

SECTION LU

ENGINE LUBRICATION SYSTEM

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PRECAUTIONS

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Precautions For Liquid Gasket
REMOVAL OF LIQUID GASKET SEALING

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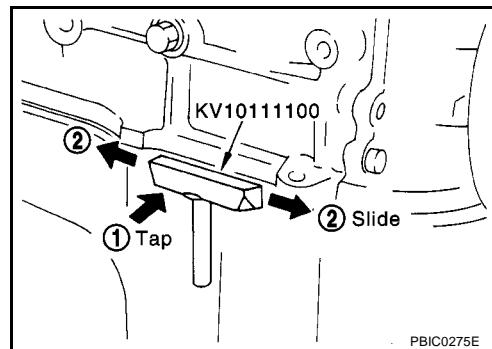
- After removing the mounting bolts and nuts, separate the mating surface using a seal cutter and remove the liquid gasket.

CAUTION:**Be careful not to damage the mating surfaces.**

- In areas where the seal cutter is difficult to use, use a plastic hammer to lightly tap the gasket area.

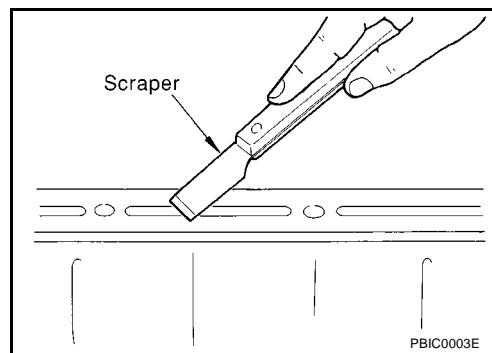
CAUTION:

If for some unavoidable reason a tool such as a flat-bladed screwdriver is used, be careful not to damage the mating surfaces.

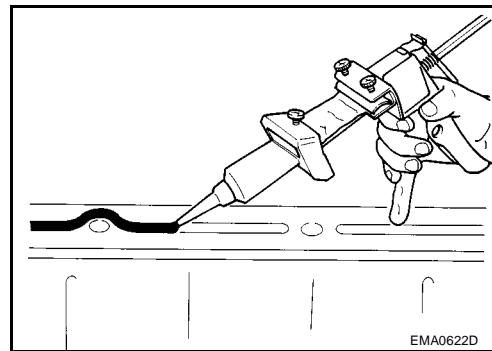


LIQUID GASKET APPLICATION PROCEDURE

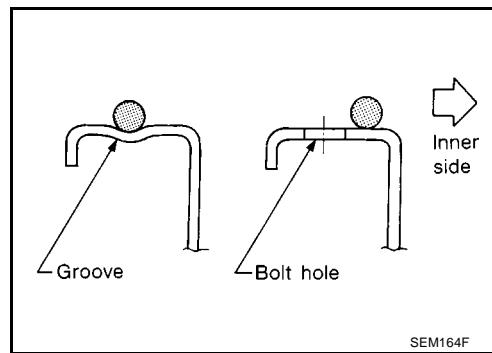
- Using a scraper, remove the old liquid gasket adhering to the gasket application surface and the mating surface.
- Remove the liquid gasket completely from the groove of the gasket application surface, mounting bolts and bolt holes.
- Wipe the gasket application surface and the mating surface with white gasoline (lighting and heating use) to remove adhering moisture, grease and foreign materials.
- Attach the liquid gasket to the tube presser.

Use Genuine Liquid Gasket or equivalent.

- Apply the gasket without breaks to the specified location with the specified dimensions.
- If there is a groove for the liquid gasket application, apply the gasket to the groove.



- As for the bolt holes, normally apply the gasket inside the holes. Occasionally, it should be applied outside the holes. Make sure to read the instruction in this manual.
- Within five minutes of gasket application, install the mating component.
- If the liquid gasket protrudes, wipe it off immediately.
- Do not retighten after the installation.
- After 30 minutes or more have passed from the installation, fill the engine oil and coolant.

**CAUTION:****If there are additional instructions in this manual, observe them.**

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PREPARATION

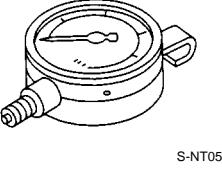
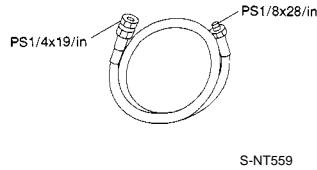
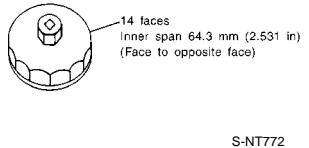
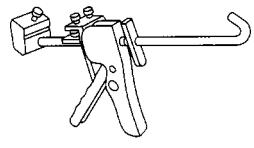
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PREPARATION

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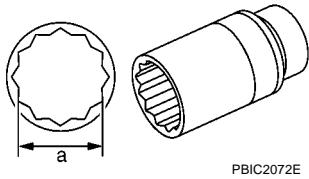
Special Service Tools

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Tool number Tool name	Description
ST25051001 Oil pressure gauge	<p>Measuring oil pressure Maximum measuring range: 2,452 kPa (24.5 bar, 25 kg/cm² , 356 psi)</p> 
ST25052000 Hose	<p>Adapting oil pressure gauge to cylinder block</p> 
KV10115801 Oil filter wrench	<p>Removing oil filter</p> 
WS39930000 Tube presser	<p>Pressing the tube of liquid gasket</p> 

Commercial Service Tool

EBS01JAV

Tool name	Description
Deep socket	<p>Removing and installing oil pressure switch a: 24 mm (0.94 in)</p> 

LUBRICATION SYSTEM

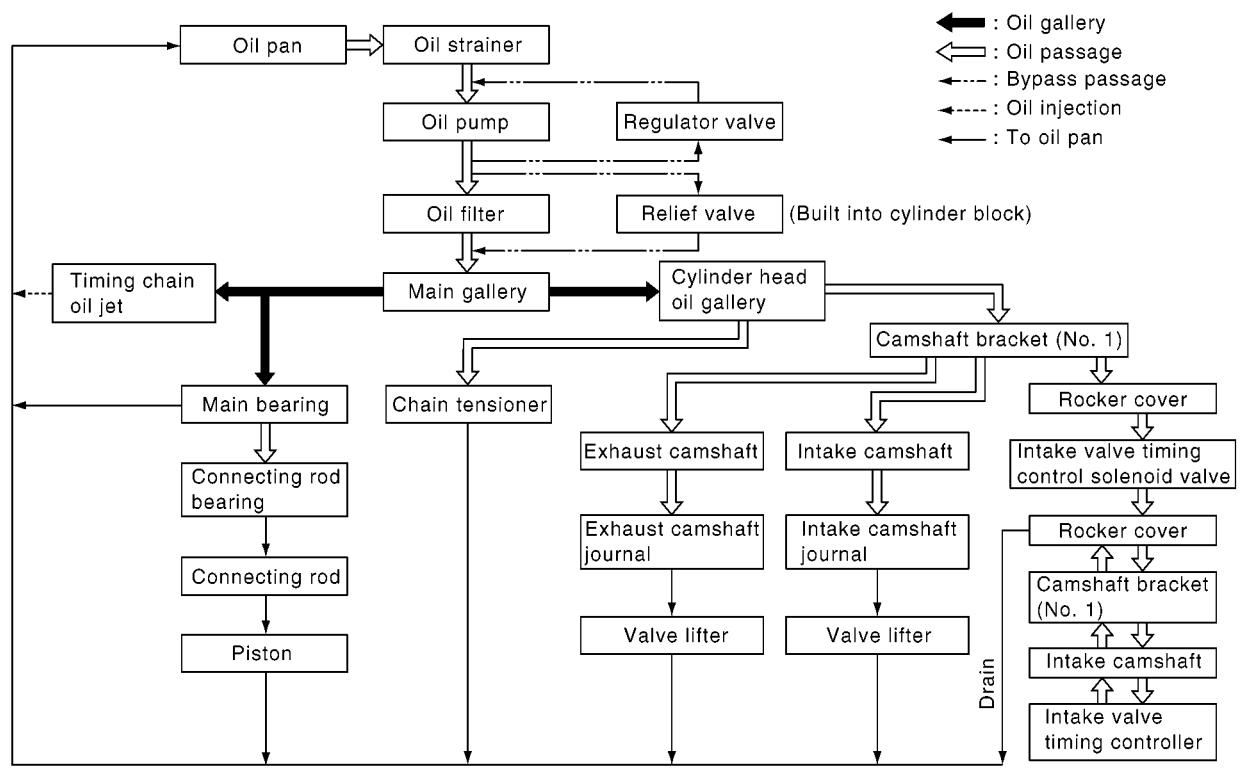
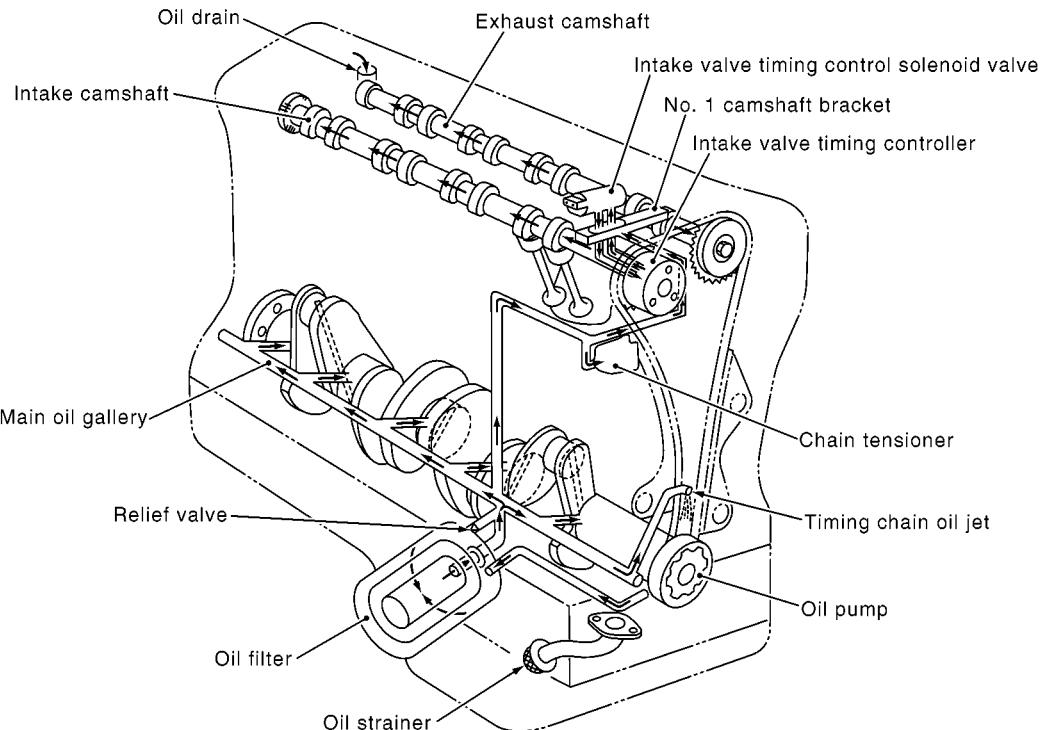
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LUBRICATION SYSTEM

