the battery negative terminal or remove the fuse.

1. Remove front bumper. Refer to EI-13, "STANDARD TYPE : Component Parts Location".
2. Remove front bumper retainer (upper). Refer to EI-13, "STANDARD TYPE : Component Parts Location".
3. Remove front bumper clips. Refer to EI-13, "STANDARD TYPE : Component Parts Location".
4. Remove headlamp mounting bolts and nuts.
5. Remove plastic bumper bracket, then pull headlamp toward vehicle front, disconnect connector, and remove headlamp.

INSTALLATION

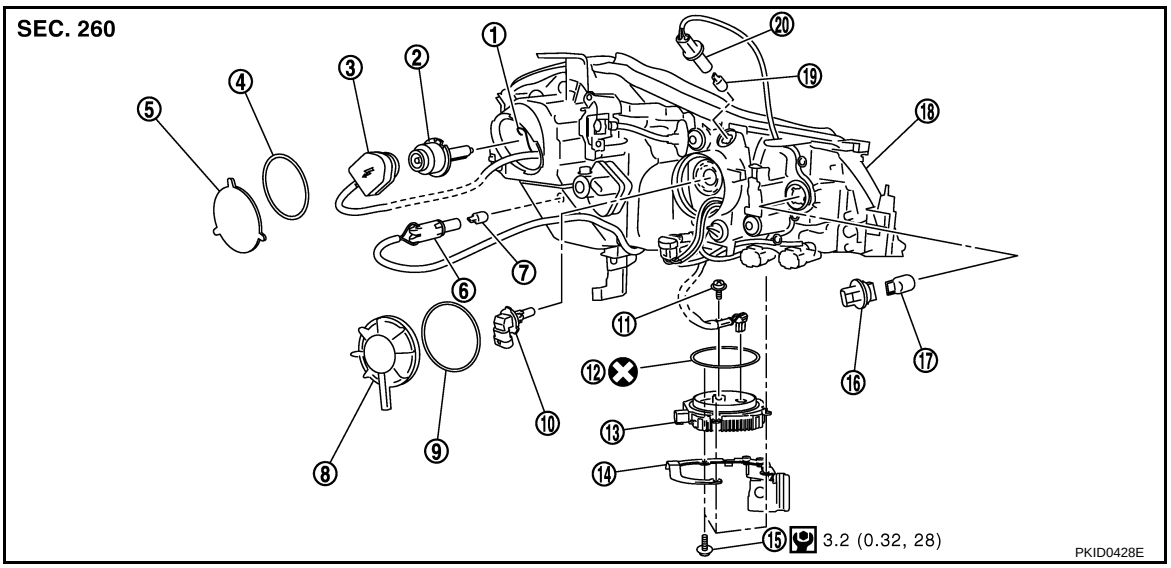
Note the following, and installation is the reverse order of removal.

NOTE:

After installation, perform aiming adjustment. Refer to LT-30, "Aiming Adjustment".

Disassembly and Assembly

INFOID:0000000004160333



1. Retaining spring
2. Xenon bulb (low)
3. Xenon bulb socket (low)
4. Seal packing
5. Plastic cap
6. Side marker lamp bulb socket
7. Side marker lamp bulb
8. Plastic cap
9. Seal packing
10. Halogen bulb (high)
11. Screw
12. Seal packing
13. HID control unit
14. Bracket
15. Screw
16. Front turn signal lamp bulb socket
17. Front turn signal lamp bulb
18. Headlamp housing assembly
19. Parking lamp bulb
20. Parking lamp bulb socket

Refer to GI-9, "Component" for symbols in the figure

DISASSEMBLY

1. Turn plastic cap counterclockwise and unlock it.
2. Turn xenon bulb (low) socket counterclockwise and unlock it.
3. Unlock retaining spring, and remove xenon bulb (low).
4. Remove HID control unit screws.
5. Remove bracket.
6. Remove screw and ground from HID control unit.
7. Disconnect connectors from HID control unit.
8. Turn halogen bulb (high) counterclockwise and unlock it.
9. Remove halogen bulb (high) and disconnect connector it.
10. Turn front turn signal lamp bulb socket counterclockwise and unlock it.
11. Remove front turn signal lamp bulb from its socket.
12. Turn parking lamp bulb from socket counterclockwise and unlock it.
13. Remove parking lamp bulb from its socket.
14. Turn front side marker lamp bulb socket counterclockwise and unlock it.
15. Remove front side marker lamp bulb from its socket.

ASSEMBLY

Note the following, and installation is the reverse order of removal.

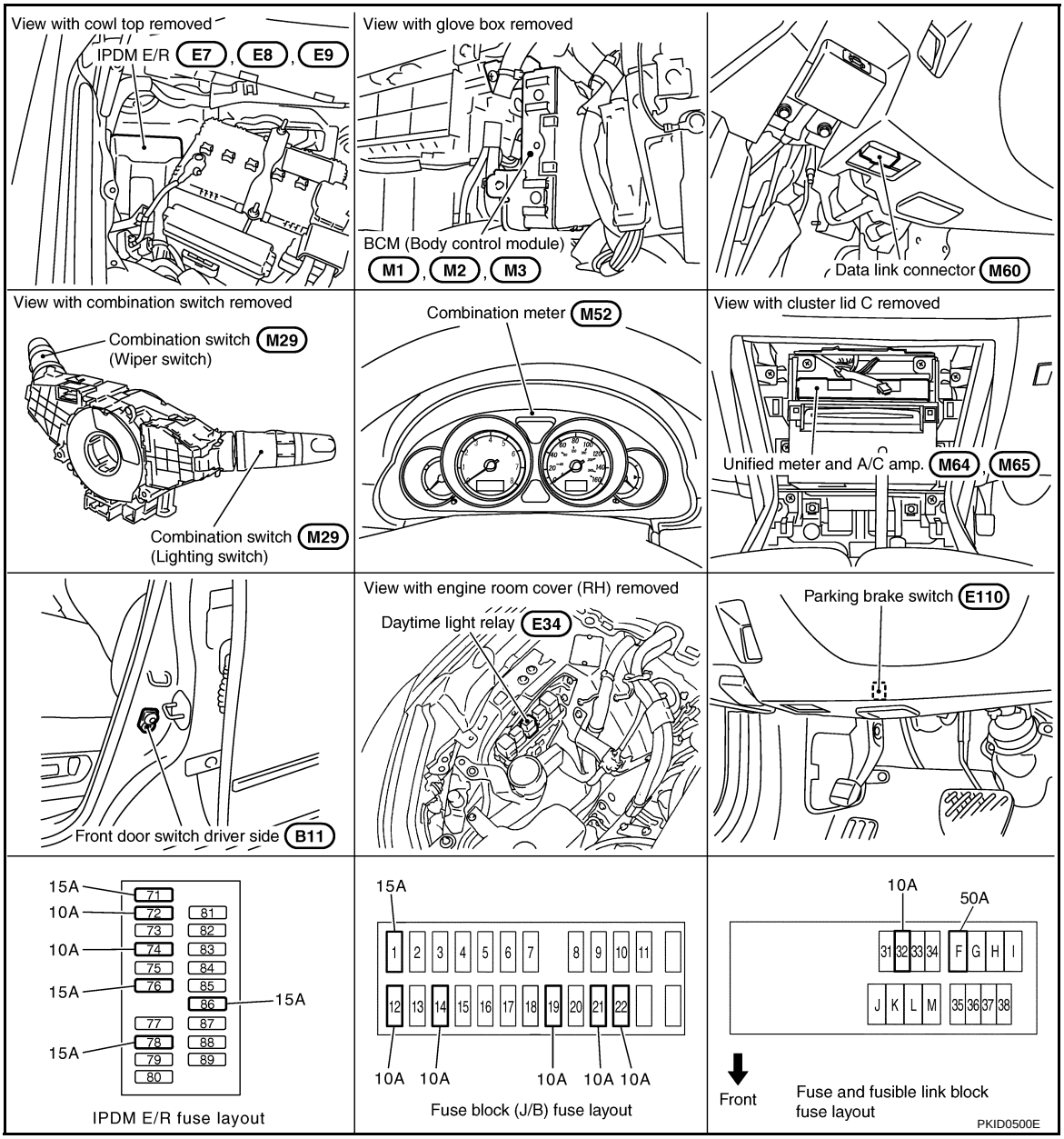
CAUTION:

- **When HID control unit is removed, reinstall it securely and avoid any looseness.**
- **After installing bulb, be sure to install plastic cap and bulb socket securely to insure watertightness**

HEADLAMP (FOR CANADA) - DAYTIME LIGHT SYSTEM -

Component Parts and Harness Connector Location

INFOID:0000000004160334



System Description

INFOID:0000000004160335

DAYTIME LIGHT SYSTEM turns on daytime light lamps while driving. Daytime light lamps are not turned on if engine is activated with parking brake on. Take off parking brake to turn on daytime light lamps. The lamps turn off when lighting switch is in the 2ND position or AUTO position (Head lamp is “ON”) and when lighting switch is in the PASSING position. (Daytime light lamps are not turned off only by parking brake itself.)
A parking brake signal and engine run or stop signal are sent to BCM (body control module) by CAN communication line, and control daytime light system.

OUTLINE

Power is supplied at all times
- to headlamp high relay, located in IPDM E/R (intelligent power distribution module engine room) and
- to headlamp low relay, located in IPDM E/R, from battery direct,
- through 15A fuse (No. 71, located in IPDM E/R)
- to CPU (central processing unit), located in IPDM E/R,
- through 15A fuse (No. 78, located in IPDM E/R)

- to CPU, located in IPDM E/R,
- through 50A fusible link (letter F, located in fuse and fusible link block)
- to BCM terminal 55,
- through 10A fuse [No. 21, located in fuse block (J/B)]
- to BCM terminal 42 and
- to combination meter terminal 23,
- through 10A fuse (No. 32, located in IPDM E/R)
- to daytime light relay terminals 2 and 5,
- through 10A fuse [No. 19, located in fuse block (J/B)]
- to unified meter and A/C amp. terminal 54,
- through 10A fuse [No. 22, located in fuse block (J/B)]
- to key slot terminal 1.

When the ignition switch is in ON or START position, power is supplied
- to CPU, located in IPDM E/R,
- through 15A fuse [No. 1, located in fuse block (J/B)]
- to BCM terminal 38,
- through 10A fuse [No. 14, located in fuse block (J/B)]
- to combination meter terminal 12,
- through 10A fuse [No. 12, located in fuse block (J/B)]
- to unified meter and A/C amp. terminal 53.

Ground is supplied
- to BCM terminal 52
- to combination meter terminals 9, 10, and 11
- to unified meter and A/C amp. terminal 55 and 71
- to push-button ignition switch (push switch) terminal 1
- to key slot terminal 8
- through grounds M16 and M70,
- to IPDM E/R terminals 38 and 51
- through grounds E22 and E43.

HEADLAMP OPERATION

Low Beam Operation

With the lighting switch in 2ND position, the BCM receives input signal requesting the headlamps to illuminate. This input signal is communicated to IPDM E/R across the CAN communication lines. The CPU located in the IPDM E/R controls the headlamp low relay coil, which when energized, directs power
- through 15A fuse (No. 76, located in IPDM E/R)
- through IPDM E/R terminal 20
- to front combination lamp RH terminal 8,
- through 15A fuse (No. 86, located in IPDM E/R)
- through IPDM E/R terminal 30
- to front combination lamp LH terminal 8.

Ground is supplied
- to front combination lamp RH terminal 4
- to front combination lamp LH terminal 4
- through grounds E22 and E43.

With power and ground supplied, low beam headlamps illuminate.

High Beam Operation (When Daytime Light Does Not Operate)/Flash-to-Pass Operation

With the lighting switch in 2ND position and placed in HIGH BEAM or PASSING position, the BCM receives input signal requesting headlamp high beams to illuminate. High beam request signal is communicated to the IPDM E/R across the CAN communication lines. The CPU located in the IPDM E/R controls headlamp high relay coil and low relay coil, which when energized, directs power
- through 10A fuse (No. 72, located in IPDM E/R)
- through IPDM E/R terminal 27
- through front combination lamp RH terminals 6 and 2
- to daytime light relay terminal 3,
- through 10A fuse (No. 74, located in IPDM E/R)
- through IPDM E/R terminal 28
- to front combination lamp LH terminal 6,
- through 15A fuse (No. 76, located in IPDM E/R)
- through IPDM E/R terminal 20

- to front combination lamp RH terminal 8,
- through 15A fuse (No. 86, located in IPDM E/R)
- through IPDM E/R terminal 30
- to front combination lamp LH terminal 8.

Ground is supplied
- to daytime light relay terminal 4
- to front combination lamp RH terminal 4
- to front combination lamp LH terminal 2
- to front combination lamp LH terminal 4
- through grounds E22 and E43.

With the power and ground supplied, the headlamp high beam and low headlamp illuminate.
High beam indicator illuminates when combination meter receives input signal requesting high beam indicator to illuminate. This is communicated to BCM across the CAN communication lines.

DAYTIME LIGHT OPERATION

With the engine running, the lighting switch in the OFF or AUTO position (headlamp is not illuminate) and parking brake released, the IPDM E/R receives input request signal from BCM to turn on daytime light. This input is communicated across the CAN communication lines. The CPU of the IPDM E/R controls the daytime light relay coil. When energized, this relay directs power
- through daytime light relay terminals 5 and 3
- through front combination lamp RH terminal 2
- through front combination lamp RH terminal 6
- through IPDM E/R terminal 27
- through 10A fuse (No. 72, located in IPDM E/R)
- through 10A fuse (No. 74, located in IPDM E/R)
- through IPDM E/R terminal 28
- to front combination lamp LH terminal 6.

Ground is supplied
- to combination lamp LH terminal 2
- through grounds E22 and E43.

With power and grounds supplied, the daytime lights illuminate. The high beam headlamps are now wired in series and illuminate at a reduced intensity.

COMBINATION SWITCH READING FUNCTION

Refer to BCS-4, "System Description".

AUTO LIGHT OPERATION

For auto light operation, refer to LT-65, "System Description".

CAN Communication System Description

INFOID:0000000004160336

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

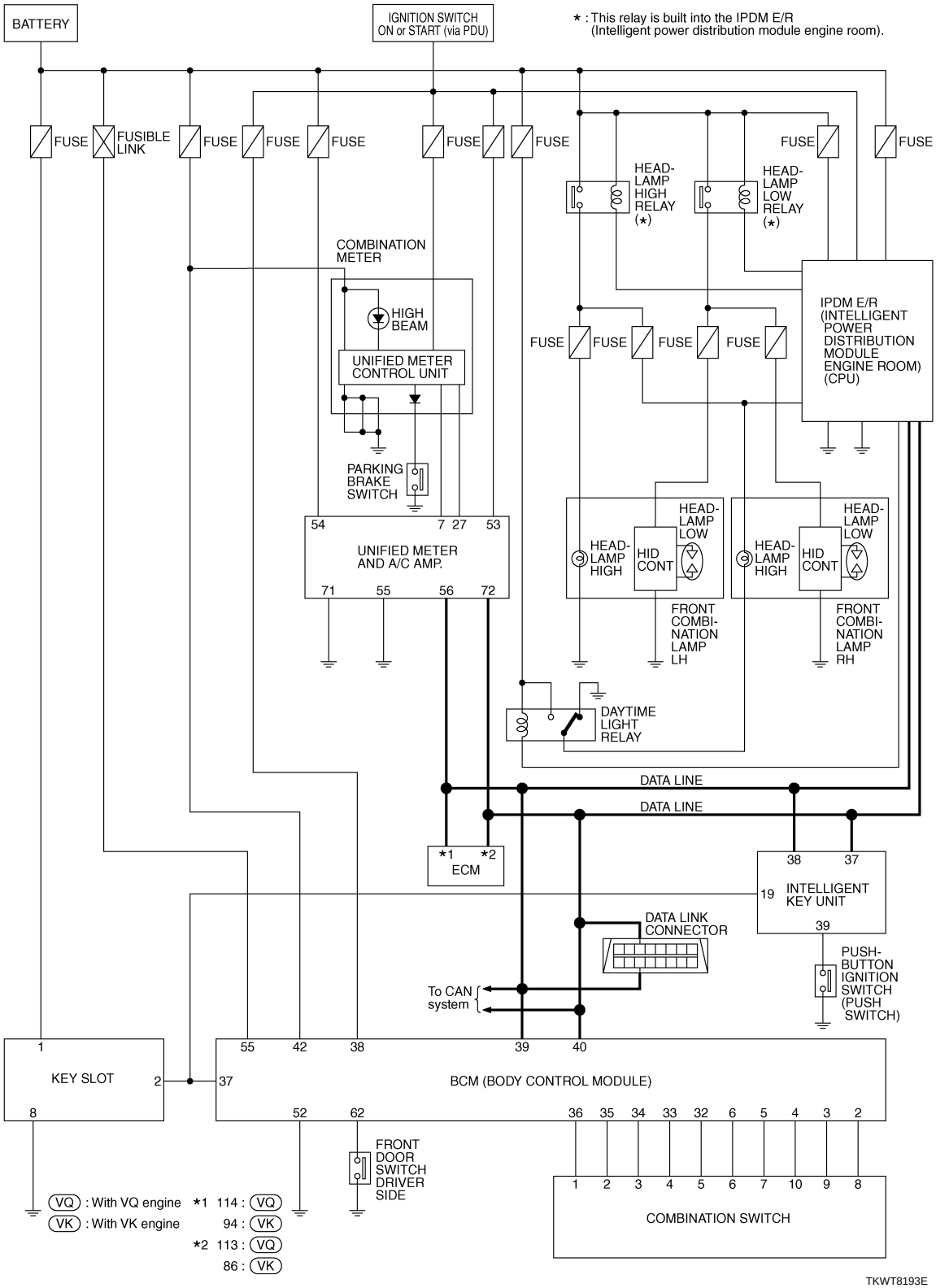
CAN Communication Unit

INFOID:0000000004160337

Refer to LAN-11, "System Description".

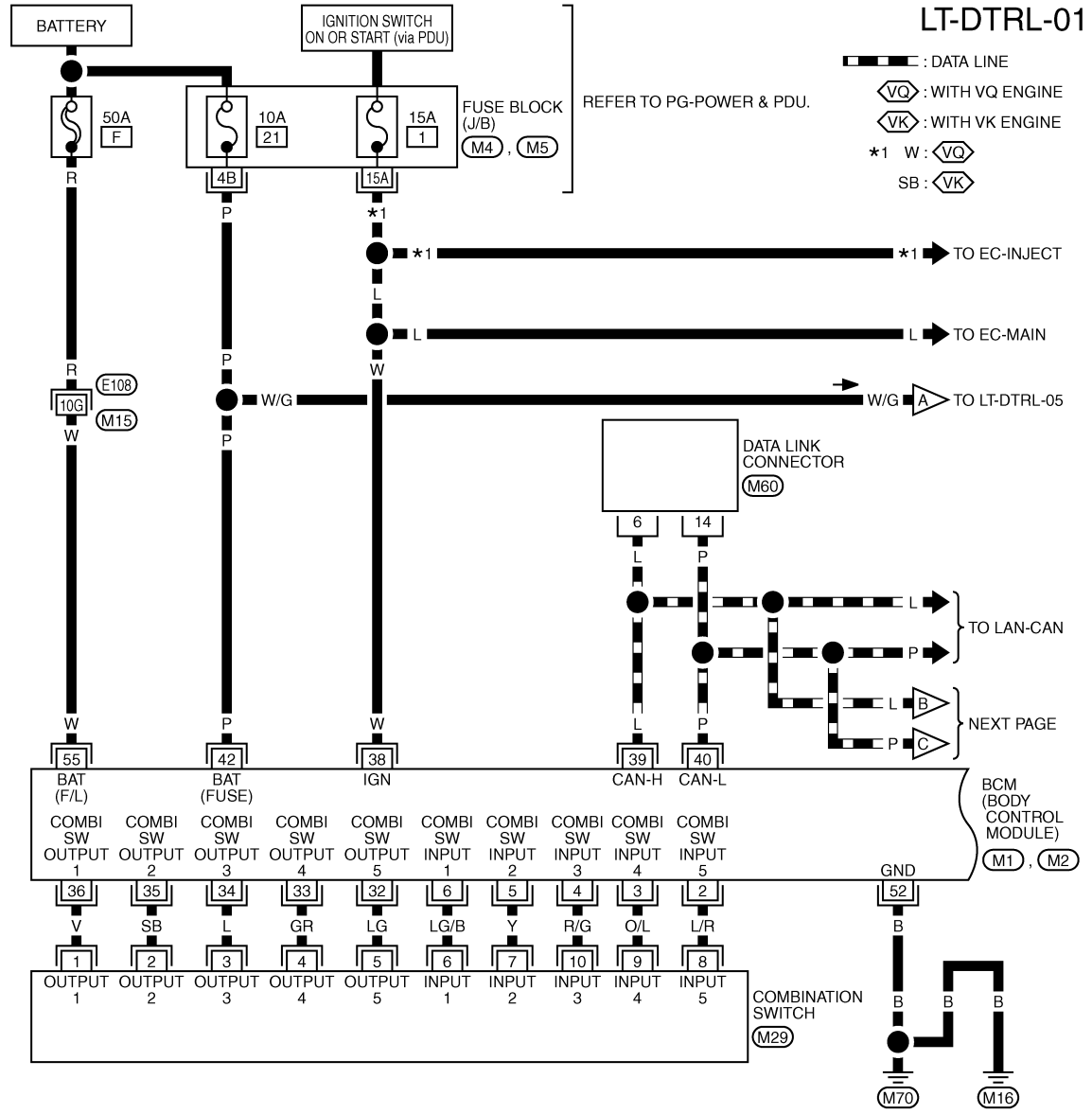
Schematic

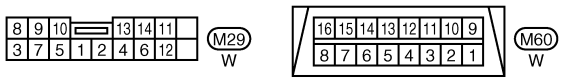
INFOID:0000000004160338



Wiring Diagram - DTRL -

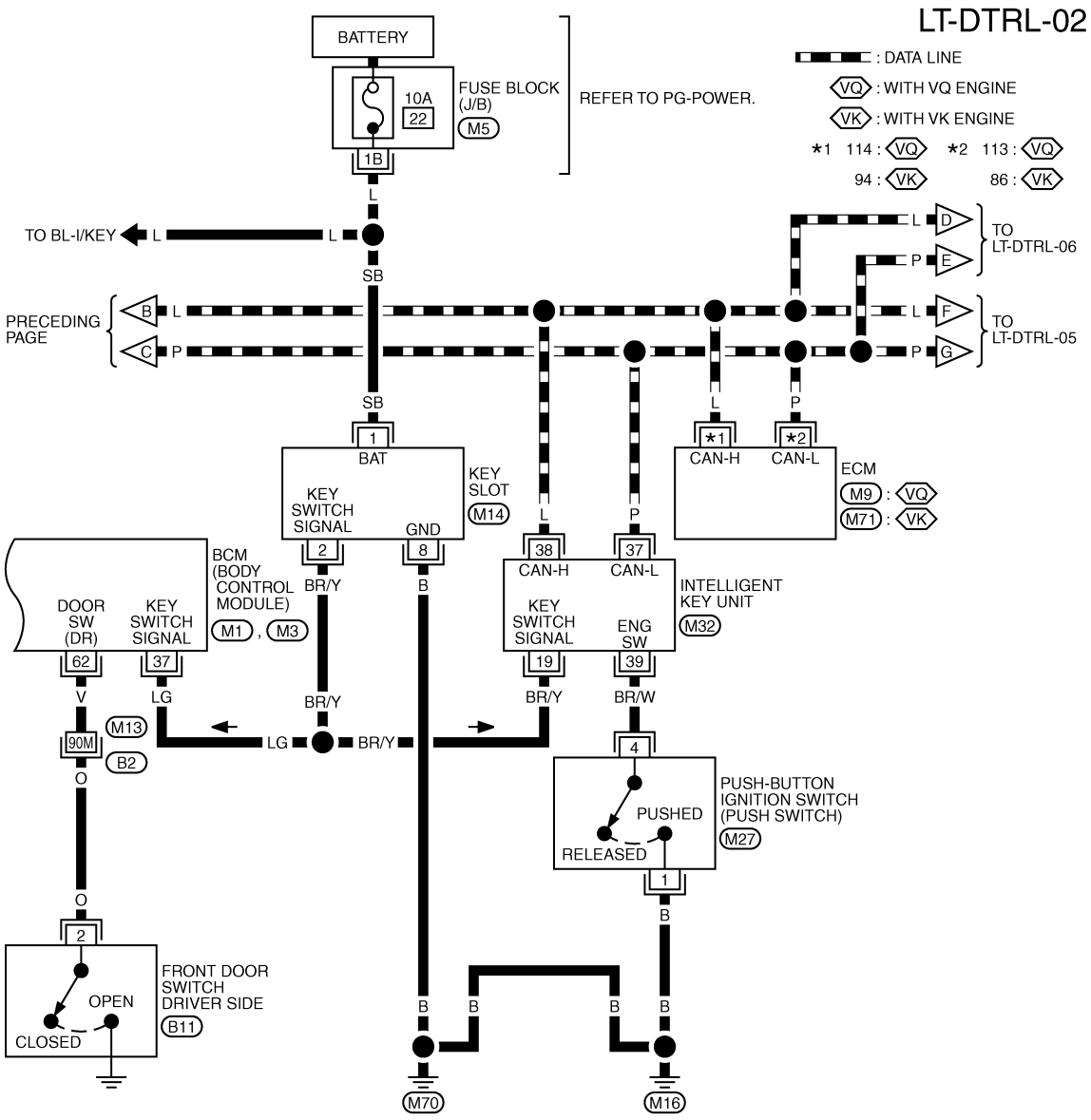
INFOID:0000000004160339

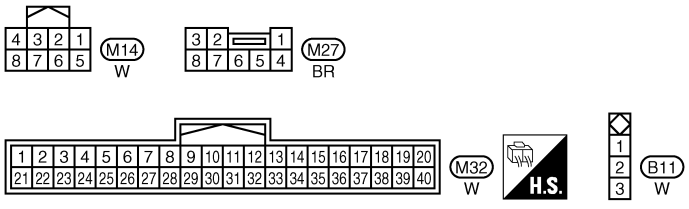




REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , M5 -FUSE BLOCK-JUNCTION BOX (J/B)
M1 , M2 -ELECTRICAL UNITS

TKWT8194E





REFER TO THE FOLLOWING.

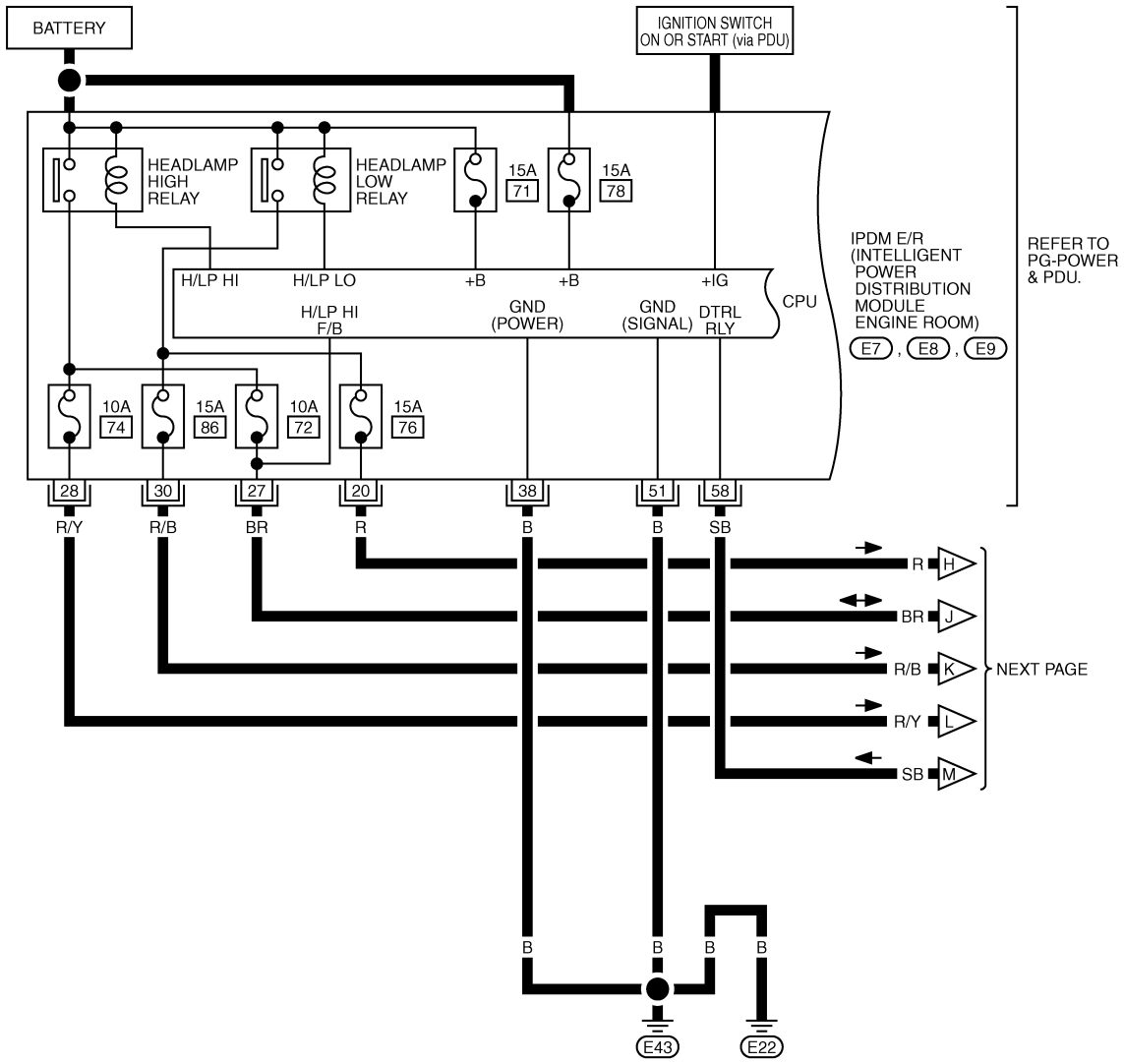
B2 -SUPER MULTIPLE JUNCTION (SMJ)

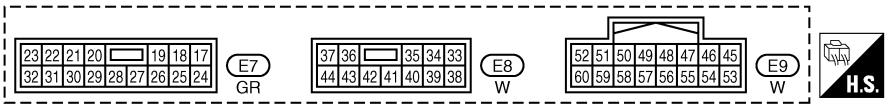
M5 -FUSE BLOCK-JUNCTION BOX (J/B)

M1 , M3 , M9 , M71 -ELECTRICAL UNITS

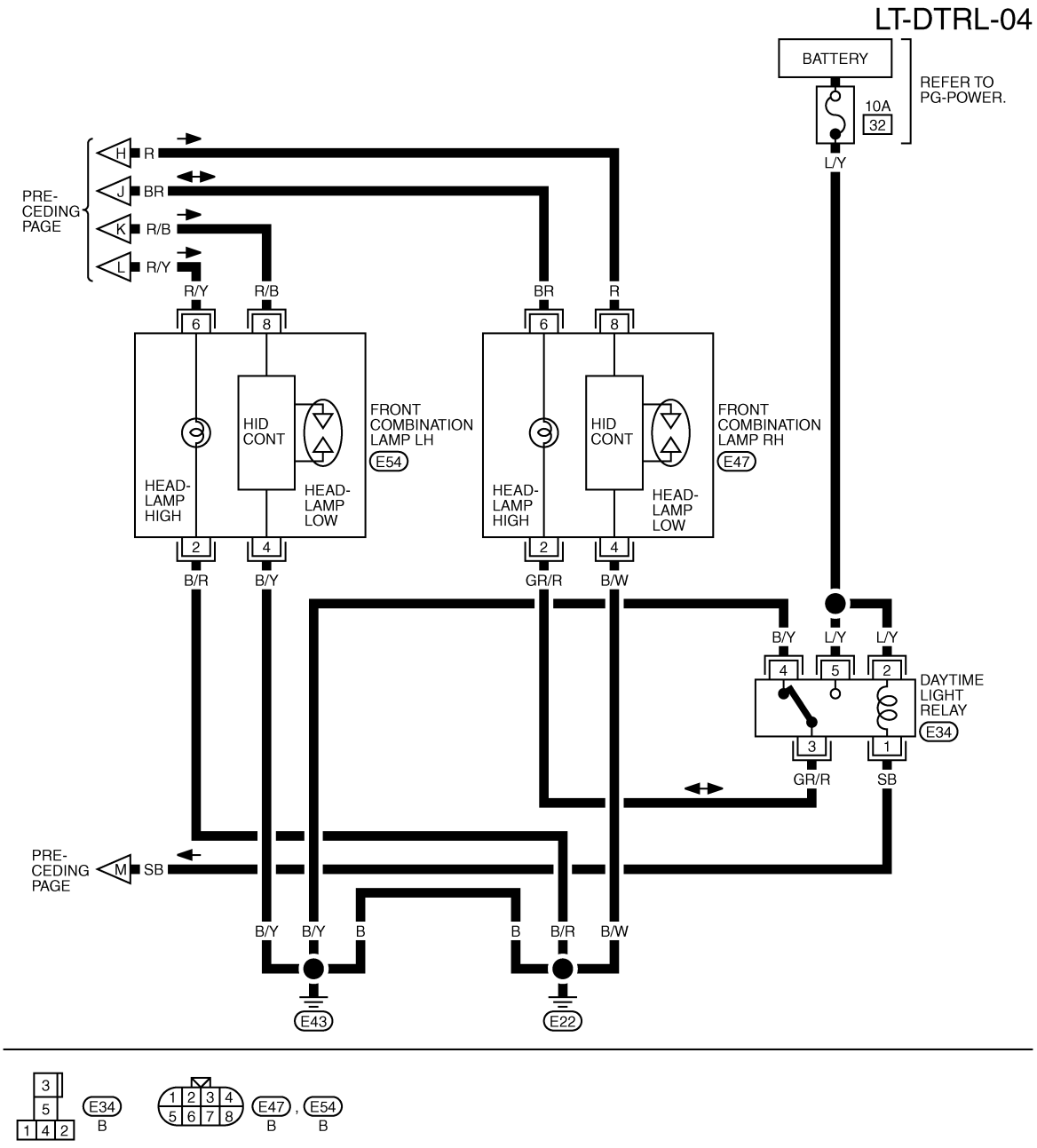
TKWT8195E

LT-DTRL-03



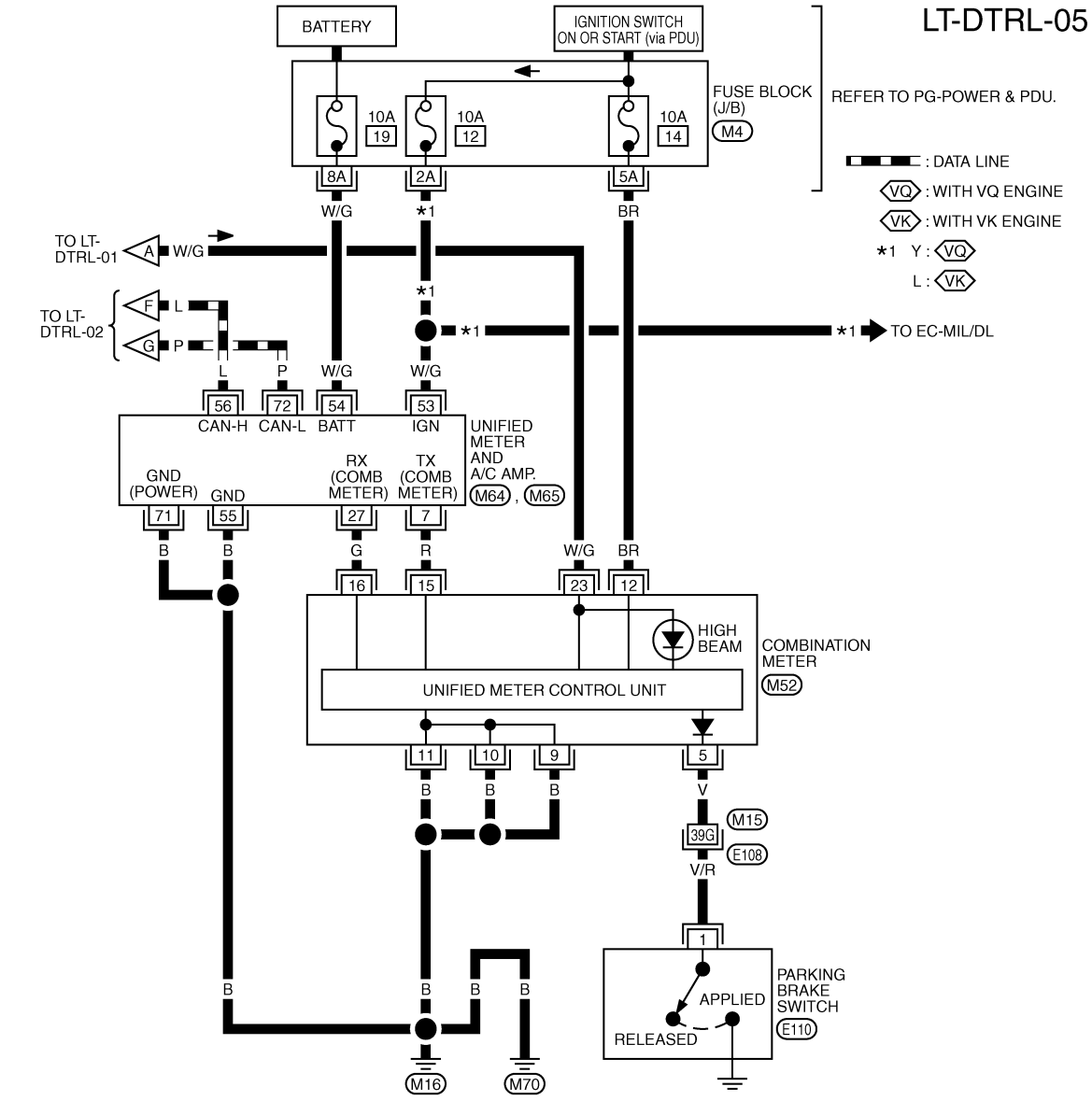


TKWT5259E


LT-DTRL-04
BATTERY
REFER TO PG-POWER.
10A
32
L/Y
PRE-CEDING PAGE
H R
J BR
K R/B
L R/Y
R/Y R/B BR R
6 8 6 8
HID CONT
HEAD-LAMP HIGH
HEAD-LAMP LOW
FRONT COMBINATION LAMP LH
E54
FRONT COMBINATION LAMP RH
E47
2 4 2 4
B/R B/Y GR/R B/W
B/Y L/Y L/Y
4 5 2
DAYTIME LIGHT RELAY
E34
3 1
GR/R SB
PRE-CEDING PAGE
M SB
B/Y B/Y B B B/R B/W
E43
E22

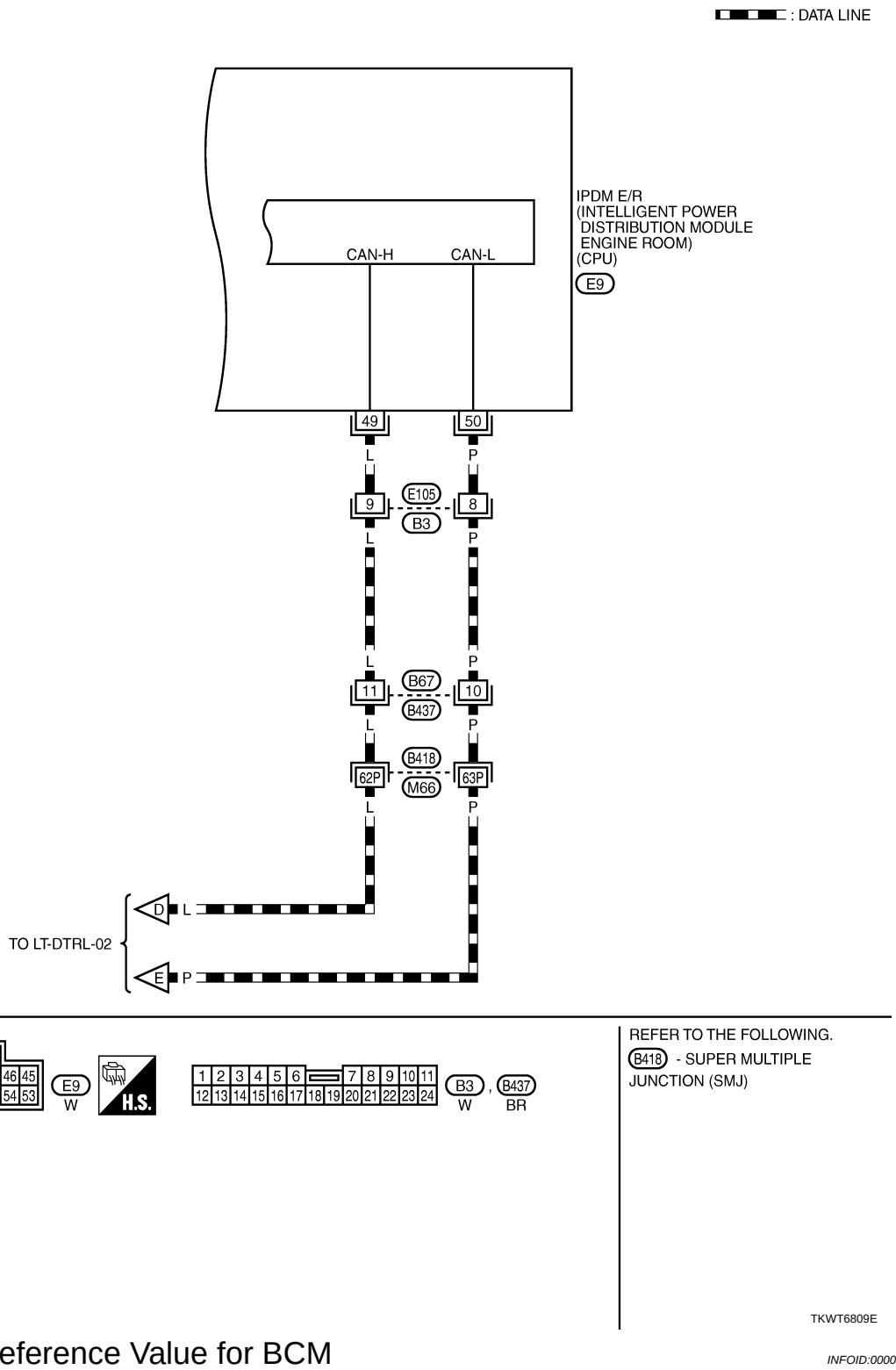
3
5
1 4 2
E34
B
1 2 3 4
5 6 7 8
E47
B
E54
B

TKWT8196E


LT-DTRL-05
BATTERY
IGNITION SWITCH ON OR START (via PDU)
FUSE BLOCK (J/B) M4
10A 19
10A 12
10A 14
8A
2A
5A
W/G
*1
BR
REFER TO PG-POWER & PDU.
: DATA LINE
VQ : WITH VQ ENGINE
VK : WITH VK ENGINE
*1 Y : VQ
L : VK
TO LT-DTRL-01
TO LT-DTRL-02
TO EC-MIL/DL
CAN-H
CAN-L
BATT
IGN
UNIFIED METER AND A/C AMP. M64, M65
GND (POWER)
GND
RX (COMB METER)
TX (COMB METER)
HIGH BEAM
COMBINATION METER M52
UNIFIED METER CONTROL UNIT
M15
39G
E108
V/R
PARKING BRAKE SWITCH E110
APPLIED
RELEASED
M16
M70
M52
W
M64
W
M65
W
H.S.
E110
W
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT8197E

LT-DTRL-06

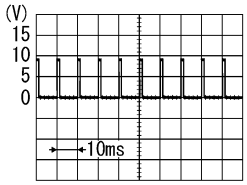
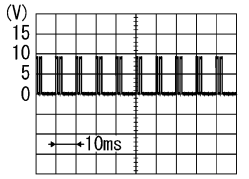
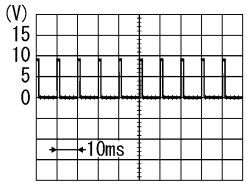
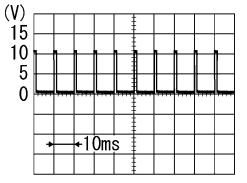
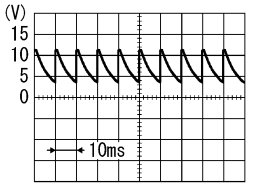


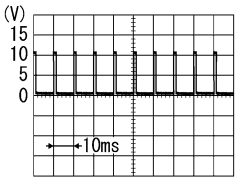
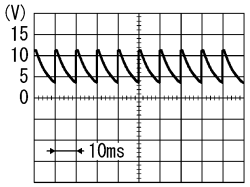
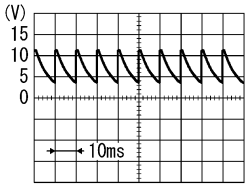
Terminal and Reference Value for BCM

INFOID:0000000004160340

CAUTION:

- **Check combination switch system terminal waveform under the loaded condition with lighting switch, turn signal switch and wiper switch OFF not to be fluctuated by overloaded.**
- **Turn wiper dial position to 4 except when checking waveform or voltage of wiper dial position. Wiper dial position can be confirmed on CONSULT-III. Refer to LT-174, "CONSULT-III Functions (BCM - COMB SW)".**

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
2	L/R	Combination switch input 5	ON	Lighting, turn, wiper switch (Wiper dial position 4)	Lighting switch HI beam (Operates only HI beam switch)	 PKIB4957J Approx. 1.0 V
					Lighting switch 2ND	 PKIB4953J Approx. 2.0 V
					OFF	Approx. 0 V
3	O/L	Combination switch input 4	ON	Lighting, turn, wiper switch (Wiper dial position 4)	Any of several conditions below • Lighting switch 2ND • Lighting switch PASSING (Operates only PASSING switch)	 PKIB4957J Approx. 1.0 V
					OFF	Approx. 0 V
34	L	Combination switch output 3	ON	Lighting, turn, wiper switch (Wiper dial position 4)	Any of several conditions below • Lighting switch 2ND • Lighting switch HI beam (Operates only HI beam switch)	 PKIB4958J Approx. 1.2 V
					OFF	 PKIB4960J Approx. 7.0 - 7.5 V

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
35	SB	Combination switch output 2	ON	Lighting, turn, wiper switch (Wiper dial position 4)	Any of several conditions below • Lighting switch 2ND • Lighting switch PASSING (Operates only PASSING switch)	 PKIB4958J Approx. 1.2 V
					OFF	 PKIB4960J Approx. 7.0 - 7.5 V
37	LG	Key switch signal	OFF	Intelligent Key is inserted into key slot.		Battery voltage
				Intelligent Key is removed from key slot.		Approx. 0 V
38	W	Ignition switch (ON)	ON	—		Battery voltage
39	L	CAN – H	—	—		—
40	P	CAN – L	—	—		—
42	P	Battery power supply	OFF	—		Battery voltage
52	B	Ground	ON	—		Approx. 0 V
55	W	Battery power supply	OFF	—		Battery voltage
62	V	Front door switch driver side signal	OFF	Front door switch driver side	ON (open)	Approx. 0 V
					OFF (closed)	 PKIB4960J Approx. 7.5 - 8.0 V

Terminal and Reference Value for IPDM E/R

INFOID:0000000004160341

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
20	R	Headlamp low (RH)	ON	Lighting switch 2ND position	OFF	Approx. 0 V
					ON	Battery voltage
27	BR	Headlamp high (RH)	ON	Lighting switch HIGH or PASSING position	OFF	Approx. 0 V
					ON	Battery voltage
				Daytime running light is operating[NOTE]		Approx. 6.5 V

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
28	R/Y	Headlamp high (LH)	ON	Lighting switch HIGH or PASSING position	OFF	Approx. 0 V
					ON	Battery voltage
				Daytime running light is operating[NOTE]		Approx. 6.5 V
30	R/B	Headlamp low (LH)	ON	Lighting switch 2ND position	OFF	Approx. 0 V
					ON	Battery voltage
38	B	Ground	ON	—		Approx. 0 V
49	L	CAN – H	—	—		—
50	P	CAN – L	—	—		—
51	B	Ground	ON	—		Approx. 0 V
58	SB	Daytime light relay signal	ON	Daytime running light is operating[NOTE]		Approx. 0 V
				Daytime running light is not operating		Battery voltage

NOTE:

Daytime running light is operating: Lighting switch in OFF position with engine running and parking brake is released.

How to Perform Trouble Diagnosis

INFOID:0000000004160342

1. Confirm the symptom or customer complaint.
2. Understand operation description and function description. Refer to LT-35, "System Description".
3. Perform the Preliminary Check. Refer to LT-47, "Preliminary Check".
4. Check symptom and repair or replace the cause of malfunction.
5. Does the headlamp operate normally? If YES: GO TO 6. If NO: GO TO 4.
6. INSPECTION END

Preliminary Check

INFOID:0000000004160343

INSPECTION FOR POWER SUPPLY AND GROUND CIRCUIT

1.CHECK FUSES AND FUSIBLE LINK

Check for blown fuses and fusible link.

Unit	Power source	Fuse No.
BCM	Battery	F
		21
	Ignition switch ON or START position	1
Daytime light relay	Battery	32

Refer to LT-39, "Wiring Diagram - DTRL -".

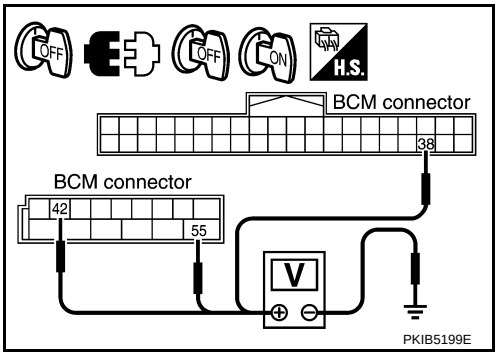
OK or NG

OK >> GO TO 2.

NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4.

2.CHECK POWER SUPPLY CIRCUIT

1. Disconnect BCM connector.
2. Check voltage between BCM harness connector and ground.



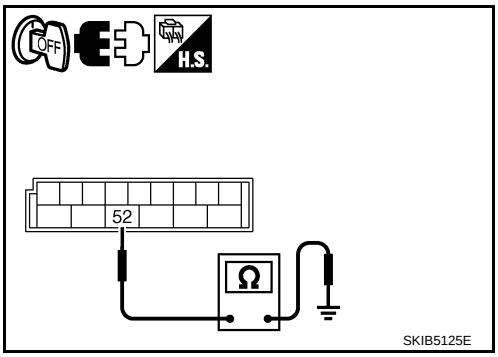
Terminals			Ignition switch position	
(+)		(–)	OFF	ON
BCM connector	Terminal			
M1	38	Ground	Approx. 0 V	Battery voltage
M2	42		Battery voltage	Battery voltage
	55		Battery voltage	Battery voltage

OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3.CHECK GROUND CIRCUIT

Check continuity between BCM harness connector and ground.



BCM connector	Terminal	Ground	Continuity
M2	52		Yes

OK or NG

OK >> INSPECTION END.
NG >> Repair harness or connector.

INSPECTION FOR PARKING BRAKE SWITCH CIRCUIT

1.CHECK BRAKE INDICATOR

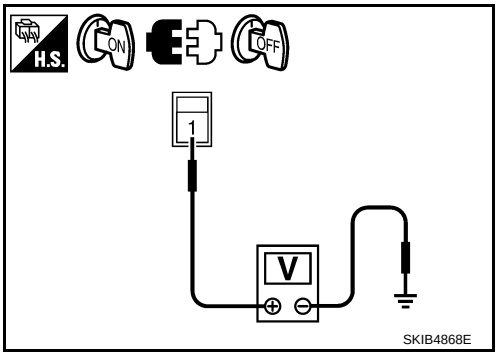
1. Turn ignition switch ON.
2. When parking brake is switched ON/OFF, it checks whether the brake indicator lamp of combination meter lights up / puts out the light.

OK or NG

OK >> INSPECTION END
NG >> GO TO 2.

2.CHECK PARKING BRAKE SWITCH SIGNAL

1. Turn ignition switch OFF.
2. Disconnect parking brake switch connector.
3. Turn ignition switch ON.
4. Check voltage between parking brake switch harness connector and ground.



Terminals			Voltage (Approx.)
(+)		(–)	
Parking brake switch connector	Terminal		
E110	1	Ground	Battery voltage

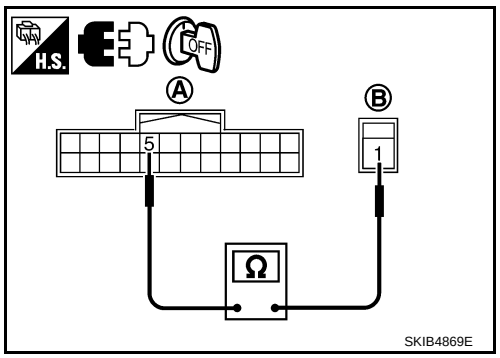
OK or NG

OK >> Replace parking brake switch.
NG >> GO TO 3.

3.CHECK PARKING BRAKE SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect combination meter connector.

3. Check continuity between combination meter harness connector (A) and parking brake switch harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M52	5	E110	1	Yes

OK or NG

OK >> Replace combination meter.
NG >> Repair harness or connector.

CONSULT-III Functions (BCM - HEAD LAMP)

INFOID:0000000004160344

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

Diagnosis mode	Description
Work Support	Changes the setting for each function.NOTE
Data Monitor	Displays BCM input data in real time.
Active Test	Operation of electrical loads can be checked by sending drive signal to them.
Self-Diag Results	BCM performs self-diagnosis of CAN communication.
Can Diag Support Monitor	The result of transmit/receive diagnosis of CAN communication can be read.

NOTE:
Cannot change setting for headlamp.

DATA MONITOR

Display Item List

Monitor item		Contents
IGN ON SW	“On/Off”	Displays “IGN position (ON)/OFF, ACC position (OFF)” judged from the ignition switch signal.
ACC ON SW	“On/Off”	Displays “ACC (ON)/OFF, Ignition OFF (OFF)” status judged from ignition switch signal.
KEY ON SW	“On/Off”	Displays “Intelligent Key inserted into key slot (ON)/Intelligent Key removed from key slot (OFF)” status judged from the key switch signal.
TURN SIGNAL R	“On/Off”	Displays status (turn right: ON/others: OFF) as judged from lighting switch signal.
TURN SIGNAL L	“On/Off”	Displays status (turn left: ON/others: OFF) as judged from lighting switch signal.
HI BEAM SW	“On/Off”	Displays status (high beam switch: ON/others: OFF) of high beam switch judged from lighting switch signal.
HEAD LAMP SW 1	“On/Off”	Displays status (headlamp switch 1: ON/others: OFF) of headlamp switch 1 judged from lighting switch signal.
HEAD LAMP SW 2	“On/Off”	Displays status (headlamp switch 2: ON/others: OFF) of headlamp switch 2 judged from lighting switch signal.
TAIL LAMP SW	“On/Off”	Displays status (lighting switch 1ST or 2ND position: ON/others: OFF) of lighting switch judged from lighting switch signal.
AUTO LIGHT SW	“On/Off”	Displays status of the lighting switch as judged from the lighting switch signal. (AUTO position: ON/other than AUTO position: OFF)
PASSING SW	“On/Off”	Displays status (flash-to-passing switch: ON/others: OFF) of flash-to-passing switch judged from lighting switch signal.
FR FOG SW	“On/Off”	Displays status (front fog lamp switch: ON/others: OFF) of front fog lamp switch judged from lighting switch signal.
DOOR SW - DR	“On/Off”	Displays status of the driver door as judged from the driver door switch signal. (door is open: ON/door is closed: OFF)
DOOR SW - AS	“On/Off”	Displays status of the passenger door as judged from the passenger door switch signal. (door is open: ON/door is closed: OFF)

Monitor item		Contents
DOOR SW - RR	“On/Off”	Displays status of the rear door as judged from the rear door switch (RH) signal. (door is open: ON/door is closed: OFF)
DOOR SW - RL	“On/Off”	Displays status of the rear door as judged from the rear door switch (LH) signal. (door is open: ON/door is closed: OFF)
BACK DOOR SW NOTE	“Off”	—
PKB SW	“On/Off”	Displays status (parking brake released: ON/ parking brake applied: OFF) of parking brake switch judged from parking brake switch signal.
ENGINE RUN	“On/Off”	Displays status (engine running: ON/ engine stopped: OFF) of engine judged from engine run signal.
I - KEY LOCK	“On/Off”	Displays “locked (ON)/other (OFF)” status, determined from lock signal.
OPTICAL SENSOR	“0 - 5V”	Displays “outside brightness (close to 5 V when light/close to 0 V when dark)” judged from optical sensor signal.
VEHICLE SPEED	“km/h”	Displays vehicle speed as judged from vehicle speed signal.

NOTE:
This item is displayed, but cannot be monitored.

ACTIVE TEST

Display Item List

Test item	Description
TAIL LAMP	Allows tail lamp relay to operate by switching ON-OFF.
FR FOG LAMP	Allows front fog lamp relay to operate by switching ON-OFF.
DAYTIME RUNNING LIGHT	Allows daytime relay to operate by switching ON-OFF.
HEAD LAMP (HI, LO)	Allows headlamp relay to operate by switching ON-OFF.

CONSULT-III Functions (IPDM E/R)

INFOID:0000000004160345

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

Diagnosis Mode	Description
SELF-DIAGNOSTIC RESULTS	Refer to PG-20, "CONSULT-III Function (IPDM E/R)".
DATA MONITOR	The input/output data of IPDM E/R is displayed in real time.
CAN DIAG SUPPORT Monitor	The result of transmit/receive diagnosis of CAN communication can be read.
ACTIVE TEST	IPDM E/R sends a drive signal to electronic components to check their operation.

DATA MONITOR

All Signals, Main Signals, Selection From Menu

Item name	CONSULT-III screen display	Display or unit	Monitor item selection			Description
			ALL SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
Position lights request	TAIL&CLR REQ	On/Off	×	×	×	Signal status input from BCM
Headlamp low beam request	HL LO REQ	On/Off	×	×	×	Signal status input from BCM
Headlamp high beam request	HL HI REQ	On/Off	×	×	×	Signal status input from BCM
Front fog lights request	FR FOG REQ	On/Off	×	×	×	Signal status input from BCM
Daytime running light request	DTRL REQ	On/Off	×	–	×	Signal status input from BCM

NOTE:
Perform monitoring of IPDM E/R data with the ignition switch ON. When the ignition switch is at ACC, the display may not be correct.

ACTIVE TEST

Test item	CONSULT-III screen display	Description
Tail lamp relay output	TAIL LAMP	Allows tail lamp relay to operate by switching operation ON-OFF at your option.
Headlamp relay (HI, LO) output	LAMPS	Allows headlamp relay (HI, LO) to operate by switching operation (OFF, HI ON, LO ON) at your option (Headlamp high beam repeats ON-OFF every 1 second).
Front fog lamp relay output		Allows fog lamp relay to operate by switching operation ON-OFF at your option.

Daytime Light Control Does Not Operate Properly (Normal Headlamps Operate Properly)

INFOID:0000000004160346

1.DAYTIME LIGHT ACTIVE TEST

CONSULT-III ACTIVE TEST
1. Select “DAYTIME RUNNING LIGHT” of BCM (HEAD LAMP) active test item.
2. With operating the test item, check the daytime light operation.

On : Daytime running light ON
Off : Daytime running light OFF

OK or NG

OK >> GO TO 2.
NG >> GO TO 4.

2.CHECK INPUT SIGNAL

CONSULT-III DATA MONITOR
1. Select “ENGINE RUN” of BCM (HEAD LAMP) data monitor item.
2. With operating the engine running or stop, check the monitor status.

Engine running : ENGINE RUN On
Engine stop : ENGINE RUN Off

3. Select “PKB SW” of BCM (HEAD LAMP) data monitor item.
4. With operating the parking brake, check the monitor status.

Parking brake ON : PKB SW On
Parking brake OFF : PKB SW Off

OK or NG

OK >> GO TO 3.
NG >> Check BCM CAN communication system. Refer to LAN-17, "CAN Diagnosis with CONSULT-III".

3.CHECK INPUT SIGNAL

CONSULT-III DATA MONITOR
1. Start engine and release parking brake. Headlamp switch OFF.
2. Select “DTRL REQ” of IPDM E/R data monitor item.
3. With operating the parking brake, check the monitor status.

Parking brake ON : DTRL REQ On
Parking brake OFF : DTRL REQ Off

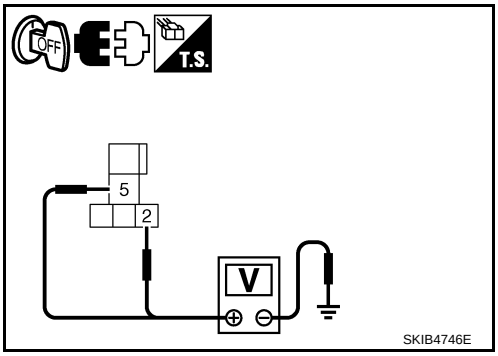
OK or NG

OK >> Replace IPDM E/R. Refer to PG-27, "Removal and Installation of IPDM E/R".
NG >> Replace BCM. Refer to BCS-14, "Removal and Installation of BCM".

4.CHECK DAYTIME LIGHT RELAY POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Remove daytime light relay.

3. Check voltage between daytime light relay harness connector and ground.



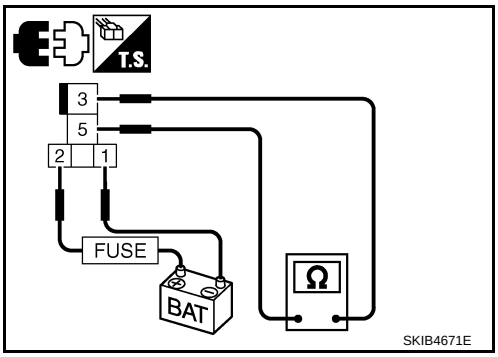
Terminals			Voltage (Approx.)
(+)		(–)	
Daytime light relay connector	Terminal		
E34	2	Ground	Battery voltage
	5		

OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

5. CHECK DAYTIME LIGHT RELAY

Check continuity between daytime light relay terminals.



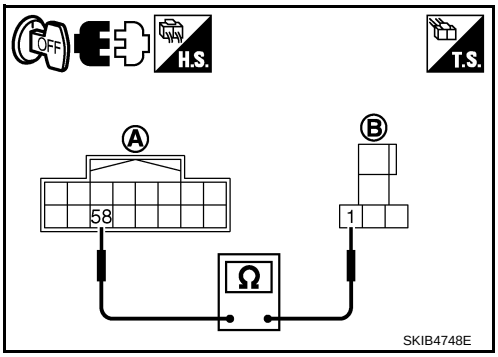
Daytime light relay terminals		Condition	Continuity
3	5	Applying battery voltage to between daytime light relay terminals 1 and 2	Yes
		No battery voltage	No

OK or NG

OK >> GO TO 6.
NG >> Replace daytime light relay.

6. CHECK CIRCUIT BETWEEN DAYTIME LIGHT RELAY AND IPDM E/R

1. Disconnect IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector (A) and daytime light relay harness connector (B).



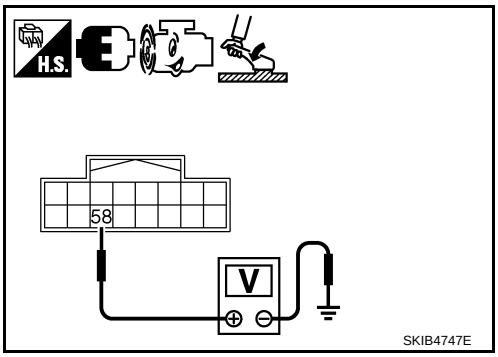
A		B		Continuity
Connector	Terminal	Connector	Terminal	
E9	58	E34	1	Yes

OK or NG

OK >> GO TO 7.
NG >> Repair harness or connector.

7. CHECK DAYTIME LIGHT RELAY SIGNAL

1. Connect IPDM E/R connector.
2. Install daytime light relay.
3. Turn ignition switch ON.
4. Applied parking brake.
5. Check voltage between IPDM E/R harness connector and ground.



Terminals			Voltage (Approx.)
(+)		(–)	
IPDM E/R connector	Terminal		
E9	58	Ground	Battery voltage

6. Start engine and release parking break. Headlamp switch OFF.
7. Check voltage between IPDM E/R harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
IPDM E/R connector	Terminal		
E9	58	Ground	0 V

OK or NG

OK >> Check connecting condition daytime light relay harness connector.
NG >> GO TO 8.

8.CHECK CAN COMMUNICATIONS

CONSULT-III SELF-DIAGNOSIS
Perform self-diagnosis for “BCM” on CONSULT-III.

Displayed self-diagnosis results

NO DTC>>Replace BCM. Refer to BCS-14, "Removal and Installation of BCM".
CAN COMM CIRCUIT>>Check BCM CAN communication system. Refer to LAN-17, "CAN Diagnosis with CONSULT-III".

Headlamp High Beam Does Not Illuminate (Both Sides)

INFOID:0000000004160347

1.CHECK COMBINATION SWITCH INPUT SIGNAL

CONSULT-III DATA MONITOR
1. Select “HI BEAM SW” of BCM (HEAD LAMP) data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is HIGH BEAM position : HI BEAM SW ON

CHECK THE COMBINATION SWITCH
Refer to LT-175, "Combination Switch Inspection".

OK or NG

OK >> GO TO 2.
NG >> Check combination switch (lighting switch). Refer to LT-175, "Combination Switch Inspection".

2.HEADLAMP ACTIVE TEST

CONSULT-III ACTIVE TEST
1. Select “LAMPS” of IPDM E/R active test item.
2. With operating the test item, check the headlamp high beam operation.

HI : Headlamp high beam ON
Off : Headlamp high beam OFF

NOTE:
Headlamp high beam repeats ON-OFF every 1 second.

IPDM E/R AUTO ACTIVE TEST
1. Activate auto active test. Refer to PG-22, "Auto Active Test".
2. Make sure headlamp high beam operation.

Headlamp high beam should operate.

OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3.CHECK IPDM E/R

CONSULT-III DATA MONITOR
1. Select “HL LO REQ” and “HL HI REQ” of IPDM E/R data monitor item.
2. With operating the lighting switch is in HIGH BEAM position, check the monitor status.

When lighting switch is HIGH BEAM position : **HL LO REQ ON** / **HL HI REQ ON**

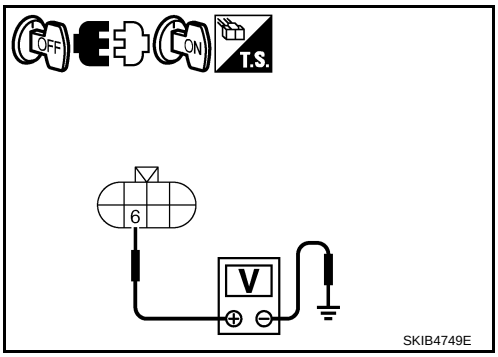
OK or NG

OK >> Replace IPDM E/R. Refer to PG-27, "Removal and Installation of IPDM E/R".
NG >> Replace BCM. Refer to BCS-14, "Removal and Installation of BCM".

4. CHECK HEADLAMP INPUT SIGNAL

CONSULT-III ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Select “LAMPS” of IPDM E/R active test item.
4. Touch “HI” screen.
5. With operating the test item, check voltage between front combination lamp (RH and LH) harness connector and ground. (Headlamp high beam repeats ON-OFF every 1 second.)



Terminal			Voltage (Approx.)
(+)		(–)	
Front combination lamp connector		Terminal	
RH	E47	6	Ground	Battery voltage
LH	E54	6		

IPDM E/R AUTO ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Activate auto active test. Refer to PG-22, "Auto Active Test".
4. When headlamp high beam is operating, check voltage between front combination lamp (RH and LH) harness connector and ground.

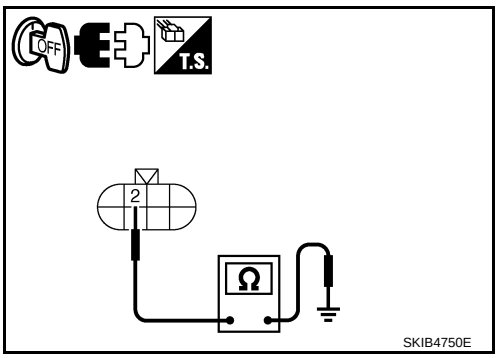
Terminal			Voltage (Approx.)
(+)		(–)	
Front combination lamp connector		Terminal	
RH	E47	6	Ground	Battery voltage
LH	E54	6		

OK or NG

OK >> GO TO 5.
NG >> GO TO 8.

5. CHECK HEADLAMP (LH SIDE) GROUND

1. Turn ignition switch OFF.
2. Check continuity between front combination lamp LH harness connector and ground.



Front combination lamp LH connector	Terminal	Ground	Continuity
E54	2		Yes

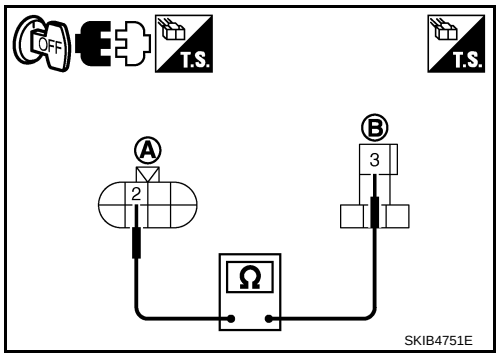
OK or NG

OK >> GO TO 6.
NG >> Repair harness or connector.

6. CHECK HEADLAMP (RH SIDE) GROUND

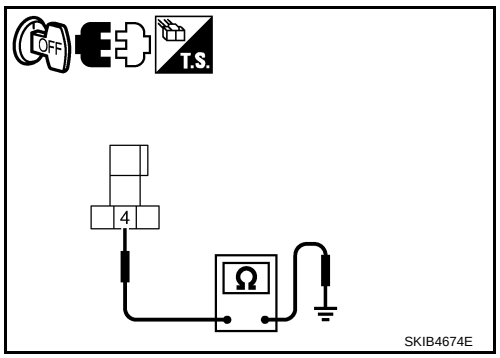
1. Remove daytime light relay.
2. Check continuity between front combination lamp RH harness connector (A) and daytime light relay harness connector (B).

A		B		Continuity
Connector	Terminal	Connector	Terminal	
E47	2	E34	3	Yes



3. Check continuity between daytime light relay harness connector and ground.

Daytime light relay connector	Terminal	Ground	Continuity
E34	4		Yes



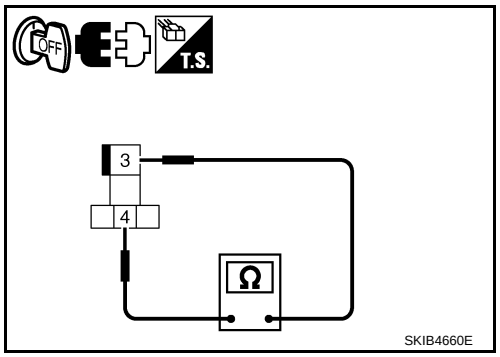
OK or NG

OK >> GO TO 7.
NG >> Repair harness or connector.

7. CHECK DAYTIME LIGHT RELAY

Check continuity between daytime light relay terminals.

Daytime light relay terminals		Continuity
3	4	Yes

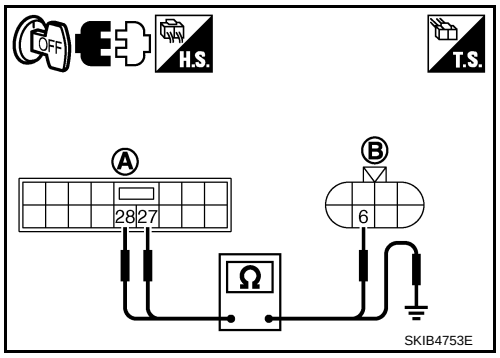


OK >> Check headlamp bulb and connecting condition combination lamp terminal connector.
NG >> Replace daytime light relay.

8. CHECK CIRCUIT BETWEEN IPDM E/R AND FRONT COMBINATION LAMP

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector (A) and front combination lamp (RH and LH) harness connector (B).

Circuit	A		B		Continuity
	Connector	Terminal	Connector	Terminal	
RH	E7	27	E47	6	Yes
LH		28	E54	6	



4. Check continuity between IPDM E/R harness connector (A) and ground.

A			Ground	Continuity
Connector		Terminal		
RH	E7	27		No
LH		28		

OK or NG

OK >> Replace IPDM E/R. Refer to PG-27, "Removal and Installation of IPDM E/R".
NG >> Repair harness or connector.

RH High Beam Does Not Illuminate But LH High Beam Illuminates

INFOID:0000000004160348

1.CHECK BULB

Check bulb of lamp.

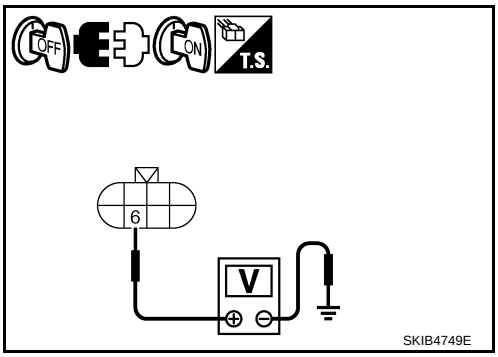
OK or NG

OK >> GO TO 2.
NG >> Replace headlamp bulb.

2.CHECK HEADLAMP INPUT SIGNAL

CONSULT-III ACTIVE TEST

1. Disconnect front combination lamp RH connector.
2. Select “LAMPS” of IPDM E/R active test item.
3. Touch “HI” screen.
4. With operating the test item, check voltage between front combination lamp RH harness connector and ground. (Headlamp high beam repeats ON–OFF every 1 second.)



Terminals			Voltage (Approx.)
(+)		(–)	
Front combination lamp RH connector	Terminal		
E47	6	Ground	Battery voltage

IPDM E/R AUTO ACTIVE TEST

1. Disconnect front combination lamp RH connector.
2. Activate auto active test. Refer to PG-22, "Auto Active Test".
3. When headlamp HI is operating, check voltage between front combination lamp RH harness connector and ground.

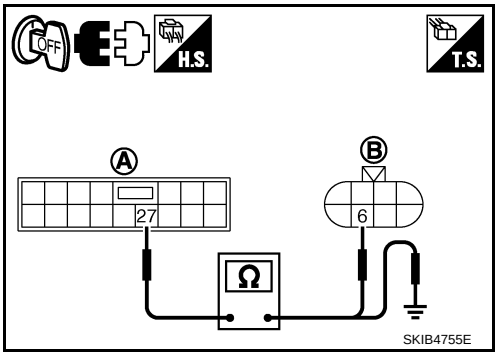
Terminals			Voltage (Approx.)
(+)		(–)	
Front combination lamp RH connector	Terminal		
E47	6	Ground	Battery voltage

OK or NG

OK >> GO TO 4.
NG >> GO TO 3.

3.CHECK CONTINUITY BETWEEN IPDM E/R AND FRONT COMBINATION LAMP

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector (A) and front combination lamp RH harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
E7	27	E47	6	Yes

4. Check continuity between IPDM E/R harness connector (A) and ground.

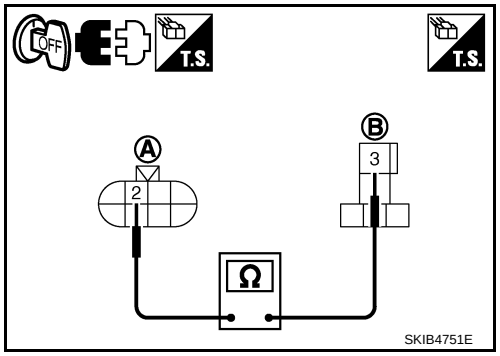
A		Ground	Continuity
Connector	Terminal		
E7	27		No

OK or NG

OK >> Replace IPDM E/R. Refer to PG-27, "Removal and Installation of IPDM E/R".
NG >> Repair harness or connector.

4. CHECK HEADLAMP GROUND (1)

1. Turn ignition switch OFF.
2. Remove daytime light relay.
3. Check continuity between front combination lamp RH harness connector (A) and daytime light relay harness connector (B).



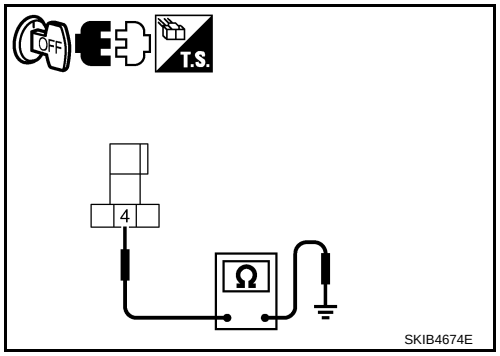
A		B		Continuity
Connector	Terminal	Connector	Terminal	
E47	2	E34	3	Yes

OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

5. CHECK HEADLAMP GROUND (2)

Check continuity between daytime light relay harness connector and ground.



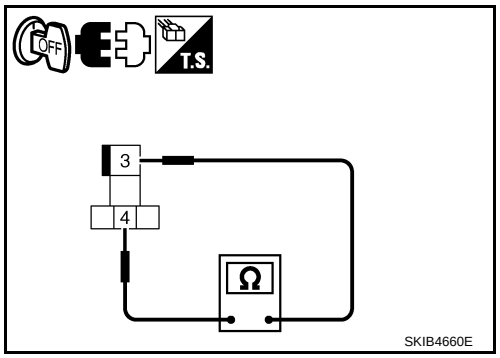
Daytime light relay connector	Terminal	Ground	Continuity
E34	4		Yes

OK or NG

OK >> GO TO 6.
NG >> Repair harness or connector.

6. CHECK DAYTIME RELAY

Check continuity between daytime light relay terminals.



Daytime light relay terminals		Continuity
3	4	Yes

OK >> Check connecting condition front combination lamp RH harness connector.
NG >> Replace daytime light relay.

LH High Beam Does Not Illuminate But RH High Beam Illuminates

INFOID:0000000004160349

1. CHECK BULB

Check bulb of lamp.

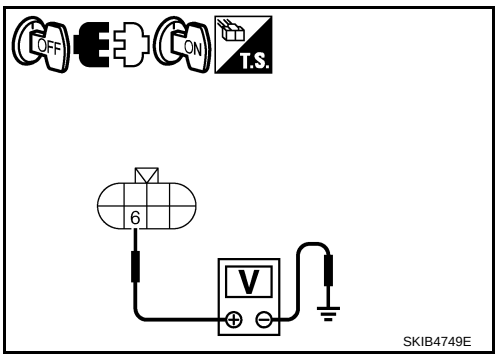
OK or NG

OK >> GO TO 2.
NG >> Replace bulb of lamp.

2.CHECK HEADLAMP INPUT SIGNAL

CONSULT-III ACTIVE TEST

1. Disconnect front combination lamp LH connector.
2. Select “LAMPS” of IPDM E/R active test item.
3. Touch “HI” screen.
4. With operating the test item, check voltage between front combination lamp LH harness connector and ground. (Headlamp high beam repeats ON–OFF every 1 second.)



Terminals			Voltage (Approx.)
(+)		(–)	
Front combination lamp LH connector	Terminal		
E54	6	Ground	Battery voltage

IPDM E/R AUTO ACTIVE TEST

1. Disconnect front combination lamp LH connector.
2. Activate auto active test. Refer to PG-22, "Auto Active Test".
3. When headlamp high beam is operating, check voltage between front combination lamp LH harness connector and ground.

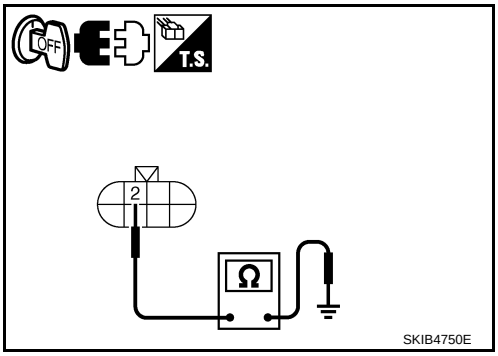
Terminals			Voltage (Approx.)
(+)		(–)	
Front combination lamp LH connector	Terminal		
E54	6	Ground	Battery voltage

OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3.CHECK HEADLAMP GROUND

1. Turn ignition switch OFF.
2. Check continuity front combination lamp harness connector and ground.



Front combination lamp LH connector	Terminal	Ground	Continuity
E54	2		Yes

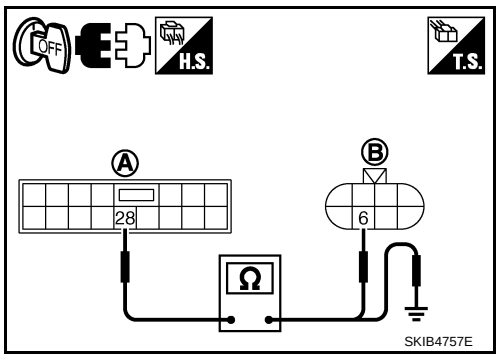
OK or NG

OK >> Check connecting condition front headlamp LH connector harness.
NG >> Repair harness or connector.

4. CHECK CIRCUIT BETWEEN IPDM E/R AND FRONT COMBINATION LAMP

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and front combination lamp LH connector.

3. Check continuity between IPDM E/R harness connector (A) and front combination lamp LH harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
E7	28	E54	6	Yes

4. Check continuity between IPDM E/R harness connector (A) and ground.

A		Ground	Continuity
Connector	Terminal		
E7	28		No

OK or NG

OK >> Replace IPDM E/R. Refer to PG-27, "Removal and Installation of IPDM E/R".
NG >> Repair harness or connector.

Headlamp Low Beam Does Not Illuminate (Both Sides)

INFOID:0000000004160350

1.CHECK COMBINATION SWITCH INPUT SIGNAL

CONSULT-III DATA MONITOR
1. Select “HEAD LAMP SW 1” and “HEAD LAMP SW 2” of BCM (HEAD LAMP) data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is 2ND position : HEAD LAMP SW 1 ON
: HEAD LAMP SW 2 ON

CHECK THE COMBINATION SWITCH
Refer to LT-175, "Combination Switch Inspection".

OK or NG

OK >> GO TO 2.
NG >> Check lighting switch. Refer to LT-175, "Combination Switch Inspection".

2.HEADLAMP ACTIVE TEST

CONSULT-III ACTIVE TEST
1. Select “LAMPS” of IPDM E/R active test item.
2. With operating the test item, check the headlamp low beam operation.

LO : Headlamp low beam ON
Off : Headlamp low beam OFF

IPDM E/R AUTO ACTIVE TEST
1. Activate auto active test. Refer to PG-22, "Auto Active Test".
2. Make sure headlamp low beam operation.

Headlamp low beam should operate.

OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3.CHECK IPDM E/R

CONSULT-III DATA MONITOR
1. Select “HL LO REQ” of IPDM E/R data monitor item.
2. With operating the lighting switch is in 2ND position, check the monitor status.

When lighting switch is 2ND position : HL LO REQ ON

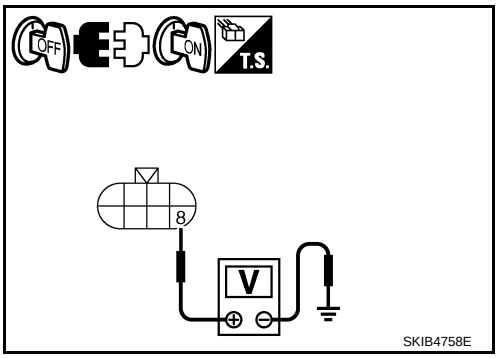
OK or NG

OK >> Replace IPDM E/R. Refer to PG-27, "Removal and Installation of IPDM E/R".
NG >> Replace BCM. Refer to BCS-14, "Removal and Installation of BCM".

4. CHECK HEADLAMP INPUT SIGNAL

CONSULT-III ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Select “LAMPS” of IPDM E/R active test item.
4. Touch “LO” screen.
5. With operating the test item, check voltage between front combination lamp (RH and LH) harness connector and ground.



