SECTION EM

ENGINE MECHANICAL

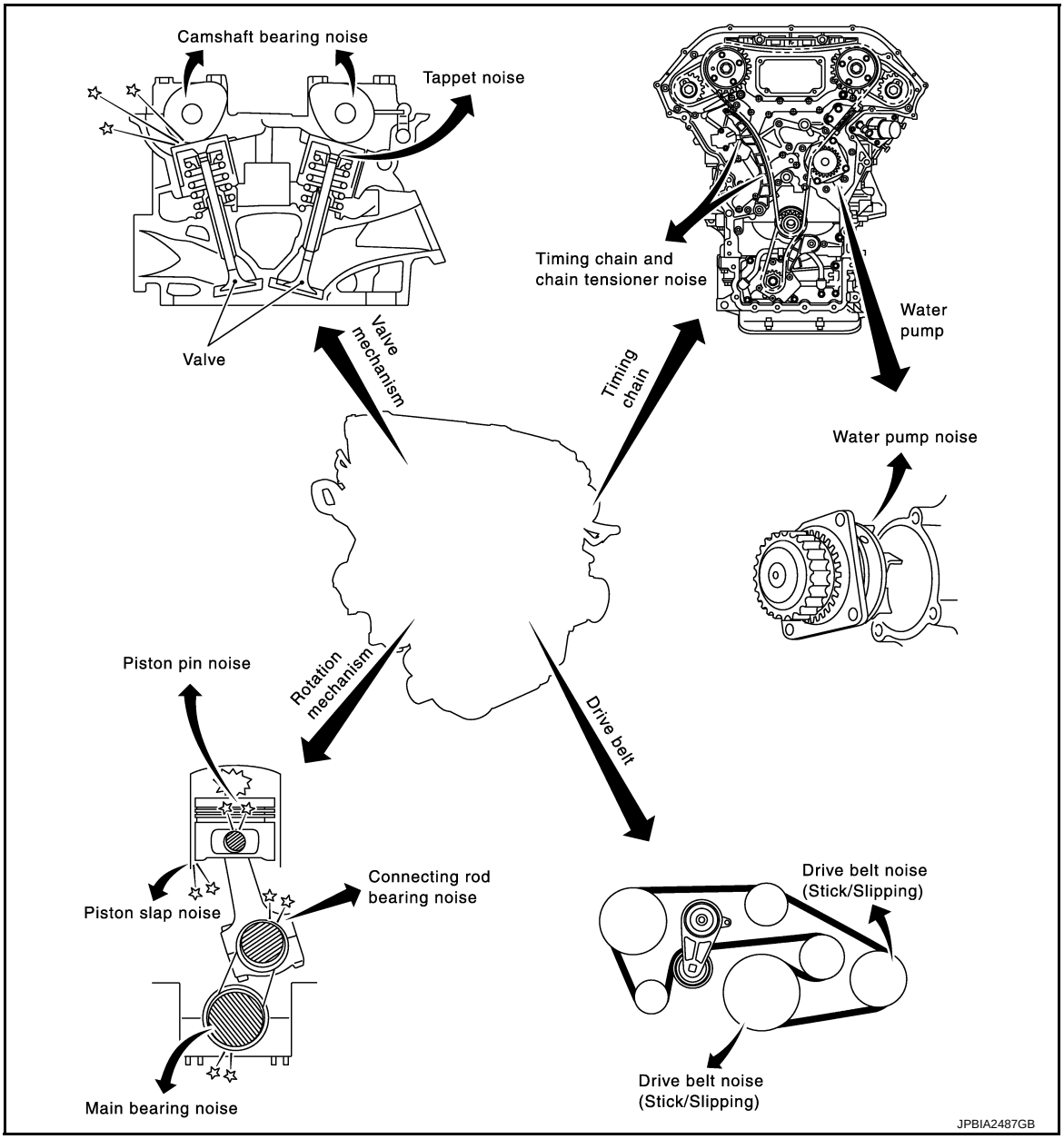
CONTENTS

SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting - Engine Noise (GT-R certified NISSAN dealer)

INFOID:0000000011488014



Use the Chart Below to Help You Find the Cause of the Symptom (GT-R certified NISSAN dealer)

INFOID:0000000011488015

1. Locate the area where noise occurs.
2. Confirm the type of noise.
3. Specify the operating condition of the engine.
4. Check specified noise source.

If necessary, repair or replace these parts.

Location of noise	Type of noise	Operating condition of engine						Source of noise	Check item	Reference page
		Before warm-up	After warm-up	When starting	When idling	When racing	While driving			
Top of engine Rocker cover Cylinder head	Ticking or clicking	C	A	—	A	B	—	Tappet noise	Valve clearance	EM-20
	Rattle	C	A	—	A	B	C	Camshaft bearing noise	Camshaft runout Camshaft journal oil clearance	EM-141
Crankshaft pulley Cylinder block (Side of engine) Oil pan	Slap or knock	—	A	—	B	B	—	Piston pin noise	Piston to piston pin oil clearance Connecting rod bushing oil clearance	EM-146
	Slap or rap	A	—	—	B	B	A	Piston slap noise	Piston to cylinder bore clearance Piston ring side clearance Piston ring end gap Connecting rod bend and torsion	EM-146
	Knock	A	B	C	B	B	B	Connecting rod bearing noise	Connecting rod bushing oil clearance Connecting rod bearing oil clearance	EM-146 EM-151
	Knock	A	B	—	A	B	C	Main bearing noise	Main bearing oil clearance Crankshaft runout	EM-150 EM-146
Front of engine Timing chain case	Tapping or ticking	A	A	—	B	B	B	Timing chain and timing chain tensioner noise	Timing chain cracks and wear Timing chain tensioner operation	EM-85 EM-70
Front of engine	Squeaking or fizzing	A	B	—	B	—	C	Drive belt (Sticking or slipping)	Drive belt deflection	EM-15
	Creaking	A	B	A	B	A	B	Drive belt (Slipping)	Idler pulley bearing operation	
	Squall Creak	A	B	—	B	A	B	Water pump noise	Water pump operation	CO-27

A: Closely related B: Related C: Sometimes related —: Not related

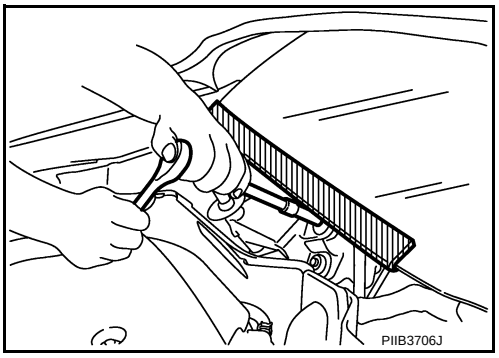
PRECAUTION

PRECAUTIONS

Precaution for Procedure without Cowl Top Cover

INFOID:0000000011488016

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc to prevent damage to windshield.



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

INFOID:0000000011488017

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 “SRS AIR BAG” and “SEAT BELT” of this Service Manual.

WARNING:

Always observe the following items for preventing accidental activation.

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that 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 “SRS AIR BAG”.**
- **Never 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:

Always observe the following items for preventing accidental activation.

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never 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 Necessary for Steering Wheel Rotation After Battery Disconnection

INFOID:0000000011488018

CAUTION:

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

- **Before removing and installing any control units, first turn the ignition switch to the LOCK position, then disconnect both battery cables.**
- **After finishing work, confirm that all control unit connectors are connected properly, then re-connect both battery cables.**
- **Always use CONSULT to perform self-diagnosis as a part of each function inspection after finishing work. If a DTC is detected, perform trouble diagnosis according to self-diagnosis results.**

For vehicle with steering lock unit, if the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.
If turning the steering wheel is required with the battery disconnected or discharged, follow the operation procedure below before starting the repair operation.

OPERATION PROCEDURE

1. Connect both battery cables.
   NOTE:
   Supply power using jumper cables if battery is discharged.
2. Turn the ignition switch to ACC position.
   (At this time, the steering lock will be released.)
3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
4. Perform the necessary repair operation.
5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the ignition switch is turned to LOCK position.)
6. Perform self-diagnosis check of all control units using CONSULT.

Precaution for Battery Service

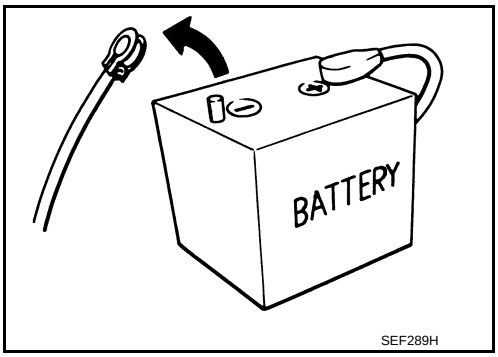
INFOID:0000000011488019

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Removing Battery Terminal

INFOID:0000000011488020

- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.
  NOTE:
  ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.
  NOTE:
  If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.



SEF289H

- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.
  NOTE:
  The removal of 12V battery may cause a DTC detection error.

Titanium Muffler Handling

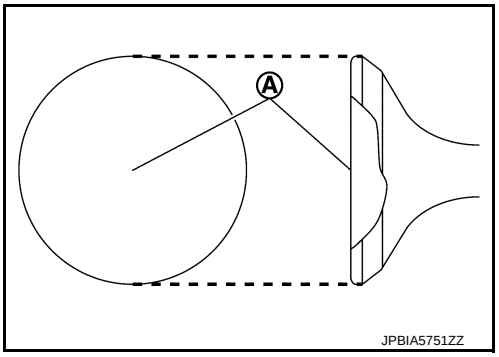
INFOID:0000000011488021

CAUTION:
- **Never touch the titanium muffler directly with bare hands or allow oils to adhere to it during inspection, removal, and installation.**
- **Always wear new thick cotton gloves or working gloves. (Never use oil-adhered gloves.)**
- **After oil adhesion, wait until the titanium muffler cools and immediately remove oil with parts cleaner.**
- **Always use genuine parts cleaner (dry type) or the equivalent.**
- **When cleaning oil in on-board condition, apply parts cleaner to a waste to wipe out oil. By doing so, peripheral parts can be protected from parts cleaner adhesion.**
- **Be careful not to cut fingers with the insulator edge or the main muffler cooling fin.**

Special Cautions to Ensure the Safe Disposal of Sodium-filled Exhaust Valves

INFOID:0000000011488022

Handling and disposal of sodium-filled exhaust valves requires special care and consideration. Under conditions such as breakage with subsequent contact with water, metal sodium which lines the inner portion of exhaust valve will react violently, forming sodium hydroxide and hydrogen which may result in an explosion. Sodium-filled exhaust valve is identified on the top of its stem as shown in illustration.



Identification of sodium-filled exhaust valve

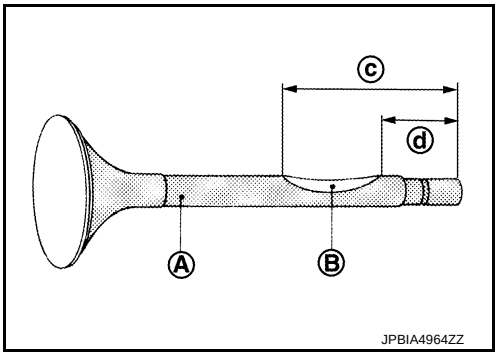
A : Flat surface

DEALER DISPOSAL INSTRUCTIONS

CAUTION:

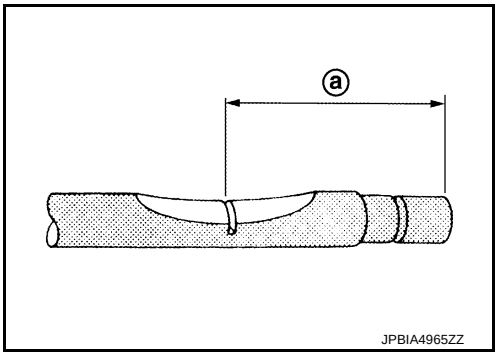
- **Use approved shatter-resistant eye protection when performing this procedure.**
- **Perform this and all subsequent disposal work procedures in an open room, away from flammable liquids. Keep a fire extinguisher, rated at least 10 ABC, in close proximity to the work area.**
- **Be sure to wear rubber gloves when performing the following operations.**
- **Make sure the resultant (high alkalinity) waste water does not contact your skin. If the waste water does contact you, wash the contacted area immediately with large quantities of water.**
- **Dealers should check their respective state and local regulations concerning any chemical treatment or waste water discharge permits which may be required to dispose of the resultant (high alkalinity) waste water.**

1. Clamp valve stem in a vice.
2. The valve has a specially-hardened surface. To cut through it, first remove a half-round section, approximately 30 mm (1.18 in) long using air-powered grinder until black color is removed and silver color appears.



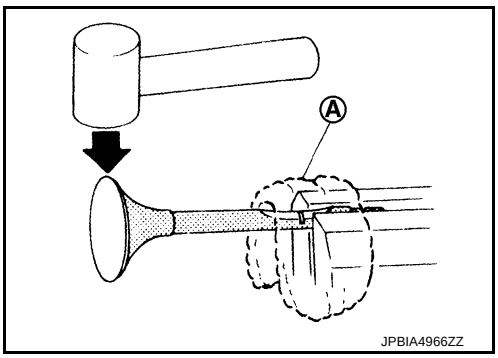
A : Black color
B : Silver color
c : 47 mm (1.85 in)
d : 17 mm (0.67 in)

3. Use hacksaw to cut through approximately half the diameter of valve stem. Make the serration at a point 40 mm (1.57 in) from the end of valve stem.



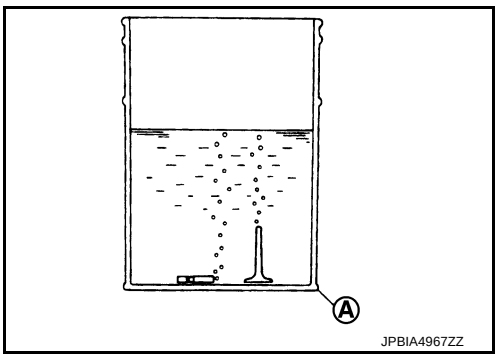
a : 32 mm (1.26 in)

4. Cover the serrated end of the valve with a large shop towel (A). Strike the valve face end with a hammer, separating it into two pieces.
5. Fill a bucket (such as a 20 ℓ oil can) with at least 10 ℓ (2-1/4 lmp gal) of water. Carefully place the alreadycut (serrated) valves into the water one-at-a-time using a set of large tweezers and quickly move away at least 2.7 m (9 ft).



6. The valves should be placed in a standing position as shown in the illustration to allow complete reaction. After the bubbling action has subsided, additional valves can be placed into the bucket allowing each subsequent chemical reaction to subside. However, no more than 8 valves should be placed in the same 10 ℓ (2-1/4 lmp gal) amount of water. The complete chemical reaction may take as long as 4 to 5 hours. Remove the valves using a set of large tweezers after the chemical reaction has stopped. Afterwards, valves can be disposed as ordinary scrap.

A : Bucket (Such as 20 ℓ oil can)



General Precautions

INFOID:0000000011488023

CAUTION:

After finishing servicing, check that all the tools and waste are stored in a customary place.

Precautions For Engine Service (GT-R certified NISSAN dealer)

INFOID:0000000011488024

DISCONNECTING FUEL PIPING (GT-R CERTIFIED NISSAN DEALER)

- Before starting work, check no fire or spark producing items are in the work area.
- Release fuel pressure before disconnecting and disassembly.
- After disconnecting pipes, plug openings to stop fuel leakage.

DRAINING ENGINE COOLANT

Drain engine coolant and engine oil when the engine is cooled.

INSPECTION, REPAIR AND REPLACEMENT (GT-R CERTIFIED NISSAN DEALER)

Before repairing or replacing, thoroughly inspect parts. Inspect new replacement parts in the same way, and replace if necessary.

REMOVAL AND DISASSEMBLY (GT-R CERTIFIED NISSAN DEALER)

- When instructed to use SST, use specified tools. Always be careful to work safely, avoid forceful or uninstructed operations.
- Exercise maximum care to avoid damage to mating or sliding surfaces.
- Dowel pins are used for several parts alignment. When replacing and reassembling parts with dowel pins, check that dowel pins are installed in the original position.
- Must cover openings of engine system with a tape or equivalent, to seal out foreign materials.
- Mark and arrange disassembly parts in an organized way for easy troubleshooting and reassembly.
- When loosening nuts and bolts, as a basic rule, start with the one furthest outside, then the one diagonally opposite, and so on. If the order of loosening is specified, do exactly as specified. Power tools may be used in the step.

ASSEMBLY AND INSTALLATION (GT-R CERTIFIED NISSAN DEALER)

- Use torque wrench to tighten bolts or nuts to specification.

- When tightening nuts and bolts, as a basic rule, equally tighten in several different steps starting with the ones in center, then ones on inside and outside diagonally in this order. If the order of tightening is specified, do exactly as specified.
- Replace with new gasket, packing, oil seal or O-ring.
- Thoroughly wash, clean, and air-blow each part. Carefully check engine oil or engine coolant passages for any restriction and blockage.
- Avoid damaging sliding or mating surfaces. Completely remove foreign materials such as cloth lint or dust. Before assembly, oil sliding surfaces well.
- After disassembling and opening the engine, change engine oil and replace oil filter with a new one.
- Release air within route when refilling after draining engine coolant.
- After repairing, start the engine and increase engine speed to check engine coolant, fuel, engine oil, and exhaust gases for leakage.

Parts Requiring Angle Tightening (GT-R certified NISSAN dealer)

INFOID:0000000011488025

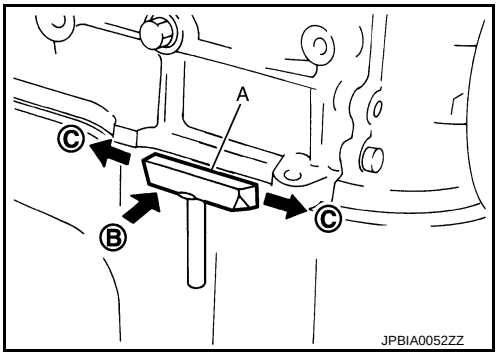
- Use the angle wrench [SST: KV10112100 (BT8653-A)] for the final tightening of the following engine parts:
- Cylinder head bolts
- Lower cylinder block bolts
- Connecting rod cap bolts
- Do not use a torque value for final tightening.
- The torque value for these parts are for a preliminary step.
- Ensure thread and seat surfaces are clean and coated with engine oil.

Liquid Gasket (GT-R certified NISSAN dealer)

INFOID:0000000011488026

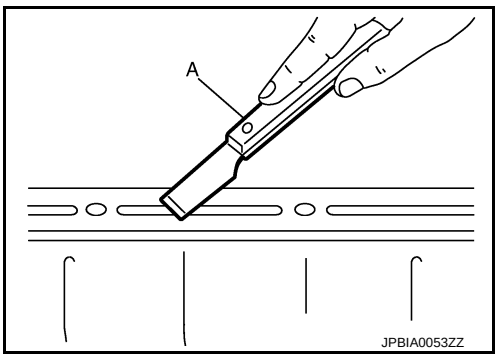
REMOVAL OF LIQUID GASKET SEALING

- After removing mounting nuts and bolts, separate the mating surface using the seal cutter [SST: KV10111100 (J-37228)] (A) and remove old liquid gasket sealing.
  CAUTION:
  Be careful not to damage the mating surfaces.
- Tap the seal cutter to insert it (B), and then slide it (C) by tapping on the side as shown in the figure.
- In areas where the seal cutter is difficult to use, use a plastic hammer to lightly tap the parts, to remove it.
  CAUTION:
  If for some unavoidable reason tool such as a screwdriver is used, be careful not to damage the mating surfaces.



LIQUID GASKET APPLICATION PROCEDURE

1. Using a scraper (A), remove old liquid gasket adhering to the liquid gasket application surface and the mating surface.
   - Remove liquid gasket completely from the groove of the liquid gasket application surface, mounting bolts, and bolt holes.
     CAUTION:
     The mounting surface of oil pan (upper) is surface-treated. Be sure to use a resin gasket scraper [SST: KV10119100 (J-49360)] so as not to damage the surface-treated.

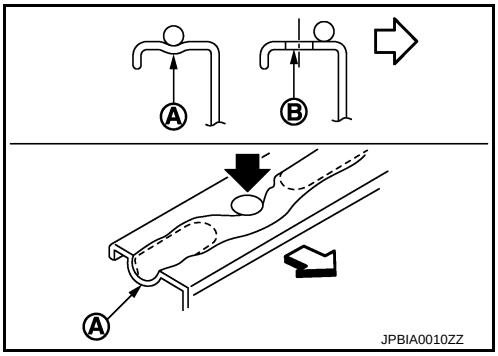


2. Wipe the liquid gasket application surface and the mating surface with white gasoline (lighting and heating use) to remove adhering moisture, grease and foreign materials.
3. Attach liquid gasket tube to the cartridge gun (commercial service tool).
   Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-18, "Recommended Chemical Products and Sealants".
4. Apply liquid gasket without breaks to the specified location with the specified dimensions.
   - If there is a groove for liquid gasket application, apply liquid gasket to the groove.

- As for bolt holes (B), normally apply liquid gasket inside the holes. Occasionally, it should be applied outside the holes. Check to read the text of this manual.

  A : Groove

  ⇦ : Inside



- Within 5 minutes of liquid gasket application, install the mating component.
- If liquid gasket protrudes, wipe it off immediately.
- Do not retighten mounting bolts or nuts after the installation.
- After 30 minutes or more have passed from the installation, fill engine oil and engine coolant.

CAUTION:

If there are specific instructions in this manual, observe them.

Definitions of Bank Names

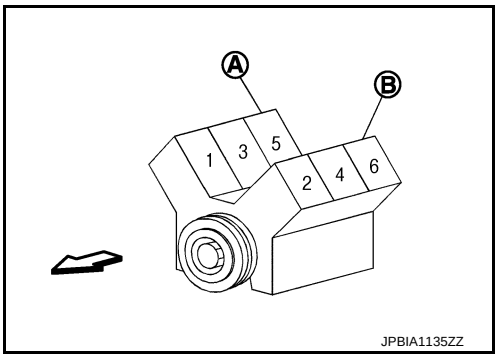
INFOID:0000000011488027

- In this manual, each bank name is defined as follows:

  A : Bank 1 (The conventional right bank)

  B : Bank 2 (The conventional left bank)

  ⇦ : Engine front



- For cylinder numbers and bank layout, refer to the illustration.

  Bank 1 : The bank side including cylinder No. 1 (odd-numbered cylinder side)

  Bank 2 : The other bank side of the above (even-numbered cylinder side)

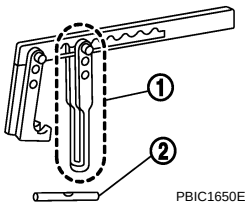
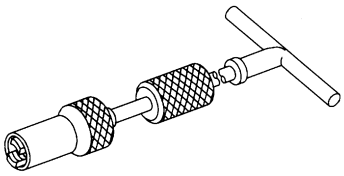
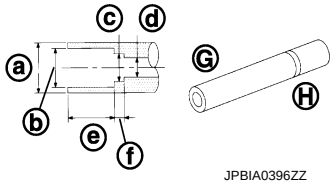
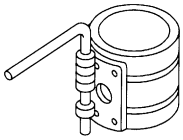
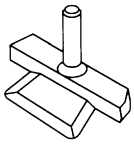
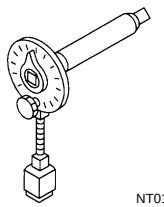
PREPARATION

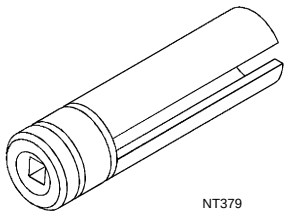
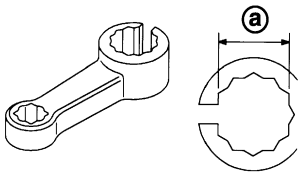
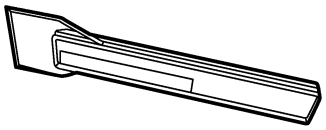
PREPARATION

Special Service Tools (GT-R certified NISSAN dealer)

INFOID:0000000011488028

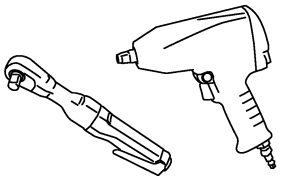
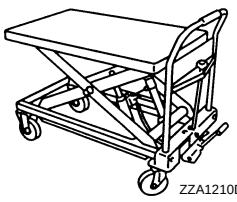
The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

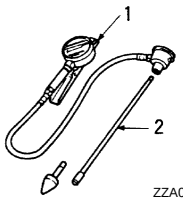
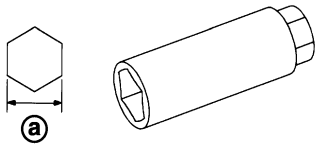
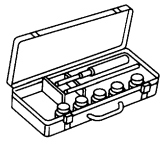
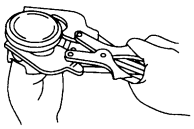
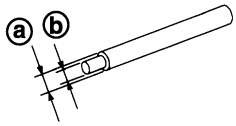
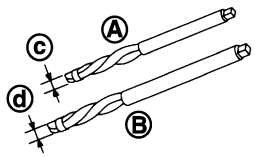
Tool number (Kent-Moore No.) Tool name	Description
KV10116200 (J-26336-A) Valve spring compressor 1. KV10115900 (J-26336-20) Attachment 2. KV10109220 (—) Adapter  PBIC1650E	Disassembling valve mechanism Part (1) is a component of KV10116200 (J-26336-A), but Part (2) is not so.
KV10107902 (J-38959) Valve oil seal puller  NT011	Replacing valve oil seal
KV10115600 (J-38958) Valve oil seal drift  JPBIA0396ZZ	Installing valve oil seal **Use side A (G).** **a: 20 (0.79) dia.** **d: 8 (0.31) dia.** **b: 13 (0.51) dia.** **e: 10.7 (0.421)** **c: 10.3 (0.406) dia.** **f: 5 (0.20)** **H: side B** Unit: mm (in)
EM03470000 (J-8037) Piston ring compressor  NT044	Installing piston assembly into cylinder bore
KV10111100 (J-37228) Seal cutter  NT046	Removing oil pan (lower), front and rear timing chain case, etc.
KV10112100 (BT8653-A) Angle wrench  NT014	Tightening bolts for connecting rod bearing cap, cylinder head, etc. in angle

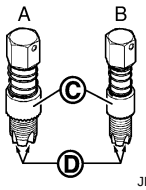
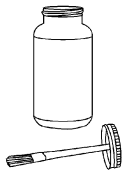
Tool number (Kent-Moore No.) Tool name	Description
KV10117100 (J-3647-A) Heated oxygen sensor wrench  NT379	Loosening or tightening air fuel ratio sensor 1 **For 22 mm (0.87 in) width hexagon nut**
KV10114400 (J-38365) Heated oxygen sensor wrench  JPBIA0397ZZ	Loosening or tightening heated oxygen senor 2 **a: 22 mm (0.87 in)**
KV101056S0 (J-49374) Ring gear stopper  ZZA1005D	Fixing flywheel
KV10119100 (J-49360) Resin gasket scraper  NNBIA0173ZZ	Liquid gasket scraper for oil pan (upper)

Commercial Service Tools (GT-R certified NISSAN dealer)

INFOID:0000000011488029

(Kent-Moore No.) Tool name	Description
(—) Power tool  PBIC0190E	Loosening nuts and bolts
(—) Manual lift table caddy  ZZA1210D	Removing and installing engine

(Kent-Moore No.) Tool name	Description
(—) 1. Compression gauge 2. Adapter  ZZA0008D	Checking compression pressure
(—) Spark plug wrench  JPBIA0399ZZ	Removing and installing spark plug **a: 14 mm (0.55 in)**
(—) Valve seat cutter set  NT048	Finishing valve seat dimensions
(—) Piston ring expander  NT030	Removing and installing piston ring
(—) Valve guide drift  JPBIA0400ZZ	Removing and installing valve guide **Intake and Exhaust:** **a: 9.5 mm (0.374 in) dia.** **b: 5.5 mm (0.217 in) dia.**
(—) Valve guide reamer  JPBIA0401ZZ	A: Reaming valve guide inner hole B: Reaming hole for oversize valve guide **Intake and Exhaust:** **c: 6.0 mm (0.236 in) dia.** **d: 10.2 mm (0.402 in) dia.**

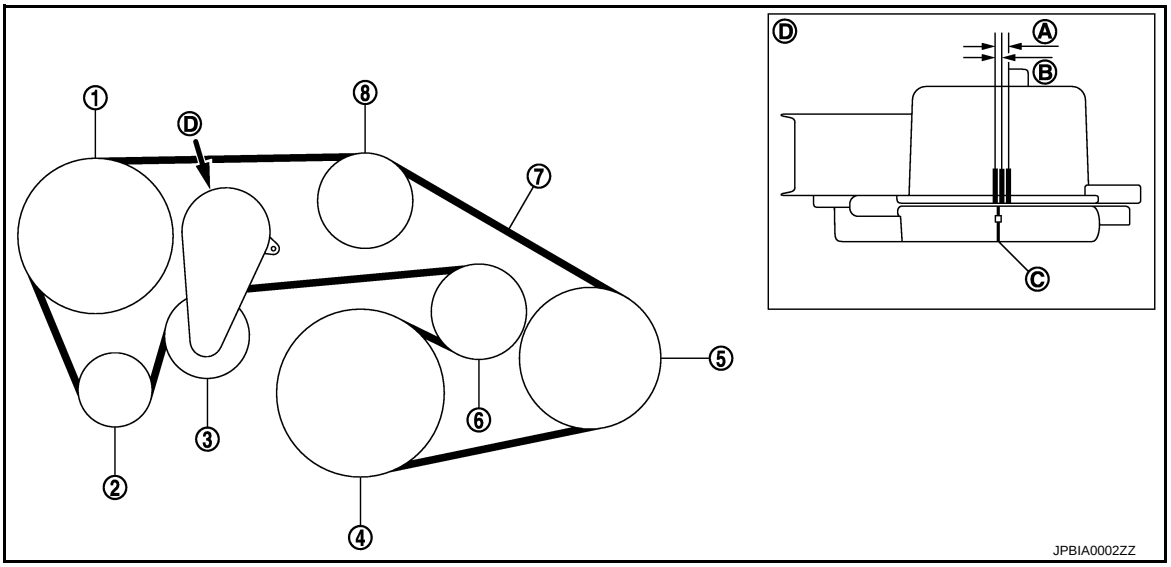
(Kent-Moore No.) Tool name	Description
(J-43897-18) (J-43897-12) Oxygen sensor thread cleaner  JPBIA0238ZZ	Reconditioning the exhaust system threads before installing a new air fuel ratio sensor and heated oxygen sensor (Use with anti-seize lubricant shown below.) **A: J-43897-18 [18 mm (0.71 in) dia.] for zirconia heated oxygen sensor and air fuel ratio sensor** **B: J-43897-12 [12 mm (0.47 in) dia.] for titania heated oxygen sensor** C: Mating surface shave cylinder D: Flutes
(—) 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

PERIODIC MAINTENANCE

DRIVE BELT

Exploded View

INFOID:0000000011488030



1.	Power steering oil pump	2.	Alternator	3.	Drive belt auto-tensioner
4.	Crankshaft pulley	5.	A/C compressor	6.	Idler pulley
7.	Drive belt	8.	Idler pulley		
A.	Possible use range	B.	Range when new drive belt is installed	C.	Indicator
D.	View D				

Checking

INFOID:0000000011488031

WARNING:

Be sure to perform this step when engine is stopped.

- Check that the indicator (C) (notch on fixed side) of drive belt auto-tensioner is within the possible use range (A).

  NOTE:

  - Check the drive belt auto-tensioner indication when the engine is cold.
  - When new drive belt is installed, the indicator (notch on fixed side) should be within the range (B) in the figure.
- Visually check entire drive belt for wear, damage or cracks.
- If the indicator (notch on fixed side) is out of the possible use range or belt is damaged, replace drive belt.

Tension Adjustment (GT-R certified NISSAN dealer)

INFOID:0000000011488032

Refer to EM-140, "Drive Belt (GT-R certified NISSAN dealer)".

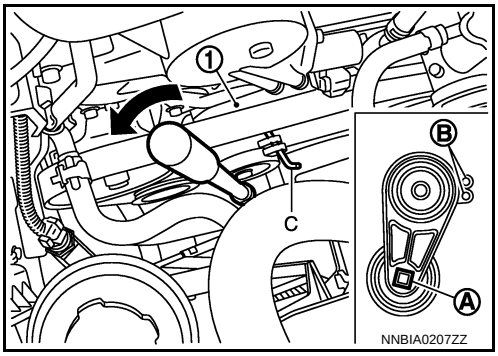
Removal and Installation (GT-R certified NISSAN dealer)

INFOID:0000000011488033

REMOVAL

1. While securely holding the square hole (A) in pulley center of auto tensioner (1) with a spinner handle, move spinner handle in the direction of arrow (loosening direction of drive belt).
   CAUTION:
   Avoid placing hand in a location where pinching may occur if the holding tool accidentally comes off.

   ⬅ : Loosening direction of drive belt



2. Under the above condition, insert a metallic bar of approximately 6 mm (0.24 in) in diameter [hexagonal wrench (C) shown as example in the figure] through the holding boss (B) to lock auto-tensioner pulley arm.
3. Remove drive belt.
   • Keep auto-tensioner pulley arm locked after drive belt is removed.

INSTALLATION

Note the following, and install in the reverse order of removal.

CAUTION:

- **Check drive belt is securely installed around all pulleys.**
- **Check drive belt is correctly engaged with the pulley groove.**
- **Check for engine oil and engine coolant are not adhered drive belt and pulley groove.**

Inspection (GT-R certified NISSAN dealer)

INFOID:0000000011488034

INSPECTION AFTER INSTALLATION

- Turn crankshaft pulley clockwise several times to equalize tension between each pulley, and then confirm tension of drive belt at indicator (notch on fixed side) is within the possible use range. Refer to EM-15, "Exploded View".

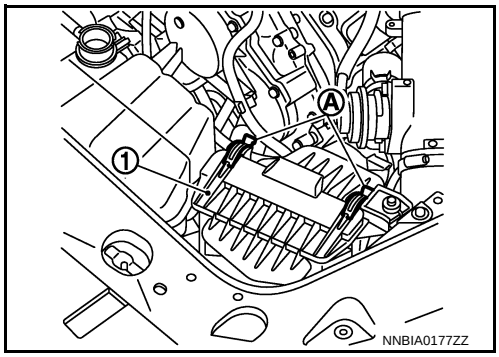
AIR CLEANER FILTER

Removal and Installation

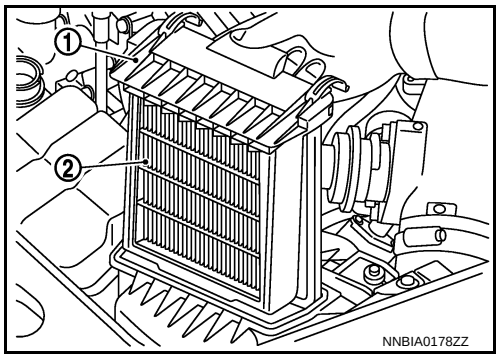
INFOID:0000000011488035

REMOVAL

1. Unhook clips (A) and remove holder (1) from air cleaner case.



2. Remove air cleaner filter (2) from holder (1).



INSTALLATION

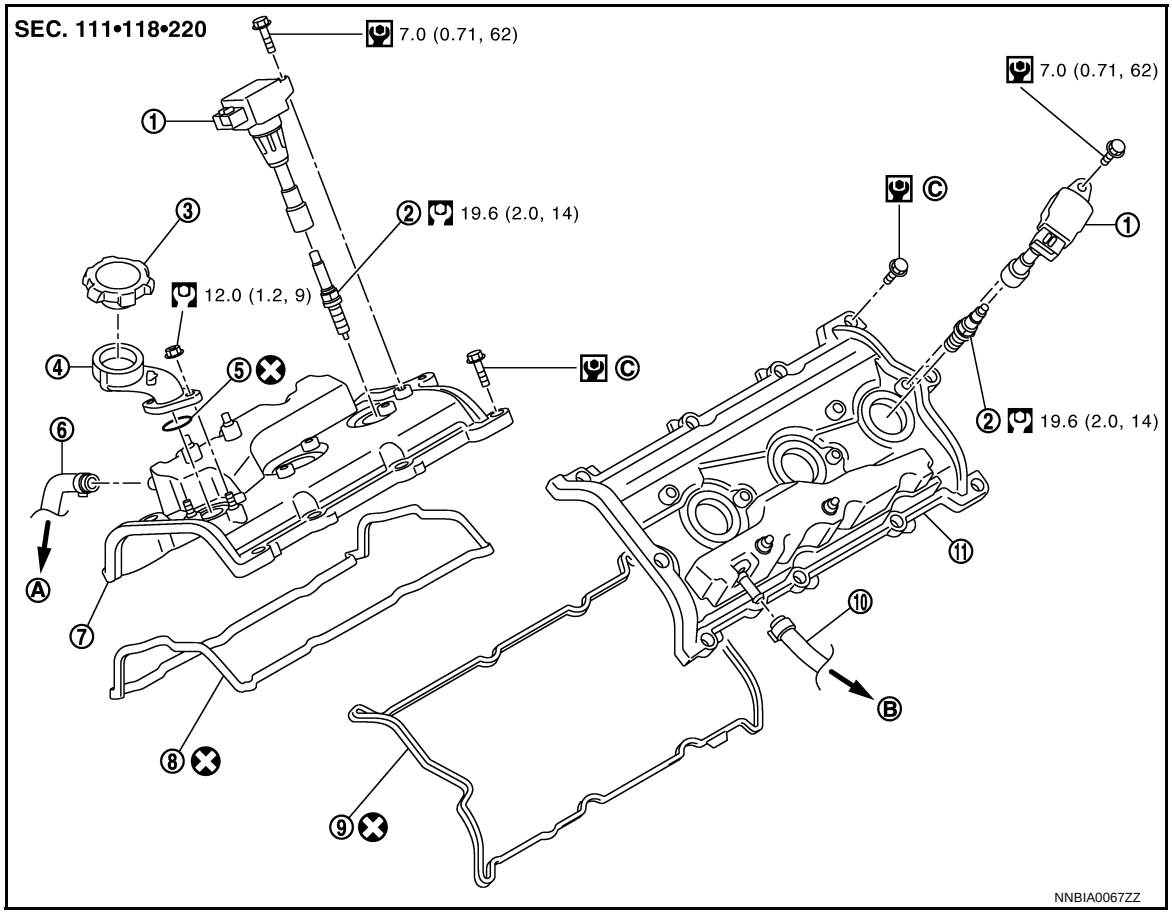
Note the following, and install in the reverse order of removal.

- Install the air cleaner filter by aligning the seal with the notch of air cleaner case.

SPARK PLUG

Exploded View

INFOID:0000000011488036



1.	Ignition coil	2.	Spark plug	3.	Oil filler cap
4.	Oil filler tube	5.	O-ring	6.	Fresh air hose
7.	Rocker cover (bank 1)	8.	Rocker cover gasket (bank 1)	9.	Rocker cover gasket (bank 2)
10.	Fresh air hose	11.	Rocker cover (bank 2)		
A.	To fresh air tube (bank 1)	B.	To fresh air tube (bank 2)	C.	Comply with the installation procedure when tightening. Refer to EM-47

Refer to GI-4, "Components" for symbols in the figure.

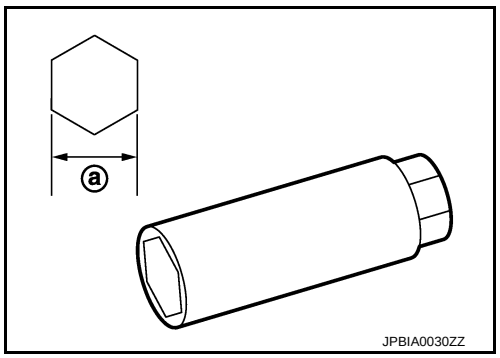
Removal and Installation

INFOID:0000000011488037

REMOVAL

1. Remove engine cover with power tool. Refer to EM-26, "Exploded View".
2. Remove intake manifold collector. Refer to EM-35, "Exploded View".
   CAUTION:
   Mark the parts with paint in advance of the reinstallation to prevent misalignment between the intake manifold collector and intake manifold.
3. Remove ignition coil.

4. Remove spark plug with a spark plug wrench (commercial service tool).



a : 14 mm (0.55 in)

CAUTION:
Never drop or shock spark plug.

INSTALLATION

Installation is the reverse order of removal.

Inspection

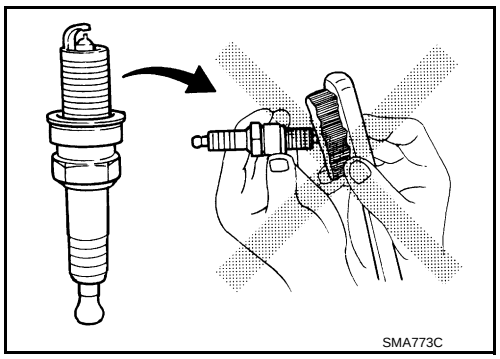
INFOID:0000000011488038

INSPECTION AFTER REMOVAL

Use the standard type spark plug for normal condition.

Spark plug (Standard type) : Refer to EM-141, "Spark Plug".

CAUTION:
- **Never drop or shock spark plug.**
- **Never use a wire brush for cleaning.**
- **If plug tip is covered with carbon, spark plug cleaner may be used.**



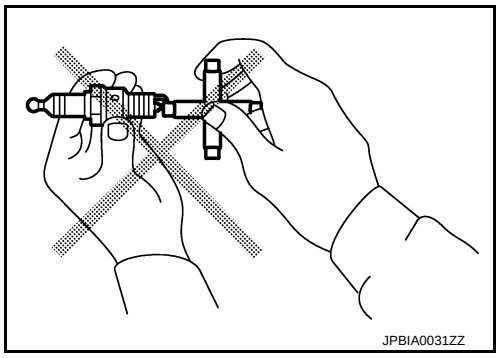
Cleaner air pressure:

Less than 588 kPa (6 kg/cm^2, 85 psi)

Cleaning time:

Less than 20 seconds

- **Measure spark plug gap. When it exceeds the limit, replace spark plug even if it is within the specified replacement mileage. Refer to EM-141, "Spark Plug".**
- **Spark plug gap adjustment is not required between replacement intervals.**



CAMSHAFT VALVE CLEARANCE

Inspection (GT-R certified NISSAN dealer)

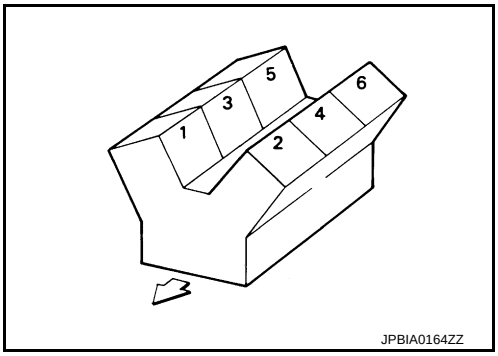
INFOID:0000000011488039

INSPECTION

Perform inspection as follows after removal, installation or replacement of camshaft or valve-related parts, or if there is unusual engine conditions regarding valve clearance.

In cases of removing/installing or replacing camshaft and valve-related parts, or of unusual engine conditions due to changes in valve clearance (found malfunctions during stating, idling or causing noise), perform inspection as follows:

⇦ : Engine front



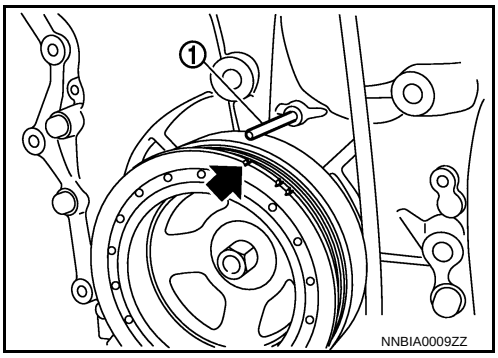
1. Remove rocker covers (bank 1 and bank 2). Refer to EM-47, "Exploded View".
2. Measure the valve clearance as follows:

a. Set No. 1 cylinder at TDC of its compression stroke.

- Rotate crankshaft pulley clockwise to align timing mark (grooved line without color) with timing indicator (1).

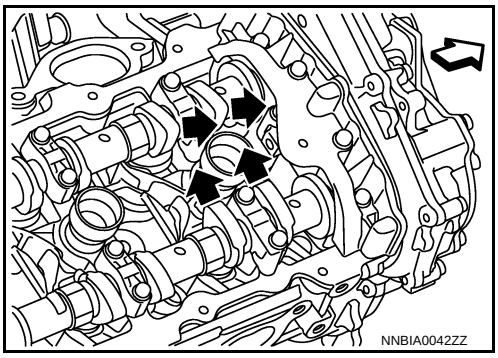
⬅ : Timing mark (grooved line without color)

NOTE:
Timing indicator is not included because it is not factory-supplied.



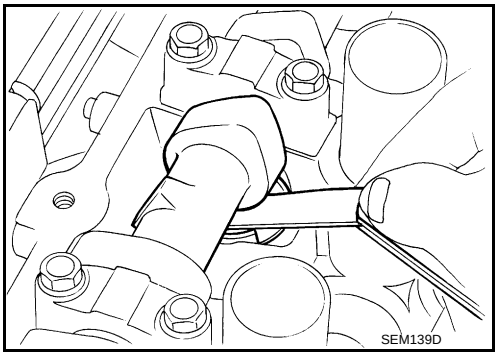
- Check that intake and exhaust cam nose on No. 1 cylinder (engine front side of bank 1) are located as shown in the figure.
- If not, turn crankshaft one revolution (360 degrees) and align as shown in the figure.

⇦ : Engine front



b. Use a feeler gauge, measure the clearance between valve lifter and camshaft.

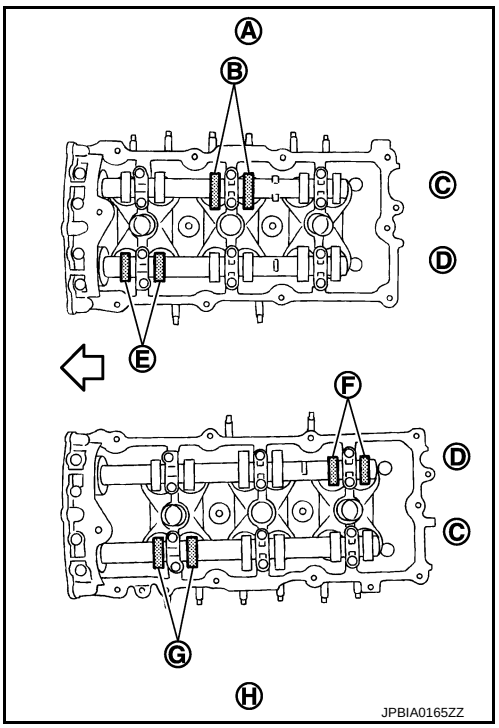
Valve clearance : **Refer to EM-141, "Camshaft (GT-R certified NISSAN dealer)".**



- By referring to the figure, measure the valve clearances at locations marked "×" as shown in the table below (locations indicated in the figure).

  ⇦ : Engine front

- No. 1 cylinder at compression TDC



Measuring position [bank 1 (A)]		No. 1 CYL.	No. 3 CYL.	No. 5 CYL.
No. 1 cylinder at compression TDC	EXH (C)		× (B)	
	INT (D)	× (E)		
Measuring position [bank 2 (H)]		No. 2 CYL.	No. 4 CYL.	No. 6 CYL.
No. 1 cylinder at compression TDC	INT (D)			× (F)
	EXH (C)	× (G)		

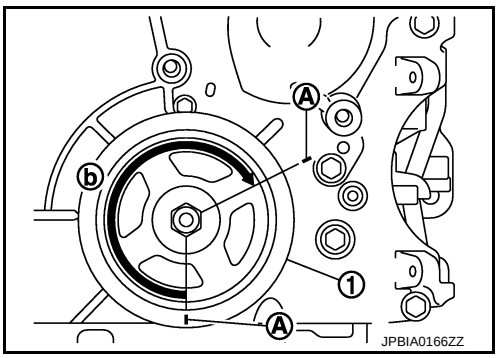
c. Rotate crankshaft by 240 degrees clockwise (when viewed from engine front) to align No. 3 cylinder at TDC its compression stroke.

NOTE:

Mark a position 240 degrees (b) from a corner of the hexagonal part of crankshaft pulley mounting bolt as shown in the figure. Use the hexagonal part as a guide.

1 : Crankshaft pulley

A : Paint mark

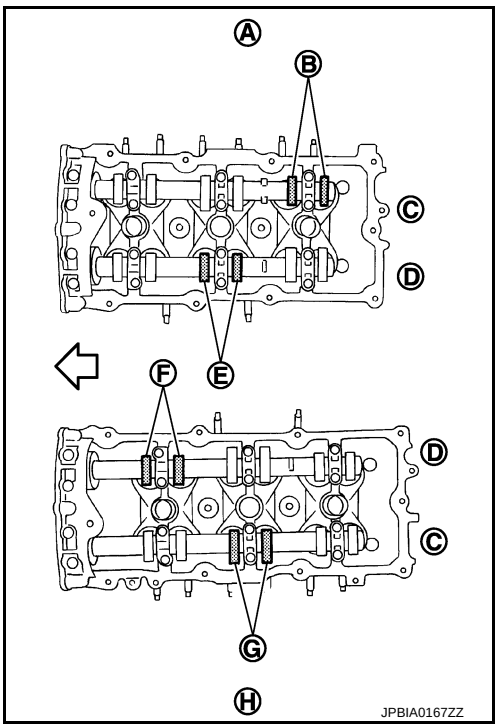


- By referring to the figure, measure the valve clearances at locations marked "×" as shown in the table below (locations indicated in the figure).

  ⇦ : Engine front

- No. 3 cylinder at compression TDC

Measuring position [bank 1 (A)]		No. 1 CYL.	No. 3 CYL.	No. 5 CYL.
No. 3 cylinder at compression TDC	EXH (C)			× (B)
	INT (D)		× (E)	
Measuring position [bank 2 (H)]		No. 2 CYL.	No. 4 CYL.	No. 6 CYL.
No. 3 cylinder at compression TDC	INT (D)	× (F)		
	EXH (C)		× (G)	



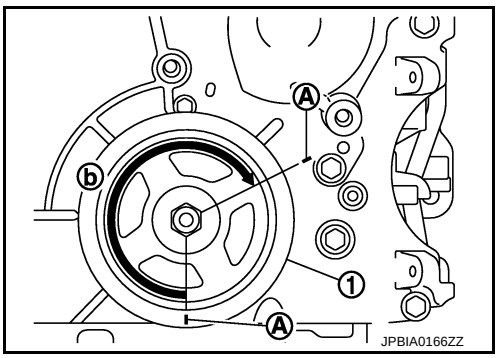
d. Rotate crankshaft by 240 degrees clockwise (when viewed from engine front) to align No. 5 cylinder at TDC of compression stroke.

NOTE:

Mark a position 240 degrees (b) from a corner of the hexagonal part of crankshaft pulley mounting bolt as shown in the figure. Use the hexagonal part as a guide.

1 : Crankshaft pulley

A : Paint mark

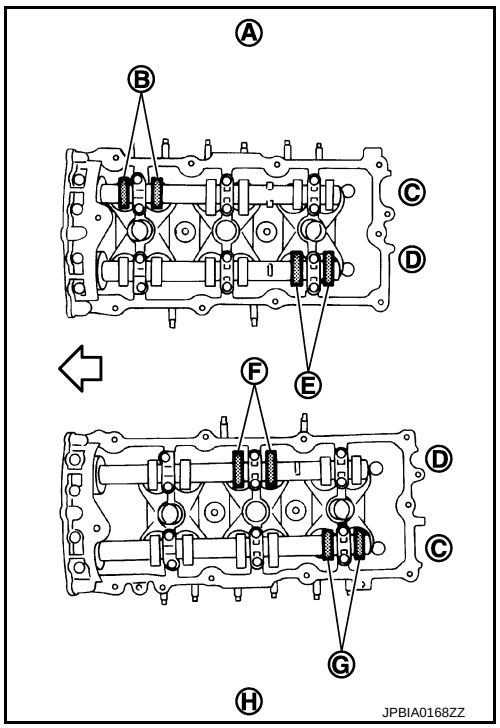


- By referring to the figure, measure the valve clearances at locations marked "×" as shown in the table below (locations indicated in the figure).

⇦ : Engine front

- No. 5 cylinder at compression TDC

Measuring position [bank 1 (A)]		No. 1 CYL.	No. 3 CYL.	No. 5 CYL.
No. 5 cylinder at compression TDC	EXH (C)	× (B)		
	INT (D)			× (E)
Measuring position [bank 2 (H)]		No. 2 CYL.	No. 4 CYL.	No. 6 CYL.
No. 5 cylinder at compression TDC	INT (D)		× (F)	
	EXH (C)			× (G)



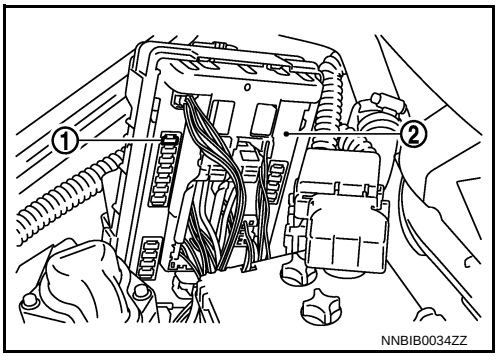
3. Perform adjustment if the measured value is out of the standard. Refer to EM-91, "Inspection (GT-R certified NISSAN dealer)".

COMPRESSION PRESSURE

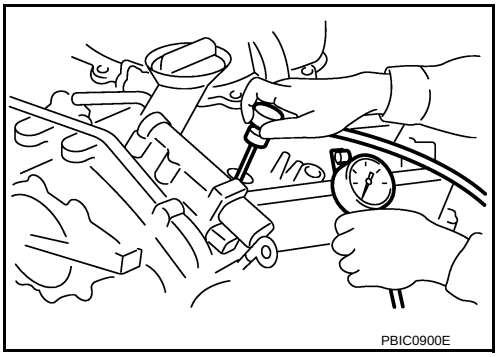
Inspection (GT-R certified NISSAN dealer)

INFOID:0000000011488040

1. Warm up engine thoroughly. Then, stop it.
2. Release fuel pressure. Refer to EC-637, "Inspection (GT-R certified NISSAN dealer)".
3. Disconnect fuel pump fuse (1) from IPDM E/R (2) to avoid fuel injection during measurement.

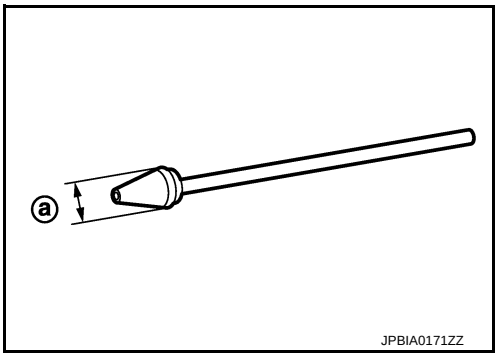


4. Remove engine cover with power tool. Refer to EM-26, "Exploded View".
5. Remove ignition coil and spark plug from each cylinder. Refer to EM-47, "Exploded View".
6. Connect engine tachometer (not required in use of CONSULT).
7. Install compression gauge with an adapter (commercial service tool) onto spark plug hole.



- Use the adapter whose picking up end inserted to spark plug hole is smaller than 20 mm (0.79 in) in diameter. Otherwise, it may be caught by cylinder head during removal.

  a : 20 mm (0.79 in)



8. With accelerator pedal fully depressed, turn ignition switch to “START” for cranking. When the gauge pointer stabilizes, read the compression pressure and the engine rpm. Perform these steps to check each cylinder.

Compression pressure **: Refer to EM-140, "General Specification (GT-R certified NISSAN dealer)".**

CAUTION:

Always use a fully changed battery to obtain the specified engine speed.

- If the engine speed is out of the specified range, check battery liquid for proper gravity. Check the engine speed again with normal battery gravity. Refer to PG-94, "Battery".

- If compression pressure is below minimum value, check valve clearances and parts associated with combustion chamber (valve, valve seat, piston, piston ring, cylinder bore, cylinder head, and cylinder head gasket). After the checking, measure compression pressure again.
- If some cylinder has low compression pressure, pour small amount of engine oil into the spark plug hole of the cylinder to re-check it for compression.
  - If the added engine oil improves the compression, piston rings may be worn out or damaged. Check piston rings and replace if necessary. Refer to EM-124, "Inspection (GT-R certified NISSAN dealer)".
  - If the compression pressure remains at low level despite the addition of engine oil, valves may be malfunctioning. Check valves for damage. Replace valve or valve seat accordingly. Refer to EM-110, "Inspection (GT-R certified NISSAN dealer)".
- If two adjacent cylinders have respectively low compression pressure and their compression remains low even after the addition of engine oil, cylinder head gaskets are leaking. In such a case, replace cylinder head gaskets. Refer to EM-103, "Exploded View (GT-R certified NISSAN dealer)".

9. After inspection is completed, install removed parts.
10. Start the engine, and check that the engine runs smoothly.
11. Perform trouble diagnosis. If DTC appears, erase it. Refer to EC-12, "Work Flow (GT-R certified NISSAN dealer)".