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Lubrication Circuit

EBS000II



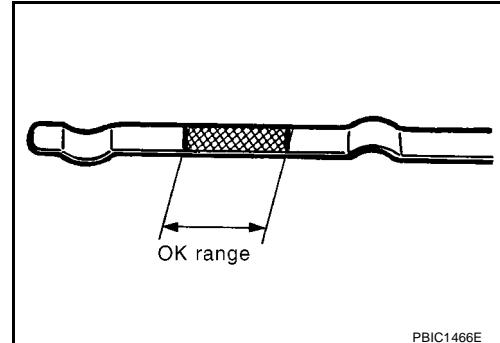
ENGINE OIL

PFP:KLA92

Inspection**OIL LEVEL AND CONTAMINATION**

EBS0001U

- Before starting the engine, put vehicle horizontally and check the oil level. If the engine is already started, stop it and allow 10 minutes before checking.
- Check that the oil level is within the range shown in the figure.
- If oil level is outside the range, adjust level.
- Check the oil for white turbidity or remarkable contamination.
- If the oil becomes turbid and white, it is highly probable that it is contaminated with coolant. Find the cause and repair.
- When oil level gauge is inserted in guide, apply engine oil to rubber seal of grip.



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OIL LEAK

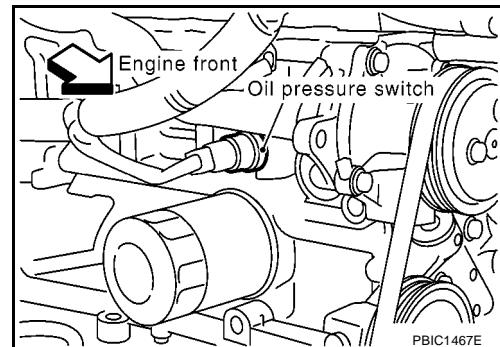
Check the following parts for engine oil leaks.

- Oil pan
- Oil pan drain plug
- Oil pressure switch
- Oil filter
- Front cover
- Cylinder head front cover
- Mating surfaces of cylinder block and cylinder head
- Mating surfaces of cylinder head and rocker cover
- Crankshaft oil seals (front and rear)

OIL PRESSURE CHECK**WARNING:**

- Be careful not to burn yourself, as the engine oil is hot.
- Oil pressure check should be done in P or N (A/T), Neutral (M/T) position.

1. Check the engine oil level. Refer to [LU-6, "OIL LEVEL AND CONTAMINATION"](#)
2. Remove oil filter. Refer to [LU-9, "OIL FILTER"](#).
3. Remove oil pressure switch using a deep socket (commercial service tool).

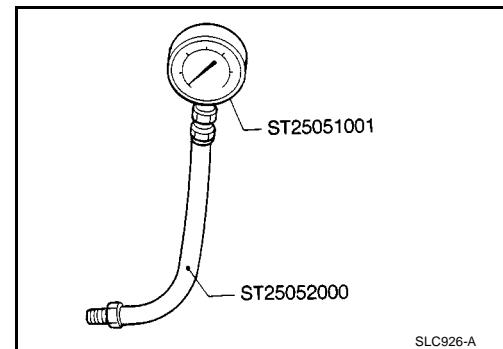


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4. Install oil pressure gauge and hose (SST).
5. Install oil filter. Refer to [LU-9, "OIL FILTER"](#) .
6. After warming up the engine, check that oil pressure corresponding to the engine speed is produced.

NOTE:

Low oil temperature creates high pressure.

**Engine oil pressure [When oil temperature is 80 °C (176 °F)]**

Engine speed (rpm)	Idle speed	2,000	6,000
Engine oil pressure kPa (bar, kg/cm ² , psi)	Approx. 44.1 (0.441, 0.45, 6.4) or more	Approx. 265 (2.65, 2.7, 38) or more	Approx. 373 (3.73, 3.8, 54) or more

If difference is extreme, check oil passage and oil pump for oil leaks.

7. After checking the oil pressure, install oil pressure switch as follows:
- a. Remove old liquid gasket on the switch and engine.

- b. Apply liquid gasket and tighten oil pressure switch to specification.

Use Genuine Liquid Gasket or equivalent.

: 18.7 - 20.5 N·m (1.9 - 2.0 kg·m, 14 - 15 ft-lb)

CAUTION:

Be careful not to get burned when engine or engine oil is heated.

Changing Engine Oil

EBS000IK

WARNING:

- Be careful not to burn yourself, as the engine oil is hot.
- Prolonged and repeated contact with used engine oil may cause skin cancer: try to avoid direct skin contact with used oil. If skin contact is made, wash thoroughly with soap or hand cleaner as soon as possible.

1. Warm up engine, and check for oil leakage from engine components. Refer to [LU-6, "OIL LEAK"](#) .
2. Stop engine and wait for 10 minutes.
3. Remove oil filler cap, and remove drain plug.
4. Drain engine oil.
5. Install drain plug with new washer. Refer to [EM-26, "OIL PAN AND OIL STRAINER"](#) .

CAUTION:

- Be sure to clean drain plug and install with new washer.

Oil pan drain plug:

: 29.4 - 39.2 N·m (3.0 - 3.9 kg·m, 22 - 28 ft-lb)

- Engine oil specification and viscosity: Refer to [MA-35, "RECOMMENDED FLUIDS AND LUBRICANTS"](#) .

6. Refill with new engine oil.

ENGINE OIL

[CR]

Oil capacity (Approximate):

Unit: ℓ (Imp qt)

Drain and refill	With oil filter change	3.4 (3)
	Without oil filter change	3.2 (2-7/8)
Dry engine (engine overhaul)		3.9 (3-3/8)

CAUTION:

- The refill capacity depends on the oil temperature and drain time. Use these specifications for reference only.
- Always use oil level gauge to determine the proper amount of oil is in the engine.
- 7. Warm up engine and check area around drain plug and oil filter for oil leakage.
- 8. Stop engine and wait for 10 minutes.
- 9. Check oil level. Refer to [LU-6, "OIL LEVEL AND CONTAMINATION"](#) .

OIL FILTER

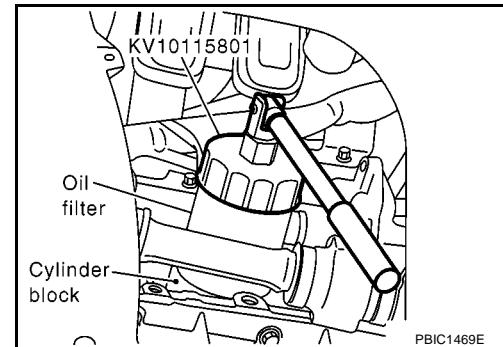
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Removal and Installation**REMOVAL**

Using an oil filter wrench (special service tool), remove oil filter.