Terminal				Voltage (Approx.)
(+)			(–)	
Front combination lamp connector		terminal		
RH	E47	8	Ground	Battery voltage
LH	E54	8		

IPDM E/R AUTO ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Activate auto active test. Refer to PG-22, "Auto Active Test".
4. When headlamp low beam is operating, check voltage between front combination lamp (RH and LH) harness connector and ground.

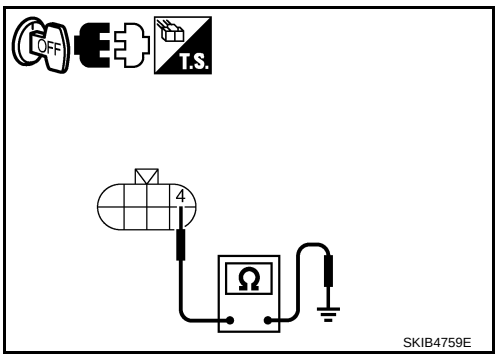
Terminal				Voltage (Approx.)
(+)			(–)	
Front combination lamp connector		terminal		
RH	E47	8	Ground	Battery voltage
LH	E54	8		

OK or NG

OK >> GO TO 5.
NG >> GO TO 6.

5. CHECK HEADLAMP GROUND

1. Turn ignition switch OFF.
2. Check continuity between front combination lamp (RH and LH) harness connector and ground.



Front combination lamp connector		Terminal	Ground	Continuity
RH	E47	4		Yes
LH	E54	4		

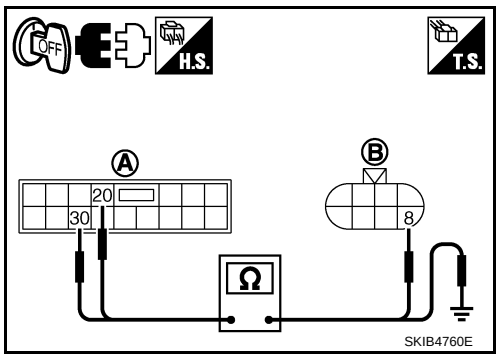
OK or NG

OK >> Check headlamp harness, connectors, ballasts (HID control unit), and xenon bulbs. Refer to LT-63, "Xenon Headlamp Trouble Diagnosis".
NG >> Repair harness or connector.

6. CHECK CIRCUIT BETWEEN IPDM E/R AND FRONT COMBINATION LAMP

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.

3. Check continuity between IPDM E/R harness connector (A) and front combination lamp (RH and LH) harness connector (B).



Circuit	A		B		Continuity
	Connector	Terminal	Connector	Terminal	
RH	E7	20	E47	8	Yes
LH		30	E54	8	

4. Check continuity between IPDM E/R harness connector (A) and ground.

A			Ground	Continuity
Connector		Terminal		
RH	E7	20		No
LH		30		

OK or NG

OK >> Replace IPDM E/R. Refer to PG-27, "Removal and Installation of IPDM E/R".
NG >> Repair harness or connector.

Headlamp Low Beam Does Not Illuminate (One Side)

INFOID:0000000004160351

1.CHECK BULB

Check ballast (HID control unit) and xenon bulb of lamp which does not illuminate. Refer to LT-63, "Xenon Headlamp Trouble Diagnosis".

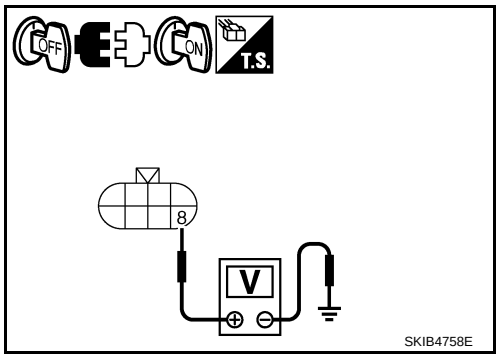
OK or NG

OK >> GO TO 2.
NG >> Repair malfunctioning part.

2.CHECK HEADLAMP INPUT SIGNAL

CONSULT-III ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH or LH connector.
3. Select “LAMPS” of IPDM E/R active test item.
4. Touch “LO” screen.
5. With operating the test item, check voltage between front combination lamp RH or LH harness connector and ground.



Terminal				Voltage (Approx.)
(+)			(–)	
Front combination lamp connector		Terminal		
RH	E47	8	Ground	Battery voltage
LH	E54	8		

IPDM E/R AUTO ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH or LH connector.
3. Activate auto active test. Refer to PG-22, "Auto Active Test".
4. When headlamp low beam is operating, check voltage between front combination lamp RH or LH harness connector and ground.

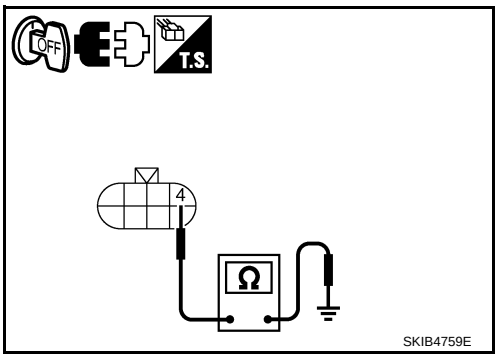
Terminal				Voltage (Approx.)
(+)			(–)	
Front combination lamp connector		Terminal		
RH	E47	8	Ground	Battery voltage
LH	E54	8		

OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3. CHECK HEADLAMP GROUND

1. Turn ignition switch OFF.
2. Check continuity between front combination lamp RH or LH harness connector and ground.



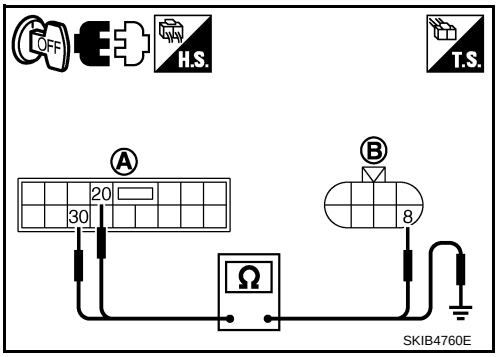
Front combination lamp connector		Terminal	Ground	Continuity
RH	E47	4		Yes
LH	E54	4		

OK or NG

OK >> Check connecting condition headlamp harness connector.
NG >> Repair harness or connector.

4. CHECK CIRCUIT BETWEEN IPDM E/R AND FRONT COMBINATION LAMP

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector (A) and front combination lamp RH or LH harness connector (B).



Circuit	A		B		Continuity
	Connector	Terminal	Connector	Terminal	
RH	E7	20	E47	8	Yes
LH		30	E54	8	

4. Check continuity between IPDM E/R harness connector (A) and ground.

A			Ground	Continuity
Connector		Terminal		
RH	E7	20		No
LH		30		

OK or NG

OK >> Replace IPDM E/R. Refer to PG-27, "Removal and Installation of IPDM E/R".
NG >> Repair harness or connector.

Headlamps Do Not Turn OFF

INFOID:0000000004160352

1. CHECK HEADLAMP TURN OFF

Make sure that lighting switch is OFF. And make sure is headlamp turns off when ignition switch is turned OFF.

OK or NG

OK >> GO TO 3.

NG >> GO TO 2.

2.CHECK COMBINATION SWITCH INPUT SIGNAL

CONSULT-III DATA MONITOR
1. Select “HEAD LAMP SW 1” and “HEAD LAMP SW 2” of BCM (HEAD LAMP) data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is OFF position	**: HEAD LAMP SW 1 OFF**
	: HEAD LAMP SW 2 OFF

OK or NG

OK >> Replace IPDM E/R. Refer to PG-27, "Removal and Installation of IPDM E/R".
NG >> Check lighting switch. Refer to LT-175, "Combination Switch Inspection".

3.CHECK CAN COMMUNICATIONS BETWEEN BCM AND IPDM E/R

CONSULT-III SELF-DIAGNOSIS
Perform self-diagnosis for “BCM”.

Display of self-diagnosis results

NO DTC>> Replace IPDM E/R. Refer to PG-27, "Removal and Installation of IPDM E/R".
CAN COMM CIRCUIT>> Refer to LAN-17, "CAN Diagnosis with CONSULT-III".

General Information for Xenon Headlamp Trouble Diagnosis

INFOID:0000000004160353

In most cases, malfunction of xenon headlamp - “does not illuminate”, “flickers” or “dark” - is caused by a malfunctioning xenon bulb. A HID control unit or lamp housing, however, may be a cause of malfunction. Be sure to perform trouble diagnosis following the steps described below.

Caution

INFOID:0000000004160354

- Installation or removal of connector must be done with lighting switch OFF.
- When lamp is illuminated (when lighting switch is ON), do not touch harness, HID control unit, inside of lamp, or lamp metal parts.
- To check illumination, temporarily install lamp in the vehicle. Be sure to connect power at the vehicle-side connector.
- If the error can be traced directly to the electrical system, first check for items such as burned-out fuses and fusible links, broken wires or loose connectors, pulled-out terminals, and improper connections.
- Do not work with wet hands.
- Using a tester for HID control unit circuit trouble diagnosis is prohibited.
- Disassembling the HID control unit or harnesses (bulb socket harness, ECM harness) is prohibited.
- Immediately after illumination, the light intensity and color will fluctuate, but there is nothing wrong.
- When the bulb has reached the end of its lifetime, the brightness may drop significantly, it may flash repeatedly, or the light may turn a reddish color.

Xenon Headlamp Trouble Diagnosis

INFOID:0000000004160355

1.CHECK 1: XENON HEADLAMP LIGHTING

Install normal xenon bulb to corresponding xenon bulb headlamp, and check if lamp lights up.

OK or NG

OK >> Replace xenon bulb.
NG >> GO TO 2.

2.CHECK 2: XENON HEADLAMP LIGHTING

Install normal HID control unit to corresponding xenon headlamp, and check if lamp lights up.

OK or NG

OK >> Replace HID control unit.
NG >> GO TO 3.

3.CHECK 3: XENON HEADLAMP LIGHTING

Install normal xenon lamp housing assembly to corresponding xenon headlamp, and check if lamp lights up.

OK or NG

OK >> Replace xenon headlamp housing assembly.
NG >> INSPECTION END

Aiming Adjustment

INFOID:0000000004160356

Refer to LT-30, "Aiming Adjustment" in “HEADLAMP -XENON TYPE-”.

Bulb Replacement

INFOID:0000000004160357

Refer to LT-31, "Bulb Replacement" in “HEADLAMP -XENON TYPE-”.

Removal and Installation

INFOID:0000000004160358

Refer to LT-33, "Removal and Installation" in “HEADLAMP -XENON TYPE-”.

Disassembly and Assembly

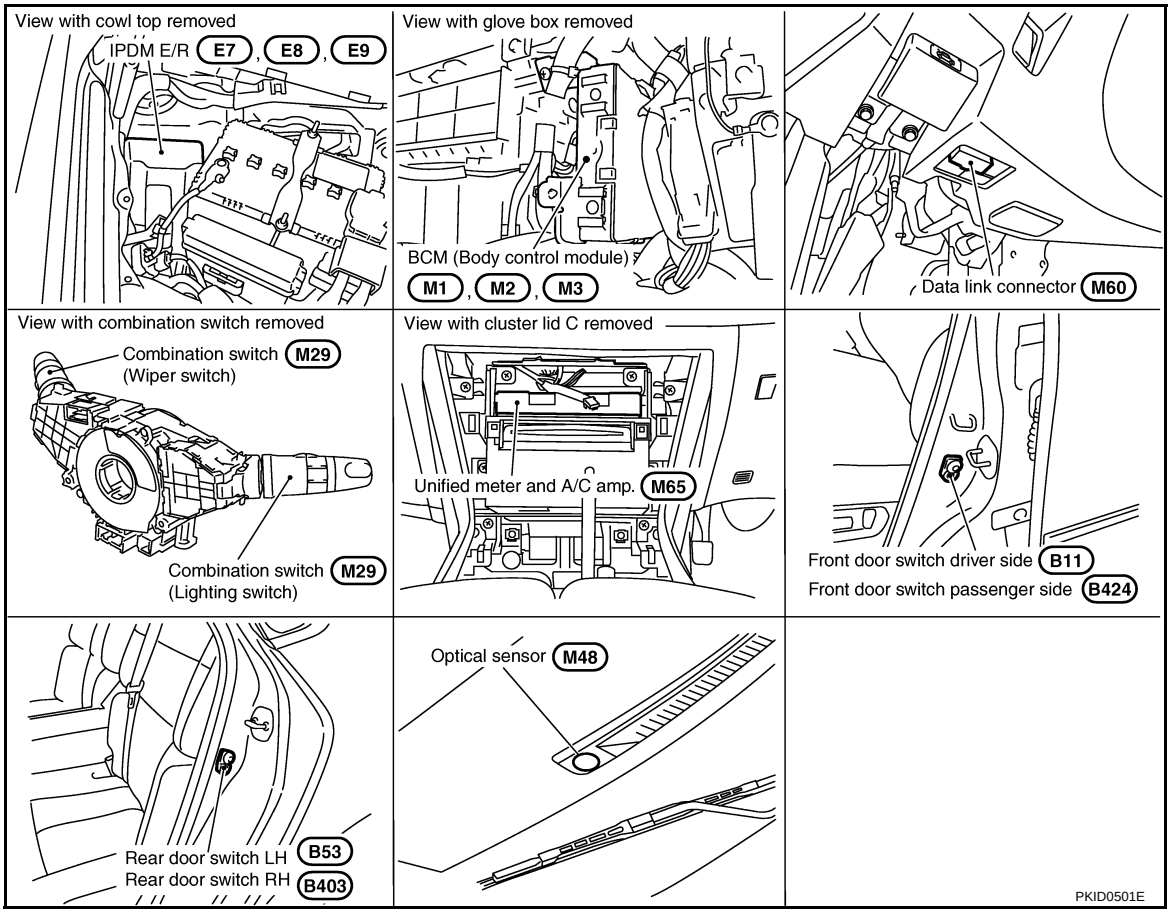
INFOID:0000000004160359

Refer to LT-33, "Disassembly and Assembly" in “HEADLAMP -XENON TYPE-”.

AUTO LIGHT SYSTEM

Component Parts and Harness Connector Location

INFOID:0000000004160360



System Description

INFOID:0000000004160361

Automatically turns ON/OFF the parking lamps and the headlamps in accordance with ambient light.
Timing for when lamps turn ON/OFF can be selected using four modes.

OUTLINE

The auto light control system has an optical sensor inside it that detects outside brightness.
When the lighting switch is in AUTO position, it automatically turns ON/OFF the parking lamps and the headlamps in accordance with ambient light. Sensitivity can be adjusted in four steps. For the details of the setting, Refer to LT-75, "Preliminary Check".
Optical sensor, power is supplied
- from BCM (body control module) terminal 17
- to optical sensor terminal 1.

Optical sensor, ground is supplied
- to optical sensor terminal 3
- through BCM terminal 18.

When ignition switch is turn to ON position, and
When outside brightness is darker than prescribed level, input is supplied
- from optical sensor terminal 2
- to BCM terminal 14.

The headlamps will then illuminate. For a description of headlamp operation, Refer to "System Description".

COMBINATION SWITCH READING FUNCTION

Refer to BCS-4, "System Description".

EXTERIOR LAMP BATTERY SAVER CONTROL

When the combination switch (lighting switch) is in the 2ND position (or if auto light system is activated), and the ignition switch is turned from ON or ACC to OFF, the battery saver control function is activated.

Under this condition, the headlamps remain illuminated for 5 minutes, then the headlamps are turned off. Exterior lamp battery saver control mode can be changed by the function setting of CONSULT-III.

DELAY TIMER FUNCTION

Delay timer function carries out a function that BCM activates the timer and controls lights out of headlamps by door switch signal and lightning switch signal when turning the Ignition switch OFF while it is ON and headlamps are ON by the auto light function.
Timer types are a 5 minutes timer and a 45 seconds timer

- When opening any door (door switch is ON), the 5 minutes timer starts and then headlamps go out five minutes later
- When all the doors are closed (from door switch ON to OFF), the 45 second timer starts and then headlamps go out 45 seconds later. If any door is opened (door switch ON) while the 45 seconds timer is in operation, the 5 minutes timer starts again
- The timer stops when turning on the ignition switch or turning off the auto light switch under the above conditions.

Delay timer control mode can be changed by the function setting of CONSULT-III.

CAN Communication System Description

INFOID:0000000004160362

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing the high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

CAN Communication Unit

INFOID:0000000004160363

Refer to LAN-11, "System Description".

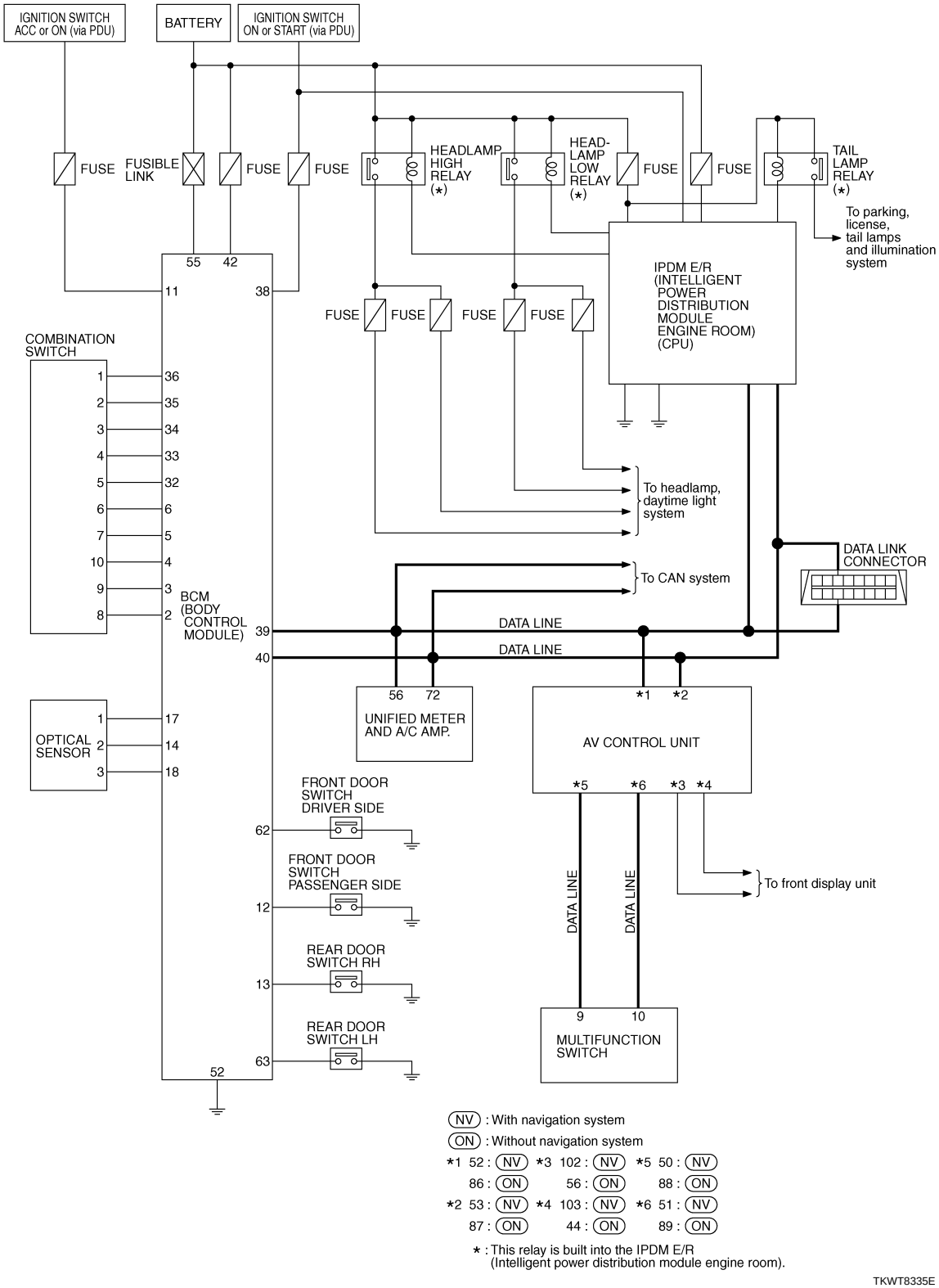
Major Component and Functions

INFOID:0000000004160364

Components	Functions
BCM	• Turns on/off circuits of tail light and headlamp according to signals from optical sensor, lighting switch (AUTO), driver door switch, passenger door switch, rear door switch, and ignition switch (ON, OFF).
Optical sensor	• Converts outside brightness (lux) to voltage, and sends it to BCM. (Detects brightness of 50 to 1,300 lux)

Schematic

INFOID:0000000004160365



(NV) : With navigation system
(ON) : Without navigation system

*1 52 : (NV) *3 102 : (NV) *5 50 : (NV)
86 : (ON) 56 : (ON) 88 : (ON)
*2 53 : (NV) *4 103 : (NV) *6 51 : (NV)
87 : (ON) 44 : (ON) 89 : (ON)

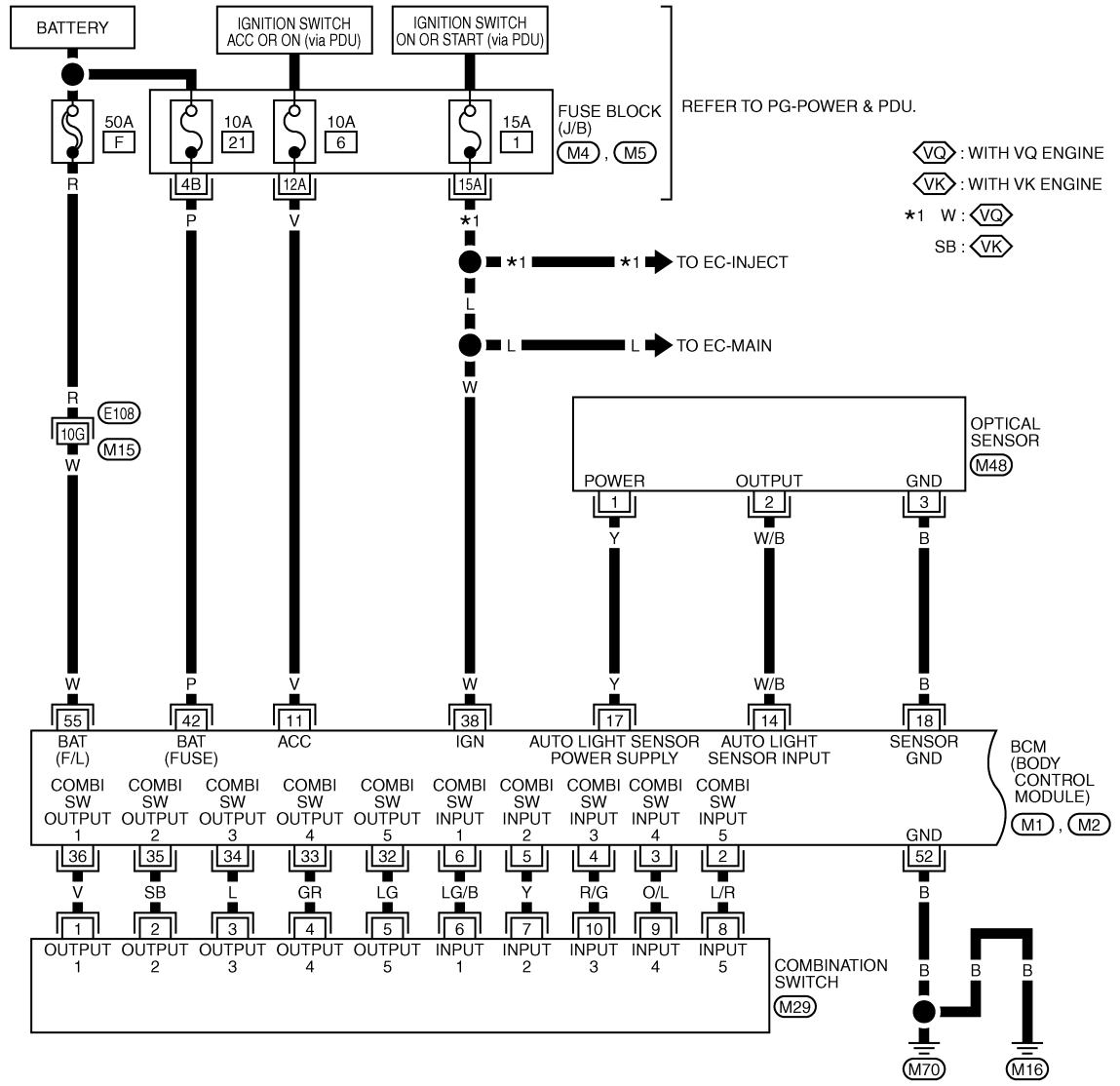
* : This relay is built into the IPDM E/R (Intelligent power distribution module engine room).

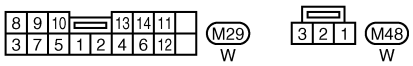
TKWT8335E

Wiring Diagram - AUTO/L -

INFOID:0000000004160366

LT-AUTO/L-01





REFER TO THE FOLLOWING.

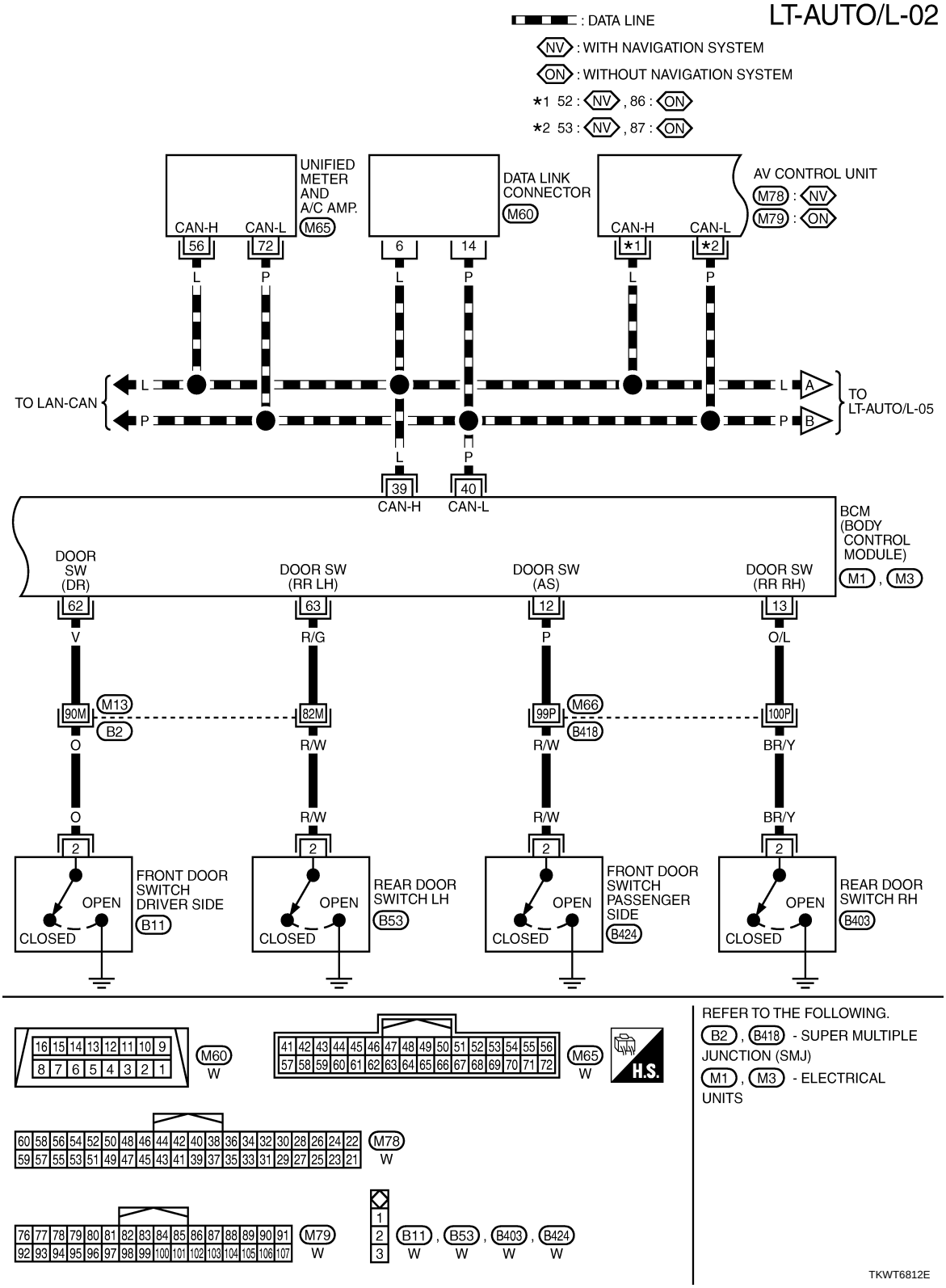
E108 -SUPER MULTIPLE JUNCTION (SMJ)

M4 , M5 -FUSE BLOCK-JUNCTION BOX (J/B)

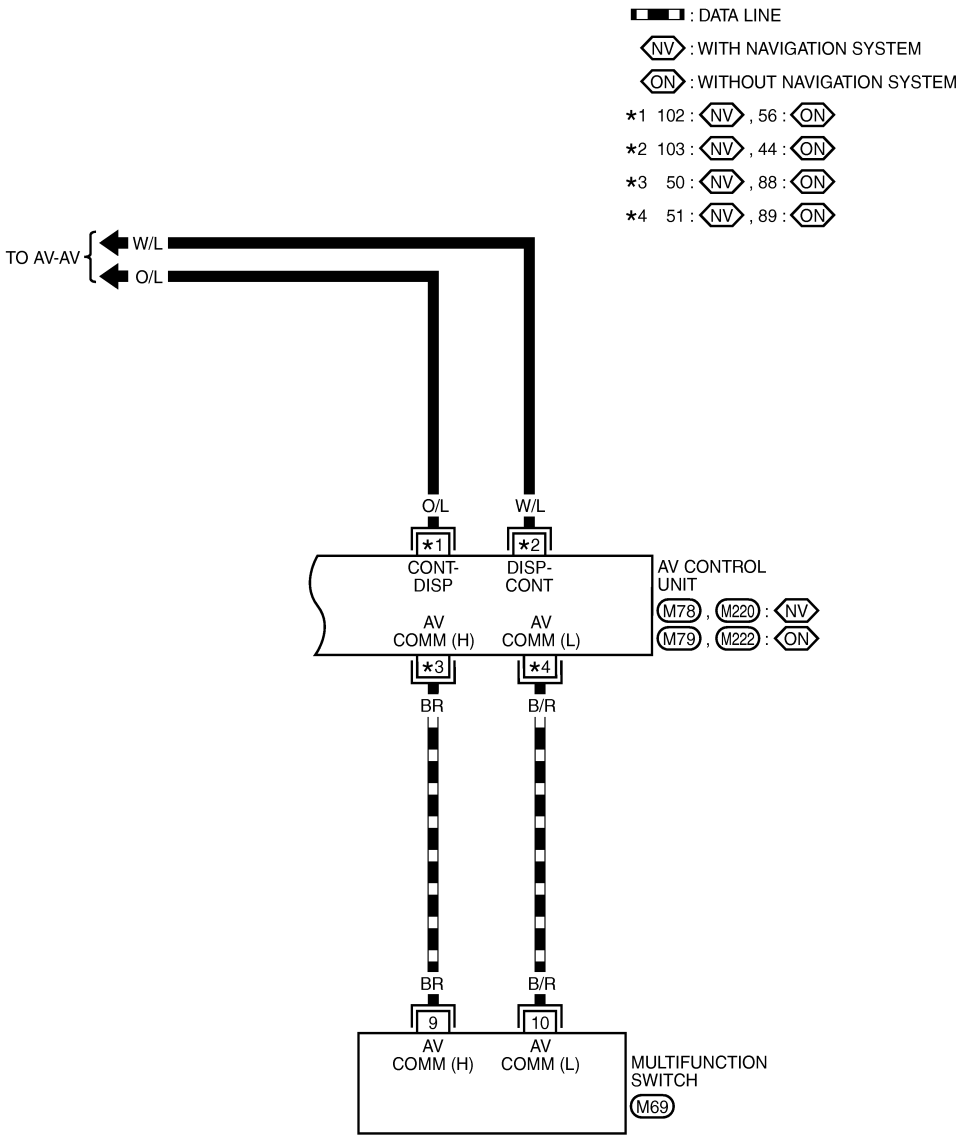
M1 , M2 -ELECTRICAL UNITS

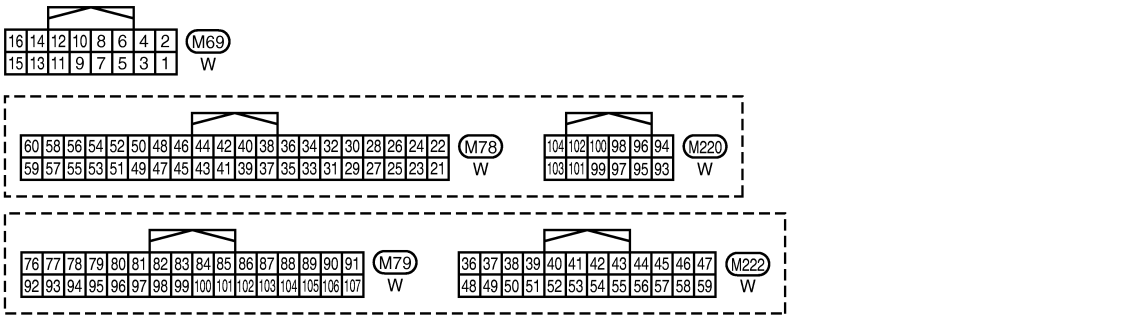
TKWT8198E

LT-AUTO/L-02


: DATA LINE
NV : WITH NAVIGATION SYSTEM
ON : WITHOUT NAVIGATION SYSTEM
*1 52 : NV , 86 : ON
*2 53 : NV , 87 : ON
UNIFIED METER AND A/C AMP.
M65
DATA LINK CONNECTOR
M60
AV CONTROL UNIT
M78 : NV
M79 : ON
CAN-H
CAN-L
56
72
6
14
*1
*2
L
P
TO LAN-CAN
TO LT-AUTO/L-05
A
B
39
40
BCM (BODY CONTROL MODULE)
M1 , M3
DOOR SW (DR)
DOOR SW (RR LH)
DOOR SW (AS)
DOOR SW (RR RH)
62
63
12
13
V
R/G
P
O/L
90M
82M
99P
100P
M13
B2
M66
B418
O
R/W
BR/Y
2
FRONT DOOR SWITCH DRIVER SIDE
B11
REAR DOOR SWITCH LH
B53
FRONT DOOR SWITCH PASSENGER SIDE
B424
REAR DOOR SWITCH RH
B403
OPEN
CLOSED
M60
W
M65
W
H.S.
M78
W
M79
W
B11 , B53 , B403 , B424
REFER TO THE FOLLOWING.
B2 , B418 - SUPER MULTIPLE JUNCTION (SMJ)
M1 , M3 - ELECTRICAL UNITS
TKWT6812E

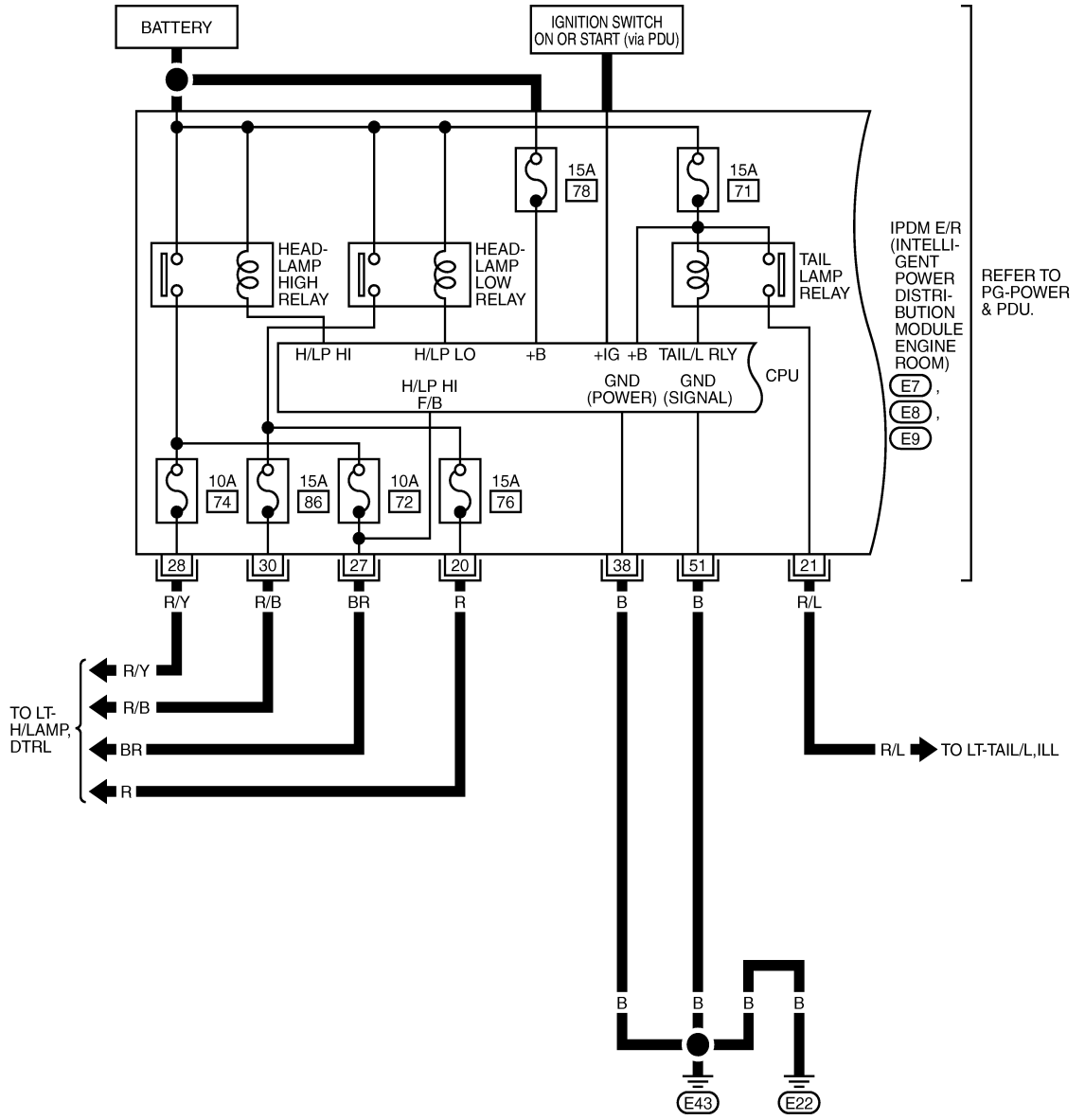
LT-AUTO/L-03

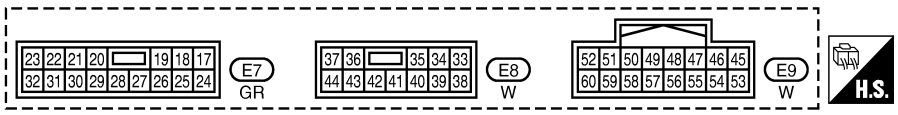




TKWT6813E

LT-AUTO/L-04





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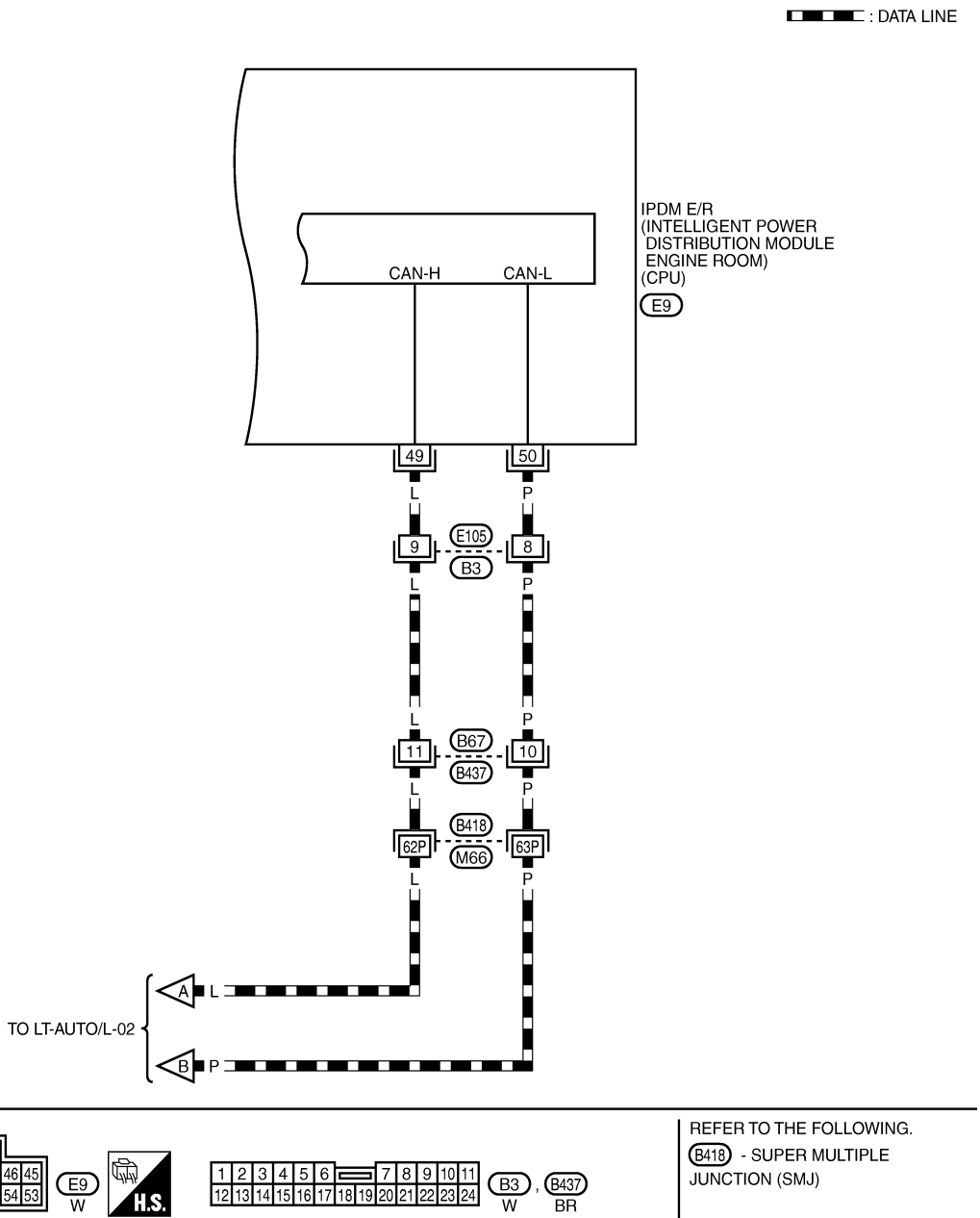
LT-AUTO/L-05

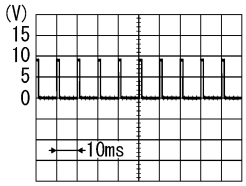
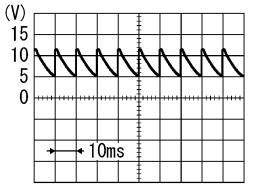
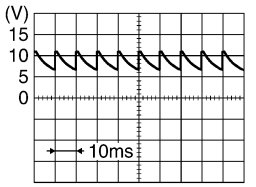


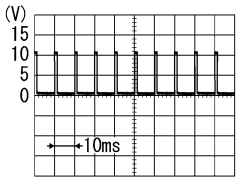
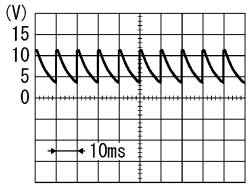
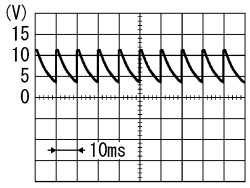
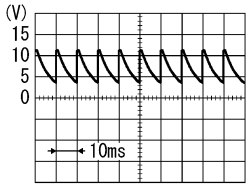
Terminal and Reference Value for BCM

INFOID:0000000004160367

CAUTION:

- **Check combination switch system terminal waveform under the loaded condition with lighting switch, turn signal switch and wiper switch OFF not to be fluctuated by overloaded.**
- **Turn wiper dial position to 4 except when checking waveform or voltage of wiper dial position. Wiper dial position can be confirmed on CONSULT-III. Refer to LT-174, "CONSULT-III Functions (BCM - COMB SW)".**

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
4	R/G	Combination switch input 3	ON	Lighting, turn, wiper OFF (Wiper dial position 4)	Lighting switch AUTO	 PKIB4957J Approx. 1.0 V
					OFF	Approx. 0 V
11	V	Ignition switch (ACC)	ACC	—		Battery voltage
12	P	Front door switch passenger side signal	OFF	Front door switch passenger side	ON (open)	Approx. 0 V
					OFF (closed)	 SKIB3419J Approx. 8.0 - 8.5 V
13	O/L	Rear door switch RH signal	OFF	Rear door switch RH	ON (open)	Approx. 0 V
					OFF (closed)	 SKIB4865E Approx. 8.5 - 9.0 V
14	W/B	Optical sensor signal	ON	When optical sensor is illuminated.		3.1 V or more[NOTE]
				When optical sensor is not illuminated.		0.6 V or less
17	Y	Optical sensor power supply	ON	—		Approx. 5 V
18	B	Optical sensor ground	ON	—		Approx. 0 V

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
33	GR	Combination switch output 4	ON	Lighting, turn, wiper OFF (Wiper dial position 4)	Lighting switch AUTO	 PKIB4958J Approx. 1.2 V
					OFF	 PKIB4960J Approx. 7.0 - 7.5 V
38	W	Ignition switch (ON)	ON	—		Battery voltage
39	L	CAN – H	—	—		—
40	P	CAN – L	—	—		—
42	P	Battery power supply	OFF	—		Battery voltage
52	B	Ground	ON	—		Approx. 0 V
55	W	Battery power supply	OFF	—		Battery voltage
62	V	Front door switch driver side signal	OFF	Front door switch driver side	ON (open)	Approx. 0 V
					OFF (closed)	 PKIB4960J Approx. 7.5 - 8.0 V
63	R/G	Rear door switch LH signal	OFF	Rear door switch LH	ON (open)	Approx. 0V
					OFF (closed)	 PKIB4960J Approx. 7.5 - 8.0 V

NOTE:

Optical sensor must be securely subjected to work lamp light. If the optical sensor is insufficiently illuminated, the measured value may not satisfy standard.

Terminal and Reference Value for IPDM E/R

INFOID:0000000004160368

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
20	R	Headlamp low (RH)	ON	Lighting switch 2ND position	OFF	Approx. 0 V
					ON	Battery voltage
21	R/L	Parking, license plate, and tail lamp	ON	Lighting switch 1ST position	OFF	Approx. 0 V
					ON	Battery voltage
27	BR	Headlamp high (RH)	ON	Lighting switch HIGH or PASSING position	OFF	Approx. 0 V
					ON	Battery voltage
28	R/Y	Headlamp high (LH)	ON	Lighting switch HIGH or PASSING position	OFF	Approx. 0 V
					ON	Battery voltage
30	R/B	Headlamp low (LH)	ON	Lighting switch 2ND position	OFF	Approx. 0 V
					ON	Battery voltage
38	B	Ground	ON	—		Approx. 0 V
49	L	CAN – H	—	—		—
50	P	CAN – L	—	—		—
51	B	Ground	ON	—		Approx. 0 V

How to Perform Trouble Diagnosis

INFOID:0000000004160369

1. Confirm the symptom or customer complaint.
2. Understand operation description and function description. Refer to LT-65, "System Description".
3. Perform the Preliminary Check. Refer to LT-75, "Preliminary Check".
4. Check symptom and repair or replace the cause of malfunction. Refer to LT-78, "Symptom Chart".
5. Does the auto light system operate normally? If YES, GO TO 6. If NO, GO TO 4.
6. INSPECTION END.

Preliminary Check

INFOID:0000000004160370

SETTING CHANGE FUNCTIONS

- Sensitivity of auto light system can be adjusted using CONSULT-III. Refer to LT-76, "CONSULT-III Functions (BCM - HEAD LAMP)".

CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSE AND FUSIBLE LINK

Check for blown fuses and fusible link.

Unit	Power source	Fuse and fusible link No.
BCM	Battery	F
		21
	Ignition switch ON or START position	1
	Ignition switch ACC or ON position	6

Unit	Power source	Fuse and fusible link No.
IPDM E/R	Battery	71
		72
		74
		76
		78
		86

Refer to LT-68, "Wiring Diagram - AUTO/L -".

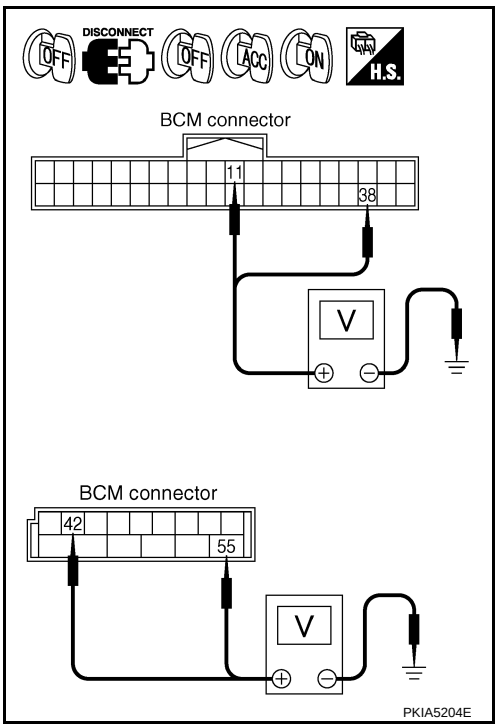
OK or NG

OK >> GO TO 2.
NG >> If fuse or fusible link is blown, be sure to eliminate cause of malfunction before installing new fuse or fusible link. Refer to PG-4.

2.CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM harness connector and ground.

Terminal			Ignition switch position		
(+)		(–)	OFF	ACC	ON
BCM connector	Terminal				
M1	11	Ground	Approx. 0 V	Battery voltage	Battery voltage
	38		Approx. 0 V	Approx. 0 V	Battery voltage
M2	42		Battery voltage	Battery voltage	Battery voltage
	55		Battery voltage	Battery voltage	Battery voltage



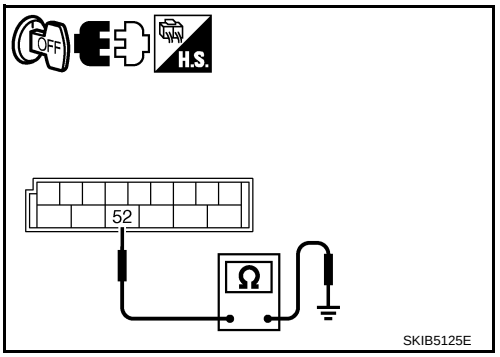
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3.CHECK GROUND CIRCUIT

Check continuity between BCM harness connector and ground.

BCM connector	Terminal	Ground	Continuity
M2	52		Yes



OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.

CONSULT-III Functions (BCM - HEAD LAMP)

INFOID:0000000004160371

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

Diagnosis mode	Description
Work Support	Changes the setting for each function.
Data Monitor	Displays BCM input data in real time.
Active Test	Operation of electrical loads can be checked by sending drive signal to them.
Self-Diag Results	BCM performs self-diagnosis of CAN communication.
Can Diag Support Monitor	The result of transmit/receive diagnosis of CAN communication can be read.

WORK SUPPORT

Work Support Setting Item

- Customizing Auto Light Setting

Work item	Description
CUSTOM A/LIGHT SETTING	Auto light sensitivity can be changed in this mode. Sensitivity can be adjusted in four modes. • Mode 1 (Factory settings)/Mode 2 (More sensitive Mode 1)/ Mode 3 (More sensitive than Mode 2)/Mode 4 (Less sensitive than Mode 1)
ILL DELAY SET	Auto light delay off timer period can be changed in this mode. Selects Auto light delay off timer period among eight modes. • Mode 1 (45 sec.)NOTE/Mode 2 (OFF)/Mode 3 (30 sec.)/Mode 4 (60 sec.)/ Mode 5 (90 sec.)/Mode 6 (120 sec.)/Mode 7 (150 sec.)/Mode 8 (180 sec.)

NOTE:

Factory settings

DATA MONITOR

Display Item List

Monitor item		Contents
IGN ON SW	“On/Off”	Displays “IGN position (ON)/OFF, ACC position (OFF)” judged from the ignition switch signal.
ACC ON SW	“On/Off”	Displays “ACC (ON)/OFF, Ignition OFF (OFF)” status judged from ignition switch signal.
KEY ON SW	“On/Off”	Displays “Intelligent Key inserted into key slot (ON)/Intelligent Key removed from key slot (OFF)” status judged from the key switch signal.
TURN SIGNAL R	“On/Off”	Displays status (turn right: ON/others: OFF) as judged from lighting switch signal.
TURN SIGNAL L	“On/Off”	Displays status (turn left: ON/others: OFF) as judged from lighting switch signal.
HI BEAM SW	“On/Off”	Displays status (high beam switch: ON/others: OFF) of high beam switch judged from lighting switch signal.
HEAD LAMP SW 1	“On/Off”	Displays status (headlamp switch 1: ON/others: OFF) of headlamp switch 1 judged from lighting switch signal.
HEAD LAMP SW 2	“On/Off”	Displays status (headlamp switch 2: ON/others: OFF) of headlamp switch 2 judged from lighting switch signal.
TAIL LAMP SW	“On/Off”	Displays status (lighting switch 1ST or 2ND position: ON/others: OFF) of lighting switch judged from lighting switch signal.
AUTO LIGHT SW	“On/Off”	Displays status of the lighting switch as judged from the lighting switch signal. (AUTO position: ON/other than AUTO position: OFF)
PASSING SW	“On/Off”	Displays status (flash-to-passing switch: ON/others: OFF) of flash-to-passing switch judged from lighting switch signal.
FR FOG SW	“On/Off”	Displays status (front fog lamp switch: ON/others: OFF) of front fog lamp switch judged from lighting switch signal.
DOOR SW - DR	“On/Off”	Displays status of the driver door as judged from the driver door switch signal. (door is open: ON/door is closed: OFF)
DOOR SW - AS	“On/Off”	Displays status of the passenger door as judged from the passenger door switch signal. (door is open: ON/door is closed: OFF)
DOOR SW - RR	“On/Off”	Displays status of the rear door as judged from the rear door switch (RH) signal. (door is open: ON/door is closed: OFF)

Monitor item		Contents
DOOR SW - RL	“On/Off”	Displays status of the rear door as judged from the rear door switch (LH) signal. (door is open: ON/door is closed: OFF)
BACK DOOR SW NOTE	“Off”	—
I - KEY LOCK	“On/Off”	Displays “locked (ON)/other (OFF)” status, determined from lock signal.
OPTICAL SENSOR	“0 - 5V”	Displays “outside brightness (close to 5 V when light/close to 0 V when dark)” judged from optical sensor signal.
VEHICLE SPEED	“km/h”	Displays vehicle speed as judged from vehicle speed signal.

NOTE:

This item is displayed, but cannot be monitored.

ACTIVE TEST

Display Item List

Test item	Description
TAIL LAMP	Allows tail lamp relay to operate by switching ON-OFF.
FR FOG LAMP	Allows front fog lamp relay to operate by switching ON-OFF.
DAYTIME RUNNING LIGHT NOTE	Allows daytime light relay to operate by switching ON-OFF.
HEAD LAMP (HI, LO)	Allows headlamp relay to operate by switching ON-OFF.

NOTE:

This item is tested only for CANADA models.

Symptom Chart

INFOID:0000000004160372

Phenomenon	Malfunction system and reference
• Parking lamps and headlamps will not illuminate when outside of the vehicle becomes dark. (Lighting switch 1ST position and 2ND position operate normally.) • Parking lamps and headlamp will not go out when outside of the vehicle becomes light. (Lighting switch 1ST position and 2ND position operate normally.) • Headlamps go out when outside of the vehicle becomes light, but parking lamps stay on.	• Refer to LT-76, "CONSULT-III Functions (BCM - HEAD LAMP)". • Refer to LT-78, "Lighting Switch Inspection". • Refer to LT-79, "Optical Sensor System Inspection". If above systems are normal, replace BCM.
Parking lamps illuminate when outside of the vehicle becomes dark, but headlamps stay off. (Lighting switch 1ST position and 2ND position operate normally.)	• Refer to LT-76, "CONSULT-III Functions (BCM - HEAD LAMP)". • Refer to LT-79, "Optical Sensor System Inspection". If above systems are normal, replace BCM.
With the ignition key in ACC position, headlamps, parking lamps, tail lamps, etc. will not go out when the driver's door is opened.	• Refer toBL-88, "Check Door Switch". If above system is normal, replace BCM.
Auto light adjustment system will not operate. (Lighting switch AUTO, 1ST position and 2ND position operate normally.)	• Refer to LT-79, "Optical Sensor System Inspection". If above system is normal, replace BCM.
Auto light adjustment system of combination meter will not operate.	• CAN communication line inspection between BCM and combination meter: Refer to LAN-17, "CAN Diagnosis with CONSULT-III".

Lighting Switch Inspection

INFOID:0000000004160373

1.CHECK LIGHTING SWITCH INPUT SIGNAL

CONSULT-III DATA MONITOR

1. Select “AUTO LIGHT SW” of BCM (HEAD LAMP) data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is AUTO position : AUTO LIGHT SW ON

CHECK THE COMBINATION SWITCH
Refer to LT-175, "Combination Switch Inspection".

OK or NG

OK >> INSPECTION END
NG >> Replace combination switch (lighting switch). Refer to LT-175, "Combination Switch Inspection".

Optical Sensor System Inspection

INFOID:0000000004160374

1. CHECK OPTICAL SENSOR INPUT SIGNAL

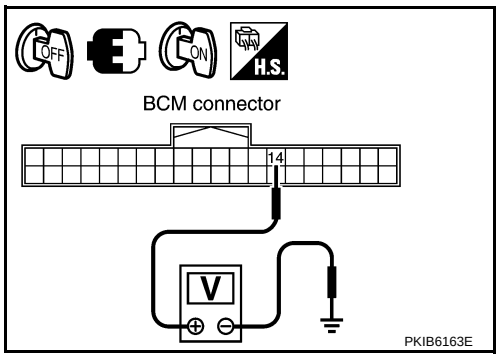
CONSULT-III DATA MONITOR
1. Select “OPTICAL SENSOR” of BCM (HEAD LAMP) data monitor item.
2. Check difference in the voltage when optical sensor is illuminated and not illuminated.

Illuminated
OPTICAL SENSOR : 3.1 V or more
Not illuminated
OPTICAL SENSOR : 0.6 V or less

CAUTION:
Optical sensor must be securely subjected to work lamp light. If the optical sensor is insufficiently illuminated, the measured value may not satisfy the standard.

CHECK THE OPTICAL SENSOR INPUT SIGNAL
1. Turn ignition switch ON.
2. Check voltage between BCM harness connector and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(–)		
BCM connector	Terminal			
M1	14	Ground	Illuminated Optical sensor	3.1 V or more
			Not illuminated Optical sensor	0.6 V or less



CAUTION:
Optical sensor must be securely subjected to work lamp light. If the optical sensor is insufficiently illuminated, the measured value may not satisfy the standard.

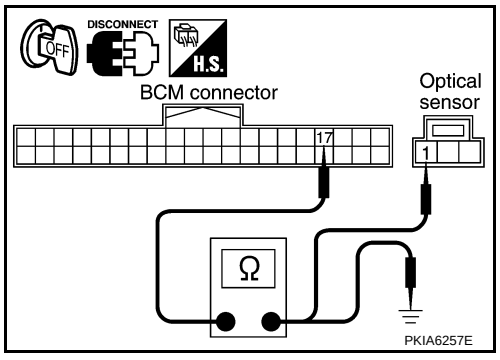
OK or NG

OK >> INSPECTION END
NG >> GO TO 2.

2. CHECK OPTICAL SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector and optical sensor connector.
3. Check continuity (open circuit) between BCM harness connector and optical sensor harness connector.

BCM		Optical sensor		Continuity
Connector	Terminal	Connector	Terminal	
M1	17	M48	1	Yes



4. Check continuity (short circuit) between BCM harness connector and ground.

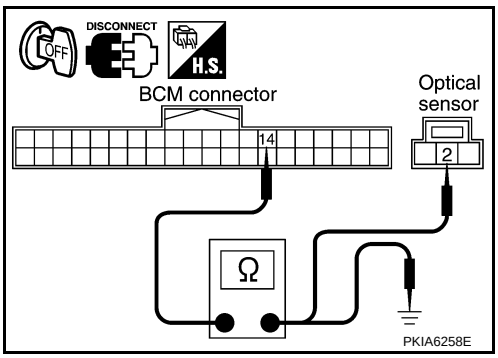
BCM connector	Terminal	Ground	Continuity
M1	17		No

OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK OPTICAL SENSOR SIGNAL CIRCUIT

1. Check continuity (open circuit) between BCM harness connector and optical sensor harness connector.



BCM		Optical sensor		Continuity
Connector	Terminal	Connector	Terminal	
M1	14	M48	2	Yes

2. Check continuity between (short circuit) BCM harness connector and ground.

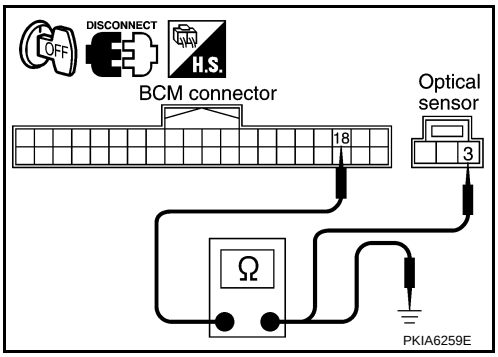
BCM connector	Terminal	Ground	Continuity
M1	14		No

OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

4. CHECK OPTICAL SENSOR GROUND CIRCUIT

1. Check continuity (open circuit) between BCM harness connector and optical sensor harness connector.



BCM		Optical sensor		Continuity
Connector	Terminal	Connector	Terminal	
M1	18	M48	3	Yes

2. Check continuity (short circuit) between BCM harness connector and ground.

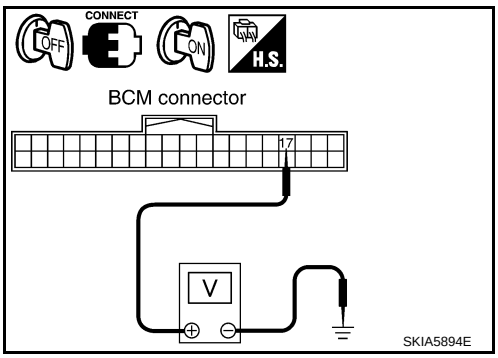
BCM connector	Terminal	Ground	Continuity
M1	18		No

OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

5. CHECK OPTICAL SENSOR VOLTAGE

1. Connect BCM connector.
2. Turn ignition switch ON.
3. Check voltage between BCM harness connector and ground.



Terminal			Voltage (Approx.)
(+)		(–)	
BCM connector	Terminal		
M1	17	Ground	5.0 V

OK or NG

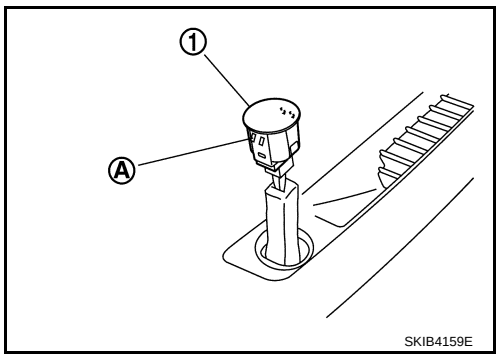
OK >> Replace optical sensor. Refer to LT-80, "Removal and Installation for Optical Sensor".
NG >> Replace BCM. Refer to BCS-14, "Removal and Installation of BCM".

Removal and Installation for Optical Sensor

INFOID:0000000004160375

REMOVAL

1. Disengage the tab (A) and disconnect connector.
2. Remove optical sensor (1).



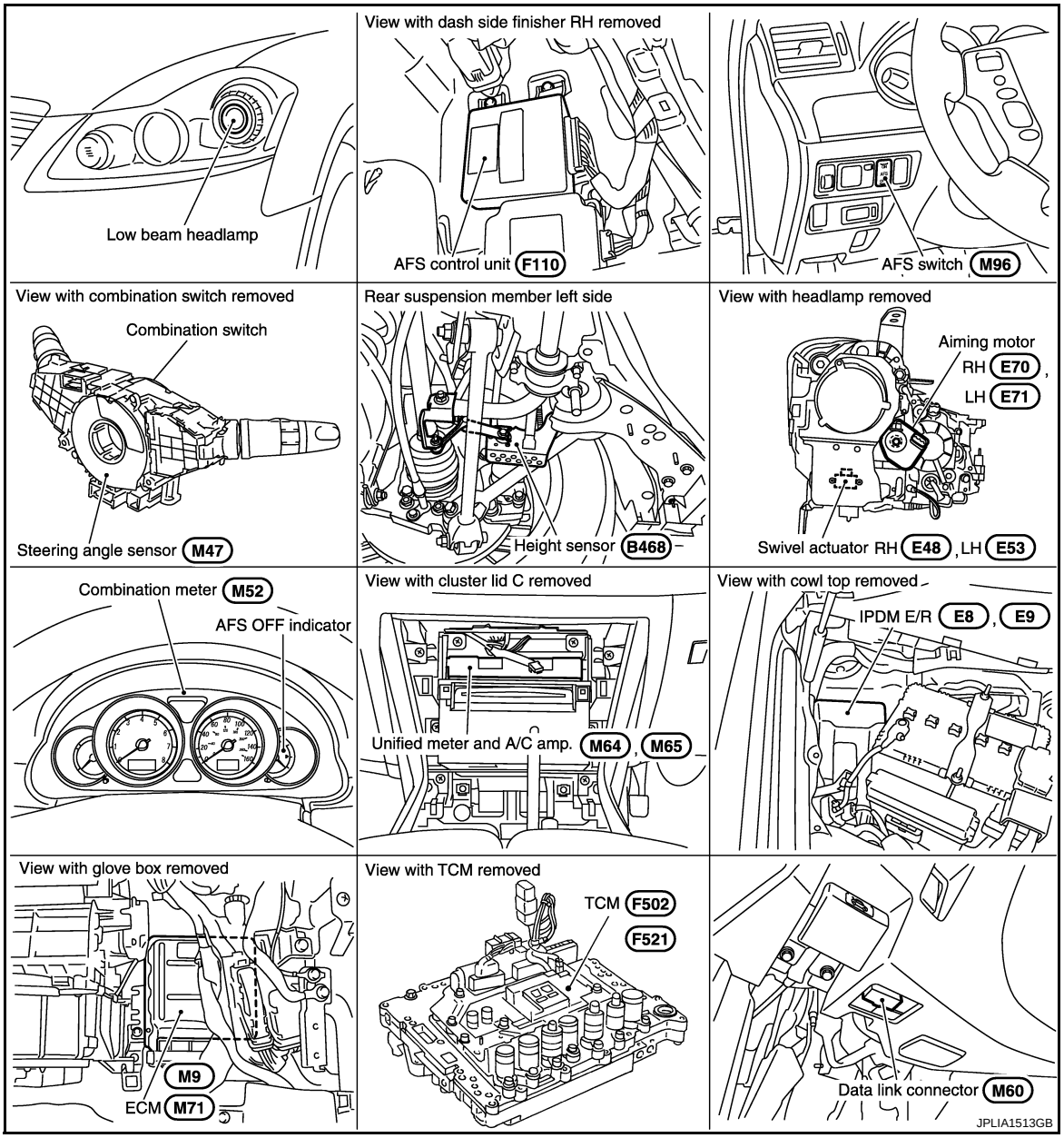
INSTALLATION

Installation is the reverse order of removal.

ACTIVE AFS

Component Parts and Harness Connector Location

INFOID:0000000004160376



System Description

INFOID:0000000004160377

AFS control unit controls AFS and headlamp auto aiming.
The following signals are input to AFS control unit via CAN communication:

- Steering angle sensor signal
- A/T position indicator signal
- Low beam status signal
- Vehicle speed signal
- Engine speed signal

Other signals are input as follows:

- AFS switch signal from AFS switch connected to AFS control unit
- Height sensor signal from height sensor connected to AFS control unit
- Swivel position sensor signal from swivel position sensor built into both right and left swivel actuators connected to AFS control unit

In response to the state of control, AFS control unit switches commands of AFS off indicator signal sent to unified meter and A/C amp. via CAN communication; and then turns on/off or blinks AFS off indicator lamp built in the combination meter.

AFS (ADAPTIVE FRONT-LIGHTING SYSTEM)

AFS increases viewability of cornering direction by changing light axis automatically to the direction of travel with low beam headlamps during vehicle's cornering.
AFS switch allows AFS function to be stopped.
AFS control unit determines the current vehicle conditions by each received signals, and sends commands to the low beam headlamp to swivel. With the headlamps (HIGH/LOW) illuminated, the AFS switch on, engine running and the A/T select lever in any position but range P or range R, the low beam headlamps are operative by AFS control unit commands.
As the steering wheel is turned to the left (right), the left (right) low beam headlamp will automatically swivel angle in accordance with the steering angle and vehicle speed, and stop the operation when the steering wheel is returned to the straight-ahead position.
Swivel operation allows drive signal to be sent to the swivel actuator on the side that AFS control unit is actuated. Step motor built in swivel actuator adjusts low beam projector of headlamp to swivel angle that matches drive signal. Swivel position sensor built in swivel actuator detects swivel angle and transmits a swivel position sensor signal to the AFS control unit. AFS control unit monitors if swivel operation is performed normally via swivel position sensor signal.

- Swivel operation

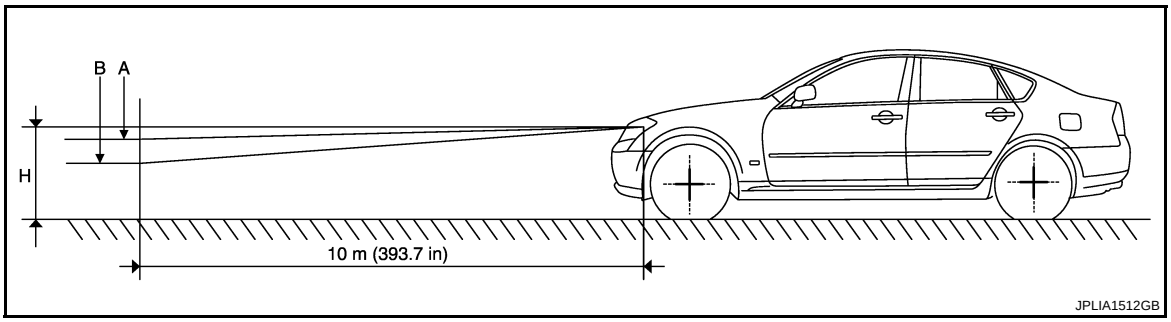
	Low beam status	A/T selector lever position	Vehicle speed	AFS switch	Engine speed	Low beam headlamp LH (swivel)	Low beam headlamp RH (swivel)
Left turn	Illuminated*1	Except P, R	Running*2	ON	While engine running*3	×	
Right turn	Illuminated*1	Except P, R	Irrespective	ON	While engine running*3		×

*1: Included high beam illuminated.

*2: The swivel operates when running at approx. 25 km/h (15.5 MPH). When swivel operation is started, it works on until vehicle stops.

*3: The low beam headlamps perform small movements when AFS control unit detects start of the engine. This is normal with initialization of swivel actuator by AFS control unit.

HEADLAMP AUTO AIMING



Operating range	With 18-inch wheel (Reference value)	With 19-inch wheel (Reference value)	Vehicle height
A	0 mm (Standard position)	0 mm (Standard position)	Unloaded vehicle position
B	Approx. 200 mm (7.9 in)	Approx.180 mm (7.1 in)	Low

Headlamp auto aiming control automatically corrects vertical deviation of light axis that is brought by the change of vehicle height with changing number of passenger and laden weight, and relieves dazzle to oncoming vehicles.
AFS control unit determines the current vehicle conditions by each received signals, and sends commands to the low beam headlamps to auto aiming. With the headlamps (HIGH/LOW) illuminated and engine running, the low beam headlamps are operative by AFS control unit commands.
The height sensor is located on the left side of the rear suspension member and detects rear vehicle height change by sensing the displacement of the rear suspension arm. And transmits a height sensor signal to the AFS control unit.

With reference to the rear vehicle height under the empty condition, light axis of low beam with low rear vehicle height is relatively higher than that with the empty condition. AFS control unit switches drive signal corrects height of low beam axis to maintain height of light axis with empty condition.
Light axis of low beam with high rear vehicle height is relatively lower than that with empty condition. Light axis of low beam with empty condition is set as upper limit of headlamp auto aiming control operation. Control to correct deviation is not performed when light axis of low beam gets relatively higher than that with empty condition. Timing of control is switched in accordance with driving conditions.

- Headlamp auto aiming operation

Low beam status	Vehicle speed	Engine speed	AFS switch
Illuminated*1	Control switch by driving conditions*2	While engine running	Irrespective*3

*1: Included high beam illuminated

*2: Control timing of drive signal is switched by vehicle speed and accelerating/decelerating vehicle.

*3: Control is performed without regard to the condition of AFS switch. Headlamp auto aiming control function cannot be cancelled.

OUTLINE

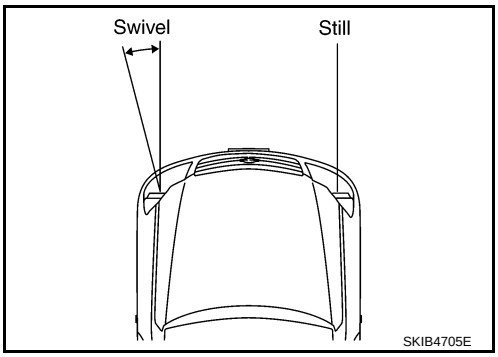
Power is supplied
When the ignition switch is ON or START position, power is supplied
- through 10A fuse [No.12, located in fuse block (J/B)]
- to AFS control unit terminal 1
- to front combination lamp LH and RH terminal 13
- to AFS switch terminal 1
- to unified meter and A/C amp. terminal 53.

Ground is supplied
- to AFS control unit terminal 25
- through grounds M16 and M70,
- to front combination lamp LH and RH terminal 11
- through grounds E22 and E43.

AFS OPERATION

When The Steering Wheel Is Turned To The Left

Swivel motor driving signal (1-phase) is transmitted when the steering wheel is turned to left approximately more than 10* degrees (predetermined), with vehicle speed at approximately 25 km/h (15.5 MPH) or more, headlamps (HIGH/LOW) illuminated, AFS switch ON and the engine running and the A/T select lever in any position except range P or R.



*: Slightly different from the case when it is turned to the right.
Swivel motor driving signal (1-phase) is sent
- to front combination lamp LH terminal 17
- through AFS control unit terminal 15,
- to AFS control unit terminal 38
- through front combination lamp LH terminal 21.

And swivel motor driving signal (2-phase) is sent:
- to front combination lamp LH terminal 16
- through AFS control unit terminal 17,
- to AFS control unit terminal 36
- through front combination lamp LH terminal 20.

Swivel position sensor detects swivel angle during ignition switch ON, and transmits swivel position sensor signals to the AFS control unit:
When ignition switch is turn to ON position, power is supplied
- to front combination lamp LH terminal 15
- through AFS control unit terminal 24.

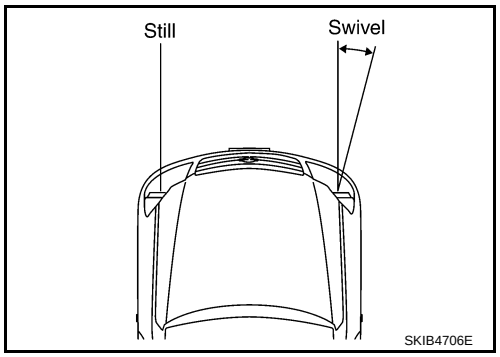
When ignition switch is turn to ON position, swivel position sensor signal input is supplied
- to AFS control unit terminal 29
- through front combination lamp LH terminal 14.

Ground is supplied
- to front combination lamp LH terminal 19
- through AFS control unit terminal 27.

The low beam headlamp LH starts to swivel to the left.

The swivel motor driving signals are blocked and the swivel motion stops when the steering angle reaches approximately more than 80 degrees (predetermined). The low beam headlamp will not swivel any further no matter how further left. As the steering wheel is turned back to the right, the swivel motor driving signals (both 1-phase and 2-phase) will be reversed, causing low beam headlamp LH to start swiveling to the right. When steering angle becomes smaller than predetermined value, the low beam headlamp is set in the straight-ahead position, swivel motor driving signals are blocked and low beam headlamps stop swiveling.

When The Steering Wheel Is Turned To The Right



Swivel motor driving signal (1-phase) is transmitted when the steering wheel is turned to right approximately more than 10* degrees (predetermined), with headlamps (HIGH/LOW) illuminated, AFS switch ON, the engine running and the A/T select lever in any position except range P or R.

*: Slightly different from the case when it is turned to the left.

Swivel motor driving signal (1-phase) is sent

- to front combination lamp RH terminal 16
- through AFS control unit terminal 34,
- to AFS control unit terminal 11
- through front combination lamp RH terminal 20.

And swivel motor driving signal (2-phase) is sent

- to front combination lamp RH terminal 17
- through AFS control unit terminal 32,
- to AFS control unit terminal 13
- through front combination lamp RH terminal 21.

Swivel position sensor detects swivel angle during ignition switch ON, and transmits swivel position sensor signals to the AFS control unit:

When ignition switch is turn to ON position, power is supplied

- to front combination lamp RH terminal 15
- through AFS control unit terminal 4.

When ignition switch is turn to ON position, swivel position sensor input signal is supplied

- to AFS control unit terminal 9
- through front combination lamp RH terminal 14.

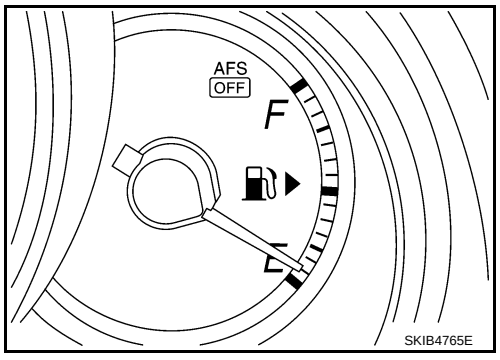
Ground is supplied

- to front combination lamp RH terminal 19
- through AFS control unit terminal 2.

The low beam headlamp RH starts to swivel to the right.

The swivel motor driving signals are blocked and the swivel motion stops when the steering angle reaches approximately more than 80 degrees (predetermined). The low beam headlamp will not swivel any further no matter how further right. As the steering wheel is turned back to the left, the swivel motor driving signals (both 1-phase and 2-phase) will be reversed, causing low beam headlamp RH to start swiveling to the left. When steering angle becomes smaller than predetermined value, the low beam headlamp is set in the straight-ahead position, swivel motor driving signals are blocked and low beam headlamps stop swiveling.

AFS OFF INDICATOR OPERATION



In response to the state of control, AFS control unit switches commands of AFS off indicator signal sent to unified meter and A/C amp. via CAN communication; and then turns on/off or blinks AFS off indicator lamp built in the combination meter depending on the following condition.

- Bulb check operation
  AFS off indicator lamp is turned off after illuminating for one second as a bulb check for AFS off indicator lamp when turn ignition switch ON is detected.
  NOTE:
  AFS off indicator lamp is turned off without a lapse of one second when start of the engine is detected.
- AFS switch operation
  AFS off indicator lamp is illuminated while AFS switch is OFF.
  AFS off indicator lamp is turned off while AFS switch is ON.
- System warning operation

AFS off indicator lamp illuminates at intervals of approximately one second when AFS control unit detects any specific DTC (diagnosis trouble code), or when unified meter and A/C amp. cannot receive AFS off indicator signals.

NOTE:

Unified meter and A/C amp. transmits a command to combination meter to blink AFS off indicator lamp when they cannot receive AFS off indicator signal.

SWIVEL ACTUATOR INITIALIZATION

AFS control unit performs swivel operation to initialize swivel actuator when start of the engine is detected. Straight-ahead position of low beam headlamps is adjusted by turning low beam headlamps to outside vehicle with specified swivel angle after turning it to the center of vehicle and making sure that it reaches the stopper. Swivel actuator initialization shall be performed every time when start of the engine is detected.

HEADLAMP AUTO AIMING OPERATION

The height sensor detects a change in height of rear vehicle with ignition switch ON, and transmits signals to the AFS control unit:

When ignition switch is turn to ON position, power is supplied

- to height sensor terminal 1
- through AFS control unit terminal 6.

When ignition switch is turned to ON position, height sensor input signal is supplied

- to AFS control unit terminal 28
- through height sensor terminal 2.

Ground is supplied

- to height sensor terminal 3
- through AFS control unit terminal 8.

Aiming motor driving signal (voltage signal that corresponds to the vehicle height) is transmitted depending on the height sensor signal at the start of the engine

- to front combination lamp LH (aiming motor) terminal 12
- through AFS control unit terminal 40,
- to front combination lamp RH (aiming motor) terminal 12
- through AFS control unit terminal 19.

Output of aiming motor driving signal is maintained unless headlamp (HIGH/LOW) illuminate detected.

Auto aiming control operation starts when headlamps (HIGH/LOW) illuminate detected.

When headlamps (HIGH/LOW) illuminate, output of aiming motor driving signal is changed according to the height sensor signal. After the change, it is changed according to height sensor signals with predetermined timing based on driving condition while headlamps are ON.

Auto Aiming Operation

AFS control unit starts outputting aiming motor drive signal when the engine starts, and continues to output it until the engine stops. Aiming motor drive signal changes output when the specified conditions described below are met.

Headlamp aiming motors set the low beam projectors according to aiming motor drive signals received from AFS control unit, both headlamp aiming motors cause the low beam projectors to move to the position commanded by the signal.

The aiming motor drive signal level retains when the following conditions are not met.

- AFS control unit operation when the vehicle is stopped (low beam headlamps illuminated)
  Headlamp aiming motor drive signal is changed when vehicle height is stabilized with a parked condition, depending on the height sensor signal detected with height sensor signal by AFS control unit.
- AFS control unit operation when the vehicle is running (low beam headlamps illuminated)
  When vehicle is running, headlamp aiming motor drive signal is changed depending on the height sensor signal which is detected when AFS control unit detects constant steady speed of vehicle.
  When the vehicle is accelerating or decelerating, AFS control unit keeps headlamp aiming motor drive signal voltage level rather than changing it, so that the low beam projectors of both headlamps do not operate.

CAN COMMUNICATION SYSTEM DESCRIPTION

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

CAN COMMUNICATION UNIT

Refer to LAN-11, "System Description".