REMOVAL AND INSTALLATION

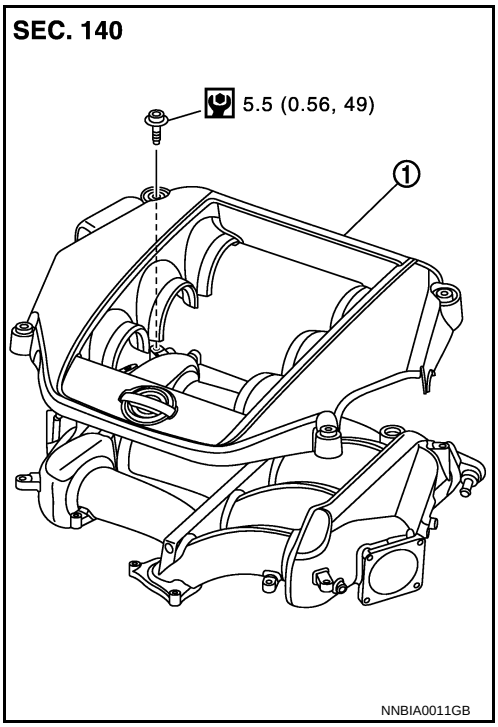
ENGINE COVER

Exploded View

INFOID:0000000011488041

1. Engine room cover

Refer to GI-4, "Components" for symbols in the figure.



Removal and Installation

INFOID:0000000011488042

Removal

Remove engine cover with the following cares.

CAUTION:

- **Perform this step when the engine is cold.**
- **Never damage engine cover.**
- **Wipe out oil with wasted as soon as possible whenever necessary.**
- **Never exert pressure by hand on the surface of engine cover.**

Installation

Install engine cover with the following cares.

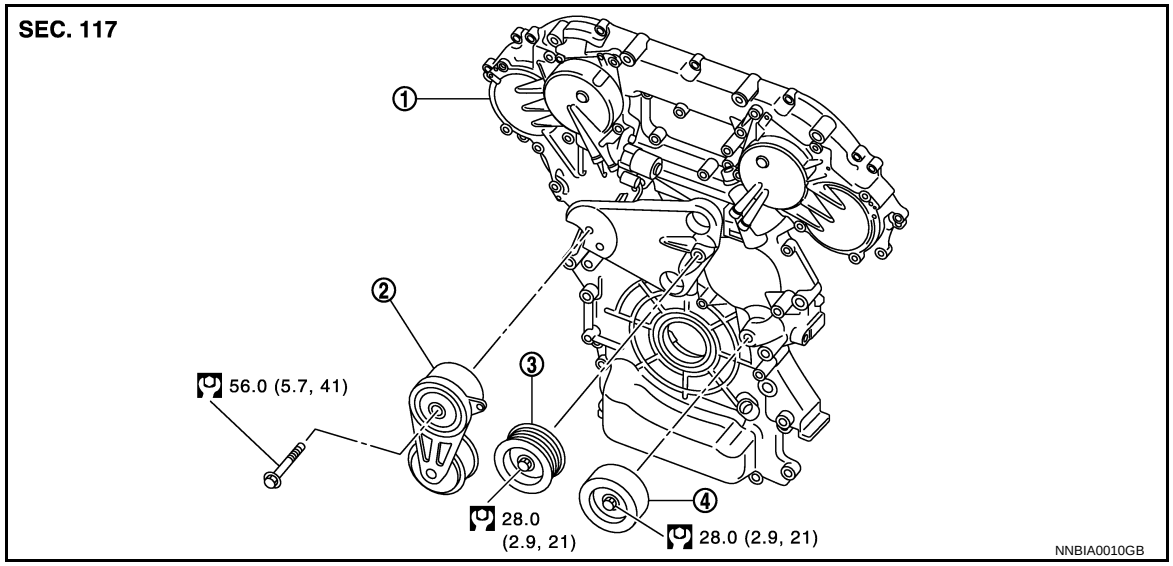
CAUTION:

- **Never damage engine cover.**
- **Never get harnesses and hoses caught between engine cover and intake manifold collector.**
- **Wipe out oil with wasted as soon as possible whenever necessary.**
- **Never exert pressure by hand on the surface of engine cover.**

DRIVE BELT AUTO TENSIONER AND IDLER PULLEY

Exploded View

INFOID:0000000011488043



1. Front timing chain case
2. Drive belt auto-tensioner
3. Idler pulley
4. Idler pulley

Refer to GI-4, "Components" for symbols in the figure.

Removal and Installation (GT-R certified NISSAN dealer)

INFOID:0000000011488044

Removal

1. Remove drive belt. Refer to EM-15, "Exploded View".
   - Keep auto-tensioner pulley arm locked after drive belt is removed.
2. Remove auto-tensioner and idler pulley.
   - Keep auto-tensioner pulley arm locked to install or remove auto-tensioner.

Installation

Note the following, and install in the reverse order of removal.

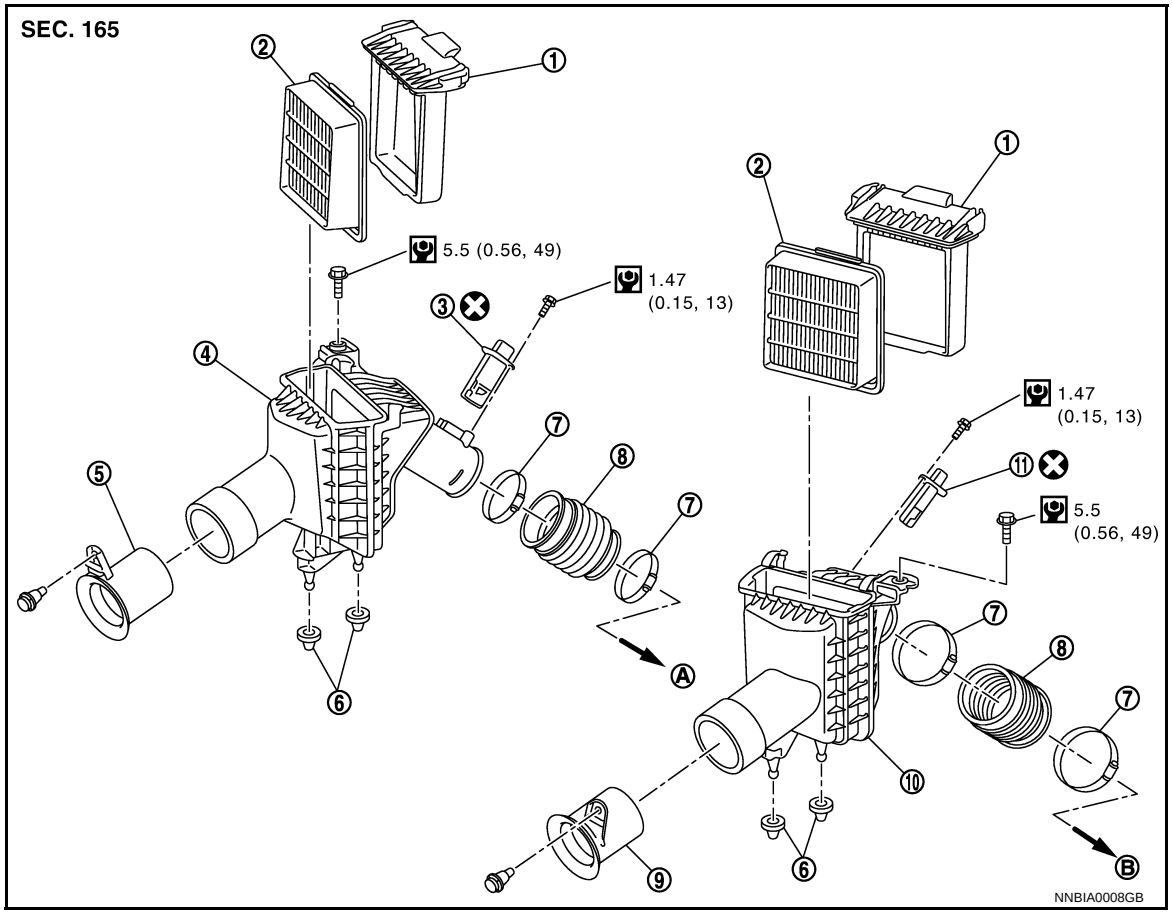
CAUTION:

- **Check drive belt is securely installed around all pulleys.**
- **Check drive belt is correctly engaged with the pulley groove.**
- **Check for engine oil and engine coolant are not adhered drive belt and pulley groove.**

AIR CLEANER AND AIR DUCT

Exploded View

INFOID:0000000011488045



1.	Holder	2.	Air cleaner filter	3.	Mass air flow sensor (bank 1)
4.	Air cleaner case (bank 1)	5.	Dust side duct (bank 1)	6.	Grommet
7.	Clamp	8.	Air duct	9.	Dust side duct (bank 2)
10.	Air cleaner case (bank 2)	11.	Mass air flow sensor (bank 2)		
A.	To exhaust manifold and turbocharger (bank 1)	B.	To exhaust manifold and turbocharger (bank 2)		

Refer to GI-4, "Components" for symbols in the figure.

Removal and Installation

INFOID:0000000011488046

REMOVAL

NOTE:

Mass air flow sensor is removable under the car-mounted condition.

1. Disconnect mass air flow sensor harness connector.
2. Remove radiator cover. Refer to DLK-221, "Exploded View (GT-R certified NISSAN dealer)".
3. Remove dust side duct.
4. Disconnect ground cable at front timing chain case side.
5. Remove recirculation pipe and air inlet hose. Refer to EM-30, "Exploded View".
6. Remove air cleaner case with mass air flow sensor and air duct, disconnecting each joints.
   - Mark with paint for a reference purpose before removal.
7. Remove mass air flow sensor from air cleaner case, if necessary.
   CAUTION:
   Mass air flow sensor is non-reusable. Never mass flow sensor remove unless this is required.

INSTALLATION

Note the following, and install in the reverse order of removal.

- Align marks. Attach each joint. Screw clamps firmly.

Clamp tightening torque **: 4.5 N·m (0.46 kg-m, 40 in-lb)**

CAUTION:

Never use air tool or power tools for tightening.

Inspection (GT-R certified NISSAN dealer)

INFOID:0000000011488047

INSPECTION AFTER REMOVAL

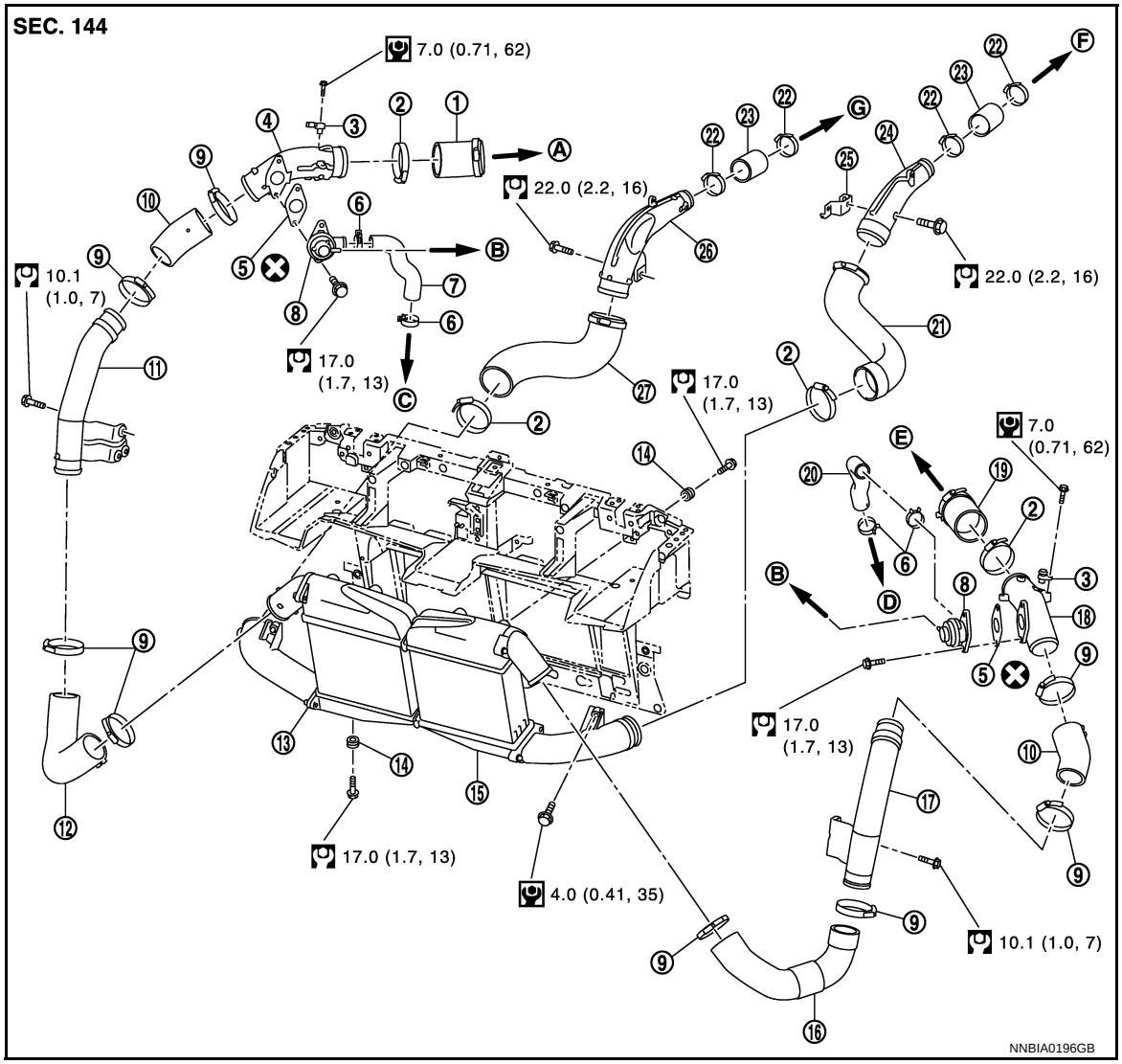
Inspect air duct assembly for crack or tear.

- If anything found, replace air duct assembly.

CHARGE AIR COOLER

Exploded View

INFOID:0000000011488048



1.	Air inlet hose (bank 1)	2.	Clamp	3.	Turbocharger boost sensor
4.	Recirculation pipe (bank 1)	5.	Gasket	6.	Clamp
7.	Recirculation hose (bank 1)	8.	Recirculation valve	9.	Clamp
10.	Air inlet hose	11.	Air inlet pipe assembly (bank 1)	12.	Air inlet hose (bank 1)
13.	Charge air cooler assembly (bank 1)	14.	Grommet	15.	Charge air cooler assembly (bank 2)
16.	Air inlet hose (bank 2)	17.	Air inlet pipe assembly (bank 2)	18.	Recirculation pipe (bank 2)
19.	Air inlet hose (bank 2)	20.	Recirculation hose (bank 2)	21.	Air inlet hose (bank 2)
22.	Clamp	23.	Air inlet hose	24.	Air inlet pipe (bank 2)
25.	Bracket	26.	Air inlet pipe (bank 1)	27.	Air inlet hose (bank 1)
A.	To electric throttle control actuator (bank 1)	B.	To intake manifold collector	C.	To exhaust manifold and turbocharger assembly (bank 1) (upper)
D.	To exhaust manifold and turbocharger assembly (bank 2) (upper)	E.	To electric throttle control actuator (bank 2)	F.	To exhaust manifold and turbocharger assembly (bank 2)
G.	To exhaust manifold and turbocharger assembly (bank 1)				

Refer to GI-4, "Components" for symbols in the figure.

Removal and Installation

INFOID:0000000011488049

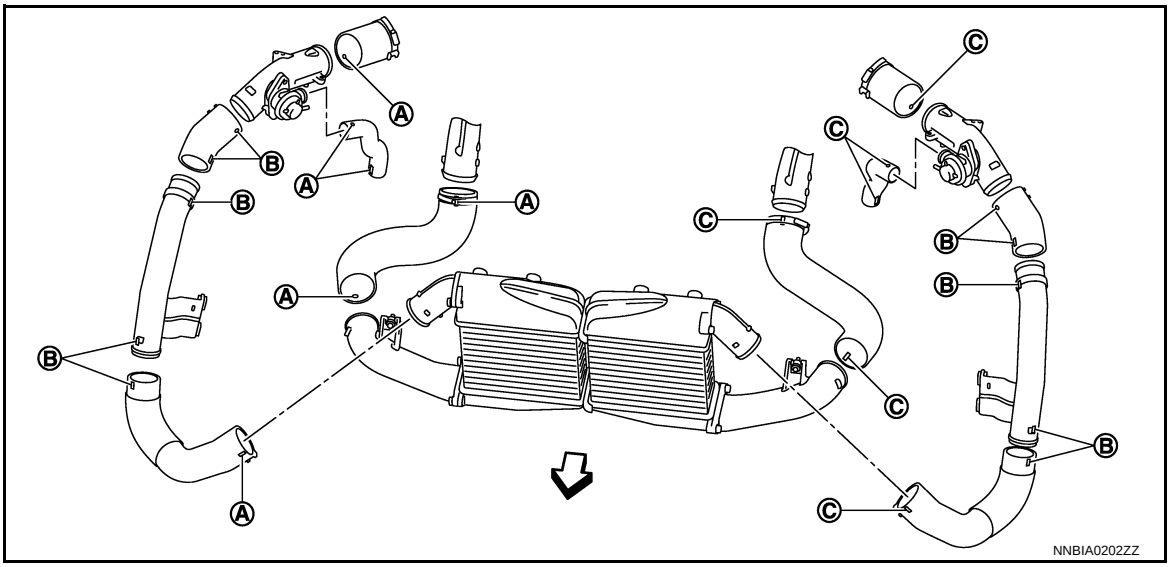
REMOVAL

1. Remove air cleaner case and air duct assembly. Refer to EM-28, "Exploded View".
2. Disconnect turbocharger boost sensor harness connector.
3. Disconnect air inlet hose to remove the turbocharger boost sensor and the integrated recirculation valve and pipe.
   NOTE:
   Mark with paint for a reference purpose before removal.
4. Remove front bumper. Refer to EXT-14, "Exploded View".
5. Remove air intake duct assembly. Refer to DLK-221, "Exploded View (GT-R certified NISSAN dealer)".
6. Disconnect air inlet hose and pipe to remove the charge air cooler assembly.
   CAUTION:
   Never damage or scratch charge air cooler core when removing.

INSTALLATION

Note the following, and install in the reverse order of removal.

AIR INLET HOSE ASSEMBLY



A. Matching mark (blue)
B. Matching mark (yellow)
C. Matching mark (pink)
⇦ : Vehicle front

- To install each part, refer to the above figure to align the matching marks.
- Temporarily assemble all the removed parts before tightening the clamp.
- Tighten the clamp to the specified torque as shown below:

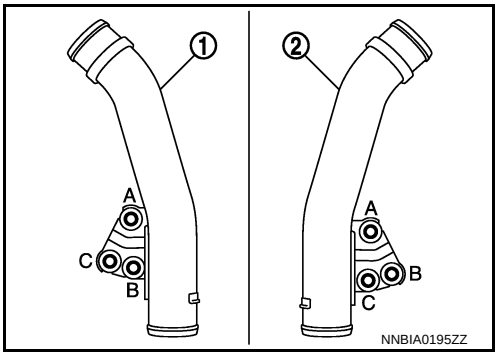
Clamp tightening torque : 4.6 N·m (0.47 kg-m, 41 in-lb)

CAUTION:
Never use air tool or power tools for tightening.

AIR INLET PIPE ASSEMBLY

- Install air inlet pipe assembly as follows:

  1 : Air inlet pipe assembly (bank 1)
  2 : Air inlet pipe assembly (bank 2)



1. Tighten bolt (A) (temporarily).
2. Tighten bolt (B) (temporarily).
3. Tighten bolt (C) (specified torque).
4. Tighten bolt (A) (specified torque).
5. Tighten bolt (B) (specified torque).

Inspection (GT-R certified NISSAN dealer)

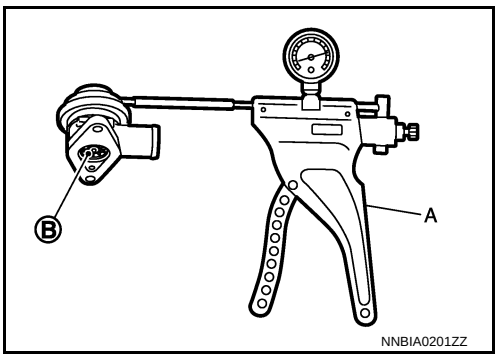
INFOID:0000000011488050

INSPECTION AFTER REMOVAL

Recirculation Valve

- Check that diaphragm lifts and the valve (B) opens when applying negative pressure with a handy vacuum pump (commercial service tool) (A).

Standard **: Refer to EM-141, "Recirculation Valve (GT-R certified NISSAN dealer)".**



- If it exceeds the standard, replace recirculation valve.

Checking Charge Air Cooler

- Visually check that there is no incident and damage on the charge air cooler core and air tank (upper side and lower side).
- If there is an unusual condition, replace the charge air cooler.

Cleaning Charge Air Cooler

Check charge air cooler for mud or clogging. If necessary, clean charge air cooler as follows:

CAUTION:

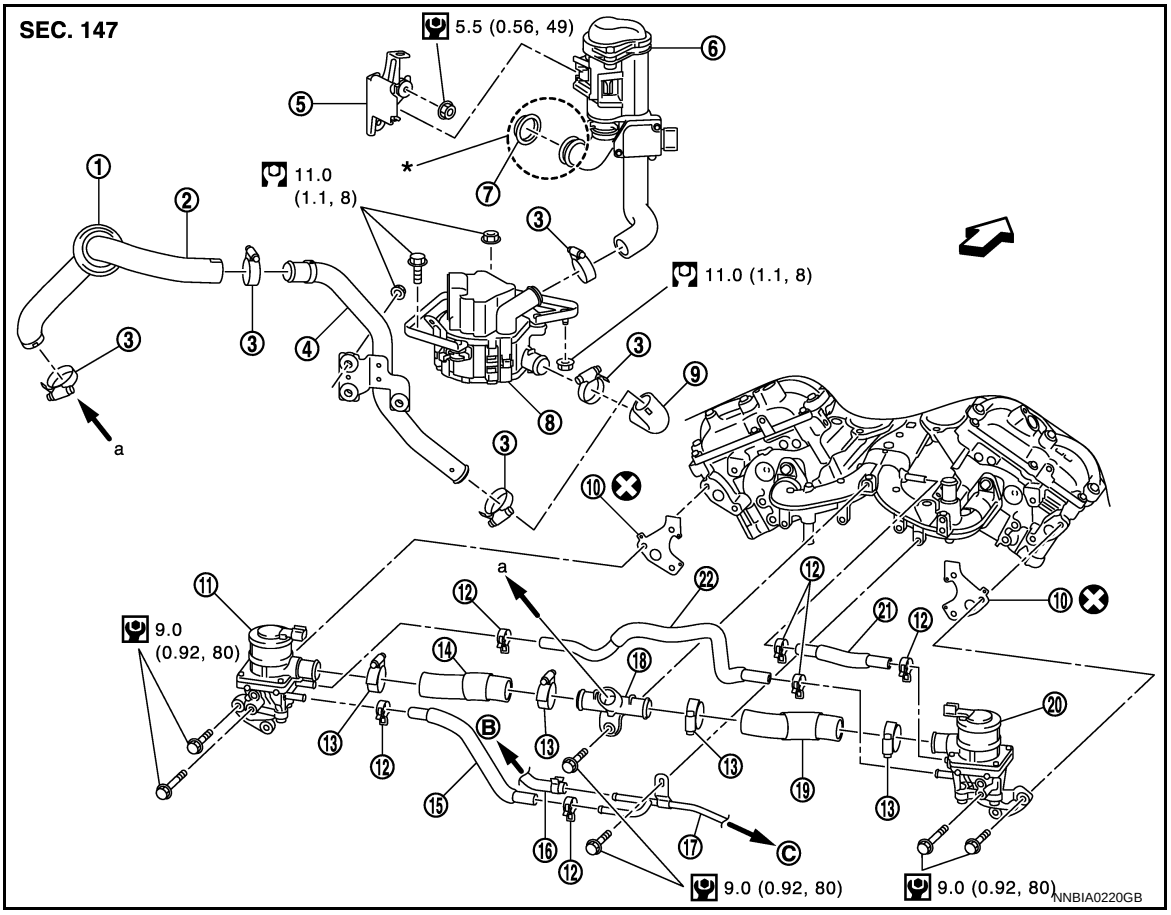
- **Be careful not to bend or damage the charge air cooler fins.**
- **When charge air cooler is cleaned without removal, remove all surrounding parts such as cooling fan shroud and horns. Then tape the harness and connectors to prevent water from entering.**

1. Apply water by hose to the back side of the charge air cooler core vertically download.
   - Apply water again to all charge air cooler core surfaces once per minute.
   - Stop washing if any stains no longer flow out from the charge air cooler.
2. Blow air into the back side of charge air cooler core vertically download.
   - Use compressed air lower than 490 kPa (5 kg/cm2, 71 psi) and keep distance more than 30 cm (11.81 in).
   - Blow air again into all the charge air cooler core surfaces once per minute until no water sprays out.

SECONDARY AIR INJECTION SYSTEM

Exploded View (GT-R certified NISSAN dealer)

INFOID:0000000011488051



1.	Rubber	2.	Air pump hose	3.	Clamp
4.	Air pump pipe	5.	Air pump cleaner bracket	6.	Air pump cleaner assembly
7.	Collar	8.	Air pump assembly	9.	Air pump hose
10.	Gasket	11.	Air cut solenoid valve (bank 2)	12.	Clamp
13.	Clamp	14.	Air hose	15.	Water hose
16.	Water hose	17.	Water outlet tube	18.	3-WAY hose connector
19.	Air hose	20.	Air cut solenoid valve (bank 1)	21.	Water hose
22.	Water hose				
B.	To heater pipe	C.	To exhaust manifold and turbocharger assembly (bank 1)		

⇦ : Engine front

Refer to GI-4, "Components" for symbols in the figure.

CAUTION:

An air cut solenoid valve malfunction may cause a backflow of exhaust gas. Therefore, install pipes with the utmost caution. Special cautions are required for installing the parts marked with an asterisk (*) shown in the exploded view. (Check that the collar pawl is thoroughly fit.)

Removal and Installation (GT-R certified NISSAN dealer)

INFOID:0000000011488052

REMOVAL

1. Remove battery. Refer to PG-91, "Exploded View".
2. Remove fender protector (rear). Refer to EXT-31, "FENDER PROTECTOR : Exploded View".

3. Disconnect air pump hose at 3-way hose connector side.
   • Mark with paint for a reference purpose before removal.
   CAUTION:
   When removing hoses, never apply excessive force to prevent parts (e.g. 3-way hose connector) from damage.
4. Remove cowl top cover (RH). Refer to EXT-28, "Exploded View".
5. Remove air pump assembly and air pump cleaner assembly, disconnecting each joints.
   • Mark with paint for a reference purpose before removal.
   CAUTION:
   • Handle carefully to avoid any shock to air pump assembly and air pump cleaner assembly.
   • Never disassemble air pump assembly and air pump cleaner assembly.
6. Remove the following part before removing the air cut solenoid valve:
   • Intake manifold collector: Refer to EM-35, "Exploded View".
   CAUTION:
   Mark the parts with paint in advance of the reinstallation to prevent misalignment between the intake manifold collector and intake manifold.
   • Heater pipe and heater hose: Refer to CO-23, "Exploded View (GT-R certified NISSAN dealer)".
   CAUTION:
   • Handle carefully to avoid any shock to air cut solenoid valve.
   • Never disassemble air cut solenoid valve.

INSTALLATION

Note the following, and install in the reverse order of removal.

CAUTION:
An air cut solenoid valve malfunction may cause a backflow of exhaust gas. Therefore, install pipes with the utmost caution. Special cautions are required for installing the parts marked with an asterisk (*) shown in the exploded view. (Check that the collar pawl is thoroughly fit.)

• Align marks. Attach each joint. Screw clamps firmly.

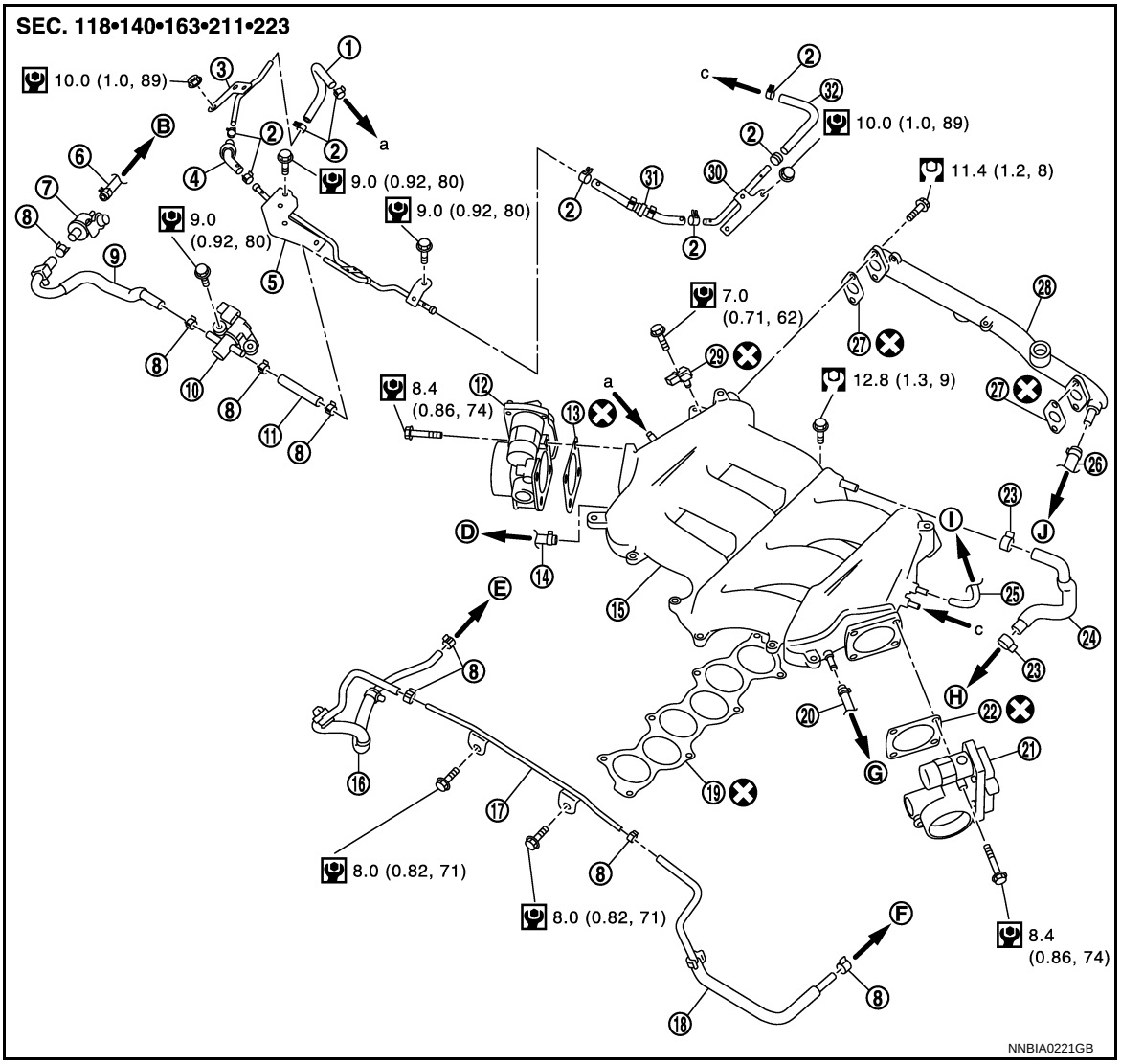
Clamp tightening torque : **1.85 N·m (0.19 kg-m, 16 in-lb)**

CAUTION:
Never use air tool or power tools for tightening.

INTAKE MANIFOLD COLLECTOR

Exploded View

INFOID:0000000011488053



1.	EVAP hose	2.	Clamp	3.	EVAP tube (bank 1)
4.	EVAP connector hose	5.	EVAP tube (front)	6.	EVAP hose
7.	Vacuum tank (service port)	8.	Clamp	9.	EVAP hose
10.	EVAP canister purge control solenoid valve	11.	EVAP hose	12.	Electric throttle control actuator (bank 1)
13.	Gasket	14.	Vacuum hose	15.	Intake manifold collector
16.	Vacuum hose	17.	Vacuum tube assembly	18.	Vacuum hose
19.	Gasket	20.	Vacuum hose	21.	Electric throttle control actuator (bank 2)
22.	Gasket	23.	Clamp	24.	PCV hose
25.	Vacuum hose	26.	Vacuum hose	27.	Gasket
28.	Balance tube	29.	Manifold absolute pressure (MAP) sensor	30.	EVAP tube (bank 2)
31.	EVAP connector hose	32.	EVAP hose		
B.	To centralized under-floor piping	D.	To recirculation valve (bank 1)	E.	To exhaust manifold and turbocharger (bank 1)
F.	To turbocharger boost control solenoid valve	G.	To recirculation valve (bank 2)	H.	To breather separator assembly

I. To pressure regulator and fuel hose assembly
J. To brake booster

Refer to GI-4, "Components" for symbols in the figure.

Removal and Installation

INFOID:0000000011488054

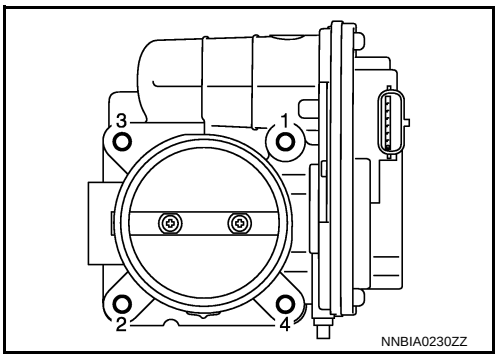
REMOVAL

WARNING:
To avoid the danger of being scalded, never drain engine coolant when the engine is hot.

1. Remove engine cover. Refer to EM-26, "Exploded View".
2. Remove recirculation valve and air inlet hose. Refer to EM-30, "Exploded View".
3. Remove electric throttle control actuator as follows:
   - Loosen mounting bolts in reverse order as shown in the figure.

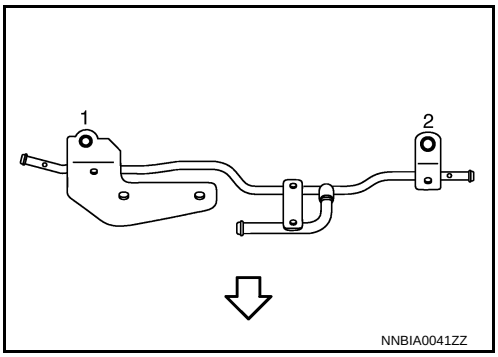
   CAUTION:
   - **Handle carefully to avoid any shock to electric throttle control actuator.**
   - **Never disassemble and adjust electric throttle control actuator.**

   NOTE:
   - The figure shows the electric throttle control actuator (bank 2) viewed from the air duct side.
   - Viewed from the air duct side, order of loosening mounting bolts of electric throttle control actuator (bank 2) is the same as that of the electric throttle control actuator (bank 1).



4. Remove EVAP canister purge volume control solenoid valve and EVAP tube (front) from intake manifold collector.
   - Loosen mounting bolts in reverse order as shown in the figure.

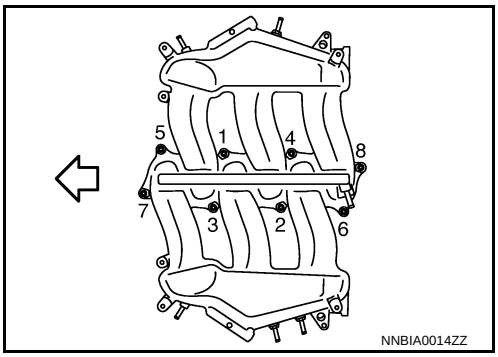
   ⇦ : Engine front



5. Remove vacuum hoses, PCV hoses and EVAP hoses, disconnecting each joints
6. Remove intake manifold collector.
   - Loosen mounting bolts in the reverse order as shown in the figure with power tool.

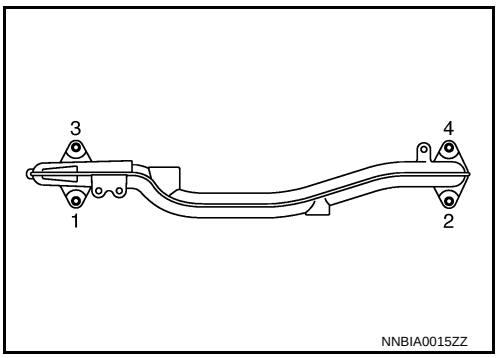
   ⇦ : Engine front

   CAUTION:
   Mark the parts with paint in advance of the reinstallation to prevent misalignment between the intake manifold collector and intake manifold.



7. Remove balance tube.

- Loosen mounting bolts in the reverse order as shown in the figure with power tool.



8. Remove EVAP tube (bank 1 and bank 2), if necessary.
9. Remove vacuum tube assembly, if necessary.
10. Remove manifold absolute pressure (MAP) sensor, if necessary.

CAUTION:
Handle carefully to avoid any shock to manifold absolute pressure (MAP) sensor.

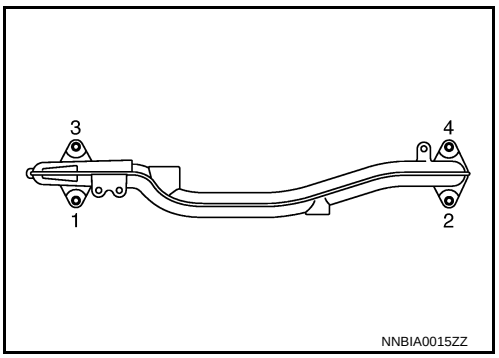
INSTALLATION

Note the following, and install in the reverse order of removal.

Balance Tube

- Tighten mounting bolts in numerical order as shown in the figure.

⇦ : Engine front

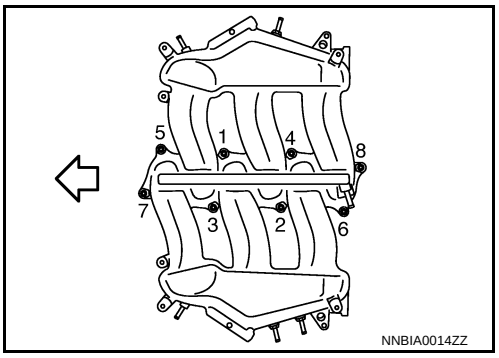


Intake Manifold Collector

- Tighten mounting bolts in numerical order as shown in the figure.

⇦ : Engine front

CAUTION:
- **Install each part according to the marks put before removal.**
- **Tighten mounting bolts with care to avoid misalignment in the intake manifold collector.**

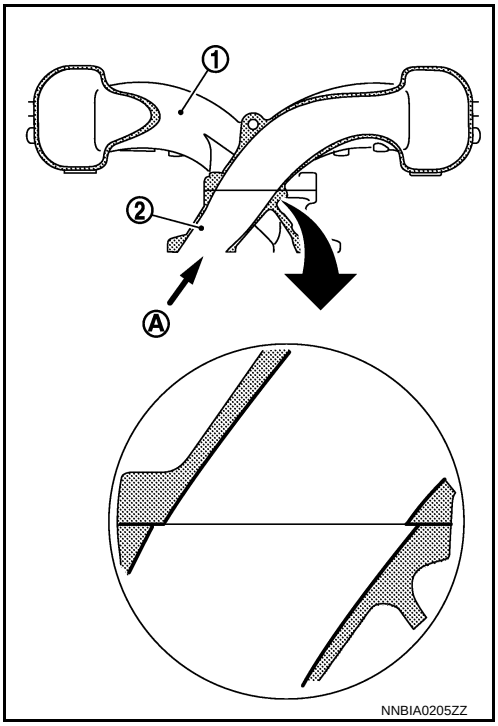


- **After replacing an intake manifold collector, be sure to adjust the position as instructed below.**

1. Remove intake manifold. Refer to EM-40, "Exploded View".

CAUTION:
Mark the parts with paint with advance of the reinstallation to prevent misalignment between the intake manifold and cylinder head.

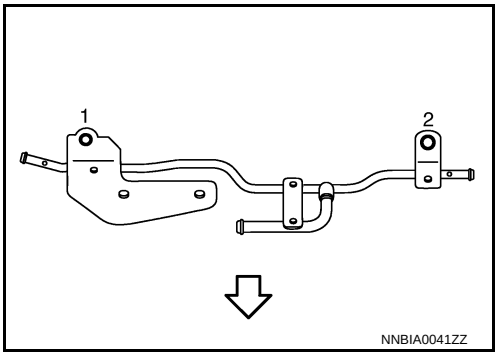
2. Temporarily assemble intake manifold collector (1) and intake manifold (2).
3. Check an exact location that the intake manifold collector port locates inside the intake manifold port and mark each part. Refer to the arrow (A) shown in the figure to check the location.
4. After another disassembly, install the parts, aligning with the marks put before the temporary assembly.
   CAUTION:
   Tighten mounting bolts with care to avoid misalignment in the intake manifold collector and intake manifold.



EVAP Tube (front)

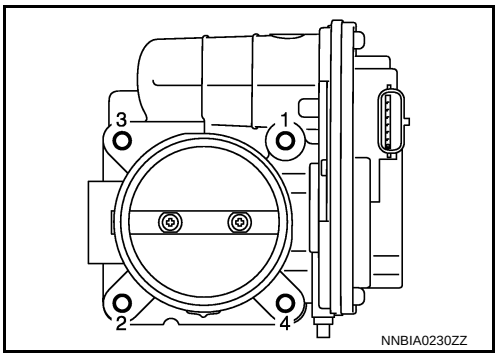
- Tighten mounting bolts in numerical order as shown in the figure.

⇦ : Engine front



Electric Throttle Control Actuator

- Tighten bolts in numerical order as shown in the figure.
  NOTE:
  - The figure shows the electric throttle control actuator (bank 2) viewed from the air duct side.
  - Viewed from the air duct side, the order of tightening mounting bolts of electric throttle control actuator (bank 2) is the same as that of the electric throttle control actuator (bank 1).
  - Perform the “Throttle Valve Closed Position Learning” when harness connector of electric throttle control actuator is disconnected. Refer to EC-23, "THROTTLE VALVE CLOSED POSITION LEARNING : Description (GT-R certified NISSAN dealer)".



- Perform the “Idle Air Volume Learning” and “Throttle Valve Closed Position Learning” when electric throttle control actuator is replaced. Refer to EC-23, "THROTTLE VALVE CLOSED POSITION LEARNING : Description (GT-R certified NISSAN dealer)" and EC-24, "IDLE AIR VOLUME LEARNING : Description (GT-R certified NISSAN dealer)".

Inspection (GT-R certified NISSAN dealer)

INFOID:0000000011488055

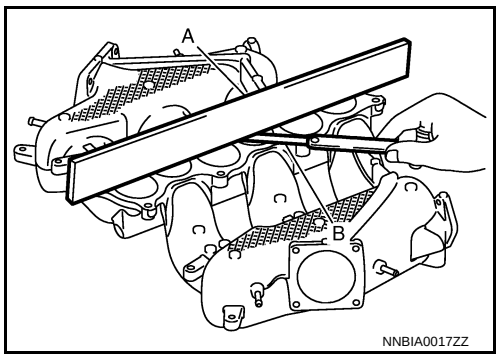
INSPECTION AFTER REMOVAL

Surface Distortion

- Check the surface distortion of the intake manifold collector mating surface with a straightedge (A) and a feeler gauge (B).

Limit : **Refer to** **EM-141, "Intake Manifold Collector (GT-R certified NISSAN dealer)"****.**

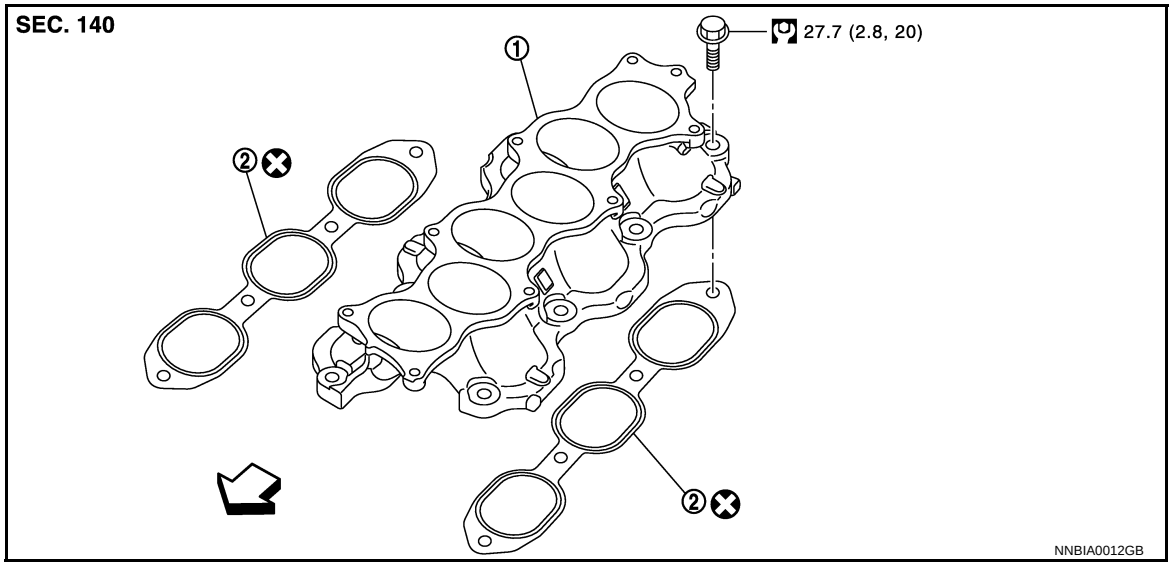
- If it exceeds the limit, replace intake manifold collector.



INTAKE MANIFOLD

Exploded View

INFOID:0000000011488056



1. Intake manifold
2. Gasket

⇦ : Engine front

Refer to GI-4, "Components" for symbols in the figure.

Removal and Installation

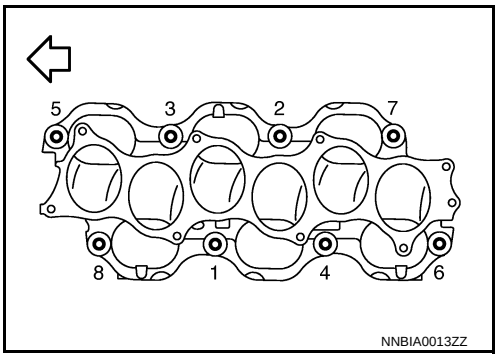
INFOID:0000000011488057

REMOVAL

1. Remove intake manifold collector. Refer to EM-35, "Exploded View".
   CAUTION:
   Mark the parts with paint in advance of the reinstallation to prevent misalignment between the intake manifold collector and intake manifold.
2. Loosen pressure regulator and fuel hose assembly mounting bolt. Refer to EM-42, "Exploded View".
3. Disconnect harness connector from fuel tube.
4. Remove intake manifold.
   - Loosen mounting bolts in reverse order as shown in the figure with power tool.

   ⇦ : Engine front

   CAUTION:
   - **Mark the parts with paint in advance of the reinstallation to prevent misalignment between the intake manifold and cylinder head.**
   - **Cover engine openings to avoid entry of foreign materials.**



5. Remove gaskets.

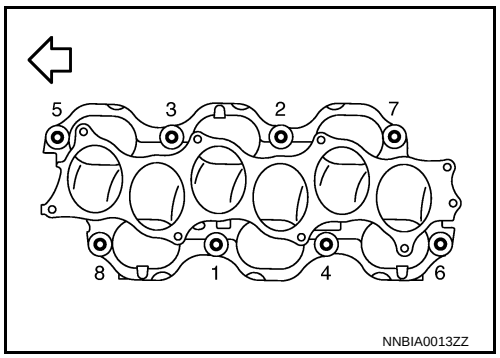
INSTALLATION

Note the following, and install in the reverse order of removal.

Intake Manifold

- Tighten mounting bolts in numerical order as shown in the figure.

⇦ : Engine front



- Refer to the figure to check the installation direction of the intake manifold.

CAUTION:

- **Install each part according to the marks put before removal.**
- **Tighten mounting bolts with care to avoid misalignment in the intake manifold.**

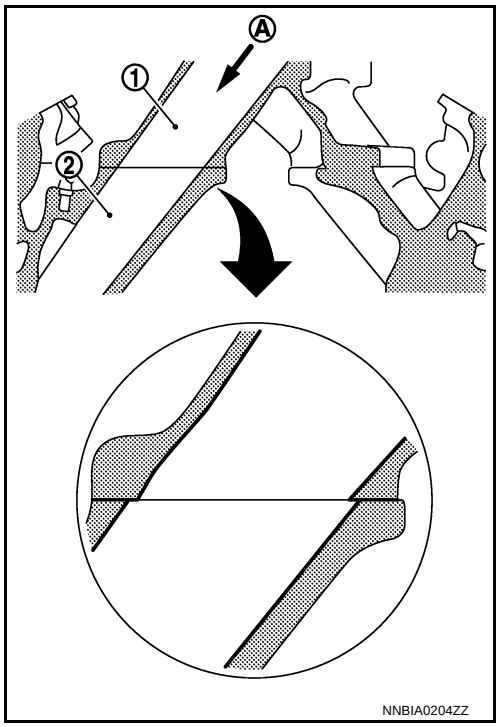
- **After replacing an intake manifold, be sure to adjust the position as instructed below.**
- Check an exact location that the intake manifold port locates inside the cylinder head port and mark each part. Refer to the arrow (A) shown in the figure to check the location.

1 : Intake manifold

2 : Cylinder head

CAUTION:

Tighten mounting bolts with care to avoid misalignment in the intake manifold.



Inspection (GT-R certified NISSAN dealer)

INFOID:0000000011488058

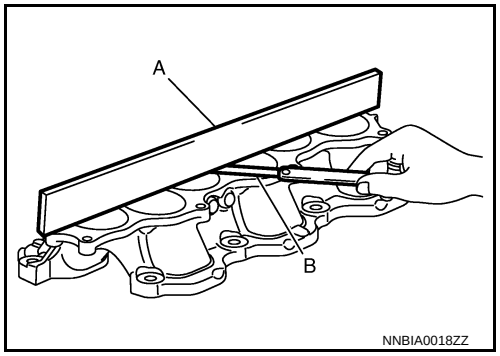
INSPECTION AFTER REMOVAL

Surface Distortion

- Check the surface distortion of the intake manifold mating surface with a straightedge (A) and a feeler gauge (B).

Limit : **Refer to EM-141, "Intake Manifold (GT-R certified NISSAN dealer)".**

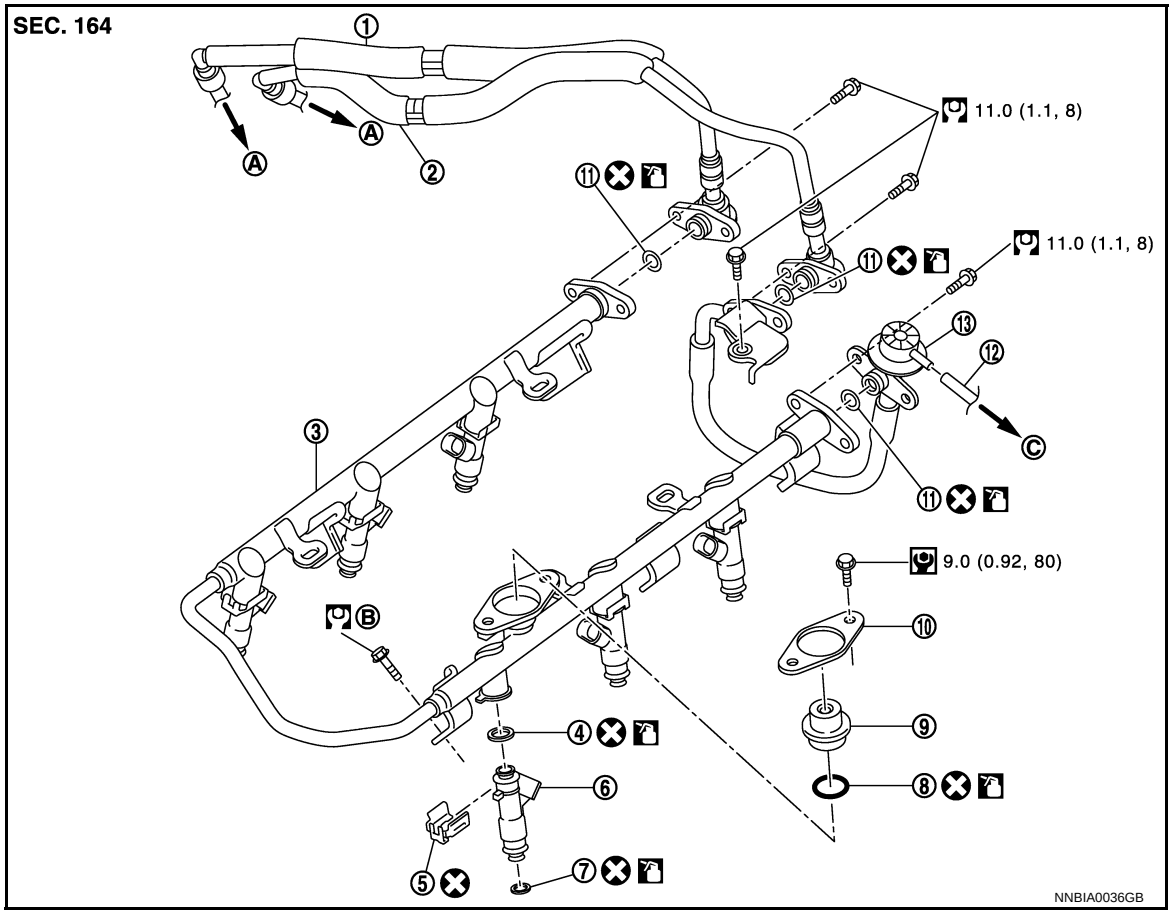
- If it exceeds the limit, replace intake manifold.



FUEL INJECTOR AND FUEL TUBE

Exploded View

INFOID:0000000011488059



1.	Fuel feed hose (with damper)	2.	Fuel return hose (with damper)	3.	Fuel tube
4.	O-ring (black)	5.	Clip	6.	Fuel injector
7.	O-ring (green)	8.	O-ring	9.	Fuel damper
10.	Fuel damper cap	11.	O-ring	12.	Vacuum hose
13.	Fuel hose (with pressure regulator)				
A.	To centralized under-floor piping	B.	Comply with the assembly procedure when tightening. Refer to EM-42	C.	To intake manifold collector

Refer to GI-4, "Components" for symbols in the figure.

CAUTION:
Never remove or disassemble parts unless instructed as shown in the figure.

Removal and Installation (GT-R certified NISSAN dealer)

INFOID:0000000011488060

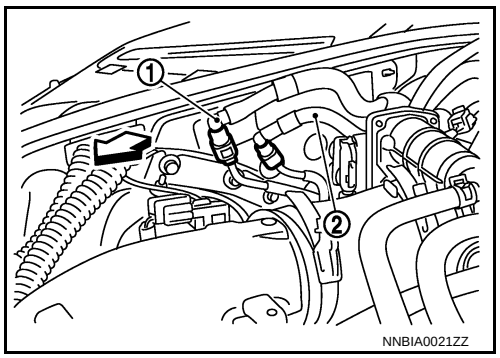
REMOVAL

WARNING:
- **Put a “CAUTION: FLAMMABLE” sign in the workshop.**
- **Be sure to work in a well ventilated area and furnish workshop with a CO_2 fire extinguisher.**
- **Never smoke while servicing fuel system. Keep open flames and sparks away from the work area.**
- **To avoid the danger of being scalded, never drain engine coolant when the engine is hot.**

1. Release fuel pressure. Refer to EC-637, "Inspection (GT-R certified NISSAN dealer)".
2. Remove engine cover with power tool. Refer to EM-26, "Exploded View".

3. Disconnect fuel feed hose (with damper) (1) and fuel return hose (with damper) (2) from centralized under-floor piping connection, disconnect quick connector as follows:

⇦ : Engine front



a. Push in retainer (D).

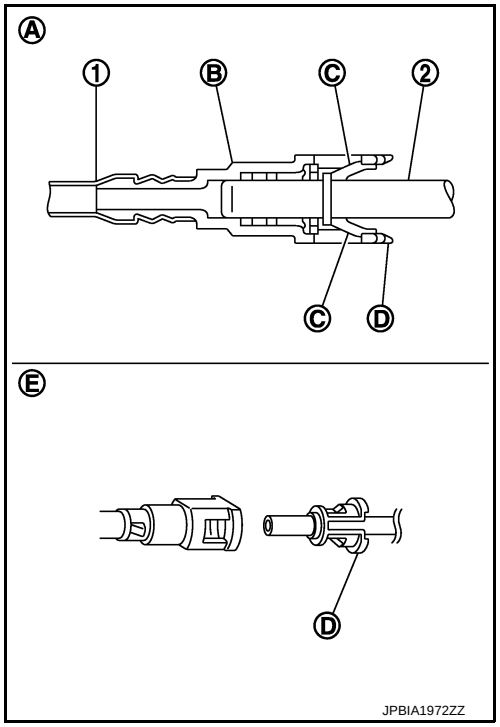
1 : Fuel hose
A : Connection (Cross-section)
C : Tabs
E : Disconnection

b. Draw and pull out quick connector (B) straight from centralized under-floor piping (2).