CAUTION:

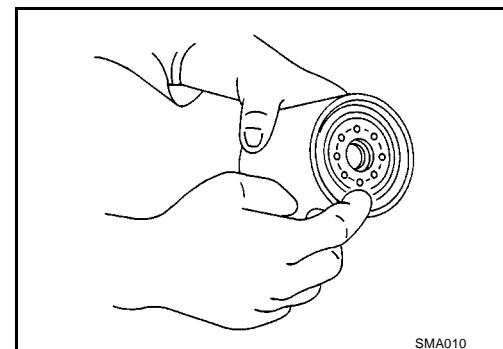
- Oil filter is provided with relief valve. Use genuine NISSAN oil filter or equivalent.
- Be careful not to get burned when the engine and engine oil are hot.
- When removing, prepare a shop cloth to absorb any oil leakage or spillage.
- Do not allow engine oil to adhere to the drive belts.
- Completely wipe off any oil that adheres to the engine and vehicle.

**INSTALLATION**

1. Remove foreign materials adhering to the oil filter installation surface.
2. Apply engine oil to the oil seal circumference of the new oil filter.

CAUTION:

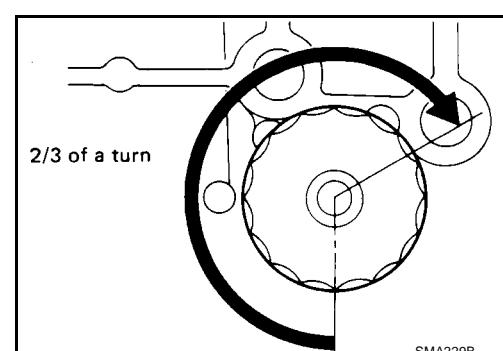
- Use genuine NISSAN oil filter or the equivalent.



3. Screw the oil filter manually until it touches the installation surface, then tighten it by 2/3 turn.

Oil filter:

:11 - 14 N·m (1.2 - 1.4 kg·m, 9 - 10 ft-lb)

**INSPECTION AFTER INSTALLATION**

1. Check the engine oil level. Refer to [LU-6, "OIL LEVEL AND CONTAMINATION"](#) .
2. After warming up the engine, check for engine oil leakage.
3. Stop engine and wait for 10 minutes.
4. Check the engine oil level. Refer to [LU-6, "OIL LEVEL AND CONTAMINATION"](#)

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OIL PUMP

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Removal and Installation**REMOVAL**

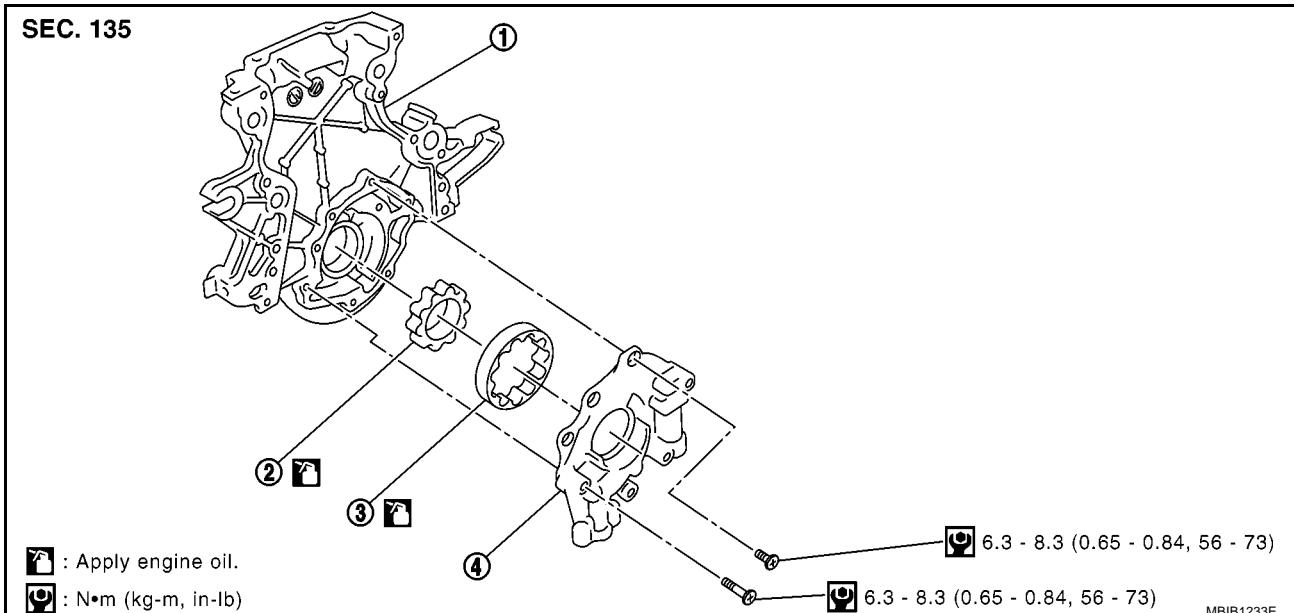
- Remove front cover. Refer to [EM-50, "TIMING CHAIN"](#) .

INSTALLATION

- Install in the reverse order of removal.

Disassembly and Assembly

EBS0001N



- Front cover
- Inner rotor
- Outer rotor
- Oil pump cover

CAUTION:

Prior to installation, apply new engine oil to the parts marked in figure.

DISASSEMBLY

- Remove oil pump cover.
- Remove outer rotor and inner rotor from front cover.

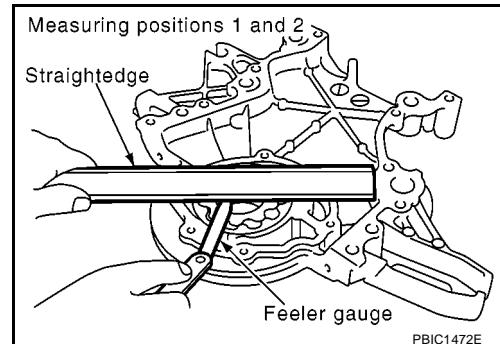
INSPECTION AFTER DISASSEMBLY**Clearances of Oil Pump Parts**

- Measure clearance with feeler gauge and straightedge.
Side clearance between inner rotor and front cover (position 1).

Standard : 0.025 - 0.075 mm (0.0010 - 0.0030 in)

Side clearance between outer rotor and front cover (position 2).

Standard : 0.025 - 0.075 mm (0.0010 - 0.0030 in)

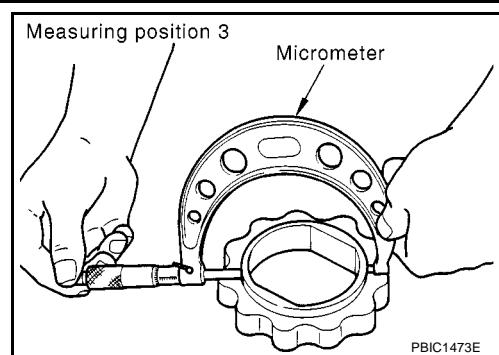


- Calculate the clearance from inner rotor to front cover socket with the following procedures.

OIL PUMP

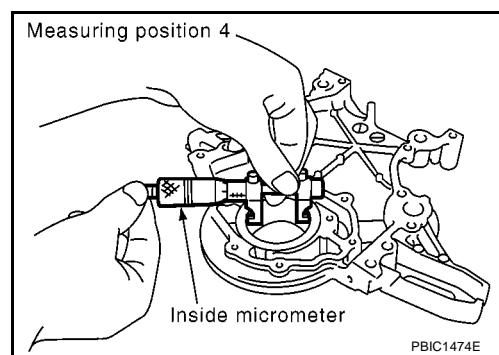
[CR]

1. Using a micrometer, measure the outer diameter of inner rotor protrusion (Position 3).



2. Using an inside micrometer, measure the inner diameter of front cover. (Position 4)
(Clearance) = (Inner diameter of front cover) - (outer diameter of inner rotor protrusion)

Standard : 0.045 - 0.095 mm (0.0011 - 0.0037 in)



ASSEMBLY

Install in the reverse order of disassembly.

