

SECTION LU

ENGINE LUBRICATION SYSTEM

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PRECAUTIONS

PFP:00001

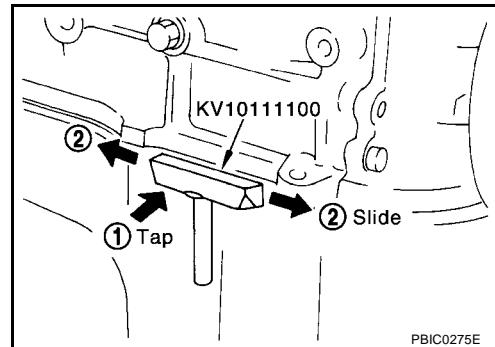
Precautions For Liquid Gasket
REMOVAL OF LIQUID GASKET

EBS0000DQ

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

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 areas where the liquid gasket is applied.

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

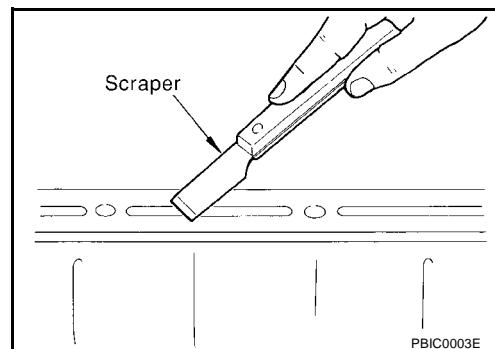
LIQUID GASKET APPLICATION PROCEDURE

- Using a scraper, remove the old liquid gasket adhering to the liquid gasket application surface and the mating surface.

- Remove the liquid gasket completely from the groove of the liquid gasket application surface, mounting bolts and bolt holes.

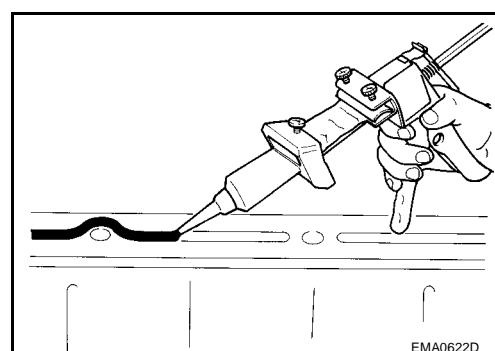
- Wipe the liquid gasket application surface and the mating surface with white gasoline (lighting and heating use) to remove adhering moisture, grease and foreign materials.

- Attach the liquid gasket to the tube presser.

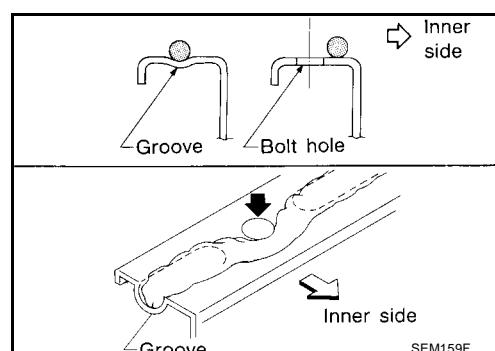
Use Genuine Liquid Gasket or equivalent.

- Apply the liquid gasket without breaks to the specified location with the specified dimensions.

- If there is a groove for the liquid gasket application, apply the liquid gasket to the groove.



- As for the bolt holes, normally apply the liquid 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 liquid 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 engine coolant.

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

PREPARATION

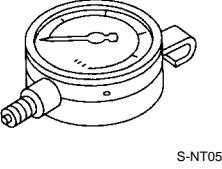
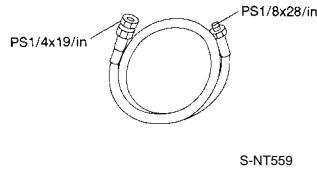
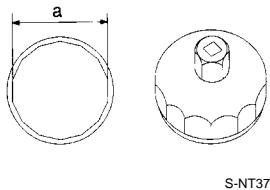
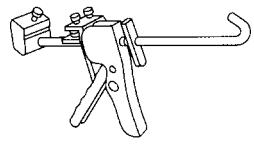
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PREPARATION

PFP:00002

Special Service Tools

EBS00K00

Tool number Tool name	Description
ST25051001 Oil pressure gauge	<p>Measuring oil pressure Maximum measuring range: 2,452 kPa (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> 

LUBRICATION SYSTEM

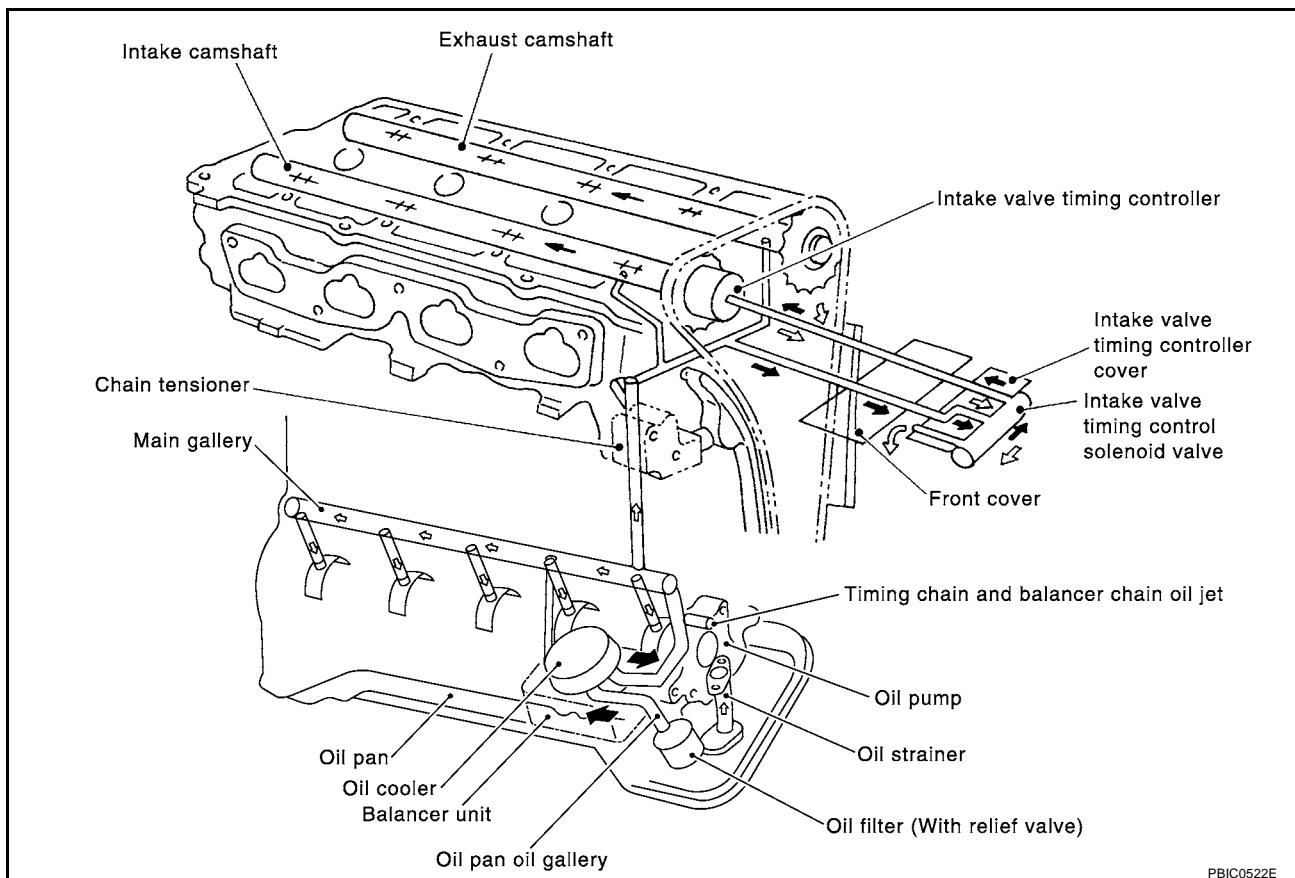
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LUBRICATION SYSTEM