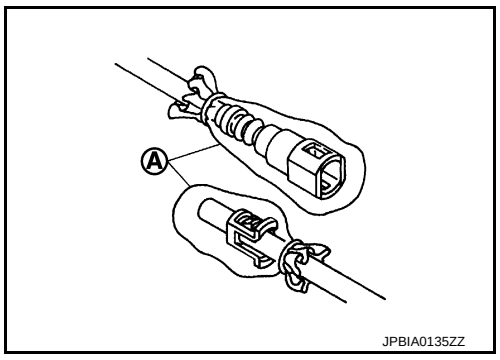
CAUTION:

- **Keep parts away from heat source. Especially, be careful when welding is performed around them.**
- **Never expose parts to battery electrolyte or other acids.**
- **Never pull with lateral force applied. O-ring inside quick connector may be damaged.**
- **Never remove the remaining retainer.**
- **Never bend or twist connection between quick connector and fuel hose during installation/removal.**
- **When centralized under-floor piping is replaced, also replace retainer with a new one.**

Retainer color
Feed side : Yellow
Return side : Light blue



- **To keep clean the connecting portion and to avoid damage and foreign materials, cover them completely with plastic bags, etc. (A) or something similar.**



4. Remove intake manifold collector. Refer to EM-35, "Exploded View".

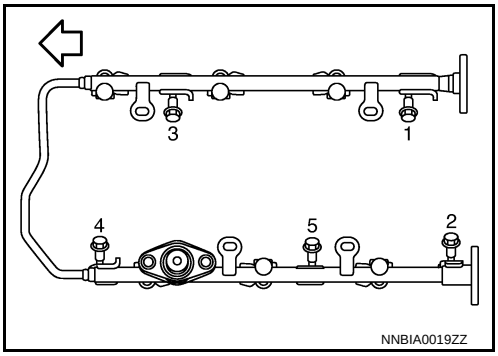
CAUTION:
Mark the parts with paint in advance of the reinstallation to prevent misalignment between the intake manifold collector and intake manifold.

5. Remove fuel feed hose (with damper) and fuel return hose (with damper) from fuel tube.
6. Remove fuel hose (with pressure regulator), if necessary.

CAUTION:
Never tilt it, or remaining fuel in pipes may flow out from pipes.

7. Disconnect fuel injector sub harness from fuel injector.

8. Remove fuel tube and fuel injector assembly.

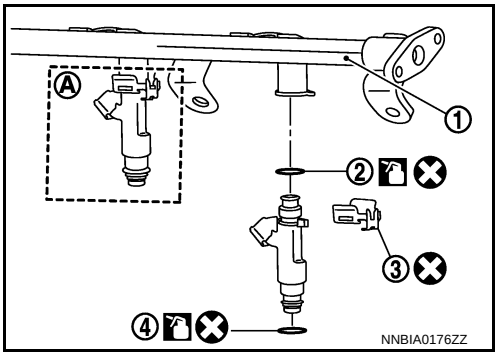


⇦ : Engine front

- Loosen mounting bolts in reverse order as shown in the figure.

CAUTION:
Never tilt it, or remaining fuel in pipes may flow out from pipes.

9. Remove fuel injector from fuel tube (1) as follows:



2 : O-ring (black)
4 : O-ring (green)
A : Installed condition

a. Open and remove clip (3).
b. Remove fuel injector from fuel tube by pulling straight.

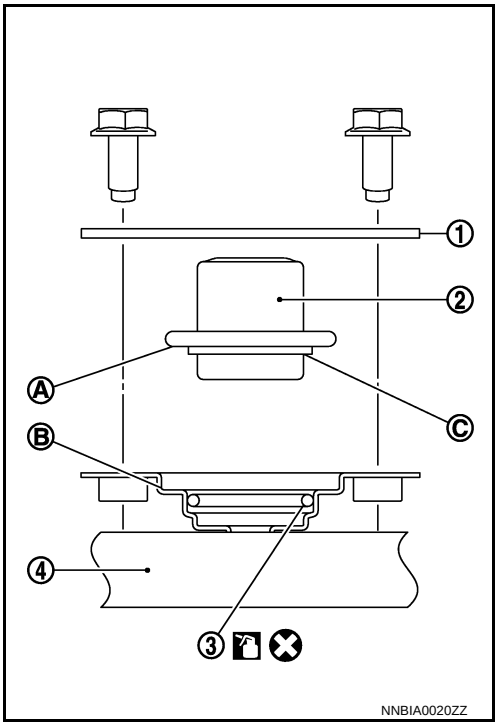
CAUTION:
- **Be careful with remaining fuel that may go out from fuel tube.**
- **Be careful not to damage injector nozzles during removal.**
- **Never bump or drop fuel injector.**
- **Never disassemble fuel injector.**

10. Remove fuel damper from fuel tube, if necessary.

INSTALLATION

CAUTION:
Do not reuse O-rings.

1. Install fuel damper (2) as follows:



1 : Fuel damper cap

a. Install new O-ring (3) to fuel tube (4) as shown. When handling new O-ring, be careful of the following caution:

CAUTION:
- **Do not reuse O-ring.**
- **Handle O-ring with bare hands. Never wear gloves.**
- **Lubricate O-ring with new engine oil.**
- **Never clean O-ring with solvent.**
- **Check that O-ring and its mating part are free of foreign material.**
- **When installing O-ring, be careful not to scratch it with tool or fingernails. Also be careful not to twist or stretch O-ring. If O-ring was stretched while it was being attached, never insert it quickly into fuel tube.**
- **Insert new O-ring straight into fuel tube. Never twist it.**

b. Install spacer (C) to fuel damper.
c. Insert fuel damper straight into fuel tube.

CAUTION:
- **Insert fuel damper until (A) is touching (B) of fuel tube.**
- **Insert straight, making sure that the axis is lined up.**
- **Never pressure-fit with excessive force.**

Reference value : 130 N (13.3 kg, 29.2 lb)

d. Tighten bolts evenly in turn.
- After tightening bolts, check that there is no gap between fuel damper cap and fuel tube.

2. Install new O-rings to fuel injector, paying attention to the following.

CAUTION:

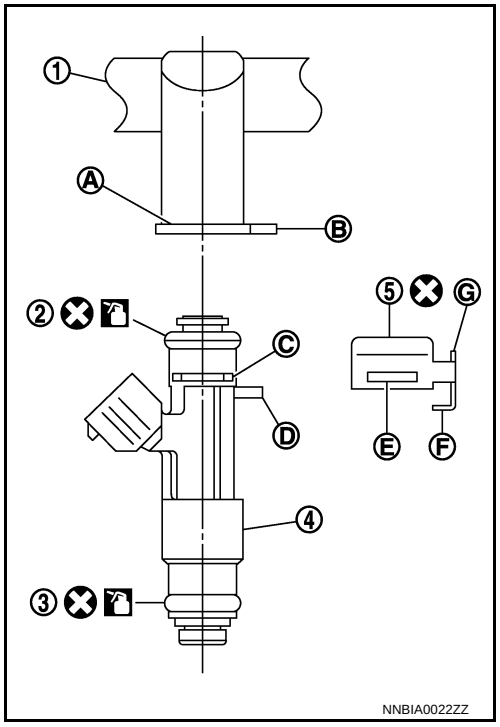
- **Do not reuse O-rings.**
- **Upper and lower O-ring are different. Be careful not to confuse them.**

Fuel tube side : Black
Nozzle side : Green

- **Handle O-ring with bare hands. Never wear gloves.**
- **Lubricate O-ring with new engine oil.**
- **Never clean O-ring with solvent.**
- **Check that O-ring and its mating part are free of foreign material.**
- **When installing O-ring, be careful not to scratch it with tool or fingernails. Also be careful not to twist or stretch O-ring. If O-ring was stretched while it was being attached, never insert it quickly into fuel tube.**
- **Insert O-ring straight into fuel injector. Never decenter or twist it.**

3. Install fuel injector (4) to fuel tube as follows:

2 : O-ring (Black)
3 : O-ring (Green)



a. Insert clip (5) into clip mounting groove (C) on fuel injector.
- Insert clip so that protrusion (D) of fuel injector matches cutout (F) of clip.

CAUTION:

- **Never reuse clip. Replace it with a new one.**
- **Be careful to keep clip from interfering with O-ring. If interference occurs, replace O-ring.**

b. Insert fuel injector into fuel tube (1) with clip attached.
- Insert it while matching it to the axial center.
- Insert fuel injector so that protrusion (B) of fuel tube matches cutout (G) of clip.
- Check that fuel tube flange (A) is securely fixed in flange fixing groove (E) on clip.

CAUTION:
Never pressure-fit with excessive force.

Reference value : 130 N (13.3 kg, 29.2 lb)

c. Check that installation is complete by checking that fuel injector does not rotate or come off.
- Check that protrusions of fuel injectors are aligned with cutouts of clips after installation.

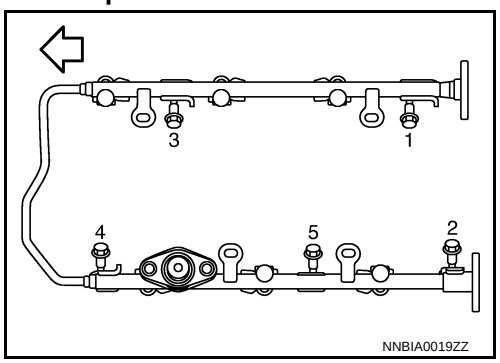
4. Install fuel tube and fuel injector assembly.

CAUTION:
Be careful not to let tip of injector nozzle come in contact with other parts.

- Tighten mounting bolts in two steps in numerical order as shown in the figure.

⇦ : Engine front

1st step : 10.1 N·m (1.0 kg-m, 7 ft-lb)
2nd step : 22.0 N·m (2.2 kg-m, 16 ft-lb)



5. Connect fuel injector sub harness.
6. Install fuel hose (with pressure regulator), if removed.
- Handling procedure of O-ring is the same as that of fuel damper.

- Insert fuel damper straight into fuel tube.
- Tighten mounting bolts evenly in turn.
- After tightening mounting bolts, check that there is no gap between flange and fuel tube.

7. Install fuel feed hose (with damper) and fuel return hose (with damper) as follows:

a. Fuel tube side:
- Handling procedure of O-ring is the same as that of fuel damper.
- Insert fuel damper straight into fuel tube.
- Tighten mounting bolts evenly in turn.
- After tightening mounting bolts, check that there is no gap between flange and fuel tube.

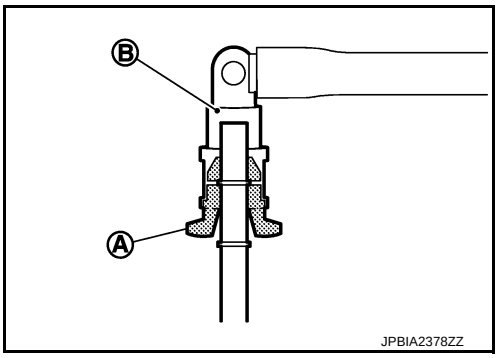
b. Connect quick connector centralized under-floor piping side:

i. Check no foreign substances are deposited in and around centralized under-floor piping and quick connector, and no damage on them.

ii. Thinly apply new engine oil around centralized under-floor piping from tip end to spool end.

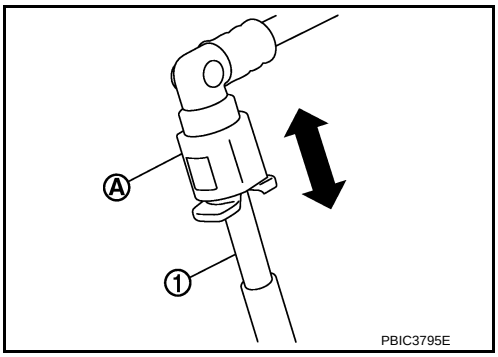
iii. Align center to insert quick connector straightly into centralized under-floor piping.
- Visually confirm that the two retainer tabs (A) are connected to the quick connector (B).

CAUTION:
- **Carefully align center to avoid inclined insertion to prevent damage to O-ring inside quick connector.**
- **Insert until you hear a “click” sound and actually feel the engagement.**
- **To avoid misidentification of engagement with a similar sound, be sure to perform the next step.**



iv. Pull quick connector (A) by hand holding position. Check it is completely engaged (connected) so that it does not come out from fuel piping.

1 : Centralized under-floor piping



8. Install in the reverse order of removal after this step.

Inspection (GT-R certified NISSAN dealer)

INFOID:0000000011488061

INSPECTION AFTER INSTALLATION

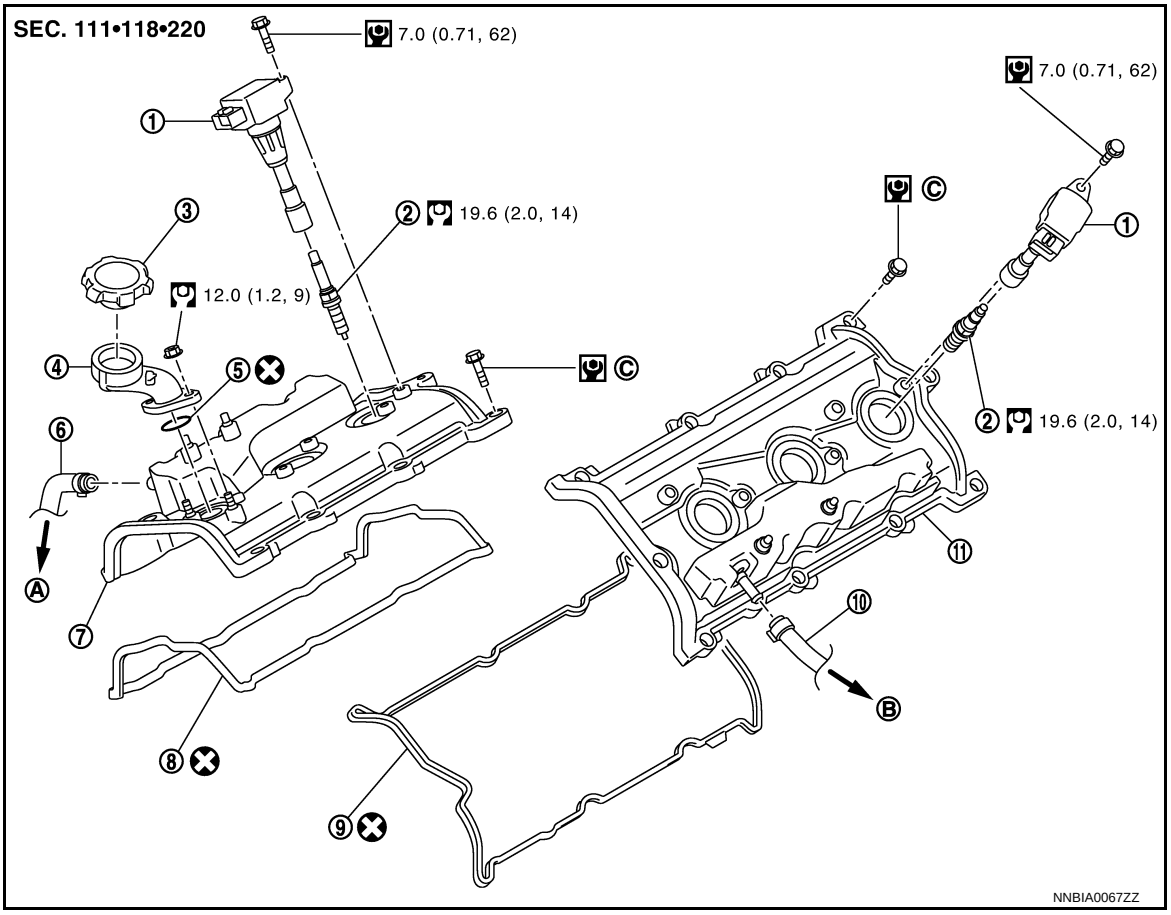
Check on Fuel Leakage

1. Turn ignition switch “ON” (with the engine stopped). With fuel pressure applied to fuel piping, check there are no fuel leakage at connection points.
NOTE:
Use mirrors for checking at points out of clear sight.
2. Start the engine. With engine speed increased, check again that there are no fuel leakage at connection points.
CAUTION:
Never touch the engine immediately after stopped, as the engine becomes extremely hot.

IGNITION COIL, SPARK PLUG AND ROCKER COVER

Exploded View

INFOID:0000000011488062



1.	Ignition coil	2.	Spark plug	3.	Oil filler cap
4.	Oil filler tube	5.	O-ring	6.	Fresh air hose
7.	Rocker cover (bank 1)	8.	Rocker cover gasket (bank 1)	9.	Rocker cover gasket (bank 2)
10.	Fresh air hose	11.	Rocker cover (bank 2)		
A.	To fresh air tube (bank 1)	B.	To fresh air tube (bank 2)	C.	Comply with the installation procedure when tightening. Refer to EM-47.

Refer to GI-4, "Components" for symbols in the figure.

Removal and Installation (GT-R certified NISSAN dealer)

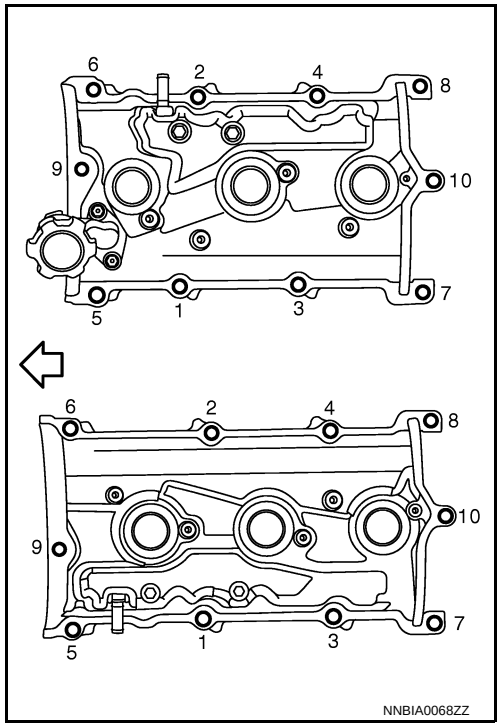
INFOID:0000000011488063

REMOVAL

1. Remove engine cover. Refer to EM-26, "Exploded View".
2. Remove intake manifold collector. Refer to EM-35, "Exploded View".
   CAUTION:
   Mark the parts with paint in advance of the reinstallation to prevent misalignment between the intake manifold collector and intake manifold.
3. Disconnect EVAP tube. Refer to EM-35, "Exploded View".
4. Remove ignition coil.
   CAUTION:
   Never shock ignition coil.
5. Remove fresh air hose.

6. Loosen heater pipe mounting bolts (bank 2 side). Refer to CO-23, "Exploded View (GT-R certified NISSAN dealer)".
7. Remove rocker cover.
   • Loosen bolts in reverse order shown in the figure.

   ⇦ : Engine front



8. Remove rocker cover gasket from rocker cover.
9. Remove oil filler tube from rocker cover, if necessary.
10. Use scraper to remove all traces of liquid gasket from cylinder head and camshaft bracket (No. 1).
    CAUTION:
    Never scratch or damage the mating surface when cleaning off old liquid gasket.

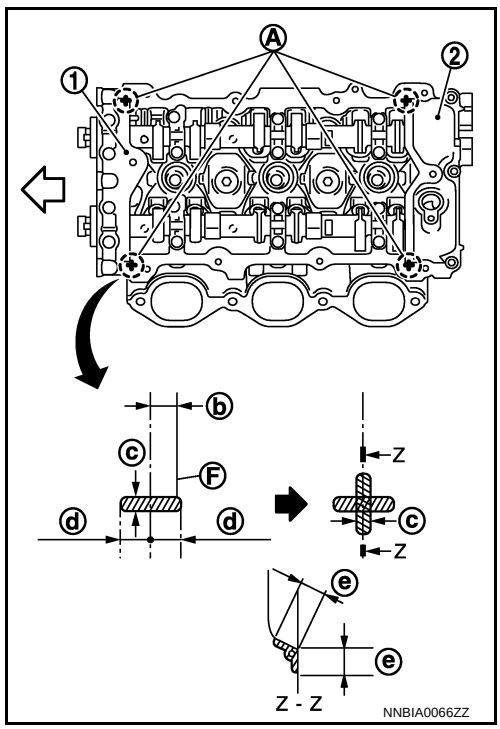
INSTALLATION

CAUTION:
Do not reuse O-rings.

1. Apply liquid gasket to camshaft bracket (No. 1) (1) and camshaft sensor bracket (2). (bank 1 and bank 2)

   A : Liquid gasket application point
   F : End surface of camshaft bracket (No. 1)
   b : 4 mm (0.16 in)
   c : ϕ2.5 - 3.5 mm (0.098 - 0.138 in)
   d : 5 mm (0.20 in)
   e : 10 mm (0.39 in)
   ⇦ : Engine front

   Use Genuine RTV silicone sealant or equivalent. Refer toGI-18, "Recommended Chemical Products and Sealants".
   • Apply liquid gasket on the front and rear side of engine first. [5 mm (0.20 in) + 5 mm (0.20 in) side as shown in the figure]
   NOTE:
   The figure shows an example of bank 1 side.



2. Install rocker cover as follows:

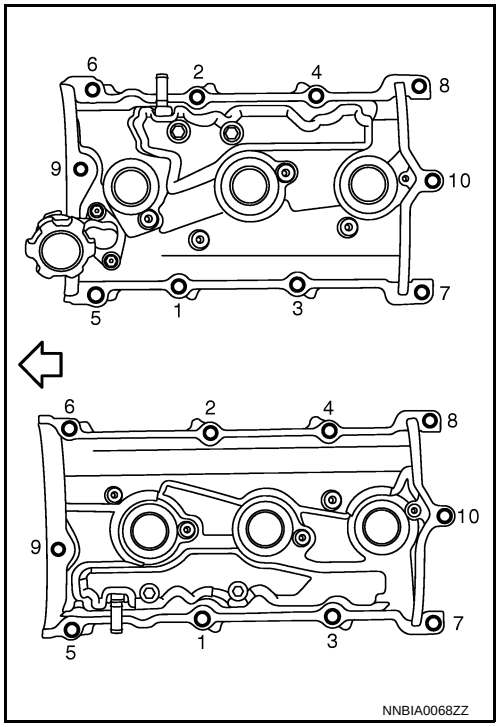
a. Install rocker cover gasket to rocker cover.
- Check if rocker cover gasket is not dropped from the installation groove of rocker cover.

b. Tighten bolts in two steps separately in numerical order as shown in the figure.

⇦ : Engine front

1st step : 2.0 N·m (0.2 kg-m, 18 in-lb)

2nd step : 8.3 N·m (0.85 kg-m, 73 in-lb)



4. Install fresh air hose.
- Insert hose by 27 to 32 mm (1.06 to 1.26 in) from connector end.

5. Install in the reverse order of removal after this step.

CATALYST

Exploded View

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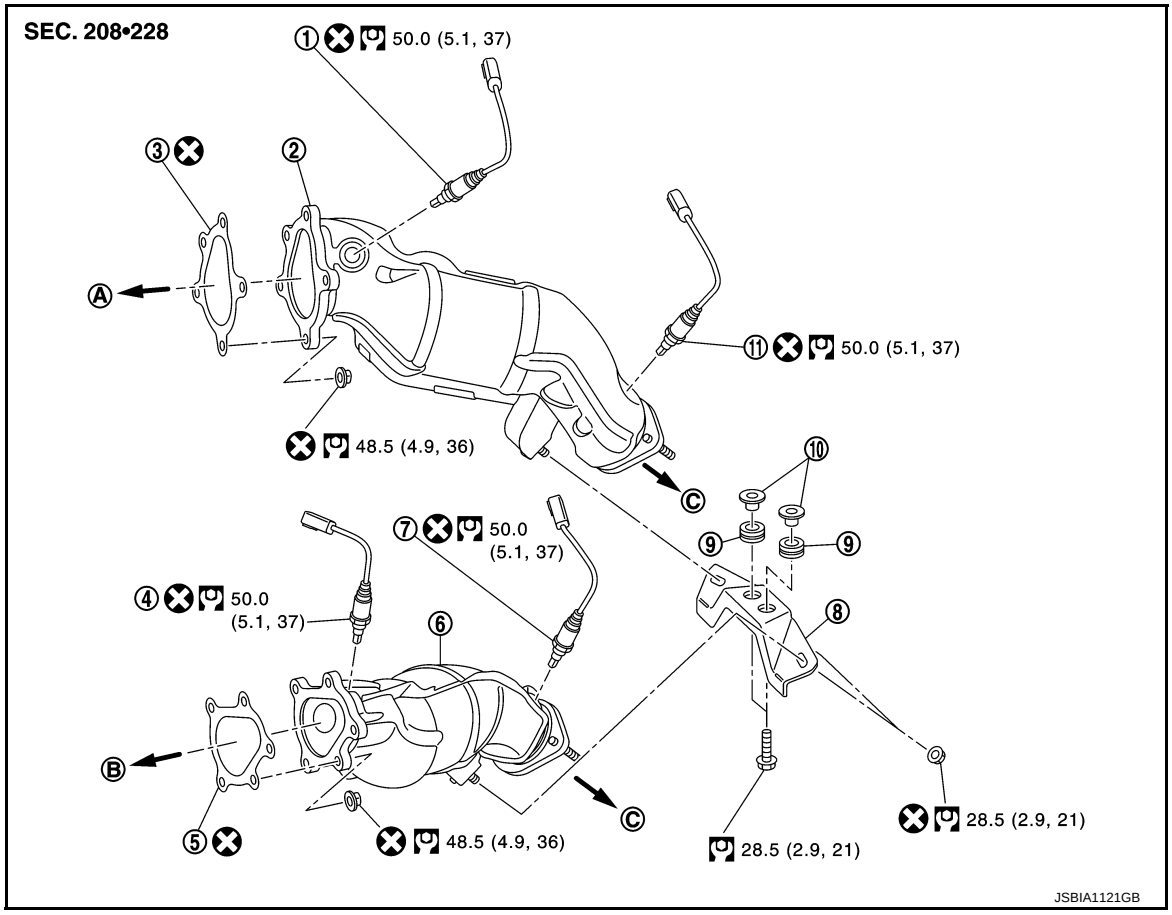


1.	Air fuel ratio sensor 1 (bank 1)	2.	Three way catalyst (bank 1)	3.	Gasket
4.	Air fuel ratio sensor 1 (bank 2)	5.	Gasket	6.	Three way catalyst (bank 2)
7.	Heated oxygen sensor 2 (bank 2)	8.	Bracket	9.	Mounting rubber
10.	Collar	11.	Heated oxygen sensor 2 (bank 1)		
A.	To exhaust manifold and turbocharger assembly (bank 1)	B.	To exhaust manifold and turbocharger assembly (bank 2)	C.	To sub muffler

Refer to GI-4, "Components" for symbols in the figure.

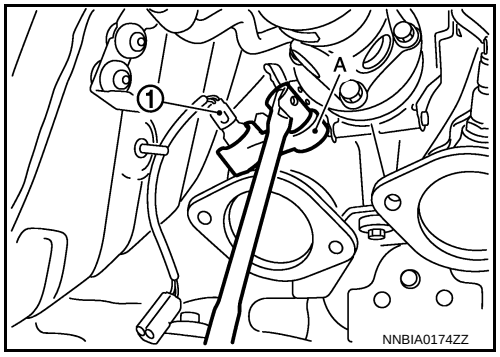
Removal and Installation (GT-R certified NISSAN dealer)

INFOID:0000000011488065

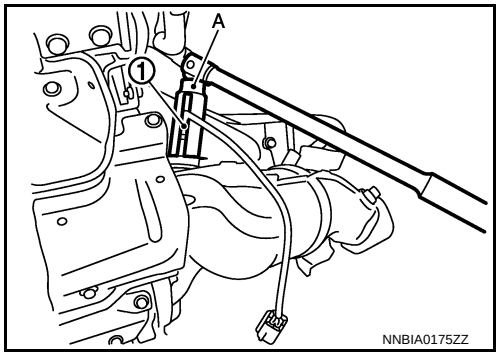
REMOVAL

1. Disconnect air fuel ratio sensor 1 harness connector.
2. Remove floor under cover. Refer to EXT-41, "FLOOR UNDER COVER : Exploded View".
3. Remove front under cover. Refer to EXT-40, "FRONT UNDER COVER : Exploded View".
4. Remove front cross bar. Refer to EX-7, "Exploded View".
5. Loosen the nut of the mounting bracket (No.2), and remove a sub muffler. Refer to EX-7, "Exploded View".
   NOTE:
   Move the sub muffler to the rear and pull it up from a stud bolt of the three way catalyst.
6. Remove front propeller shaft. Refer to DLN-51, "Exploded View".
7. Remove main propeller shaft. Refer to DLN-60, "Exploded View".
8. Remove bracket.

9. Disconnect heated oxygen sensor 2 harness connector.
   CAUTION:
   Place an identification mark on the harness connectors of heated oxygen sensor 2 for discrimination between right and left to facilitate the installation.
10. Remove three way catalyst.
    CAUTION:
    Be careful not to damage three way catalyst.
    NOTE:
    Apply penetrating lubricant to nuts before operation.
11. Remove gaskets.
    CAUTION:
    Cover engine openings to avoid entry of foreign materials.
12. Remove air fuel ratio sensor 1 and heated oxygen sensor 2, if necessary.
    - Using the heated oxygen sensor wrench [SST: KV10114400 (J-38365)] (A), remove heated oxygen sensor 2 (1).
      CAUTION:
      Heated oxygen sensor 2 is not reusable. Never remove it except when necessary.
      NOTE:
      Heated oxygen sensor 2 is removable under the car-mounted condition.



    - Using the heated oxygen sensor wrench [SST: KV10117100 (J-3647-A)] (A), remove air fuel ratio sensor 1 (1).
      CAUTION:
      Air fuel ration sensor 1 is not reusable. Never remove it except when necessary.
      NOTE:
      Air fuel ration sensor 1 is removable under the car-mounted condition.



INSTALLATION

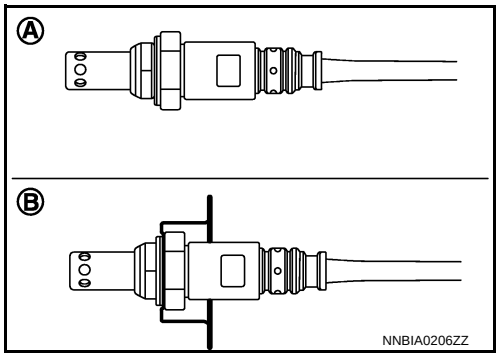
Note the following, and install in the reverse order of removal.

Air Fuel Ratio Sensor 1 and Heated Oxygen Sensor 2

CAUTION:

- **The shape of air fuel ratio sensor 1 depends on bank position. Refer to the figure to install.**

A : Bank 1
B : Bank 2



- **Before installing a new air fuel ration sensor 1 and heated oxygen sensor 2, clean exhaust system threads using heated oxygen sensor thread cleaner tool (commercial service tool: J-43897-18 or J-43897-12) and apply anti-seize lubricant.**
- **Set the tool in the hexagonal part to tighten new air fuel ration sensor 1 and heated oxygen sensor 2.**

- **Never over torque new air fuel ration sensor 1 and heated oxygen sensor 2. Doing so may cause damage to them, resulting in the “MIL” coming on.**
- **Prevent rust preventives from adhering to the sensor body.**

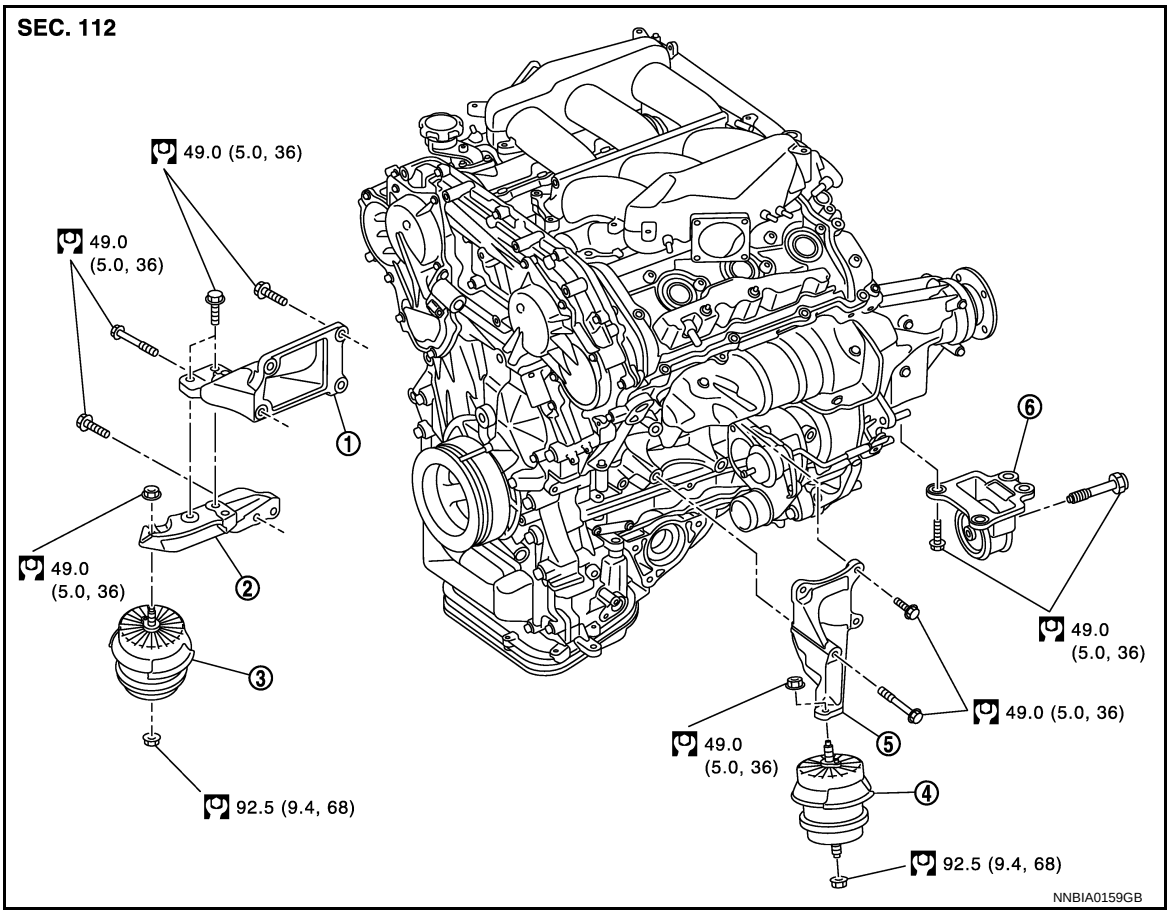
NOTE:
Universal joint can be used only when tightening three way catalyst on the exhaust manifold turbocharger assembly side.

UNIT REMOVAL AND INSTALLATION

ENGINE ASSEMBLY

Exploded View (GT-R certified NISSAN dealer)

INFOID:0000000011488066



1. Engine mounting bracket (RH)
2. Engine mounting bracket (RH) (lower)
3. Engine mounting insulator (RH)
4. Engine mounting insulator (LH)
5. Engine mounting bracket (LH)
6. Engine mounting insulator (rear)

Refer to GI-4, "Components" for symbols in the figure.

Removal and Installation (GT-R certified NISSAN dealer)

INFOID:0000000011488067

WARNING:
- **Situate the vehicle on a flat and solid surface.**
- **Place chocks at front and back of rear wheels.**
- **For engines not equipped with engine slingers, attach proper slingers and bolts described in PARTS CATALOG.**

CAUTION:
- **Always be careful to work safely, avoid forceful or uninstructed operations.**
- **Never start working until exhaust system and engine coolant are cool enough.**
- **If items or work required are not covered by the engine section, refer to the applicable sections.**
- **Always use the support point specified for lifting.**
- **Use either 2-pole lift type or separate type lift as best you can. If board-on type is used for unavoidable reasons, support at rear axle jacking point with transmission jack or similar tool before starting work, in preparation for the backward shift of center of gravity.**
- **For supporting points for lifting and jacking point at rear axle, refer to GI-31, "Garage Jack and Safety Stand and 2-Pole Lift".**

NOTE:
When removing/installing only the engine mounting, the hold engine assembly as instructed bellow:

REMOVAL

Outline

At first, remove the engine & the flywheel housing assembly and front final drive assembly with front suspension member downward. Then separate the engine, flywheel housing, front final drive assembly and front suspension member.

Preparation

1. Release fuel pressure. Refer to EC-637, "Inspection (GT-R certified NISSAN dealer)".
2. Drain engine coolant from radiator. Refer to CO-10, "Draining".
   CAUTION:
   - **Perform this step when engine is cold.**
   - **Never spill engine coolant on drive belt.**
3. Remove front undercover. Refer to EXT-40, "FRONT UNDER COVER : Exploded View".
4. Remove floor undercover. Refer to EXT-41, "FLOOR UNDER COVER : Exploded View".
5. Disconnect both battery terminals. Refer to PG-91, "Exploded View".
6. Remove the following parts:
   - Radiator reservoir tank: Refer to CO-15, "Exploded View (GT-R certified NISSAN dealer)".
   - Engine cover: Refer to EM-26, "Exploded View".
   - Front road wheel and tires (power tool): Refer to WT-75, "Removal and Installation".
   - Cowl top cover: Refer to EXT-28, "Exploded View".
   - Air duct and air cleaner case assembly: Refer to EM-28, "Exploded View".
   - Recirculation pipe: Refer to EM-30, "Exploded View".
   - Fender protector: Refer to EXT-31, "FENDER PROTECTOR : Exploded View".
7. Discharge refrigerant from A/C circuit. Refer to HA-27, "Collection and Charge".
8. Remove radiator hoses (upper and lower). Refer to CO-15, "Exploded View (GT-R certified NISSAN dealer)".

Engine Room LH

1. Disconnect vacuum hose (for brake booster). Refer to EM-35, "Exploded View".
2. Disconnect heater hose from vehicle-side, and fit a plug onto hose end to prevent engine coolant leak.
3. Disconnect A/C piping from A/C compressor, and temporarily fasten it on vehicle with a rope. Refer to HA-42, "Exploded View (GT-R certified NISSAN dealer)".
4. Disconnect battery positive cable vehicle side and temporarily fasten it on engine.

Engine Room RH

1. Disconnect positive cable of alternator at vehicle side.
2. Disconnect fuel feed hose (with damper), fuel return hose (with damper) and EVAP hose. Refer to EM-42, "Exploded View".
   CAUTION:
   Fit plugs onto disconnected hoses to prevent fuel leak.
3. Remove oil cooler hose and suction hose of power steering oil pump. Refer to ST-33, "Exploded View".
4. Remove reservoir tank of power steering oil pump and piping from vehicle, and temporarily secure them on engine. Refer to ST-33, "Exploded View".
   CAUTION:
   When temporarily securing, keep the reservoir tank upright to avoid a fluid leak.

Engine Room Rear

Remove air pump hose. Refer to EM-33, "Exploded View (GT-R certified NISSAN dealer)".

Vehicle Inside

Follow procedure below to disconnect engine room harness connectors at passenger room side, and temporarily secure them on engine.

1. Remove passenger-side kicking plate and dash side finisher. Refer to INT-15, "Exploded View".
2. Disconnect engine room harness connectors at unit sides ECM and other.
3. Disengage intermediate fixing point. Pull out engine room harnesses to engine room side, and temporarily secure them on engine.
   CAUTION:
   - **When pulling out harnesses, take care not to damage harnesses and connectors.**

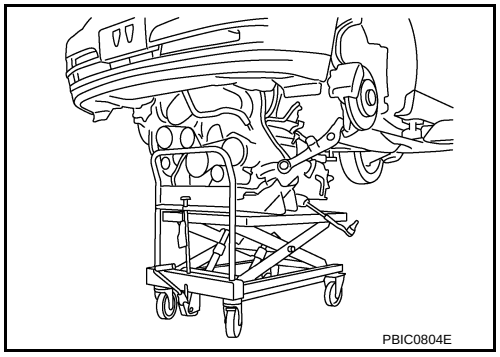
- **After temporarily securing, cover connectors with vinyl or similar material to protect against foreign material adhesion.**

Vehicle Underbody

1. Remove air inlet hose. Refer to EM-30, "Exploded View".
2. Remove oil cooler hoses at oil cooler side. Refer to LU-16, "Exploded View (GT-R certified NISSAN dealer)".
3. Remove sub muffler. Refer to EX-7, "Exploded View".
4. Disconnect steering lower joint at power steering gear assembly side, and release steering lower shaft. Refer to ST-18, "Exploded View".
5. Remove front propeller shaft and main propeller shaft. Refer to DLN-51, "Exploded View" and DLN-60, "Exploded View".
6. Remove front stabilizer connecting rod from transverse link. Refer to FSU-25, "TYPE 1 : Exploded View" (except for NISMO) or FSU-26, "TYPE 2 : Exploded View" (for NISMO).
7. Remove drive shaft (RH and LH). Refer to FAX-16, "Exploded View (GT-R certified NISSAN dealer)".
8. Remove heat exchanger water hose. Refer to TM-386, "HEAT EXCHANGER PIPING : Exploded View (GT-R certified NISSAN dealer)".

Removal Work

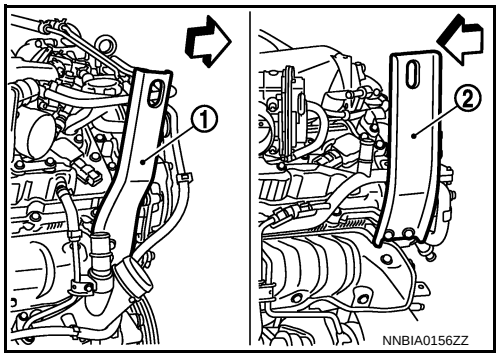
1. Use a manual lift table caddy (commercial service tool) or equivalently rigid tool such as a transmission jack. Securely support bottom of suspension member.
   CAUTION:
   Put a piece of wood or something similar as the supporting surface, secure a completely stable condition.



2. Remove rear engine mounting member bolts and nuts.
3. Remove front suspension member mounting bolts and nuts. Refer to FSU-27, "Exploded View".
4. Carefully lower jack, or raise lift to remove the engine & flywheel housing assembly and front final drive assembly with front suspension member. When performing work, observe the following caution:
   CAUTION:
   - **Confirm there is no interference with the vehicle.**
   - **Check that all connection points have been disconnected.**
   - **Keep in mind the center of the vehicle gravity changes. If necessary, use jack(s) to support the vehicle at rear jacking point(s) to prevent it from falling it off the lift.**

Separation Work

1. Remove power steering oil pump from engine side. Refer to ST-27, "Exploded View".
2. Install engine slingers into front of cylinder head (bank 1) and rear of cylinder head (bank 2).



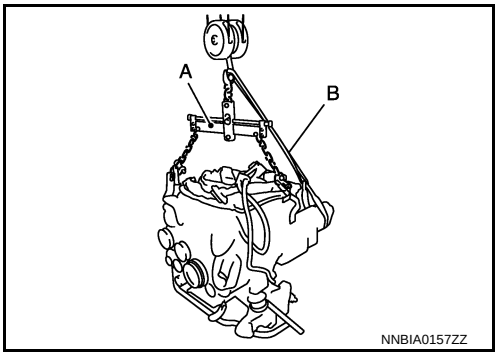
1 : Engine front slinger
2 : Engine rear slinger
⇦ : Engine front

Slinger bolts:

: 28.0 N·m (2.9 kg-m, 21 ft-lb)

3. Hang the lifting hook of a engine lifter (commercial service tool) (A) from the front and rear engine slingers to hoist engine &fly-wheel housing assembly.
   - For the flywheel housing side, use a webbing slinger (B) or an equivalent to hoist the assembly horizontally.

   CAUTION:
   Always hoist the engine by using a engine lifter (i.e. hoisting the front and rear slingers from one point in the air), or the rocker cover and parts around the engine may be damaged due to the fall of the engine slinger.



4. Remove engine mounting insulators (RH and LH) with power tool.
5. Lift with hoist and separate the engine & flywheel housing assembly from front suspension member.

   CAUTION:
   - **Before and during this lifting, always check if any harnesses are left connected.**
   - **Avoid damage to and oil/grease smearing or spills onto engine mounting insulator.**
6. Remove A/C compressor. Refer to HA-40, "Exploded View (GT-R certified NISSAN dealer)".
7. Remove alternator. Refer to CHG-30, "Exploded View (GT-R certified NISSAN dealer)".
8. Remove starter motor. Refer to STR-19, "Exploded View (GT-R certified NISSAN dealer)".
9. Remove three way catalyst. Refer to EM-50, "Exploded View".
10. Remove exhaust manifold and turbocharger assembly. Refer to EM-61, "Exploded View".
11. Remove engine mounting bracket from the engine with power tool.
12. Remove the front final drive assembly from oil pan (upper). Refer to DLN-77, "Exploded View (GT-R certified NISSAN dealer)".

INSTALLATION

Note the following, and install in the reverse order of removal.
- Do not allow engine mounting insulator to be damage and careful no engine oil gets on it.
- For a location with a positioning pin, insert it securely into hole of mating part.
- For a part with a specified installation orientation, refer to component figure in EM-53, "Exploded View (GT-R certified NISSAN dealer)".

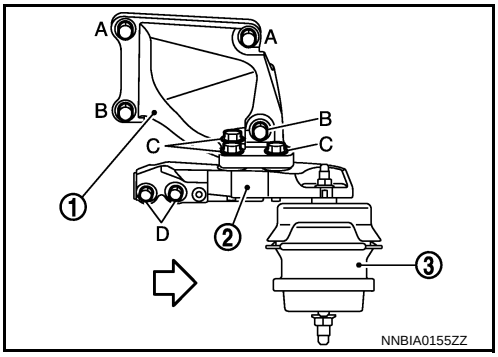
Engine Mounting (RH side)

1. Install engine mounting bracket (RH) (1) as follows:

   3 : Engine mounting insulator (RH)

   ⇦ : Vehicle front

   - Temporarily tighten all mounting bolts.
   - Tighten mounting bolts to the specified torque with following mounting surfaces touched.
   - Engine mounting bracket (RH) upper side (blot A).
   - Engine mounting bracket (RH) lower side (blot B).



2. Install engine mounting bracket (lower) (2) as follows:
   - Temporarily tighten all mounting bolts.
   - Tighten mounting bolts to the specified torque with following mounting surfaces touched.
   - Engine mounting bracket (lower) upper side (blot C).
   - Engine mounting bracket (lower) lower side (blot D).

Engine Mounting (LH side)

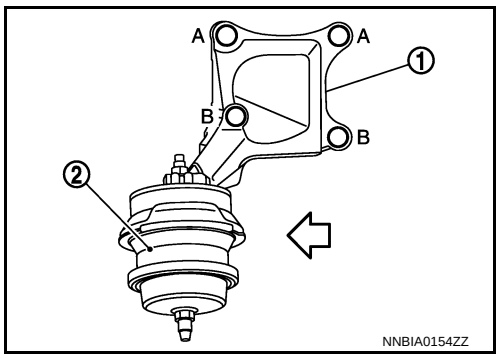
Install engine mounting bracket (LH) (1) as follows:

2 : Engine mounting insulator (LH)

⇦ : Vehicle front

- Temporarily tighten all mounting bolts.
- Tighten mounting bolts to the specified torque with following mounting surfaces touched.

- Engine mounting bracket (LH) upper side (blot A).
- Engine mounting bracket (LH) lower side (blot B).

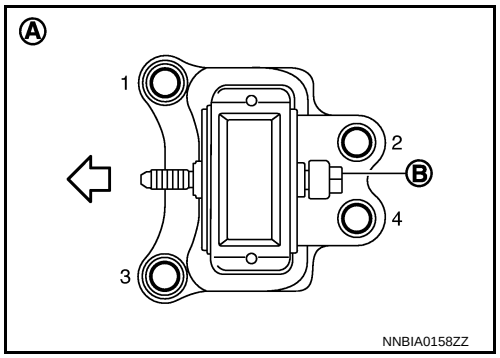


Engine Mounting (rear side)

Tighten mounting bolt (B), and then tighten in numerical order as shown in the figure.

A : The figure shows downward gaze.

⇦ : Vehicle front



Inspection (GT-R certified NISSAN dealer)

INFOID:0000000011488068

INSPECTION AFTER INSTALLATION

Inspection for Leakage

The following are procedures for checking fluids leak, lubricates leak and exhaust gases leak.

- Before starting engine, check oil/fluid levels including engine coolant and engine oil. If less than required quantity, fill to the specified level. Refer to MA-21, "Fluids and Lubricants".
- Use procedure below to check for fuel leakage.

- Turn ignition switch “ON” (with engine stopped). With fuel pressure applied to fuel piping, check for fuel leakage at connection points.
- Start engine. With engine speed increased, check again for fuel leakage at connection points.

- Run engine to check for unusual noise and vibration.
- Warm up engine thoroughly to check there is no leakage of fuel, exhaust gases, or any oil/fluids including engine oil and engine coolant.
- Bleed air from lines and hoses of applicable lines, such as in cooling system.
- After cooling down engine, again check oil/fluid levels including engine oil and engine coolant. Refill to the specified level, if necessary.

Summary of the inspection items:

Items		Before starting engine	Engine running	After engine stopped
Engine coolant		Level	Leakage	Level
Engine oil		Level	Leakage	Level
Transmission / transaxle fluid	AT & CVT Models	Leakage	Level / Leakage	Leakage
	MT Models	Level / Leakage	Leakage	Level / Leakage
Other oils and fluids*		Level	Leakage	Level
Fuel		Leakage	Leakage	Leakage

* Power steering fluid, brake fluid, etc.

UNIT DISASSEMBLY AND ASSEMBLY

ENGINE STAND SETTING

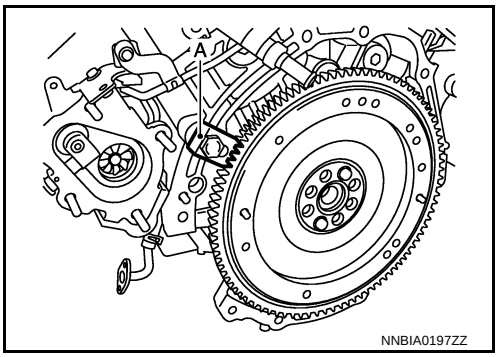
Setting (GT-R certified NISSAN dealer)

INFOID:0000000011488069

NOTE:
Explained here is how to disassemble with engine stand supporting transmission surface. When using different type of engine stand, note with difference in steps and etc.

1. Remove the engine assembly from the vehicle. Refer to EM-53, "Exploded View (GT-R certified NISSAN dealer)".
2. Remove crankshaft pulley as follows:
   NOTE:
   Loosen crankshaft pulley bolt before removing a flywheel.

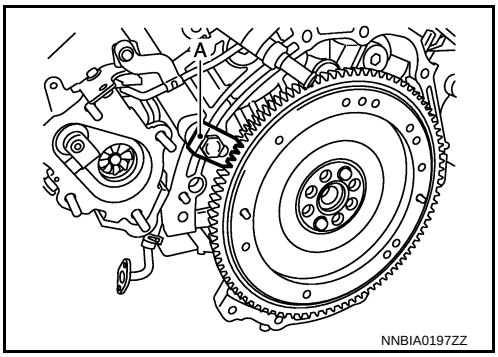
a. Fix flywheel with a ring gear stopper [SST: KV101056S0 (J-49374)] (A).



b. Loosen crankshaft pulley bolt and rotate bolt seating surface at 10 mm (0.39 in) from its original position.
   CAUTION:
   Never remove crankshaft pulley bolt because it is used as a supporting point for suitable puller.
c. Place suitable puller tab on holes of crankshaft pulley, and pull crankshaft pulley through.
   CAUTION:
   Never put suitable puller tab on crankshaft pulley periphery, because this damages internal damper.

3. Remove the parts that may restrict installation of engine to widely use engine stand.
   NOTE:
   The procedure is described assuming that you use a widely use engine stand holding the surface, to which transmission is installed.

a. Fix flywheel with a ring gear stopper [SST: KV101056S0 (J-49374)] (A).
b. Loosen flywheel mounting bolts.
   - Loosen mounting bolts in diagonal order.
   - Check for deformation or damage flywheel. Refer to EM-124, "Inspection (GT-R certified NISSAN dealer)".

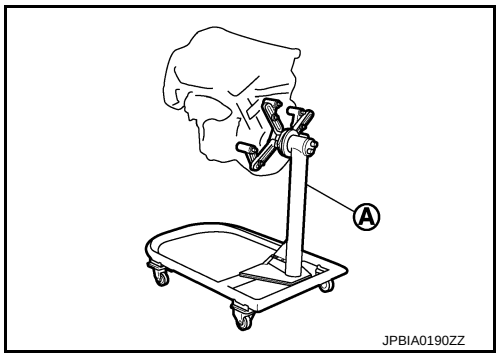


4. Lift the engine with hoist to install it onto the widely use engine stand.
   CAUTION:
   Use an engine stand that has a load capacity [220 kg (485 lb) or more] large enough for supporting the engine weight.
   - If the load capacity of the stand is not adequate, remove the following parts beforehand to reduce the potential risk of overturning the stand.
   - Remove intake manifold collector. Refer to EM-35, "Exploded View".
     CAUTION:
     Mark the parts with paint in advance of the reinstallation to prevent misalignment between the intake manifold collector and intake manifold.

- Remove intake manifold. Refer to EM-40, "Exploded View".
- Remove fuel injector and fuel tube assembly. Refer to EM-42, "Exploded View".
- Remove ignition coil. Refer to EM-47, "Exploded View".
- Remove rocker cover. Refer to EM-47, "Exploded View".
- Remove exhaust manifold and turbocharger assembly. Refer to EM-61, "Exploded View".
- Other removable brackets.

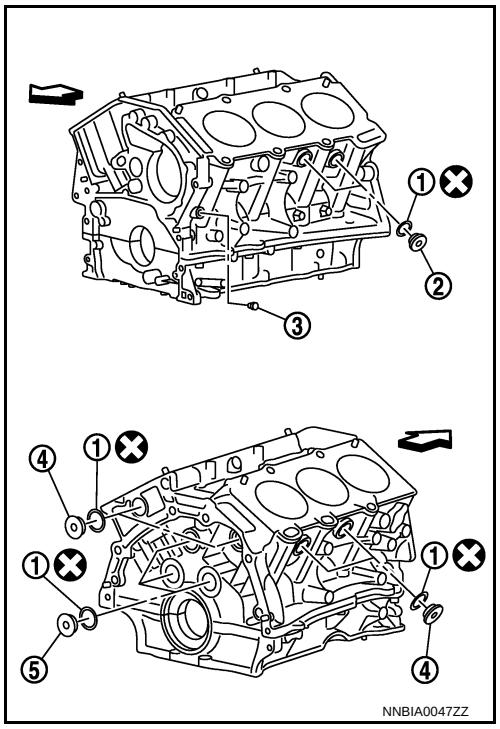
NOTE:
The figure shows an example of widely use engine stand (A) that can hold mating surface of transmission with flywheel removed.

CAUTION:
Before removing the hanging chains, check the engine stand is stable and there is no risk of overturning.



5. Drain engine oil. Refer to LU-11, "Draining".
6. Drain engine coolant by removing water drain plugs (3) from cylinder block as shown in the figure.

1 : Washer
2 : Plug
4 : Plug
5 : Plug
⇦ : Engine front



ENGINE UNIT

Disassembly and Assembly (GT-R certified NISSAN dealer)

INFOID:0000000011488070

DISASSEMBLY

1. Remove intake manifold collector. Refer to EM-35, "Exploded View".
   CAUTION:
   Mark the parts with paint in advance of the reinstallation to prevent misalignment between the intake manifold collector and intake manifold.
2. Remove fuel injector and fuel tube assembly. Refer to EM-42, "Exploded View".
3. Remove intake manifold. Refer to EM-40, "Exploded View".
4. Remove ignition coil, spark plug and rocker cover. Refer to EM-47, "Exploded View".
5. Remove front timing chain case. Refer to EM-69, "Exploded View (GT-R certified NISSAN dealer)".
6. Remove oil pan (lower and upper). Refer to EM-97, "Exploded View (GT-R certified NISSAN dealer)".
7. Remove rear timing chain case. Refer to EM-69, "Exploded View (GT-R certified NISSAN dealer)".
8. Remove exhaust manifold and turbocharger assembly. Refer to EM-61, "Exploded View".
9. Remove camshaft. Refer to EM-87, "Exploded View (GT-R certified NISSAN dealer)".
10. Remove cylinder head. Refer to EM-103, "Exploded View (GT-R certified NISSAN dealer)".

ASSEMBLY

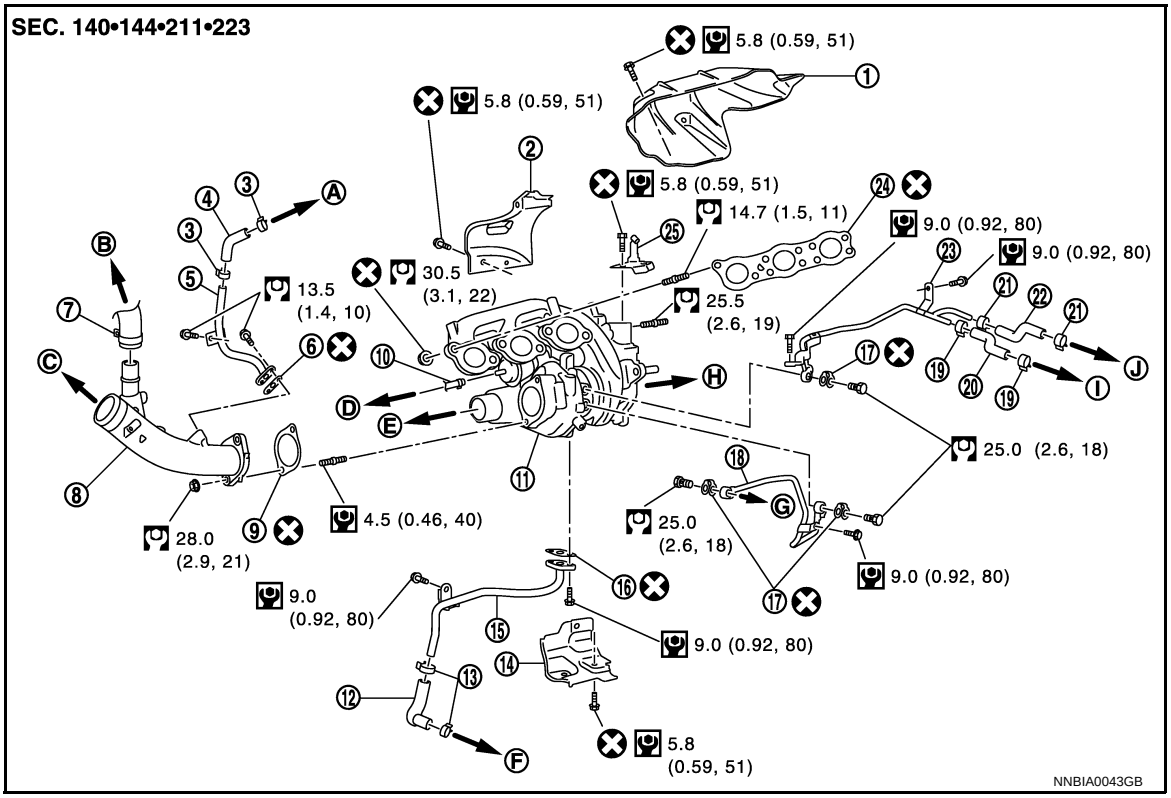
Assembly in the reverse order of disassembly.

