

## GENERAL INFORMATION

The lubrication method is a fully force-fed, full-flow filtration type.

The corrugate fin type of engine oil cooler have been adopted, and installed forward of the radiator.

<6G7-MPI>

An oil cooler with high cooling performance and which is built into the crankcase has been adopted.  
<4M4>

Items	6G7	4M4
Oil pump type	Trochoid type	External gear type
Drive method	Crankshaft	Crankshaft gear

## ENGINE OILS

### Health Warning

Prolonged and repeated contact with mineral oil will result in the removal of natural fats from the skin, leading to dryness, irritation and dermatitis. In addition, used engine oil contains potentially

harmful contaminants which may cause skin cancer. Adequate means of skin protection and washing facilities must be provided.

### Recommended Precautions

The most effective precaution is to adapt working practices which prevent, as far as practicable, the risk of skin contact with mineral oils, for example by using enclosed systems for handling used engine oil and by degreasing components, where practicable, before handling them.

Other precautions:

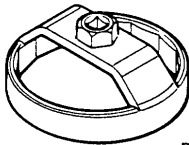
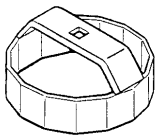
- Avoid prolonged and repeated contact with oils, particularly used engine oils.
- Wear protective clothing, including impervious gloves where practicable.
- Avoid contaminating clothes, particularly underpants, with oil.
- Do not put oily rags in pockets, the use of overalls without pockets will avoid this.
- Do not wear heavily soiled clothing and oil-impregnated foot-wear. Overalls must be cleaned regularly and kept separate from personal clothing.

- Where there is a risk of eye contact, eye protection should be worn, for example, chemical goggles or face shields; in addition an eye wash facility should be provided.
- Obtain First Aid treatment immediately for open cuts and wounds.
- Wash regularly with soap and water to ensure all oil is removed, especially before meals (skin cleansers and nail brushes will help). After cleaning, the application of preparations containing lanolin to replace the natural skin oils is advised.
- Do not use petrol, kerosine, diesel fuel, gas oil, thinners or solvents for cleaning skin.
- Use barrier creams, applying them before each work period, to help the removal of oil from the skin after work.
- If skin disorders develop, obtain medical advice without delay.

## LUBRICANTS

Items		6G7-GDI	6G7-MPI	4M4
Engine oil API classification		SG or higher	SG or higher	CD or higher
Engine oil quantity litre	Oil filter	0.3	0.3	1.0
	Oil cooler	–	0.3	1.3
	Total	4.6	4.9	9.8

## SPECIAL TOOLS

Tool	Number	Name	Use
 B991610	MB991610	Oil filter wrench	Removal and installation of engine oil filter (When using the oil filter of MD352626)
 H061590	MH061590	Oil filter wrench	Removal and installation of engine oil filter (When using the oil filter of ME013307)

## ON-VEHICLE SERVICE

### ENGINE OIL CHECK

1. Pull out the level gauge slowly and check that the oil level is in the illustrated range.
2. Check that the oil is not excessively dirty, that there is no coolant or petrol mixed in, and that it has sufficient viscosity.

### ENGINE OIL REPLACEMENT

1. Start the engine and allow it to warm up until the temperature of the coolant reaches 80°C to 90°C.
2. Remove the engine oil filler cap.
3. Remove the drain plug to drain oil.

