

SECTION

LU

ENGINE LUBRICATION SYSTEM

CONTENTS

HR16DE	FUNCTION DIAGNOSIS	11	F
FUNCTION DIAGNOSIS	LUBRICATION SYSTEM	11	G
DESCRIPTION	Lubrication Circuit	11	
Engine Lubrication System	PRECAUTION	12	
Engine Lubrication System Schematic	PRECAUTIONS	12	H
PRECAUTION	Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"	12	I
PRECAUTIONS	Precaution for Liquid Gasket	12	
Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"	PREPARATION	13	J
Liquid Gasket	PREPARATION	13	
PREPARATION	Special Service Tool	13	K
PREPARATION	Commercial Service Tool	13	
Special Service Tools	ON-VEHICLE MAINTENANCE	15	L
Commercial Service Tools	ENGINE OIL	15	
ON-VEHICLE MAINTENANCE	Inspection	15	M
ENGINE OIL	Changing Engine Oil	16	
Inspection	OIL FILTER	18	N
Draining	Removal and Installation	18	
Refilling	ON-VEHICLE REPAIR	19	O
OIL FILTER	OIL COOLER	19	P
Removal and Installation	Components	19	
Inspection	Removal and Installation	19	
SERVICE DATA AND SPECIFICATIONS (SDS)	OIL PUMP	20	
SERVICE DATA AND SPECIFICATIONS (SDS)	Components	20	
Periodical Maintenance Specification	Removal and Installation	20	
Engine Oil Pressure	SERVICE DATA AND SPECIFICATIONS (SDS)	22	
MR18DE	SERVICE DATA AND SPECIFICATIONS (SDS)	22	

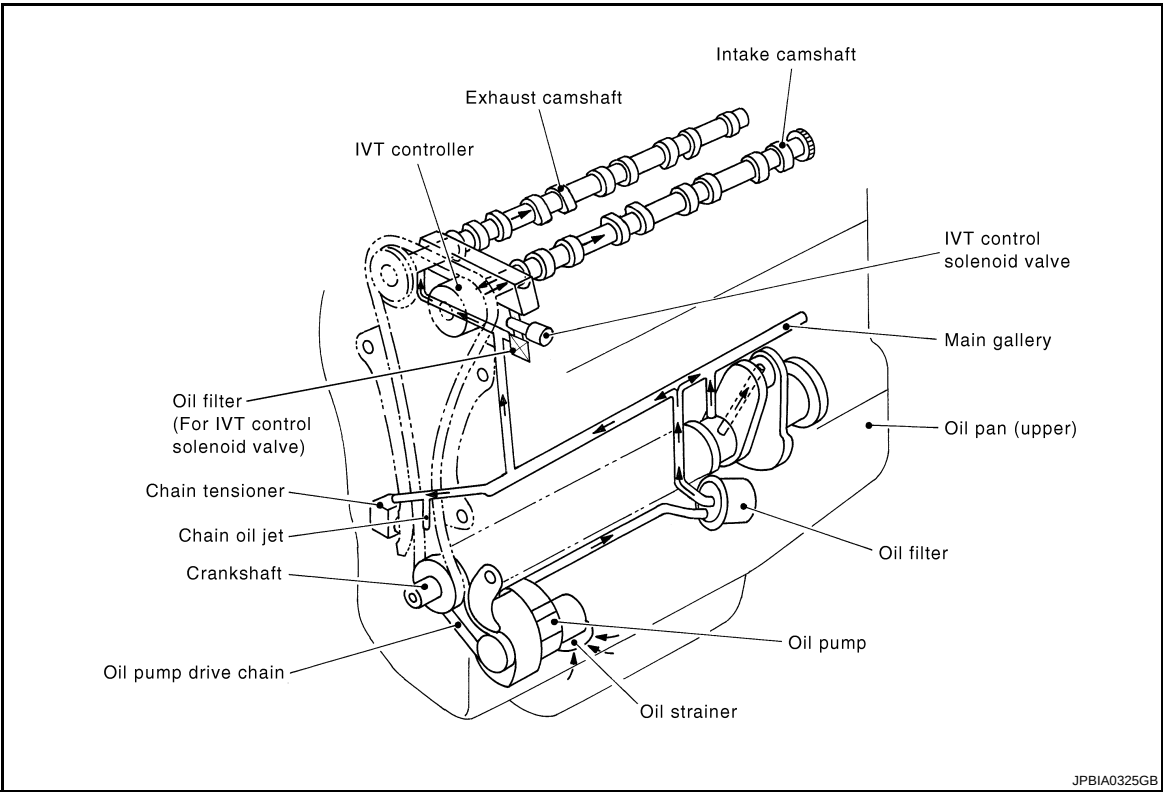
Standard and Limit	22	Replacement	28
K9K			
PRECAUTION	23	ON-VEHICLE REPAIR	29
PRECAUTIONS	23	OIL FILTER BRACKET	29
Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TEN- SIONER"	23	Exploded View	29
Precaution for Liquid Gasket	23	Removal and Installation	29
PREPARATION	25	OIL COOLER	30
PREPARATION	25	Exploded View	30
Special Service Tools	25	Removal and Installation	30
Commercial Service Tools	25	Inspection	31
ON-VEHICLE MAINTENANCE	26	OIL PUMP	32
ENGINE OIL	26	Exploded View	32
Inspection	26	Removal and Installation	32
Draining	27	SERVICE DATA AND SPECIFICATIONS	
Refilling	27	(SDS)	33
OIL FILTER	28	SERVICE DATA AND SPECIFICATIONS	
		(SDS)	33
		Periodical Maintenance Specification	33
		Engine Oil Pressure	33

