

GROUP 12

ENGINE
LUBRICATION

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GENERAL DESCRIPTION

M1121000100249

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

ITEMS	SPECIFICATIONS
Oil pump type	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

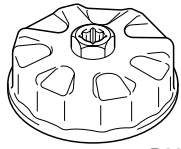
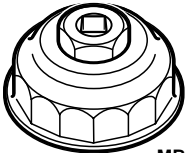
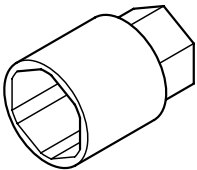
The most effective precaution is to adapt working practices which prevent, as far as practical, the risk of skin contact with mineral oils, i.e. use enclosed systems for handling used engine oil and decrease components, where practical, before handling them.

Other precautions:

- Avoid prolonged and repeated contact with oil, particularly used engine oil.
- Wear protective clothing, including impervious gloves where practical.
- Avoid contaminating clothes, particularly underwear 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, especially before meals (skin cleansers and nail brushes will help). After cleaning, apply lotion, etc., containing lanolin to replace natural skin oils.
- Do not use gasoline, kerosene, diesel fuel, gas oil, thinners or solvents for cleaning skin.
- Apply barrier creams before each work period to help clean the skin after work.
- If skin disorders develop, obtain medical advice immediately.

SPECIAL TOOLS

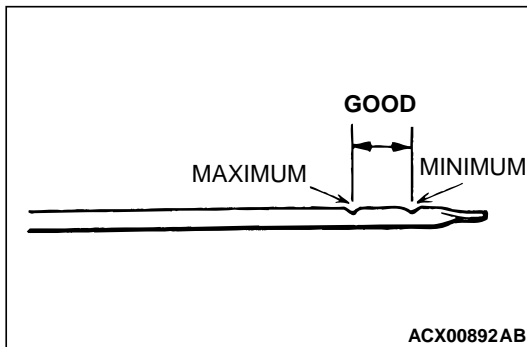
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TOOLS	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
 B991396	MB991396 Oil filter wrench	General service tool or MB991396-01	Removal and installation of engine oil filter (when using oil filter MD360935)
 MB991828	MB991828 Oil filter wrench	General service tool	Removal and installation of engine oil filter (when using oil filter MD365876)
	MD998054 Oil pressure switch wrench	General service tool or MD998054-01	Removal and installation of oil pressure switch

ON-VEHICLE SERVICE

ENGINE OIL CHECK

M1121000900234



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

M1121001000256

Refer to GROUP 00, Maintenance Service – Engine Oil
(Change) [P.00-41](#).