PFP:15010

Lubrication Circuit

EBS00K01

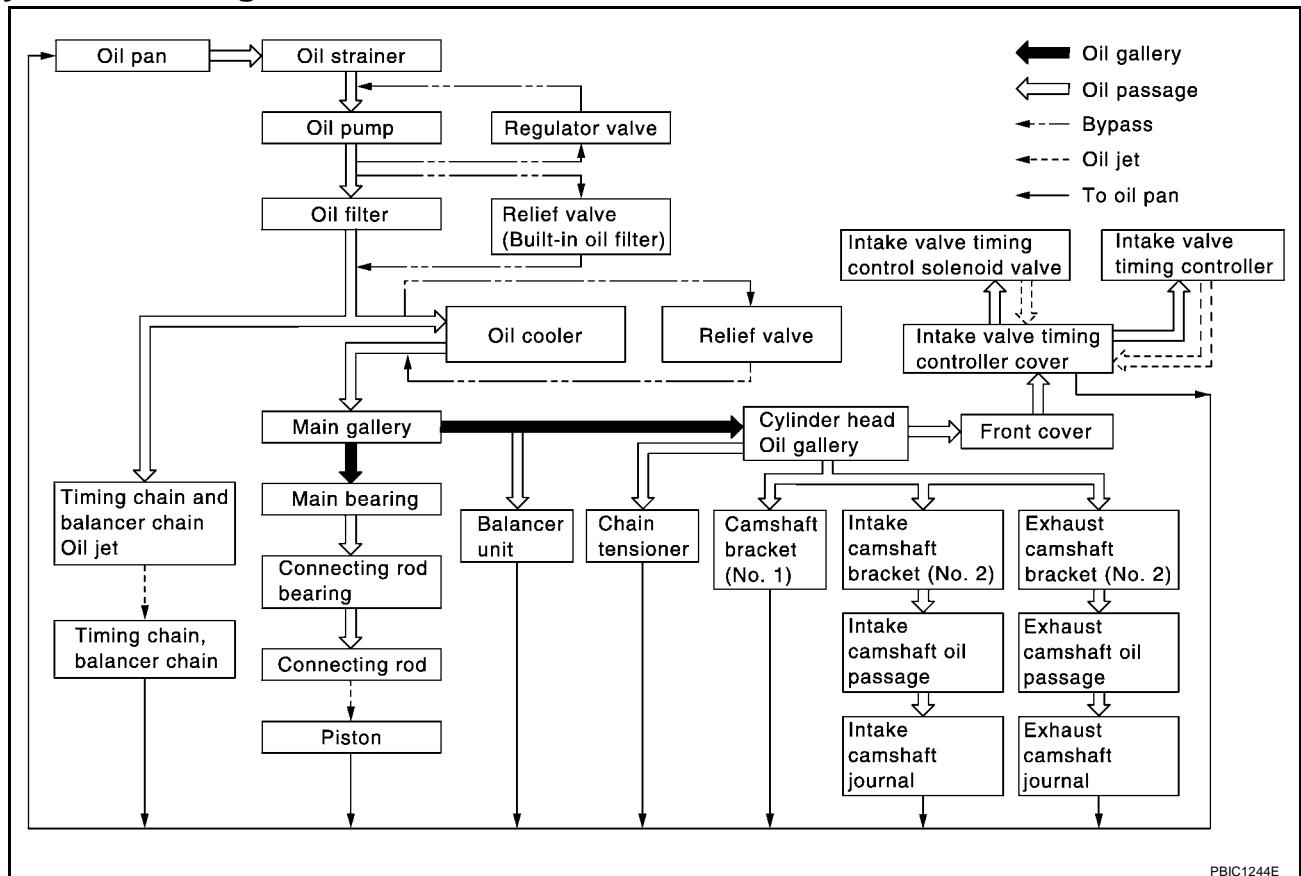


LUBRICATION SYSTEM

[QR]

System Drawing

EBS00K02



ENGINE OIL

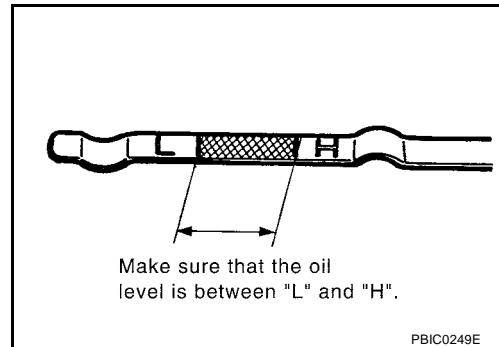
PFP:KLA92

Inspection

EBS00K03

ENGINE OIL LEVEL

- Before starting the engine, put vehicle horizontally then check the engine oil level. If the engine is already started, stop it and allow 10 minutes before checking.
- Check that the engine oil level is within the range shown in the figure.
- If it is out of range, adjust it.

**ENGINE OIL APPEARANCE**

- Check the engine oil for white turbidity or remarkable contamination.
- If the engine oil becomes turbid and white, it is highly probable that it is contaminated with engine coolant. Find the cause and repair.

ENGINE OIL LEAKAGE

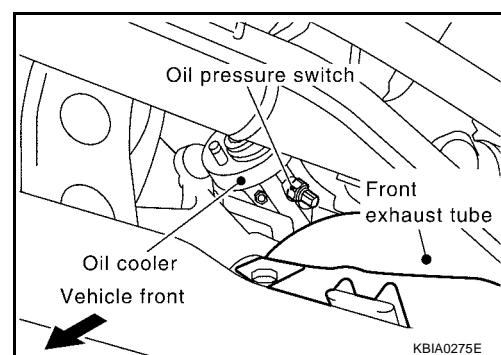
Check for engine oil leakage around the following area.

- Oil pan
- Oil pan drain plug
- Oil pressure switch
- Oil filter
- Oil cooler
- Intake valve timing control cover and 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 seal.

OIL PRESSURE CHECK**WARNING:**

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

- Check engine oil level. Refer to [LU-7, "ENGINE OIL LEVEL"](#).
- Remove the undercover.
- Remove the oil pressure switch to connect the oil pressure gauge.
- After warming up the engine, check that oil pressure corresponding to the engine speed is produced.

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

Engine speed (rpm)	Idle speed	2,000	6,000
Engine pressure kPa (bar, kg/cm ² , psi)	Approx. 98 (0.98, 1.0, 14) or more	Approx. 294 (2.9, 3.0, 43) or more	Approx. 392 (3.9, 4.0, 57) or more

- 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:

 : 12.3 - 17.2 N·m (1.25 - 1.75 kg·m, 9 - 12 ft-lb)

- c. After warming up the engine, check for engine oil leakage with running engine.

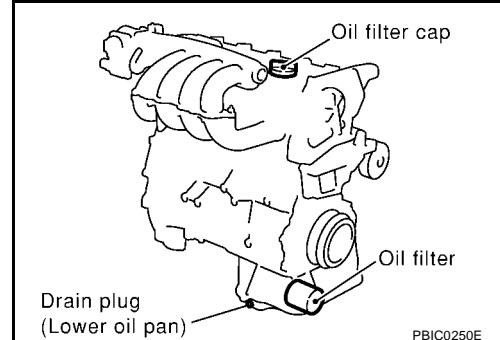
Changing Engine Oil

EBS00KO4

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 engine oil. If skin contact is made, wash thoroughly with soap or hand cleaner as soon as possible.

1. Warm up engine, put vehicle horizontally and check for engine oil leakage from engine components.
2. Stop engine and wait for 10 minutes.
3. Remove drain plug and oil filler cap.
4. Drain engine oil.
 - Install drain plug and refill with new engine oil.

**Engine oil specifications and viscosity:**

- API grade SG, SH, SJ or SL.
- ILSAC grade GF-I, GF-II or GF-III
- ACEA 96-A2
- Refer to [MA-16, "RECOMMENDED FLUIDS AND LUBRICANTS"](#) for further detail.

Engine oil capacity (Approximate):Unit: ℓ (Imp qt)

Drain and refill	With oil filter change	Approximately 3.9 (3-3/8)
	Without oil filter change	Approximately 3.5 (3-1/8)
Dry engine (engine overhaul)		Approximately 4.5 (4)

CAUTION:

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

Oil pan drain plug:

 : 29.4 - 39.2 N·m (3.0 - 4.0 kg·m, 22 - 28 ft-lb)

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

5. Warm up engine and check area around drain plug and oil filter for engine oil leakage.
6. Stop engine and wait for 10 minutes.
7. Check engine oil level. Refer to [LU-7, "ENGINE OIL LEVEL"](#) .

OIL FILTER

PFP:15208

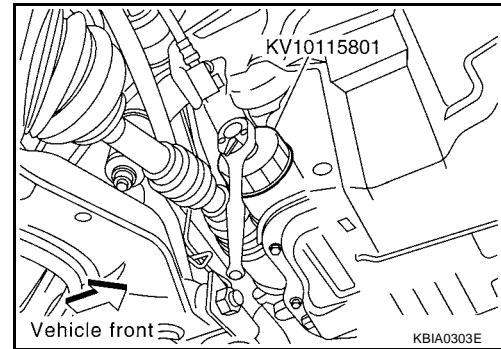
Removal and Installation

REMOVAL

1. Open the oil filter installation/removal cover on the under cover.
2. Using an oil filter wrench, remove the oil filter.

