SECTION EX
EXHAUST SYSTEM

CONTENTS

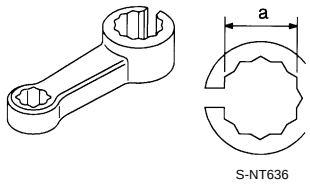
PREPARATION

PFP:00002

Special Service Tools

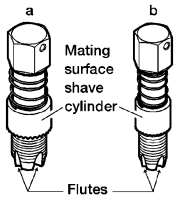
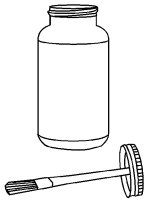
EBS003GD

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
KV10114400 (J-38365) Heated oxygen sensor wrench  S-NT636	Loosening or tightening heated oxygen sensors **a: 22 mm (0.87 in)**

Commercial Service Tools

EBS003GE

Tool number (Kent-Moore No.) Tool name	Description
(J-43897-18) (J-43897-12) Oxygen sensor thread cleaner  AEM488	Reconditioning the exhaust system threads before installing a new oxygen sensor (Use with anti-seize lubricant shown below.) **a: J-43897-18 (18 mm dia.) for zirconia oxygen sensor** **b: J-43897-12 (12 mm dia.) for titania oxygen sensor**
Anti-seize lubricant (Permatex 133AR or equivalent meeting MIL specification MIL-A-907)  AEM489	Lubricating oxygen sensor thread cleaning tool when reconditioning exhaust system threads

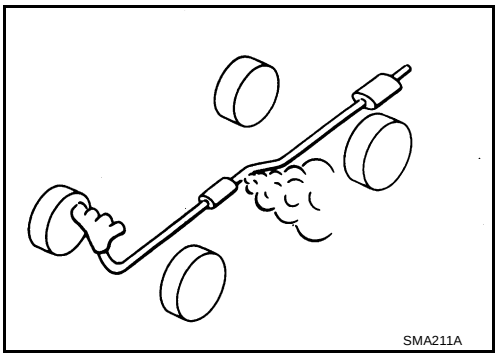
EXHAUST SYSTEM

PFP:20100

Checking Exhaust System

EBS004VQ

Check exhaust pipes, muffler and mounting for improper attachment, leaks, cracks, damage or deterioration.