SERVICE DATA AND SPECIFICATIONS (SDS)

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SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Standard and Limit OIL PRESSURE

EBS000IO

Engine speed rpm	Approximate discharge pressure kPa (bar, kg/cm ² , psi)
Idle speed	Approx. 44.1 (0.441, 0.45, 6.4) or more
2,000	Approx. 265 (2.65, 2.7, 38) or more
6,000	Approx. 373 (3.73, 3.8, 54) or more

OIL PUMP

Unit: mm (in)

Body to inner rotor axial clearance	0.025 - 0.075 (0.0010 - 0.0030)
Body to outer rotor axial clearance	0.025 - 0.075 (0.0010 - 0.0030)
Inner rotor to brazed portion of housing clearance	0.045 - 0.095 (0.0018 - 0.0037)

OIL CAPACITY

Unit: ℥ (Imp qt)

With oil filter change	Approximately 3.4 (3)
Without oil filter change	Approximately 3.2 (2-7/8)
Dry engine (engine overhaul)	Approximately 3.9 (3-3/8)

TIGHTENING TORQUE

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

Oil pressure switch	18.7 - 20.5 (1.9 - 2.0, 14 - 15)
Oil pan drain plug	29.4 - 39.2 (3.0 - 3.9, 22 - 28)
Oil filter	11 - 14 (1.2 - 1.4, 9 - 10)
Oil pump cover	6.3 - 8.3 (0.65 - 0.84, 56 - 73)*

PRECAUTIONS

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Precautions for Liquid Gasket
REMOVAL OF LIQUID GASKET SEALING

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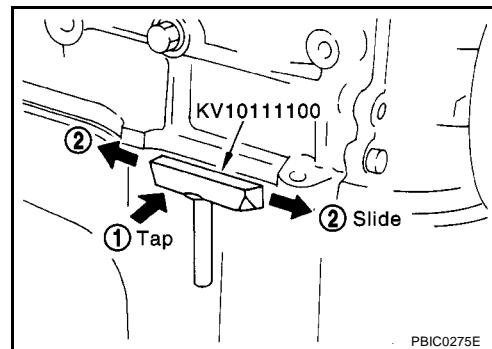
- After removing the mounting bolts and nuts, separate the mating surface using a seal cutter and remove the liquid gasket.

CAUTION:**Be careful not to damage the mating surfaces.**

- In areas where the seal cutter is difficult to use, use a plastic hammer to lightly tap the gasket area.

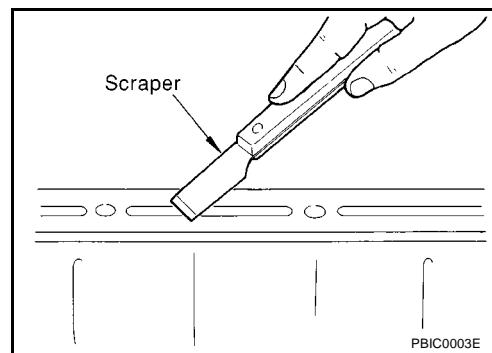
CAUTION:

If for some unavoidable reason a tool such as a flat-bladed screwdriver is used, be careful not to damage the mating surfaces.

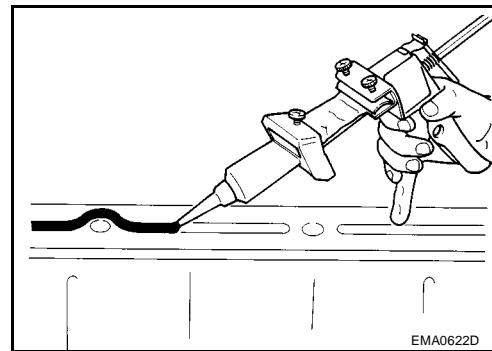


LIQUID GASKET APPLICATION PROCEDURE

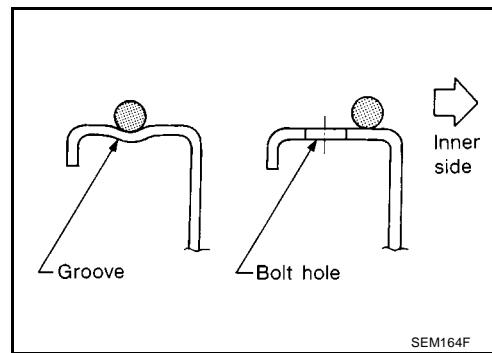
- Using a scraper, remove the old liquid gasket adhering to the gasket application surface and the mating surface.
- Remove the liquid gasket completely from the groove of the gasket application surface, mounting bolts and bolt holes.
- Wipe the gasket application surface and the mating surface with white gasoline (lighting and heating use) to remove adhering moisture, grease and foreign materials.
- Attach the liquid gasket to the tube presser.

Use Genuine Liquid Gasket or equivalent.

- Apply the gasket without breaks to the specified location with the specified dimensions.
- If there is a groove for the liquid gasket application, apply the gasket to the groove.



- As for the bolt holes, normally apply the gasket inside the holes. Occasionally, it should be applied outside the holes. Make sure to read the instruction in this manual.
- Within five minutes of gasket application, install the mating component.
- If the liquid gasket protrudes, wipe it off immediately.
- Do not retighten after the installation.
- After 30 minutes or more have passed from the installation, fill the engine oil and coolant.

**CAUTION:****If there are additional instructions in this manual, observe them.**

PREPARATION

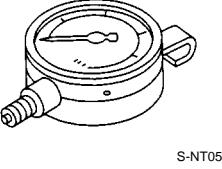
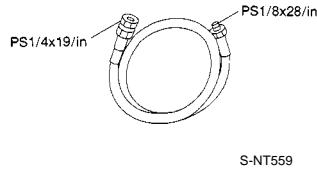
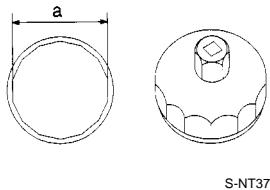
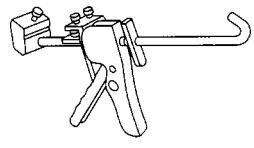
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PREPARATION

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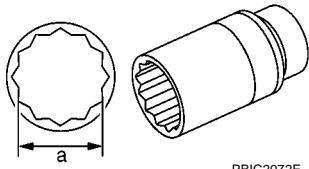
Special Service Tools

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Tool number Tool name	Description
ST25051001 Oil pressure gauge	<p>Measuring oil pressure Maximum measuring range: 2,452 kPa (24.52 bar, 25 kg/cm² , 356 psi)</p> 
ST25052000 Hose	<p>Adapting oil pressure gauge to cylinder block</p> 
KV10115801 Oil filter wrench	<p>Removing and installing oil filter a: 64.3 mm (2.531 in)</p> 
WS39930000 Tube presser	<p>Pressing the tube of liquid gasket</p> 

Commercial Service Tool

EBS01J8H

Tool name	Description
Deep socket	<p>Removing and installing oil pressure switch a: 27 mm (1.06 in)</p> 