EXHAUST MANIFOLD AND TURBOCHARGER ASSEMBLY

Exploded View

INFOID:0000000011488071

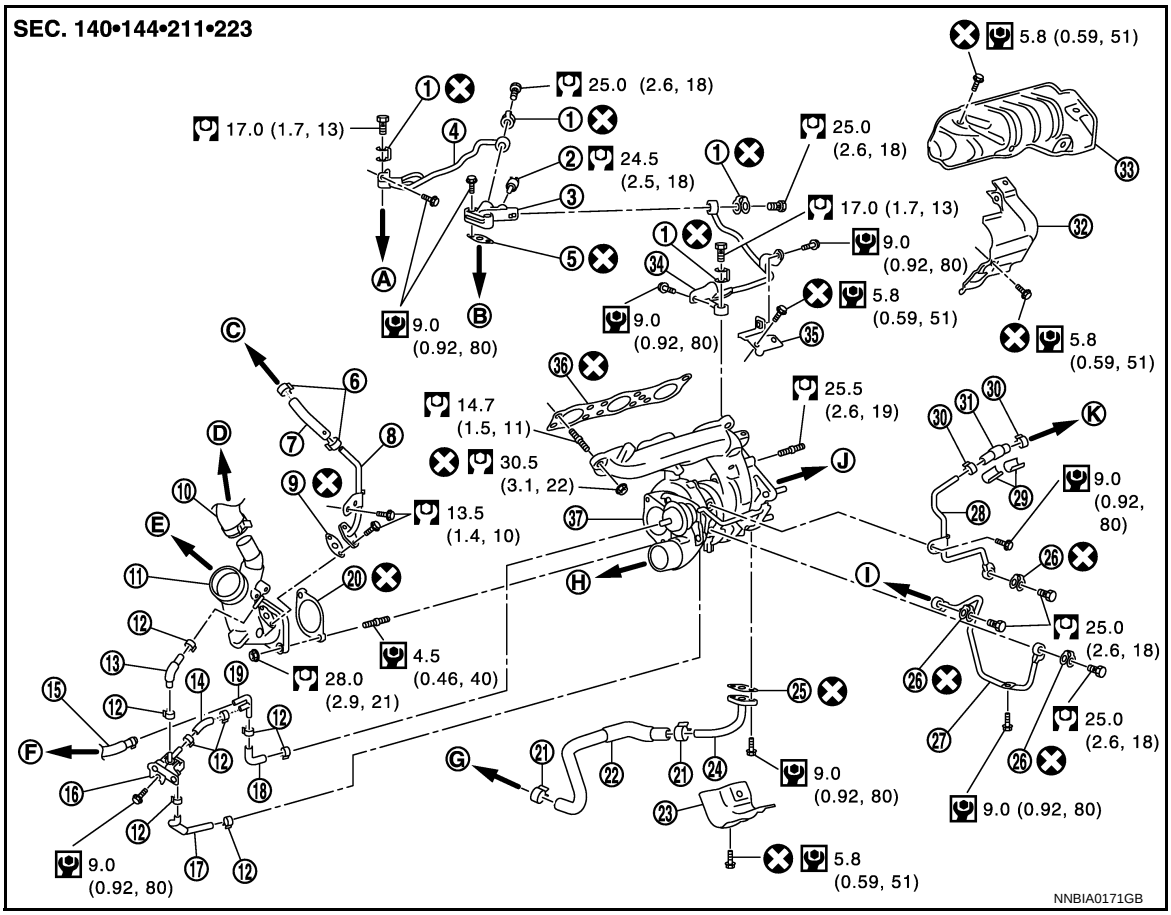
Bank 1 side



1.	Exhaust manifold cover	2.	Insulator (upper)	3.	Clamp
4.	Fresh air hose	5.	Fresh air tube	6.	Gasket
7.	Recirculation hose	8.	Air inlet pipe	9.	Gasket
10.	Vacuum hose	11.	Exhaust manifold and turbocharger assembly	12.	Oil return hose
13.	Clamp	14.	Insulator (lower)	15.	Oil return tube
16.	Gasket	17.	Gasket	18.	Water inlet tube
19.	Clamp	20.	Water hose	21.	Clamp
22.	Water hose	23.	Water outlet tube	24.	Gasket
25.	Bracket				
A.	To rocker cover (bank 1)	B.	To recirculation valve (bank 1)	C.	To air cleaner (bank 1)
D.	To turbocharger boost control solenoid valve	E.	To charge air cooler	F.	To oil filter bracket
G.	To cylinder block	H.	To three way catalyst (bank 1)	I.	To heater pipe
J.	To air cut solenoid valve (bank 2)				

Refer to GI-4, "Components" for symbols in the figure.

Bank 2 side



1.	Gasket	2.	Oil temperature sensor	3.	Oil feed adapter
4.	Oil feed tube (bank 1)	5.	Gasket	6.	Clamp
7.	Fresh air hose	8.	Fresh air tube	9.	Gasket
10.	Recirculation hose	11.	Air inlet pipe	12.	Clamp
13.	Vacuum hose	14.	Vacuum hose	15.	Vacuum hose
16.	Turbocharger boost control solenoid valve	17.	Vacuum hose	18.	Vacuum hose
19.	3- WAY connector	20.	Gasket	21.	Clamp
22.	Oil return hose	23.	Insulator (lower)	24.	Oil return tube
25.	Gasket	26.	Gasket	27.	Water inlet tube
28.	Water outlet tube	29.	Clip	30.	Clamp
31.	Water hose	32.	Insulator (upper)	33.	Exhaust manifold cover
34.	Oil feed tube	35.	Bracket	36.	Gasket
37.	Exhaust manifold and turbocharger assembly				
A.	To exhaust manifold and turbocharger assembly (bank 1)	B.	To cylinder block	C.	To rocker cover (bank 2)
D.	To recirculation valve (bank 2)	E.	To air cleaner (bank 2)	F.	To exhaust manifold and turbo-charger assembly (bank 1)
G.	To oil pan (upper)	H.	To charge air cooler	I.	To cylinder block
J.	To three way catalyst (bank 2)	K.	To heater pipe		

Refer to GI-4, "Components" for symbols in the figure.

Disassembly and Assembly (GT-R certified NISSAN dealer)

INFOID:0000000011488072

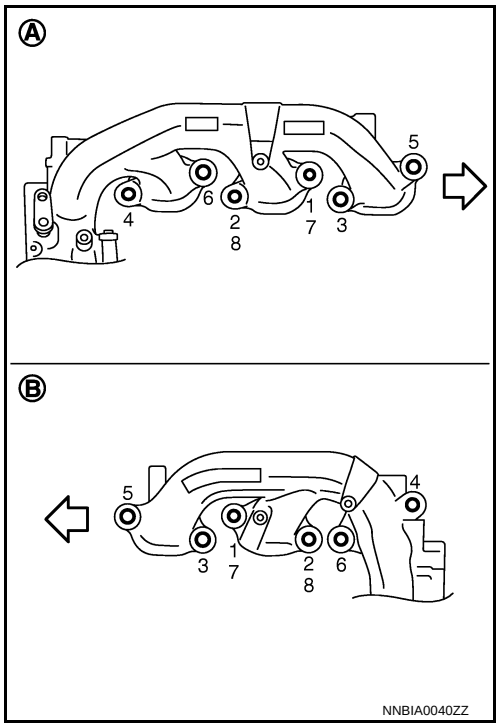
DISASSEMBLY

1. Remove air inlet pipe, fresh air hose and fresh air tube.

2. Remove turbocharger boost control solenoid valve.
CAUTION:
Never shock turbocharger boost control solenoid valve.
3. Remove insulator (upper and lower).
4. Remove water inlet tube and water outlet tube.
5. Remove oil feed tube and oil return tube.
6. Remove exhaust manifold and turbocharger assembly as follows:

a. Loosen mounting nuts in the reverse order as shown in the figure.

A : Bank 1
B : Bank 2
⇦ : Engine front



CAUTION:
Disregard the numerical order No. 7 and 8 in removal.
NOTE:
Apply penetrating lubricant to nuts before operation.

b. Remove exhaust manifold and turbocharger assembly.
CAUTION:
- **Be careful not to bend piping.**
- **Never hold actuator rod.**
- **Check the following route if compressor wheel, turbine wheel, and/or rotor shaft were broken. Remove all fragments and other foreign materials in order to avoid secondary contamination.**

Intake side: **Between exhaust manifold and turbocharger assembly and charge air cooler**
Between exhaust manifold and turbocharger assembly and air cleaner

Exhaust side: **Between exhaust manifold and turbocharger assembly and three way catalyst**

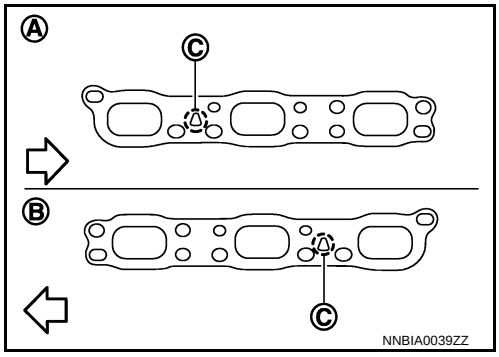
ASSEMBLY

Note the following, and install in the reverse order of removal.

Exhaust manifold and Turbocharger Assembly Gasket

- To install, check that the identification hole (triangle mark) (C) is located as shown in the figure.

A : Bank 1
B : Bank 2
⇦ : Engine front

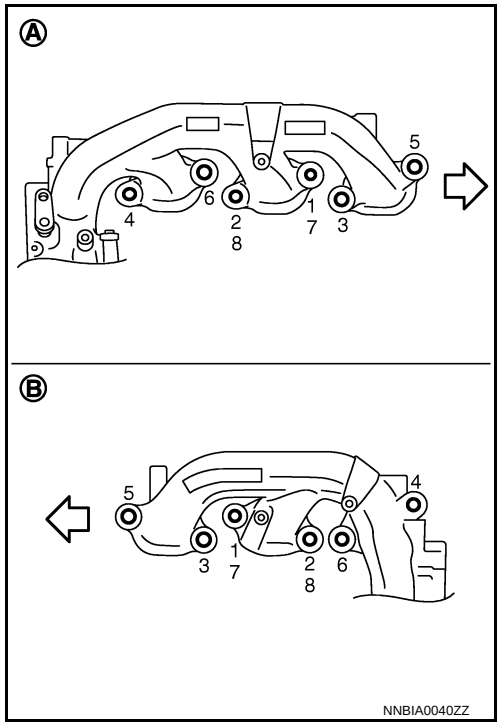


Exhaust manifold and Turbocharger Assembly

- Tighten mounting nuts in numerical order as shown in the figure.

A : Bank 1
B : Bank 2
⇦ : Engine front

NOTE:
Tighten nuts No. 1 and 2 in two steps. The numerical order No. 7 and 8 shows second step.



Water Inlet Tube and Water Outlet Tube

- After temporarily installing each part, check for a twist or bent, and tighten mounting bolts.

CAUTION:
Be careful not to bend piping.

Oil Feed Tube and Oil Return Tube

- After temporarily installing each part, check for a twist or bent, and tighten mounting bolts of the feed side.

CAUTION:
Be careful not to bend piping.

Inspection (GT-R certified NISSAN dealer)

INFOID:0000000011488073

INSPECTION PROCEDURE

Trouble Diagnosis of Turbocharger
Check items before trouble diagnosis

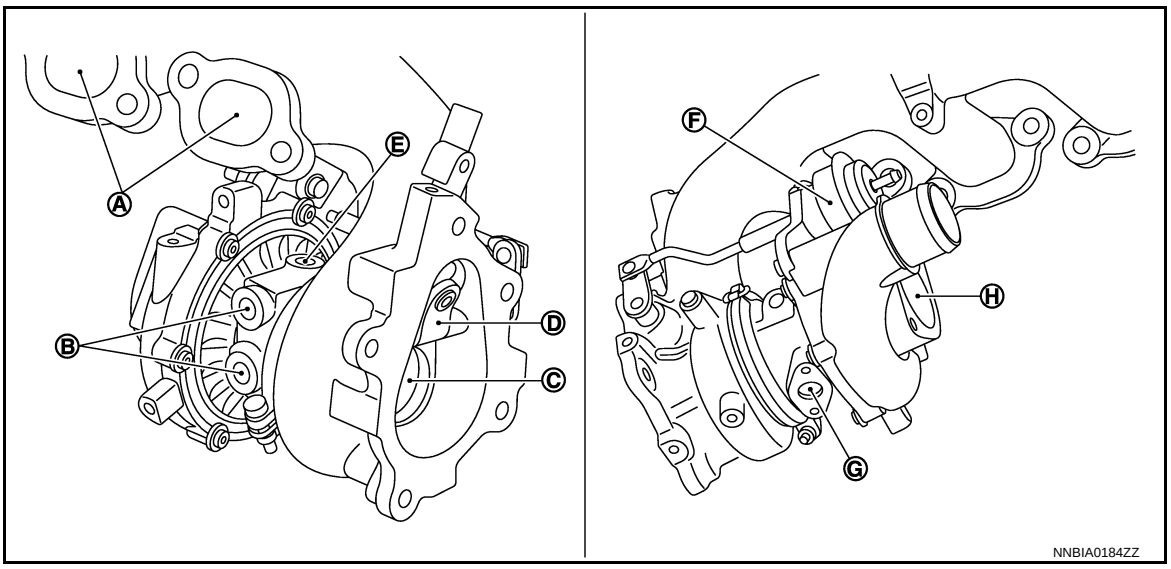
1. Check that the engine oil level is between L (Low level) and H (High level) of the oil level gauge. [When the engine oil amount is more then H (High level), the engine oil flows into the inlet duct through the blow-by gas passage, and the turbocharger is misjudged failure.] Refer to LU-8, "Inspection".
2. Ask the customer if he/she always runs the vehicle in idle engine speed to cool the engine oil down after driving.
   - Replace the exhaust manifold and turbocharger assembly when any malfunction is found after unit inspections specified in the table below.
   - If no malfunction is found after the unit inspections, judge that the turbocharger body has no non-standard conditions. Check the other parts again.

Inspection Location	Result	Symptoms likely to occur when the results shown on the left exist.			
		Oil leakage	Smoke	Noise	Poor power Poor acceleration
Turbine wheel	Wet with oil.	C	A	C	C
	Carbon deposits observed.	C	A	B	B
	“Rubs against” housing.	C	B	A	B
	Vane is bent or broken.			A	A
Compressor wheel	Inside of intake port is badly stained with oil.	B	B		
	“Rubs against” housing.	C	B	A	B
	Vane is bent or broken.			A	A
Check both turbine and compressor rotor shaft end play.	Heavy feel or catching when turned by hand.		C	C	B
	Cannot be turned by hand.				A
	Excessively loose bearing.	C	C	B	C
Rotor shaft, oil return port (Check inside using penlight.)	Carbon or sludge deposits in oil drain port.	C	A	C	C
Boost control valve actuator operation (using a handy pump)	• Does not operate smoothly when air pressure is gradually applied. • Stroke amount is not compliance with the air pressure.				A

A: Highly possible. B: Possible. C: May exist.

INSPECTION AFTER DISASSEMBLY

- Check for the following items and clean the parts if there are adherents. When finding a malfunction or disagreement with the standard value, replace exhaust manifold and turbocharger assembly.

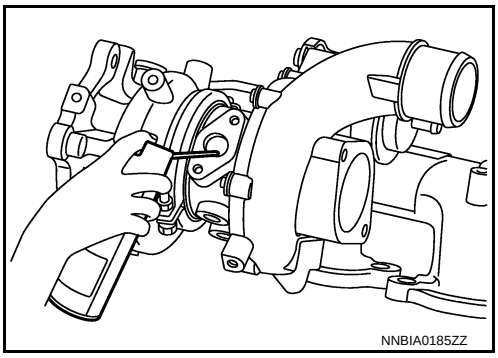


A. Check for exhaust gas leakage
B. Check for water leakage
C. Check for compressor wheel and rotor shaft
D. Check for boost control valve
E. Check for oil leakage
F. Check for boost pressure control
G. Check for oil leakage
H. Check for turbine wheel and rotor shaft

- Refer to the figure for component names and visually check points.

Cleaning Procedure

- Clean the oil feed and the return port with engine conditioner.
- Clean the water inlet and the outlet port with radiator cleaner.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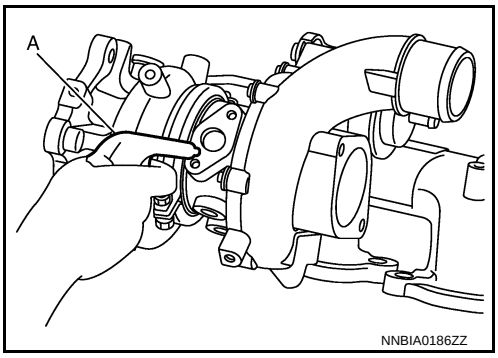
- Dry it using an air gun (A) after cleaning.
- Dry compressor wheel, turbine wheel, compressor housing, and turbine housing using an air gun.



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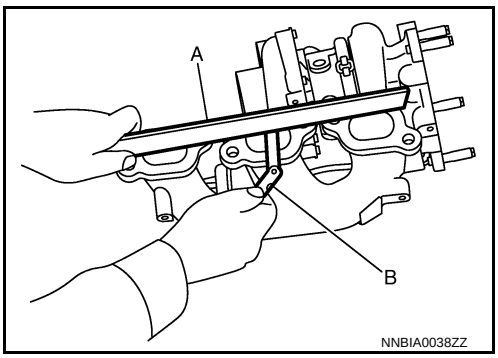
Surface Distortion

- Use a reliable straightedge (A) and feeler gauge (B) to check the flatness of exhaust manifold and turbocharger assembly fitting surface.

Limit:

Refer to EM-141, "Exhaust Manifold and Turbocharger (GT-R certified NISSAN dealer)".



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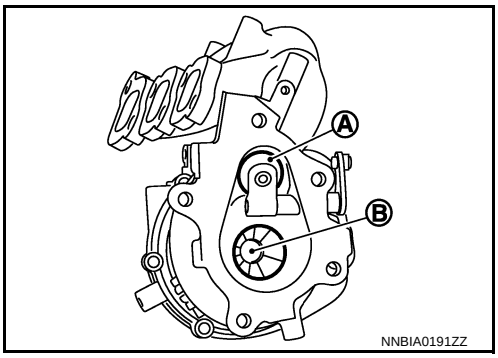
Turbine Wheel and Boost Control Valve

- Check that the boost control valve (A) has no deformation and cracks.
- Check for engine oil stains on turbine wheel (B).
- Check for carbon deposits.
- Check if turbine wheel vane is bent or broken.
- Check for interference with turbine housing.



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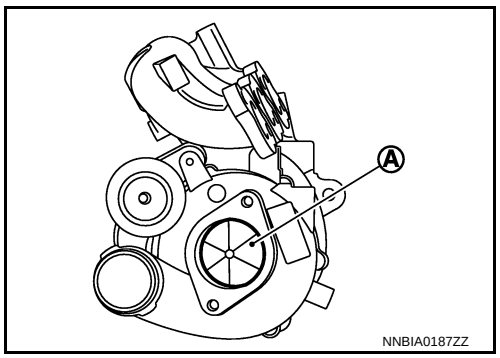
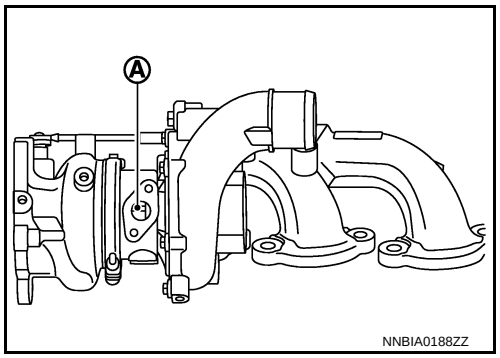
Compressor Wheel

- Check for engine oil stains inside inlet port.
- Check if compressor wheel (A) is bent or broken.
- Check for interference with compressor housing.



Rotor Shaft

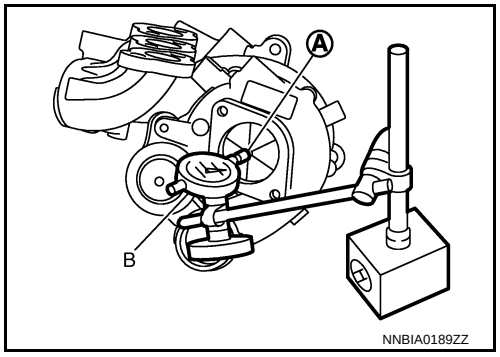
- Check that the rotor shaft (A) rotates smoothly without any resistance when it is rotated by fingertips.
- Shake rotor shaft vertically and horizontally and check for looseness.
- Check for carbon sludge deposits.



Rotor Shaft End Play

- Place a dial indicator (B) at the rotor shaft end (A) in the axial direction to measure the end play.

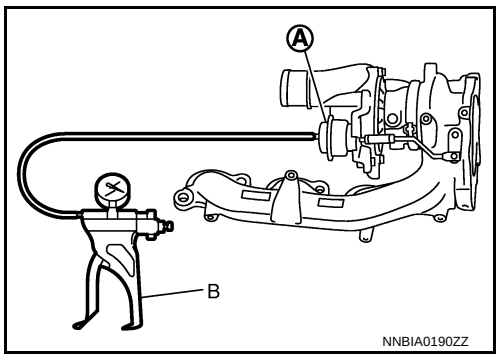
Standard : 0.031 - 0.099 mm (0.0012 - 0.0039 in)



Boost Control

- Check that actuator rod activates and boost control valve opens when applying pressure with a pressurized handy pump (commercial service tool) (B).

CAUTION:
Never apply a pressure of 75 kPa (563 mmHg, 22.1 inHg) or more to prevent a diaphragm in the boost control actuator (A) from damage.



- Check that the boost control valve is in absolute contact with the turbine housing without an inspection pressure.

Except for NISMO

Standard:

Pressure/Actuator rod distance (stroke)

Bank 1 : 68.0 kPa (510 mmHg, 20.0 inHg)/1.0 mm (0.039 in)

Bank 2 : 63.1 kPa (473 mmHg, 18.6 inHg)/1.0 mm (0.039 in)

For NISMO

Standard:

Pressure/Actuator rod distance (stroke)

Bank 1 : 61.4 kPa (460 mmHg, 18.1 inHg)/1.0 mm (0.039 in)

Bank 2 : 56.4 kPa (423 mmHg, 16.7 inHg)/1.0 mm (0.039 in)

Oil Feed Tube and Oil Return Tube

- Clean inside of oil feed tube and oil return tube, and check tubes for clogging.

Water Inlet Tube and Water Outlet Tube

- Clean inside of water inlet tube and water outlet tube, and check tubes for clogging.

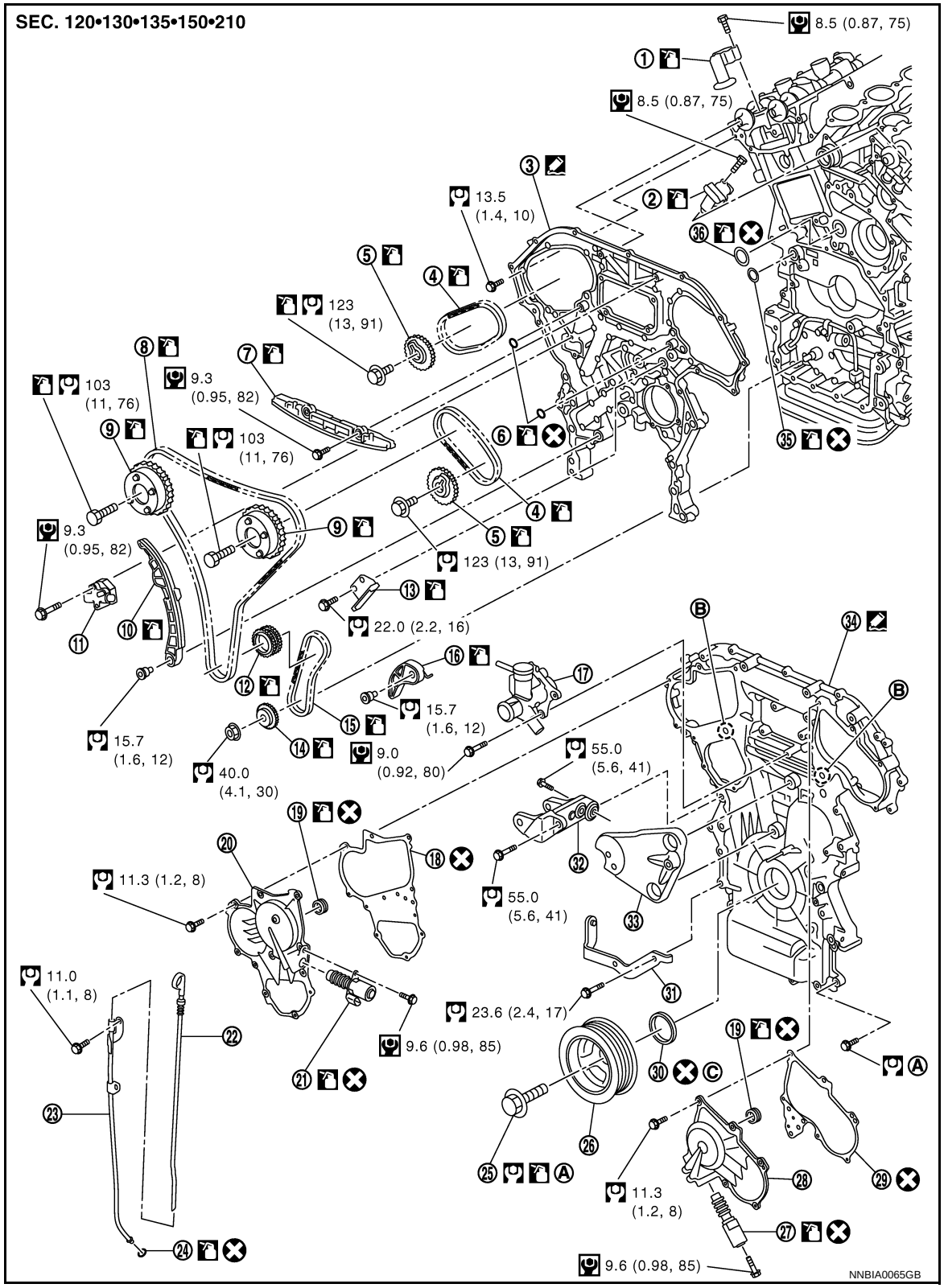
INSPECTION AFTER ASSEMBLY

Start engine, and raise engine speed to check that there are exhaust gas and no oil leakage.

TIMING CHAIN

Exploded View (GT-R certified NISSAN dealer)

INFOID:0000000011488074



1.	Timing chain tensioner (secondary) (bank 1)	2.	Timing chain tensioner (secondary) (bank 2)	3.	Rear timing chain case
4.	Timing chain (secondary)	5.	Camshaft sprocket (EXH)	6.	O-ring

7. Internal chain guide	8. Timing chain (primary)	9. Camshaft sprocket (INT)
10. Slack guide	11. Timing chain tensioner (primary)	12. Crankshaft sprocket
13. Tension guide	14. Oil pump sprocket	15. Oil pump drive chain
16. Oil pump drive chain tensioner	17. Water outlet (front)	18. Gasket
19. Rubber ring	20. Intake valve timing control cover (bank 1)	21. Intake valve timing control solenoid valve (bank 1)
22. Oil level gauge	23. Oil level gauge guide	24. O-ring
25. Crankshaft pulley bolt	26. Crankshaft pulley	27. Intake valve timing control solenoid valve (bank 2)
28. Intake valve timing control cover (bank 2)	29. Gasket	30. Front oil seal
31. Alternator bracket	32. Power steering oil pump bracket	33. Idler pulley bracket
34. Front timing chain case	35. O-ring	36. O-ring
A. Comply with the assembly procedure when tightening. Refer to EM-70	B. Oil filter	C. Apply neutral detergent on the rim

Refer to GI-4, "Components" for symbols in the figure.

Disassembly and Assembly (GT-R certified NISSAN dealer)

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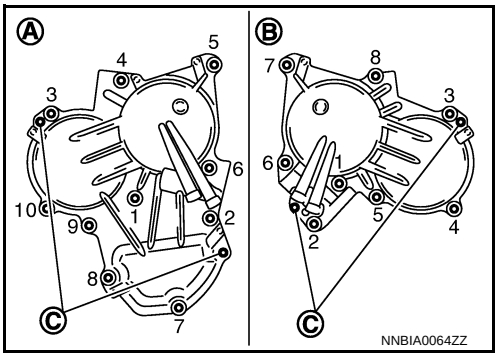
DISASSEMBLY

1. Remove intake manifold collector. Refer to EM-35, "Exploded View".
   CAUTION:
   Mark the parts with paint in advance of the reinstallation to prevent misalignment between the intake manifold collector and intake manifold.
2. Remove oil level gauge and oil level gauge guide.
3. Remove power steering oil pump bracket.
4. Remove alternator bracket.
5. Remove idler pulley bracket.
6. Remove water outlet (front) and heater pipe. Refer to CO-23, "Exploded View (GT-R certified NISSAN dealer)".
7. Remove intake valve timing control covers as follows:

a. Disconnect intake valve timing control solenoid valve harness connector.

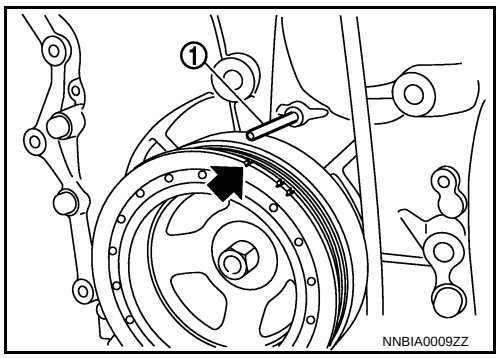
b. Loosen mounting bolts in reverse order as shown in the figure.

A : Bank 1
B : Bank 2
C : Dowel pin hole



c. Shaft is engaged with camshaft sprocket (INT) center hole on inside. Pull straight out so that it does not tilt until the joint is disengaged.
   CAUTION:
   Never shock intake valve timing control cover.
8. Remove intake valve timing control solenoid valve, if necessary.
   CAUTION:
   Intake valve timing control solenoid valve is non-reusable. Never remove it unless required.
9. Remove rocker cover. Refer to EM-47, "Exploded View".
10. Obtain No. 1 cylinder at TDC of its compression stroke as follows:

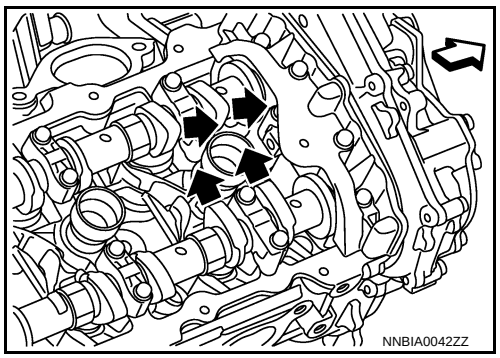
a. Rotate crankshaft pulley clockwise to align timing mark (grooved line without color) with timing indicator (1).



⬅ : Timing mark (grooved line without color)

NOTE:
Timing indicator is not included because it is not factory-supplied.

b. Check that intake and exhaust cam noses on No. 1 cylinder (engine front side of bank 1) are located as shown in the figure.

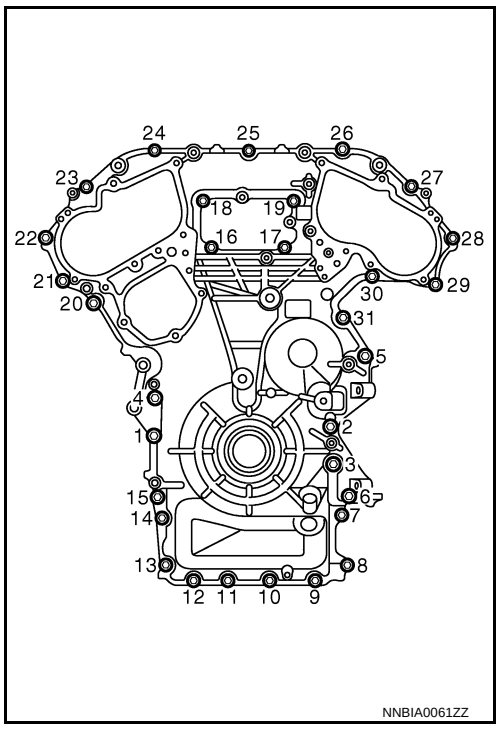


⇦ : Engine front

- If not, turn crankshaft one revolution (360 degrees) and align as shown in the figure.

11. Remove crankshaft pulley. Refer to EM-58, "Setting (GT-R certified NISSAN dealer)" for the removing procedure.
12. Remove front timing chain case as follows:

a. Loosen mounting bolts in reverse order as shown in the figure.

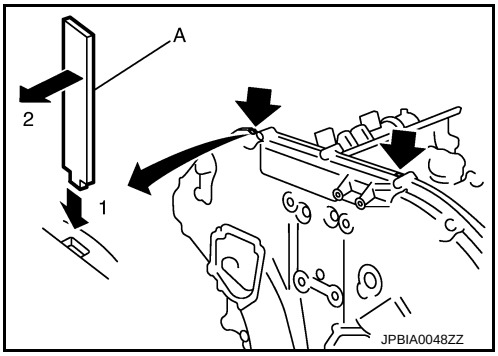


b. Insert a suitable tool (A) into the notch at the top of front timing chain case as shown.

c. Pry off case by moving the suitable tool as shown.

CAUTION:

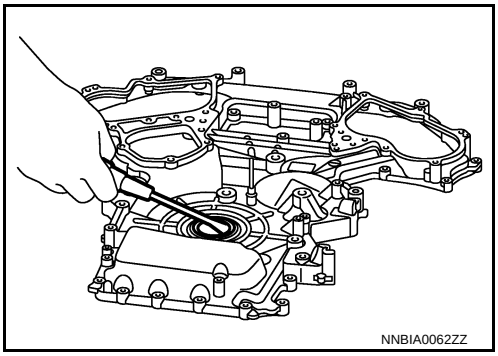
- **Never use a screwdriver or something similar.**
- **After removal, handle front timing chain case carefully so it does not tilt, cant, or warp under a load.**



13. Remove front oil seal from front timing chain case using a suitable tool.
    - Use a screwdriver for removal.

CAUTION:

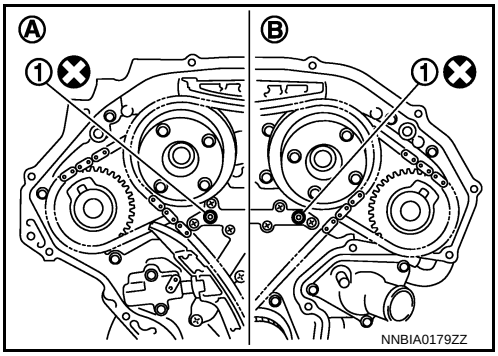
Be careful not to damage front timing chain case.



14. Remove O-rings (1).

A : Bank 1

B : Bank 2



15. Remove timing chain tensioner (primary) (1) as follows:

a. Remove lower mounting bolt (A).

b. Loosen upper mounting bolt (B) slowly, and then turn timing chain tensioner (primary) on the upper mounting bolt so that plunger (C) is fully expanded.

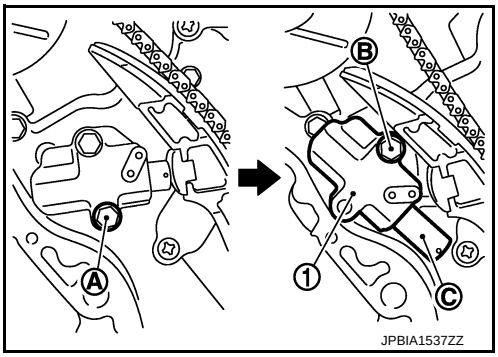
NOTE:

Even if plunger is fully expanded, it is not dropped from the body of timing chain tensioner (primary).

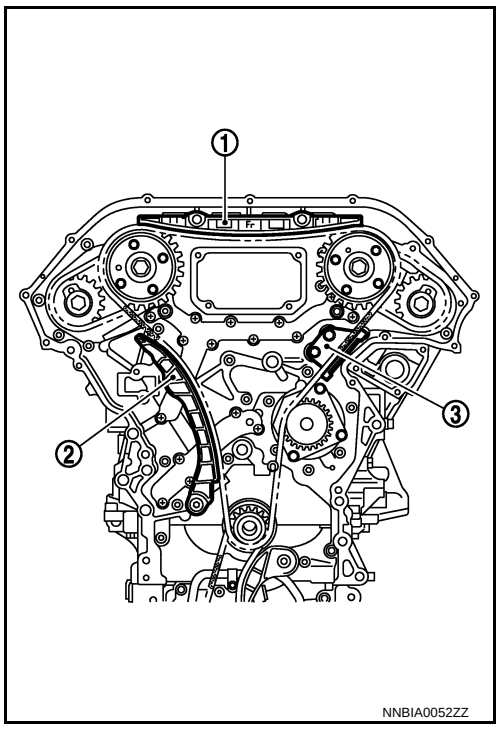
c. Remove upper mounting bolt, and then remove timing chain tensioner (primary).

CAUTION:

After removing timing chain tensioner (primary), never turn crankshaft and camshaft separately, or valves will strike the piston heads.



16. Remove internal chain guide (1), slack guide (2) and tension guide (3).

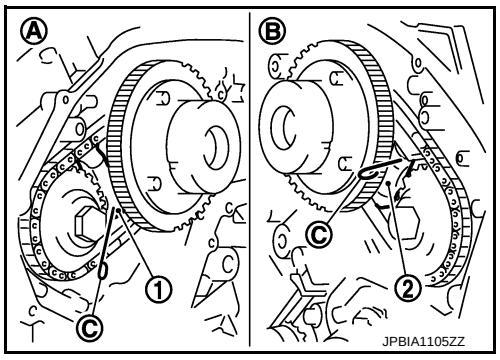


17. Remove timing chain (primary).
18. Remove timing chain (secondary) and camshaft sprockets as follows:

a. Attach suitable stopper pin (C) to the right and left timing chain tensioners (secondary) (1), (2).

A : Bank 1
B : Bank 2

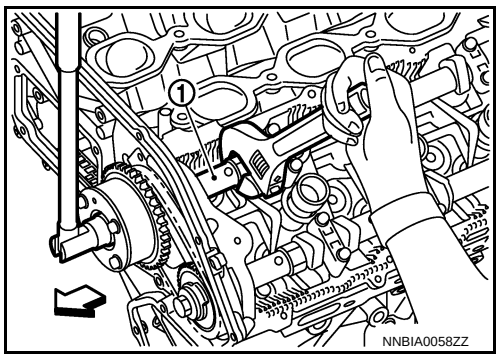
NOTE:
Use approximately 0.5 mm (0.02 in) dia. hard metal pin as a stopper pin.



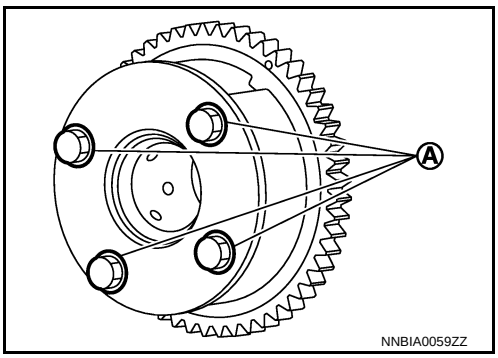
b. Remove camshaft sprocket mounting bolts (INT and EXH).
- Secure the hexagonal portion of camshaft using a wrench to loosen mounting bolts.

1 : Camshaft (INT)
⇦ : Engine front

CAUTION:
- **Never loosen the mounting bolts with securing anything other than the camshaft hexagonal portion or with tensioning the timing chain.**



- **Never disassemble camshaft sprocket (INT). [Never loosen bolts (A) as shown in the figure.]**

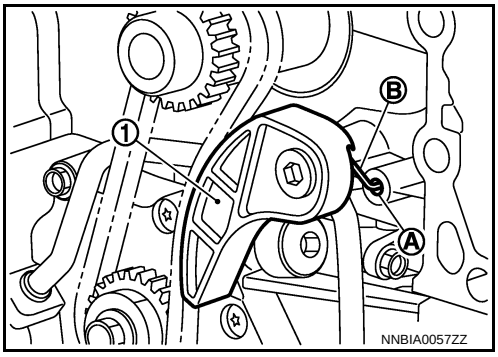


c. Remove timing chain (secondary) together with camshaft sprockets.

19. Remove the crankshaft sprocket and the oil pump related parts as follows:

a. Remove oil pump drive chain tensioner (1).
- Pull out spring (B) from spring fixing hole (A).

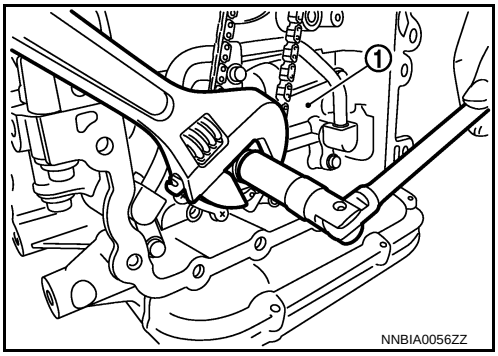
NOTE:
At this step, the tensioner does not have to be fixed to release tension.



b. Hold the hexagonal portion of oil pump sprocket, and then loosen the oil pump sprocket mounting nut.

1 : Oil pump assembly

NOTE:
There is no matching mark in the oil pump related parts.



c. Remove the crankshaft sprocket, the oil pump drive chain, and the oil pump sprocket at the same time.

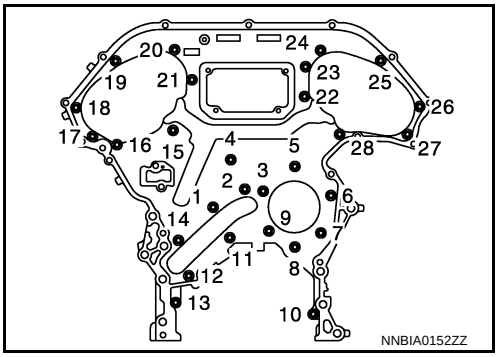
20. Remove water pump. Refer to CO-25, "Exploded View (GT-R certified NISSAN dealer)".

21. Remove oil pan (upper). Refer to EM-97, "Exploded View (GT-R certified NISSAN dealer)".

22. Remove rear timing chain case as follows:

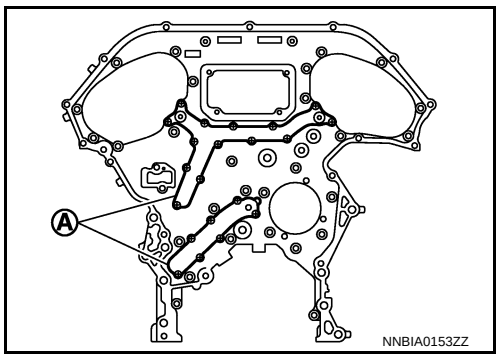
a. Loosen mounting bolts in reverse order as shown in the figure.

b. Cut liquid gasket using the seal cutter [SST: KV10111100 (J-37228)] and remove rear timing chain case.



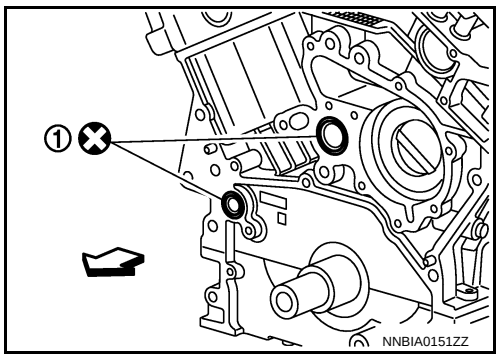
CAUTION:

- **Never remove plate metal cover (A) of oil passage.**
- **After removal, handle rear timing chain case carefully so it does not tilt, cant, or warp under a load.**



23. Remove O-rings (1).

⇦ : Engine front



24. Remove timing chain tensioners (secondary) from cylinder head as follows, if necessary.

a. Remove camshaft brackets (No. 1). Refer to EM-87, "Exploded View (GT-R certified NISSAN dealer)".

b. Remove timing chain tensioners (secondary) with a stopper pin attached.

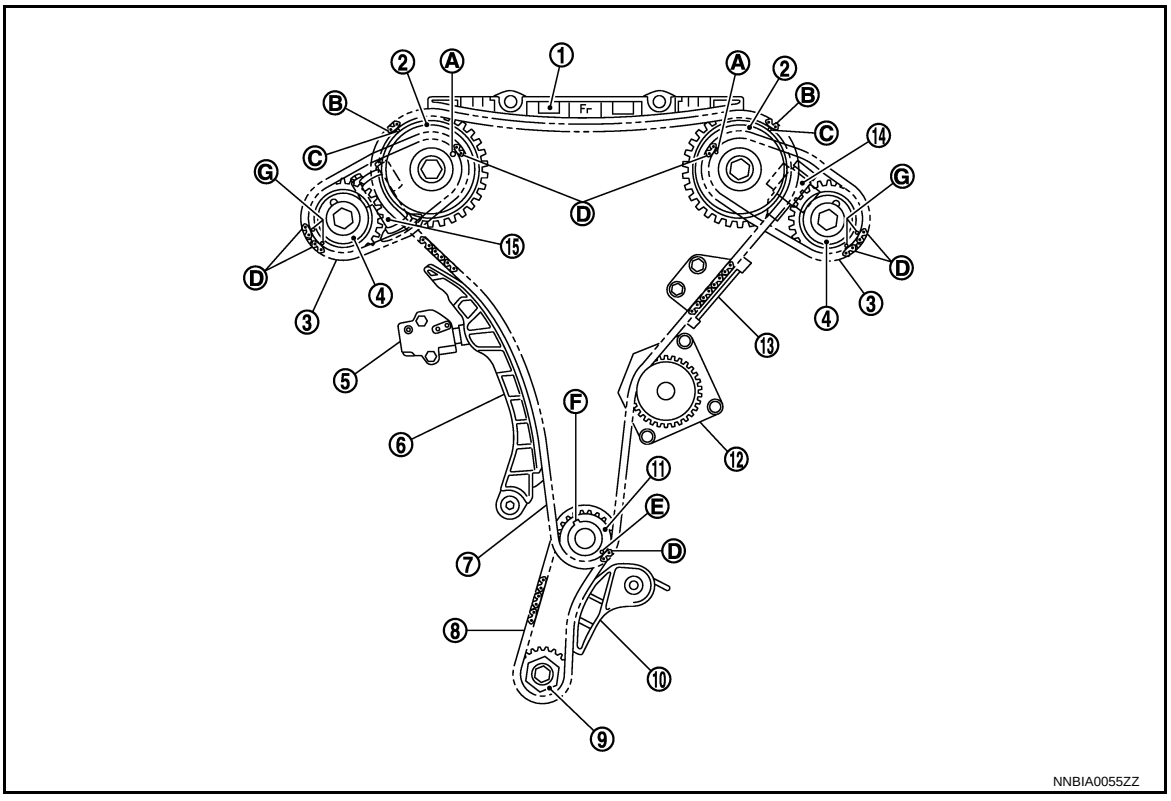
ASSEMBLY

CAUTION:

Do not reuse O-rings.

NOTE:

The below figure shows the relationship between the matching mark on each timing chain and that on the corresponding sprocket, with the components installed.



1.	Internal chain guide	2.	Camshaft sprocket (INT)	3.	Timing chain (secondary)
4.	Camshaft sprocket (EXH)	5.	Timing chain tensioner (primary)	6.	Slack guide
7.	Timing chain (primary)	8.	Oil pump drive chain	9.	Oil pump sprocket
10.	Oil pump drive chain tensioner	11.	Crankshaft sprocket	12.	Water pump
13.	Tension guide	14.	Timing chain tensioner (secondary) (bank 2)	15.	Timing chain tensioner (secondary) (bank 1)
A.	Matching mark [punched (back side)]	B.	Matching mark (yellow link)	C.	Matching mark (punched)
D.	Matching mark (orange link)	E.	Matching mark (notched)	F.	Crankshaft key
G.	Matching mark (punched)				

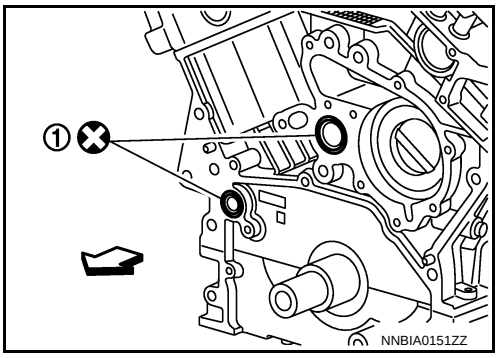
1. Install timing chain tensioners (secondary) to cylinder head, if removed. Refer to EM-87, "Exploded View (GT-R certified NISSAN dealer)".
2. Install rear timing chain case as follows:

a. Install O-rings (1).

CAUTION:

Do not reuse O-rings.

⇦ : Engine front



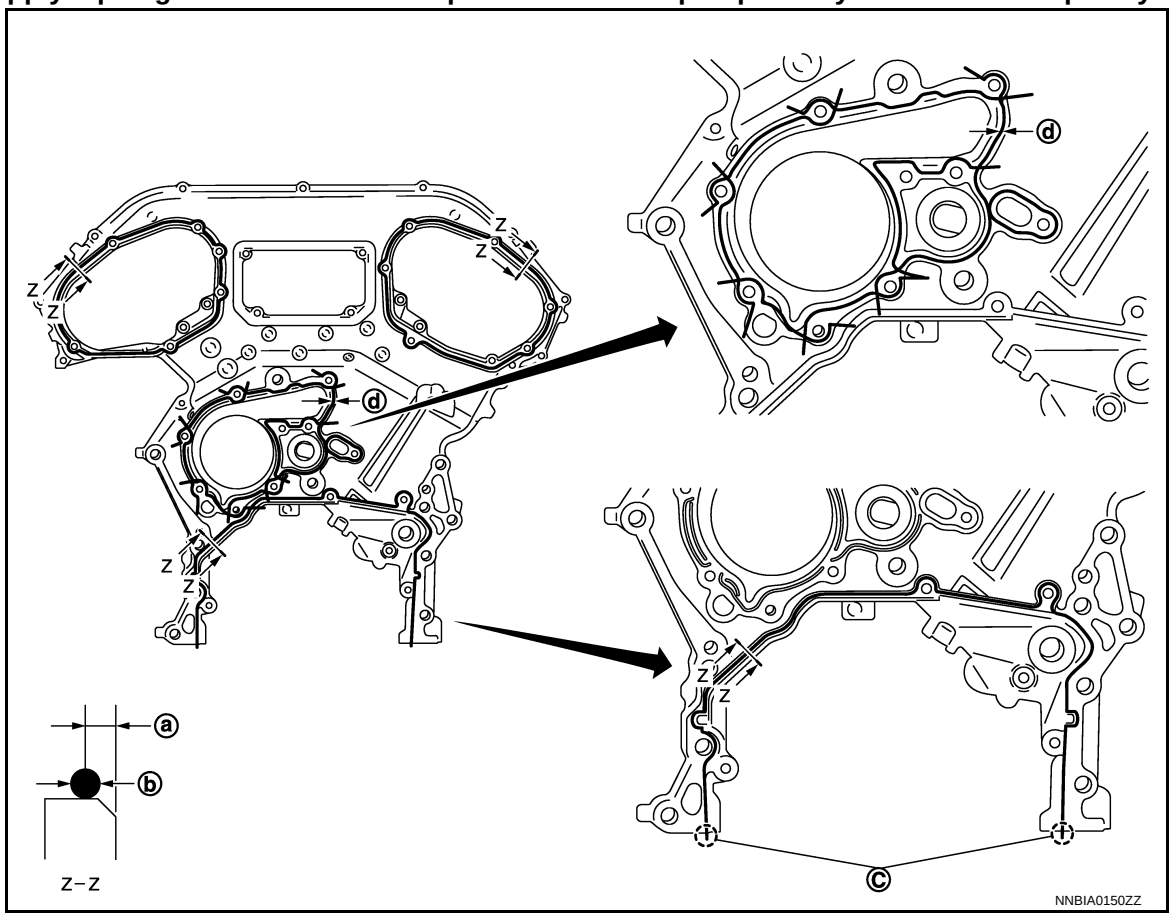
b. Apply liquid gasket with the cartridge gun (commercial service tool) to rear timing chain case back side as shown in the figure.

Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-18, "Recommended Chemical Products and Sealants".

CAUTION:

- **For in the figure, completely wipe off liquid gasket extended on a portion touching at engine coolant.**

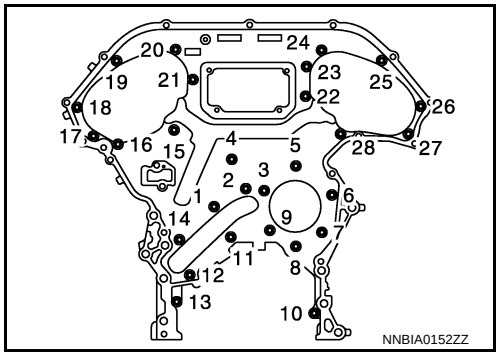
- **Apply liquid gasket on installation position of water pump and cylinder head completely.**



a. 4.8 mm (0.189 in)
b. ϕ3.9 mm (0.154 in)
c. Protrusions at beginning and end of gasket
d. ϕ2.7 mm (0.106 in)

c. Align rear timing chain case with dowel pins on cylinder block and install rear timing chain case.
   - Check that O-rings stay in place during installation to cylinder block.

d. Tighten mounting bolts in numerical order as shown in the figure.



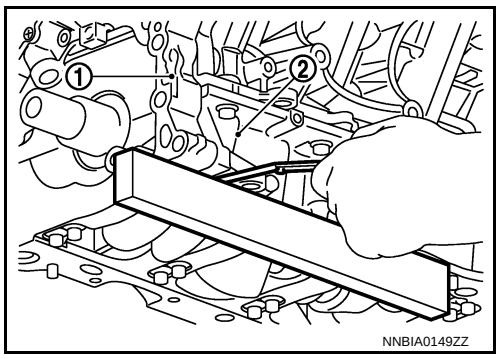
Bolt length

20 mm (0.79 in) : 1, 2, 3, 4, 5, 6, 7, 8, 9

16 mm (0.63 in) : Except the above

e. After all bolts are tightened, retighten them to the specified torque in numerical order shown in the figure.
   - If liquid gasket protrudes, wipe it off immediately.

f. After installing rear timing chain case, check the surface height difference between the following parts on the oil pan (upper) mounting surface.

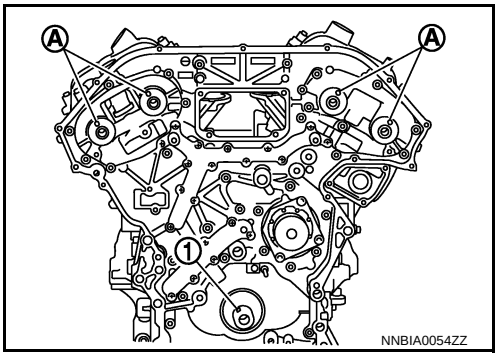


1 : Rear timing chain case
2 : Lower cylinder block

Standard : Less than –0.24 mm (–0.0094 in)

- If not within the standard, repeat the installation procedure.

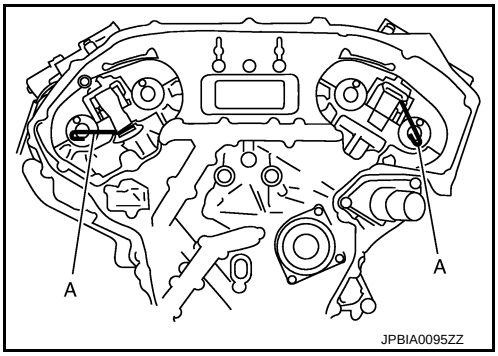
3. Install oil pan (upper). Refer to EM-97, "Exploded View (GT-R certified NISSAN dealer)".
4. Install water pump. Refer to CO-25, "Exploded View (GT-R certified NISSAN dealer)".
5. Check that dowel pin (A) and crankshaft key (1) are located as shown in the figure. (No. 1 cylinder at compression TDC)
NOTE:
Though camshaft does not stop at the position as shown in the figure, for the placement of cam noses, it is generally accepted camshaft is placed for the same direction of the figure.