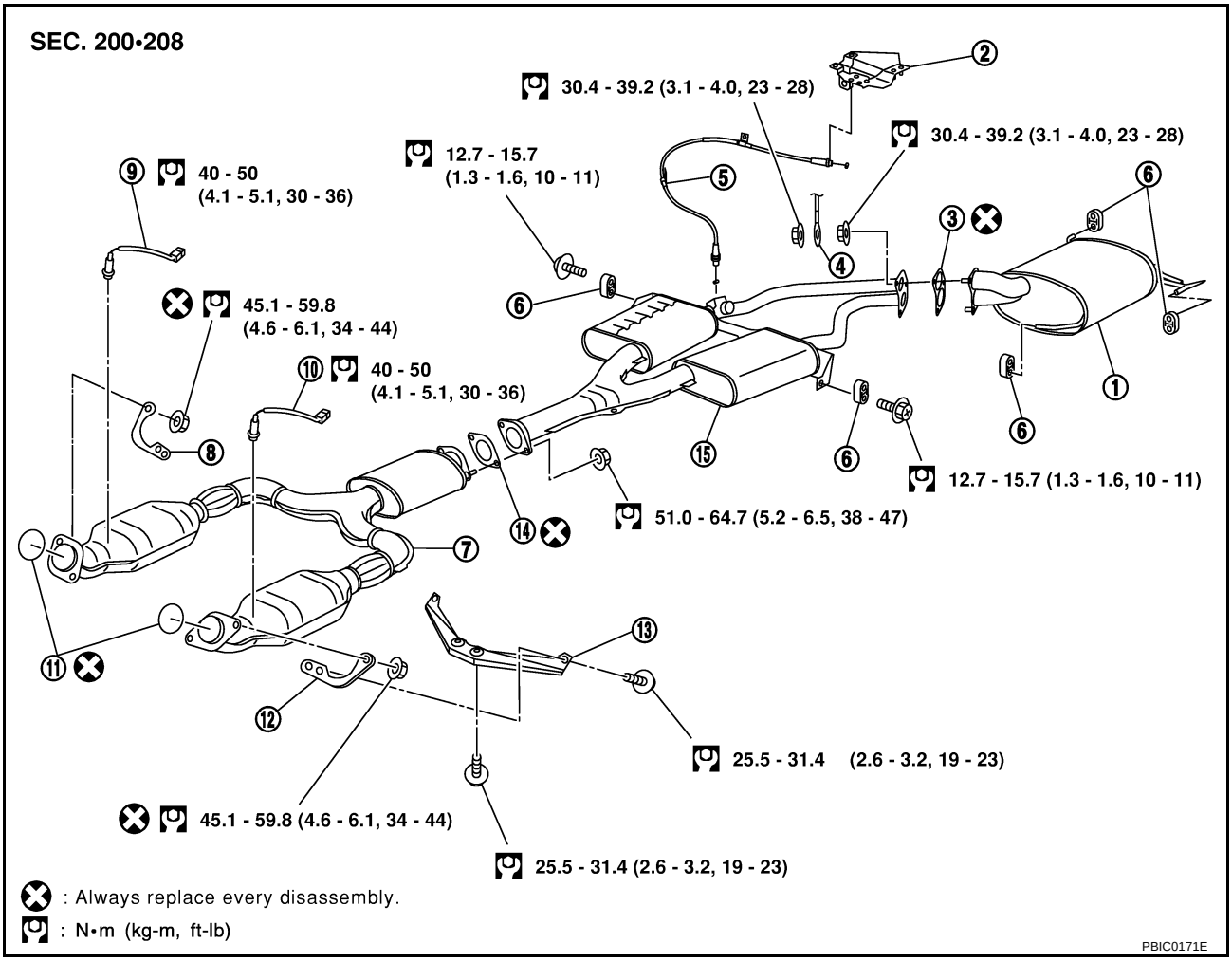


Removal and Installation

EBS001JQ

CAUTION:

- **Be sure to use genuine exhaust system parts or equivalents which are specially designed for heat resistance, corrosion resistance, and shape.**
- **Perform the operation with the exhaust system fully cooled down because the system will be hot just after the engine stops.**
- **Be careful not to cut your hand on the insulator edge.**



1. Main muffler
2. Actuator
3. Gasket
4. Ground cable
5. Cable
6. Mounting rubber
7. Exhaust front tube
8. Bracket
9. Heated oxygen sensor 2 (rear) (bank 2)

10. Heated oxygen sensor 2 (rear) (bank 1)
11. Ring gasket
12. Bracket
13. Bracket
14. Gasket
15. Center muffler

REMOVAL

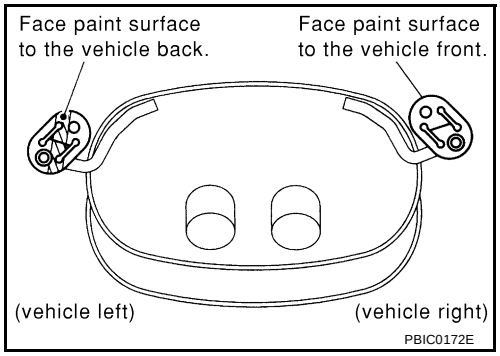
1. Remove cable from exhaust control valve.
   Refer to Dual mode muffler, EX-5, "Removal and Installation" .
2. Disconnect each joint and mounting.

INSTALLATION

- Install in the reverse order of removal.