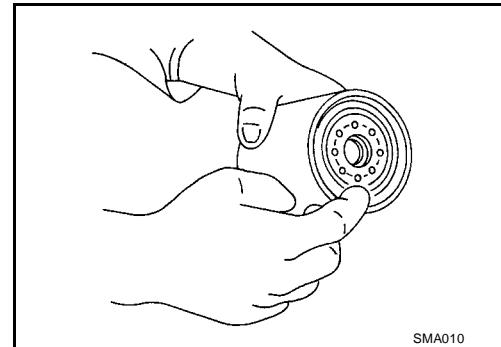
CAUTION:

- The oil filter is provided with a 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 engine oil leakage or spillage.
- Do not allow engine oil to adhere to the drive belts.
- Completely wipe off any engine oil that adhere to the engine and the vehicle.



INSTALLATION

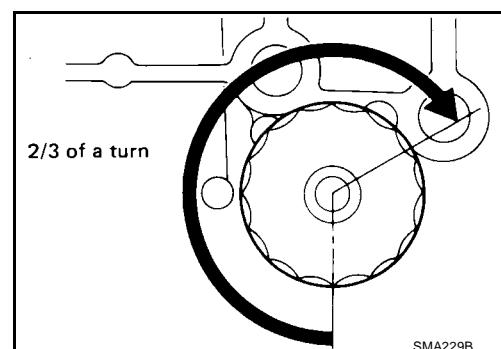
1. Remove foreign materials adhering to the oil filter installation surface.
2. Apply engine oil to the oil seal circumference of the new oil filter.



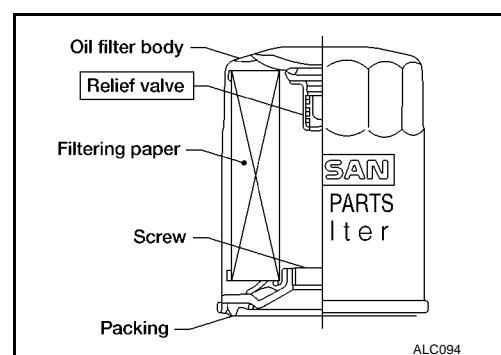
3. Screw the oil filter manually until it touches the installation surface, then tighten it by 2/3 turn.

Oil filter:

: 14.7 - 20.5 N·m (1.5 - 2.1 Kg·m, 11 - 15 ft-lb)



4. After warming up the engine, check for engine oil leakage.
5. Check engine oil level and add engine oil. Refer to [LU-7, "ENGINE OIL"](#).



OIL PUMP

PFP:15010

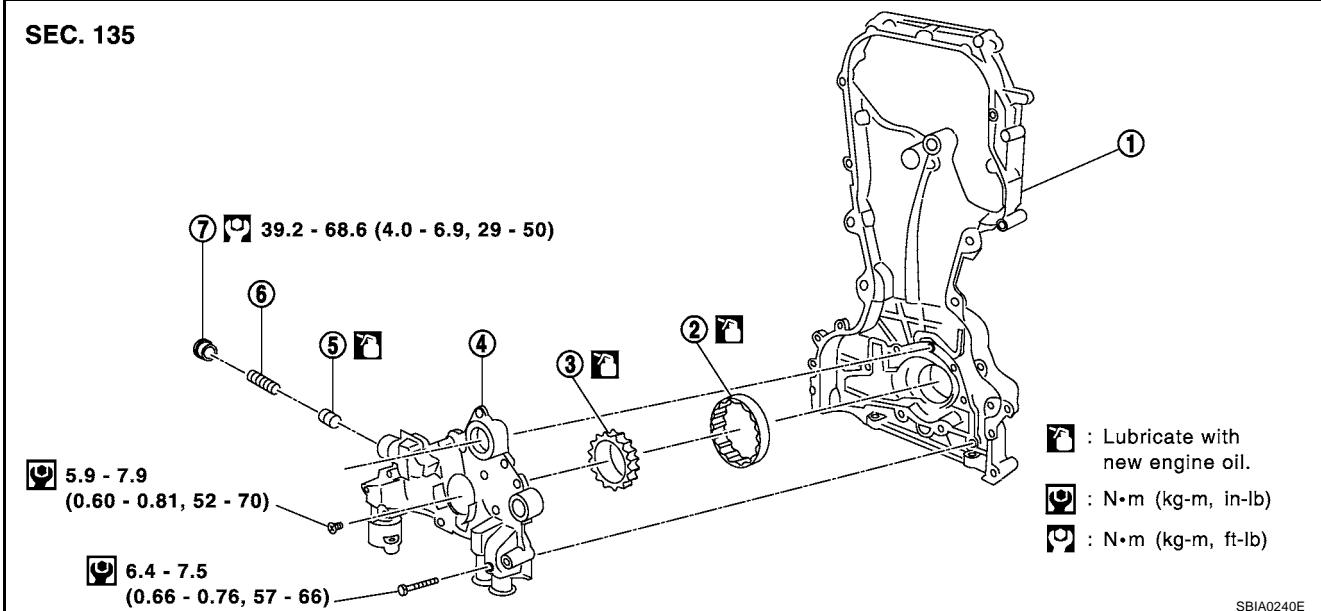
Removal and Installation

EBS00K06

Remove front cover. Refer to [EM-37, "TIMING CHAIN"](#) .

Disassembly and Assembly

EBS00K07



1. Front cover (oil pump body is united)
2. Outer rotor
3. Inner rotor
4. Oil pump cover
5. Regulator valve
6. Spring
7. Regulator plug

CAUTION:

Before installation, apply new engine oil to the parts as instructed in the figure.

DISASSEMBLY

1. Remove oil pump cover.
2. Remove inner rotor and outer rotor from front cover.
3. After removing regulator plug, remove regulator spring and regulator valve.

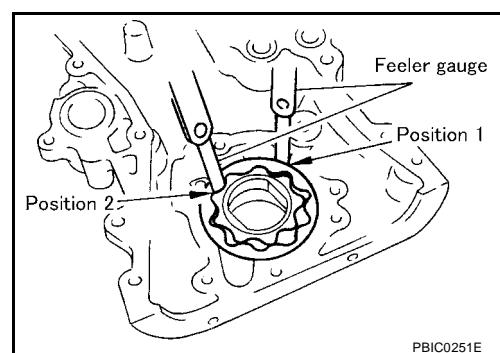
INSPECTION AFTER DISASSEMBLY

Clearance of Oil Pump Parts

- Measure clearance with feeler gauge.
Clearance between outer rotor and oil pump body (position 1)

Standard: 0.114 - 0.179mm (0.0045 - 0.0070 in)

Tip clearance between inner rotor and outer rotor (position 2)

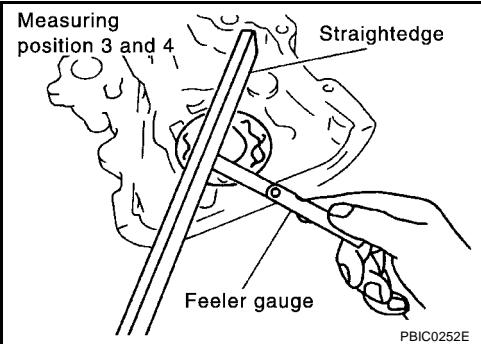
Standard: Below 0.220 mm (0.0087in)

- Measure clearance with feeler gauge and straightedge. Side clearance between inner rotor and oil pump body (position 3).

Standard: 0.030 - 0.070 mm (0.0012 - 0.0028 in)

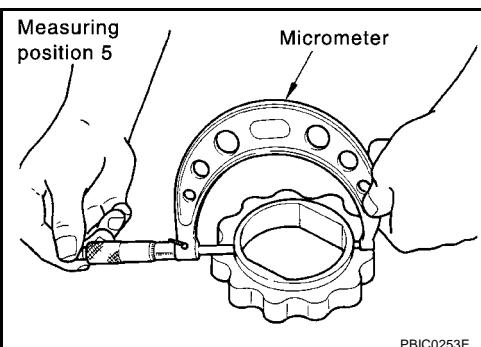
Side clearance between outer rotor and oil pump body (position 4).

Standard: 0.060 - 0.110 mm (0.0024 - 0.0043 in)



- Calculate the clearance between inner rotor and oil pump body as follows.