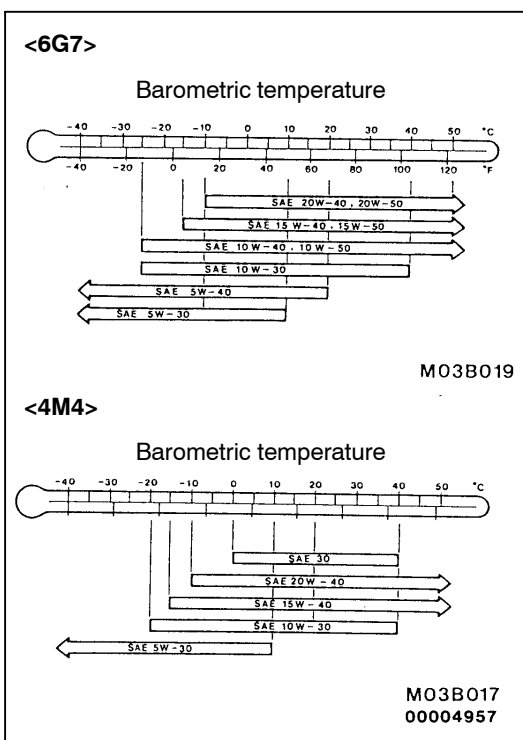
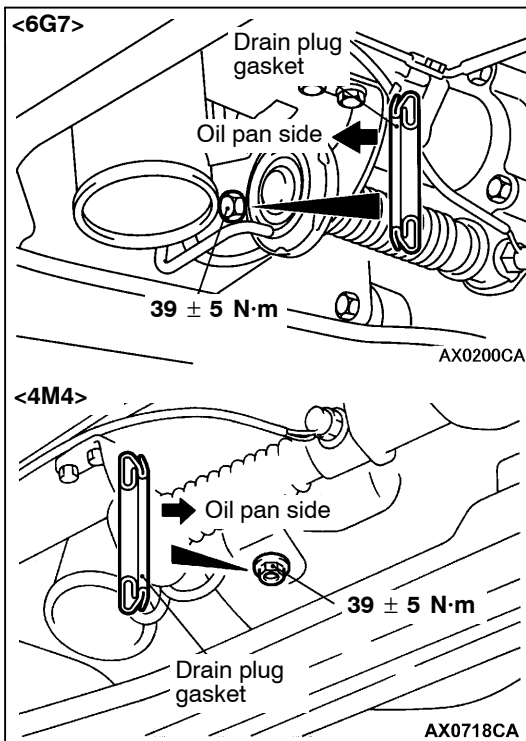
#### Caution

**Use care as oil could be hot.**

4. Install a new drain plug gasket so that it faces in the direction shown in the illustration, and then tighten the drain plug to the specified torque.

#### NOTE

Install the drain plug gasket so it faces in the direction shown in the illustration.



5. Refill with specified quantity of oil.

#### Specified Engine Oil (API classification):

<6G7> SG or higher

<4M4> CD or higher

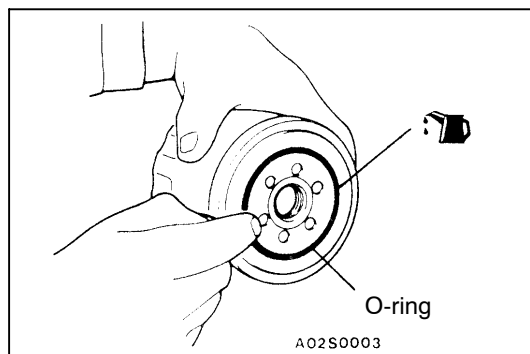
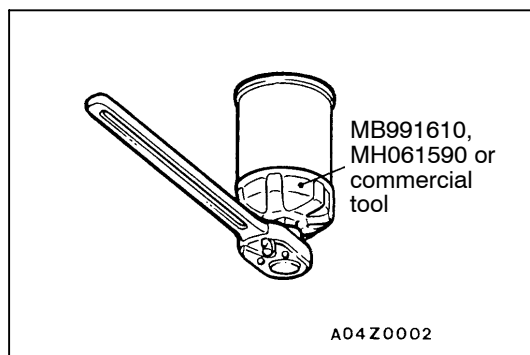
#### Total quantity (Includes volume inside oil filter and oil cooler):

<6G7-GDI> 4.6 litre

<6G7-MPI> 4.9 litre

<4M4> 9.8 litre

6. Install the engine oil filler cap.
7. Check oil level.



## OIL FILTER REPLACEMENT

1. Start the engine and allow it to warm up until the temperature of the coolant reaches 80°C to 90°C.
2. Remove the engine oil filler cap.
3. Remove the drain plug to drain oil.

### Caution

**Use care as oil could be hot.**

4. Remove the under cover.
5. Use the respective tool in the following table to remove the engine oil filter.
6. Clean the filter bracket side mounting surface.
7. Apply a small amount of engine oil to the O-ring of the new oil filter.
8. Once the O-ring of the oil filter is touching the flange, use the respective tool in the following table to tighten to the specified torque.
9. Install the drain plug and refill the engine oil. (Refer to Engine Oil Replacement P.12-4.)
10. Race the engine 2-3 times, and check to be sure that no engine oil leaks from installation section of the oil filter.