FUNCTION DIAGNOSIS

DESCRIPTION

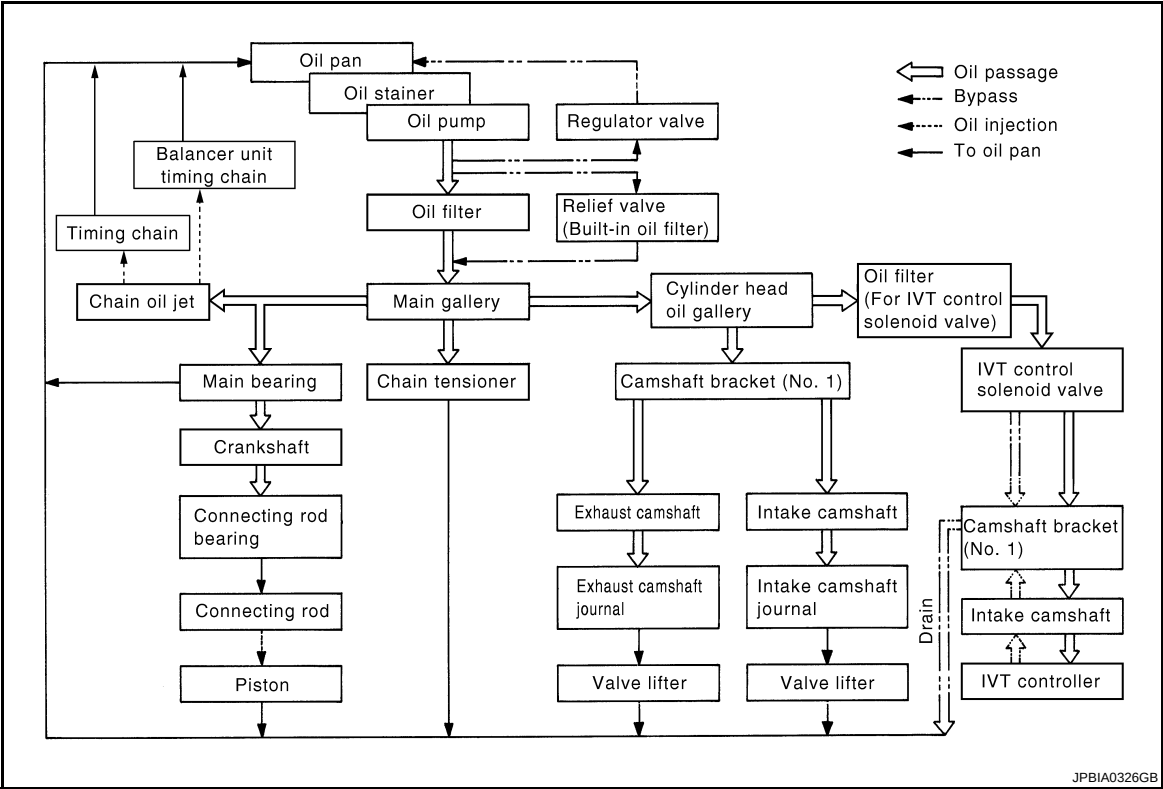
Engine Lubrication System

INFOID:000000001381522



Engine Lubrication System Schematic

INFOID:000000001381523



PRECAUTION

PRECAUTIONS

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

INFOID:000000001516581

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

Liquid Gasket

INFOID:000000001381524

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

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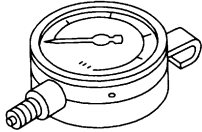
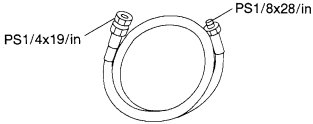
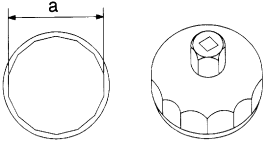
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PREPARATION

PREPARATION

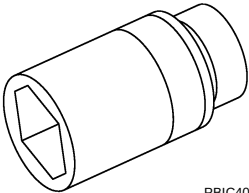
Special Service Tools

INFOID:000000001381525

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

Commercial Service Tools

INFOID:000000001381526

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

ON-VEHICLE MAINTENANCE

ENGINE OIL

Inspection

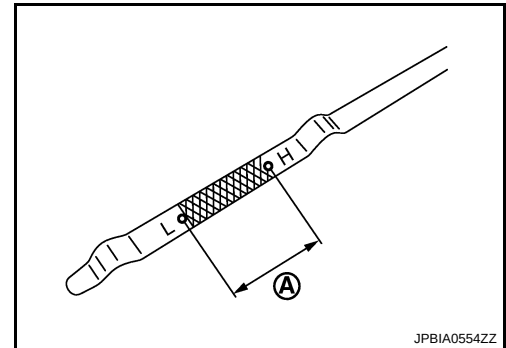
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ENGINE OIL LEVEL

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 make sure the engine oil level is within the range (A) shown in the figure.
3. If it is out of range, adjust it.



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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

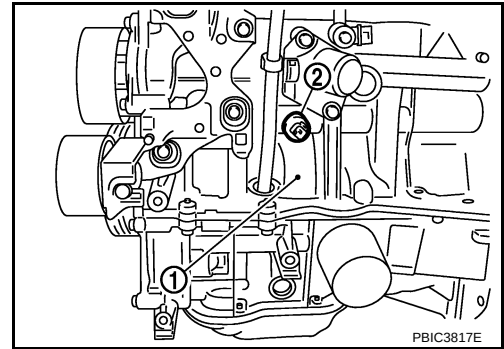
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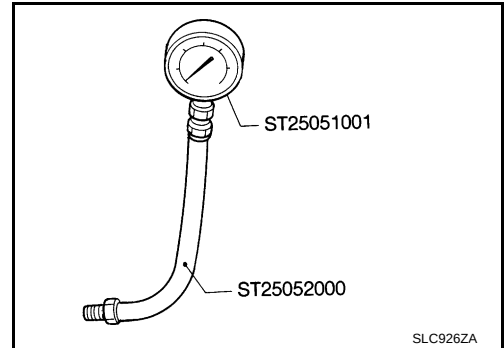
2. Disconnect harness connector at oil pressure switch (2), and remove oil pressure switch (2) from the cylinder block (1) using a deep socket (commercial service tool).

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.

Oil pressure switch : Refer to [EM-100, "Exploded View"](#).

- c. Check engine oil level. Refer to [LU-6, "Inspection"](#).
- d. After warming up engine, make sure there is no leaks of engine oil with running engine.

Draining

INFOID:000000001381528

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

1. Install drain plug with new washer. Refer to [EM-100, "Exploded View"](#).

CAUTION:

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

Drain plug : Refer to [EM-100, "Exploded View"](#).

2. Refill with new engine oil.
Engine oil specification and viscosity: Refer to [MA-19, "Fluids and Lubricants"](#).
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

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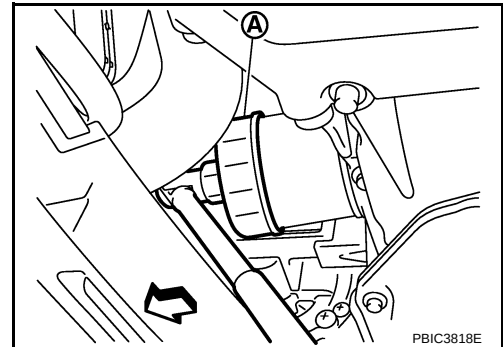
REMOVAL

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

↩ : Vehicle front

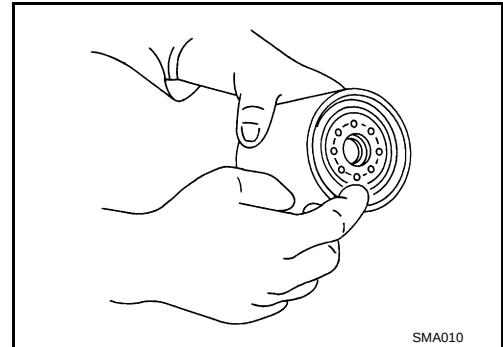
CAUTION:

- 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.



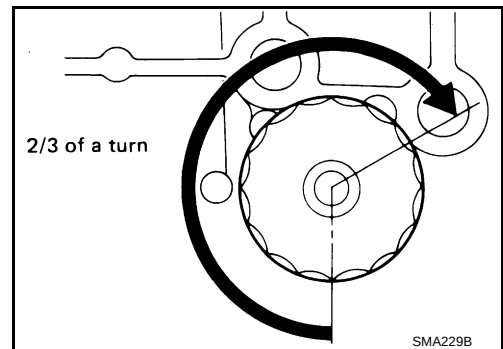
INSTALLATION

- 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:000000001381531

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)

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[HR16DE]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Periodical Maintenance Specification

INFOID:0000000001381532

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:0000000001381533

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 270 (2.7, 2.8, 39)

