

# SECTION LU

## ENGINE LUBRICATION SYSTEM

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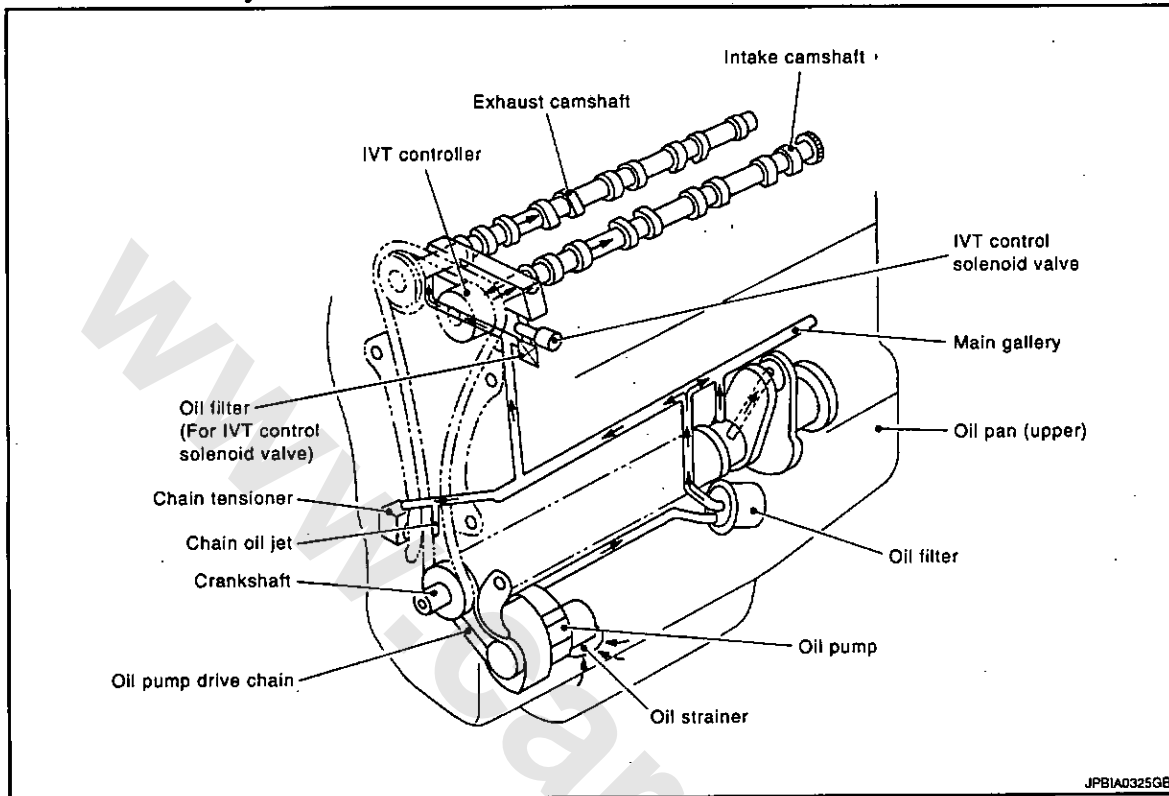
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# FUNCTION DIAGNOSIS

## DESCRIPTION

### Engine Lubrication System

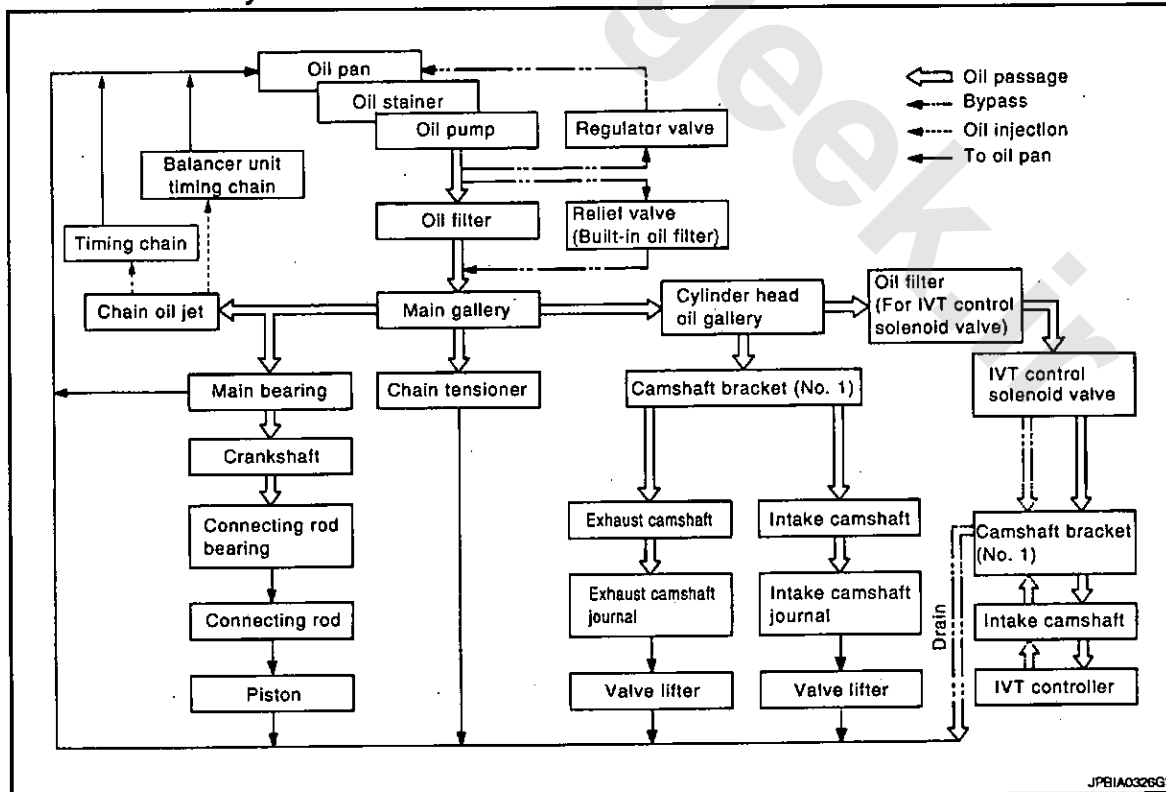
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JPBIA0325GB

### Engine Lubrication System Schematic

INFOID:0000000004899391



JPBIA0326GB

## PRECAUTION

### PRECAUTIONS

#### Liquid Gasket

INFOID:0000000004899392

#### LIQUID GASKET APPLICATION PROCEDURE

1. Remove old liquid gasket adhering to the liquid gasket application surface and the mating surface.
  - Remove liquid gasket completely from the liquid gasket application surface, mounting bolts, and bolt holes.
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. Apply liquid gasket to the liquid gasket application surface.  
**Use Genuine liquid gasket or equivalent.**
  - Within five 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.