Component Parts Description

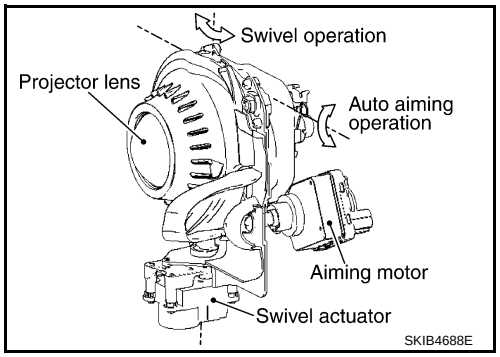
INFOID:0000000004160378

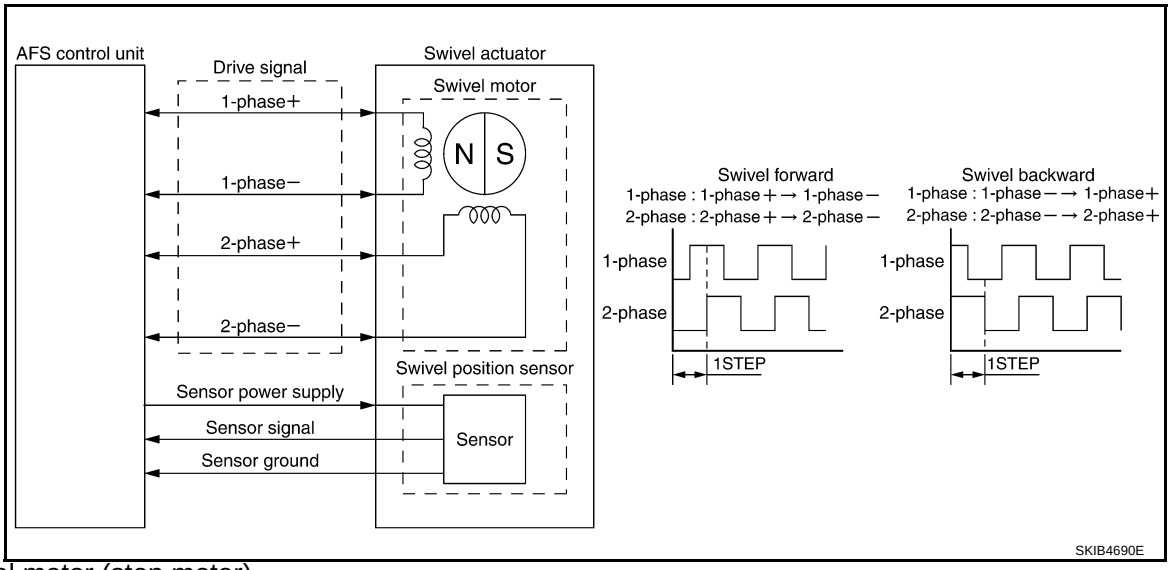
AFS CONTROL UNIT

AFS control unit determines current vehicle conditions by received signals and controls AFS and headlamp auto aiming.

SWIVEL ACTUATOR

Swivel actuator is configured with swivel motor and swivel position sensor and is built in headlamps.

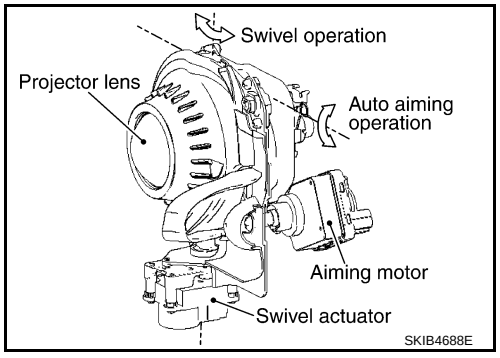




- Swivel motor (step motor)
  Swivel motor is a two−phase step motor. It is driven according to drive signals from AFS control unit when two drive windings are energized in set sequences, and adjusts low beam projector of headlamp.
  The direction of actuator rotation can be changed as desired by selecting appropriate energizing sequences.
- Swivel position sensor
  Swivel position sensor detects swivel angle and transmits a swivel position sensor signal to the AFS control unit.

AIMING MOTOR

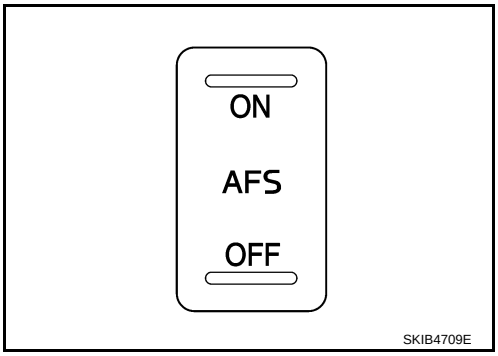
Aiming motor is installed outside the headlamps. Headlamp aiming motors set the low beam projectors according to headlamp aiming motor drive signals received from AFS control unit.



AFS SWITCH

AFS switch transmits state of ON/OFF as AFS switch signals to AFS control unit.

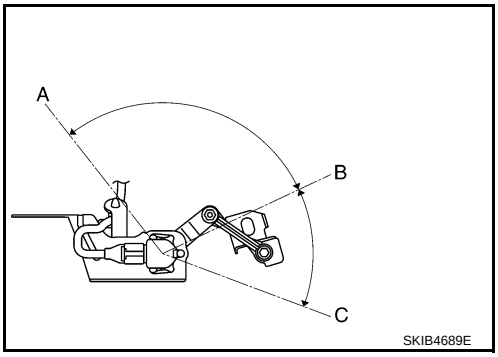
- AFS control unit performs AFS operation when AFS switch is ON and turns off AFS off indicator lamp.
- AFS control unit does not perform AFS operation when AFS switch is OFF, and turns on AFS off indicator lamp.



HEIGHT SENSOR

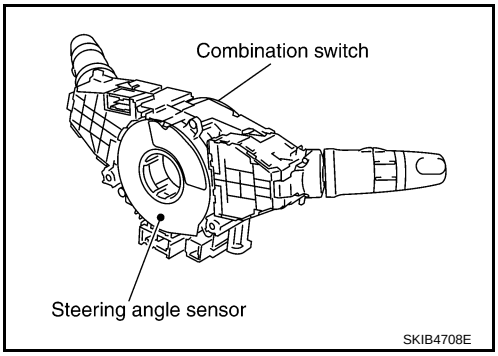
The height sensor is located on the left side of the rear suspension member and detects rear vehicle height change by sensing the displacement of the rear suspension arm. And transmits a height sensor signal to the AFS control unit.

	Sensor angle	Vehicle height
A	Approx. –103° (Link stopper angle)	Low side
B	0° (Standard position)	Approx. unloaded vehicle position
C	Approx. 46° (Link stopper angle)	High side



STEERING ANGLE SENSOR

The steering angle sensor is located combination switch and detects steering angle. And transmits a steering angle sensor signal to the AFS control unit.



IPDM E/R

IPDM E/R detects ON/OFF state of low beam headlamps. It transmits a low beam state signal to the AFS control unit.

ECM

ECM transmits an engine speed signal to the AFS control unit.

TCM

TCM transmits an A/T position indicator signal to the AFS control unit.

UNIFIED METER AND A/C AMP.

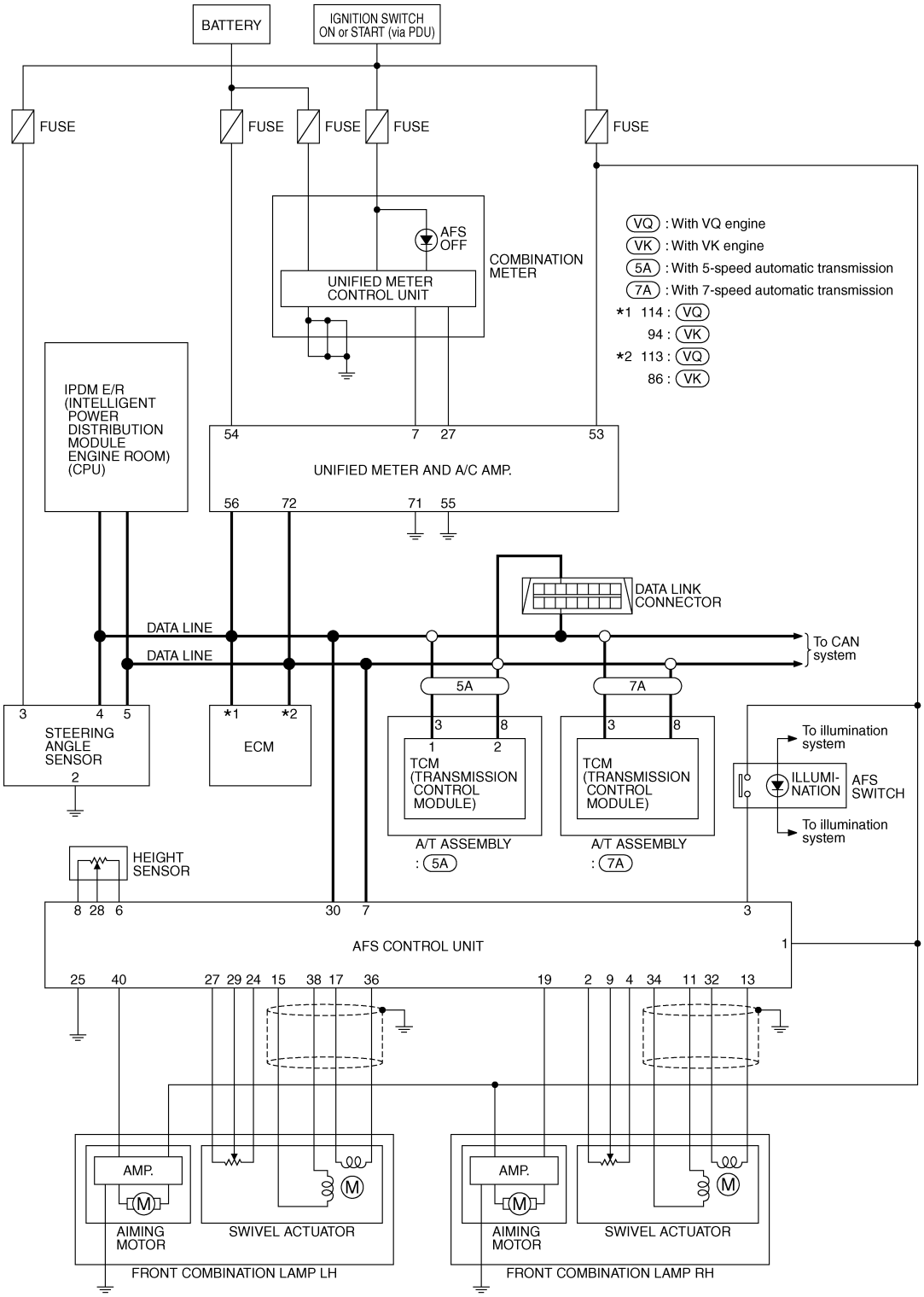
- Unified meter and A/C amp. transmits vehicle speed signals to the AFS control unit.
- Unified meter and A/C amp. transmits AFS off indicator signals received from the AFS control unit to the combination meter.

COMBINATION METER

Combination meter turns on/off or blinks built-in AFS off indicator lamp depending on AFS off indicator signal received from unified meter and A/C amp.

Schematic

INFOID:0000000004160379

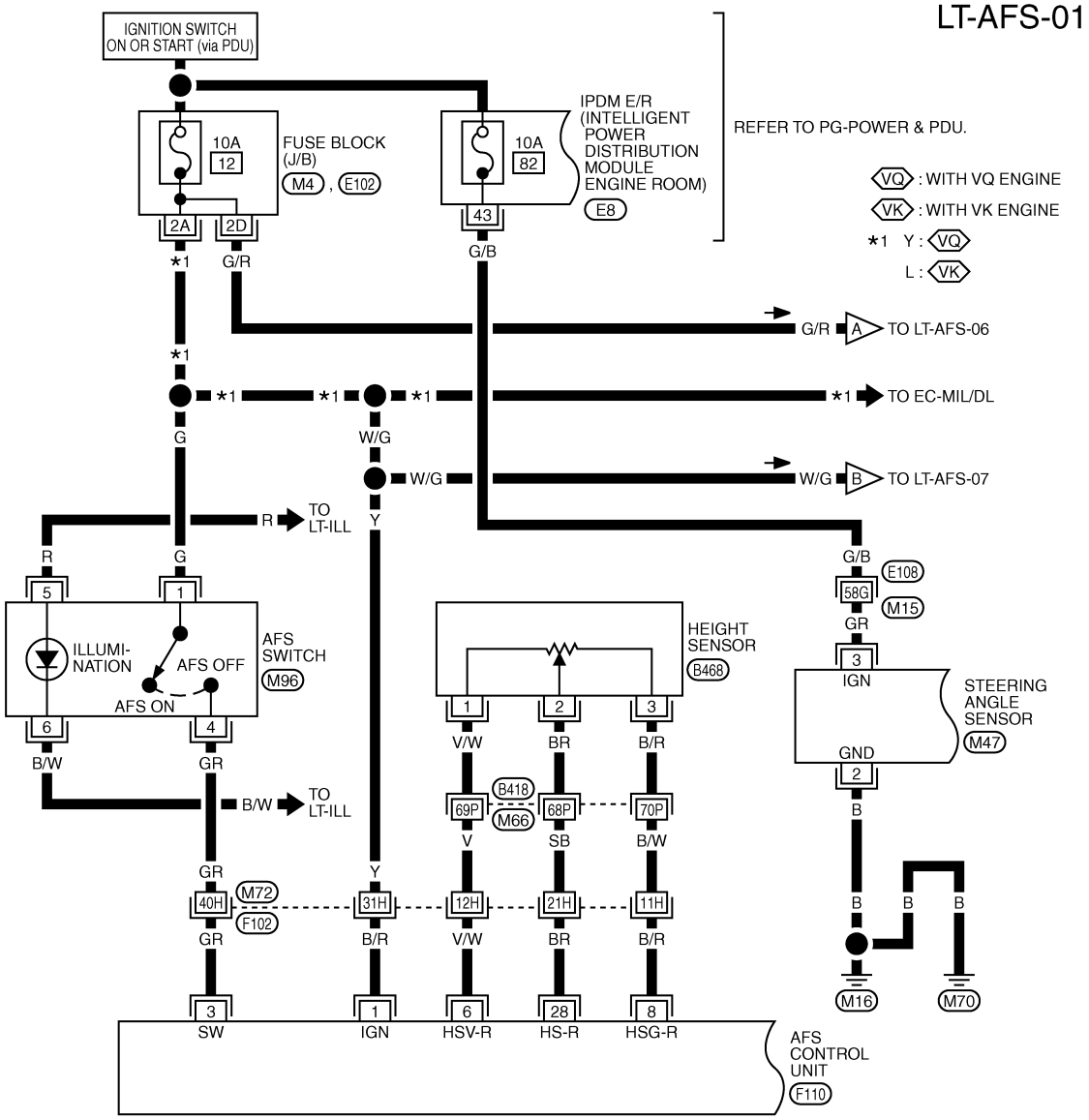


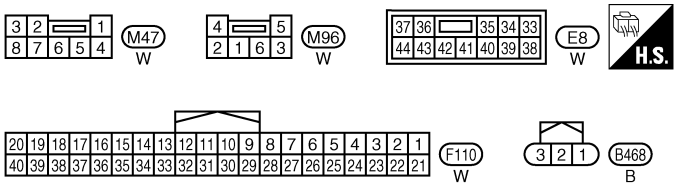
TKWT8199E

Wiring Diagram - AFS -

INFOID:0000000004160380

LT-AFS-01

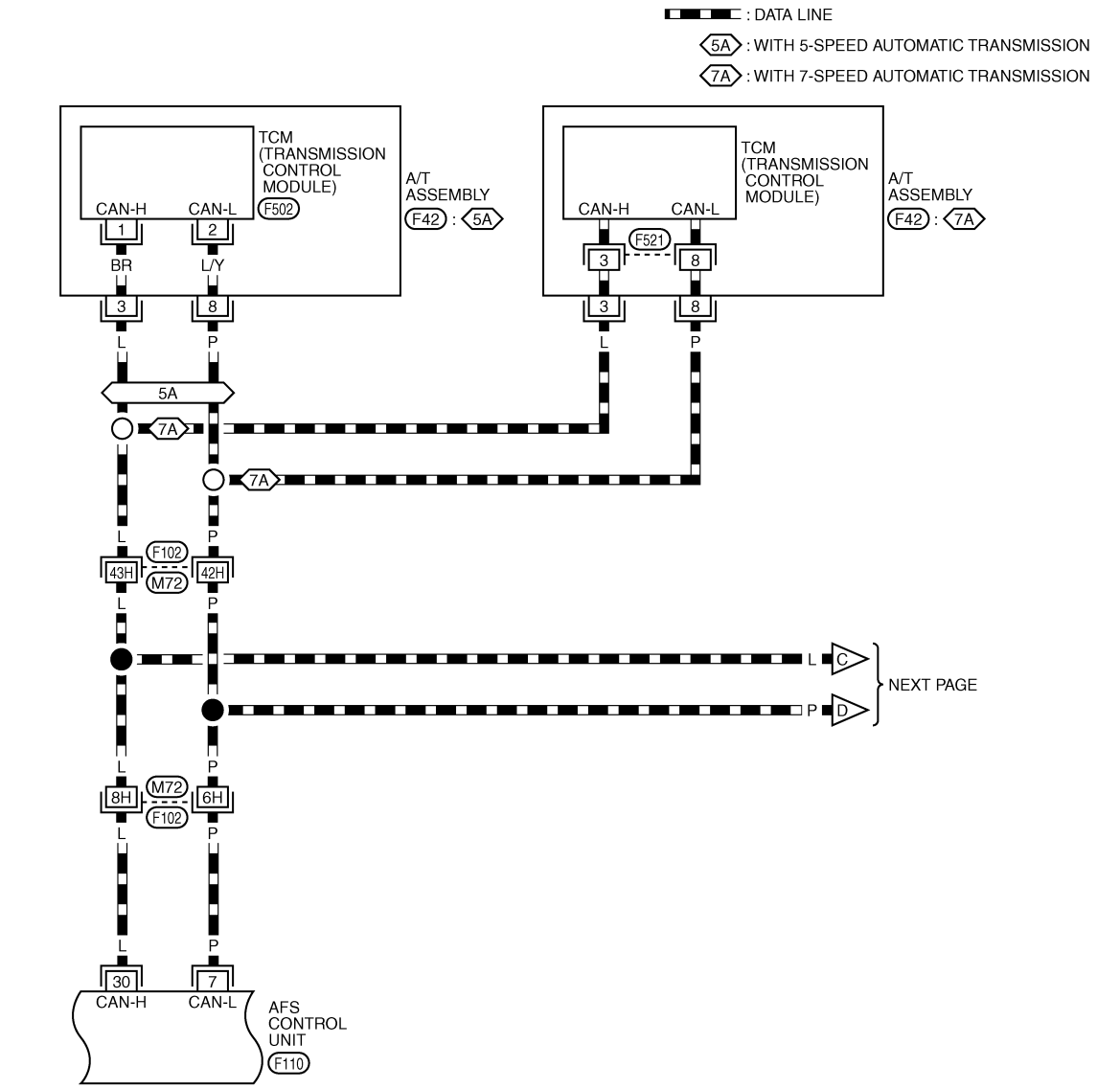


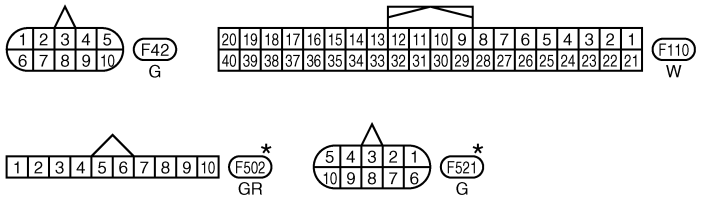


REFER TO THE FOLLOWING.
E108 , F102 , B418 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , E102 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT8200E

LT-AFS-02



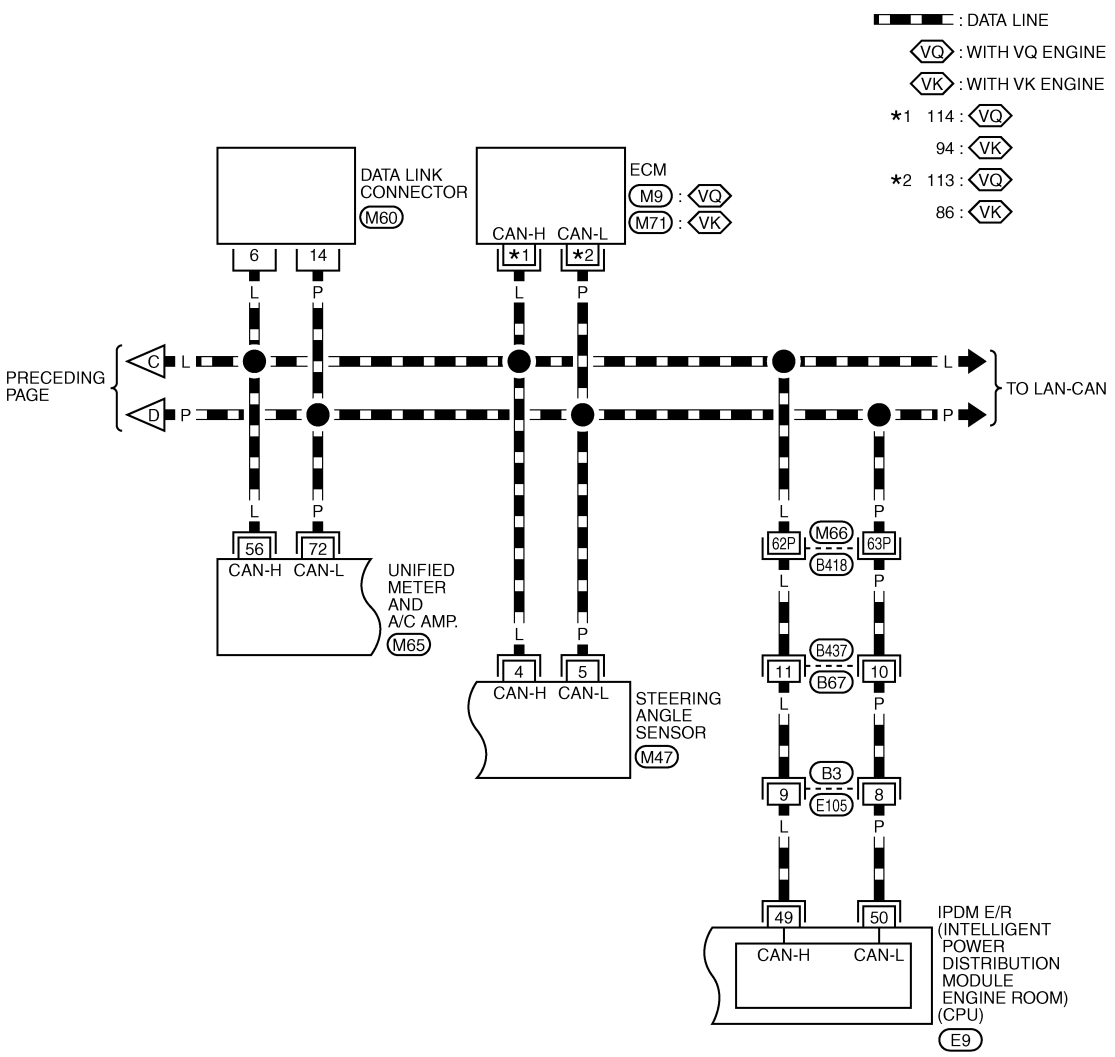


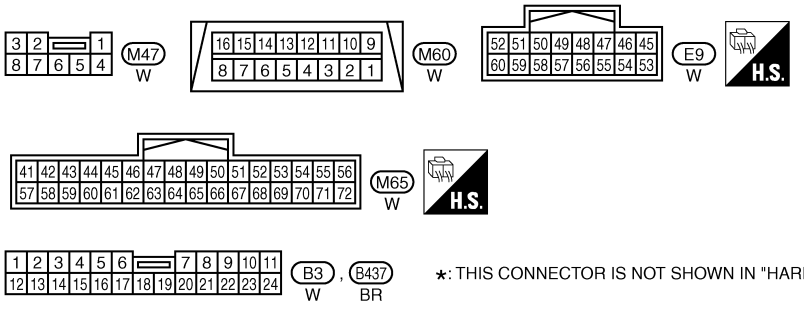
REFER TO THE FOLLOWING.
F102 -SUPER MULTIPLE JUNCTION (SMJ)

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

TKWT8201E

LT-AFS-03



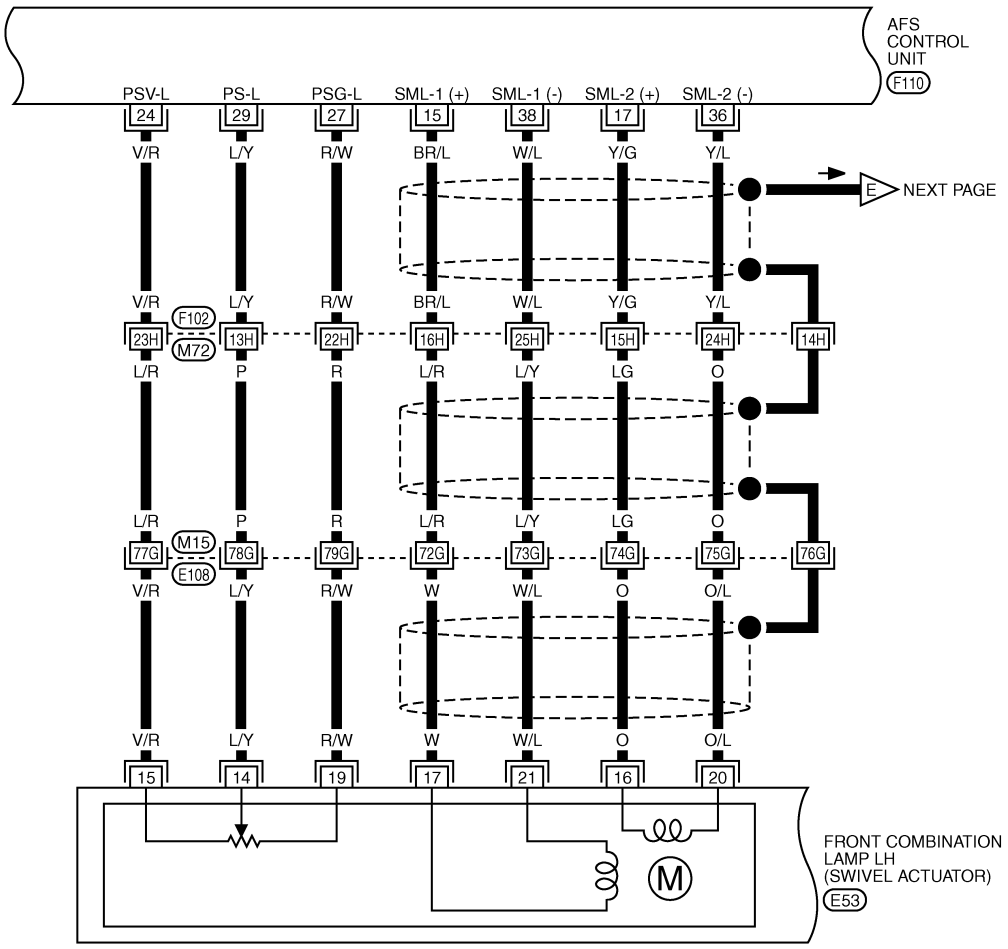


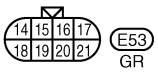
REFER TO THE FOLLOWING.
B418 -SUPER MULTIPLE JUNCTION (SMJ)
M9 , M71 -ELECTRICAL UNITS

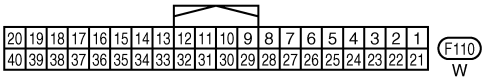
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TKWT8202E

LT-AFS-04



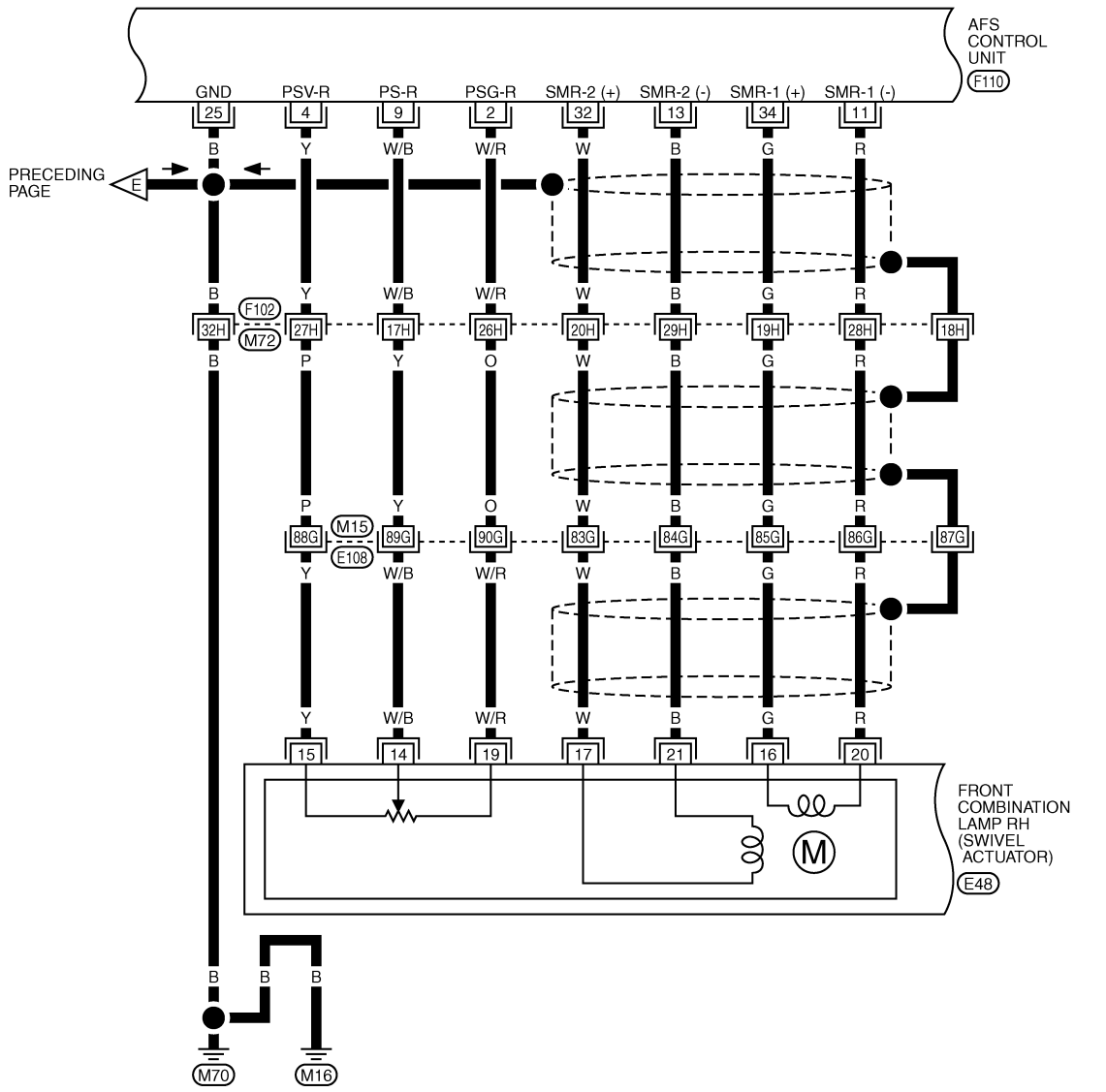


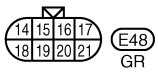


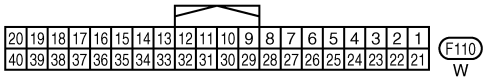
REFER TO THE FOLLOWING.
E108 , F102 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT8203E

LT-AFS-05



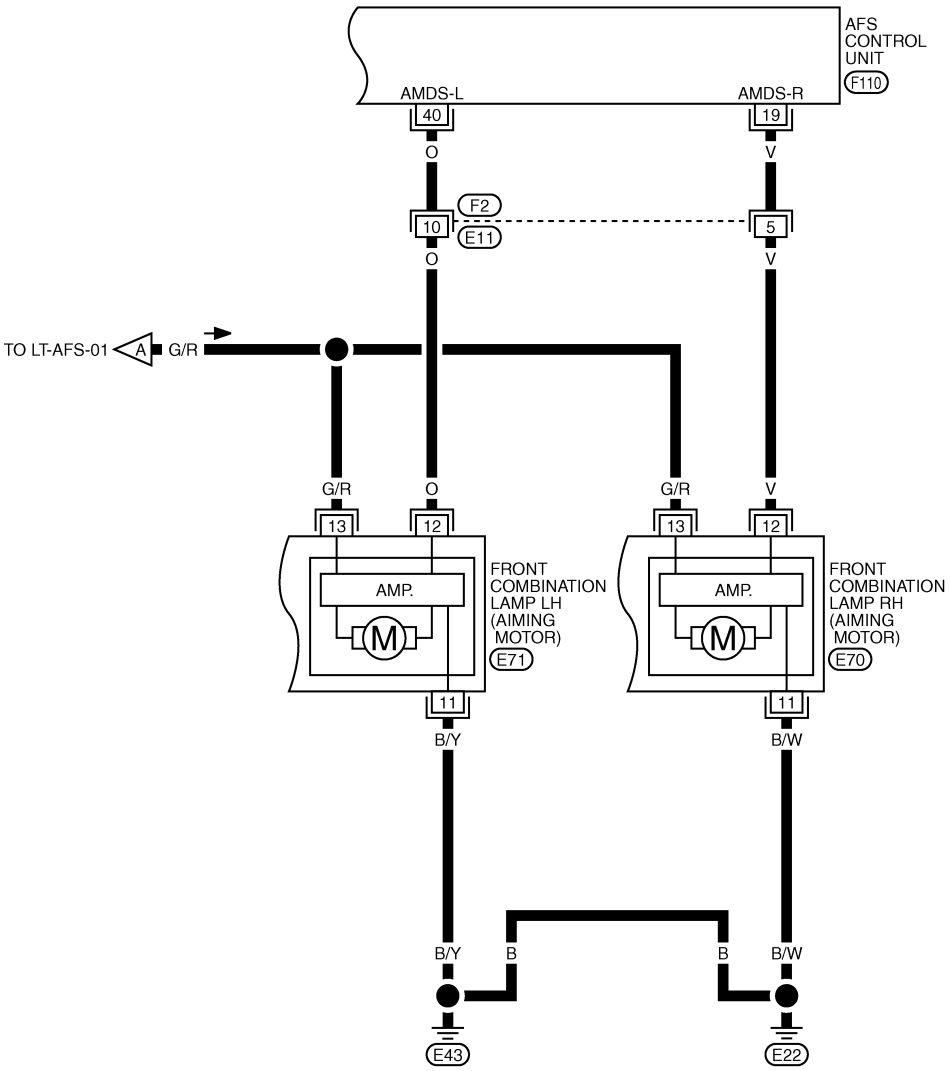


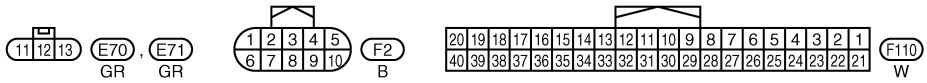


REFER TO THE FOLLOWING.
E108 , F102 -SUPER MULTIPLE JUNCTION (SMJ)

TKWT8204E

LT-AFS-06





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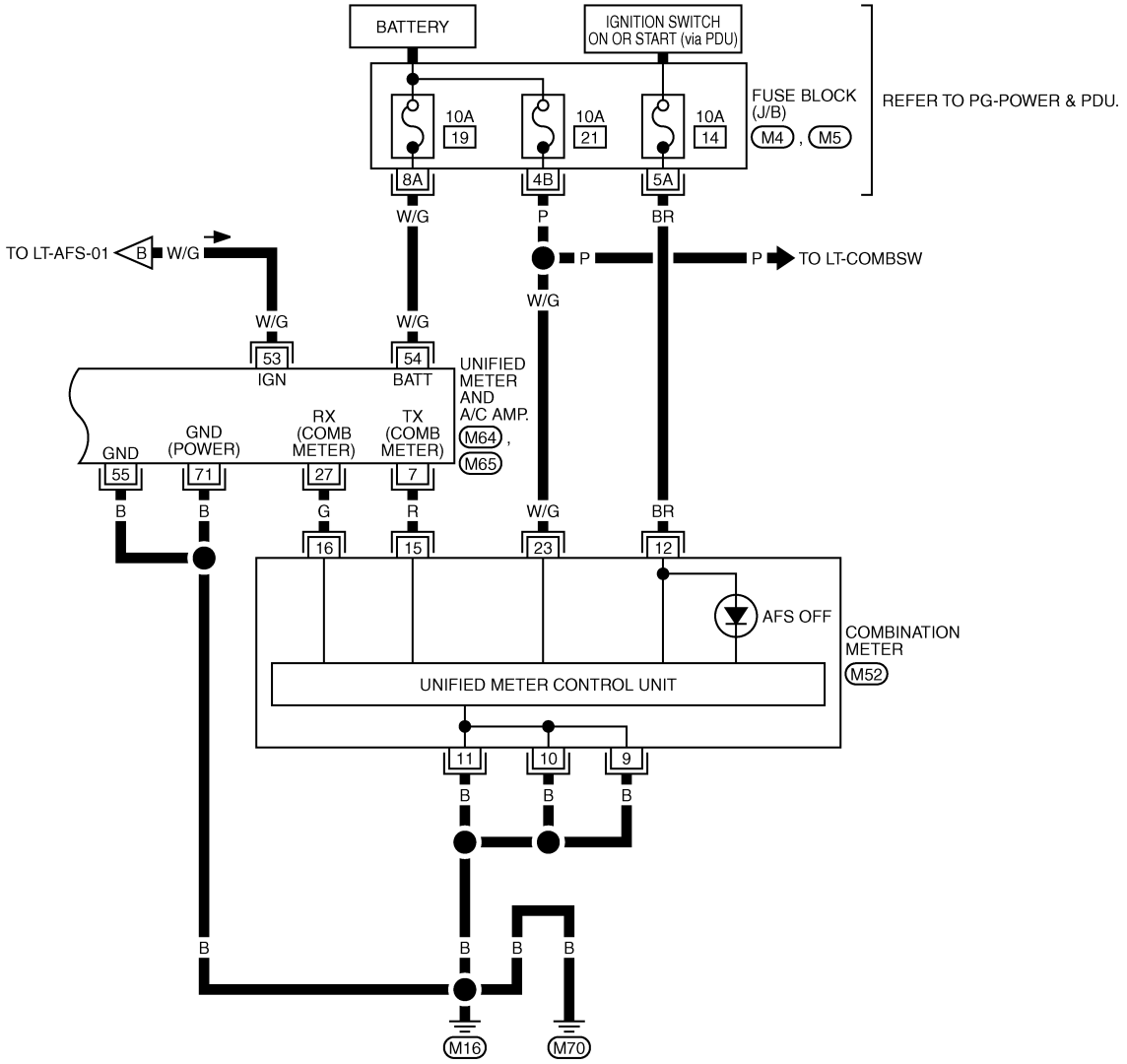
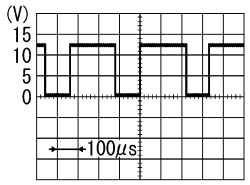
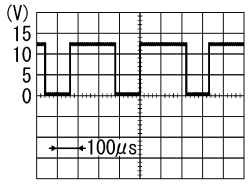
LT-AFS-07

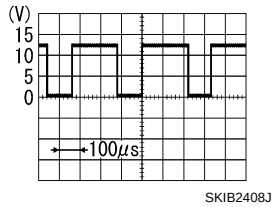
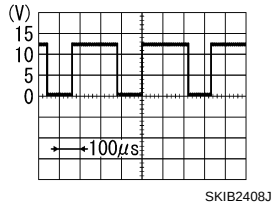


TKWT8206E

Terminal and Reference Value for AFS Control Unit

INFOID:0000000004160381

Terminal No.	Wire color	Item	Measuring condition			Reference value
			Ignition switch	Operation or condition		
1	B/R	IGN power supply	ON	—		Battery voltage
2	W/R	Swivel position sensor ground (right)	ON	—		Approx. 0 V
3	GR	AFS switch signal	ON	AFS switch	ON	Approx. 0 V
					OFF	Battery voltage
4	Y	Swivel position sensor power supply (right)	ON	—		Approx. 5 V
6	V/W	Height sensor power supply	ON	—		Approx. 5 V
7	P	CAN-L	—	—		—
8	B/R	Height sensor ground	ON	—		Approx. 0 V
9	W/B	Swivel position sensor signal (right)	ON	Low beam headlamp (right) swivel angle	0°	Approx. 1.5 V
					Maximum angle	Approx. 2.5 V
11	R	Swivel motor 1 phase– (right)	ON	Low beam headlamp (right) swivel	ON	Reference waveform  SKIB2408J Approx. 8 - 12 V
13	B	Swivel motor 2 phase– (right)	ON		OFF	Approx. 9.5 - 11.5 V
15	BR/L	Swivel motor 1 phase+ (left)	ON	Low beam headlamp (left) swivel	ON	Reference waveform  SKIB2408J Approx. 8 - 12 V
17	Y/G	Swivel motor 2 phase+ (left)	ON		OFF	Approx. 9.5 - 11.5 V
19	V	Aiming motor drive signal (right)	ON	Low beam headlamp (right) auto aiming	Unloaded vehicle position	Approx. 9 V
					Maximum laden condition	Approx. 4.8 V (With 18- inch wheel) Approx. 5.2 V (With 19 -inch wheel)
24	V/R	Swivel position sensor power supply (left)	ON	—		Approx. 5 V
25	B	Ground	ON	—		Approx. 0 V
27	R/W	Swivel position sensor ground (left)	ON	—		Approx. 0 V

Terminal No.	Wire color	Item	Measuring condition			Reference value
			Ignition switch	Operation or condition		
28	BR	Height sensor signal	ON	Vehicle height	Unloaded vehicle position	Approx. 2.5 V
					Maximum laden condition	Approx. 1.0 V (With 18- inch wheel) Approx. 1.3 V (With 19- inch wheel)
29	L/Y	Swivel position sensor signal (left)	ON	Low beam headlamp (left) swivel angle	0°	Approx. 1.5 V
					Maximum angle	Approx. 3.5 V
30	L	CAN-H	—	—		—
32	W	Swivel motor 2 phase+ (right)	ON	Low beam headlamp (right) swivel	ON	Reference waveform  SKIB2408J Approx. 8 - 12 V
34	G	Swivel motor 1phase+ (right)	ON		OFF	Approx. 9.5 - 11.5V
36	Y/L	Swivel motor 2 phase– (left)	ON	Low beam headlamp (left) swivel	ON	Reference waveform  SKIB2408J Approx. 8 - 12 V
38	W/L	Swivel motor 1 phase– (left)	ON		OFF	Approx. 9.5 - 11.5 V
40	O	Aiming motor drive signal (left)	ON	Low beam headlamp (left) auto aiming	Unloaded vehicle position	Approx. 9 V
					Maximum laden condition	Approx. 4.8 V (With 18 -inch wheel) Approx. 5.2 V (With 19 -inch wheel)

How to Proceed with Trouble Diagnosis

INFOID:0000000004160382

1. Confirm the symptom or customer complaint.
2. Understand operation description and function description. Refer to LT-82, "System Description".
3. Perform the preliminary check. Refer to LT-98, "Preliminary Check".
4. Perform self-diagnosis by CONSULT-III. Refer to LT-99, "CONSULT-III Function (ADAPTIVE LIGHT)".
5. Check symptom and repair or replace the cause of malfunction.
6. Does the AFS operate normally? If YES: GO TO 7. If NO: GO TO 4.
7. INSPECTION END

Preliminary Check

INFOID:0000000004160383

1.CHECK FUSES AND FUSIBLE LINK

Check for blown fuses and fusible link.

Unit	Power source	Fuse No.
AFS control unit	Ignition switch ON or START	12

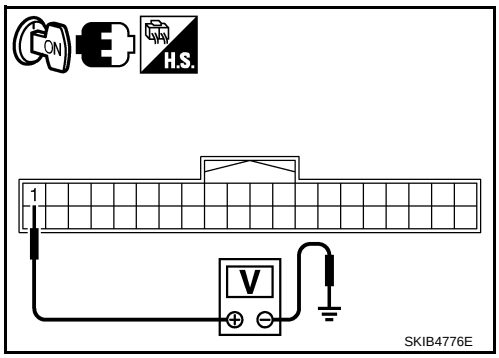
Refer to LT-90, "Wiring Diagram - AFS -".

OK or NG

OK >> GO TO 2.
NG >> If the fuse is brown be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-4.

2.CHECK AFS CONTROL UNIT VOLTAGE

1. Turn ignition switch ON.
2. Check voltage between AFS control unit harness connector and ground.



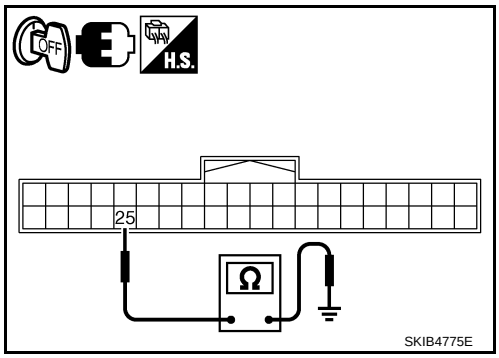
Terminals			Voltage (Approx.)
(+)		(–)	
AFS control unit connector	Terminal		
F110	1	Ground	Battery voltage

OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3.CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between AFS control unit harness connector and ground.



AFS control unit connector	Terminal	Ground	Continuity
F110	25		Yes

OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.

CONSULT-III Function (ADAPTIVE LIGHT)

INFOID:0000000004160384

CONSULT-III can display each diagnostic item using diagnostic test modes shown following.

Check item, diagnosis mode	Description
Work Support	Adjusts steering angle sensor (Never use this function but on VDC side) and adjusts levelizer.
Self-Diag Results	Displays self-diagnosis
Data Monitor	Displays AFS control unit inputs and outputs in real time.
Can Diag Support Monitor	The result of transmit/receive diagnosis of CAN communication can be read.
Active Test	AFS control unit sends a drive signal to electronic components to check their operation.
Ecu Part Number	AFS control unit part number can be read.

WORK SUPPORT (STEERING ANGLE SENSOR ADJUSTMENT)

Work Support Item List

Item	Description
ST ANG SEN ADJUSTMENT	Adjust steering angle sensor neutral point (straight-ahead position).

CAUTION:

Never use this function but on VDC side.

Notes on Steering Angle Sensor (Neutral Point) Adjustment

- Be sure to adjust steering angle sensor neutral point before driving if any of the following has been removed/ installed or replaced: Steering angle sensor; Steering system part, Suspension system part.
- On vehicle with VDC, perform steering angle sensor neutral point adjustment only on VDC side. Never perform the adjustment on ADAPTIVE LIGHT side as this may lead to VDC malfunctions. If the adjustment has been performed on AFS side, readjust on VDC side. For steering angle sensor neutral point adjustment procedures on VDC side, refer to BRC-8, "Adjustment of Steering Angle Sensor Neutral Position" in “ON-VEHICLE SERVICE”.
- When replaced steering angle sensor, AFS control unit detects “DTC C1026 ST ANG SEN SIG”. Delete the malfunction history after adjust steering angle sensor on VDC side.
- Steering angle sensor neutral point adjustment should be performed using CONSULT-III. (The adjustment will not be possible without CONSULT-III.)

Operation Procedure

Refer to BRC-8, "Adjustment of Steering Angle Sensor Neutral Position".

WORK SUPPORT (LEVELIZER ADJUSTMENT)

Work Support Item List

Item	Description
LEVELIZER ADJUSTMENT	Adjust the height sensor signal value at unloaded vehicle position recognized by AFS control unit.

CAUTION:

When “CAN NOT BE TESTED” is displayed, AFS control unit stops levelizer adjustment as it detected the change of height sensor signal. AFS control unit detects “DTC B2519 LEVELIZER CALIB”.
Turn ignition switch OFF not to change the vehicle height. Then turn ignition switch ON and perform levelizer adjustment again.

- **When “ADJUSTMENT COMPLETE” is displayed, and “NO DTC IS DETECTED” is displayed on self-diagnosis results, levelizer adjustment is completed.**
- **When “ADJUSTMENT COMPLETE” is displayed, and “B2514 HI SEN UNUSUAL” is displayed on self-diagnosis results, refer to LT-117, "DTC B2514 HI SEN UNUSUAL RR".**

SELF-DIAG RESULTS

CAUTION:

DTC B2503 and B2504 cannot be detected before the swivel operation. Thus, perform swivel operation first, and then check the display in self-diagnostic results.

Description of DTC and Solutions after Detection

CONSULT-III can detect DTC (Diagnosis trouble code). The descriptions and solutions of DTC are listed below.

Details of error indication detected by CONSULT-III	Conditions of error detection	Fail-safe 1. Swivel operation 2. Auto aiming operation 3. AFS OFF indicator operation 4. Cancellation	Reference
CAN COMM CIRCUIT [U1000]	CAN communication system.	1. Stop the swivel motor RH and LH when the malfunction occurred. 2. Stop the aiming motors when the malfunction occurred. 3. Flash at intervals of approx. 1 second when keeping error state for 2 seconds or longer. 4. Turn ignition switch OFF.	LAN-20, "Trouble Diagnosis Flow Chart".
CONTROL UNIT (CAN) [U1010]	AFS control unit malfunctions.	1. Stop the swivel motor RH and LH when the malfunction occurred. 2. Stop aiming motors when the malfunction occurred. 3. Flash at intervals of approx. 1 second when keeping error state for 2 seconds or longer. 4. Turn ignition switch OFF.	Replace AFS control unit. LT-132
SWIVEL ACTUATOR [RH] [B2503]	Any of several statuses below • Large difference between swivel motor drive signal (swivel angle command signal) transmitted by AFS control unit and swivel position sensor signal (swivel angle feed back signal) by swivel position sensor exists for 2 seconds or longer. Or swivel position sensor signal does not change for 2 seconds or longer even when AFS control unit transmit swivel motor drive signal. **CAUTION:** **Detects when swivel operating (excludes initialization).** • Short or open circuit exists for 2 seconds or longer on one of swivel motor circuits (AFS control unit terminals 11, 13, 32 or 34). **CAUTION:** **Detects when swivel operating (excludes initialization).** • Voltage of swivel position sensor power supply (AFS control unit terminal 4) had more than 6 V or had less than 4 V for 2 seconds or longer. • Voltage of swivel position sensor signal (AFS control unit terminal 9) had more than 4.75 V or had less than 0.25 V for 2 seconds or longer.	1. Stop the swivel motor RH and LH when the malfunction occurred. 2. Reduce approx. 2 V of the aiming motor drive signal value from that of when error is detected. 3. Flash at intervals of approx. 1 second when keeping error state for 2 seconds or longer. 4. Turn ignition switch OFF.	LT-107, "DTC B2503 SWIVEL ACTUATOR RH"
SWIVEL ACTUATOR [LH] [B2504]	Any of several statuses below • Large difference between swivel motor drive signal (swivel angle command signal) transmitted by AFS control unit and swivel position sensor signal (swivel angle feed back signal) by swivel position sensor exists for 2 seconds or longer. Or swivel position sensor signal does not change for 2 seconds or longer even when AFS control unit transmit swivel motor drive signal. **CAUTION:** **Detects when swivel operating (excludes initialization).** • Short or open circuit exists for 2 seconds or longer on one of swivel motor circuits (AFS control unit terminals 15, 17, 36 or 38). **CAUTION:** **Detects when swivel operating (excludes initialization).** • Voltage of swivel position sensor power supply (AFS control unit terminal 24) had more than 6 V or had less than 4 V for 2 seconds or longer. • Voltage of swivel position sensor signal (AFS control unit terminal 29) had more than 4.75 V or had less than 0.25 V for 2 seconds or longer.	1. Stop the swivel motor RH and LH when the malfunction occurred. 2. Reduce approx. 2 V of the aiming motor drive signal value from that of when error is detected. 3. Flash at intervals of approx. 1 second when keeping error state for 2 seconds or longer. 4. Turn ignition switch OFF.	LT-112, "DTC B2504 SWIVEL ACTUATOR LH"

Details of error indication detected by CONSULT-III	Conditions of error detection	Fail-safe 1. Swivel operation 2. Auto aiming operation 3. AFS OFF indicator operation 4. Cancellation	Reference
HI SEN UNUSUAL [RR] [B2514]	Any of several statuses below • Voltage of height sensor power supply (AFS control unit terminal 6) had more than 6 V or had less than 4 V for 2 seconds or longer. • Voltage of height sensor signal (AFS control unit terminal 28) had more than 4.75 V or had less than 0.25 V for 2 seconds or longer.	1. Normal operation 2. Stop aiming motors when the malfunction occurred. 3. Remains OFF. 4. Turn ignition switch OFF.	LT-117, "DTC B2514 HI SEN UNUSUAL RR"
ST ANG SEN SIG [C0126]	Any of several statuses below • Cannot receive steering angle sensor signal. • Receives steering angle sensor error. • Receives steering angle sensor signal except −780° to +780°.	1. Back to the initial position. 2. Normal operation 3. Flash at intervals of approx. 1 second when keeping error state for 2 seconds or longer. 4. Turn ignition switch OFF.	LT-99, "CONSULT-III Function (ADAPTIVE LIGHT)". If above system is normal, replace AFS control unit.
SHIFT SIG [P, R] [B2516]	Cannot receive A/T position indicator signal.	1. Back to the initial position. 2. Normal operation 3. Flash at intervals of approx. 1 second when keeping error state for 2 seconds or longer. 4. Turn ignition switch OFF.	LT-99, "CONSULT-III Function (ADAPTIVE LIGHT)". If above system is normal, replace AFS control unit.
VEHICLE SPEED SIG [B2517]	Cannot receive vehicle speed signal.	1. Back to the initial position. 2. Stop when the malfunction occurred. 3. Flash at intervals of approx. 1 second when keeping error state for 2 seconds or longer. 4. Turn ignition switch OFF.	DI-28, "CONSULT-III Function (METER/M&A)". If above system is normal, replace AFS control unit.
LEVELIZER CALIB [B2519]	Cannot recognize height sensor signal value at unloaded vehicle position.	1. Normal operation 2. Stop aiming motors when the malfunction occurred. 3. Remains OFF. 4. When levelizer adjustment is completed	"WORK SUPPORT (LEVELIZER ADJUSTMENT)"

Details of error indication detected by CONSULT-III	Conditions of error detection	Fail-safe 1. Swivel operation 2. Auto aiming operation 3. AFS OFF indicator operation 4. Cancellation	Reference
ST ANGLE SEN CALIB [C0428]	Cannot recognize steering angle sensor neutral point (straight-ahead position).	1. Back to the initial position. 2. Normal operation 3. Flash at intervals of approx. 1 second when keeping error state for 2 seconds or longer. 4. When steering angle sensor adjustment is completed	BRC-8, "Adjustment of Steering Angle Sensor Neutral Position".
ECU CIRC [B2521]	Any of several statuses below • Short circuit exists for 2 seconds or longer on power supply (approx. 12 V) or ground of swivel position sensor (RH) power supply (AFS control unit terminal 4). • Short circuit exists for 2 seconds or longer on power supply (approx. 12 V) of swivel position sensor (RH) signal (AFS control unit terminal 9). • Short circuit exists for 2 seconds or longer on power supply (approx. 12 V) or ground of swivel position sensor (LH) power supply (AFS control unit terminal 24). • Short circuit exists for 2 seconds or longer on power supply (approx. 12 V) of swivel position sensor (LH) signal (AFS control unit terminal 29). • Short circuit exists for 2 seconds or longer on power supply (approx. 12 V) or ground of height sensor power supply (AFS control unit terminal 6). • Short circuit exists for 2 seconds or longer on power supply (approx. 12 V) of height sensor signal (AFS control unit terminal 28). • AFS control unit (RAM/ROM) malfunctions.	1. Stop the swivel motor RH and LH when the malfunction occurred. 2. Stop aiming motors when the malfunction occurred. 3. Flash at intervals of approx. 1 second when keeping error state for 2 seconds or longer. 4. Turn ignition switch OFF.	LT-121, "DTC B2521 ECU CIRC"

CAUTION:

- **If DTC relating to CAN communication [U1000] and other components are displayed at the same time, diagnose CAN communication first.**
- **Make sure of the normal operation after the parts (except AFS control unit) replacement according to the self-diagnosis results. Delete the malfunction history.**
  Display Results
- **0: There is malfunction now.**
- **1 – 39: Displays when it is normal at present and finds malfunction in the past. It increases in order of 0→1→2...38→39 after returning to the normal condition whenever IGN OFF→ON. If it is over 39, it is fixed to 39 until the self-diagnostic results are erased. It returns to 0 when malfunction is detected again in the process.**

DATA MONITOR

Data Monitor item

Monitors item		Measuring condition			Description
		Operation or condition		Reference value	
STR ANGLE SIG	“ ° ”	Steering wheel	Straight-ahead	Approx. 0°	Displays steering angle based on steering angle sensor signals.
			Turned	Approx. –550° to 550°	
VHCL SPD	“ km/h ”	—			Displays vehicle speed based on vehicle speed sensor signals.
SLCT LVR POSI	“ P – 1 ”	—			Displays A/T selector lever position based on AT position indicator signals.

Monitors item		Measuring condition			Description
		Operation or condition		Reference value	
HEAD LAMP	" On/Off "	Lighting switch	2ND	ON	Displays low beam headlamps on/off status based on low beam status signal.
			Out of 2ND	OFF	
AFS SW	" On/Off "	AFS switch	ON	ON	Displays AFS switch ON/OFF position based on AFS switch signals.
			OFF	OFF	
HI SEN OTP RR	" V "	Vehicle height (With 18-inch wheel)	Unloaded vehicle position	Approx. 2.5 V	Displays vehicle height value based on height sensor signals.
			Maximum laden condition	Approx. 1.0 V	
		Vehicle height (With 19-inch wheel)	Unloaded vehicle position	Approx. 2.5 V	
			Maximum laden condition	Approx. 1.3 V	
LEV ACTR VLTG	"% "	Low beam headlamp auto aiming (With 18-inch wheel)	Unloaded vehicle position	Approx. 70.0%	Displays aiming motor drive signal based on AFS control unit interpretation of various vehicle sensor signals. The value is a ratio to IGN power supply.
			Maximum laden condition	Approx. 38.0%	
		Low beam headlamp auto aiming (With 19-inch wheel)	Unloaded vehicle position	Approx. 70.0%	
			Maximum laden condition	Approx. 41.8%	
SWVL SEN RH*	" ° "	Low beam headlamp (right) swivel	OFF	Approx. 0°	Displays low beam headlamp (right) swivel angle based on swivel position sensor signals (right).
			ON	+°	
SWVL SEN LH*	" ° "	Low beam headlamp (left) swivel	OFF	Approx. 0°	Displays low beam headlamp (left) swivel angle based on swivel position sensor signals (left).
			ON	+°	
SWVL ANGLE RH*	" ° "	Low beam headlamp (right) swivel	OFF	Approx. 0°	Displays swivel motor drive signal (right) based on AFS control unit interpretation of various vehicle sensor signals.
			ON	+°	
SWVL ANGLE LH*	" ° "	Low beam headlamp (left) swivel	OFF	Approx. 0°	Displays swivel motor drive signal (left) based on AFS control unit interpretation of various vehicle sensor signals.
			ON	+°	

CAUTION:

***: The value can be slightly different between that is displayed on "SWVL SEN RH/LH" and that on "SWVL ANGLE RH/LH".**

ACTIVE TEST

CAUTION:

Can be tested only when swivel actuator initialization is completed. If initialization is not completed, "RETRY COMMAND" is displayed and cannot be tested.

- LOW BEAM TEST RIGHT
  Low beam headlamp (right) can be operated to swivel angle 0° by touching "ORIGIN", and to maximum angle by "PEAK".

Test Item	Swivel Speed	Mode
ORIGIN/PEAK - FAST	Three times fast as SLOW	Normal operation
ORIGIN/PEAK - SLOW	—	Initialization

- LOW BEAM TEST LEFT
  Low beam headlamp (left) can be operated to swivel angle 0° by touching "ORIGIN", and to maximum angle by "PEAK".

Test Item	Swivel Speed	Mode
ORIGIN/PEAK - FAST	Three times fast as SLOW	Normal operation
ORIGIN/PEAK - SLOW	—	Initialization

- LEVELIZER TEST
  Aiming motor drive signal can be changed to approx. 85% (ratio to IGN power supply) by touching “ORIGIN”, and to approx. 15% by “PEAK”. That angles headlamp LO up and down.

Test Item	Aiming Motor Drive Signal		Light Axis (Reference Value)
	Ratio to IGN power supply	Voltage	
ORIGIN	Approx. 85%	Approx. 10.6 V	0°
PEAK	Approx. 15%	Approx. 1.9 V	Approx. 2.5° (Relatively lower than that of origin)

Symptom Chart

INFOID:0000000004160385

CAUTION:
The low beam headlamps performs small movements when AFS control unit detects the engine start. This is normal with initialization of swivel actuator by AFS control unit.

Symptom	AFS OFF indicator	Causal system	Reference
• AFS operates, but cannot judge normal/abnormal. (AFS function test)	Normal	Check swivel operation.	LT-124, "AFS Operation Check (Function Test)"
		Check steering angle sensor neutral point (straight-ahead position).	
• Auto aiming operates, but cannot judge normal/abnormal. (Auto aiming function test)	Normal	Check auto aiming operation.	LT-125, "Auto Aiming Operation Check (Function Test)"
		Check height sensor signal value recognized by AFS control unit at unloaded vehicle position.	
		Check height sensor signal and aiming motor drive signal.	
• Neither AFS operates nor auto aiming operates.	Blinking	Check AFS control unit self-diagnostic results.	LT-99, "CONSULT-III Function (ADAPTIVE LIGHT)"
		Check AFS control unit power supply and ground circuit. **NOTE:** Check only when “ADAPTIVE LIGHT” is not displayed on CONSULT-III “SELECT SYSTEM” screen.	LT-98, "Preliminary Check"
• AFS does not operate. (Auto aiming operation is normal.)	Blinking	Check AFS control unit self-diagnostic results.	LT-99, "CONSULT-III Function (ADAPTIVE LIGHT)"
	Illuminated	Check AFS switch system circuit.	LT-127, "AFS Switch Does Not Operate"

Symptom	AFS OFF indicator	Causal system	Reference
• Auto aiming does not operate. (AFS operation is normal.)	Normal	Check AFS control unit self-diagnostic results.	LT-99, "CONSULT-III Function (ADAPTIVE LIGHT)"
		Check aiming motor system circuit.	LT-129, "Auto Aiming Does Not Operate (Check Aiming Motor System Circuit)"
• Auto aiming operates in the reverse way. (Lowering vehicle height angles light axis up.)	Normal	Replace AFS control unit.	LT-132, "Removal and Installation of AFS Control Unit"
• AFS OFF indicator does not illuminate. (AFS operation and auto aiming operation are normal.)	Not illuminated	Check circuit between unified meter and A/C amp. and combination meter.	LT-132, "AFS OFF Indicator Does Not Operate"
• AFS OFF indicator blinks. (AFS operation and auto aiming operation are normal.)	Blinking	Check receive state of AFS off indicator signal from unified meter and A/C amp.	
• AFS cannot be cancelled. (AFS switch does not operate.)	Normal	Check AFS switch system circuit.	LT-127, "AFS Switch Does Not Operate"

DTC U1000 CAN COMM CIRCUIT

INFOID:0000000004160386

Details of error indication detected by CONSULT-III	Conditions of error detection	Fail-safe 1. Swivel operation 2. Auto aiming operation 3. AFS OFF indicator operation 4. Cancellation	Reference
CAN COMM CIRCUIT [U1000]	CAN communication system.	1. Stop the swivel motor RH and LH when the malfunction occurred. 2. Stop the aiming motors when the malfunction occurred. 3. Flash at intervals of approx. 1 second when keeping error state for 2 seconds or longer. 4. Turn ignition switch OFF.	LAN-20, "Trouble Diagnosis Flow Chart".

DTC U1010 CONTROL UNIT (CAN)

INFOID:0000000004160387

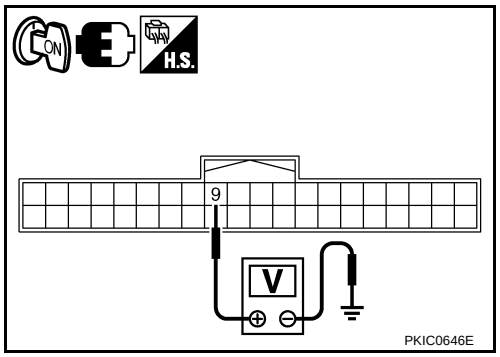
Details of error indication detected by CONSULT-III	Conditions of error detection	Fail-safe 1. Swivel operation 2. Auto aiming operation 3. AFS OFF indicator operation 4. Cancellation	Reference
CONTROL UNIT (CAN) [U1010]	AFS control unit malfunctions.	1. Stop the swivel motor RH and LH when the malfunction occurred. 2. Stop aiming motors when the malfunction occurred. 3. Flash at intervals of approx. 1 second when keeping error state for 2 seconds or longer. 4. Turn ignition switch OFF.	Replace AFS control unit. LT-132

DTC B2503 SWIVEL ACTUATOR RH

INFOID:0000000004160388

1.CHECK SWIVEL POSITION SENSOR SIGNAL

1. Turn ignition switch ON.
2. Check voltage between AFS control unit harness connector and ground.



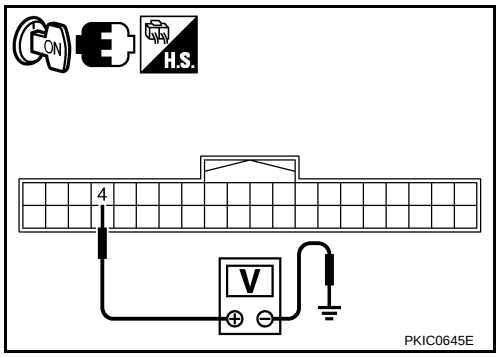
Terminals			Voltage (Approx.)
(+)		(–)	
AFS control unit connector	Terminal		
F110	9	Ground	0.25 - 4.75 V

OK or NG

OK >> GO TO 2.
NG >> • If voltage is less than approx. 0.25V, GO TO 3.
• If voltage is more than approx. 4.75V, GO TO 6.

2.CHECK SWIVEL POSITION SENSOR POWER SUPPLY

Check voltage between AFS control unit harness connector and ground.



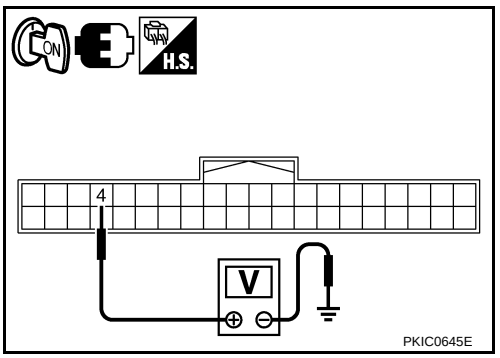
Terminals			Voltage (Approx.)
(+)		(–)	
AFS control unit connector	Terminal		
F110	4	Ground	4.0 - 6.0 V

OK or NG

OK >> GO TO 12.
NG >> Replace AFS control unit. Refer to LT-132, "Removal and Installation of AFS Control Unit".

3.CHECK SWIVEL POSITION SENSOR POWER SUPPLY

Check voltage between AFS control unit harness connector and ground.



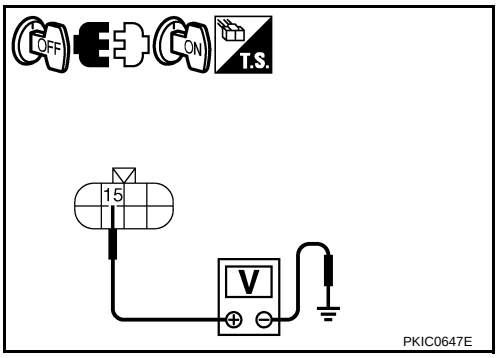
Terminals			Voltage (Approx.)
(+)		(–)	
AFS control unit connector	Terminal		
F110	4	Ground	4.0 - 6.0 V

OK or NG

OK >> GO TO 4.
NG >> GO TO 8.

4. CHECK SWIVEL POSITION SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH connector.
3. Turn ignition switch ON.
4. Check voltage between front combination lamp RH harness connector and ground.



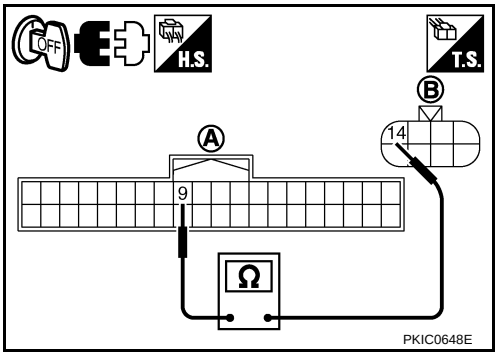
Terminals			Voltage (Approx.)
(+)		(–)	
Front combination lamp RH connector	Terminal		
E48	15	Ground	4.0 - 6.0 V

OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

5. CHECK SWIVEL POSITION SENSOR SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect AFS control unit connector.
3. Check continuity between AFS control unit harness connector (A) and front combination lamp RH harness connector (B).



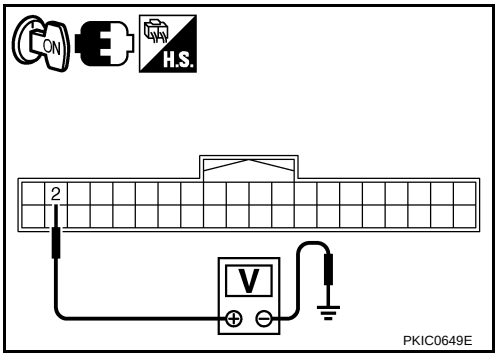
A		B		Continuity
Connector	Terminal	Connector	Terminal	
F110	9	E48	14	Yes

OK or NG

OK >> Replace front combination lamp RH (swivel position sensor malfunction). Refer to LT-132, "Removal and Installation of Front Combination Lamp".
NG >> Repair harness or connector.

6. CHECK SWIVEL POSITION SENSOR GROUND

Check voltage between AFS control unit harness connector and ground.



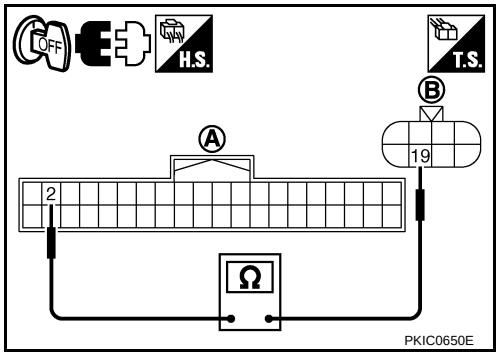
Terminals			Voltage (Approx.)
(+)		(–)	
AFS control unit connector	Terminal		
F110	2	Ground	0 V

OK or NG

OK >> GO TO 7.
NG >> Check connector for connection, bend and loose fit. If it is normal, replace AFS control unit. Refer to LT-132, "Removal and Installation of AFS Control Unit".

7. CHECK SWIVEL POSITION SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect AFS control unit connector and front combination lamp RH connector.
3. Check continuity between AFS control unit harness connector (A) and front combination lamp RH harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
F110	2	E48	19	Yes

OK or NG

OK >> Replace front combination lamp RH (swivel position sensor malfunction). Refer to LT-132, "Removal and Installation of Front Combination Lamp".
NG >> Repair harness or connector.

8. CHECK DIAGNOSIS RESULT

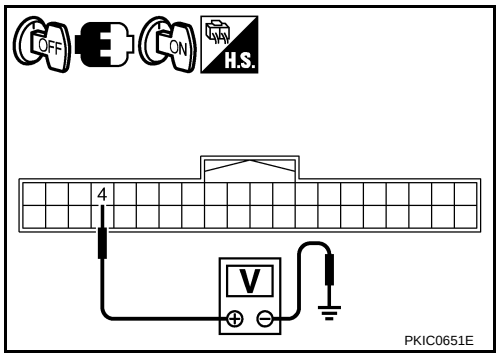
Select “ADAPTIVE LIGHT” on CONSULT-III. Select “SELF-DIAG RESULTS” on “SELECT DIAG MODE” screen.

Is DTC B2521 ECU CIRC detected?

YES >> Refer to LT-121, "DTC B2521 ECU CIRC".
NO >> GO TO 9.

9. CHECK SWIVEL POSITION SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH connector.
3. Turn ignition switch ON.
4. Check voltage between AFS control unit harness connector and ground.



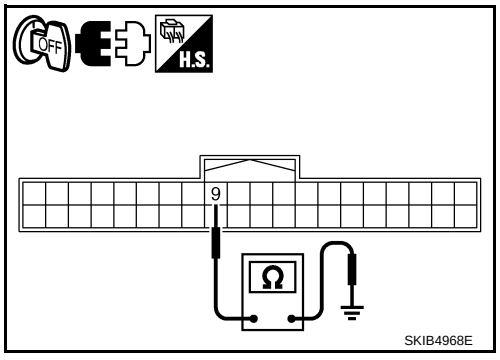
Terminals			Voltage (Approx.)
(+)		(–)	
AFS control unit connector	Terminal		
F110	4	Ground	4.0 - 6.0 V

OK or NG

OK >> GO TO 10.
NG >> GO TO 11.

10. CHECK SWIVEL POSITION SENSOR SIGNAL CIRCUIT (SHORT CIRCUIT)

1. Turn ignition switch OFF.
2. Disconnect AFS control unit connector.
3. Check continuity between AFS control unit harness connector and ground.



AFS control unit connector	Terminal	Ground	Continuity
F110	9		No

OK or NG

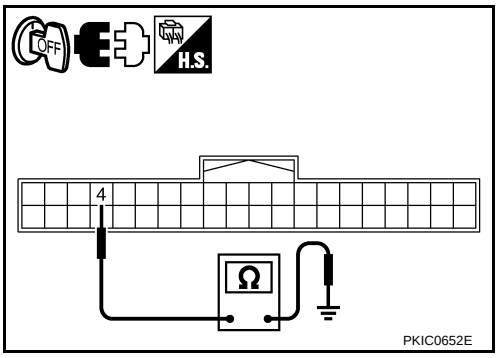
OK >> Replace front combination lamp RH (swivel position sensor malfunction). Refer to LT-132, "Removal and Installation of Front Combination Lamp".

NG >> Repair harness or connector.

11. CHECK SWIVEL POSITION SENSOR POWER SUPPLY CIRCUIT (SHORT CIRCUIT)

1. Turn ignition switch OFF.
2. Disconnect AFS control unit connector.
3. Check continuity between AFS control unit harness connector and ground.

AFS control unit connector	Terminal	Ground	Continuity
F110	4		No



OK or NG

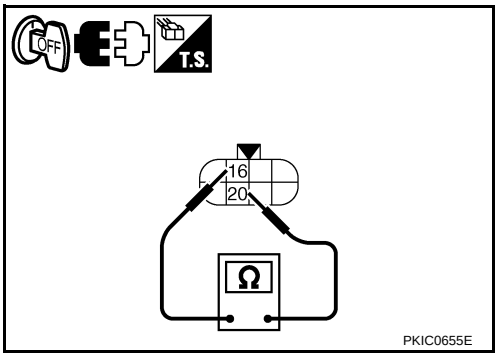
OK >> Replace AFS control unit. Refer to LT-132, "Removal and Installation of AFS Control Unit".

NG >> Repair harness or connector.

12. CHECK SWIVEL MOTOR

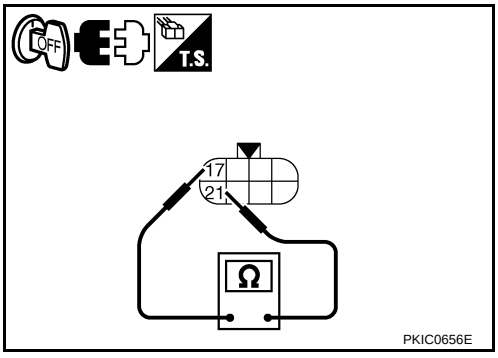
1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH connector.
3. Check continuity between front combination lamp RH connector terminals.

Front combination lamp RH terminals (1 phase)		Resistance
16	20	Approx. 7.4 Ω



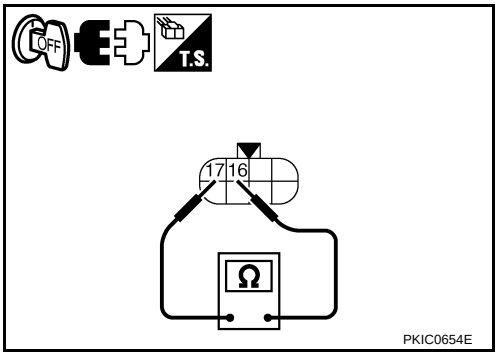
4. Check continuity between front combination lamp RH connector terminals.

Front combination lamp RH terminals (2 phase)		Resistance
17	21	Approx. 7.4 Ω



5. Check continuity between front combination lamp RH connector terminals (insulation resistance).

Front combination lamp RH terminals		Resistance
16	17	Approx. 1 MΩ or more



OK or NG

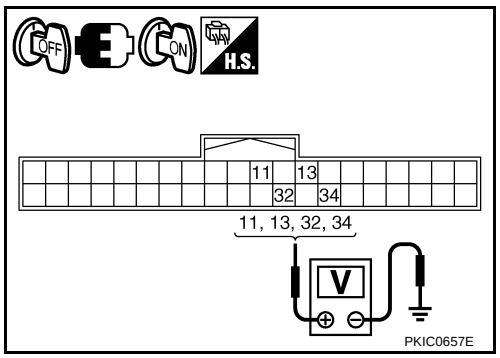
OK >> GO TO 13.

NG >> Replace front combination lamp RH (swivel motor malfunction). Refer to LT-132, "Removal and Installation of Front Combination Lamp".

13. CHECK SWIVEL MOTOR CIRCUIT 1

1. Connect front combination lamp RH connector.
2. Turn ignition switch ON.

3. Check voltage between AFS control unit harness connector and ground.



(+)		(–)	Voltage (Approx.)
AFS control unit connector	Terminal		
F110	11	Ground	9.5 - 11.5 V
	13		
	32		
	34		

OK or NG

OK >> GO TO 14.
NG >> GO TO 16.

14. CHECK DIAGNOSIS RESULT 1

Select “ADAPTIVE LIGHT” on CONSULT-III. Select “SELF-DIAG RESULTS” on “SELECT DIAG MODE” screen.

Is DTC of present malfunction detected?

YES >>
- If detect DTC B2503 and B2504, refer to LT-112, "DTC B2504 SWIVEL ACTUATOR LH".
- If detect DTC B2503 only, replace AFS control unit. Refer to LT-132, "Removal and Installation of AFS Control Unit".
- If detect any DTC except B2503 and B2504, refer to LT-99, "CONSULT-III Function (ADAPTIVE LIGHT)".

NO >> GO TO 15.

15. CHECK DIAGNOSIS RESULT 2

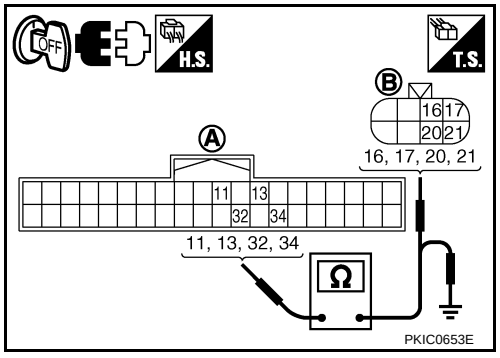
Select “ADAPTIVE LIGHT” on CONSULT-III, check “SELF-DIAG RESULTS” with steering turning 180° or more to right under swivel operative condition to keep more than 2 seconds.

Is DTC B2503 of present malfunction detected?

YES >> Replace front combination lamp RH (swivel actuator malfunction). Refer to LT-132, "Removal and Installation of Front Combination Lamp".
NO >> The swivel actuator system RH is normal at present.

16. CHECK SWIVEL MOTOR CIRCUIT 2

1. Turn ignition switch OFF.
2. Disconnect AFS control unit connector and front combination lamp RH connector.
3. Check continuity between AFS control unit harness connector (A) and front combination lamp RH harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
F110	11	E48	20	Yes
	13		21	
	32		17	
	34		16	

4. Check continuity between AFS control unit harness connector (A) and ground.

A			Continuity
Connector	Terminal		
F110	11	Ground	No
	13		
	32		
	34		

OK or NG

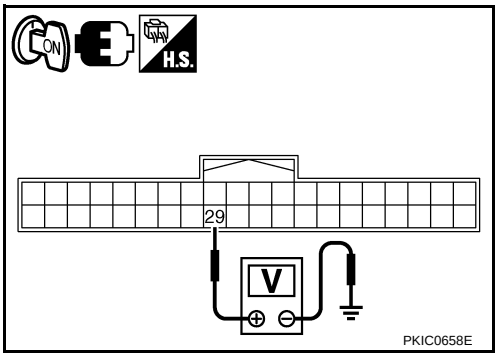
OK >> Replace AFS control unit. Refer to LT-132, "Removal and Installation of AFS Control Unit".
NG >> Repair or replace harness or connector.

DTC B2504 SWIVEL ACTUATOR LH

INFOID:0000000004160389

1.CHECK SWIVEL POSITION SENSOR SIGNAL

1. Turn ignition switch ON.
2. Check voltage between AFS control unit harness connector and ground.



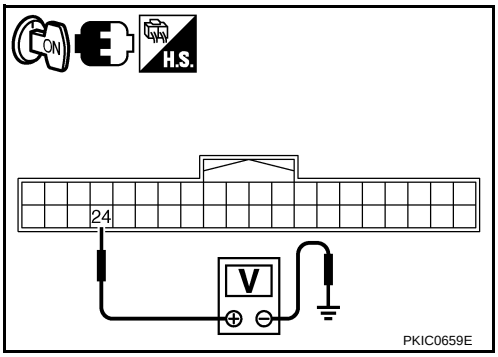
Terminals			Voltage (Approx.)
(+)		(–)	
AFS control unit connector	Terminal		
F110	29	Ground	0.25 - 4.75 V

OK or NG

OK >> GO TO 2.
NG >> • If voltage is less than approx. 0.25V, GO TO 3.
• If voltage is more than approx. 4.75V, GO TO 6.

2.CHECK SWIVEL POSITION SENSOR POWER SUPPLY

Check voltage between AFS control unit harness connector and ground.



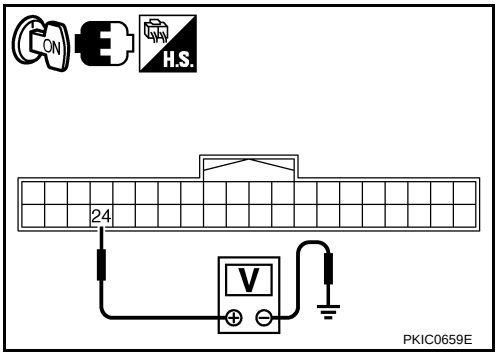
Terminals			Voltage (Approx.)
(+)		(–)	
AFS control unit connector	Terminal		
F110	24	Ground	4.0 - 6.0 V

OK or NG

OK >> GO TO 12.
NG >> Replace AFS control unit. Refer to LT-132, "Removal and Installation of AFS Control Unit".

3.CHECK SWIVEL POSITION SENSOR POWER SUPPLY

Check voltage between AFS control unit harness connector and ground.



Terminals			Voltage (Approx.)
(+)		(–)	
AFS control unit connector	Terminal		
F110	24	Ground	4.0 - 6.0 V

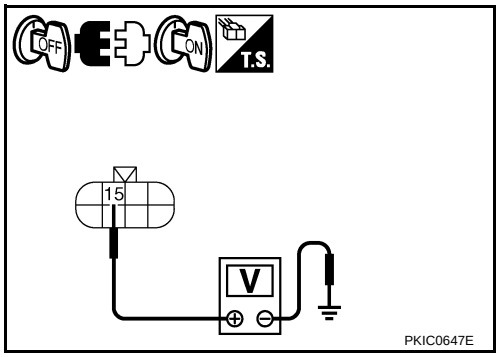
OK or NG

OK >> GO TO 4.

NG >> GO TO 8.

4. CHECK SWIVEL POSITION SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect front combination lamp LH connector.
3. Turn ignition switch ON.
4. Check voltage between front combination lamp LH harness connector and ground.



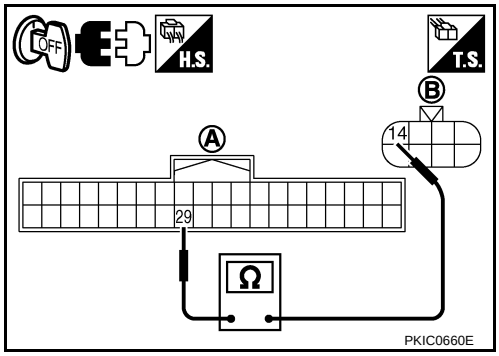
Terminals			Voltage (Approx.)
(+)		(–)	
Front combination lamp LH connector	Terminal		
E53	15	Ground	4.0 - 6.0 V

OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

5. CHECK SWIVEL POSITION SENSOR SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect AFS control unit connector.
3. Check continuity between AFS control unit harness connector (A) and front combination lamp LH harness connector (B).