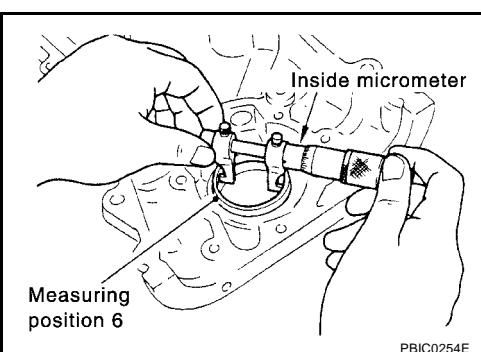
- Measure the outer diameter of protruded portion of inner rotor (Position 5).



- Measure the inner diameter of oil pump body with inside micrometer (Position 6).

(Clearance) = (Inner diameter of oil pump body) – (Outer diameter of inner rotor)

Standard: 0.035 - 0.070mm (0.0014 - 0.0028 in)



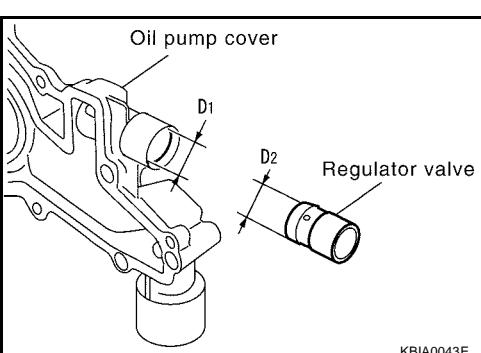
Regulator Valve Clearance

(Clearance) = D1 (Valve hole diameter) – D2 (Outer diameter of valve)

Standard: 0.040 - 0.097 mm (0.0016 - 0.0038 in)

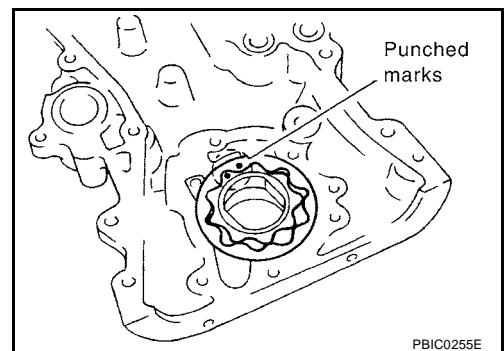
CAUTION:

- Coat regulator valve with engine oil.
- Check that it falls smoothly into the valve hole by its own weight.



ASSEMBLY

- Assemble in the reverse order of disassembly.
- Install the inner rotor and outer rotor with the punched marks on the oil pump cover side.
- After warming up the engine, check for engine oil leakage and engine oil level. Refer to [LU-7, "ENGINE OIL LEVEL"](#) .



OIL COOLER

PFP:21305

Removal and Installation

EBS00K08

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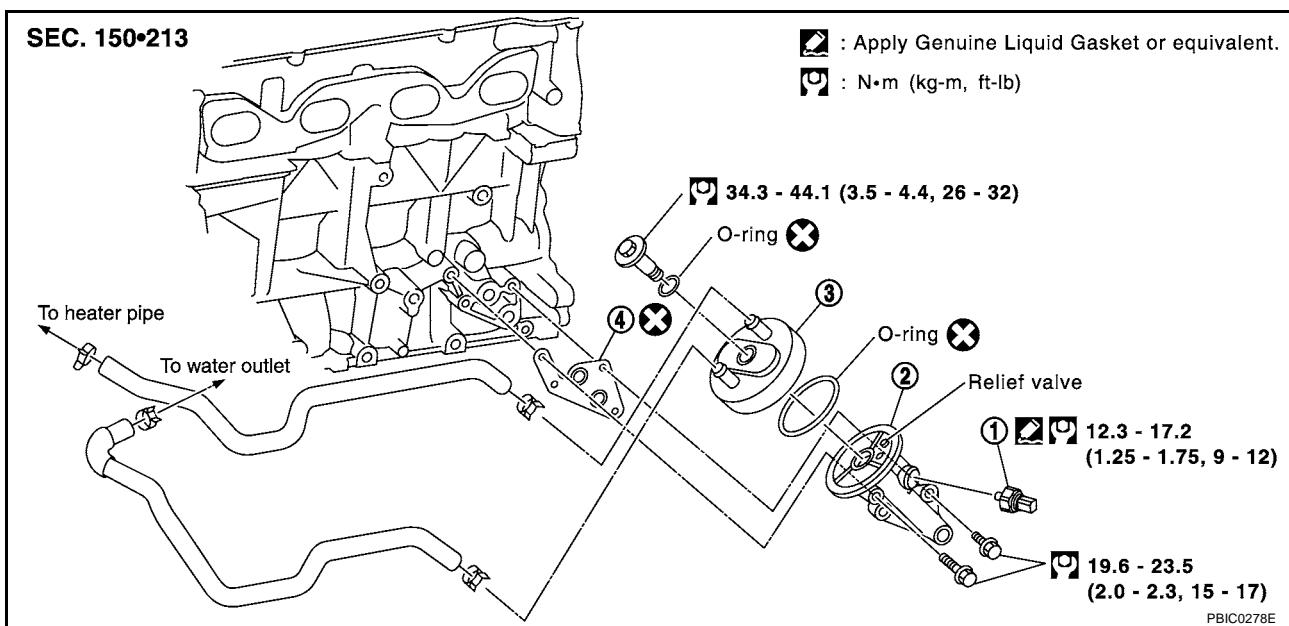
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M



1. Oil pressure switch
2. Oil cooler bracket
3. Oil cooler
4. Gasket

WARNING:

Be careful not to get burned when the engine and engine oil are hot.

CAUTION:

- When removing oil cooler, prepare a shop cloth to absorb any engine oil leakage or spillage.
- Completely wipe off any engine oil that adhere to the engine and the vehicle.

REMOVAL

1. Remove front RH wheel and engine room right side cover.
2. Drain engine coolant by removing cylinder block drain plug and radiator drain cock. Refer to [CO-9, "Changing Engine Coolant"](#).
3. Paint a mating mark at the oil cooler and oil cooler bracket.

INSPECTION**Oil Cooler**

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

Oil Pressure Relief Valve

Inspect oil pressure relief valve for movement, cracks and breaks by pushing the ball. If replacement is necessary, remove valve by prying it out with a suitable tool. Install a new valve in place by tapping it.

INSTALLATION

Installation is in the reverse order of removal.

- After warming up the engine, check for engine oil and engine coolant leakage and for engine oil level. Refer to [LU-7, "ENGINE OIL"](#).

SERVICE DATA AND SPECIFICATIONS (SDS)

[QR]

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Standard and Limit OIL PRESSURE

EBS00K09

Engine speed (rpm)	Approximate discharge pressure kPa (bar, kg/cm ² , psi)*
Idle speed	More than 98 (0.98, 1.0, 14)
2,000	294 (2.9, 3.0, 43)
6,000	392 (3.9, 4.0, 57)

*:Engine oil temperature at 80°C (176°C)

OIL PUMP

Unit: mm (in)

Body to outer rotor radial clearance	0.114 - 0.179 (0.0045 - 0.0070)
Inner rotor to outer rotor tip clearance	Below 0.220 (0.0087)
Body to inner rotor axial clearance	0.030 - 0.070 (0.0012 - 0.0028)
Body to outer rotor axial clearance	0.060 - 0.110 (0.0024 - 0.0043)
Inner rotor to brazed portion of housing clearance	0.035 - 0.070 (0.0014 - 0.0028)

REGULATOR VALVE

Unit: mm (in)

Regulator valve to oil pump cover clearance	0.040 - 0.097 (0.0016 - 0.0038)
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ENGINE OIL CAPACITY

Unit: ℥ (Imp qt)

With oil filter change	Approximately 3.9 (3-3/8)
Without oil filter change	Approximately 3.5 (3-1/8)
Dry engine (engine overhaul)	Approximately 4.5 (4)

Tightening Torque

EBS00K0A

Unit: N·m (kg-m, ft-lb)

Unit: N·m (kg-m, in-lb)*

Oil pressure switch	12.3 - 17.2 (1.25 - 1.75, 9 - 12)
Oil pan drain plug	29.4 - 39.2 (3.0 - 4.0, 22 - 28)
Oil filter	14.7 - 20.5 (1.5 - 2.1, 11 - 15)
Oil pump assembly	6.4 - 7.5 (0.66 - 0.76, 57 - 66)*
Oil pump cover	5.9 - 7.9 (0.60 - 0.81, 52 - 70)*
Regulator plug	39.2 - 68.6 (4.0 - 6.9, 29 - 50)
Oil cooler	34.3 - 44.1 (3.5 - 4.4, 26 - 32)
Oil cooler bracket	19.6 - 23.5 (2.0 - 2.3, 15 - 17)