CAUTION:

- **Always replace exhaust gaskets with new ones when reassembling.**
- **Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing a new oxygen sensor, clean exhaust system threads using oxygen sensor thread cleaner tool, J-43897-18 or J-43897-12, and apply anti-seize lubricant.**
- **Do not over torque the oxygen sensor. Doing so may cause damage to the oxygen sensor, resulting in the MIL coming on.**
- **If the insulator is badly deformed, repair or replace it. If deposits such as mud pile up on the insulator, remove them.**
- **When installing the insulator avoid large gaps or interference between the insulator and each exhaust pipe.**
- **Remove deposits and left over gasket material from the sealing surface of each connection. Connect them securely to avoid gas leakage.**
- **Temporarily tighten mounting nuts on the exhaust manifold side and mounting bolts on the vehicle side. Check each part for abnormal interference, and then tighten them to the specified torque.**
- **When installing each clamp, align the protrusion on the insulator with the clamp hole.**
- **When installing each mounting rubber, avoid twisting or abnormal extension in up/down and right/left directions.**
- **Install mounting rubbers on rear main muffler as shown.**



INSPECTION AFTER INSTALLATION

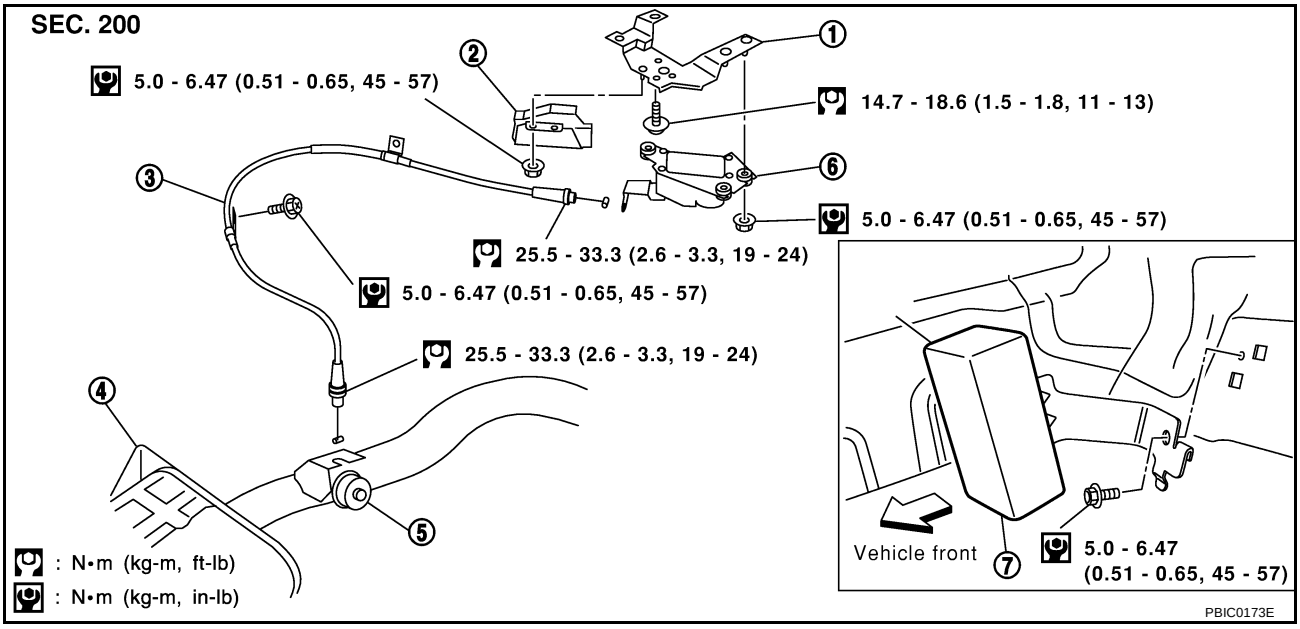
- With the engine running, check exhaust tube joints for gas leakage and unusual noises.
- Check to ensure that mounting brackets and mounting insulators are installed properly and free from undue stress. Improper installation could result in excessive noise and vibration.