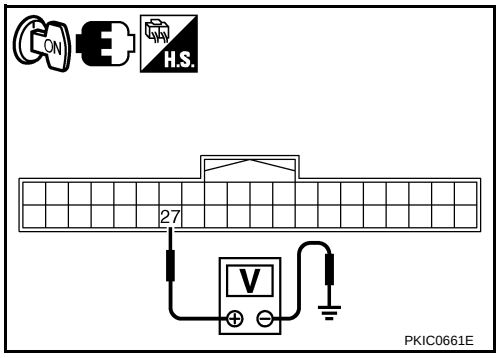
A		B		Continuity
Connector	Terminal	Connector	Terminal	
F110	29	E53	14	Yes

OK or NG

OK >> Replace front combination lamp LH (swivel position sensor malfunction). Refer to LT-132, "Removal and Installation of Front Combination Lamp".
NG >> Repair harness or connector.

6. CHECK SWIVEL POSITION SENSOR GROUND

Check voltage between AFS control unit harness connector and ground.



Terminals			Voltage (Approx.)
(+)		(–)	
AFS control unit connector	Terminal		
F110	27	Ground	0 V

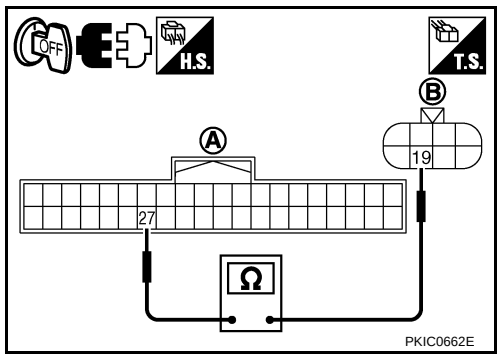
OK or NG

OK >> GO TO 7.
NG >> Check connector for connection, bend and loose fit. If it is normal, replace AFS control unit. Refer to LT-132, "Removal and Installation of AFS Control Unit".

7. CHECK SWIVEL POSITION SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect AFS control unit connector and front combination lamp LH connector.

3. Check continuity between AFS control unit harness connector (A) and front combination lamp LH harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
F110	27	E53	19	Yes

OK or NG

OK >> Replace front combination lamp LH (swivel position sensor malfunction). Refer to LT-132, "Removal and Installation of Front Combination Lamp".

NG >> Repair harness or connector.

8.CHECK DIAGNOSIS RESULT

Select “ADAPTIVE LIGHT” on CONSULT-III. Select “SELF-DIAG RESULTS” on “SELECT DIAG MODE” screen.

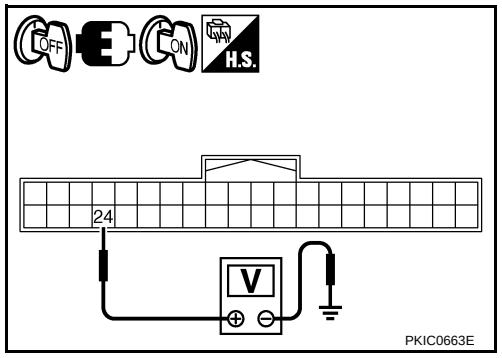
Is DTC B2521 ECU CIRC detected?

YES >> Refer to LT-121, "DTC B2521 ECU CIRC".

NO >> GO TO 9.

9.CHECK SWIVEL POSITION SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect front combination lamp LH connector.
3. Turn ignition switch ON.
4. Check voltage between AFS control unit harness connector and ground.



Terminals			Voltage (Approx.)
(+)		(–)	
AFS control unit connector	Terminal		
F110	24	Ground	4.0 - 6.0 V

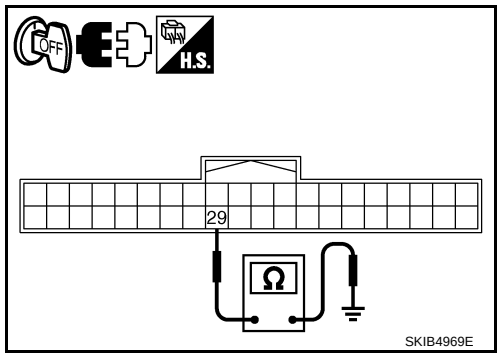
OK or NG

OK >> GO TO 10.

NG >> GO TO 11.

10.CHECK SWIVEL POSITION SENSOR SIGNAL CIRCUIT (SHORT CIRCUIT)

1. Turn ignition switch OFF.
2. Disconnect AFS control unit connector.
3. Check continuity between AFS control unit harness connector and ground.



AFS control unit connector	Terminal	Ground	Continuity
F110	29		No

OK or NG

OK >> Replace front combination lamp LH (swivel position sensor malfunction). Refer to LT-132, "Removal and Installation of Front Combination Lamp".

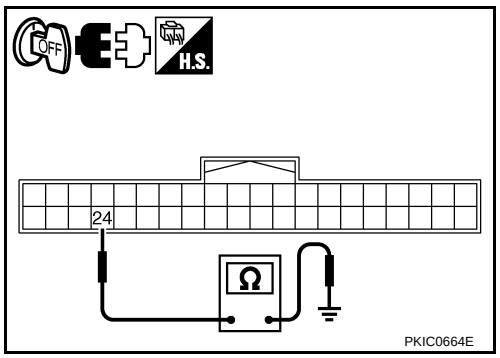
NG >> Repair harness or connector.

11.CHECK SWIVEL POSITION SENSOR POWER SUPPLY CIRCUIT (SHORT CIRCUIT)

1. Turn ignition switch OFF.
2. Disconnect AFS control unit connector.

3. Check continuity between AFS control unit harness connector and ground.

AFS control unit connector	Terminal	Ground	Continuity
F110	24		No



OK or NG

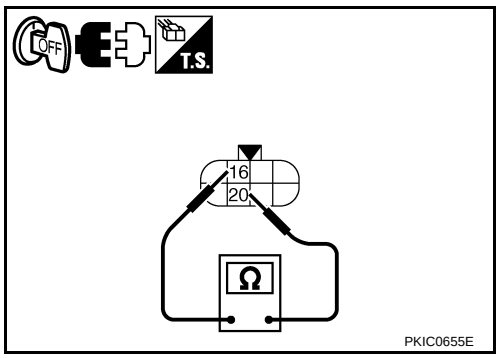
OK >> Replace AFS control unit. Refer to LT-132, "Removal and Installation of AFS Control Unit".

NG >> Repair harness or connector.

12. CHECK SWIVEL MOTOR

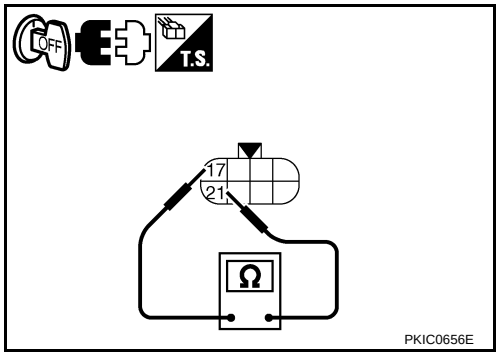
1. Turn ignition switch OFF.
2. Disconnect front combination lamp LH connector.
3. Check continuity between front combination lamp LH connector terminals.

Front combination lamp LH terminals (2 phase)		Resistance
16	20	Approx. 7.4 Ω



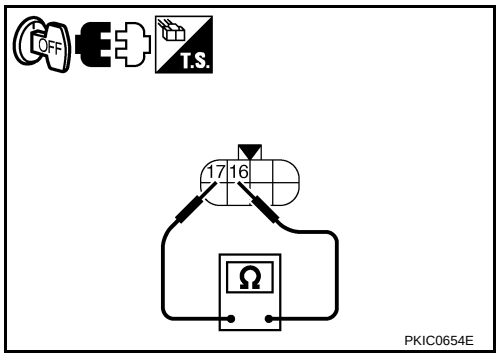
4. Check continuity between front combination lamp LH connector terminals.

Front combination lamp LH terminals (1 phase)		Resistance
17	21	Approx. 7.4 Ω



5. Check continuity between front combination lamp LH connector terminals (insulation resistance).

Front combination lamp LH terminals		Resistance
16	17	Approx. 1 MΩ or more



OK or NG

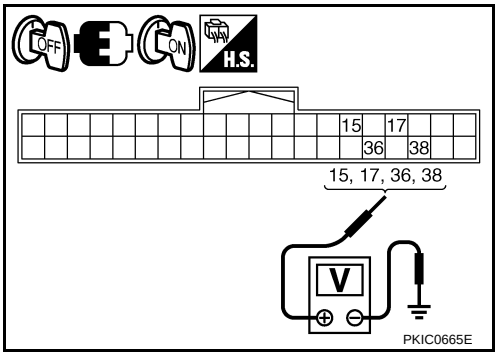
OK >> GO TO 13.

NG >> Replace front combination lamp LH (swivel motor malfunction). Refer to LT-132, "Removal and Installation of Front Combination Lamp".

13. CHECK SWIVEL MOTOR CIRCUIT 1

1. Connect front combination lamp LH connector.
2. Turn ignition switch ON.

3. Check voltage between AFS control unit harness connector and ground.



(+)		(–)	Voltage (Approx.)
AFS control unit connector	Terminal		
F110	15	Ground	9.5 - 11.5 V
	17		
	36		
	38		

OK or NG

OK >> GO TO 14.
NG >> GO TO 16.

14. CHECK DIAGNOSIS RESULT 1

Select “ADAPTIVE LIGHT” on CONSULT-III. Select “SELF-DIAG RESULTS” on “SELECT DIAG MODE” screen.

Is DTC of present malfunction detected?

YES >>
- If detect DTC B2503 and B2504, refer to "DTC B2504 SWIVEL ACTUATOR LH".
- If detect DTC B2504 only, replace AFS control unit. Refer to LT-132, "Removal and Installation of AFS Control Unit".
- If detect any DTC except B2503 and B2504, refer to LT-99, "CONSULT-III Function (ADAPTIVE LIGHT)".

NO >> GO TO 15.

15. CHECK DIAGNOSIS RESULT 2

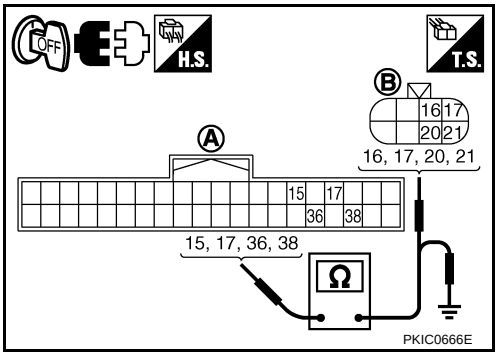
Select “ADAPTIVE LIGHT” on CONSULT-III, check “SELF-DIAG RESULTS” with steering turning 180° or more to left under swivel operative condition to keep more than 2 seconds.

Is DTC B2504 of present malfunction detected?

YES >> Replace front combination lamp LH (swivel actuator malfunction). Refer to LT-132, "Removal and Installation of Front Combination Lamp".
NO >> The swivel actuator system LH is normal at present.

16. CHECK SWIVEL MOTOR CIRCUIT 2

1. Turn ignition switch OFF.
2. Disconnect AFS control unit connector and front combination lamp LH connector.
3. Check continuity between AFS control unit harness connector (A) and front combination lamp LH harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
F110	15	E53	17	Yes
	17		16	
	36		20	
	38		21	

4. Check continuity between AFS control unit harness connector (A) and ground.

A			
Connector	Terminal	Ground	Continuity
F110	15		No
	17		
	36		
	38		

OK or NG

OK >> Replace AFS control unit. Refer to LT-132, "Removal and Installation of AFS Control Unit".
NG >> Repair or replace harness or connector.

DTC B2514 HI SEN UNUSUAL RR

INFOID:0000000004160390

1.CHECK HEIGHT SENSOR SIGNAL

CONSULT-III DATA MONITOR
1. Turn ignition switch ON.
2. Select “HI SEN OTP RR” of ADAPTIVE LIGHT data monitor item.
3. Check the monitor status.

HI SEN OTP RR : Approx. 0.25 – 4.75 V

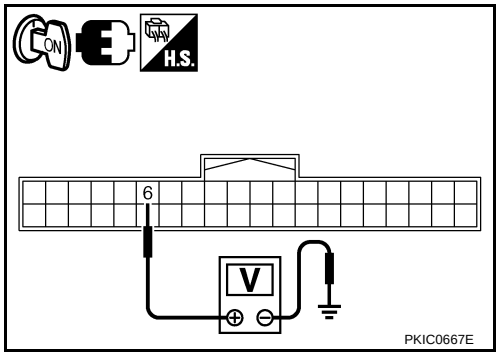
OK or NG

OK >> GO TO 2.
NG >> If voltage is more than approx. 4.75V, GO TO 7.
>> If voltage is less than approx. 0.25V, GO TO 3.

2.CHECK HEIGHT SENSOR POWER SUPPLY

Check voltage between AFS control unit harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
AFS control unit connector	Terminal		
F110	6	Ground	4.0 - 6.0 V



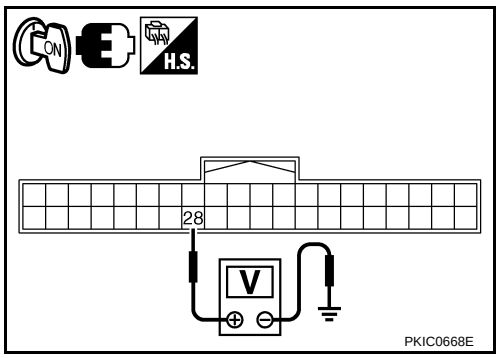
OK or NG

OK >> The height sensor system is normal at present.
NG >> Replace AFS control unit. Refer to LT-132, "Removal and Installation of AFS Control Unit".

3.CHECK HEIGHT SENSOR SIGNAL

Check voltage between AFS control unit harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
AFS control unit connector	Terminal		
F110	28	Ground	0.25 - 4.75 V

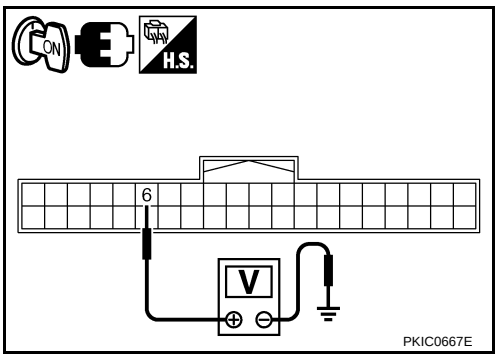


OK or NG

OK >> Replace AFS control unit. Refer to LT-132, "Removal and Installation of AFS Control Unit".
NG >> If voltage is less than approx. 0.25V, GO TO 4.
>> If voltage is more than approx. 4.75V, GO TO 7.

4.CHECK HEIGHT SENSOR POWER SUPPLY

Check voltage between AFS control unit harness connector and ground.



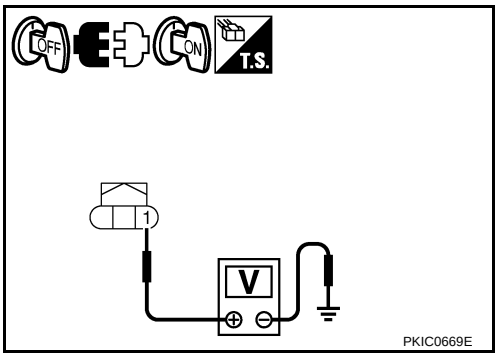
Terminals			Voltage (Approx.)
(+)		(–)	
AFS control unit connector	Terminal		
F110	6	Ground	4.0 - 6.0 V

OK or NG

OK >> GO TO 5.
NG >> GO TO 9.

5.CHECK HEIGHT SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect height sensor connector.
3. Turn ignition switch ON.
4. Check voltage between height sensor harness connector and ground.



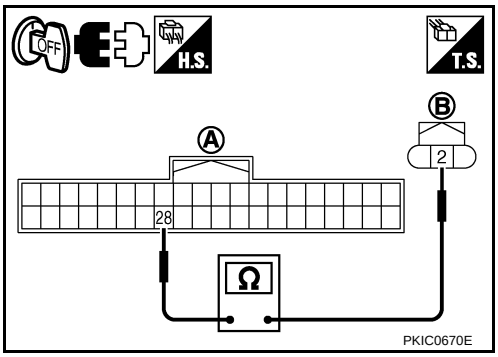
Terminals			Voltage (Approx.)
(+)		(–)	
Height sensor connector	Terminal		
B468	1	Ground	4.0 - 6.0 V

OK or NG

OK >> GO TO 6.
NG >> Repair harness or connector.

6.CHECK HEIGHT SENSOR SIGNAL CIRCUIT

1. Disconnect AFS control unit connector.
2. Check continuity between AFS control unit harness connector (A) and height sensor harness connector (B).



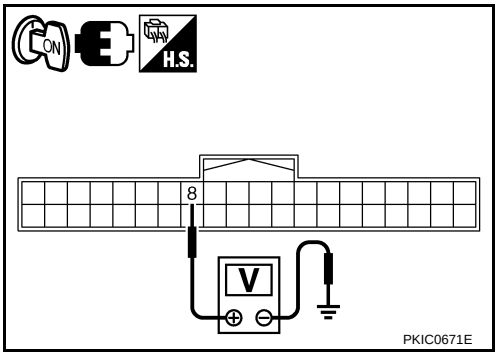
A		B		Continuity
Connector	Terminal	Connector	Terminal	
F110	28	B468	2	Yes

OK or NG

OK >> Replace height sensor. Refer to LT-133, "Removal and Installation of Height Sensor".
NG >> Repair harness or connector.

7.CHECK HEIGHT SENSOR GROUND

Check voltage between AFS control unit harness connector and ground.



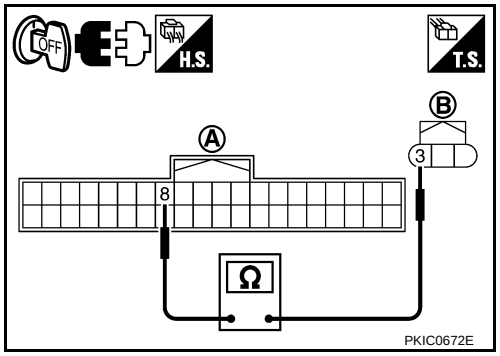
Terminals			Voltage (Approx.)
(+)		(–)	
AFS control unit connector	Terminal		
F110	8	Ground	0 V

OK or NG

OK >> GO TO 8.
NG >> Check connector for connection, bend and loose fit. If it is normal, replace AFS control unit. Refer to LT-132, "Removal and Installation of AFS Control Unit".

8. CHECK HEIGHT SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect AFS control unit connector and height sensor connector.
3. Check continuity between AFS control unit harness connector (A) and height sensor harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
F110	8	B468	3	Yes

OK or NG

OK >> Replace height sensor. Refer to LT-133, "Removal and Installation of Height Sensor".
NG >> Repair harness or connector.

9. CHECK DIAGNOSIS RESULT

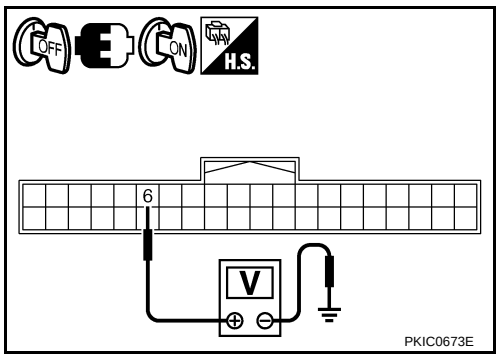
Select “ADAPTIVE LIGHT” on CONSULT-III. Select “SELF-DIAG RESULTS” on “SELECT DIAG MODE” screen.

Is DTC B2521 ECU CIRC detected?

YES >> Refer to LT-121, "DTC B2521 ECU CIRC".
NO >> GO TO 10.

10. CHECK HEIGHT SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect height sensor connector.
3. Turn ignition switch ON.
4. Check voltage between AFS control unit harness connector and ground.



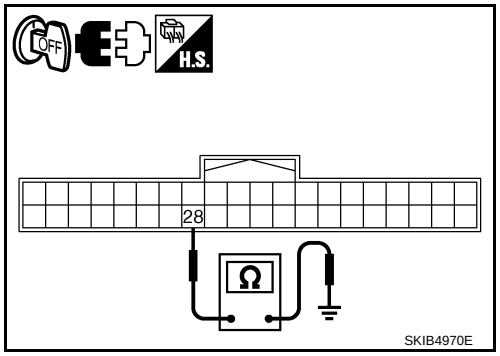
Terminals			Voltage (Approx.)
(+)		(–)	
AFS control unit connector	Terminal		
F110	6	Ground	4.0 - 6.0 V

OK or NG

OK >> GO TO 11.
NG >> GO TO 12.

11. CHECK HEIGHT SENSOR SIGNAL CIRCUIT (SHORT CIRCUIT)

1. Disconnect AFS control unit connector.
2. Check continuity between AFS control unit harness connector and ground.



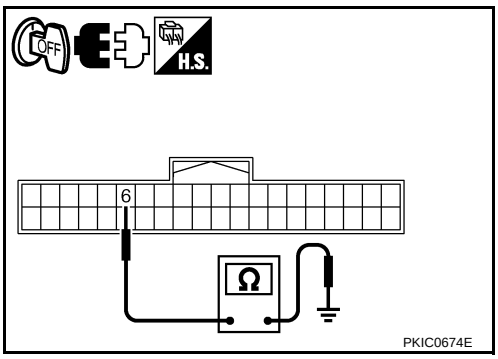
AFS control unit connector	Terminal	Ground	Continuity
F110	28		No

OK or NG

OK >> Replace height sensor. Refer to LT-133, "Removal and Installation of Height Sensor".
NG >> Repair harness or connector.

12. CHECK HEIGHT SENSOR POWER SUPPLY CIRCUIT (SHORT CIRCUIT)

1. Turn ignition switch OFF.
2. Disconnect AFS control unit connector.
3. Check continuity between AFS control unit harness connector and ground.



AFS control unit connector	Terminal	Ground	Continuity
F110	6		No

OK or NG

OK >> Replace AFS control unit. Refer to LT-132, "Removal and Installation of AFS Control Unit".

NG >> Repair harness or connector.

DTC C0126 ST ANG SEN SIG

INFOID:0000000004449181

Details of error indication detected by CONSULT-III	Conditions of error detection	Fail-safe 1. Swivel operation 2. Auto aiming operation 3. AFS OFF indicator operation 4. Cancellation	Reference
ST ANG SEN SIG [C0126]	Any of several statuses below • Cannot receive steering angle sensor signal. • Receives steering angle sensor error. • Receives steering angle sensor signal except –943° to +943°.	1. Back to the initial position. 2. Normal operation 3. Flash at intervals of approx. 1 second when keeping error state for 2 seconds or longer. 4. Turn ignition switch OFF.	LT-99, "CONSULT-III Function (ADAPTIVE LIGHT)". If above system is normal, replace AFS control unit.

DTC B2516 SIFT SIG [P,R]

INFOID:0000000004160392

Details of error indication detected by CONSULT-III	Conditions of error detection	Fail-safe 1. Swivel operation 2. Auto aiming operation 3. AFS OFF indicator operation 4. Cancellation	Reference
SHIFT SIG [P, R] [B2516]	Cannot receive A/T position indicator signal.	1. Back to the initial position. 2. Normal operation 3. Flash at intervals of approx. 1 second when keeping error state for 2 seconds or longer. 4. Turn ignition switch OFF.	AT-92, "CONSULT-III Function (TRANSMISSION)". If above system is normal, replace AFS control unit.

DTC B2517 VEHICLE SPEED SIG

INFOID:0000000004160393

Details of error indication detected by CONSULT-III	Conditions of error detection	Fail-safe 1. Swivel operation 2. Auto aiming operation 3. AFS OFF indicator operation 4. Cancellation	Reference
VEHICLE SPEED SIG [B2517]	Cannot receive vehicle speed signal.	1. Back to the initial position. 2. Stop when the malfunction occurred. 3. Flash at intervals of approx. 1 second when keeping error state for 2 seconds or longer. 4. Turn ignition switch OFF.	DI-28, "CONSULT-III Function (METER/M&A)". If above system is normal, replace AFS control unit.

DTC B2519 LEVELIZER CALIB

INFOID:0000000004160395

Details of error indication detected by CONSULT-III	Conditions of error detection	Fail-safe 1. Swivel operation 2. Auto aiming operation 3. AFS OFF indicator operation 4. Cancellation	Reference
LEVELIZER CALIB [B2519]	Cannot recognize height sensor signal value at unloaded vehicle position.	1. Normal operation 2. Stop aiming motors when the malfunction occurred. 3. Remains OFF. 4. When levelizer adjustment is completed	"WORK SUPPORT (LEVELIZER ADJUSTMENT)"

DTC C0428 ST ANGLE SEN CALIB

INFOID:0000000004449187

Details of error indication detected by CONSULT-III	Conditions of error detection	Fail-safe 1. Swivel operation 2. Auto aiming operation 3. AFS OFF indicator operation 4. Cancellation	Reference
ST ANGLE SEN CALIB [C0428]	Cannot recognize steering angle sensor neutral point (straight-ahead position).	1. Back to the initial position. 2. Normal operation 3. Flash at intervals of approx. 1 second when keeping error state for 2 seconds or longer. 4. When steering angle sensor adjustment is completed	BRC-8, "Adjustment of Steering Angle Sensor Neutral Position".

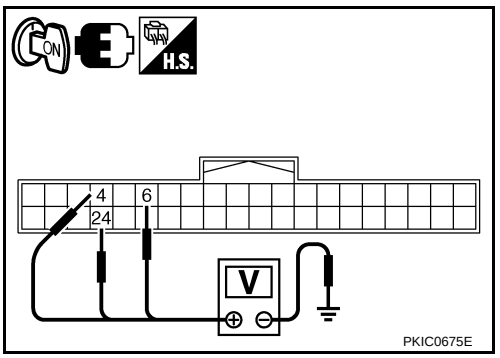
DTC B2521 ECU CIRC

INFOID:0000000004160397

1.CHECK SENSOR POWER SUPPLY

1. Turn ignition switch ON.

2. Check voltage between AFS control unit harness connector and ground.



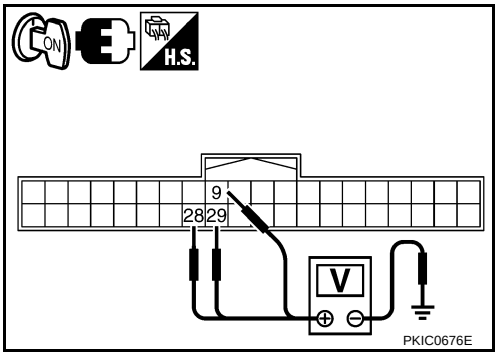
(+)		(–)	Voltage (Approx.)
AFS control unit connector	Terminal		
F110	4	Ground	4.0 - 6.0 V
	6		
	24		

OK or NG

OK >> GO TO 2.
NG >> If voltage is less than approx. 4 V, GO TO 3.
>> If voltage is more than approx. 6 V, GO TO 4.

2.CHECK SENSOR SIGNAL

Check voltage between AFS control unit harness connector and ground.



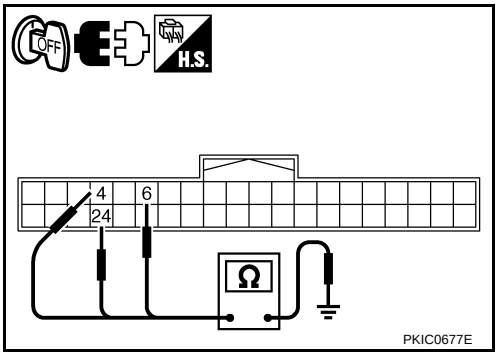
(+)		(–)	Voltage (Approx.)
AFS control unit connector	Terminal		
F110	9	Ground	0.25 - 4.75 V
	28		
	29		

OK or NG

OK >> Replace AFS control unit. Refer to LT-132, "Removal and Installation of AFS Control Unit".
NG >> If voltage is less than approx. 0.25 V, GO TO 5.
>> If voltage is more than approx. 4.75 V, GO TO 6.

3.CHECK SENSOR POWER SUPPLY CIRCUIT (GROUND SHORT CIRCUIT)

1. Turn ignition switch OFF.
2. Disconnect AFS control unit connector.
3. Check continuity between AFS control unit harness connector and ground.



AFS control unit connector	Terminal		Continuity
F110	4	Ground	No
	6		
	24		

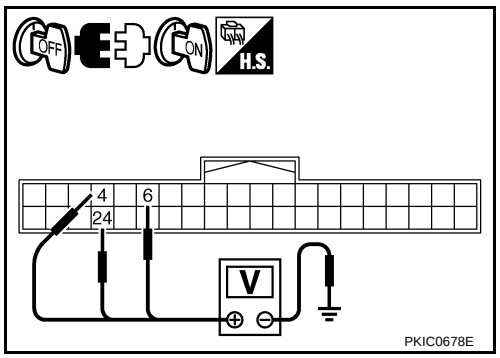
OK or NG

OK >> Replace AFS control unit. Refer to LT-132, "Removal and Installation of AFS Control Unit".
NG >> GO TO 7.

4.CHECK SENSOR POWER SUPPLY CIRCUIT (IGN POWER SUPPLY SHORT CIRCUIT)

1. Turn ignition switch OFF.
2. Disconnect AFS control unit connector.
3. Turn ignition switch ON.

4. Check voltage between AFS control unit harness connector and ground.



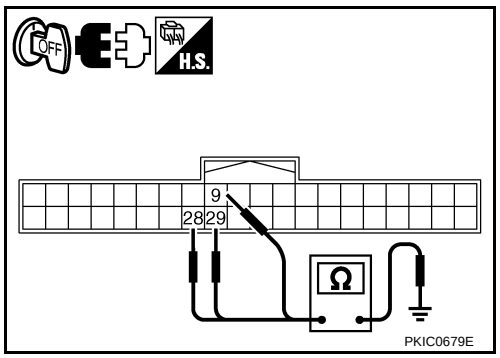
(+)		(–)	Voltage (Approx.)
AFS control unit connector	Terminal		
F110	4	Ground	0 V
	6		
	24		

OK or NG

OK >> Replace AFS control unit. Refer to LT-132, "Removal and Installation of AFS Control Unit".
NG >> GO TO 8.

5. CHECK SENSOR SIGNAL CIRCUIT (GROUND SHORT CIRCUIT)

1. Turn ignition switch OFF.
2. Disconnect AFS control unit connector.
3. Check continuity between AFS control unit harness connector and ground.



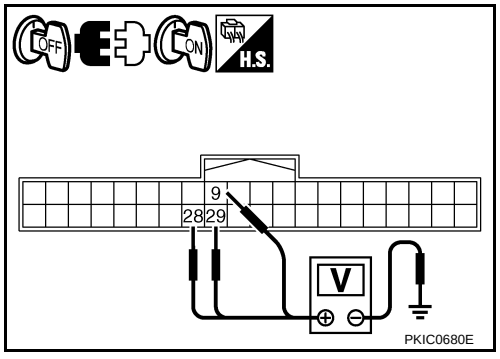
AFS control unit connector	Terminal		Continuity
F110	9	Ground	No
	28		
	29		

OK or NG

OK >> Replace AFS control unit. Refer to LT-132, "Removal and Installation of AFS Control Unit".
NG >> GO TO 7.

6. CHECK SENSOR SIGNAL CIRCUIT (IGN POWER SUPPLY SHORT CIRCUIT)

1. Turn ignition switch OFF.
2. Disconnect AFS control unit connector.
3. Turn ignition switch ON.
4. Check voltage between AFS control unit harness connector and ground.



(+)		(–)	Voltage (Approx.)
AFS control unit connector	Terminal		
F110	9	Ground	0 V
	28		
	29		

OK or NG

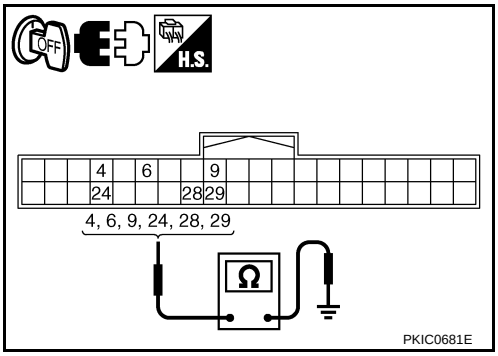
OK >> Replace AFS control unit. Refer to LT-132, "Removal and Installation of AFS Control Unit".
NG >> GO TO 8.

7. CHECK SENSOR SIGNAL AND POWER SUPPLY CIRCUIT (GROUND SHORT CIRCUIT)

1. Disconnect height sensor connector, front combination lamp LH and RH connector.

2. Check continuity between AFS control unit harness connector and ground.

AFS control unit connector	Terminal		Continuity
F110	4	Ground	No
	6		
	9		
	24		
	28		
	29		



OK or NG

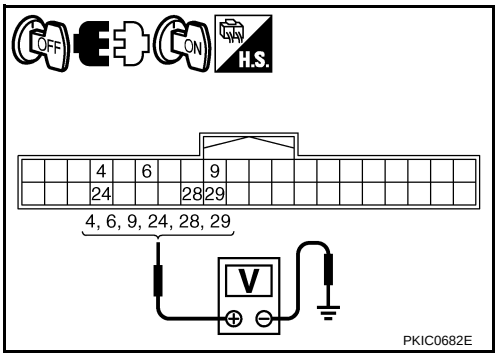
OK >> Replace height sensor, front combination lamp LH or RH with malfunction at the preceding process 3 or 5. Refer to LT-133, "Removal and Installation of Height Sensor" or LT-132, "Removal and Installation of Front Combination Lamp".

NG >> Repair harness or connector.

8. CHECK SENSOR SIGNAL AND POWER SUPPLY CIRCUIT (IGN POWER SUPPLY SHORT CIRCUIT)

1. Turn ignition switch OFF.
2. Disconnect height sensor connector, front combination lamp LH and RH connector.
3. Turn ignition switch ON.
4. Check voltage between AFS control unit harness connector and ground.

(+)		(–)	Voltage (Approx.)
AFS control unit connector	Terminal		
F110	4	Ground	0 V
	6		
	9		
	24		
	28		
	29		



OK or NG

OK >> Replace height sensor, front combination lamp LH or RH with malfunction at the preceding process 4 or 6. Refer to LT-133, "Removal and Installation of Height Sensor" or LT-132, "Removal and Installation of Front Combination Lamp".

NG >> Repair harness or connector.

AFS Operation Check (Function Test)

INFOID:0000000004160400

1. CHECK SWIVEL ACTUATOR

CONSULT-III ACTIVE TEST

1. Start engine and turn lighting switch to 2ND position.
2. Select “LOW BEAM TEST RIGHT” or “LOW BEAM TEST LEFT” of ADAPTIVE LIGHT active test item.
3. Touch “ORIGIN–FAST/SLOW” and “PEAK–FAST/SLOW” screen.
4. Make sure of swivel operation.

TEST ITEM	ORIGIN	PEAK	Light axis range at 10 m (394.7 in) off (Reference value)
LOW BEAM TEST RIGHT	Swivel angle 0°	Swivel angle 7° to 13°	Approx. 1.200 to 2.300 mm (47 to 91 in)
LOW BEAM TEST LEFT	Swivel angle 0°	Swivel angle 17° to 23°	Approx. 3.000 to 4.200 mm (118 to 165 in)

OK or NG

OK >> GO TO 2.
NG >> • When interference or poor fitment is found, perform aiming adjustment. Refer to LT-30, "Aiming Adjustment". If it is normal, replace headlamp. Refer to LT-132, "Removal and Installation of Front Combination Lamp".
• When the operation range is irregular, perform aiming adjustment. Refer to LT-30, "Aiming Adjustment". If it is normal, GO TO 3.

2.CHECK STEERING ANGLE SENSOR

CONSULT-III DATA MONITOR
Check “STR ANGLE SIG” in “Data Monitor” when driving straight and steering turn 90° to right or left.

Steering condition	STR ANGLE SIG (Data monitor)
Driving straight	– 5.0 ° to + 5.0°
Turn 90° to right	Approx. + 90°
Turn 90° to left	Approx. – 90°

OK or NG

OK >> GO TO 3.
NG >> • When steering is out of range while driving straight, perform steering angle sensor adjustment. Refer to BRC-8, "Adjustment of Steering Angle Sensor Neutral Position" in “ON-VEHICLE SERVICE”.
• When the function is normal while driving straight but the displayed value is different from actual steering position with turning to right or left, replace steering angle sensor. Refer to LT-132, "Removal and Installation of Steering Angle Sensor".

3.CHECK SWIVEL ACTUATOR AND AFS CONTROL UNIT

CONSULT-III DATA MONITOR
Check “SWVL SEN RH/LH” and “SWVL ANGLE RH/LH” in “Data Monitor” with steering turning to right or left under swivel operative condition.

TEST ITEM	Turn 180° or more to left	Turn 180° or more to right
• SWVL SEN RH • SWVL ANGLE RH	Approx. 0°	7° to 13°
• SWVL SEN LH • SWVL ANGLE LH	17° to 23°	Approx. 0°

NOTE:
The angle can be slightly different between the displayed value on “SWVL SEN” and that on “SWVL ANGLE” even when AFS operation is normal.

OK or NG

OK >> AFS function is normal.
NG >> • When the difference is 4.5° or more between the displayed value on “SWVL ANGLE” and that on “SWVL SEN”, replace headlamp.
• When the displayed angle on “SWVL ANGLE” is irregular, replace AFS control unit.

Auto Aiming Operation Check (Function Test)

INFOID:0000000004160401

1.CHECK AIMING MOTOR

CONSULT-III ACTIVE TEST
1. Start engine and turn lighting switch to 2ND position.
2. Select “LEVELIZER TEST” of ADAPTIVE LIGHT active test item.
3. Touch “ORIGIN” and “PEAK” screen.
4. Make sure of auto aiming operation.

TEST ITEM	ORIGIN	PEAK (Reference value)	Light axis range at 10 m (393.7 in) off (Reference value)
LEVELIZER TEST	Light axis angle 0°	Light axis angle approx. 2.5°	Approx. 450 mm (17.7 in)

OK or NG

OK >> GO TO 2.

NG >> • When interference or poor fitment is found, perform aiming adjustment. Refer to LT-30, "Aiming Adjustment". If it is normal, replace headlamp. Refer to LT-132, "Removal and Installation of Front Combination Lamp".
• When the operation range is irregular, perform aiming adjustment. Refer to LT-30, "Aiming Adjustment". If it is normal, GO TO 4.

2. PERFORM STATE LEVELIZER ADJUSTMENT 1

CONSULT-III DATA MONITOR

Check “LEV ACTR VLTG” in “Data Monitor” with unloaded vehicle position. (Remove all loads in driver, passenger and trunk rooms.)

TEST ITEM	Unloaded vehicle position
LEV ACTR VLTG	Approx. 70%

OK or NG

OK >> GO TO 3.

NG >> Perform LEVELIZER ADJUSTMENT. Refer to LT-99, "CONSULT-III Function (ADAPTIVE LIGHT)".

3. PERFORM STATE LEVELIZER ADJUSTMENT 2

CONSULT-III DATA MONITOR

Check if “LEV ACTR VLTG” changes approx. 3 seconds after lowering vehicle height as low as approx. –0.5V from the value of “HI SEN OTP RR” in “Data Monitor” at unloaded vehicle position. (Remove all loads in driver, passenger and trunk rooms.)

OK or NG

OK >> GO TO 4.

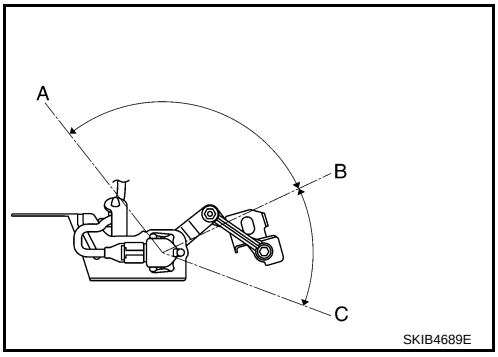
NG >> Perform LEVELIZER ADJUSTMENT. Refer to LT-99, "CONSULT-III Function (ADAPTIVE LIGHT)".

4. CHECK HEIGHT SENSOR SIGNAL AND AIMING MOTOR DRIVE SIGNAL

CONSULT-III DATA MONITOR

Remove height sensor link bracket mounting nuts (rear stabilizer side). For details, refer to LT-133, "Removal and Installation of Height Sensor". Change sensor angle from the basic point of sensor angle 0° (standard position) and check “HI SEN OTP RR” and “LEV ACTR VLTG” of “Data Monitor”.

	Sensor angle	Vehicle height
A	Approx. –103° (Link stopper angle)	Low side
B	0° (Standard position)	Unloaded vehicle position
C	Approx. 46° (Link stopper angle)	High side



With 18-inch wheel

	Sensor angle	"HI SEN OTP RR"	"LEV ACTR VLTG"	Light axis range at 10 m (393.7 in) off (Reference value)
Limit value of vehicle height (high side)	Approx. 45°	Approx. 4.5 V	Approx. 70.0%	—
Maximum angle of auto aiming operation[NOTE1] (Unloaded vehicle position)	Approx. 0°	Approx. 2.5 V	Approx. 70.0%	0
Minimum angle of auto aiming operation[NOTE1] (Maximum laden condition)	Approx. –35°	Approx. 1.0 V[NOTE2]	Approx. 38.0%	Approx. 200 mm (7.9 in)
Limit value of vehicle height (low side)	Approx. –45°	Approx. 0.5 V	Approx. 38.0%	—

NOTE:

1. Reference value. The value can be different from that of sensor angle and HI SEN OTP RR of maximum/minimum angle of auto aiming operation depending on LEVELIZER ADJUSTMENT state.
2. Reference value. Approx. –1.5 V from the LEVELIZER ADJUSTMENT value.

With 19-inch wheel

	Sensor angle	"HI SEN OTP RR"	"LEV ACTR VLTG"	Light axis range at 10 m (393.7 in) off (Reference value)
Limit value of vehicle height (high side)	Approx. 45°	Approx. 4.5 V	Approx. 70.0%	—
Maximum angle of auto aiming operation[NOTE1] (Unloaded vehicle position)	Approx. 0°	Approx. 2.5 V	Approx. 70.0%	0
Minimum angle of auto aiming operation[NOTE1] (Maximum laden condition)	Approx. –27°	Approx. 1.3 [NOTE2]	Approx. 41.8%	Approx. 180 mm (7.1 in)
Limit value of vehicle height (low side)	Approx. –45°	Approx. 0.5 V	Approx. 41.8%	—

NOTE:

1. Reference value. The value can be different from that of sensor angle and HI SEN OTP RR of maximum/minimum angle of auto aiming operation depending on LEVELIZER ADJUSTMENT state.
2. Reference value. Approx. –1.2 V from LEVELIZER ADJUSTMENT value.

OK or NG

OK >> Auto aiming operation function is normal.

NG >>
- When approx. 4.5 V or 0.5 V is not displayed on "HI SEN OTP RR" screen with sensor angle approx. 45° or –45°, check connector for connection, bend and loose fit. If it is normal, replace height sensor. Refer to LT-133, "Removal and Installation of Height Sensor".
- When "HI SEN OTP RR" value is normal but "LEV ACTR VLTG" value differs from maximum/minimum angle of auto aiming operation, replace AFS control unit. Refer to LT-132, "Removal and Installation of AFS Control Unit".
- When "LEV ACTR VLTG" value is normal but operation range is irregular, check aiming motor system circuit. Refer to LT-129, "Auto Aiming Does Not Operate (Check Aiming Motor System Circuit)".

AFS Switch Does Not Operate

INFOID:0000000004160402

1.CHECK AFS SWITCH SIGNAL 1

CONSULT-III DATA MONITOR

1. Turn ignition switch ON.
2. Select "AFS SW" of ADAPTIVE LIGHT data monitor item.
3. With operating the AFS switch, check the monitor status.

OK or NG

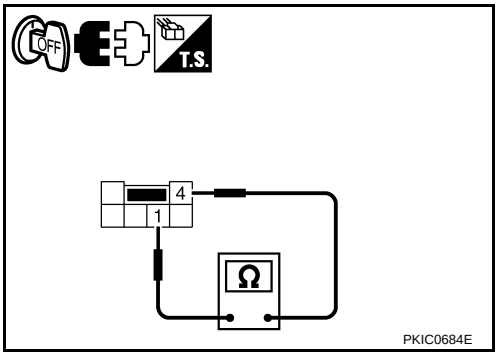
OK >> Replace AFS control unit. Refer to LT-132, "Removal and Installation of AFS Control Unit".

NG >> GO TO 2.

2.CHECK AFS SWITCH

1. Turn ignition switch OFF.
2. Disconnect AFS switch connector.

3. Check continuity AFS switch.



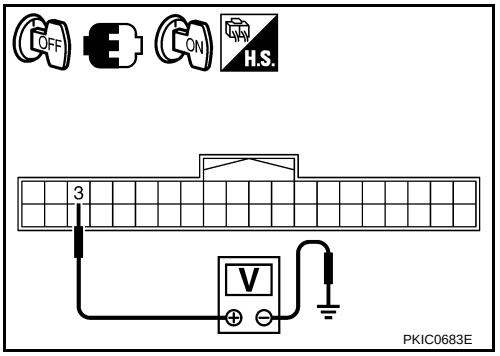
AFS switch		Condition	Continuity
Terminal			
1	4	AFS switch is ON.	No
		AFS switch is OFF.	Yes

OK or NG

OK >> GO TO 3.
NG >> Replace AFS switch. Refer to LT-133, "Removal and Installation of AFS Switch".

3.CHECK AFS SWITCH SIGNAL 2

1. Connect AFS switch connector.
2. Turn ignition switch ON.
3. Check voltage between AFS control unit harness connector and ground according to AFS switch operation.



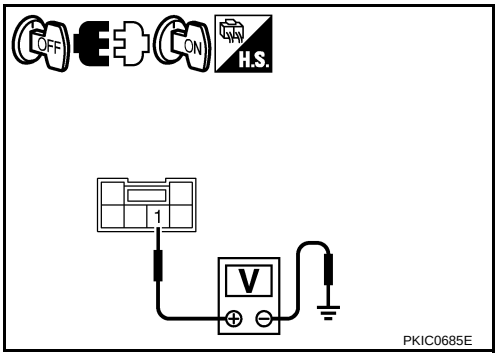
(+)		(–)	Condition	Voltage (Approx.)
AFS control unit connector	Terminal			
F110	3	Ground	AFS switch is ON.	0 V
			AFS switch is OFF.	Battery voltage

OK or NG

OK >> Replace AFS control unit. Refer to LT-132, "Removal and Installation of AFS Control Unit".
NG >> If voltage is approx. 0 V and stays unchanged, GO TO 4.
>> If voltage is battery voltage and stays unchanged, GO TO 6.

4.CHECK AFS SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect AFS switch connector.
3. Turn ignition switch ON.
4. Check voltage between AFS switch harness connector and ground.



Terminals			Voltage (Approx.)
(+)		(–)	
AFS switch connector	Terminal		
M96	1	Ground	Battery voltage

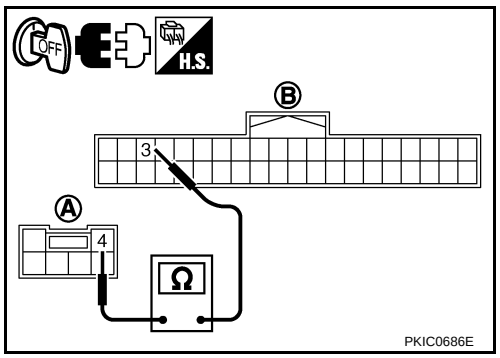
OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

5.CHECK AFS SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect AFS control unit connector.

3. Check continuity between AFS switch harness connector (A) and AFS control unit harness connector (B).



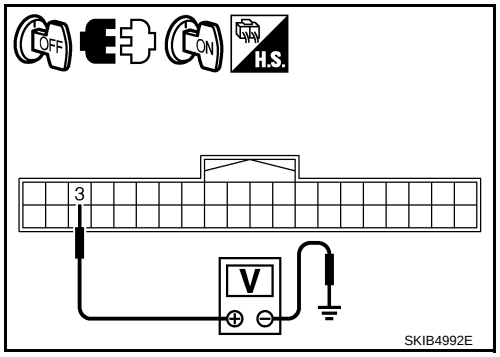
A		B		Continuity
Connector	Terminal	Connector	Terminal	
M96	4	F110	3	Yes

OK or NG

OK >> Check connector for connection, bend and loose fit.
NG >> Repair harness or connector.

6. CHECK AFS SWITCH CIRCUIT (IGN POWER SUPPLY SHORT CIRCUIT)

1. Turn ignition switch OFF.
2. Disconnect AFS control unit connector and AFS switch connector.
3. Turn ignition switch ON.
4. Check voltage between AFS control unit harness connector and ground.



Terminals			Voltage (Approx.)
(+)		(–)	
AFS control unit connector	Terminal		
F110	3	Ground	Battery voltage

OK or NG

OK >> Replace AFS control unit. Refer to LT-132, "Removal and Installation of AFS Control Unit".
NG >> Repair harness or connector.

Auto Aiming Does Not Operate (Check Aiming Motor System Circuit)

INFOID:0000000004160403

1. CHECK AIMING MOTOR

CONSULT-III ACTIVE TEST

1. Start engine and turn lighting switch to 2ND position.
2. Select “LEVELIZER TEST” of ADAPTIVE LIGHT active test item.
3. Touch “ORIGIN” or “PEAK” screen.
4. Make sure of aiming motor operation.

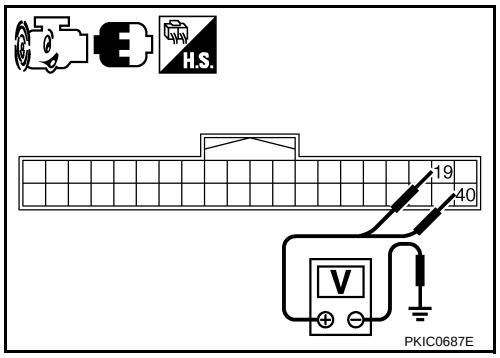
OK or NG

OK >> Replace AFS control unit. Refer to LT-132, "Removal and Installation of AFS Control Unit".
NG >> GO TO 2.

2. CHECK AIMING MOTOR DRIVE SIGNAL

CONSULT-III ACTIVE TEST

1. Start engine and turn lighting switch to 2ND position.
2. Select “LEVELIZER TEST” of ADAPTIVE LIGHT active test item.
3. Touch “ORIGIN” or “PEAK” screen.
4. Check voltage between AFS control unit harness connector and ground.



(+)			(–)	Condition	Voltage (Approx.)
AFS control unit connector		Terminal			
RH	F110	19	Ground	ORIGIN	10.6 V
				PEAK	1.9 V
LH		40		ORIGIN	10.6 V
				PEAK	1.9 V

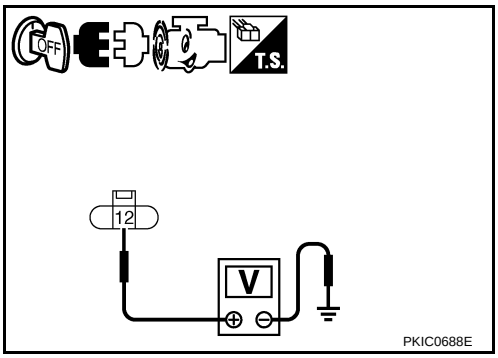
OK or NG

OK >> GO TO 3.
NG >> GO TO 6.

3.CHECK AIMING MOTOR DRIVE SIGNAL CIRCUIT

CONSULT-III ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Start engine and turn lighting switch to 2ND position.
4. Select “LEVELIZER TEST” of ADAPTIVE LIGHT active test item.
5. Touch “ORIGIN” or “PEAK” screen.
6. Check voltage between front combination lamp (LH and RH) harness connector and ground.



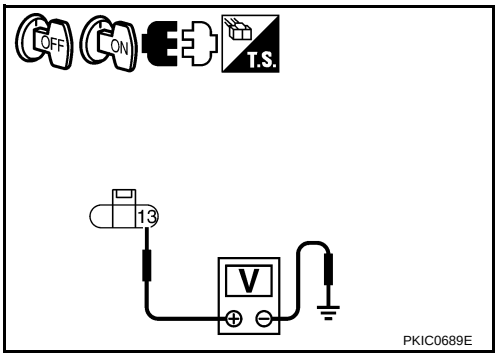
(+)			(–)	Condition	Voltage (Approx.)
Front combination lamp connector		Terminal			
RH	E70	12	Ground	ORIGIN	10.6 V
				PEAK	1.9 V
LH	E71	12		ORIGIN	10.6 V
				PEAK	1.9 V

OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

4.CHECK AIMING MOTOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Turn ignition switch ON.
3. Check voltage between front combination lamp (RH and LH) harness connector and ground.



(+)			(–)	Voltage (Approx.)
Front combination lamp connector		Terminal		
RH	E70	13	Ground	Battery voltage
LH	E71	13		

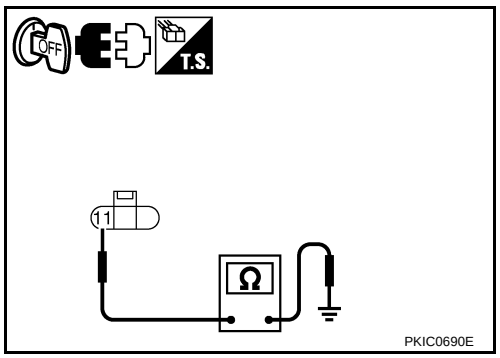
OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

5.CHECK AIMING MOTOR GROUND

1. Turn ignition switch OFF.

2. Check continuity between front combination lamp (RH and LH) harness connector and ground.



Front combination lamp connector		Terminal	Ground	Continuity
RH	E70	11		Yes
LH	E71	11		

OK or NG

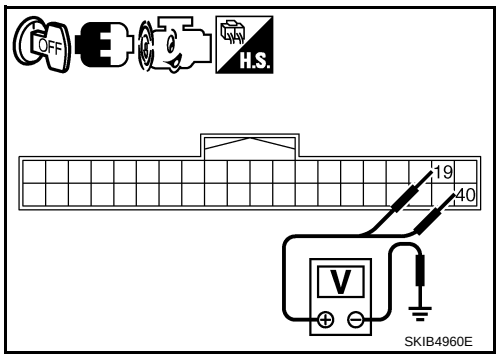
OK >> Replace front combination lamp RH and LH (aiming motor malfunction). Refer to LT-132, "Removal and Installation of Front Combination Lamp".

NG >> Repair harness or connector.

6. CHECK AIMING MOTOR DRIVE SIGNAL CIRCUIT

CONSULT-III ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH connector.
3. Start engine and turn lighting switch to 2ND position.
4. Select “LEVELIZER TEST” of ADAPTIVE LIGHT active test item.
5. Touch “ORIGIN” or “PEAK” screen.
6. Check voltage between AFS control unit harness connector and ground.



(+)			(–)	Condition	Voltage (Approx.)
AFS control unit connector		Terminal			
RH	F110	19	Ground	ORIGIN	10.6 V
				PEAK	1.9 V
LH		40		ORIGIN	10.6 V
				PEAK	1.9 V

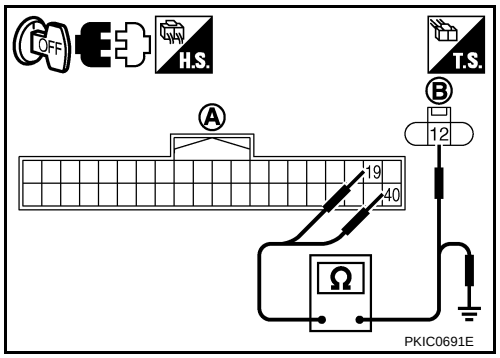
OK or NG

OK >> Replace front combination lamp RH and LH (aiming motor malfunction). Refer to LT-132, "Removal and Installation of Front Combination Lamp".

NG >> GO TO 7.

7. CHECK AIMING MOTOR DRIVE SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect AFS control unit connector.
3. Check continuity between AFS control unit harness connector (A) and front combination lamp (LH or RH) harness connector (B).



Circuit	A		B		Continuity
	Connector	Terminal	Connector	Terminal	
RH	F110	19	E70	12	Yes
LH		40	E71	12	

4. Check continuity between AFS control unit harness connector (A) and ground.

A		Ground	Continuity
Connector	Terminal		
F110	19		No
	40		

OK or NG

OK >> Replace AFS control unit. Refer to LT-132, "Removal and Installation of AFS Control Unit".
NG >> Repair harness or connector.

AFS OFF Indicator Does Not Operate

INFOID:0000000004160404

1.CHECK DIAGNOSIS RESULT (AFS CONTROL UNIT)

Select “ADAPTIVE LIGHT” on CONSULT-III. Select “SELF-DIAG RESULTS” on “SELECT DIAG MODE” screen.

Is DTC detected?

YES >> Refer to LT-99, "CONSULT-III Function (ADAPTIVE LIGHT)".
NO >> GO TO 2.

2.CHECK DIAGNOSIS RESULT (UNIFIED METER AND A/C AMP.)

Select “METER A/C AMP” on CONSULT-III. Select “SELF-DIAG RESULTS” on “SELECT DIAG MODE” screen.

Is DTC detected?

YES >> Refer to DI-28, "CONSULT-III Function (METER/M&A)".
NO >> GO TO 3.

3.CHECK AFS OFF INDICATOR SIGNAL (UNIFIED METER AND A/C AMP.)

CONSULT-III DATA MONITOR
1. Select “AFS OFF IND”of METER A/C AMP data monitor item.
2. With operating the AFS switch, check the monitor status.

Condition	“AFS OFF IND”
AFS switch is OFF.	On
AFS switch is ON.	Off

OK or NG

OK >> Replace combination meter.
NG >> Replace unified meter and A/C amp.

Removal and Installation of Steering Angle Sensor

INFOID:0000000004160405

Refer to BRC-65.

Removal and Installation of Front Combination Lamp

INFOID:0000000004160406

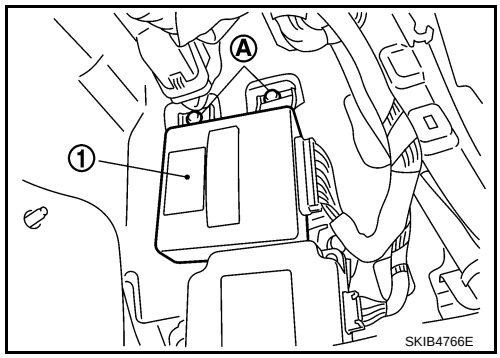
Refer to LT-33, "Removal and Installation".

Removal and Installation of AFS Control Unit

INFOID:0000000004160407

REMOVAL

1. Remove dash side finisher RH. Refer to EI-49.
2. Remove screw (A).
3. Disconnect AFS control unit connector.
4. Remove AFS control unit (1).



INSTALLATION

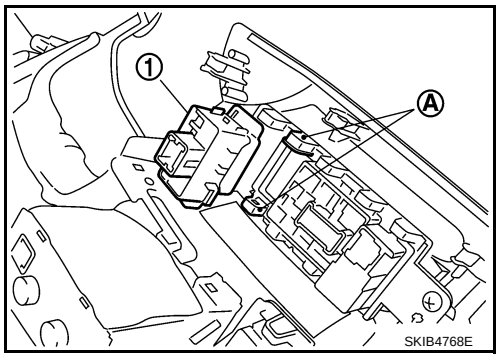
Installation is the reverse order of removal.

Removal and Installation of AFS Switch

INFOID:0000000004160408

REMOVAL

1. Remove instrument lower driver panel. Refer to IP-12.
2. Press AFS switch fixing pawls (A), And remove AFS switch (1) from instrument lower driver panel.



INSTALLATION

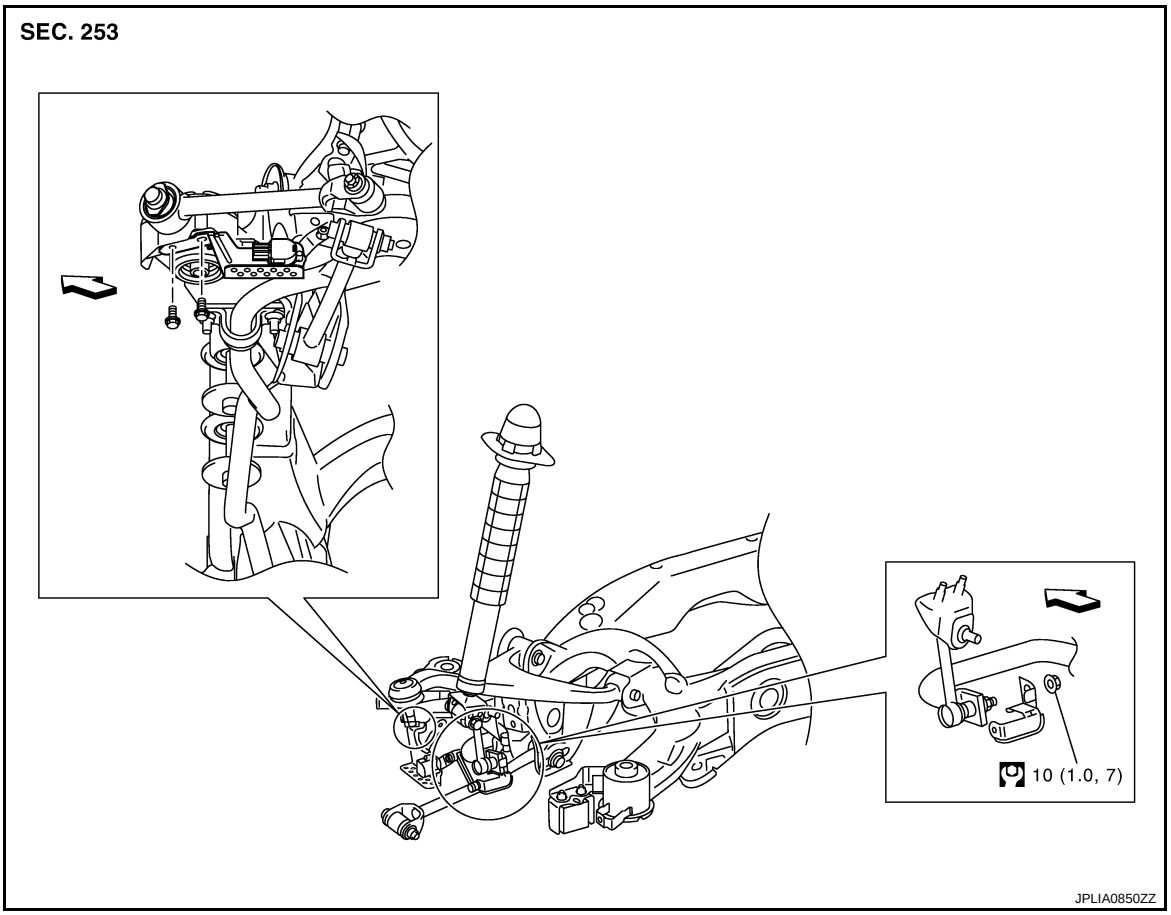
Installation is the reverse order of removal.

Removal and Installation of Height Sensor

INFOID:0000000004160409

REMOVAL

1. Disconnect height sensor connector.
2. Remove height sensor link bracket mounting nut. (rear stabilizer side)
   CAUTION:
   Never remove from the installation nut of height sensor link bracket (height sensor link side).
3. Remove bolts, and remove height sensor.



⇦ :Vehicle front

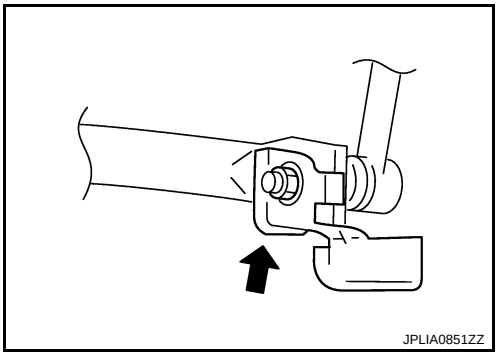
Refer to GI-9, "Component" for symbols in the figure.

INSTALLATION

Installation is the reverse order of removal.

CAUTION:

Tighten the bracket while pushing onto rear stabilizer when installing the installation nut of height sensor link bracket (stabilizer side).



⇦ :Presses

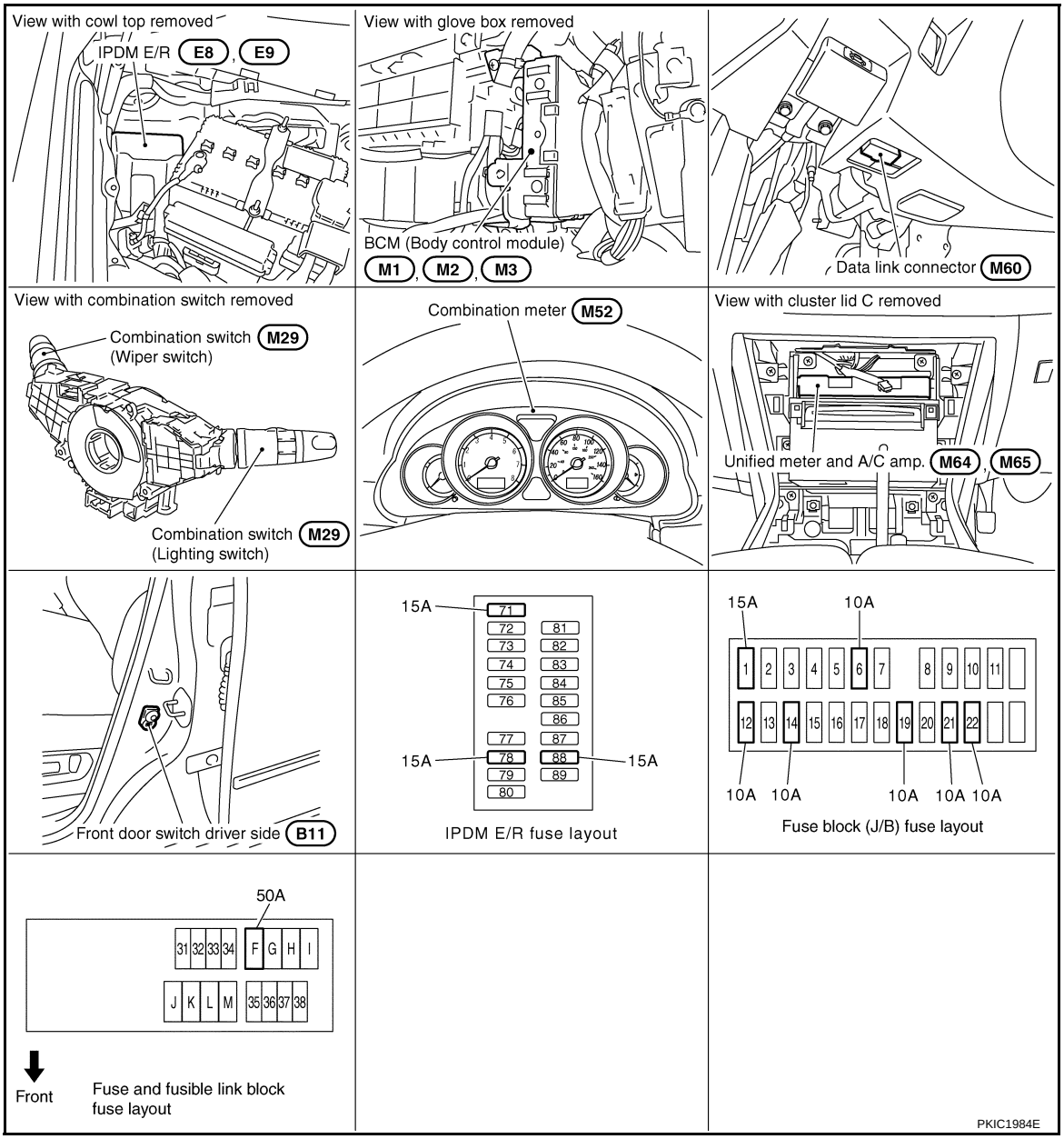
NOTE:

Adjust levelizer when replacing height sensor. For details, refer to LT-99, "CONSULT-III Function (ADAPTIVE LIGHT)".

FRONT FOG LAMP

Component Parts and Harness Connector Location

INFOID:0000000004160410



System Description

INFOID:0000000004160411

The control of the fog lamps is dependent upon the position of the combination switch (lighting switch). The lighting switch must be in the 2ND position or AUTO position (headlamp is ON) for front fog lamp operation. When the lighting switch is placed in fog lamp position, the BCM (body control module) receives input signal requesting the fog lamps to illuminate. When the headlamps are illuminated, this input signal is communicated to the IPDM E/R (intelligent power distribution module engine room) across the CAN communication lines. The CPU (central processing unit) located in the IPDM E/R controls the front fog lamp relay coil. When activated, this relay directs power to the front fog lamps.

OUTLINE

Power is supplied at all times
- through 15A fuse (No. 88, located in IPDM E/R)
- to front fog lamp relay, located in IPDM E/R,
- through 15A fuse (No. 78, located in IPDM E/R)
- to CPU, located in IPDM E/R,

• through 15A fuse (No. 71, located in IPDM E/R)
• to CPU, located in IPDM E/R,
• through 50A fusible link (letter F, located in fuse fusible link and relay block)
• to BCM terminal 55,
• through 10A fuse [No. 21, located in fuse block (J/B)]
• to BCM terminal 42, and
• to combination meter terminal 23,
• through 10A fuse [No. 19, located in fuse block (J/B)]
• to unified meter and A/C amp. terminal 54,
• through 10A fuse [No. 22, located in fuse block (J/B)]
• to key slot terminal 1.

With the ignition switch in the ON or START position, power is supplied
• to CPU, located in IPDM E/R,
• through 15A fuse [No. 1, located in fuse block (J/B)]
• to BCM terminal 38,
• through 10A fuse [No. 14, located in fuse block (J/B)]
• to combination meter terminal 12,
• through 10A fuse [No. 12, located in fuse block (J/B)]
• to unified meter and A/C amp. terminal 53.

With the ignition switch in the ACC or ON position, power is supplied
• through 10A fuse [No. 6, located in fuse block (J/B)]
• to BCM terminal 11.

Ground is supplied
• to BCM terminal 52
• to combination meter terminals 9, 10 and 11
• to unified meter and A/C amp. terminals 55 and 71
• to push-button ignition switch (push switch) terminal 1
• to key slot terminal 8
• through grounds M16 and M70,
• to IPDM E/R terminals 38 and 51
• through grounds E22 and E43.

FOG LAMP OPERATION

The fog lamp switch is built in combination switch. The lighting switch must be in 2ND position or AUTO position (headlamp is ON) and fog lamp switch must be ON for fog lamp operation.

With the fog lamp switch in the ON position, the CPU located in IPDM E/R grounds coil side of the fog lamp relay. Fog lamp relay then directs power
• through IPDM E/R terminal 37
• to front fog lamp RH terminal 1,
• through IPDM E/R terminal 36
• to front fog lamp LH terminal 1.

Ground is supplied
• to front fog lamp RH terminal 2
• through grounds E22 and E43,
• to front fog lamp LH terminal 2
• through grounds E22 and E43.

With power and grounds supplied, the front fog lamps illuminate.

The unified meter and A/C amp. that received the front fog lamp request signal by BCM across the CAN communication makes a front fog lamp indicator lamp turn on in combination meter.

COMBINATION SWITCH READING FUNCTION

Refer to BCS-4, "System Description".

EXTERIOR LAMP BATTERY SAVER CONTROL

When the combination switch (lighting switch) is in the 2ND position (ON), and the ignition switch is turned from ON or ACC to OFF, the battery saver control function is activated.

Under this condition, the headlamps remain illuminated for 5 minutes, then the headlamps are turned off.

Exterior lamp battery saver control mode can be changed by the function setting of CONSULT-III.

CAN Communication System Description

INFOID:0000000004160412

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many elec-

tronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

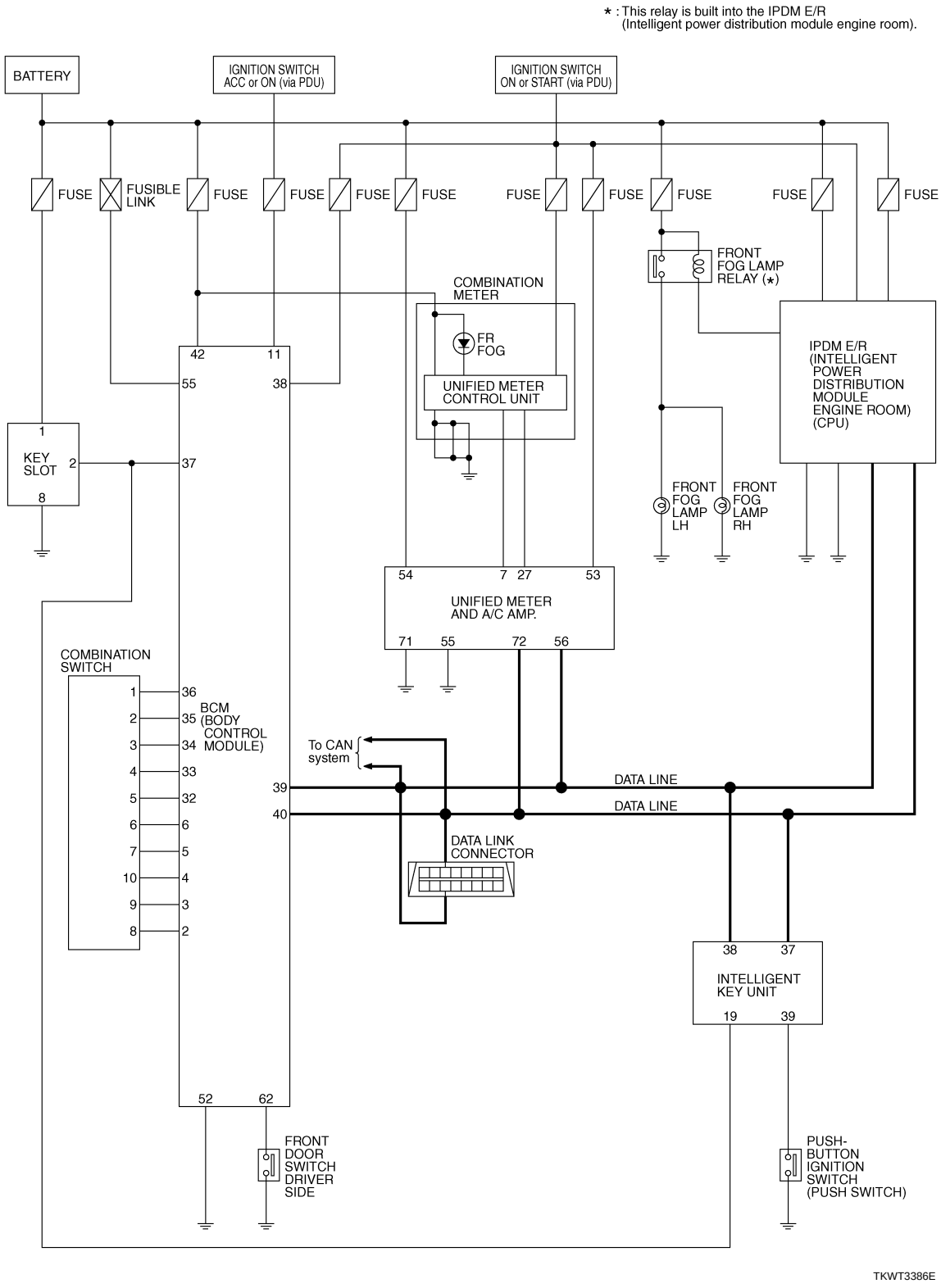
CAN Communication Unit

INFOID:0000000004160413

Refer to LAN-11, "System Description".

