

TROOPER

ENGINE

ENGINE LUBRICATION

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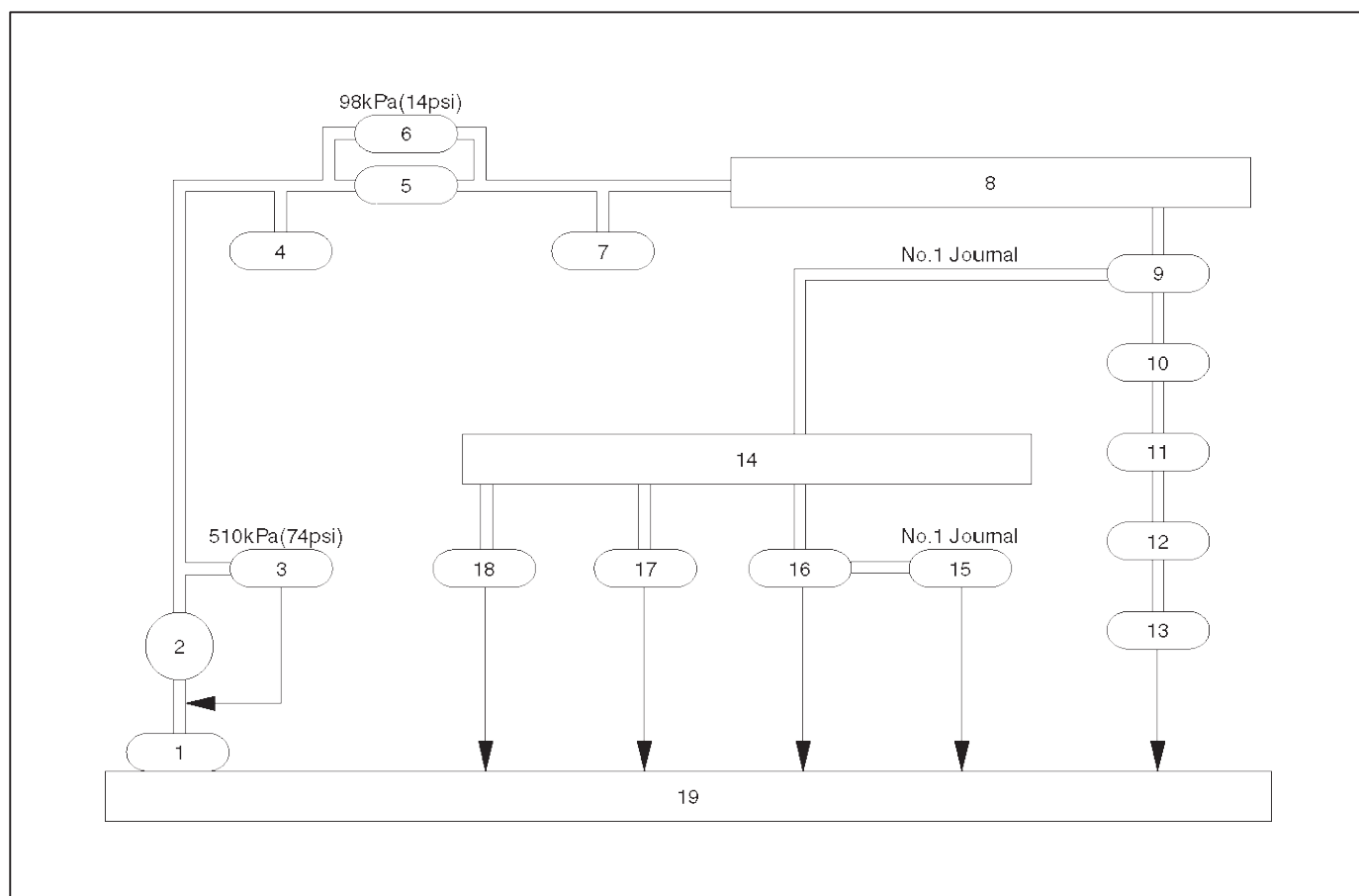
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Service Precaution

WARNING: THIS VEHICLE HAS A SUPPLEMENTAL RESTRAINT SYSTEM (SRS). REFER TO THE SRS COMPONENT AND WIRING LOCATION VIEW IN ORDER TO DETERMINE WHETHER YOU ARE PERFORMING SERVICE ON OR NEAR THE SRS COMPONENTS OR THE SRS WIRING. WHEN YOU ARE PERFORMING SERVICE ON OR NEAR THE SRS COMPONENTS OR THE SRS WIRING, REFER TO THE SRS SERVICE INFORMATION. FAILURE TO FOLLOW WARNINGS COULD RESULT IN POSSIBLE AIR BAG DEPLOYMENT, PERSONAL INJURY, OR OTHERWISE UNNEEDED SRS SYSTEM REPAIRS.

