

---

# ENGINE LUBRICATION

## CONTENTS

<b>GENERAL INFORMATION</b> .....	<b>2</b>	<b>ON-VEHICLE SERVICE</b> .....	<b>4</b>
<b>SERVICE SPECIFICATIONS</b> .....	<b>3</b>	Engine Oil Check .....	4
<b>SEALANT</b> .....	<b>3</b>	Engine Oil Replacement .....	4
<b>LUBRICANTS</b> .....	<b>3</b>	Oil Filter Replacement .....	5
<b>SPECIAL TOOL</b> .....	<b>3</b>	Oil Pressure Check .....	5
		<b>ENGINE OIL COOLER</b> .....	<b>7</b>

## GENERAL INFORMATION

The lubrication method is a fully force-fed, full-flow filtration type. The oil pump is a gear type which is driven by the crankshaft via the timing belt.

### 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.

## SERVICE SPECIFICATIONS

Items		Standard value
Oil pressure kPa	at idle	29 or more
	at 3,500 r/min	294 - 686

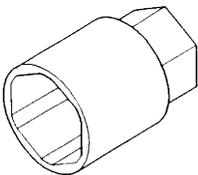
## SEALANT

Items	Specified sealant	Remark
Oil pressure switch	3M ATD Part No. 8660 or equivalent	Semi-drying sealant

## LUBRICANTS

Items		Specifications
Engine oil ACEA classification	For Europe	A1, A2, A3
Engine oil API classification	For Europe	SG or higher
	For General Export	SE or higher
Engine oil quantity L	Oil filter	0.3
	Oil cooler	0.3
	Total	5.1

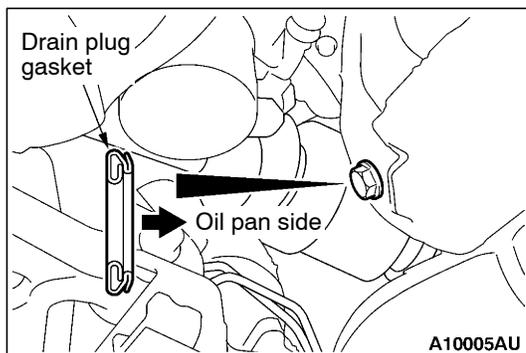
## SPECIAL TOOL

Tool	Number	Name	Use
	MD998054	Oil pressure switch wrench	Removal and installation of oil pressure switch

## 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

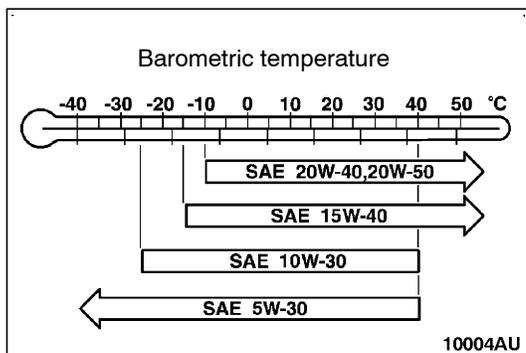
**Use care as oil could be hot.**

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.

**Tightening torque: 39 ± 5 N·m**

#### 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 (ACEA and API classification):

<For Europe>

**ACEA A1, A2, A3 / API SG or higher**

<For General Export>

**API SE or higher**

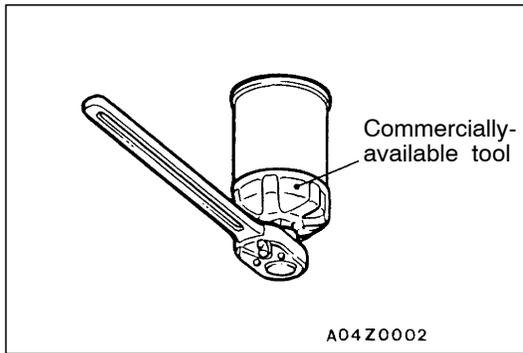
#### Total quantity

**(Includes volume inside oil filter and oil cooler):  
5.1 L**

#### NOTE

SAE 5W-30 can be only used at the area where the lowest temperature is lower than the applicable temperature of SAE 5W-30.