DUAL MODE MUFFLER

PFP:20130

Removal and Installation

EBS001ZA



1. Bracket
2. Cover
3. Cable
4. Center muffler
5. Exhaust control valve (Do not disassemble.)
6. Actuator
7. Muffler control unit

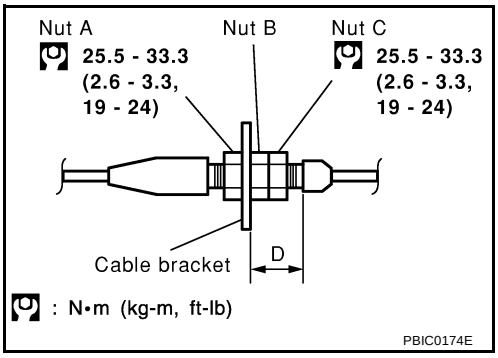
NOTE:
Exhaust control valve is provided in center muffler and not permitted to disassemble.

REMOVAL (CABLE)

NOTE:
Removal and installation procedure is the same on both side of actuator and exhaust control valve.

1. Remove cable from actuator and exhaust control valve.
   - Loosen lock nut A.
   - Do not loosen positioning nuts B and C.
2. Remove middle clamp bolt and cable.

- Install in the reverse order of removal.
- Install cable on cable bracket and then tighten lock nut A to specified torque.



INSTALLATION

- To avoid twisting the cable when tightening the lock nut A, hold the positioning nut B or C with a wrench.
- If the positioning nuts B and C are loosened, place the nut B so that span D becomes 17.5 mm (0.689 in) to 18.5 mm (0.728 in). Hold the nut B with a wrench and tighten the nut C to specified torque.

  NOTE:
  Additional adjustment is unnecessary.

REMOVAL (ACTUATOR)

1. Remove insulator on lower side of actuator.
2. Remove harness connector and cable from actuator.
   Refer to EX-5, "REMOVAL (CABLE)" .
3. Remove actuator.

INSTALLATION

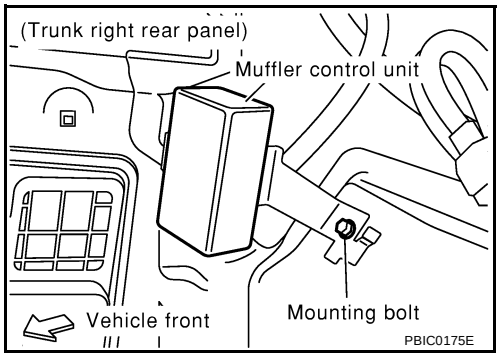
- Install in the reverse order of removal.

REMOVAL (MUFFLER CONTROL UNIT)

1. Open trunk lid, and remove trunk side finisher (right).
2. Remove muffler control unit fixing bolt.
3. Remove harness connector and muffler control unit along with bracket.

CAUTION:

Do not drop or damage muffler control unit when removing.



