

SECTION **TTS** TRAILER TOWING SYSTEM

CONTENTS

PRECAUTION	2	WIRING DIAGRAM	10
PRECAUTIONS	2	TRAILER TOWING SYSTEM	10
Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TEN- SIONER"	2	Wiring Diagram	10
SYSTEM DESCRIPTION	3	DTC/CIRCUIT DIAGNOSIS	19
COMPONENT PARTS	3	POWER SUPPLY AND GROUND CIRCUIT	19
Component Parts Location	3	TRAILER BRAKE CONTROL UNIT	19
Trailer Brake Control Unit	6	TRAILER BRAKE CONTROL UNIT : Diagnosis Procedure	19
SYSTEM	7	BULB CHECK RELAY	21
TRAILER TOWING SYSTEM	7	Diagnosis Procedure	21
TRAILER TOWING SYSTEM : System Diagram	7	Component Inspection	21
TRAILER LIGHT CHECK FUNCTION	7	REMOVAL AND INSTALLATION	23
TRAILER LIGHT CHECK FUNCTION : System Description	8	GOOSENECK HITCH	23
DIAGNOSIS SYSTEM (TRAILER BRAKE CONTROL UNIT)	9	Exploded View	23
TRAILER BRAKE CONTROL UNIT	9	Removal and Installation	23
TRAILER BRAKE CONTROL UNIT : Diagnosis Description	9	TRAILER HITCH	24
		Exploded View	24
		Removal and Installation	24
		TRAILER BRAKE CONTROL UNIT	26
		Removal and Installation	26

A
B
C
D
E
F
G
H
I
J
TTS
L
M
N
O
P

PRECAUTIONS

< PRECAUTION >

PRECAUTION

PRECAUTIONS

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

INFOID:0000000014391546

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

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.
- Improper repair, 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 SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

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 or batteries, and wait at least three minutes before performing any service.

COMPONENT PARTS

< SYSTEM DESCRIPTION >

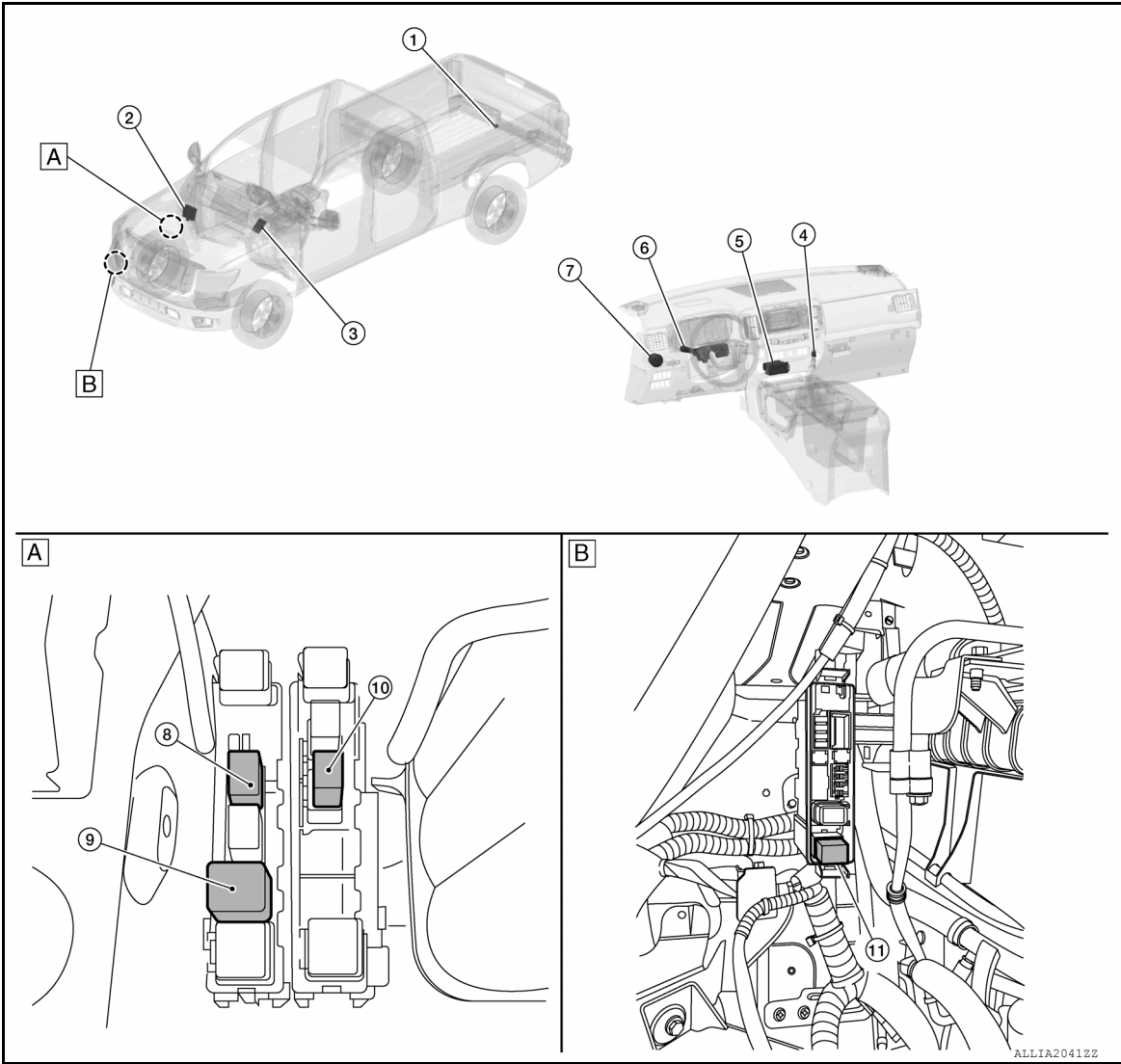
SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

with Cummins 5.0L

INFOID:0000000014391547



A. Engine room RH (shown with cover removed) B. Engine room RH

No.	Part	Function
1.	Trailer connector	Provides connection of the trailer for trailer lighting, and trailer brake controls.
2.	IPDM E/R	- Supplies voltage to the load according to the request from BCM (via CAN communication). - Refer to PCS-5, "Component Parts Location".