PRECAUTIONS

PFP:00001

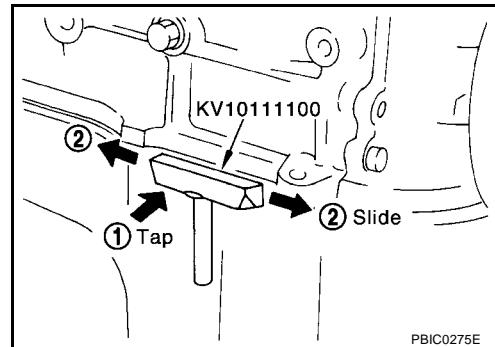
Precautions For Liquid Gasket
REMOVAL OF LIQUID GASKET

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

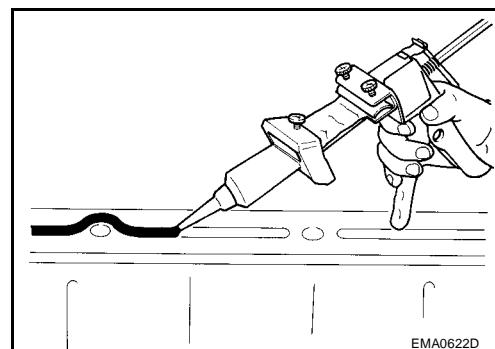
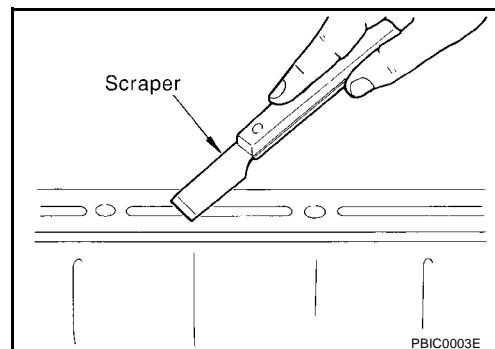
CAUTION:**Be careful not to damage the mating surfaces.**

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

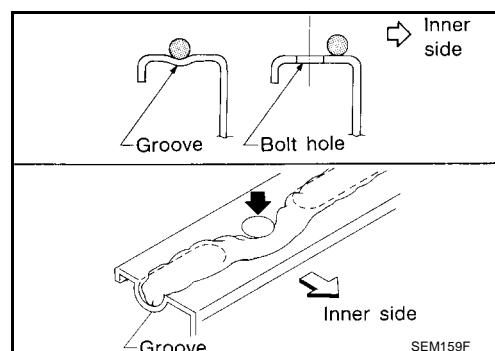
CAUTION:**If for some unavoidable reason a tool such as a flat-blade screwdriver is used, be careful not to damage the mating surfaces.**

LIQUID GASKET APPLICATION PROCEDURE

- Using a scraper, remove the old liquid gasket adhering to the liquid gasket application surface and the mating surface.
 - Remove the liquid gasket completely from the groove of the liquid gasket application surface, mounting bolts and bolt holes.
- 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.
- Attach the liquid gasket to the tube presser.
Use Genuine Liquid Gasket or equivalent.
- Apply the liquid gasket without breaks to the specified location with the specified dimensions.
 - If there is a groove for the liquid gasket application, apply the liquid gasket to the groove.



- As for the bolt holes, normally apply the liquid 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 liquid 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 engine coolant.

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

PREPARATION

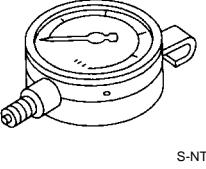
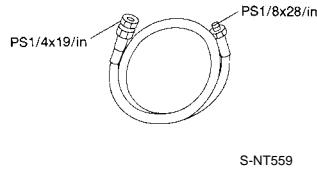
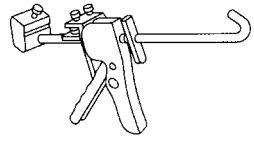
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PREPARATION

PFP:00002

Special Service Tools

EBS00B01

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

LUBRICATION SYSTEM

[YD22DDTi]

LUBRICATION SYSTEM

PFP:15010

Lubrication Circuit

EBS00B02

A

LU

C

D

E

F

G

H

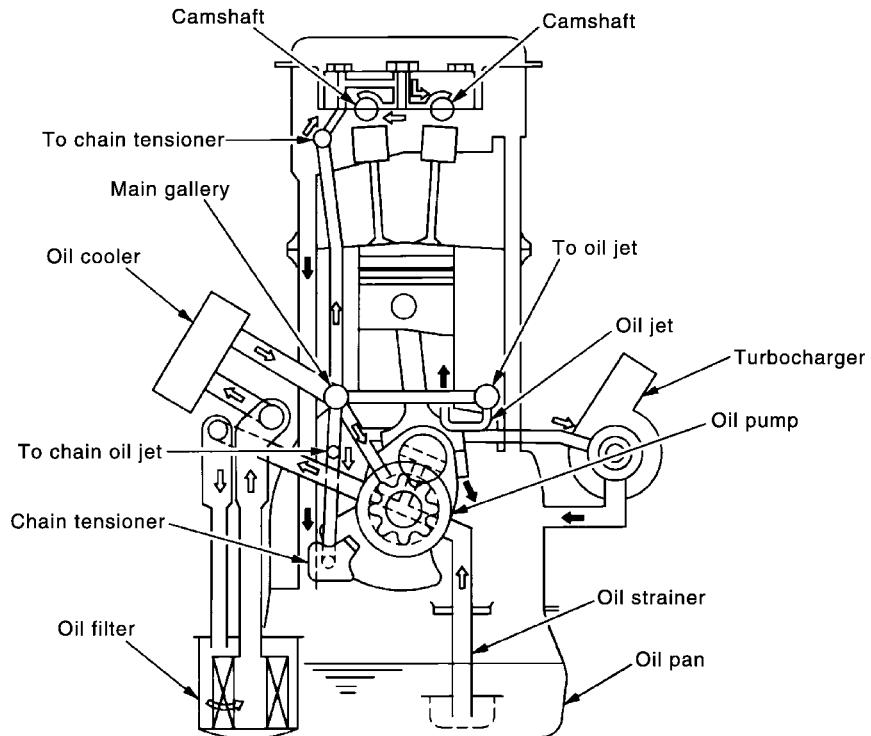
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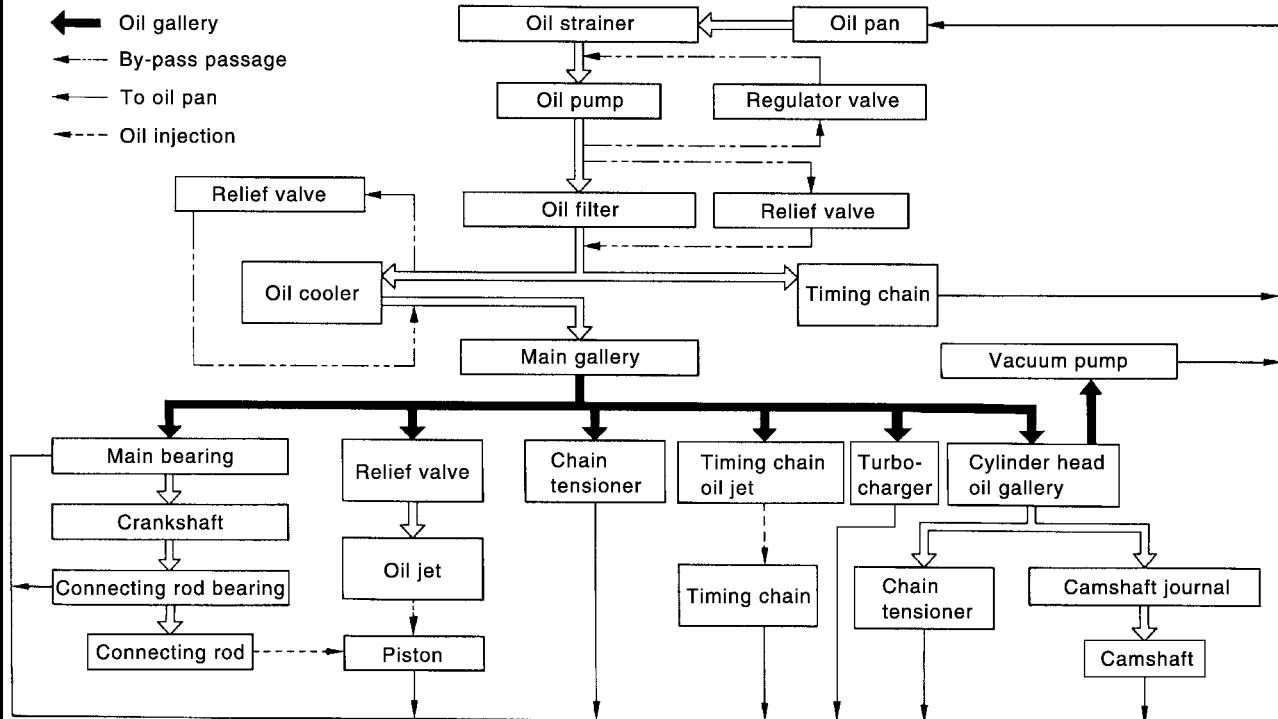
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L