CAUTION: Always use the correct fastener in the proper location. When you replace a fastener, use **ONLY** the exact part number for that application. ISUZU will call out those fasteners that require a replacement after removal. ISUZU will also call out the fasteners that require thread lockers or thread sealant. **UNLESS OTHERWISE SPECIFIED**, do not use supplemental coatings (Paints, greases, or other corrosion inhibitors) on threaded fasteners or fastener joint interfaces. Generally, such coatings adversely affect the fastener torque and the joint clamping force, and may damage the fastener. When you install fasteners, use the correct tightening sequence and specifications. Following these instructions can help you avoid damage to parts and systems.

General Description



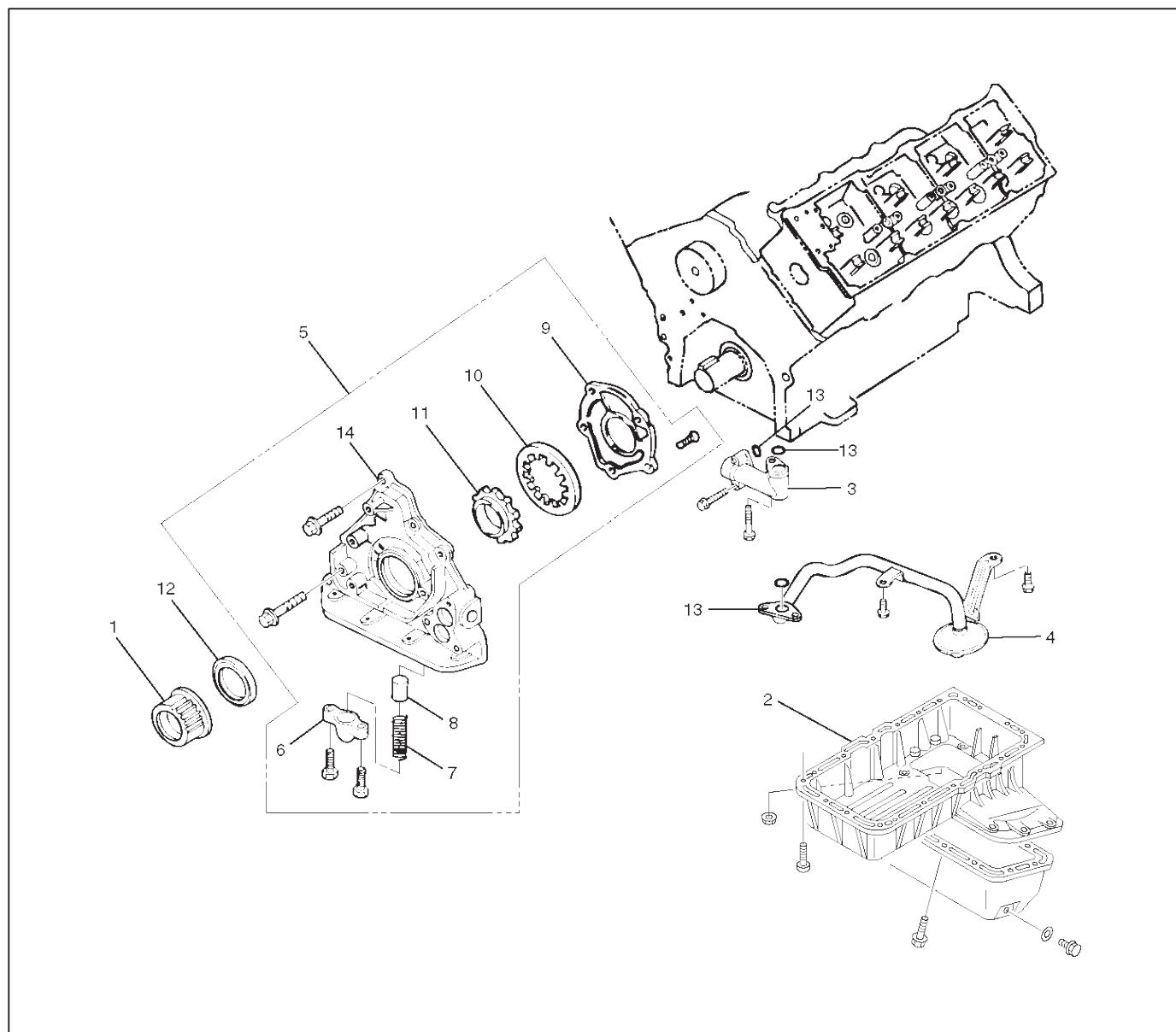
C08RW002

Legend

- | | |
|-------------------------|---|
| (1) Oil Strainer | (10) Crankshaft |
| (2) Oil Pump | (11) Connecting Rod Bearing |
| (3) Relief Valve | (12) Connecting Rod |
| (4) Oil Pressure Switch | (13) Piston |
| (5) Oil Filter | (14) Oil Gallery; Cylinder Head |
| (6) Safety Valve | (15) Camshaft |
| (7) Oil Pressure Unit | (16) Camshaft Journal |
| (8) Oil Gallery | (17) Front Journal; Camshaft Drive Gear |
| (9) Crankshaft Bearing | (18) Rear Journal; Camshaft Drive Gear |
| | (19) Oil Pan |

