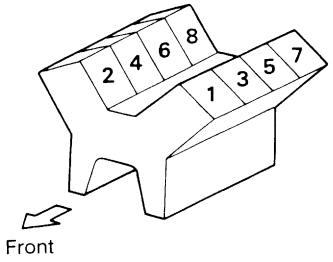
Engine Tune-up Data : VK56DE

INFOID:0000000001733189

GENERAL SPECIFICATIONS

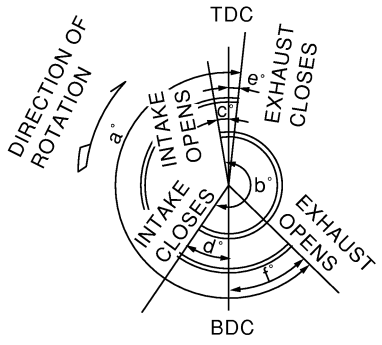
Cylinder arrangement		V-8
Displacement cm^3 (in^3)		5,552 (338.80)
Bore and stroke mm (in)		98 x 92 (3.86 x 3.62)
Valve arrangement		DOHC
Firing order		1-8-7-3-6-5-4-2
Number of piston rings	Compression	2
	Oil	1
Number of main bearings		5
Compression ratio		9.8:1
Compression pressure kPa (kg/cm^2, psi)/rpm	Standard	1,520 (15.5, 220)/200
	Minimum	1,324 (13.5, 192)/200
	Differential limit between cylinders	98 (1.0, 14)/200

Cylinder number



SEM957C

Valve timing



PBIC0187E

Unit: degree

a	b	c	d	e	f
244°	232°	8°	60°	10°	54°

HOW TO USE THIS MANUAL

HOW TO USE THIS MANUAL

Description

INFOID:0000000003938032

This volume explains “Removal, Disassembly, Installation, Inspection and Adjustment” and “Trouble Diagnoses”.

Terms

INFOID:0000000003938033

- The captions **WARNING** and **CAUTION** warn you of steps that must be followed to prevent personal injury and/or damage to some part of the vehicle.
  WARNING indicates the possibility of personal injury if instructions are not followed.
  CAUTION indicates the possibility of component damage if instructions are not followed.
  BOLD TYPED STATEMENTS except **WARNING** and **CAUTION** give you helpful information.
  Standard value:Tolerance at inspection and adjustment.
  Limit value:The maximum or minimum limit value that should not be exceeded at inspection and adjustment.

Units

INFOID:0000000003938034

- The **UNITS** given in this manual are primarily expressed as the SI UNIT (International System of Unit), and alternatively expressed in the metric system and in the yard/pound system.
  Also with regard to tightening torque of bolts and nuts, there are descriptions both about range and about the standard tightening torque.

“Example”
Range

Outer Socket Lock Nut : 59 - 78 N·m (6.0 - 8.0 kg-m, 43 - 58 ft-lb)

Standard

Drive Shaft Installation Bolt : 44.3 N·m (4.5 kg-m, 33 ft-lb)

Contents

INFOID:0000000003938035

- **A QUICK REFERENCE INDEX**, a black tab (e.g. BR) is provided on the first page. You can quickly find the first page of each section by matching it to the section's black tab.
- **THE CONTENTS** are listed on the first page of each section.
- **THE TITLE** is indicated on the upper portion of each page and shows the part or system.
- **THE PAGE NUMBER** of each section consists of two or three letters which designate the particular section and a number (e.g. “BR-5”).
- **THE SMALL ILLUSTRATIONS** show the important steps such as inspection, use of special tools, knacks of work and hidden or tricky steps which are not shown in the previous large illustrations.
  Assembly, inspection and adjustment procedures for the complicated units such as the automatic transaxle or transmission, etc. are presented in a step-by-step format where necessary.

Component

INFOID:0000000003938036

- **THE LARGE ILLUSTRATIONS** are exploded views (see the following) and contain tightening torques, lubrication points, section number of the **PARTS CATALOG** (e.g. SEC. 440) and other information necessary to perform repairs.
  The illustrations should be used in reference to service matters only. When ordering parts, refer to the appropriate **PARTS CATALOG**.
  Components shown in an illustration may be identified by a circled number. When this style of illustration is used, the text description of the components will follow the illustration.

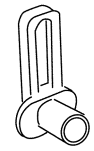
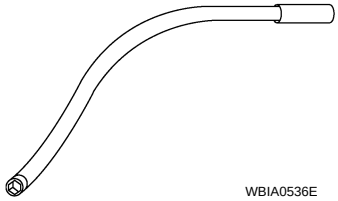
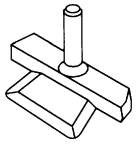
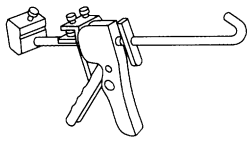
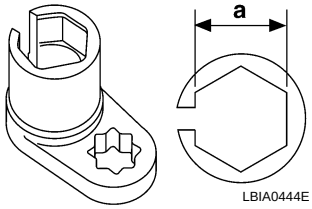
PREPARATION