Camshaft dowel pin
: At cylinder head upper face side in each bank
Crankshaft key
: At cylinder head side of bank 1

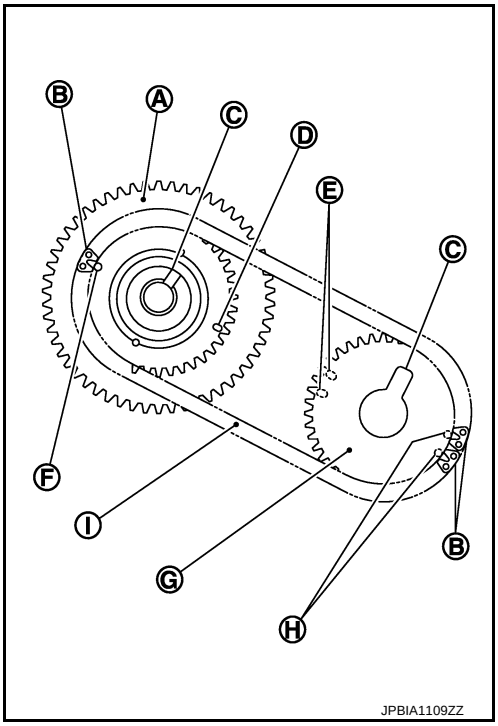
6. Install timing chains (secondary) and camshaft sprockets as follows:
CAUTION:
Matching marks between timing chain and sprockets slip easily. Confirm all matching mark positions repeatedly during the installation process.

a. Push plunger of timing chain tensioner (secondary) and keep it pressed in with a stopper pin (A).



b. Install timing chains (secondary) and camshaft sprockets.

A : Camshaft sprocket (INT) back face
B : Orange link
C : Dowel groove
D : Matching mark (oval)
E : Matching mark (2 oval)
F : Matching mark (circle)
G : Camshaft sprocket (EXH) back face
H : Matching mark (2 circle)
I : Timing chain (secondary)

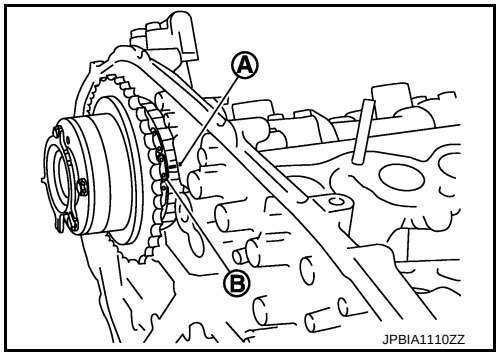


- Align the matching marks on timing chain (secondary) (orange link) with the ones on intake and exhaust camshaft sprockets (punched), and install them.
NOTE:
  - Figure shows bank 1 (rear view).
  - Matching marks for camshaft sprockets (INT) are on the back side of camshaft sprockets (secondary).
  - There are two types of matching marks, circle and oval types. They should be used for the bank 1 and bank 2, respectively.

Bank 1 : Use circle type
Bank 2 : Use oval type

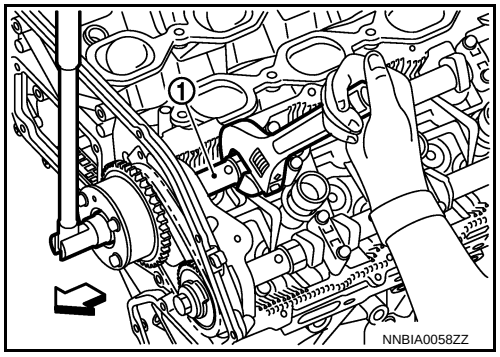
- Align dowel pin camshafts with the groove on sprockets, and install them.

- In case that positions of each matching mark and each dowel pin are not fit on matching parts, make fine adjustment to the position holding the hexagonal portion on camshaft with wrench or equivalent.
- Mounting bolts for camshaft sprockets must be tightened in the next step. Tightening them by hand is enough to prevent the dislocation of dowel pins.
- It may be difficult to visually check the dislocation of matching marks (B) during and after installation. To make the matching easier, make a matching mark (A) on the top of sprocket teeth and its extended line in advance with paint.



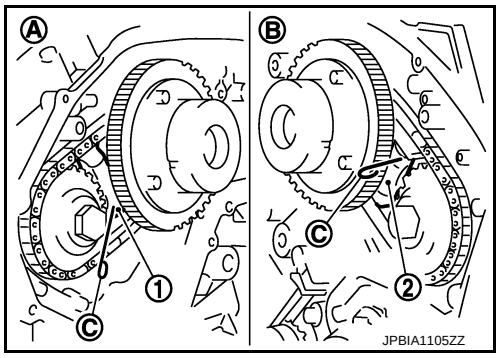
c. After confirming the matching marks are aligned, tighten camshaft sprocket mounting bolts.
- Secure camshaft using a wrench at the hexagonal portion to tighten mounting bolts.

1 : Camshaft (INT)
⇦ : Engine front



d. Pull stopper pins (C) out from timing chain tensioners (secondary) (1), (2).

A : Bank 1
B : Bank 2

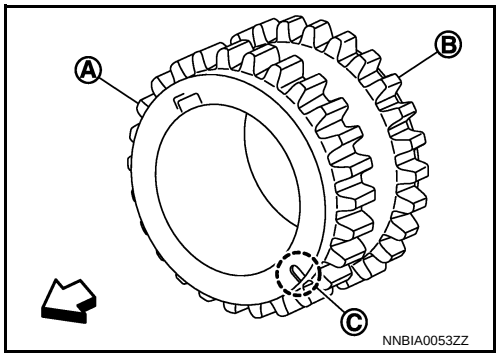


7. Install the crankshaft sprocket and the oil pump related parts as follows:

a. Install oil pump. Refer to LU-18, "Exploded View (GT-R certified NISSAN dealer)".

b. Install the crankshaft sprocket, the oil pump drive chain, and the oil pump sprocket at the same time.
- Check that the matching mark (C) on crankshaft sprocket face the front of the engine.

A : Timing chain (primary) side
B : Oil pump drive chain side
⇦ : Engine front

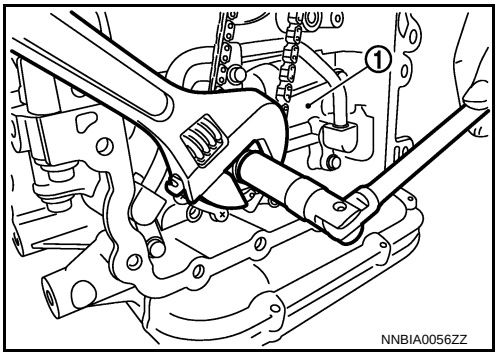


- Check that the hexagonal portion of oil pump sprocket face the front of the engine.

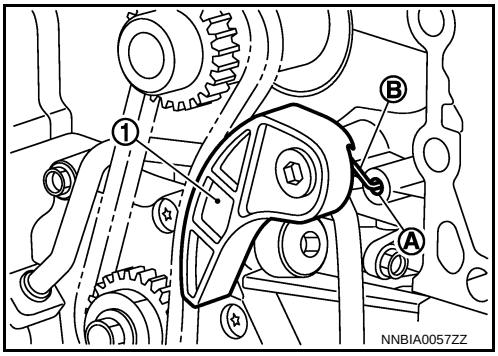
NOTE:
There is no matching mark in the oil pump related parts.

c. Hold the hexagonal portion of oil pump sprocket, and then tighten the oil pump sprocket mounting nut.

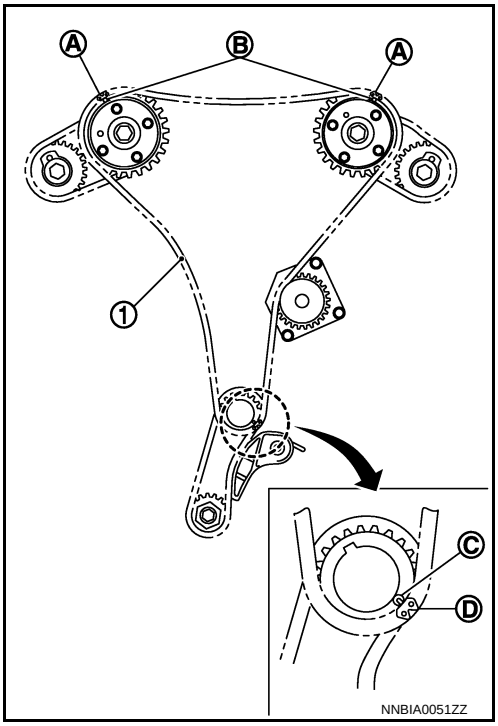
1 : Oil pump assembly



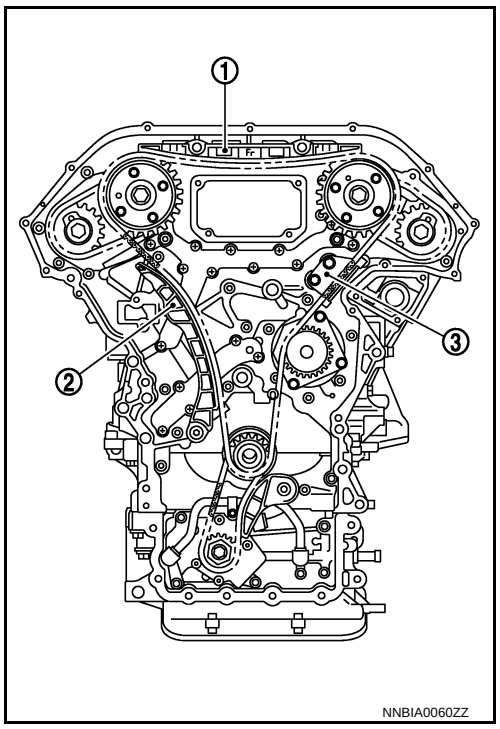
d. Install oil pump drive chain tensioner (1).
- Insert the spring (B) into the fixing hole (A) on the front side of cylinder block before tighten mounting bolt.
- Check that the tension is applied to the oil pump drive chain after installing.



8. Install timing chain (primary) (1).
- Install timing chain (primary) so that the matching mark (punched) (B) on camshaft sprocket (INT) is aligned with the yellow link (A) on timing chain, while the matching mark (notched) (C) on crankshaft sprocket is aligned with the orange link (D) one on timing chain, as shown in the figure.
- When it is difficult to align matching marks of timing chain (primary) with each sprocket, gradually turn camshaft using wrench on the hexagonal portion to align it with the matching marks.

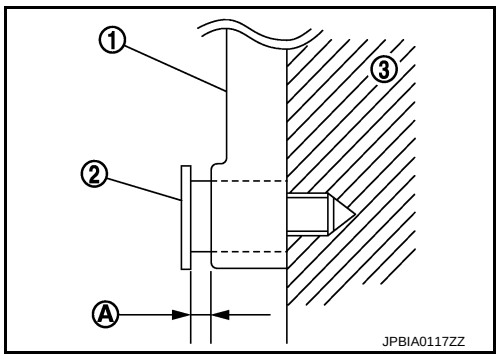


9. Install internal chain guide (1), slack guide (2) and tension guide (3).



CAUTION:
Never overtighten slack guide mounting bolts (2). It is normal for a gap (A) to exist under the bolt seats when mounting bolts are tightened to the specification.

1 : Slack guide
3 : Cylinder block



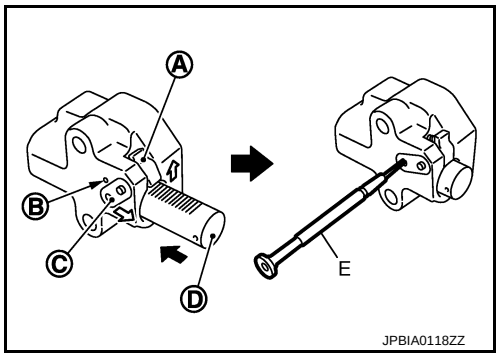
10. Install the timing chain tensioner (primary) with the following procedure:

a. Pull plunger stopper tab (A) up (or turn lever downward) so as to remove plunger stopper tab from the ratchet of plunger (D).
NOTE:
Plunger stopper tab and lever (C) are synchronized.

b. Push plunger into the inside of tensioner body.

c. Hold plunger in the fully compressed position by engaging plunger stopper tab with the tip of ratchet.

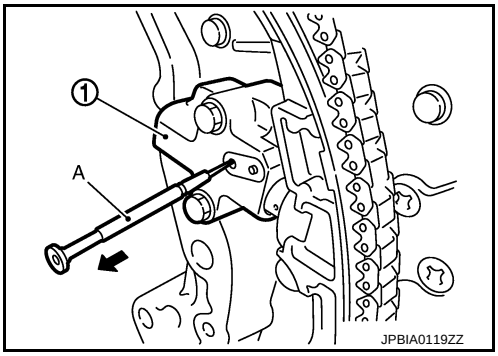
d. To secure lever, insert stopper pin (E) through hole of lever into tensioner body hole (B).
- The lever parts and the plunger stopper tab are synchronized. Therefore, the plunger will be secured under this condition.



NOTE:
Figure shows the example of 1.2 mm (0.047 in) diameter thin screwdriver being used as the stopper pin.

e. Install timing chain tensioner (primary) (1).
- Remove any dirt and foreign materials completely from the back and the mounting surfaces of timing chain tensioner (primary).

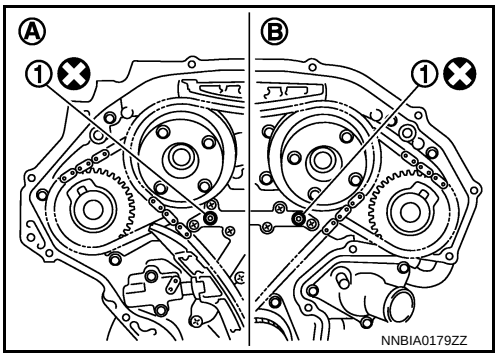
f. Pull out stopper pin (A) after installing, and then release plunger.



11. Check again that the matching marks on sprockets and timing chain have not slipped out of alignment.
12. Install new O-rings (1) on rear timing chain case.

CAUTION:
Do not reuse O-rings.

A : Bank 1
B : Bank 2



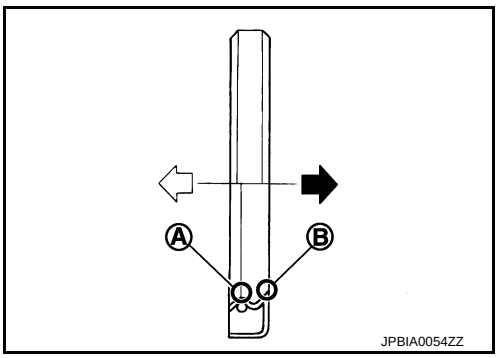
13. Install new front oil seal on front timing chain case as follows:

a. Apply neutral detergent on the rim.

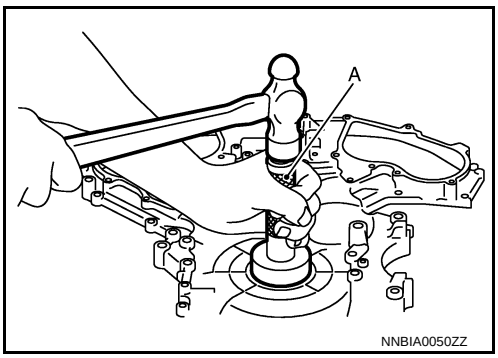
b. Install it so that each seal lip is oriented as shown in the figure.

B : Dust seal lip
⇦ : Engine inside
⬅ : Engine outside

CAUTION:
Never touch oil seal lip (A).



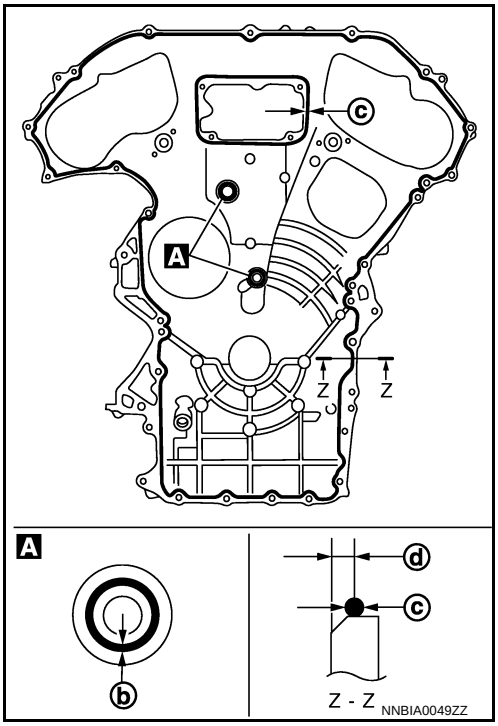
c. Using a suitable drift (A), press-fit oil seal until it becomes flush with front timing chain case end face.
- Check the garter spring is in position and seal lip is not inverted.



14. Install front timing chain case as follows:

a. Apply a continuous bead of liquid gasket with the cartridge gun (commercial service tool) to front timing chain case back side as shown in the figure.
Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-18, "Recommended Chemical Products and Sealants".

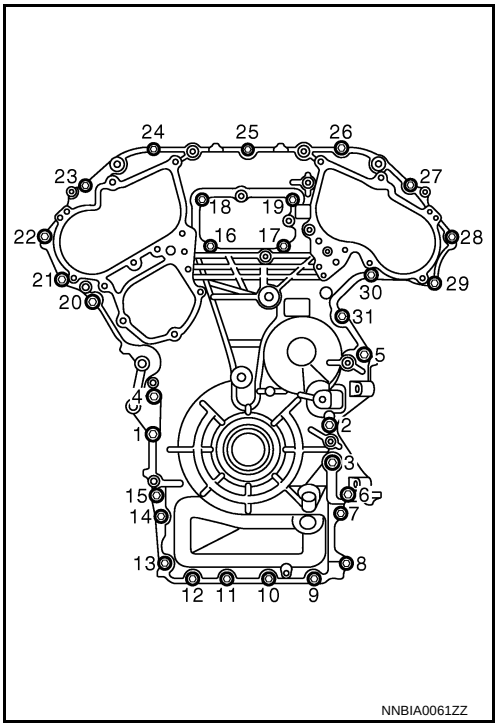
b : ϕ2.6 - 3.6 mm (0.102 - 0.142 in) dia.
c : ϕ3.4 - 4.4 mm (0.134 - 0.173 in) dia.
d : 4.0 - 5.6 mm (0.157 - 0.220 in) dia.



b. Tighten mounting bolts to the specified torque in numerical order as shown in the figure.
- There are three types of mounting bolts. Refer to the following for locating bolts.

M10 bolts : 1, 2, 3, 4, 5, 6
: 80.0 N·m (8.2 kg-m, 59 ft-lb)
M8 bolts : 7, 8, 9, 10, 11, 12, 13, 14
: 35.0 N·m (3.6 kg-m, 26 ft-lb)
M6 bolts : Except the above
: 13.5 N·m (1.4 kg-m, 10 ft-lb)

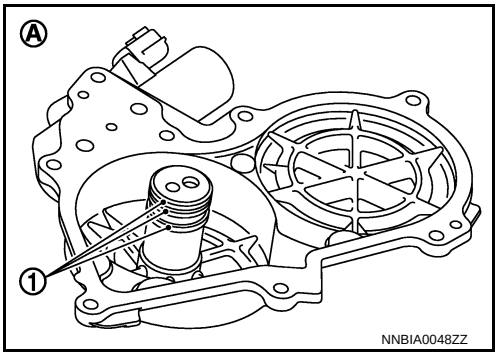
c. After all bolts are tightened, retighten them to the specified torque in numerical order shown in the figure.



15. Install intake valve timing control covers as follows:
a. Install new seal rings (1) in shaft grooves.

A : Bank 2

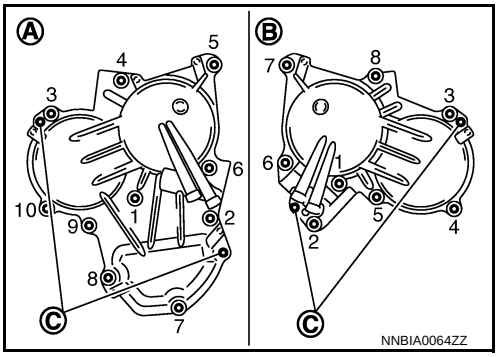
CAUTION:
When replacing seal ring, replace all rings with new one.



b. Install intake valve timing control cover with new gasket to front timing chain case.
CAUTION:
- **Align the center of both shaft holes of the shaft and the intake side camshaft sprocket, and then insert them.**
- **Be careful not to drop the seal ring from the shaft groove.**

c. Being careful not to move seal ring from the installation groove, align dowel pins on front timing chain case with dowel pin holes (C) to install intake valve timing control covers.

A : Bank 1
B : Bank 2



d. Tighten mounting bolts in numerical order as shown in the figure.
- After all bolts are tightened, tighten No. 1 bolt to the specified torque again.

16. Install crankshaft pulley as follows:

a. Fix crankshaft with a ring gear stopper [SST: KV101056S0 (J-49374)]. Refer to EM-58, "Setting (GT-R certified NISSAN dealer)".

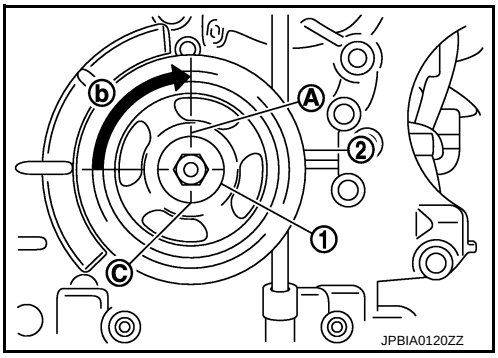
b. Install crankshaft pulley, taking care not to damage front oil seal.
- When press-fitting crankshaft pulley with plastic hammer, tap on its center portion (not circumference).

c. Tighten crankshaft pulley bolt.

: 44.1 N·m (4.5 kg-m, 33 ft-lb)

d. Tighten crankshaft pulley bolt (clockwise).
- Place a matching mark (A) on crankshaft pulley (2) aligning with the matching (C) of crankshaft pulley bolt (1).

Angle tightening: 90 degrees (b)

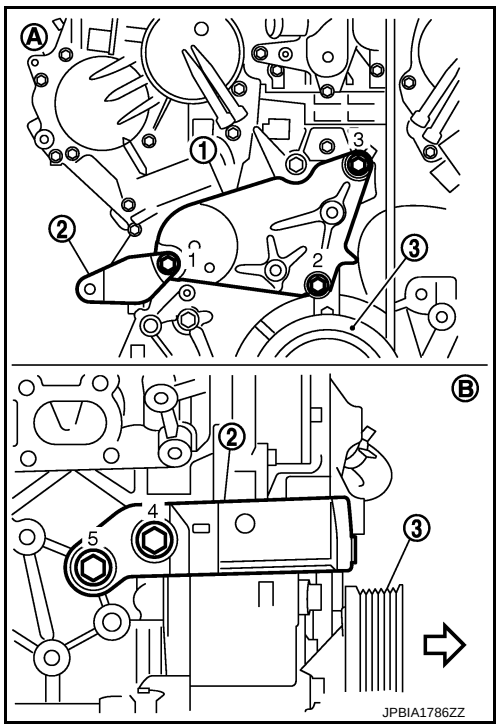


e. Rotate crankshaft pulley in normal direction (clockwise when viewed from front) to confirm it turns smoothly.

17. Install drive belt auto-tensioner bracket (1) and power steering oil pump bracket (2) as follows:

3 : Crankshaft pulley
A : Engine front side
B : Engine right side
⇦ : Engine front

a. Tighten mounting bolts in numerical order as shown in the figure. (temporarily)
b. Tighten mounting bolts to specified torque in numerical order as shown in the figure.



18. For the following operations, perform steps in the reverse order of removal.

Inspection (GT-R certified NISSAN dealer)

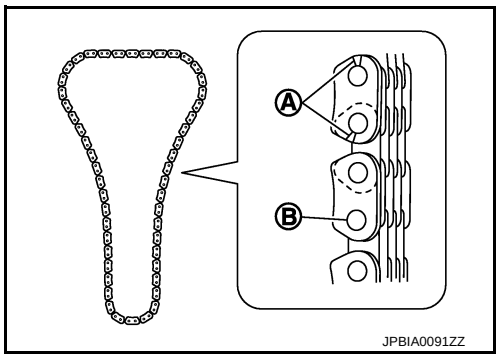
INFOID:0000000011488076

INSPECTION AFTER DISASSEMBLY

Timing Chain

Check for cracks and any excessive wear at link plates and roller links of timing chain. Replace timing chain as necessary.

A : Crack
B : Wear



INSPECTION AFTER ASSEMBLY

Inspection for Leakage

The following are procedures for checking fluids leak, lubricates leak.

- Before starting engine, check oil/fluid levels including engine coolant and engine oil. If less than required quantity, fill to the specified level. Refer to MA-21, "Fluids and Lubricants".
- Use procedure below to check for fuel leakage.
- Turn ignition switch “ON” (with engine stopped). With fuel pressure applied to fuel piping, check for fuel leakage at connection points.
- Start engine. With engine speed increased, check again for fuel leakage at connection points.
- Run engine to check for unusual noise and vibration.

NOTE:
If hydraulic pressure inside chain tensioner drops after removal/installation, slack in guide may generate a pounding noise during and just after the engine start. However, this does not indicate an unusualness. Noise will stop after hydraulic pressure rises.

- Warm up engine thoroughly to check there is no leakage of fuel, or any oil/fluids including engine oil and engine coolant.
- Bleed air from lines and hoses of applicable lines, such as in cooling system.

- After cooling down engine, again check oil/fluid levels including engine oil and engine coolant. Refill to the specified level, if necessary.

Summary of the inspection items:

Items		Before starting engine	Engine running	After engine stopped
Engine coolant		Level	Leakage	Level
Engine oil		Level	Leakage	Level
Transmission / transaxle fluid	AT & CVT Models	Leakage	Level / Leakage	Leakage
	MT Models	Level / Leakage	Leakage	Level / Leakage
Other oils and fluids*		Level	Leakage	Level
Fuel		Leakage	Leakage	Leakage

* Power steering fluid, brake fluid, etc.

CAMSHAFT

Exploded View (GT-R certified NISSAN dealer)

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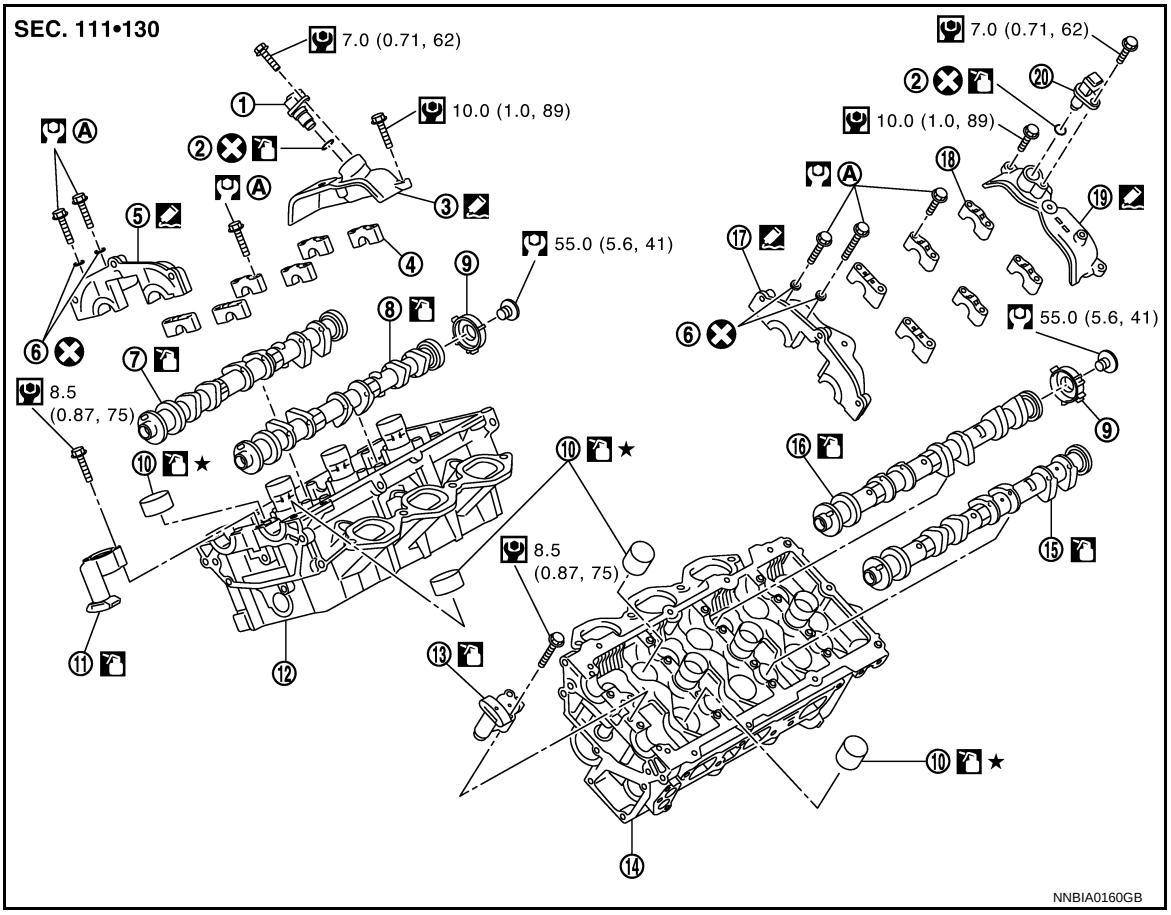


1.	Camshaft position sensor (PHASE) (bank 1)	2.	O-ring	3.	Camshaft sensor bracket (bank 1)
4.	Camshaft bracket (No. 2 - 4) (bank 1)	5.	Camshaft bracket (No. 1) (bank 1)	6.	Seal washer
7.	Camshaft (EXH) (bank 1)	8.	Camshaft (INT) (bank 1)	9.	Camshaft signal plate
10.	Valve lifter	11.	Timing chain tensioner (secondary) (bank 1)	12.	Cylinder head (bank 1)
13.	Timing chain tensioner (secondary) (bank 2)	14.	Cylinder head (bank 2)	15.	Camshaft (EXH) (bank 2)
16.	Camshaft (INT) (bank 2)	17.	Camshaft bracket (No. 1) (bank 2)	18.	Camshaft bracket (No. 2 - 4) (bank 2)
19.	Camshaft sensor bracket (bank 2)	20.	Camshaft position sensor (PHASE) (bank 2)		
A.	Comply with the assembly procedure when tightening. Refer to EM-87				

Refer to GI-4, "Components" for symbols in the figure.

Disassembly and Assembly (GT-R certified NISSAN dealer)

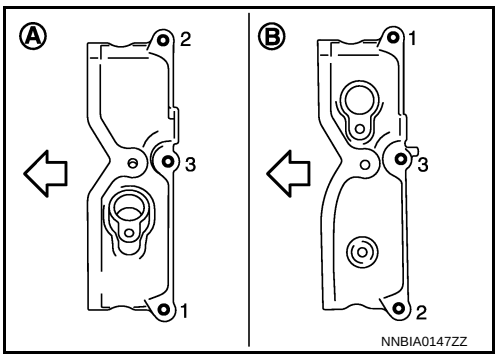
INFOID:0000000011488078

DISASSEMBLY

1. Remove front timing chain case, rear timing chain case, camshaft sprocket and timing chain. Refer to EM-69, "Exploded View (GT-R certified NISSAN dealer)".

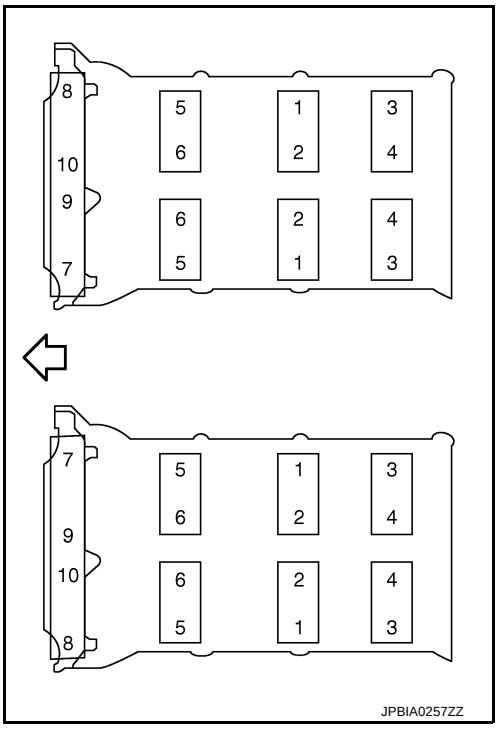
2. Remove camshaft sensor bracket.
   • Loosen mounting bolts in reverse order as shown in the figure.

   A : Bank 1
   B : Bank 2
   ⇦ : Engine front



3. Remove camshaft brackets.
   • Mark camshafts, camshaft brackets and bolts so they are placed in the same position and direction for installation.
   • Equally loosen camshaft bracket bolts in several steps in reverse order as shown in the figure.

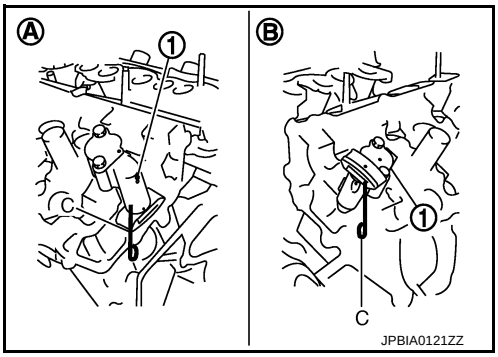
   ⇦ : Engine front



4. Remove timing chain tensioners (secondary) (1) from cylinder head.

   A : Bank 1
   B : Bank 2

   • Remove timing chain tensioners (secondary) with its stopper pin (C) attached.



5. Remove camshaft.
6. Remove valve lifter.
   • Identify installation positions, and store them without mixing them up.
7. Remove camshaft position sensor (PHASE), if necessary.
   CAUTION:
   Never shock camshaft position sensors.

ASSEMBLY

CAUTION:
Do not reuse O-rings or washers.

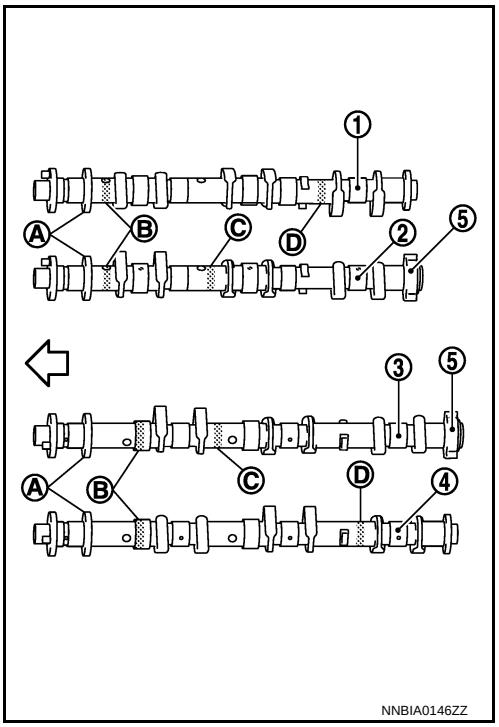
1. Install valve lifter.
   - Install it in the original position.
2. Install camshafts.

5 : Camshaft signal plate

⇦ : Engine front

- Follow your identification marks made during removal, or follow the identification marks that are present on new camshafts for proper placement and direction.

Bank	Camshaft	Paint marks			Identification mark (A)
		M1 (C)	M2 (D)	M3 (B)	
Bank 1	EXH (1)	No	White	Light blue	1R
	INT (2)	White	No	Light blue	1Q
Bank 2	INT (3)	White	No	Light blue	1S
	EXH (4)	No	White	Light blue	1T



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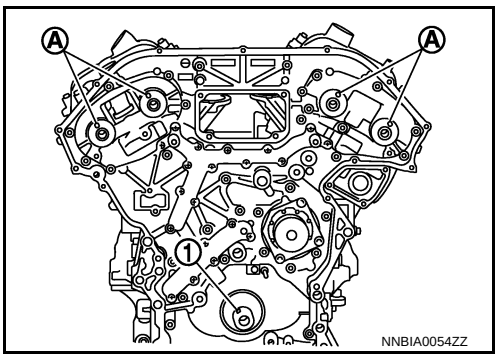
- Install camshaft so that dowel pin (A) on front end face are positioned as shown in the figure. (No. 1 cylinder TDC on its compression stroke)

1 : Crankshaft key

NOTE:
Though camshaft does not stop at the portion as shown in the figure, for the placement of cam nose, it is generally accepted camshaft is placed for the same direction of the figure.



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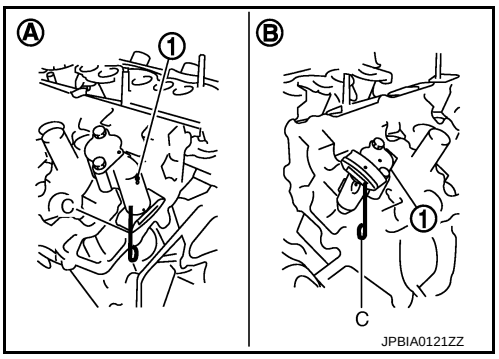
3. Install timing chain tensioners (secondary) (1) on both sides of cylinder head.

A : Bank 1

B : Bank 2

- Install timing chain tensioner with its stopper pin (C) attached.
- Install timing chain tensioner with sliding part facing downward on cylinder head (bank 1), and with sliding part facing upward on cylinder head (bank 2).



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4. Install camshaft brackets as follows.

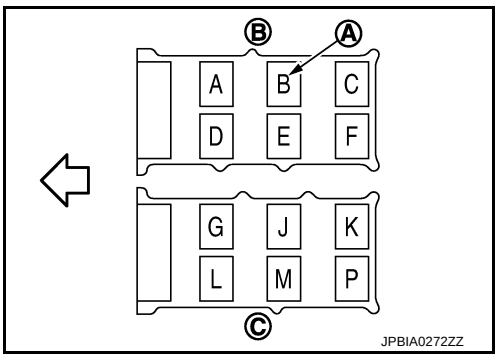
a. Remove foreign material completely from camshaft bracket backside and from cylinder head installation face.

b. Install camshaft bracket in original position and direction as shown in figure.

- Install camshaft brackets (No. 2 to 4) aligning the stamp marks (A) as shown in the figure.

B : Bank 1
C : Bank 2
⇦ : Engine front

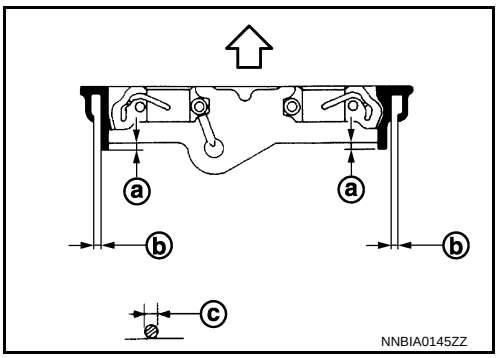
NOTE:
There are no identification marks indicating bank 1 and bank 2 for camshaft bracket (No. 1).



c. Apply liquid gasket to mating surface of camshaft bracket (No. 1) as shown on both bank 1 and bank 2.

a : 2 mm (0.08 in)
b : Clearance 5 mm (0.20 in)
c : ϕ2.5 mm (0.098 in)
⇦ : Engine front

Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-18, "Recommended Chemical Products and Sealants".



5. Tighten camshaft bracket bolts in the following steps, in numerical order as shown.

⇦ : Engine front

a. Tighten No. 7 to 10 in numerical order as shown.

: 2.0 N·m (0.20 kg-m, 1 ft-lb)

b. Tighten No. 1 to 6 in numerical order as shown.

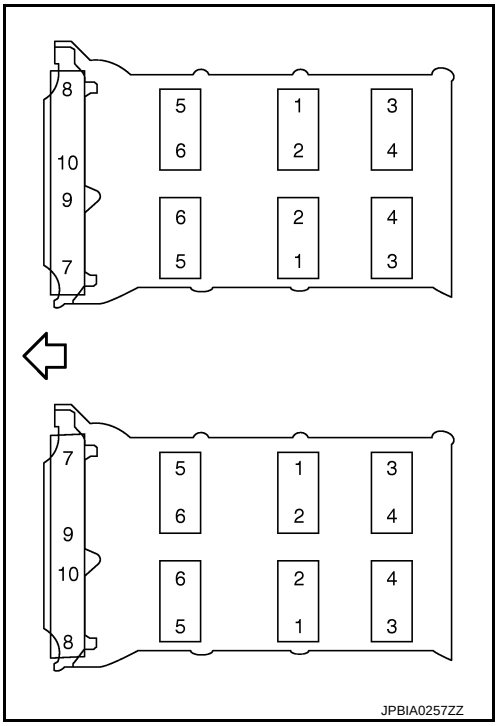
: 2.0 N·m (0.20 kg-m, 1 ft-lb)

c. Tighten No. 1 to 10 in numerical order as shown.

: 5.9 N·m (0.60 kg-m, 4 ft-lb)

d. Tighten No. 1 to 10 in numerical order as shown.

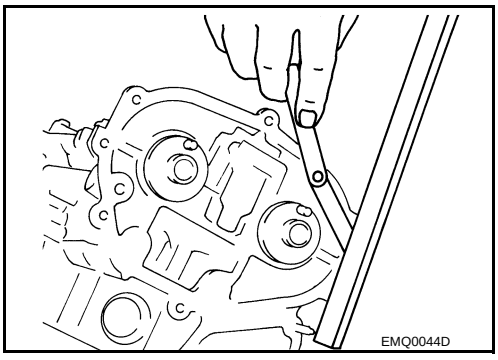
: 10.4 N·m (1.1 kg-m, 8 ft-lb)



6. Measure difference in levels between front end camshaft bracket (No. 1) and cylinder head.

Standard : –0.14 to 0.14 mm (–0.0055 to 0.0055 in)

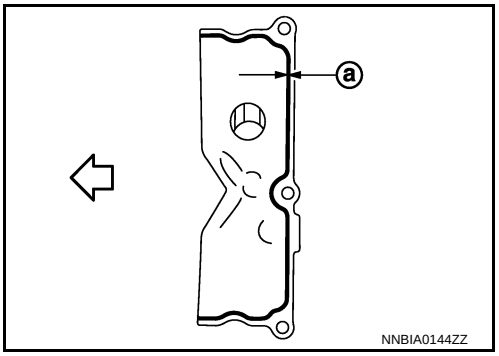
- Measure two positions (both intake and exhaust side) for a single bank.
- If the measured value is out of the standard, re-install camshaft bracket (No. 1).



7. Install camshaft sensor bracket as follows:

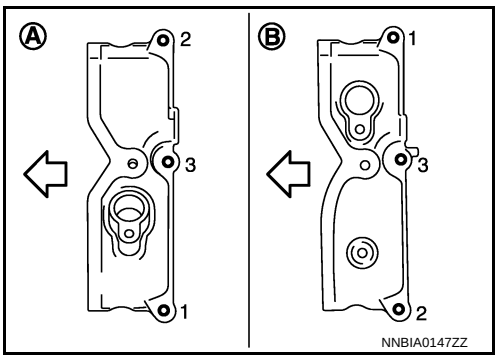
a. Apply liquid gasket to mating surface of camshaft sensor bracket as shown in the figure.
Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-18, "Recommended Chemical Products and Sealants".

a : ϕ2.5 mm (0.098 in)
⇦ : Engine front



b. Tighten mounting bolts in numerical order as shown in the figure.

A : Bank 1
B : Bank 2
⇦ : Engine front



8. Inspect and adjust the valve clearance. Refer to EM-20, "Inspection (GT-R certified NISSAN dealer)" and EM-91, "Inspection (GT-R certified NISSAN dealer)".
9. Install in the reverse order of removal after this step.

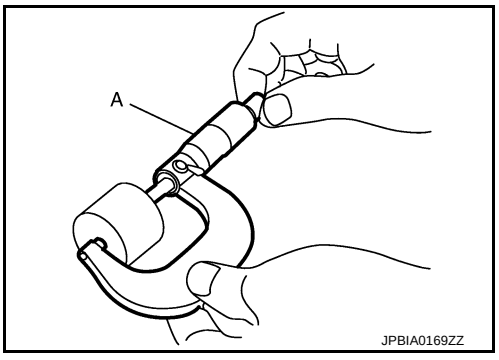
Inspection (GT-R certified NISSAN dealer)

INFOID:0000000011488079

VALVE CLEARANCE ADJUSTMENT

• Perform adjustment depending on selected head thickness of valve lifter.

1. Measure the valve clearance. Refer to EM-20, "Inspection (GT-R certified NISSAN dealer)".
2. Remove camshaft. Refer to EM-87, "Disassembly and Assembly (GT-R certified NISSAN dealer)".
3. Remove valve lifters at the locations that are out of the standard.
4. Measure the center thickness of the removed valve lifters with a micrometer (A).



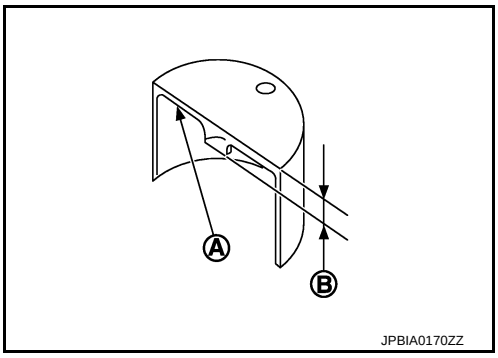
5. Use the equation below to calculate valve lifter thickness for replacement.

Valve lifter thickness calculation: $t = t_1 + (C_1 - C_2)$
t = Valve lifter thickness to be replaced
t_1 = Removed valve lifter thickness
C_1 = Measured valve clearance
C_2 = Standard valve clearance:

Intake : 0.30 mm (0.012 in)
Exhaust : 0.33 mm (0.013 in)

- Thickness of new valve lifter can be identified by stamp marks on the reverse side (inside the cylinder).
  Stamp mark 788 indicates 7.88 mm (0.3102 in) in thickness.

A : Stamp
B : Thickness of valve lifter



Available thickness of valve lifter: 27 sizes with range 7.88 to 8.40 mm (0.3102 to 0.3307 in) in steps of 0.02 mm (0.0008 in) (when manufactured at factory). Refer to EM-141, "Camshaft (GT-R certified NISSAN dealer)".

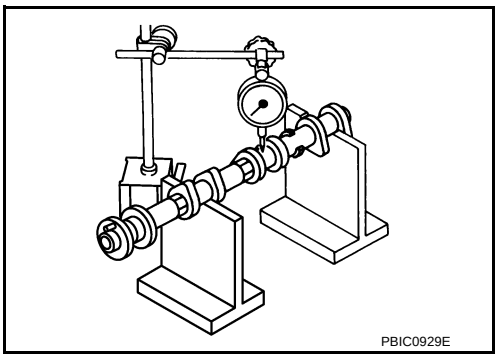
6. Install selected valve lifter.
7. Install camshaft. Refer to EM-87, "Disassembly and Assembly (GT-R certified NISSAN dealer)".
8. Manually turn crankshaft pulley a few turns.
9. Check that the valve clearances for cold engine are within the specifications by referring to the specified values. Refer to EM-20, "Inspection (GT-R certified NISSAN dealer)".
10. Install all removal parts in the reverse order of removal.
11. Warm up the engine, and check for unusual noise and vibration.

INSPECTION AFTER DISASSEMBLY

Camshaft Runout

1. Put V-block on precise flat table, and support No. 2 and 4 journals of camshaft.
   CAUTION:
   Never support No. 1 journal (on the side of camshaft sprocket) because it has a different diameter from the other three locations.
2. Set a dial indicator vertically to No. 3 journal.
3. Turn camshaft to one direction with hands, and measure the camshaft runout on a dial indicator. (Total indicator reading)

Standard & limit : Refer to EM-141, "Camshaft (GT-R certified NISSAN dealer)".



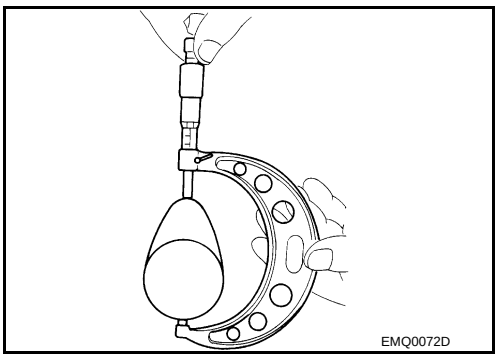
4. If it exceeds the limit, replace camshaft.

Camshaft Cam Height

1. Measure the camshaft cam height with a micrometer.

Standard & limit : Refer to EM-141, "Camshaft (GT-R certified NISSAN dealer)".

2. If wear exceeds the limit, replace camshaft.

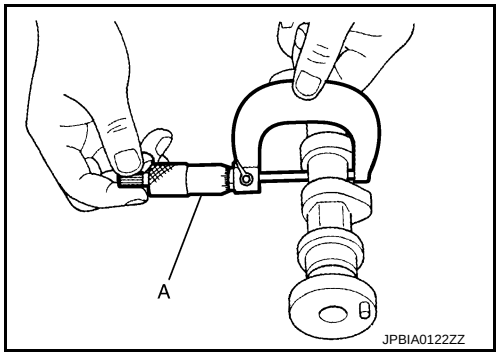


Camshaft Journal Oil Clearance

CAMSHAFT JOURNAL DIAMETER

- Measure the outer diameter of camshaft journal with a micrometer (A).

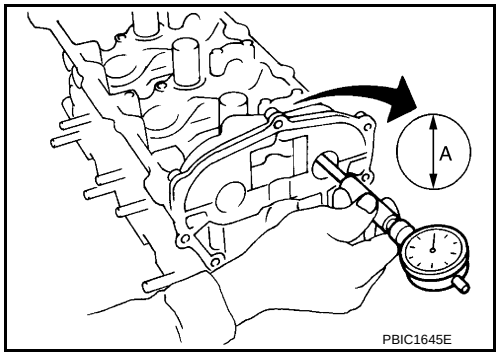
Standard : Refer to EM-141, "Camshaft (GT-R certified NISSAN dealer)".



CAMSHAFT BRACKET INNER DIAMETER

- Tighten camshaft bracket bolt with the specified torque. Refer to “ASSEMBLY” for the tightening procedure.
- Measure inner diameter (A) of camshaft bracket with a bore gauge.

Standard : Refer to EM-141, "Camshaft (GT-R certified NISSAN dealer)".



CAMSHAFT JOURNAL OIL CLEARANCE

- (Oil clearance) = (Camshaft bracket inner diameter) – (Camshaft journal diameter).

Limit : Refer to EM-141, "Camshaft (GT-R certified NISSAN dealer)".

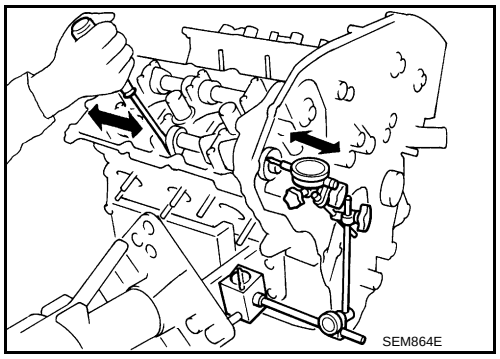
- If the calculated value exceeds the limit, replace either or both camshaft and cylinder head.

NOTE:
Camshaft brackets cannot be replaced as single parts, because there are machined together with cylinder head. Replace whole cylinder head assembly.

Camshaft End Play

- Install a dial indicator in thrust direction on front end of camshaft. Measure the end play of a dial indicator when camshaft is moved forward/backward (in direction to axis).

Standard and limit : Refer to EM-141, "Camshaft (GT-R certified NISSAN dealer)".



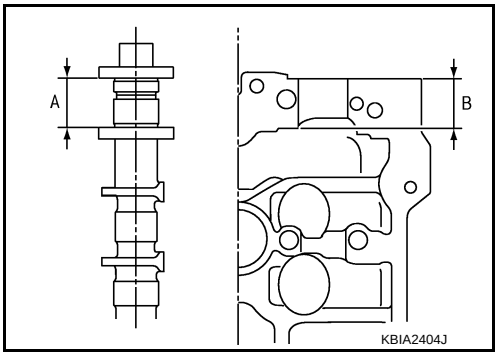
• Measure the following parts if out of the limit.
- Dimension “A” for camshaft No. 1 journal

Standard : 27.500 - 27.548 mm (1.0827 - 1.0846 in)

- Dimension “B” for cylinder head No. 1 journal bearing

Standard : 27.360 - 27.385 mm (1.0772 - 1.0781 in)

• Refer to the standards above, and then replace camshaft and/or cylinder head.

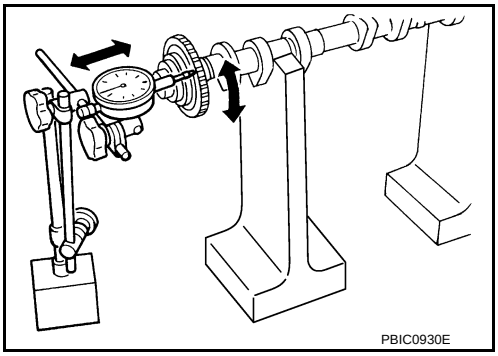


Camshaft Sprocket Runout

1. Put V-block on precise flat table, and support No. 2 and 4 journals of camshaft.
   CAUTION:
   Never support No. 1 journal (on the side of camshaft sprocket) because it has a different diameter from the other three locations.
2. Measure the camshaft sprocket runout with a dial indicator. (Total indicator reading)

Limit : Refer to EM-141, "Camshaft (GT-R certified NISSAN dealer)".

• If it exceeds the limit, replace camshaft sprocket.



Camshaft Signal Plate Runout

1. Put V-block on precise flat table, and support No. 2 and 4 journals of camshaft.
   CAUTION:
   Never support No. 1 journal (on the side of camshaft sprocket) because it has a different diameter from the other three locations.
2. Measure the camshaft signal plate runout with a dial indicator. (Total indicator reading)

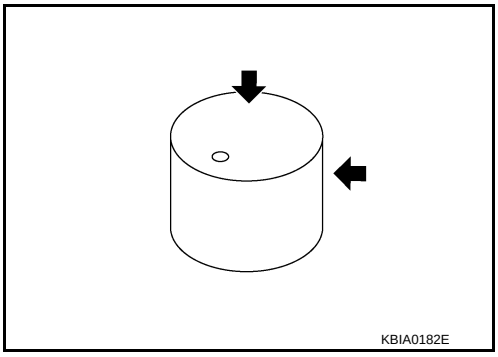
Limit : Refer to EM-141, "Camshaft (GT-R certified NISSAN dealer)".

• If it exceeds the limit, replace camshaft signal plate.

Valve Lifter

Check if surface of valve lifter has any wear or cracks.

• If anything above is found, replace valve lifter. Refer to EM-141, "Camshaft (GT-R certified NISSAN dealer)".

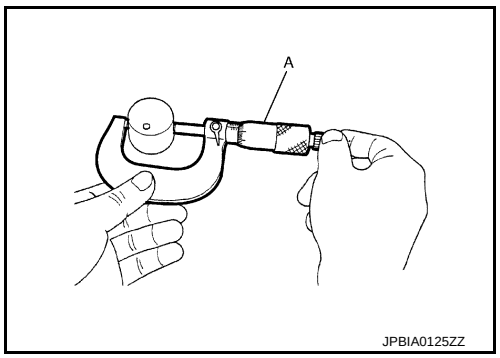


Valve Lifter Clearance

VALVE LIFTER OUTER DIAMETER

- Measure the outer diameter at 1/2 height of valve lifter with a micrometer (A) since valve lifter is in barrel shape.

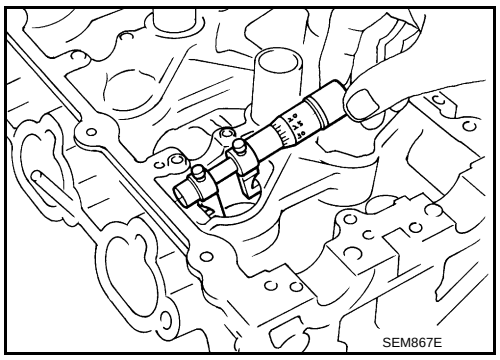
Standard **: Refer to EM-141, "Camshaft (GT-R certified NISSAN dealer)".**



VALVE LIFTER HOLE DIAMETER

- Measure the inner diameter of valve lifter hole of cylinder head with an inside micrometer.

Standard **: Refer to EM-141, "Camshaft (GT-R certified NISSAN dealer)".**



VALVE LIFTER CLEARANCE

- (Valve lifter clearance) = (Valve lifter hole diameter) – (Valve lifter outer diameter)

Standard **: Refer to EM-141, "Camshaft (GT-R certified NISSAN dealer)".**

- If the calculated value is out of the standard, referring to each standard of valve lifter outer diameter and valve lifter hole diameter, replace either or both valve lifter and cylinder head.

INSPECTION AFTER ASSEMBLY

Inspection of Camshaft Sprocket (INT) Oil Groove

CAUTION:

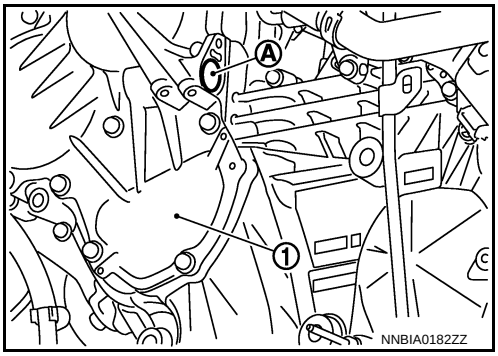
- **Perform this inspection only when DTC P0011, P0021 are detected in self-diagnostic results of CONSULT and it is directed according to inspection procedure of EC section. Refer to EC-196, "DTC Logic (GT-R certified NISSAN dealer)".**
- **Check when engine is cold so as to prevent burns from the splashing engine oil.**

1. Check engine oil level. Refer to LU-8, "Inspection".
2. Perform the following procedure so as to prevent the engine from being unintentionally started while checking.

a. Release the fuel pressure. Refer to EC-637, "Inspection (GT-R certified NISSAN dealer)".
b. Disconnect ignition coil and injector harness connectors. Refer to EM-47, "Exploded View".