Oil Pump

Oil Pump and Associated Parts



051RW005

Legend

- | | |
|------------------------------|--------------------|
| (1) Crankshaft Timing Pulley | (8) Relief Valve |
| (2) Crankcase with Oil Pan | (9) Oil Pump Cover |
| (3) Oil Pipe | (10) Driven Gear |
| (4) Oil Strainer | (11) Drive Gear |
| (5) Oil Pump Assembly | (12) Oil Seal |
| (6) Plug | (13) O-ring |
| (7) Spring | (14) Oil Pump Body |

Disassembly

1. Remove crankshaft timing pulley.
2. Remove crankcase with oil pan.
3. Remove oil pipe.
4. Remove oil strainer.
5. Remove oil pump assembly.
6. Remove plug.
7. Remove spring.
8. Remove relief valve.
9. Remove oil pump cover.
10. Remove driven gear.

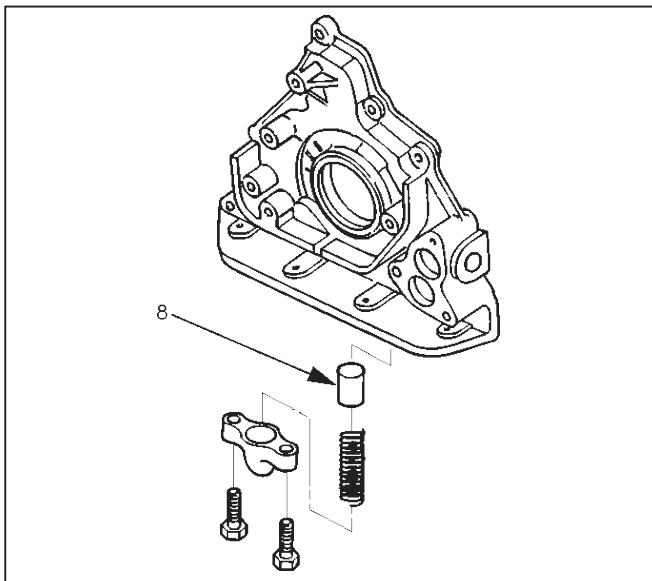
11. Remove drive gear.
12. Remove oil seal.
13. Remove O-ring.

Inspection and Repair

CAUTION: Make necessary correction or parts replacement if wear, damage or any other abnormal conditions are found during inspection.

Relief Valve (8)

- Check to see that the relief valve slides freely.
- The oil pump must be replaced if the relief valve does not slide freely.
- Replace the spring and/or the oil pump assembly (5) if the spring is damaged or badly worn.



051RS002

Body (14) and Gears (10, 11)

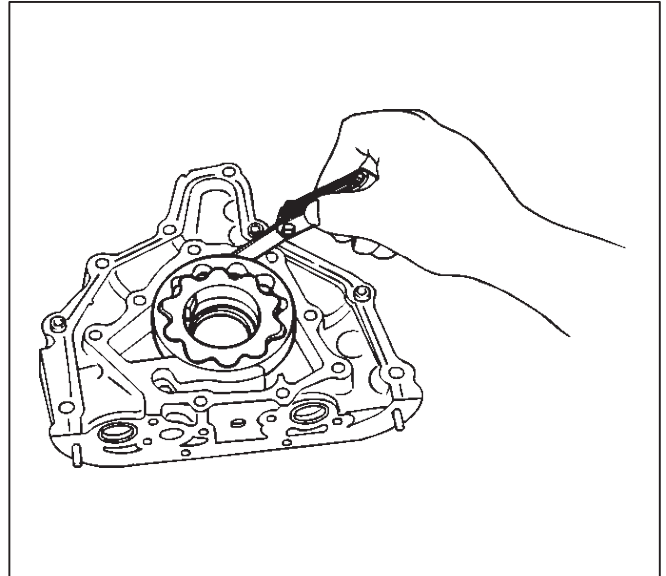
The pump assembly must be replaced if one or more of the conditions below is discovered during inspection.

- Badly worn or damaged driven gear (10).
- Badly worn drive gear (11) driving face.
- Badly scratched or scored body sliding face (14) or driven gear (10).
- Badly worn or damaged gear teeth.

Measure the clearance between the body and the driven gear with a feeler gauge.

