
GROUP 12

ENGINE LUBRICATION

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GENERAL DESCRIPTION

M1121000100595

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

ITEM		SPECIFICATION
Oil pump type	2.4L Engine	Involute gear type
	3.8L Engine	Trochoid type
Drive method		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

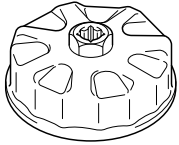
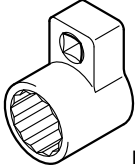
The most effective precaution is to prevent, as far as practical, the risk of skin contact with mineral oils i.e. use enclosed systems for handling used engine oil and degrease components, where practical, before handling them.

OTHER PRECAUTIONS:

- Avoid prolonged and repeated contact with oil, particularly used engine oil.
- Wear protective clothing, including impervious gloves where practical.
- Avoid contaminating clothes with oil.
- Do not put oily rags in pockets.
- Do not wear heavily soiled clothing and oil-soaked 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 i.e. 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 (skin cleansers and nail brushes will help). After cleaning, apply lotion, etc., containing lanolin to replace natural skin oils is advised.
- Do not use gasoline, kerosene, diesel fuel, gas oil, thinners or solvents for cleaning skin.
- Apply barrier creams before each work period.
- If skin disorders develop, obtain medical advice immediately.

SPECIAL TOOLS

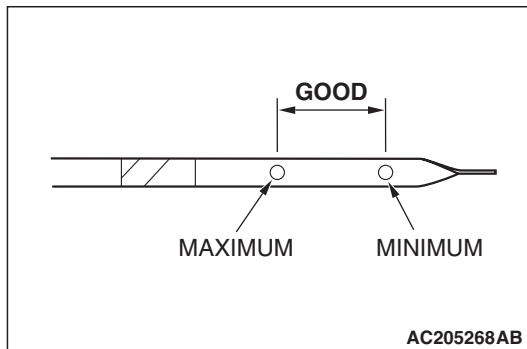
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TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
 B991396	MB991396 Oil filter wrench	General service tool or MB991396-01	Removal and installation of engine oil filter (when using oil filter MD321589 and MD352627)
 MB992118	MB992118 Oil pressure switch wrench	–	Removal and installation of engine oil pressure switch

ON-VEHICLE SERVICE

ENGINE OIL CHECK

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1. Pull out the oil dipstick slowly and check that the oil level is within the marks on the oil dipstick.
2. Check that the oil is not excessively dirty, that there is no coolant or gasoline mixed in, and that it is sufficiently thick and slippery.

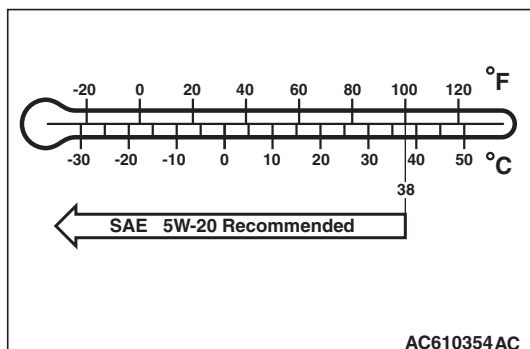
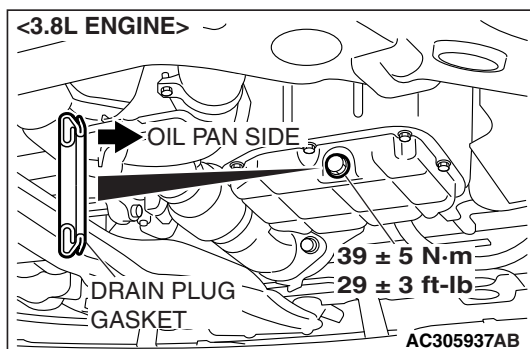
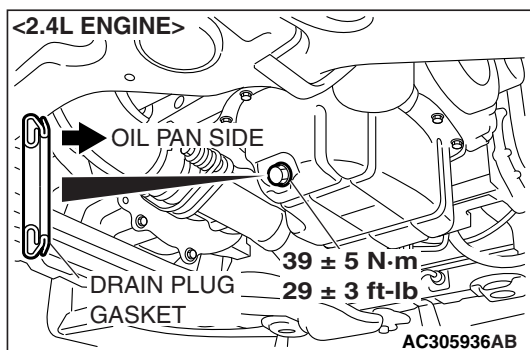
ENGINE OIL REPLACEMENT