3. Remove intake valve timing control solenoid valve. Refer to EM-69, "Exploded View (GT-R certified NISSAN dealer)".

4. Crank engine, and then check that engine oil comes out from intake valve timing control solenoid valve hole (A). End crank after checking.



1 : Intake valve timing control cover (bank 1)

WARNING:
Be careful not to touch rotating parts. (drive belts, idler pulley, and crankshaft pulley, etc.)
CAUTION:
- **Prevent splashing by using a shop cloth so as to prevent the worker from injury from engine oil and so as to prevent engine oil contamination.**
- **Prevent splashing by using a shop cloth so as to prevent engine oil from being splashed to engine and vehicle. Especially, be careful no to apply engine oil to rubber parts of drive belts, engine mounting insulator, etc. Wipe engine oil off immediately if it is splashed.**

5. Perform the following inspection if engine oil does not come out from intake valve timing control solenoid valve oil hole of the cylinder head.
   - Remove oil filter, and then clean it. Refer to EM-69, "Exploded View (GT-R certified NISSAN dealer)".
   - Clean oil groove between oil strainer and intake valve timing control solenoid valve. Refer to LU-2, "Engine Lubrication System (GT-R certified NISSAN dealer)".
6. Remove components between intake valve timing control solenoid valve and camshaft sprocket (INT), and then check each oil groove for clogging.
   - Clean oil groove if necessary. Refer to LU-2, "Engine Lubrication System (GT-R certified NISSAN dealer)".
7. After inspection, install removed parts in the reverse order.

Inspection for Leakage

The following are procedures for checking fluids leak, lubricates leak.
- Before starting engine, check oil/fluid levels including engine coolant and engine oil. If less than required quantity, fill to the specified level. Refer to MA-21, "Fluids and Lubricants".
- Use procedure below to check for fuel leakage.
- Turn ignition switch “ON” (with engine stopped). With fuel pressure applied to fuel piping, check for fuel leakage at connection points.
- Start engine. With engine speed increased, check again for fuel leakage at connection points.
- Run engine to check for unusual noise and vibration.

  NOTE:
  If hydraulic pressure inside timing chain tensioner drops after removal/installation, slack in the guide may generate a pounding noise during and just after engine start. However, this is normal. Noise will stop after hydraulic pressure rises.
- Warm up engine thoroughly to check there is no leakage of fuel, or any oil/fluids including engine oil and engine coolant.
- Bleed air from lines and hoses of applicable lines, such as in cooling system.
- After cooling down engine, again check oil/fluid levels including engine oil and engine coolant. Refill to the specified level, if necessary.

Summary of the inspection items:

Items		Before starting engine	Engine running	After engine stopped
Engine coolant		Level	Leakage	Level
Engine oil		Level	Leakage	Level
Transmission / transaxle fluid	AT & CVT Models	Leakage	Level / Leakage	Leakage
	MT Models	Level / Leakage	Leakage	Level / Leakage
Other oils and fluids*		Level	Leakage	Level
Fuel		Leakage	Leakage	Leakage

* Power steering fluid, brake fluid, etc.

OIL PAN AND OIL STRAINER

Exploded View (GT-R certified NISSAN dealer)

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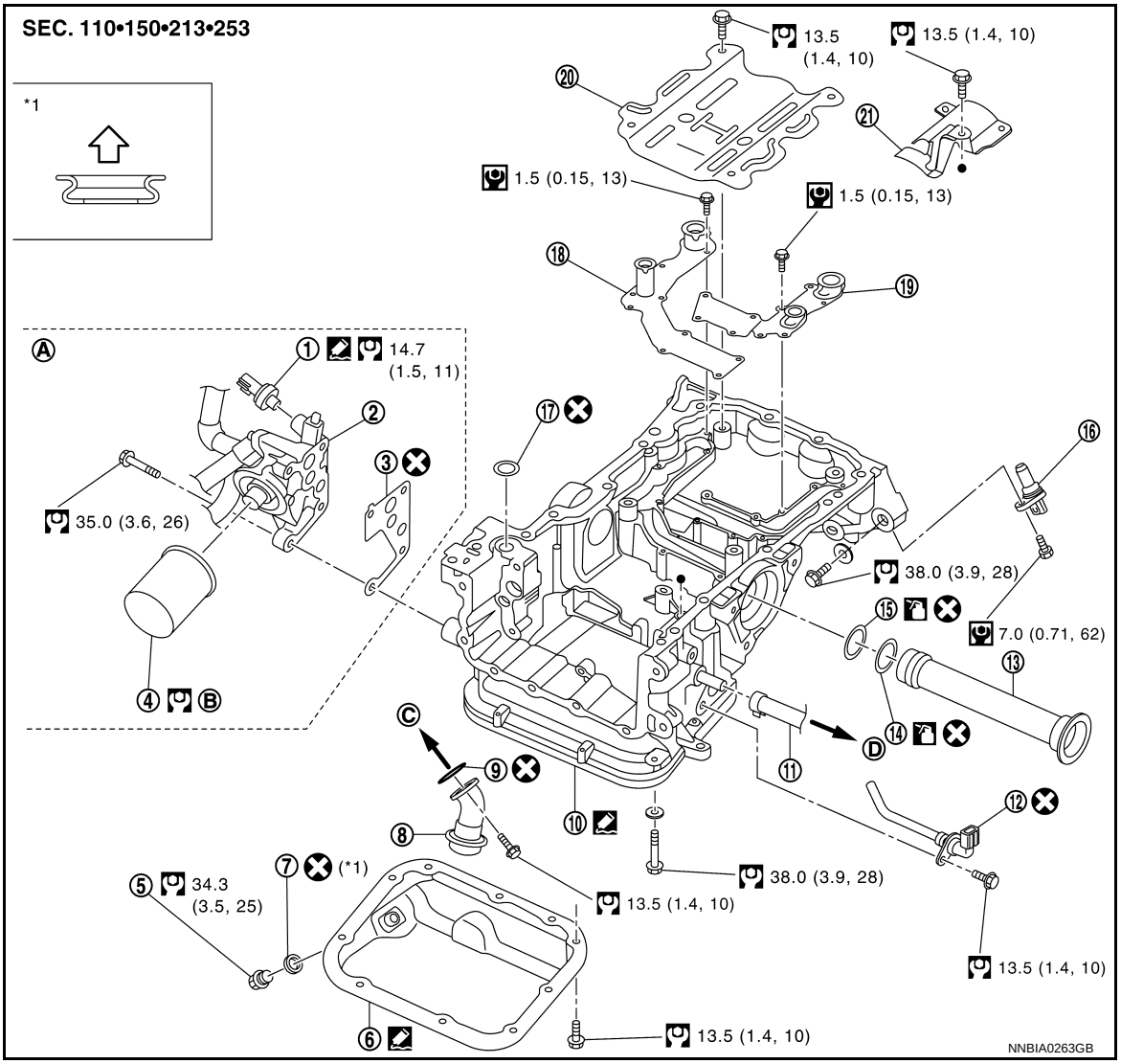


1.	Oil pressure sensor	2.	Oil filter bracket	3.	Gasket
4.	Oil filter	5.	Oil pan drain plug	6.	Oil pan (lower)
7.	Drain plug washer	8.	Oil strainer	9.	Gasket
10.	Oil pan (upper)	11.	Oil return hose	12.	Oil level sensor
13.	Axle pipe	14.	O-ring	15.	O-ring
16.	Crankshaft position sensor (POS)	17.	O-ring	18.	Baffle plate
19.	Baffle plate	20.	Baffle plate	21.	Baffle plate
A.	Refer to LU-14	B.	Refer to LU-13	C.	To oil pump
D.	To exhaust manifold and turbocharger assembly (bank 2)				

⇦ : Oil pan side

● : Indicates that the parts is connected at points with same symbols in actual vehicle.

Refer to GI-4, "Components" for symbols in the figure.

Disassembly and Assembly (GT-R certified NISSAN dealer)

INFOID:0000000011488081

DISASSEMBLY

CAUTION:

Never remove/install liquid gasket-applied oil pans (lower and upper) more than once. Replace them with new ones for a second or further removal/installation.

1. Remove oil pan (lower).
   - Loosen mounting bolts in the reverse order as shown in the figure with power tool.

     ⇦ : Engine front

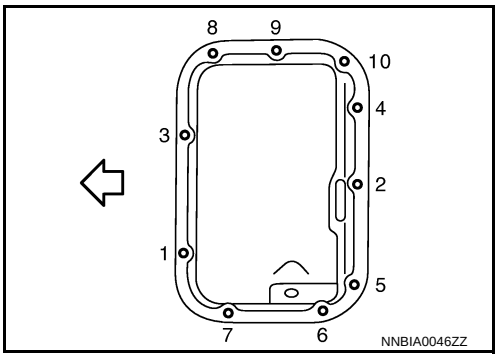
   - Insert the seal cutter [SST: KV10111100 (J-37228)] between oil pan (upper) and oil pan (lower).

   CAUTION:

   Never allow the mounting surface of oil pan (upper) to get scratched because it is surface-treated.

   NOTE:

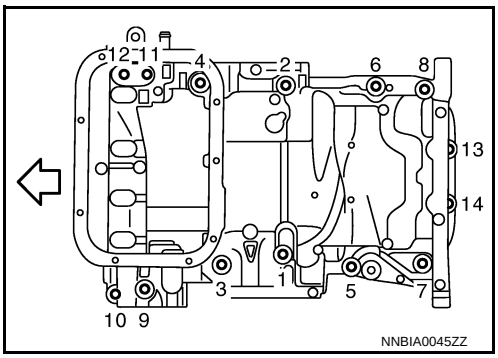
   The figure shows downward gaze.



2. Remove oil strainer.
3. Remove front timing chain case, timing chain (primary) and oil pump drive chain. Refer to EM-69, "Exploded View (GT-R certified NISSAN dealer)".
4. Remove oil pump. Refer to LU-18, "Exploded View (GT-R certified NISSAN dealer)".
5. Remove oil pan (upper) as follows:

a. Loosen mounting bolts in the reverse order as shown in the figure with power tool.

⇦ : Engine front



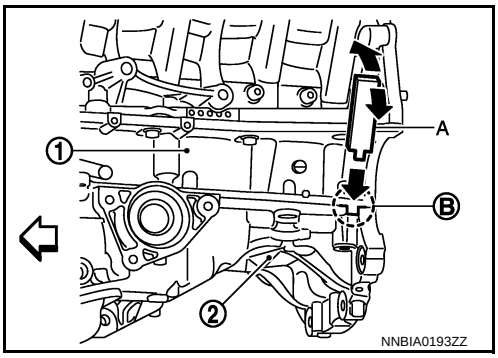
b. Pry off the notch (B) located at the rear of oil pan (upper) (2) with a suitable tool (A) to separate the liquid gasket.

1 : Lower cylinder block

⇦ : Engine front

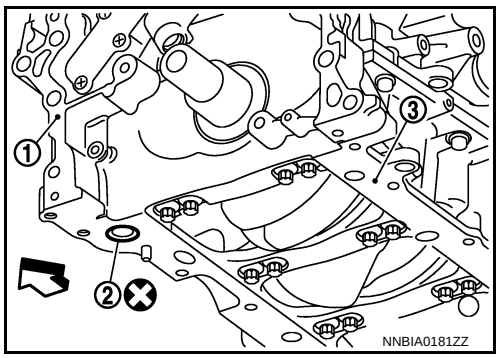
CAUTION:

- **Never allow the mounting surface of oil pan (upper) to get scratched because it is surface-treated.**
- **Never use the seal cutter.**

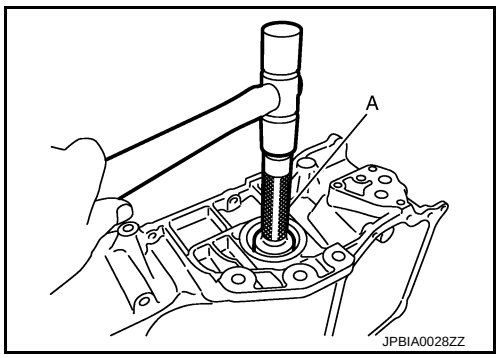


6. Remove O-rings (2).

1 : Rear timing chain case
3 : Lower cylinder block
⇦ : Engine front



7. Remove axle pipe, if necessary.
   - Remove axle pipe from oil pan (upper) using a suitable drift (A) [outer diameter: ϕ37 mm (1.46 in)].



ASSEMBLY

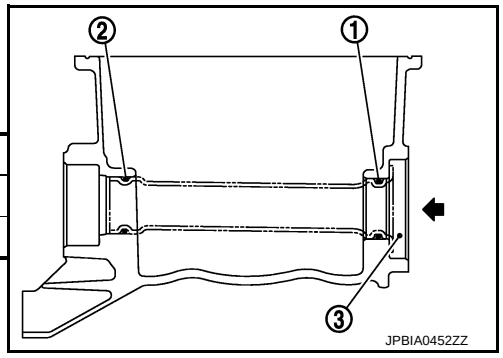
CAUTION:

Do not reuse O-rings or drain plug washer.

1. Install axle pipe (3) to oil pan (upper), if removed.
   - Lubricate O-ring groove of axle pipe, O-rings, and O-ring joint of oil pan with new engine oil.

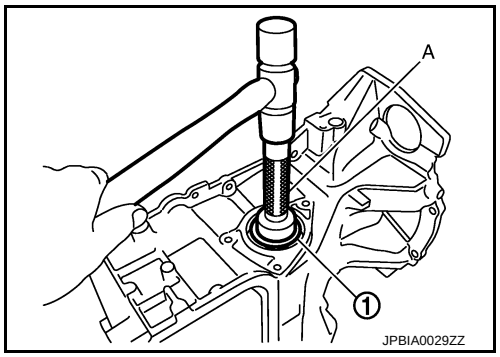
Unit: mm (in)

Items	O-ring inner diameter
Front final drive side (right side) O-ring (2)	ϕ31.4 (1.236)
Axle pipe flange side (left side) O-ring (1)	ϕ33.6 (1.323)



   - Install axle pipe (1) to oil pan (upper) from axle pipe flange side (left side) using a suitable drift (A) [outer diameter: 43 to 57 mm (1.69 to 2.24 in)].

     CAUTION:
     - **Insert it with care to prevent O-ring from sliding.**
     - **Do not reuse O-rings.**

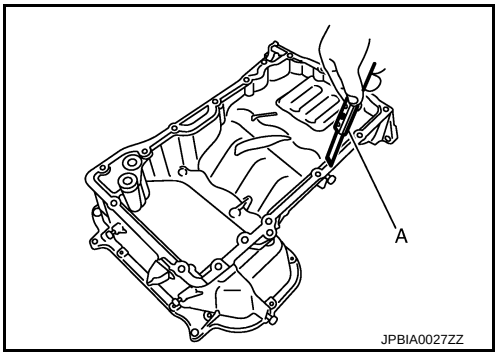


2. Install oil pan (upper) as follows:

a. Apply gasket remover (commercial service tool) on old liquid gasket adhered to the oil pan (upper).

b. Remove gasket with a resin gasket scraper [SST: KV10119100 (J-49360) (A).

CAUTION:
The mounting surface of oil pan (upper) is surface-treated. Be sure to use a resin gasket scraper so as not to damage the surface-treated.

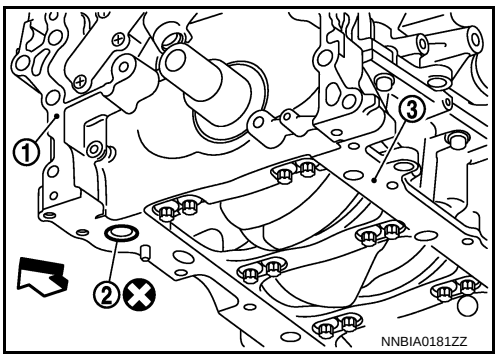


c. Install new O-rings (2) on the bottom of lower cylinder block (3).

1 : Rear timing chain case

⇦ : Engine front

CAUTION:
Do not reuse O-rings.



d. Apply a continuous bead of liquid gasket with the cartridge gun (commercial service tool) to the oil pan (upper) as shown in the figure.

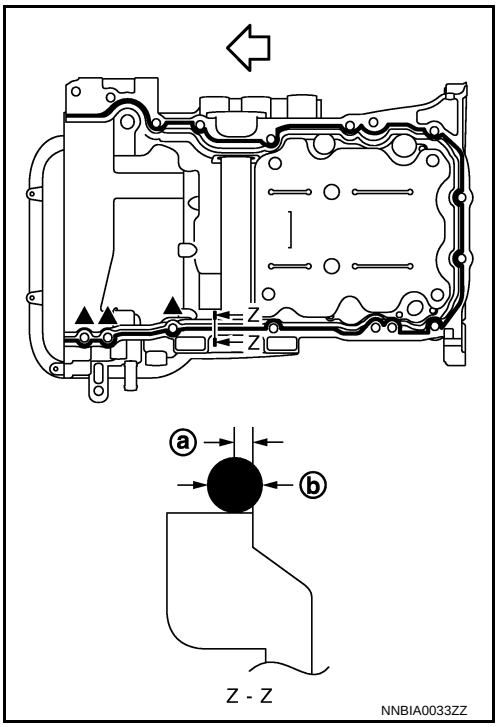
a : 1.5 mm (0.059 in)

b : ϕ4.5 mm (0.177 in)

⇦ : Engine front

Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-18, "Recommended Chemical Products and Sealants".

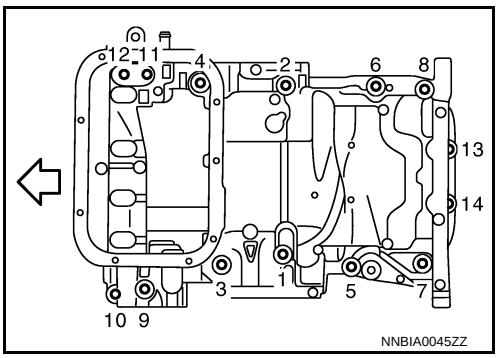
CAUTION:
- **For bolt holes with ▲ marks (3 locations), apply liquid gasket outside the holes.**
- **Attaching should be done within 5 minutes after coating.**



e. Tighten mounting bolts in numerical order as shown in the figure.

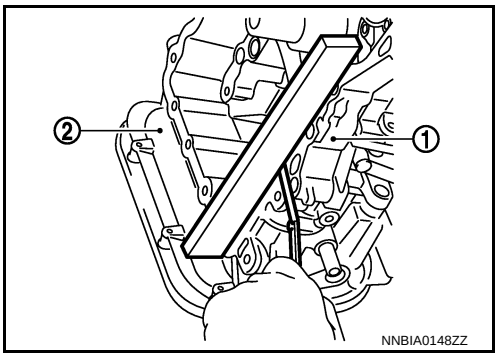
⇦ : Engine front

CAUTION:
Install avoiding misalignment of O-rings.
- There are four types of mounting bolts. Refer to the following for locating bolts.



M8×30 mm (1.18 in) : 5, 6, 13, 14
M8×40 mm (1.57 in) : 10
M8×60 mm (2.36 in) : 1, 2, 3, 4, 7, 8, 11, 12
M8×75 mm (2.95 in) : 9

f. After installing oil pan (upper) (2), check the front timing chain case mounting surface.



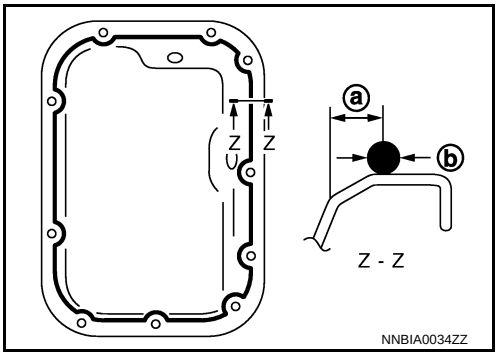
1 : Rear timing chain case

Standard : Less than 0.14 mm (0.006 in)

- If not within the standard, repeat the installation procedure.

3. Install oil pump. Refer to LU-18, "Exploded View (GT-R certified NISSAN dealer)".
4. Install front timing chain case, timing chain (primary) and oil pump drive chain. Refer to EM-69, "Exploded View (GT-R certified NISSAN dealer)".
5. Install oil strainer.
6. Install oil pan (lower) as follows:

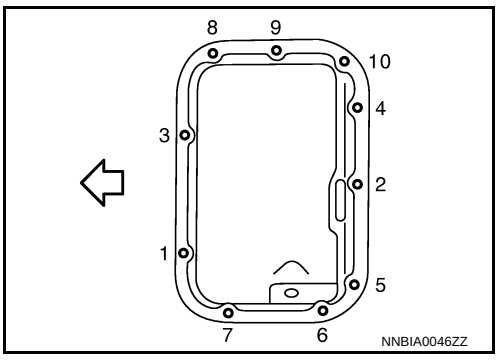
a. Apply a continuous bead of liquid gasket with the cartridge gun (commercial service tool) to the oil pan (lower) as shown in the figure.



a : 8.5 mm (0.335 in)
b : ϕ4.5 mm (0.177 in)

Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-18, "Recommended Chemical Products and Sealants".
CAUTION:
Attaching should be done within 5 minutes after coating.

b. Tighten mounting bolts in numerical order as shown in the figure.



⇦ : Engine front

NOTE:
The figure shows downward gaze.

7. Install oil pan drain plug.
CAUTION:
Do not reuse drain plug washer.
- Refer to the figure of components of former page for installation direction of drain plug washer. Refer to EM-97, "Exploded View (GT-R certified NISSAN dealer)".

8. Install in the reverse order of removal after this step.
NOTE:
At least 30 minutes after oil pan is installed, pour engine oil.

Inspection (GT-R certified NISSAN dealer)

INFOID:0000000011488082

INSPECTION AFTER DISASSEMBLY

Clean oil strainer if any object attached.

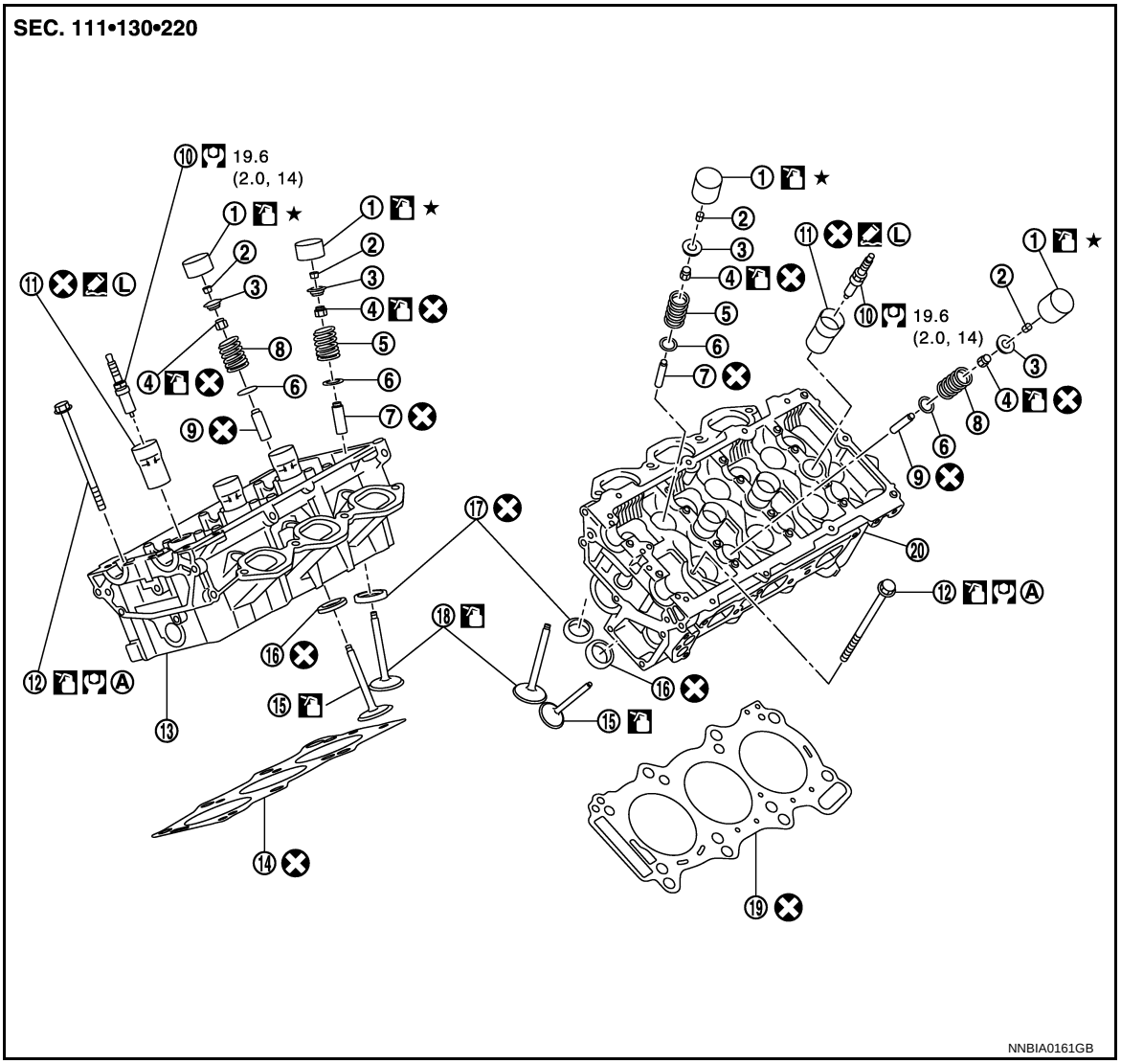
INSPECTION AFTER ASSEMBLY

1. Check the engine oil level and adjust engine oil. Refer to LU-8, "Inspection".
2. Start engine, and check there is no leak of engine oil.
3. Stop engine and wait for 5 minutes.
4. Check the engine oil level again. Refer to LU-8, "Inspection".

CYLINDER HEAD

Exploded View (GT-R certified NISSAN dealer)

INFOID:0000000011488083



1. Valve lifter
2. Valve collet
3. Valve spring retainer
4. Valve oil seal
5. Valve spring (INT)
6. Valve spring seat
7. Valve guide (INT)
8. Valve spring (EXH)
9. Valve guide (EXH)
10. Spark plug
11. Spark plug tube
12. Cylinder head bolt
13. Cylinder head (bank 1)
14. Cylinder head gasket (bank 1)
15. Valve (EXH)
16. Valve seat (EXH)
17. Valve seat (INT)
18. Valve (INT)
19. Cylinder head gasket (bank 2)
20. Cylinder head (bank 2)

A. Comply with the installation procedure when tightening. Refer to EM-103

Ⓛ: Apply thread locking sealant.

Refer to GI-4, "Components" for symbol marks not described on the above.

Disassembly and Assembly (GT-R certified NISSAN dealer)

INFOID:0000000011488084

DISASSEMBLY

1. Remove the following parts:

- Intake manifold collector: Refer to EM-35, "Exploded View".

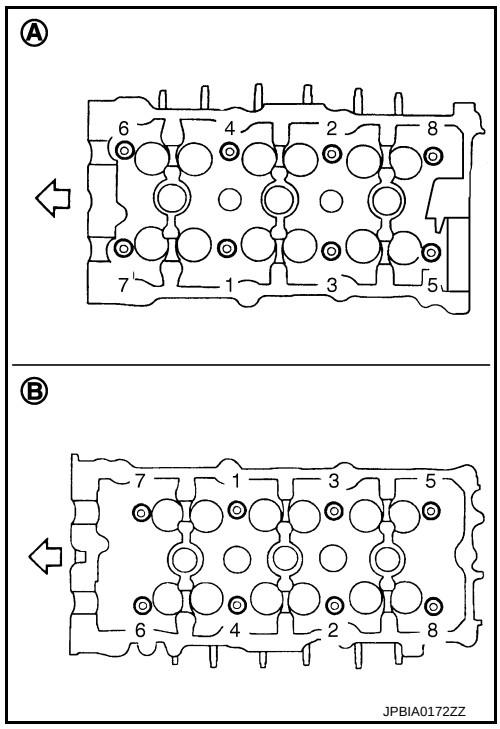
CAUTION:

Mark the parts with paint in advance of the reinstallation to prevent misalignment between the intake manifold collector and intake manifold.

- Fuel tube and fuel injector assembly: Refer to EM-42, "Exploded View".
- Intake manifold: Refer to EM-40, "Exploded View".
- Rocker cover: Refer to EM-47, "Exploded View".
- Exhaust manifold and turbocharger assembly: Refer to EM-61, "Exploded View".
- Water inlet and thermostat assembly: Refer to CO-21, "Exploded View (GT-R certified NISSAN dealer)".
- Water outlet, water pipe and heater pipe: Refer to CO-23, "Exploded View (GT-R certified NISSAN dealer)".
- Timing chain: Refer to EM-69, "Exploded View (GT-R certified NISSAN dealer)".
- Rear timing chain case: Refer to EM-69, "Exploded View (GT-R certified NISSAN dealer)".
- Camshaft: Refer to EM-87, "Exploded View (GT-R certified NISSAN dealer)".

2. Remove spark plug with spark plug wrench (commercial service tool).
3. Remove cylinder head.
   - Loosen mounting bolts in several steps in reverse order as shown in the figure with power tool.

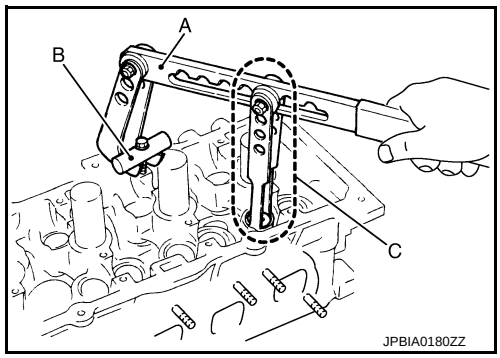
   A : Bank 1
   B : Bank 2
   ⇦ : Engine front



4. Remove cylinder head gaskets.
5. Remove valve lifter.
   - Identify installation positions, and store them without mixing them up.
6. Remove valve collet.
   - Compress valve spring with the valve spring compressor [SST: KV10116200 (J-26336-A)] (A), the attachment [SST: KV10115900 (J-26336-20)] (C), and the adapter [SST: KV10109220 (—)] (B). Remove valve collet with a magnet hand.

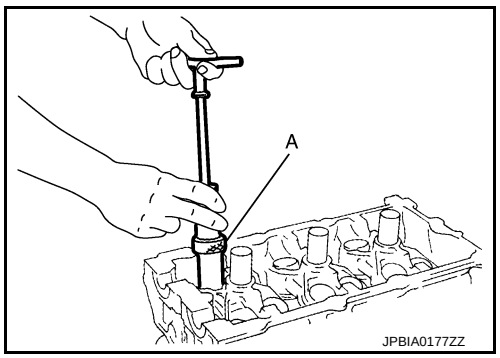
CAUTION:

When working, take care not to damage valve lifter holes.



7. Remove valve spring retainer, valve spring and valve spring seat.
8. Push valve stem to combustion chamber side, and remove valve.
   - Identify installation positions, and store them without mixing them up.

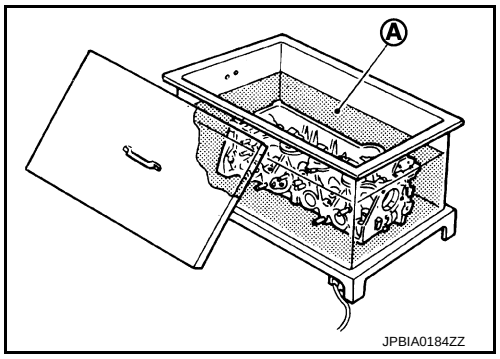
9. Remove valve oil seal using the valve oil seal puller [SST: KV10107902 (J-38959)] (A).



10. Remove valve seat, if valve seat must be replaced.
    - Bore out old seat until it collapses. Boring should not continue beyond the bottom face of the seat recess in cylinder head. Set the machine depth stop to ensure this. Refer to EM-143, "Cylinder Head (GT-R certified NISSAN dealer)".

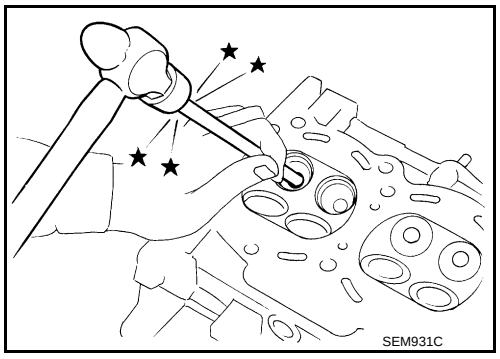
    CAUTION:
    Prevent to scratch cylinder head by excessive boring.
11. Remove valve guide, if valve guide must be replaced.

a. To remove valve guide, heat cylinder head to 110 to 130°C (230 to 266°F) by soaking in heated oil (A).



b. Drive out valve guide with a press [under a 20 kN (2 ton, 2.2 US ton, 2.0 lmp ton) pressure] or a hammer and the valve guide drift (commercial service tool).

WARNING:
Cylinder head contains heat. When working, wear protective equipment to avoid getting burned.



12. Remove spark plug tube, if necessary.
    - Using a pliers, pull spark plug tube out of cylinder head.

    CAUTION:
    - **Take care not to damage cylinder head.**
    - **Once removed, spark plug tube will be deformed and cannot be reused. Never remove it unless absolutely necessary.**

ASSEMBLY

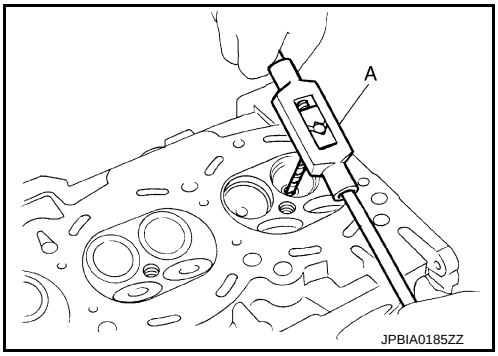
1. Install valve guide, if removed.
   Replace with oversized [0.2 mm (0.008 in)] valve guide.

a. Using the valve guide reamer (commercial service tool) (A), ream cylinder head valve guide hole.

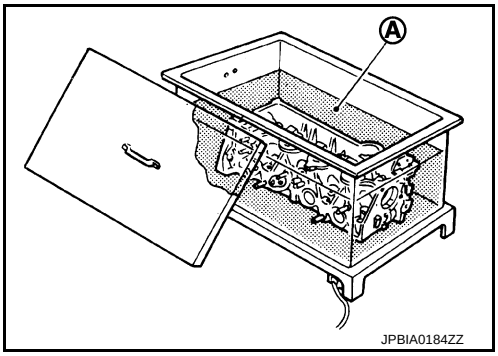
Valve guide hole diameter (for service parts):

Intake and exhaust

: Refer to EM-143, "Cylinder Head (GT-R certified NISSAN dealer)".



b. Heat cylinder head to 110 to 130°C (230 to 266°F) by soaking in heated oil (A).



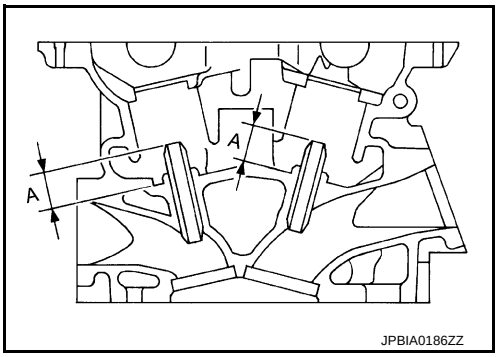
c. Using the valve guide drift (commercial service tool), press valve guide from camshaft side to the dimensions as in the figure.

Projection (A)

: Refer to EM-143, "Cylinder Head (GT-R certified NISSAN dealer)".

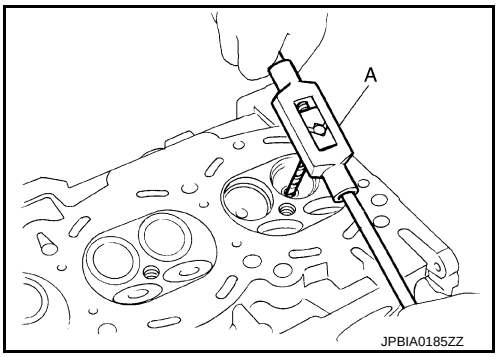
WARNING:

Cylinder head contains heat. When working, wear protective equipment to avoid getting burned.



d. Using the valve guide reamer (commercial service tool) (A), apply reamer finish to valve guide.

Standard **: Refer to EM-143, "Cylinder Head (GT-R certified NISSAN dealer)".**

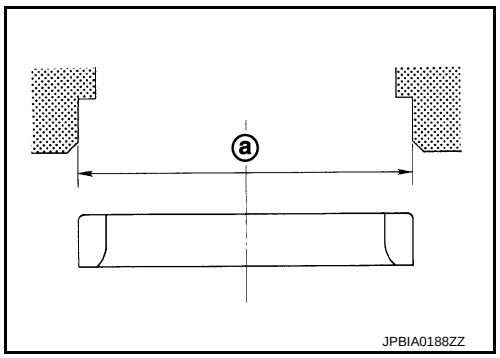


2. Install valve seat, if removed.
Replace with oversize [0.5 mm (0.020 in)] valve seat.

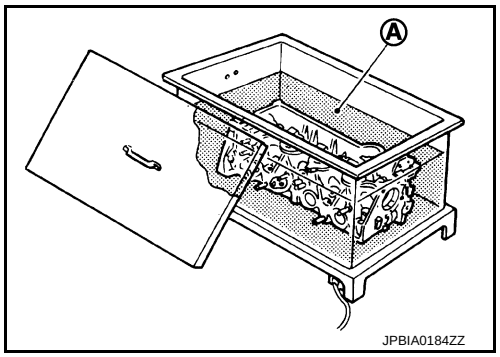
a. Ream cylinder head recess diameter (a) for service valve seat.

Oversize : Refer to EM-143, "Cylinder Head (GT-R certified NISSAN dealer)".

- Be sure to ream in circles concentric to valve guide center. This will enable valve to fit correctly.



b. Heat cylinder head to 110 to 130°C (230 to 266°F) by soaking in heated oil (A).

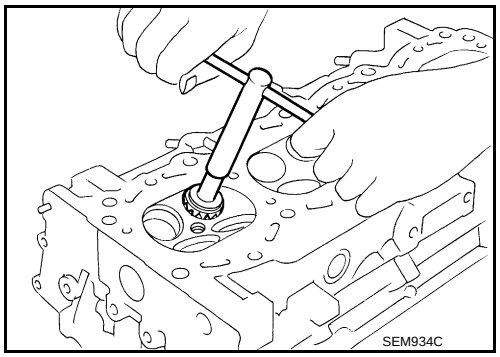


c. Provide valve seats cooled well with dry ice. Force fit valve seat into cylinder head.

WARNING:
Cylinder head contains heat. When working, wear protective equipment to avoid getting burned.
CAUTION:
Avoid directly touching cold valve seats.

d. Using the valve seat cutter set (commercial service tool) or valve seat grinder, finish seat to the specified dimensions. Refer to EM-143, "Cylinder Head (GT-R certified NISSAN dealer)".

CAUTION:
When using the valve seat cutter, firmly grip cutter handle with both hands. Then, press on the contacting surface all around the circumference to cut in a single drive. Improper pressure on with cutter or cutting many different times may result in stage valve seat.



e. Using compound, grind to adjust valve fitting.

f. Check again for normal contact. Refer to EM-110, "Inspection (GT-R certified NISSAN dealer)" .

3. Install spark plug tube.
   - Press-fit spark plug tube as follows:

a. Remove old locking sealant adhering to cylinder head mounting hole.

b. Apply sealant to spark plug tube press-fit side.
Use Genuine High Strength Locking Sealant or equivalent. Refer to GI-18, "Recommended Chemical Products and Sealants".

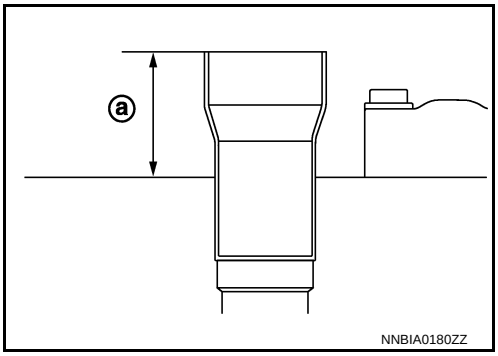
c. Using drift, press-fit spark plug tube so that its height is as specified in the figure.

Standard press-fit height (a):

: 34.6 - 35.6 mm (1.362 - 1.402 in)

CAUTION:

- **When press-fitting, take care not to deform spark plug tube.**
- **After press-fitting, wipe off locking sealant protruding onto cylinder-head upper face.**



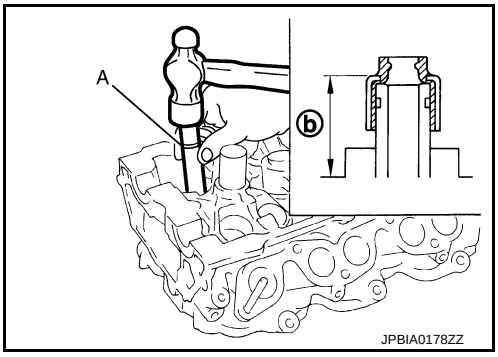
4. Install new valve oil seals as follows:

a. Apply new engine oil on valve oil seal joint and seal lip.

b. Install with the valve oil seal drift [SST: KV10115600 (J-38958)] (A) to match dimension in the figure.

Height (b) (Without valve spring seat installed)

Intake and exhaust : 13.3 - 13.9 mm (0.524 - 0.547 in)



5. Install valve.
NOTE:
Larger diameter valves are for intake side.

6. Install valve spring seat.

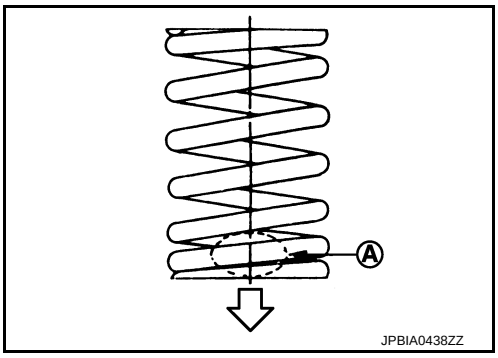
7. Install valve spring (uneven pitch type).
- Install narrow pitch end [paint mark (A)] to cylinder head side (valve spring seat side).

⇦ : Cylinder head side

Paint mark color

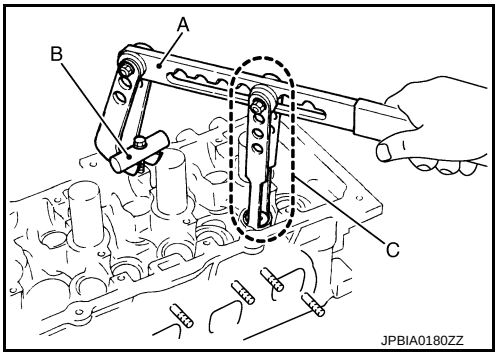
Intake : Blue

Exhaust : Pink



8. Install valve spring retainer.

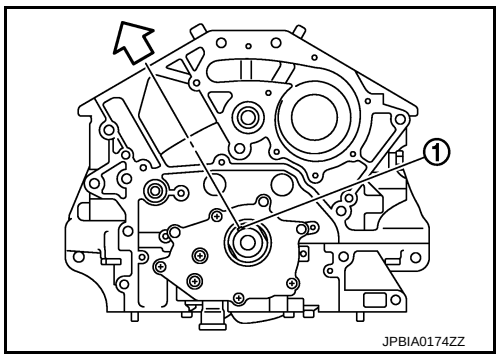
9. Install valve collet.
- Compress valve spring with the valve spring compressor [SST: KV10116200 (J-26336-A)] (A), the attachment [SST: KV10115900 (J-26336-20)] (C), and the adapter [SST: KV10109220 (—)] (B). Install valve collet with a magnet hand.
CAUTION:
When working, take care not to damage valve lifter holes.
- Tap valve stem edge lightly with plastic hammer after installation to check its installed condition.



10. Turn crankshaft until No. 1 piston is set at TDC.

1 : Crankshaft key
⇦ : Bank 1 side

- Crankshaft key should line up with the bank 1 cylinder center line as shown in the figure.

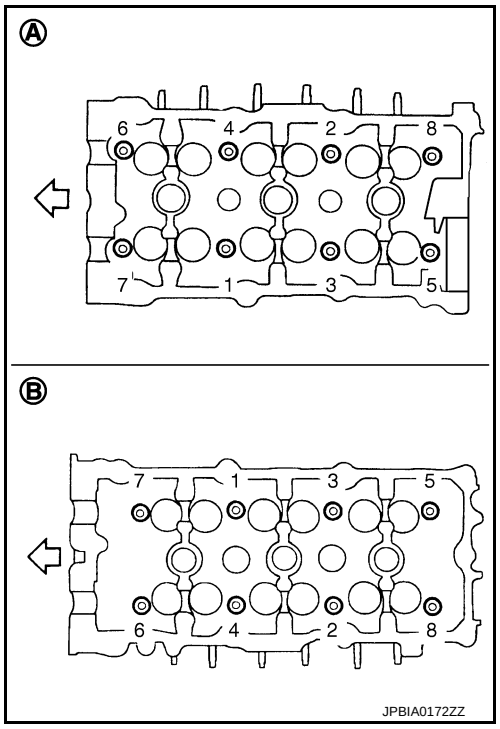


11. Install new cylinder head gaskets.
12. Install cylinder head as follows:

CAUTION:

- **If cylinder head bolts reused, check their outer diameters before installation. Refer to EM-110, "Inspection (GT-R certified NISSAN dealer)".**
- **Before installing cylinder head, inspect cylinder head and cylinder block distortion. Refer to EM-110, "Inspection (GT-R certified NISSAN dealer)" or EM-124, "Inspection (GT-R certified NISSAN dealer)".**
- Tighten cylinder head bolts in numerical order as shown in the figure

A : Bank 1
B : Bank 2
⇦ : Engine front



a. Apply new engine oil to threads and seat surfaces of cylinder head bolts.
b. Tighten all cylinder head bolts.

: 40.0 N·m (4.1 kg-m, 30 ft-lb)

c. Tighten all cylinder head bolts (clockwise).

Angle tightening: 65 degrees

d. Tighten all cylinder head bolts again (clockwise).

Angle tightening: 65 degrees

e. Completely loosen all cylinder head bolts.

: 0 N·m (0 kg-m, 0 ft-lb)

CAUTION:
In step “e”, loosen bolts in reverse order of that indicated in the figure.

f. Tighten all cylinder head bolts.

: 40.0 N·m (4.1 kg-m, 30 ft-lb)

g. Tighten all cylinder head bolts (clockwise).

Angle tightening: 135 degrees

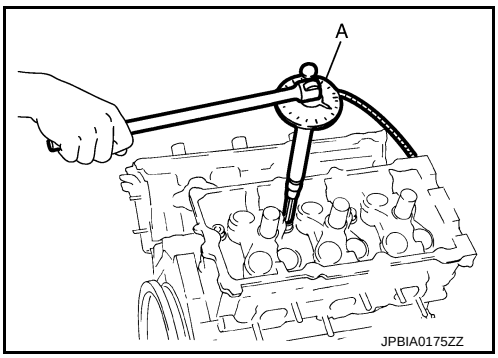
h. Tighten all cylinder head bolts again (clockwise).

Angle tightening: 135 degrees

CAUTION:

Check the tightening angle by using the angle wrench [SST: KV10112100 (BT8653-A)] (A). Never make judgment by visual inspection.

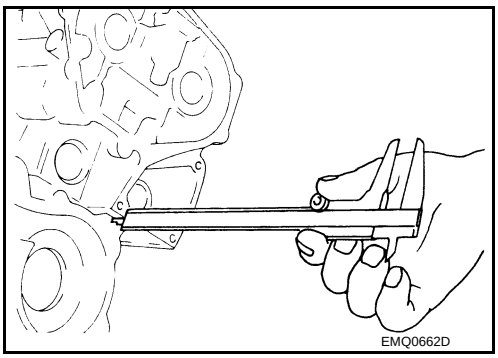
- Check tightening angle indicated on the angle wrench indicator plate.



13. After installing cylinder head, measure distance between front end faces of cylinder block and cylinder head (bank 1 and bank 2).

Standard : 14.1 - 14.9 mm (0.555 - 0.587 in)

- If measured value is out of the standard, reinstall cylinder head.



14. Install valve lifter.
    - Install it in the original position.
15. Install in the reverse order of removal after this step.

Inspection (GT-R certified NISSAN dealer)

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INSPECTION AFTER DISASSEMBLY

Cylinder Head Distortion

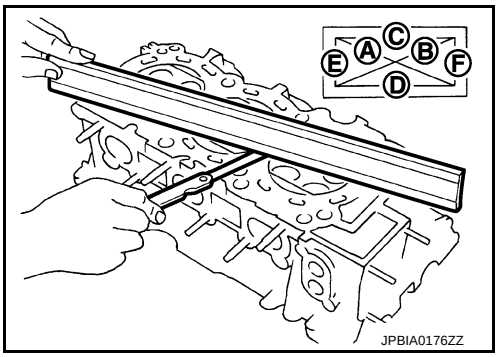
NOTE:

When performing this inspection, cylinder block distortion should be also checking. Refer to EM-124, "Inspection (GT-R certified NISSAN dealer)".

1. Using a scraper, wipe off oil, scale, gasket, sealant and carbon deposits from surface of cylinder head.
   CAUTION:
   Never allow gasket fragments to enter engine oil or engine coolant passages.
2. At each of several locations on bottom surface of cylinder head, measure the distortion in six directions (A), (B), (C), (D), (E), and (F).

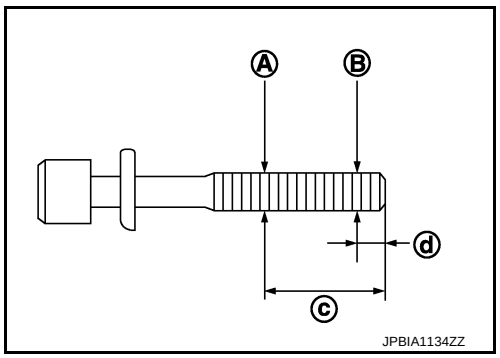
Limit : Refer to EM-143, "Cylinder Head (GT-R certified NISSAN dealer)".

- If it exceeds the limit, replace cylinder head.



Cylinder Head Bolts Outer Diameter

- Cylinder head bolts are tightened by plastic zone tightening method. Whenever the size difference between (A) and (B) exceeds the limit, replace them with new one.



c : 62 mm (2.441 in)
d : 12 mm (0.472 in)

Limit [(B) - (A)] : 0.16 mm (0.006 in)

- If reduction of outer diameter appears in a position other than (A), use it as (A) point.

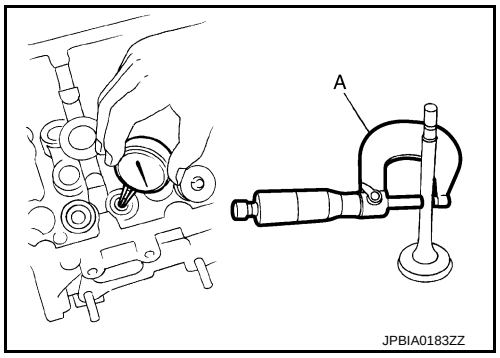
Valve Dimensions

- Check the dimensions of each valve. For the dimensions, refer to EM-143, "Cylinder Head (GT-R certified NISSAN dealer)".
- If dimensions are out of the standard, replace valve and check valve seat contact. Refer to "VALVE SEAT CONTACT".

Valve Guide Clearance

Valve Stem Diameter

- Measure the diameter of valve stem with micrometer (A).



Standard : Refer to EM-143, "Cylinder Head (GT-R certified NISSAN dealer)".

Valve Guide Inner Diameter

- Measure the inner diameter of valve guide with bore gauge.

Standard : Refer to EM-143, "Cylinder Head (GT-R certified NISSAN dealer)".

Valve Guide Clearance

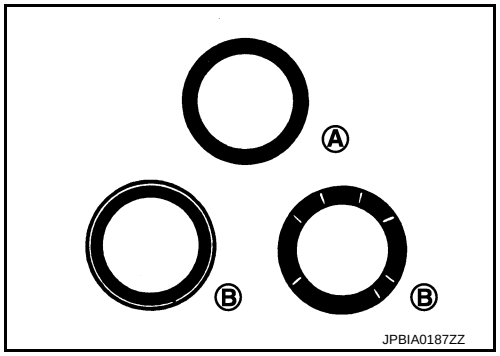
- (Valve guide clearance) = (Valve guide inner diameter) – (Valve stem diameter)

Valve guide clearance Standard and limit : Refer to EM-143, "Cylinder Head (GT-R certified NISSAN dealer)".

- If the calculated value exceeds the limit, replace valve and/or valve guide. When valve guide must be replaced, refer to EM-103, "Disassembly and Assembly (GT-R certified NISSAN dealer)".

Valve Seat Contact

- After confirming that the dimensions of valve guides and valves are within the specifications, perform this procedure.
- Apply prussian blue (or white lead) onto contacting surface of valve seat to check the condition of the valve contact on the surface.
- Check if the contact area band is continuous all around the circumference.

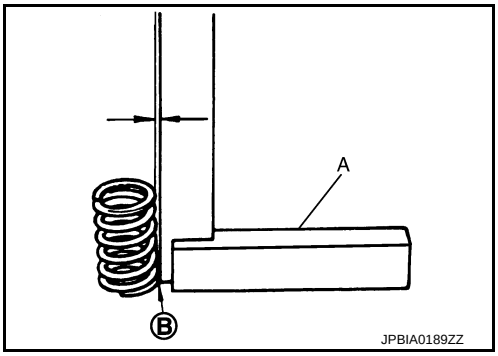


A : OK

- If not, grind to adjust valve fitting and check again. If the contacting surface still has “NG” (B) conditions even after the re-check, replace valve seat. Refer to EM-103, "Disassembly and Assembly (GT-R certified NISSAN dealer)".

Valve Spring Squareness

- Set a try square (A) along the side of valve spring and rotate spring. Measure the maximum clearance between the top of spring and try square.



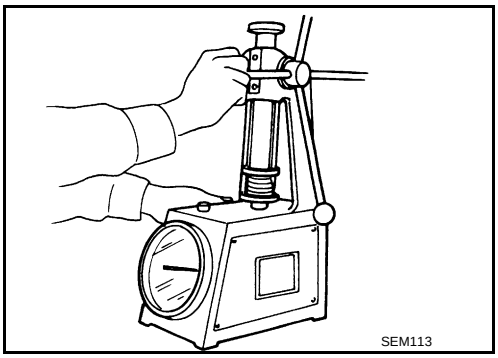
B : Contact

Limit : Refer to EM-143, "Cylinder Head (GT-R certified NISSAN dealer)".

- If it exceeds the limit, replace valve spring.

Valve Spring Dimensions and Valve Spring Pressure Load

- Check the valve spring pressure at specified spring height.



Standard

Free height

Installation height

Installation load

Height during valve open

Load with valve open

: Refer to EM-143, "Cylinder Head (GT-R certified NISSAN dealer)".

- If the installation load or load with valve open is out of the standard, replace valve spring.

INSPECTION AFTER ASSEMBLY

Inspection for Leakage

The following are procedures for checking fluids leak, lubricates leak and exhaust gases leak.

- Before starting engine, check oil/fluid levels including engine coolant and engine oil. If less than required quantity, fill to the specified level. Refer to MA-21, "Fluids and Lubricants".
- Use procedure below to check for fuel leakage.
- Turn ignition switch “ON” (with engine stopped). With fuel pressure applied to fuel piping, check for fuel leakage at connection points.
- Start engine. With engine speed increased, check again for fuel leakage at connection points.
- Run engine to check for unusual noise and vibration.
- Warm up engine thoroughly to check there is no leakage of fuel, exhaust gases, or any oil/fluids including engine oil and engine coolant.
- Bleed air from lines and hoses of applicable lines, such as in cooling system.
- After cooling down engine, again check oil/fluid levels including engine oil and engine coolant. Refill to the specified level, if necessary.

Summary of the inspection items:

Items		Before starting engine	Engine running	After engine stopped
Engine coolant		Level	Leakage	Level
Engine oil		Level	Leakage	Level
Transmission / transaxle fluid	AT & CVT Models	Leakage	Level / Leakage	Leakage
	MT Models	Level / Leakage	Leakage	Level / Leakage
Other oils and fluids*		Level	Leakage	Level
Fuel		Leakage	Leakage	Leakage

* Power steering fluid, brake fluid, etc.