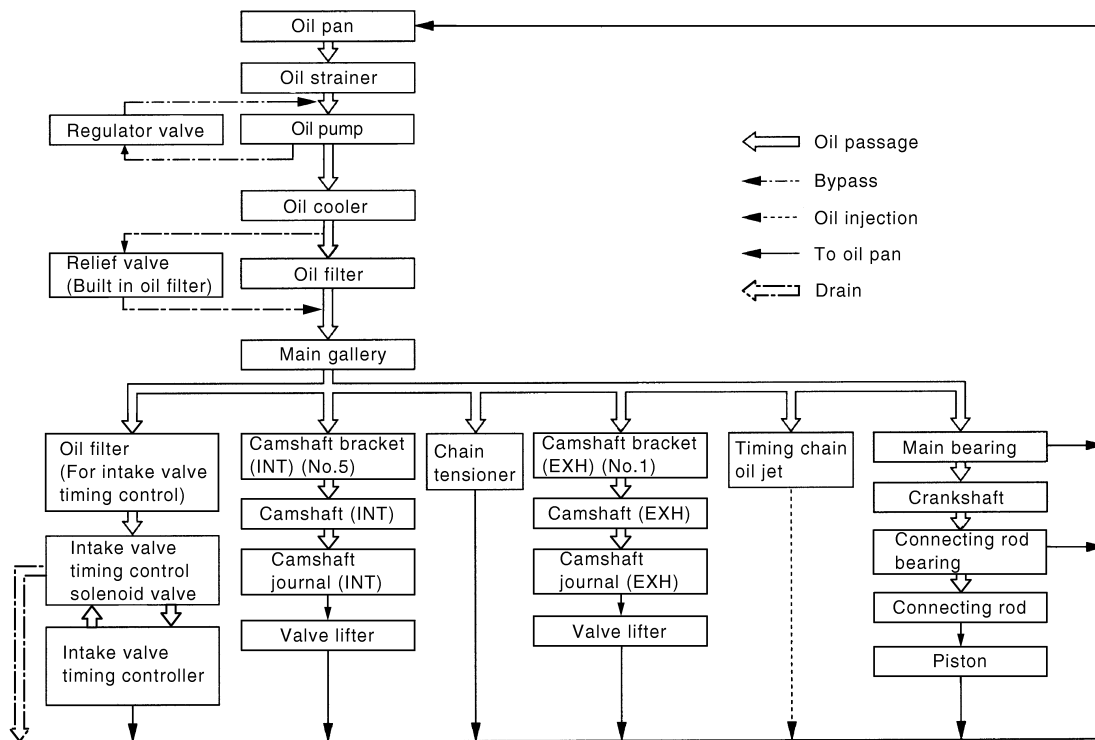
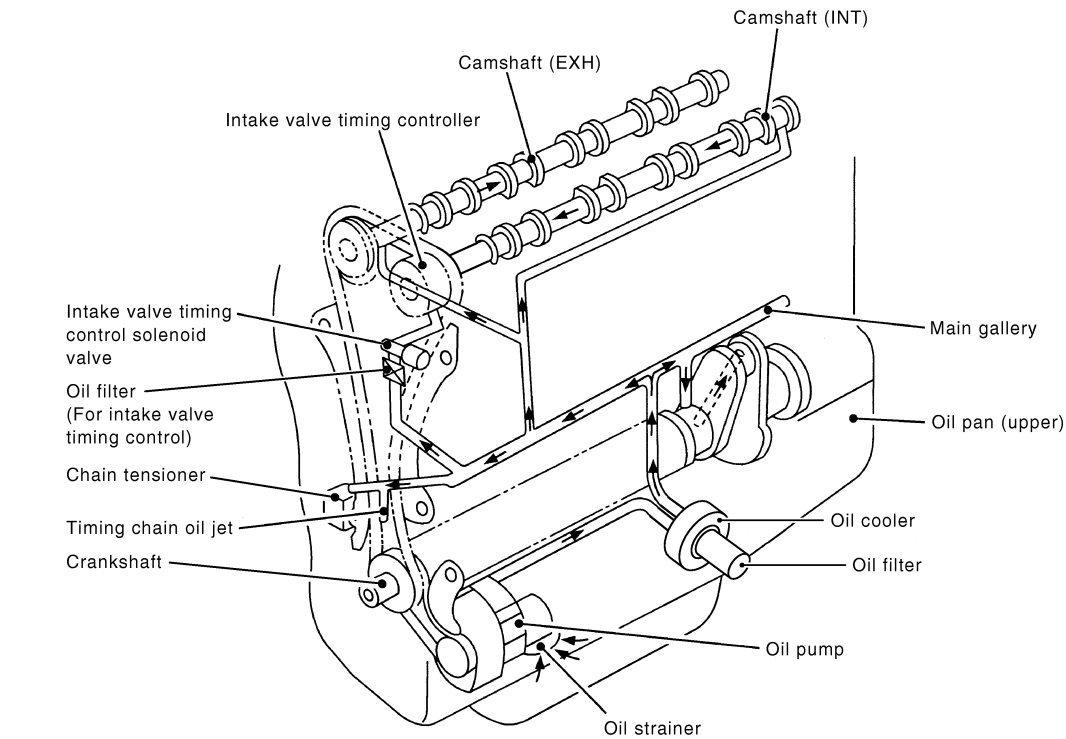
*: Engine oil temperature at 80°C (176°F)

FUNCTION DIAGNOSIS

LUBRICATION SYSTEM

Lubrication Circuit

INFOID:000000001337826



PBIC4546E

PRECAUTION

PRECAUTIONS

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

INFOID:000000001532084

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

Precaution for Liquid Gasket

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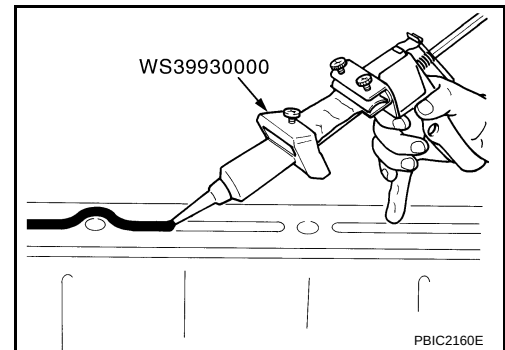
LIQUID GASKET APPLICATION PROCEDURE

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, 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. Attach liquid gasket tube to the Tool.

Use Genuine Silicone RTV Sealant or equivalent. Refer to [GI-27, "Recommended Chemical Products and Sealants"](#).

Tool number :WS39930000 (—)

- Within 5 minutes of liquid gasket application, install the mating component.
- If liquid gasket protrudes, wipe it off immediately.
- Do not retighten bolts or nuts after the installation.
- Wait 30 minutes or more after installation before refilling engine oil and engine coolant.



PREPARATION

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[MR18DE]

PREPARATION

PREPARATION

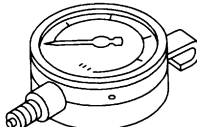
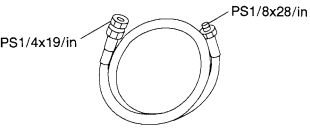
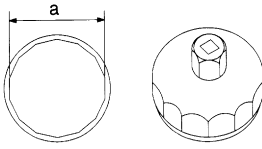
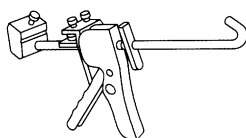
Special Service Tool

INFOID:000000001337824

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

Tool number (Kent-Moore No.) Tool name	Description
ST25051001 (J-25695-1) Oil pressure gauge  NT050	Measuring oil pressure Maximum measuring range: 2,452 kPa (25 kg/cm², 356 psi)
ST25052000 (J-25695-2) Hose  S-NT559	Adapting oil pressure gauge to oil pan (upper)
KV10115801 (J-38956) Oil filter wrench  S-NT375	Removing oil filter a: 64.3 mm (2.531 in)
WS39930000 (—) Tube presser  NT052	Pressing the tube of liquid gasket

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Commercial Service Tool

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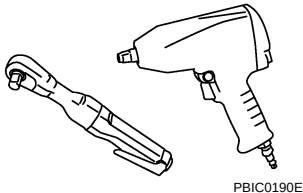
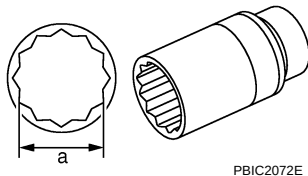
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PREPARATION

< PREPARATION >

[MR18DE]

Tool name	Description
Power tool  PBIC0190E	Loosening nuts and bolts
Deep socket  PBIC2072E	Removing and installing oil pressure sensor a: 26 mm (1.02 in)

ON-VEHICLE MAINTENANCE

ENGINE OIL

Inspection

INFOID:000000001337827

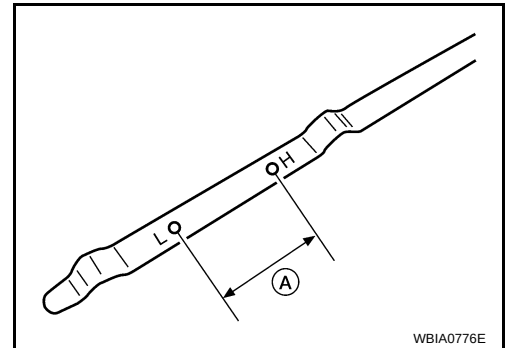
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ENGINE OIL LEVEL

NOTE:

Before starting engine, park vehicle on a level surface 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 make sure the engine oil level is within the range (A) as shown.
3. If it is out of range, adjust it.