INSTALLATION

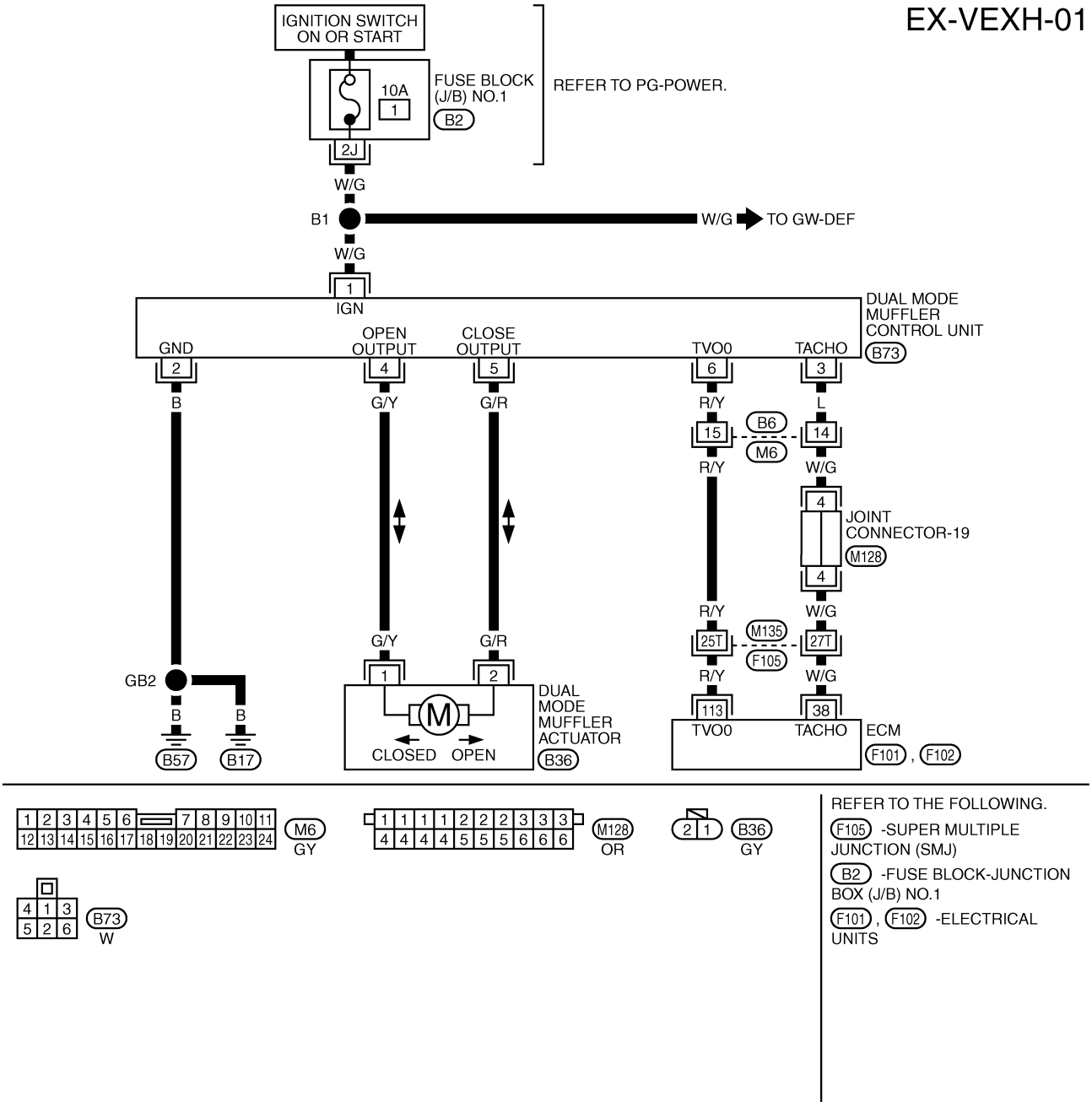
- Install in the reverse order of removal.