Standard : 0.10 mm–0.18 mm
(0.0039 in.–0.0070 in)

Limit : 0.20mm (0.0079 in)

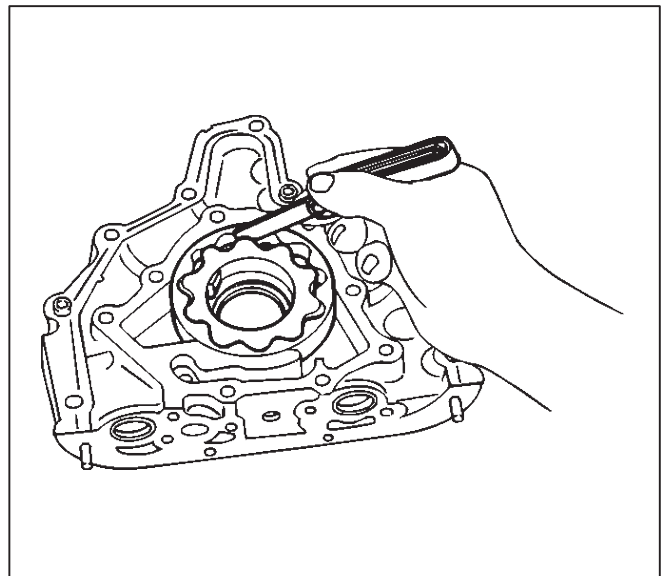


051RS004

- Measure the clearance between the drive gear and driven gear with a feeler gauge.

Standard : 0.11 mm–0.24 mm
(0.0043 in–0.0094 in)

Limit : 0.35mm (0.0138 in)



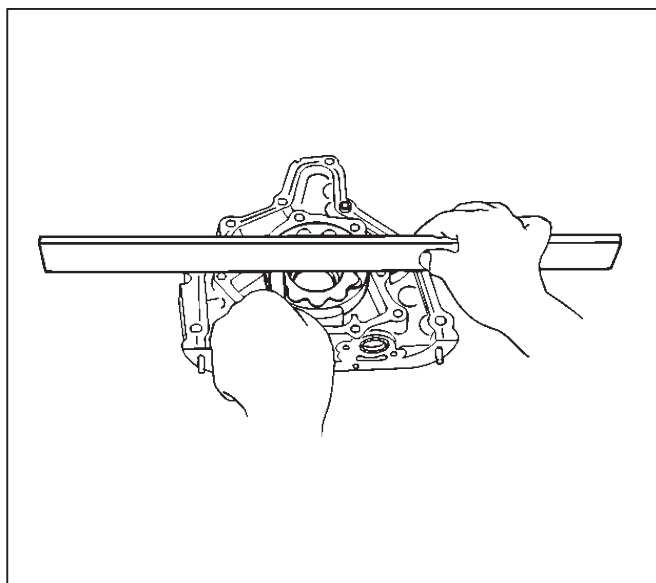
051RS003

- Measure the side clearance with a precision straight edge and a feeler gauge.

Clearance

Standard : 0.03 mm–0.09 mm
(0.0011 in–0.0035 in)

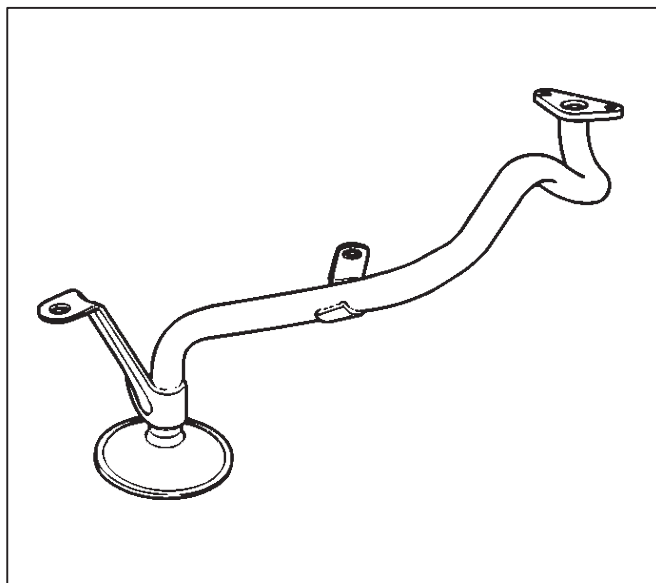
Limit : 0.15mm (0.0059 in)



051RS005

Oil Strainer

Check the oil strainer for cracking and scoring. If cracking and scoring are found, the oil strainer must be replaced.



051RS006

Reassembly

1. Install drive gear (11).
2. Install driven gear (10).
3. Install oil pump cover (9) and first, loosely tighten all of the attaching screws. Next, tighten the attaching screws to the specified torque.