# PREPARATION

< PRÉPARATION >

[HR16DE]


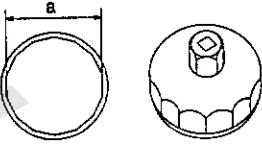
## PREPARATION

## PREPARATION

### Special Service Tools

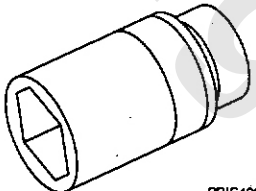
INFOID:0000000004899393

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Tool number Tool name	Description
<b>030T1005A</b> <b>Old number:(ST25051001 gauge,</b> <b>ST25052000 Hose)</b> Oil pressure gauge	 Measuring oil pressure <b>Maximum measuring range:</b> 2,452 kPa (24.52 bar, 25 kg-cm <sup>2</sup> , 356 psi) Adapting oil pressure gauge to cylinder block
<b>KV10115801</b> Oil filter wrench	 Removing and installing oil filter <b>a: 64.3 mm (2.531 in)</b>

### Commercial Service Tools

INFOID:0000000004899394

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

## ON-VEHICLE MAINTENANCE

## ENGINE OIL

## Inspection

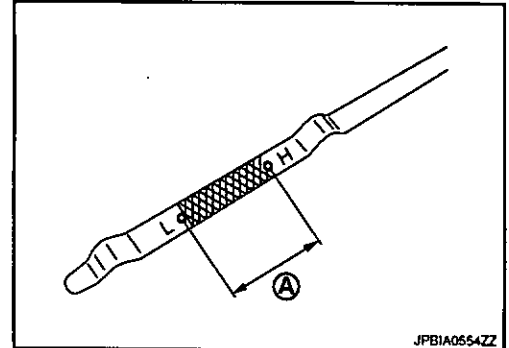
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## ENGINE OIL LEVEL

**NOTE:**

Before starting engine, put vehicle horizontally and check the engine oil level. If engine is already started, stop it and allow 10 minutes before checking.

1. Pull out oil level gauge and wipe it clean.
2. Insert oil level gauge and check the engine oil level is within the range (A) shown in the figure.
3. If it is out of range, adjust it.



## ENGINE OIL APPEARANCE

- Check engine oil for white turbidity or heavy contamination.
- If engine oil becomes turbid and white, it is highly probable that it is contaminated with engine coolant. Repair or replace damaged parts.

## 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 level sensor
- Oil filter
- Intake valve timing control solenoid valve
- Front cover
- Mating surface between cylinder head and camshaft bracket
- 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 get burned, as engine oil may be hot.
- When checking engine oil pressure, shift position should be "Neutral", and apply parking brake securely.

1. Check engine oil level. Refer to LU-6, "Inspection".

# ENGINE OIL

## < ON-VEHICLE MAINTENANCE >

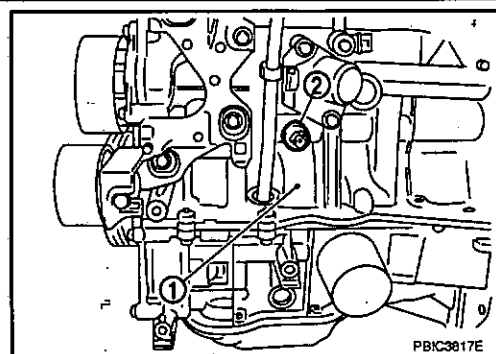
[HR16DE]

2. Disconnect harness connector at oil pressure switch (2), and remove oil pressure switch using a deep socket (commercial service tool).

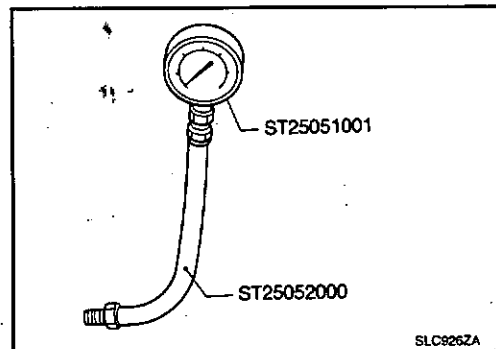
1 : Cylinder block

### CAUTION:

**Never drop or shock oil pressure switch.**



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



4. Start engine and warm it up to normal operating temperature.
5. Check oil pressure with engine running under no-load.

### NOTE:

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

**Engine oil pressure** : Refer to LU-10, "Engine Oil Pressure".

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

6. After the inspections, install oil pressure switch as follows:
  - a. Remove old liquid gasket adhering to oil pressure switch and engine.
  - b. Apply liquid gasket and tighten oil pressure switch to specification.  
**Use Genuine Liquid Gasket or equivalent.**

**Tightening torque** : Refer to EM-94, "Exploded View".

- c. Check engine oil level. Refer to LU-6, "Inspection".
- d. After warming up engine, check there is no leaks of engine oil with running engine.

## Draining

INFOID:0000000004899396

### WARNING:

- Be careful not to get burned, 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.

1. Warm up the engine, and check for engine oil leakage from engine components. Refer to LU-6, "Inspection".
2. Stop the engine and wait for 10 minutes.
3. Loosen oil filler cap.
4. Remove drain plug and then drain engine oil.

## Refilling

INFOID:0000000004899397

1. Install drain plug with new washer. Refer to EM-41, "Exploded View".

**CAUTION:**

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

**Tightening torque** : Refer to EM-41, "Exploded View".

2. Refill with new engine oil.

**Engine oil specification and viscosity:** Refer to MA-13, "Fluids and Lubricants".

**Engine oil capacity** : Refer to LU-10, "Periodical Maintenance Specification".

**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.

3. Warm up engine and check area around drain plug and oil filter for engine oil leakage.
4. Stop engine and wait for 10 minutes.
5. Check the engine oil level. Refer to LU-6, "Inspection".



## OIL FILTER

## Removal and Installation

INFOID:0000000004899398

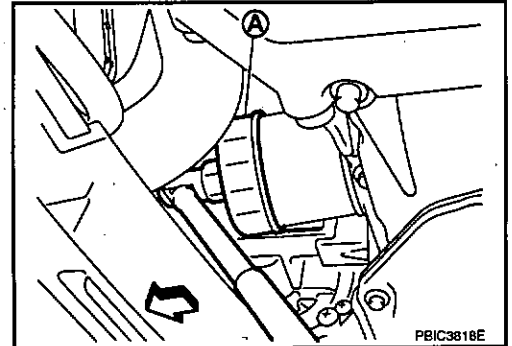
## REMOVAL

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

↩ : Vehicle front

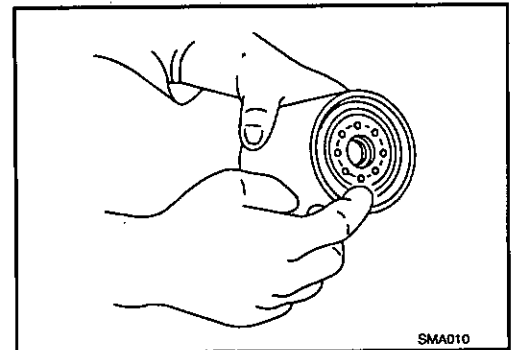
## CAUTION:

- 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.
- Completely wipe off any engine oil that adheres to engine and vehicle.




## INSTALLATION

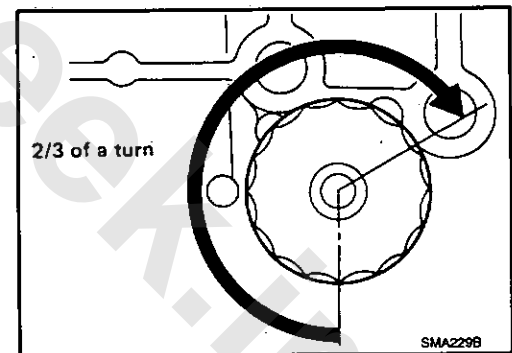
- Remove foreign materials adhering to the oil filter installation surface.
- Apply new engine oil to the oil seal contact surface of new oil filter.



- 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

INFOID:0000000004899399

## INSPECTION AFTER INSTALLATION

- Check the engine oil level. Refer to LU-6, "Inspection".
- Start the engine, and check there is no leak of engine oil.
- Stop the engine and wait for 10 minutes.
- Check the engine oil level, and adjust the level. Refer to LU-6, "Inspection".

## SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[HR16DE]

## SERVICE DATA AND SPECIFICATIONS (SDS)

### SERVICE DATA AND SPECIFICATIONS (SDS)

#### Periodical Maintenance Specification

INFOID:0000000004899400

#### ENGINE OIL CAPACITY (APPROXIMATE)

Unit: ℓ (Imp qt)

Drain and refill	With oil filter change	4.3 (3-3/4)
	Without oil filter change	4.1 (3-5/8)
Dry engine (Overhaul)		4.8 (4-1/4)

#### Engine Oil Pressure

INFOID:0000000004899401

Engine speed (rpm)	Approximate discharge pressure* [kPa (bar, kg/cm <sup>2</sup> , psi)]
Idle speed	More than 60 (0.60, 0.61, 9)
2,000	More than 270 (2.7, 2.8, 39)

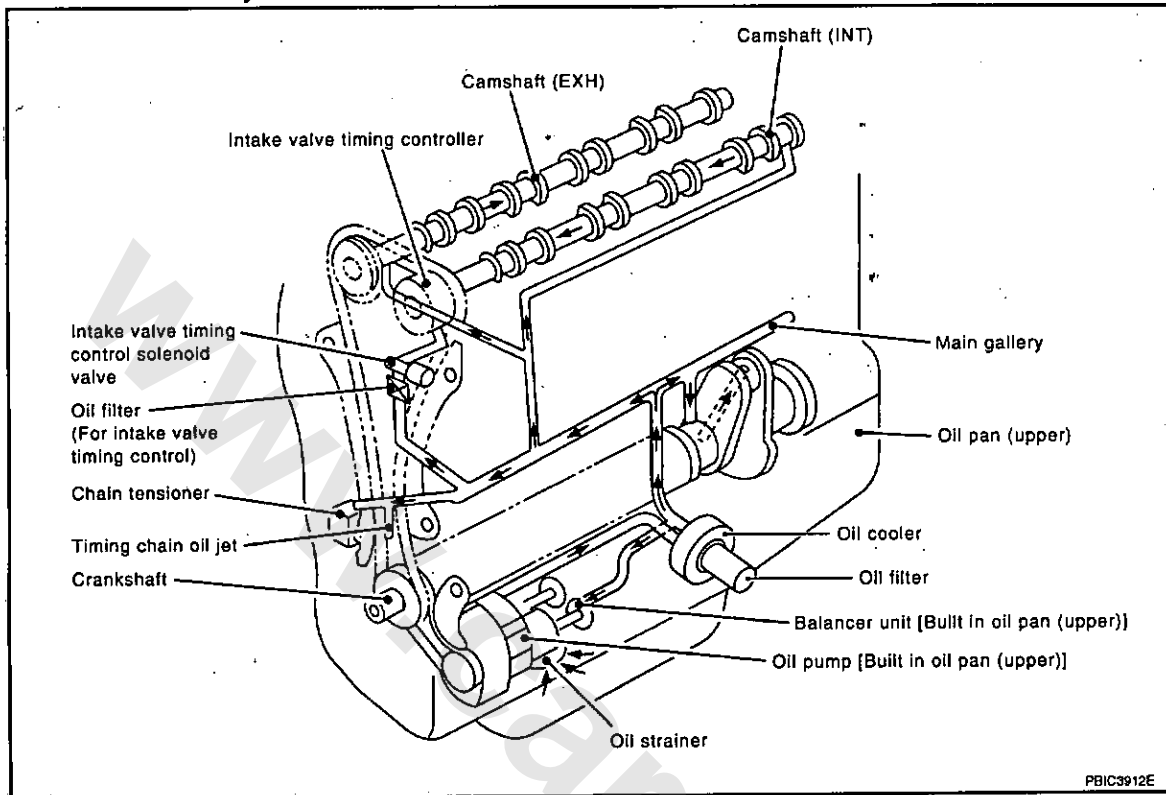
\*: Engine oil temperature at 80°C (176°F)

# FUNCTION DIAGNOSIS

## DESCRIPTION

### Engine Lubrication System

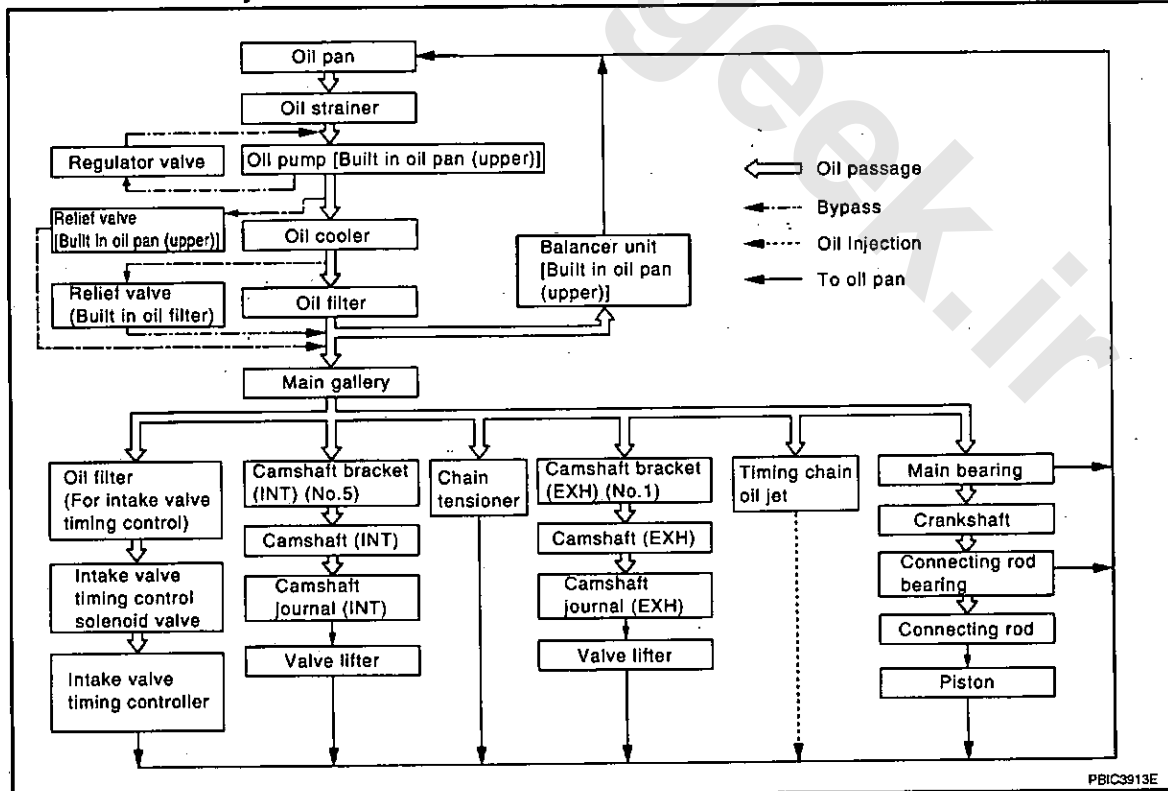
INFOID:000000004899402



PBIC3912E

### Engine Lubrication System Schematic

INFOID:000000004899403



PBIC3913E

## PRECAUTION

### PRECAUTIONS

#### Liquid Gasket

INFOID:0000000004899404

#### LIQUID GASKET APPLICATION PROCEDURE

1. Remove old liquid gasket adhering to the liquid gasket application surface and the mating surface.
  - Remove liquid gasket completely from the liquid gasket application surface, mounting bolts, and bolt holes.
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. Apply liquid gasket to the liquid gasket application surface.  
**Use Genuine liquid gasket or equivalent.**
  - Within five 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.