Number	Tool	Tightening torque
MD352626	MB991610 or equivalent tool	Approx. 3/4 turn (14 ± 2 N·m)
ME013307	MH061590 or equivalent tool	Approx. 3/4 turn (20 ± 2 N·m)

# ENGINE OIL COOLER

## REMOVAL AND INSTALLATION

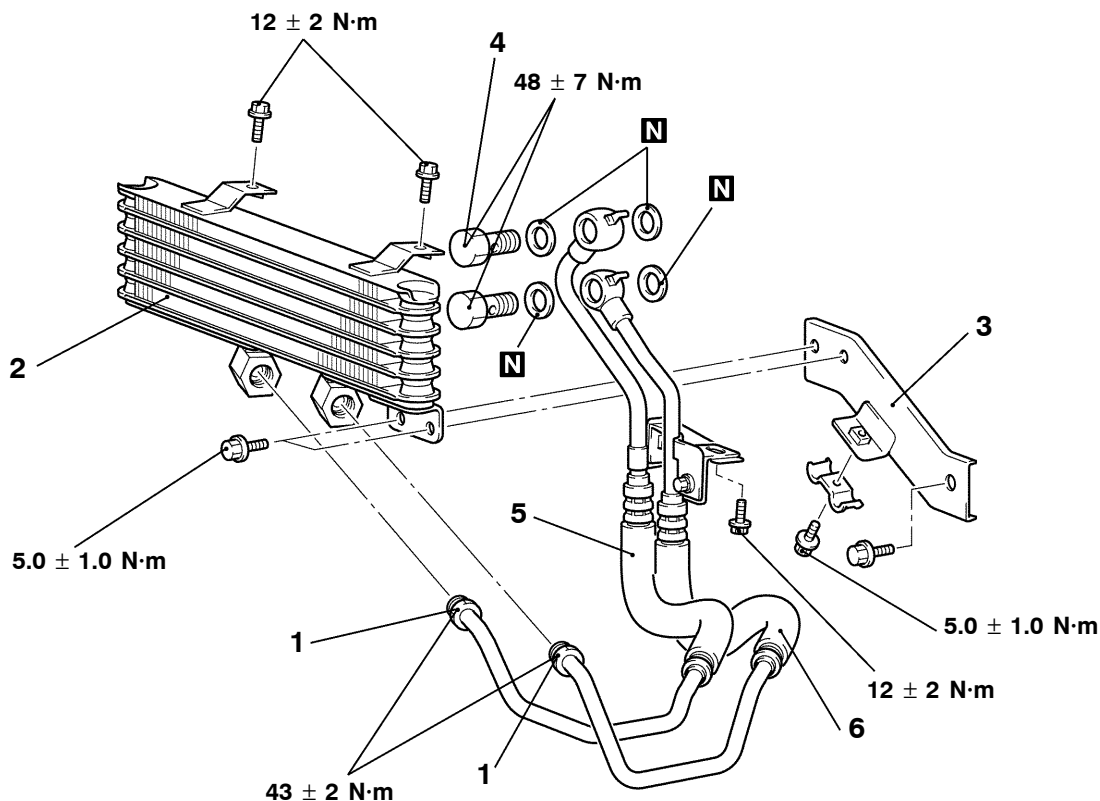
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### Pre-removal Operation

- Skid Plate, Under Cover Removal
- Radiator Shroud Lower Cover Removal (Refer to GROUP 14 – Radiator.)

### Post-installation Operation

- Skid Plate, Under Cover Installation
- Radiator Shroud Lower Cover Installation (Refer to GROUP 14 – Radiator.)
- Engine Oil Refilling and Level Check (Refer to P.12-4.)



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### Removal steps

1. Oil cooler hose connection at cooler side
2. Oil cooler assembly
3. Bracket
4. Eye bolts
5. Oil cooler return hose
6. Oil cooler feed hose

