

LUBRICATION

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120002658

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GENERAL INFORMATION

120002135

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.

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

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 separately 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

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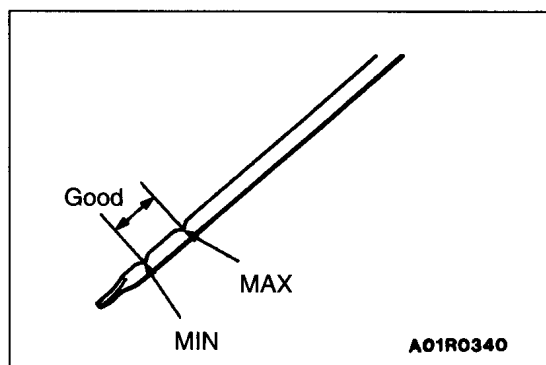
Items		4G63, 4G64	4D56
Engine oil (API Classification)		SG or higher	CD or higher
Quantity dm ³	Oil filter	0.3	0.8
	Oil cooler	–	0.6
	Total quantity	4.3	6.9

SERVICE ADJUSTMENT PROCEDURES

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ENGINE OIL INSPECTION

1. Pull out the oil level gauge and remove oil adhered to the level gauge, wiping with clean cloth.
2. Insert the level gauge into the oil level gauge guide.



3. Pull out the level gauge slowly and check that the oil level is in the illustrated range.

NOTE

1. For this inspection, place the vehicle on a level surface.
2. Check while the engine is stationary. If the engine has been started, stop it and allow for some time before inspection.
4. If below the minimum level, supply with specified oil.

Specified oil: (API classification)

<4G63, 4G64>: SG or higher

<4D56>: CD or higher

Caution

Refilling beyond the maximum level has adverse effect on engine performance.

5. Run the engine at idle and stop. Then allow some time and check oil level again to make sure it is within the specified range.
6. 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

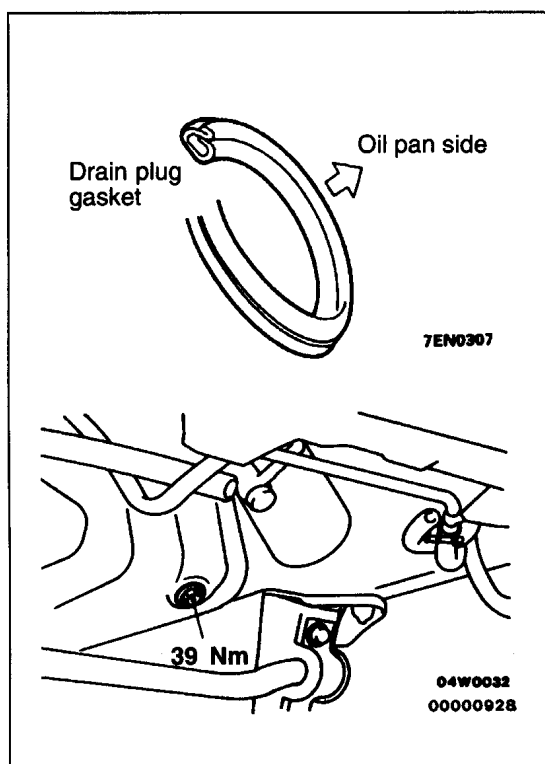
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1. Start the engine and allow it to warm up until the temperature of the coolant reaches 80°C to 90°C.
2. Remove the engine oil filler cap.
3. Remove the drain plug to drain oil.

Caution

Use care as oil could be hot.

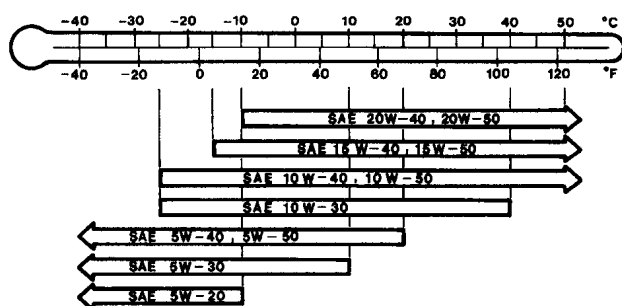
4. Install a new drain plug gasket so that it faces in the direction shown in the illustration, and then tighten the drain plug to the specified torque.