M1121001001550

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

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

2. Remove the engine oil filler cap.
3. Remove the drain plug to drain oil.



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

5. Refill the specified quantity of oil.

Specified engine oil: Engine oils displaying ILSAC certification mark ("Starburst" symbol) or conforming to the API classification SM

Total quantity: 4.3 dm^3 (4.52 quarts)

NOTE: SAE 5W-20 engine oil is strongly recommended for optimum fuel economy and cold starting. SAE 10W-30 may be used when the normal operating temperature is above 38°C (100°F).

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

ENGINE OIL FILTER REPLACEMENT

M1121001101063

Required Special Tool:

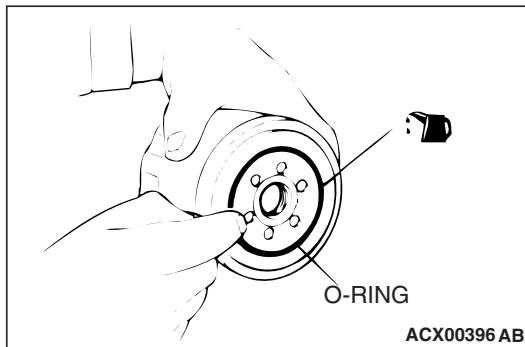
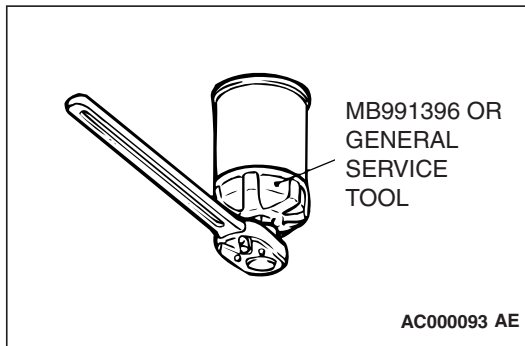
- MB991396: Oil Filter Wrench

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

WARNING

Use care as oil could be hot.

2. Remove the engine oil filler cap.
3. Remove the drain plug to drain oil.
4. Use an oil filter wrench to remove the engine oil filter.
5. Clean the filter bracket side mounting surface and ensure the old O-ring has been removed.



6. Apply a small amount of engine oil to the O-ring of the new oil filter.

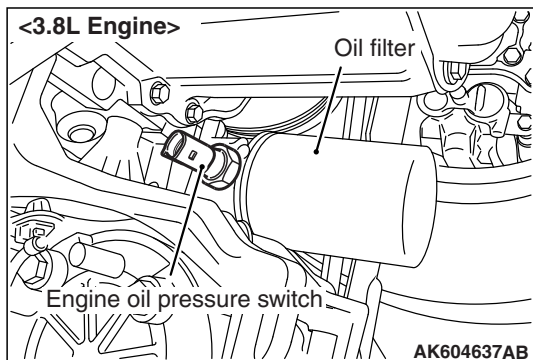
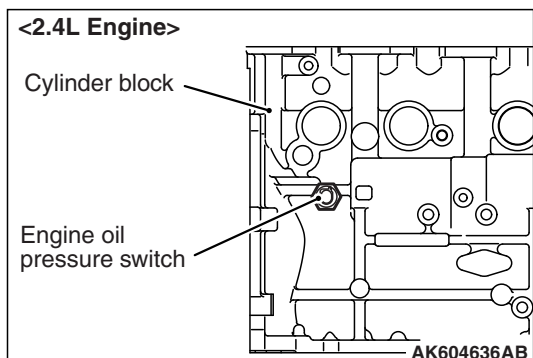
7. Screw on the oil filter by hand until it touches the surface of the flange and then tighten it with an oil filter wrench.