LUBRICATION SYSTEM

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LUBRICATION SYSTEM

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Lubrication Circuit

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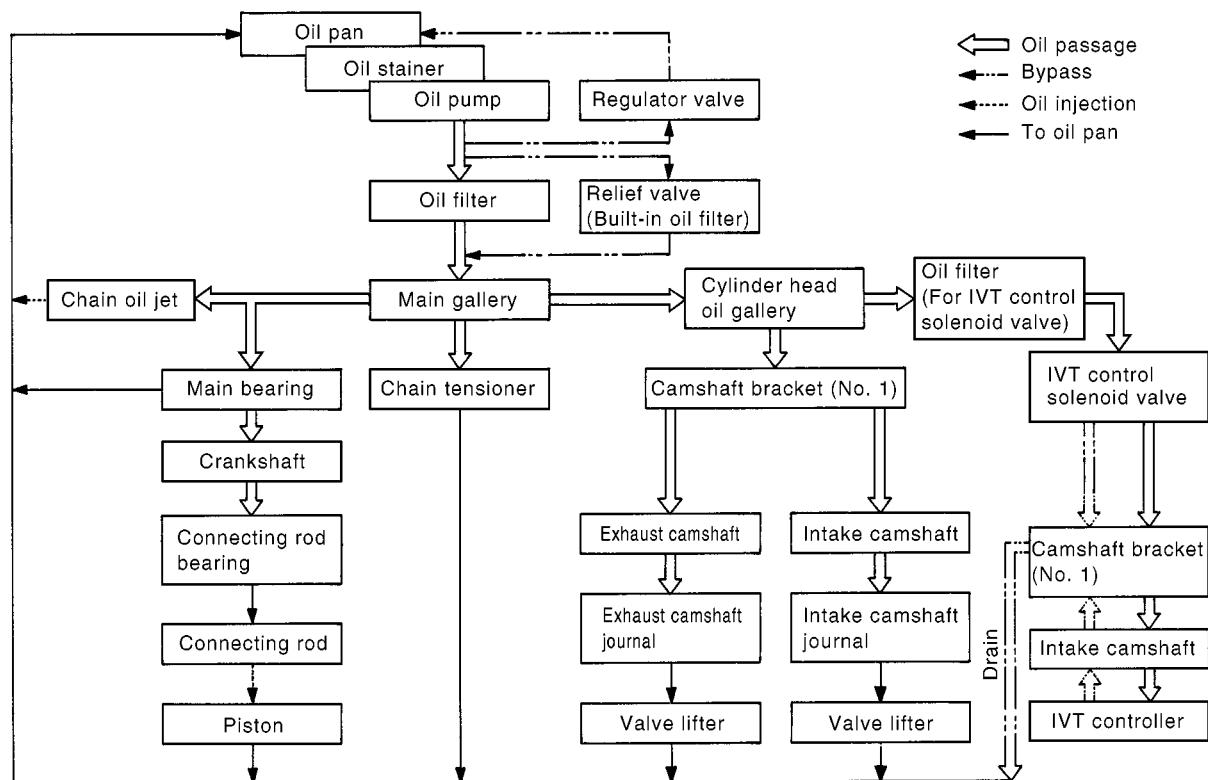
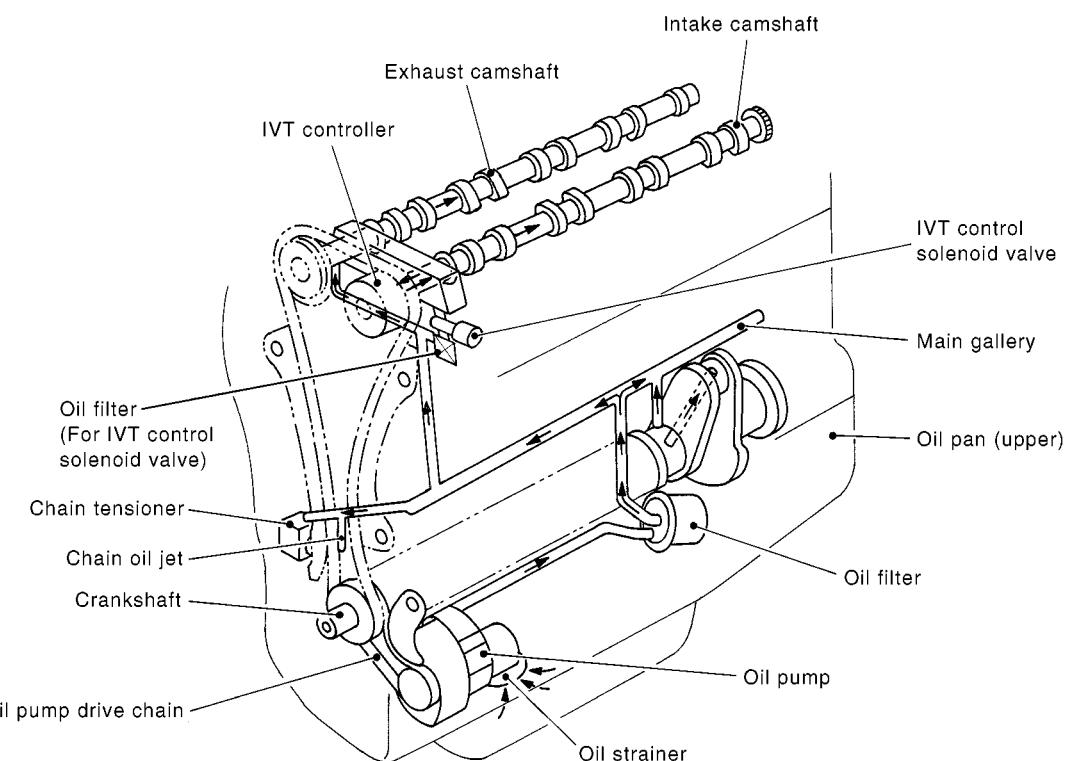
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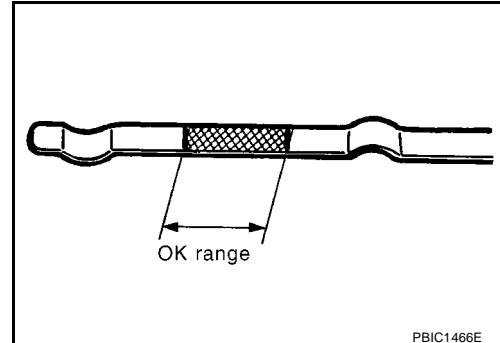
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ENGINE OIL

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Inspection**OIL LEVEL AND CONTAMINATION**

- Before starting the engine, put vehicle horizontally and check the oil level. If the engine is already started, stop it and allow 10 minutes before checking.
- Check that the oil level is within the range shown in the figure.
- If oil level is outside the range, adjust level.
- Check the oil for white turbidity or remarkable contamination.
- If the oil becomes turbid and white, it is highly probable that it is contaminated with coolant. Find the cause and repair.
- When oil level gauge is inserted in guide, apply engine oil to rubber seal of grip.



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ENGINE OIL LEAKAGE

Check for engine oil leakage around the following area.

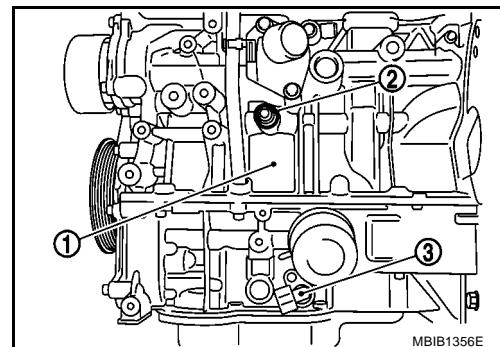
- Oil pan (upper and lower)
- Oil pan drain plug
- Oil pressure switch
- Oil filter
- Intake valve timing control solenoid valve
- Front cover
- Mating surface between cylinder block and cylinder head
- Mating surface between cylinder head and rocker cover
- Crankshaft oil seals (front and rear)
- Oil filter (for intake valve timing control)

OIL PRESSURE CHECK**WARNING:**

- Be careful not to burn yourself, as engine oil may be hot.
- Engine oil pressure check should be in Neutral position and should apply parking brake securely.

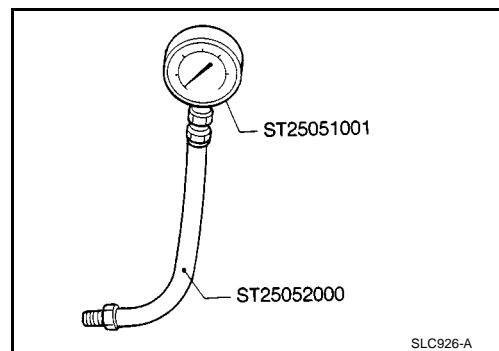
- Check oil level. Refer to [LU-16, "OIL LEVEL AND CONTAMINATION"](#)
- Remove oil filter. Refer to [LU-19, "OIL FILTER"](#).
- Disconnect harness connector at oil pressure switch (2), and remove oil pressure switch using a deep socket (commercial service tool).

1 Cylinder block
3. Oil level sensor



MBIB1356E

4. Install oil pressure gauge and hose (SST).



5. Install oil filter. Refer to [LU-19, "OIL FILTER"](#) .
 6. Check engine oil level. Refer to [LU-16, "OIL LEVEL AND CONTAMINATION"](#) .
 7. Start engine and warm it up to normal operating temperature.
 8. Check oil pressure with engine running under no-load.

NOTE:

When engine oil temperature is low, engine oil pressure becomes high.

Engine oil pressure [Engine oil temperature at 80°C (176°F)]

Engine speed rpm	Approximate discharge pressure kPa (bar, kg/cm ² , psi)
Idle speed	More than 60 (0.60, 0.61, 9)
2,000	More than 275 (2.7, 2.8, 40)

If difference is extreme, check oil passage and oil pump for oil leaks.

9. After the inspections, install oil pressure switch as follows:
 a. Remove oil filter. Refer to [LU-19, "OIL FILTER"](#) .
 b. Remove old liquid gasket adhering to oil pressure switch and engine.
 c. Apply liquid gasket and tighten oil pressure switch to specification.
Use Genuine Liquid Gasket or equivalent.

扭矩: 19.6 N·m (2.0 kg-m, 14 ft-lb)

d. Install oil filter. Refer to [LU-19, "OIL FILTER"](#) .
 e. Check engine oil level. Refer to [LU-16, "OIL LEVEL AND CONTAMINATION"](#) .
 f. After warming up engine, make sure there is no leaks of engine oil with running engine.

Changing Engine Oil

EBS01J8K

WARNING:

- Be careful not to burn yourself, as engine oil may be hot.
- Prolonged and repeated contact with used engine oil may cause skin cancer; try to avoid direct skin contact with used engine oil. If skin contact is made, wash thoroughly with soap or hand cleaner as soon as possible.

- Warm up engine, put vehicle horizontally and check for engine oil leakage from engine components. Refer to [LU-16, "ENGINE OIL LEAKAGE"](#) .
- Stop engine and wait for 10 minutes.
- Loosen oil filler cap and then remove drain plug.
- Drain engine oil.
- Install drain plug with new washer. Refer to [EM-128, "OIL PAN AND OIL STRAINER"](#) .

CAUTION:

Be sure to clean drain plug and install with new washer.

Oil pan drain plug:

扭矩: 34.3 N·m (3.5 kg-m, 25 ft-lb)

ENGINE OIL

[HR]

6. Refill with new engine oil.

Engine oil specification and viscosity:

Refer to [MA-35, "RECOMMENDED FLUIDS AND LUBRICANTS"](#) .

Engine oil capacity (Approximate):

Unit: ℓ (Imp qt)

Drain and refill	With oil filter change	4.6 (4)
	Without oil filter change	4.4 (3-7/8)
Dry engine (Overhaul)		4.8 (4-1/4)

CAUTION:

- The refill capacity depends on the engine oil temperature and drain time. Use these specifications for reference only.
- Always use oil level gauge to determine the proper amount of engine oil in the engine.