ENGINE OIL FILTER REPLACEMENT

M1121001100264

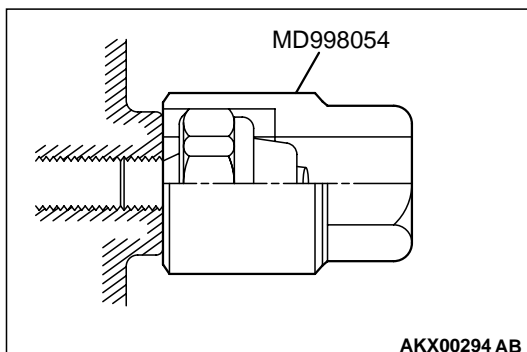
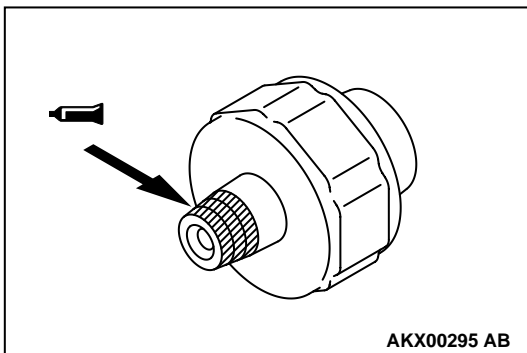
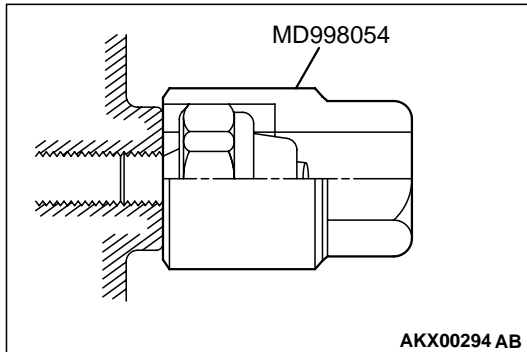
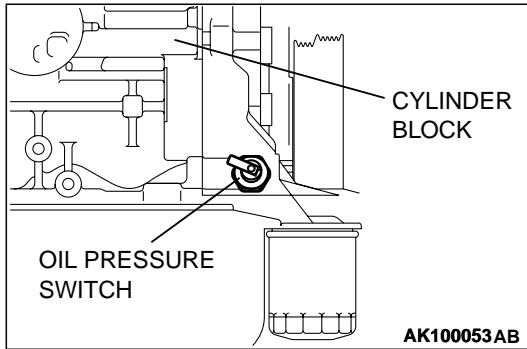
Refer to GROUP 00, Maintenance Service – Engine Oil Filter
(Change) [P.00-41](#).

OIL PRESSURE CHECK

M1121002300250

Required Special Tool:

MD998054:Oil Pressure Switch Wrench



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

⚠ CAUTION

Since sealant is applied to the thread of the oil pressure switch and may be difficult to unscrew, take care not to damage the oil pressure switch when removing it.

3. Use special tool MD998054 to remove the oil pressure switch.
4. Install the oil pressure gauge.
NOTE: Use a 1/8 pipe thread adapter.
5. Run the engine to warm it.
6. After the engine has 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 (43 – 100 psi)

7. Remove the oil pressure gauge.
8. Apply the specified sealant 3M™ AAD Part number 8672 or equivalent to thread of the oil pressure switch.

⚠ CAUTION

Do not start the engine within one hour after the engine oil pressure switch has been installed to allow sufficient drying time for the sealant.

9. Use special tool MD998054 to tighten the oil pressure switch to the specified torque.

Tightening torque: 10 ± 2 N·m (87 ± 17 in·lb)

10. Install the oil pressure switch terminal.

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

M1121002200219

ITEMS		SPECIFICATIONS
Engine oil filter	MD360935, MD352626	14 ± 2 N·m (124 ± 18 in-lb)
	MD325714, MD332687, MD365876	16 ± 4 N·m (12 ± 3 ft-lb)
	MD136466, MD322508	17 ± 3 N·m (13 ± 2 ft-lb)
Engine oil pan drain plug		39 ± 5 N·m (29 ± 4 ft-lb)
Oil pressure switch		10 ± 2 N·m (87 ± 17 in-lb)

SERVICE SPECIFICATION(S)

M1121000300102

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

SEALANT

M1121000500098

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

LUBRICANT

M1121000400284

ITEMS		ENGINE OIL	QUANTITY dm ³ (qt)
Oil filter		Engine oil displaying ILSAC certification mark ("Starburst" symbol) or conforming to the API classification SJ EC or SJ/CD EC	0.3 (0.32)
Total quantity	1.6L Engine		3.0 (3.1)
	2.0L Engine		3.5 (3.7)

ENGINE OIL

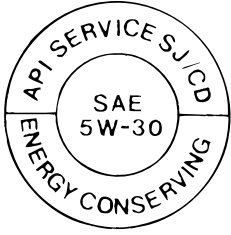
**Never use nondetergent or straight mineral oil.**

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

ILSAC CERTIFICATION MARK
("STARBURST" SYMBOL)

ACX00394AI

API SERVICE SYMBOL



ACX00886 AB

If these oils are not available, an API classification SJ EC or SJ/CD EC can be used.