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



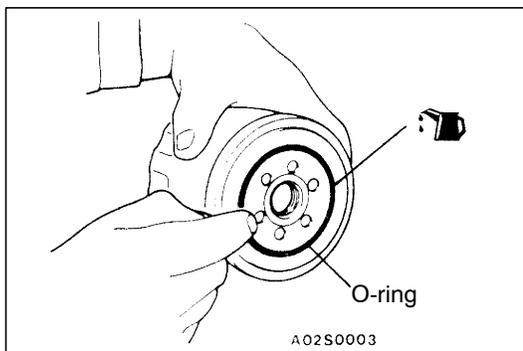
## OIL FILTER REPLACEMENT

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.

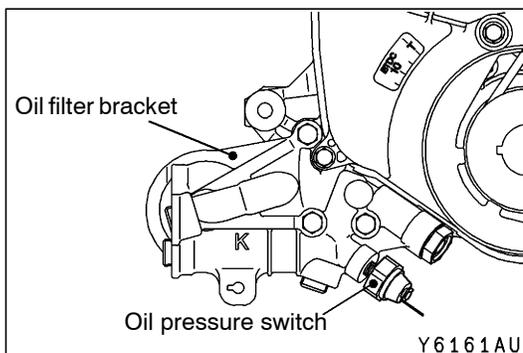
### Caution

**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.

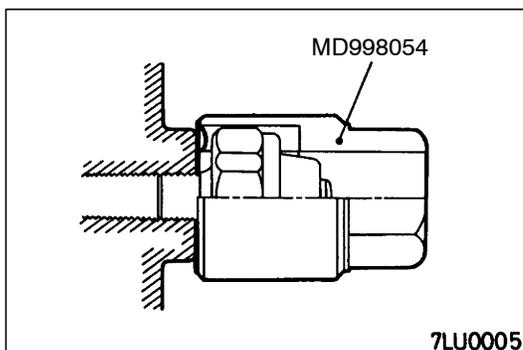


7. Apply a small amount of engine oil to the O-ring of the new oil filter.
8. Once the O-ring of the oil filter is touching the flange, use the generic tool to turn for approximately 3/4 round and tighten to  $(14 \pm 2 \text{ N}\cdot\text{m})$ .
9. Install the drain plug and refill the engine oil. (Refer 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.



## OIL PRESSURE CHECK

1. Check engine oil quantity.
2. Remove the oil pressure switch terminal.



3. Use the special tool (oil pressure switch wrench) to remove the oil pressure switch.

### Caution

**Since sealant is applied to the thread of oil pressure switch, take care not to damage the oil pressure switch when removing it.**

4. Install the oil pressure gauge.

**NOTE**

Use a adapter of PT 1/8 thread.

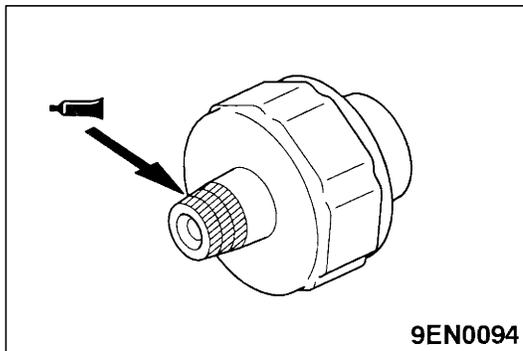
5. Run the engine to warm it.
6. After the engine has been warmed up, check that oil pressure is within the standard value.