# PREPARATION

< PREPARATION >

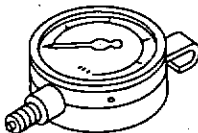
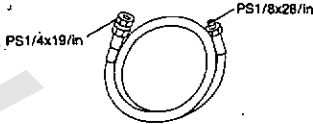
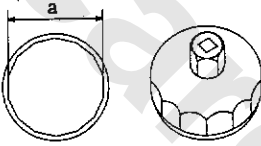
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## PREPARATION

### PREPARATION

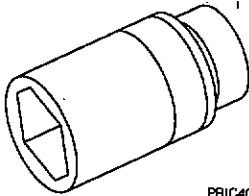
#### Special Service Tools

INFOID:0000000004899405

Tool number Tool name	Description
ST25051001 Oil pressure gauge	Measuring oil pressure <b>Maximum measuring range:</b> 2,452 kPa (24.52 bar, 25 kg-cm <sup>2</sup> , 356 psi)
 NT050	
ST25052000 Hose	Adapting oil pressure gauge to cylinder block
 S-NT559	
KV10115801 Oil filter wrench	Removing and installing oil filter <b>a: 64.3 mm (2.531 in)</b>
 S-NT375	

#### Commercial Service Tools

INFOID:0000000004899406

Tool name	Description
Deep socket	Removing and installing oil pressure switch <b>a: 27 mm (1.06 in)</b>
 PBIC4066E	

## ON-VEHICLE MAINTENANCE

## ENGINE OIL

## Inspection

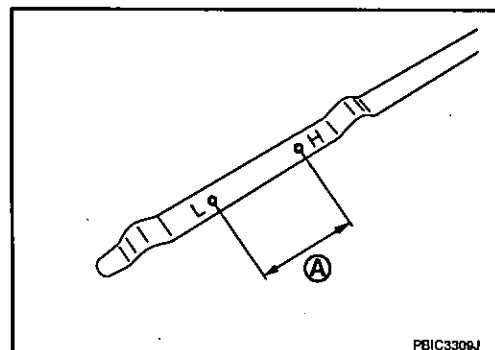
INFOID:000000004899407

## ENGINE OIL LEVEL

**NOTE:**

Before starting engine, put vehicle horizontally and check the engine oil level. If engine is already started, stop it and allow 10 minutes before checking.

1. Pull out oil level gauge and wipe it clean.
2. Insert oil level gauge and check the engine oil level is within the range (A) shown in the figure.
3. If it is out of range, adjust it.



## ENGINE OIL APPEARANCE

- Check engine oil for white turbidity or heavy contamination.
- If engine oil becomes turbid and white, it is highly probable that it is contaminated with engine coolant. Repair or replace damaged parts.

## 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 level sensor
- Oil filter
- Oil cooler
- Intake valve timing control solenoid valve
- Front cover
- Mating surface between cylinder head and camshaft bracket
- Mating surface between cylinder block and cylinder head
- Mating surface between cylinder head and rocker cover
- Crankshaft oil seals (front and rear)

## OIL PRESSURE CHECK

**WARNING:**

- Be careful not to get burned, as engine oil may be hot.
- When checking engine oil pressure, shift position should be "Parking" (CVT models) or "Neutral" (M/T models), and apply parking brake securely.

1. Check engine oil level. Refer to LU-14, "Inspection".

# ENGINE OIL

## < ON-VEHICLE MAINTENANCE >

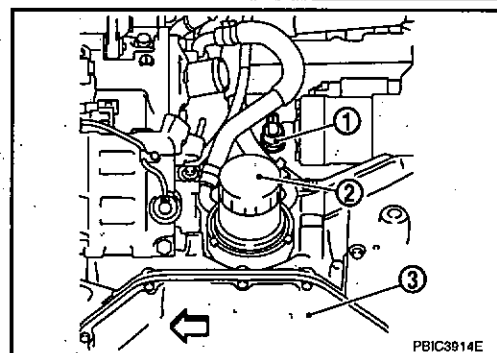
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2. Disconnect harness connector at oil pressure switch (1), and remove oil pressure switch using a deep socket (commercial service tool).

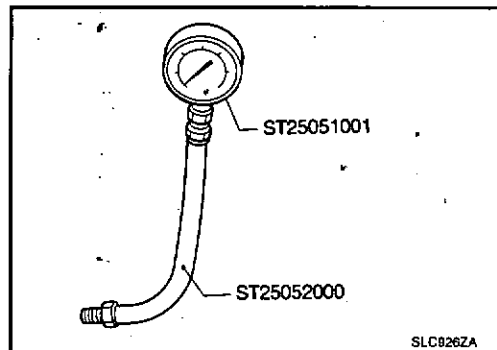
- 2 : Oil filter
- 3 : Oil pan (lower)
- ⇐ : Engine front

### CAUTION:

**Never drop or shock oil pressure switch.**



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



4. Start engine and warm it up to normal operating temperature.
5. Check oil pressure with engine running under no-load.

### NOTE:

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

**Engine oil pressure** : Refer to LU-20, "Engine Oil Pressure".

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

6. After the inspections, install oil pressure switch as follows:
  - a. Remove old liquid gasket adhering to oil pressure switch and engine.
  - b. Apply liquid gasket and tighten oil pressure switch to specification.  
**Use Genuine Liquid Gasket or equivalent.**

**Tightening torque** : Refer to EM-212, "Exploded View".

- c. Check engine oil level. Refer to LU-14, "Inspection".
- d. After warming up engine, check there is no leaks of engine oil with running engine.

## Draining

INFOID:0000000004899406

### WARNING:

- Be careful not to get burned, 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.

1. Warm up the engine, and check for engine oil leakage from engine components. Refer to LU-14, "Inspection".
2. Stop the engine and wait for 10 minutes.
3. Loosen oil filler cap.
4. Remove drain plug and then drain engine oil.

## Refilling

INFOID:0000000004899409

1. Install drain plug with new washer. Refer to EM-154, "Exploded View".

**CAUTION:**

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

Tightening torque : Refer to EM-154, "Exploded View".

2. Refill with new engine oil.

Engine oil specification and viscosity: Refer to MA-13, "Fluids and Lubricants".

Engine oil capacity : Refer to LU-20, "Periodical Maintenance Specification".

**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.
3. Warm up engine and check area around drain plug and oil filter for engine oil leakage.
  4. Stop engine and wait for 10 minutes.
  5. Check the engine oil level. Refer to LU-14, "Inspection".



## OIL FILTER

## Removal and Installation

INFOID:0000000004899410

## REMOVAL

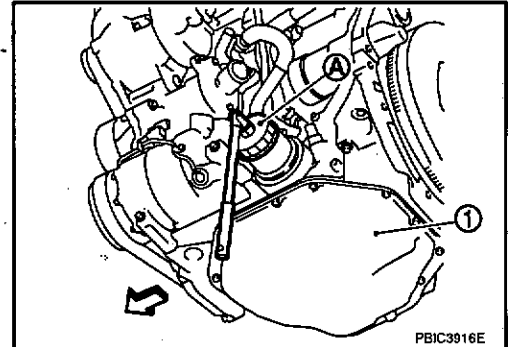
- Using oil filter wrench [SST: KV10115801] (A), remove oil filter.

1 : Oil pan (lower)

↔ : Vehicle front

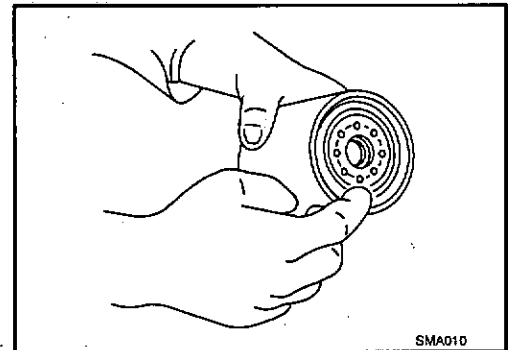
## CAUTION:

- 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.
- Completely wipe off any engine oil that adheres to engine and vehicle.