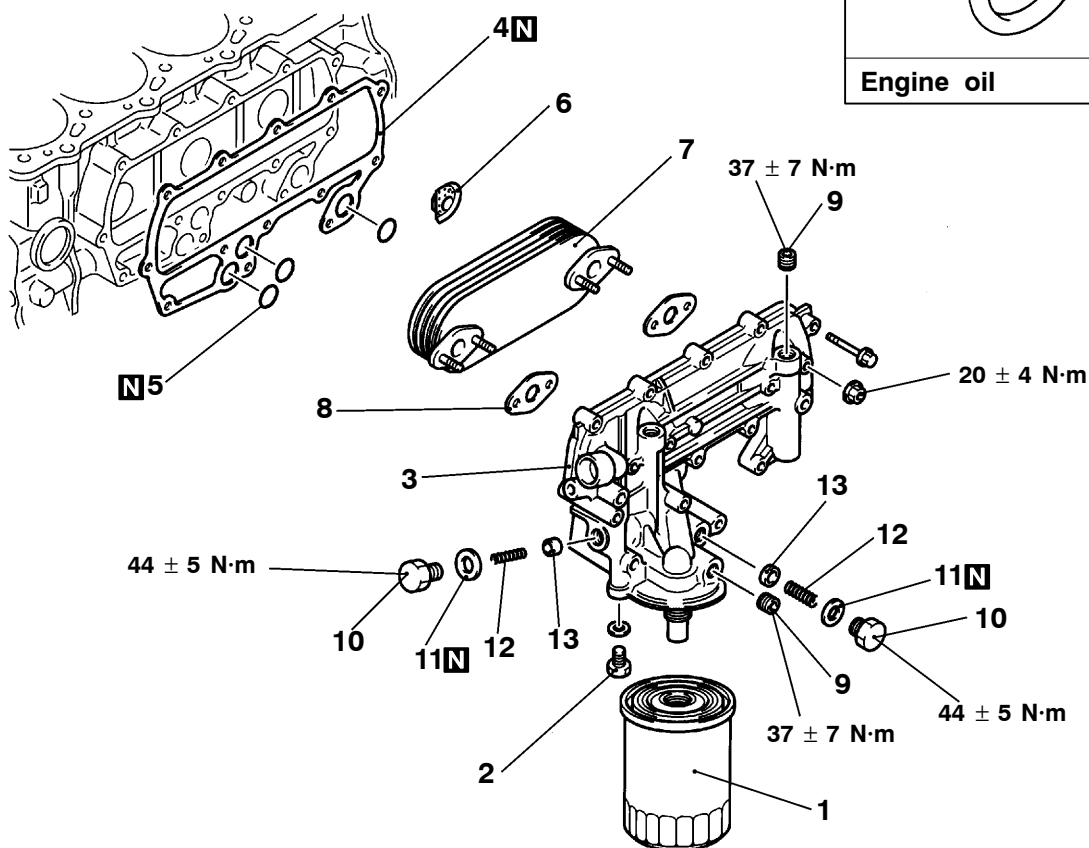
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**Pre-removal Operation**

- Coolant Draining (Refer to GROUP 14 – On-vehicle Service.)
- Turbocharger Removal (Refer to GROUP 33A.)

**Post-installation Operation**

- Turbocharger Installation (Refer to GROUP 15.)
- Coolant Refilling (Refer to GROUP 14 – On-vehicle Service.)
- Engine Oil Refilling and Level Check (Refer to P.12-4.)

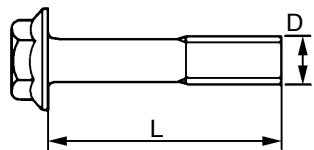


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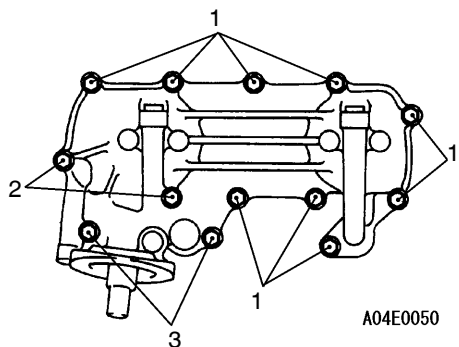
**Removal steps**

1. Oil filter (Refer to P.12-5.)
2. Water drain plug
3. Oil cooler assembly
4. Gasket
5. O ring
6. Water separator
- Engine oil draining (Refer to P.12-4.)

7. Oil cooler element
8. Gasket
9. Plug
10. Plug
11. Gasket
12. Spring
13. Valve



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**INSTALLATION SERVICE POINT****►A◄ OIL COOLER ASSEMBLY INSTALLATION**

Symbol	Head mark	D×L mm
1	7T	8×32
2		8×75
3		10×80