A
B
C
D
E
F
G
H
I
J
TTS
L
M
N
O
P

COMPONENT PARTS

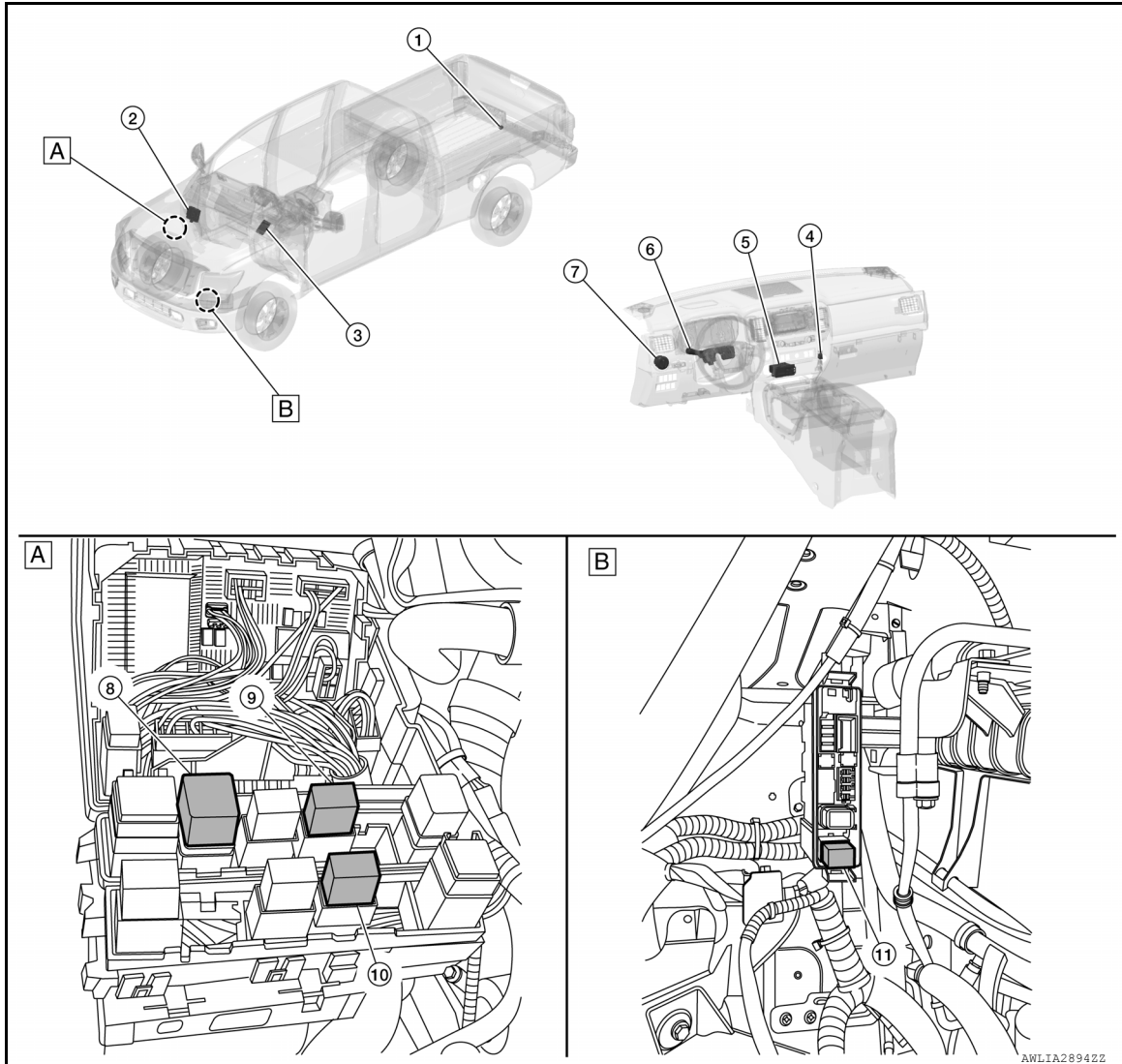
< SYSTEM DESCRIPTION >

No.	Part	Function
3.	BCM	• Detects each switch condition by the lighting switch, front fog lamp switch, and combination switch reading function. • Judges that the exterior lamps are turned ON according to the vehicle condition. • Judges the outside brightness from the optical sensor signal. • Judges the ON/OFF timing according to the vehicle condition. • Judges the ON/OFF status of the exterior lamp according to the outside brightness and the vehicle condition. • Refer to BCS-5. "BODY CONTROL SYSTEM : Component Parts Location" for detailed installation location.
4.	Trailer tow relay-1	Supplies voltage to the trailer connector.
5.	Trailer brake control unit	The TBCU assists the vehicle on an effective and smooth braking while towing a trailer. Refer to TTS-6. "Trailer Brake Control Unit" .
6.	Combination switch (Lighting and turn signal switch)	Refer to MWI-8. "METER SYSTEM : Component Parts Location" for detailed installation location.
7.	Lighting switch	Sends signals to the BCM for headlamp operation.
8.	Trailer turn relay LH	Supplies voltage to the LH trailer lighting.
9.	Trailer tow relay-2	Supplies voltage to the trailer connector.
10.	Trailer turn relay RH	Supplies voltage to the RH trailer lighting.
11.	Bulb check relay	Supplies voltage for trailer bulb check function.

with VK56VD

COMPONENT PARTS

< SYSTEM DESCRIPTION >



A. Engine room RH (shown with cover removed) B. Engine room LH

No.	Part	Function
1.	Trailer connector	Provides connection of the trailer for trailer lighting, and trailer brake controls.
2.	IPDM E/R	- Supplies voltage to the load according to the request from BCM (via CAN communication). - Refer to PCS-5, "Component Parts Location".
3.	BCM	- Detects each switch condition by the lighting switch, front fog lamp switch, and combination switch reading function. - Judges that the exterior lamps are turned ON according to the vehicle condition. - Judges the outside brightness from the optical sensor signal. - Judges the ON/OFF timing according to the vehicle condition. - Judges the ON/OFF status of the exterior lamp according to the outside brightness and the vehicle condition. - Refer to BCS-5, "BODY CONTROL SYSTEM : Component Parts Location" for detailed installation location.
4.	Trailer tow relay-1	Supplies voltage to the trailer connector.
5.	Trailer brake control unit	The TBCU assists the vehicle on an effective and smooth braking while towing a trailer. Refer to TTS-6, "Trailer Brake Control Unit" .
6.	Combination switch (Lighting and turn signal switch)	Refer to MWI-8, "METER SYSTEM : Component Parts Location" for detailed installation location.

A
B
C
D
E
F
G
H
I
J
TTS
L
M
N
O
P

COMPONENT PARTS

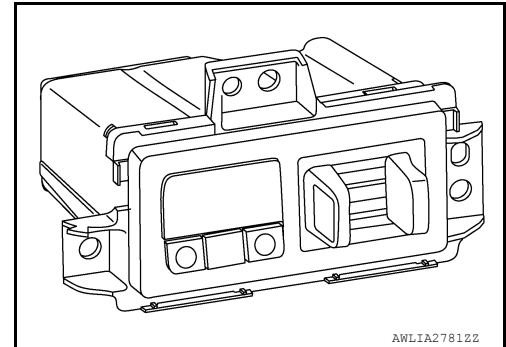
< SYSTEM DESCRIPTION >

No.	Part	Function
7.	Lighting switch	Sends signals to the BCM for headlamp operation.
8.	Trailer tow relay-2	Supplies voltage to the trailer connector.
9.	Trailer turn relay LH	Supplies voltage to the LH trailer lighting.
10.	Trailer turn relay RH	Supplies voltage to the RH trailer lighting.
11.	Bulb check relay	Supplies voltage for trailer bulb check function.

Trailer Brake Control Unit

INFOID:0000000014391548

The Trailer Brake Control Unit (TBCU) assists the vehicle on an effective and smooth braking while towing a trailer's electric, or electric-over-hydraulic, brakes with a proportional output based on the towing vehicle's brake pressure.



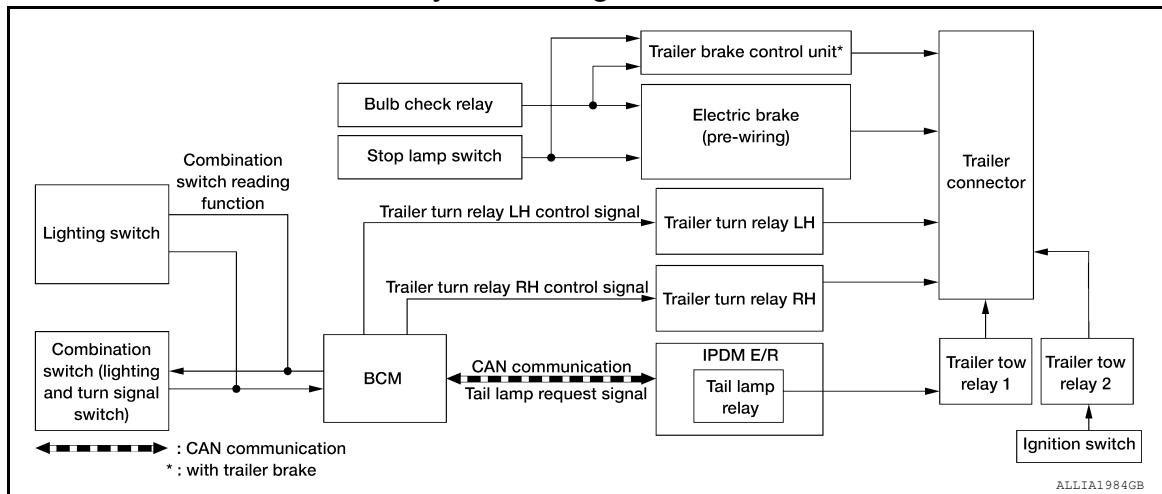
SYSTEM

< SYSTEM DESCRIPTION >

SYSTEM

TRAILER TOWING SYSTEM

TRAILER TOWING SYSTEM : System Diagram



TRAILER TAIL LAMP OPERATION

The trailer tail lamps are controlled by the trailer tow relay 1 and trailer tow relay 2 located in the IPDM E/R. With the combination switch (lighting and turn signal switch) in the 1st position, the BCM detects the LIGHTING SWITCH 1ST POSITION ON. The BCM sends a parking light ON request via the CAN communication lines to the IPDM E/R. The IPDM E/R then activates the tail lamp relay which activates the trailer tow relay 1 and sends power to the trailer connector. The trailer tow relay 2 is activated when the IPDM E/R activates ignition relay 1.

TRAILER TURN SIGNAL LAMP OPERATION

The trailer turn signal lamps are controlled by the BCM. When the turn signal switch is in the LH or RH position with the ignition switch ON, the combination switch (lighting and turn signal switch) sends a signal to the BCM. The BCM detects the TURN RH or TURN LH ON request. The BCM sends a control signal to the respective trailer turn relay which sends power to the trailer connector.

TRAILER HAZARD LAMP OPERATION

The trailer hazard lamps are controlled by the BCM. When the hazard switch is pressed, the BCM detects the hazard ON request. The BCM then sends a control signal to both trailer turn relays which sends power to the trailer connector.

TRAILER BRAKE LAMP OPERATION

The trailer brake lamps are controlled by the BCM. When the brake pedal is depressed, the combination meter receives a stop lamp switch signal from the stop lamp switch. The combination meter then sends the brake signal to the BCM via the CAN communication lines. The BCM then sends a control signal to both trailer turn relays which sends power to the trailer connector.

TRAILER BRAKE CONTROL UNIT

The Trailer Brake Control Unit (TBCU) assists the vehicle in effective and smooth braking while towing a trailer's electric, or electric-over-hydraulic, brakes with a proportional output based on towing vehicle's brake-pressure. The TBCU has 2 operating modes:

- Automatic Mode: This is the normal operation of the TBCU depending on the gain and boost setting adjusted by the customer. This mode will activate the vehicle brake pedal if pressed.
- Manual Mode: This mode is initiated by adjusting the manual control lever from resting position. This mode will provide output power to the trailer brakes without pressing the vehicle brake pedal.