## INSTALLATION

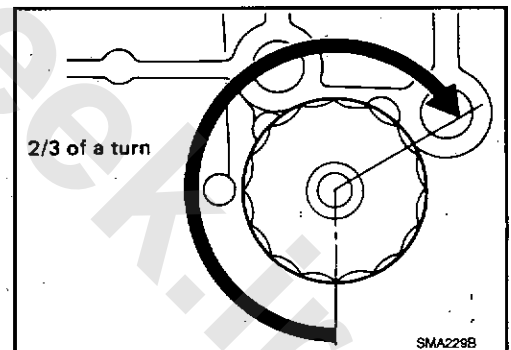
- Remove foreign materials adhering to the oil filter installation surface.
- Apply new engine oil to the oil seal contact surface of new oil filter.



- 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

INFOID:0000000004899411

## INSPECTION AFTER INSTALLATION

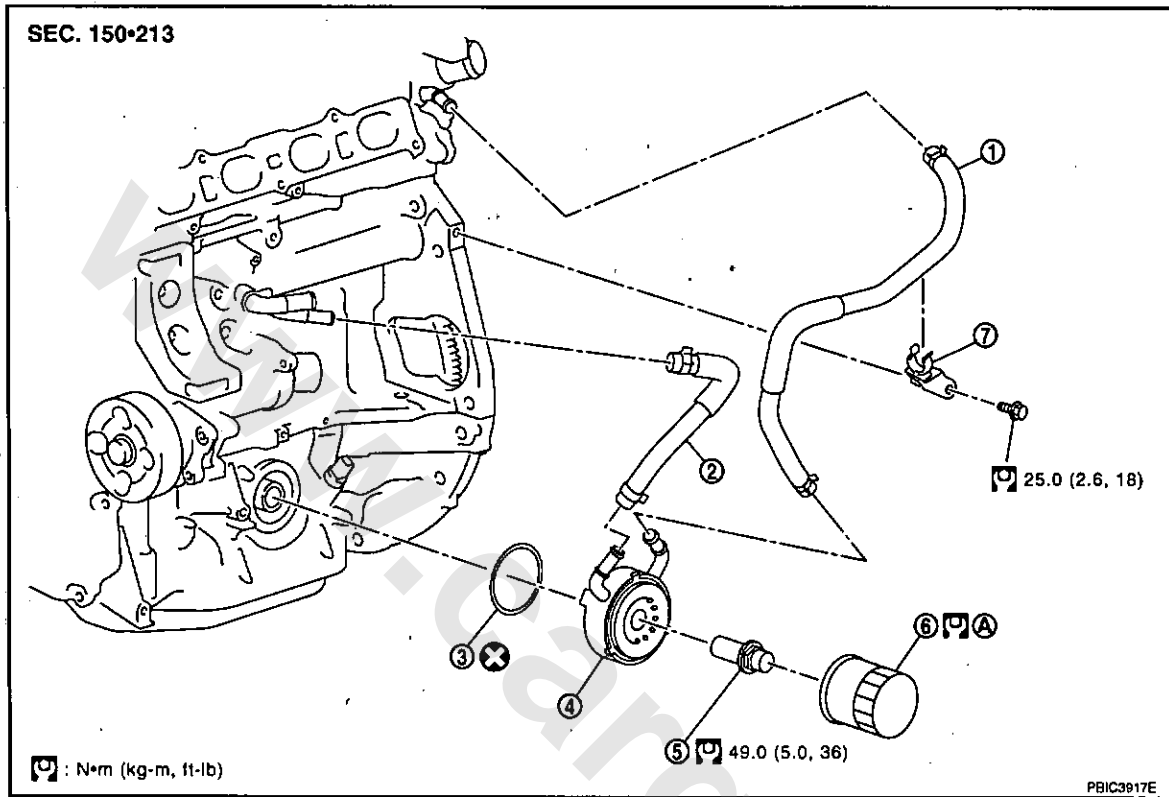
- Check the engine oil level. Refer to LU-14, "Inspection".
- Start the engine, and check there is no leak of engine oil.
- Stop the engine and wait for 10 minutes.
- Check the engine oil level, and adjust the level. Refer to LU-14, "Inspection".

## ON-VEHICLE REPAIR

## OIL COOLER

## Exploded View

INFOID:000000004899412



- |                   |                   |               |
|-------------------|-------------------|---------------|
| 1. Water hose     | 2. Water hose     | 3. O-ring     |
| 4. Oil cooler     | 5. Connector bolt | 6. Oil filter |
| 7. Bracket        |                   |               |
| A. Refer to LU-17 |                   |               |

Refer to GI-3, "Components" for symbol marks in the figure.

## Removal and Installation

INFOID:000000004899413

## REMOVAL

**WARNING:**

**Be careful not to get burn yourself, as engine oil and engine coolant may be hot.**

1. Drain engine coolant from radiator and cylinder block. Refer to CO-30, "Draining" and EM-213, "Disassembly and Assembly".
2. Using oil filter wrench [SST: KV10115801], remove oil filter. Refer to LU-17, "Removal and Installation".
3. Disconnect water hoses from oil cooler.
  - When removing oil cooler only, pinching water hoses near oil cooler to prevent engine coolant from spilling out.
  - Remaining engine coolant in piping will come out. Use a tray to collect it.

**CAUTION:**

**Perform this step when the engine is cold.**

4. Remove connector bolt, and remove oil cooler.

**NOTE:**

For reference when installing, put a matching mark on oil cooler and oil pan (upper).

## INSTALLATION

## OIL COOLER

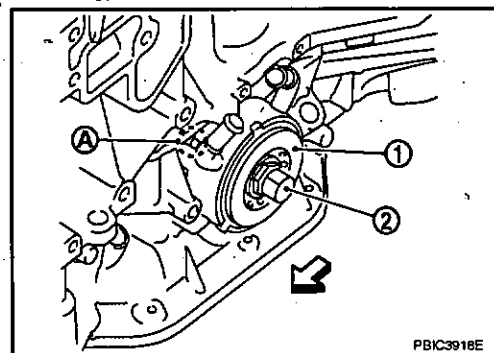
### < ON-VEHICLE REPAIR >

[MR20DE]

Installation in the reverse order of removal.

- Tighten the connecting bolt (2) after aligning the stopper (A) on the oil pan (upper) side with protrusion of oil cooler (1).

↩ : Engine front



### Inspection

INFOID:0000000004899414

#### INSPECTION AFTER REMOVAL

##### Oil Cooler

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

#### INSPECTION AFTER INSTALLATION

1. Check the engine oil level and the engine coolant level and add engine oil and engine coolant. Refer to LU-14, "Inspection" and CO-30, "Inspection".
2. Start the engine, and check there is no leaks of engine oil or engine coolant.
3. Stop the engine and wait for 10 minutes.
4. Check the engine oil level and the engine coolant level again. Refer to LU-14, "Inspection" and CO-30, "Inspection".

## SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[MR20DE]

## SERVICE DATA AND SPECIFICATIONS (SDS)

### SERVICE DATA AND SPECIFICATIONS (SDS)

#### Periodical Maintenance Specification

INFOID:0000000004899415

#### ENGINE OIL CAPACITY (APPROXIMATE)

Unit: ℓ (Imp qt)

Drain and refill	With oil filter change	4.4 (3-7/8)
	Without oil filter change	4.2 (3-3/4)
Dry engine (Overhaul)		5.2 (4-5/8)

#### Engine Oil Pressure

INFOID:0000000004899416

Engine speed (rpm)	Approximate discharge pressure* [kPa (bar, kg/cm <sup>2</sup> , psi)]
Idle speed	More than 80 (0.80, 0.8, 12)
2,000	More than 450 (4.50, 4.6, 65)