PREPARATION

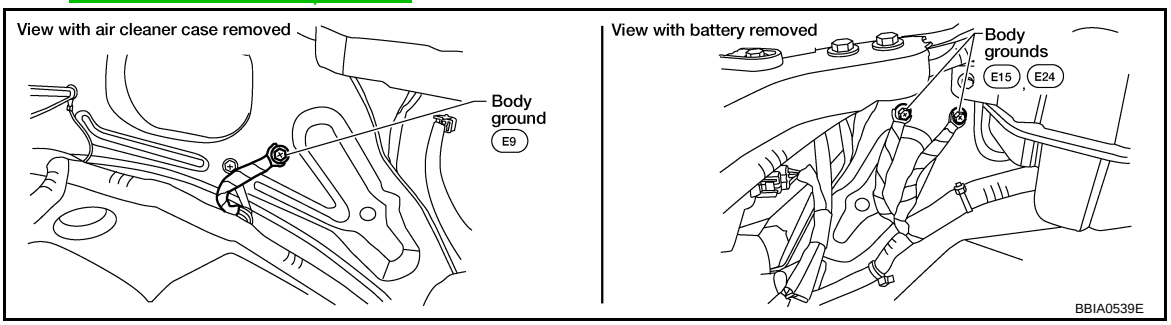
Special Service Tool

INFOID:0000000003939530

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
16441 6N210 (J-45488) Quick connector release  PBIC0198E	Removing fuel tube quick connectors in engine room (Available in SEC. 164 of PARTS CATALOG: Part No. 16441 6N210)
— (J-46535) Drive belt tension releaser  WBIA0536E	Releasing drive belt tension
KV10111100 (J-37228) Seal cutter  S-NT046	Removing steel oil pan and rear timing chain case
WS39930000 (—) Tube presser  S-NT052	Pressing the tube of liquid gasket
— (J-44626) Air fuel sensor Socket  LBIA0444E	Loosening or tightening air fuel ratio A/F sensor **a: 22 mm (0.87 in)**
EG15050500 (J-45402) Compression gauge adapter  ZZA1225D	Inspecting compression pressure

Refer to EC-95, "Ground Inspection".

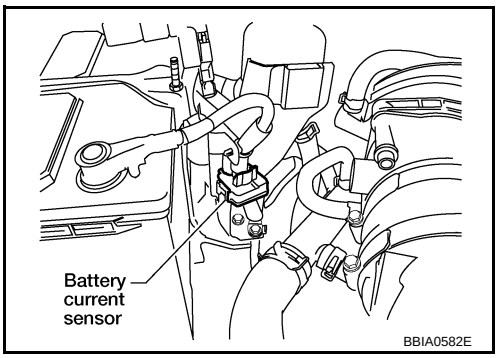


OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

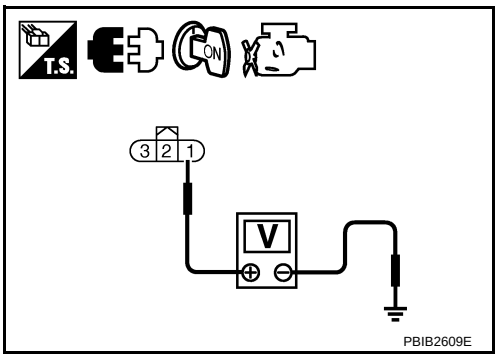
2. CHECK BATTERY CURRENT SENSOR POWER SUPPLY CIRCUIT

1. Disconnect battery current sensor harness connector.
2. Turn ignition switch ON.



3. Check voltage between battery current sensor terminal 1 and ground with CONSULT-III or tester.

Voltage: Approximately 5V



OK or NG

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

3. DETECT MALFUNCTIONING PART

Check the following.
- Harness connectors E5, F14
- Harness for open or short between battery current sensor and ECM

>> Repair circuit or short to ground or short to power in harness or connectors.

4. CHECK BATTERY CURRENT SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between battery current sensor terminal 2 and ECM terminal 67.

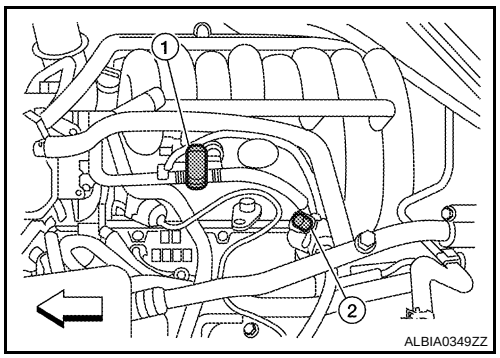
Continuity should exist.

4. Also check harness for short to ground and short to power.

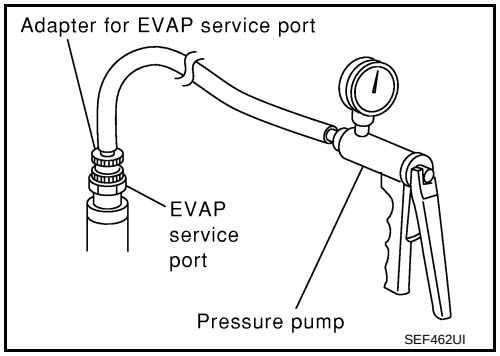
OK or NG

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

1. Attach the EVAP service port adapter (commercial service tool) securely to the EVAP service port (2).
- EVAP canister purge volume control solenoid valve (1)
- ⇦: Vehicle front