M



- ← Oil passage
- ← Oil gallery
- ← By-pass passage
- ← To oil pan
- Oil injection



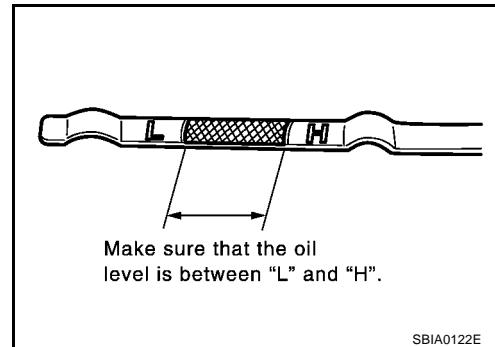
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ENGINE OIL

PFP:KLA92

Inspection**ENGINE OIL LEVEL AND MUDDINESS**

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



SBIA0122E

ENGINE OIL LEAKAGE

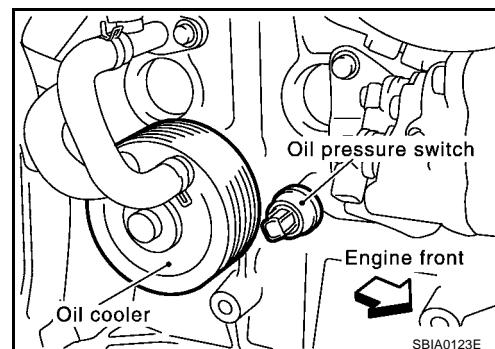
Check for engine oil leakage around the following area.

- Oil pan
- Oil pan drain plug
- Oil pressure switch
- Oil filter bracket
- Oil cooler.
- Oil pump housing
- Vacuum pump
- Cylinder head rear cover assembly
- Chain case
- Mating surface between cylinder block and cylinder head
- Mating surface between cylinder head and rocker cover
- Crankshaft oil seal. Refer to [LU-18, "ENGINE OIL LEVEL AND MUDDINESS"](#) .

ENGINE OIL PRESSURE CHECK**WARNING:**

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

- Check the engine oil level. Refer to [LU-18, "ENGINE OIL LEVEL AND MUDDINESS"](#) .
- Remove the undercover.
- Remove the oil pressure switch to connect the oil pressure gauge.
- After warming up the engine, check that oil pressure corresponding to the engine speed is produced.



SBIA0123E

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

Engine speed (rpm)	Idle speed	2,000	4,000
Engine pressure kPa (bar, kg/cm ² , psi)	Approx. 140 (1.40, 1.43, 20.3) or more	Approx. 270 (2.69, 2.75, 39.1) or more	Approx. 430 (4.29, 4.38, 62.3) or more

- 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:

 : 13.0 - 17.0 N·m (1.4 - 1.7 kg·m, 10 - 12 ft-lb)

- c. After warming up the engine, check for oil leakage with running engine.

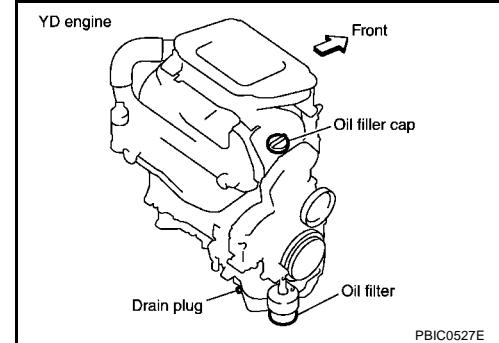
Changing Engine Oil

EBS00B04

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 engine oil. If skin contact is made, wash thoroughly with soap or hand cleaner as soon as possible.

1. Warm up engine, put vehicle horizontally and check for engine oil leakage from engine components.
2. Stop engine and wait for 10 minutes.
3. Remove drain plug and oil filler cap.



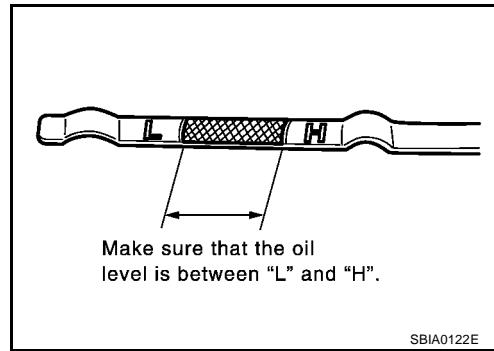
4. Drain engine oil.
 - Install drain plug and refill with new engine oil.

Engine oil specification and viscosity:

- API grade CF-4.
- ACEA B1, B3, B4, B5
- Refer to [MA-16, "RECOMMENDED FLUIDS AND LUBRICANTS"](#).

Engine oil capacity (Approximate):

Drain and refill	With oil filter change	5.2 ℥ (4-5/8 Imp qt)
	Without oil filter change	4.9 ℥ (4-3/8 Imp qt)
Dry engine (engine overhaul)	6.3 ℥ (5-1/2 Imp qt)	



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

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

CAUTION:

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

Oil pan drain plug:

 : 29 - 39 N·m (3.0 - 4.0 kg·m, 22 - 29 ft-lb)

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

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

5. Warm up engine and check area around drain plug and oil filter for engine oil leakage.
6. Stop engine and wait for 10 minutes.
7. Check engine oil level. Refer to [LU-18, "ENGINE OIL LEVEL AND MUDDINESS"](#).

OIL FILTER

PFP:15208

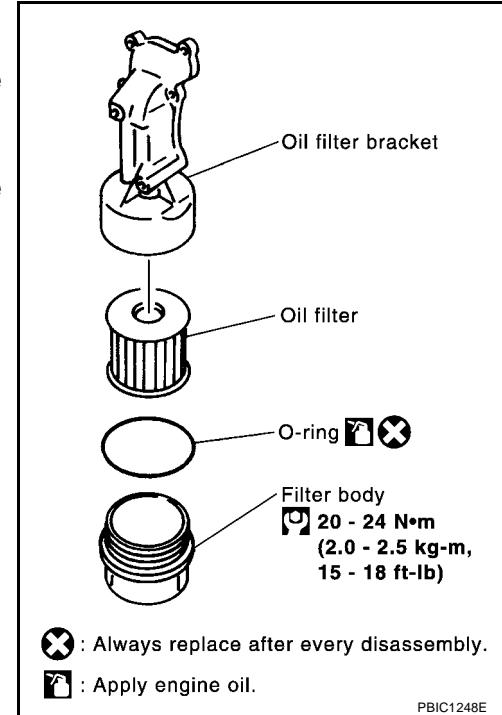
Removal and Installation

REMOVAL

EBS00B05

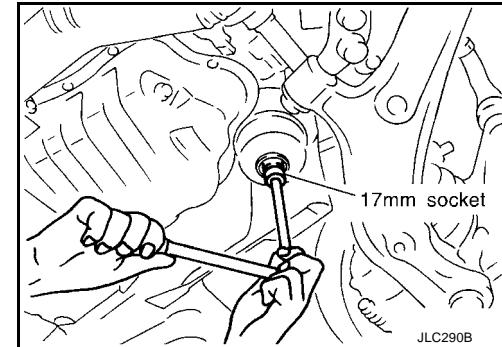
CAUTION:

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



PBIC1248E

1. Using a socket wrench [plane-to-plane width: 17 mm (0.67 in)], loosen the filter body approximately four turns.



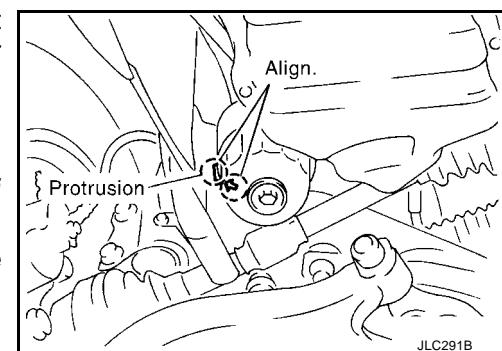
2. Drain the engine oil after matching the "DRAIN" arrow mark at the bottom of the filter body to the protrusion on the oil filter bracket.

- Catch the engine oil with a pan or cloth.