TRAILER LIGHT CHECK FUNCTION

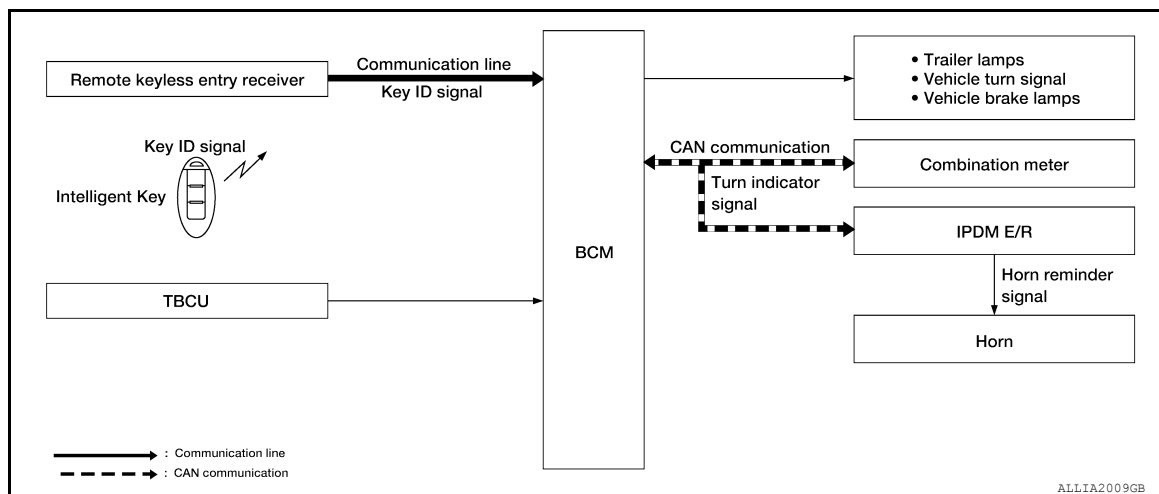
SYSTEM

< SYSTEM DESCRIPTION >

TRAILER LIGHT CHECK FUNCTION : System Description

INFOID:0000000014391550

SYSTEM DIAGRAM



OPERATION

The trailer lights can be checked from outside the vehicle using the Intelligent Key[®], or from inside the vehicle using the TOWING SETTINGS through the combination meter. The trailer light check operation range is 197ft (60m)

Trailer Light Check will not function under the following conditions:

1. The vehicle speed is above 0mph (0km/h).
2. The brake switch is depressed.
3. the left or right turn signal is on.
4. The Trailer Light Check Configuration is disabled, or not available in the combination meter towing settings.
5. The hazard switch is on.
6. The A/T shift selector is any other position than Park.

Trailer Light Function will be cancelled under the following circumstances:

1. Ignition status is changed.
2. A button on the keyfob is pressed.
3. Any of the above conditions are not met.

DIAGNOSIS SYSTEM (TRAILER BRAKE CONTROL UNIT)

< SYSTEM DESCRIPTION >

DIAGNOSIS SYSTEM (TRAILER BRAKE CONTROL UNIT) TRAILER BRAKE CONTROL UNIT

TRAILER BRAKE CONTROL UNIT : Diagnosis Description

INFOID:0000000014391551

DIANOSTIC DISPLAY ITEM:

The Diagnostic routines check to ensure proper operation and warn the operator of abnormal or dangerous fault conditions:

Ignition Voltage Out of Range	No Error Display
Open Ground	(Flashing) 0.9
Short to Ground	(Flashing) 5H
Short to Battery	(Flashing) 5b
Output overload	(Flashing) 0L
Battery Voltage Out of Range	No Error Display
Accelerometer Communication Error	No Error Display
Button Stuck Error	No Error Display
Relay Stuck Error	(Flashing) Er
Manual Stuck Error	(Flashing) Er.

AWLIA2783GB

NOTICE:

The TBCU has been verified to be compatible with trailers having electric actuated brakes (one to four axles) and electric-over-hydraulic brakes. It will not activate hydraulic surge-style trailer brakes.