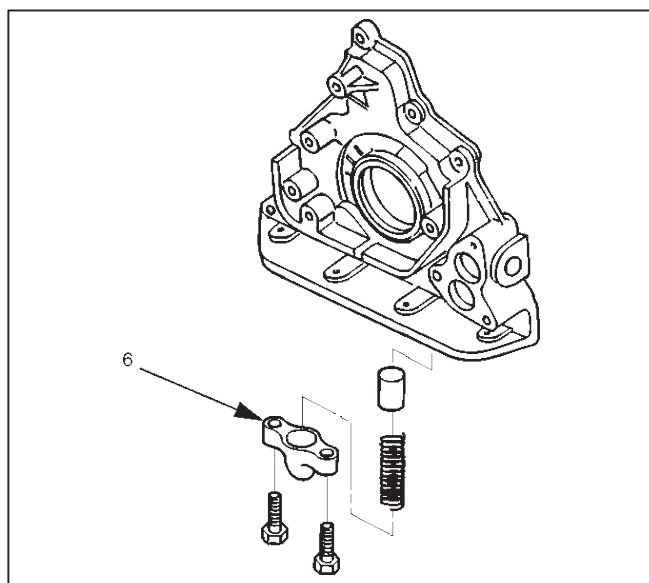
Torque : 10 N·m (89 lb in)

After installation, check that the gear rotates smoothly.

4. Install relief valve (8) and apply engine oil to the relief valve and spring (7).
5. Install spring (7).

6. Install the plug (6).

Torque : 8 N·m (69 lb in)



051RS007

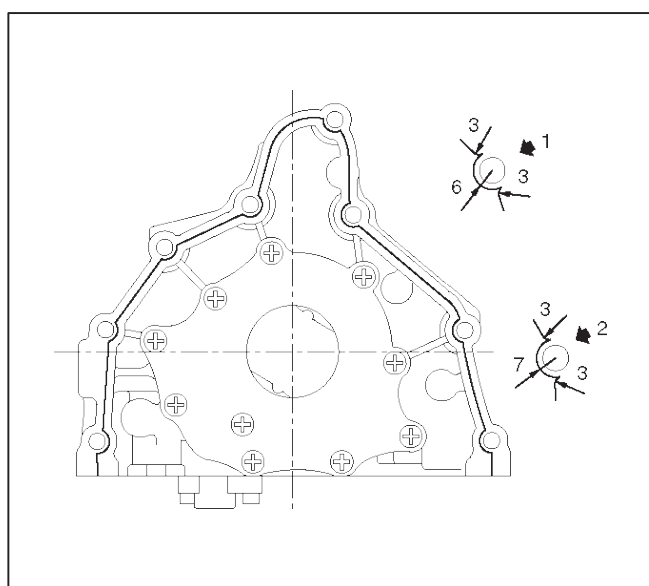
7. Install oil pump assembly (5).

- Carefully remove any oil from the cylinder body and the pump. Apply sealant (TB-1207B or equivalent) to the pump fitting face as shown in illustration. Take care that sealant is not applied to oil port surfaces. The oil pump assembly must be installed within 5 minutes after sealant application before the sealant hardens.

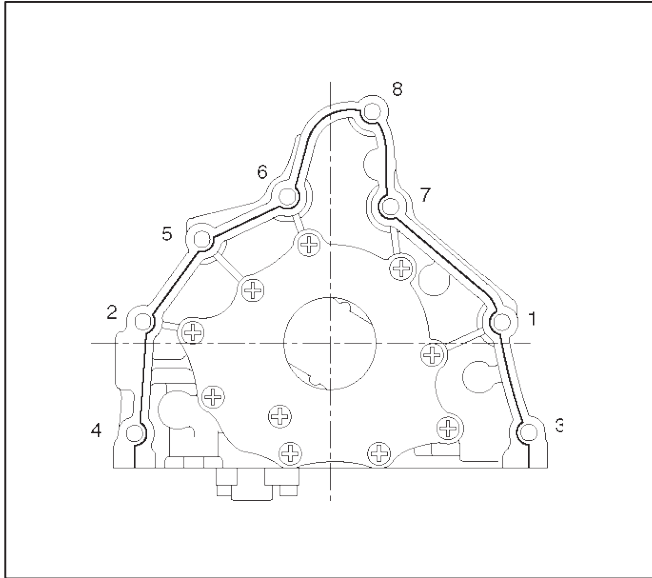
CAUTION: Do not apply an excessive amount of sealant to the contact surface. Applying too much sealant will overflow the contact surfaces. This could cause serious damage to the engine.

- Attach oil pump assembly to cylinder body.
- Tighten the oil pump fixing bolts.