2. Set the pressure pump and a hose.
3. Also set a vacuum gauge via 3-way connector and a hose.
4. Turn ignition switch ON.
5. Connect GST and select Service $08.
6. Using Service $08, control the EVAP canister vent control valve (close).
NOTE:
For more information, refer to GST Instruction Manual.
7. Apply pressure and check that the following conditions are satisfied.
Pressure to be applied: 2.7 kPa (0.028 kg/cm^2, 0.39 psi)
Time to be waited after the pressure drawn in to the EVAP system and the pressure to be dropped: 60 seconds and the pressure should not be dropped more than 0.4 kPa (0.004 kg/cm^2, 0.06 psi).
If NG, go to EC-749, "Diagnosis Procedure".
If OK, go to next step.
8. Disconnect GST.
9. Start engine and warm it up to normal operating temperature.
10. Turn ignition switch OFF and wait at least 10 seconds.
11. Restart engine and let it idle for 90 seconds.
12. Keep engine speed at 2,000 rpm for 30 seconds.
13. Turn ignition switch OFF.



Diagnosis Procedure

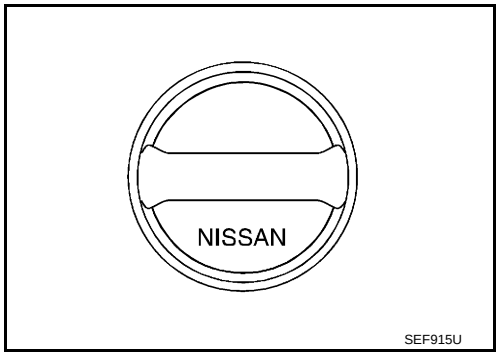
INFOID:0000000003936682

1.CHECK FUEL FILLER CAP DESIGN

1. Turn ignition switch OFF.
2. Check for genuine NISSAN fuel filler cap design.

OK or NG

OK >> GO TO 2.
NG >> Replace with genuine NISSAN fuel filler cap.



2.CHECK FUEL FILLER CAP INSTALLATION

Check that the fuel filler cap is tightened properly by rotating the cap clockwise.

OK or NG

OK >> GO TO 3.
NG >> 1. Open fuel filler cap, then clean cap and fuel filler neck threads using air blower.
2. Retighten until ratcheting sound is heard.

3.CHECK FUEL FILLER CAP FUNCTION

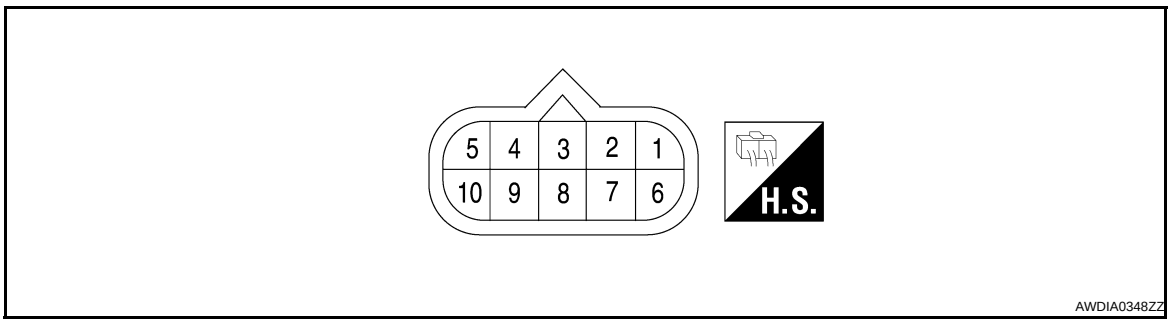
ECU DIAGNOSIS

TCM

TCM Terminals and Reference Values

INFOID:0000000003937090

A/T ASSEMBLY HARNESS CONNECTOR TERMINAL LAYOUT



TERMINALS AND REFERENCE VALUES FOR TCM

Data are reference value and are measured between each terminal and ground.

Terminal No.	Wire color	Item	Condition		Data (Approx.)
1	R/B	Power supply (Memory back-up)	Always		Battery voltage
2	R/B	Power supply (Memory back-up)	Always		Battery voltage
3	L	CAN H	–		–
4	V	K-line (CONSULT-III signal)	The terminal is connected to the data link connector for CONSULT-III.		–
5	B	Ground	Always		0V
6	W/G	Power supply		–	Battery voltage
				–	0V
7	LG	Back-up lamp relay		Selector lever in “R” position.	0V
				Selector lever in other positions.	Battery voltage
8	P	CAN L	–		–
9	R	Starter relay		Selector lever in “N”, “P” positions.	Battery voltage
				Selector lever in other positions.	0V
10	B	Ground	Always		0V