TRAILER TOWING SYSTEM

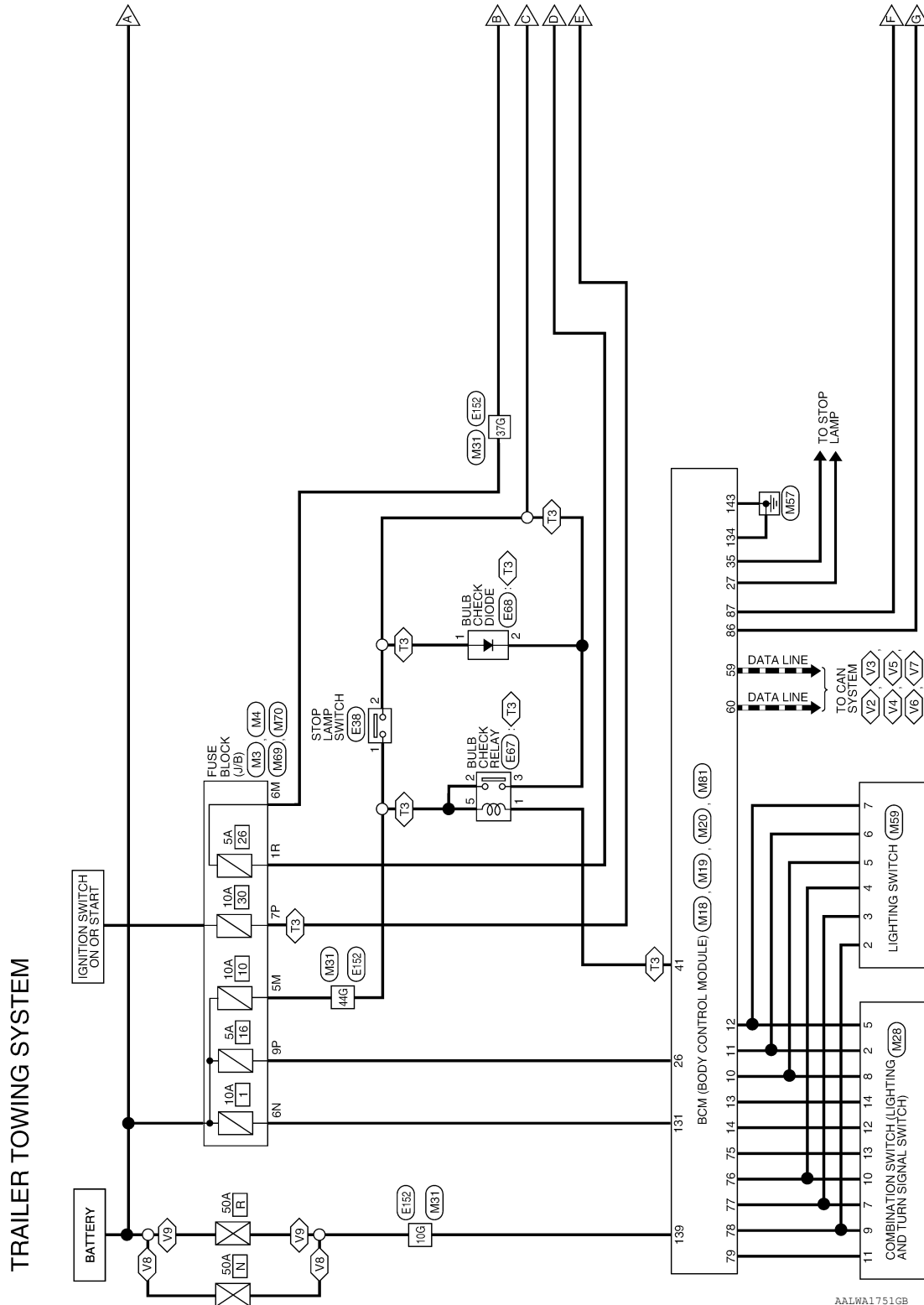
< WIRING DIAGRAM >

WIRING DIAGRAM

TRAILER TOWING SYSTEM

Wiring Diagram

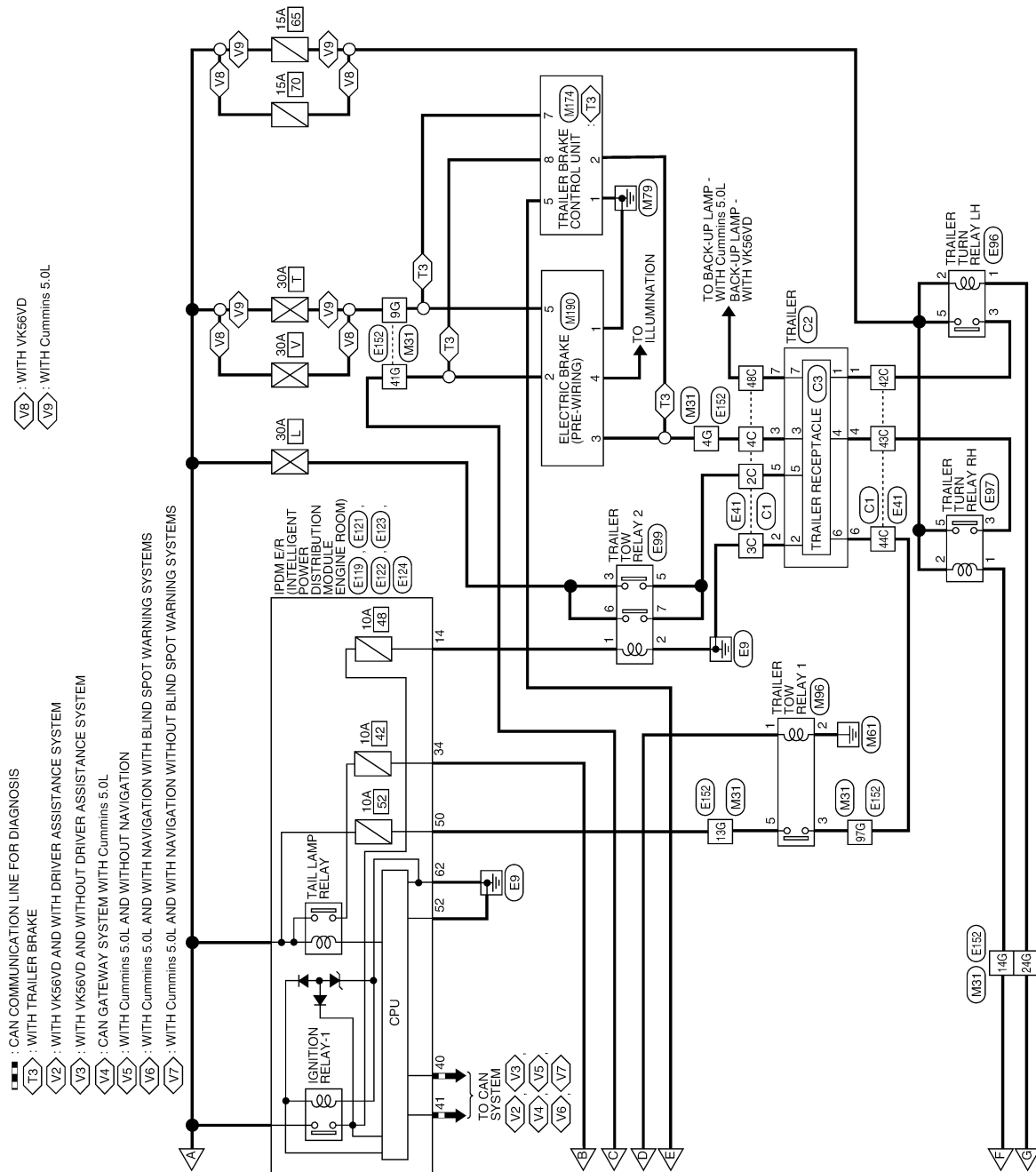
INFOID:0000000014391552



AALWA1751GB

TRAILER TOWING SYSTEM

< WIRING DIAGRAM >



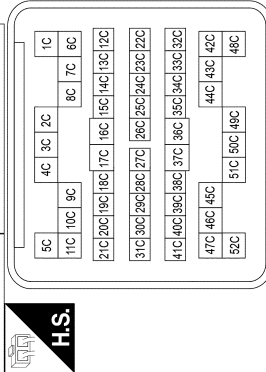
AALWA1752GB

TRAILER TOWING SYSTEM

< WIRING DIAGRAM >

TRAILER TOWING SYSTEM CONNECTORS

Connector No.	C1
Connector Name	WIRE TO WIRE
Connector Type	RK26FGY-RS20-X6
Connector Color	GRAY

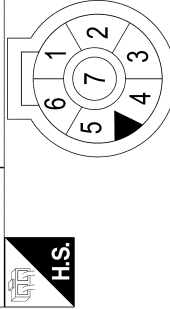


Terminal No.	Color of Wire	Signal Name
1C	Y/V	TO ENGINE ROOM HARNESS
2C	W/L	TO ENGINE ROOM HARNESS
3C	B	TO ENGINE ROOM HARNESS
4C	BR/W	TO ENGINE ROOM HARNESS
5C	BR/Y	TO ENGINE ROOM HARNESS
6C	Y	TO ENGINE ROOM HARNESS
7C	G/R	TO ENGINE ROOM HARNESS - (WITH CUMMINS 5.0L)
7C	R	TO ENGINE ROOM HARNESS - (WITH VK56VD)
8C	B	TO ENGINE ROOM HARNESS - (WITH CUMMINS 5.0L)
8C	O/B	TO ENGINE ROOM HARNESS - (WITH VK56VD)
9C	W/L	TO ENGINE ROOM HARNESS - (WITH CUMMINS 5.0L)
9C	SB	TO ENGINE ROOM HARNESS - (WITH VK56VD)
10C	GR/R	TO ENGINE ROOM HARNESS - (WITH CUMMINS 5.0L)
10C	GR	TO ENGINE ROOM HARNESS - (WITH VK56VD)
11C	B	TO ENGINE ROOM HARNESS - (WITH CUMMINS 5.0L)
11C	R/W	TO ENGINE ROOM HARNESS - (WITH VK56VD)
12C	Y	TO ENGINE ROOM HARNESS
13C	B	TO ENGINE ROOM HARNESS
14C	B/G	TO ENGINE ROOM HARNESS
15C	Y	TO ENGINE ROOM HARNESS
16C	B	TO ENGINE ROOM HARNESS
17C	V	TO ENGINE ROOM HARNESS
18C	B/G	TO ENGINE ROOM HARNESS
19C	L	TO ENGINE ROOM HARNESS
20C	W	TO ENGINE ROOM HARNESS
21C	L/G	TO ENGINE ROOM HARNESS

AALIA5692GB

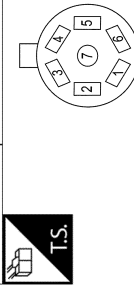
22C	SHIELD	TO ENGINE ROOM HARNESS
23C	G/B	TO ENGINE ROOM HARNESS
24C	G/B	TO ENGINE ROOM HARNESS
25C	W	TO ENGINE ROOM HARNESS
26C	B	TO ENGINE ROOM HARNESS
27C	L/G	TO ENGINE ROOM HARNESS
28C	G/W	TO ENGINE ROOM HARNESS
29C	R/L/G	TO ENGINE ROOM HARNESS
30C	R/L	TO ENGINE ROOM HARNESS
31C	B	TO ENGINE ROOM HARNESS
32C	R	TO ENGINE ROOM HARNESS
33C	L/W	TO ENGINE ROOM HARNESS
34C	L	TO ENGINE ROOM HARNESS
35C	R/W	TO ENGINE ROOM HARNESS
36C	L	TO ENGINE ROOM HARNESS
37C	Y	TO ENGINE ROOM HARNESS
38C	GR	TO ENGINE ROOM HARNESS
39C	R	TO ENGINE ROOM HARNESS
40C	P	TO ENGINE ROOM HARNESS
41C	V	TO ENGINE ROOM HARNESS
42C	L/G/B	TO ENGINE ROOM HARNESS
43C	Y/B	TO ENGINE ROOM HARNESS
44C	R	TO ENGINE ROOM HARNESS
45C	G	TO ENGINE ROOM HARNESS
46C	BR	TO ENGINE ROOM HARNESS
47C	B	TO ENGINE ROOM HARNESS
48C	Y/R	TO ENGINE ROOM HARNESS
48C	R/Y	TO ENGINE ROOM HARNESS - (WITH CUMMINS 5.0L)
49C	V	TO ENGINE ROOM HARNESS - (WITH VK56VD)
50C	B	TO ENGINE ROOM HARNESS - (WITH CUMMINS 5.0L)
50C	B/Y	TO ENGINE ROOM HARNESS - (WITH VK56VD)
51C	V	TO ENGINE ROOM HARNESS - (WITH CUMMINS 5.0L)
51C	B	TO ENGINE ROOM HARNESS - (WITH VK56VD)
52C	V/W	TO ENGINE ROOM HARNESS

Connector No.	C2
Connector Name	TRAILER
Connector Type	15354653-1
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	L/G/B	STOP TURN LH
2	B	GND
3	BR/W	BRAKE
4	Y/B	STOP TURN RH
5	W/L	POWER
6	R	RUNNING LAMPS
7	Y/R	REVERSE

Connector No.	C3
Connector Name	TRAILER RECEPTACLE
Connector Type	-
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	-	STOP/TURN LH
2	-	GROUND
3	-	ELECTRIC BRAKE
4	-	STOP/TURN RH
5	-	BATTERY
6	-	RUNNING LAMPS
7	-	BACK-UP LAMPS

Connector No.	E38
Connector Name	STOP LAMP SWITCH
Connector Type	M04FW-LC
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	R/Y	BATTERY
2	W	RELAY CONT. - (WITHOUT LED REAR COMBINATION LAMPS)
2	R/G	STOP LAMPS - (WITH LED REAR COMBINATION LAMPS)
3	GR	IGNITION
4	R/B	STOP 2

TRAILER TOWING SYSTEM

< WIRING DIAGRAM >

TRAILER TOWING SYSTEM CONNECTORS

Connector No.	E41
Connector Name	WIRE TO WIRE
Connector Type	RK26MGY-RS20-X6
Connector Color	GRAY

