

GROUP 12

ENGINE  
LUBRICATION

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## GENERAL INFORMATION

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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.

## ENGINE OILS

**⚠ 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:

**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

M1121000301031

| Item                          |                | Standard value          |
|-------------------------------|----------------|-------------------------|
| Engine oil pressure kPa (psi) | at idle        | 29 (4.2) or more        |
|                               | at 3,500 r/min | 294 – 686 (42.7 – 99.4) |

## SEALANT

M1121000501466

| Item                       | Specified sealant                                              | Remark              |
|----------------------------|----------------------------------------------------------------|---------------------|
| Engine oil pressure switch | ThreeBond 1215, ThreeBond 1141J, ThreeBond 1212D or equivalent | Semi-drying sealant |

## LUBRICANTS

M1121000403012

| Item           | Engine oil                                                                                                                                                                     | Quantity dm <sup>3</sup> (qt) |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| Oil filter     | Engine oils displaying the ILSAC certification symbol ("Starburst" symbol) on the container. If these oils are not available, and API classification SN or higher can be used. | 0.2 (0.21)                    |
| Total quantity |                                                                                                                                                                                | 3.0 (3.11)                    |

## ENGINE OIL

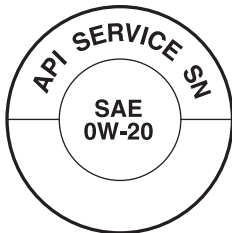
 CAUTION**Never use nondetergent or straight mineral oil.**

Use only engine oils displaying the ILSAC certification symbol ("Starburst" symbol) on the container.

ILSAC certification symbol  
("Starburst" symbol)

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API service symbol

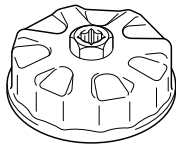
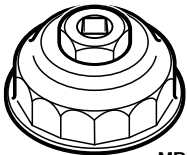
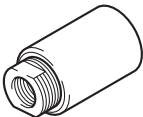
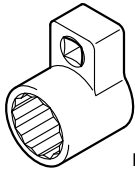


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If these oils are not available, and API classification SN or higher can be used.

## SPECIAL TOOLS

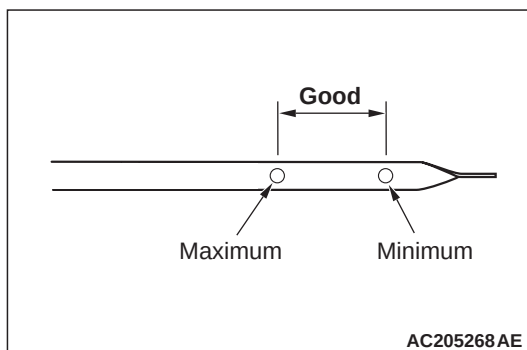
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| Tool                                                                                           | Tool number and name                   | Supersession                        | Application                                            |
|------------------------------------------------------------------------------------------------|----------------------------------------|-------------------------------------|--------------------------------------------------------|
| <br>B991396   | MB991396<br>Oil filter wrench          | General service tool or MB991396-01 | Removal and installation of oil filter                 |
| <br>MB991828  | MB991828<br>Oil filter wrench          | General service tool                |                                                        |
| <br>MB992676  | MB992676<br>Oil filter stud setter     | —                                   | Installation of oil filter stud                        |
| <br>MB992118 | MB992118<br>Oil pressure switch wrench | —                                   | Removal and installation of engine oil pressure switch |

## ON-VEHICLE SERVICE

## ENGINE OIL CHECK

M1121000901497



1. Pull out the oil dipstick, clean off the engine oil on the oil dipstick, and then reinsert the oil dipstick.
2. Pull out the oil dipstick, and check the engine oil level is within the marks on one side of the oil dipstick.

## NOTE:

- Checking the engine oil might be difficult shortly after stopping the engine or engine oil replacement.
- If difficult, take some time (approximately 30 seconds) and try again.
- Refer to the information label indicating the engine oil check process on the cylinder head cover.

3. Check that the engine oil is not excessively dirty, that there is no coolant or gasoline mixed in, and that it is sufficiently thick and slippery.