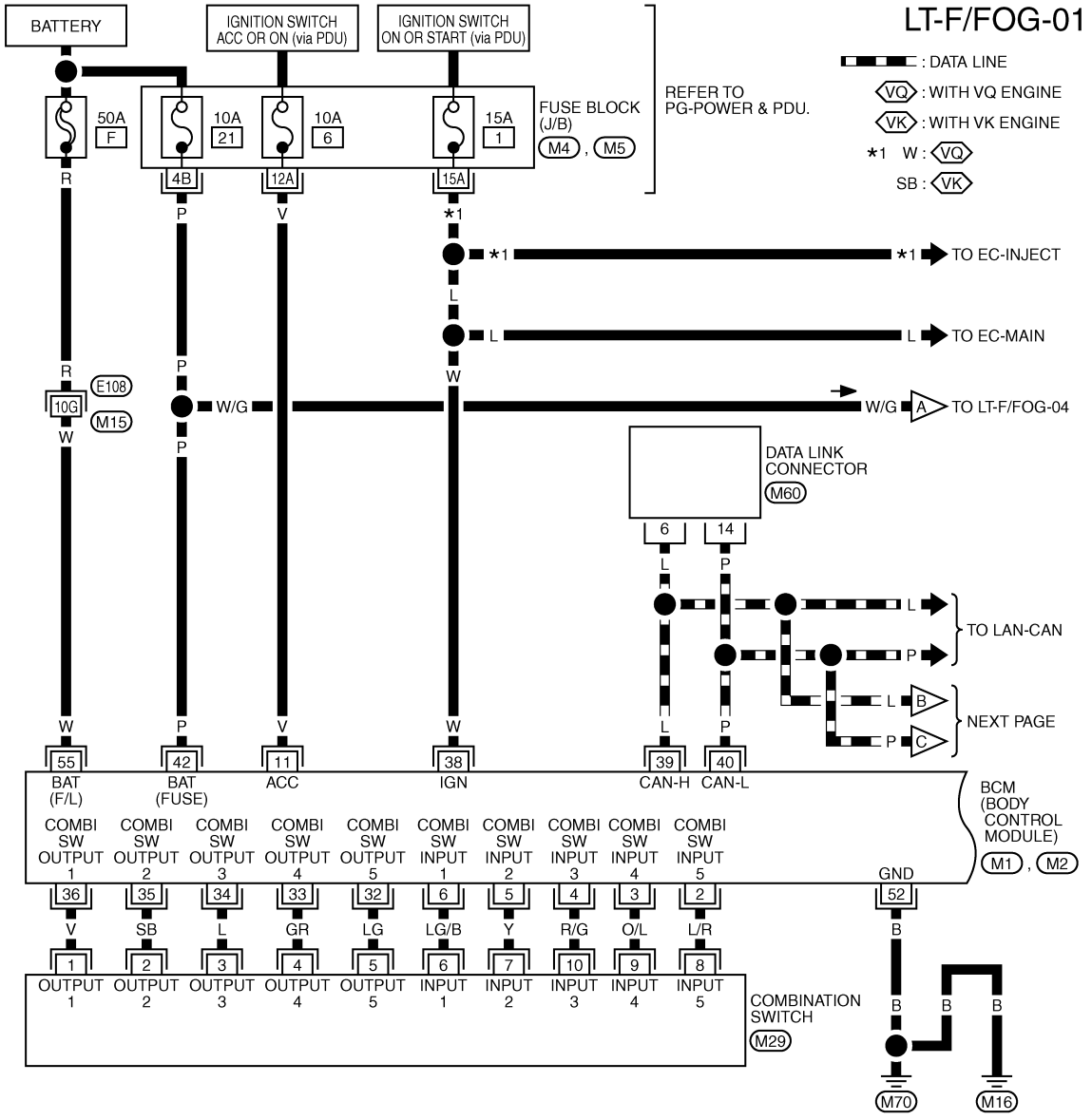
Schematic

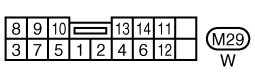
INFOID:0000000004160414

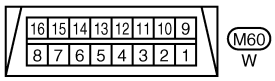


Wiring Diagram - F/FOG -

INFOID:0000000004160415

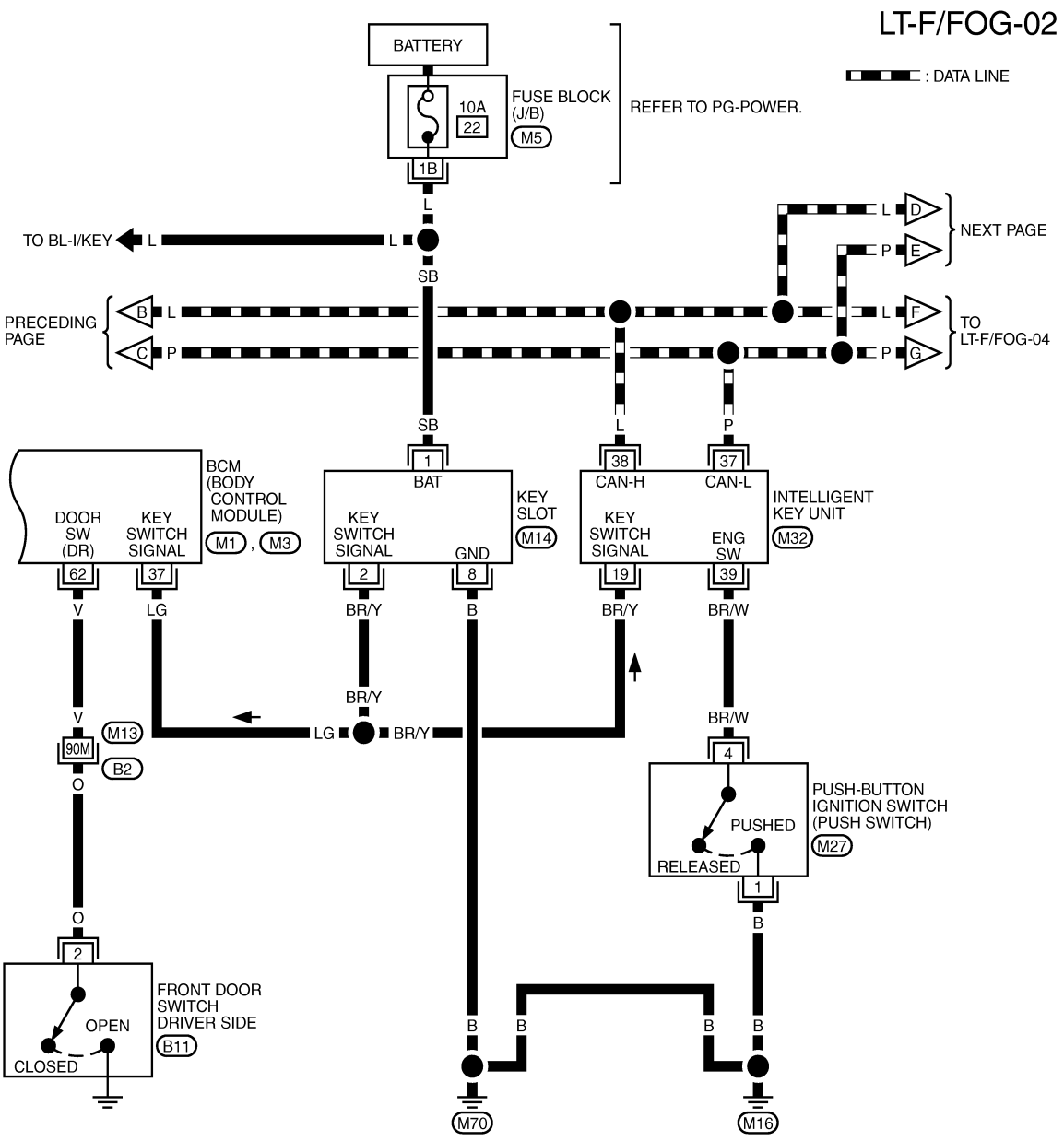




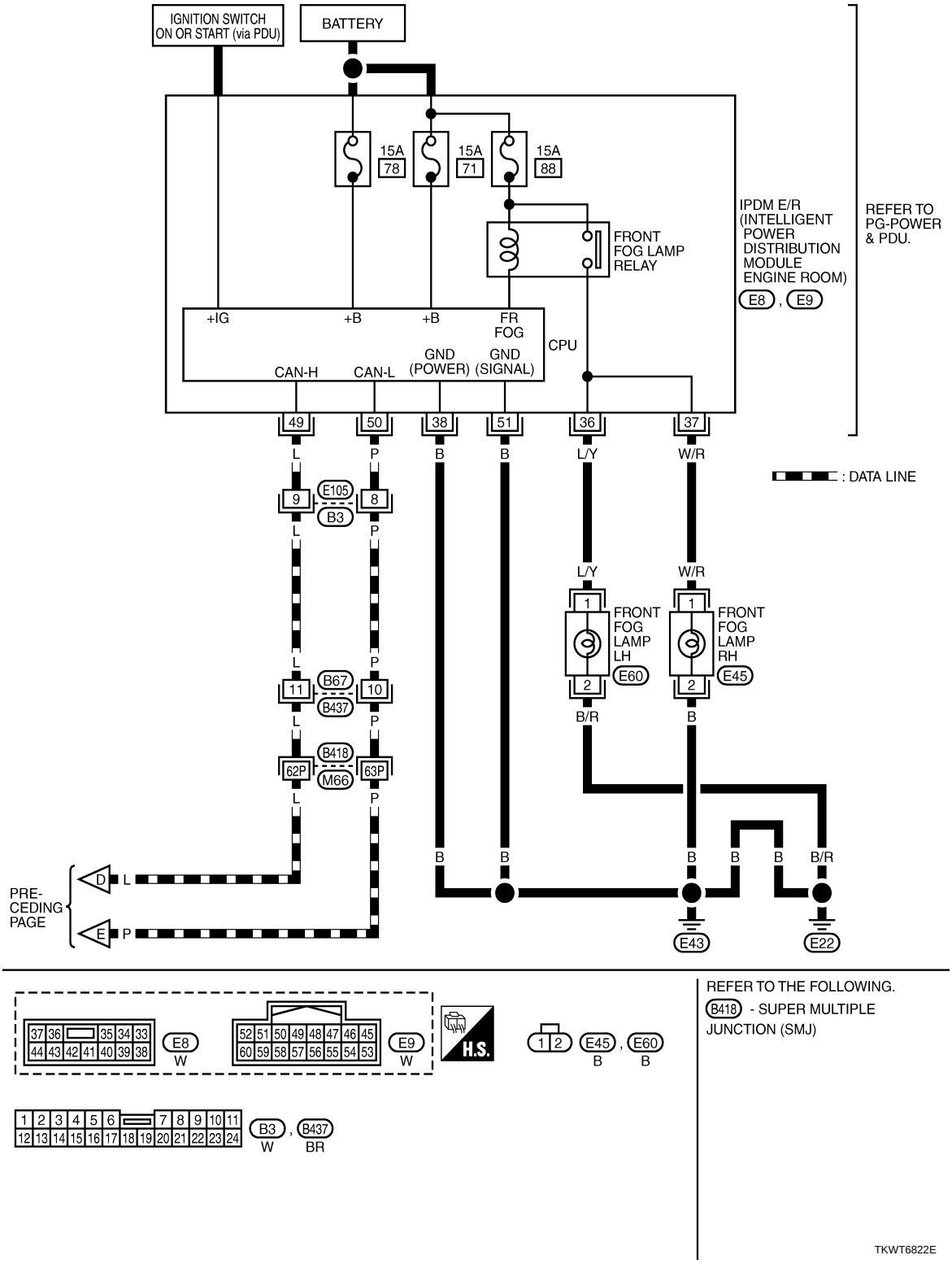


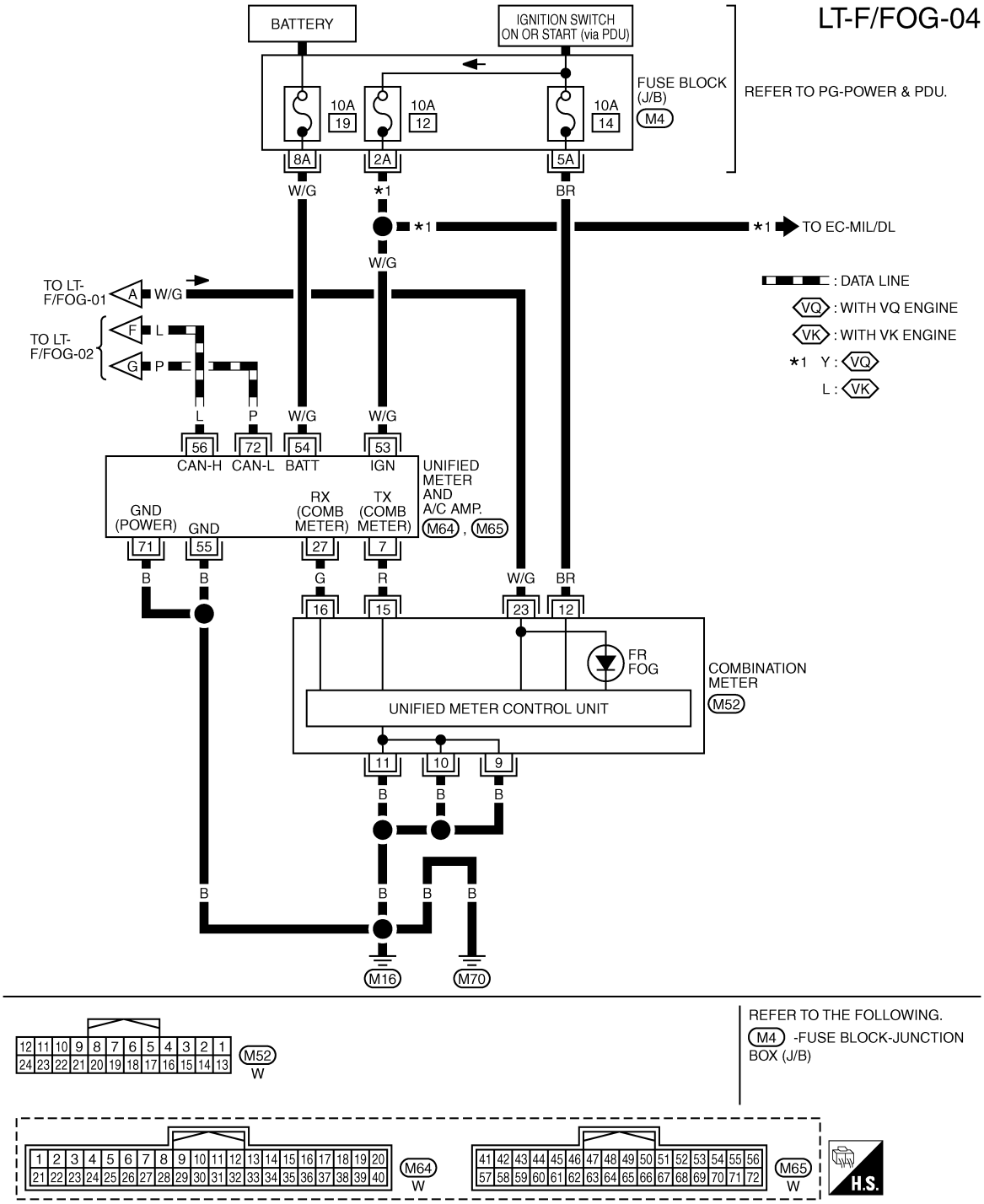
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , M5 -FUSE BLOCK-JUNCTION BOX (J/B)
M1 , M2 -ELECTRICAL UNITS

TKWT8207E


LT-F/FOG-02
: DATA LINE
BATTERY
10A
22
FUSE BLOCK
(J/B)
M5
1B
REFER TO PG-POWER.
TO BL-I/KEY
L
SB
NEXT PAGE
PRECEDING
PAGE
TO
LT-F/FOG-04
BCM
(BODY
CONTROL
MODULE)
M1 , M3
DOOR
SW
(DR)
KEY
SWITCH
SIGNAL
62
37
BAT
KEY
SLOT
M14
GND
2
8
CAN-H
CAN-L
INTELLIGENT
KEY UNIT
M32
ENG
SW
19
39
V
LG
BR/Y
B
BR/W
M13
90M
B2
PUSH-BUTTON
IGNITION SWITCH
(PUSH SWITCH)
M27
PUSHED
RELEASED
4
1
FRONT DOOR
SWITCH
DRIVER SIDE
B11
OPEN
CLOSED
M70
M16
M14
W
M27
BR
M32
W
H.S.
B11
W
REFER TO THE FOLLOWING.
B2 - SUPER MULTIPLE
JUNCTION (SMJ)
M5 - FUSE BLOCK-JUNCTION
BOX (J/B)
M1 , M3 - ELECTRICAL
UNITS
TKWT6821E

LT-F/FOG-03


IGNITION SWITCH ON OR START (via PDU)
BATTERY
15A 78
15A 71
15A 88
FRONT FOG LAMP RELAY
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
E8 , E9
REFER TO PG-POWER & PDU.
+IG
+B
+B
FR FOG
CPU
CAN-H
CAN-L
GND (POWER)
GND (SIGNAL)
49
50
38
51
36
37
L
P
B
B
L/Y
W/R
: DATA LINE
9
E105
B3
8
11
B67
B437
10
62P
B418
M66
63P
FRONT FOG LAMP LH
E60
FRONT FOG LAMP RH
E45
1
2
B/R
B
PRE-CEDING PAGE
D
E
E43
E22
REFER TO THE FOLLOWING.
B418 - SUPER MULTIPLE JUNCTION (SMJ)
E8
W
E9
W
H.S.
E45 , E60
B
B
B3 , B437
W
BR
TKWT6822E



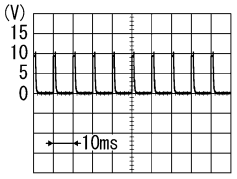
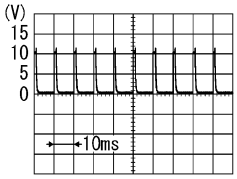
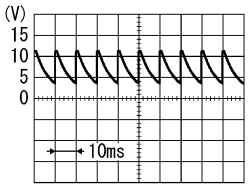
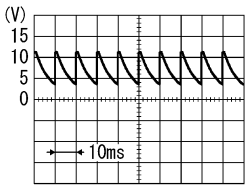
TKWT8208E

Terminal and Reference Value for BCM

INFOID:0000000004160416

CAUTION:

- **Check combination switch system terminal waveform under the loaded condition with lighting switch, turn signal switch and wiper switch OFF not to be fluctuated by overloaded.**
- **Turn wiper dial position to 4 except when checking waveform or voltage of wiper dial position. Wiper dial position can be confirmed on CONSULT-III. Refer to LT-174, "CONSULT-III Functions (BCM - COMB SW)".**

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
3	O/L	Combination switch input 4	ON	Lighting, turn, wiper switch (Wiper dial position 4)	Front fog lamp switch ON (Operates only front fog lamp switch)	 PKIB4955J Approx. 0.8 V
					OFF	Approx. 0 V
11	V	Ignition switch (ACC)	ACC	—		Battery voltage
32	LG	Combination switch output 5	ON	Lighting, turn, wiper switch (Wiper dial position 4)	Front fog lamp switch ON (Operates only front fog lamp switch)	 PKIB4956J Approx. 1.0 V
					OFF	 PKIB4960J Approx. 7.0 - 7.5 V
37	LG	Key switch signal	OFF	Intelligent Key is inserted into key slot.		Battery voltage
				Intelligent Key is removed from key slot.		Approx. 0 V
38	W	Ignition switch (ON)	ON	—		Battery voltage
39	L	CAN – H	—	—		—
40	P	CAN – L	—	—		—
42	P	Battery power supply	OFF	—		Battery voltage
52	B	Ground	ON	—		Approx. 0 V
55	W	Battery power supply	OFF	—		Battery voltage
62	V	Front door switch driver side signal	OFF	Front door switch driver side	ON (open)	Approx. 0 V
					OFF (closed)	 PKIB4960J Approx. 7.5 - 8.0 V

Terminal and Reference Value for IPDM E/R

INFOID:0000000004160417

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
36	L/Y	Front fog lamp (LH)	ON	Lighting switch must be in the 2ND position or AUTO position (headlamp is ON)	Front fog lamp switch: OFF	Approx. 0 V
					Front fog lamp switch: ON	Battery voltage
37	W/R	Front fog lamp (RH)	ON	Lighting switch must be in the 2ND position or AUTO position (headlamp is ON)	Front fog lamp switch: OFF	Approx. 0 V
					Front fog lamp switch: ON	Battery voltage
38	B	Ground	ON	—		Approx. 0 V
49	L	CAN – H	—	—		—
50	P	CAN – L	—	—		—
51	B	Ground	ON	—		Approx. 0 V

How to Perform Trouble Diagnosis

INFOID:0000000004160418

1. Confirm the symptom or customer complaint.
2. Understand operation description and function description. Refer to LT-135, "System Description".
3. Perform the Preliminary Check. Refer to LT-143, "Preliminary Check".
4. Check symptom and repair or replace the cause of malfunction.
5. Does the front fog lamp operate normally? If YES, GO TO 6. If NO, GO TO 4.
6. INSPECTION END

Preliminary Check

INFOID:0000000004160419

CHECK POWER SUPPLY AND GROUND CIRCUIT

1.CHECK FUSES AND FUSIBLE LINK

Check for blown fuses and fusible link.

Unit	Power source	Fuse and fusible link No.
BCM	Battery	F
		21
	Ignition switch ON or START position	1
	Ignition switch ACC or ON position	6
IPDM E/R	Battery	71
		88
		78

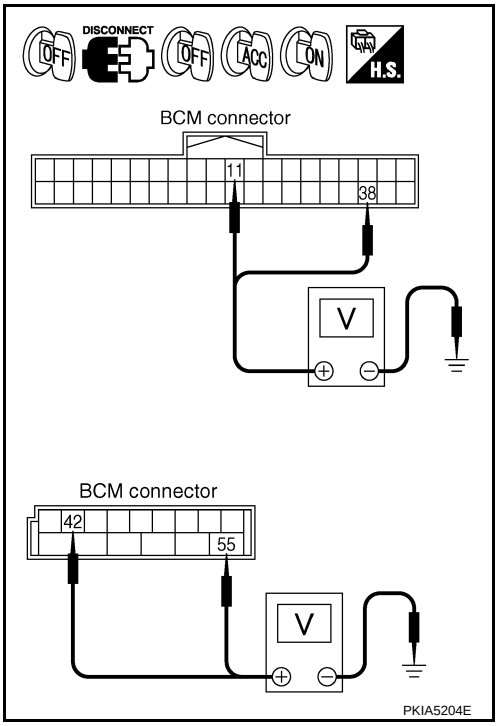
Refer to LT-138, "Wiring Diagram - F/FOG -".

OK or NG

OK >> GO TO 2.
NG >> If fuse or fusible link is blown, be sure to eliminate cause of malfunction before installing new fuse or fusible link. Refer to PG-4.

2.CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM harness connector and ground.



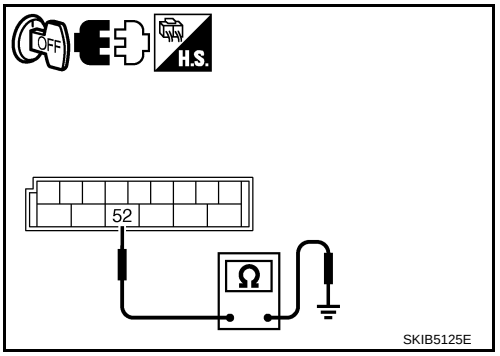
Terminal			Ignition switch position		
(+)		(–)	OFF	ACC	ON
BCM connector	Terminal				
M1	11	Ground	Approx. 0 V	Battery voltage	Battery voltage
	38		Approx. 0 V	Approx. 0 V	Battery voltage
M2	42		Battery voltage	Battery voltage	Battery voltage
	55		Battery voltage	Battery voltage	Battery voltage

OK or NG

OK >> GO TO 3.
NG >> Check harness for open or short between BCM and fuse.

3.CHECK GROUND CIRCUIT

Check continuity between BCM harness connector and ground.



BCM connector	Terminal	Ground	Continuity
M2	52		Yes

OK or NG

OK >> INSPECTION END
NG >> Check harness ground circuit.

CONSULT-III Functions (BCM - HEAD LAMP)

INFOID:0000000004160420

Refer to LT-19, "CONSULT-III Functions (BCM - HEAD LAMP)" in HEADLAMP (FOR USA) -XENON TYPE-.
Refer to LT-49, "CONSULT-III Functions (BCM - HEAD LAMP)" in HEADLAMP (FOR CANADA).

CONSULT-III Functions (IPDM E/R)

INFOID:0000000004160421

Refer to LT-20, "CONSULT-III Functions (IPDM E/R)" in HEADLAMP (FOR USA) -XENON TYPE-.
Refer to LT-50, "CONSULT-III Functions (IPDM E/R)" in HEADLAMP (FOR CANADA).

Front Fog Lamps Do Not Illuminate (Both Sides)

INFOID:0000000004160422

1.CHECK COMBINATION SWITCH INPUT SIGNAL

CONSULT-III DATA MONITOR
1. Select “FR FOG SW” of BCM (HEAD LAMP) data monitor item.
2. With operating the front fog lamp switch, check the monitor status.

When fog lamp switch is ON : FR FOG SW ON

CHECK THE COMBINATION SWITCH
Refer to LT-175, "Combination Switch Inspection".

OK or NG

OK >> GO TO 2.

NG >> Check combination switch (lighting switch). Refer to LT-175, "Combination Switch Inspection".

2. FRONT FOG LAMP ACTIVE TEST

CONSULT-III ACTIVE TEST
1. Select “LAMPS” of IPDM E/R active test item.
2. With operating the test item, check the fog lamp operation.

FOG : Front fog lamps ON
Off : Front fog lamps OFF

IPDM E/R AUTO ACTIVE TEST
1. Activate auto active test. Refer to PG-22, "Auto Active Test".
2. Make sure fog lamp operation.

Front fog lamp should operate.

OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3. CHECK IPDM E/R

CONSULT-III DATA MONITOR
1. Select “FR FOG REQ” of IPDM E/R data monitor item.
2. With operating the fog lamp switch is in ON position, check the monitor status.

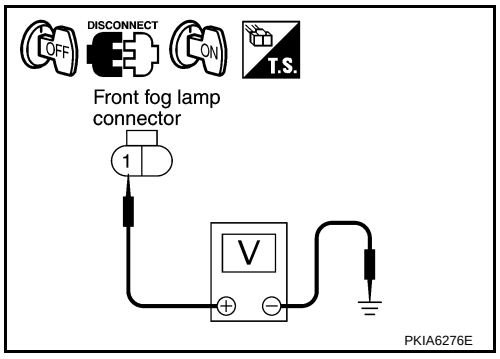
When lighting switch is ON position : FR FOG REQ ON

OK or NG

OK >> Replace IPDM E/R. Refer to PG-27, "Removal and Installation of IPDM E/R".
NG >> Replace BCM. Refer to BCS-14, "Removal and Installation of BCM".

4. CHECK FOG LAMP INPUT SIGNAL

CONSULT-III ACTIVE TEST
1. Turn ignition switch OFF.
2. Disconnect front fog lamp RH and LH connector.
3. Select “LAMPS” of IPDM E/R active test item.
4. Touch “FOG” screen.
5. With operating the test item, check voltage between front fog lamp (RH and LH) harness connector and ground.



Terminal			(–)	Voltage (Approx.)
(+)				
Front fog lamp connector		Terminal		
RH	E45	1	Ground	Battery voltage
LH	E60	1		

IPDM E/R AUTO ACTIVE TEST
1. Turn ignition switch OFF.
2. Disconnect front fog lamp RH and LH connector.
3. Activate auto active test. Refer to PG-22, "Auto Active Test".
4. When fog lamp is operating, check voltage between front fog lamp (RH and LH) harness connector and ground.

Terminal		(–)	Voltage (Approx.)
(+)			
Front fog lamp connector	Terminal		

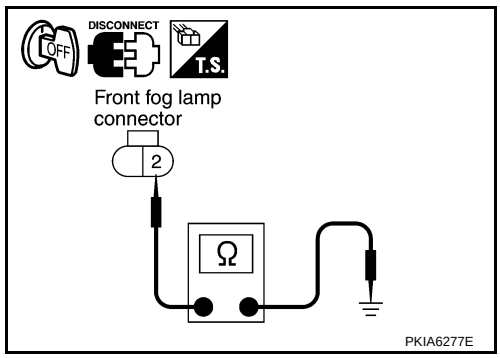
RH	E45	1	Ground	Battery voltage
LH	E60	1		

OK or NG

OK >> GO TO 5.
NG >> GO TO 6.

5.CHECK FOG LAMP GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between front fog lamp (RH and LH) harness connector and ground.



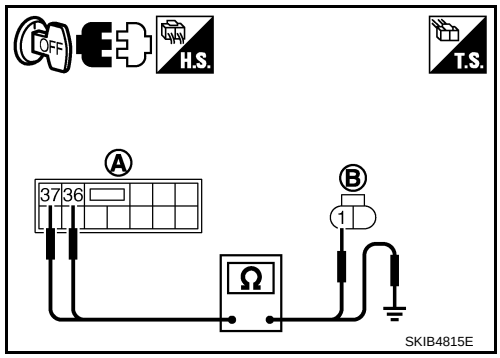
Front fog lamp connector		Terminal	Ground	Continuity
RH	E45	2		Yes
LH	E60	2		

OK or NG

OK >> Check front fog lamp bulbs.
NG >> Repair harness or connector.

6.CHECK FRONT FOG LAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector (A) and front fog lamp (RH and LH) harness connector (B).



Circuit	A		B		Continuity
	Connector	Terminal	Connector	Terminal	
RH	E8	37	E45	1	Yes
LH		36	E60	1	

4. Check continuity between IPDM E/R harness connector (A) and ground.

A			Ground	Continuity
Connector		Terminal		
RH	E8	37		No
LH		36		

OK or NG

OK >> Replace IPDM E/R. Refer to PG-27, "Removal and Installation of IPDM E/R".
NG >> Repair harness or connector.

Front Fog Lamp Does Not Illuminate (One Side)

INFOID:0000000004160423

1. CHECK BULB

Check bulb of fog lamp which does not illuminate.

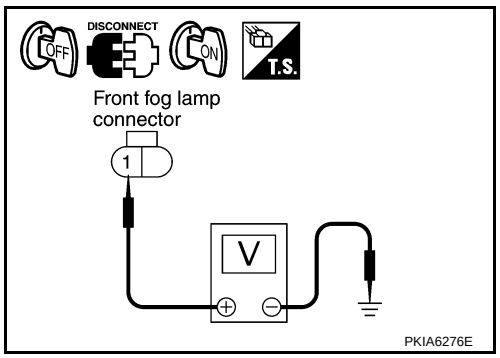
OK or NG

OK >> GO TO 2.
NG >> Replace front fog lamp bulb.

2.CHECK FOG LAMP INPUT SIGNAL

1. Turn ignition switch OFF.
2. Disconnect front fog lamp RH or LH connector.
3. Turn ignition switch ON.
4. Lighting switch is turned 2ND position and fog lamp ON position.

5. Check voltage between front fog lamp RH or LH harness connector and ground.



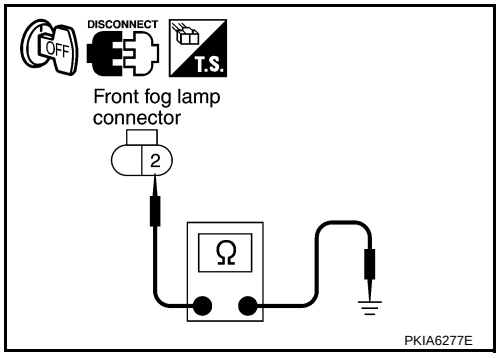
Terminal				Voltage (Approx.)
(+)			(–)	
Front fog lamp connector		Terminal		
RH	E45	1	Ground	Battery voltage
LH	E60	1		

OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3.CHECK FRONT FOG LAMP GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between front fog lamp RH or LH harness connector and ground.



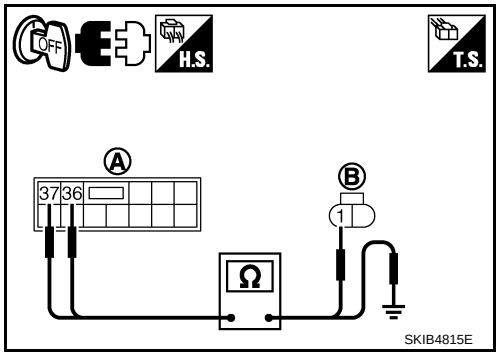
Front fog lamp connector		Terminal	Ground	Continuity
RH	E45	2	Ground	Yes
LH	E60	2		

OK or NG

OK >> Check connecting condition front fog lamp harness connector.
NG >> Repair harness or connector.

4.CHECK FOG LAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector (A) and front fog lamp RH or LH harness connector (B).



Circuit	A		B		Continuity
	Connector	Terminal	Connector	Terminal	
RH	E8	37	E45	1	Yes
LH		36	E60	1	

4. Check continuity between IPDM E/R harness connector (A) and ground.

A			Ground	Continuity
Connector		Terminal		
RH	E8	37	Ground	No
LH		36		

OK or NG

OK >> Replace IPDM E/R. Refer to PG-27, "Removal and Installation of IPDM E/R".
NG >> Repair harness or connector.

Front Fog Lamps Do Not Turn OFF

INFOID:0000000004160424

1.CHECK FRONT FOG LAMP TURN OFF

Make sure that lighting switch is OFF. And make sure front fog lamp turns off when ignition switch is turned OFF.

OK or NG

OK >> GO TO 3.
NG >> GO TO 2.

2.CHECK COMBINATION SWITCH INPUT SIGNAL

CONSULT-III DATA MONITOR
1. Select “FR FOG SW” of BCM (HEAD LAMP) data monitor item.
2. With operating the front fog lamp switch, check the monitor status.

When fog lamp switch is OFF position	**: FR FOG SW OFF**

OK or NG

OK >> Replace IPDM E/R. Refer to PG-27, "Removal and Installation of IPDM E/R".
NG >> Check combination switch (lighting switch). Refer to LT-175, "Combination Switch Inspection".

3.CHECK CAN COMMUNICATIONS BETWEEN BCM AND IPDM E/R

CONSULT-III SELF-DIAGNOSIS
Perform self-diagnosis for “BCM” on CONSULT-III.

Display of self-diagnosis results

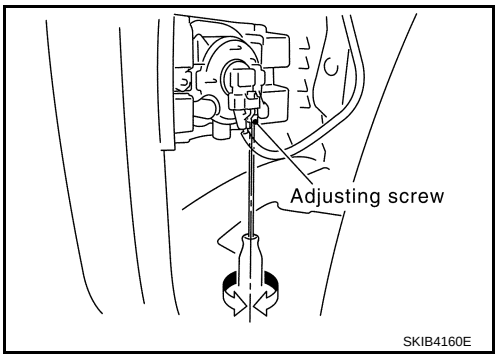
NO DTC>> Replace IPDM E/R. Refer to PG-27, "Removal and Installation of IPDM E/R".
CAN COMM CIRCUIT>> Refer to LAN-17, "CAN Diagnosis with CONSULT-III".

Aiming Adjustment

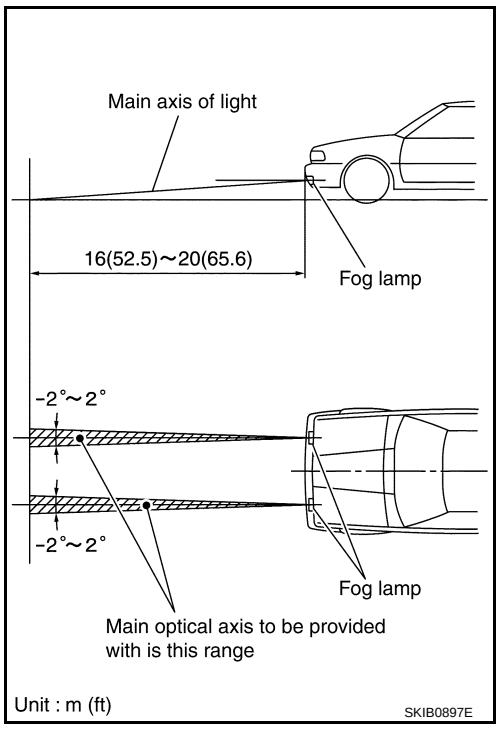
INFOID:0000000004160425

The fog lamp is a semi-sealed beam type which uses a replaceable halogen bulb. Before performing aiming adjustment, make sure of the following.
- Keep all tires inflated to correct pressure.
- Place vehicle on level ground.

Adjust aiming in the vertical direction by turning the adjusting screw.



1. Set the distance between the screen and the center of fog lamp lens as shown.
2. Turn front fog lamps ON.
3. Adjust front fog lamps using adjusting screw so that the top edge of the high intensity zone is in the figure.
   When performing adjustment, if necessary, cover the headlamps and opposite fog lamp.



Bulb Replacement

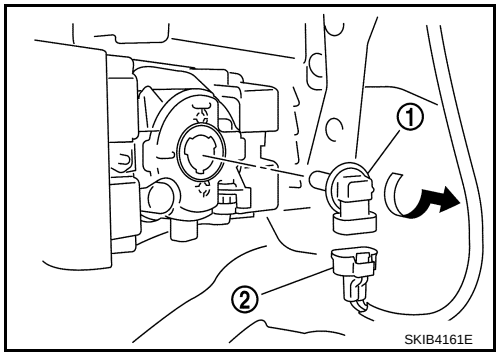
INFOID:0000000004160426

CAUTION:

- **Disconnect the battery negative terminal or remove the fuse.**
- **Never touch the glass of bulb directly by hand. Keep grease and other oily matters away from it. Never touch bulb by hand while it is lit or right after being turned off.**
- **Never leave bulb out of lamp reflector for a long time because dust, moisture smoke, etc. may affect the performance of lamp. When replacing bulb, be sure to replace it with new one.**

1. Remove fender protector (front). Refer to EI-32.
2. Turn bulb (1) counterclockwise and unlock it.
3. Disconnect connector (2), and remove bulb (1).

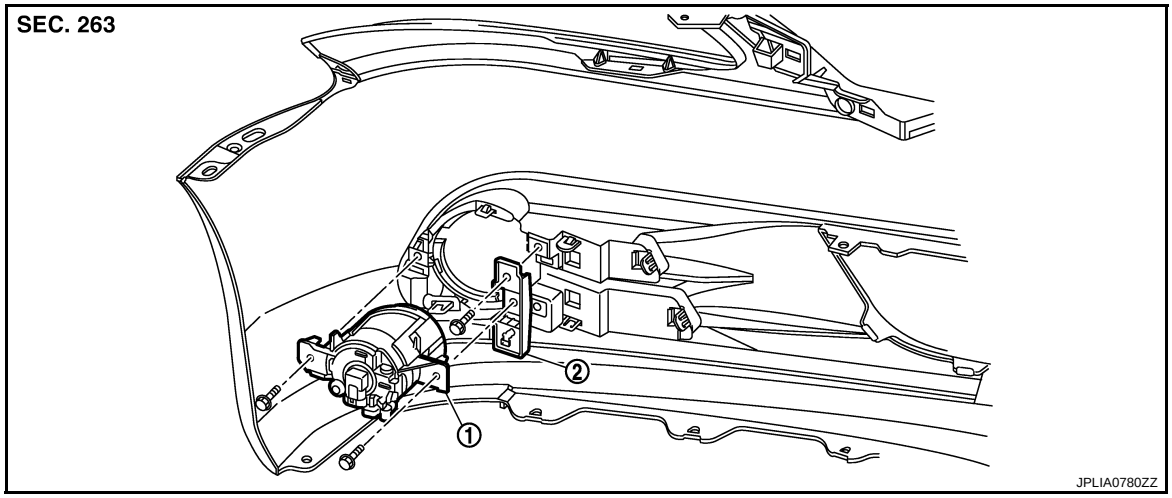
Front fog lamp : 12V - 55W (H11)



STANDARD TYPE

STANDARD TYPE : Removal and Installation

INFOID:0000000004160427



1. Front fog lamp
2. Fog lamp bracket

REMOVAL

CAUTION:

Disconnect the battery negative terminal or remove the fuse.

1. Remove fender protector (front). Refer to EI-32, "FENDER PROTECTOR : Removal and Installation".
2. Remove front fog lamp connector.
3. Remove screws and remove front fog lamp.

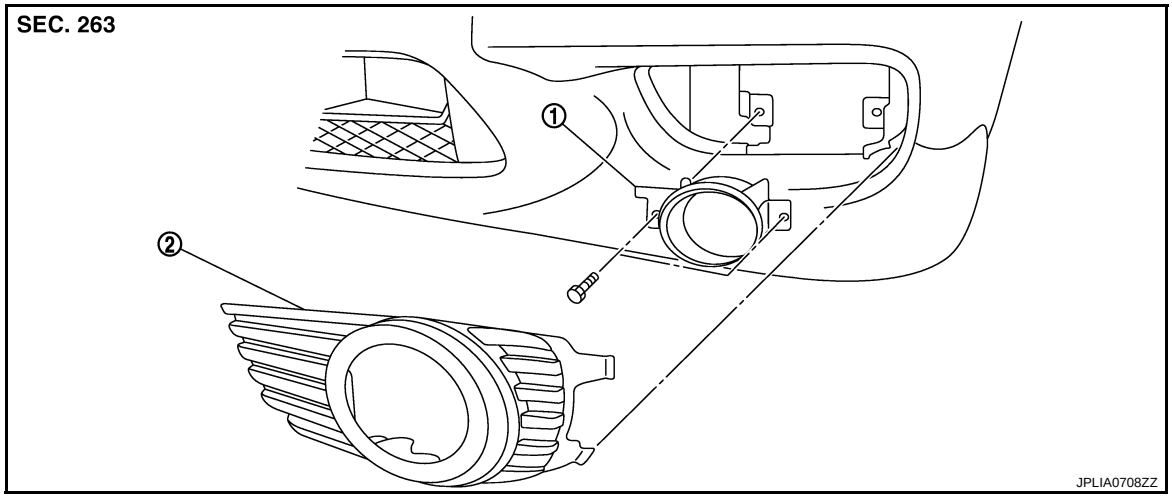
INSTALLATION

Installation is the reverse order of removal.

SPORTS TYPE

SPORTS TYPE : Removal and Installation

INFOID:0000000004160428



1. Front fog lamp
2. Front bumper grille

REMOVAL

CAUTION:

Disconnect the battery negative terminal or remove the fuse.

1. Remove front bumper grille. Refer to EI-28, "Removal and Installation".
2. Remove screws and remove front fog lamp.

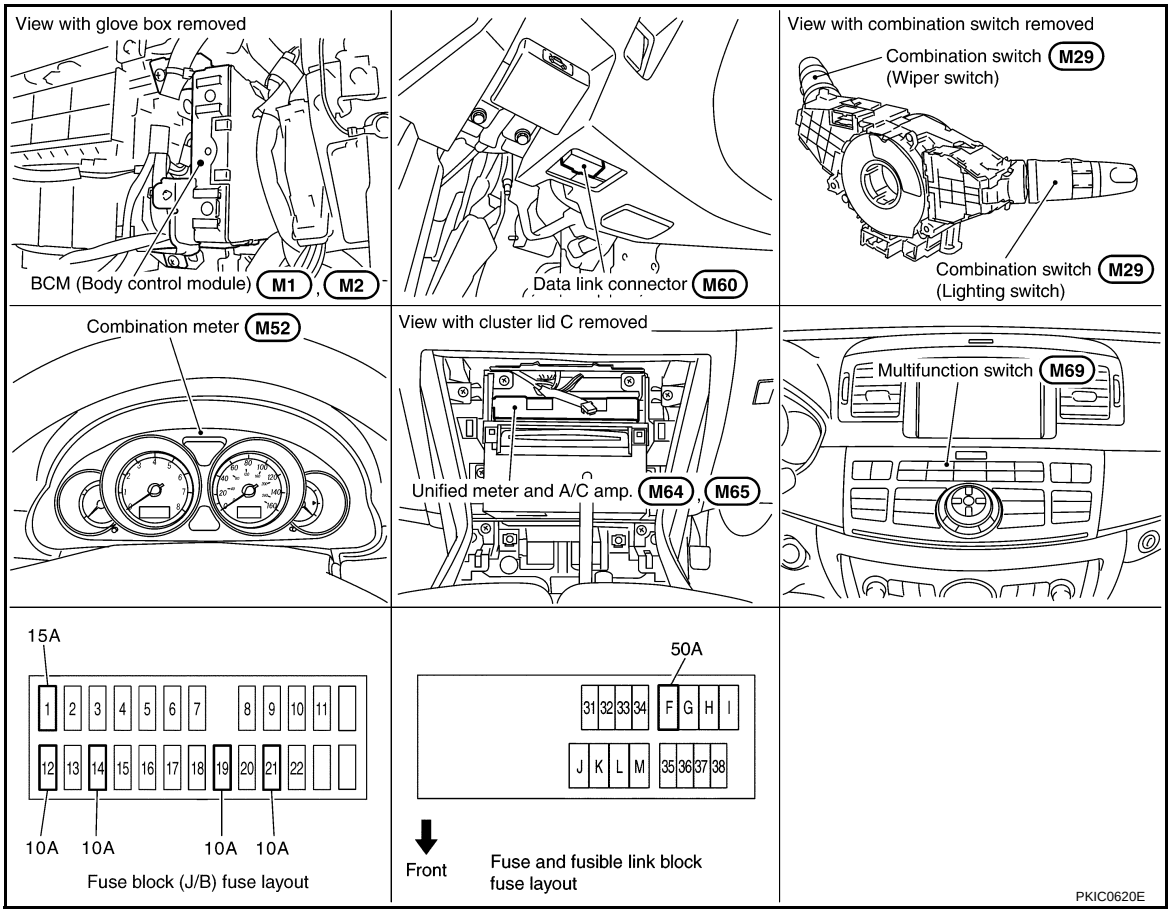
INSTALLATION

Installation is the reverse order of removal.

TURN SIGNAL AND HAZARD WARNING LAMPS

Component Parts and Harness Connector Location

INFOID:0000000004160429



System Description

INFOID:0000000004160430

TURN SIGNAL OPERATION

With the ignition switch is in the ON or START position, power is supplied
- through 15A fuse [No. 1, located in fuse block (J/B)]
- to BCM (body control module) terminal 38,
- through 10A fuse [No. 14, located in fuse block (J/B)]
- to combination meter terminal 12,
- through 10A fuse [No. 12, located in fuse block (J/B)]
- to unified meter and A/C amp. terminal 53.

Ground is supplied
- to BCM terminal 52
- to combination meter terminals 9, 10 and 11
- to unified meter and A/C amp. terminals 55 and 71
- through grounds M16 and M70.

LH Turn Signal Lamp

When turn signal switch is moved to left position, BCM receives input signal requesting left turn signals to flash. BCM then supplies power
- through BCM terminal 45
- to front combination lamp LH (turn signal) terminal 10
- to side turn signal lamp LH terminal 1, and
- to rear combination lamp LH (turn signal) terminal 3.

Ground is supplied
- to front combination lamp LH (turn signal) terminal 9
- to side turn signal lamp LH terminal 2
- through grounds E22 and E43,

- to rear combination lamp LH (turn signal) terminal 4
- through grounds B5, B40 and B131.

The BCM also supplies input to unified meter and A/C amp. terminals 56 and 72 across the CAN communication lines.
The unified meter and A/C amp. which received the turn indicator signal makes the left turn signal indicator turn on in combination meter.
With power and input supplied, the BCM controls the flashing of the LH turn signal lamps.

RH Turn Signal Lamp
When turn signal switch is moved to right position, BCM receives input signal requesting right turn signals to flash. BCM then supplies power
- through BCM terminal 46
- to front combination lamp RH (turn signal) terminal 10
- to side turn signal lamp RH terminal 1, and
- to rear combination lamp RH (turn signal) terminal 3.

Ground is supplied
- to front combination lamp RH (turn signal) terminal 9
- to side turn signal lamp RH terminal 2
- through grounds E22 and E43,
- to rear combination lamp RH (turn signal) terminal 4
- through grounds B5, B40 and B131.

The BCM also supplies input to unified meter and A/C amp. terminals 56 and 72 across the CAN communication lines.
The unified meter and A/C amp. which received the turn indicator signal makes the right turn signal indicator turn on in combination meter.
With power and input supplied, the BCM controls the flashing of the RH turn signal lamps.

HAZARD LAMP OPERATION

Power is supplied at all times
- through 50A fusible link (letter F, located in fuse, fusible link and relay block)
- to BCM terminal 55,
- through 10A fuse [No. 21, located in fuse block (J/B)]
- to BCM terminal 42
- to combination meter terminal 23,
- through 10A fuse [No. 19, located in fuse block (J/B)]
- to unified meter and A/C amp. terminal 54.

When the hazard switch is depressed, ground is supplied
- to BCM terminal 29
- through multifunction switch terminal 6.

Ground is supplied
- to multifunction switch terminal 14
- to BCM terminal 52
- to combination meter terminals 9, 10 and 11
- to unified meter and A/C amp. terminals 55 and 71
- through grounds M16 and M70.

BCM then supplies power
- through BCM terminal 45
- to front combination lamp LH (turn signal) terminal 10
- to side turn signal lamp LH terminal 1
- to rear combination lamp LH (turn signal) terminal 3,
- through BCM terminal 46
- to front combination lamp RH (turn signal) terminal 10
- to side turn signal lamp RH terminal 1
- to rear combination lamp RH (turn signal) terminal 3.

Ground is supplied
- to front combination lamp LH (turn signal) terminal 9
- to front combination lamp RH (turn signal) terminal 9
- to side turn signal lamp LH terminal 2
- to side turn signal lamp RH terminal 2
- through grounds E22 and E43,
- to rear combination lamp LH (turn signal) terminal 4
- to rear combination lamp RH (turn signal) terminal 4

• through grounds B5, B40 and B131.

The BCM also supplies input to unified meter and A/C amp. terminals 56 and 72 across the CAN communication lines.

The unified meter and A/C amp. which received the turn indicator signal makes the left and right turn signal indicator turn on in combination meter.

With power and input supplied, the BCM controls the flashing of the hazard warning lamps.

COMBINATION SWITCH READING FUNCTION

Refer to BCS-4, "System Description".

CAN Communication System Description

INFOID:0000000004160431

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

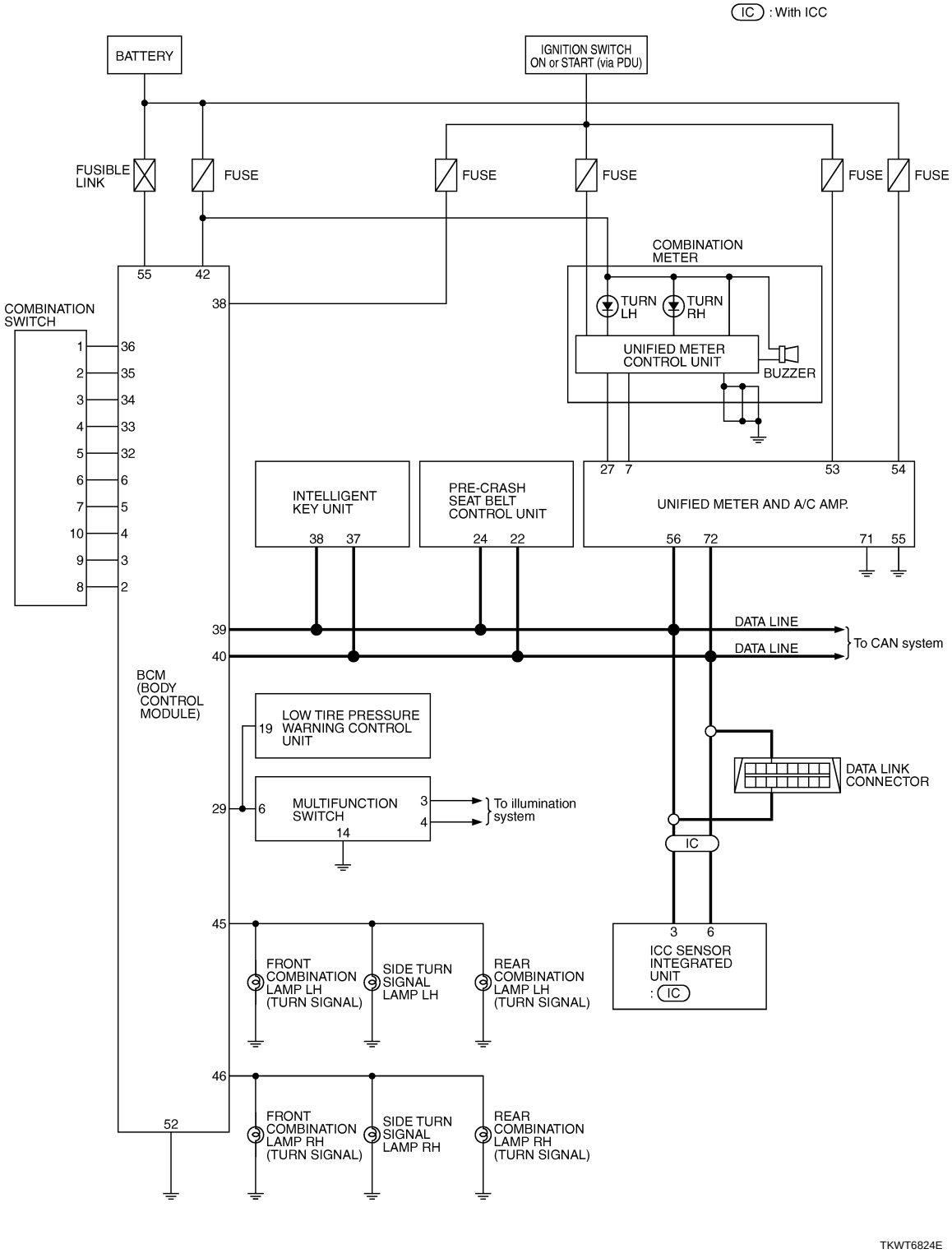
CAN Communication Unit

INFOID:0000000004160432

Refer to LAN-11, "System Description".

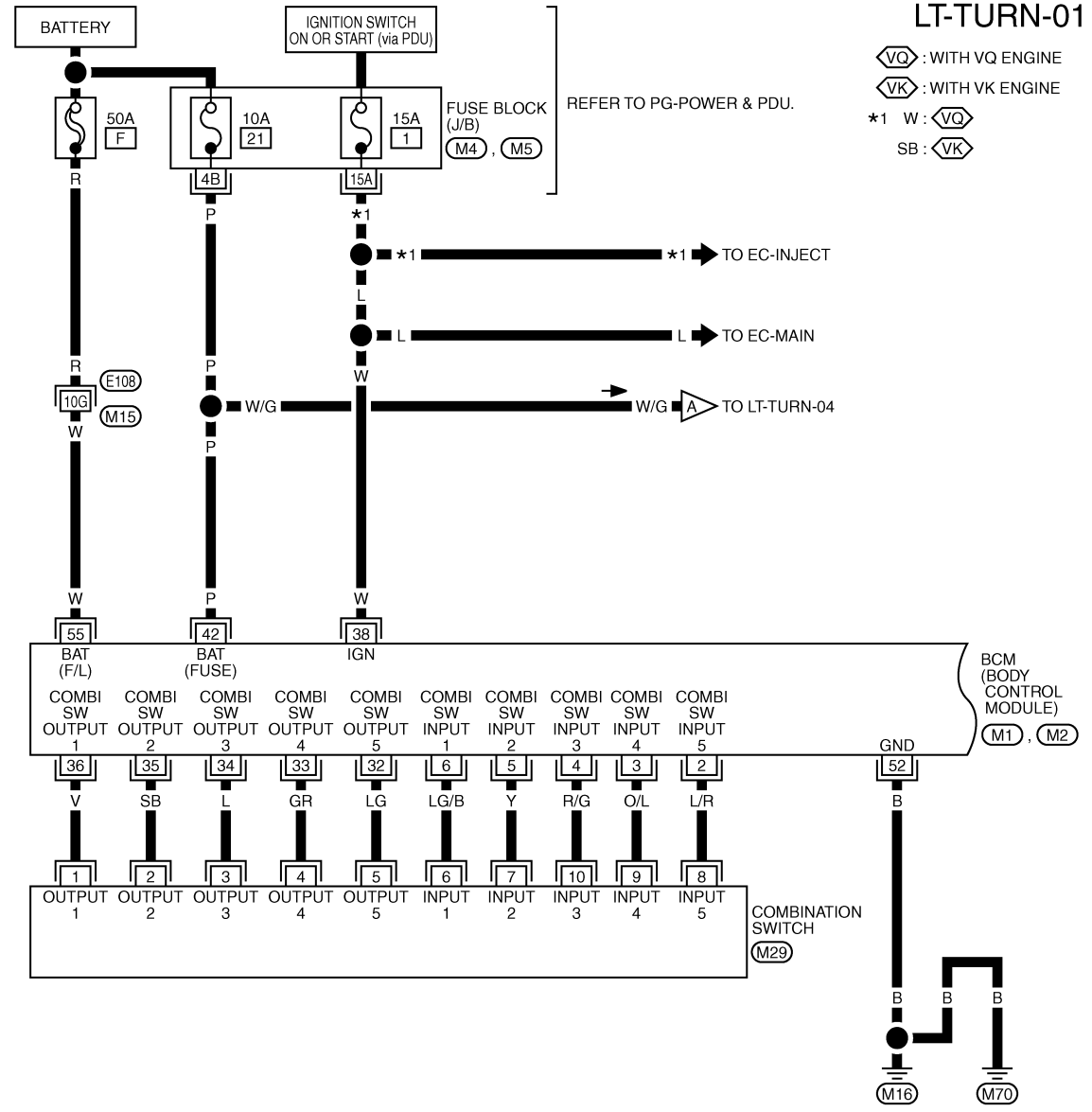
Schematic

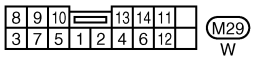
INFOID:0000000004160433



Wiring Diagram - TURN -

INFOID:0000000004160434

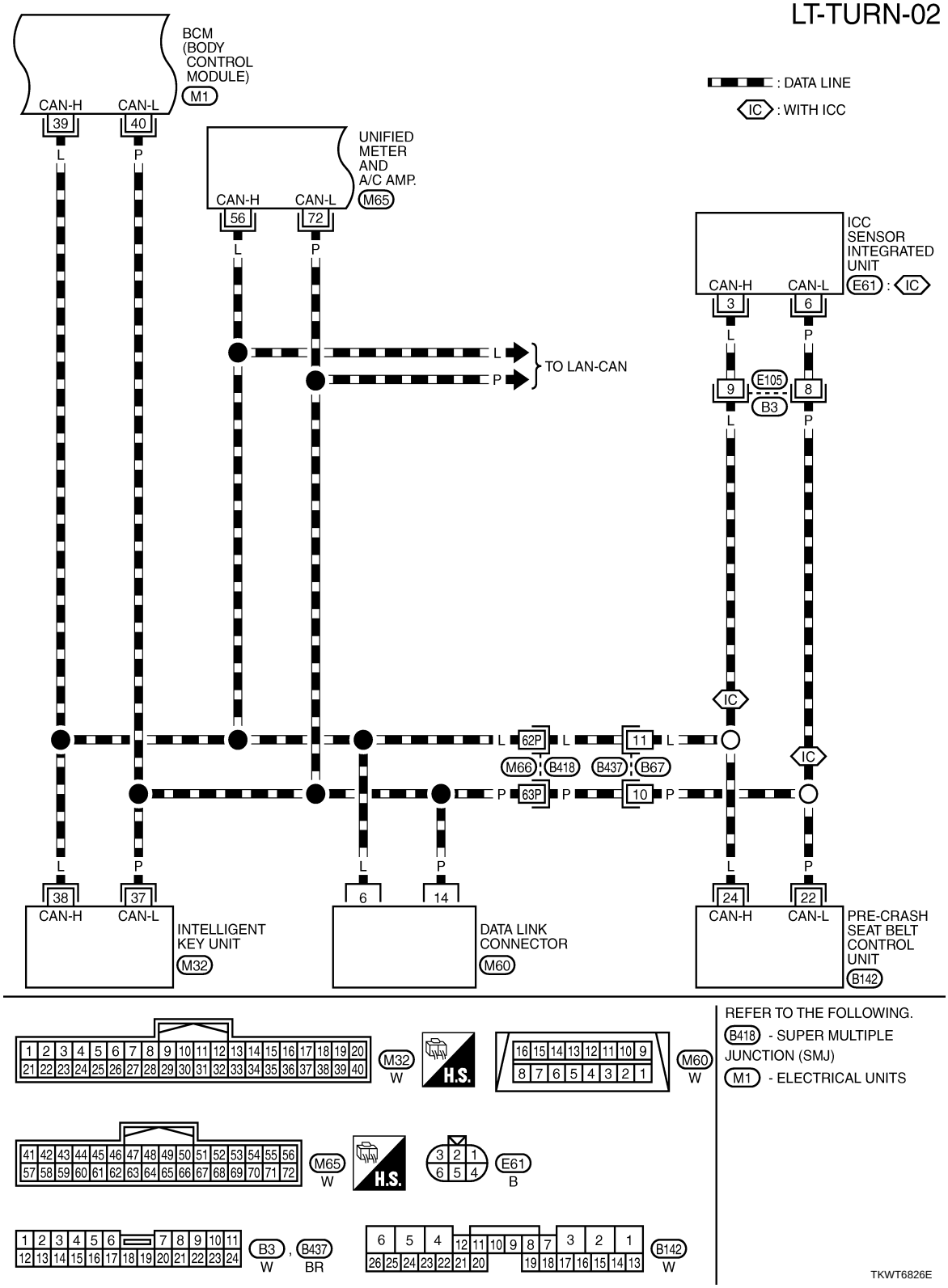


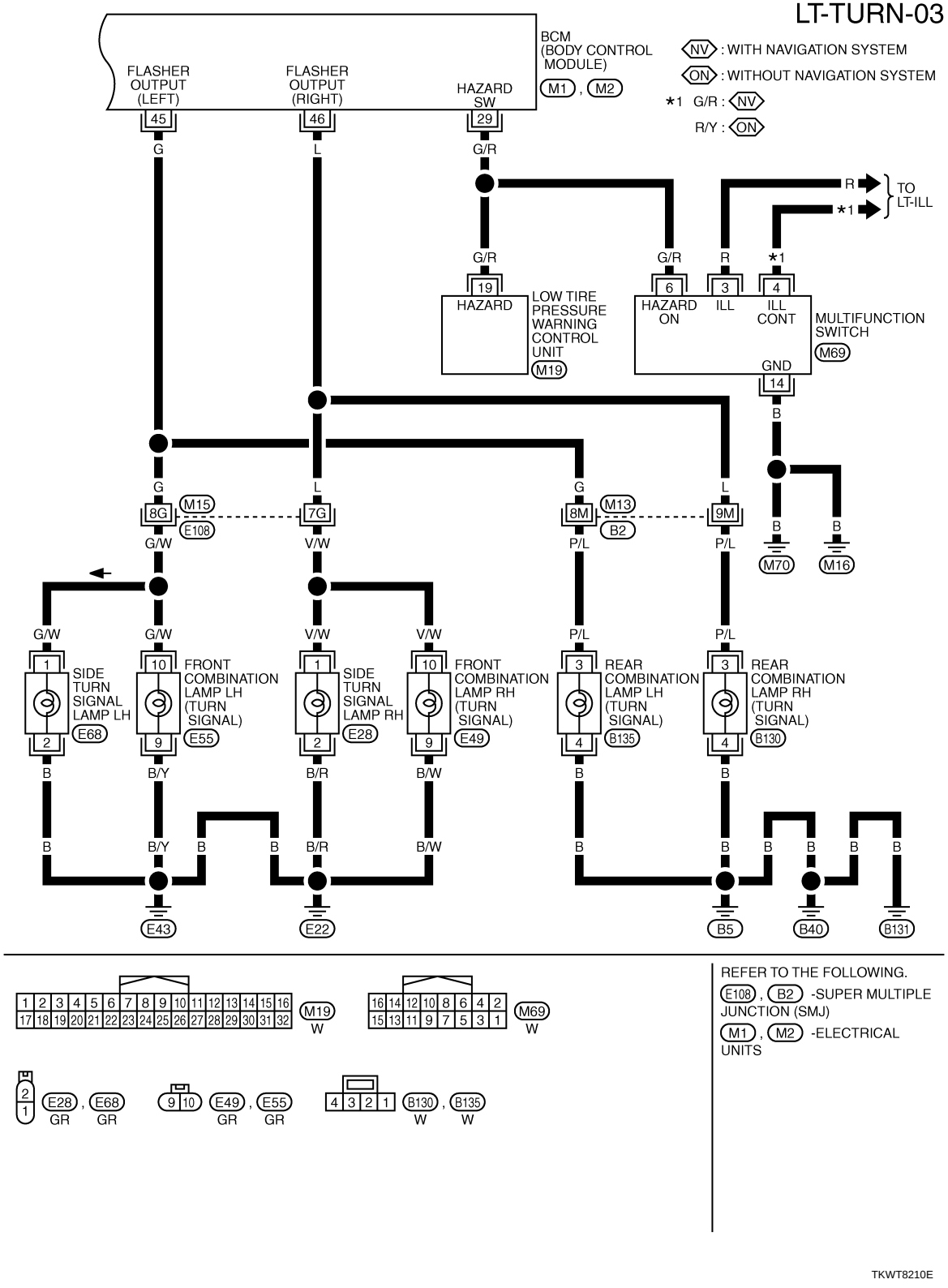


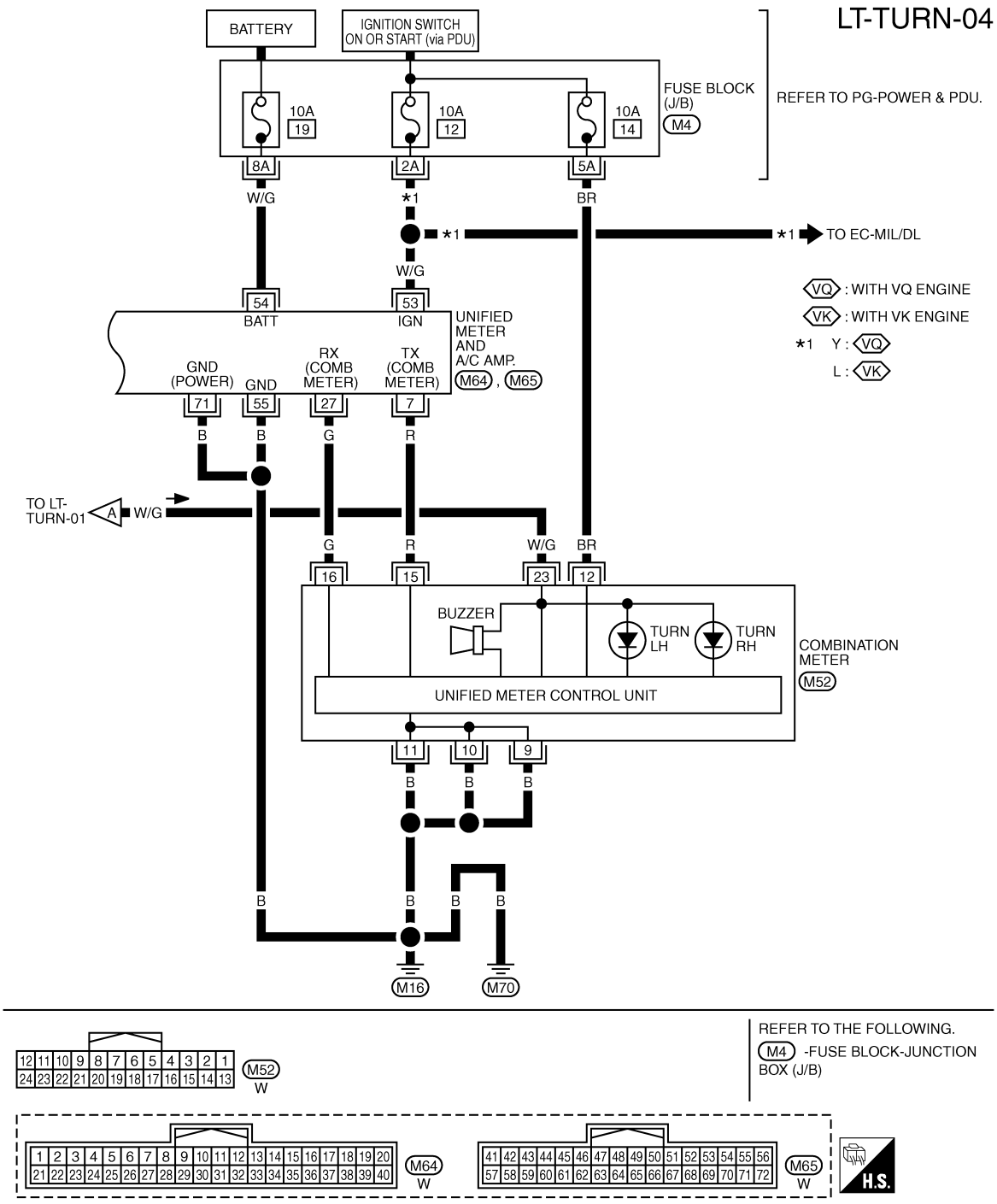
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , M5 -FUSE BLOCK-JUNCTION BOX (J/B)
M1 , M2 -ELECTRICAL UNITS

TKWT8209E

LT-TURN-02


BCM (BODY CONTROL MODULE) M1
CAN-H 39
CAN-L 40
: DATA LINE
IC : WITH ICC
UNIFIED METER AND A/C AMP. M65
CAN-H 56
CAN-L 72
ICC SENSOR INTEGRATED UNIT E61 : IC
CAN-H 3
CAN-L 6
TO LAN-CAN
E105
B3
9
8
62P
11
M66
B418
B437
B67
63P
10
INTELLIGENT KEY UNIT M32
CAN-H 38
CAN-L 37
DATA LINK CONNECTOR M60
6
14
PRE-CRASH SEAT BELT CONTROL UNIT B142
CAN-H 24
CAN-L 22
REFER TO THE FOLLOWING.
B418 - SUPER MULTIPLE JUNCTION (SMJ)
M1 - ELECTRICAL UNITS
M32 W
M60 W
M65 W
E61 B
B3 W
B437 BR
B142 W
H.S.
TKWT6826E


LT-TURN-03
BCM (BODY CONTROL MODULE)
M1, M2
FLASHER OUTPUT (LEFT)
45
FLASHER OUTPUT (RIGHT)
46
HAZARD SW
29
NV : WITH NAVIGATION SYSTEM
ON : WITHOUT NAVIGATION SYSTEM
*1 G/R : NV
R/Y : ON
TO LT-ILL
HAZARD
19
LOW TIRE PRESSURE WARNING CONTROL UNIT
M19
HAZARD ON
6
ILL
3
ILL CONT
4
MULTIFUNCTION SWITCH
M69
GND
14
M15
E108
M13
B2
M70
M16
SIDE TURN SIGNAL LAMP LH
E68
FRONT COMBINATION LAMP LH (TURN SIGNAL)
E55
SIDE TURN SIGNAL LAMP RH
E28
FRONT COMBINATION LAMP RH (TURN SIGNAL)
E49
REAR COMBINATION LAMP LH (TURN SIGNAL)
B135
REAR COMBINATION LAMP RH (TURN SIGNAL)
B130
E43
E22
B5
B40
B131
M19 W
M69 W
E28, E68 GR GR
E49, E55 GR GR
B130, B135 W W
REFER TO THE FOLLOWING.
E108, B2 -SUPER MULTIPLE JUNCTION (SMJ)
M1, M2 -ELECTRICAL UNITS
TKWT8210E



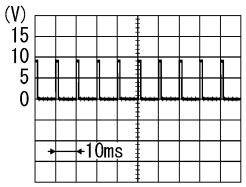
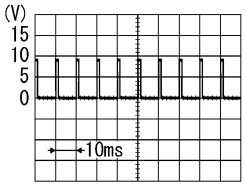
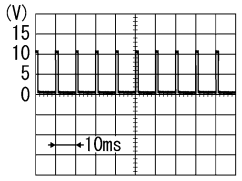
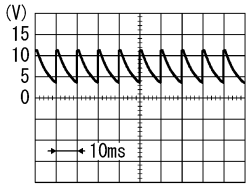
TKWT8211E

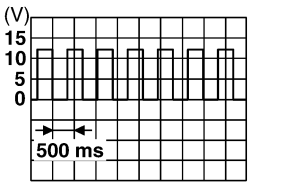
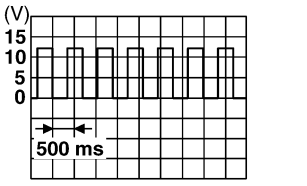
Terminal and Reference Value for BCM

INFOID:0000000004160435

CAUTION:

- **Check combination switch system terminal waveform under the loaded condition with lighting switch, turn signal switch and wiper switch OFF not to be fluctuated by overloaded.**
- **Turn wiper dial position to 4 except when checking waveform or voltage of wiper dial position. Wiper dial position can be confirmed on CONSULT-III. Refer to LT-174, "CONSULT-III Functions (BCM - COMB SW)".**

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
2	L/R	Combination switch input 5	ON	Lighting, turn, wiper switch (Wiper dial position 4)	Turn signal switch to right	 PKIB4957J Approx. 1.0 V
					OFF	Approx. 0 V
3	O/L	Combination switch input 4	ON	Lighting, turn, wiper switch (Wiper dial position 4)	Turn signal switch to left	 PKIB4957J Approx. 1.0 V
					OFF	Approx. 0 V
29	G/R	Hazard switch signal	OFF	Hazard switch	ON	Approx. 0 V
					OFF	Battery voltage
36	V	Combination switch output 1	ON	Lighting, turn, wiper switch (Wiper dial position 4)	Any of several conditions below • Turn signal switch to right • Turn signal switch to left	 PKIB4958J Approx. 1.2 V
					OFF	 PKIB4960J Approx. 7.0 - 7.5 V
38	W	Ignition switch (ON)	ON	—		Battery voltage
39	L	CAN – H	—	—		—
40	P	CAN – L	—	—		—
42	P	Battery power supply	OFF	—		Battery voltage

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
45	G	Flasher output (Left)	ON	Turn signal switch	To left	 SKIA3009J
					OFF	Approx. 0 V
46	L	Flasher output (Right)	ON	Turn signal switch	To right	 SKIA3009J
					OFF	Approx. 0 V
52	B	Ground	ON	—		Approx. 0 V
55	W	Battery power supply	OFF	—		Battery voltage

How to Perform Trouble Diagnosis

INFOID:0000000004160436

1. Confirm the symptom or customer complaint.
2. Understand operation description and function description. Refer to LT-152, "System Description".
3. Perform the Preliminary Check. Refer to LT-161, "Preliminary Check".
4. Check symptom and repair or replace the cause of malfunction.
5. Do turn signal and hazard warning lamps operate normally? If YES, GO TO 6. If NO, GO TO 4.
6. INSPECTION END

Preliminary Check

INFOID:0000000004160437

CHECK POWER SUPPLY AND GROUND CIRCUIT

1.CHECK FUSES AND FUSIBLE LINK

Check for blown fuses and fusible link.

Unit	Power source	Fuse and fusible link No.
BCM	Battery	F
		21
	Ignition switch ON or START position	1
Combination meter	Battery	21
	Ignition switch ON or START position	14
Unified meter and A/C amp.	Battery	19
	Ignition switch ON or START position	12

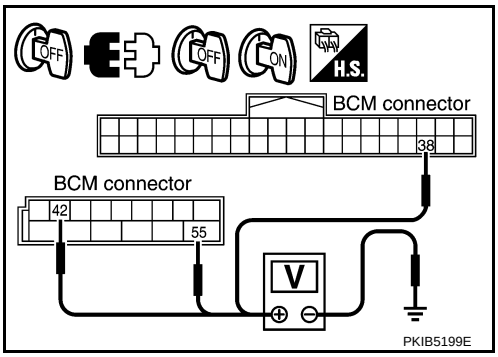
Refer to LT-156, "Wiring Diagram - TURN -".

OK or NG

OK >> GO TO 2.
NG >> If fuse or fusible link is blown, be sure to eliminate cause of malfunction before installing new fuse or fusible link. Refer to PG-4.

2.CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM harness connector and ground.



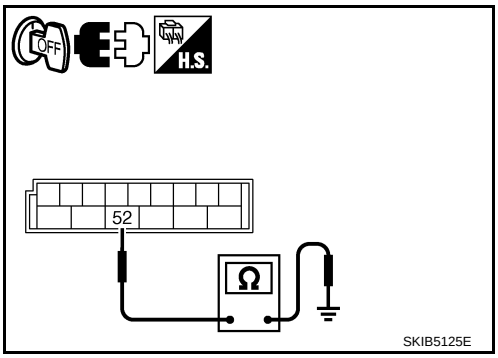
Terminal			Ignition switch position	
(+)		(-)	OFF	ON
BCM connector	Terminal			
M1	38	Ground	Approx. 0 V	Battery voltage
M2	42		Battery voltage	Battery voltage
	55		Battery voltage	Battery voltage

OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3.CHECK GROUND CIRCUIT

Check continuity between BCM harness connector and ground.



BCM connector	Terminal	Ground	Continuity
M2	52		Yes

OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.

CONSULT-III Functions (BCM - FLASHER)

INFOID:0000000004160438

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

Diagnosis mode	Description
DATA MONITOR	Displays BCM input data in real time.
ACTIVE TEST	Operation of electrical loads can be checked by sending driving signal to them.

DATA MONITOR

Display Item List

Monitor item		Contents
IGN ON SW	“On/Off”	Displays “IGN position (ON)/OFF, ACC position (OFF)” judged from the ignition switch signal.
HAZARD SW	“On/Off”	Displays “hazard ON (ON)/hazard OFF (OFF)” status, determined from hazard switch signal.
TURN SIGNAL R	“On/Off”	Displays “turn right (ON)/other (OFF)” status, determined from lighting switch signal.
TURN SIGNAL L	“On/Off”	Displays “turn left (ON)/other (OFF)” status, determined from lighting switch signal.

ACTIVE TEST

Display Item List

Test item	Description
FLASHER (RIGHT)	Turn signal lamp (right) can be operated by any ON-OFF operations.
FLASHER (LEFT)	Turn signal lamp (left) can be operated by any ON-OFF operations.

Turn Signal Lamp Does Not Operate

INFOID:0000000004160439

1.CHECK BULB

Check bulb standard of each turn signal lamp is correct.

OK or NG

OK >> GO TO 2.
NG >> Replace turn signal lamp bulb.

2.CHECK COMBINATION SWITCH INPUT SIGNAL

CONSULT-III DATA MONITOR
1. Select “TURN SIGNAL R” and “TURN SIGNAL L” of BCM (FLASHER) data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is TURN RH position : TURN SIGNAL R On

When lighting switch is TURN LH position : TURN SIGNAL L On

CHECK THE COMBINATION SWITCH
Refer to LT-175, "Combination Switch Inspection".

OK or NG

OK >> GO TO 3.
NG >> Check combination switch (lighting switch). Refer to LT-175, "Combination Switch Inspection".

3.ACTIVE TEST

CONSULT-III ACTIVE TEST
1. Select “FLASHER” of BCM (FLASHER) active test item.
2. With operating the test item, check the turn signal lamps operation.

Turn signal lamp should operate.

CHECK TURN SIGNAL LAMP CIRCUIT
GO TO 4.

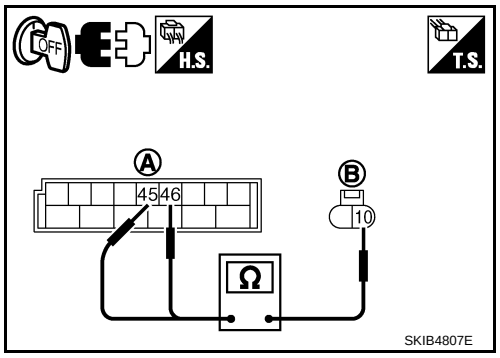
OK or NG

OK >> Replace BCM. Refer to BCS-14, "Removal and Installation of BCM".
NG >> GO TO 4.

4.CHECK TURN SIGNAL LAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector, front combination lamp RH and LH connector, side turn signal lamp RH and LH connector, rear combination lamp RH and LH connector.
3. Check continuity between BCM harness connector (A) and front combination lamp (RH and LH) harness connector (B).

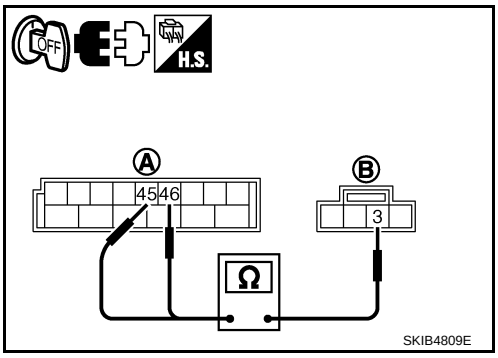
Circuit	A		B		Continuity
	Connector	Terminal	Connector	Terminal	
LH	M2	45	E55	10	Yes
RH		46	E49	10	



4. Check continuity between BCM harness connector (A) and side turn signal lamp (RH and LH) harness connector (B).

Circuit	A		B		Continuity
	Connector	Terminal	Connector	Terminal	
LH	M2	45	E68	1	Yes
RH		46	E28	1	

5. Check continuity between BCM harness connector (A) and rear combination lamp (RH and LH) harness connector (B).



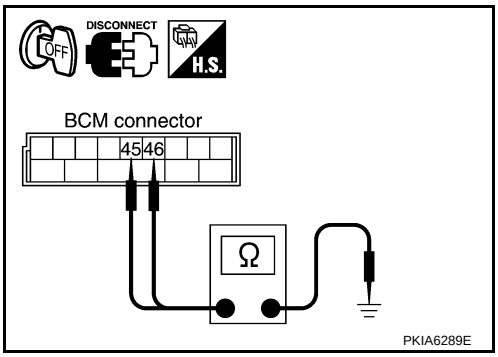
Circuit	A		B		Continuity
	Connector	Terminal	Connector	Terminal	
LH	M2	45	B135	3	Yes
RH		46	B130	3	

OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.

5.CHECK SIGNAL LAMP CIRCUIT (SHORT CIRCUIT)

Check continuity between BCM harness connector and ground.



BCM connector	Terminal	Ground	Continuity
M2	45		No
	46		

OK or NG

OK >> Replace BCM. Replace BCM if turn signal lamp does not work after setting the connector again. Refer to BCS-14, "Removal and Installation of BCM".
NG >> Repair harness or connector.

Hazard Warning Lamp Does Not Operate But Turn Signal Lamp Operates

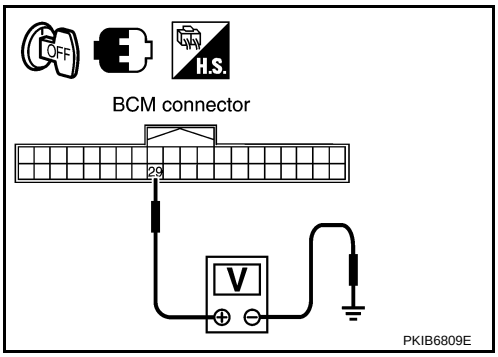
INFOID:0000000004160440

1.CHECK CIRCUIT BETWEEN HAZARD SWITCH AND BCM

CONSULT-III DATA MONITOR
1. Select “HAZARD SW” of BCM (FLASHER) data monitor item.
2. With operating the multifunction switch (hazard switch), check the monitor status.

When hazard switch is ON position : HAZARD SW ON

CHECK CIRCUIT BETWEEN HAZARD SWITCH AND BCM
Check voltage between BCM harness connector and ground.



Terminal			Condition	Voltage (Approx.)
(+)		(–)		
Connector	Terminal			
M1	29	Ground	Hazard switch is ON.	0 V
			Hazard switch is OFF.	Battery Voltage

OK or NG

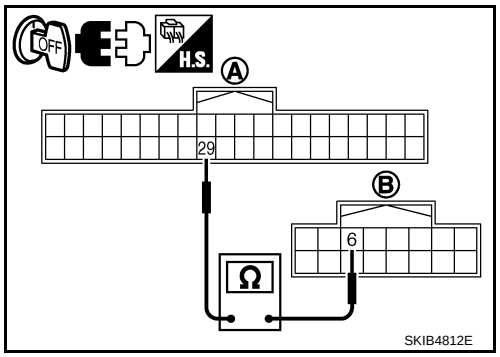
OK >> Replace BCM. Refer to BCS-14, "Removal and Installation of BCM".
NG >> GO TO 2.

2.CHECK HAZARD SWITCH BCM CIRCUIT

1. Turn ignition switch OFF.

2. Disconnect BCM connector and multifunction switch connector.
3. Check continuity between BCM harness connector (A) and multifunction switch harness connector (B).

A		B		Continuity
Connector	Terminal	Connector	Terminal	
M1	29	M69	6	Yes



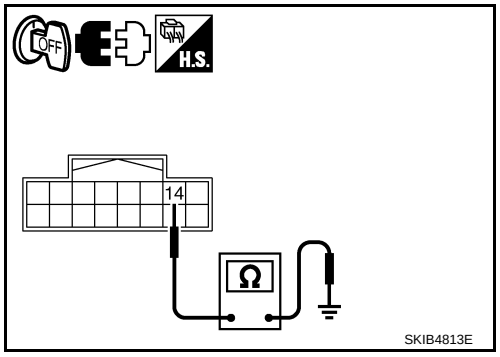
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK HAZARD SWITCH GROUND CIRCUIT

Check continuity between multifunction switch harness connector and ground.

Multifunction switch connector	Terminal	Ground	Continuity
M69	14		Yes



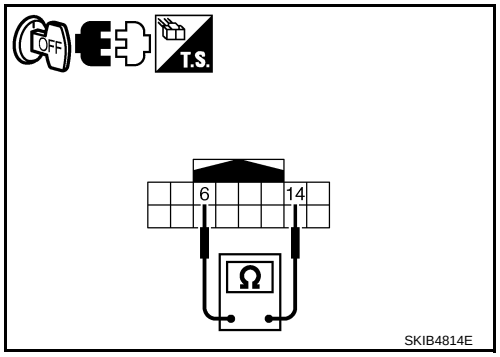
OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

4. CHECK HAZARD SWITCH

Check continuity multifunction switch (hazard switch).

Multifunction switch (Hazard switch)		Condition	Continuity
Terminal			
6	14	Hazard switch is ON.	Yes
		Hazard switch is OFF.	No



OK or NG

OK >> Replace BCM. Replace BCM if turn signal lamp does not work after setting the connector again. Refer to BCS-14, "Removal and Installation of BCM".
NG >> Replace multifunction switch. Refer to AV-1077, "Exploded View".

Turn Signal Indicator Lamp Does Not Operate

INFOID:0000000004160441

1. CHECK UNIFIED METER AND A/C AMP.

CONSULT-III SELF-DIAGNOSIS
1. Perform self-diagnosis for “METER A/C AMP” on CONSULT-III.
2. Check if malfunction is indicated.

Is malfunction indicated?

YES >> Repair or replace malfunctioning parts.
NO >> GO TO 2.

2. CHECK CIRCUIT BETWEEN COMBINATION SWITCH AND BCM

CONSULT-III DATA MONITOR
1. Select “TURN IND” of METER A/C AMP data monitor item.
2. With operating the turn signal switch, check the monitor status.

When turn signal switch is in the RH or LH position : TURN IND ON

OK or NG

OK >> Replace combination meter. Refer to DI-25, "Removal and Installation of Combination Meter".
NG >> Replace unified meter and A/C amp. Refer to DI-34, "Removal and Installation of Unified Meter and A/C Amp".

Bulb Replacement (Front Turn Signal Lamp)

INFOID:0000000004160442

Refer to LT-31, "Bulb Replacement" in “HEADLAMP -XENON TYPE-”.

Bulb Replacement (Side Turn Signal Lamp)

INFOID:0000000004160443

Bulb Replacement

Replace the side turn signal lamp as an assembly because it cannot be disassembled.

Bulb Replacement (Rear Turn Signal Lamp)

INFOID:0000000004160444

Refer to LT-200, "Bulb Replacement".

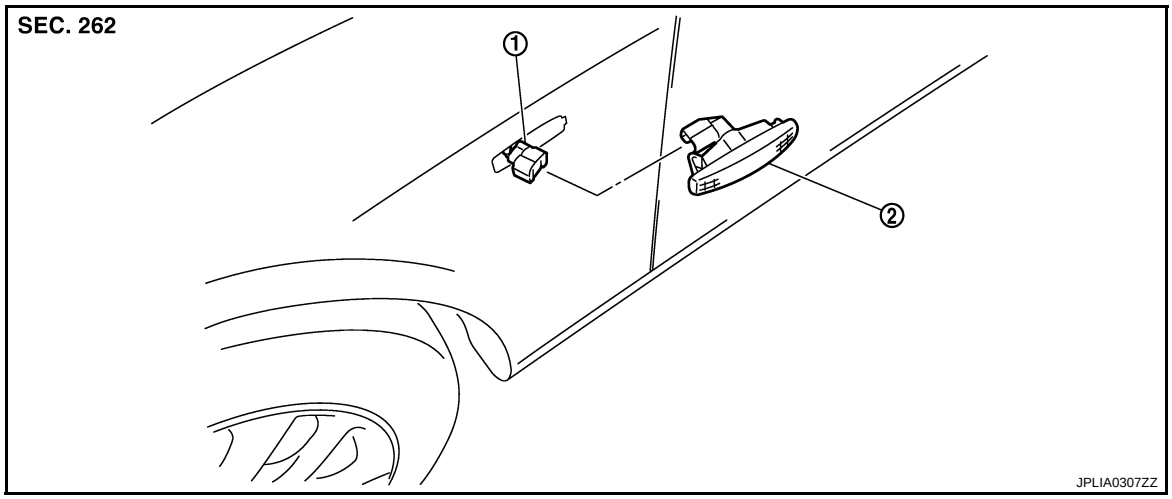
Removal and Installation of Front Turn Signal Lamp

INFOID:0000000004160445

Refer to LT-33, "Removal and Installation" in “HEADLAMP -XENON TYPE-”

Removal and Installation of Side Turn Signal Lamp

INFOID:0000000004160446

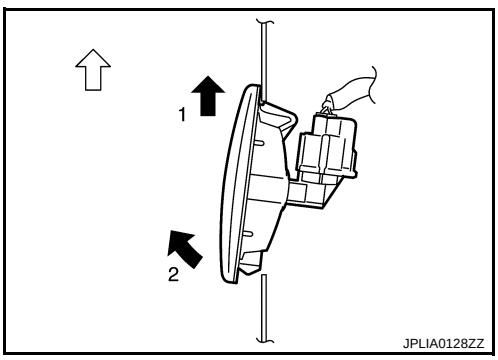


1. Side turn signal lamp connector 2. Side turn signal lamp

NOTE:
Replace as an assembly because it cannot be disassembled.
CAUTION:
Disconnect battery negative terminal or remove the fuse.

REMOVAL

1. Remove the side turn signal lamp in numerical order shown in the figure.



⇦ **: Vehicle front (side turn signal lamp LH)**
: Vehicle rear (side turn signal lamp RH)

2. Disconnect side turn signal lamp connector.

NOTE:
Support the vehicle-side harness of the side turn signal lamp with tape so that it does not drop inside the front fender.

INSTALLATION

1. Connect the connector.
2. Fix the pawl-side behind the side turn signal lamp housing first, then push the resin clip-side.

Removal and Installation of Rear Turn Signal Lamp

INFOID:0000000004160447

Refer to LT-200, "Removal and Installation".

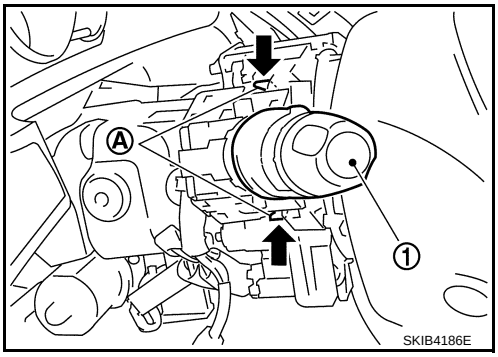
LIGHTING AND TURN SIGNAL SWITCH

Removal and Installation

INFOID:0000000004160448

REMOVAL

1. Remove steering column lower cover. Refer to IP-12.
2. While pressing pawls (A) in direction as shown in the figure, pull lighting and turn signal switch (1) toward driver door and disconnect from the base.



INSTALLATION

Installation is the reverse order of removal.