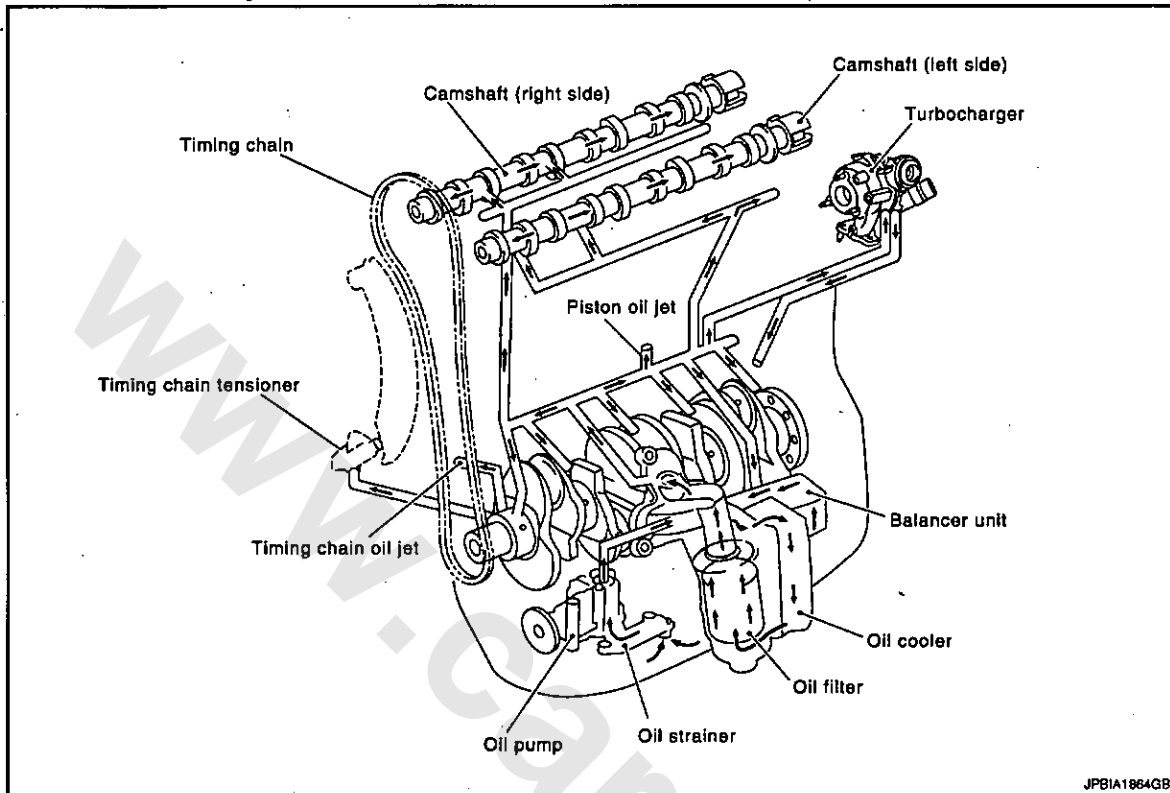
\*: Engine oil temperature at 80°C (176°F)

## FUNCTION DIAGNOSIS

## DESCRIPTION

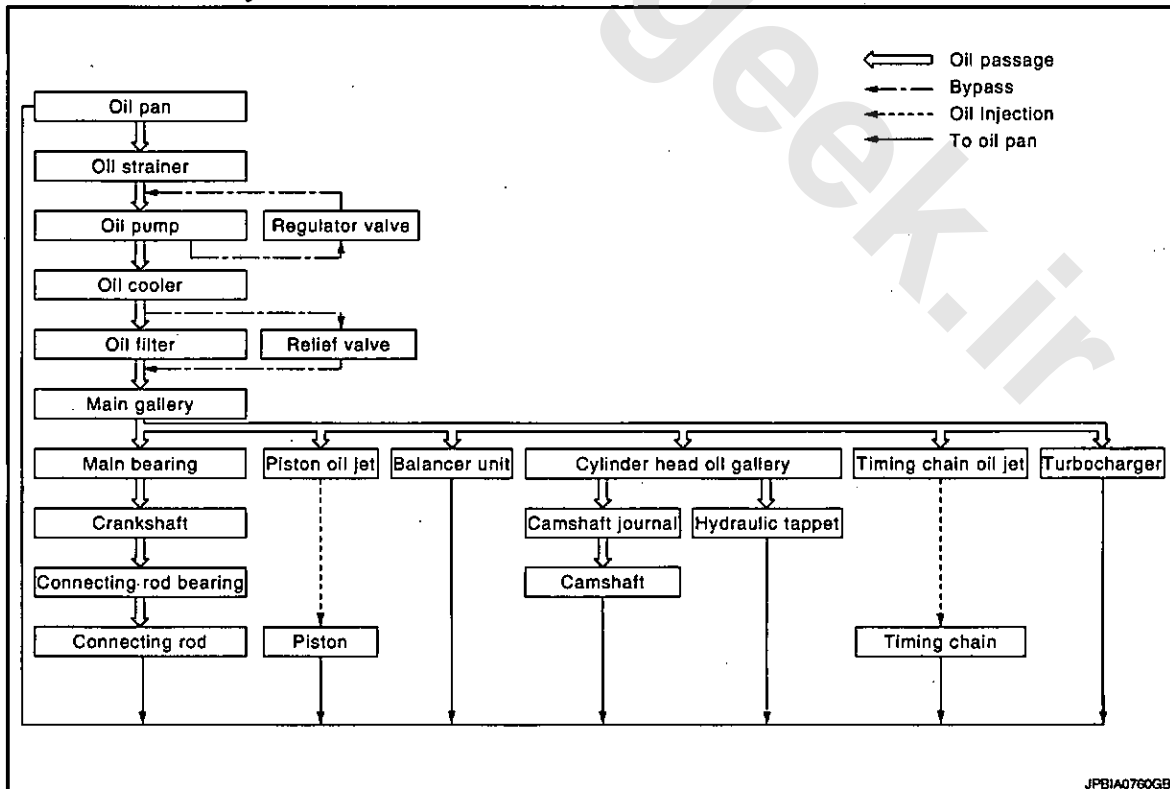
## Engine Lubrication System

INFOID:000000004899417



## Engine Lubrication System Schematic

INFOID:000000004899418



# PREPARATION

< PREPARATION >

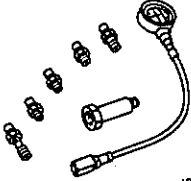
[M9R]

## PREPARATION

### PREPARATION

#### Special Service Tools

INFOID:0000000004899419

NISSAN tool number (RENAULT tool number) Tool name	Description
KV113E0020 (Mot.836-05) Oil pressure gauge set  JPB/A0949ZZ	Measuring oil pressure

## ON-VEHICLE MAINTENANCE

## ENGINE OIL

## Inspection

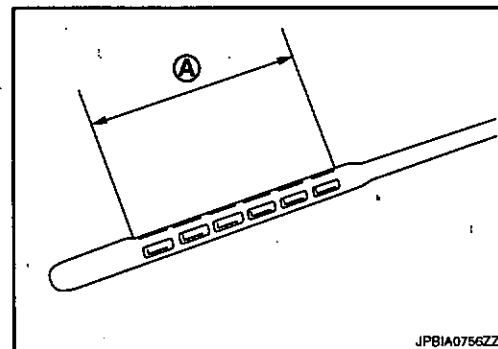
INFOID:000000004899420

## ENGINE OIL LEVEL

**NOTE:**

Before starting engine, put vehicle horizontally and check that the engine oil level. If engine is already started, stop it and allow 10 minutes before checking.

1. Pull out oil level gauge and wipe it clean.
2. Insert oil level gauge and check that the engine oil level is within the range (A) shown in the figure.
3. If it is out of range, adjust it.



## ENGINE OIL APPEARANCE

- Check that engine oil for white turbidity or heavy contamination.
- If engine oil becomes turbid and white, it is highly probable that it is contaminated with engine coolant. Repair or replace damaged parts.