Torque : 25 N·m (18 lb-ft)



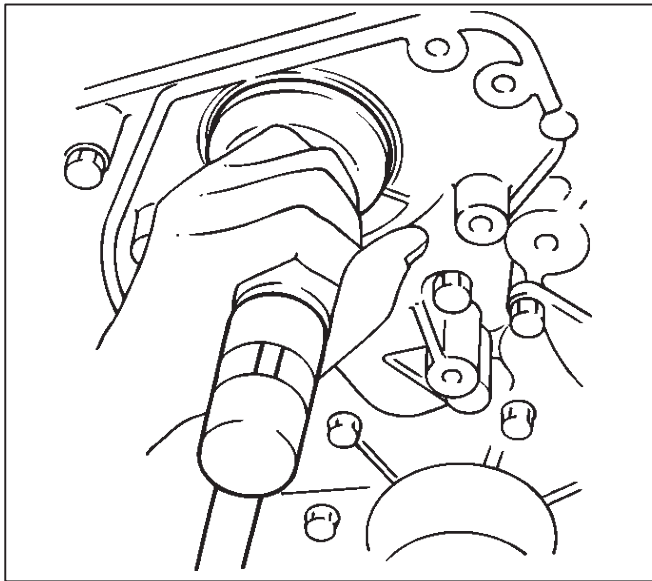
051RW002



Legend

- (1) Around Bolt Holes
- (2) Around Dowel Pin

8. Install the new oil seal (12). Apply engine oil to the oil seal lip before installation then use J-39202 oil seal Installer, install oil seal.



9. Install oil strainer (4) with O-ring (13).

Torque: 25 N·m (18 lb ft)

10. Install oil pipe (3) with O-ring (13).

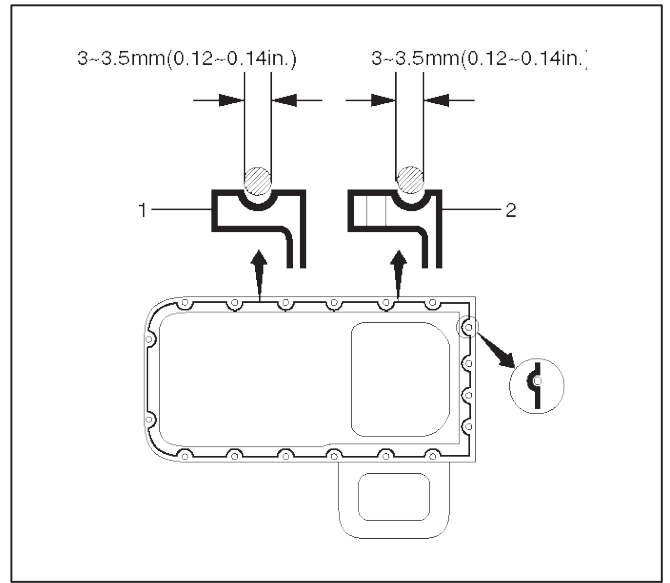
Torque: 25 N·m (18 lb ft)

11. Install crankcase with oil pan (2).

- Remove oil on crankcase mounting surface and dry the surface.
- Apply a proper 4.5 mm (0.7 in) wide bead of sealant (TB1207C or equivalent) to the crankcase mounting surface. The bead must be continuous.
- The crankcase must be installed within 5 minutes after sealant application before the sealant hardens.

- Tighten fixing bolts to the specified torque.

Torque : 10 N·m (89 lb in)

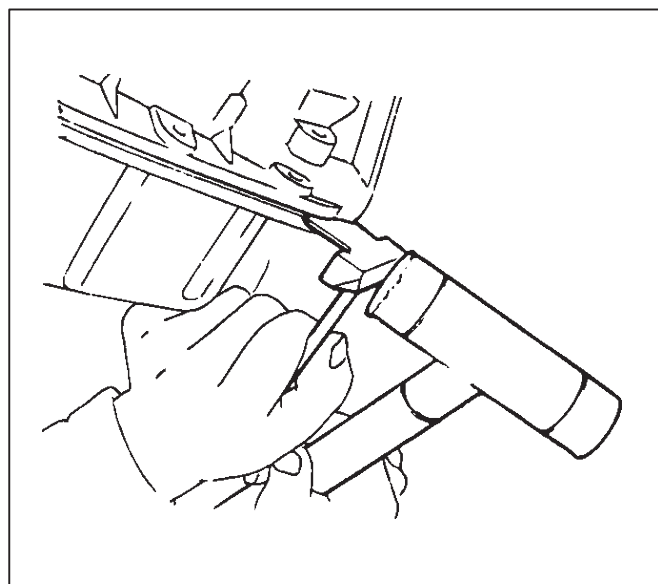


12. Install crankshaft timing pulley.

Oil Pan and Crankcase

Removal

1. Disconnect battery ground cable.
2. Lift vehicle by supporting the frame.
3. Remove under cover.
4. Drain engine oil.
5. Remove front wheels.
6. Remove oil level dipstick from level gauge tube.
7. Remove radiator under fan shroud.
8. Remove suspension cross member fixing bolts, 2 pcs each per side and remove suspension cross member.
9. Remove pitman arm and relay lever assembly, using the J-29107 remover, remove pitman arm from the steering unit and remove four fixing bolts for relay lever assembly.
10. Remove axle housing assembly four fixing bolts from housing isolator side and mounting bolts from wheel side. At this time support the axle with a garage jack and remove axle housing assembly. (For 4×4)
11. Remove starter fixing bolts.
12. Remove oil pan fixing bolts.
13. Remove oil pan, using J-37228 sealer cutter, remove oil pan.