Switch Circuit Inspection

INFOID:0000000004160449

Refer to LT-175, "Combination Switch Inspection".

HAZARD SWITCH

Removal and Installation

INFOID:0000000004160450

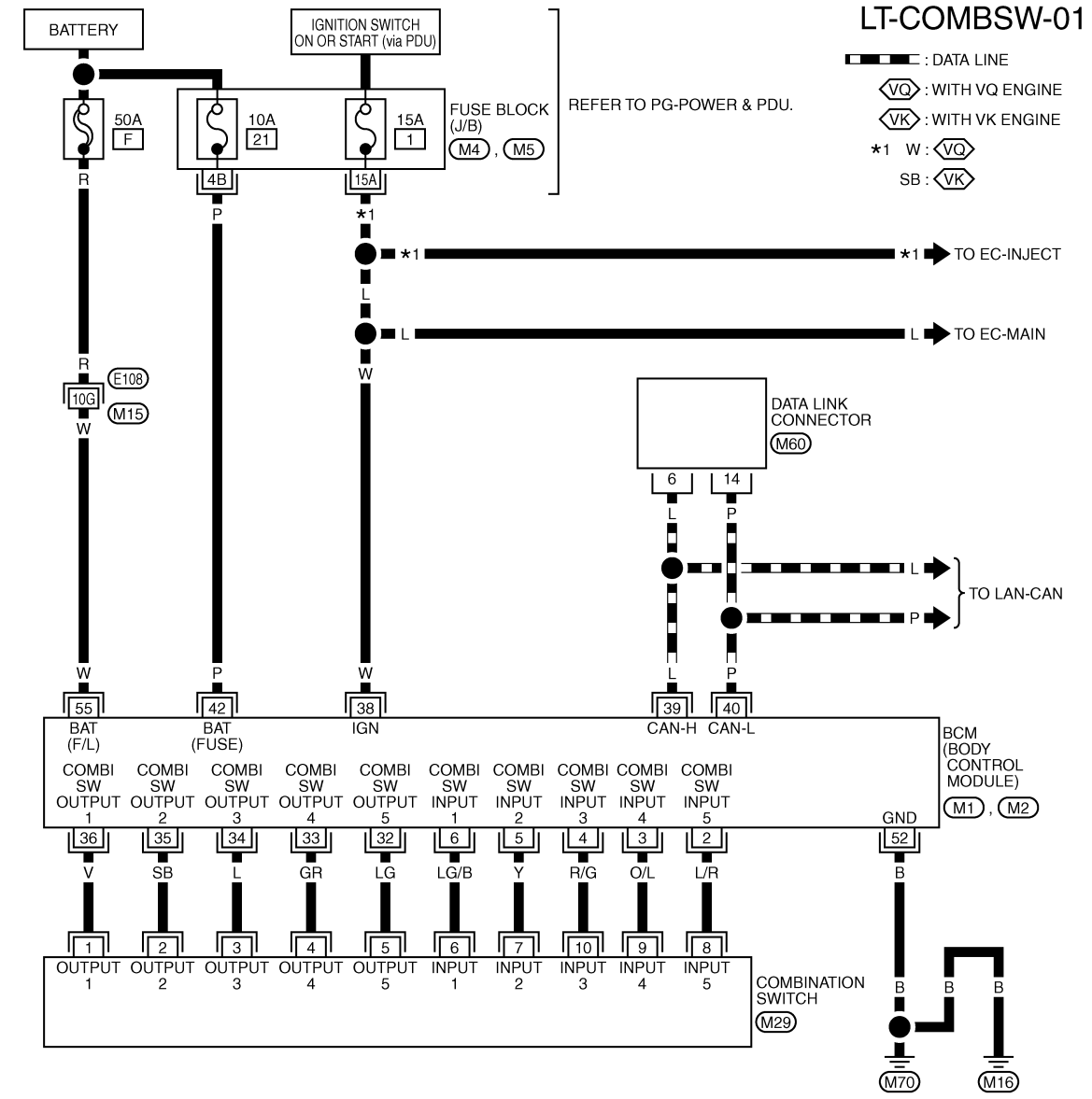
REMOVAL

The hazard warning switch is integrated in the multifunction switch. Refer to AV-1077, "Exploded View".

COMBINATION SWITCH

Wiring Diagram - COMB SW -

INFOID:0000000004160451



TKWT8212E

Combination Switch Reading Function

INFOID:0000000004160452

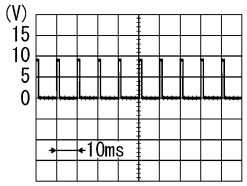
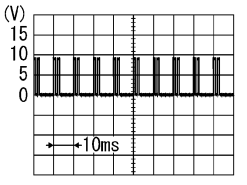
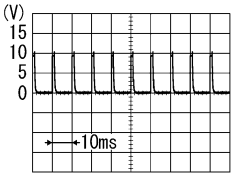
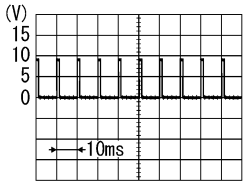
For details, refer to BCS-4, "System Description".

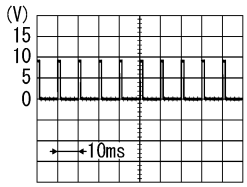
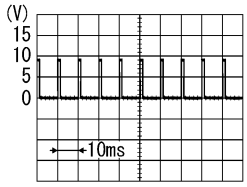
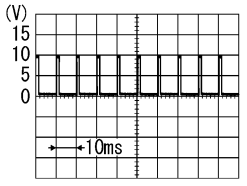
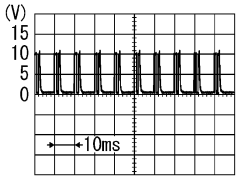
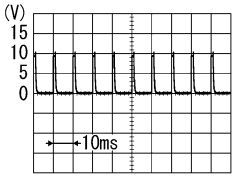
Terminal and Reference Value for BCM

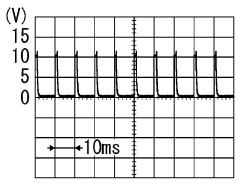
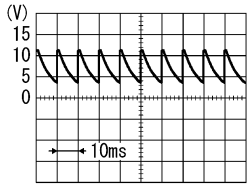
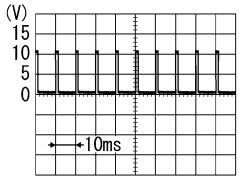
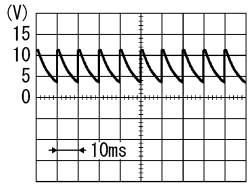
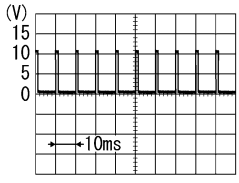
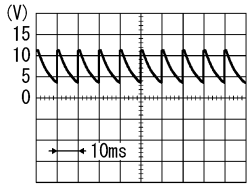
INFOID:0000000004160453

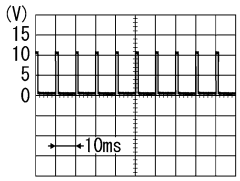
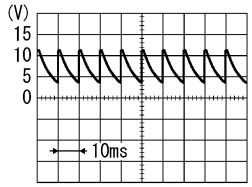
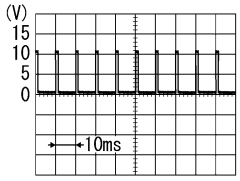
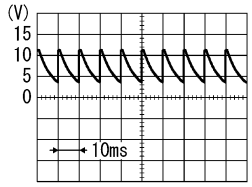
CAUTION:

- **Check combination switch system terminal waveform under the loaded condition with lighting switch, turn signal switch and wiper switch OFF not to be fluctuated by overloaded.**
- **Turn wiper dial position to 4 except when checking waveform or voltage of wiper dial position. Wiper dial position can be confirmed on CONSULT-III. Refer to LT-174, "CONSULT-III Functions (BCM - COMB SW)".**

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
2	L/R	Combination switch input 5	ON	Lighting, turn, wiper switch (Wiper dial position 4)	Any of several conditions below • Lighting switch 1ST • Turn signal switch to right • Lighting switch HI beam (Operates only HI beam switch)	 PKIB4957J Approx. 1.0 V
					Lighting switch 2ND	 PKIB4953J Approx. 2.0 V
					OFF	Approx. 0 V
3	O/L	Combination switch input 4	ON	Lighting, turn, wiper switch (Wiper dial position 4)	Front fog lamp switch ON	 PKIB4955J Approx. 0.8 V
					Any of several conditions below • Lighting switch 2ND • Lighting switch PASSING (Operates only PASSING switch) • Turn signal switch to left	 PKIB4957J Approx. 1.0 V
					OFF	Approx. 0 V

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
4	R/G	Combination switch input 3	ON	Lighting, turn, wiper switch (Wiper dial position 4)	Any of several conditions below • Lighting switch AUTO • Front wiper switch MIST • Front wiper switch INT • Front wiper switch LO	 PKIB4957J Approx. 1.0 V
					OFF	Approx. 0 V
5	Y	Combination switch input 2	ON	Lighting, turn, wiper switch	Any of several conditions below • Front washer switch (Wiper dial position 4) • Wiper dial position 1 • Wiper dial position 5 • Wiper dial position 6	 PKIB4957J Approx. 1.0 V
					OFF (Wiper dial position 4)	Approx. 0 V
6	LG/B	Combination switch input 1	ON	Lighting, turn, wiper switch	Any of several conditions below • Front wiper switch HI (Wiper dial position 4) • Wiper dial position 3	 PKIB4959J Approx. 1.0 V
					Any of several conditions below • Wiper dial position 1 • Wiper dial position 2	 PKIB4952J Approx. 1.7 V
					Any of several conditions below • Wiper dial position 6 • Wiper dial position 7	 PKIB4955J Approx. 0.8 V
					OFF (Wiper dial position 4)	Approx. 0 V

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
32	LG	Combination switch output 5	ON	Lighting, turn, wiper switch	Any of several conditions below • Front fog lamp switch (Operates only front fog lamp switch) (Wiper dial position 4) • Wiper dial position 1 • Wiper dial position 2 • Wiper dial position 6 • Wiper dial position 7	 PKIB4956J Approx. 1.0 V
					OFF (Wiper dial position 4)	 PKIB4960J Approx. 7.0 - 7.5 V
33	GR	Combination switch output 4	ON	Lighting, turn, wiper switch	Any of several conditions below • Lighting switch AUTO (Wiper dial position 4) • Lighting switch 1ST (The same result with lighting switch 2ND) (Wiper dial position 4) • Wiper dial position 1 • Wiper dial position 5 • Wiper dial position 6	 PKIB4958J Approx. 1.2 V
					OFF (Wiper dial position 4)	 PKIB4960J Approx. 7.0 - 7.5 V
34	L	Combination switch output 3	ON	Lighting, turn, wiper switch	Any of several conditions below • Lighting switch 2ND (Wiper dial position 4) • Lighting switch HI beam (Operates only HI beam switch) (Wiper dial position 4) • Wiper dial position 1 • Wiper dial position 2 • Wiper dial position 3	 PKIB4958J Approx. 1.2 V
					OFF (Wiper dial position 4)	 PKIB4960J Approx. 7.0 - 7.5 V

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
35	SB	Combination switch output 2	ON	Lighting, turn, wiper switch (Wiper dial position 4)	Any of several conditions below • Lighting switch 2ND • Lighting switch PASSING (Operates only PASSING switch) • Front wiper switch INT • Front wiper switch HI	 PKIB4958J Approx. 1.2 V
					OFF	 PKIB4960J Approx. 7.0 - 7.5 V
36	V	Combination switch output 1	ON	Lighting, turn, wiper switch (Wiper dial position 4)	Any of several conditions below • Turn signal switch right • Turn signal switch left • Front wiper switch MIST • Front wiper switch LO • Front washer switch	 PKIB4958J Approx. 1.2 V
					OFF (Wiper dial position 4)	 PKIB4960J Approx. 7.0 - 7.5 V
38	W	Ignition switch (ON)	ON	—		Battery voltage
39	L	CAN – H	—	—		—
40	P	CAN – L	—	—		—
42	P	Battery power supply	OFF	—		Battery voltage
52	B	Ground	ON	—		Approx. 0 V
55	W	Battery power supply	OFF	—		Battery voltage

CONSULT-III Functions (BCM - COMB SW)

INFOID:0000000004160454

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

Diagnosis mode	Description
DATA MONITOR	Displays BCM input data in real time.

DATA MONITOR

Display Item List

Monitor item name		Contents
TURN SIGNAL R	“On/Off”	Displays “turn right (ON)/other (OFF)” status, determined from lighting switch signal.
TURN SIGNAL L	“On/Off”	Displays “turn left (ON)/other (OFF)” status, determined from lighting switch signal.
HI BEAM SW	“On/Off”	Displays status (high beam switch: ON/others: OFF) of high beam switch judged from lighting switch signal.
HEAD LAMP SW 1	“On/Off”	Displays status (headlamp switch 1: ON/others: OFF) of headlamp switch 1 judged from lighting switch signal.
HEAD LAMP SW 2	“On/Off”	Displays status (headlamp switch 2: ON/others: OFF) of headlamp switch 2 judged from lighting switch signal.
TAIL LAMP SW	“On/Off”	Displays status (lighting switch 1ST or 2ND position: ON/others: OFF) of lighting switch judged from lighting switch signal.
PASSING SW	“On/Off”	Displays status (flash-to-pass switch: ON/others: OFF) of flash-to-pass switch judged from lighting switch signal.
AUTO LIGHT SW	“On/Off”	Displays “auto light switch (ON)/other (OFF)” status, determined from lighting switch signal.
FR FOG SW	“On/Off”	Displays “front fog lamp switch (ON)/other (OFF)” status, determined from lighting switch signal.
FR WIPER HI	“On/Off”	Displays “front wiper HI (ON)/other (OFF)” status, determined from wiper switch signal.
FR WIPER LOW	“On/Off”	Displays “front wiper LOW (ON)/other (OFF)” status, determined from wiper switch signal.
FR WIPER INT	“On/Off”	Displays “front wiper INT (ON)/other (OFF)” status, determined from wiper switch signal.
FR WASHER SW	“On/Off”	Displays “front washer switch (ON)/other (OFF)” status, determined from wiper switch signal.
INT VOLUME	“1 - 7”	Displays intermittent operation knob setting (1 - 7), determined from wiper switch signal.

Combination Switch Inspection

INFOID:0000000004160455

1.SYSTEM CHECK

Referring to table below, check the system to which malfunctioning switch belongs.

System 1	System 2	System 3	System 4	System 5
—	FR WASHER	FR WIPER LO	TURN LH	TURN RH
FR WIPER HI	—	FR WIPER INT	PASSING	HEAD LAMP1
INT VOLUME 1	—	—	HEAD LAMP2	HI BEAM
—	INT VOLUME 3	AUTO LIGHT	—	LIGHT SW 1ST
INT VOLUME 2	—	—	FR FOG	—

>> Check the system to which malfunctioning switch belongs, and then GO TO 2.

2.SYSTEM CHECK

CONSULT-III DATA MONITOR

1. Select COMB SW data monitor item.
2. Confirm that other switches in malfunctioning system operate normally.
   Example: When the HI BEAM switch is malfunctioning, confirm that “TURN RH”, “HEAD LAMP 1” and “TAIL LAMP SW” in System 5, to which the HI BEAM switch belongs, turn ON-OFF normally.

SYSTEM CHECK

Operating combination switch, and confirm that other switches in malfunctioning system operate normally.
Example: When the HI BEAM switch is malfunctioning, confirm that “TURN RH”, “HEAD LAMP 1” and “TAIL LAMP SW” in System 5, to which HI BEAM switch belongs, turn ON-OFF normally.

Check results

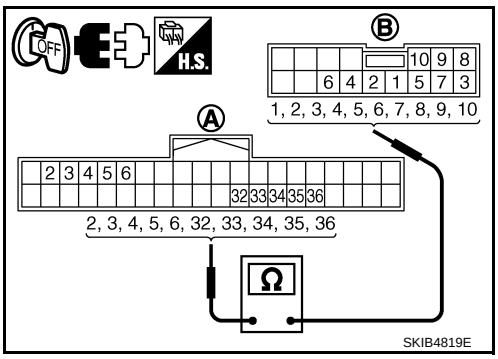
Other switches in malfunctioning system operate normally.>>Replace lighting switch or wiper switch.
Other switches in malfunctioning system do not operate normally.>>GO TO 3.

3.CHECK HARNESS

1. Turn ignition switch OFF.

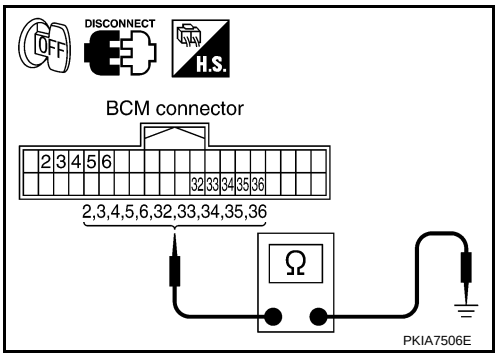
2. Disconnect BCM and combination switch connectors.
3. Check for continuity between BCM harness connector (A) of the suspect system and the corresponding combination switch connector (B).

Suspect system	A			B		Continuity
	Connector	Terminal		Connector	Terminal	
1	M1	Input 1	6	M29	6	Yes
		Output 1	36		1	
2		Input 2	5		7	
		Output 2	35		2	
3		Input 3	4		10	
		Output 3	34		3	
4		Input 4	3		9	
		Output 4	33		4	
5		Input 5	2		8	
		Output 5	32		5	



4. Check for continuity between each of BCM harness connector in suspect malfunctioning system and ground.

Suspect system	BCM connector	Terminal			Continuity
1	M1	Input 1	6	Ground	No
		Output 1	36		
2		Input 2	5		
		Output 2	35		
3		Input 3	4		
		Output 3	34		
4		Input 4	3		
		Output 4	33		
5		Input 5	2		
		Output 5	32		

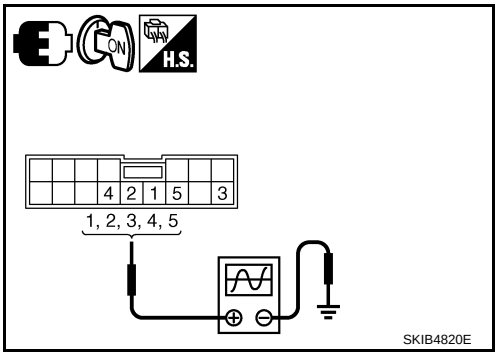


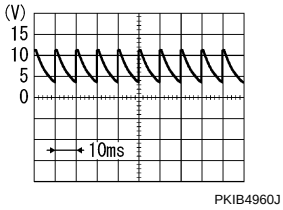
OK or NG

OK >> GO TO 4.
NG >> Check harness between BCM and combination switch for open or short circuit.

4. CHECK BCM OUTPUT TERMINAL

1. Connect BCM and combination switch connectors.
2. Turn ignition switch ON.
3. Turn lighting switch and wiper switch into OFF.
4. Set wiper dial position 4.
5. Check BCM output terminal voltage waveform of suspect malfunctioning system.



Suspect system	Terminal (+) Combination switch connector	Terminal (+) Terminal	Terminal (–)	Reference value
1	M29	1	Ground	 PKIB4960J Approx. 7.0 - 7.5 V
2		2		
3		3		
4		4		
5		5		

OK or NG

OK >> Open circuit in combination switch, GO TO 5.
NG >> Replace BCM. Refer to BCS-14, "Removal and Installation of BCM".

5. CHECK COMBINATION SWITCH

Referring to table below, perform combination switch inspection.

Procedure													
1	2		3	4		5	6		7				
Replace lighting switch	Confirm check results	OK	INSPECTION END	Confirm check results	OK	INSPECTION END	Confirm check results	OK	INSPECTION END				
		NG	Replace wiper switch		NG	Replace switch base		NG	Check symptom again				

>> INSPECTION END

Removal and Installation

INFOID:0000000004160456

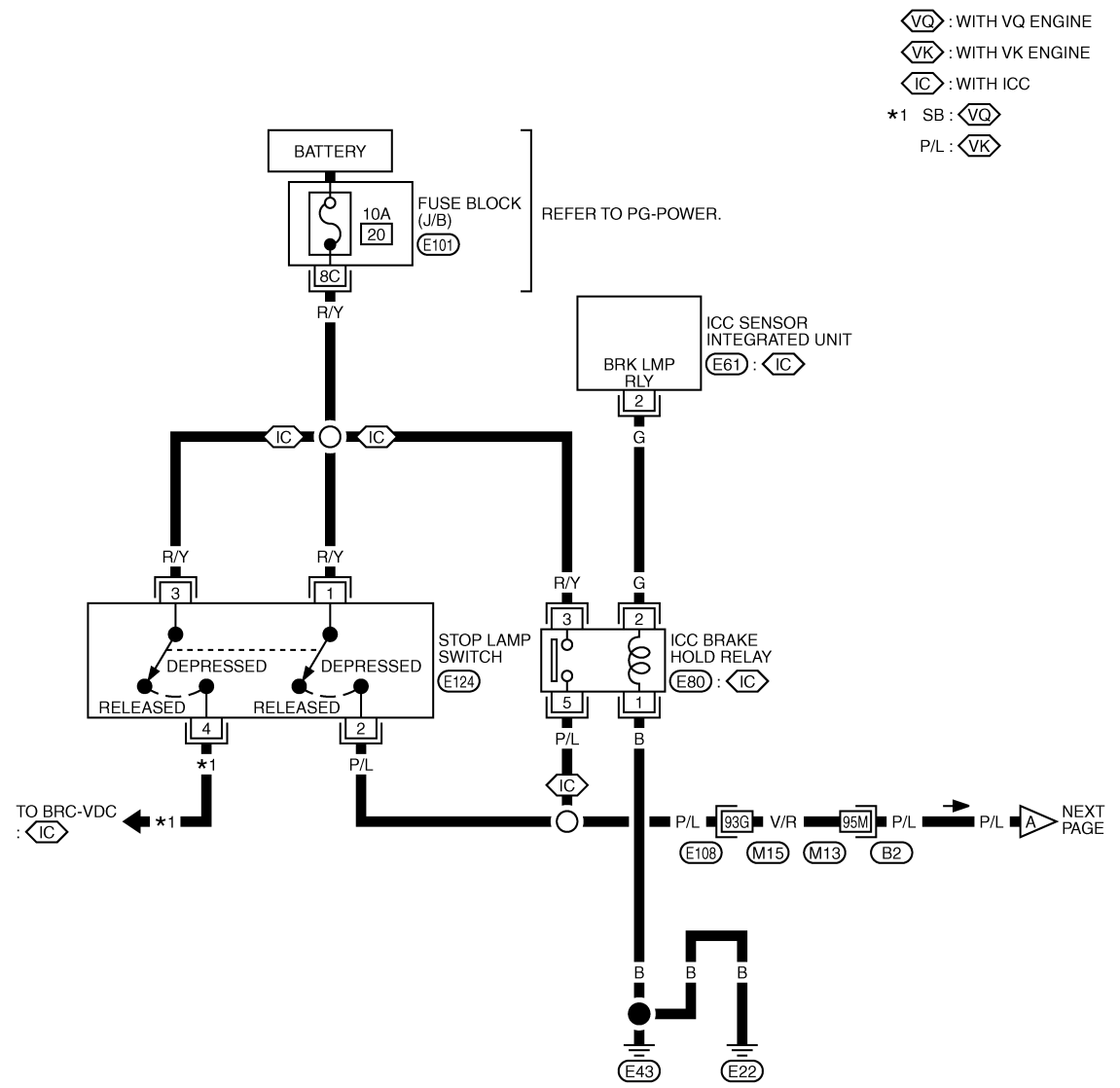
Refer to LT-168.

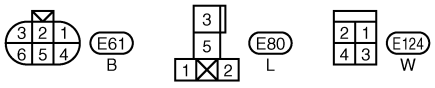
STOP LAMP

Wiring Diagram - STOP LAMP -

INFOID:0000000004160457

LT-STOP/L-01

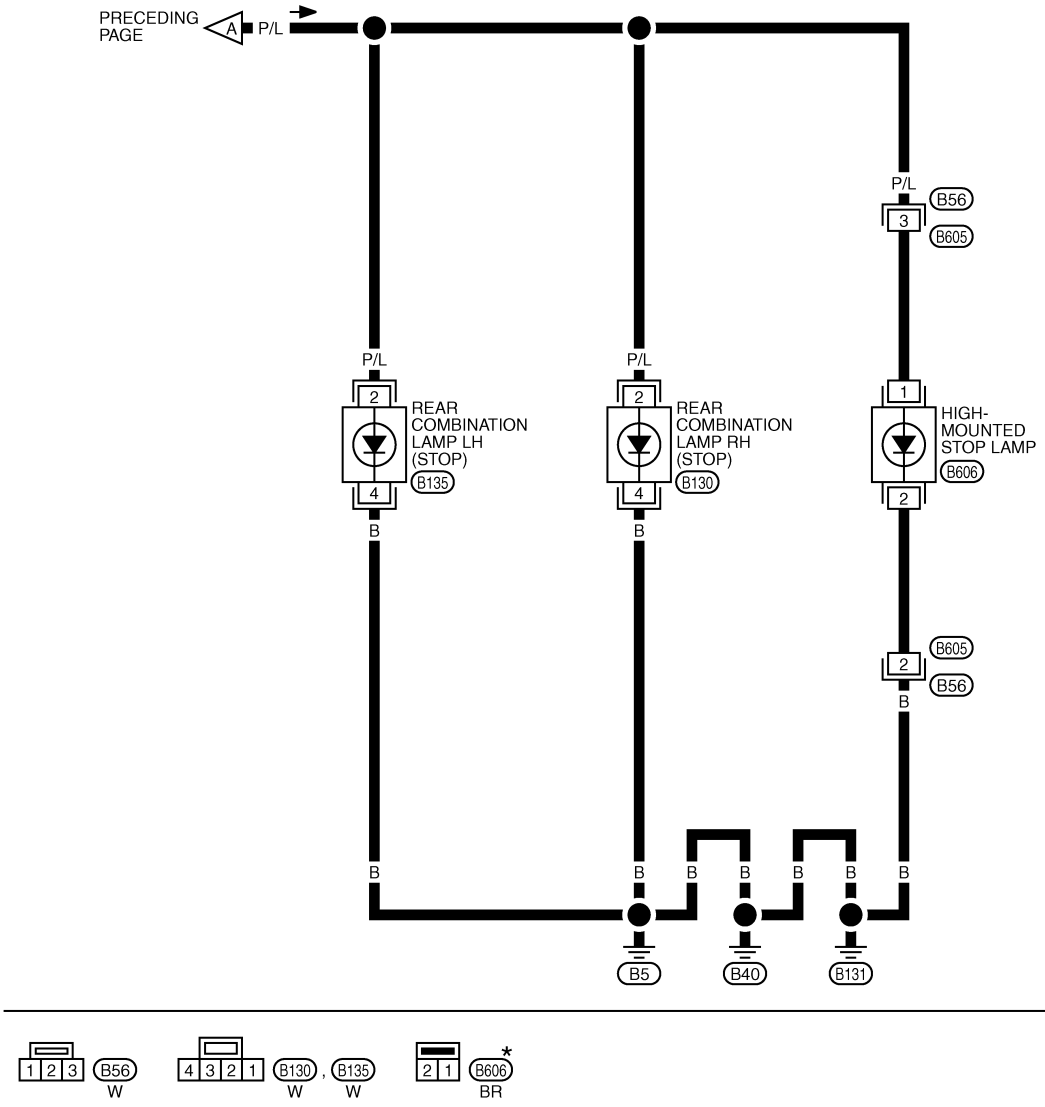




REFER TO THE FOLLOWING.
E108 , B2 -SUPER MULTIPLE JUNCTION (SMJ)
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT8336E

LT-STOP/L-02



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

TKWT3398E

High-Mounted Stop Lamp

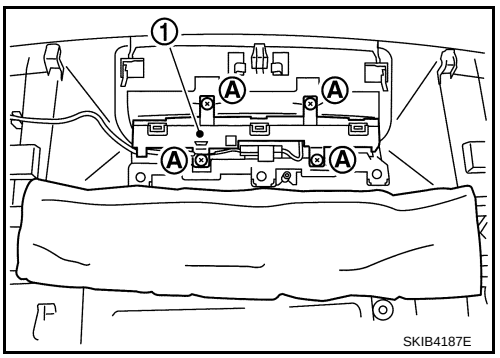
INFOID:0000000004160458

BULB REPLACEMENT, REMOVAL AND INSTALLATION

1. Remove rear parcel shelf finisher. Refer to EI-53.
2. Turned over protection sheet and disconnect connector.

3. Remove screws (A) and remove high-mounted stop lamp (1) from rear parcel shelf finisher.

High-mounted stop lamp : LED



Stop Lamp

INFOID:0000000004160459

BULB REPLACEMENT

Refer to LT-200, "Bulb Replacement".

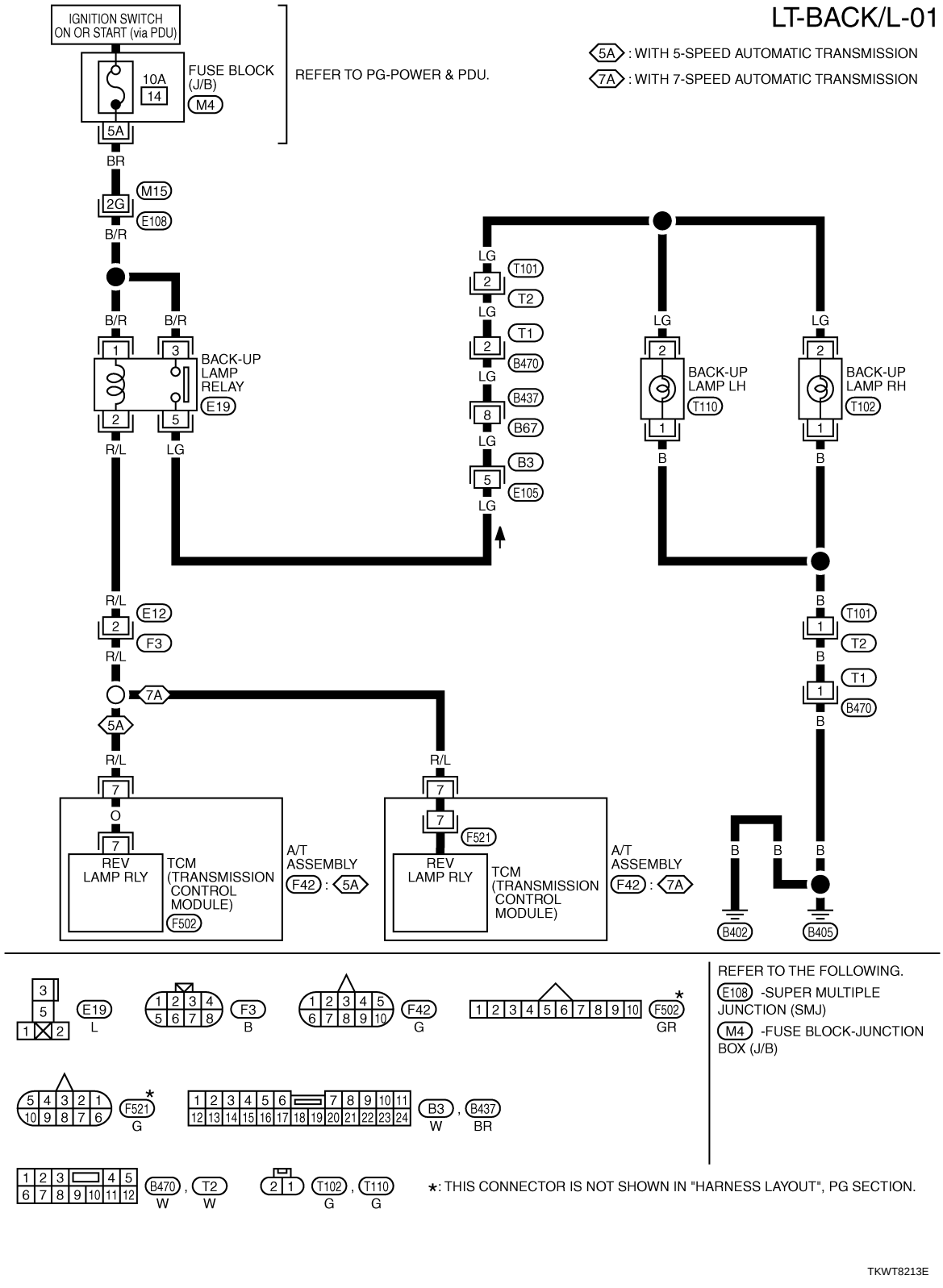
REMOVAL AND INSTALLATION

Refer to LT-200, "Removal and Installation".

BACK-UP LAMP

Wiring Diagram - B/LAMP -

INFOID:0000000004160460



TKWT8213E

Bulb Replacement

INFOID:0000000004160461

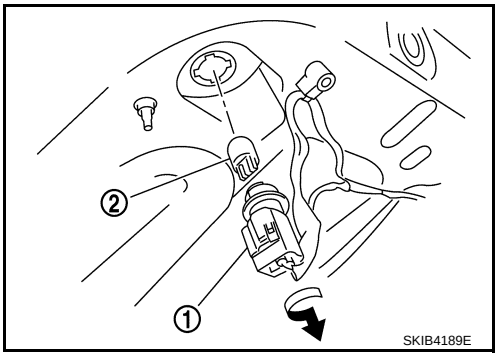
CAUTION:

- **Disconnect the battery negative terminal or remove the fuse.**

- **Never touch the glass of bulb directly by hand. Keep grease and other oily matters away from it. Never touch bulb by hand while it is lit or right after being turned off.**
- **Never leave bulb out of lamp reflector for a long time because dust, moisture smoke, etc. may affect the performance of lamp. When replacing bulb, be sure to replace it with new one.**

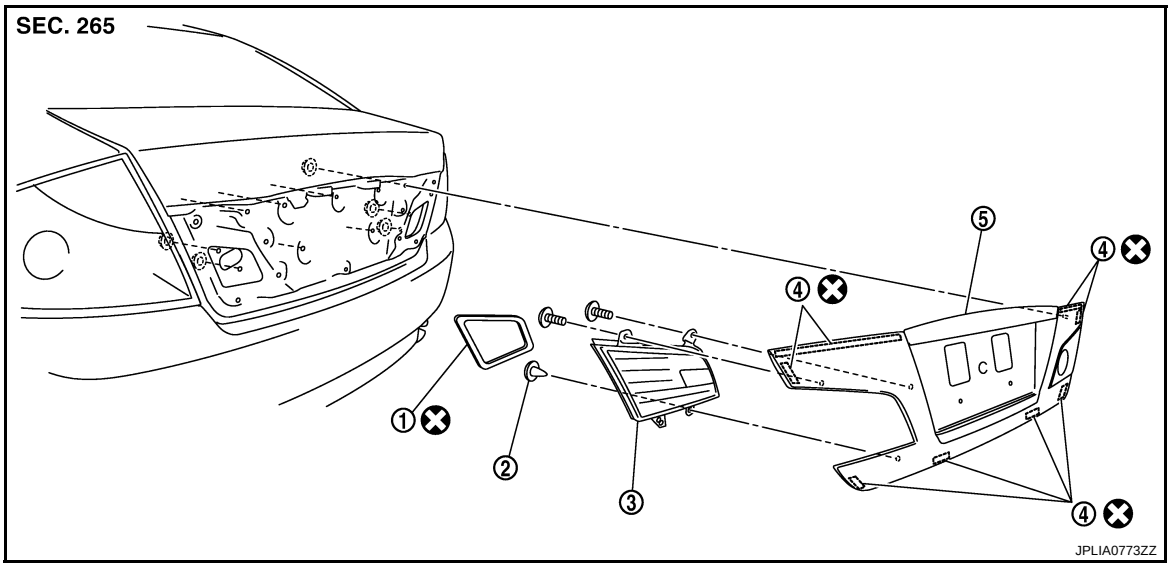
1. Remove trunk lid finisher inner. Refer to EI-45.
2. Turn bulb socket (1) counterclockwise and unlock it.
3. Remove bulb (2) from its socket.

Back-up lamp : 12V - 16W



Removal and Installation

INFOID:0000000004160462



1. Seal packing
2. Clip
3. Back up lamp
4. Two-sided tape
5. Trunk lid finisher outer

Refer to GI-9, "Component" for symbols in the figure.

REMOVAL

CAUTION:

Disconnect the battery negative terminal or remove the fuse.

1. Remove trunk lid finisher inner. Refer to EI-45.
2. Disconnect back up lamp and trunk lid request switch connector.
3. Remove trunk lid finisher outer. Refer to EI-45.
4. Remove screws and clip, and then remove back up lamp.
5. Remove seal packing from back up lamp.

INSTALLATION

Installation is the reverse order of removal.
Install a new seal packing to the back up lamp.

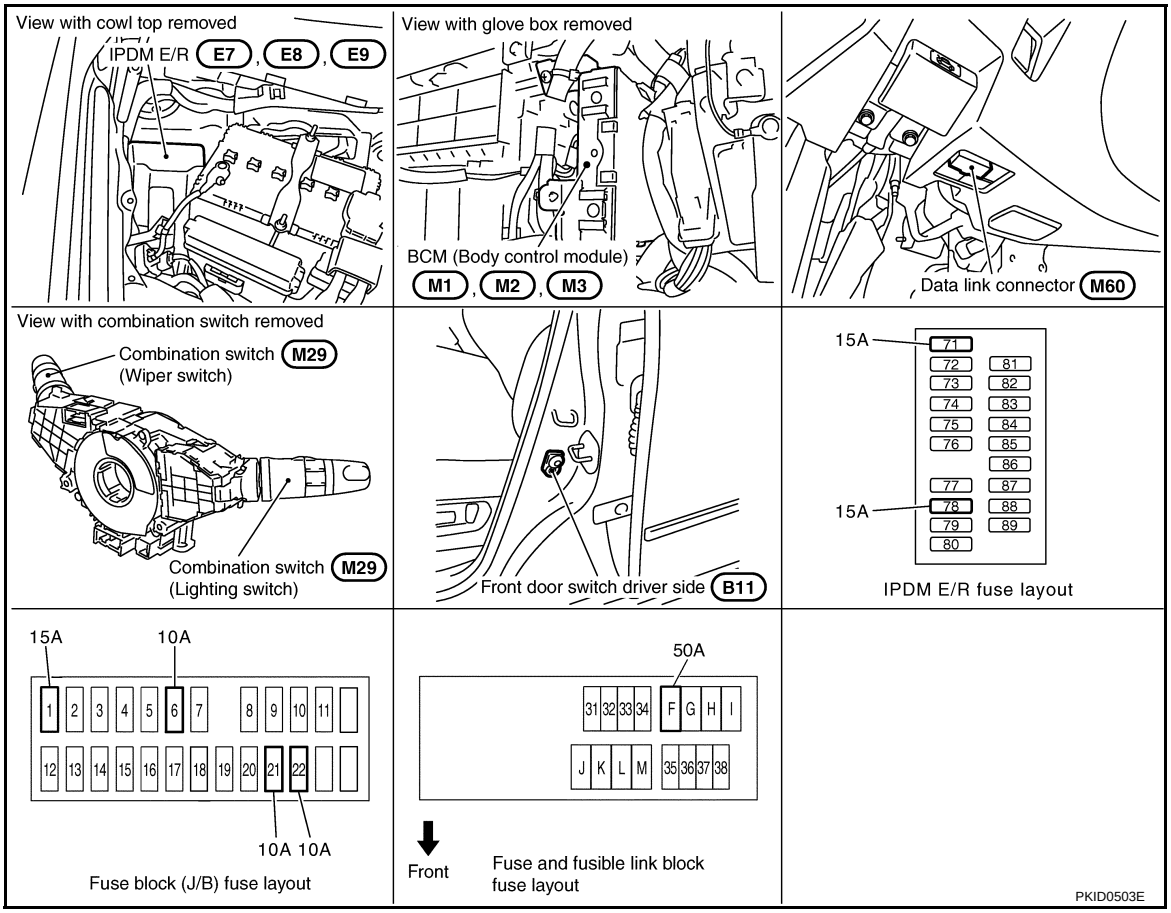
CAUTION:

Seal packing cannot be reused.

PARKING, LICENSE PLATE AND TAIL LAMPS

Component Parts and Harness Connector Location

INFOID:0000000004160463



System Description

INFOID:0000000004160464

The control of the parking, license plate and tail lamp operation is dependent upon the position of the lighting switch (combination switch). When the lighting switch is placed in the 1ST position, the BCM (body control module) receives input signal requesting the parking, license plate and tail lamps to illuminate. This input signal is communicated to the IPDM E/R (intelligent power distribution module engine room) across the CAN communication lines. The CPU (central processing unit) located in the IPDM E/R controls the tail lamp relay coil. This relay, when energized, directs power to parking, license plate and tail lamps, which then illuminate.

OUTLINE

Power is supplied at all times
- through 15A fuse (No. 71, located in IPDM E/R)
- to CPU located in IPDM E/R, and
- to tail lamp relay located in IPDM E/R,
- through 15A fuse (No. 78, located in IPDM E/R)
- to CPU located in IPDM E/R,
- through 50A fusible link (letter F, located in fuse, fusible link and relay block)
- to BCM terminal 55,
- through 10A fuse [No. 21, located in fuse block (J/B)]
- to BCM terminal 42,
- through 10A fuse [No. 22, located in fuse block (J/B)]
- to key slot terminal 1.

With the ignition switch in the ON or START position, power is supplied
- to CPU located in IPDM E/R,
- through 15A fuse [No. 1, located in fuse block (J/B)]
- to BCM terminal 38.

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

- through 10A fuse [No. 6, located in fuse block (J/B)]
- to BCM terminal 11.

Ground is supplied

- to BCM terminal 52
- through grounds M16 and M70,
- to IPDM E/R terminals 38 and 51
- through grounds E22 and E43.

OPERATION BY LIGHTING SWITCH

With the lighting switch in the 1ST or 2ND position (or if the auto light system is activated), the BCM receives input signal requesting the parking, license plate and tail lamps to illuminate. This input signal is communicated to the IPDM E/R across the CAN communication lines. The CPU located in the IPDM E/R controls the tail lamp relay coil, which when energized, directs power

- through IPDM E/R terminal 21
- to front combination lamp LH and RH terminals 5 (parking)
- to front combination lamp LH and RH terminals 7 (side marker)
- to rear combination lamp LH and RH terminals 1 (tail and side marker)
- to license plate lamp LH and RH terminals 1.

Ground is supplied at all times

- to front combination lamp LH and RH terminals 1 (parking and side marker)
- through grounds E22 and E43,
- to rear combination lamp LH and RH terminals 4 (tail and side marker)
- through grounds B5, B40 and B131.
- to license plate lamp LH and RH terminals 2
- through grounds B402 and B405.

With power and ground supplied, the parking, license plate and tail lamps illuminate.
The unified meter and A/C amp. that received the position light request signal by BCM across the CAN communication makes a tail lamp indicator lamp turn on in the combination meter.

COMBINATION SWITCH READING FUNCTION

Refer toBCS-4, "System Description".

EXTERIOR LAMP BATTERY SAVER CONTROL

When the combination switch (lighting switch) is in the 1ST (or 2ND) position, and ignition switch is turned from ON or ACC to OFF, battery saver control feature is activated.
Under this condition, parking, license plate, side marker and tail lamps remain illuminated for 5 minutes, then the parking, license plate, side marker and tail lamps are turned off.
Exterior lamp battery saver control mode can be changed by the function setting of CONSULT-III.

CAN Communication System Description

INFOID:0000000004160465

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

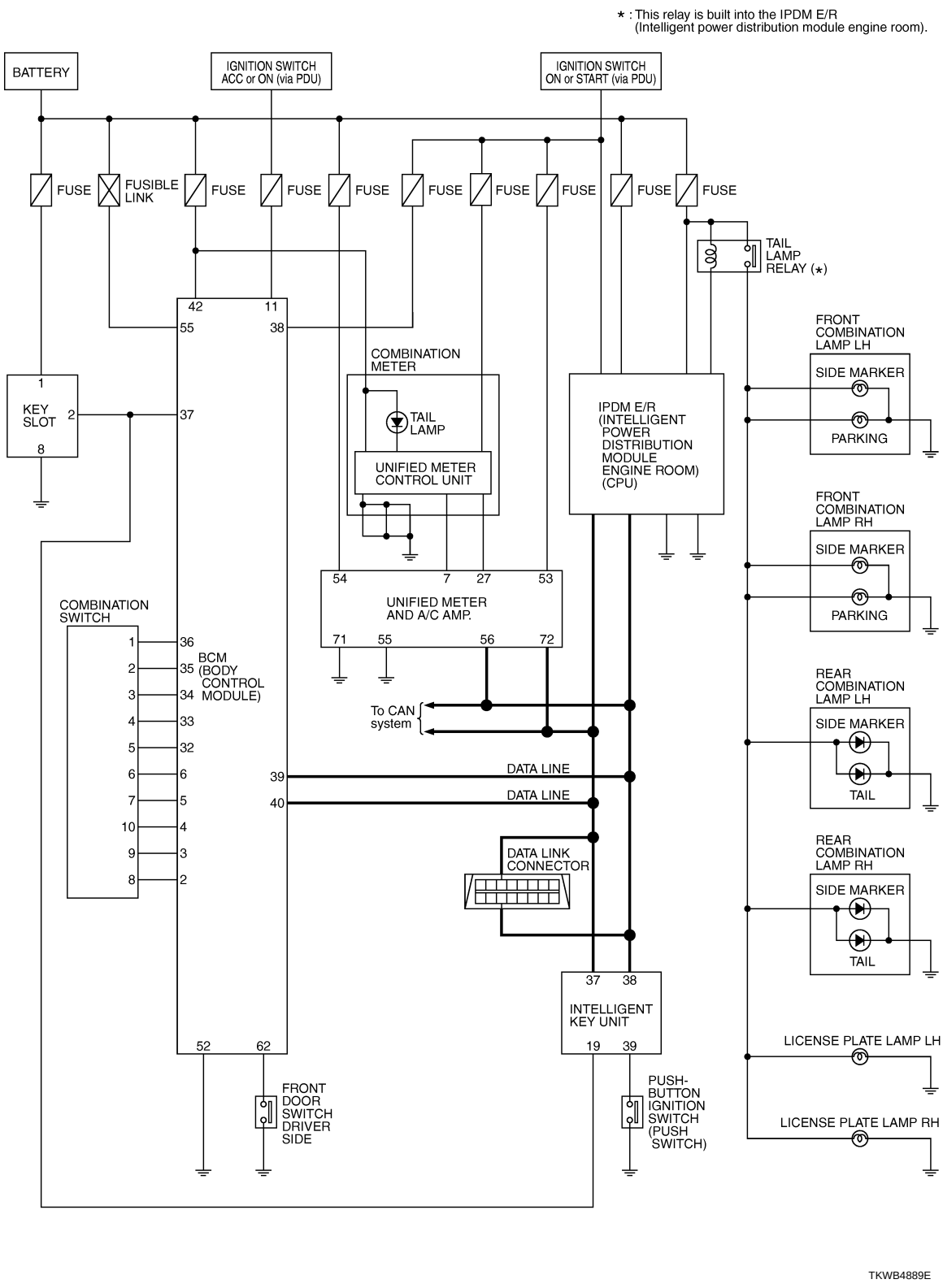
CAN Communication Unit

INFOID:0000000004160466

Refer to LAN-11, "System Description".

Schematic

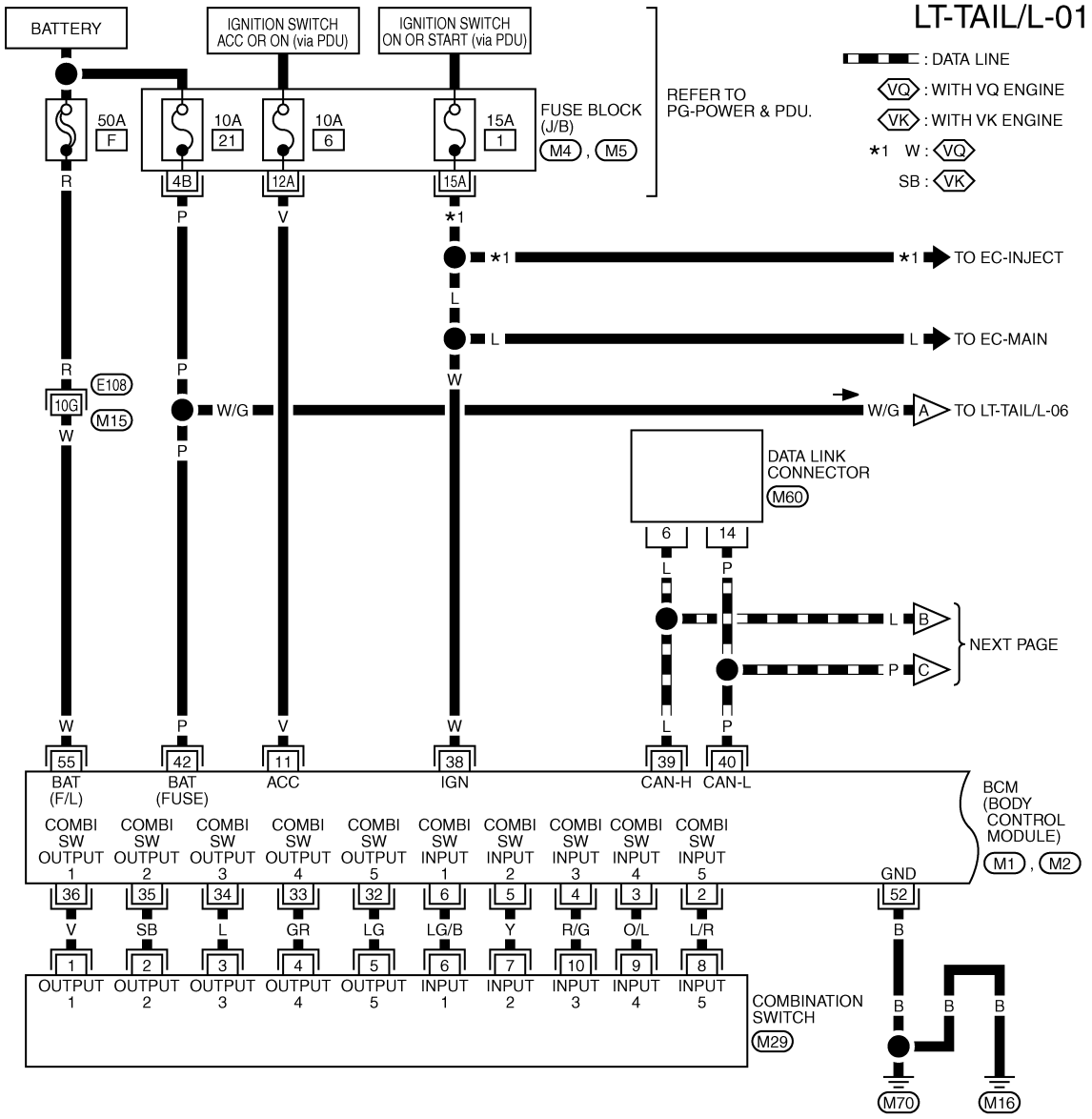
INFOID:0000000004160467

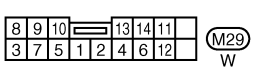


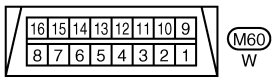
TKWB4889E

Wiring Diagram - TAIL/L -

INFOID:0000000004160468







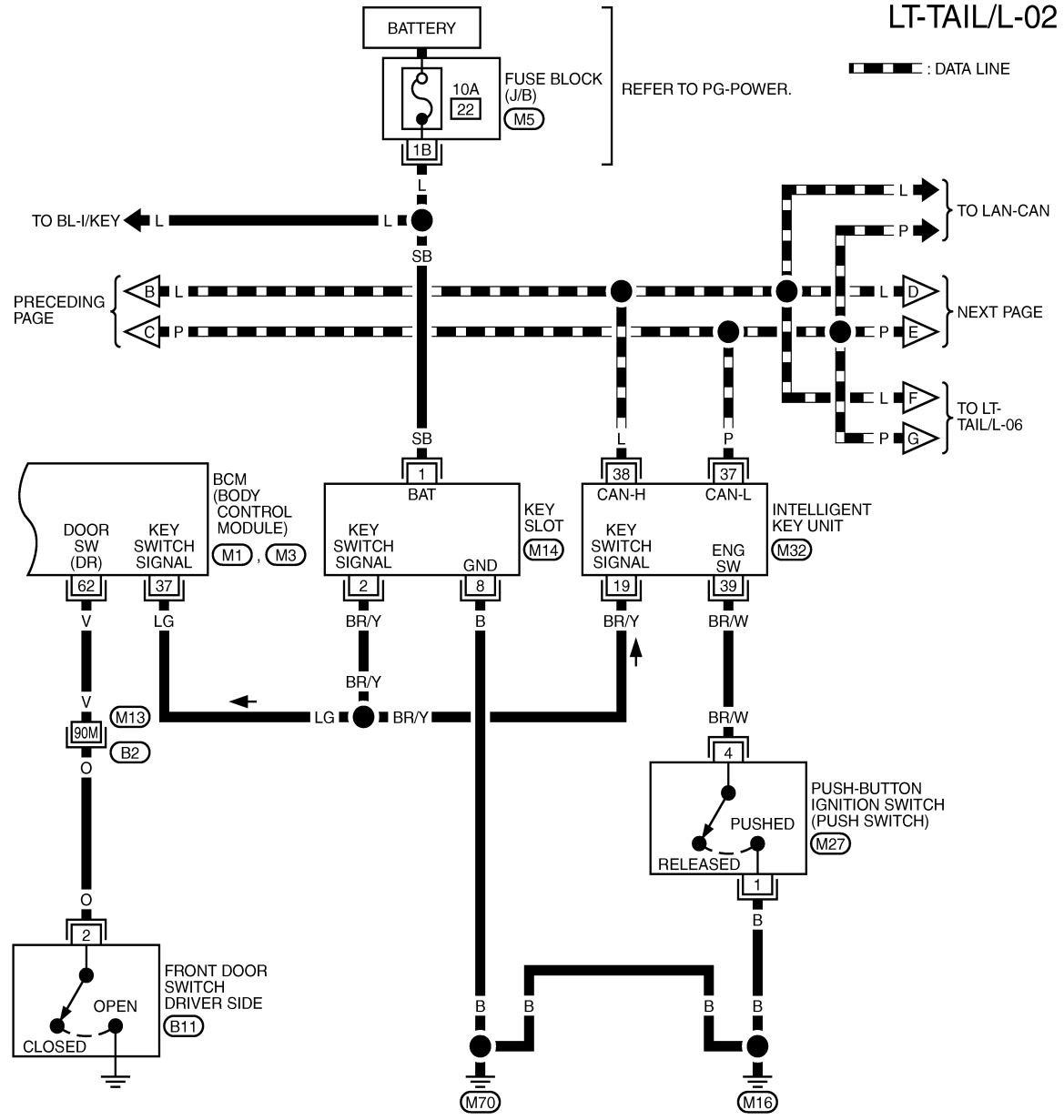
REFER TO THE FOLLOWING.

E108 -SUPER MULTIPLE JUNCTION (SMJ)

M4 , M5 -FUSE BLOCK-JUNCTION BOX (J/B)

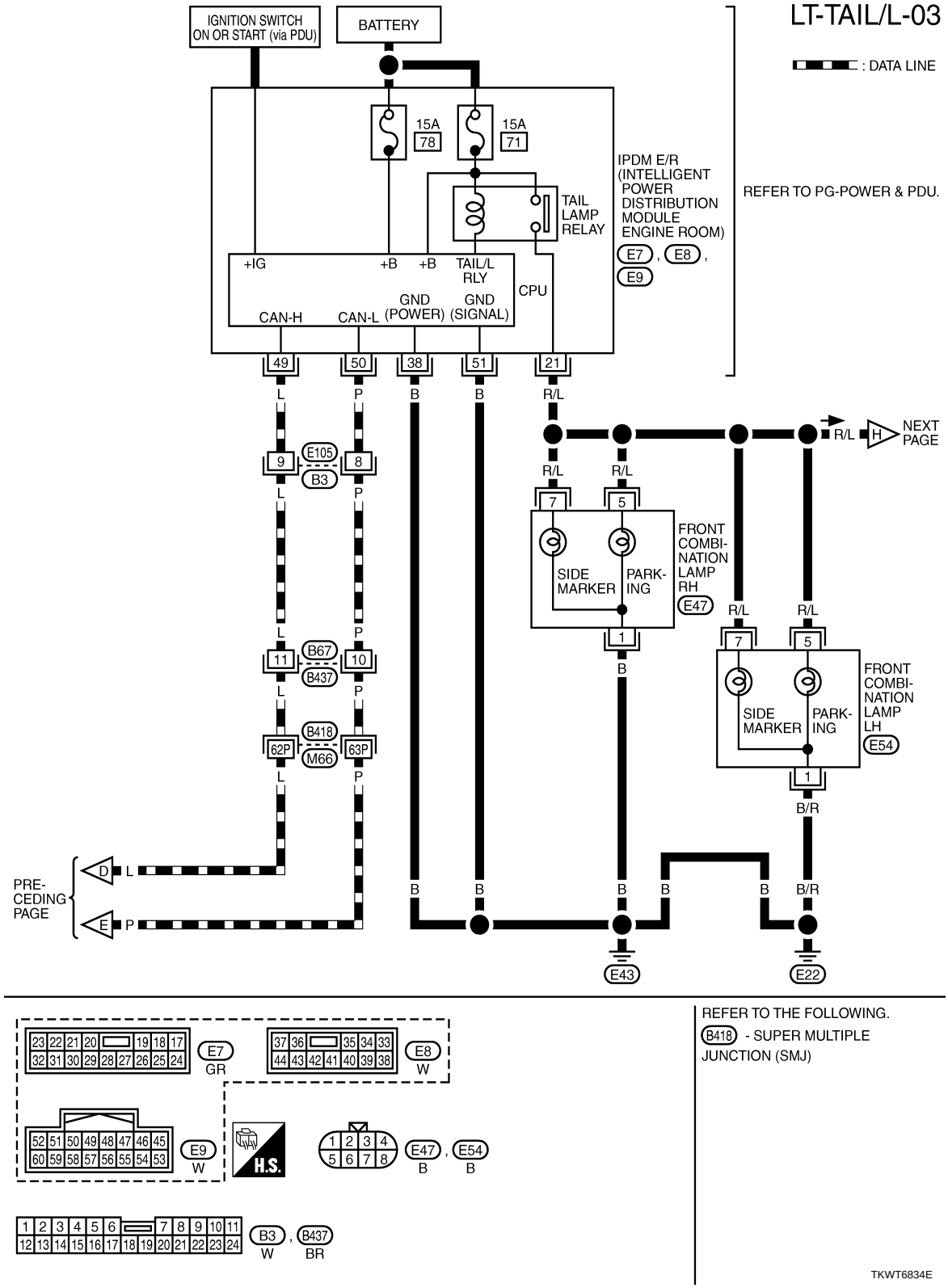
M1 , M2 -ELECTRICAL UNITS

TKWT8214E

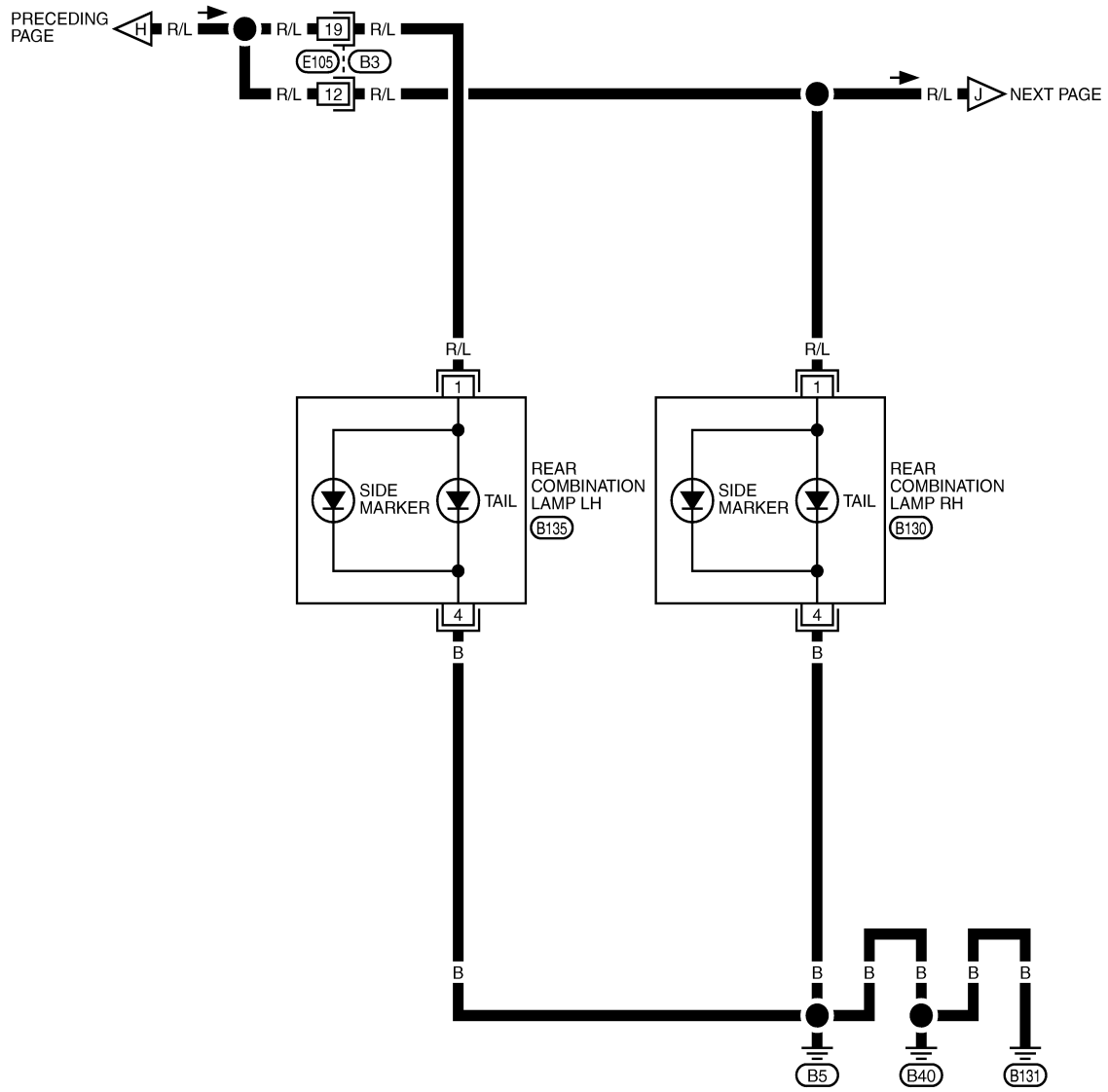


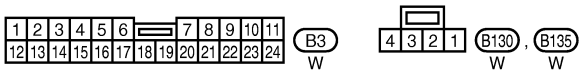
REFER TO THE FOLLOWING.
B2 - SUPER MULTIPLE JUNCTION (SMJ)
M5 - FUSE BLOCK - JUNCTION BOX (J/B)
M1 , M3 - ELECTRICAL UNITS

TKWT6833E


LT-TAIL/L-03
: DATA LINE
IGNITION SWITCH ON OR START (via PDU)
BATTERY
15A 78
15A 71
TAIL LAMP RELAY
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
E7 , E8 , E9
REFER TO PG-POWER & PDU.
+IG
+B
+B
TAIL/L RLY
CPU
CAN-H
CAN-L
GND (POWER)
GND (SIGNAL)
49
50
38
51
21
L
P
B
B
R/L
E105
B3
9
8
B67
B437
11
10
B418
M66
62P
63P
R/L
H
NEXT PAGE
7
5
SIDE MARKER
PARK-ING
FRONT COMBI-NATION LAMP RH
E47
1
B
FRONT COMBI-NATION LAMP LH
E54
B/R
PRE-CEDING PAGE
D
E
E43
E22
E7
GR
E8
W
E9
W
H.S.
E47 , E54
B B
B3 , B437
W BR
REFER TO THE FOLLOWING.
B418 - SUPER MULTIPLE JUNCTION (SMJ)
TKWT6834E

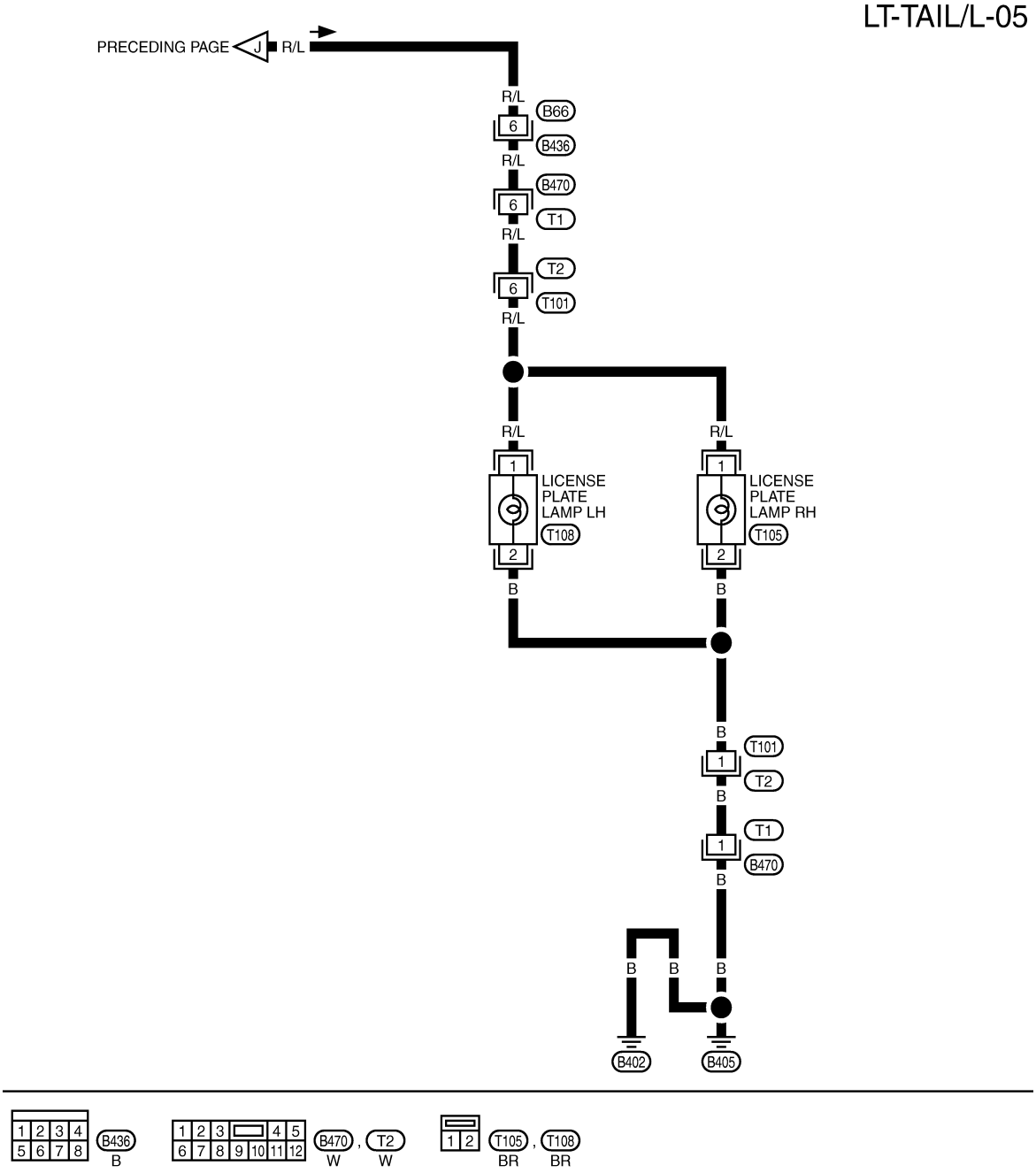
LT-TAIL/L-04



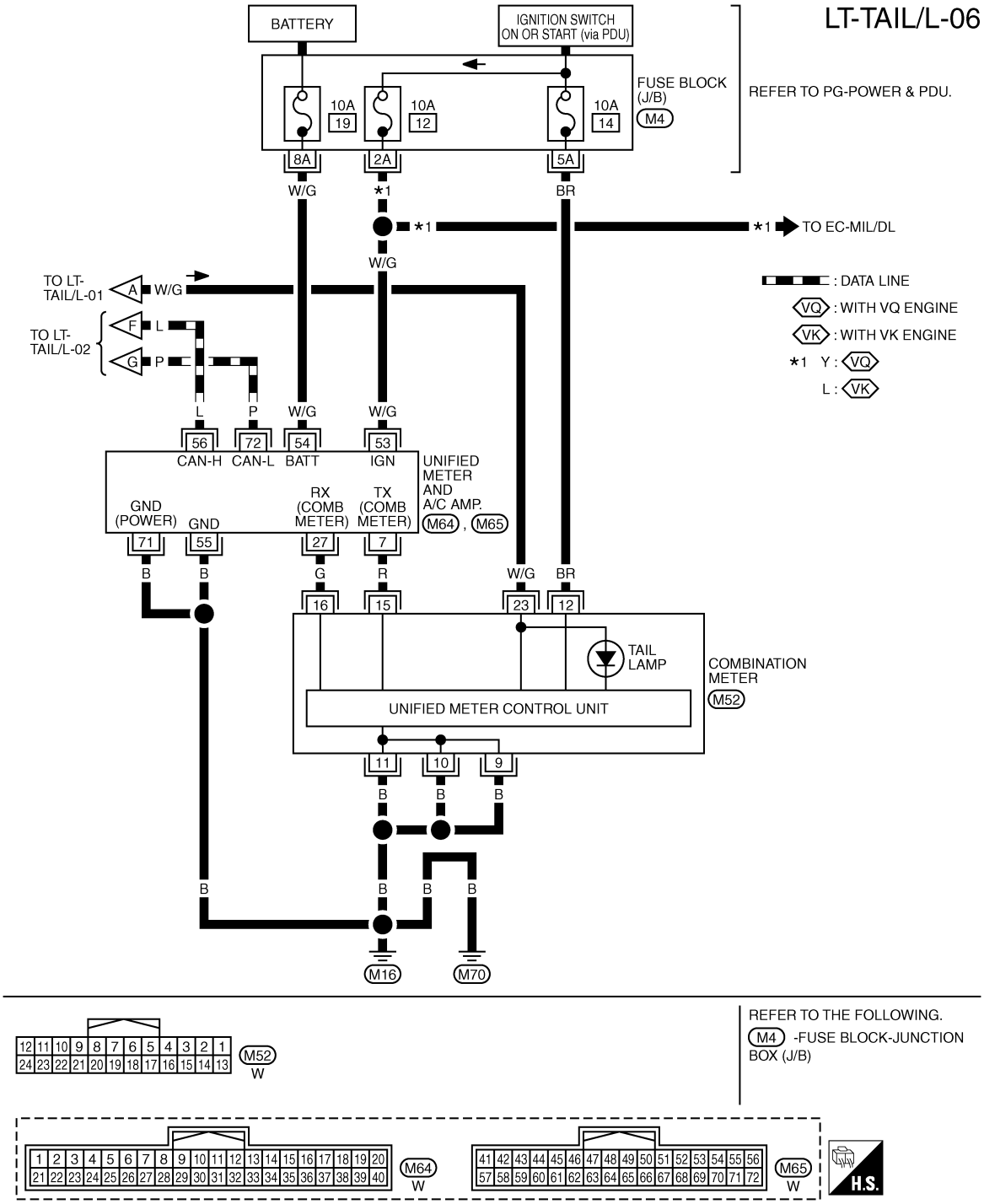


TKWT7181E

LT-TAIL/L-05



TKWT7182E



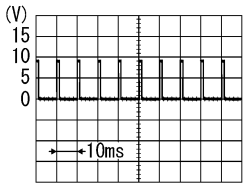
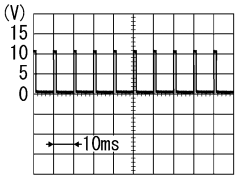
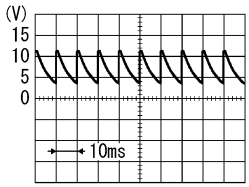
TKWT8215E

Terminal and Reference Value for BCM

INFOID:0000000004160469

CAUTION:

- **Check combination switch system terminal waveform under the loaded condition with lighting switch, turn signal switch and wiper switch OFF not to be fluctuated by overloaded.**
- **Turn wiper dial position to 4 except when checking waveform or voltage of wiper dial position. Wiper dial position can be confirmed on CONSULT-III. Refer to LT-174, "CONSULT-III Functions (BCM - COMB SW)".**

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
2	L/R	Combination switch input 5	ON	Lighting, turn, wiper switch (Wiper dial position 4)	Lighting switch 1ST	 PKIB4957J Approx. 1.0 V
					OFF	Approx. 0 V
11	V	Ignition switch (ACC)	ACC	—		Battery voltage
33	GR	Combination switch output 4	ON	Lighting, turn, wiper switch (Wiper dial position 4)	Lighting switch 1ST (The same result with lighting switch 2ND)	 PKIB4958J Approx. 1.2 V
					OFF	 PKIB4960J Approx. 7.0 - 7.5 V
38	W	Ignition switch (ON)	ON	—		Battery voltage
39	L	CAN – H	—	—		—
40	P	CAN – L	—	—		—
42	P	Battery power supply	OFF	—		Battery voltage
52	B	Ground	ON	—		Approx. 0 V
55	W	Battery power supply	OFF	—		Battery voltage

Terminal and Reference Value for IPDM E/R

INFOID:0000000004160470

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
21	R/L	Parking, license plate, and tail lamp output	ON	Lighting switch 1ST	OFF	Approx. 0 V
					ON	Battery voltage
38	B	Ground	ON	—		Approx. 0 V
49	L	CAN – H	—	—		—

Terminal No.	Wire color	Signal name	Measuring condition		Reference value
			Ignition switch	Operation or condition	
50	P	CAN – L	—	—	—
51	B	Ground	ON	—	Approx. 0 V

How to Perform Trouble Diagnosis

INFOID:0000000004160471

1. Confirm the symptom or customer complaint.
2. Understand operation description and function description. Refer to LT-183, "System Description".
3. Carry out the Preliminary Check. Refer to LT-193, "Preliminary Check".
4. Check symptom and repair or replace the cause of malfunction.
5. Do the parking, license plate and tail lamps operate normally? If YES, GO TO 6. If NO, GO TO 4.
6. INSPECTION END

Preliminary Check

INFOID:0000000004160472

CHECK POWER SUPPLY AND GROUND CIRCUIT

1.CHECK FUSES AND FUSIBLE LINK

Check for blown fuses and fusible link.

Unit	Power source	Fuse and fusible link No.
BCM	Battery	F
		21
	Ignition switch ON or START position	1
	Ignition switch ACC or ON position	6
IPDM E/R	Battery	71
		78

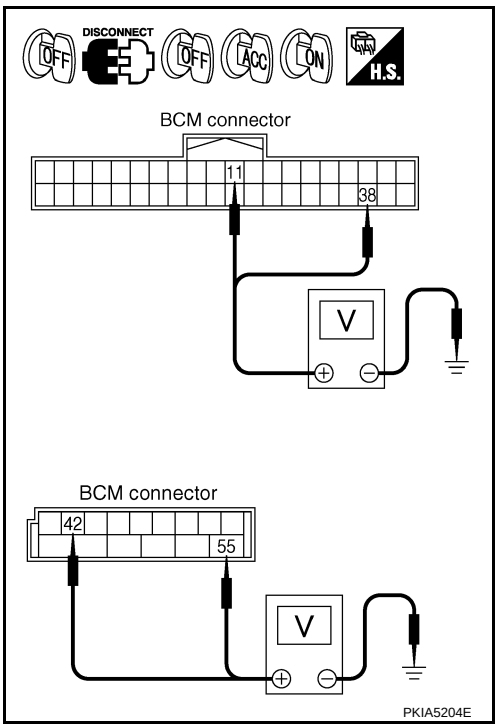
Refer to LT-186, "Wiring Diagram - TAIL/L -".

OK or NG

OK >> GO TO 2.
NG >> If fuse or fusible link is blown, be sure to eliminate cause of malfunction before installing new fuse or fusible link. Refer to PG-4.

2.CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM harness connector and ground.



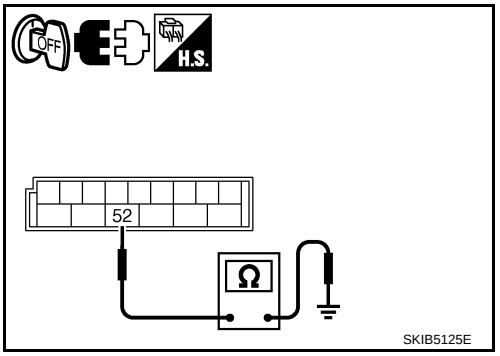
Terminal			Ignition switch position		
(+)		(–)	OFF	ACC	ON
BCM connector	Terminal				
M1	11	Ground	Approx. 0 V	Battery voltage	Battery voltage
	38		Approx. 0 V	Approx. 0 V	Battery voltage
M2	42		Battery voltage	Battery voltage	Battery voltage
	55		Battery voltage	Battery voltage	Battery voltage

OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3.CHECK GROUND CIRCUIT

Check continuity between BCM harness connector and ground.



BCM connector	Terminal	Ground	Continuity
M2	52		Yes

OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.

CONSULT-III Functions (BCM - HEAD LAMP)

INFOID:0000000004160473

Refer to LT-19, "CONSULT-III Functions (BCM - HEAD LAMP)" in HEADLAMP (FOR USA) -XENON TYPE-.
Refer to LT-49, "CONSULT-III Functions (BCM - HEAD LAMP)" in HEADLAMP (FOR CANADA).

CONSULT-III Functions (IPDM E/R)

INFOID:0000000004160474

Refer to LT-20, "CONSULT-III Functions (IPDM E/R)" in HEADLAMP (FOR USA) -XENON TYPE-.
Refer to LT-50, "CONSULT-III Functions (IPDM E/R)" in HEADLAMP (FOR CANADA).

Parking, License Plate and Tail Lamps Do Not Illuminate

INFOID:0000000004160475

1.CHECK COMBINATION SWITCH INPUT SIGNAL

CONSULT-III DATA MONITOR
1. Select “TAIL LAMP SW” of BCM (HEAD LAMP) data monitor item.
2. With operating the lighting switch, check the monitor status.

When lighting switch is 1ST position : TAIL LAMP SW ON

CHECK THE COMBINATION SWITCH
Refer toLT-175, "Combination Switch Inspection".

OK or NG

OK >> GO TO 2.
NG >> Check combination switch (lighting switch). Refer to LT-175, "Combination Switch Inspection".

2.ACTIVE TEST

CONSULT-III ACTIVE TEST
1. Select “TAIL LAMP” of IPDM E/R active test item.
2. With operating the test item, check the parking, license plate and tail lamp operation.

On :Parking, license plate and tail lamps ON
Off :Parking, license plate and tail lamps OFF

IPDM E/R AUTO ACTIVE TEST
1. Activate auto active test. Refer to PG-22, "Auto Active Test".
2. Make sure parking, license plate and tail lamp operation.

Parking, license plate and tail lamps should operate.

OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3.CHECK IPDM E/R

CONSULT-III DATA MONITOR
1. Select “TAIL & CLR REQ” of IPDM E/R data monitor item.
2. With operating the lighting switch is in 1ST position, check the monitor status.

When lighting switch is 1ST position : TAIL & CLR REQ ON

OK or NG

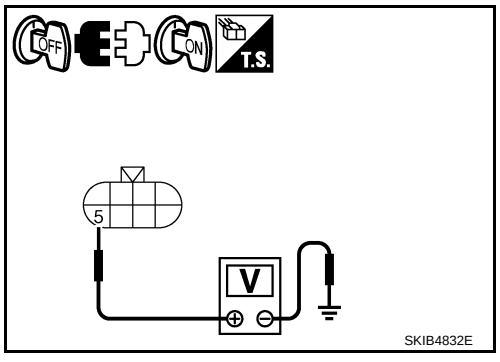
OK >> Replace IPDM E/R. Refer to PG-27, "Removal and Installation of IPDM E/R".
NG >> Replace BCM. Refer to BCS-14, "Removal and Installation of BCM".

4.CHECK INPUT SIGNAL

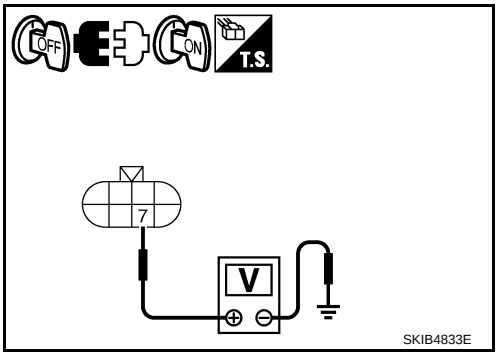
CONSULT-III ACTIVE TEST
1. Turn ignition switch OFF.
2. Disconnect front combination lamp, license plate lamp and rear combination lamp connectors.
3. Select “TAIL LAMP” of IPDM E/R active test item.
4. With operating the test item, check voltage between front combination lamp, license plate lamp, rear combination lamp harness connector and ground.

IPDM E/R AUTO ACTIVE TEST
1. Turn ignition switch OFF.
2. Disconnect front combination lamp, license plate lamp and rear combination lamp connectors.
3. Activate auto active test. Refer to PG-22, "Auto Active Test".
4. When tail lamp relay is operating, check voltage between front combination lamp, license plate lamp, rear combination lamp harness connector and ground.

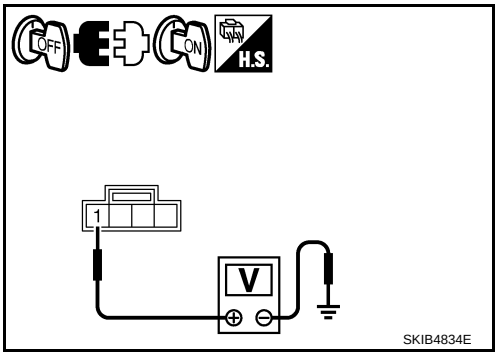
Terminal				Voltage (Approx.)
(+)			(–)	
Front combination lamp (parking) connector		Terminal		
RH	E47	5	Ground	Battery voltage
LH	E54			



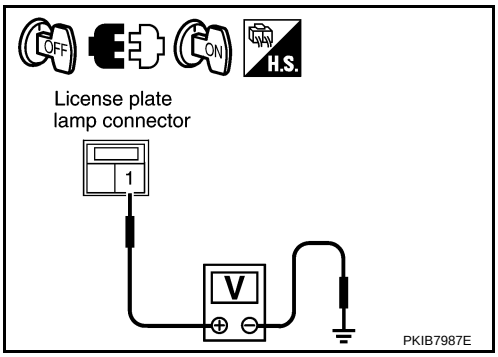
Terminal				Voltage (Approx.)
(+)			(–)	
Front combination lamp (side marker) connector		Terminal		
RH	E47	7	Ground	Battery voltage
LH	E54			



Terminal				Voltage (Approx.)
(+)			(–)	
Rear combination lamp (tail) connector		Terminal		
RH	B130	1	Ground	Battery voltage
LH	B135			



Terminal				Voltage (Approx.)
(+)			(–)	
License plate lamp connector		Terminal		
RH	T105	1	Ground	Battery voltage
LH	T108			



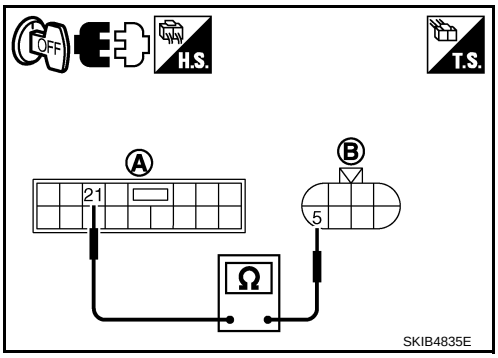
OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. CHECK PARKING, LICENSE PLATE AND TAIL LAMP CIRCUIT

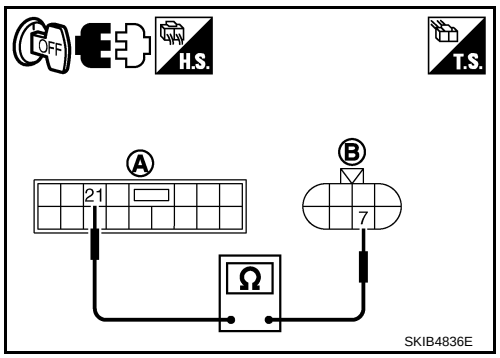
1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector (A) and front combination lamp harness connector (B).