1C	2C	3C	4C	5C
6C	7C	8C	9C	10C
11C	12C	13C	14C	15C
16C	17C	18C	19C	20C
21C	22C	23C	24C	25C
26C	27C	28C	29C	30C
31C	32C	33C	34C	35C
36C	37C	38C	39C	40C
41C	42C	43C	44C	45C
46C	47C	48C	49C	50C
51C	52C	53C	54C	55C

Terminal No.	Color of Wire	Signal Name
1C	Y/V	TO CHASSIS HARNESS
2C	W/L	TO CHASSIS HARNESS
3C	B	TO CHASSIS HARNESS
4C	B/W	TO CHASSIS HARNESS
5C	B/Y	TO CHASSIS HARNESS
6C	Y	TO CHASSIS HARNESS
7C	G/R	TO CHASSIS HARNESS - (WITH CUMMINS 5.0L)
8C	R	TO CHASSIS HARNESS - (WITH VK56VD)
9C	B	TO CHASSIS HARNESS - (WITH CUMMINS 5.0L)
10C	O/B	TO CHASSIS HARNESS - (WITH VK56VD)
11C	W/L	TO CHASSIS HARNESS - (WITH CUMMINS 5.0L)
12C	SB	TO CHASSIS HARNESS - (WITH VK56VD)
13C	GR/R	TO CHASSIS HARNESS - (WITH CUMMINS 5.0L)
14C	GR	TO CHASSIS HARNESS - (WITH VK56VD)
15C	B	TO CHASSIS HARNESS - (WITH CUMMINS 5.0L)
16C	R/W	TO CHASSIS HARNESS - (WITH VK56VD)
17C	Y	TO CHASSIS HARNESS
18C	BG	TO CHASSIS HARNESS
19C	B	TO CHASSIS HARNESS
20C	BG	TO CHASSIS HARNESS
21C	B	TO CHASSIS HARNESS

AALIA5693GB

22C	SHIELD	TO CHASSIS HARNESS
23C	G/B	TO CHASSIS HARNESS
24C	G/Y	TO CHASSIS HARNESS
25C	W	TO CHASSIS HARNESS
26C	B	TO CHASSIS HARNESS
27C	LG	TO CHASSIS HARNESS
28C	G/W	TO CHASSIS HARNESS
29C	R/G	TO CHASSIS HARNESS - (WITHOUT BULB CHECK)
29C	G/R	TO CHASSIS HARNESS - (WITH BULB CHECK)
30C	R/L	TO CHASSIS HARNESS
31C	B	TO CHASSIS HARNESS
32C	R	TO CHASSIS HARNESS
33C	L/W	TO CHASSIS HARNESS
34C	L	TO CHASSIS HARNESS
35C	R/W	TO CHASSIS HARNESS
36C	L	TO CHASSIS HARNESS
37C	Y	TO CHASSIS HARNESS
38C	BR	TO CHASSIS HARNESS
39C	R	TO CHASSIS HARNESS
40C	P	TO CHASSIS HARNESS
41C	V	TO CHASSIS HARNESS
42C	G/B	TO CHASSIS HARNESS
43C	Y/B	TO CHASSIS HARNESS
44C	R	TO CHASSIS HARNESS
45C	G	TO CHASSIS HARNESS
46C	BR	TO CHASSIS HARNESS
47C	B	TO CHASSIS HARNESS
48C	Y/R	TO CHASSIS HARNESS
49C	R/Y	TO CHASSIS HARNESS - (WITH CUMMINS 5.0L)
49C	V	TO CHASSIS HARNESS - (WITH VK56VD)
50C	B	TO CHASSIS HARNESS - (WITH CUMMINS 5.0L)
50C	B/Y	TO CHASSIS HARNESS - (WITH VK56VD)
51C	V	TO CHASSIS HARNESS - (WITH CUMMINS 5.0L)
51C	B	TO CHASSIS HARNESS - (WITH VK56VD)
52C	B	TO CHASSIS HARNESS - (WITHOUT FFV)
52C	L	TO CHASSIS HARNESS - (WITH FFV)
52C	V/W	TO CHASSIS HARNESS

Connector No.	E67
Connector Name	BULB CHECK RELAY
Connector Type	MS02FL-M2-LC
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
1	Y/L	BULB CHECK RLY OUT
2	R/Y	BATTERY
3	G/R	STOP LAMPS
5	R/Y	BATTERY

Connector No.	E68
Connector Name	BULB CHECK DIODE
Connector Type	24335_C9900
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	R/G	STOP LAMP
2	G/R	STOP LAMP

Connector No.	E96
Connector Name	TRAILER TURN RELAY LH
Connector Type	MS02FL-M2-LC
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
1	G/B	TRAILER LH FLASH

2	L	BATTERY
3	G/B	STOP/TURN LH (7 PIN)
5	L	BATTERY

Connector No.	E97
Connector Name	TRAILER TURN RELAY RH
Connector Type	MS02FL-M2-LC
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
1	Y/B	TRAILER RH FLASH
2	L	BATTERY
3	Y/B	STOP/TURN RH (7 PIN)
5	L	BATTERY

Connector No.	E99
Connector Name	TRAILER TOW RELAY 2
Connector Type	M06FBR-R-LC
Connector Color	BROWN



Terminal No.	Color of Wire	Signal Name
1	G	RELAY CONT
2	B	GND
3	Y	BATTERY
5	W/L	POWER (7 PIN)
6	Y	BATTERY
7	W/L	POWER (7 PIN)

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P

TTS

TRAILER TOWING SYSTEM

< WIRING DIAGRAM >

TRAILER TOWING SYSTEM CONNECTORS

Connector No.	E119
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	NS16FW-CS
Connector Color	WHITE



9	8	7	6	5	4	3
18	17	16	15	14	13	12
11	10					

25	BR	ECM VB - (WITH CUMMINS 5.0L)
25	W	ECM VB - (WITH VK56VD)
26	V	O2 SENS - (WITH VK56VD)
27		PARKING RH
28	R/L	TAIL 1
29	Y	FR WIPER HI
30	-	-
31	L	ECM RLY CONT
32	L	ECM BAT - (WITH VK56VD)
33	R/L	PARKING LH
34	R/W	TAIL 2
35	BR	FR WIPER LO
36	-	-

Terminal No.	Color of Wire	Signal Name
3	-	-
4	B/R	NP SW
5	L/W	H/LAMP HI RH
6	G	H/LAMP HI LH
7	L	H/LAMP LO LH
8	R/Y	H/LAMP LO RH
9	G/W	FR FOG/L LH
10	-	-
11	P	ETC VB - (WITH CUMMINS 5.0L)
11	O	ETC VB - (WITH VK56VD)
12	W/R	FR FOG/L RH
13	Y/R	AT ECU IGN
14	G	REVERSE LAMP IGN
15	GR	ABS ECU IGN
16	G	ETC RLY CONT - (WITH CUMMINS 5.0L)
16	V/R	ETC RLY CONT - (WITH VK56VD)
17	L/W	IGN COIL - (WITH CUMMINS 5.0L)
17	W	IGN COIL - (WITH VK56VD)
18	-	-

Connector No.	E121
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	NS12FBR-CS
Connector Color	BROWN



29	28	27	26	25
36	35	34	33	32
31	30			

Terminal No.	Color of Wire	Signal Name
--------------	---------------	-------------

Connector No.	E123
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	NS08FBR-CS
Connector Color	BROWN



51	50	49
56	55	54
53	52	

Terminal No.	Color of Wire	Signal Name
49	Y/B	A/C COMP - (WITH CUMMINS 5.0L)
49	GR/R	A/C COMP - (WITH VK56VD)
50	BR	TRAILER TOW
51	-	-
52	B	S-GND
53	-	-
54	-	-
55	-	-
56	-	-

Connector No.	E124
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	M06FB-LC
Connector Color	BLACK



59	58	57
62	61	60

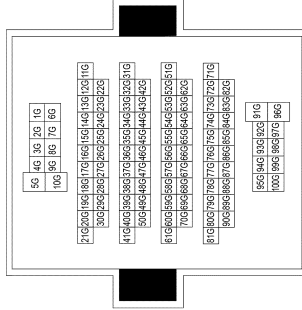
Terminal No.	Color of Wire	Signal Name
57	W/B	RR DEF
58	BR	FUEL PUMP - (WITH CUMMINS 5.0L)
58	B/Y	FUEL PUMP - (WITH VK56VD)
59	-	-
60	-	-
61	-	-
62	B	P GND

TRAILER TOWING SYSTEM

< WIRING DIAGRAM >

TRAILER TOWING SYSTEM CONNECTORS

Connector No.	E152
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4
Connector Color	WHITE