NUMBER	ENGINE	SPECIAL TOOL	TIGHTENING TORQUE
MD136466, MD322508	2.4L	General service tool	Approximately 3/4 turn [17 ± 3 N·m (13 ± 2 ft-lb)]
MD352627		MB991396 or equivalent	Approximately one turn [14 ± 2 N·m (124 ± 18 in-lb)]
MD356000		General service tool	Approximately 3/4 turn [14 ± 2 N·m (124 ± 18 in-lb)]
MD321589, MD352627	3.8L	MB991396 or equivalent	Approximately one turn [14 ± 2 N·m (124 ± 18 in-lb)]

8. Install the drain plug and refill engine oil (Refer to Engine Oil Replacement [P.12-3](#)).
9. Rev the engine a few times, and check to be sure that no engine oil leaks at the oil filter.

ENGINE OIL PRESSURE CHECK

M1121002302126



1. Check engine oil level.
2. Remove the engine oil pressure switch (Refer to [P.12-7](#)).
3. Install the engine oil pressure gauge.
NOTE: Use a 1/8 pipe thread adapter.
4. Run the engine to warm it.
5. After the engine has been warmed up, check that engine 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 (43 – 100 psi)**

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

ENGINE OIL PRESSURE SWITCH

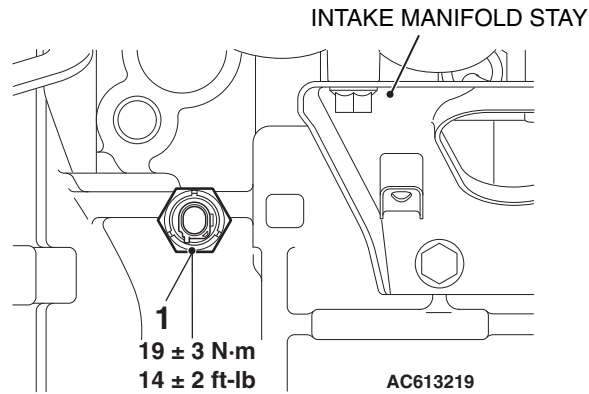
REMOVAL AND INSTALLATION

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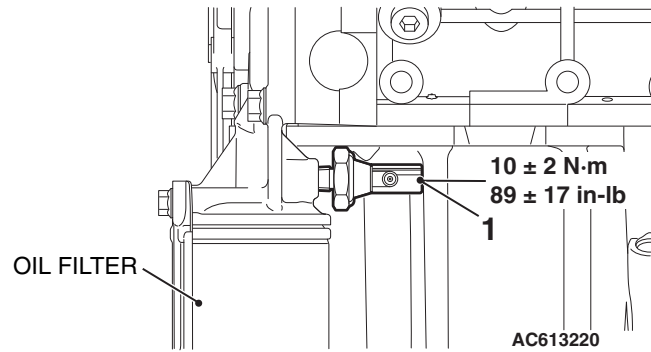
Post-installation operation

- Engine Oil Check (Refer to P.12-3).

<2.4L ENGINE>



<3.8L ENGINE>



AC613391AB

Removal

- <<A>> >>A<< 1. ENGINE OIL PRESSURE SWITCH

Required Special Tool:

- MB992118: Oil Pressure Switch Wrench

REMOVAL SERVICE POINT

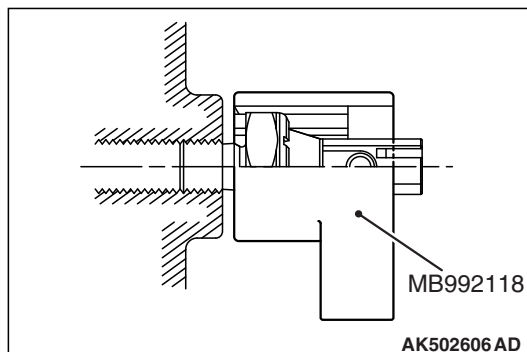
<<A>> ENGINE OIL PRESSURE SWITCH REMOVAL