A		B			Continuity
Connector	Terminal	Connector		Terminal	
E7	21	RH	E47	5	Yes
		LH	E54		



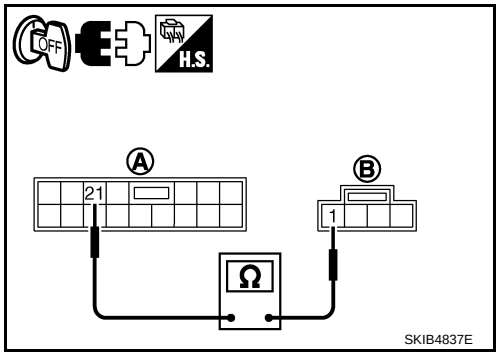
4. Check continuity between IPDM E/R harness connector (A) and front combination lamp harness connector (B).

A		B			Continuity
Connector	Terminal	Connector		Terminal	
E7	21	RH	E47	7	Yes
		LH	E54		



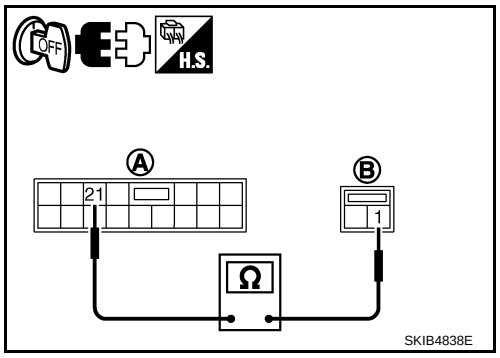
5. Check continuity between IPDM E/R harness connector (A) and rear combination lamp harness connector (B).

A		B			Continuity
Connector	Terminal	Connector		Terminal	
E7	21	RH	B130	1	Yes
		LH	B135		



6. Check continuity between IPDM E/R harness connector (A) and license plate lamp harness connector (B).

A		B			Continuity
Connector	Terminal	Connector		Terminal	
E7	21	RH	T105	1	Yes
		LH	T108		



OK or NG

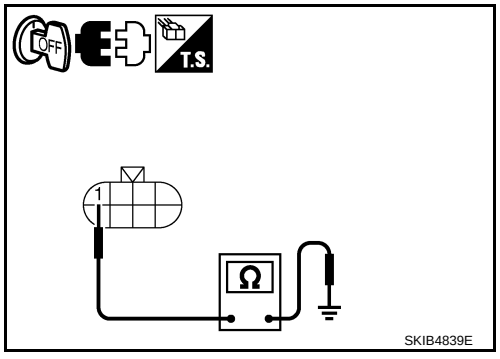
OK >> Replace IPDM E/R. Refer to PG-27, "Removal and Installation of IPDM E/R".

NG >> Repair harness or connector.

6. CHECK PARKING, LICENSE PLATE AND TAIL LAMPS GROUND CIRCUIT

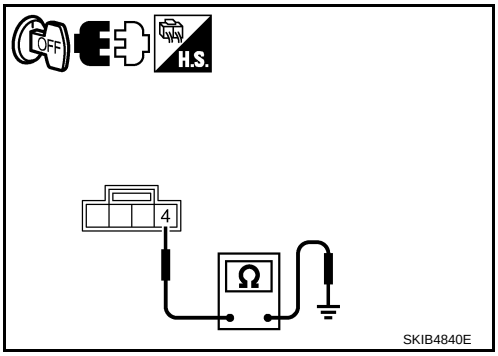
1. Check continuity between front combination lamp harness connector and ground.

Front combination lamp (parking and side marker) connector		Terminal	Ground	Continuity
RH	E47	1		Yes
LH	E54			



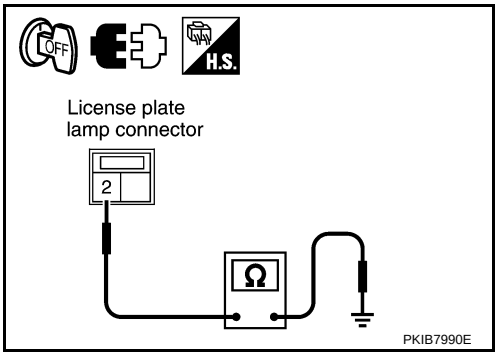
2. Check continuity between rear combination lamp harness connector and ground.

Rear combination lamp (tail and side marker) connector		Terminal	Ground	Continuity
RH	B130	4		Yes
LH	B135			



3. Check continuity between license plate lamp harness connector and ground.

License plate lamp connector		Terminal	Ground	Continuity
RH	T105	2		Yes
LH	T108			



OK or NG

OK >> Check bulbs.
NG >> Repair harness or connector.

Parking, License Plate and Tail Lamps Do Not Turn OFF (After Approx. 10 Minutes)

INFOID:0000000004160476

- This symptom indicates the malfunction of ignition relay in IPDM E/R. Refer to PG-20, "Function of Detecting Ignition Relay Malfunction".
- Select “LIGHT SW 1ST” of BCM (HEAD LAMP) data monitor item. If “LIGHT SW 1ST” is OFF when lighting switch is OFF, replace IPDM E/R.

License Plate Lamp

INFOID:0000000004160477

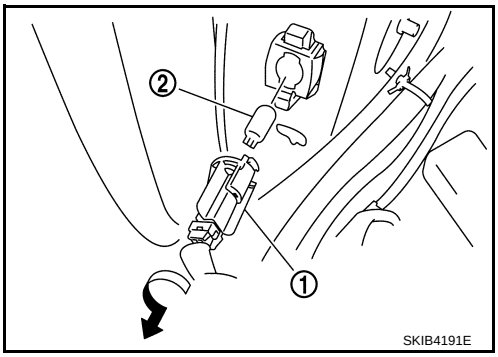
BULB REPLACEMENT

CAUTION:

- **Disconnect the battery negative terminal or remove the fuse.**
- **Never touch the glass of bulb directly by hand. Keep grease and other oily matters away from it. Never touch bulb by hand while it is lit or right after being turned off.**
- **Never leave bulb out of lamp reflector for a long time because dust, moisture smoke, etc. may affect the performance of lamp. When replacing bulb, be sure to replace it with new one.**

1. Remove trunk lid finisher inner. Refer to EI-66, "Component Parts Location".
2. Turn bulb socket (1) counterclockwise and unlock it.
3. Remove bulb (2) from its socket.

License plate lamp : 12V - 5W



Removal and Installation

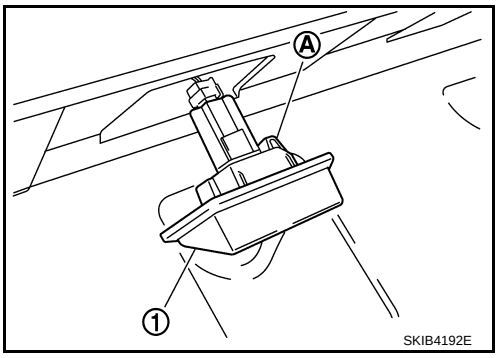
INFOID:0000000004160478

REMOVAL

CAUTION:

Disconnect the battery negative terminal or remove the fuse.

1. Remove trunk lid finisher inner. Refer to EI-66, "Component Parts Location".
2. From the trunk room inside, push a lamp to outside while pushing a resin clip (A).
3. Disconnect connector and remove license plate lamp (1).



INSTALLATION

Installation is the reverse order of removal.

Parking Lamp

INFOID:0000000004160479

BULB REPLACEMENT

Refer to LT-31, "Bulb Replacement" in “HEAD LAMP - XENON TYPE-”.

REMOVAL AND INSTALLATION

Refer to LT-198, "License Plate Lamp".

REAR COMBINATION LAMP

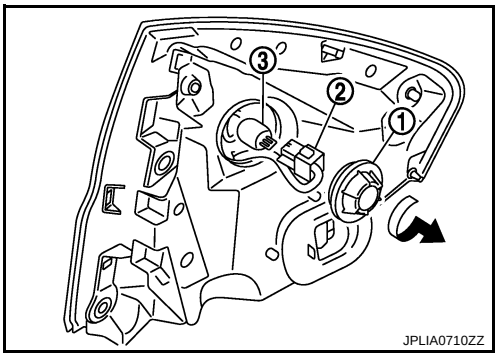
Bulb Replacement

INFOID:0000000004160480

CAUTION:
- **Disconnect the battery negative terminal or remove the fuse.**
- **Never touch the glass of bulb directly by hand. Keep grease and other oily matters away from it. Never touch bulb by hand while it is lit or right after being turned off.**
- **Never leave bulb out of lamp reflector for a long time because dust, moisture smoke, etc. may affect the performance of lamp. When replacing bulb, be sure to replace it with new one.**

REAR TURN SIGNAL LAMP BULB

1. Remove rear combination lamp. Refer to LT-200, "Removal and Installation".
2. Rotate the resin cap (1) counterclockwise and unlock it.
3. Turn rear turn signal lamp bulb socket (2) counterclockwise and unlock it.
4. Remove bulb (3).



CAUTION:
Seal packing cannot be reused.

Rear turn signal lamp : 12V - 21W (amber bulb)

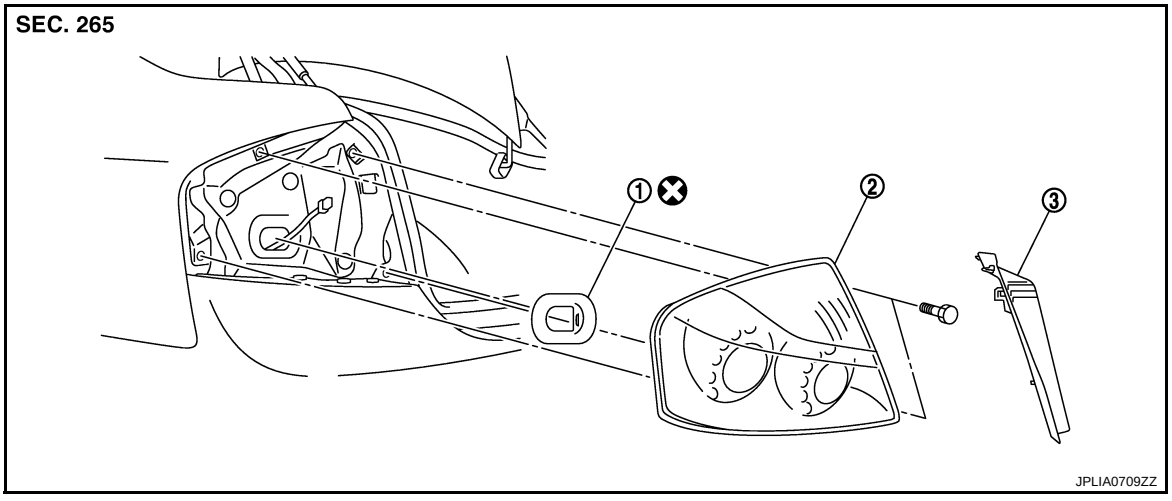
STOP/TAIL LAMP

Replacement integral with rear combination lamp.

Stop/tail lamp : LED

Removal and Installation

INFOID:0000000004160481



1. Seal packing
2. Rear combination lamp assembly
3. Rear combination lamp finisher

Refer to GI-9, "Component" for symbols in the figure.

REMOVAL

CAUTION:
Disconnect the battery negative terminal or remove the fuse.

1. Remove trunk side finisher. Refer to EI-66, "Component Parts Location".
2. Disconnect rear combination lamp connector.

3. Remove rear combination lamp finisher.
4. Remove rear combination lamp mounting bolts.
5. Pull the rear combination lamp toward rear of the vehicle and remove from the vehicle.
6. Remove seal packing from the vehicle.

INSTALLATION

Installation is the reverse order of removal.

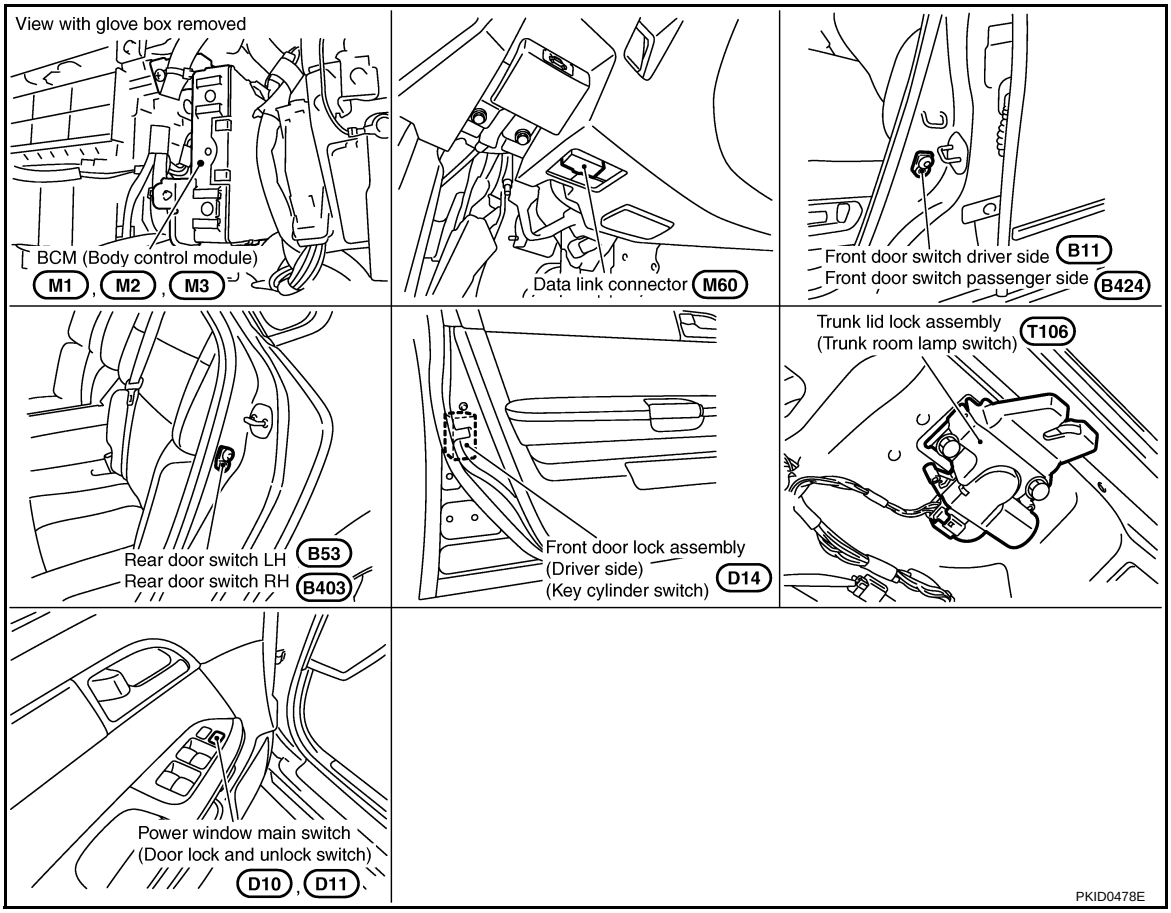
CAUTION:

Seal packing cannot be reused.

INTERIOR ROOM LAMP

Component Parts and Harness Connector Location

INFOID:0000000004160482



System Description

INFOID:0000000004160483

BCM (body control module) controls interior lamp, room lamp timer and interior lamp battery saver.
The following signals are input to BCM:

- Door lock/unlock trunk open request signal from the Intelligent Key unit via CAN communication
- Key cylinder switch status signal from power window main switch via power window serial link
- Door switch signal from door switches (driver side, passenger side, rear LH and RH)
- IGN power supply (signal) from PDU (power distribution unit)
- ACC power supply (signal) from PDU

ROOM LAMP TIMER BASIC OPERATION

Applicable lamps

- Room lamp system: map lamp, foot lamp (driver side and passenger side) and personal lamp (rear LH and rear RH).

1. When getting on the vehicle
   - Lamps illuminate by timer operation when driver side door or passenger side door is unlocked.*
   - Lamps illuminate by timer operation after any door is open and then all doors are closed.*
   - Timer operation stops and lamps are OFF, when driver side door is locked or the push-button ignition switch (push switch) is turned to ACC or ON from OFF.

   *: This setting can be changed by CONSULT-III. Refer to LT-218, "CONSULT-III Functions (BCM - INT LAMP)".

2. When getting off the vehicle
   - Lamps illuminate by timer operation when the push-button ignition switch (push switch) is turned OFF.*

- Lamps illuminate by timer operation after any door is open and then all doors are closed.*
- Timer operation stops and lamps are OFF, when driver side door is locked.

*: This setting can be changed by CONSULT-III. Refer to LT-218, "CONSULT-III Functions (BCM - INT LAMP)".

POWER SUPPLY AND GROUND

Power is supplied at all times
- through 50A fusible link (letter F, located in fuse and fusible link block)
- to BCM terminal 55,
- through 10A fuse [No. 21, located in fuse block (J/B)]
- to BCM (body control module) terminal 42,
- through 10A fuse [No. 22, located in fuse block (J/B)]
- to key slot terminal 1.

With the ignition switch in the ON or START position, power is supplied
- through 15A fuse [No. 1, located in fuse block (J/B)]
- to BCM terminal 38.

With the ignition switch in the ACC or ON position, power is supplied
- through 10A fuse [No. 6, located in fuse block (J/B)]
- to BCM terminal 11.

Ground is supplied
- to BCM terminal 52
- through grounds M16 and M70.

When the driver side door is opened, ground is supplied
- to BCM terminal 62
- through front door switch driver side terminal 2
- through case ground of front door switch driver side.

When the passenger side door is opened, ground is supplied
- to BCM terminal 12
- through front door switch passenger side terminal 2
- through case ground of front door switch passenger side.

When the rear door LH is opened, ground is supplied
- to BCM terminal 63
- through rear door switch LH terminal 2
- through case ground of rear door switch LH.

When the rear door RH is opened, ground is supplied
- to BCM terminal 13
- through rear door switch RH terminal 2
- through case ground of rear door switch RH.

When driver side door is unlocked by door lock and unlock switch, BCM receives a ground signal
- to BCM terminal 22
- through power window main switch (door lock and unlock switch) terminal 14 or power window sub-switch (front passenger side) (door lock and unlock switch) terminal 16
- through power window main switch (door lock and unlock switch) terminal 17 or power window sub-switch (front passenger side) (door lock and unlock switch) terminal 11
- through grounds M16 and M70.

When the driver side door is unlocked by the front door lock assembly (driver side) (key cylinder switch), BCM receives a ground signal
- to BCM terminal 22
- through power window main switch (door lock and unlock switch) terminals 14 and 6
- through front door lock assembly (driver side) (key cylinder switch) terminals 5 and 4
- through grounds M16 and M70.

When a signal, or combination of door open signals is received by BCM, ground is supplied
- to foot lamp driver side and passenger side terminals 2
- to personal lamp LH and RH terminals 1
- to map lamp terminal 2 and 5
- through BCM terminal 48,
- to step lamp (driver side, passenger side, rear LH and RH) terminals 2
- to kicking plate illumination (driver side and passenger side) terminals 2
- through BCM terminal 47.

With power and ground supplied, the interior lamps illuminate.

SWITCH OPERATION

When any front door switch is ON (door is opened), ground is supplied
- to step lamp (driver side, passenger side, rear LH and RH) terminals 2
- to kicking plate illumination (driver side and passenger side) terminals 2
- through BCM terminal 47.

And power is supplied
- through BCM terminal 41
- to step lamp (driver side, passenger side, rear LH and RH) terminals 1
- to kicking plate illumination (driver side and passenger side) terminals 1.

When any door switch is ON (door is opened) and personal lamp and map lamp is DOOR position, ground is supplied
- to personal lamp LH and RH terminal 1
- to map lamp terminals 2 and 5
- through BCM terminal 48.

And power is supplied
- through BCM terminal 41
- to personal lamp LH and RH terminals 3
- to map lamp terminal 3.

When map lamp switch is ON, ground is supplied
- to map lamp terminal 1
- through grounds M16 and M70.

And power is supplied
- through BCM terminal 41
- to map lamp terminal 3.

When personal lamp LH and RH switch is ON, ground is supplied
- to personal lamp LH and RH terminals 2
- through grounds M16 and M70.

And power is supplied
- through BCM terminal 41
- to personal lamp LH and RH terminals 3.

When trunk lid lock assembly (trunk room lamp switch) is ON, ground is supplied
- to trunk room lamp (upper and lower) terminals 2
- through trunk lid lock assembly (trunk room lamp switch) terminals 1 and 2
- through grounds B405 and B402.

And power is supplied
- through BCM terminal 41
- to trunk room lamp (upper and lower) terminals 1.

When vanity mirror lamp LH and RH switch is ON, ground is supplied
- to vanity mirror lamp LH and RH terminals 2
- through grounds M16 and M70.

And power is supplied
- through BCM terminal 41
- to vanity mirror lamp (LH and RH) terminals 1.

ROOM LAMP TIMER OPERATION

BCM controls applicable lamps to illuminate for 15 seconds (can be set maximum 30 seconds) by timer operation under following conditions. BCM also controls applicable lamps to brighten for 1 second (can be set maximum 5 seconds) when turned ON, or to dim for 3 seconds (can be set maximum 5 seconds) when turned OFF. (Timer operating time and dimming/brightening time can be changed with CONSULT-III. Refer to LT-218, "CONSULT-III Functions (BCM - INT LAMP)".) This control operates as follows.

Applicable lamps
- Room lamp system: map lamp, foot lamp (driver side and passenger side) and personal lamp (rear LH and rear RH).

BCM controls room lamp timer operation under following condition.
- Condition 1: Door lock state changes.*
  BCM judges as the door lock is unlocked under either case below.
  - The Intelligent Key unit sends door lock/unlock trunk open request signal (driver side unlock or passenger side unlock) to BCM through CAN communication line by unlock operation of intelligent key, outside key antenna and front door request switch (driver side) or outside key antenna and front door request switch (passenger side).

- Key cylinder switch state (unlock) signal is sent to BCM through power window serial link when front door lock assembly (driver side) (key cylinder switch) is unlocked (ON) by power window main switch unlock operation.

And fulfills all the conditions below.
- The engine switch (push switch) is OFF.
- All the doors are closed.

*: This setting can be changed by CONSULT-III. Refer to LT-218, "CONSULT-III Functions (BCM - INT LAMP)".

- Condition 2: Any door switch state changes.*
  The BCM terminal value of operated door switch is changed when any door is opened and then closed. From that BCM judges as the door is opened and then closed.

And fulfills all the conditions below.
- The engine switch (push switch) is OFF.
- All the doors are closed.

*: This setting can be changed by CONSULT-III. Refer to LT-218, "CONSULT-III Functions (BCM - INT LAMP)".

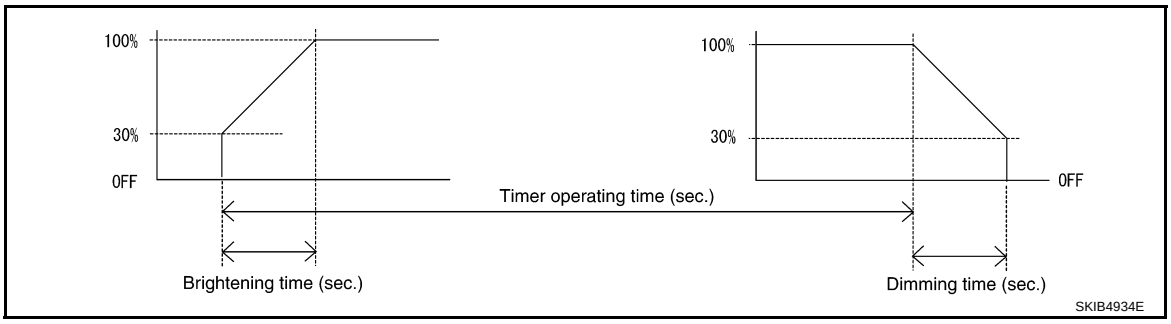
- Condition 3: Engine switch (push switch) state changes.*
  The Intelligent Key unit judges as the engine switch (push switch) is OFF and sends push-button ignition switch (push switch) signal to PDU (power distribution unit) when push-button ignition switch (push switch) turned OFF. Then PDU (power distribution unit) turns OFF, IGN power supply and ACC power supply.

And fulfills the conditions below.
- All the doors are closed.

*:This setting can be changed by CONSULT-III. Refer to LT-218, "CONSULT-III Functions (BCM - INT LAMP)".

NOTE:
When timer operation signal is input during former timer operation, BCM goes for latter timer operation.

ROOM LAMP TIMER OPERATING TIME



CONDITIONS FOR CANCELING TIMER

Timer operation is cancelled in any of the following conditions.
- Driver door is locked.
- Any door is opened.
- Turn ignition switch is ACC or ON.

ROOM LAMP TIMER INAPPLICABLE LAMPS OPERATION

- Step lamp system: step lamp (driver side, passenger side, rear LH and rear RH) and kicking plate illumination (driver side and passenger side).
  Step lamp system lamps are ON/OFF linked with any door (driver side, passenger side, rear LH and rear RH) opened and then closed.
- Vanity mirror lamp LH and RH.
  Operated side vanity mirror lamp is ON/OFF linked with vanity mirror opened and then closed.
- Trunk room lamp (lower) and trunk room lamp (upper).
  Trunk room lamps (lower and upper) are ON/OFF linked with trunk opened and then closed.

INTERIOR ROOM LAMP BATTERY SAVER FUNCTION

Applicable lamps
- Room lamp system: map lamp, foot lamp (driver side and passenger side) and personal lamp (rear LH and rear RH).
- Step lamp system: step lamp (driver side, passenger side, rear LH and rear RH) and kicking plate illumination (driver side and passenger side).

- Vanity mirror lamp LH and RH.
- Trunk room lamp (lower) and trunk room lamp (upper).

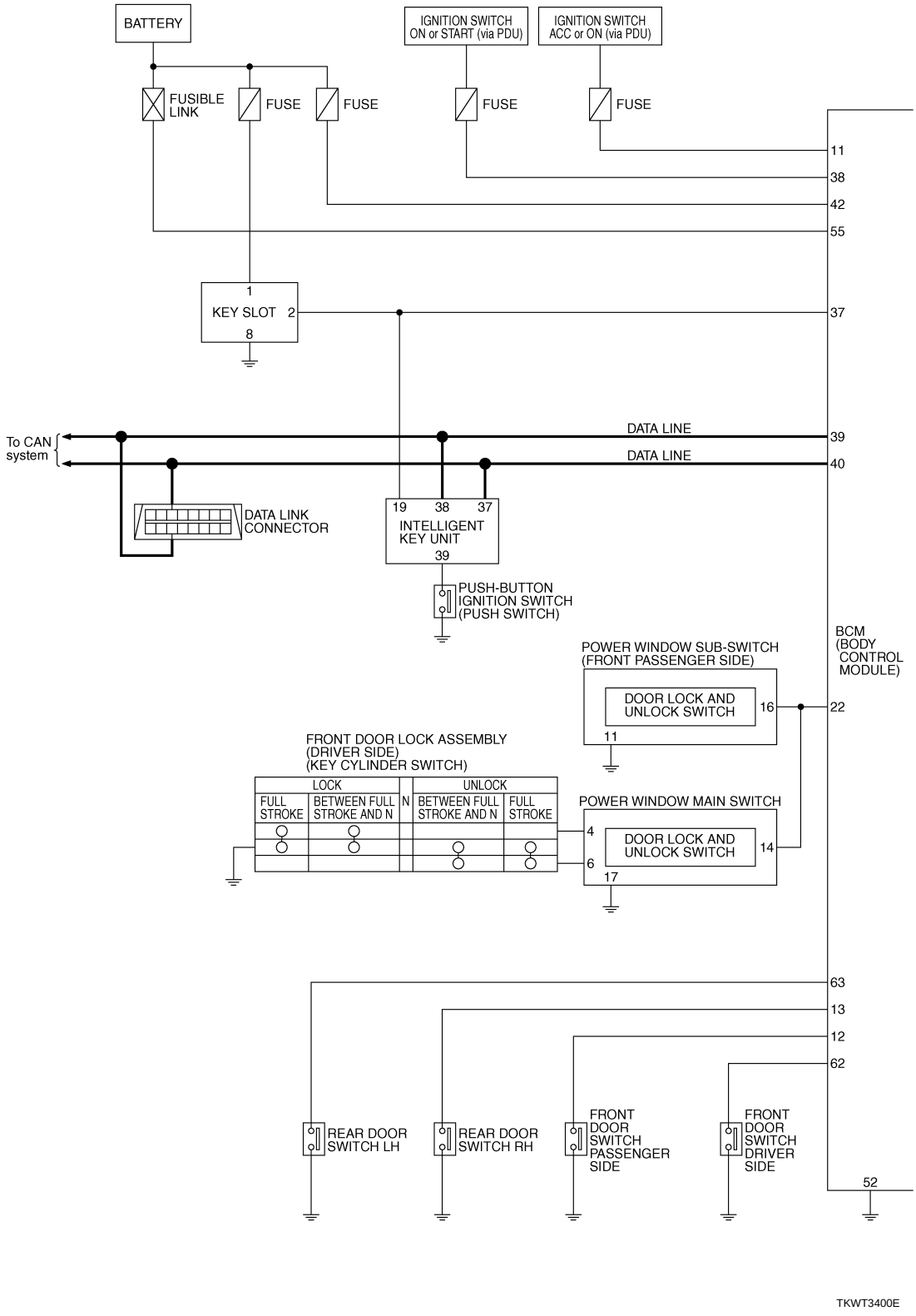
If the any applicable lamp is left illuminated, BCM turns OFF the battery saver output power supply 30 or 60 minutes to prevent run down of the battery. (Factory setting time is 30 minutes. And timer setting can be changed by CONSULT-III. Refer to LT-218, "CONSULT-III Functions (BCM - INT LAMP)".)

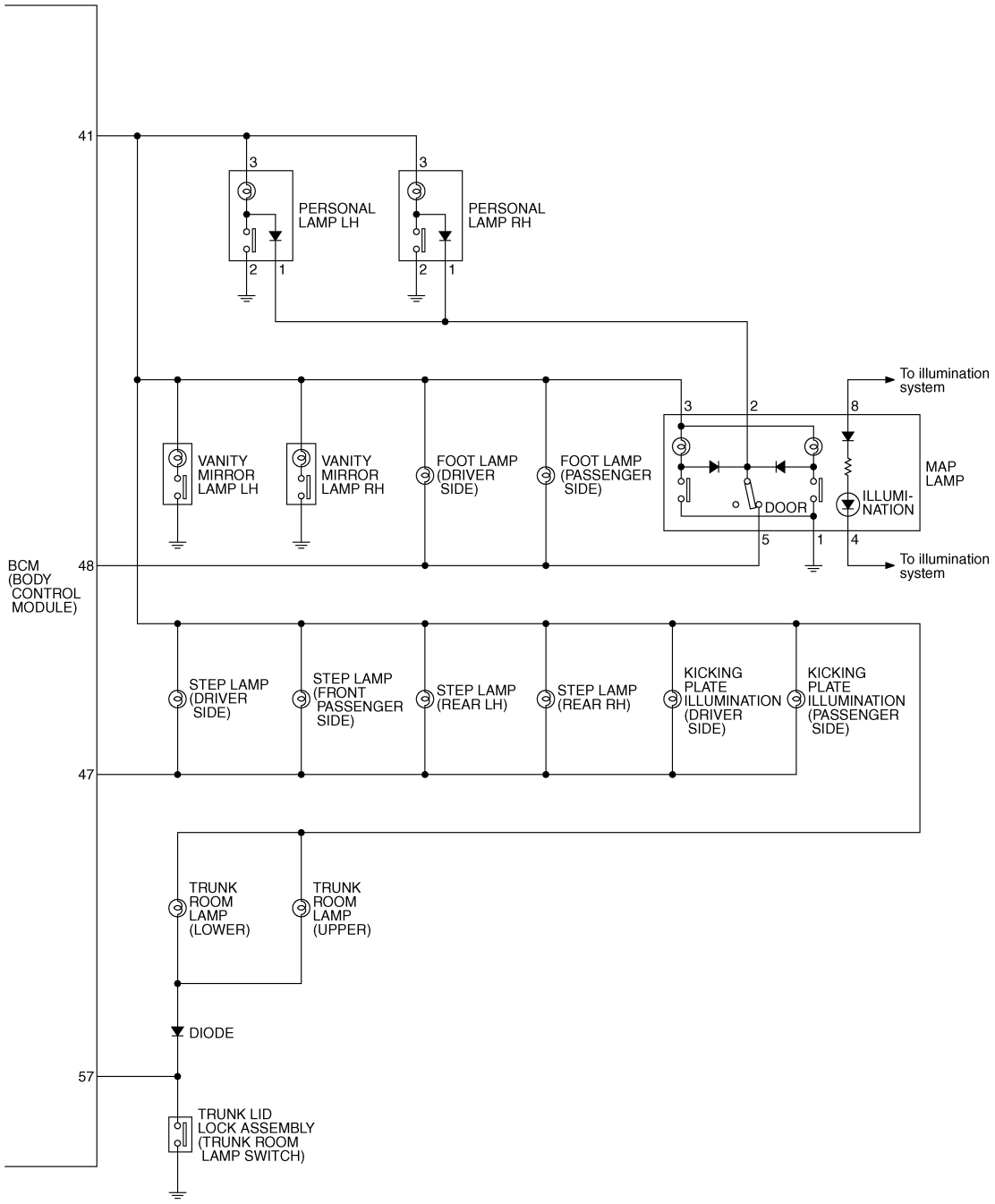
- When the push-button ignition switch (push switch) is turned from ON to OFF, the timer is activated.
- If any of the following door switch signal condition is changed with the push-button ignition switch (push switch) in OFF position, the timer is activated when the change is occurred.

Door switch signals (driver side, passenger side, rear LH and RH), front door lock assembly (driver side) (key cylinder switch) signal and Intelligent Key unlock signal.

Schematic

INFOID:0000000004160484

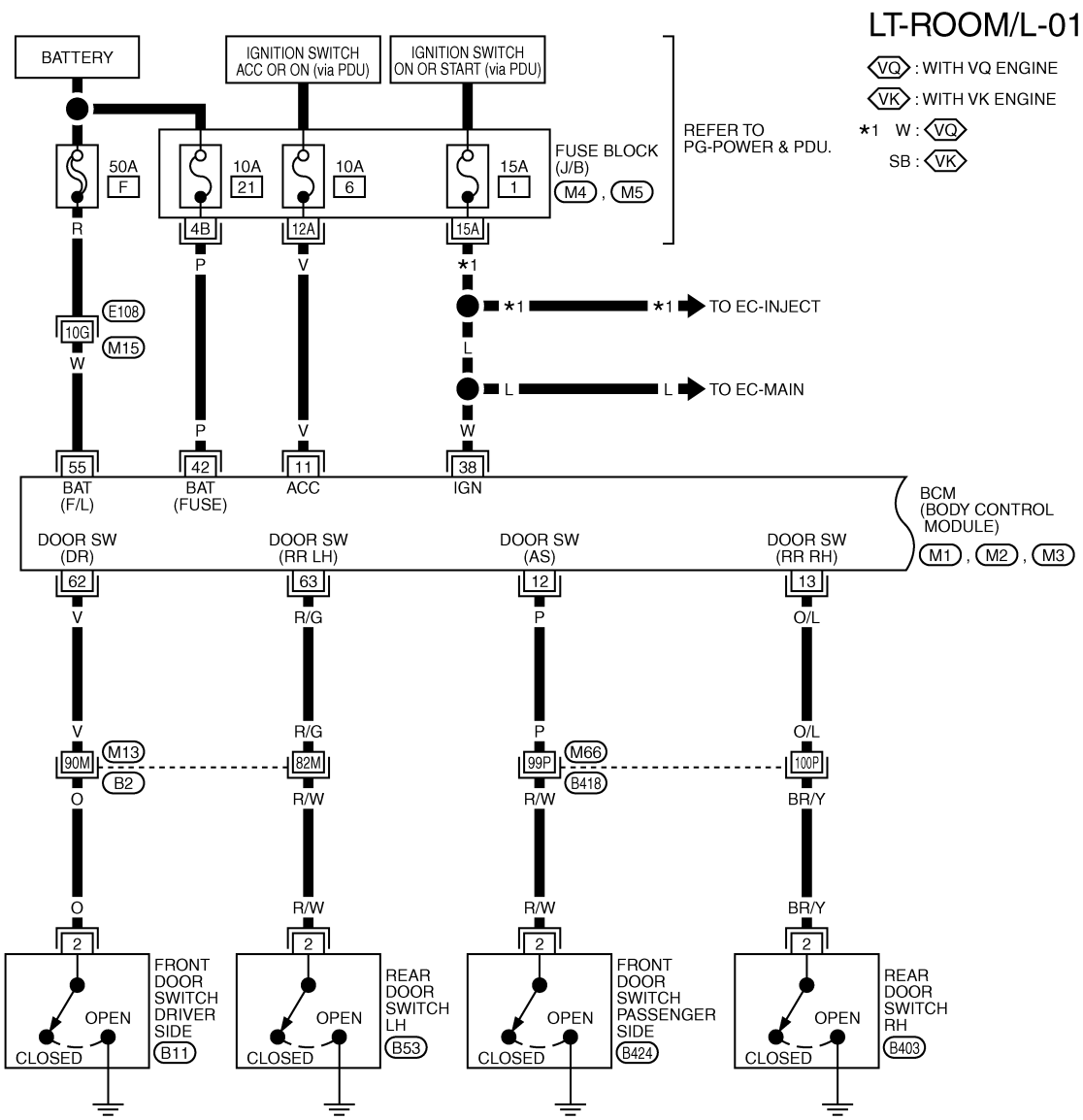



41
3
PERSONAL LAMP LH
2
1
3
PERSONAL LAMP RH
2
1
To illumination system
3
2
8
VANITY MIRROR LAMP LH
VANITY MIRROR LAMP RH
FOOT LAMP (DRIVER SIDE)
FOOT LAMP (PASSENGER SIDE)
DOOR
ILLUMI-NATION
MAP LAMP
5
1
4
To illumination system
BCM (BODY CONTROL MODULE)
48
STEP LAMP (DRIVER SIDE)
STEP LAMP (FRONT PASSENGER SIDE)
STEP LAMP (REAR LH)
STEP LAMP (REAR RH)
KICKING PLATE ILLUMINATION (DRIVER SIDE)
KICKING PLATE ILLUMINATION (PASSENGER SIDE)
47
TRUNK ROOM LAMP (LOWER)
TRUNK ROOM LAMP (UPPER)
DIODE
57
TRUNK LID LOCK ASSEMBLY (TRUNK ROOM LAMP SWITCH)

TKWT3401E

Wiring Diagram - ROOM/L -

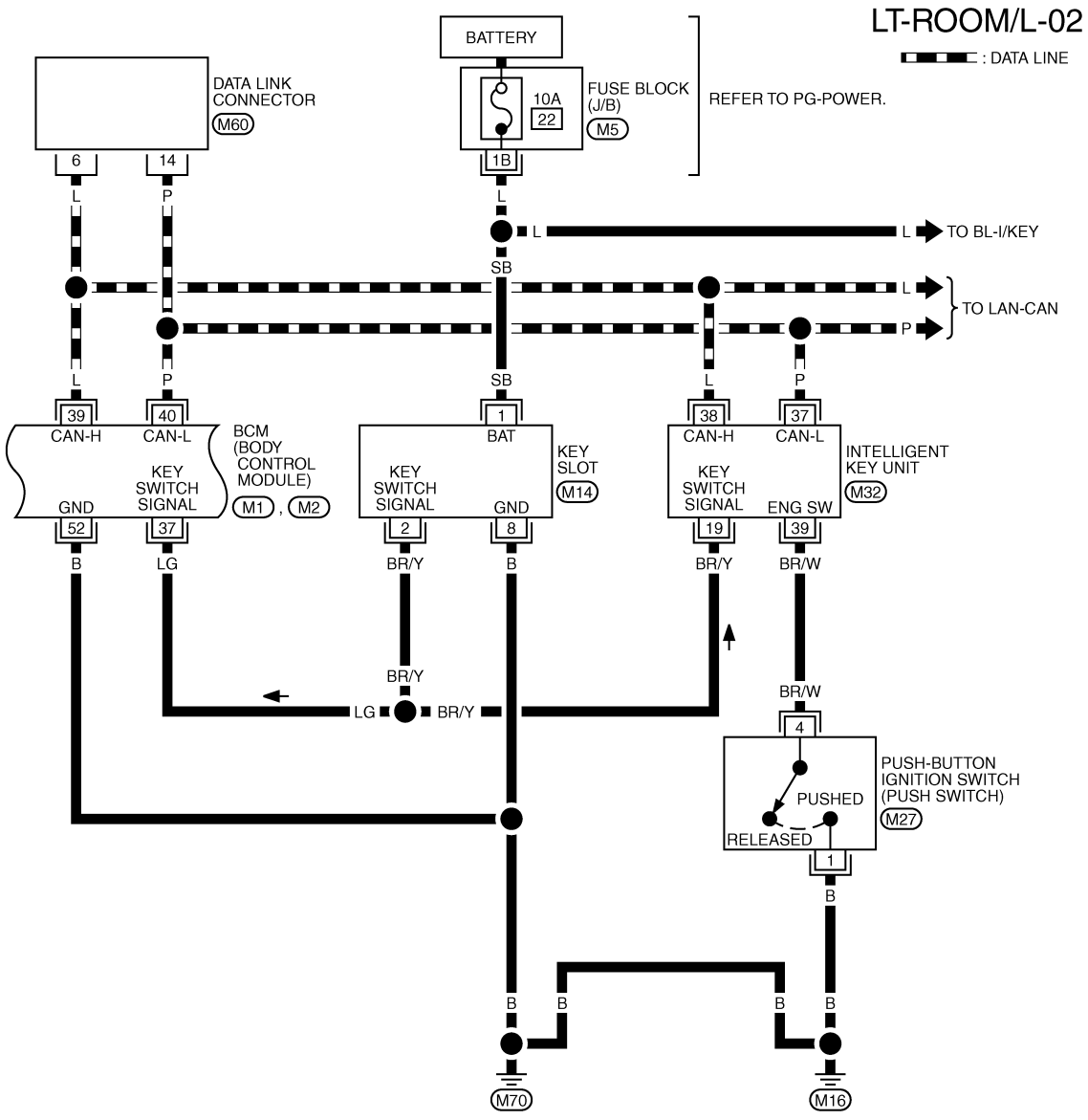
INFOID:0000000004160485

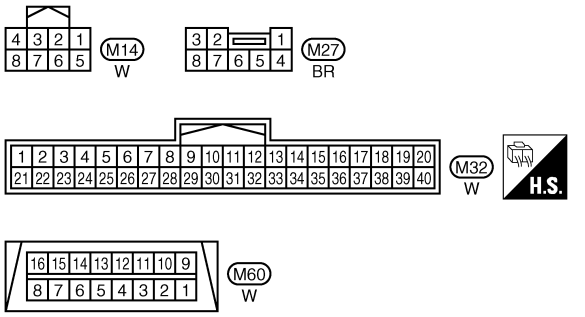


1				
2	B11	B53	B403	B424
3	W	W	W	W

REFER TO THE FOLLOWING.
E108 , B2 , B418 -SUPER MULTIPLE JUNCTION (SMJ)
M4 , M5 -FUSE BLOCK-JUNCTION BOX (J/B)
M1 , M2 , M3 -ELECTRICAL UNITS

TKWT8216E

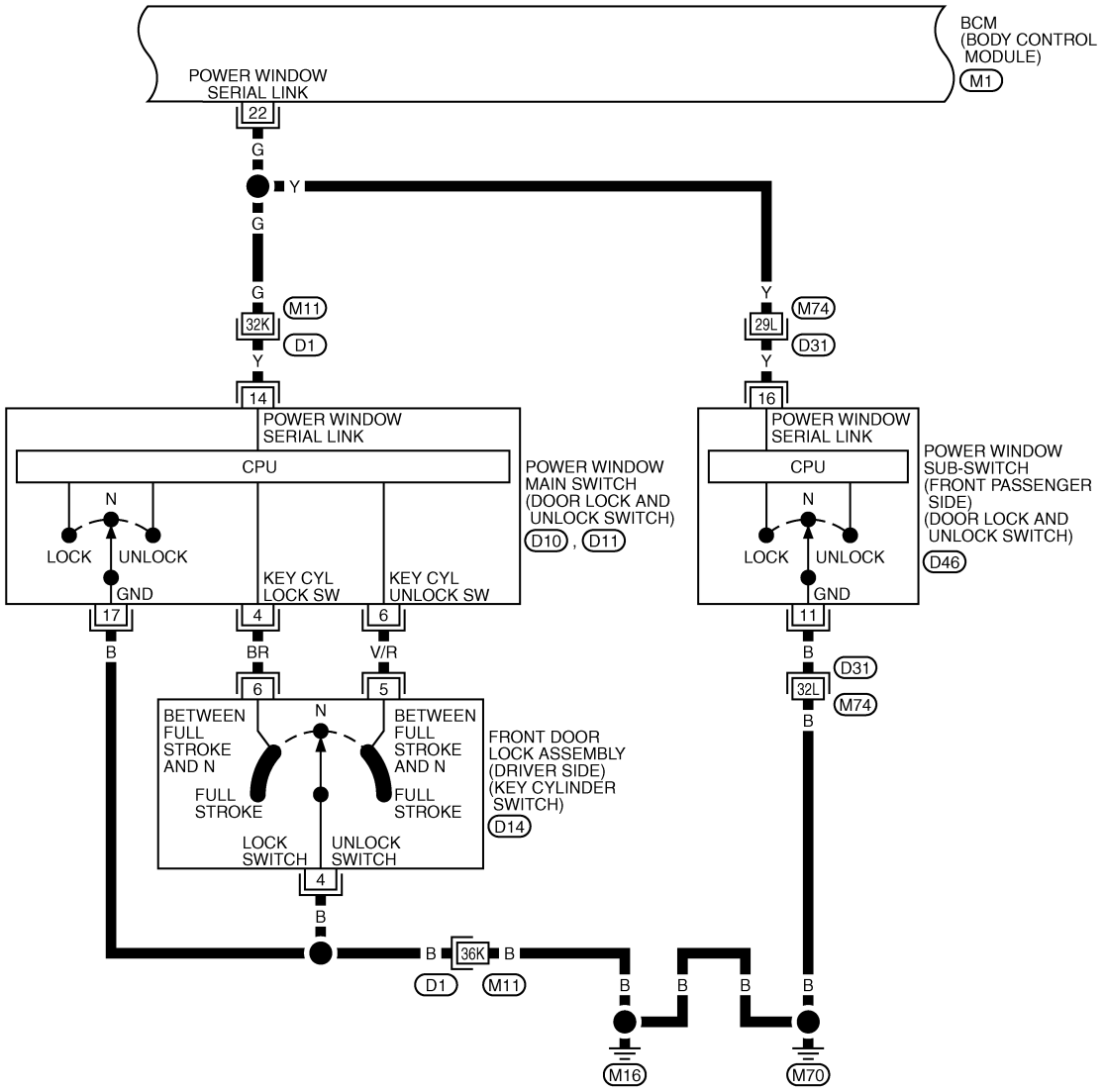


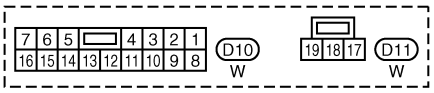


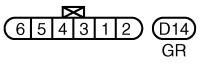
REFER TO THE FOLLOWING.
M5 -FUSE BLOCK-JUNCTION BOX (J/B)
M1 , M2 -ELECTRICAL UNITS

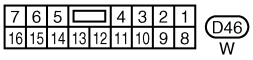
TKWT3403E

LT-ROOM/L-03





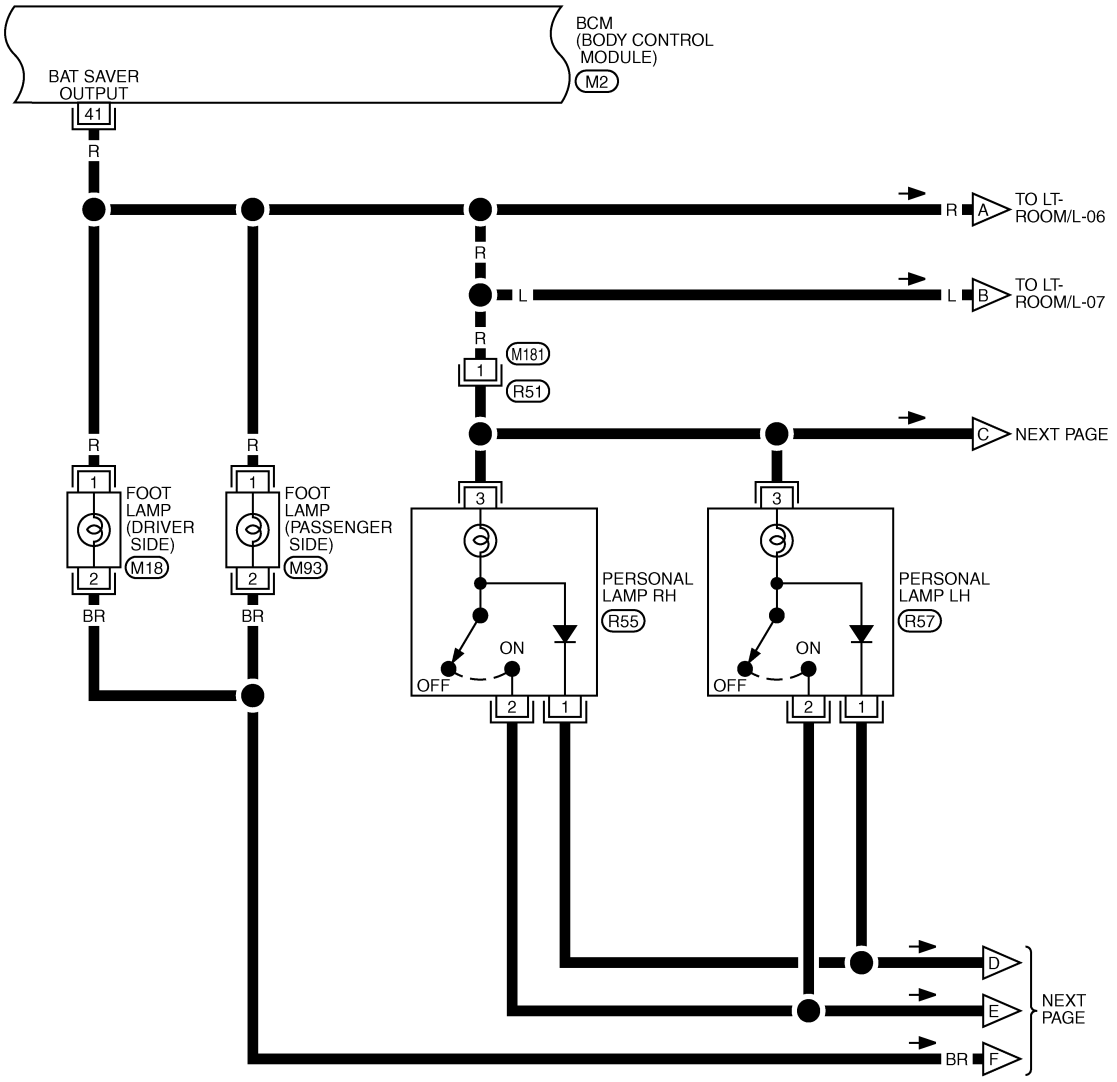


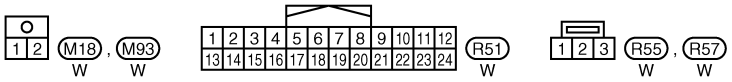


REFER TO THE FOLLOWING.
D1 , D31 -SUPER MULTIPLE JUNCTION (SMJ)
M1 -ELECTRICAL UNITS

TKWT3404E

LT-ROOM/L-04

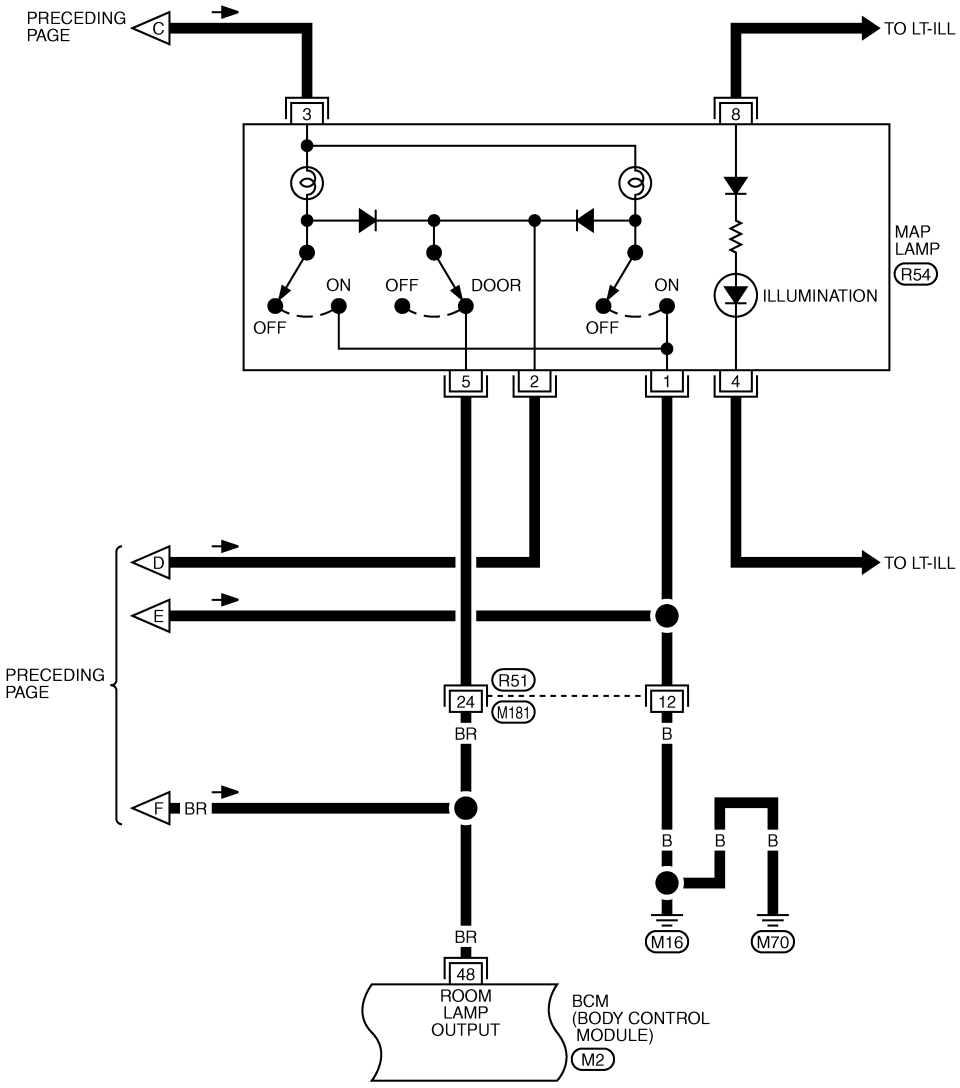


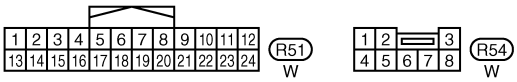


REFER TO THE FOLLOWING.
M2 -ELECTRICAL UNITS

TKWT8217E

LT-ROOM/L-05

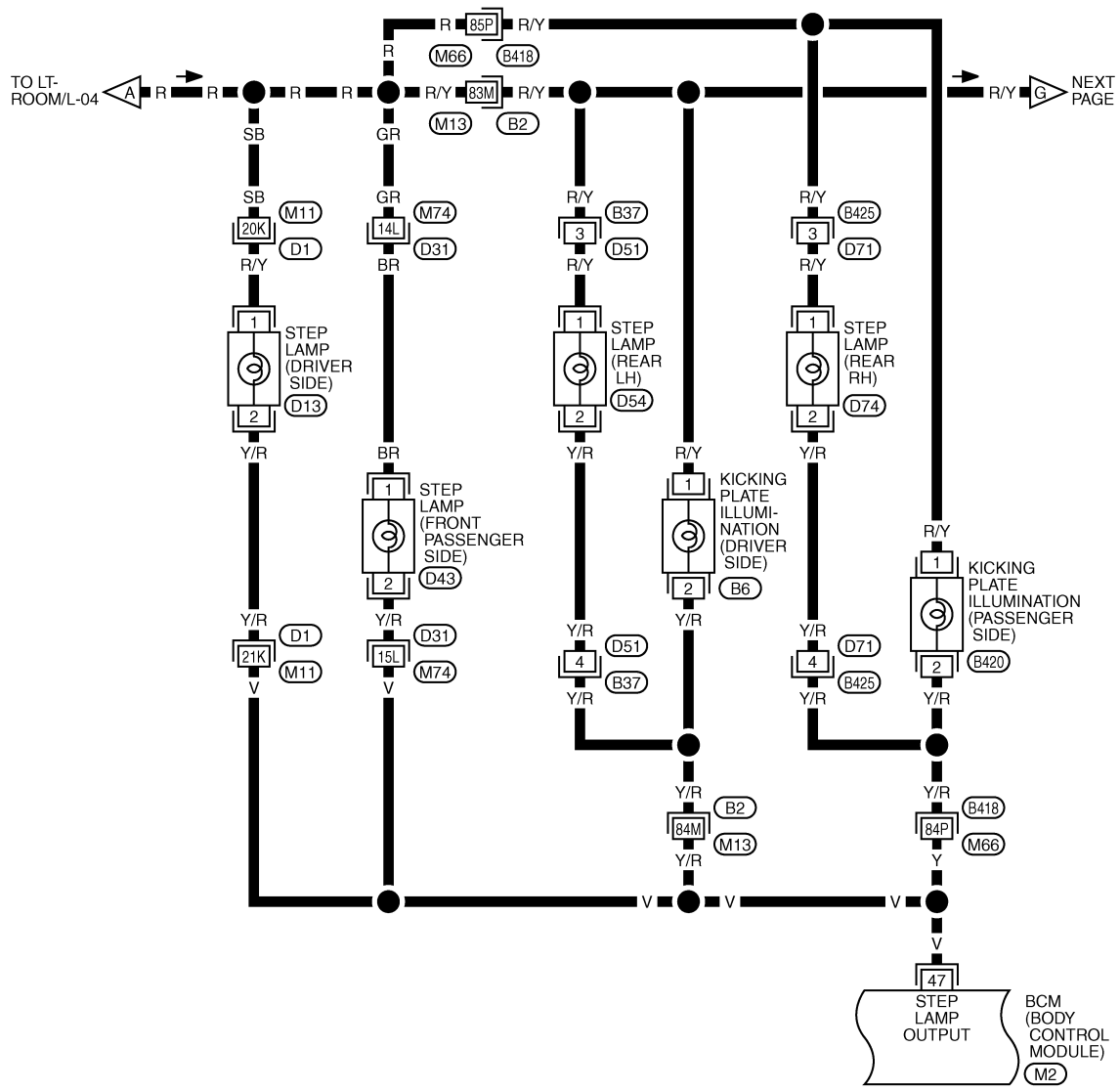


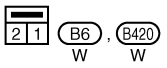


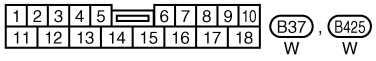
REFER TO THE FOLLOWING.
M2 -ELECTRICAL UNITS

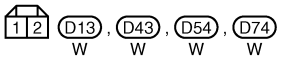
TKWT3406E

LT-ROOM/L-06





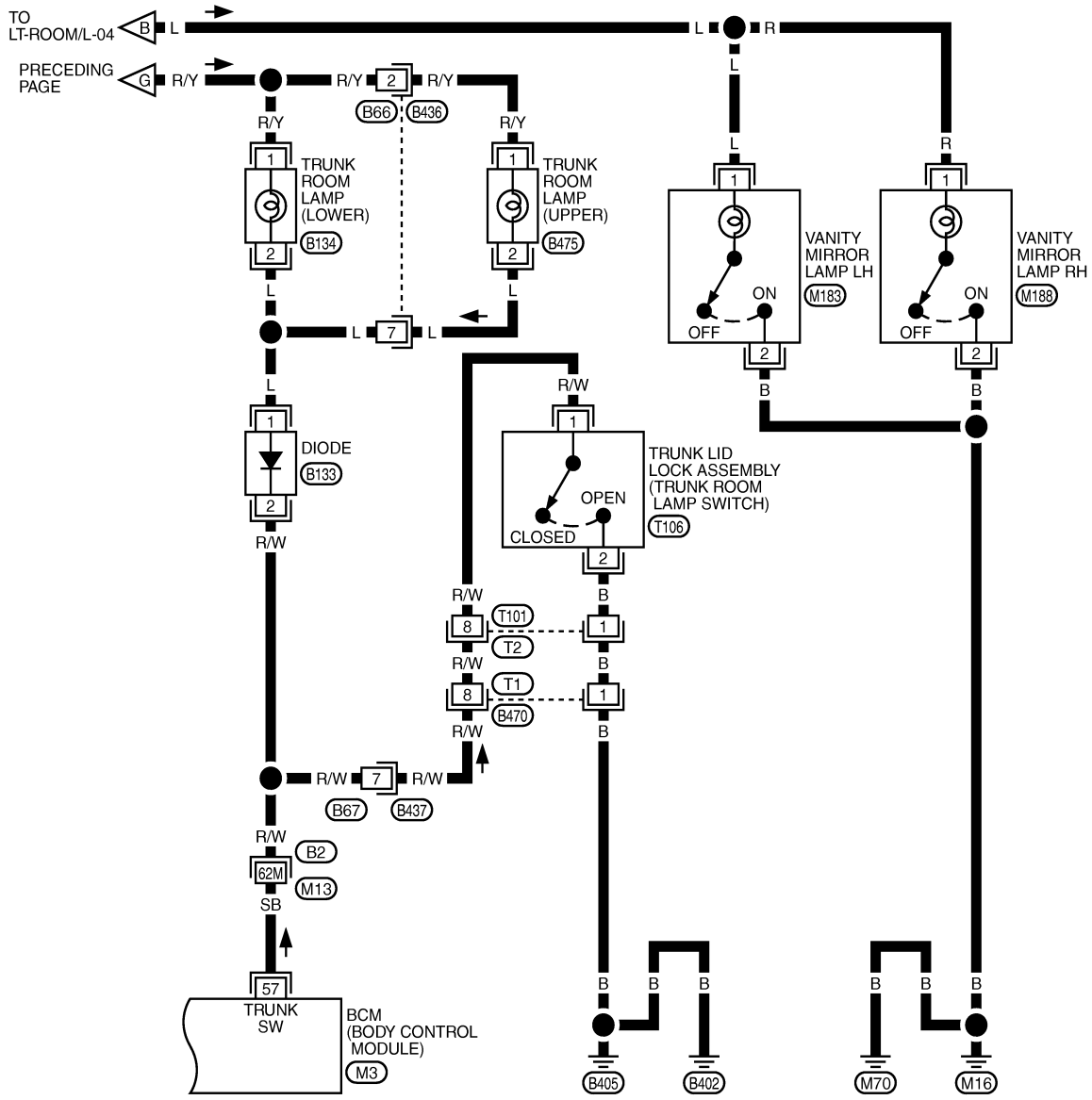


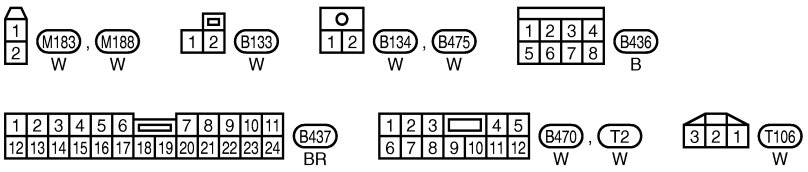


REFER TO THE FOLLOWING.
B2 , B418 , D1 , D31
-SUPER MULTIPLE JUNCTION (SMJ)
M2 -ELECTRICAL UNITS

TKWT8218E

LT-ROOM/L-07



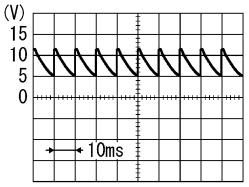
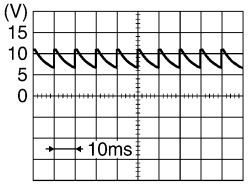
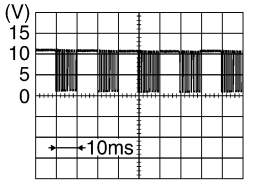


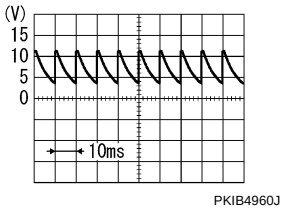
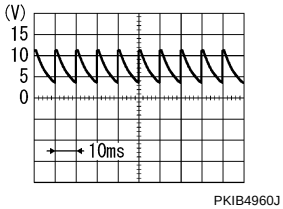
REFER TO THE FOLLOWING.
B2 - SUPER MULTIPLE JUNCTION (SMJ)
M3 - ELECTRICAL UNITS

TKWT6838E

Terminal and Reference Value for BCM

INFOID:0000000004160486

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
11	V	Ignition switch (ACC)	ACC	—		Battery voltage
12	P	Front door switch passenger side signal	OFF	Front door switch passenger side	ON (open)	Approx. 0 V
					OFF (closed)	 SKIB3419J Approx. 8.0 - 8.5 V
13	O/L	Rear door switch RH signal	OFF	Rear door switch RH	ON (open)	Approx. 0 V
					OFF (closed)	 SKIB4865E Approx. 8.5 - 9.0 V
22	G	Power window serial link	OFF	Power window main switch (door lock and unlock switch) and power window sub-switch (front passenger side) (door lock and unlock switch)	Lock or unlock switch ON **NOTE:** 10 seconds just after door lock and unlock switch (driver side and passenger side) is turned “LOCK” or “UNLOCK”.	 PKIC0930E
					OFF	Battery voltage
37	LG	Key switch signal	OFF	Intelligent Key is inserted into key slot.		Battery voltage
				Intelligent Key is removed from key slot.		Approx. 0 V
38	W	Ignition power supply	ON	—		Battery voltage
39	L	CAN – H	—	—		—
40	P	CAN – L	—	—		—
41	R	BAT saver output signal	OFF	—		Battery voltage
42	P	Battery power supply	OFF	—		Battery voltage
47	V	Step lamp output signal	OFF	Any door switch	ON (open)	Approx. 0 V
					OFF (close)	Battery voltage
48	BR	Room lamp output signal	ON	Any door switch	ON (open)	Approx. 0 V
					OFF (close)	Battery voltage
			—	All doors are closed	Turn ignition switch ON → OFF	Approx. 0 V (When room lamp timer is operating)
					Turn ignition switch ON	Battery voltage

Terminal No.	Wire color	Signal name	Measuring condition			Reference value
			Ignition switch	Operation or condition		
52	B	Ground	ON	—		Approx. 0 V
55	W	Battery power supply	OFF	—		Battery voltage
57	SB	Trunk switch signal	OFF	Trunk room lamp switch	ON (open)	Approx. 0 V
					OFF (close)	Battery voltage
62	V	Front door switch driver side signal	OFF	Front door switch driver side	ON (open)	Approx. 0 V
					OFF (closed)	 PKIB4960J Approx. 7.5 - 8.0 V
63	R/G	Rear door switch LH signal	OFF	Rear door switch LH	ON (open)	Approx. 0 V
					OFF (closed)	 PKIB4960J Approx. 7.5 - 8.0 V

How to Perform Trouble Diagnosis

INFOID:0000000004160487

1. Confirm the symptom or customer complaint.
2. Understand operation description and function description. Refer to LT-202, "System Description".
3. Perform the Preliminary Check. Refer to LT-217, "Preliminary Check".
4. Check symptom and repair or replace the cause of malfunction.
5. Does the interior room lamp operate normally? If YES, GO TO 6. If NO, GO TO 4.
6. INSPECTION END

Preliminary Check

INFOID:0000000004160488

CHECK POWER SUPPLY AND GROUND CIRCUIT

1.CHECK FUSES AND FUSIBLE LINK

Check for blown fuses and fusible link.

Unit	Power source	Fuse or fusible link No.
BCM	Battery	F
		21
	Ignition switch ON or START position	1
	Ignition switch ACC or ON position	6
Key slot	Battery	22

Refer to LT-209, "Wiring Diagram - ROOM/L -".

OK or NG

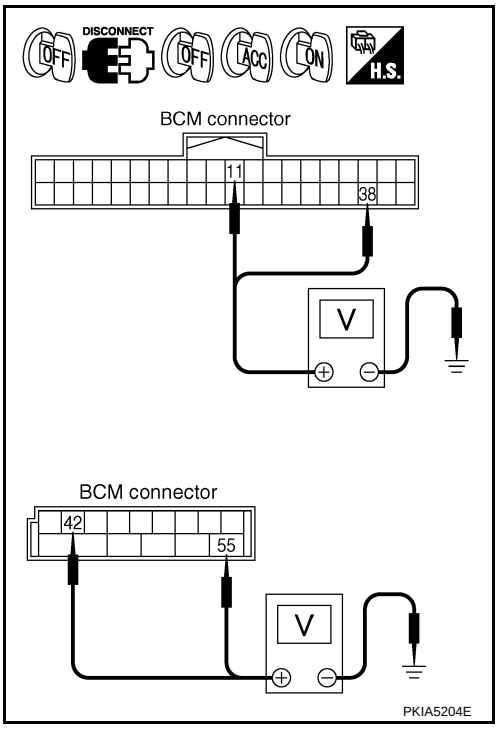
OK >> GO TO 2.

NG >> If fuse or fusible link is blown, be sure to eliminate cause of malfunction before installing new fuse or fusible link. Refer to PG-4.

2.CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM harness connector and ground.

Terminal			Ignition switch position		
(+)		(–)	OFF	ACC	ON
BCM connector	Terminal				
M1	11	Ground	Approx. 0 V	Battery voltage	Battery voltage
	38		Approx. 0 V	Approx. 0 V	Battery voltage
M2	42		Battery voltage	Battery voltage	Battery voltage
	55		Battery voltage	Battery voltage	Battery voltage



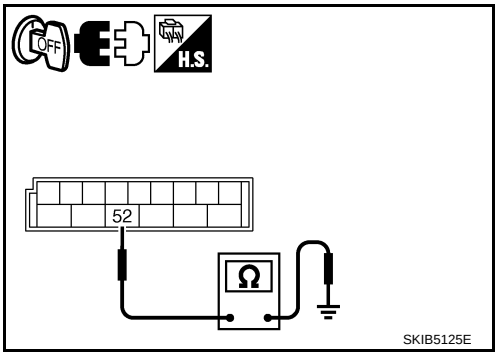
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3.CHECK GROUND CIRCUIT

Check continuity between BCM harness connector and ground.

BCM connector	Terminal	Ground	Continuity
M2	52		Yes



OK or NG

OK >> INSPECTION END
NG >> Repair harness or connector.

CONSULT-III Functions (BCM - INT LAMP)

INFOID:0000000004160489

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

Diagnosis mode	Description
Work Support	Changes the setting for each function.
Data Monitor	Displays BCM input data in real time.
Active Test	Operation of electrical loads can be checked by sending driving signal to them.
Self-Diag Results	BCM performs self-diagnosis of CAN communication.
Can Diag Support Monitor	The result of transmit/receive diagnosis of CAN communication can be read.

WORK SUPPORT

Display Item List

Item	Description	CONSULT-III
ROOM LAMP TIMER SET	The lighting time can be selected when the interior room lamps are unlocked by Intelligent Key or any door request switch. • Mode 1 (0 sec.)/Mode 2 (7.5 sec.)/Mode 3[NOTE] (15 sec.)/Mode 4 (30 sec.)	MODE 1 – 4
SET I/L D–UNLCK INTCON	Room lamp timer operation can be selected. • ON[NOTE] (Room lamp timer operates)/OFF (Room lamp timer does not operates)	On/Off
ROOM LAMP ON TIME SET	The time to escalate illumination can be selected when the interior room lamp is turned on. • Mode 1 (0.5 sec.)/Mode 2[NOTE] (1 sec.)/Mode 3 (2 sec.)/Mode 4 (3 sec.)/ Mode 5 (4 sec.)/Mode 6 (5 sec.)/Mode 7 (0 sec.)	MODE 1 – 7
ROOM LAMP OFF TIME SET	The time to diminish illumination can be selected when the interior room lamp is turned off. • Mode 1 (0.5 sec.)/Mode 2 (1 sec.)/Mode 3 (2 sec.)/Mode 4[NOTE] (3 sec.)/ Mode 5 (4 sec.)/Mode 6 (5 sec.)/Mode 7 (0 sec.)	MODE 1 – 7
R LAMP TIMER LOGIC SET	The lighting condition of room lamp timer can be selected when the door is opened/closed. • Mode 1[NOTE] (Connected with all doors)/Mode 2 (Connected with driver door only)	MODE 1 – 2
ROOM LAMP ON AT LOCK	The connected operation with room lamp timer can be selected when engine switch (push switch) is turned OFF. • ON [NOTE](Connected with room lamp timer operation) /OFF (Disconnected with room lamp operation)	On/Off

NOTE:
Factory setting

DATA MONITOR

Display Item List

Monitor item		Contents
IGN ON SW	“On/Off”	Displays “IGN ON position (ON)/OFF, ACC position (OFF)” judged from the ignition switch signal.
ACC ON SW	“On/Off”	Displays “IGN ACC, ON position (ON)/OFF position (OFF)” status judged from the key switch signal.
KEY ON SW	“On/Off”	Displays “Intelligent Key inserted into key slot (ON)/Intelligent Key removed from key slot (OFF)” status judged from the key switch signal.
DOOR SW - DR	“On/Off”	Displays status of the driver door as judged from the driver door switch signal. (door is open: ON/door is closed: OFF)
DOOR SW - AS	“On/Off”	Displays “door open (ON)/door closed (OFF)” status, determined from passenger door switch signal.
DOOR SW - RR	“On/Off”	Displays “door open (ON)/door closed (OFF)” status, determined from rear door switch RH signal.
DOOR SW - RL	“On/Off”	Displays “door open (ON)/door closed (OFF) ” status, determined from rear door switch LH signal.
BACK DOOR SW [NOTE]	“Off”	—
CDL LOCK SW	“On/Off”	Displays “door locked (ON)/other (OFF) status, determined from central door lock switch LOCK signal.
CDL UNLOCK SW	“On/Off”	Displays “door unlocked (ON)/other (OFF)” status, determined from central door lock switch UNLOCK signal.
KEY CYL LK - SW	“On/Off”	Displays ”door locked (ON)” status, determined from key cylinder switch in driver door.
KEY CYL UN - SW	“On/Off”	Displays “door unlocked (OFF)” status, determined from key cylinder switch in driver door.
I - KEY LOCK	“On/Off”	Displays “locked (ON)/other (OFF)” status, determined from lock signal.
I - KEY UNLOCK	“On/Off”	Displays “unlocked (ON)/other (OFF)” status, determined from unlock signal.

Monitor item		Contents
TRNK/HAT Monitor	“On/Off”	Displays “trunk open (ON)/trunk close (OFF)” status, determined from trunk room lamp switch.
I - KEY DR UNLK	“On/Off”	Displays “ON” when only driver door is unlocked or “OFF” other cases by intelligent Key or any door request switch, determined from unlock signal.
I - KEY AS UNLK	“On/Off”	Displays “unlocked (ON)/locked (OFF)” states of passenger door by passenger side door request switch, determined from unlock signal.

NOTE:
This item is displayed, but cannot be monitored.

ACTIVE TEST

Display Item List

Test item	Description
INT LAMP	Personal lamps and map lamps can be operated by any ON-OFF operations.
STEP LAMP TEST	Step lamp can be operated by any ON-OFF operations.

CONSULT-III Functions (BCM - BATTERY SAVER)

INFOID:0000000004160490

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

Diagnosis mode	Description
Work Support	Changes the setting for each function.
Data Monitor	Displays BCM input data in real time.
Active Test	Operation of electrical loads can be checked by sending driving signal to them.
Self-Diag Results	BCM performs self-diagnosis of CAN communication.
Can Diag Support Monitor	The result of transmit/receive diagnosis of CAN communication can be read.

WORK SUPPORT

Display Item List

Item	Description	CONSULT-III
ROOM LAMP TIMER SET	Interior room lamp battery saver timer setting can be changed.	MODE 1: 30 min. MODE 2: 60 min.

DATA MONITOR

Display Item List

Monitor item		Contents
IGN ON SW	“On/Off”	Displays “IGN ON position (ON)/OFF, ACC position (OFF)” judged from the ignition switch signal.
ACC ON SW	“On/Off”	Displays “IGN ACC, ON position (ON)/OFF position (OFF)” status judged from the key switch signal.
KEY ON SW	“On/Off”	Displays “Intelligent Key inserted into key slot (ON)/Intelligent Key removed from key slot (OFF)” status judged from the key switch signal.
DOOR SW - DR	“On/Off”	Displays status of the driver door as judged from the driver door switch signal. (door is open: ON/door is closed: OFF)
DOOR SW - AS	“On/Off”	Displays “door open (ON)/door closed (OFF)” status, determined from passenger door switch signal.
DOOR SW - RR	“On/Off”	Displays “door open (ON)/door closed (OFF)” status, determined from rear door switch RH signal.
DOOR SW - RL	“On/Off”	Displays “door open (ON)/door closed (OFF) ” status, determined from rear door switch LH signal.
BACK DOOR SW NOTE	“Off”	—

Monitor item		Contents
CDL LOCK SW	“On/Off”	Displays “door locked (ON)/other (OFF) status, determined from central door lock switch LOCK signal.
CDL UNLOCK SW	“On/Off”	Displays “door unlocked (ON)/other (OFF)” status, determined from central door lock switch UNLOCK signal.
KEY CYL LK – SW	“On/Off”	Displays “door locked (ON)” status, determined from key cylinder switch in driver door.
KEY CYL UN – SW	“On/Off”	Displays “door unlocked (OFF)” status, determined from key cylinder switch in driver door.
I - KEY LOCK	“On/Off”	Displays “locked (ON)/other (OFF)” status, determined from lock signal.
I - KEY UNLOCK	“On/Off”	Displays “unlocked (ON)/other (OFF)” status, determined from unlock signal.
TRNK/HAT Monitor	“On/Off”	Displays “trunk open (ON)/trunk close (OFF)” status, determined from trunk room lamp switch.
I - KEY DR UNLK	“On/Off”	Displays “ON” when only driver door is unlocked or “OFF” other cases by Intelligent Key or any door request switch, determined from unlock signal.
I - KEY AS UNLK	“On/Off”	Displays “unlocked (ON)/locked (OFF)” states of passenger door by passenger side door request switch, determined from unlock signal.

NOTE:

This item is displayed, but cannot be monitored.

ACTIVE TEST

Display Item List

Test item	Description
BATTERY SAVER	Personal lamps and map lamps can be operated by any ON-OFF operations.

Interior Room Lamp Control Does Not Operate

INFOID:0000000004160491

1.SELF-DIAGNOSIS

Ⓟ CONSULT-III SELF-DIAGNOSIS
Select “SELF-DIAG RESULTS” of BCM on CONSULT-III.
Ⓜ CHECK CIRCUIT BETWEEN EACH SWITCH AND BCM
GO TO 2.

Self-diagnostic result

NO DTC>>GO TO 2.
CAN communication>>Check CAN communication system of BCM. Refer to LAN-17, "CAN Diagnosis with CONSULT-III".

2.CHECK CIRCUIT BETWEEN EACH SWITCH AND BCM

Ⓟ CONSULT-III DATA MONITOR
1. Select “SELECT DIAG MODE” of BCM (INT LAMP) data monitor item.
2. With operating the switch, check the monitor status. Refer to LT-218, "CONSULT-III Functions (BCM - INT LAMP)" for switches and their functions.

Ⓜ CHECK THE EACH SWITCH
Check each switch. Refer to BL-88, "Check Door Switch".

OK or NG

OK >> GO TO 3.
NG >> Inspect malfunctioning switch system. Refer to BL-88, "Check Door Switch".

3.CHECK CIRCUIT BETWEEN BCM AND LAMP (1)

Ⓟ CONSULT-III ACTIVE TEST
1. Set map lamp switch and rear personal lamp switches to DOOR.
2. Select “INT LAMP” of BCM (INT LAMP) active test item.
3. With operating the test item, check the map lamps, personal lamps LH and RH operation.

Map lamps, personal lamps LH and RH operate normally.

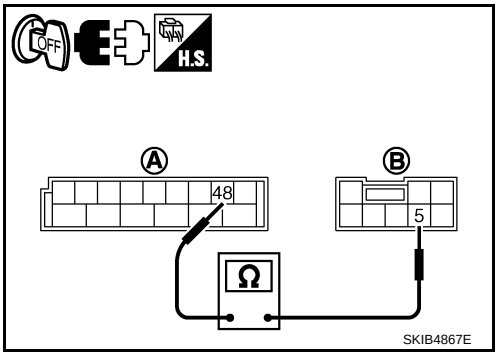
CHECK THE CIRCUIT
GO TO 4.

OK or NG

OK >> Replace BCM. Refer to BCS-14, "Removal and Installation of BCM".
NG >> GO TO 4.

4. CHECK CIRCUIT BETWEEN BCM AND MAP LAMP (2)

1. Turn ignition switch OFF.
2. Disconnect BCM connector and map lamp connector.
3. Check continuity between BCM harness connector (A) and map lamp harness connector (B).



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M2	48	R54	5	Yes

OK or NG

OK >> Replace BCM. Refer to BCS-14, "Removal and Installation of BCM". (Reconnect BCM connector and check the operation of map lamp. If it is faulty, replace BCM.)
NG >> Repair harness or connector between BCM and map lamp.

Map Lamp

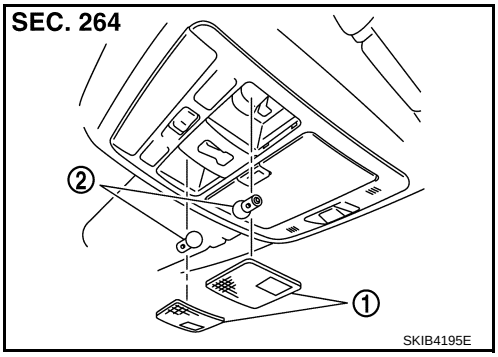
INFOID:0000000004160492

BULB REPLACEMENT

CAUTION:
Disconnect the battery negative terminal or remove the fuse.

1. Remove lens (1) using clip driver or suitable tool.
2. Remove bulb (2).

Map lamp : 12V - 8 W



REMOVAL AND INSTALLATION

Refer to EI-63.

Personal Lamp

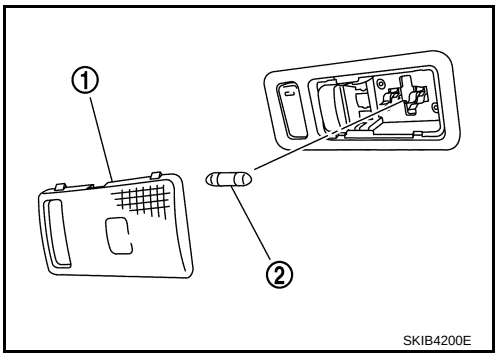
INFOID:0000000004160493

BULB REPLACEMENT

CAUTION:
Disconnect the battery negative terminal or remove the fuse.