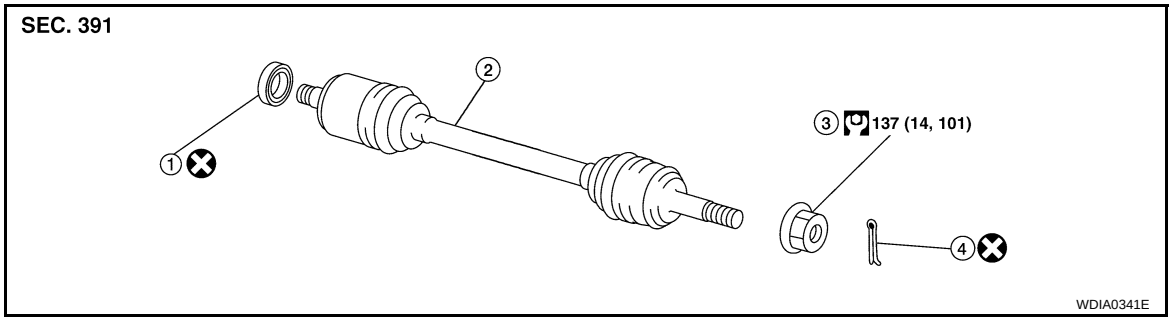
REMOVAL AND INSTALLATION

DRIVE SHAFT

VQ40DE

VQ40DE : Removal and Installation

INFOID:0000000003938776

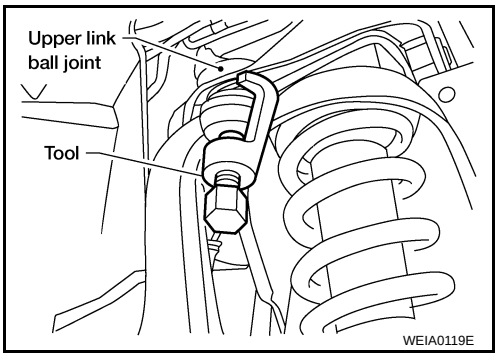


1. Differential side oil seal
2. Drive shaft
3. Drive shaft lock nut
4. Cotter pin

REMOVAL

1. Remove wheel and tire using power tool.
2. Remove rear engine under cover using power tool.
3. Remove wheel sensor harness from mount on knuckle, then disconnect wheel sensor harness connector.
   CAUTION:
   Do not pull on wheel sensor harness.
4. Remove wheel hub and bearing assembly. Refer to FAX-9, "Removal and Installation".
   - It is not necessary to remove wheel sensor from wheel hub when wheel hub is not being replaced.
   - Carefully feed wheel sensor harness through hole in splash shield.
5. Separate upper link ball joint stud from steering knuckle using Tool.
   - Support lower link with jack.

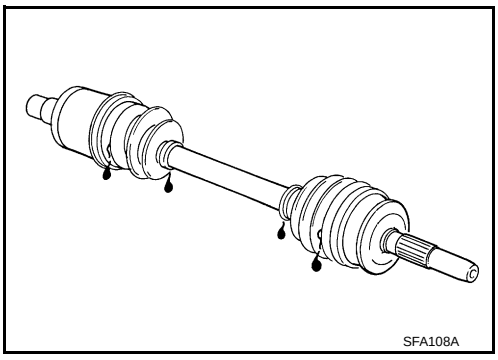
   Tool number : ST29020001 (J-24319-01)



6. Remove drive shaft assembly.
   - Pry drive shaft front final drive using suitable tool.

INSPECTION AFTER REMOVAL

- Move joint up, down, left, right, and in axial direction. Check for any rough movement or significant looseness.
- Check boot for cracks or other damage, and for grease leakage.
- If damaged, disassemble drive shaft to verify damage, and repair or replace as necessary.



INSTALLATION

ABS actuator and electric unit (control unit)		—	Continuity
Connector	Terminal		
E127 (A)	26	Ground	No
	39		
	40		

Is the inspection result normal?

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

3.DELTA STROKE SENSOR INSPECTION

1. Reconnect the delta stroke sensor and ABS actuator and electric unit (control unit) connectors.
2. Perform the delta stroke sensor component inspection. Refer to BRC-82, "Component Inspection".

Is the inspection result normal?

YES >> Perform self-diagnosis again. If the same results appear, replace ABS actuator and electric unit (control unit). Refer to BRC-131, "Removal and Installation".
NO >> Replace the delta stroke sensor. Refer to BR-34, "Removal and Installation".

Component Inspection

INFOID:0000000003937825

1.CHECK DATA MONITOR

Use “DATA MONITOR” to check if the status of “DELTA S SEN” is normal.

Condition	DELTA S SEN (DATA MONITOR)
When brake pedal is depressed.	1.05–1.80 mm
When brake pedal is released.	0.00 mm (+0.6/-0.4)

Is the inspection result normal?

YES >> Inspection End
NO >> Replace the delta stroke sensor. Refer to BR-34, "Removal and Installation".

Special Repair Requirement

INFOID:0000000003937826

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR : Description".