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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 areas:

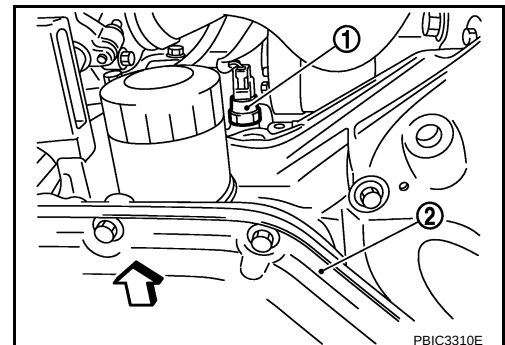
- Oil pan (upper and lower)
- Oil pan drain plug
- Oil pressure switch
- Oil filter
- Intake valve timing control solenoid valve
- Front cover
- Mating surface between cylinder block and cylinder head
- Mating surface between cylinder head and rocker cover
- Crankshaft oil seals (front and rear)
- Oil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

OIL PRESSURE CHECK

WARNING:

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

1. Disconnect harness connector at oil pressure switch (1), and remove oil pressure switch using a suitable tool.
 - Oil pan (lower) (2)
 - ⇐ Front



PBIC3310E

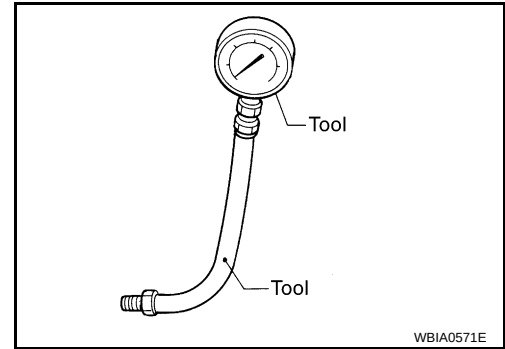
ENGINE OIL

< ON-VEHICLE MAINTENANCE >

[MR18DE]

2. Install oil pressure gauge and hose.

Tool number : ST25051001 (J-25695-1)
: ST25052000 (J-25695-2)



3. Check engine oil level. Refer to [LU-15, "Inspection"](#).
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 [Engine oil temperature at 80°C (176°F)]

Engine speed rpm	Approximate discharge pressure kPa (bar, kg/cm ² , psi)
Idle speed	More than 71.5 (0.70, 0.70, 10)
2,000	More than 200 (2.0, 2.0, 29)

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

6. After the inspections, install oil pressure switch as follows:
- Remove old liquid gasket adhering to oil pressure switch and engine.
 - Apply liquid gasket and tighten oil pressure switch to specification.
Use Genuine Silicone RTV Sealant or equivalent. Refer to [GI-27, "Recommended Chemical Products and Sealants"](#).

Oil pressure switch : 14.7 N·m (1.5 kg-m, 11 ft-lb)

- Check engine oil level. Refer to [LU-15, "Inspection"](#).
- After warming up engine, make sure there are no engine leaks of oil with running engine.

Changing Engine Oil

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WARNING:

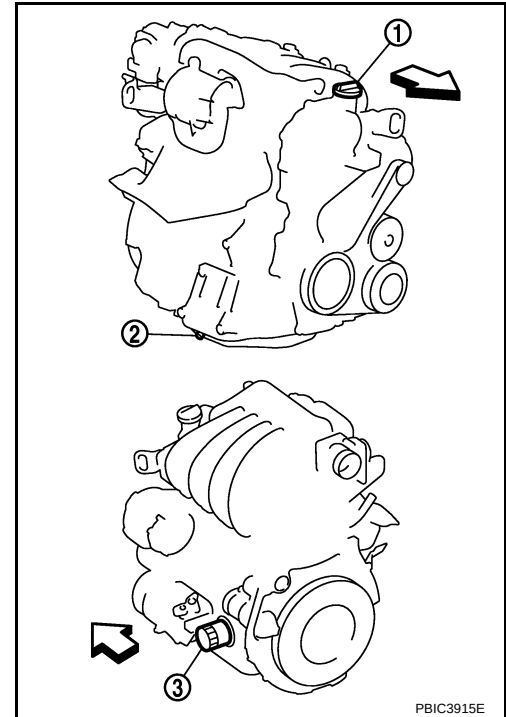
- Be careful not to burn yourself, as engine oil may be hot.
 - Prolonged and repeated contact with used engine oil may cause skin cancer; try to avoid direct skin contact with used engine oil. If skin contact is made, wash thoroughly with soap or hand cleaner as soon as possible.
1. Warm up engine, park vehicle on a level surface and check for engine oil leakage from engine components. Refer to [LU-15, "Inspection"](#).
 2. Stop engine and wait for 10 minutes.

ENGINE OIL

< ON-VEHICLE MAINTENANCE >

[MR18DE]

3. Loosen oil filler cap (1) and then remove drain plug (2).
 - Oil filter (3)
 - ← Engine front
4. Drain engine oil.
5. Install drain plug (2) with new washer. Refer to [EM-211, "Component"](#).
CAUTION:
Be sure to clean drain plug (2) and install with new washer.
6. Refill with new engine oil.
Refer to [MA-19, "Fluids and Lubricants"](#).
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 (2) and oil filter (3) for engine oil leakage.
8. Stop engine and wait for 10 minutes.
9. Check the engine oil level. Refer to [LU-15, "Inspection"](#).



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OIL FILTER

Removal and Installation

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REMOVAL

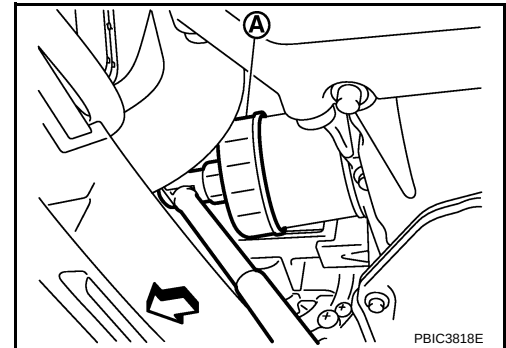
1. Remove oil filter using Tool (A).

Tool number : KV10115801 (J-38956)

- ⇐ Front

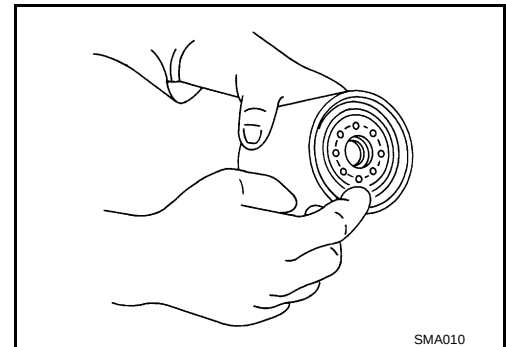
CAUTION:

- 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.
- Do not allow engine oil to adhere to drive belt.
- Completely wipe off any engine oil that adheres to engine and vehicle.



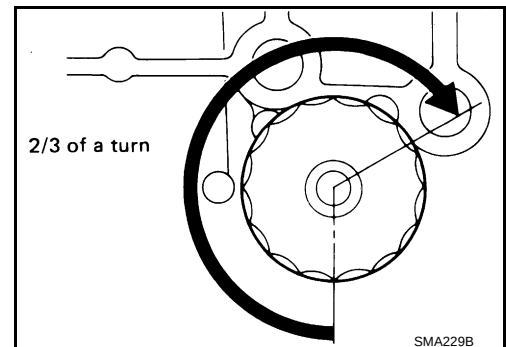
INSTALLATION

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.



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-6, "Inspection"](#).
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 and adjust engine oil. Refer to [LU-6, "Inspection"](#).