7. Warm up engine and check area around drain plug and oil filter for engine oil leakage.
8. Stop engine and wait for 10 minutes.
9. Check the engine oil level. Refer to [LU-16, "OIL LEVEL AND CONTAMINATION"](#) .

OIL FILTER

PFP:15208

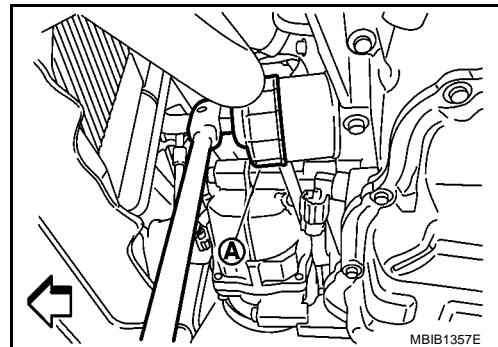
Removal and Installation**REMOVAL**

Using oil filter wrench (SST: KV10115801) (A), remove oil filter.

◀ : Vehicle font

CAUTION:

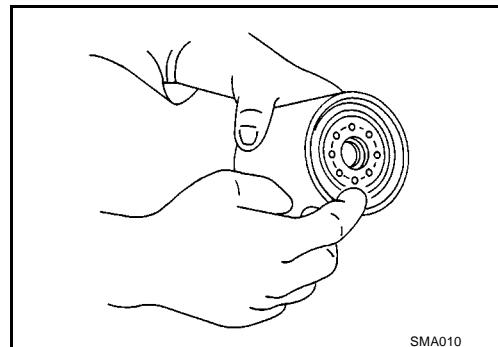
- Oil filter is provided with relief valve. Use Genuine NISSAN oil filter or equivalent.
- Be careful not to get burned when engine and engine oil may be hot.
- When removing, prepare a shop cloth to absorb any engine oil leakage or spillage.
- Do not allow engine oil to adhere to drive belt.
- Completely wipe off any engine oil that adheres to engine and vehicle.



MBIB1357E

INSTALLATION

1. Remove foreign materials adhering to the oil filter installation surface.
2. Apply new engine oil to the oil seal contact surface of new oil filter.

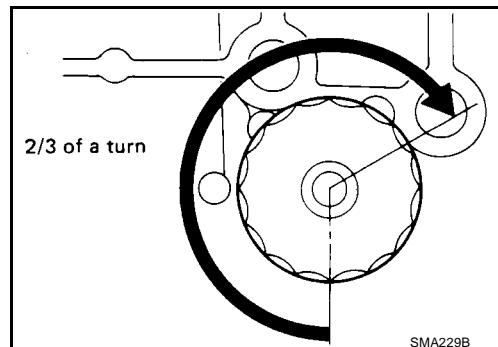
**CAUTION:**

Use genuine NISSAN oil filter or the equivalent.

3. Screw oil filter manually until it touches the installation surface, then tighten it by 2/3 turn. Or tighten to specification.

Oil filter:

⌚ : 17.7 N·m (1.8 kg·m, 13 ft-lb)

**INSPECTION AFTER INSTALLATION**

1. Check the engine oil level. Refer to [LU-16, "OIL LEVEL AND CONTAMINATION"](#) .
2. Start engine, and make sure there is no leaks of engine oil.
3. Stop engine and wait for 10 minutes.
4. Check the engine oil level. Refer to [LU-16, "OIL LEVEL AND CONTAMINATION"](#) .

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SERVICE DATA AND SPECIFICATIONS (SDS)

[HR]

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Standard and Limit OIL PRESSURE

EBS01J8M

Engine speed rpm	Approximate discharge pressure kPa (bar, kg/cm ² , psi)
Idle speed 2,000	60 (0.60, 0.61, 9) 275 (2.7, 2.8, 40)

OIL CAPACITY (APPROXIMATE)

Unit: ℥ ·(Imp qt)

With oil filter change	4.6 (4 Imp qt)
Without oil filter change	4.4 (3-7/8 Imp qt)
Dry engine (overhaul)	4.8 (4-1/4 Imp qt)

TIGHTENING TORQUE

Unit: N·m (kg·m, ft-lb)

Oil pressure switch	19.6 (2.0, 14)
Oil pan drain plug	34.3 (3.5, 25)
Oil filter	17.7 (1.8, 13)

APPLICATION NOTICE

[K9K]

APPLICATION NOTICE

PFP:00000

How to Check Vehicle Type

EBS01LRI

Confirm K9K engine type with Model written on identification plate (refer to [GI-44, "IDENTIFICATION INFORMATION"](#)),then refer to service information in EM section.

Vehicle type	Engine type
xTKxxxxK12Vxx	Euro3 48kW
xTKxxxxK12Yxx	Euro3 60kW
xTKxxxxK12Txx	Euro4 50kW
xTKxxxxK12Uxx	Euro4 63kW

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PRECAUTIONS

PFP:00001

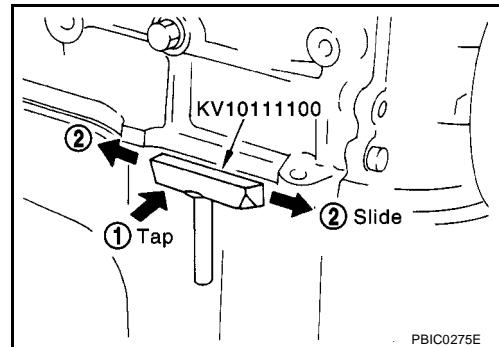
Precautions For Liquid Gasket
REMOVAL OF LIQUID GASKET

EBS01C7G

- After removing the mounting bolts and nuts, separate the mating surface using a seal cutter and remove the liquid gasket.

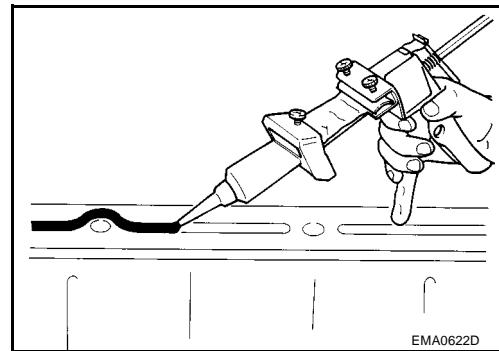
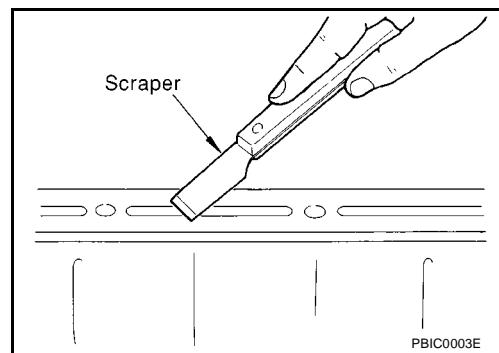
CAUTION:**Be careful not to damage the mating surfaces.**

- In areas where the cutter is difficult to use, use a plastic hammer to lightly tap the gasket applied area.

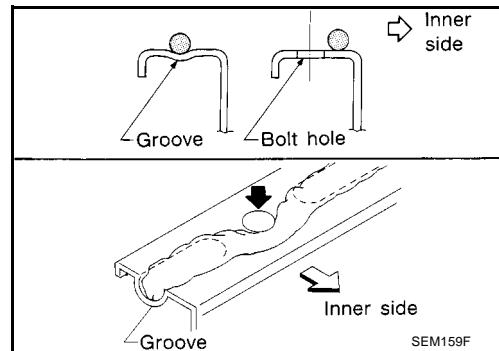
CAUTION:**If for some unavoidable reason a tool such as a flat-bladed screwdriver is used, be careful not to damage the mating surfaces.**

LIQUID GASKET APPLICATION PROCEDURE

- Using a scraper, remove the old liquid gasket adhering to the gasket application surface and the mating surface.
 - Remove the liquid gasket completely from the groove of the gasket application surface, mounting bolts and bolt holes.
- Wipe the gasket application surface and the mating surface with white gasoline (lighting and heating use) to remove adhering moisture, grease and foreign materials.
- Attach the liquid gasket to the tube presser.
Use Genuine Liquid Gasket or equivalent.
- Apply the gasket without breaks to the specified location with the specified dimensions.
 - If there is a groove for the liquid gasket application, apply the gasket to the groove.



- As for the bolt holes, normally apply the gasket inside the holes. If specified, it should be applied outside the holes. Make sure to read the instruction in this manual.
- Within five minutes of gasket application, install the mating component.
- If the liquid gasket protrudes, wipe it off immediately.
- Do not retighten after the installation.
- After 30 minutes or more have passed from the installation, fill the engine oil and coolant.