>> END

Part	SRS is activated	SRS is NOT activated
LH side curtain air bag module	If the LH side curtain air bag has deployed: REPLACE the LH side curtain air bag module. (Repair the center pillar inner, etc. before installing new one if damaged.)	If the LH side curtain air bag has NOT deployed: 1. Check for visible signs of damage (dents, tears, deformation) of the center pillar on the collision side. 2. If damaged—Remove the LH side curtain air bag module. 3. Check for visible signs of damaged (tears etc.) of the LH side curtain air bag module. 4. Check harness and connectors for damage, and terminals for deformities. 5. If no damage is found, reinstall the LH side curtain air bag module with new fasteners. 6. If damaged—REPLACE the LH side curtain air bag module with new fasteners.
RH side curtain air bag module	If the RH side curtain air bag has deployed: REPLACE the RH side curtain air bag module. (Repair the center pillar inner, etc. before installing new one if damaged.)	If the RH side curtain air bag has NOT deployed: 1. Check for visible signs of damage (dents, tears, deformation) of the center pillar on the collision side. 2. If damaged—Remove the RH side curtain air bag module. 3. Check for visible signs of damaged (tears etc.) of the RH side curtain air bag module. 4. Check harness and connectors for damage, and terminals for deformities. 5. If no damage is found, reinstall the RH side curtain air bag module with new fasteners. 6. If damaged—REPLACE the RH side curtain air bag module with new fasteners.
Front LH side air bag module	If the front LH side air bag has deployed: REPLACE front LH seatback assembly.	If the front LH side air bag has NOT deployed: 1. Check for visible signs of damage (dents, tears, deformation) of the seat back on the collision side. 2. Check harness and connectors for damage, and terminals for deformities. 3. If damaged—REPLACE the front LH seatback assembly.
Front RH side air bag module	If the front RH side air bag has deployed: REPLACE front RH seatback assembly.	If the front RH side air bag has NOT deployed: 1. Check for visible signs of damage (dents, tears, deformation) of the seat back on the collision side. 2. Check harness and connectors for damage, and terminals for deformities. 3. If damaged—REPLACE the front RH seatback assembly.
(LH or RH) side air bag (satellite) sensor	If any of the SRS components have deployed: REPLACE the side air bag (satellite) sensor on the collision side with new fasteners. (Repair the center pillar inner, etc. before installing new one if damaged.)	If none of the SRS components have been activated: 1. Remove the side air bag (satellite) sensor on the collision side. Check harness connectors for damage, terminals for deformities, and harness for binding. 2. Check for visible signs of damage (dents, cracks, deformation) of the side air bag (satellite) sensor. 3. Install the side air bag (satellite) sensor to check fit. 4. If no damage is found, reinstall the side sir bag (satellite) sensor with new fasteners. 5. If damaged—REPLACE the side air bag (satellite) sensor with new fasteners.
Diagnosis sensor unit	If any of the SRS components have deployed: REPLACE the diagnosis sensor unit with new fasteners.	If none of the SRS components have been activated: 1. Check case and bracket for dents, cracks or deformities. 2. Check connectors for damage, and terminals for deformities. 3. If no damage is found, reinstall the diagnosis sensor unit with new fasteners. 4. If damaged—REPLACE the diagnosis sensor unit with new fasteners.
Seat belt pre-tensioner assemblies (All applicable locations: buckle, reel, lap outer)	If either the driver or passenger seat belt pre-tensioner* has been activated: REPLACE all seat belt pre-tensioner assemblies with new fasteners. * Confirm seat belt pre-tensioner activation using CONSULT-III only.	If the pre-tensioners have NOT been activated: 1. Remove seat belt pre-tensioners. Check harness cover and connectors for damage, terminals for deformities, and harness for binding. 2. Check belts for damage and anchors for loose mounting. 3. Check retractor for smooth operation. 4. Check seat belt adjuster for damage. 5. Check for deformities of the center pillar inner. 6. If the center pillar inner has no damage, REPLACE the seat belt pre-tensioner assembly. 7. If no damage is found, reinstall seat belt pre-tensioner assembly. 8. If damaged—REPLACE. Install the seat belt pre-tensioners with new fasteners.

MAGNET CLUTCH

System Description

INFOID:0000000003935973

SYSTEM DESCRIPTION

The front air control controls compressor operation based on ambient and intake temperature and a signal from ECM.

Low Temperature Protection Control

The front air control will turn the compressor ON or OFF as determined by a signal detected by the intake sensor and the ambient sensor.

When intake air temperature is higher than 3.5° C (38.3° F), the compressor turns ON. The compressor turns OFF when intake air temperature is lower than 2.5° C (36.5° F).

Magnet Clutch Component Function Check

INFOID:0000000003935974

SYMPTOM: Magnet clutch does not engage.

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - MAGNET CLUTCH

1. Rotate blower control dial clockwise.
2. Rotate mode dial to vent ( ) position.
3. Press A/C switch. Confirm that the compressor clutch engages (sound or visual inspection).

Can the symptom be duplicated?

YES >> GO TO 3.
NO >> GO TO 2.

2. CHECK FOR ANY SYMPTOMS

Perform a complete operational check for any symptoms. Refer to HAC-125, "Operational Check".

Does another symptom exist?

YES >> Refer to HAC-174, "Symptom Matrix Chart".
NO >> System OK.

3. CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

>> GO TO 4.

4. CHECK INTAKE SENSOR

Check and verify intake sensor circuit. Refer to HAC-162, "Intake Sensor Component Inspection".

>> GO TO 5.

5. RECHECK FOR ANY SYMPTOMS

Perform a complete operational check for any symptoms. Refer to HAC-125, "Operational Check".

Does another symptom exist?

YES >> Refer to HAC-174, "Symptom Matrix Chart".
NO >> Replace front air control. Refer to VTL-7, "Removal and Installation".