1. Disconnect the engine oil pressure switch connector.

CAUTION

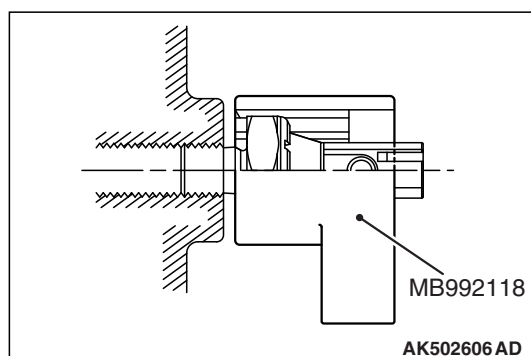
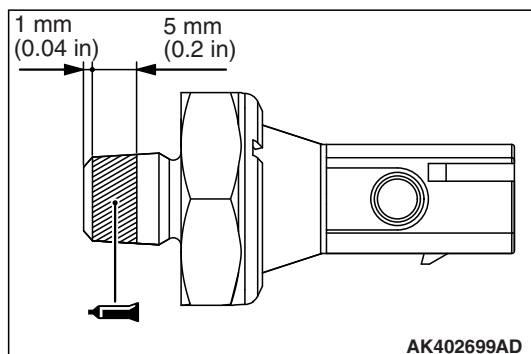
The sealant is applied to the bolt. Remove the bolt with care not to break it.

2. Use special tool MB992118 to remove the engine oil pressure switch.



INSTALLATION SERVICE POINT

>>A<< ENGINE OIL PRESSURE SWITCH INSTALLATION



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

Specified sealant: 3M™ AAD Part number 8672 or equivalent

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

⚠ CAUTION

After installing the parts, wait at least one hour. Never start the engine or let engine oil or water touch the sealant application area during that time.

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

Tightening torque:

<2.4L ENGINE> 19 ± 3 N·m (14 ± 2 ft-lb)

<3.8L ENGINE> 10 ± 2 N·m (89 ± 17 in-lb)

3. Connect the engine oil pressure switch connector.

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

M1121002200435

ITEM		SPECIFICATION
Engine oil filter	MD136466, MD322508	17 ± 3 N·m (13 ± 2 ft-lb)
	MD321589, MD352627, MD356000	14 ± 2 N·m (124 ± 18 in-lb)
Engine oil pan drain plug		39 ± 5 N·m (29 ± 3 ft-lb)
Engine oil pressure switch	2.4L Engine	19 ± 3 N·m (14 ± 2 ft-lb)
	3.8L Engine	10 ± 2 N·m (89 ± 17 in-lb)

SERVICE SPECIFICATIONS

M1121000300339

ITEM		STANDARD VALUE
Engine oil pressure kPa (psi)	at idle	29 (4.2) or more
	at 3,500 r/min	294 – 686 (43 – 100)

SEALANT

M1121000500344

ITEM	SPECIFIED SEALANT
Engine oil pressure switch	3M™ AAD Part No. 8672 or equivalent

LUBRICANTS

M1121000401340

ITEM	ENGINE OIL	QUANTITY dm ³ (qt)
Oil filter	Engine oils displaying ILSAC certification mark ("Starburst" symbol) or conforming to the API classification SM	0.3 (0.32)
Total quantity		4.3 (4.52)

ENGINE OIL



CAUTION

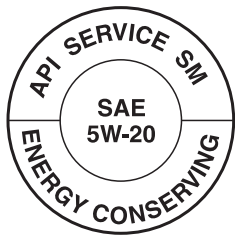
Never use nondetergent or straight mineral oil.

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

ILSAC CERTIFICATION MARK
("STARBURST" SYMBOL)

ACX00394 AI

API SERVICE SYMBOL



AC613125AB

If these oils are not available, an API classification SM can be used.