## 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 level sensor
- Oil filter body
- Oil cooler
- Fuel pump
- Vacuum pump
- Turbocharger
- Crankshaft position sensor
- Camshaft position sensor
- Front cover
- Mating surface between cylinder head and cylinder head housing
- Mating surface between cylinder block and cylinder head
- Mating surface between cylinder head housing and oil separator
- Front oil seal
- Rear oil seal retainer

## OIL PRESSURE CHECK

**WARNING:**

- Be careful not to get burned, as engine oil may be hot.
- When checking engine oil pressure, shift position should be "Parking" (A/T models) or "Neutral" (M/T models), and apply parking brake securely.

1. Check engine oil level. Refer to LU-23, "Inspection".
2. Disconnect harness connector at oil pressure switch, and remove oil pressure switch using a deep socket.

**CAUTION:**

Handle oil pressure switch carefully and avoid impacts.

3. Install oil pressure gauge set [SST:KV113E0020 (Mot.836-05)].
4. Start engine and warm it up to normal operating temperature.

# ENGINE OIL

## < ON-VEHICLE MAINTENANCE >

[M9R]

5. Check oil pressure with engine running under no-load.

**NOTE:**

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

**Engine oil pressure** : Refer to LU-29, "Engine Oil Pressure".

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

6. After the inspections, install oil pressure switch with the following procedure:
  - a. Tighten oil pressure switch to specification.

**Tightening torque** : Refer to LU-27, "Exploded View".

- b. Check engine oil level. Refer to LU-23, "Inspection".
- c. After warming up engine, check that there is no leakage of engine oil with running engine.

## Draining

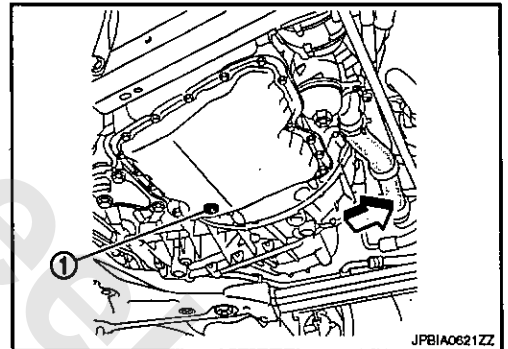
INFOID:0000000004899421

**WARNING:**

- Be careful not to get burned, 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.

1. Warm up the engine, and check for engine oil leakage from engine components. Refer to LU-23, "Inspection".
2. Stop the engine and wait for 10 minutes.
3. Remove engine undercover.
4. Loosen oil level gauge.
5. Remove oil pan drain plug (1) using a square driver [8 mm (0.315 in)]. Drain engine oil.

↶ : Vehicle front



## Refilling

INFOID:0000000004899422

1. Install drain plug with new washer.

**CAUTION:**

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

**Tightening torque** : Refer to EM-282, "Exploded View".

2. Refill with new engine oil.  
**Engine oil specification and viscosity:** Refer to MA-13, "Fluids and Lubricants".

**Engine oil capacity** : Refer to LU-29, "Periodical Maintenance Specification".

**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.
3. Warm up engine and check area around drain plug and oil filter body for engine oil leakage.
  4. Stop engine and wait for 10 minutes.
  5. Check the engine oil level. Refer to LU-23, "Inspection".



## OIL FILTER

## Removal and Installation

INFOID:0000000004899423

## REMOVAL

**WARNING:**

Be careful not to get burned when engine and engine oil may be hot.

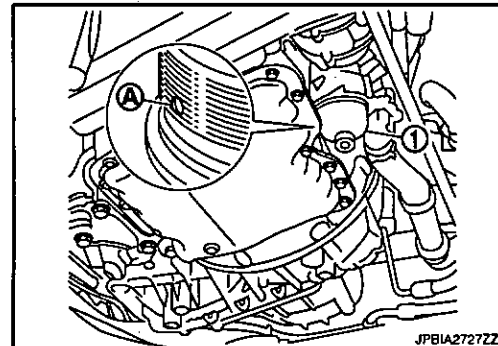
**CAUTION:**

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

1. Remove engine undercover.
2. Loosen oil filter body (1) using a socket [27 mm (1.06 in)].
  - Loosen oil filter body until orifice (A) of the oil filter body is exposed, and then drain engine oil.
  - Catch the engine oil drip, using a tray or waste.

**CAUTION:**

Completely wipe clean any engine oil remaining on oil filter body or vehicle.



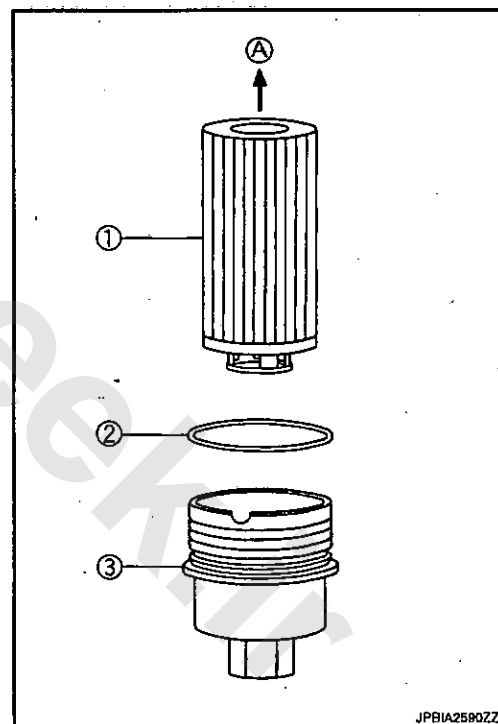
3. Remove oil filter body (3), and then remove oil filter (1) and O-ring (2).

A : Oil cooler side

- Push the O-ring in the one direction by hand, and then pick a pushed out-part with fingers to remove the O-ring.

**CAUTION:**

Never use wires or screwdrivers to prevent the oil filter body from damage.



## INSTALLATION

1. Completely remove all foreign objects adhering to the inside of oil filter body or O-ring mounting area.

## OIL FILTER

### < ON-VEHICLE MAINTENANCE >

[M9R]

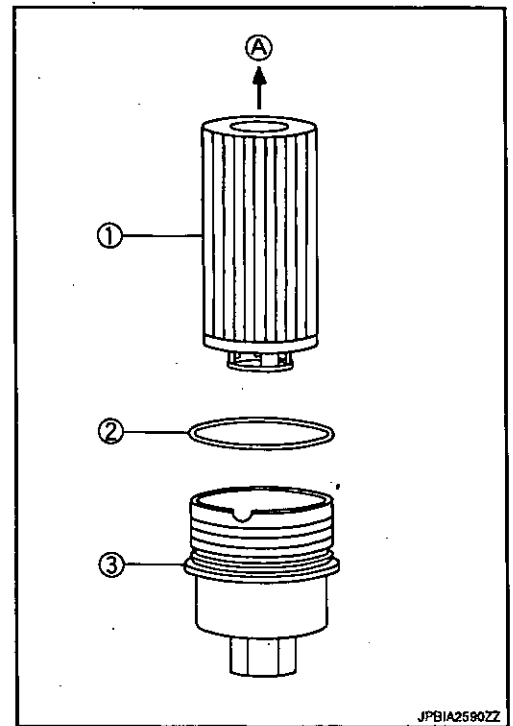
2. Install oil filter (1) and O-ring (2) to oil filter body (3).

A : Oil cooler side

#### CAUTION:

**Be sure to use a new O-ring.**

- Securely press the oil filter into the oil filter body.
- When installing an O-ring, apply engine oil all around the O-ring.