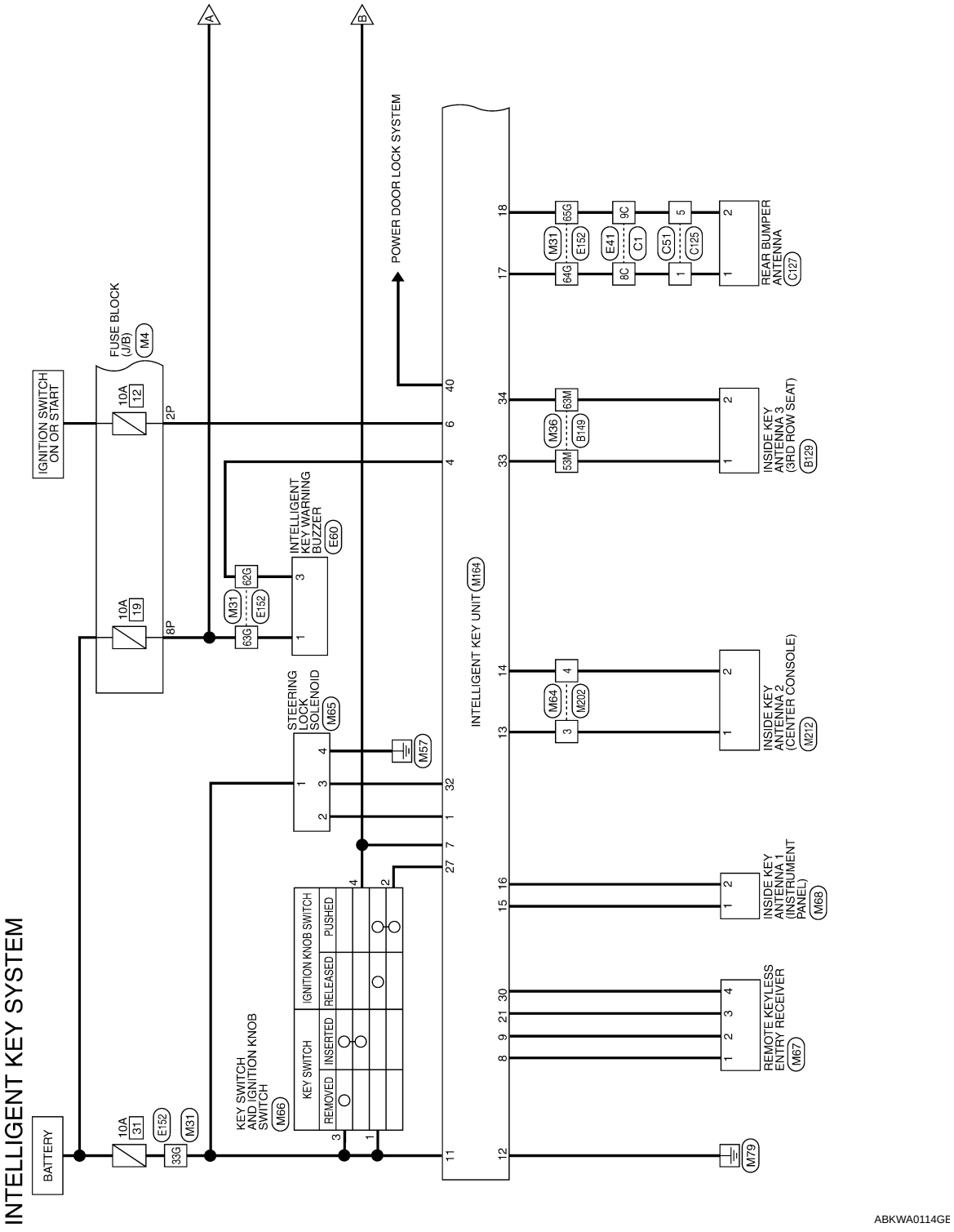
Magnet Clutch Diagnosis Procedure

INFOID:0000000003935975

DIAGNOSTIC PROCEDURE FOR MAGNET CLUTCH

Wiring Diagram — INTELLIGENT KEY SYSTEM —

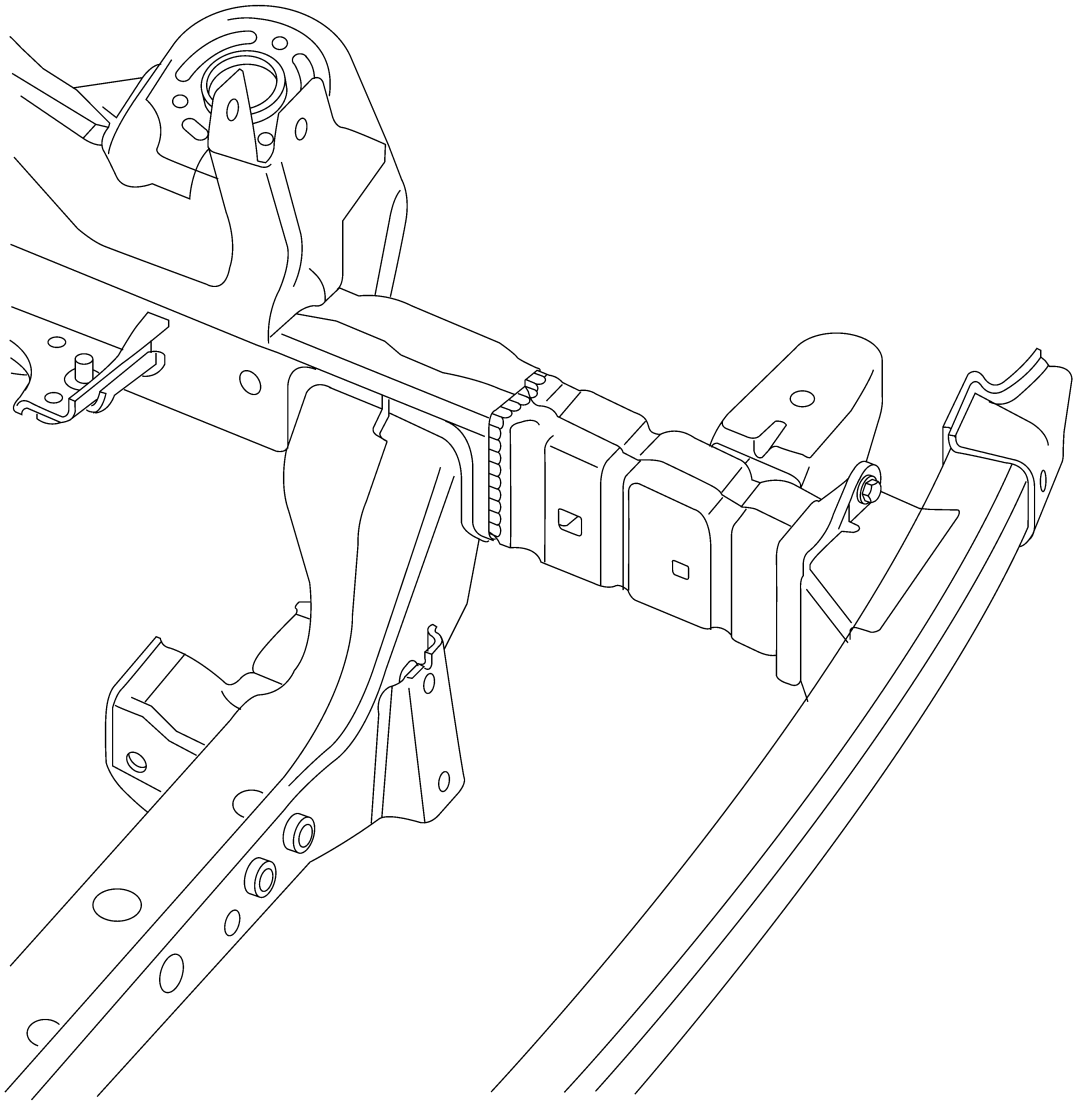
INFOID:0000000003938257

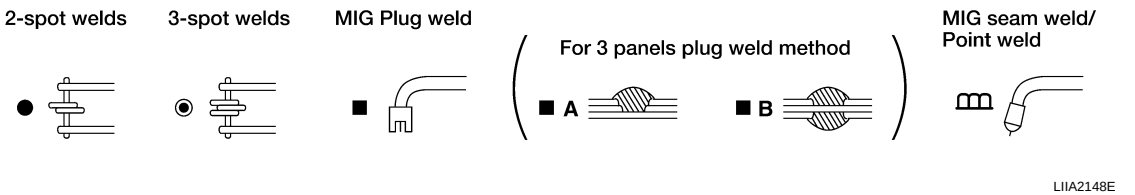


ABKWA0114GE

Be sure to replace the entire crush horn when the crush horn has damage at the back of the body mounting bracket.

Service Joint





BOTH SIDE HEADLAMPS DO NOT SWITCH TO HIGH BEAM

Description

INFOID:0000000003939645

The headlamps (both sides) do not switch to high beam when the lighting switch is in the HI or PASS setting.

Diagnosis Procedure

INFOID:0000000003939646

1.COMBINATION SWITCH INSPECTION

Check the combination switch. Refer to BCS-7, "System Description".

Is the combination switch normal?

YES >> GO TO 2
NO >> Repair or replace the malfunctioning part.

2.CHECK HEADLAMP (HI) REQUEST SIGNAL INPUT

CONSULT-III DATA MONITOR
1. Select "HL HI REQ" of IPDM E/R DATA MONITOR item.
2. With operating the lighting switch, check the monitor status.

Monitor item	Condition		Monitor status
HL HI REQ	Lighting switch (2ND)	HI or PASS	ON
		Except for HI or PASS	OFF

Is the monitor item status normal?

YES >> GO TO 3
NO >> Replace BCM. Refer to BCS-59, "Removal and Installation" .

3.HEADLAMP (HI) CIRCUIT INSPECTION

Check the headlamp (HI) circuit. Refer to EXL-36, "Description".

Is the headlamp (HI) circuit normal?

YES >> Replace IPDM E/R. Refer to PCS-33, "Removal and Installation of IPDM E/R" .
NO >> Repair or replace the malfunctioning part.

BASIC INSPECTION

INSPECTION AND ADJUSTMENT

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Description

INFOID:0000000003935242

When replacing BCM, save or print current vehicle specification with CONSULT-III configuration before replacement.
Configuration has three functions as follows

- READ CONFIGURATION is the function to read (extract) vehicle configuration of current BCM.
- WRITE CONFIGURATION - Manual selection is the function to select and write vehicle configuration on BCM manually.
- WRITE CONFIGURATION - Config file is the function to write vehicle configuration with the data extracted from current BCM.

CAUTION:

- **When replacing BCM, you must perform WRITE CONFIGURATION with CONSULT-III.**
- **Complete the procedure of WRITE CONFIGURATION in order.**
- **If you set incorrect WRITE CONFIGURATION, incidents will occur.**
- **Configuration is different for each vehicle model. Confirm configuration of each vehicle model.**

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Special Repair Requirement

INFOID:0000000003935243

1. SAVING VEHICLE SPECIFICATION

Perform “READ CONFIGURATION” with CONSULT-III to save or print current vehicle specification.