## ENGINE OIL CHANGE

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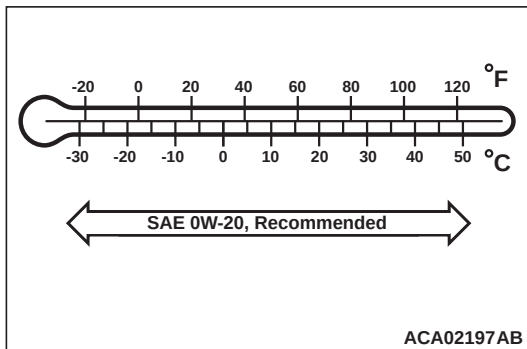
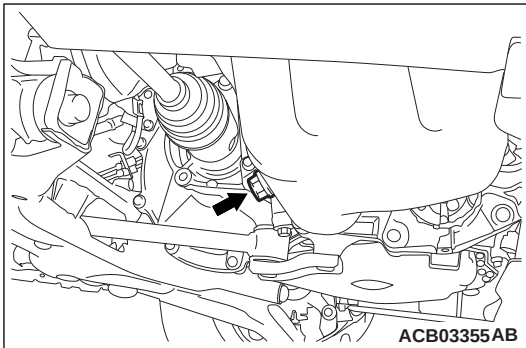
1. Start the engine and allow it to warm up until the temperature of the engine coolant reaches 80 – 90°C (176 – 194°F).

**⚠ WARNING**

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

2. Remove the oil filler cap.
3. Remove the oil drain plug to drain engine oil.
4. Install a new oil drain plug gasket and then tighten the oil drain plug to the specified torque.

**Tightening torque:  $39 \pm 5 \text{ N}\cdot\text{m}$  ( $29 \pm 3 \text{ ft}\cdot\text{lb}$ )**



5. Refill with specified quantity of engine oil.

**Specified Engine Oil:** Engine oils displaying the ILSAC certification symbol ("Starburst" symbol) on the container. If these oils are not available, and API classification SN or higher can be used.

**Total quantity (Includes volume inside engine oil filter):  $3.0 \text{ dm}^3$  (3.11 quarts)**

*NOTE: Mitsubishi Motors Genuine 0W-20 Synthetic Engine Oil is recommended for optimum fuel economy and cold weather starting.*

*If Mitsubishi Motors Genuine 0W-20 Synthetic Engine Oil is not available, 5W-20 grade oils displaying the ILSAC certification can be used.*

*However, Mitsubishi Motors Genuine 0W-20 Synthetic Engine Oil should be used at the next oil change to maintain optimum fuel economy and cold weather starting.*

6. Install the oil filler cap.
7. Let the engine run for a few minutes.
8. Stop the engine, and then check the engine oil level using the engine oil dipstick after a few minutes.

## OIL FILTER REPLACEMENT

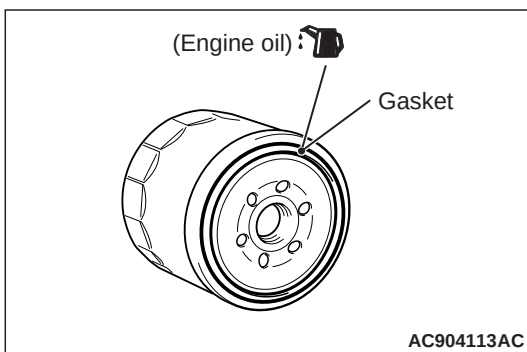
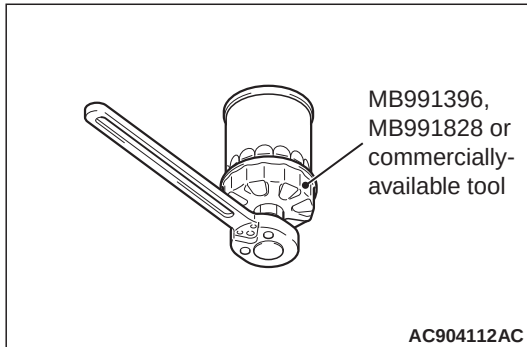
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1. Remove the oil drain plug to drain engine oil (Refer to P.12-4).