CYLINDER BLOCK

Exploded View (GT-R certified NISSAN dealer)

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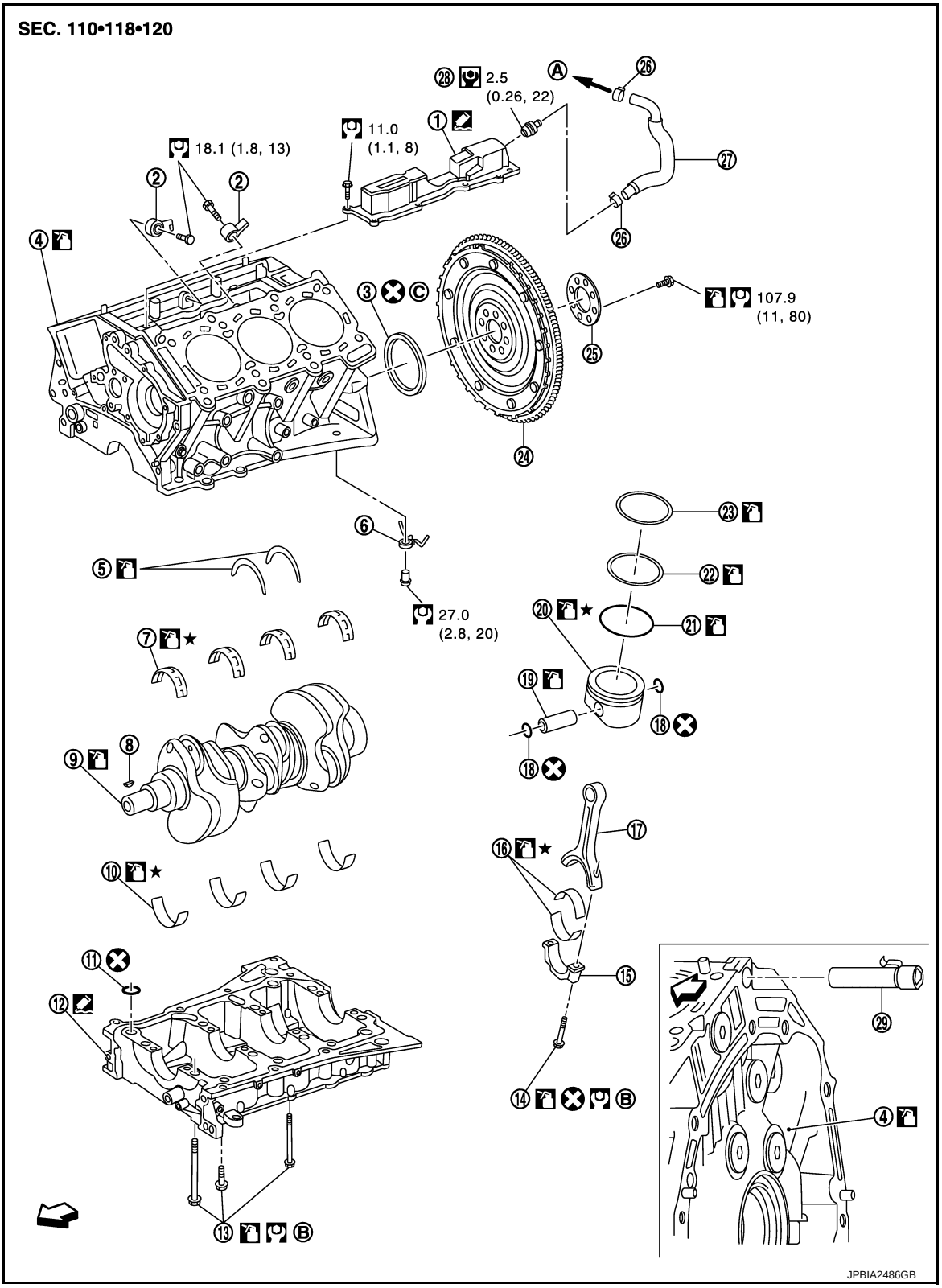


1. Breather separator
2. Knock sensor
3. Rear oil seal
4. Cylinder block
5. Thrust bearing
6. Oil jet
7. Main bearing (upper)
8. Crankshaft key
9. Crankshaft

10. Main bearing (lower)	11. O-ring	12. Lower cylinder block
13. Lower cylinder block bolt	14. Connecting rod bolt	15. Connecting rod bearing cap
16. Connecting rod bearing	17. Connecting rod	18. Snap ring
19. Piston pin	20. Piston	21. Oil ring
22. Second ring	23. Top ring	24. Flywheel
25. Reinforcement plate	26. Clamp	27. PCV hose
28. PCV valve	29. Cylinder block heater (for Canada)	
A. To intake manifold collector	B. Comply with the assembly procedure when tightening. Refer to EM-114	C. Apply neutral detergent on the outer edge.

⇦ : Engine front

Refer to GI-4, "Components" for symbols in the figure.

Disassembly and Assembly (GT-R certified NISSAN dealer)

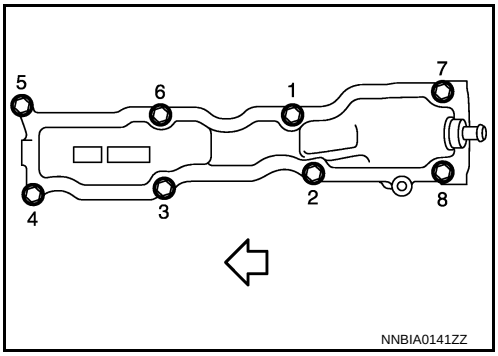
INFOID:0000000011488087

DISASSEMBLY

1. Remove the following parts:
   - Oil pans (lower and upper): Refer to EM-97, "Exploded View (GT-R certified NISSAN dealer)".
   - Front and rear timing chain case: Refer to EM-69, "Exploded View (GT-R certified NISSAN dealer)".
   - Cylinder head: Refer to EM-103, "Exploded View (GT-R certified NISSAN dealer)".
2. Remove knock sensor.
   CAUTION:
   Carefully handle knock sensor avoiding shocks.
3. Remove breather separator.

a. Loosen mounting bolts in reverse order as shown in the figure.

⇦ : Engine front



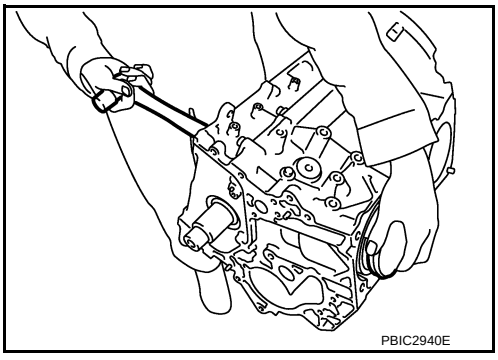
4. Remove piston and connecting rod assembly with the following procedure:
   - Before removing piston and connecting rod assembly, check the connecting rod side clearance. Refer to EM-124, "Inspection (GT-R certified NISSAN dealer)".

   CAUTION:
   Be careful not to drop connecting rod bearing, and to scratch the surface.

a. Position crankshaft pin corresponding to connecting rod to be removed onto the bottom dead center.

b. Remove connecting rod bearing cap.

c. Using a hammer handle or similar tool, push piston and connecting rod assembly out to the cylinder head side.
   CAUTION:
   Be careful not to damage the cylinder wall and crankshaft pin, resulting from an interference of the connecting rod big end.

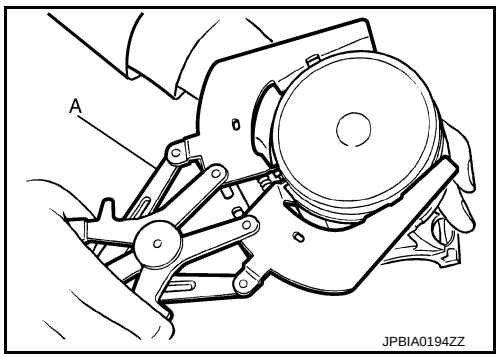


5. Remove connecting rod bearings from connecting rod and connecting rod bearing cap.
   CAUTION:
   - **Be careful not to drop connecting rod bearing, and to scratch the surface.**

- **Identify installation positions, and store them without mixing them up.**

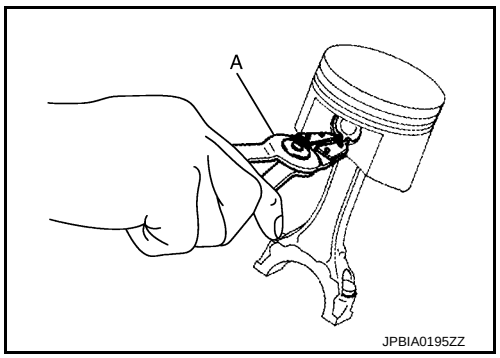
6. Remove piston rings from piston.
   - Before removing piston rings, check the piston ring side clearance. Refer to EM-124, "Inspection (GT-R certified NISSAN dealer)".
   - Use a piston ring expander (commercial service tool) (A).

   CAUTION:
   - **When removing piston rings, be careful not to damage piston.**
   - **Be careful not to damage piston rings by expanding them excessively.**

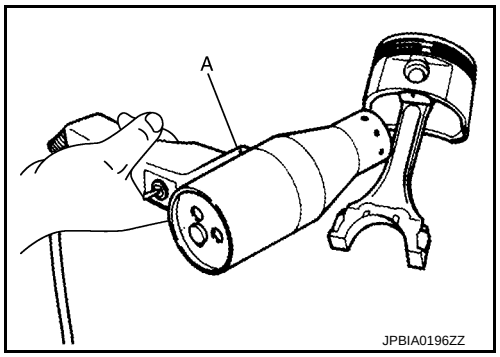


7. Remove piston from connecting rod as follows:

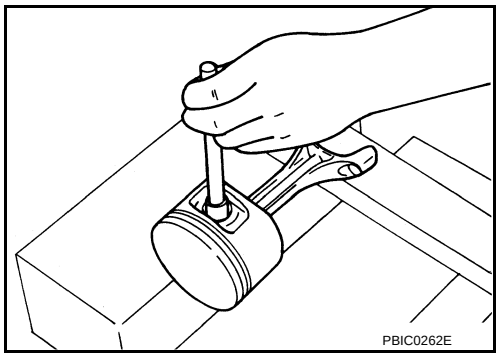
a. Using a snap ring pliers (A), remove snap rings.



b. Heat piston to 60 to 70°C (140 to 158°F) with an industrial use drier (A) or equivalent.



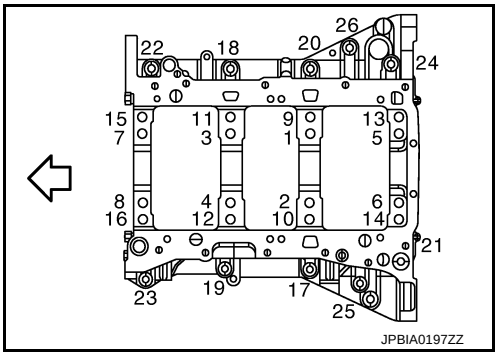
c. Push out piston pin with stick of outer diameter approximately 20 mm (0.79 in).



8. Remove lower cylinder block bolts as follows:
   - Before loosening lower cylinder block bolts, measure the crankshaft end play. Refer to EM-124, "Inspection (GT-R certified NISSAN dealer)".

a. Loosen lower cylinder block bolts in several steps in the reverse order shown in the figure.

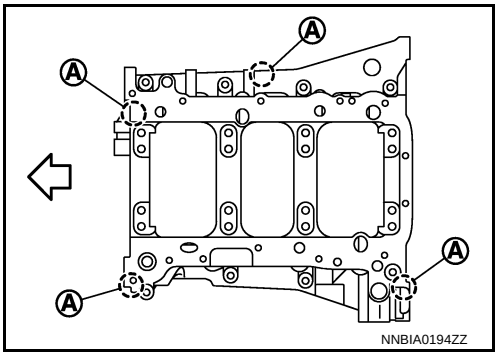
⇦ : Engine front



b. Pry off the notch (A) located at lower cylinder block with a suitable tool to separate the liquid gasket.

⇦ : Engine front

CAUTION:
Be careful not to damage the mounting surfaces.



9. Remove rear oil seal.
10. Remove crankshaft.
11. Remove main bearings and thrust bearings from cylinder block and lower cylinder block.
    CAUTION:
    - **Be careful not to drop main bearing, and to scratch the surface.**
    - **Identify installation positions, and store them without mixing them up.**
12. Remove oil jet.

ASSEMBLY

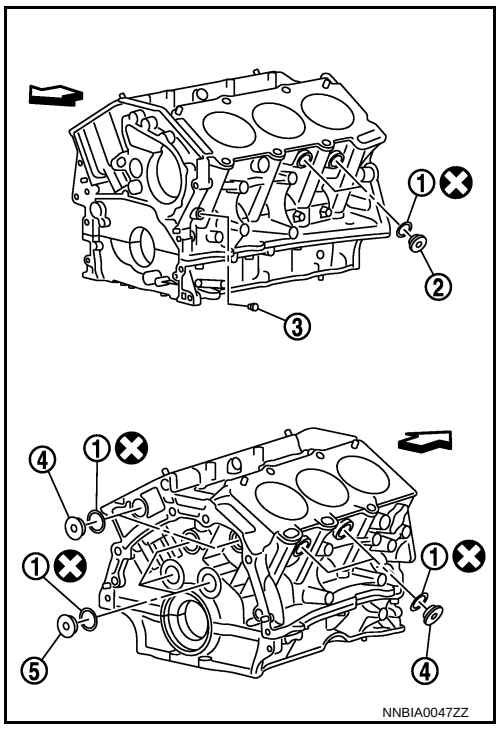
CAUTION:
Do not reuse O-rings or washers.

1. Fully air-blow engine coolant and engine oil passages in cylinder block, cylinder bore and crankcase to remove any foreign material.
   CAUTION:
   Use a goggles to protect your eye.
2. Install each plug to cylinder block as shown in the figure.

⇦ : Engine front

- Apply sealant to the thread of water drain plug (3).
  Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-18, "Recommended Chemical Products and Sealants".
- Apply sealant to the thread of plugs (2), (4).
  Use Genuine High Strength Thread Locking Sealant or equivalent. Refer to GI-18, "Recommended Chemical Products and Sealants".
- Replace washers (1) with new one.
  CAUTION:
  Do not reuse washers.
- Tighten each plug as specified below.

Part	Washer	Tightening torque	
2	Yes	53.9 N·m (5.5 kg-m, 40 ft-lb)	
3	No	New	6.0 N·m (0.61 kg-m, 4 ft-lb)
		Reused	9.8 N·m (1.0 kg-m, 7 ft-lb)
4	Yes	62.7 N·m (6.4 kg-m, 46 ft-lb)	
5	Yes	78.0 N·m (8.0 kg-m, 58 ft-lb)	



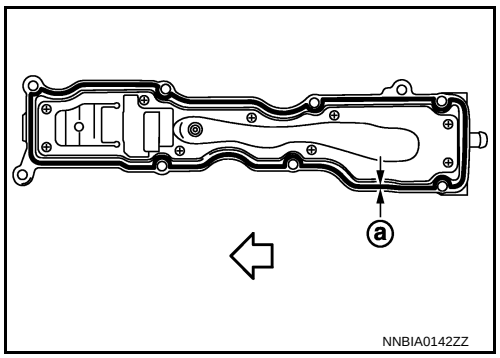
3. Install breather separator.

a. Apply a continuous bead of liquid gasket with the cartridge gun (commercial service tool) to breather separator as shown in the figure.

a : ϕ2.5 mm (0.098 in) dia

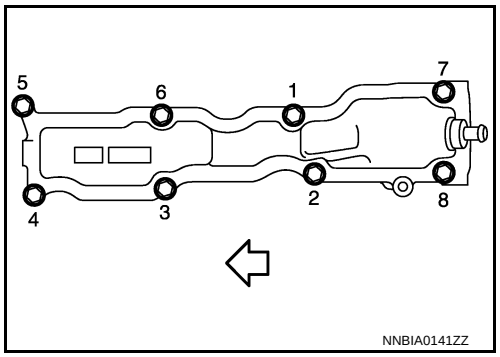
⇦ : Engine front

Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-18, "Recommended Chemical Products and Sealants".



b. Tighten mounting bolts in reverse order as shown in the figure.

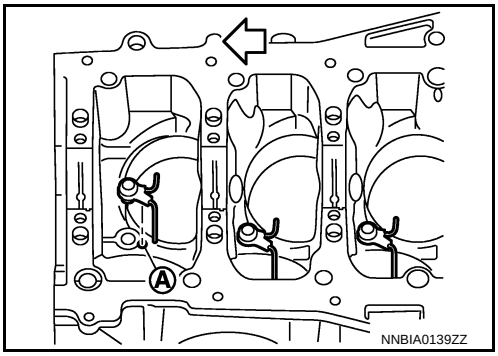
⇦ : Engine front



4. Install oil jet.

- Insert oil jet into cylinder block dowel pin hole (A), and tighten mounting bolts.

⇦ : Engine front

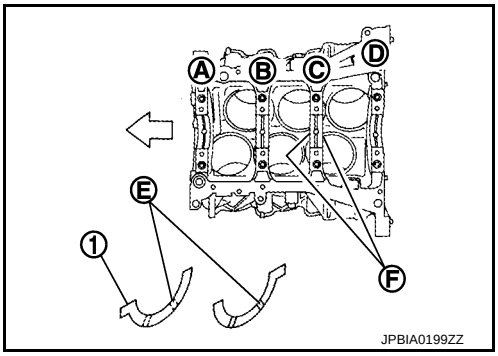


5. Install main bearings and thrust bearings as follows:
CAUTION:
Be careful not to drop main bearing, and to scratch the surface.

a. Remove dust, dirt, and engine oil on bearing mating surfaces of cylinder block and lower cylinder block.

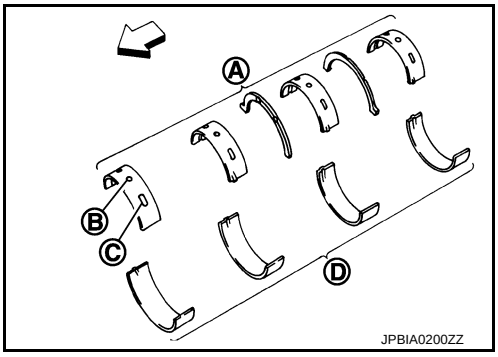
b. Install thrust bearings to the both sides of the No. 3 journal housing on cylinder block.
- Install thrust bearings (1) with the oil groove (E) facing crankshaft arm (outside).

A : No. 1
B : No. 2
C : No. 3
D : No. 4
F : Thrust bearing installation position
⇦ : Engine front



c. Install main bearings paying attention to the direction.

A : Cylinder block side
D : Lower cylinder block side
⇦ : Engine front



- Main bearing with oil hole (B) and groove (C) goes on cylinder block. The one without them goes on lower cylinder block.
- Before installing main bearings, apply engine oil to the bearing surface (inside). Do not apply engine oil to the back surface, but thoroughly clean it.
- When installing, align main bearing stopper protrusion to cut-out of cylinder block and lower cylinder block.
- Ensure the oil holes on cylinder block and those on the corresponding bearing are aligned.

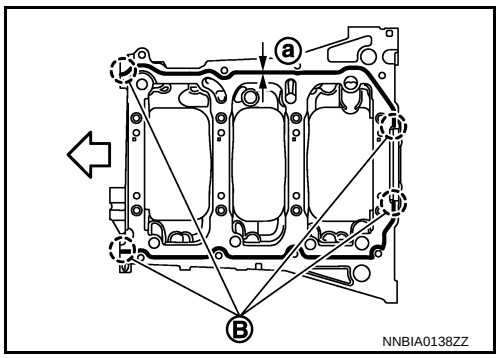
6. Install crankshaft to cylinder block.
- While turning crankshaft by hand, check that it turns smoothly.

7. Install lower cylinder block.
NOTE:
Lower cylinder block cannot be replaced as a single part, because it is machined together with cylinder block.

- Apply a continuous bead of liquid gasket with the cartridge gun (commercial service tool) to lower cylinder block as shown in the figure.

a : ϕ4.0 - 5.0 mm (0.157 - 0.197 in) dia
B : Apply to end
⇦ : Engine front

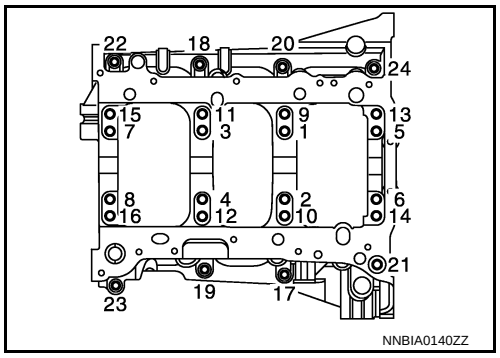
Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-18, "Recommended Chemical Products and Sealants".



8. Inspect the outer diameter of lower cylinder block bolt. Refer to EM-124, "Inspection (GT-R certified NISSAN dealer)".
9. Install lower cylinder block bolts in numerical order as shown in the figure as follows:
CAUTION:
Do not reuse O-ring.

a. Apply new engine oil to threads and seat surfaces of lower cylinder block bolts.
b. Tighten lower cylinder block bolts (No. 17 to 24) in numerical order as shown in the figure.

: 25.0 N·m (2.6 kg-m, 18 ft-lb)



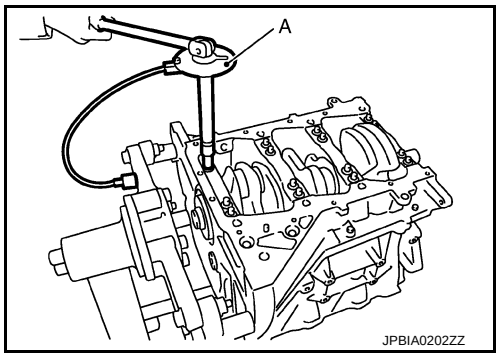
c. Repeat step b.
d. Tighten lower cylinder block bolt (No. 1 to 16) in numerical order as shown in the figure.

: 44.2 N·m (4.5 kg-m, 33 ft-lb)

e. Tighten lower cylinder block bolt (No. 1 to 16) (clockwise).

Angle tightening: 90 degrees

CAUTION:
Use the angle wrench [SST: KV10112100 (BT8653-A)] (A) to check tightening angle. Never make judgment by visual inspection.



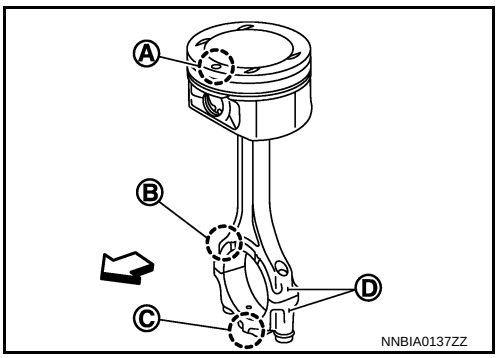
- After installing lower cylinder block bolts, check that crankshaft can be rotated smoothly by hand.
- Check the crankshaft end play. Refer to EM-124, "Inspection (GT-R certified NISSAN dealer)".

10. Install piston to connecting rod as follows:

a. Using a snap ring pliers, install new snap ring to the groove of piston rear side.
- Insert it fully into groove to install.

b. Install piston to connecting rod.
- Using an industrial use drier or similar tool, heat piston until piston pin can be pushed in by hand without excess force [approximately 60 to 70°C (140 to 158°F)]. From the front to the rear, insert piston pin into piston and connecting rod.

- Assemble so that the front mark on the piston head and the cylinder number on connecting rod are positioned as shown in the figure.

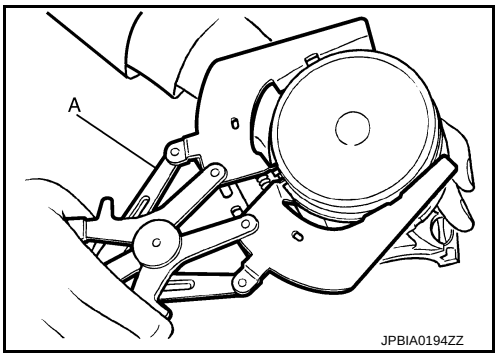


A : Front mark
B : Oil groove
C : Front mark
D : Cylinder number
⇦ : Engine front

c. Install new snap ring to the groove of the piston front side.
- Insert it fully into groove to install.
- After installing, check that connecting rod moves smoothly.

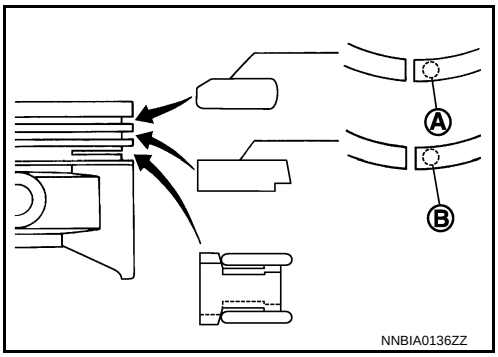
11. Using a piston ring expander (commercial service tool) (A), install piston rings.

CAUTION:
- **When installing piston rings, be careful not to damage piston.**
- **Be careful not to damage piston rings by expending them excessively.**



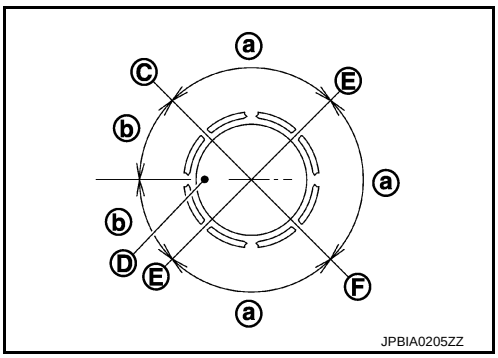
- If there is stamped mark on ring, mount it with marked side up.

Stamped mark:
Top ring (A) : R
Second ring (B) : R2



- Position each ring with the gap as shown in the figure referring to the piston front mark (D).

C : Top ring gap
E : Oil ring upper or lower rail gap (either of them)
F : Second ring and oil ring spacer gap
a : 90 degrees
b : 45 degrees



- Check the piston ring side clearance. Refer to EM-124, "Inspection (GT-R certified NISSAN dealer)".

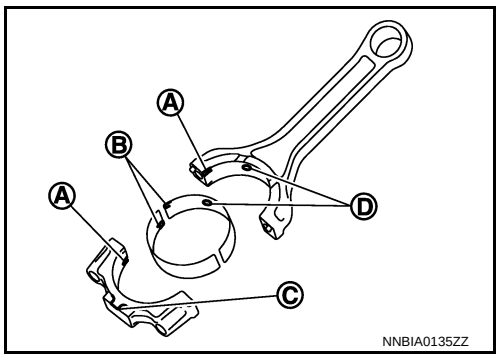
12. Install connecting rod bearings to connecting rod and connecting rod bearing cap.

CAUTION:
Be careful not to drop connecting rod bearing, and to scratch the surface.
- Before installing connecting rod bearings, apply engine oil to the bearing surface (inside). Do not apply engine oil to the back surface, but thoroughly clean it.

- When installing, align connecting rod bearing stopper protrusion (B) with cutout (A) of connecting rods and connecting rod bearing caps to install.

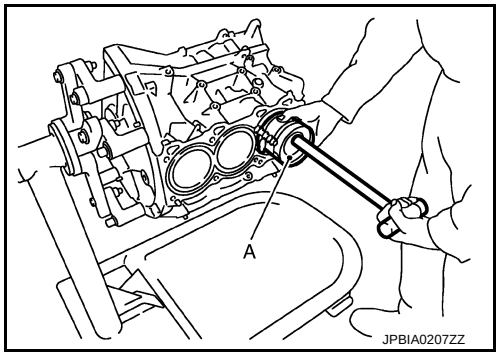
  C : Front mark

- Ensure the oil hole (D) on connecting rod and that on the corresponding bearing are aligned.



13. Install piston and connecting rod assembly to crankshaft.
- Position crankshaft pin corresponding to connecting rod to be installed onto the bottom dead center.
- Apply engine oil sufficiently to the cylinder bore, piston and crankshaft pin journal.
- Match the cylinder position with the cylinder number on connecting rod to install.
- Be sure that front mark on piston crown is facing front of engine.
- Using a piston ring compressor [SST: EM03470000 (J-8037)] (A) or suitable tool, install piston with the front mark on the piston crown facing the front of the engine.

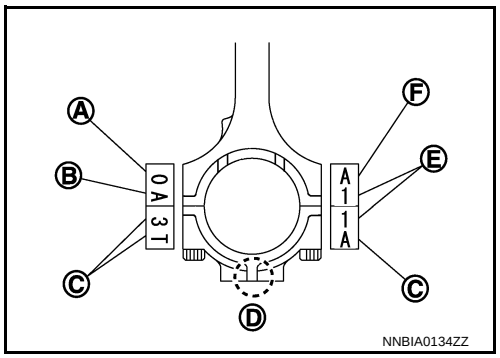
CAUTION:
Be careful not to damage the cylinder wall and crankshaft pin, resulting from an interference of the connecting rod big end.



14. Install connecting rod bearing cap.
- Match the stamped cylinder number marks on connecting rod with those on connecting rod bearing cap to install.

  A : Small-end diameter grade
  B : Weight grade
  C : Management code
  E : Cylinder No.
  F : Big-end diameter grade

- Be sure that front mark (D) on connecting rod bearing cap is facing front of the engine.



15. Tighten connecting rod bolt as follows:

CAUTION:
Connecting rod bolts are non-reusable.

a. Apply engine oil to the threads and seats of connecting rod bolts.
b. Tighten connecting rod bolts.

: 28.4 N·m (2.9 kg-m, 21 ft-lb)

c. Completely loosen connecting rod bolts.

: 0 N·m (0 kg-m, 0 ft-lb)

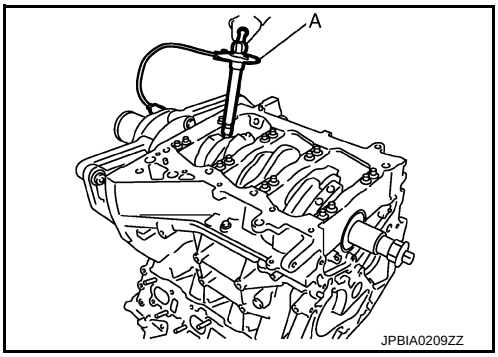
d. Tighten connecting rod bolts.

: 24.5 N·m (2.5 kg-m, 18 ft-lb)

e. Tighten connecting rod bolts (clockwise).

Angle tightening: 120 degrees

CAUTION:
Always use the angle wrench [SST: KV10112100 (BT8653-A)] (A). Avoid tightening based on visual check alone.
- After tightening connecting rod bolts, check that crankshaft rotates smoothly.
- Check the connecting rod side clearance. Refer to EM-124, "Inspection (GT-R certified NISSAN dealer)".



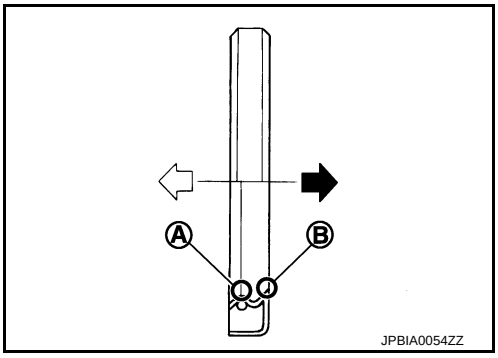
16. Install oil pan (upper). Refer to EM-97, "Exploded View (GT-R certified NISSAN dealer)".
17. Install new rear oil seal as follows:

a. Apply neutral detergent on the rim.

b. Install it so that each seal lip is oriented as shown in the figure.

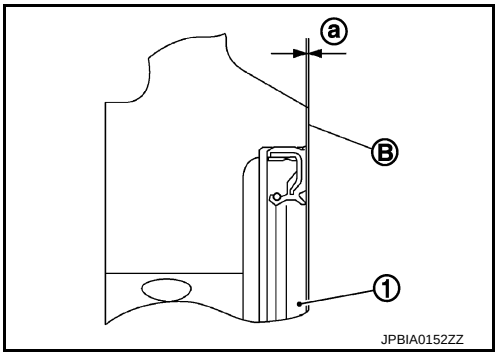
B : Dust seal lip
⇦ : Engine inside
⬅ : Engine outside

CAUTION:
Never touch oil seal lip (A).



c. Press in rear oil seal (1) to the position as shown in the figure.

B : Cylinder block rear end face
a : 0 - 0.5 mm (0 - 0.020 in)



18. Install flywheel as follows:

a. Apply engine oil to the threads and seats of bolts.

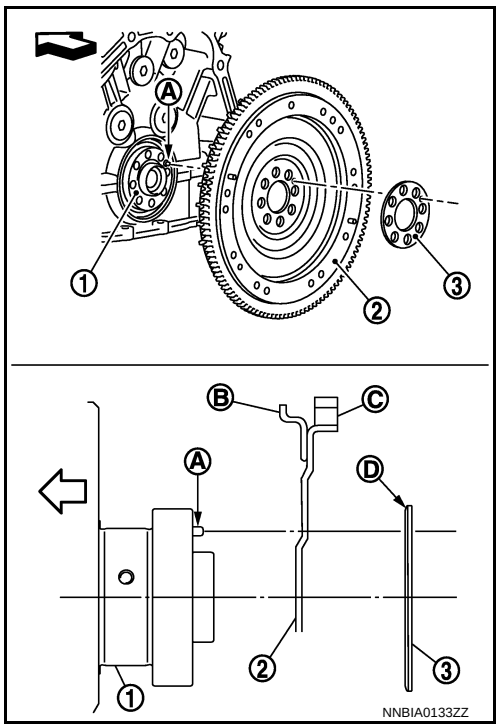
b. When installing flywheel (2) and to crankshaft (1), be sure to correctly align crankshaft side dowel pin (A) and flywheel side dowel pin hole.

3 : Reinforcement plate
B : Signal plate
C : Ring gear
D : Rounded
⇦ : Engine front

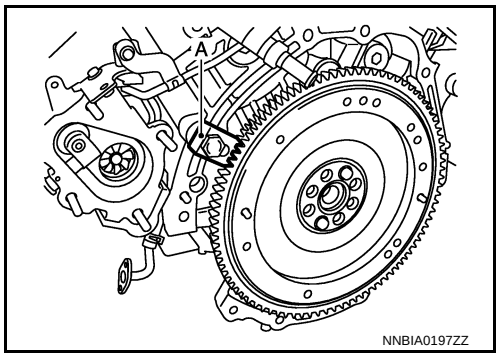
- Ensure the dowel pin is installed in the crankshaft.

CAUTION:

- **If these are not aligned correctly, engine runs roughly and "MIL" turns on.**
- **When handling signal plate, take care not to damage or scratch it.**
- **Never place drive plate with signal plate facing down.**
- **Handle signal plate in a manner that prevents it from becoming magnetized.**



c. Tighten flywheel mounting bolts crosswise over several times.
- Holding ring gear with the ring gear stopper [SST: KV101056S0 (J-49374)] (A).



d. Rotate crankshaft pulley in normal direction (clockwise when viewed from front) to confirm flywheel turns smoothly.

19. Install knock sensors.

- Install by aligning the matching mark (A) on the cylinder block.

⇦ : Engine front

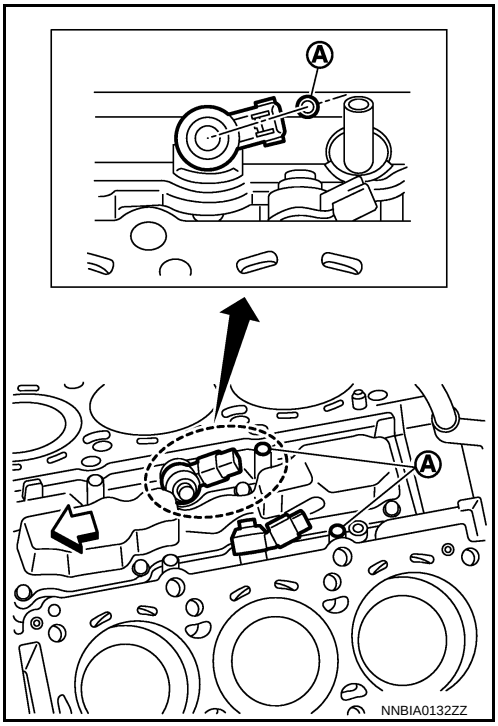
- After installing knock sensor, connect harness connector, and lay it out to rear of the engine.

CAUTION:

- **Never tighten mounting bolts while holding connector.**
- **If any impact by dropping is applied to knock sensor, replace it with new one.**

NOTE:

- Check that there is no foreign material on the cylinder block mating surface and the back surface of knock sensor.
- Check that knock sensor does not interfere with other parts.



20. Install in the reverse order of removal after this step.

Inspection (GT-R certified NISSAN dealer)

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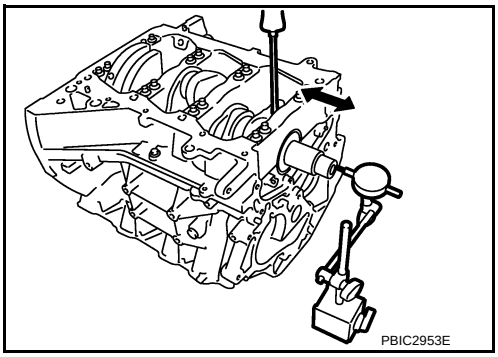
CRANKSHAFT END PLAY

- Measure the clearance between thrust bearings and crankshaft arm when crankshaft is moved fully forward or backward with a dial indicator.

Standard and limit : Refer to EM-146, "Cylinder Block (GT-R certified NISSAN dealer)".

- If the measured value exceeds the limit, replace thrust bearings, and measure again. If it still exceeds the limit, replace crankshaft also.

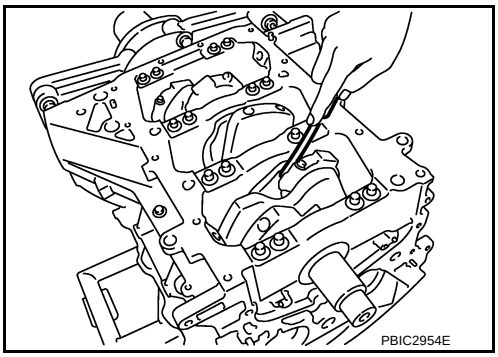


CONNECTING ROD SIDE CLEARANCE

- Measure the side clearance between connecting rod and crankshaft arm with a feeler gauge.

Standard and limit : Refer to EM-146, "Cylinder Block (GT-R certified NISSAN dealer)".

- If the measured value exceeds the limit, replace connecting rod, and measure again. If it still exceeds the limit, replace crankshaft also.

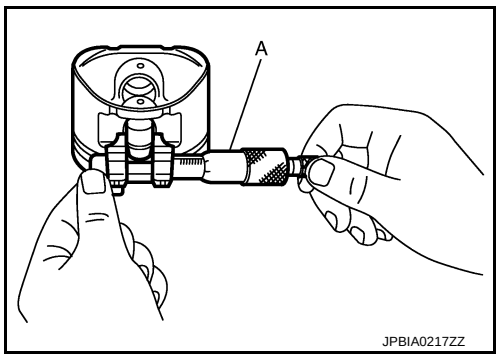


PISTON TO PISTON PIN OIL CLEARANCE

Piston Pin Hole Diameter

Measure the inner diameter of piston pin hole with an inside micrometer (A).

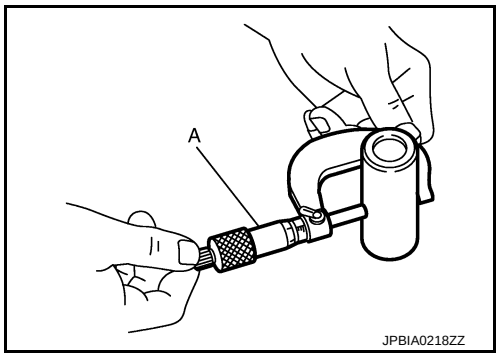
Standard : Refer to EM-146, "Cylinder Block (GT-R certified NISSAN dealer)".



Piston Pin Outer Diameter

Measure the outer diameter of piston pin with a micrometer (A).

Standard : Refer to EM-146, "Cylinder Block (GT-R certified NISSAN dealer)".



Piston to Piston Pin Oil Clearance

(Piston to piston pin oil clearance) = (Piston pin hole diameter) – (Piston pin outer diameter)

Standard : Refer to EM-146, "Cylinder Block (GT-R certified NISSAN dealer)".

- If the calculated value is out of the standard, replace piston and piston pin assembly.
- When replacing piston and piston pin assembly, refer to EM-134, "Description (GT-R certified NISSAN dealer)".

NOTE:

- Piston is available together with piston pin as assembly.
- Piston pin (piston pin hole) grade is provided only for the parts installed at the plant. For service parts, no piston pin grades can be selected. (Only “0” grade is available.)

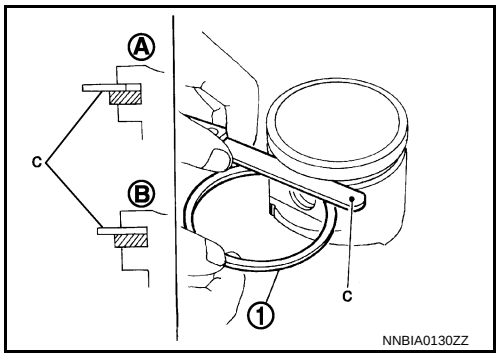
PISTON RING SIDE CLEARANCE

- Measure the side clearance of piston ring (1) and piston ring groove with a feeler gauge (C).

A : OK

B : NG

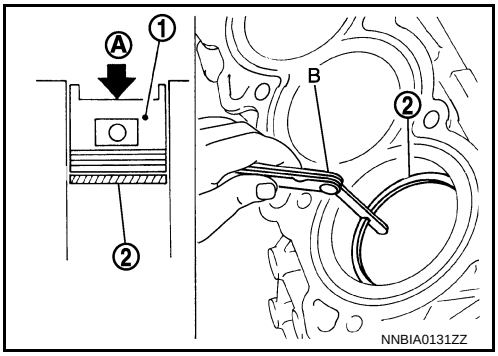
Standard and limit : Refer to EM-146, "Cylinder Block (GT-R certified NISSAN dealer)".



- If the measured value exceeds the limit, replace piston ring, and measure again. If it still exceeds the limit, replace piston also.

PISTON RING END GAP

- Check that the cylinder bore inner diameter is within the specification.
- Lubricate with new engine oil to piston (1) and piston ring (2), and then insert piston ring until middle of cylinder with piston, and measure the piston ring end gap with a feeler gauge (B).



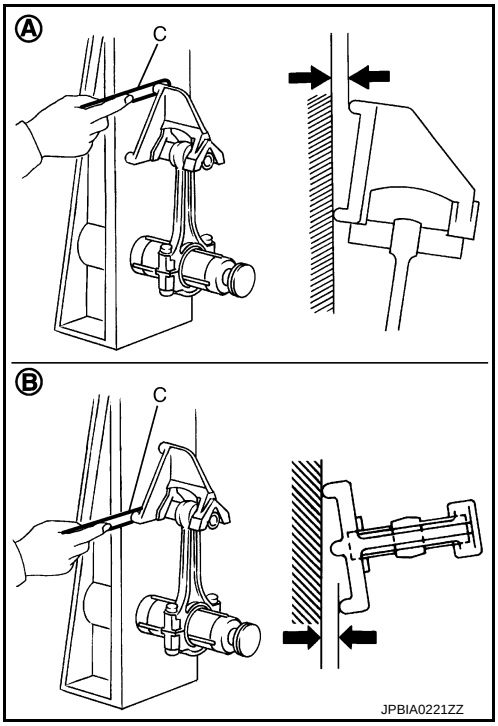
A : Press-fit

Standard and limit **: Refer to EM-146, "Cylinder Block (GT-R certified NISSAN dealer)".**

- If the measured value exceeds the limit, replace piston ring, and measure again. If it still exceeds the limit, replace cylinder block.

CONNECTING ROD BEND AND TORSION

- Check with a connecting rod aligner.



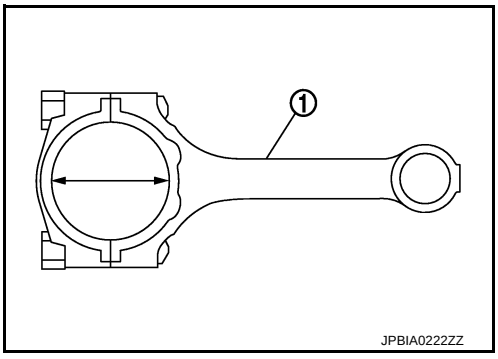
A : Bend
B : Torsion
C : Feeler gauge

Bend limit **: Refer to EM-146, "Cylinder Block (GT-R certified NISSAN dealer)".**
Torsion limit

- If it exceeds the limit, replace connecting rod assembly.

CONNECTING ROD BIG END DIAMETER

- Install connecting rod bearing cap without installing connecting rod bearing, and tightening connecting rod bolts to the specified torque. Refer to EM-114, "Disassembly and Assembly (GT-R certified NISSAN dealer)" for the tightening procedure.



1 : Connecting rod

- Measure the inner diameter of connecting rod big end with an inside micrometer.

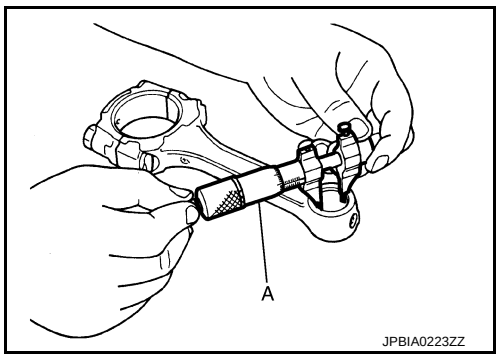
Standard **: Refer to EM-146, "Cylinder Block (GT-R certified NISSAN dealer)".**

- If out of the standard, replace connecting rod assembly.

CONNECTING ROD BUSHING OIL CLEARANCE

Connecting Rod Bushing Inner Diameter

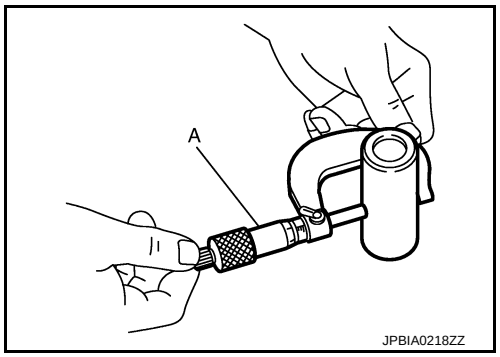
Measure the inner diameter of connecting rod bushing with an inside micrometer (A).



Standard **: Refer to EM-146, "Cylinder Block (GT-R certified NISSAN dealer)".**

Piston Pin Outer Diameter

Measure the outer diameter of piston pin with a micrometer (A).



Standard **: Refer to EM-146, "Cylinder Block (GT-R certified NISSAN dealer)".**

Connecting Rod Bushing Oil Clearance

(Connecting rod bushing oil clearance) = (Connecting rod bushing inner diameter) – (Piston pin outer diameter)

Standard and limit **: Refer to EM-146, "Cylinder Block (GT-R certified NISSAN dealer)".**

- If the calculated value exceeds the limit, replace connecting rod assembly and/or piston and piston pin assembly.
- If replacing piston and piston pin assembly, refer to EM-134, "Description (GT-R certified NISSAN dealer)".
- If replacing connecting rod assembly, refer to EM-135, "Connecting Rod Bearing (GT-R certified NISSAN dealer)" to select the connecting rod bearing.

Factory installed parts grading:

- Service parts apply only to grade “0”.

Grade	0	1
Connecting rod bushing inner diameter *	Refer to EM-146, "Cylinder Block (GT-R certified NISSAN dealer)".	
Piston pin hole diameter		
Piston pin outer diameter		

*: After installing in connecting rod

CYLINDER BLOCK DISTORTION

- Using a scraper, remove gasket on the cylinder block surface, and also remove engine oil, scale, carbon, or other contamination.

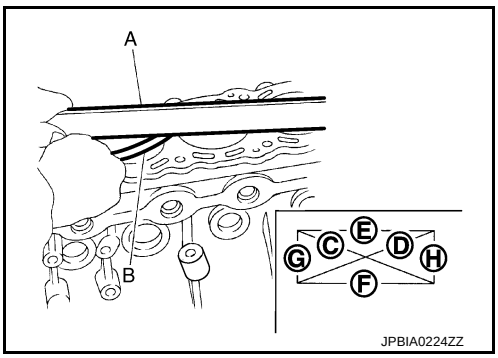
CAUTION:

Be careful not to allow gasket flakes to enter engine oil or engine coolant passages.

- Measure the distortion on the cylinder block upper face at some different points in six directions (C), (D), (E), (F), (G), and (H) with a straightedge (A) and a feeler gauge (B).

Limit : **Refer to EM-146, "Cylinder Block (GT-R certified NISSAN dealer)".**

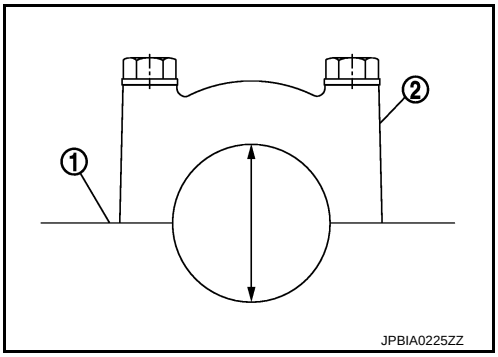
- If it exceeds the limit, replace cylinder block.



MAIN BEARING HOUSING INNER DIAMETER

- Install lower cylinder block (2) without installing main bearings, and tighten lower cylinder block bolts to the specified torque. Refer to EM-114, "Disassembly and Assembly (GT-R certified NISSAN dealer)" for the tightening procedure.
- Measure the inner diameter of main bearing housing with a bore gauge.

Standard : **Refer to EM-146, "Cylinder Block (GT-R certified NISSAN dealer)".**



- If out of the standard, replace cylinder block (1) and lower cylinder block as assembly.

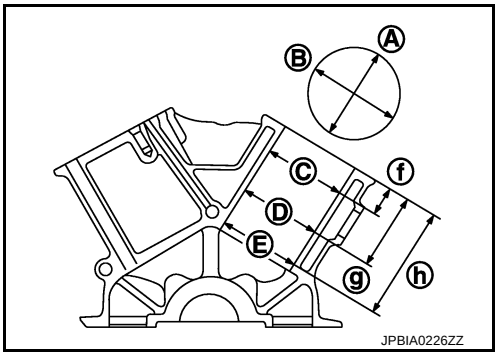
NOTE:
Cylinder block cannot be replaced as a single part, because it is machined together with lower cylinder block.

PISTON TO CYLINDER BORE CLEARANCE

Cylinder Bore Inner Diameter

- Using a bore gauge, measure cylinder bore for wear, out-of-round and taper at six different points on each cylinder. [(A) and (B) directions at (C), (D), and (E)] is in longitudinal direction of engine.

f : 10 mm (0.39 in)
g : 60 mm (2.36 in)
h : 135 mm (5.31 in)



Standard and limit

Wear limit

Out-of-round (Difference between "A" and "B")

Taper (Difference between "C" and "E")

: **Refer to EM-146, "Cylinder Block (GT-R certified NISSAN dealer)".**

- If the measured value exceeds the limit, or if there are scratches and/or seizure on the cylinder inner wall, replace cylinder block.

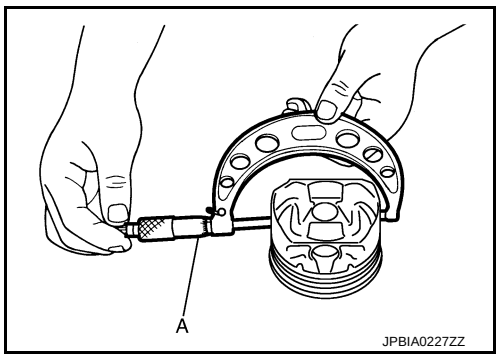
CAUTION:
Cylinder bore is covered with coating. Never perform honing and boring.
NOTE:
Oversize pistons are not service parts.

Piston Skirt Diameter

Measure the outer diameter of piston skirt with a micrometer (A).

Measure point **: Refer to EM-146, "Cylinder Block (GT-R certified NISSAN dealer)".**

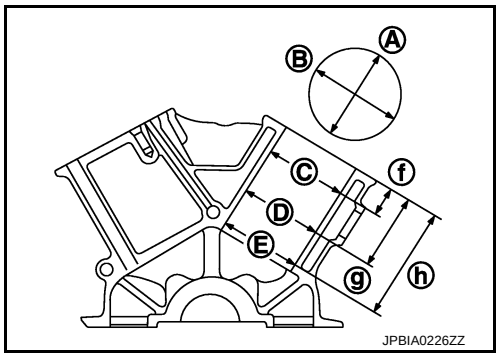
Standard



Piston-to-Cylinder Bore Clearance

Calculate by piston skirt diameter and cylinder bore inner diameter [direction (B), position (D)].

A : Longitudinal direction
C : Top position
E : Bottom position
f : 10 mm (0.39 in)
g : 60 mm (2.36 in)
h : 135 mm (5.31 in)



(Clearance) = (Cylinder bore inner diameter) – (Piston skirt diameter).

Standard and limit **: Refer to EM-146, "Cylinder Block (GT-R certified NISSAN dealer)".**

- If the calculated value exceeds the limit, replace either or both piston assembly and cylinder block. Refer to EM-114, "Disassembly and Assembly (GT-R certified NISSAN dealer)".

CRANKSHAFT MAIN JOURNAL DIAMETER

- Measure the outer diameter of crankshaft main journals with a micrometer.

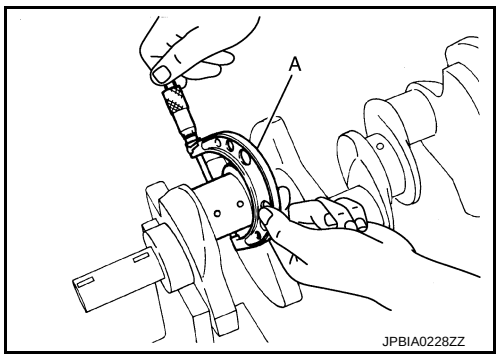
Standard **: Refer to EM-146, "Cylinder Block (GT-R certified NISSAN dealer)".**

- If out of the standard, measure the main bearing oil clearance. Then use undersize bearing. Refer to EM-137, "Main Bearing (GT-R certified NISSAN dealer)".

CRANKSHAFT PIN JOURNAL DIAMETER

- Measure the outer diameter of crankshaft pin journal with a micrometer (A).

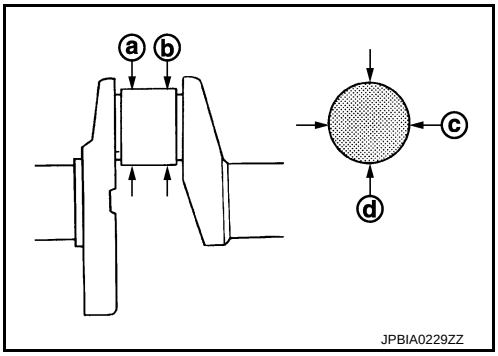
Standard **: Refer to EM-146, "Cylinder Block (GT-R certified NISSAN dealer)".**



- If out of the standard, measure the connecting rod bearing oil clearance. Then use undersize bearing. Refer to EM-135, "Connecting Rod Bearing (GT-R certified NISSAN dealer)".

CRANKSHAFT OUT-OF-ROUND AND TAPER

- Measure the dimensions at four different points as shown in the figure on each main journal and pin journal with a micrometer.
- Out-of-round is indicated by the difference in the dimensions between (d) and (c) at (a) and (b).
- Taper is indicated by the difference in the dimensions between.



Limit

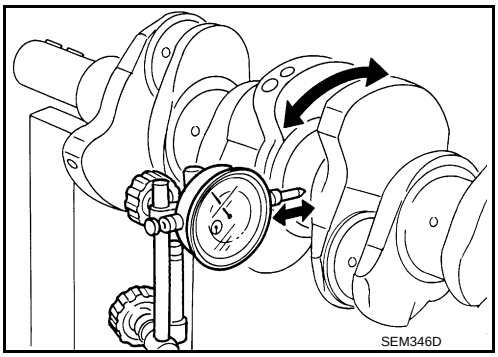
Out-of-round (Difference between "c" and "d") **: Refer to EM-146, "Cylinder Block (GT-R certified NISSAN dealer)".**

Taper (Difference between "a" and "b")

- If the measured value exceeds the limit, correct or replace crankshaft.
- If corrected, measure the bearing oil clearance of the corrected main journal and/or pin journal. Then select the main bearing and/or connecting rod bearing. Refer to EM-137, "Main Bearing (GT-R certified NISSAN dealer)" and/or EM-135, "Connecting Rod Bearing (GT-R certified NISSAN dealer)".

CRANKSHAFT RUNOUT

- Place V-block on precise flat table, and support the journals on the both end of crankshaft.
- Place a dial indicator straight up on the No. 3 journal.
- While rotating crankshaft, read the movement of the pointer on a dial indicator. (Total indicator reading)



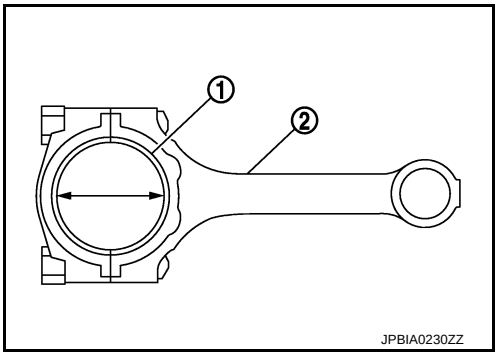
Standard and limit **: Refer to EM-146, "Cylinder Block (GT-R certified NISSAN dealer)".**

- If it exceeds the limit, replace crankshaft.

CONNECTING ROD BEARING OIL CLEARANCE

Method by Calculation

- Install connecting rod bearings (1) to connecting rod (2) and connecting rod cap, and tighten connecting rod bolts to the specified torque. Refer to EM-114, "Disassembly and Assembly (GT-R certified NISSAN dealer)" for the tightening procedure.
- Measure the inner diameter of connecting rod bearing with an inside micrometer.