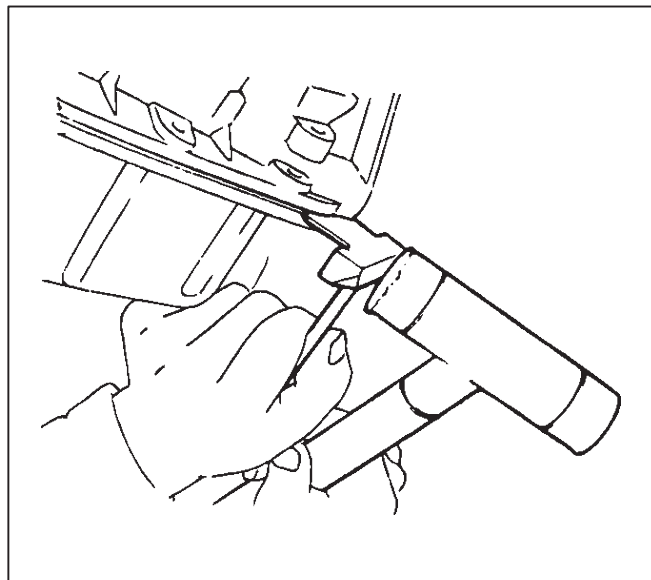


013RS003

14. Remove crankcase fixing bolts.
15. Remove crankcase, using J-37228 sealer cutter, remove crankcase.

NOTE: Do not deform or damage the flange of oil pan and crankcase.

Replace the oil pan and/or crankcase if deformed or damaged.



013RS003

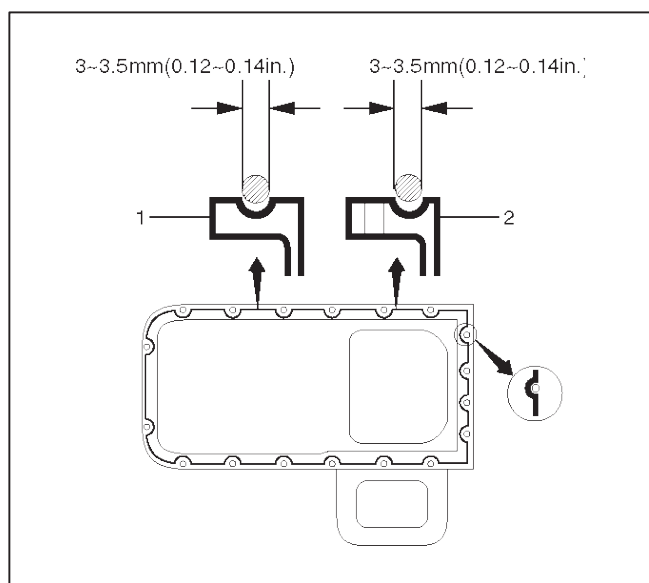
Installation

1. Install crankcase.

- A. Remove residual sealant, lubricant and moisture from mounting surface, then dry thoroughly.
- B. Properly apply a 4.5 mm (0.7 in) wide bead of sealant (TB-1207C or equivalent) to mounting surface of crankcase.

Sealant beat must be continuous.

- The crankcase must be installed within 5 minutes after sealant application before the sealant hardens.