**⚠ CAUTION**

Cover the starter assembly with a rag to prevent the engine oil from adhering to the starter assembly, otherwise the starter assembly may be damaged.

2. Use special tool oil filter wrench (MB991396, MB991828) or commercially-available tool to remove the oil filter.
3. Clean the oil filter installing surface on the cylinder block side.



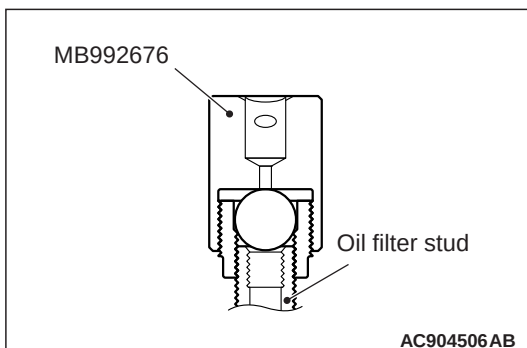
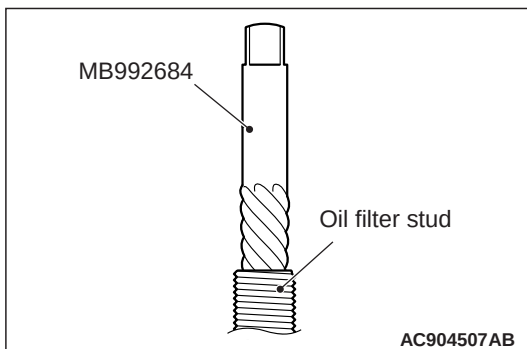
4. Apply a small amount of engine oil to the new oil filter gasket.
5. For the specified tightening torque, refer to the caution label attached on the oil filter.
6. Tighten the oil filter until the gasket contacts with the installation surface.
7. In the same manner as removal, use special tool oil filter wrench (MB991396, MB991828) or commercially-available tool to tighten the oil filter to the specified torque.
8. Install the oil drain plug and refill the engine oil (Refer to P.12-4).
9. Rev the engine a few times, and check to be sure that no engine oil leaks from the installation section of the oil filter.

**OIL FILTER STUD REPLACEMENT**

M1121003800106

1. Remove the oil filter (Refer to P.12-5).
2. Remove the oil filter stud using recommended tool screw extractor (MB992684) or equivalent.

*NOTE: This recommended tool is a component of screw extractor set (MB992678).*



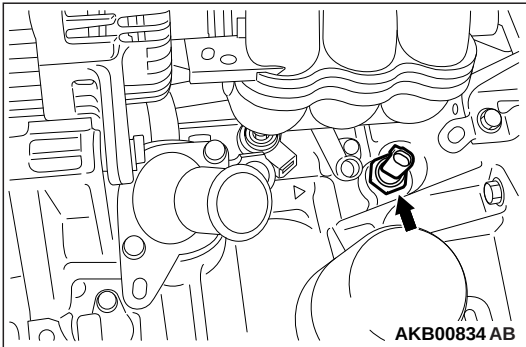
3. Using special tool oil filter stud setter (MB992676), install the new oil filter stud and tighten it to the specified torque.

**Specified torque: 27 ± 2 N·m (20 ± 1 ft·lb)**

4. Install the oil filter (Refer to P.12-5).

## ENGINE OIL PRESSURE CHECK

M1121002302513



1. Check engine oil level.
2. Remove the engine oil pressure switch (Refer to P.12-7).
3. Install the oil pressure gauge.