CAUTION:

- The drained engine oil flows over the right surface of the filter body.
- Completely wipe clean any engine oil remaining on the filter body or vehicle.

3. Remove the filter body, then remove the oil filter.



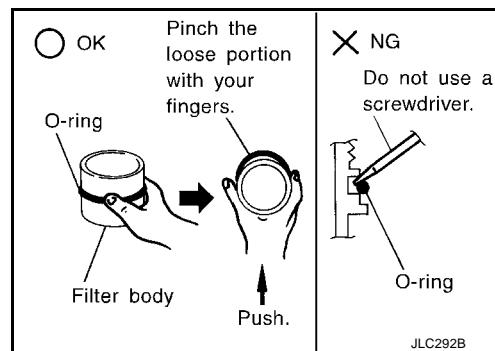
JLC291B

4. Remove the O-ring from the filter body.

- Push the O-ring in one direction, lift the slack part using fingers, and remove the O-ring from the filter body.

CAUTION:

Do not use wires or flat-bladed screwdrivers etc. as they may cause damage to the filter body.

**INSTALLATION**

- Completely remove all foreign objects adhering to the inside of the filter body or O-ring mounting area (body side and bracket side).
- Install the oil filter and O-ring to the filter body.
 - Push the oil filter into the filter body completely.
- Install the filter body to the oil filter bracket.

Oil filter:

: 20 - 24 N·m (2.0 - 2.5 Kg·m, 15 - 18 ft-lb)

- After warming up the engine, check for engine oil leakage.
- Check engine oil level and add engine oil. Refer to [LU-18, "ENGINE OIL"](#)

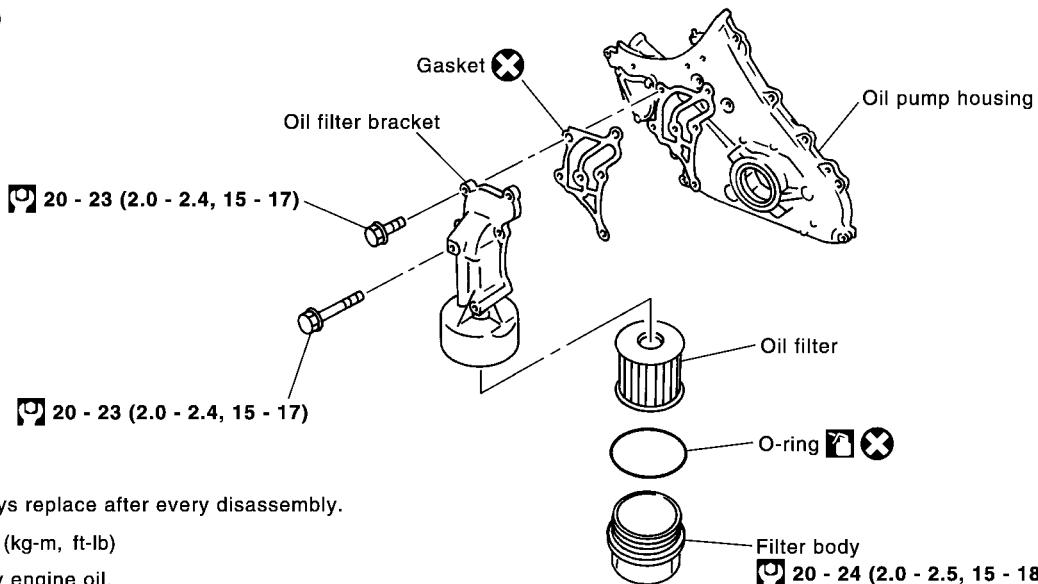
OIL FILTER BRACKET

PFP:15238

Removal and Installation

EBS00BL8

SEC. 150



PBIC1249E

REMOVAL

1. Remove the engine undercover.
2. Steer the front wheel to the right.
3. Remove the right splash cover.
4. Remove the oil filter bracket bolt. Refer to [LU-20, "OIL FILTER"](#) for cautions.

INSTALLATION

1. Install all removed parts in the reverse order of removal.
 - Insert the top mounting bolt to the oil filter bracket beforehand, and set the oil filter bracket to the installation location.
 - After warming up the engine, check for engine oil leakage and oil level. Refer to [LU-18, "ENGINE OIL"](#).

OIL PUMP

PFP:15010

Removal and Installation

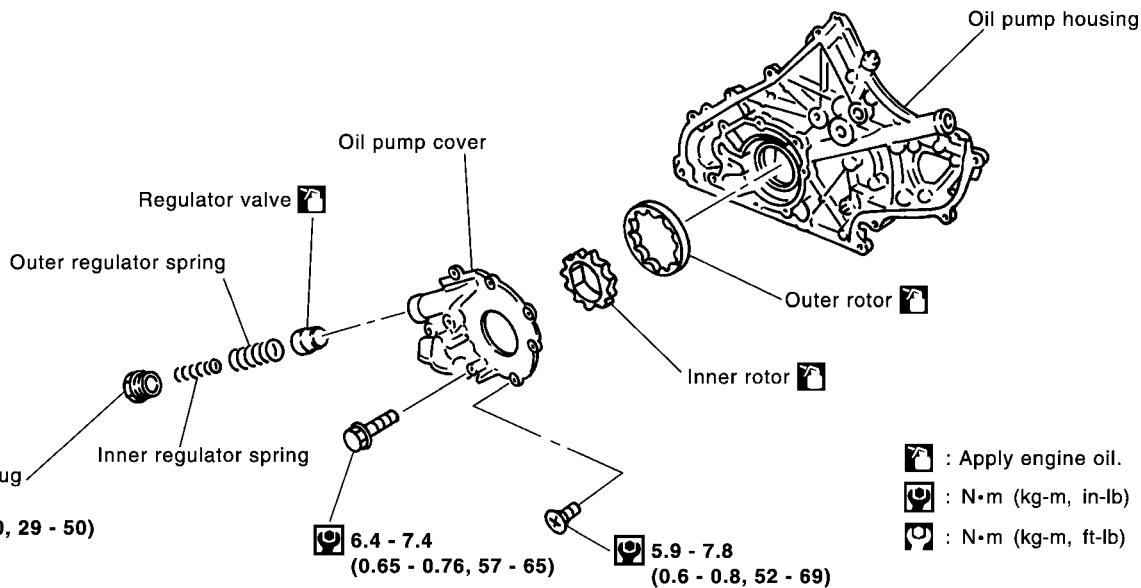
EBS00B06

Remove front cover. Refer to [EM-172, "PRIMARY TIMING CHAIN"](#) .

Disassembly and Assembly

EBS00B07

SEC. 150



PBIC1250E

CAUTION:

Before installation, apply new engine oil to the parts as instructed in the figure.

DISASSEMBLY

1. Remove oil pump cover.
2. Remove inner rotor and outer rotor from oil pump housing.
3. After removing regulator plug, remove regulator spring and regulator valve.

INSPECTION AFTER DISASSEMBLY

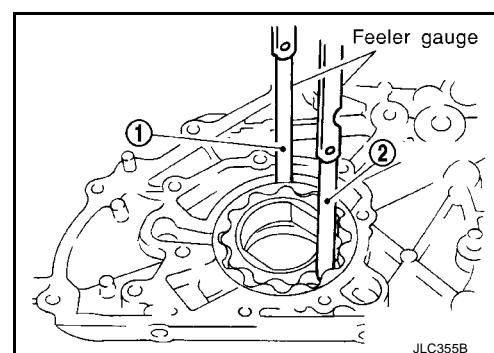
Clearance of Oil Pump Parts

- Measure clearance with feeler gauge.
Clearance between outer rotor and oil pump housing (position 1)

Standard : 0.114 - 0.260 mm (0.0045 - 0.0102 in)

Tip clearance between inner rotor and outer rotor (position 2)

Standard : Below 0.18 mm (0.0071in)



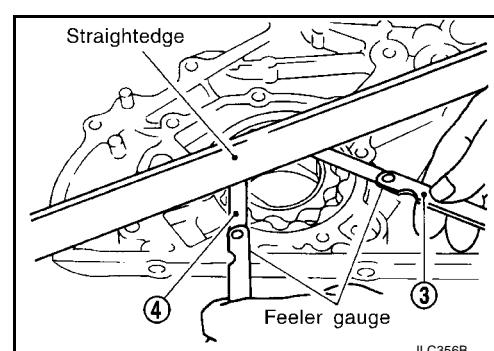
JLC355B

- Measure clearance with feeler gauge and straightedge.
Side clearance between inner rotor and oil pump housing (position 3)

Standard : 0.050 - 0.090 mm (0.0020 - 0.0035 in)

Side clearance between outer rotor and oil pump housing (position 4)