3. Install oil filter body assembly to oil cooler.

**Tightening torque: Refer to LU-27, "Exploded View".**

### Inspection

INFOID:000000004899424

#### INSPECTION AFTER INSTALLATION

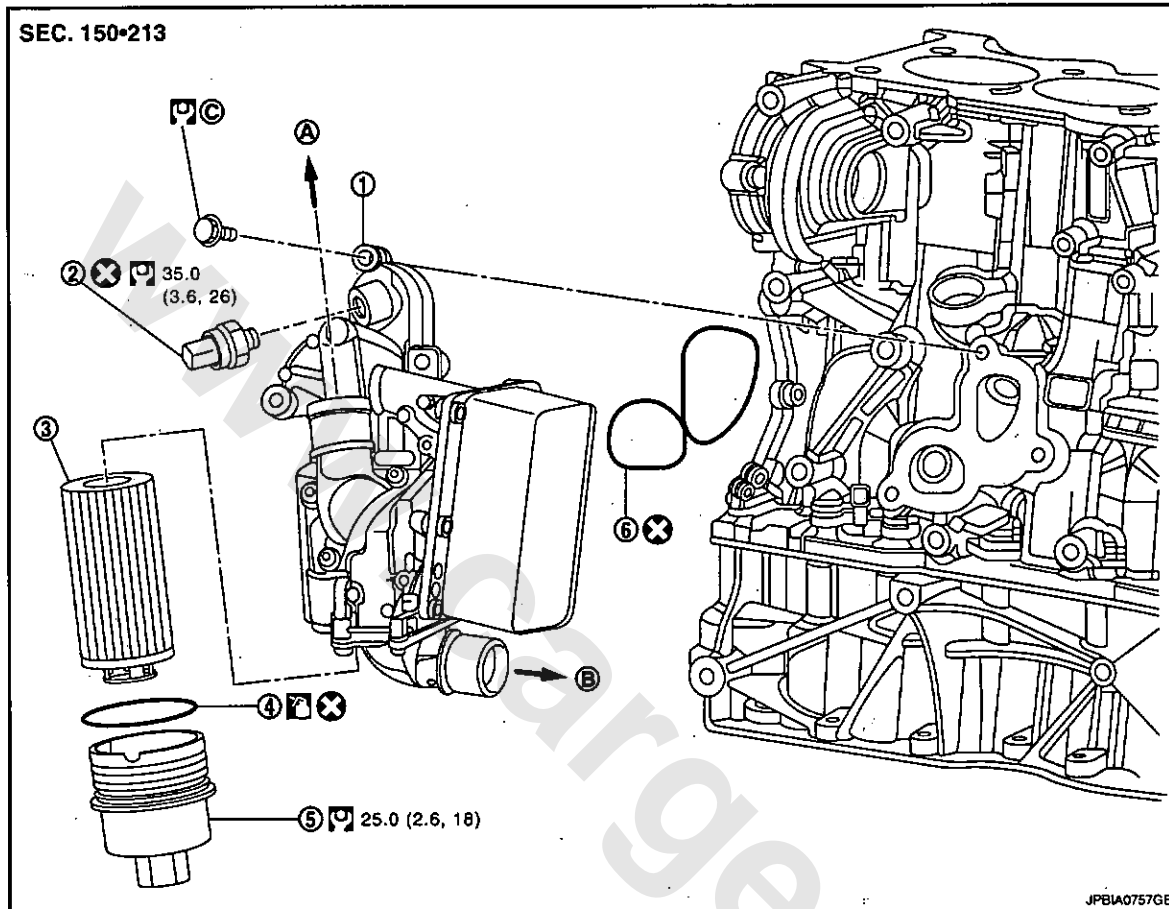
1. Check that the engine oil level. Refer to LU-23, "Inspection".
2. Start the engine, and check that there is no leak of engine oil.
3. Stop the engine and wait for 10 minutes.
4. Check that the engine oil level, and adjust the level. Refer to LU-23, "Inspection".

## ON-VEHICLE REPAIR

## OIL COOLER

## Exploded View

INFOID:000000004899425



- |                          |                        |                   |
|--------------------------|------------------------|-------------------|
| 1. Oil cooler            | 2. Oil pressure switch | 3. Oil filter     |
| 4. O-ring                | 5. Oil filter body     | 6. Gasket         |
| A. To water suction pipe | B. To radiator         | C. Refer to LU-27 |

Refer to GI-3, "Components" for symbols in the figure.

## Removal and Installation

INFOID:000000004899426

## REMOVAL

**WARNING:**

**Be careful not to get burn yourself, as engine oil and engine coolant may be hot.**

1. Drain engine coolant from radiator. Refer to CO-53, "Draining".

**CAUTION:**

**Perform this step when the engine is cold.**

2. Disconnect water hose and radiator hose (lower). Refer to CO-61, "Exploded View" and CO-57, "Exploded View".

**CAUTION:**

**Never adhere the engine coolant to electronic equipments. (alternator etc.)**

3. Remove oil pressure switch, if necessary.

**CAUTION:**

**Handle oil pressure switch carefully and avoid impacts.**

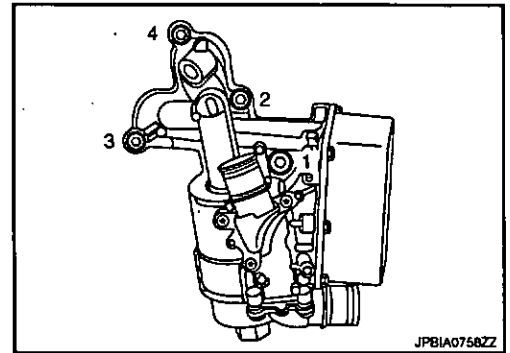
4. Remove oil cooler.

# OIL COOLER

## < ON-VEHICLE REPAIR >

[M9R]

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




## INSTALLATION

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


### Oil Cooler

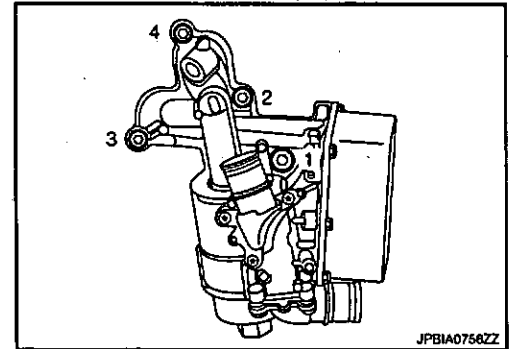
- Tighten mounting bolts in the following steps in numerical order as shown in the figure.

1. Tighten mounting bolts No.2 and 4.

: 5.0 N·m (0.51 kg-m, 4 ft-lb)

2. Tighten all mounting bolts.

: 25.0 N·m (2.6 kg-m, 18 ft-lb)



## Inspection

INFOID:000000004899427

## INSPECTION AFTER REMOVAL

### Oil Cooler

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

## INSPECTION AFTER INSTALLATION

1. Check that the engine oil level and the engine coolant level and add engine oil and engine coolant. Refer to LU-23, "Inspection" and CO-53, "Inspection".
2. Start the engine, and check that there is no leakage of engine oil or engine coolant.
3. Stop the engine and wait for 10 minutes.
4. Check that the engine oil level and the engine coolant level again. Refer to LU-23, "Inspection" and CO-53, "Draining".

# SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[M9R]

## SERVICE DATA AND SPECIFICATIONS (SDS)

### SERVICE DATA AND SPECIFICATIONS (SDS)

#### Periodical Maintenance Specification

INFOID:0000000004899428

#### ENGINE OIL CAPACITY (APPROXIMATE)

Unit: ℓ (Imp qt)

Drain and refill	With oil filter change	7.4 (6-1/2)
	Without oil filter change	7.0 (6-1/8)
Dry engine (Overhaul)		8.4 (7-3/8)

#### Engine Oil Pressure

INFOID:0000000004899429

Unit: kPa (bar, kg/cm<sup>2</sup>, psi)

Engine speed	Approximate discharge pressure*
Idle speed	More than 88 (0.9, 0.9, 13)
3,000 rpm	More than 402 (4, 4.1, 58)

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