CAUTION:**If there are instructions in this manual, observe them.**

PREPARATION

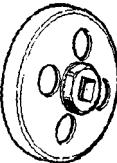
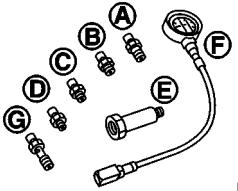
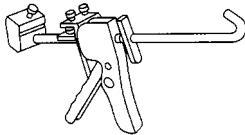
[K9K]

PREPARATION

Special Service Tools

PFP:00002

EBS01C7H

NISSAN tool number (RENAULT tool number) Tool name	Description	LU
KV113C0010 (Mot.1329) Oil filter wrench	 MBIB0369E Removing and installing oil filter	C D
KV113E0020 (Mot.836-05) Oil pressure gauge set	 MBIB0663E Measuring oil pressure Use C, E, F.	E F
WS39930000 (—) Tube presser	 S-NT052 Pressing the tube of liquid gasket	G H I J K L M

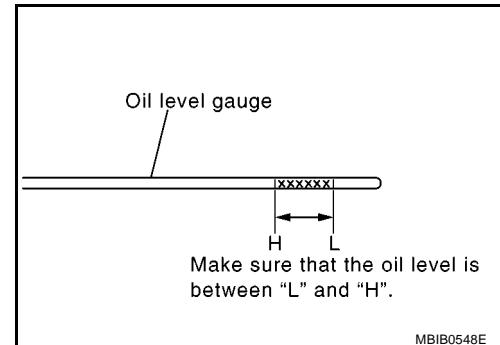
ENGINE OIL

PFP:KLA92

Inspection**OIL LEVEL AND MUDDINESS**

EBS01C71

- Before starting the engine, check the oil level placing vehicle horizontally. If the engine is already started, stop it and allow 10 minutes before checking.
- Make sure the oil level is within the range shown in the figure.
- If it is out of range, adjust it.
- Check the oil for white turbidity or remarkable contamination.
- If the oil becomes turbid and white, it is highly probable that it is contaminated with coolant. Find the cause and repair.

**OIL LEAKAGE**

Check for oil leakage around the following area.

- Oil pan
- Oil pan drain plug
- Oil pressure switch
- Oil filter bracket
- Vacuum pump
- Oil pump housing
- Mating surface between cylinder block and cylinder head
- Mating surface between cylinder head and rocker cover
- Oil cooler
- Crankshaft oil seals

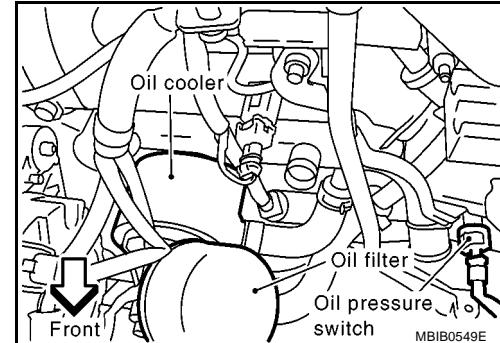
OIL PRESSURE CHECK**WARNING:**

- Be careful not to burn yourself, as the engine oil is hot.
- Oil pressure check should be done in Neutral "N" position.

- Check the oil level. Refer to [LU-24, "OIL LEVEL AND MUDDINESS"](#).
- Remove engine undercover.
- Remove the oil pressure switch to connect the oil pressure gauge (special service tool).
- After warming up the engine, make sure oil pressure corresponding to the engine speed is produced.

Idle speed : Approx. 120 kPa (1.2 bar, 1.22 kg/cm², 17.4 psi)

3000 rpm : Approx. 350 kPa (3.5 bar, 3.57 kg/cm², 50.8 psi)



- After checking, install the oil pressure switch as follows.
- Remove old sealant adhering to the switch and engine.
- Apply thread sealant.

Use Genuine Liquid Gasket or equivalent.

Oil pressure switch:

: 25 N·m (2.55 kg-m, 18.4 ft-lb)

- Start engine and check for oil leakage.

Changing Engine Oil

EBS01C7J

WARNING:

- Be careful not to burn yourself, as the engine oil is hot.
- Prolonged and repeated contact with used engine oil may cause skin cancer: try to avoid direct skin contact with used oil. If skin contact is made, wash thoroughly with soap or hand cleaner as soon as possible.

1. Put vehicle horizontally.
2. Warm up engine, and check for oil leakage from engine components.
3. Stop engine and wait for 10 minutes.
4. Remove drain plug and oil filler cap.
5. Drain oil and refill with new engine oil.
 - Refer to [MA-35, "RECOMMENDED FLUIDS AND LUBRICANTS"](#).

Oil capacity (Approximate): EURO3 48kW/60kW MODELS

Drain and refill	With oil filter change	4.70 ℥ (4-1/8 Imp qt)
	Without oil filter change	4.54 ℥ (3-1/8 Imp qt)
Dry engine (overhaul)		4.86 ℥ (4-1/4 Imp qt)

EURO4 50kW/63kW MODELS

Drain and refill	With oil filter change	4.40 ℥ (3-7/8 Imp qt)
	Without oil filter change	4.24 ℥ (3-3/4 Imp qt)
Dry engine (overhaul)		4.56 ℥ (4 Imp qt)

- The refill capacity depends on the oil temperature and drain time. Use these specifications for reference only.

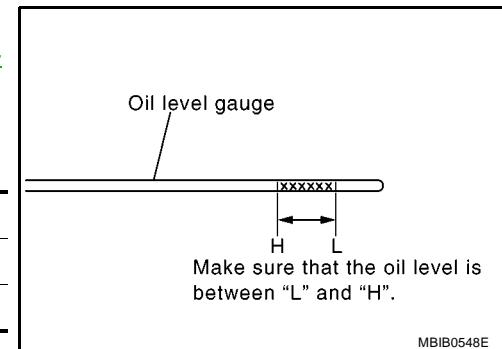
Always use the dipstick to determine when the proper amount of oil is in the engine.

CAUTION:

- Be sure to clean drain plug and install with new washer.
- The refill capacity depends on the oil temperature and drain time. Use these specifications for reference only.

Always use the dipstick to determine when the proper amount of oil is in the engine.

6. Warm up engine and check area around drain plug and oil filter for oil leakage.
7. Stop engine and wait for 10 minutes.
8. Check oil level.



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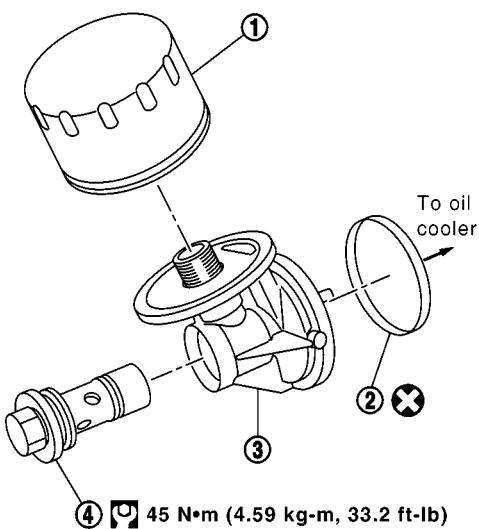
OIL FILTER

PFP:15208

Removal and Installation

EBS01C7K

SEC. 150



: Always replace after every disassembly.

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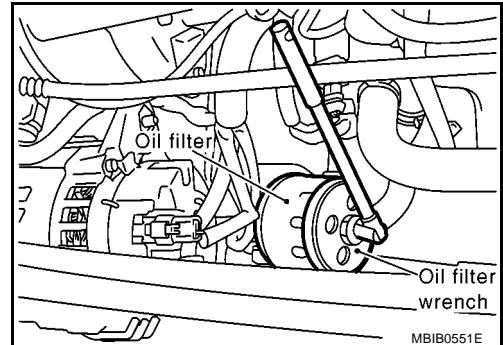
1. Oil filter
2. O-ring
3. Oil filter bracket
4. Connecting bolt

REMOVAL

1. Using an oil filter wrench (special service tool), remove oil filter.

CAUTION:

- Be careful not to get burned when the engine and engine oil are hot.
- When removing, prepare a shop cloth to absorb any oil leakage or spillage.
- Do not allow engine oil to adhere to the drive belts.
- Completely wipe off any oil that adhere to the engine and the vehicle.



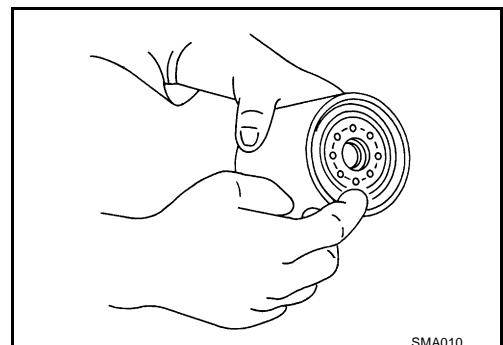
INSTALLATION

1. Remove foreign materials adhering to the oil filter installation surface.
2. Install oil filter bracket to oil cooler.

CAUTION:

Install oil filter bracket, positioning lug in the hole of oil cooler.

3. Apply engine oil to the oil seal contact surface of the new oil filter.
4. Install the oil filter until it comes into contact with the oil seal on the engine bracket.
5. Tighten the oil filter three-quarters of a turn by hand.
6. After warming up the engine, check for engine oil leakage.
7. Check oil level and add engine oil. Refer to [LU-24, "ENGINE OIL"](#).