5. Refill with specified quantity of oil.

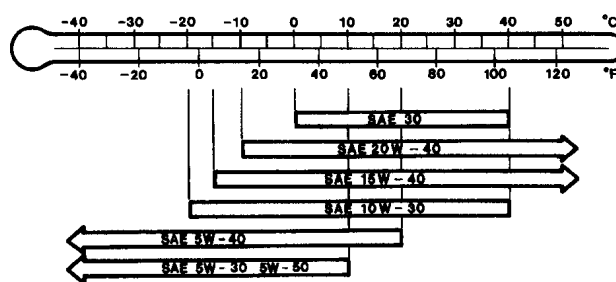
Items	Specified oil (API classification)	Total quantity (Includes volume inside oil filter and oil cooler) dm ³
4G63, 4G64	SG or higher	4.3
4D56	CD or higher	6.9

PETROL-POWERED VEHICLES Barometric temperature



72N0025

DIESEL-POWERED VEHICLES Barometric temperature



72N0026

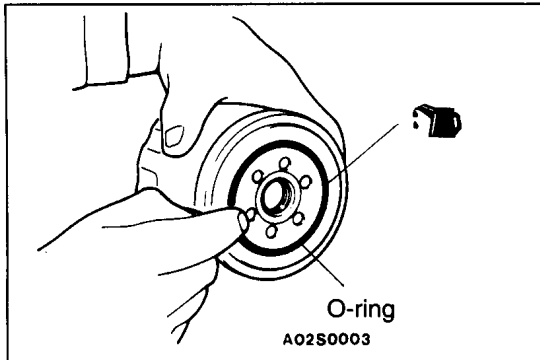
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6. Install the engine oil filler cap.
7. Check oil level. (Refer to P.12-3.)

OIL FILTER REPLACEMENT

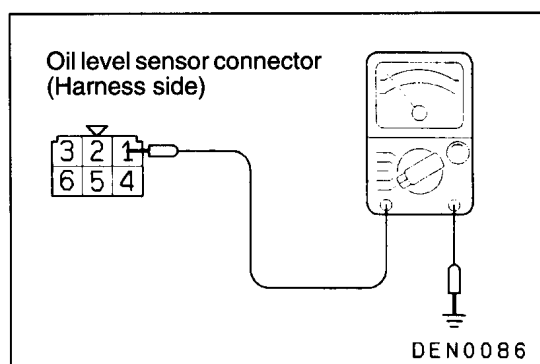
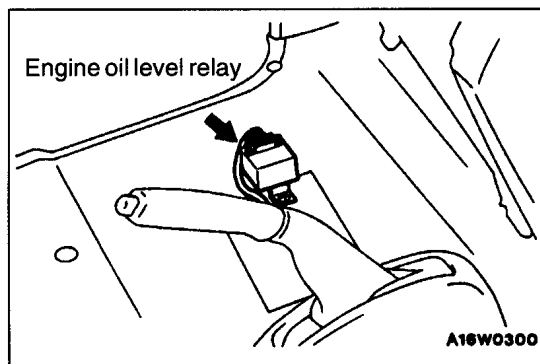
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1. Warm up the engine, and then stop the engine to remove the oil filler cap.
2. Remove the under cover. (Refer to GROUP 42 – Under Cover.)
3. Remove the drain plug to drain the engine oil.
4. Remove the air cleaner, and cover the alternator with a rag so that oil will not get on the alternator <4D56 only>.
5. Use an oil filter wrench 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. Screw in the oil filter by hand, and use a filter wrench after the O-ring starts to touch the flange.



Items	Specified torque	Remarks
4G63	1 turn [approx. 14 Nm]	MD135737
4G64	3/4 turn [approx. 14 Nm]	MD136466
4D56	5/8 turn [approx. 20 Nm]	

9. Install the air cleaner. <4D56 only>
10. Fill with engine oil.
11. 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**

120002028

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.

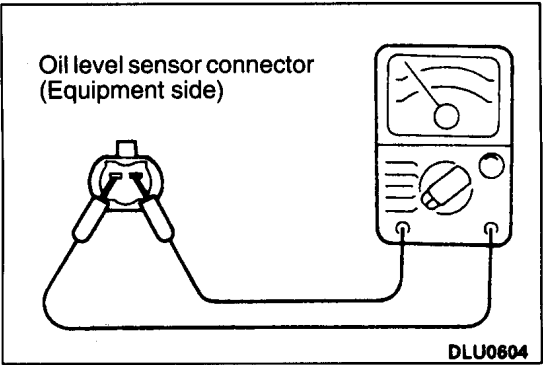
3. When the engine is started, check that the oil level warning lamp turns off.