**Standard value:**

**At idle: 29 kPa or more**

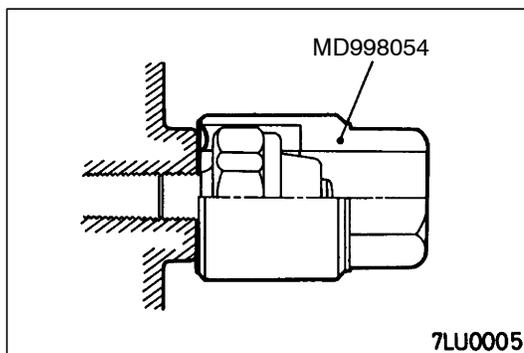
**At 3,500 r/min: 294 - 686 kPa**

7. Remove the oil pressure gauge.



8. Apply the specified sealant to the thread of oil pressure switch.

**Specified sealant: 3M ATD Part No. 8660 or equivalent**



9. Use the special tool to tighten the oil pressure switch to the specified torque.

**Tightening torque:  $10 \pm 2$  N·m**

**Caution**

**Do not start the engine within one hour after the oil pressure switch has been installed.**

10. Install the oil pressure switch terminal.

## ENGINE OIL COOLER

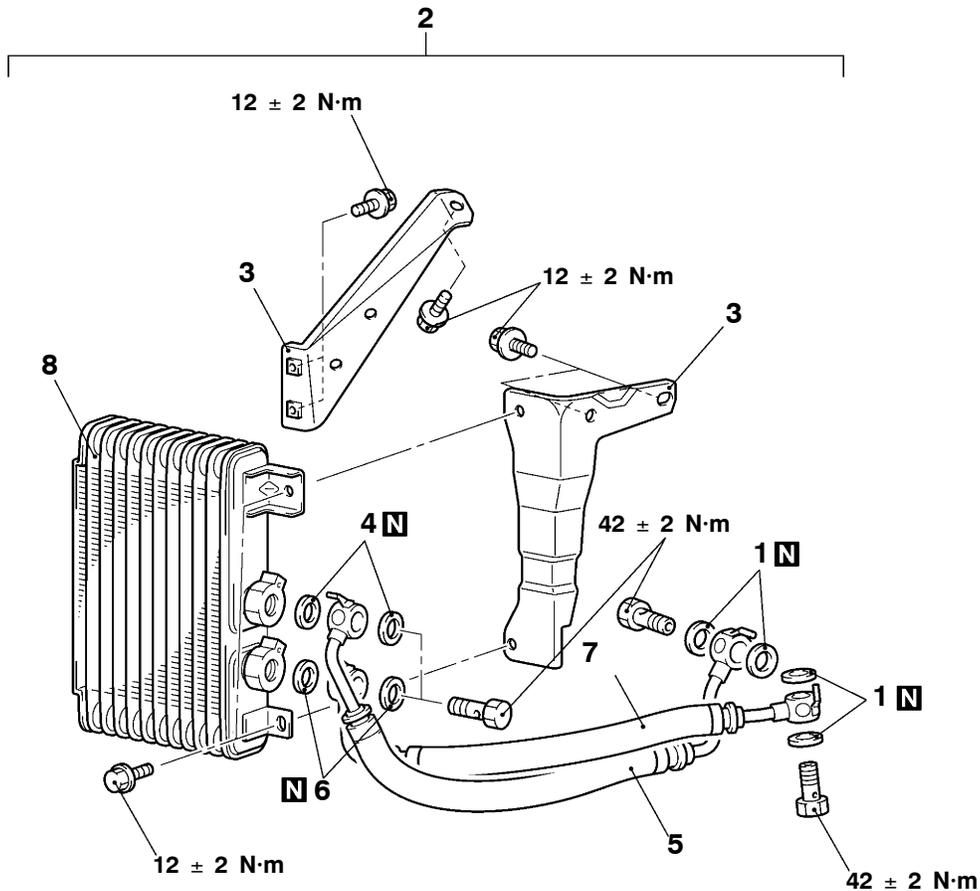
### REMOVAL AND INSTALLATION

#### Caution

If the vehicle is equipped with the Brembo disc brake, during maintenance, take care not to contact the parts or tools to the caliper because the paint of caliper will be scratched.

#### Pre-removal and Post-installation Operation

- Engine Oil Draining and Supplying (Refer to P.12-4.)
- Under Cover Removal and Installation (Refer to GROUP 51 - Front Bumper.)
- Side Cover Removal and Installation



AY2069AU

#### Removal steps

- |                                                 |                                  |
|-------------------------------------------------|----------------------------------|
| 1. Engine oil cooler tube gasket                | 5. Engine oil cooler feed hose   |
| 2. Engine oil cooler, bracket and hose assembly | 6. Engine oil cooler tube gasket |
| 3. Engine oil cooler bracket                    | 7. Engine oil cooler return hose |
| 4. Engine oil cooler tube gasket                | 8. Engine oil cooler             |

---

## NOTES