(Oil clearance) = (Connecting rod bearing inner diameter) – (Crankshaft pin journal diameter)

Standard and limit **: Refer to EM-151, "Connecting Rod Bearing (GT-R certified NISSAN dealer)".**

- If the calculated value exceeds the limit, select proper connecting rod bearing according to connecting rod big end diameter and crankshaft pin journal diameter to obtain the specified bearing oil clearance. Refer to EM-135, "Connecting Rod Bearing (GT-R certified NISSAN dealer)".

Method of Using Plastigage

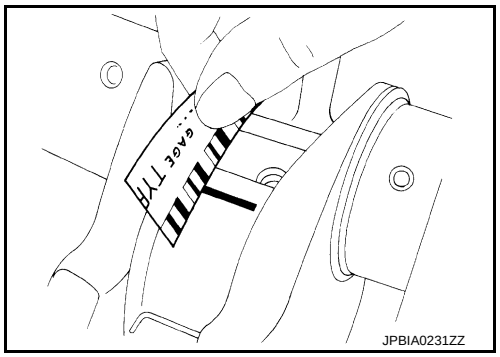
- Remove oil and dust on crankshaft pin journal and the surfaces of each bearing completely.

- Cut a plastigage slightly shorter than the bearing width, and place it in crankshaft axial direction, avoiding oil holes.
- Install connecting rod bearings to connecting rod and connecting rod bearing cap, and tighten connecting rod bolts to the specified torque. Refer to EM-114, "Disassembly and Assembly (GT-R certified NISSAN dealer)" for the tightening procedure.

CAUTION:
Never rotate crankshaft.

- Remove connecting rod bearing cap and bearings, and using the scale on the plastigage bag, measure the plastigage width.

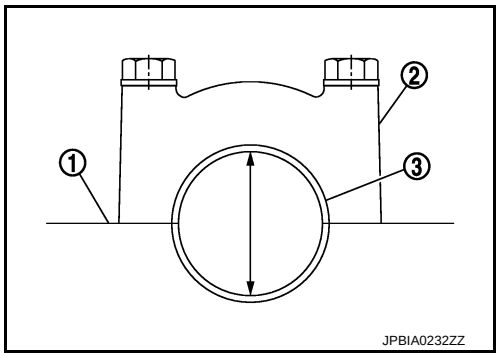
NOTE:
The procedure when the measured value exceeds the limit is same as that described in the “Method by Calculation”.



MAIN BEARING OIL CLEARANCE

Method by Calculation

- Install main bearings (3) to cylinder block (1) and lower cylinder block (2), and tighten lower cylinder block bolts to the specified torque. Refer to EM-114, "Disassembly and Assembly (GT-R certified NISSAN dealer)" for the tightening procedure.
- Measure the inner diameter of main bearing with a bore gauge.



(Oil clearance) = (Main bearing inner diameter) – (Crankshaft main journal diameter)

Standard and limit : Refer to EM-150, "Main Bearing (GT-R certified NISSAN dealer)".

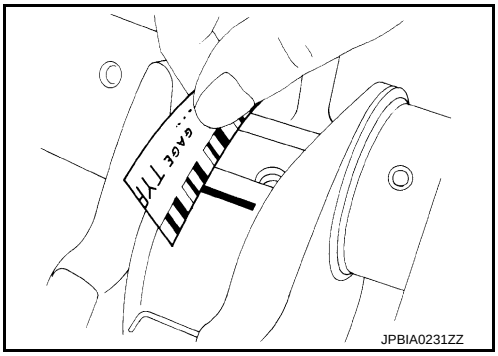
- If the calculated value exceeds the limit, select proper main bearing according to main bearing inner diameter and crankshaft main journal diameter to obtain the specified bearing oil clearance. Refer to EM-137, "Main Bearing (GT-R certified NISSAN dealer)".

Method of Using Plastigage

- Remove engine oil and dust on crankshaft journal and the surfaces of each bearing completely.
- Cut a plastigage slightly shorter than the bearing width, and place it in crankshaft axial direction, avoiding oil holes.
- Install main bearing to cylinder block and lower cylinder block, and tighten lower cylinder block bolts with lower cylinder block to the specified torque. Refer to EM-114, "Disassembly and Assembly (GT-R certified NISSAN dealer)" for the tightening procedure.

CAUTION:
Never rotate crankshaft.

- Remove lower cylinder block and bearings, and using the scale on the plastigage bag, measure the plastigage width.
  NOTE:
  The procedure when the measured value exceeds the limit is same as that described in the “Method by Calculation”.



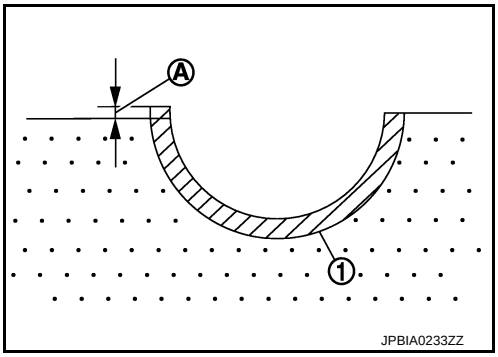
MAIN BEARING CRUSH HEIGHT

- When lower cylinder block is removed after being tightened to the specified torque with main bearings (1) installed, the tip end of bearing must protrude. Refer to EM-114, "Disassembly and Assembly (GT-R certified NISSAN dealer)" for the tightening procedure.

  A : Crush height

  Standard : There must be crush height.

- If the standard is not met, replace main bearings.



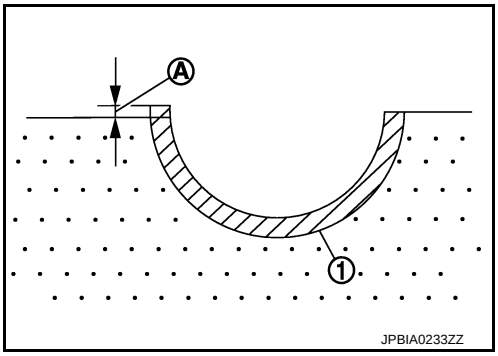
CONNECTING ROD BEARING CRUSH HEIGHT

- When connecting rod bearing cap is removed after being tightened to the specified torque with connecting rod bearings (1) installed, the tip end of bearing must protrude. Refer to EM-114, "Disassembly and Assembly (GT-R certified NISSAN dealer)" for the tightening procedure.

  A : Crush height

  Standard : There must be crush height.

- If the standard is not met, replace connecting rod bearings.



LOWER CYLINDER BLOCK BOLT OUTER DIAMETER

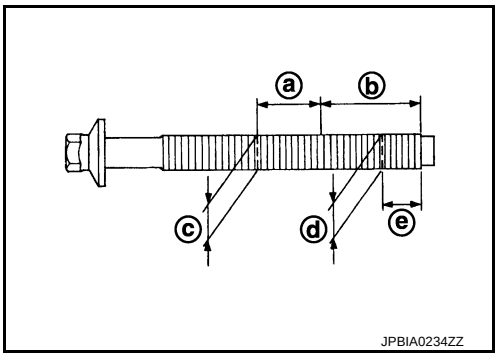
- Measure the outer diameters (c), (d) at two positions as shown in the figure.

  a : 20 mm (0.79 in)
  b : 30 mm (1.18 in)
  e : 10 mm (0.39 in)

- If reduction appears in (a) range, regard it (c).

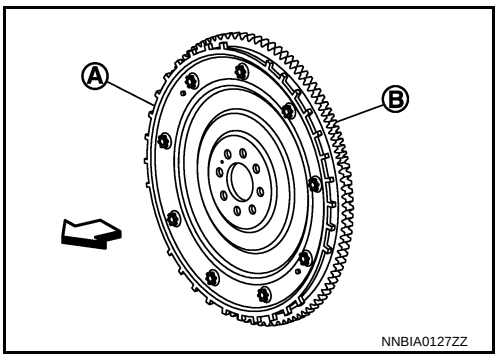
  Limit [(d) – (c)] : 0.11 mm (0.0043 in)

- If it exceeds the limit (large difference in dimensions), replace lower cylinder block bolt with new one.



FLYWHEEL

- Check signal plate (A) and ring gear (B) for deformation or damage.



⇦ : Engine front

CAUTION:

- **Never disassemble flywheel.**
- **Never place flywheel with signal plate facing down.**
- **When handling signal plate, take care not to damage or scratch it.**
- **Handle signal plate in a manner that prevents it from becoming magnetized.**

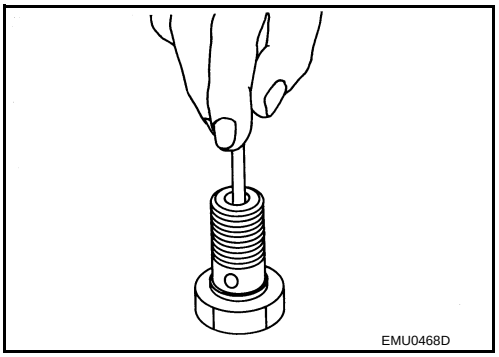
- If anything is found, replace flywheel.

OIL JET

- Check nozzle for deformation and damage.
- Blow compressed air from nozzle, and check for clogs.
- If it is not satisfied, clean or replace oil jet.

OIL JET RELIEF VALVE

- Using a clean plastic stick, press check valve in oil jet relief valve. Check that valve moves smoothly with proper reaction force.
- If it is not satisfied, replace oil jet relief valve.



HOW TO SELECT PISTON AND BEARING

Description (GT-R certified NISSAN dealer)

INFOID:0000000011488089

Selection points	Selection parts	Selection items	Selection methods
Between cylinder block and crankshaft	Main bearing	Main bearing grade (bearing thickness)	Determined by match of cylinder block bearing housing grade (inner diameter of housing) and crankshaft journal grade (outer diameter of journal)
Between crankshaft and connecting rod	Connecting rod bearing	Connecting rod bearing grade (bearing thickness)	Determined by match of connecting rod big end grade and crankshaft pin grade.
Between cylinder block and piston	Piston and piston pin assembly (Piston is available together with piston pin as assembly.)	Piston grade (piston skirt diameter)	Piston grade = cylinder bore grade (inner diameter of bore)
Between piston and connecting rod*	—	—	—

*: For the service parts, the grade for fitting cannot be selected between piston pin and connecting rod. (Only “0” grade is available.) The information at the shipment from the plant is described as a reference.

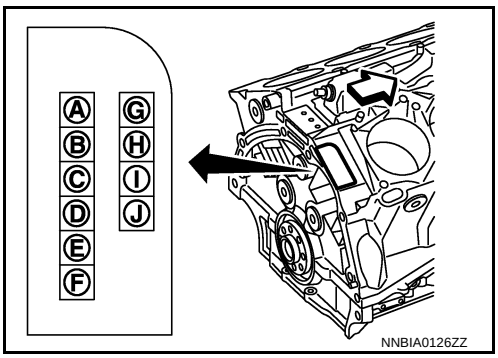
- The identification grade stamped on each part is the grade for the dimension measured in new condition. This grade cannot apply to reused parts.
- For reused or repaired parts, measure the dimension accurately. Determine the grade by comparing the measurement with the values of each selection table.
- For details of the measurement method of each part, the reuse standards and the selection method of the selective fitting parts, refer to the text.

Piston (GT-R certified NISSAN dealer)

INFOID:0000000011488090

WHEN NEW CYLINDER BLOCK IS USED

Check the cylinder bore grade (“1”, “2” or “3”) on rear side of cylinder block, and select piston of the same grade.



A : Cylinder bore grade No. 1
B : Cylinder bore grade No. 2
C : Cylinder bore grade No. 3
D : Cylinder bore grade No. 4
E : Cylinder bore grade No. 5
F : Cylinder bore grade No. 6
G : Bearing housing grade No. 1
H : Bearing housing grade No. 2
I : Bearing housing grade No. 3
J : Bearing housing grade No. 4
⇦ : Engine front

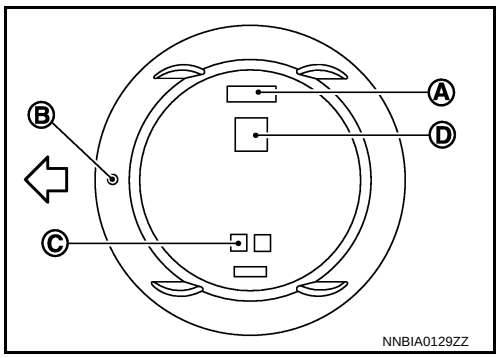
NOTE:

- Oversize pistons are not service parts.
- Piston is available with piston pin as a set for the service part. (Only “0” grade piston pin is available.)

WHEN CYLINDER BLOCK IS REUSED

1. Measure the cylinder bore inner diameter. Refer to EM-124, "Inspection (GT-R certified NISSAN dealer)".

2. Determine the bore grade by comparing the measurement with the values under the cylinder bore inner diameter of the “PISTON SELECTION TABLE”.



A : Identification code
B : Front mark
C : Piston pin grade number
D : Piston grade number
⇦ : Engine front

3. Select piston of the same grade.

PISTON SELECTION TABLE

Unit: mm (in)

Grade	1	2	3
Cylinder bore inner diameter	95.500 - 95.510 (3.7598 - 3.7602)	95.510 - 95.520 (3.7602 - 3.7606)	95.520 - 95.530 (3.7606 - 3.7610)
Piston skirt diameter	95.480 - 95.490 (3.7590 - 3.7594)	95.490 - 95.500 (3.7594 - 3.7598)	95.500 - 95.510 (3.7598 - 3.7602)

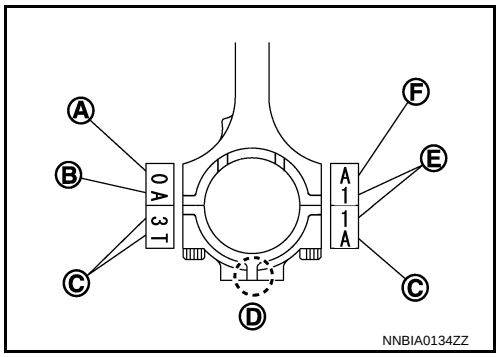
NOTE:
- Oversize pistons are not service parts.
- Piston is available together with piston pin as assembly.
- Piston pin (piston pin hole) grade is provided only for the parts installed at the plant. For service parts, no piston pin grades can be selected. (Only “0” grade is available.)

Connecting Rod Bearing (GT-R certified NISSAN dealer)

INFOID:0000000011488091

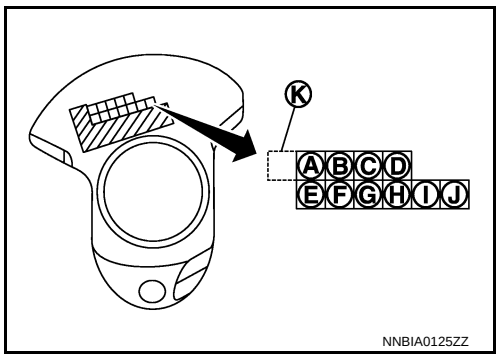
WHEN NEW CONNECTING ROD AND CRANKSHAFT ARE USED

1. Apply connecting rod big end diameter grade stamped (F) on connecting rod side face to the row in the “CONNECTING ROD BEARING SELECTION TABLE”.



A : Small-end diameter grade
B : Weight grade
C : Management code
D : Front mark
E : Cylinder No.

2. Apply crankshaft pin diameter grade stamped on crankshaft front side to the column in the “CONNECTING ROD BEARING SELECTION TABLE”



A : Journal diameter grade No. 1
B : Journal diameter grade No. 2
C : Journal diameter grade No. 3
D : Journal diameter grade No. 4
E : Pin diameter grade No. 1
F : Pin diameter grade No. 2
G : Pin diameter grade No. 3
H : Pin diameter grade No. 4
I : Pin diameter grade No. 5
J : Pin diameter grade No. 6
K : Identification

3. Read the symbol at the cross point of selected row and column in the “CONNECTING ROD BEARING SELECTION TABLE”.
4. Apply the symbol obtained to the “CONNECTING ROD BEARING GRADE TABLE” to select connecting rod bearing.

WHEN CONNECTING ROD AND CRANKSHAFT ARE REUSED

1. Measure connecting rod big end diameter and crankshaft pin journal diameter. Refer to EM-124, "Inspection (GT-R certified NISSAN dealer)".
2. Correspond the measured dimension in “connecting rod big end diameter” row of “CONNECTING ROD BEARING SELECTION TABLE”.
3. Correspond the measured dimension in “crankshaft pin diameter” column of “CONNECTING ROD BEARING SELECTION TABLE”.
4. Follow step 3 and later in “WHEN NEW CONNECTING ROD AND CRANKSHAFT ARE USED”.

CONNECTING ROD BEARING SELECTION TABLE

Connecting rod big end diameter Unit: mm (in) / Crankshaft pin journal diameter Unit: mm (in)		Mark	A	B	C	D	E	F	G	H	J	K	L	M	N
		Hole diameter	59.000-59.001 (2.3228-2.3229)	59.001-59.002 (2.3229-2.3229)	59.002-59.003 (2.3229-2.3229)	59.003-59.004 (2.3229-2.3230)	59.004-59.005 (2.3230-2.3230)	59.005-59.006 (2.3230-2.3231)	59.006-59.007 (2.3231-2.3231)	59.007-59.008 (2.3231-2.3231)	59.008-59.009 (2.3231-2.3232)	59.009-59.010 (2.3232-2.3232)	59.010-59.011 (2.3232-2.3233)	59.011-59.012 (2.3233-2.3233)	59.012-59.013 (2.3233-2.3223)
Mark	Axle diameter														
A	55.961-55.960 (2.2032-2.2031)		0	0	0	0	0	01	01	01	1	1	1	12	12
B	55.960-55.959 (2.2031-2.2031)		0	0	0	0	01	01	01	1	1	1	12	12	12
C	55.959-55.958 (2.2031-2.2031)		0	0	0	01	01	01	1	1	1	12	12	12	2
D	55.958-55.957 (2.2031-2.2030)		0	0	01	01	01	1	1	1	12	12	12	2	2
E	55.957-55.956 (2.2030-2.2030)		0	01	01	01	1	1	1	12	12	12	2	2	2
F	55.956-55.955 (2.2030-2.2029)		01	01	01	1	1	1	12	12	12	2	2	2	23
G	55.955-55.954 (2.2029-2.2029)		01	01	1	1	1	12	12	12	2	2	2	23	23
H	55.954-55.953 (2.2029-2.2029)		01	1	1	1	12	12	12	2	2	2	23	23	23
J	55.953-55.952 (2.2029-2.2028)		1	1	1	12	12	12	2	2	2	23	23	23	3
K	55.952-55.951 (2.2028-2.2028)		1	1	12	12	12	2	2	2	23	23	23	3	3
L	55.951-55.950 (2.2028-2.2028)		1	12	12	12	2	2	2	23	23	23	3	3	3
M	55.950-55.949 (2.2028-2.2027)		12	12	12	2	2	2	23	23	23	3	3	3	34
N	55.949-55.948 (2.2027-2.2027)		12	12	2	2	2	23	23	23	3	3	3	34	34
P	55.948-55.947 (2.2027-2.2026)		12	2	2	2	23	23	23	3	3	3	34	34	34
R	55.947-55.946 (2.2026-2.2026)		2	2	2	23	23	23	3	3	3	34	34	34	4
S	55.946-55.945 (2.2026-2.2026)		2	2	23	23	23	3	3	3	34	34	34	4	4
T	55.945-55.944 (2.2026-2.2025)		2	23	23	23	3	3	3	34	34	34	4	4	4
U	55.944-55.943 (2.2025-2.2025)		23	23	23	3	3	3	34	34	34	4	4	4	4

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CONNECTING ROD BEARING GRADE TABLE

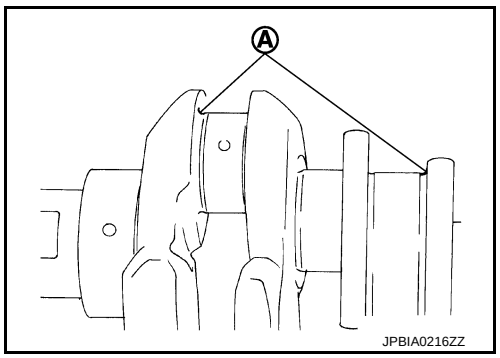
Connecting rod bearing grade table **: Refer to EM-151, "Connecting Rod Bearing (GT-R certified NISSAN dealer)".**

UNDERSIZE BEARING USAGE GUIDE

- When the specified connecting rod bearing oil clearance is not obtained with standard size connecting rod bearings, use undersize (US) bearings.
- When using undersize (US) bearing, measure the connecting rod bearing inner diameter with bearing installed, and grind crankshaft pin so that the connecting rod bearing oil clearance satisfies the standard.

CAUTION:

In grinding crankshaft pin to use undersize bearings, keep the fillet R (A) [1.5 - 1.7 mm (0.059 - 0.067 in)].



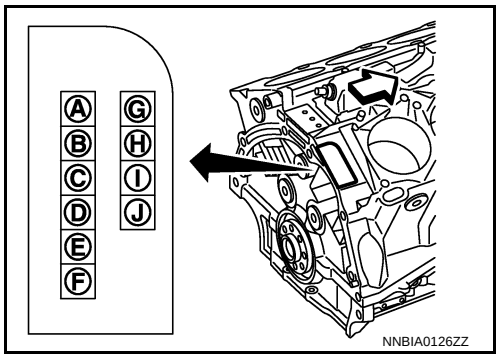
Bearing undersize table **: Refer to EM-151, "Connecting Rod Bearing (GT-R certified NISSAN dealer)".**

Main Bearing (GT-R certified NISSAN dealer)

INFOID:0000000011488092

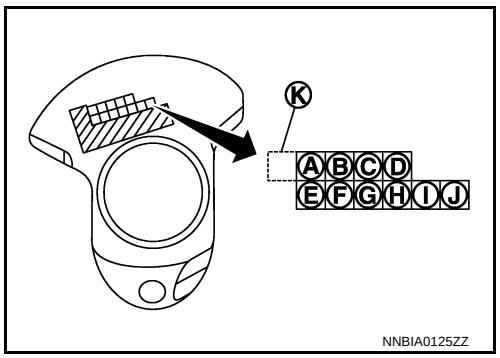
WHEN NEW CYLINDER BLOCK AND CRANKSHAFT ARE USED

1. "MAIN BEARING SELECTION TABLE" rows correspond to bearing housing grade on rear left side of cylinder block.



A : Cylinder bore grade No. 1
B : Cylinder bore grade No. 2
C : Cylinder bore grade No. 3
D : Cylinder bore grade No. 4
E : Cylinder bore grade No. 5
F : Cylinder bore grade No. 6
G : Bearing housing grade No. 1
H : Bearing housing grade No. 2
I : Bearing housing grade No. 3
J : Bearing housing grade No. 4
⇦ : Engine front

2. "MAIN BEARING SELECTION TABLE" columns correspond to journal diameter grade on front side of crankshaft.



A : Journal diameter grade No. 1
B : Journal diameter grade No. 2
C : Journal diameter grade No. 3
D : Journal diameter grade No. 4
E : Pin diameter grade No. 1
F : Pin diameter grade No. 2
G : Pin diameter grade No. 3
H : Pin diameter grade No. 4
I : Pin diameter grade No. 5
J : Pin diameter grade No. 6
K : Identification code

3. Select main bearing grade at the point where selected row and column meet in "MAIN BEARING SELECTION TABLE".
4. Apply the symbol obtained to the "MAIN BEARING GRADE TABLE" to select main bearing.
NOTE:
- "MAIN BEARING GRADE TABLE" applies to all journals.
- Service parts is available as a set of both upper and lower.

WHEN CYLINDER BLOCK AND CRANKSHAFT ARE REUSED

1. Measure cylinder block main bearing housing inner diameter and crankshaft main journal diameter. Refer to EM-124, "Inspection (GT-R certified NISSAN dealer)".
2. Correspond the measured dimension in “Cylinder block main bearing housing inner diameter” row of “MAIN BEARING SELECTION TABLE”.
3. Correspond the measured dimension in “Crankshaft main journal diameter” column of “MAIN BEARING SELECTION TABLE”.
4. Follow step 3 and later in “When New Cylinder Block and Crankshaft are Used”.

MAIN BEARING SELECTION TABLE

Cylinder block main bearing housing inner diameter
Unit: mm (in)

Crankshaft main journal diameter
Unit: mm (in)

Mark	Axle diameter	Hole diameter	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W	X	Y	4	7
			69.993 - 69.994 (2.7556 - 2.7557)	69.994 - 69.995 (2.7557 - 2.7557)	69.995 - 69.996 (2.7557 - 2.7557)	69.996 - 69.997 (2.7557 - 2.7558)	69.997 - 69.998 (2.7558 - 2.7558)	69.998 - 69.999 (2.7558 - 2.7559)	69.999 - 70.000 (2.7559 - 2.7559)	70.000 - 70.001 (2.7559 - 2.7559)	70.001 - 70.002 (2.7559 - 2.7560)	70.002 - 70.003 (2.7560 - 2.7560)	70.003 - 70.004 (2.7560 - 2.7561)	70.004 - 70.005 (2.7561 - 2.7561)	70.005 - 70.006 (2.7561 - 2.7561)	70.006 - 70.007 (2.7561 - 2.7562)	70.007 - 70.008 (2.7562 - 2.7562)	70.008 - 70.009 (2.7562 - 2.7563)	70.009 - 70.010 (2.7563 - 2.7563)	70.010 - 70.011 (2.7563 - 2.7563)	70.011 - 70.012 (2.7563 - 2.7564)	70.012 - 70.013 (2.7564 - 2.7564)	70.013 - 70.014 (2.7564 - 2.7565)	70.014 - 70.015 (2.7565 - 2.7565)	70.015 - 70.016 (2.7565 - 2.7565)	70.016 - 70.017 (2.7565 - 2.7566)
A	64.975 - 64.974 (2.5581 - 2.5580)		0	0	0	01	01	01	1	1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34
B	64.974 - 64.973 (2.5580 - 2.5580)		0	0	01	01	01	1	1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4
C	64.973 - 64.972 (2.5580 - 2.5579)		0	01	01	01	1	1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4
D	64.972 - 64.971 (2.5579 - 2.5579)		01	01	01	1	1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4
E	64.971 - 64.970 (2.5579 - 2.5579)		01	01	1	1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45
F	64.970 - 64.969 (2.5579 - 2.5578)		01	1	1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45
G	64.969 - 64.968 (2.5578 - 2.5578)		1	1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45
H	64.968 - 64.967 (2.5578 - 2.5578)		1	1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5
J	64.967 - 64.966 (2.5578 - 2.5577)		1	12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5
K	64.966 - 64.965 (2.5577 - 2.5577)		12	12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5
L	64.965 - 64.964 (2.5577 - 2.5576)		12	12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56
M	64.964 - 64.963 (2.5576 - 2.5576)		12	2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56
N	64.963 - 64.962 (2.5576 - 2.5576)		2	2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56
P	64.962 - 64.961 (2.5576 - 2.5575)		2	2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6
R	64.961 - 64.960 (2.5575 - 2.5575)		2	23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6
S	64.960 - 64.959 (2.5575 - 2.5574)		23	23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6
T	64.959 - 64.958 (2.5574 - 2.5574)		23	23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67
U	64.958 - 64.957 (2.5574 - 2.5574)		23	3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67	67
V	64.957 - 64.956 (2.5574 - 2.5573)		3	3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67	67	67
W	64.956 - 64.955 (2.5573 - 2.5573)		3	3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67	67	67	7
X	64.955 - 64.954 (2.5573 - 2.5572)		3	34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67	67	67	7	7
Y	64.954 - 64.953 (2.5572 - 2.5572)		34	34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67	67	67	7	7	7
4	64.953 - 64.952 (2.5572 - 2.5572)		34	34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67	67	67	7	7	7	X
7	64.952 - 64.951 (2.5572 - 2.5571)		34	4	4	4	45	45	45	5	5	5	56	56	56	6	6	6	67	67	67	7	7	7	X	X

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MAIN BEARING GRADE TABLE (ALL JOURNALS)

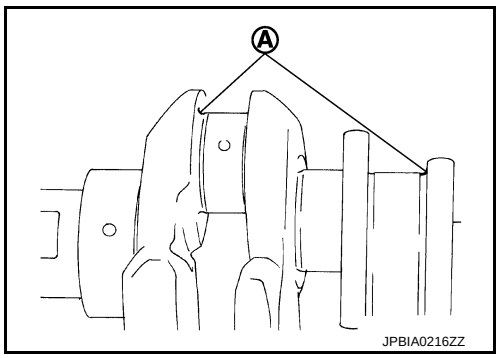
Main bearing grade table (All journals) **: Refer to EM-150, "Main Bearing (GT-R certified NISSAN dealer)".**

UNDERSIZE BEARING USAGE GUIDE

- When the specified main bearing oil clearance is not obtained with standard size main bearings, use undersize (US) bearing.
- When using undersize (US) bearing, measure the main bearing inner diameter with bearing installed, and grind main journal so that the main bearing oil clearance satisfies the standard.

CAUTION:

In grinding crankshaft main journal to use undersize bearings, keep the fillet R (A) [1.5 - 1.7 mm (0.059 - 0.067 in)].



Bearing undersize table **: Refer to EM-150, "Main Bearing (GT-R certified NISSAN dealer)".**

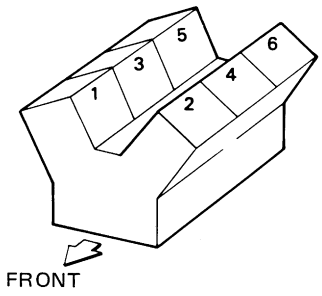
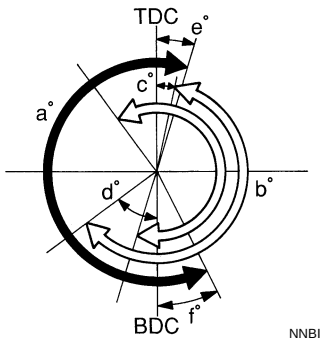
SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specification (GT-R certified NISSAN dealer)

INFOID:0000000011488093

GENERAL SPECIFICATIONS

Cylinder arrangement		V-6
Displacement cm^3 (cu in)		3,799 (231.815)
Bore and stroke mm (in)		95.5×88.4 (3.760×3.480)
Valve arrangement		DOHC
Firing order		1-2-3-4-5-6
Number of piston rings	Compression	2
	Oil	1
Number of main bearings		4
Compression ratio		9.0
Compression pressure kPa (kg/cm^2, psi)/200 rpm	Standard	970 (9.89, 141)
	Minimum	800 (8.16, 116)
	Differential limit between cylinders	100 (1.02, 14.5)
Cylinder number	 SEM713A	
Valve timing ⇦ : Intake valve ⬅ : Exhaust valve	 NNBIA0203ZZ	

Unit: degree

a	b	c	d	e	f
248	238	5 ATDC (41 BTCD)	63 ABDC (17 ABDC)	9 ATDC	59 BBDC

( ) : Valve timing control “ON”

Drive Belt (GT-R certified NISSAN dealer)

INFOID:0000000011488094

DRIVE BELT

Tension of drive belt	Belt tension is not necessary, as it is automatically adjusted by drive belt auto-tensioner.

Spark Plug

INFOID:0000000011488095

SPARK PLUG

Unit: mm (in)

Make		NGK
Standard type		DILKAR8A8
Gap (Nominal)	Standard	0.7 - 0.8 (0.028 - 0.031)
	Limit	1.0 (0.039)

Recirculation Valve (GT-R certified NISSAN dealer)

INFOID:0000000011488096

RECIRCULATION VALVE

Unit: kPa (mmHg, in Hg)

	Standard
Recirculation valve open	–59.3 (444, 17.5)

Intake Manifold Collector (GT-R certified NISSAN dealer)

INFOID:0000000011488097

INTAKE MANIFOLD COLLECTOR

Unit: mm (in)

Items	Limit
Surface distortion	0.1 (0.004)

Intake Manifold (GT-R certified NISSAN dealer)

INFOID:0000000011488098

INTAKE MANIFOLD

Unit: mm (in)

Items	Limit
Surface distortion	0.1 (0.004)

Exhaust Manifold and Turbocharger (GT-R certified NISSAN dealer)

INFOID:0000000011488099

EXHAUST MANIFOLD AND TURBOCHARGER

Unit: mm (in)

Items	Standard
Surface distortion	0.25 (0.0098)

Camshaft (GT-R certified NISSAN dealer)

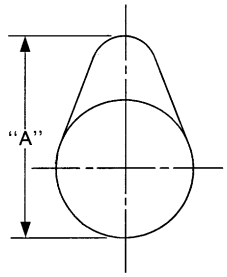
INFOID:0000000011488100

CAMSHAFT

Unit: mm (in)

Items		Standard	Limit
Camshaft journal oil clearance	No. 1	0.045 - 0.086 (0.0018 - 0.0034)	0.15 (0.0059)
	No. 2, 3, 4	0.035 - 0.076 (0.0014 - 0.0030)	
Camshaft bracket inner diameter	No. 1	26.000 - 26.021 (1.0236 - 1.0244)	—
	No. 2, 3, 4	23.500 - 23.521 (0.9252 - 0.9260)	—
Camshaft journal diameter	No. 1	25.935 - 25.955 (1.0211 - 1.0218)	—
	No. 2, 3, 4	23.445 - 23.465 (0.9230 - 0.9238)	—
Camshaft end play		0.115 - 0.188 (0.0045 - 0.0074)	0.24 (0.0094)

Camshaft cam height “A”	Intake	44.865 - 45.055 (1.7663 - 1.7738)	0.2 (0.008)*1
	Exhaust	45.185 - 45.375 (1.7789 - 1.7864)	0.2 (0.008)*1
Camshaft runout [TIR*2]		Less than 0.02 (0.0008)	0.05 (0.0020)
Camshaft sprocket runout [TIR*2]		—	0.15 (0.0059)
Camshaft signal plate runout [TIR*2]			0.24 (0.0094)



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*1: Cam wear limit

*2: Total indicator reading

VALVE LIFTER

Unit: mm (in)

Items	Standard
Valve lifter outer diameter	33.980 - 33.990 (1.3378 - 1.3382)
Valve lifter hole diameter	34.000 - 34.016 (1.3386 - 1.3392)
Valve lifter clearance	0.010 - 0.036 (0.0004 - 0.0014)

VALVE CLEARANCE

Unit: mm (in)

Items	Cold	Hot* (reference data)
Intake	0.26 - 0.34 (0.010 - 0.013)	0.304 - 0.416 (0.012 - 0.016)
Exhaust	0.29 - 0.37 (0.011 - 0.015)	0.308 - 0.432 (0.012 - 0.017)

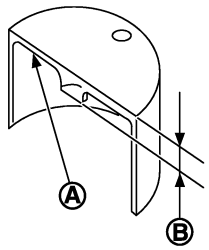
*: Approximately 80°C (176°F)

AVAILABLE VALVE LIFTER

Unit: mm (in)

Identification (stamped) mark (A)	Thickness (B)
788	7.88 (0.3102)
790	7.90 (0.3110)
792	7.92 (0.3118)
794	7.94 (0.3126)
796	7.96 (0.3134)
798	7.98 (0.3142)
800	8.00 (0.3150)
802	8.02 (0.3157)
804	8.04 (0.3165)
806	8.06 (0.3173)
808	8.08 (0.3181)
810	8.10 (0.3189)
812	8.12 (0.3197)

Identification (stamped) mark (A)	Thickness (B)
814	8.14 (0.3205)
816	8.16 (0.3213)
818	8.18 (0.3220)
820	8.20 (0.3228)
822	8.22 (0.3236)
824	8.24 (0.3244)
826	8.26 (0.3252)
828	8.28 (0.3260)
830	8.30 (0.3268)
832	8.32 (0.3276)
834	8.34 (0.3283)
836	8.36 (0.3291)
838	8.38 (0.3299)
840	8.40 (0.3307)



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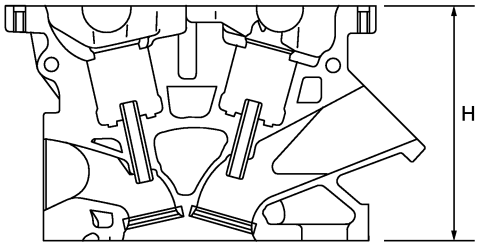
Cylinder Head (GT-R certified NISSAN dealer)

INFOID:0000000011488101

CYLINDER HEAD

Unit: mm (in)

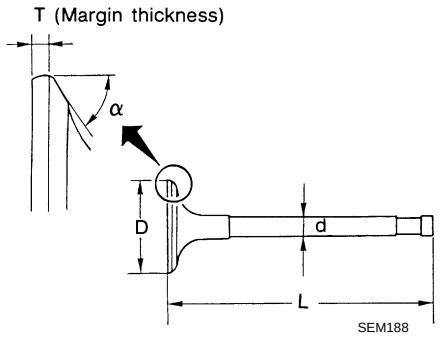
Items	Standard	Limit
Head surface distortion	—	0.03 (0.0012)
Normal cylinder head height “H”	126.3 (4.97)	—



PBIC0924E

VALVE DIMENSIONS

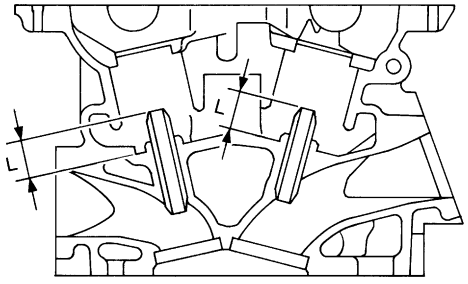
Unit: mm (in)



Valve head diameter “D”	Intake	37.0 - 37.3 (1.457 - 1.469)
	Exhaust	32.0 - 32.3 (1.260 - 1.272)
Valve length “L”	Intake	94.96 (3.7386)
	Exhaust	91.96 (3.6205)
Valve stem diameter “d”	Intake	5.965 - 5.980 (0.2348 - 0.2354)
	Exhaust	5.955 - 5.970 (0.2344 - 0.2350)
Valve seat angle “α”	Intake	45°15′ - 45°45′
	Exhaust	
Valve margin “T”	Intake	1.1 (0.043)
	Exhaust	1.3 (0.051)
Valve margin “T” limit		0.5 (0.020)
Valve stem end surface grinding limit		0.2 (0.008)

VALVE GUIDE

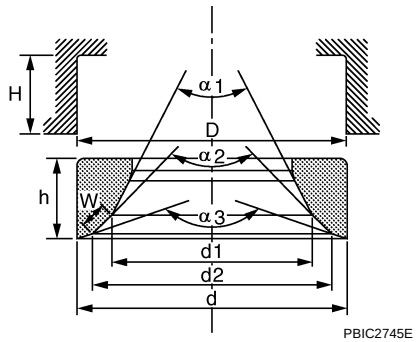
Unit: mm (in)



Items		Standard	Oversize (Service) [0.2 (0.008)]
Valve guide	Outer diameter	10.023 - 10.034 (0.3946 - 0.3950)	10.223 - 10.234 (0.4025 - 0.4029)
	Inner diameter (Finished size)	6.000 - 6.018 (0.2362 - 0.2369)	
Cylinder head valve guide hole diameter		9.975 - 9.996 (0.3927 - 0.3935)	10.175 - 10.196 (0.4006 - 0.4014)
Interference fit of valve guide		0.027 - 0.059 (0.0011 - 0.0023)	
Items		Standard	Limit
Valve guide clearance	Intake	0.020 - 0.053 (0.0008 - 0.0021)	0.08 (0.0031)
	Exhaust	0.030 - 0.063 (0.0012 - 0.0025)	0.09 (0.0035)
Projection length “L”		11.6 - 11.8 (0.457 - 0.465)	

VALVE SEAT

Unit: mm (in)



PBIC2745E

Items		Standard	Oversize (Service) [0.5 (0.020)]
Cylinder head seat recess diameter “D”	Intake	38.000 - 38.016 (1.4961 - 1.4967)	38.500 - 38.516 (1.5157 - 1.5164)
	Exhaust	33.000 - 33.016 (1.2992 - 1.2998)	33.500 - 33.516 (1.3189 - 1.3195)
Valve seat outer diameter “d”	Intake	38.097 - 38.113 (1.4999 - 1.5005)	38.597 - 38.613 (1.5196 - 1.5202)
	Exhaust	33.080 - 33.096 (1.3024 - 1.3030)	33.580 - 33.596 (1.3220 - 1.3227)
Valve seat interference fit	Intake	0.081 - 0.113 (0.0032 - 0.0044)	
	Exhaust	0.064 - 0.096 (0.0025 - 0.0038)	
Diameter “d1”*1	Intake	31.1 - 31.6 (1.224 - 1.244)	
	Exhaust	29.52 (1.1622)	
Diameter “d2”*2	Intake	36.3 - 36.8 (1.429 - 1.449)	
	Exhaust	35.0 (1.378)	
Angle “α1”	Intake	60°	
	Exhaust	60°	
Angle “α2”	Intake	88°45′ - 90°15′	
	Exhaust	88°45′ - 90°15′	
Angle “α3”	Intake	110°	
	Exhaust	110°	
Contacting width “W”*3	Intake	1.0 - 1.4 (0.039 - 0.055)	
	Exhaust	1.2 - 1.6 (0.047 - 0.063)	
Height “h”	Intake	5.9 - 6.0 (0.232 - 0.236)	4.61 - 4.71 (0.1815 - 0.1854)
	Exhaust	5.9 - 6.0 (0.232 - 0.236)	4.26 - 4.36 (0.1677 - 0.1717)
Depth “H”		6.0 (0.236)	

*1: Diameter made by intersection point of conic angles “α1” and “α2”

*2: Diameter made by intersection point of conic angles “α2” and “α3”

*3: Machining data

VALVE SPRING

Items	Standard	
	Intake	Exhaust
Free height	47.52 mm (1.8709 in)	53.81 mm (2.1185 in)
Installation height	37.00 mm (1.4567 in)	33.80 mm (1.3307 in)
Installation load	188 - 208 N (19.2 - 21.2 kg, 42 - 47 lb)	301 - 339 N (30.7 - 34.6 kg, 68 - 76 lb)
Height during valve open	27.80 mm (1.0945 in)	24.29 mm (0.9563 in)
Load with valve open	410 - 453 N (41.8 - 46.2 kg, 92 - 102 lb)	487 - 549 N (49.7 - 56.0 kg, 109 - 123 lb)

Items	Limit
Squareness	2.5 mm (0.098 in)

Cylinder Block (GT-R certified NISSAN dealer)

INFOID:0000000011488102

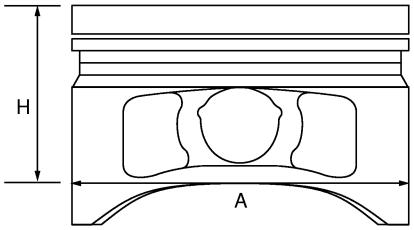
CYLINDER BLOCK

Unit: mm (in)

Surface flatness		Limit		0.1 (0.004)
Main bearing housing inner diameter		Standard		69.993 - 70.017 (2.7556 - 2.7566)
Cylinder bore	Inner diameter	Standard	Grade No. 1	95.500 - 95.510 (3.7598 - 3.7602)
			Grade No. 2	95.510 - 95.520 (3.7602 - 3.7606)
			Grade No. 3	95.520 - 95.530 (3.7606 - 3.7610)
		Wear limit		0.015 (0.0006)
Out-of-round		Limit		0.015 (0.0006)
Taper				0.010 (0.0004)
Main bearing housing inner diameter grade (Without bearing)			Grade No. A	69.993 - 69.994 (2.7556 - 2.7557)
			Grade No. B	69.994 - 69.995 (2.7557 - 2.7557)
			Grade No. C	69.995 - 69.996 (2.7557 - 2.7557)
			Grade No. D	69.996 - 69.997 (2.7557 - 2.7558)
			Grade No. E	69.997 - 69.998 (2.7558 - 2.7558)
			Grade No. F	69.998 - 69.999 (2.7558 - 2.7559)
			Grade No. G	69.999 - 70.000 (2.7559 - 2.7559)
			Grade No. H	70.000 - 70.001 (2.7559 - 2.7559)
			Grade No. J	70.001 - 70.002 (2.7559 - 2.7560)
			Grade No. K	70.002 - 70.003 (2.7560 - 2.7560)
			Grade No. L	70.003 - 70.004 (2.7560 - 2.7561)
			Grade No. M	70.004 - 70.005 (2.7561 - 2.7561)
			Grade No. N	70.005 - 70.006 (2.7561 - 2.7561)
			Grade No. P	70.006 - 70.007 (2.7561 - 2.7562)
			Grade No. R	70.007 - 70.008 (2.7562 - 2.7562)
			Grade No. S	70.008 - 70.009 (2.7562 - 2.7563)
			Grade No. T	70.009 - 70.010 (2.7563 - 2.7563)
			Grade No. U	70.010 - 70.011 (2.7563 - 2.7563)
			Grade No. V	70.011 - 70.012 (2.7563 - 2.7564)
			Grade No. W	70.012 - 70.013 (2.7564 - 2.7564)
			Grade No. X	70.013 - 70.014 (2.7564 - 2.7565)
			Grade No. Y	70.014 - 70.015 (2.7565 - 2.7565)
			Grade No. 4	70.015 - 70.016 (2.7565 - 2.7565)
			Grade No. 7	70.016 - 70.017 (2.7565 - 2.7566)
Difference in inner diameter between cylinders		Standard		Less than 0.03 (0.0012)

AVAILABLE PISTON

Unit: mm (in)



PBIC0188E

Items		Standard	Limit
Piston skirt diameter “A”	Grade No. 1	95.480 - 95.490 (3.7590 - 3.7594)	—
	Grade No. 2	95.490 - 95.500 (3.7594 - 3.7598)	—
	Grade No. 3	95.500 - 95.510 (3.7598 - 3.7602)	—
“a” dimension		44.0 (1.732)	—
Piston pin hole diameter	Grade No. 0	22.993 - 22.999 (0.9052 - 0.9055)	—
	Grade No. 1	22.999 - 23.005 (0.9055 - 0.9057)	—
Piston to cylinder bore clearance		0.010 - 0.030 (0.0004 - 0.0012)	0.08 (0.0031)

PISTON RING

Unit: mm (in)

Items		Standard	Limit
Side clearance	Top	0.040 - 0.080 (0.0016 - 0.0031)	0.11 (0.0043)
	2nd	0.030 - 0.070 (0.0012 - 0.0028)	0.10 (0.0039)
	Oil ring	0.045 - 0.125 (0.0018 - 0.0049)	—
End gap	Top	0.25 - 0.35 (0.0098 - 0.0138)	0.54 (0.0213)
	2nd	0.45 - 0.55 (0.0177 - 0.0217)	0.71 (0.0280)
	Oil (rail ring)	0.20 - 0.45 (0.0079 - 0.0177)	0.76 (0.0299)

PISTON PIN

Unit: mm (in)

Items		Standard	Limit
Piston pin outer diameter	Grade No. 0	22.989 - 22.995 (0.9051 - 0.9053)	—
	Grade No. 1	22.995 - 23.001 (0.9053 - 0.9055)	—
Piston to piston pin oil clearance		0.002 - 0.006 (0.0001 - 0.0002)	—
Connecting rod bushing oil clearance		0.005 - 0.017 (0.0002 - 0.0007)	0.030 (0.0012)

CONNECTING ROD

Unit: mm (in)

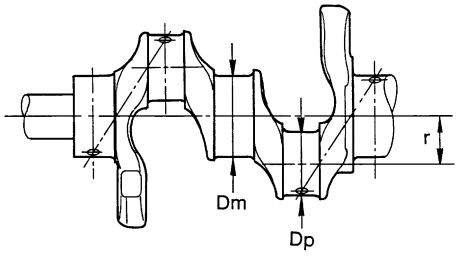
Items		Standard	Limit
Center distance		165.1 (6.50)	—
Bend [per 100 (3.94)]		—	0.15 (0.0059)
Torsion [per 100 (3.94)]		—	0.30 (0.0118)
Connecting rod bushing inner diameter*	Grade No. 0	23.000 - 23.006 (0.9055 - 0.9057)	—
	Grade No. 1	23.006 - 23.012 (0.9057 - 0.9060)	—
Side clearance		0.20 - 0.35 (0.0079 - 0.0138)	0.40 (0.0157)
		Standard	

Connecting rod big end diameter grade (Without bearing)	Grade No. A	59.000 - 59.001 (2.3228 - 2.3229)
	Grade No. B	59.001 - 59.002 (2.3229 - 2.3229)
	Grade No. C	59.002 - 59.003 (2.3229 - 2.3229)
	Grade No. D	59.003 - 59.004 (2.3229 - 2.3230)
	Grade No. E	59.004 - 59.005 (2.3230 - 2.3230)
	Grade No. F	59.005 - 59.006 (2.3230 - 2.3231)
	Grade No. G	59.006 - 59.007 (2.3231 - 2.3231)
	Grade No. H	59.007 - 59.008 (2.3231 - 2.3231)
	Grade No. J	59.008 - 59.009 (2.3231 - 2.3232)
	Grade No. K	59.009 - 59.010 (2.3232 - 2.3232)
	Grade No. L	59.010 - 59.011 (2.3232 - 2.3233)
	Grade No. M	59.011 - 59.012 (2.3233 - 2.3233)
	Grade No. N	59.012 - 59.013 (2.3233 - 2.3233)

*: After installing in connecting rod

CRANKSHAFT

Unit: mm (in)



SEM645

Main journal diameter. “Dm” grade	Standard	Grade No. A	64.975 - 64.974 (2.5581 - 2.5580)
		Grade No. B	64.974 - 64.973 (2.5580 - 2.5580)
		Grade No. C	64.973 - 64.972 (2.5580 - 2.5579)
		Grade No. D	64.972 - 64.971 (2.5579 - 2.5579)
		Grade No. E	64.971 - 64.970 (2.5579 - 2.5579)
		Grade No. F	64.970 - 64.969 (2.5579 - 2.5578)
		Grade No. G	64.969 - 64.968 (2.5578 - 2.5578)
		Grade No. H	64.968 - 64.967 (2.5578 - 2.5578)
		Grade No. J	64.967 - 64.966 (2.5578 - 2.5577)
		Grade No. K	64.966 - 64.965 (2.5577 - 2.5577)
		Grade No. L	64.965 - 64.964 (2.5577 - 2.5576)
		Grade No. M	64.964 - 64.963 (2.5576 - 2.5576)
		Grade No. N	64.963 - 64.962 (2.5576 - 2.5576)
		Grade No. P	64.962 - 64.961 (2.5576 - 2.5575)
		Grade No. R	64.961 - 64.960 (2.5575 - 2.5575)
		Grade No. S	64.960 - 64.959 (2.5575 - 2.5574)
		Grade No. T	64.959 - 64.958 (2.5574 - 2.5574)
		Grade No. U	64.958 - 64.957 (2.5574 - 2.5574)
		Grade No. V	64.957 - 64.956 (2.5574 - 2.5573)
		Grade No. W	64.956 - 64.955 (2.5573 - 2.5573)
		Grade No. X	64.955 - 64.954 (2.5573 - 2.5572)
		Grade No. Y	64.954 - 64.953 (2.5572 - 2.5572)
		Grade No. 4	64.953 - 64.952 (2.5572 - 2.5572)
		Grade No. 7	64.952 - 64.951 (2.5572 - 2.5571)
Pin journal diameter. “Dp” grade	Standard	Grade No. A	55.961 - 55.960 (2.2032 - 2.2031)
		Grade No. B	55.960 - 55.959 (2.2031 - 2.2031)
		Grade No. C	55.959 - 55.958 (2.2031 - 2.2031)
		Grade No. D	55.958 - 55.957 (2.2031 - 2.2030)
		Grade No. E	55.957 - 55.956 (2.2030 - 2.2030)
		Grade No. F	55.956 - 55.955 (2.2030 - 2.2029)
		Grade No. G	55.955 - 55.954 (2.2029 - 2.2029)
		Grade No. H	55.954 - 55.953 (2.2029 - 2.2029)
		Grade No. J	55.953 - 55.952 (2.2029 - 2.2028)
		Grade No. K	55.952 - 55.951 (2.2028 - 2.2028)
		Grade No. L	55.951 - 55.950 (2.2028 - 2.2028)
		Grade No. M	55.950 - 55.949 (2.2028 - 2.2027)
		Grade No. N	55.949 - 55.948 (2.2027 - 2.2027)
		Grade No. P	55.948 - 55.947 (2.2027 - 2.2026)
		Grade No. R	55.947 - 55.946 (2.2026 - 2.2026)
		Grade No. S	55.946 - 55.945 (2.2026 - 2.2026)
		Grade No. T	55.945 - 55.944 (2.2026 - 2.2025)
		Grade No. U	55.944 - 55.943 (2.2025 - 2.2025)
Center distance “r”			44.2 (1.740)
Taper (Difference between “A” and “B”)	Limit		0.0025 (0.0001)
Out-of-round (Difference between “X” and “Y”)			0.0025 (0.0001)

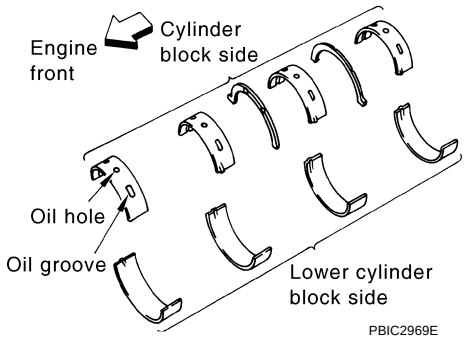
Crankshaft runout [TIR*]	Standard	Less than 0.05 (0.0020)
	Limit	0.10 (0.0039)
Crankshaft end play	Standard	0.10 - 0.25 (0.0039 - 0.0098)
	Limit	0.30 (0.0118)

*: Total indicator reading

Main Bearing (GT-R certified NISSAN dealer)

INFOID:0000000011488103

MAIN BEARING



Grade number		Thickness mm (in)	Identification color	Remarks
0		2.500 - 2.503 (0.0984 - 0.0985)	Black	Grade is the same for upper and lower bearings.
1		2.503 - 2.506 (0.0985 - 0.0987)	Brown	
2		2.506 - 2.509 (0.0987 - 0.0988)	Green	
3		2.509 - 2.512 (0.0988 - 0.0989)	Yellow	
4		2.512 - 2.515 (0.0989 - 0.0990)	Blue	
5		2.515 - 2.518 (0.0990 - 0.0991)	Pink	
6		2.518 - 2.521 (0.0991 - 0.0993)	Purple	
7		2.521 - 2.524 (0.0993 - 0.0994)	White	
01	UPR	2.503 - 2.506 (0.0985 - 0.0987)	Brown	Grade and color are different for upper and lower bearings.
	LWR	2.500 - 2.503 (0.0984 - 0.0985)	Black	
12	UPR	2.506 - 2.509 (0.0987 - 0.0988)	Green	
	LWR	2.503 - 2.506 (0.0985 - 0.0987)	Brown	
23	UPR	2.509 - 2.512 (0.0988 - 0.0989)	Yellow	
	LWR	2.506 - 2.509 (0.0987 - 0.0988)	Green	
34	UPR	2.512 - 2.515 (0.0989 - 0.0990)	Blue	
	LWR	2.509 - 2.512 (0.0988 - 0.0989)	Yellow	
45	UPR	2.515 - 2.518 (0.0990 - 0.0991)	Pink	
	LWR	2.512 - 2.515 (0.0989 - 0.0990)	Blue	
56	UPR	2.518 - 2.521 (0.0991 - 0.0993)	Purple	
	LWR	2.515 - 2.518 (0.0990 - 0.0991)	Pink	
67	UPR	2.521 - 2.524 (0.0993 - 0.0994)	White	
	LWR	2.518 - 2.521 (0.0991 - 0.0993)	Purple	

UNDERSIZE

Unit: mm (in)

Items	Thickness	Main journal diameter
0.25 (0.0098)	2.633 - 2.641 (0.1037 - 0.1040)	Grind so that bearing clearance is the specified value.

MAIN BEARING OIL CLEARANCE

Unit: mm (in)

Items	Standard	Limit
Main bearing oil clearance	0.035 - 0.045 (0.0014 - 0.0018)*	0.065 (0.0026)

*: Actual clearance

Connecting Rod Bearing (GT-R certified NISSAN dealer)

INFOID:0000000011488104

CONNECTING ROD BEARING

Unit: mm (in)

Grade number		Thickness	Identification color	Remarks
0		1.500 - 1.503 (0.0591 - 0.0592)	Black	Grade is the same for upper and lower bearings.
1		1.503 - 1.506 (0.0592 - 0.0593)	Brown	
2		1.506 - 1.509 (0.0593 - 0.0594)	Green	
3		1.509 - 1.512 (0.0594 - 0.0595)	Yellow	
4		1.512 - 1.515 (0.0595 - 0.0596)	Blue	
01	UPR	1.500 - 1.503 (0.0591 - 0.0592)	Black	Grade and color are different for upper and lower bearings
	LWR	1.503 - 1.506 (0.0592 - 0.0593)	Brown	
12	UPR	1.503 - 1.506 (0.0592 - 0.0593)	Brown	
	LWR	1.506 - 1.509 (0.0593 - 0.0594)	Green	
23	UPR	1.506 - 1.509 (0.0593 - 0.0594)	Green	
	LWR	1.509 - 1.512 (0.0594 - 0.0595)	Yellow	
34	UPR	1.509 - 1.512 (0.0594 - 0.0595)	Yellow	
	LWR	1.512 - 1.515 (0.0595 - 0.0596)	Blue	

UNDERSIZE

Unit: mm (in)

Items	Thickness	Crank pin journal diameter
0.25 (0.0098)	1.629 - 1.637 (0.0641 - 0.0644)	Grind so that bearing clearance is the specified value.

CONNECTING ROD BEARING OIL CLEARANCE

Unit: mm (in)

Items	Standard	Limit
Connecting rod bearing oil clearance	0.055 - 0.068 (0.0022 - 0.0027)*	0.088 (0.0035)

*: Actual clearance