
ENGINE LUBRICATION

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12109000037

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GENERAL INFORMATION

12100010039

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

Furthermore, the oil level sensor is located in the oil pan, and an indicator gives a warning when the oil level drops.

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.

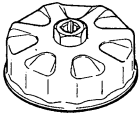
LUBRICANTS

12100040038

Items	Engine oil (API classification)	Quantity ℓ
Oil filter	SG or higher	0.3
Total quantity		4.3

SPECIAL TOOL

12100060034

Tool	Number	Name	Use
	MB991396	Oil filter wrench	Removal and installation of engine oil filter <To remove the oil filter of part no. MD135737>

ON-VEHICLE SERVICE

12100090033

ENGINE OIL INSPECTION

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 gasoline mixed in, and that it has sufficient viscosity.

ENGINE OIL REPLACEMENT

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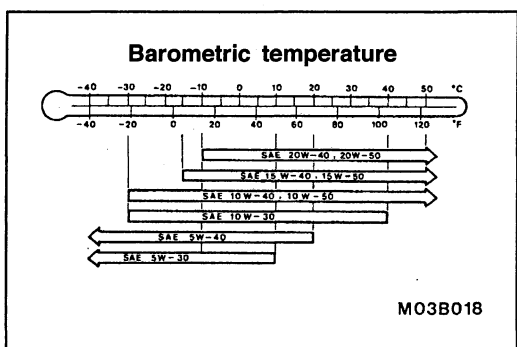
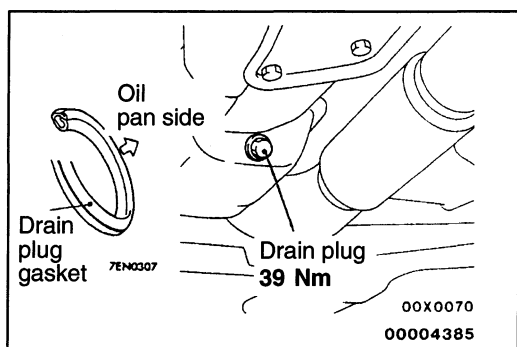
1. Start the engine and allow it to warm up until the temperature of the coolant reaches 80°C to 90°C.
2. Remove the engine oil filler cap.
3. Remove the drain plug to drain oil.

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

4. Fit the drain plug after oil has been drained completely.

NOTE

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



5. Refill with specified quantity of oil.

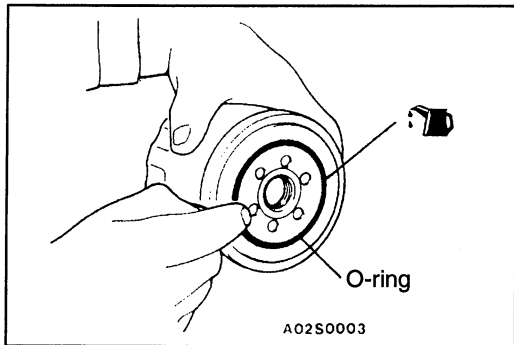
Specified Engine Oil (API classification): SG or higher**Total quantity (Includes volume inside oil filter):**
4.3 ℓ

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

OIL FILTER REPLACEMENT

12100110036

1. After removing the engine oil filler cap, remove the engine oil drain plug to drain the engine oil.
2. Use the special tool to remove the engine oil filter from the underside of the vehicle.
For the oil filter (MD135737): MB991396 or equivalent
Except the oil filter (MD135737): commercial tool
3. Clean the filter bracket side mounting surface.