*NOTE: Use an adapter of PT 1/8 thread.*

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

### Standard value:

**At idle: 29 kPa (4.2 psi) or more**

**At 3,500 r/min: 294 – 686 kPa (42.7 – 99.4 psi)**

6. Remove the oil pressure gauge.
7. Install the engine oil pressure switch (Refer to P.12-7).

## ENGINE OIL PRESSURE SWITCH

### REMOVAL AND INSTALLATION

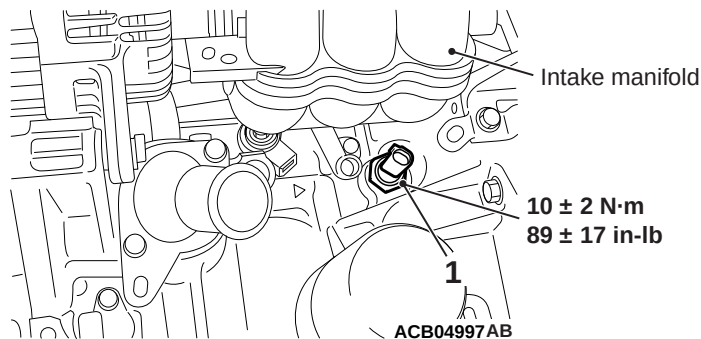
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#### Pre-removal Operation

- Engine Room Under Cover Front Removal (Refer to GROUP 51 – Under Cover P.51-15).
- Oil Filter Removal (Refer to GROUP 12 – On-vehicle Service, Oil Filter Replacement P.12-5).

#### Post-installation Operation

- Oil Filter Installation (Refer to GROUP 12 – On-vehicle Service, Oil Filter Replacement P.12-5).
- Engine Room Under Cover Front Installation (Refer to GROUP 51 – Under Cover P.51-15).



#### Removal

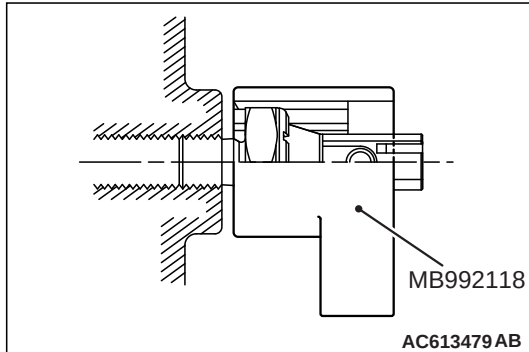
- <<A>> >>A<< 1. Engine oil pressure switch

## REMOVAL SERVICE POINT

<<A>> ENGINE OIL PRESSURE SWITCH  
REMOVAL**⚠ CAUTION**

The sealant is applied to the bolt. Remove the bolt with care not to break it.

Use special tool oil pressure switch wrench (MB992118) to remove the engine oil pressure switch.



## INSTALLATION SERVICE POINT

## &gt;&gt;A&lt;&lt; ENGINE OIL PRESSURE SWITCH INSTALLATION

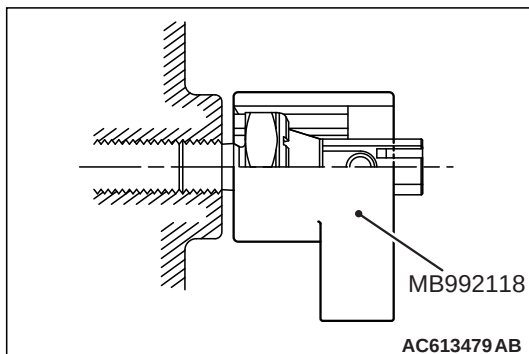
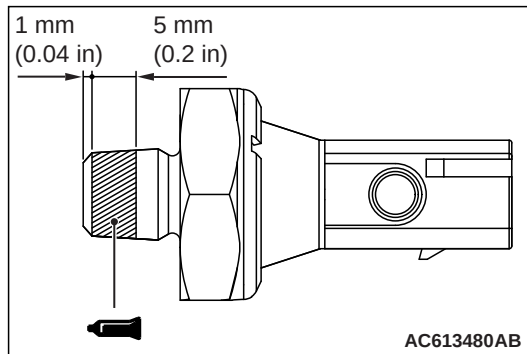
1. Apply sealant to the engine oil pressure switch thread.

**Specified sealant: ThreeBond 1215 or equivalent**

*NOTE: Install the engine oil pressure switch immediately after applying sealant.*

**⚠ CAUTION**

After the installation, until a sufficient period of time (one hour or more) elapses, do not apply the engine oil or water to the sealant application area or start the engine.



2. In the same manner as removal, use special tool oil pressure switch wrench (MB992118) to tighten the engine oil pressure switch to the specified torque.

**Tightening torque: 10 ± 2 N·m (89 ± 17 in-lb)**