SMA010

OIL PUMP

PFP:15010

Removal and Installation

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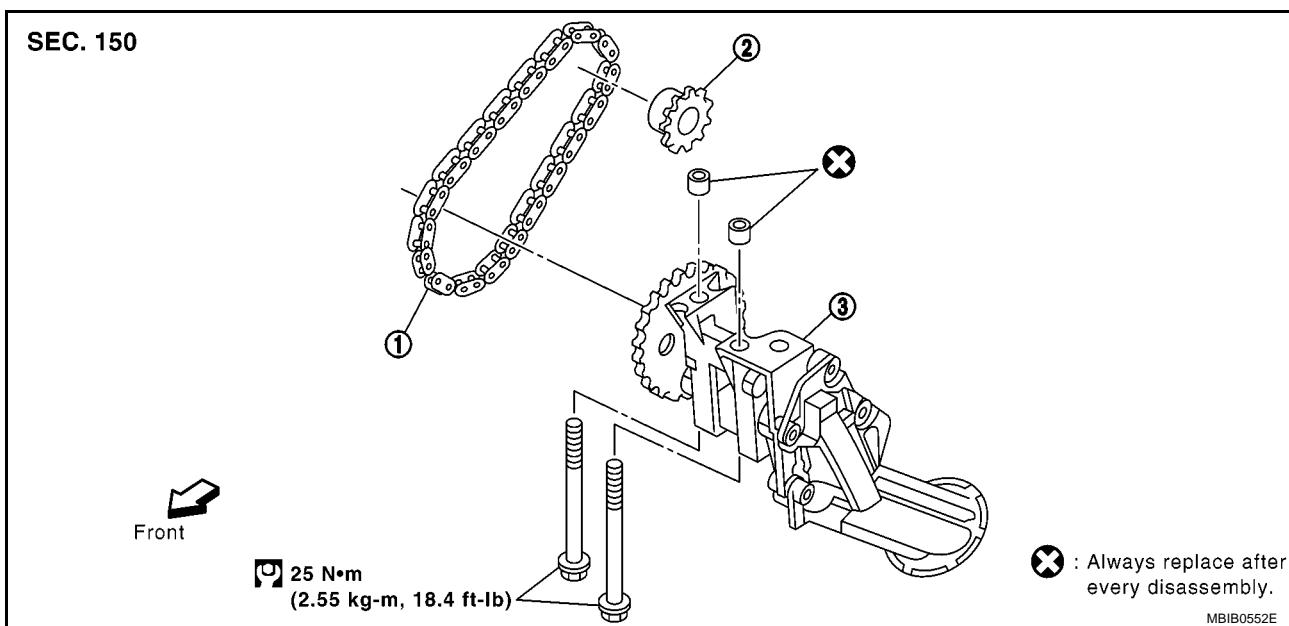
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1. Oil pump drive chain
2. Crankshaft sprocket
3. Oil pump assembly

REMOVAL

1. Remove the following parts.
 - Battery ground cable
 - Undercover
 - RH front wheel
2. Remove right side splash cover.
3. Remove drive belt. Refer to [EM-244, "DRIVE BELTS"](#) .
4. Remove oil pan. Refer to [EM-265, "OIL PAN"](#) .
5. Remove rear oil seal retainer. Refer to [EM-273, "TIMING BELT"](#) .
6. Remove oil pump drive chain. Refer to [EM-300, "Disassembly of The Bottom Engine"](#) .
7. Remove oil pump assembly.

INSTALLATION

Install in the reverse order of removal paying attention to the following.

Rear Oil Seal Retainer and Oil Pump

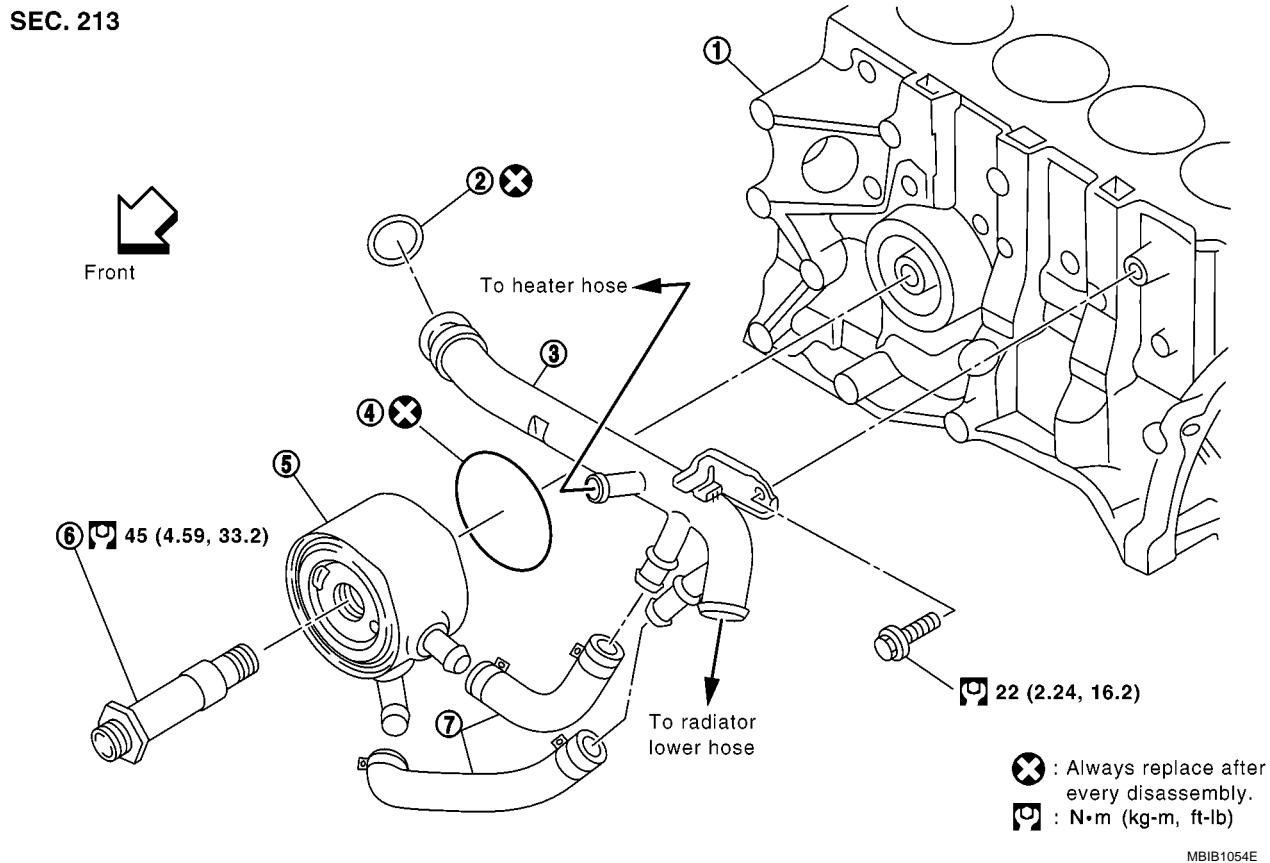
- Refer to [EM-313, "INSTALLATION OF REAR OIL SEAL RETAINER AND OIL PUMP"](#) .

OIL COOLER

PFP:21305

Removal and Installation

EBS01C7M



1. Cylinder block	2. O-ring	3. Water pipe
4. O-ring	5. Oil cooler	6. Connecting bolt
7. Water hose		

CAUTION:

- Be careful not to get burned when the engine and engine oil are hot.
- When removing, prepare a shop cloth to absorb any oil leakage or spillage.
- Completely wipe off any oil that abhore to the engine and the vehicle.

REMOVAL

1. Drain engine coolant. Refer to [CO-62, "DRAINING ENGINE COOLANT"](#) .

CAUTION:**Perform when engine is cold.**

2. Remove oil filter and oil filter bracket. Refer to [LU-26, "OIL FILTER"](#) .
3. Remove water hoses from oil cooler.
4. Remove oil cooler.

INSPECTION**Oil Cooler**

Check oil cooler for cracks and clogging by blowing through coolant inlet. If necessary, replace oil cooler assembly.

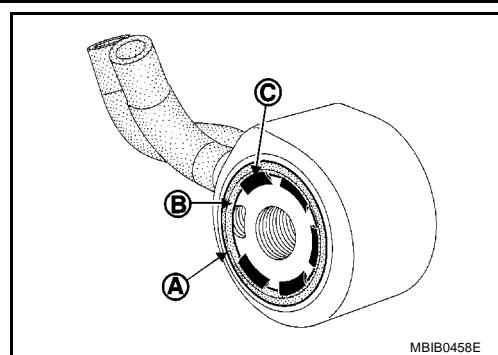
INSTALLATION

Installation is in reverse order of removal.

OIL COOLER

[K9K]

- Replace the O-ring (A) of the oil cooler, positioning the lip (B) of the seal behind the lug (C) of the oil cooler.



- Confirm that no foreign objects are adhering to the installation planes of the oil cooler and block.

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OIL COOLER

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