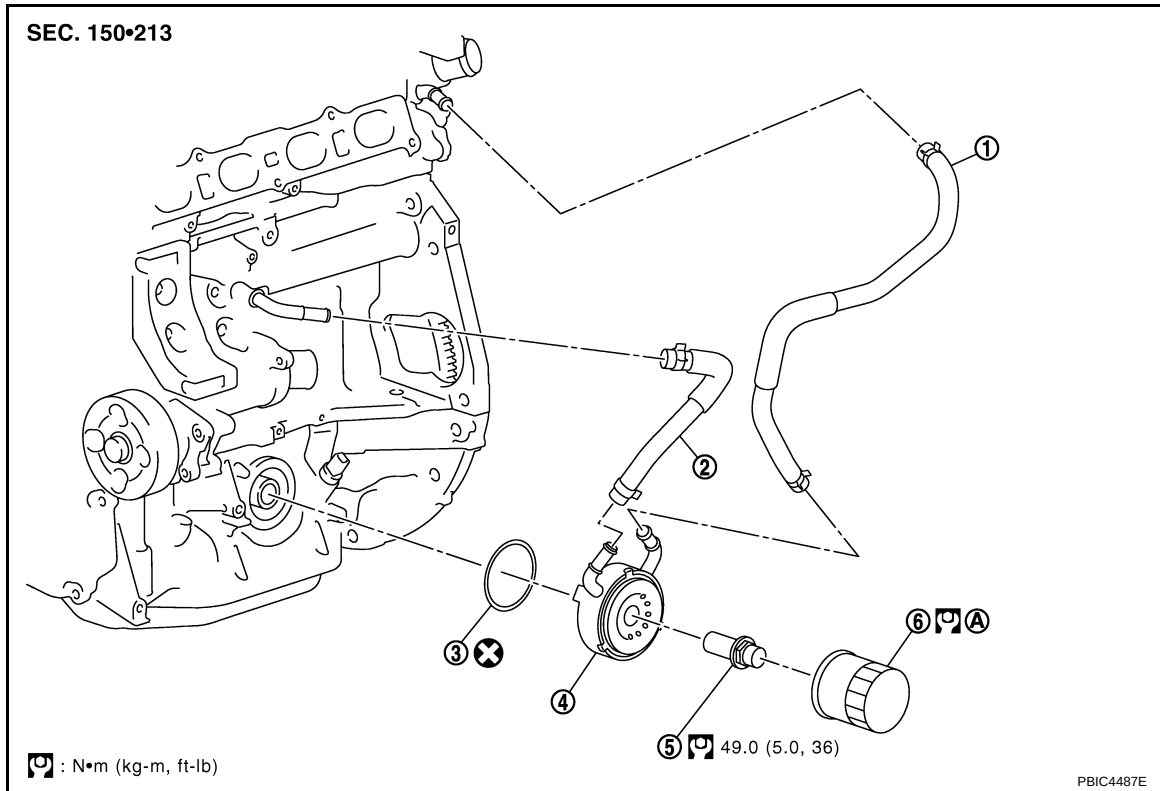
ON-VEHICLE REPAIR

OIL COOLER

Components

INFOID:000000001532089

LU



- | | | |
|---|--------------------|---------------|
| 1. Oil cooler hose | 2. Oil cooler hose | 3. O-ring |
| 4. Oil cooler | 5. Connector bolt | 6. Oil filter |
| A. Refer to LU-19, "Removal and Installation" | | |

Removal and Installation

INFOID:000000001532090

REMOVAL

WARNING:**Make sure engine is cool before performing this operation.**

1. Remove engine undercover using power tool.
2. Remove coolant hoses from oil cooler.

NOTE:

Pinch hoses to prevent coolant leaking.

3. Remove oil filter. Refer to [LU-18, "Removal and Installation"](#).
4. Remove connector bolt and oil cooler.

INSTALLATION

Installation is in the reverse order of removal.

OIL PUMP

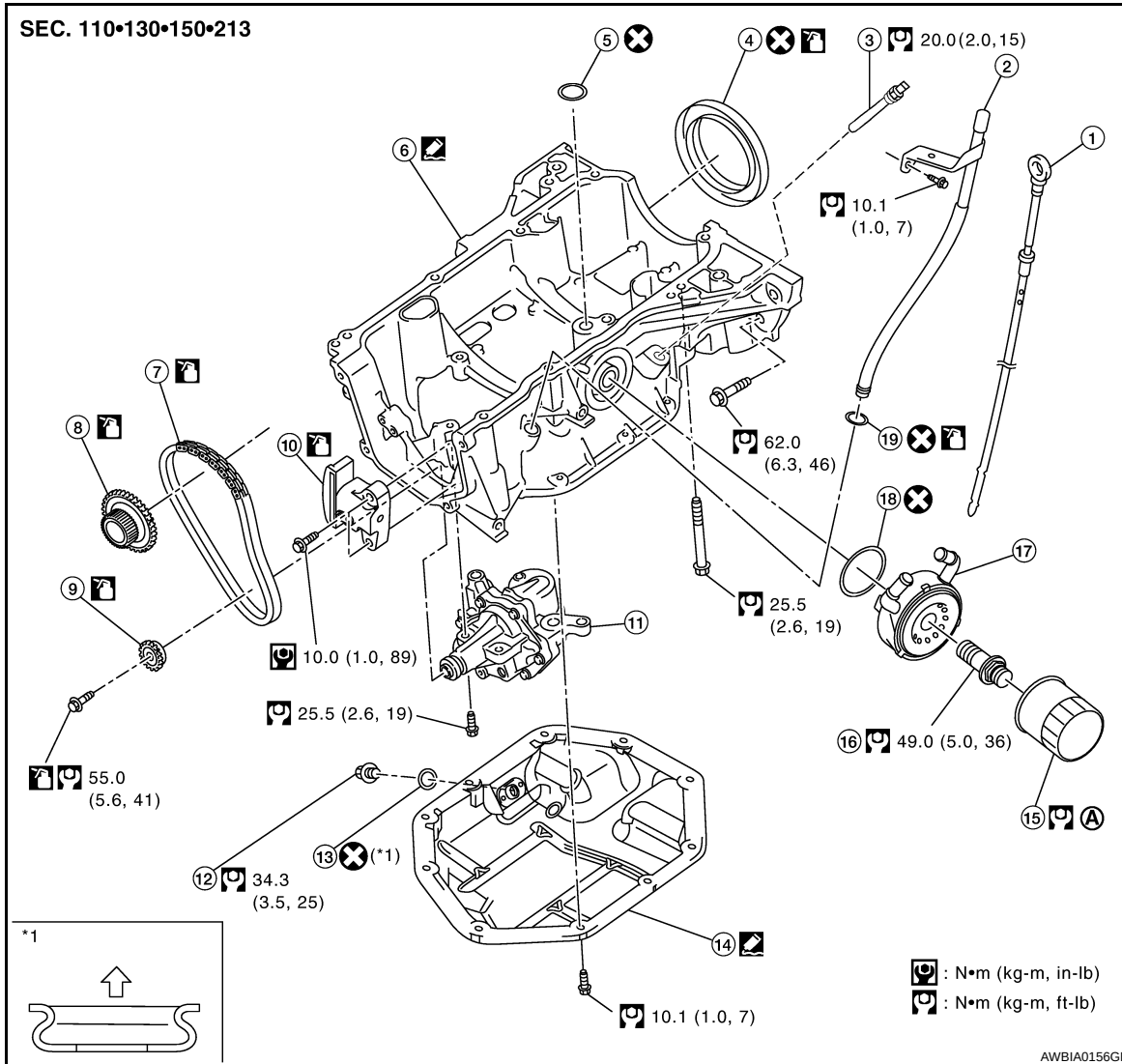
< ON-VEHICLE REPAIR >

[MR18DE]

OIL PUMP

Components

INFOID:000000001337951



- | | | |
|---|--|----------------------|
| 1. Oil level gauge | 2. Oil level gauge guide | 3. Oil level sensor |
| 4. Rear oil seal | 5. O-ring | 6. Oil pan (upper) |
| 7. Oil pump drive chain | 8. Crankshaft sprocket | 9. Oil pump sprocket |
| 10. Timing chain tensioner (for oil pump) | 11. Oil pump | 12. Drain plug |
| 13. Drain plug washer | 14. Oil pan (lower) | 15. Oil filter |
| 16. Connector bolt | 17. Oil cooler | 18. O-ring |
| 19. O-ring | A. Refer to EM-166, "Removal and Installation" | ⇐ :Oil pan side |