Standard : 0.030 - 0.190 mm (0.0012 - 0.0075 in)



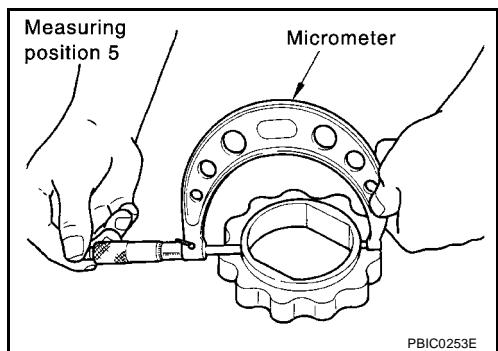
JLC356B

OIL PUMP

[YD22DDTi]

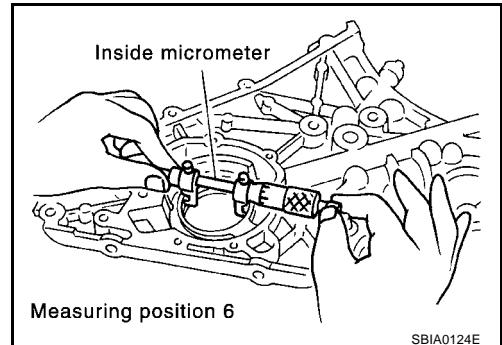
- Calculate the clearance between inner rotor and oil pump housing as follows.

- Measure the outer diameter of protruded portion of inner rotor (Position 5)



- Measure the inner diameter of oil pump housing with inside micrometer (Position 6)
(Clearance) = (Inner diameter of oil pump housing) – (Outer diameter of inner rotor)

Standard : 0.045 - 0.091mm (0.0018 - 0.0036 in)



Regulator Valve

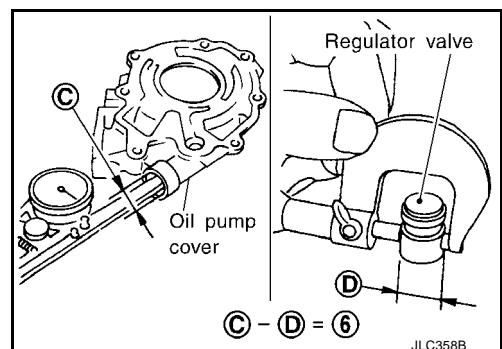
- Visually inspect components for wear and damage.
- Check oil pressure regulator valve sliding surface and valve spring.
- Coat regulator valve with engine oil. Check that it falls smoothly into the valve hole by its own weight. If damaged, replace regulator valve set or oil pump housing.
- Check regulator valve to oil pump housing clearance.

Clearance "6":

0.040 - 0.097 mm (0.0016 - 0.0038 in)

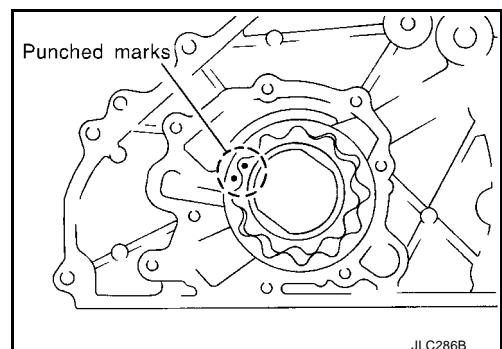
CAUTION:

Coat regulator valve with engine oil.



ASSEMBLY

- Assemble in the reverse order of disassembly.
- Install the inner rotor and outer rotor with the punched marks on the oil pump cover side.
- After warming up the engine, check for oil leakage and oil level. Refer to [LU-18, "ENGINE OIL"](#).



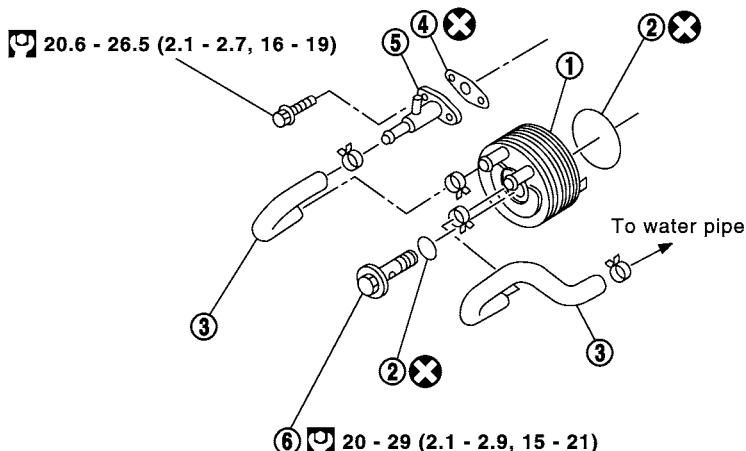
OIL COOLER

PFP:21305

Removal and Installation

EBS000E8

SEC. 213



N·m : kg·m, ft·lb

PBIC1231E

1. Oil cooler
2. O-ring
3. Water hose
4. Gasket
5. Water hose connector
6. Connecting bolt

CAUTION:

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

REMOVAL

1. Remove front RH wheel and engine side cover.
2. Remove the exhaust front tube. Refer to [EX-2, "EXHAUST SYSTEM"](#) .
3. Drain coolant by removing cylinder block drain plug and radiator drain cock.

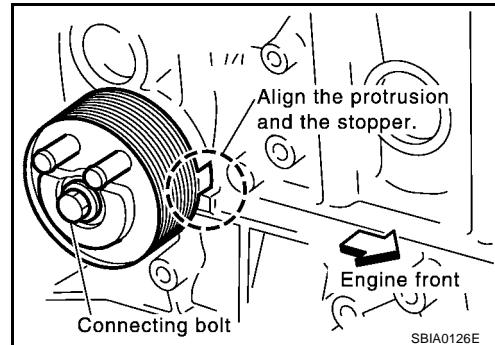
INSPECTION**Oil Cooler**

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

INSTALLATION

Installation is in reverse order of removal.

- Confirm that no foreign objects are adhering to the installation planes of the oil cooler or cylinder block.
- Tighten the connecting bolt after aligning the stopper on the cylinder block side with protrusion of the oil cooler.
- After for warming up the engine, check for engine oil and engine coolant leakage and for engine oil level. Refer to [LU-18, "ENGINE OIL"](#) .



SERVICE DATA AND SPECIFICATIONS (SDS)

[YD22DDTi]

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Standard and Limit OIL PRESSURE

EBS00CTZ

Engine speed rpm	Approximate discharge pressure kPa (bar, kg/cm ² , psi)
Idle speed	More than 140 (1.40, 1.43, 20.3)
2,000	More than 270 (2.69, 2.75, 39.1)
4,000	More than 430 (4.29, 4.38, 62.3)

OIL PUMP

Unit: mm (in)

Body to outer rotor radial clearance	0.114 - 0.260 (0.0045 - 0.0102)
Inner rotor to outer rotor tip clearance	Below 0.18 (0.0071)
Body to inner rotor axial clearance	0.050 - 0.090 (0.0020 - 0.0035)
Body to outer rotor axial clearance	0.030 - 0.190 (0.0012 - 0.0075)
Inner rotor to brazed portion of housing clearance	0.045 - 0.091 (0.0018 - 0.0036)

REGULATOR VALVE

Unit: mm (in)

Regulator valve to oil pump cover clearance	0.040 - 0.097 (0.0016 - 0.0038)
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OIL CAPACITY

Unit: ℓ · (Imp qt)

With oil filter change	Approximately 5.2 (4-5/8 Imp qt)
Without oil filter change	Approximately 4.9 (4-3/8 Imp qt)
Dry engine (engine overhaul)	Approximately 6.3 (5-1/2 Imp qt)

Tightening Torque

EBS00B0F

Unit: N·m (kg-m, ft-lb)

Unit: N·m (kg-m, in-lb)*

Oil pressure switch	13 - 17 (1.4 - 1.7, 10 - 12)
Oil pan drain plug	29 - 39 (3.0 - 4.0, 22 - 29)
Oil filter bracket	20 - 23 (2.0 - 2.4, 15 - 17)
Oil filter body	20 - 24 (2.0 - 2.5, 15 - 18)
Oil pump assembly	6.4 - 7.4 (0.65 - 0.76, 57 - 65)*
Oil pump cover	5.9 - 7.8 (0.6 - 0.8, 52 - 69)*
Regulator plug	40 - 68 (4.0 - 7.0, 29 - 50)
Water hose connector for oil cooler	25 - 31 (2.5 - 3.2, 18 - 23)
Connecting bolt	20 - 29 (2.1 - 2.9, 15 - 21)