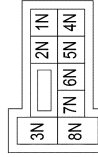


Terminal No.	Color of Wire	Signal Name
1G	G	TO MAIN HARNESS
2G	B/R	TO MAIN HARNESS
3G	W/B	TO MAIN HARNESS
4G	B/W	TO MAIN HARNESS
5G	BR	TO MAIN HARNESS
6G	P	TO MAIN HARNESS - (WITH V650D)
6G	R/W	TO MAIN HARNESS - (WITH CUMMINS 5.0L)
7G	Y	TO MAIN HARNESS
8G	G	TO MAIN HARNESS
9G	R	TO MAIN HARNESS
10G	W	TO MAIN HARNESS
11G	R/G	TO MAIN HARNESS
12G	W/B	TO MAIN HARNESS
13G	BR	TO MAIN HARNESS
14G	Y/B	TO MAIN HARNESS
15G	G/W	TO MAIN HARNESS
16G	G	TO MAIN HARNESS
17G	G/Y	TO MAIN HARNESS
18G	G/Y	TO MAIN HARNESS
19G	Y/V	TO MAIN HARNESS
20G	G/Y	TO MAIN HARNESS
21G	B/Y	TO MAIN HARNESS
22G	G/R	TO MAIN HARNESS
23G	Y/R	TO MAIN HARNESS

AALIA5695GB

72G	L/W	TO MAIN HARNESS
73G	SHIELD	TO MAIN HARNESS
74G	W	TO MAIN HARNESS
75G	R	TO MAIN HARNESS
76G	R/G	TO MAIN HARNESS
77G	G	TO MAIN HARNESS
78G	W	TO MAIN HARNESS
79G	-	TO MAIN HARNESS
80G	R	TO MAIN HARNESS
81G	L	TO MAIN HARNESS
82G	R	TO MAIN HARNESS
83G	L	TO MAIN HARNESS
84G	L	TO MAIN HARNESS
85G	W/B	TO MAIN HARNESS
86G	B/R	TO MAIN HARNESS
87G	W/B	TO MAIN HARNESS
88G	P	TO MAIN HARNESS
89G	L	TO MAIN HARNESS
90G	G	TO MAIN HARNESS
91G	V/W	TO MAIN HARNESS
92G	W	TO MAIN HARNESS
93G	BR	TO MAIN HARNESS
94G	G	TO MAIN HARNESS
95G	W	TO MAIN HARNESS
96G	W	TO MAIN HARNESS
97G	R	TO MAIN HARNESS
98G	W/B	TO MAIN HARNESS
99G	BR	TO MAIN HARNESS
100G	GR/W	TO MAIN HARNESS

Connector No.	M3
Connector Name	FUSE BLOCK (J/B)
Connector Type	CS06FW-M2
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1N	-	-
2N	W	BATTERY
3N	W	BLOWER FAN RELAY OUT
4N	V	BATTERY
5N	Y	BATTERY
6N	W	BATTERY
7N	L	ACC RELAY OUT
8N	W	IGNITION

Connector No.	M4
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS16FW-CS
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1P	R	IGNITION
2P	Y	IGNITION
3P	G	IGNITION RELAY OUT
4P	B/W	RR DEF RLY
5P	B/W	RR DEF RLY
6P	O	RR DEF RLY OUT
7P	G	IGNITION
8P	W	IGNITION
9P	L	BATTERY
10P	-	-
11P	-	-
12P	-	-
13P	R	BATTERY
14P	Y	BATTERY
15P	Y/LG	BATTERY
16P	W	BLOWER FAN RELAY OUT

A B C D E F G H I J L M N O P

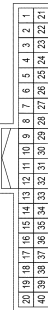
TTS

TRAILER TOWING SYSTEM

< WIRING DIAGRAM >

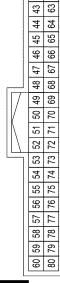
TRAILER TOWING SYSTEM CONNECTORS

Connector No.	M18
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	TH40FG-NH
Connector Color	GREEN

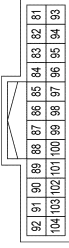
39	B/R	SHIFT N/P
40	-	-

Connector No.	M19
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	TH40FB-NH
Connector Color	BLACK

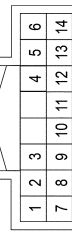



75	L/W	COMBI SW OUT 5
76	P	COMBI SW OUT 4
77	L	COMBI SW OUT 3
78	O/B	COMBI SW OUT 2
79	R/W	COMBI SW OUT 1
80	-	-

Connector No.	M20
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	TH24FGY-NH
Connector Color	GRAY

Connector No.	M28
Connector Name	COMBINATION SWITCH
Connector Type	TH16FW-NH
Connector Color	WHITE

Terminal No.	Color of Wire	Signal Name
1	G	ENG START SW NO ESCL
2	-	-
3	R	ALL POWER SUPPLY 5V
4	W/R	ALL SIGNAL
5	-	-
6	-	-
7	-	-
8	-	-
9	-	-
10	SB	COMBI SW IN 5
11	G/Y	COMBI SW IN 4
12	Y	COMBI SW IN 3
13	G/B	COMBI SW IN 2
14	V	COMBI SW IN 1
15	-	-
16	-	-
17	P	GND RF ALL
18	V	SECURITY INDICATOR
19	-	-
20	R	SHIFT P
21	R/W	STEP LAMP CONT
22	-	-
23	Y	AIRCON SW
24	-	-
25	W	BRAKE SW FUSE
26	L	SHORT IN PIN INPUT
27	P/G	BRAKE SW LAMP
28	-	-
29	W	BLOWER FAN SW
30	P	DR DOOR LOCK STATUS
31	-	-
32	Y	REAR DEFROGGER SW
33	-	-
34	-	-
35	P/G	REVERSE SW
36	W/B	HAZARD SW
37	-	-
38	-	-

Terminal No.	Color of Wire	Signal Name
41	Y/L	TRAILER LIGHT CHECK RELAY OUT
42	R/Y	CARGO LAMP OUT
43	-	-
44	-	-
45	-	-
46	-	-
47	-	-
48	R	HIGH SIDE START SW LED
49	-	-
50	-	-
51	-	-
52	W	AUDIO DONGLE
53	-	-
54	W/L	PW UART
55	W/B	LAR SENSOR K-LINE
56	-	-
57	-	-
58	-	-
59	P	CAN-L
60	L	CAN-H
61	O	REAR DEFROGGER RELAY OUT
62	W	STARTER RELAY OUT
63	-	-
64	P	Buzzer OUT
65	-	-
66	W	BLOWER FAN RELAY OUT
67	G	IGN ELEC RELAY OUT 2
68	L	MR OUTPUT
69	P/B	AT DEVICE OUT
70	P	IGN USM OUT 1
71	O	DR REQUEST SW
72	G	AS REQUEST SW
73	-	-
74	-	-

Terminal No.	Color of Wire	Signal Name
81	-	-
82	W	RL DOOR SW
83	-	-
84	-	-
85	-	-
86	G/B	TRAILER FLASHER RL
87	Y/B	TRAILER FLASHER RR
88	-	-
89	-	-
90	-	-
91	-	-
92	O	RR FLASHER
93	R	RR DOOR SW
94	G	AS DOOR SW
95	-	-
96	B/G	DR DOOR SW
97	P/L	CARGO LAMP SW
98	-	-
99	-	-
100	-	-
101	-	-
102	-	-
103	G/B	RL FLASHER
104	-	-

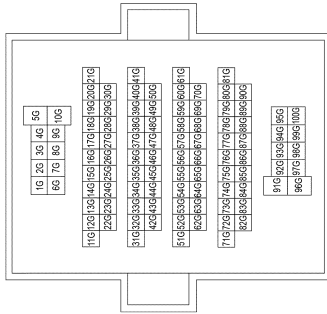
AALIA5696GB

TRAILER TOWING SYSTEM

< WIRING DIAGRAM >

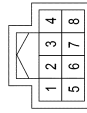
TRAILER TOWING SYSTEM CONNECTORS

Connector No.	M31
Connector Name	WIRE TO WIRE
Connector Type	TH80FW-CS16-TM4
Connector Color	WHITE



80G	R	TO ENGINE ROOM HARNESS
81G	L	TO ENGINE ROOM HARNESS
82G	R	TO ENGINE ROOM HARNESS
83G	L	TO ENGINE ROOM HARNESS
84G	L	TO ENGINE ROOM HARNESS
85G	W	TO ENGINE ROOM HARNESS
86G	B/R	TO ENGINE ROOM HARNESS
87G	W	TO ENGINE ROOM HARNESS
88G	G	TO ENGINE ROOM HARNESS
89G	P	TO ENGINE ROOM HARNESS
90G	G	TO ENGINE ROOM HARNESS
91G	P	TO ENGINE ROOM HARNESS
92G	V/W	TO ENGINE ROOM HARNESS
93G	BR	TO ENGINE ROOM HARNESS
94G	B	TO ENGINE ROOM HARNESS
95G	G	TO ENGINE ROOM HARNESS
96G	R	TO ENGINE ROOM HARNESS
97G	R	TO ENGINE ROOM HARNESS
98G	W/B	TO ENGINE ROOM HARNESS
99G	R	TO ENGINE ROOM HARNESS
100G	GR/W	TO ENGINE ROOM HARNESS

Connector No.	M59
Connector Name	LIGHTING SWITCH
Connector Type	TH08FG-NH
Connector Color	GREEN