Removal and Installation

INFOID:000000001337952

REMOVAL

1. Remove the timing chain and oil pump drive chain. Refer to [EM-177, "Removal and Installation"](#).

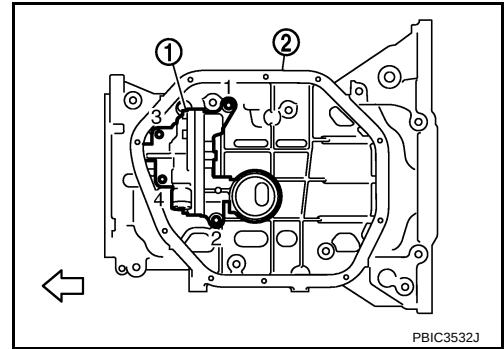
OIL PUMP

< ON-VEHICLE REPAIR >

[MR18DE]

2. Remove oil pump.
 - Loosen bolts in reverse order as shown.

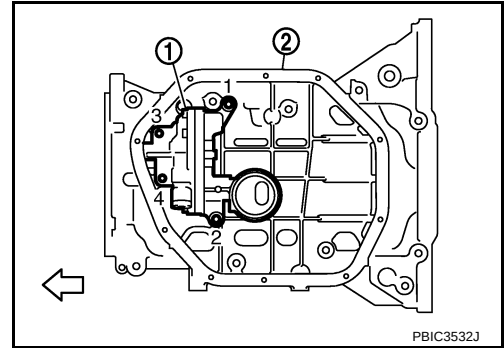
- 1** : Oil pump
2 : Oil pan (upper)
⇐ : Engine front



INSTALLATION

1. Install oil pump.
 - Tighten bolts in numerical order as shown.

- 1** : Oil pump
2 : Oil pan (upper)
⇐ : Engine front



2. Install the timing chain and oil pump drive chain. Refer to [EM-177, "Removal and Installation"](#).

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[MR18DE]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Standard and Limit

INFOID:000000001337830

OIL PRESSURE

Engine speed rpm	Approximate discharge pressure kPa (bar, kg/cm ² , psi)
Idle speed 2,000	71.5 (0.70, 0.70, 10) 200 (2.0, 2.0, 29)

Oil Capacity

Unit: ℓ (Imp qt)

Drain and refill	With oil filter change	Approximately 4.4 (3 7/8)
	Without oil filter change	Approximately 4.2 (3 3/4)
Dry engine (engine overhaul)		Approximately 5.5 (4 7/8)

PRECAUTION

PRECAUTIONS

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

INFOID:000000001516582

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

Precaution for Liquid Gasket

INFOID:000000001381534

REMOVAL OF LIQUID GASKET

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

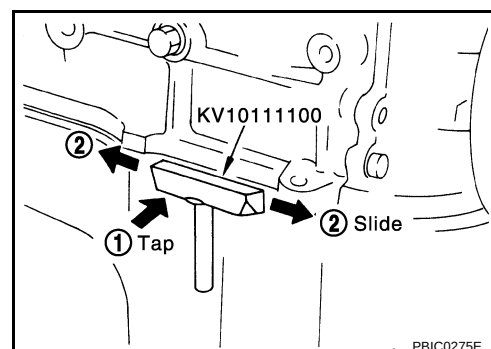
CAUTION:

Be careful not to damage the mating surfaces.

- In areas where the cutter is difficult to use, use a plastic hammer to lightly tap (1) the tool into place and slide (2) side-to-side.

CAUTION:

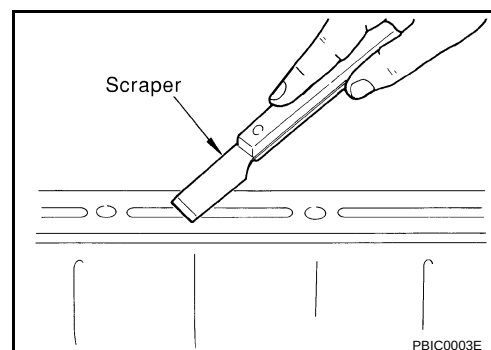
If for some unavoidable reason a tool such as a flat-bladed screwdriver is used, be careful not to damage the mating surfaces.



LIQUID GASKET APPLICATION PROCEDURE

1. 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.
2. Wipe the gasket application surface and the mating surface with white gasoline (lighting and heating use) to remove adhering moisture, grease and foreign materials.
3. Attach the liquid gasket to the tube presser.

Use Genuine Liquid Gasket or equivalent.

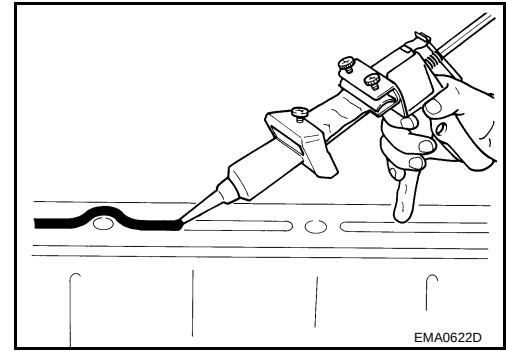


PRECAUTIONS

[K9K]

< PRECAUTION >

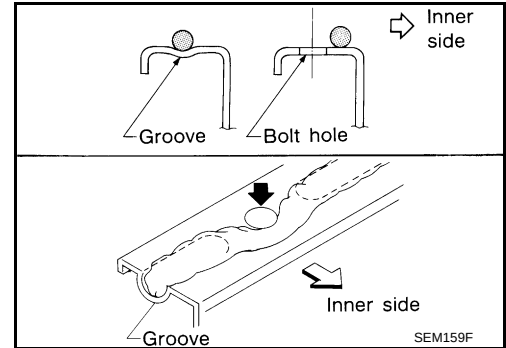
4. Apply the gasket without breaks to the specified location with the specified dimensions.
 - If there is a groove for the liquid gasket application, apply the gasket to the groove.



- 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

< PREPARATION >

[K9K]

PREPARATION

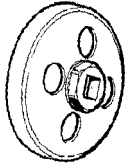
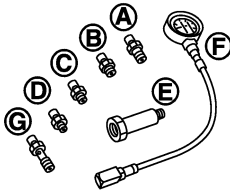
PREPARATION

Special Service Tools

INFOID:000000001381535

A

LU

NISSAN tool number (RENAULT tool number) Tool name	Description
KV113C0010 (Mot.1329) Oil filter wrench	Removing and installing oil filter
 MBIB0369E	
KV113E0020 (Mot.836-05) Oil pressure gauge set	Measuring oil pressure Use C, E, F.
 MBIB0663E	

C

D

E

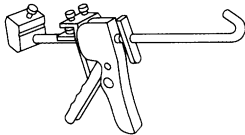
F

G

H

Commercial Service Tools

INFOID:000000001381536

NISSAN tool number Tool name	Description
WS39930000 Tube presser	Pressing the tube of liquid gasket
 S-NT052	

I

J

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L

M

N

O

P

ON-VEHICLE MAINTENANCE

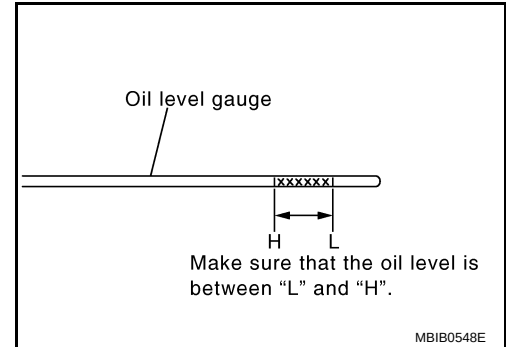
ENGINE OIL

Inspection

INFOID:000000001381537

OIL LEVEL AND MUDDINESS

- Before starting the engine, check the oil level placing the vehicle on a level surface. If the engine is already started, stop it and allow 10 minutes before checking.
- Make sure the oil level is within the range shown.
- 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.**

1. Check the engine oil level.
2. Remove engine undercover using power tool.
3. Disconnect the electrical connector (A) and remove the oil pressure switch (1) to connect the oil pressure gauge [SST: KV113E0020 (Mot. 836-05)].
4. After warming up the engine, make sure oil pressure corresponding to the engine speed is produced.