If the oil level warning lamp will not 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 is the same as the battery voltage.

NOTE

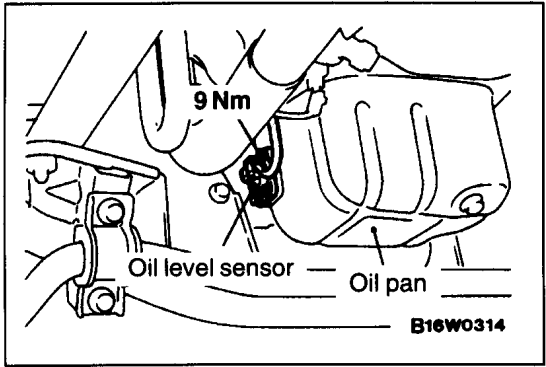
- (1) If the voltage at the connector is the same as the battery voltage, the problem is probably a malfunction of either the oil level relay or the oil level sensor.

- (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.

ENGINE OIL COOLER <4D56>

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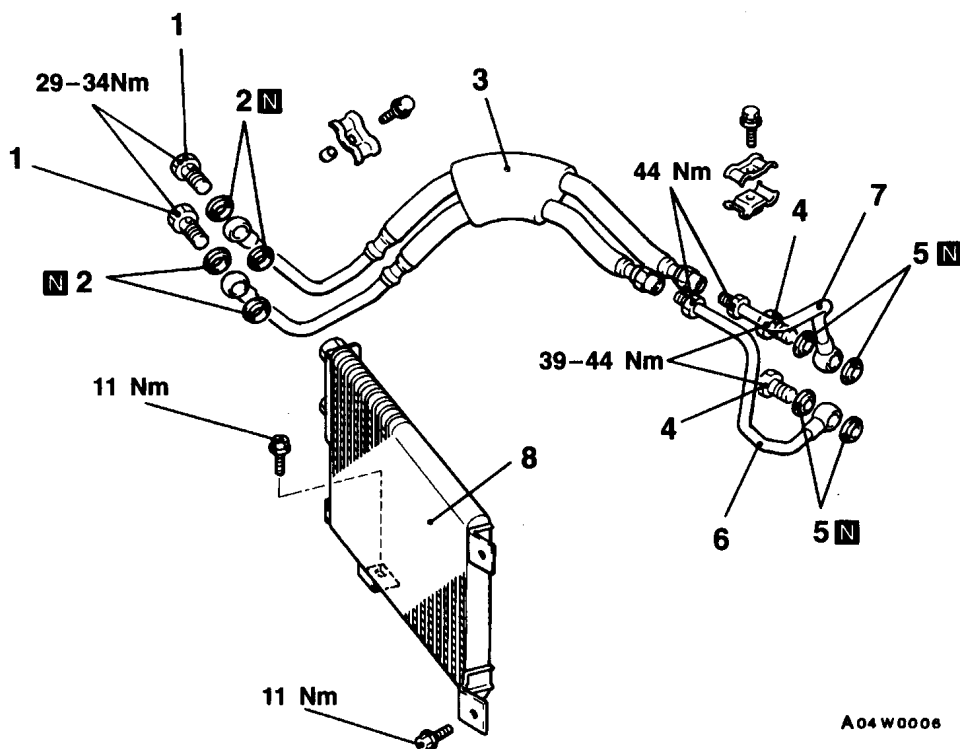
REMOVAL AND INSTALLATION

Pre-removal Operation

1. Front Bumper Removal
(Refer to GROUP 51 – Front Bumper.)
2. Air Cleaner Removal
(Refer to GROUP 15 – Air Cleaner.)

Post-Installation Operation

1. Air Cleaner Installation
(Refer to GROUP 15 – Air Cleaner.)
2. Front Bumper Installation
(Refer to GROUP 51 – Front Bumper.)
3. Oil Checking and Supplying



A04W0006

Removal steps

1. Eye bolt
2. Gasket
3. Engine oil cooler hose assembly
4. Eye bolt
5. Gasket
6. Return tube assembly
7. Feed tube assembly
8. Oil cooler assembly