>> GO TO 2

2. REPLACE BCM

Replace BCM. Refer to BCS-59, "Removal and Installation".

>> GO TO 3

3. WRITING VEHICLE SPECIFICATION

Perform “WRITE CONFIGURATION - Config file” or “WRITE CONFIGURATION - Manual selection” with CONSULT-III to write vehicle specification. Refer to BCS-3, "ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT : Special Repair Requirement".

>> GO TO 4

4. INITIALIZE BCM (NATS)

Perform BCM initialization. (NATS)

>> Work End.

CONFIGURATION

CONFIGURATION : Description

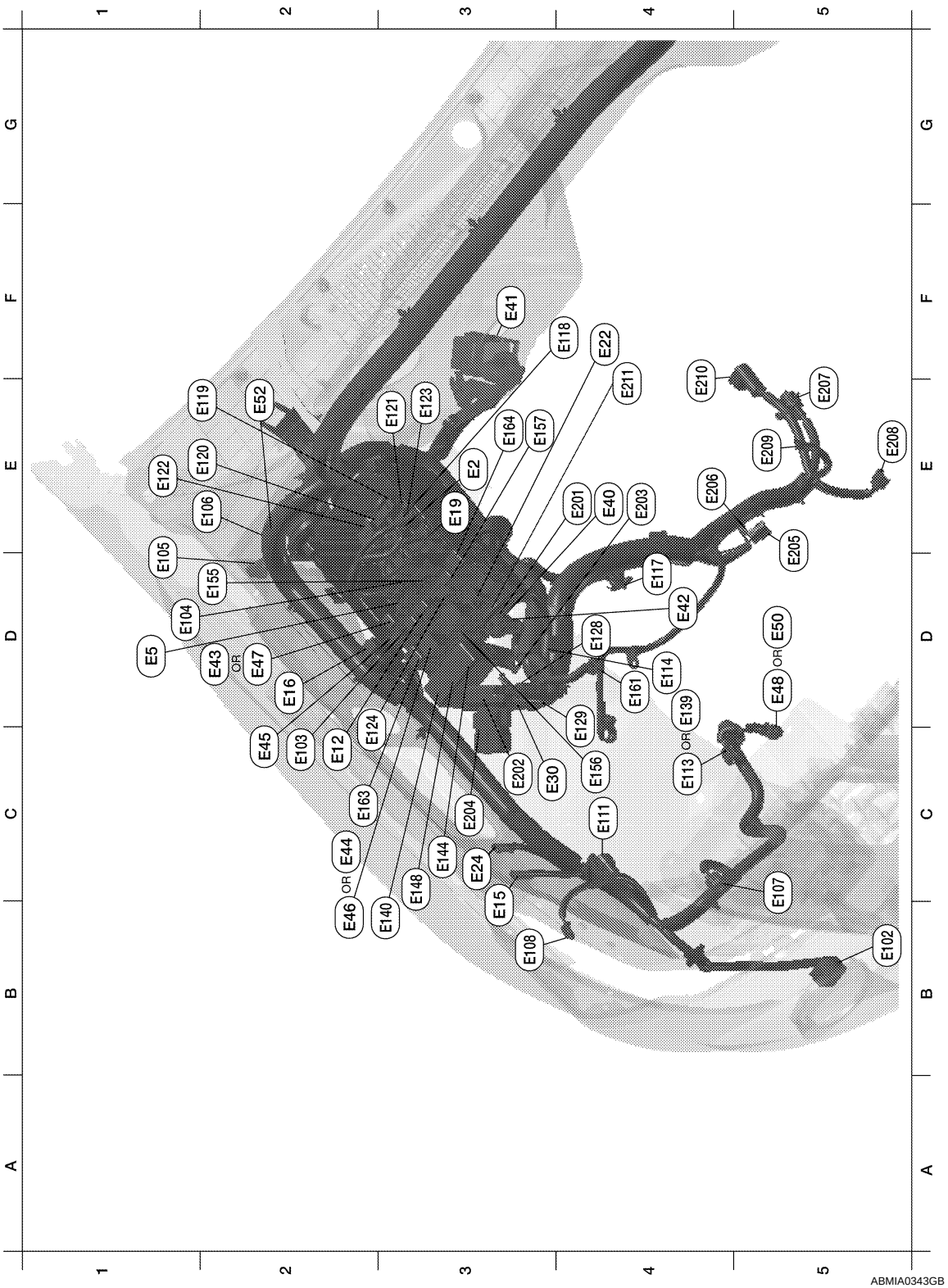
INFOID:0000000003935244

Vehicle specification needs to be written with CONSULT-III because it is not written after replacing BCM.
Configuration has three functions as follows

- READ CONFIGURATION is the function to read (extract) vehicle configuration of current BCM.
- WRITE CONFIGURATION - Manual selection is the function to select and write vehicle configuration on BCM manually.
- WRITE CONFIGURATION - Config file is the function to write vehicle configuration with the data extracted from current BCM.

CAUTION:

ENGINE ROOM HARNESS (RH VIEW)



Refer to "ENGINE ROOM HARNESS (LH VIEW)" for continuation of engine room harness"

E3	E2	W/16	: To F32	F2	E119	W/16	: IPDM E/R (intelligent power distribution module engine room)
D1	E5	W/24	: To F14	E2	E120	W/6	: IPDM E/R (intelligent power distribution module engine room)