Terminal No.	Color of Wire	Signal Name
1	L	ILLUMINATION +
2	BR	INPUT 2
3	Y	INPUT 3
4	G	INPUT 4
5	L	OUTPUT 5
6	P	OUTPUT 4
7	Y	OUTPUT 3
8	GR	ILLUMINATION -

Connector No.	M69
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS10FW-CS
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1M	GR	IGNITION
2M	-	-
3M	-	-
4M	-	-
5M	R/Y	BATTERY
6M	R/W	TAIL LAMP 2
7M	-	-
8M	-	-
9M	-	-
10M	W/R	IGNITION

AALIA5697GB

A B C D E F G H I J L M N O P

TTS

TRAILER TOWING SYSTEM

< WIRING DIAGRAM >

TRAILER TOWING SYSTEM CONNECTORS

Connector No.	M70
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS16FBR-CS
Connector Color	BROWN



7R	6R	5R	4R	3R	2R	1R
16R	15R	14R	13R	12R	11R	10R
9R	8R	7R	6R	5R	4R	3R

Terminal No.	Color of Wire	Signal Name
1R	L	TAIL LAMP 2
2R	G/R	IGNITION
3R	Y/R	BATTERY
4R	-	-
5R	W	BATTERY
6R	G/W	ACCESSORY
7R	-	-
8R	-	-
9R	-	-
10R	W	BATTERY
11R	-	-
12R	B/G	BATTERY
13R	B	ACCESSORY
14R	G/Y	BATTERY
15R	Y	BATTERY
16R	G/R	ACCESSORY

Connector No.	M81
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	FEA09FW-FHA6-SA
Connector Color	WHITE



137	136	135	134	133	132	131	130	129
143	142	141	140	139	138			

Terminal No.	Color of Wire	Signal Name
129	P/G	BATTERY SAVER OUT
130	LG	SUPER LOCK/DOOR UNLOCK AS
131	W	BAT BCM FUSE
132	Y	DOOR LOCK AS/RR/L
133	BR	DOOR UNLOCK AS/RR/L
134	B	GN2

AALIA5698GB

135	O	DOOR LOCK DRA/S/L
136	L	ROOM LAMP CONT
137	V	DOOR UNLOCK DRA/S/L
138	V	BAT REAR DOOR
139	W	BAT POWER F/L
140	LG	P/W POWER SUPPLY IGN
141	V	P/W POWER SUPPLY BAT
142	Y	BAT FRONT DOOR
143	B	GN1

Connector No.	M96
Connector Name	TRAILER TOW RELAY 1
Connector Type	MS02FL-M2-LC
Connector Color	BLUE



3	2	1
5	4	3

Terminal No.	Color of Wire	Signal Name
1	L	IGNITION
2	B	GROUND
3	R	IGNITION
4	-	-
5	BR	BATTERY

Connector No.	M174
Connector Name	TRAILER BRAKE CONTROL UNIT
Connector Type	TB04FW-TM4
Connector Color	WHITE



1	2	3	4	5	6	7	8
---	---	---	---	---	---	---	---

Terminal No.	Color of Wire	Signal Name
1	B	GROUND
2	BR/W	TRAILER BRAKE
3	L	ILLUMINATION +
4	GR	ILLUMINATION -
5	G	IGNITION
7	R	BATTERY

8	R/G	STOP LAMP OUT
---	-----	---------------



Connector No.	M190
Connector Name	ELECTRIC BRAKE (PRE-WIRING)
Connector Type	NS06FW-CS
Connector Color	WHITE

2	6
1	3
4	5

Terminal No.	Color of Wire	Signal Name
1	B	GROUND
2	R/G	STOP LAMP SW
3	BR/W	TRAILER BRAKE
4	L	ILLUMINATION +
5	R	BATTERY
6	-	-

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

DTC/CIRCUIT DIAGNOSIS

POWER SUPPLY AND GROUND CIRCUIT

TRAILER BRAKE CONTROL UNIT

TRAILER BRAKE CONTROL UNIT : Diagnosis Procedure

INFOID:0000000014391553

Regarding Wiring Diagram information, refer to [SE-57, "Wiring Diagram"](#).

1. CHECK FUSE

Check if any of the following fuses are blown:

Signal name	Fuse No.
Battery power supply (with Cummins 5.0L)	T (30A)
Battery power supply (with VK56VD)	V (30A)
Ignition switch ON or START	28 (15A)

Is the fuse blown?

YES >> Replace the blown fuse after repairing the affected circuit.

NO >> GO TO 2.

2. TRAILER BRAKE CONTROL UNIT BATTERY POWER SUPPLY

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

(+)		(-)	Voltage (Approx.)
Trailer brake control unit			
Connector	Terminal		
M174	7	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace harness or connector.

3. CHECK TRAILER BRAKE CONTROL UNIT IGNITION POWER SUPPLY

1. Turn ignition switch ON.
2. Disconnect trailer brake control unit connector.
3. Check voltage between trailer brake control unit harness connector and ground.

(+)		(-)	Voltage (Approx.)
Trailer brake control unit			
Connector	Terminal		
M174	5	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace harness or connector.

4. CHECK TRAILER BRAKE CONTROL UNIT GROUND CIRCUIT

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

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

Trailer brake control unit		(-)	Continuity
Connector	Terminal		
M174	1	Ground	Yes

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to [GI-47, "Intermittent Incident"](#).
NO >> Repair or replace harness or connector.

BULB CHECK RELAY

< DTC/CIRCUIT DIAGNOSIS >

BULB CHECK RELAY

Diagnosis Procedure

INFOID:0000000014391554

Regarding Wiring Diagram information, refer to [DEF-24, "WITH MANUAL A/C : Wiring Diagram"](#).

1. CHECK BULB CHECK RELAY GROUND CIRCUIT

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

(+)		(-)	Condition		Voltage (Approx.)
BCM					
Connector	Terminal				
M18	41	Ground	Bulb check function	ON	0V
				OFF	Battery voltage

Is the inspection result normal?

- YES >> Bulb check relay power supply circuit is OK.
NO >> GO TO 2.

2. CHECK HARNESS CONTINUITY

1. Turn ignition switch OFF.
2. Disconnect BCM and bulb check relay.
3. Check continuity between BCM connector and bulb check relay connector.

BCM		Bulb check relay		Continuity
Connector	Terminal	Connector	Terminal	
M18	41	E67	1	Yes

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Repair or replace harness.

3. CHECK BULB CHECK RELAY

Check bulb check relay.

Refer to [TTS-21, "Component Inspection"](#).

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to [GI-47, "Intermittent Incident"](#)
NO >> Replace bulb check relay.

Component Inspection

INFOID:0000000014391555

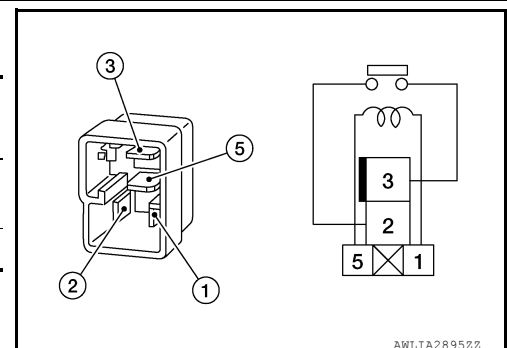
1. CHECK BULB CHECK RELAY

Check bulb check relay.

Terminal		Condition	Continuity
Bulb check relay			
2	3	12V direct current supply between terminals 1 and 5.	Yes
		No current supply	No

Is the inspection result normal?

- YES >> Inspection End.



BULB CHECK RELAY

< DTC/CIRCUIT DIAGNOSIS >

NO >> Replace bulb check relay.