Trouble Diagnoses

EBS002O9

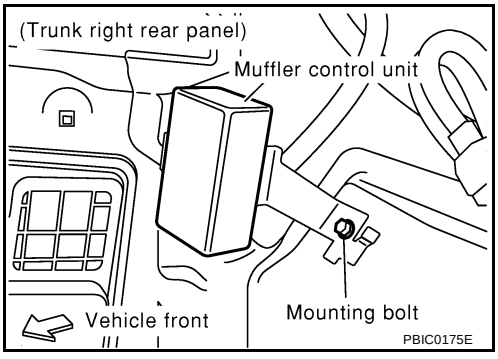
WIRING DIAGRAM

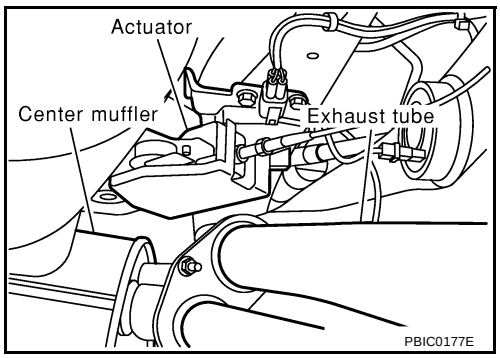
EX-VEXH-01



TBWM0058E

PARTS LOCATION

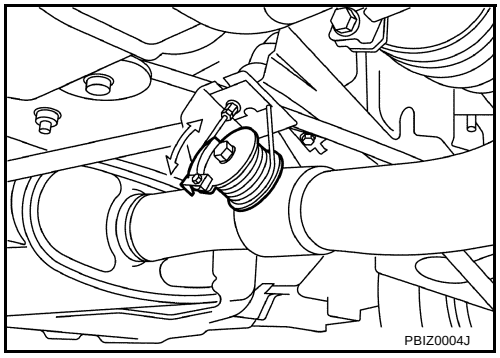




INSPECTION OF VALVE OPERATION

- Check operation of valve and actuator by revving engine.

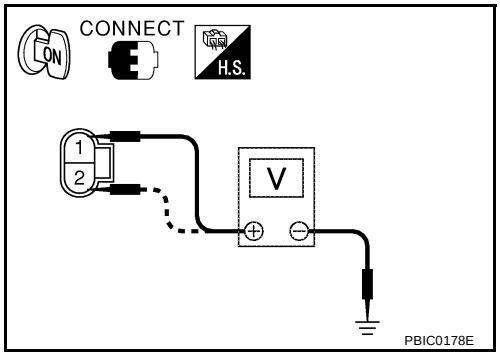
When accelerator pedal position sensor opening is below half in no-load condition:
Valve should open at engine revolution above approximate 4,800 rpm.
Valve should close at engine revolution below approximate 4,700 rpm.
When accelerator pedal position sensor opening is over half in loaded condition:
Valve should open at engine revolution above approximate 2,600 rpm.
Valve should close at engine revolution below approximate 2,500 rpm.



INSPECTION OF ACTUATOR INPUT SIGNAL

- Check voltage between terminals 1 and 2 of actuator connector and ground.

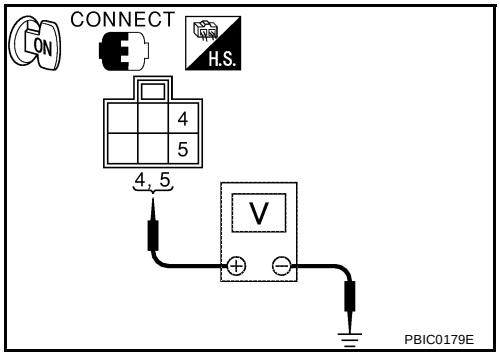
Condition	Valve open	Valve close
Between terminal No.1 and ground	Battery voltage equivalent	0 - 1 V
Between terminal No.2 and ground	0 - 1 V	Battery voltage equivalent



INSPECTION OF CONTROL UNIT OUTPUT SIGNAL

- Check voltage between terminals and ground.

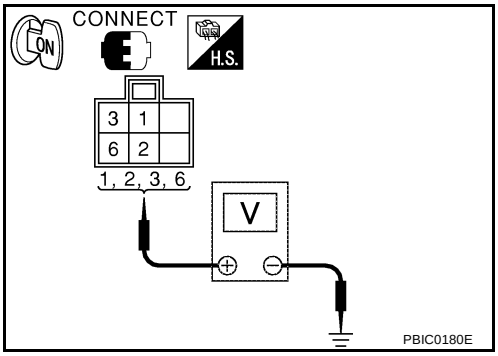
Condition	Valve open	Valve close
Between terminal No.4 and ground	Battery voltage equivalent	0 V
Between terminal No.5 and ground	0V	Battery voltage equivalent



INSPECTION OF CONTROL UNIT INPUT SIGNAL

- Check voltage at idling engine.