Idle speed : Refer to [LU-33, "Engine Oil Pressure"](#).

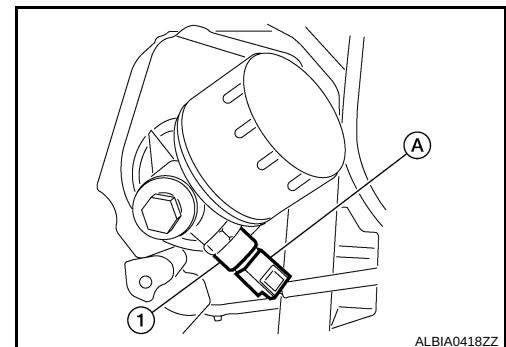
3000 rpm : Refer to [LU-33, "Engine Oil Pressure"](#).

5. After checking, install the oil pressure switch (1) as follows.
 - a. Remove old sealant adhering to the oil pressure switch (1) and engine.
 - b. Apply thread sealant.
Use Genuine Liquid Gasket or equivalent.

Oil pressure switch:

: **25 N·m (2.55 kg-m, 18.4 ft-lb)**

6. Start engine and check for oil leakage.



Draining

INFOID:000000001381538

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 the vehicle on a level surface.
2. Warm up engine, and check for oil leakage from engine components.
3. Stop engine and wait for 10 minutes.
4. Loosen oil filler cap.
5. Remove drain plug and then drain engine oil.

Refilling

INFOID:000000001381539

1. Refill with new engine oil.

Oil capacity (Approximate) : Refer to [MA-19, "Fluids and Lubricants"](#).

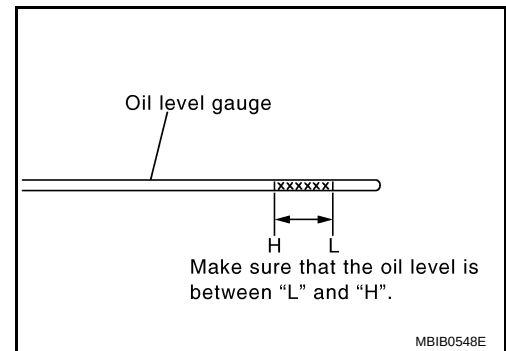
- The refill capacity depends on the oil temperature and drain time. Use these specifications for reference only. Always use the dipstick to determine when the proper amount of oil is in the engine.

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.

2. Warm up engine and check area around drain plug and oil filter for oil leakage.
3. Stop engine and wait for 10 minutes.
4. Check oil level and add engine oil as necessary. Refer to [LU-26, "Inspection"](#).



OIL FILTER

Replacement

INFOID:000000001381540

1. Remove engine undercover using power tool.
2. Using an oil filter wrench [SST: KV113C0010 (Mot. 1329)], 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.

3. Remove foreign materials adhering to the oil filter installation surface.
4. Install oil filter bracket to oil cooler.

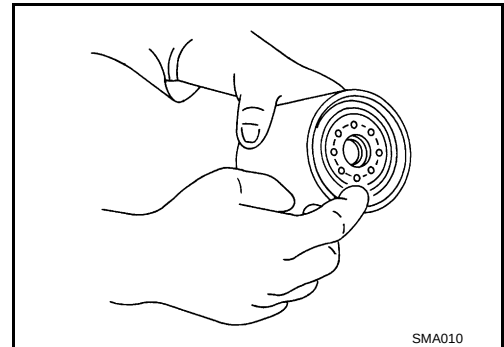
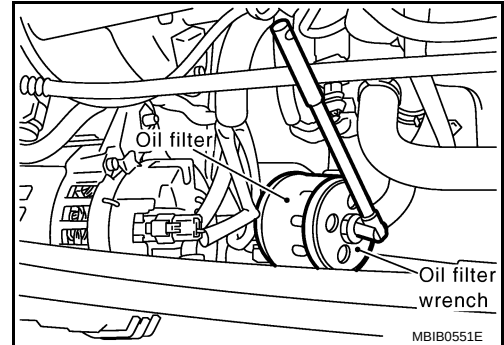
CAUTION:

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

5. Apply engine oil to the oil seal contact surface of the new oil filter.
6. Install the oil filter until it comes into contact with the oil seal on the engine bracket.
7. Using an oil filter wrench [SST: KV113C0010 (Mot. 1329)], tighten oil filter.

Oil filter : 14 N·m (1.4 kg-m, 10 ft-lb)

8. After warming up the engine, check for engine oil leakage.
9. Check oil level and add engine oil as necessary. Refer to [LU-26, "Inspection"](#).



OIL FILTER BRACKET

< ON-VEHICLE REPAIR >

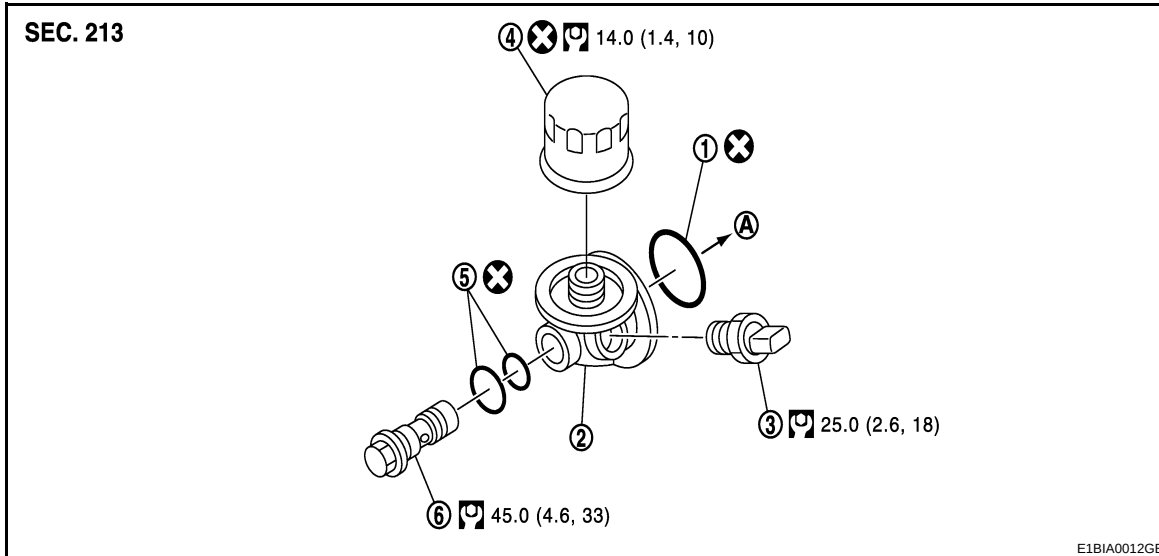
[K9K]

ON-VEHICLE REPAIR

OIL FILTER BRACKET

Exploded View

INFOID:000000001381541



- | | | |
|------------------|-----------------------|------------------------|
| 1. O-ring | 2. Oil filter bracket | 3. Oil pressure switch |
| 4. Oil filter | 5. O-ring | 6. Connecting bolt |
| A. To oil cooler | | |

Removal and Installation

INFOID:000000001381542

REMOVAL

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.

1. Remove engine undercover using power tool.
2. Remove oil filter. Refer to [LU-28, "Replacement"](#).
3. Disconnect oil pressure switch electrical connector.
4. Remove oil filter bracket.

INSTALLATION

Installation is in the reverse order of removal.