1. Insert a screwdriver or similar tool and remove lens (1).
2. Remove bulb (2).

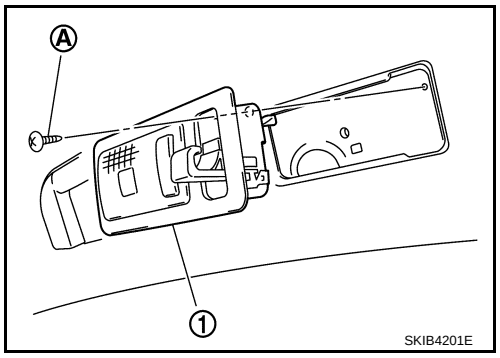
Personal lamp : 12V - 8W



REMOVAL AND INSTALLATION

Removal

1. Remove screw (A).
2. Use a clip driver or similar tool and remove personal lamp (1).
3. Disconnect connector.



Installation

Installation is the reverse order of removal.

Foot Lamp (Driver Side)

INFOID:0000000004160494

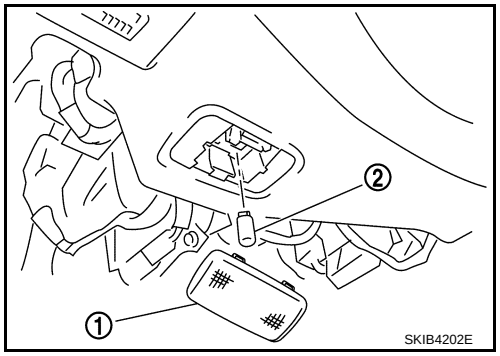
BULB REPLACEMENT

CAUTION:

Disconnect the battery negative terminal or remove the fuse.

1. Insert a screwdriver or similar tool and remove lens (1).
2. Remove bulb (2).

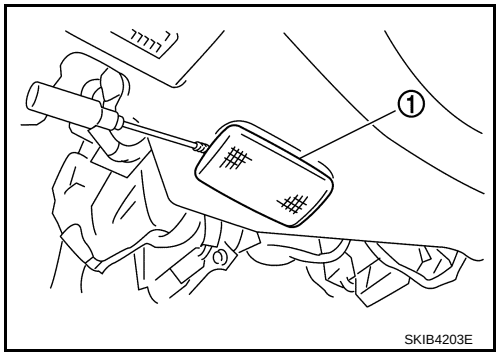
Foot lamp (Driver side) : 12V - 3.4W



REMOVAL AND INSTALLATION

Removal

1. Use a clip driver or similar tool and remove foot lamp (driver side) (1).
2. Disconnect connector.



Installation

Installation is the reverse order of removal.

Foot Lamp (Passenger Side)

INFOID:0000000004160495

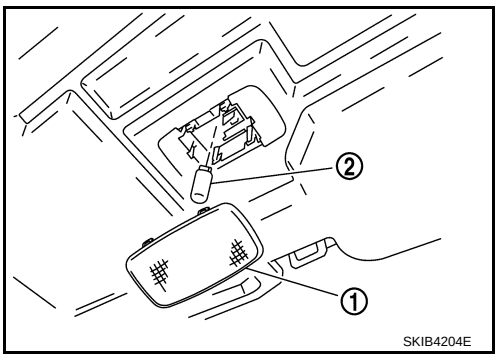
BULB REPLACEMENT

CAUTION:

Disconnect the battery negative terminal or remove the fuse.

1. Insert a screwdriver or similar tool and remove lens (1).
2. Remove bulb (2).

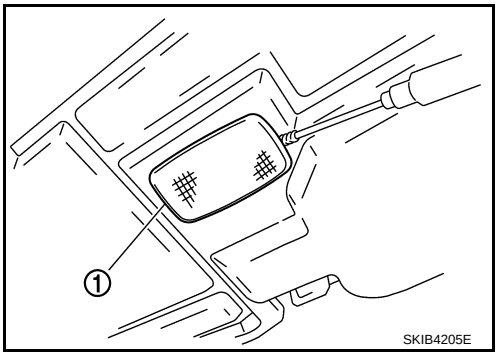
Foot lamp (Passenger side) : 12V - 3.4W



REMOVAL AND INSTALLATION

Removal

1. Use a clip driver or similar tool and remove foot lamp (passenger side) (1).
2. Disconnect connector.



Installation

Installation is the reverse order of removal.

Vanity Mirror Lamp

INFOID:0000000004160496

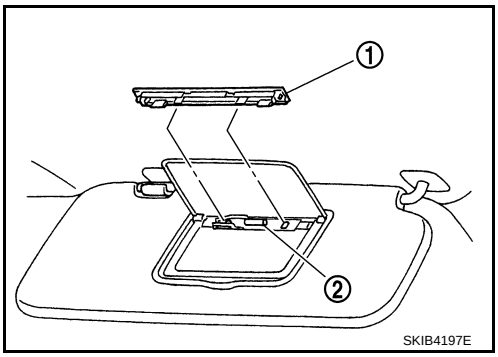
BULB REPLACEMENT

CAUTION:

Disconnect the battery negative terminal or remove the fuse.

1. Insert a thin screwdriver in the lens end and remove lens (1).
2. Remove bulb (2).

Vanity mirror lamp : 12V - 1.8 W



Step Lamp

INFOID:0000000004160497

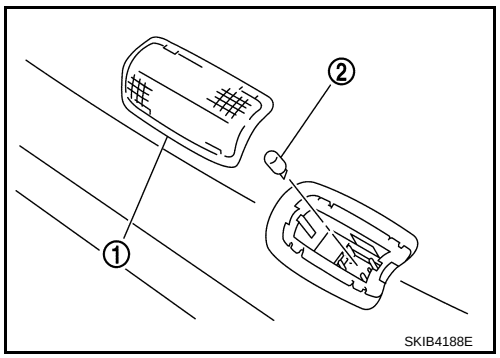
BULB REPLACEMENT

CAUTION:

Disconnect the battery negative terminal or remove the fuse.

1. Insert a screwdriver or similar tool and remove lens (1).
2. Remove bulb.

Step lamp : 12V - 5W



REMOVAL AND INSTALLATION

Remove step lamp integral with door trim. Refer toEI-49, "Component Parts Location".

Kicking Plate Illumination

INFOID:0000000004160498

BULB REPLACEMENT

Replacement integral with front kicking plate inner.

REMOVAL AND INSTALLATION

Remove integral with front kicking plate inner. Refer to EI-49, "Component Parts Location".

Trunk Room Lamp (Upper/Lower)

INFOID:0000000004160499

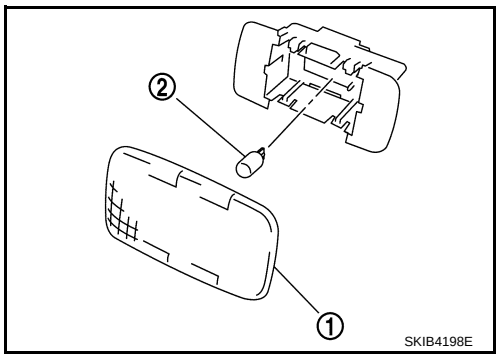
BULB REPLACEMENT

CAUTION:

Disconnect the battery negative terminal or remove the fuse.

1. Insert a screwdriver or similar tool and remove lens (1).
2. Remove bulb (2).

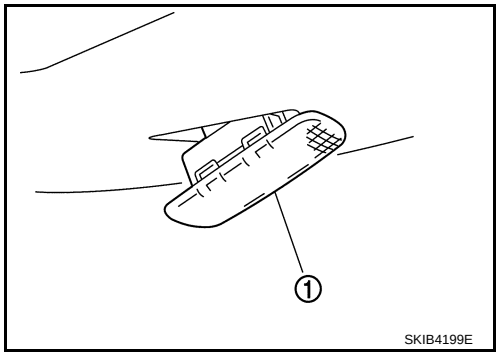
Trunk room lamp (upper/lower) : 12V - 5W



REMOVAL AND INSTALLATION

Removal

1. Insert a screwdriver or similar tool and remove trunk room lamp (1).
2. Disconnect connector.



Installation

Installation is the reverse order of removal.

ILLUMINATION

System Description

INFOID:0000000004160500

Control of the illumination lamps operation is dependent upon the position of the lighting switch (combination switch). When the lighting switch is placed in the 1ST or 2ND position (or if the auto light system is activated) the BCM (body control module) receives input signal requesting the illumination lamps to illuminate. This input signal is communicated to the IPDM E/R (intelligent power distribution module engine room) across the CAN communication lines. The CPU (central processing unit) located in the IPDM E/R controls the tail lamp relay coil. This relay, when energized, directs power to the illumination lamps, which then illuminate.

OUTLINE

Power is supplied at all times
- through 15A fuse (No. 71, located in IPDM E/R)
- to tail lamp relay, located in IPDM E/R, and
- to CPU located in IPDM E/R,
- through 15A fuse (No. 78, located in IPDM E/R)
- to CPU located in IPDM E/R,
- through 50A fusible link (letter F, located in fuse, fusible link and relay block)
- to BCM terminal 55,
- through 10A fuse [No. 21, located in fuse block (J/B)]
- to BCM terminal 42 and
- to combination meter terminal 23,
- through 10A fuse [No. 19, located in fuse block (J/B)]
- to unified meter and A/C amp. terminal 54,
- through 10A fuse [No. 22, located in fuse block (J/B)]
- to intelligent key unit terminals 1, 41 and 57.

With the ignition switch in the ON or START position, power is supplied
- through 15A fuse [No. 1, located in fuse block (J/B)]
- to BCM terminal 38,
- through 10A fuse [No. 14, located in fuse block (J/B)]
- to combination meter terminal 12,
- through 10A fuse [No. 12, located in fuse block (J/B)]
- to unified meter and A/C amp. terminal 53 and
- to rear sunshade cancel relay terminal 1.

With the ignition switch in the ACC or ON position, power is supplied
- through 10A fuse [No. 6, located in fuse block (J/B)]
- to BCM terminal 11
- to unified meter and A/C amp. terminal 41 and
- to combination meter terminal 2.

Ground is supplied
- to BCM terminal 52
- to unified meter and A/C amp. terminals 55 and 71
- to combination meter terminals 9, 10, and 11
- to Intelligent Key unit terminals 20, 40, 56 and 72, and
- to illumination control switch terminal 3
- through grounds M16 and M70,
- to IPDM E/R terminals 38 and 51
- through grounds E22 and E43.

ILLUMINATION OPERATION BY LIGHTING SWITCH

With the lighting switch in the 1ST or 2ND position (or if the auto light system is activated), the BCM receives input signal requesting the illumination lamps to illuminate. This input signal is communicated to the IPDM E/R across the CAN communication lines. The CPU located in the IPDM E/R controls the tail lamp relay coil, which, when energized, directs power
- through IPDM E/R terminal 21
- to combination meter terminal 13
- to LDW switch (illumination) terminal 5 (with lane departure prevention)
- to VDC off switch (illumination) terminal 3
- to trunk lid opener switch (illumination) terminal 3
- to combination switch (spiral cable) terminal 25
- to door mirror remote control switch (illumination) terminal 16

- to AFS switch (illumination) terminal 5 (with AFS)
- to rear sunshade front switch (illumination) terminal 5 (with rear control switch)
- to A/T illumination terminal 1
- to snow mode switch (illumination) terminal 5 (AWD models)
- to rear control cancel switch (illumination) terminal 4 (with rear control switch)
- to clock terminal 3
- to multifunction switch terminal 3
- to DVD player terminal 18 (with DVD player)
- to AV control unit terminal 9
- to climate controlled seat switch driver side (illumination) terminal 7
- to climate controlled seat switch passenger side (illumination) terminal 7
- to ashtray illumination (rear LH) terminal 1
- to ashtray illumination (rear RH) terminal 1
- to illumination control switch terminal 1
- to cigarette lighter socket (illumination) terminal 2
- to map lamp (illumination) terminal 8
- to power window main switch illumination terminal 1
- to glove box lamp terminal 1
- to rear control switch terminal 2 (with rear control switch)
- to rear power seat switch RH (illumination) terminal 4 (with rear control switch)
- to rear heated seat switch RH (illumination) terminal 7 (with rear control switch)
- to rear sunshade cancel relay terminal 6 (with rear control switch)
- to automatic return cancel switch (illumination) terminal 4 (with rear control switch)
- to rear power seat switch LH (illumination) terminal 4 (with rear control switch) and
- to rear heated seat switch LH (illumination) terminal 7 (with rear control switch),
- through Intelligent Key unit terminal 64
- to push button ignition switch (illumination) terminal 3.

Ground is supplied

- to combination meter terminal 9, 10 and 11
- through grounds M16 and M70,
- to combination meter terminal 14
- to push button ignition switch (illumination) terminal 2
- to LDW switch (illumination) terminal 4 (with lane departure prevention)
- to VDC off switch (illumination) terminal 4
- to trunk lid opener switch (illumination) terminal 4
- to combination switch (spiral cable) terminal 24
- to door mirror remote control switch (illumination) terminal 15
- to AFS switch (illumination) terminal 6 (with AFS)
- to rear sunshade front switch (illumination) terminal 6 (with rear control switch)
- to A/T illumination terminal 2
- to snow mode switch (illumination) terminal 6 (AWD models)
- to rear control cancel switch (illumination) terminal 5 (with rear control switch)
- to clock terminal 4
- to multifunction switch terminal 4
- to AV control unit terminal 8 (with navigation system)
- to AV control unit terminal 18 (without navigation system)
- to climate controlled seat switch driver side (illumination) terminal 8 and
- to climate controlled seat switch passenger side (illumination) terminal 8
- through illumination control switch terminal 2
- to illumination control switch terminal 3
- through grounds M16 and M70,
- to DVD player terminal 17 (with DVD player)
- through grounds M16 and M70,
- to cigarette lighter socket (illumination) terminal 1
- to map lamp (illumination) terminal 4
- to power window main switch illumination terminal 2 and
- to glove box lamp terminal 2
- through grounds M16 and M70,
- to ashtray illumination (rear RH) terminal 2
- through grounds B402, B405,
- to ashtray illumination (rear LH) terminal 2

- through grounds B5, B40 and B131,
- to automatic return cancel switch (illumination) terminal 2 (with rear control switch)
- to rear power seat switch LH (illumination) terminal 3 (with rear control switch)
- to rear heated seat switch LH (illumination) terminal 8 (with rear control switch)
- through grounds B5, B40 and B131,
- to rear sunshade cancel relay terminal 7(with rear control switch)
- to rear sunshade rear switch (illumination) terminal 5 (with rear control switch)
- to rear control switch terminal 4 (with rear control switch)
- through grounds B5, B40, B131 and B559.
- to rear power seat switch RH (illumination) terminal 3 (with rear control switch)
- to rear heated seat switch RH (illumination) terminal 8 (with rear control switch)
- through grounds B5, B40, B131 and B559.

With power and ground supplied, illumination lamps illuminate.

EXTERIOR LAMP BATTERY SAVER CONTROL

BCM activates the exterior lamp battery saver control function and turns off the exterior lamps to prevent battery from over discharge when the combination switch (lighting switch) is in 1ST or 2ND position and/or the front fog lamp switch ON and the door lock operation is performed by keyless entry system.

CAN Communication System Description

INFOID:0000000004160501

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

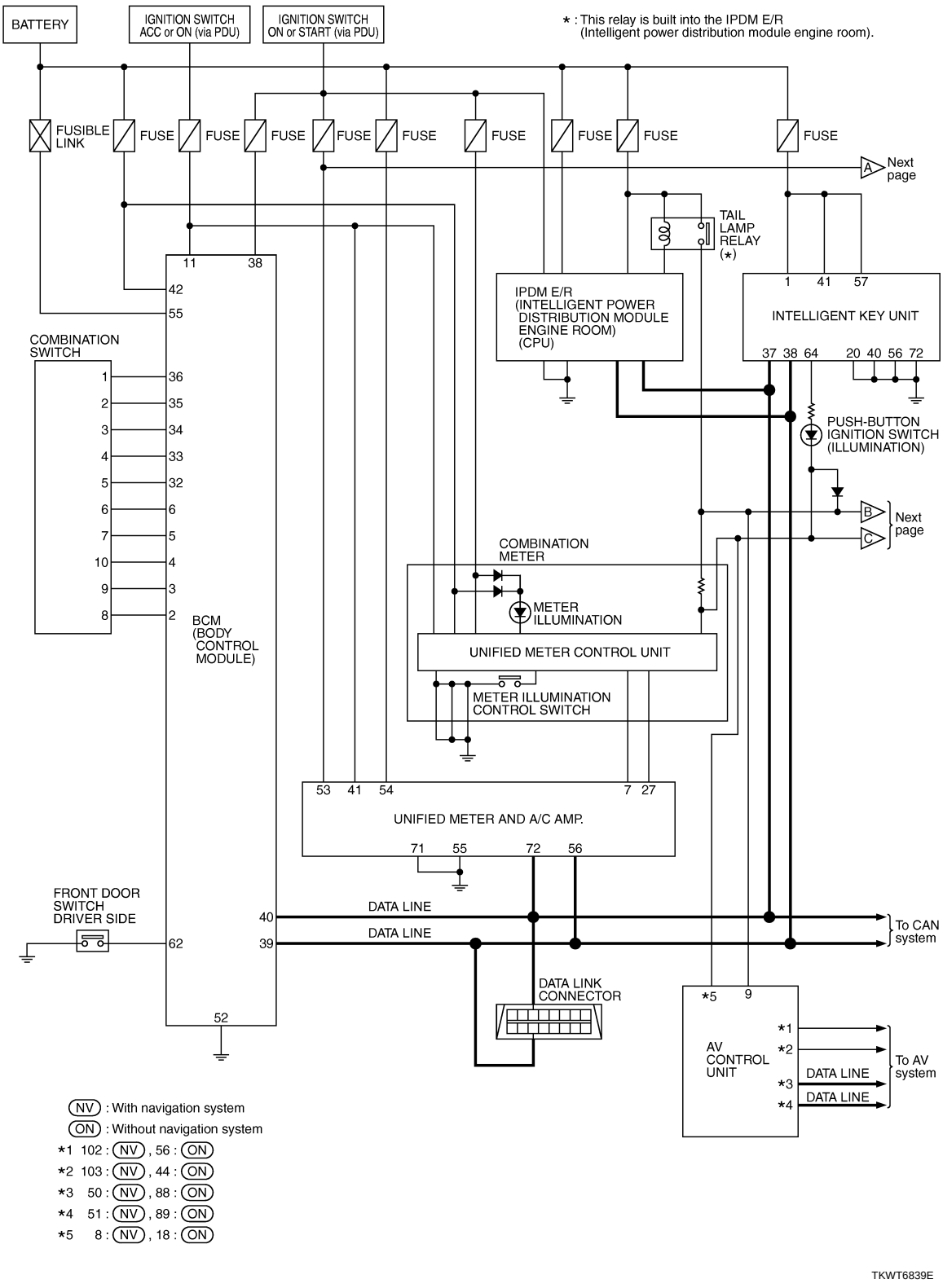
CAN Communication Unit

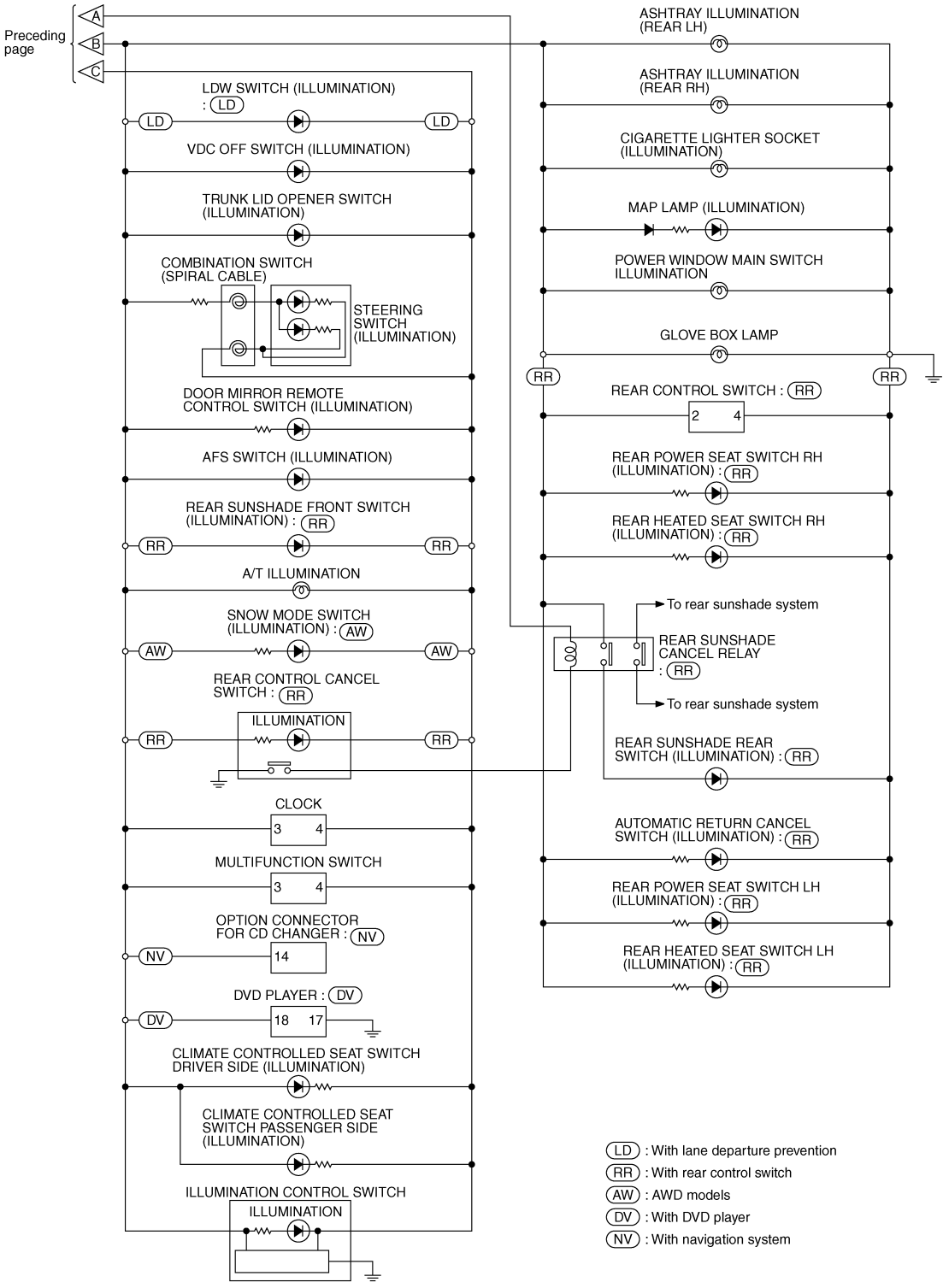
INFOID:0000000004160502

Refer to LAN-11, "System Description".

Schematic

INFOID:0000000004160503

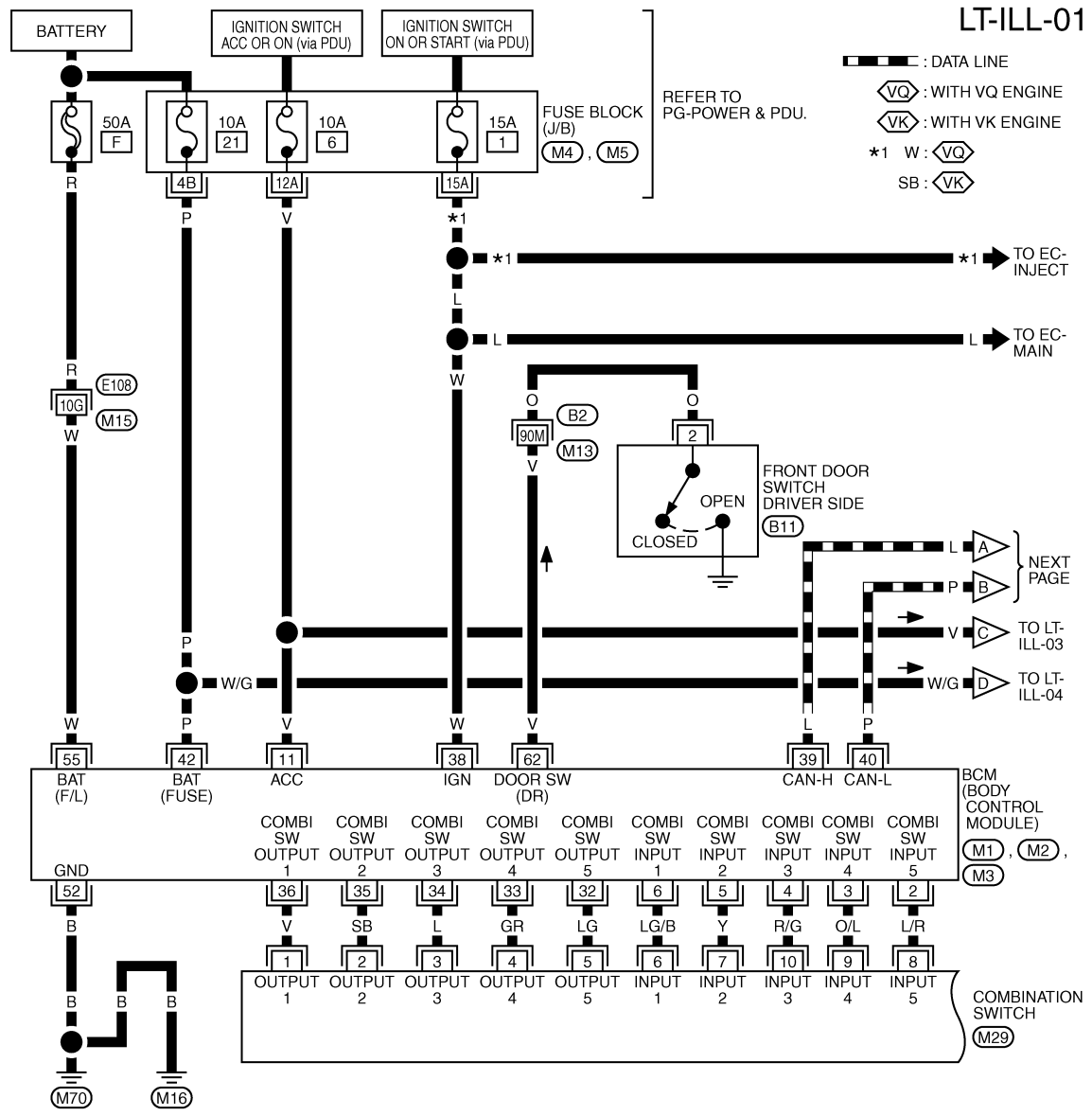



Preceding page
A
B
C
LDW SWITCH (ILLUMINATION) : LD
LD
LD
VDC OFF SWITCH (ILLUMINATION)
TRUNK LID OPENER SWITCH (ILLUMINATION)
COMBINATION SWITCH (SPIRAL CABLE)
STEERING SWITCH (ILLUMINATION)
DOOR MIRROR REMOTE CONTROL SWITCH (ILLUMINATION)
AFS SWITCH (ILLUMINATION)
REAR SUNSHADE FRONT SWITCH (ILLUMINATION) : RR
RR
RR
A/T ILLUMINATION
SNOW MODE SWITCH (ILLUMINATION) : AW
AW
AW
REAR CONTROL CANCEL SWITCH : RR
ILLUMINATION
RR
RR
CLOCK
3 4
MULTIFUNCTION SWITCH
3 4
OPTION CONNECTOR FOR CD CHANGER : NV
NV
14
DVD PLAYER : DV
DV
18 17
CLIMATE CONTROLLED SEAT SWITCH DRIVER SIDE (ILLUMINATION)
CLIMATE CONTROLLED SEAT SWITCH PASSENGER SIDE (ILLUMINATION)
ILLUMINATION CONTROL SWITCH
ILLUMINATION
ASHTRAY ILLUMINATION (REAR LH)
ASHTRAY ILLUMINATION (REAR RH)
CIGARETTE LIGHTER SOCKET (ILLUMINATION)
MAP LAMP (ILLUMINATION)
POWER WINDOW MAIN SWITCH ILLUMINATION
GLOVE BOX LAMP
RR
RR
REAR CONTROL SWITCH : RR
2 4
REAR POWER SEAT SWITCH RH (ILLUMINATION) : RR
REAR HEATED SEAT SWITCH RH (ILLUMINATION) : RR
To rear sunshade system
REAR SUNSHADE CANCEL RELAY : RR
To rear sunshade system
REAR SUNSHADE REAR SWITCH (ILLUMINATION) : RR
AUTOMATIC RETURN CANCEL SWITCH (ILLUMINATION) : RR
REAR POWER SEAT SWITCH LH (ILLUMINATION) : RR
REAR HEATED SEAT SWITCH LH (ILLUMINATION) : RR
LD : With lane departure prevention
RR : With rear control switch
AW : AWD models
DV : With DVD player
NV : With navigation system

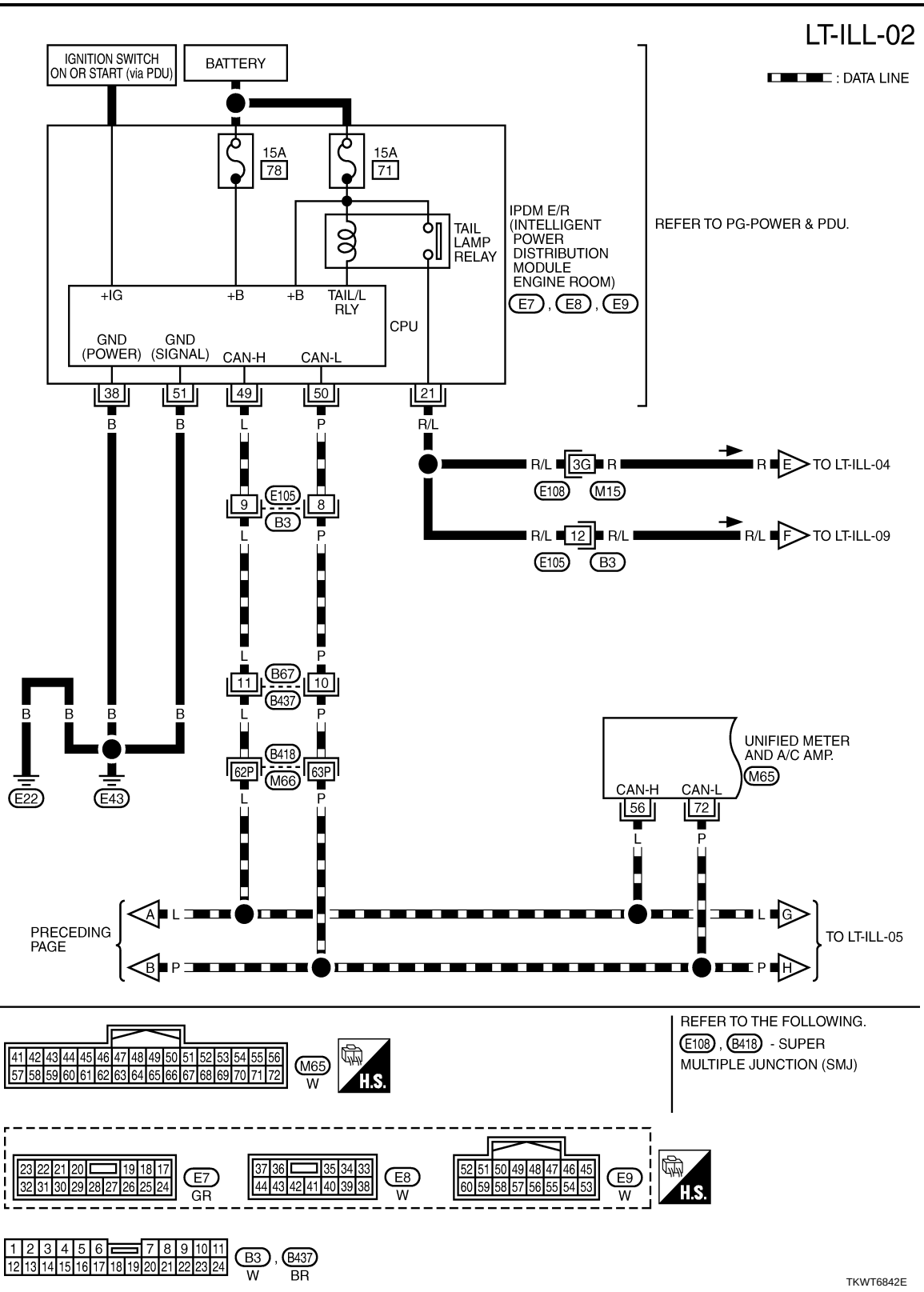
TKWT8219E

Wiring Diagram - ILL -

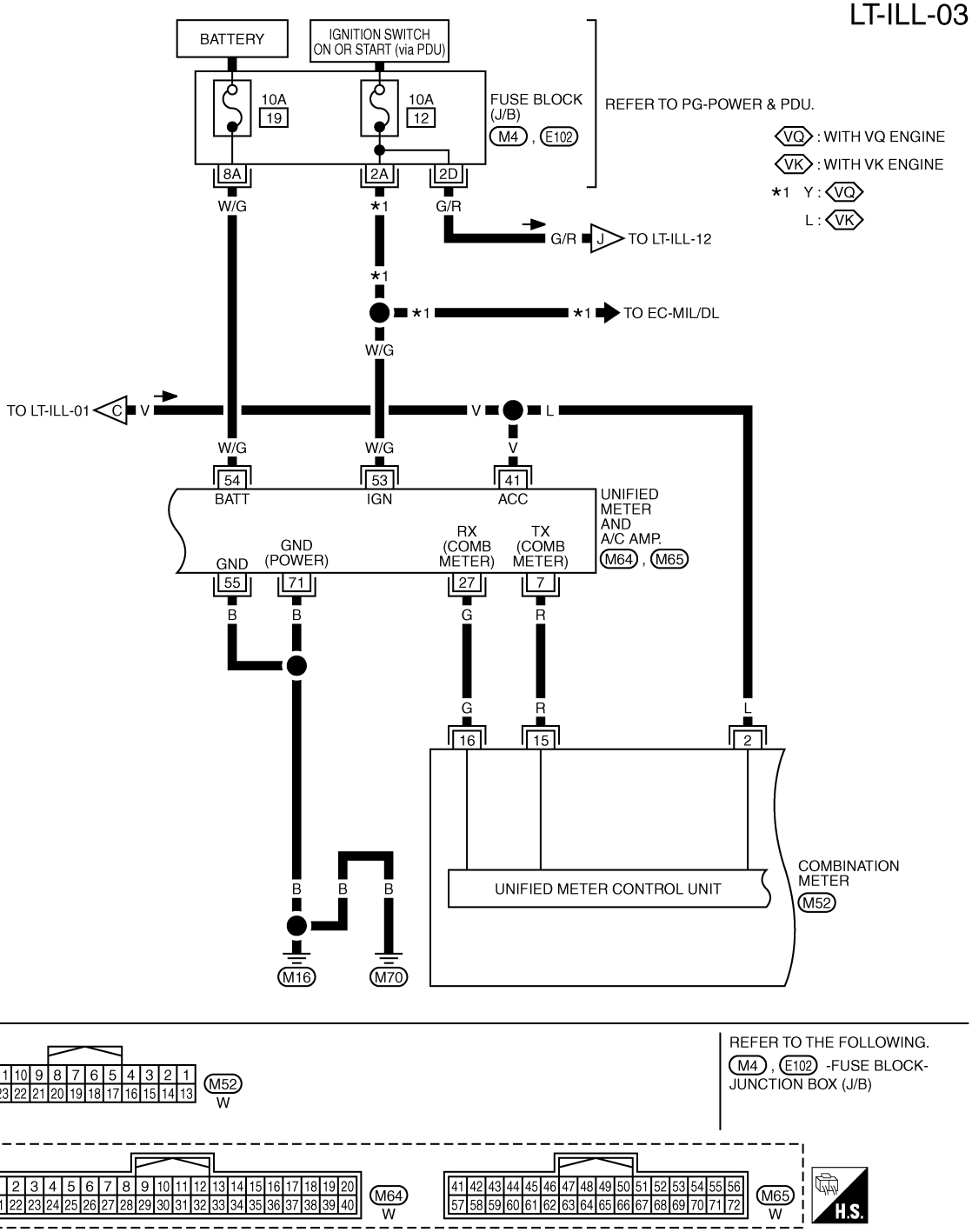
INFOID:0000000004160504



TKWT8220E

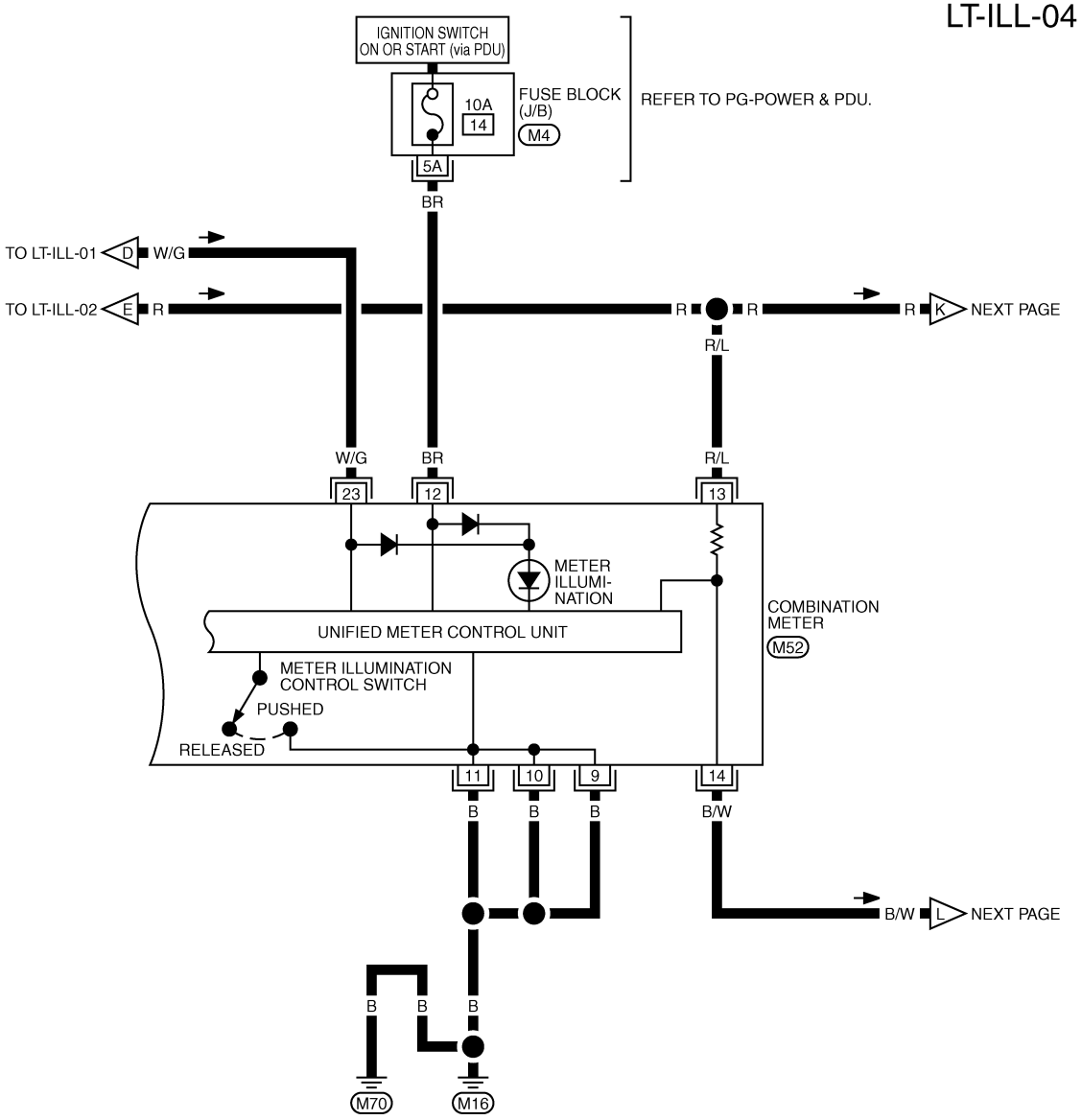

LT-ILL-02
: DATA LINE
IGNITION SWITCH ON OR START (via PDU)
BATTERY
15A 78
15A 71
TAIL LAMP RELAY
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
E7 , E8 , E9
REFER TO PG-POWER & PDU.
+IG
+B
+B
TAIL/L RLY
CPU
GND (POWER)
GND (SIGNAL)
CAN-H
CAN-L
38
51
49
50
21
B
B
L
P
R/L
R/L
3G
R
R
E
TO LT-ILL-04
E108
M15
9
E105
8
B3
R/L
12
R/L
R/L
F
TO LT-ILL-09
E105
B3
B67
11
B437
10
B418
62P
M66
63P
E22
E43
UNIFIED METER AND A/C AMP.
M65
CAN-H
CAN-L
56
72
PRECEDING PAGE
A
B
L
P
G
H
TO LT-ILL-05
REFER TO THE FOLLOWING.
E108 , B418 - SUPER MULTIPLE JUNCTION (SMJ)
M65
W
H.S.
E7
GR
E8
W
E9
W
B3 , B437
W
BR
TKWT6842E

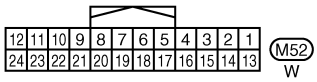
LT-ILL-03



TKWT8221E

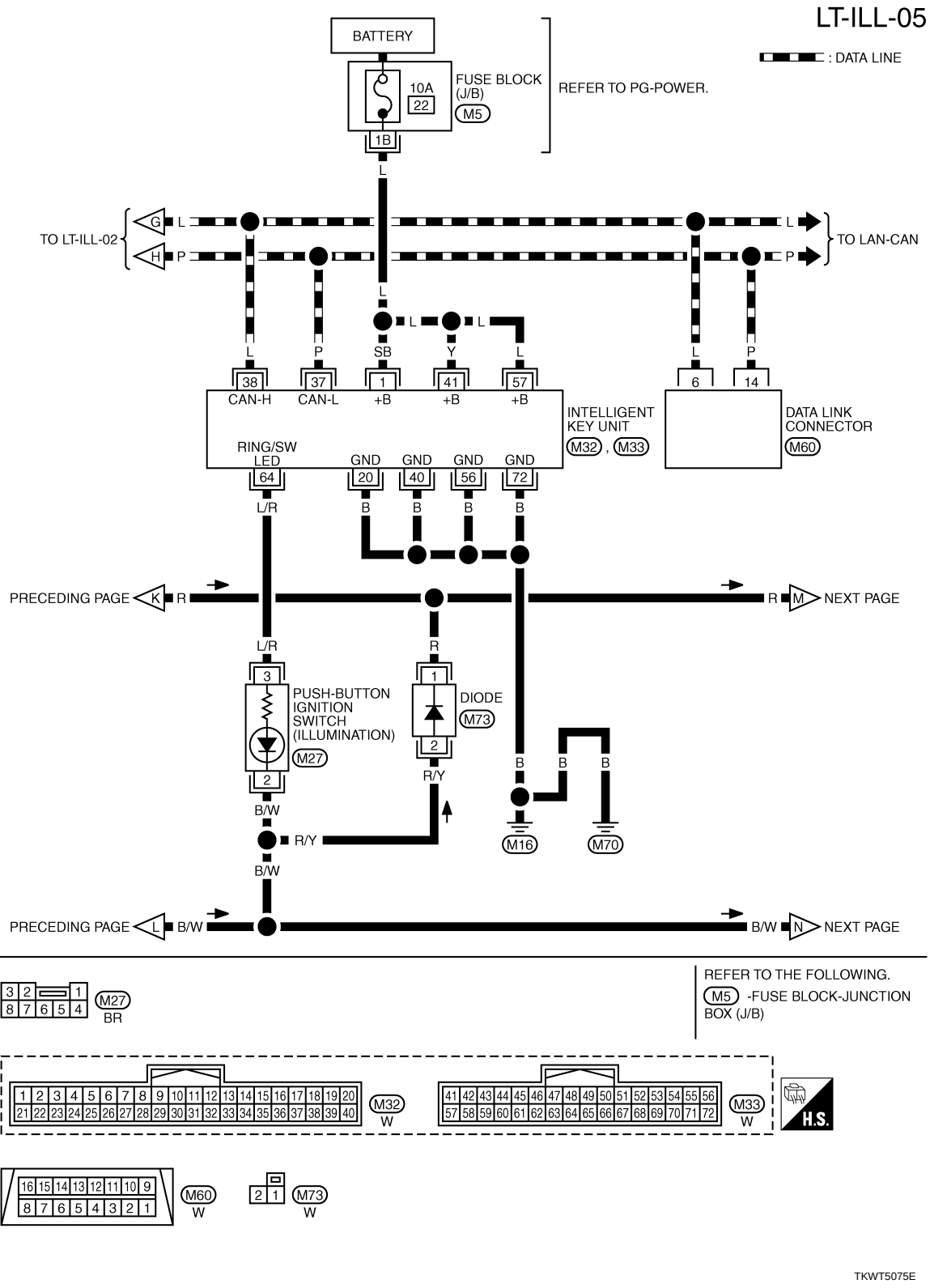
LT-ILL-04





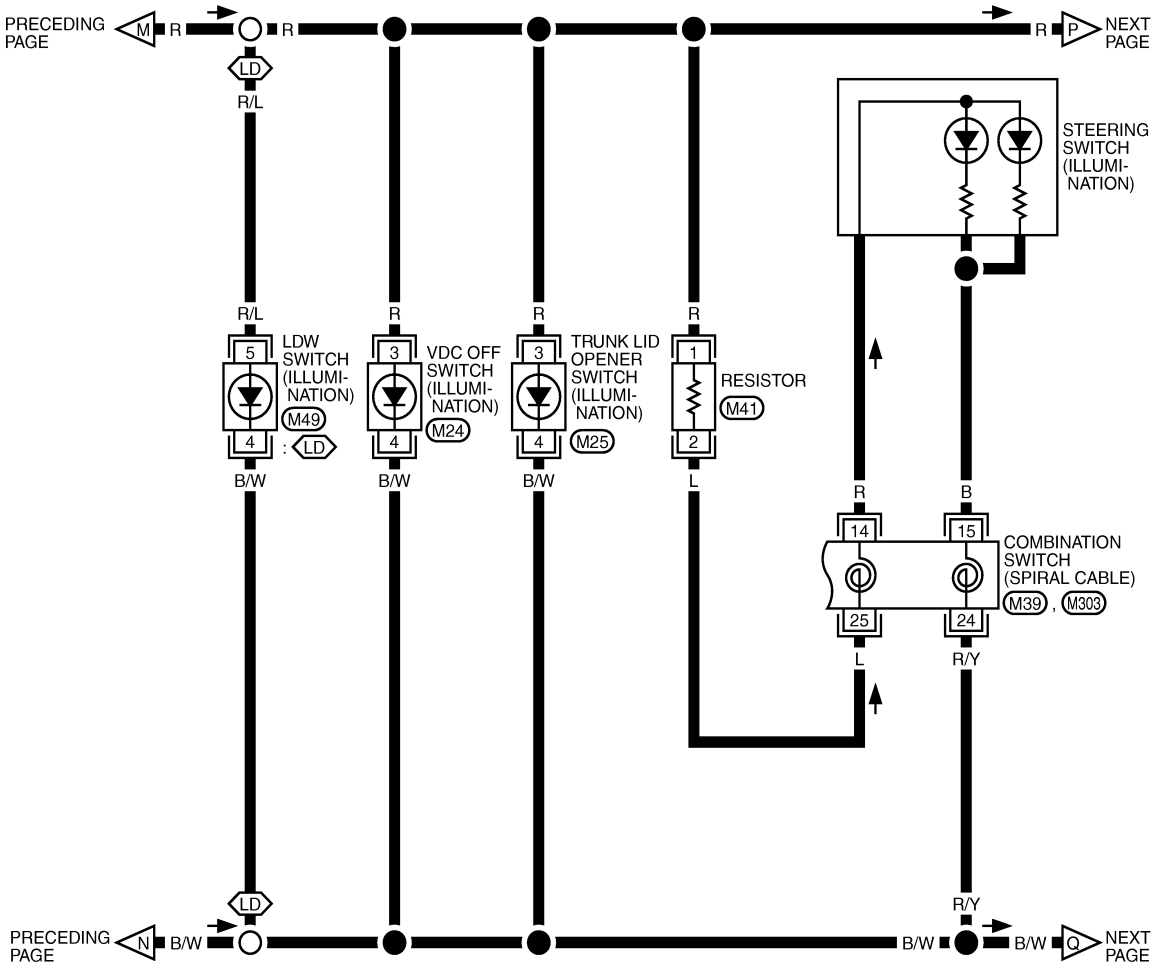
REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

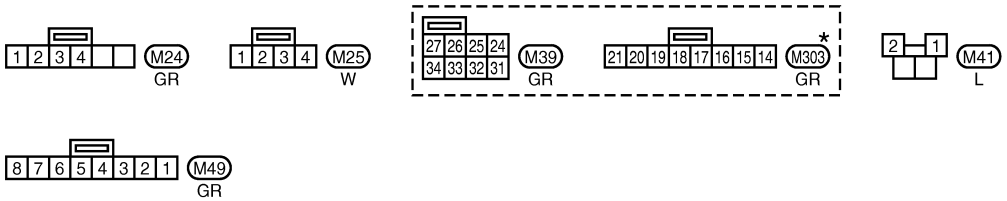
TKWT5074E


LT-ILL-05
: DATA LINE
BATTERY
10A
22
FUSE BLOCK
(J/B)
M5
1B
REFER TO PG-POWER.
TO LT-ILL-02
G
H
L
P
TO LAN-CAN
38
37
1
41
57
6
14
CAN-H
CAN-L
+B
+B
+B
INTELLIGENT
KEY UNIT
M32 , M33
DATA LINK
CONNECTOR
M60
RING/SW
LED
64
GND
20
GND
40
GND
56
GND
72
L/R
B
PRECEDING PAGE
K
R
M
NEXT PAGE
3
PUSH-BUTTON
IGNITION
SWITCH
(ILLUMINATION)
M27
DIODE
M73
R/Y
B/W
M16
M70
PRECEDING PAGE
L
N
NEXT PAGE
REFER TO THE FOLLOWING.
M5 -FUSE BLOCK-JUNCTION
BOX (J/B)
M27
BR
M32
W
M33
W
H.S.
M60
W
M73
W
TKWT5075E

LT-ILL-06

LD : WITH LANE DEPARTURE PREVENTION

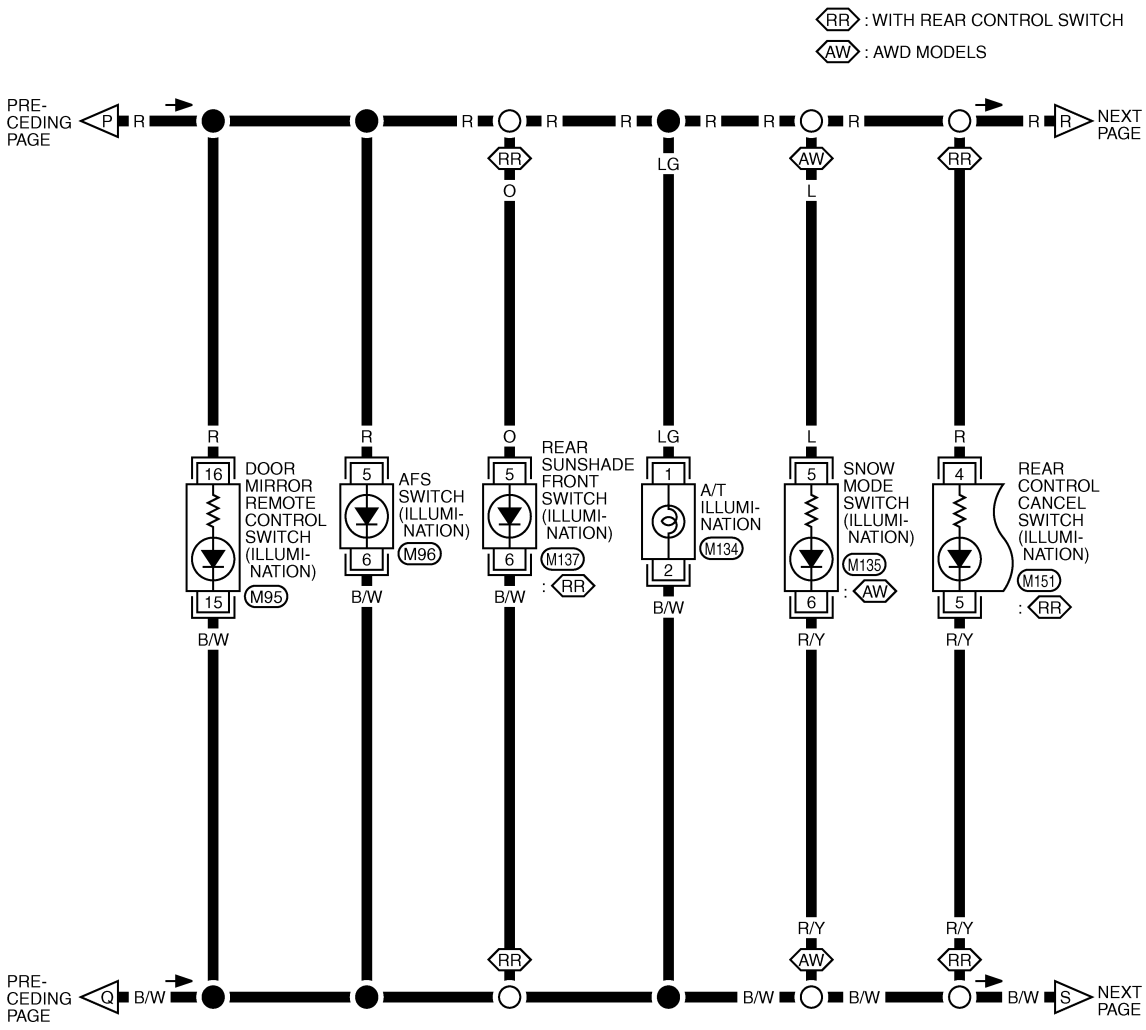


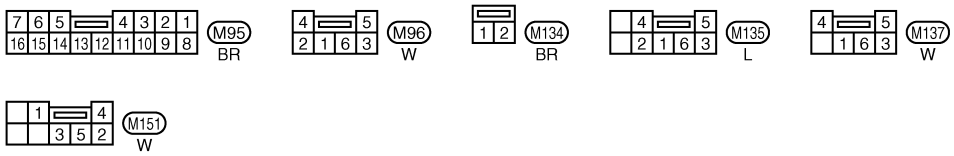


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TKWT6844E

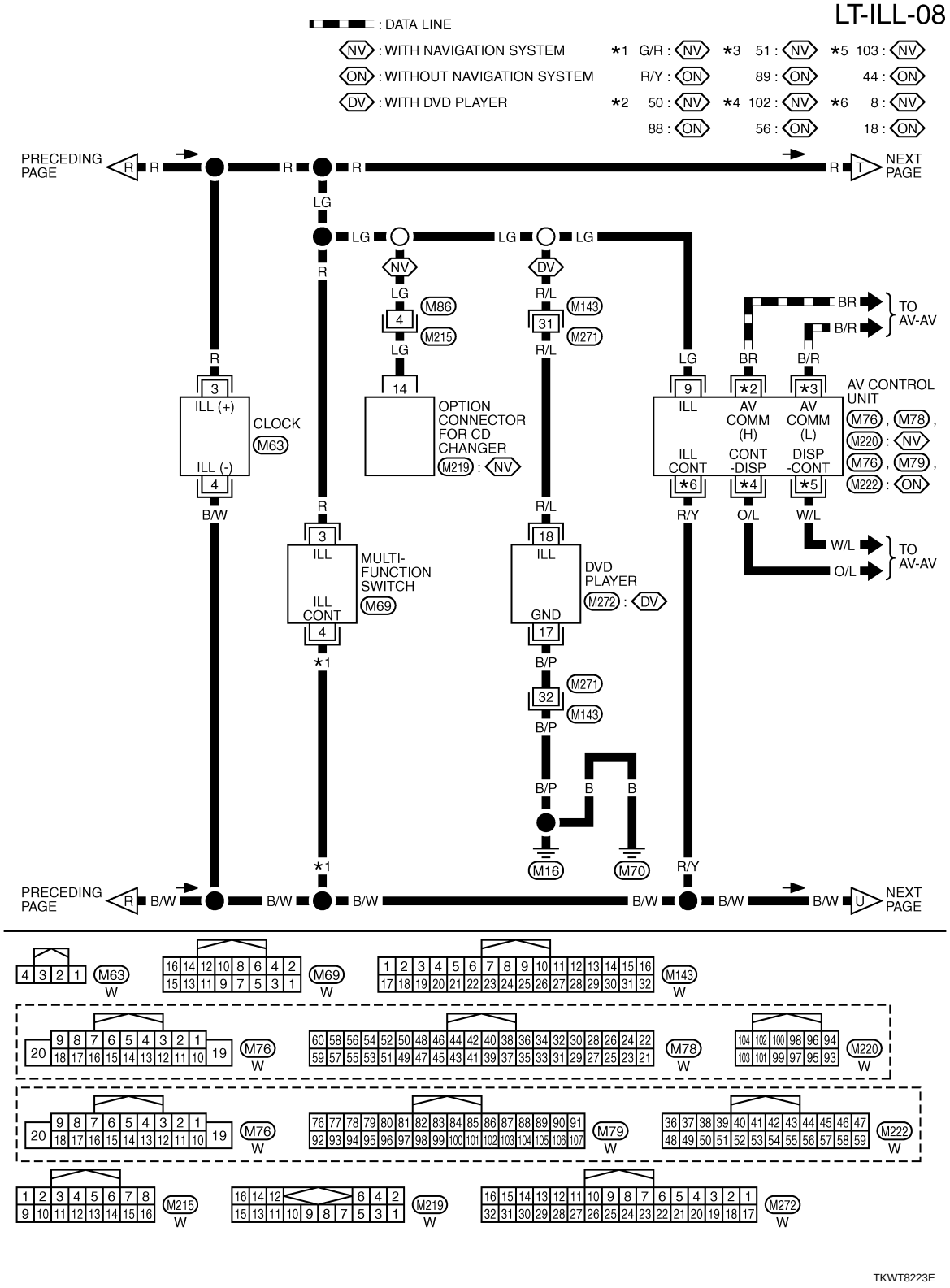
LT-ILL-07



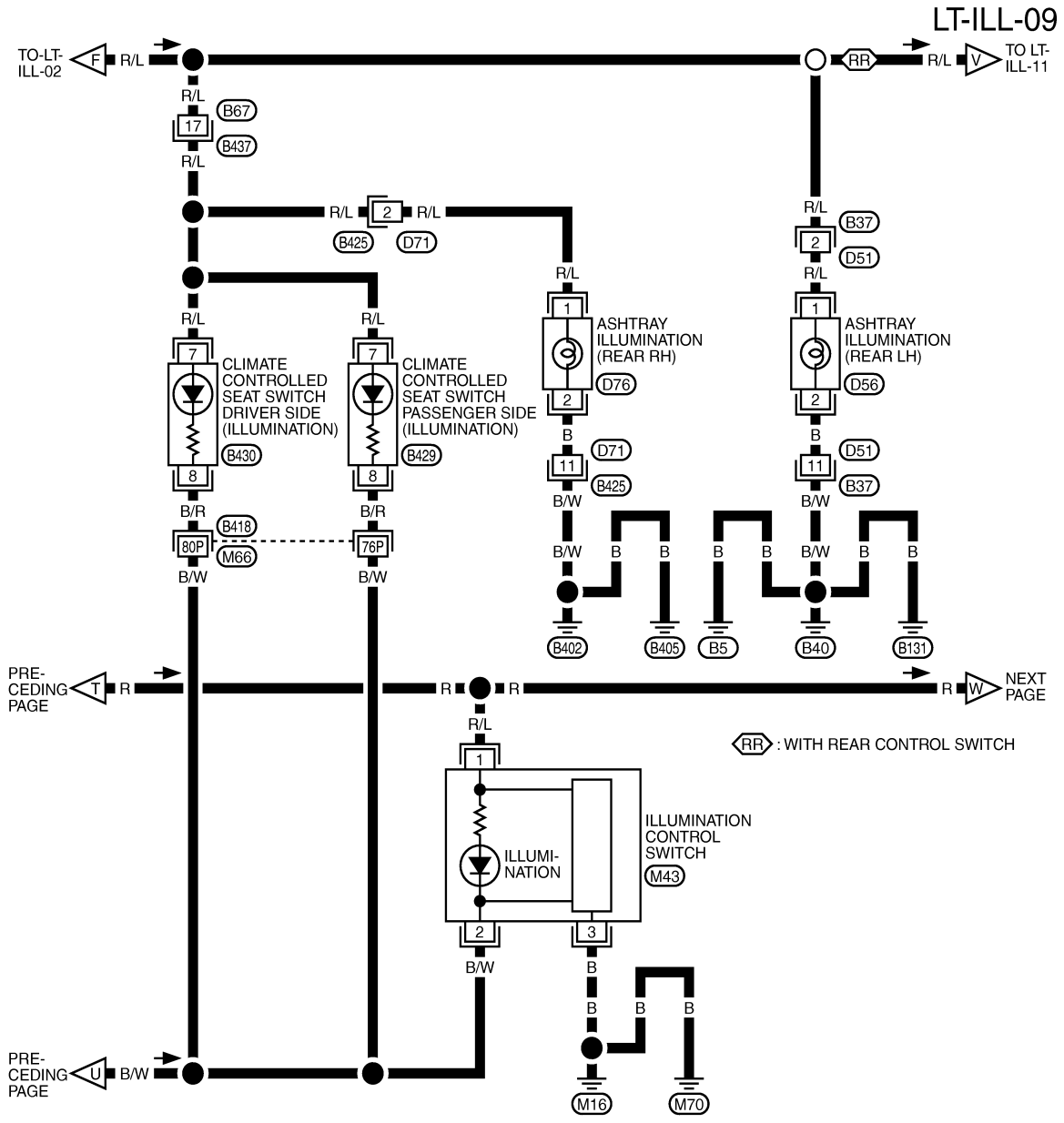


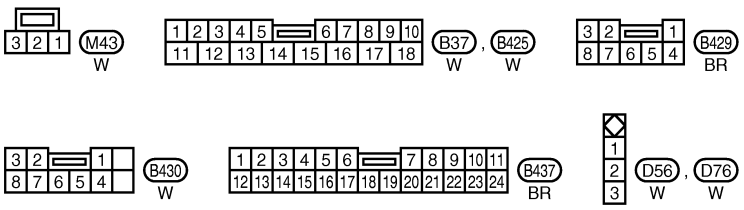
TKWT8222E

LT-ILL-08



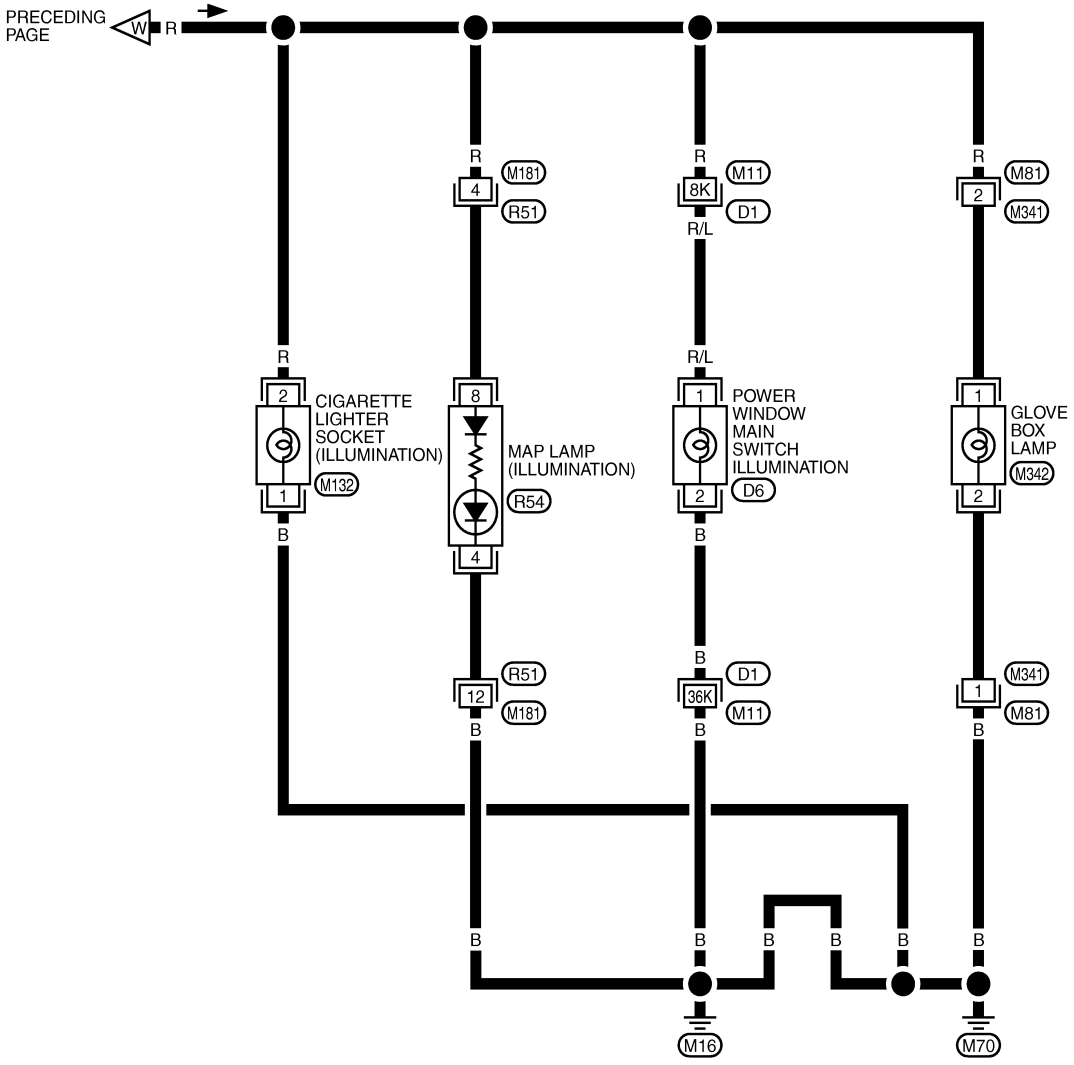
TKWT8223E

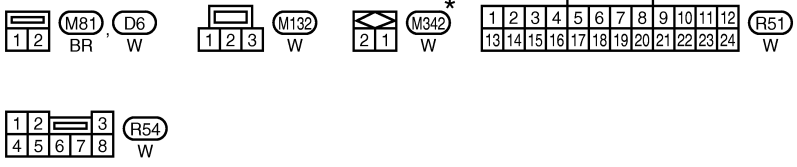




REFER TO THE FOLLOWING.
B418 - SUPER MULTIPLE JUNCTION (SMJ)

TKWT6847E



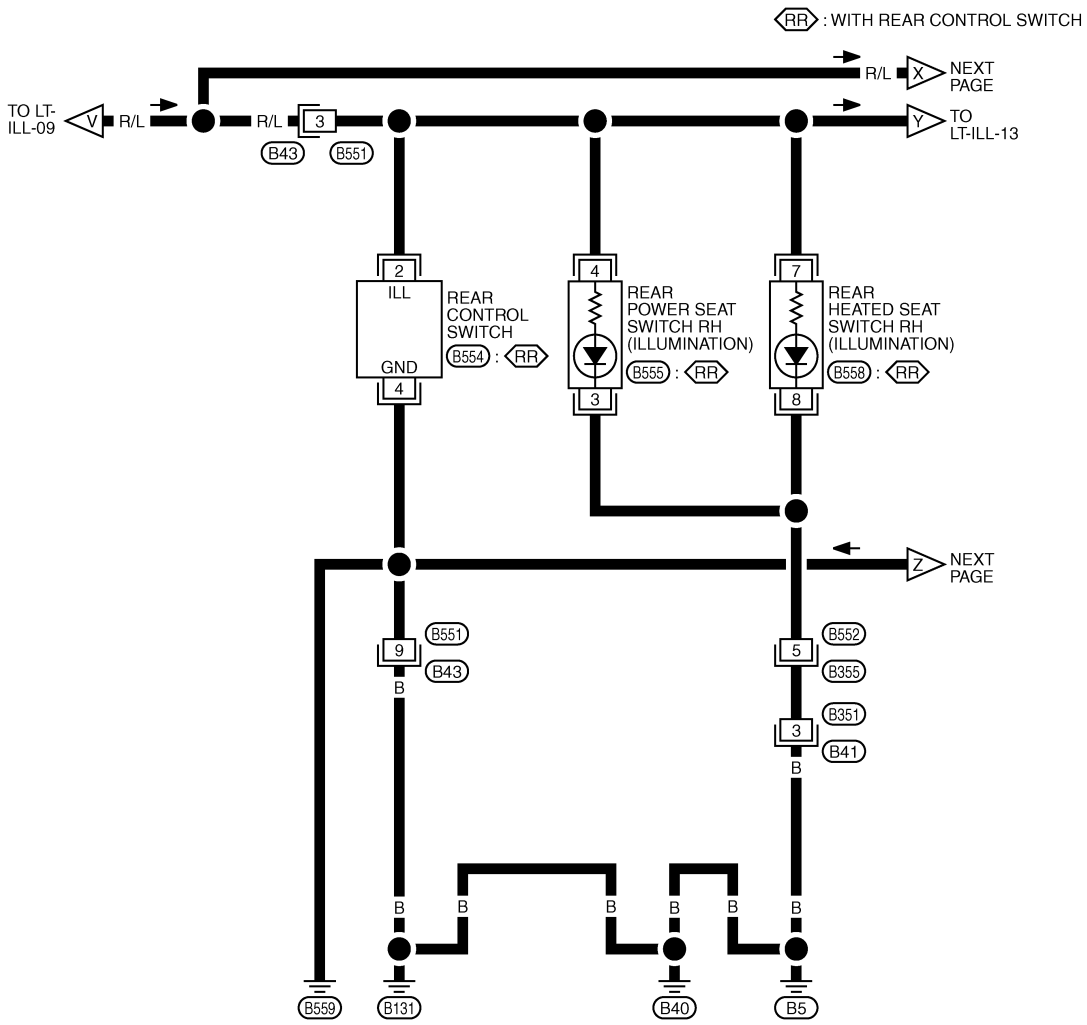


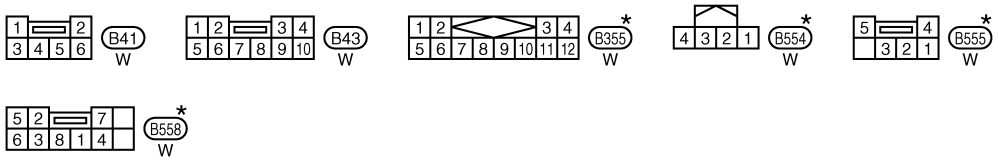
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

REFER TO THE FOLLOWING.
D1 - SUPER MULTIPLE JUNCTION (SMJ)

TKWT6848E

LT-ILL-11

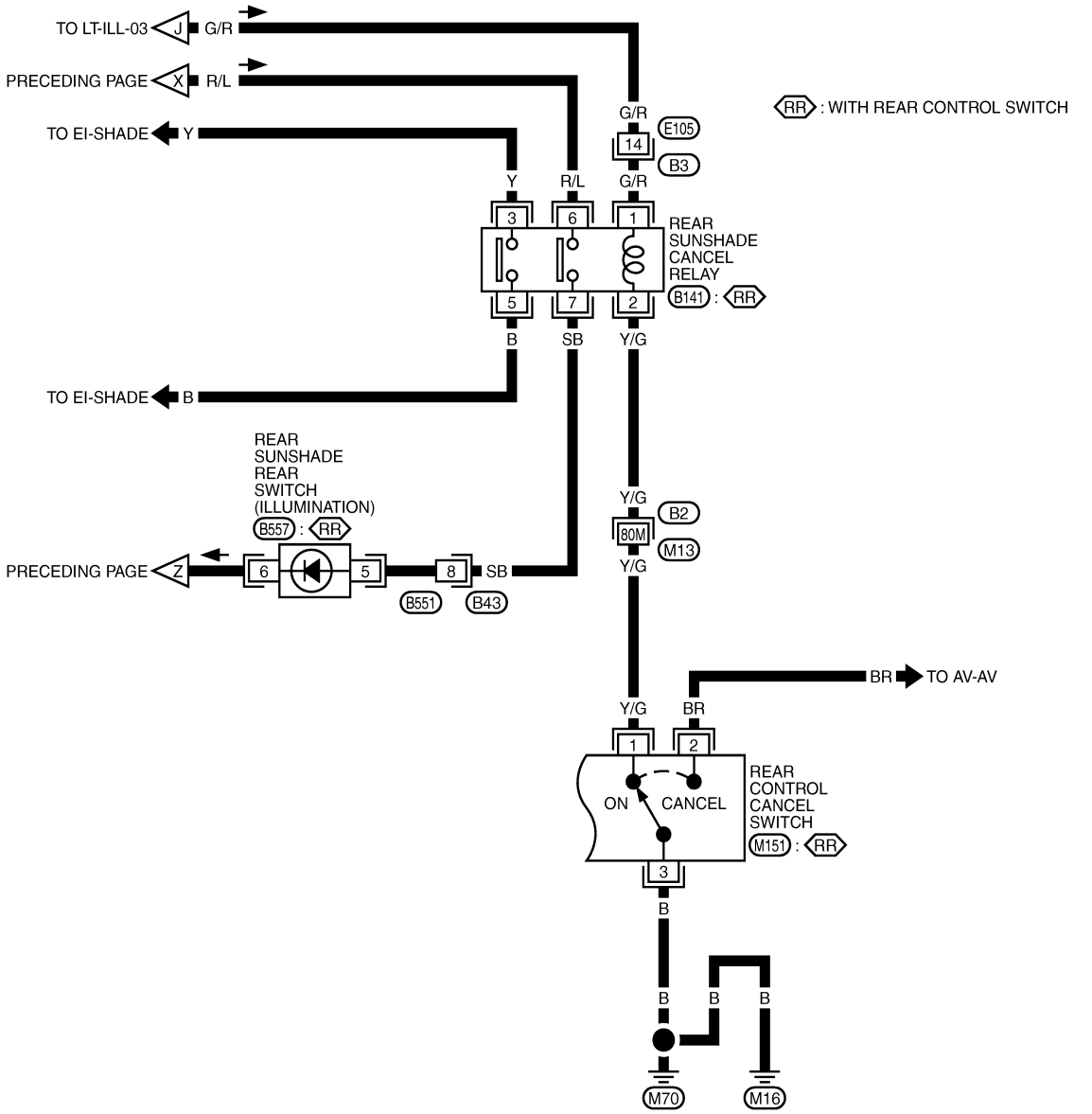


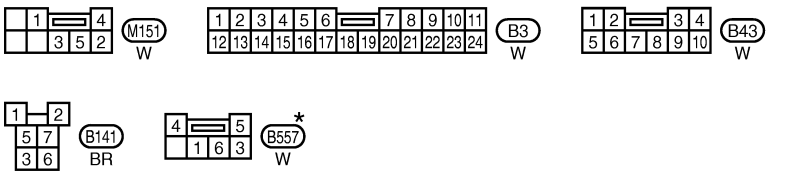


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TKWT3593E

LT-ILL-12





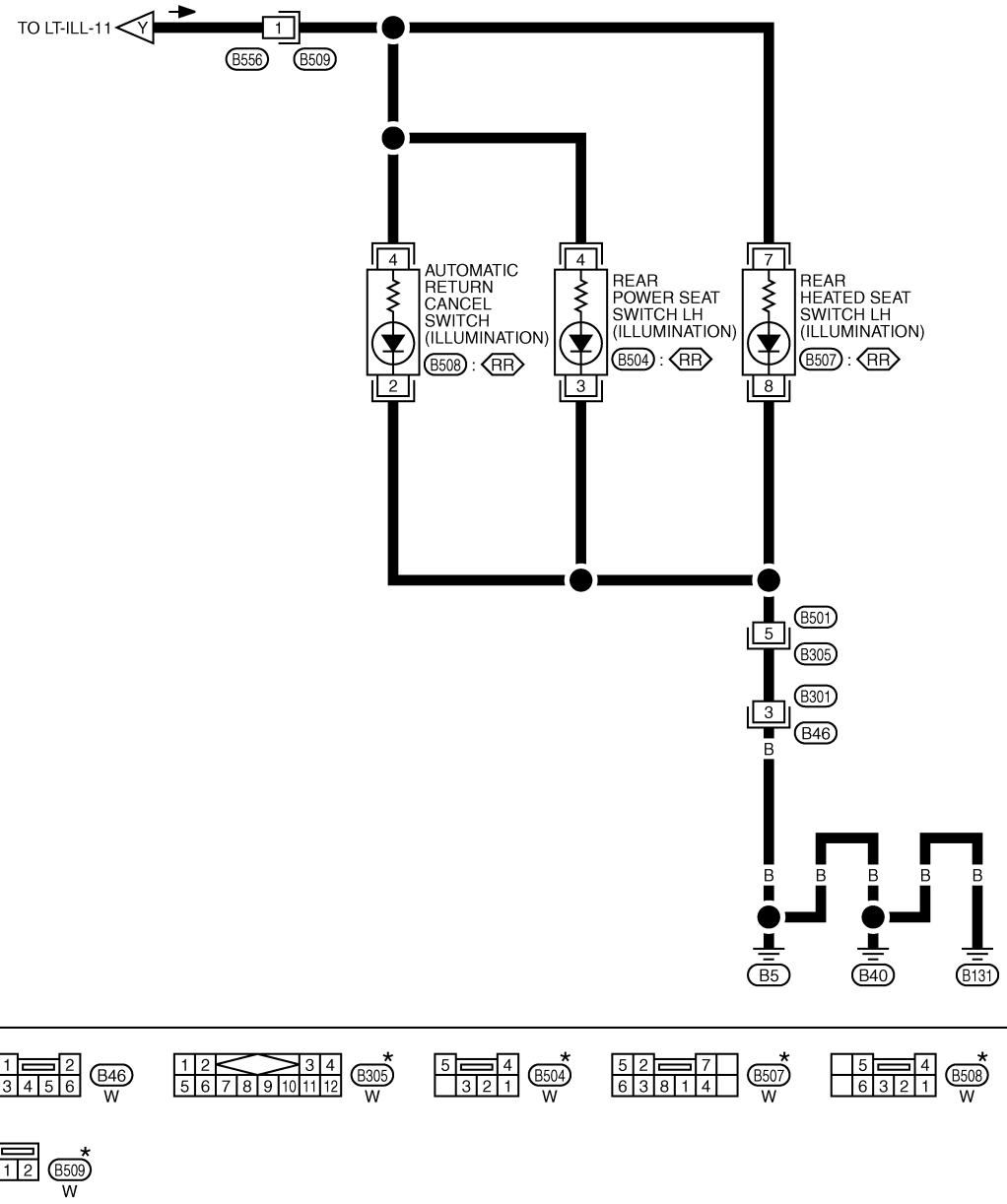
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

REFER TO THE FOLLOWING.
B2 - SUPER MULTIPLE JUNCTION (SMJ)

TKWT6849E

LT-ILL-13

RR : WITH REAR CONTROL SWITCH



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

TKWT3594E

Glove Box Lamp

INFOID:0000000004160505

BULB REPLACEMENT, REMOVAL AND INSTALLATION

CAUTION:

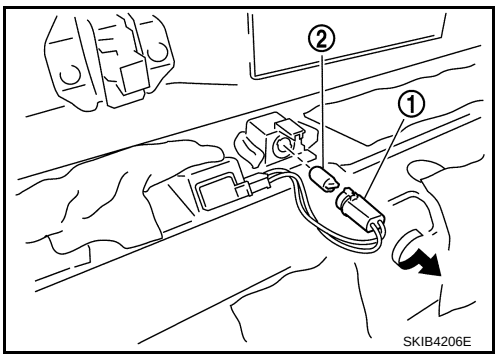
Disconnect the battery negative terminal or remove the fuse.

Removal

1. Remove glove box cover. Refer to IP-12.

2. Turn globe box lamp bulb socket (1) counterclockwise and unlock it.
3. Remove bulb (2).

Glove box lamp : 12V - 1.4W



Installation
Installation is the reverse order of removal.

Cigarette Lighter Illumination

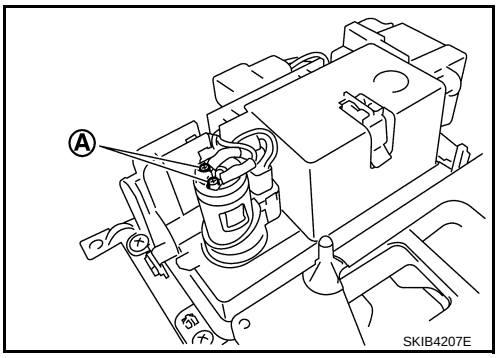
INFOID:0000000004160506

BULB REPLACEMENT, REMOVAL AND INSTALLATION

CAUTION:
Disconnect the battery negative terminal or remove the fuse.

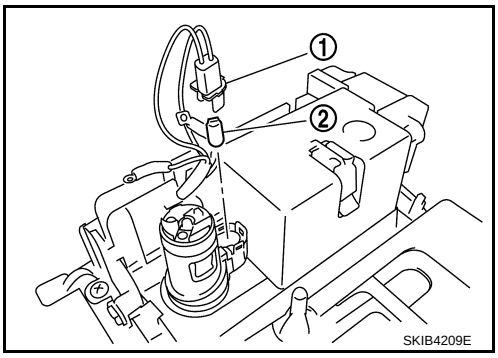
Removal

1. Remove A/T console finisher. Refer to IP-13, "INSTRUMENT PANEL : Removal and Installation".
2. Remove screws (A).



3. Use a screwdriver to undo hooks, remove bulb sockets (1).
4. Remove bulb (2).

Front ashtray and cigarette lighter illumination : 12V - 1.4W



Installation
Installation is the reverse order of removal.

Front Ashtray Illumination

INFOID:0000000004160507

BULB REPLACEMENT, REMOVAL AND INSTALLATION

Refer to LT-244, "Cigarette Lighter Illumination".

Rear Ashtray Illumination

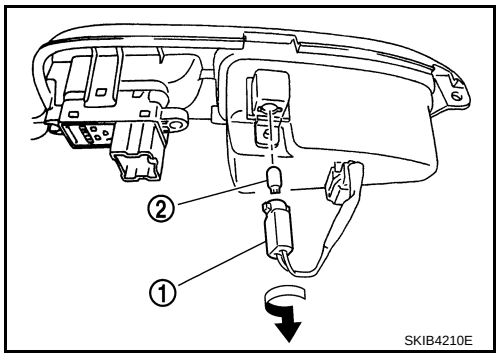
INFOID:0000000004160508

REMOVAL AND INSTALLATION

CAUTION:
Disconnect the battery negative terminal or remove the fuse.

1. Remove rear door finisher. Refer to EI-46.
2. Turn rear ashtray illumination bulb socket (1) counterclockwise and unlock it.
3. Remove bulb (2).

Rear ashtray illumination : 12V - 1.4W



INSTALLATION

Installation is the reverse order of removal.

BULB SPECIFICATIONS

Headlamp

INFOID:0000000004160509

Item	Wattage (W)
Low (Xenon type)	35 (D2S)
High	60 (HB3)

Exterior Lamp

INFOID:0000000004160510

Item		Wattage (W)
Front combination lamp	Front turn signal lamp	21 (amber)
	Parking lamp	5
	Front side marker lamp	5
Rear combination lamp	Stop/Tail lamp	LED
	Rear turn signal lamp	21 (amber)
	Rear side marker lamp	LED
Back-up lamp		16
Side turn signal lamp		Replace as an assembly because it cannot be disassembled.
Front fog lamp		55 (H11)
License plate lamp		5
High-mounted stop lamp		LED

Interior Lamp/Illumination

INFOID:0000000004160511

Item		Wattage (W)
Map lamp		8
Personal lamp		8
Trunk room lamp	Upper	5
	Lower	
Front ashtray and front cigarette lighter illumination[NOTE]		1.4
Rear ashtray illumination		1.4
Step lamp		5
Vanity mirror lamp		1.8
Center console indirect illumination		LED
Glove box lamp		1.4
Foot lamp	Driver side	3.4
	Passenger side	
Kicking plate	Driver side	LED
	Passenger side	
Power window indirect illumination		LED

NOTE:

This lamp is used as both front ashtray and front cigarette lighter.