GOOSENECK HITCH

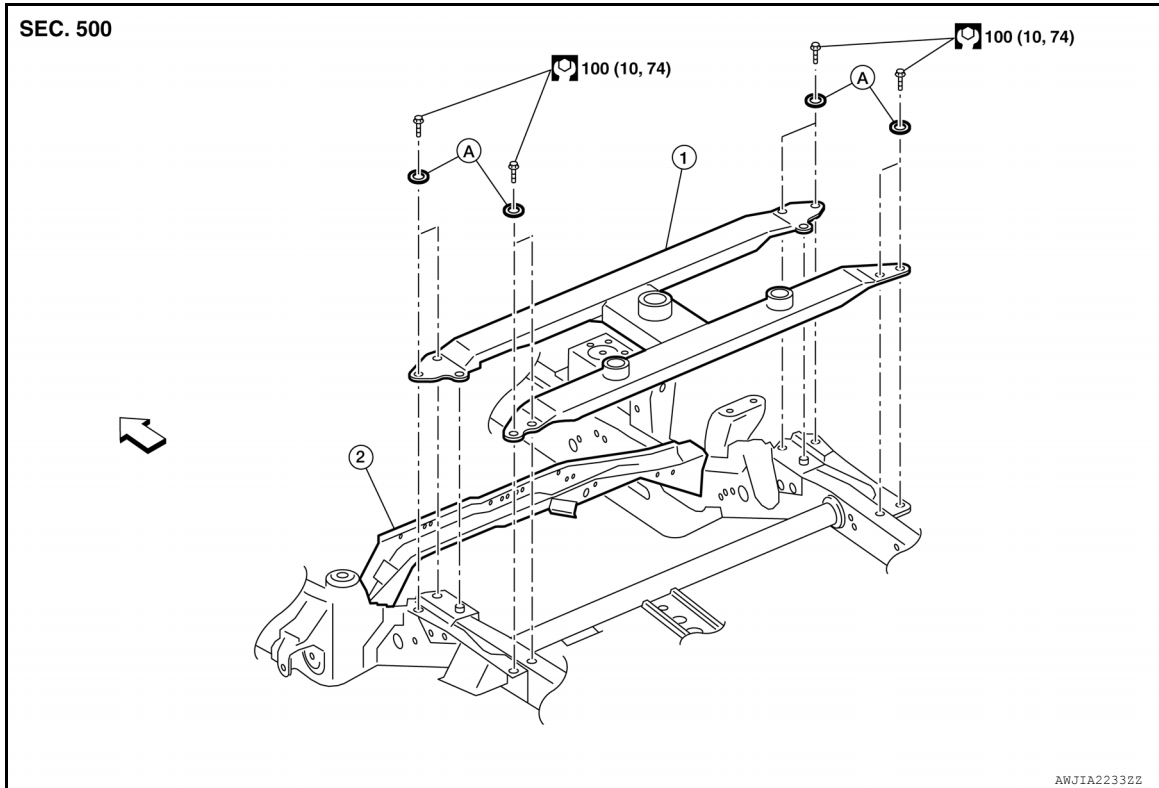
< REMOVAL AND INSTALLATION >

REMOVAL AND INSTALLATION

GOOSENECK HITCH

Exploded View

INFOID:0000000014391556



1. Gooseneck hitch

2. Frame

A. Washer

Removal and Installation

INFOID:0000000014391557

TTS

GOOSENECK HITCH

REMOVAL

1. Remove the rear body. Refer to [BRM-140, "Rear Body"](#).
2. Remove the gooseneck hitch bolts.
3. Remove the gooseneck hitch.

CAUTION:

Two people are required for the removal of the gooseneck hitch.

4. Remove the gooseneck hitch brackets.

INSTALLATION

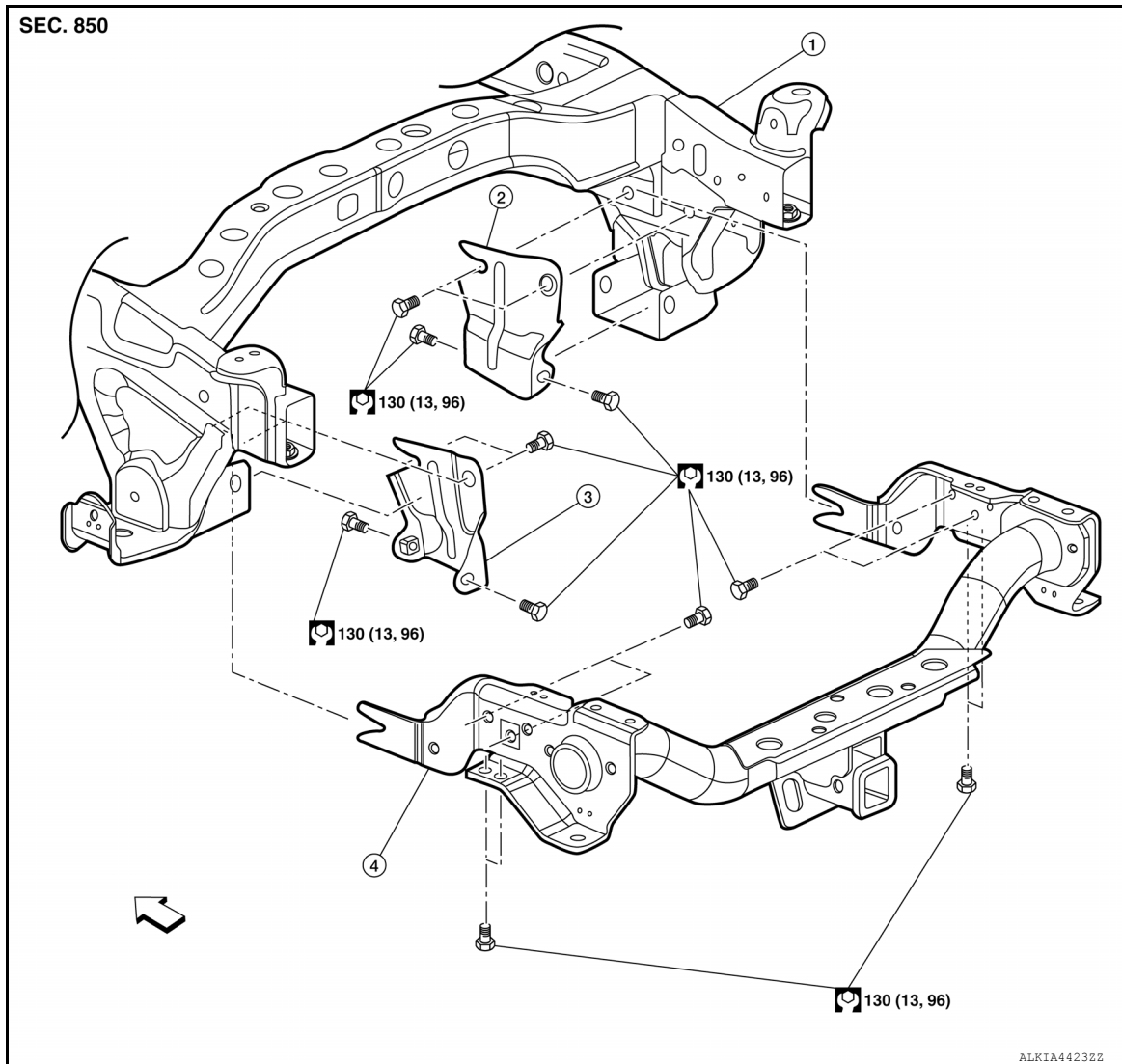
Installation is in the reverse order of removal.

< REMOVAL AND INSTALLATION >

TRAILER HITCH

Exploded View

INFOID:0000000014391558



1. Frame 2. Trailer hitch support bracket (RH) 3. Trailer hitch support bracket (LH)
4. Trailer hitch ← Front

Removal and Installation

INFOID:0000000014391559

Removal

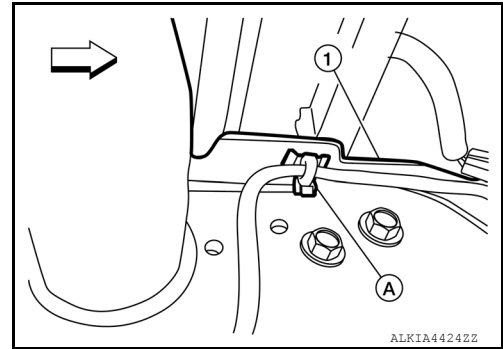
1. Remove spare tire.
2. Remove rear bumper. Refer to [EXT-29, "Removal and Installation"](#).

TRAILER HITCH

< REMOVAL AND INSTALLATION >

3. Release bumper harness retainer clip (A) from trailer hitch (1).

⇐ :Front

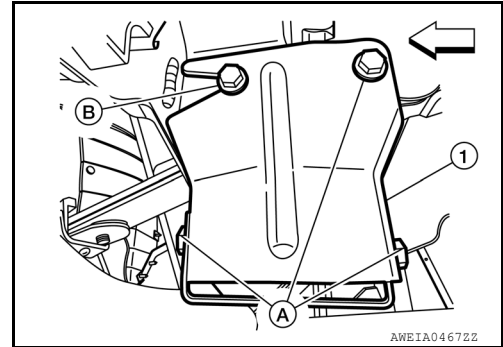


4. Loosen bolt (B) and remove bolts (A) and remove trailer hitch support bracket [RH (1)].

NOTE:

RH shown, LH similar.

⇐ :Front



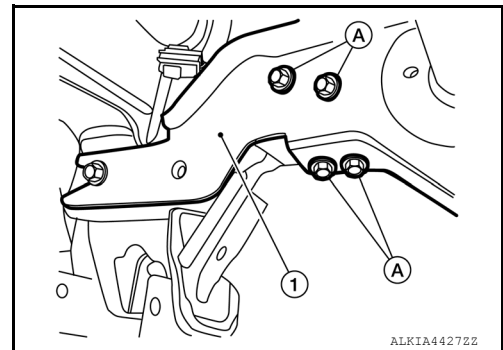
5. Using a helper, support each side of the trailer hitch, then remove bolts (A) and remove trailer hitch (1).

WARNING:

Bodily injury may occur if trailer hitch is not supported properly while removing.

NOTE:

RH shown, LH similar.



Installation

Installation is in the reverse order of removal.

TRAILER BRAKE CONTROL UNIT

< REMOVAL AND INSTALLATION >

TRAILER BRAKE CONTROL UNIT

Removal and Installation

INFOID:0000000014391560

1. Remove cluster lid C lower. Refer to [IP-17. "CLUSTER LID C LOWER : Removal and Installation"](#).
2. Disconnect the harness connector from the trailer brake control unit.
3. Remove screws (A) and remove trailer brake control unit (1).