OIL COOLER

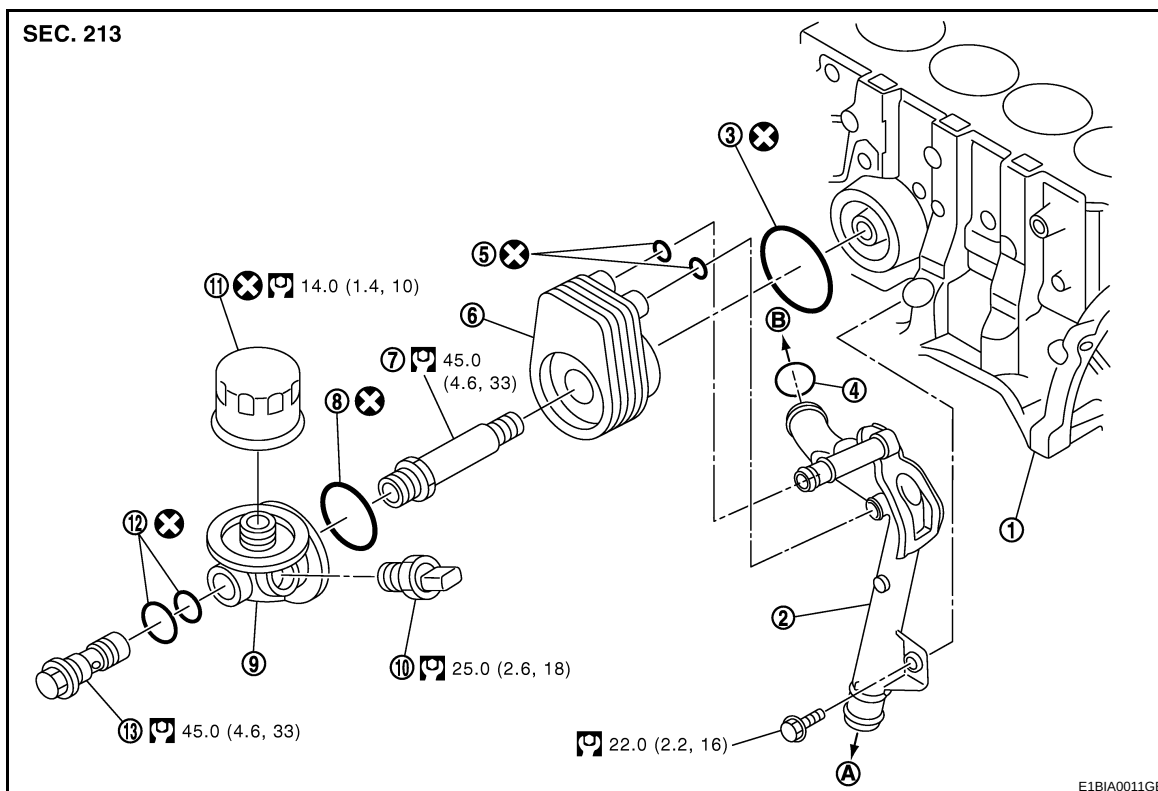
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[K9K]

OIL COOLER

Exploded View

INFOID:000000001381543



- | | | |
|---------------------------|------------------|-----------------------|
| 1. Cylinder block | 2. Water pipe | 3. O-ring |
| 4. O-ring | 5. O-ring | 6. Oil cooler |
| 7. Connecting stud | 8. O-ring | 9. Oil filter bracket |
| 10. Oil pressure switch | 11. Oil filter | 12. O-ring |
| 13. Connecting bolt | | |
| A. To radiator lower hose | B. To water pump | |

Removal and Installation

INFOID:000000001381544

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 adhere to the engine and the vehicle.

REMOVAL

1. Remove engine undercover using power tool.
2. Drain engine coolant. Refer to [CO-58, "Draining"](#).
CAUTION:
Perform when engine is cold.
3. Remove RH front wheel. Refer to [WT-6, "Rotation"](#).
4. Remove RH fender protector. Refer to [EXT-22, "Removal and Installation"](#).
5. Remove drive belt. Refer to [EM-263, "Removal and Installation"](#).
6. Remove generator and position aside. Refer to [CHG-43, "Removal and Installation"](#).
7. Remove A/C compressor and position aside. Refer to [HA-35, "Removal and Installation of Compressor - K9K"](#).
8. Remove oil filter and oil filter bracket. Refer to [LU-28, "Replacement"](#).

OIL COOLER

9. Disconnect oil pressure switch electrical connector.
10. Remove the oil cooler connecting stud.
11. Remove oil cooler.

INSTALLATION

Installation is in the reverse order of removal.

- Replace the O-ring of the oil cooler, positioning the lip of the seal behind the lug of the oil cooler.
- Confirm that no foreign objects are adhering to the seal contact areas of the oil cooler and cylinder block.

Inspection

INFOID:000000001381545

INSPECTION AFTER REMOVAL

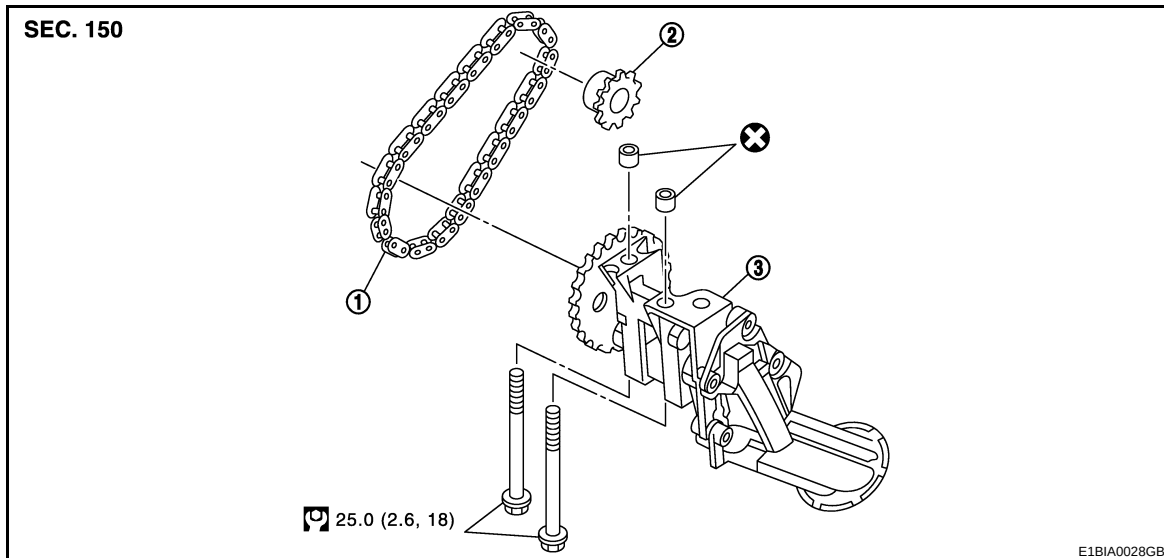
Check oil cooler for cracks and clogging by blowing through coolant inlet. If necessary, replace oil cooler assembly.

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OIL PUMP

Exploded View

INFOID:000000001381546



1. Oil pump drive chain 2. Crankshaft sprocket (oil pump drive chain) 3. Oil pump chain

Removal and Installation

INFOID:000000001381547

REMOVAL

1. Remove the battery negative cable.
2. Remove the engine undercover.
3. Remove the RH front wheel and tire. Refer to [WT-6, "Rotation"](#).
4. Remove RH fender protector. Refer to [EXT-22, "Removal and Installation"](#).
5. Remove front driveshaft assembly RH. Refer to [FAX-11, "Removal and Installation \(Right Side\)"](#).
6. Remove driveshaft center bearing bracket.
7. Remove lower torque rod. Refer to [EM-302, "Exploded View"](#).
8. Remove oil pan. Refer to [EM-284, "Removal and Installation"](#).
9. Remove oil pump drive chain.
10. Remove oil pump assembly.

INSTALLATION

Installation is in the reverse order of removal.

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[K9K]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Periodical Maintenance Specification

INFOID:0000000001381548

LU

ENGINE OIL CAPACITY (APPROXIMATE)

Unit: ℓ · (Imp qt)

With oil filter change	4.55 (4)
Without oil filter change	4.39 (3-7/8)
Dry engine (overhaul)	4.71 (4-1/8)

Engine Oil Pressure

INFOID:0000000001381549

kPa (bar, kg/cm², psi)

Engine speed	Approximate discharge pressure
Idle speed	120 (1.2, 1.22, 17.4)
3,000 rpm	350 (3.5, 5.57, 50.8)