4. Apply a small amount of engine oil to the O-ring of the new oil filter.
5. Install the engine oil filter.

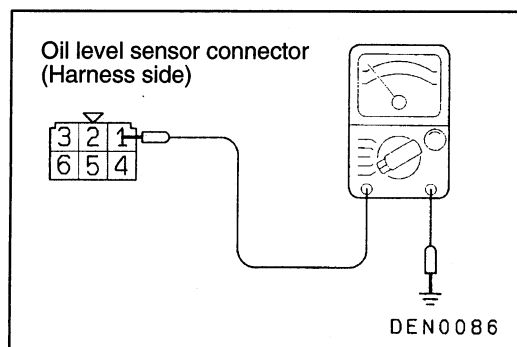
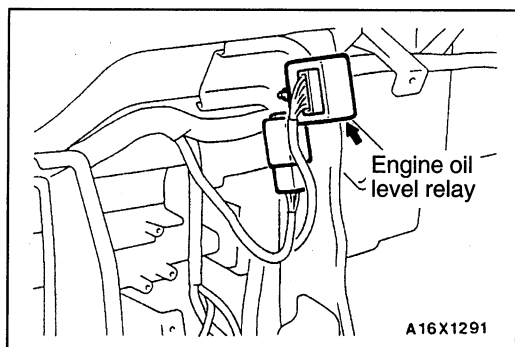
NOTE

Tightening torque

For the oilfilter (MD135737): 14 Nm

Except the oil filter (MD135737): 16 Nm

6. Fill with engine oil.
7. Race the engine 2-3 times, and check to be sure that no engine oil leaks from installation section of the oil filter.



OIL LEVEL WARNING SYSTEM INSPECTION

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1. Check that the proper amount of oil has been filled.
2. When the ignition switch is turned to ON (do not start the engine), check that the oil level warning lamp illuminates.

NOTE

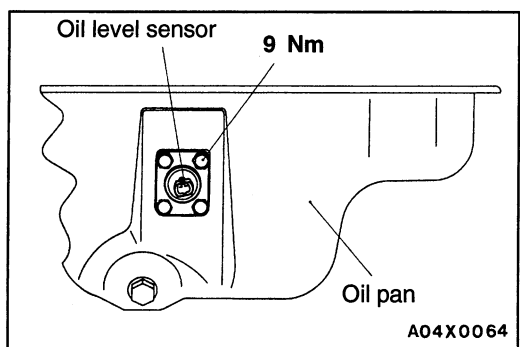
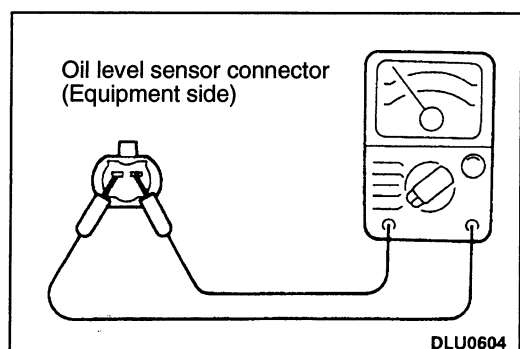
If the oil level warning lamp does not illuminate, the cause is probably a blown lamp, or a malfunction in the relay.

3. When the engine is started, check that the oil level warning lamp turns off.

If the oil level warning lamp doesn't go out, disconnect the connector of the oil level relay and measure the voltage of the No.1 terminal on the harness side of the connector while idling the engine in order to confirm that it measures the battery voltage.

NOTE

- (1) If the voltage at the connector is the same as the battery voltage, the problem is probably a malfunction of either the oil level relay or the oil level sensor.
 - (2) If the voltage at the connector is lower than the battery voltage, the problem is probably a malfunction of either the alternator or the wiring harness.
4. Disconnect the oil level sensor connector. Check that the oil level warning lamp illuminates after approximately 20 seconds.
- If the oil level warning lamp does not illuminate, replace the oil level relay.



5. Check the continuity between the oil level sensor terminals.

Engine oil temperature	Oil level	Continuity
At 40°C or lower	Normal (proper volume)	Continuity
	Low (drained)	Continuity
At 70°C or higher	Normal (proper volume)	Continuity
	Low (drained)	No continuity

6. If there is a defect, replace the oil level sensor.

NOTES