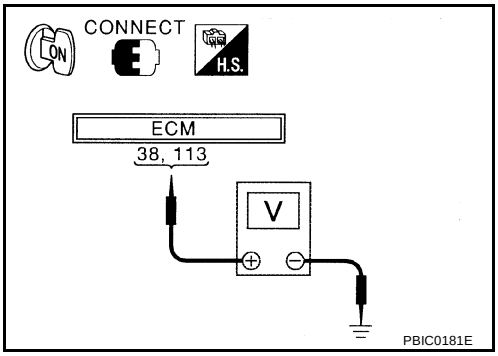
Between terminal No.1 and ground (Battery signal)	Battery voltage
Between terminal No.3 and ground (Rev. signal)	Approx. 4 - 6 V
Between terminal No.2 and ground (Earth signal)	0 V
Between terminal No.6 and ground (Accelerator pedal position sensor opening signal)	Accelerator pedal position sensor opening is over half: More than approx. 2.4 V Accelerator pedal position sensor opening is below half: Approx. 0 - 2.4 V



INSPECTION OF ECM OUTPUT SIGNAL

- Check that tachometer operates normally.
- Check voltage between terminals and ground at idling engine.

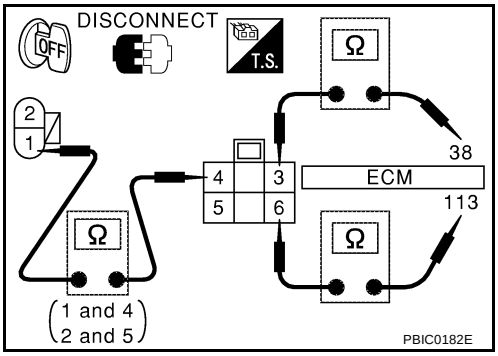
Between ECM terminal No.38 and ground	Approx. 4 - 6 V
Between ECM terminal No.113 and ground	Accelerator pedal position sensor opening is over half: More than approx. 2.4 V Accelerator pedal position sensor opening is below half: Approx. 0 - 2.4 V



INSPECTION OF HARNESS CONTINUITY

- Remove connectors of ECM, muffler control unit and actuator. Check resistance between terminals.

Between actuator terminal No.1 and muffler control unit terminal No.4: Between actuator terminal No.2 and muffler control unit terminal No.5: Between ECM terminal No.38 and muffler control unit terminal No.3: Between ECM terminal No.113 and muffler control unit terminal No.6:	0Ω



SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Tightening Torque

EBS001Z8

Unit: N·m (kg-m, ft-lb)
Unit: N·m (kg-m, in-lb)*

Exhaust system connections	
Between exhaust manifold and exhaust front tube	45.1 - 59.8 (4.6 - 6.1, 34 - 44)
Between exhaust front tube and center muffler	51.0 - 64.7 (5.2 - 6.5, 38 - 47)
Between center muffler and main muffler	30.4 - 39.2 (3.1 - 3.9, 23 - 28)
Exhaust mounting fixing bolts	
For exhaust front tube	25.5 - 31.4 (2.6 - 3.2, 19 - 23)
For center muffler	12.7 - 15.7 (1.3 - 1.6, 10 - 11)
Dual mode muffler	
Muffler control unit	5.0 - 6.47 (0.51 - 0.65, 45 - 57)*
Actuator	5.0 - 6.47 (0.51 - 0.65, 45 - 57)*
Actuator mounting bracket	14.7 - 18.6 (1.5 - 1.8, 11 - 13)
Actuator cover	5.0 - 6.47 (0.51 - 0.65, 45 - 57)*
Cable lock nut (Both actuator and valve side)	25.5 - 33.3 (2.6 - 3.3, 19 - 24)
Cable middle clamp tightening bolt	5.0 - 6.47 (0.51 - 0.65, 45 - 57)*