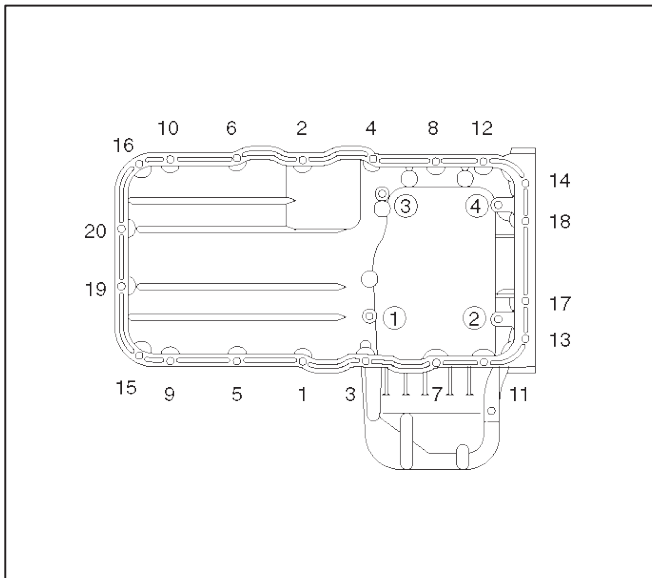


013RW010

6G-8 ENGINE LUBRICATION

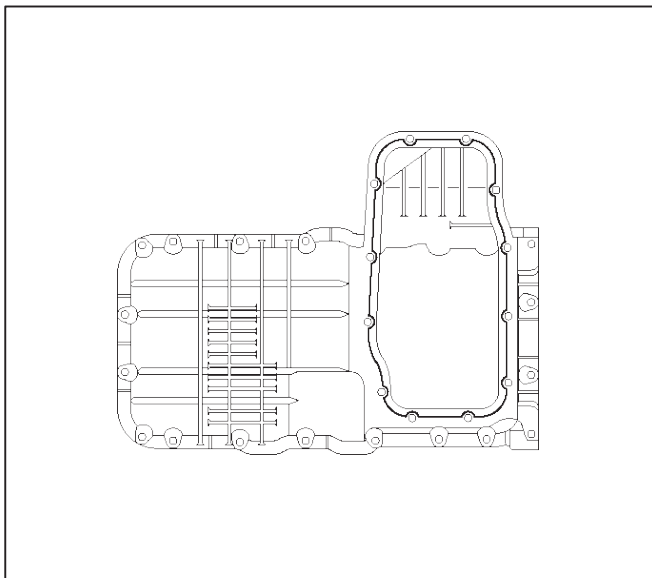
C. Install crankcase, tighten crankcase fixing bolts to the specified torque.

Torque : 10 N·m (89 lb in)



2. Install oil pan

1. Remove residual sealant, lubricant and moisture from mounting surface, then dry thoroughly.
2. Properly apply a 4.5 mm (07 in) wide bead of sealant (TB-1207C or equivalent) to mounting surface of oil pan.
Sealant beat must be continuous.
 - The crankcase must be installed within 5 minutes after sealant application before the sealant hardens.



3. Install oil pan, tighten oil pan fixing bolts to the specified torque.

Torque : 25 N·m (18 lb ft)

3. Install starter and tighten fixing bolts.

Torque: 40 N·m (30 lb ft)

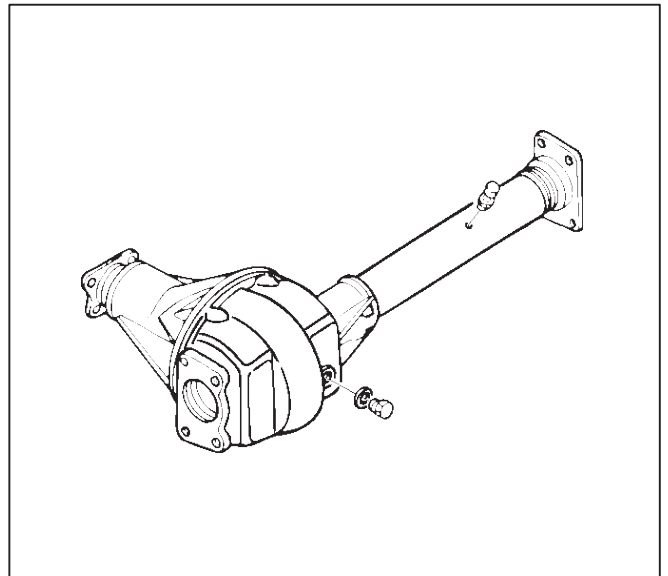
4. Install axle housing assembly and tighten fixing bolts to the specified torque. (For 4×4)

Axle case bolts

Torque : 82 N·m (60 lb ft)

Mounting bolts

Torque : 152 N·m (112 lb ft)

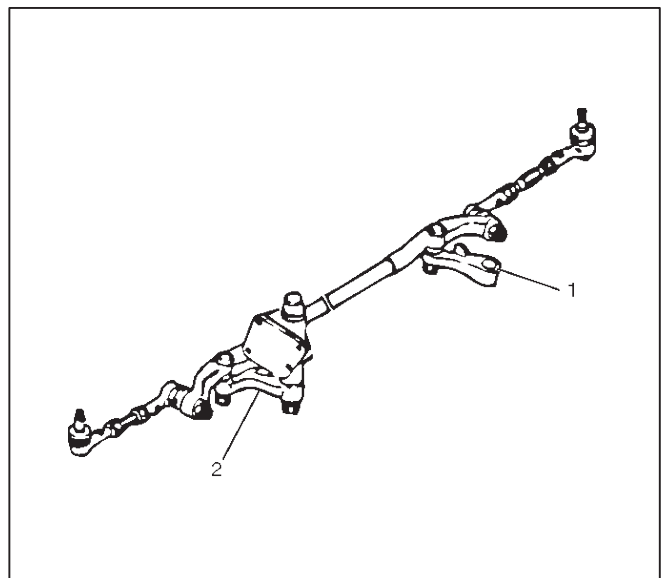


5. Install relay lever assembly and tighten fixing bolts.

Torque: 44 N·m (32 lb ft)

6. Engage teeth of pitman arm and steering unit, and tighten nut to the specified torque.

Torque : 216 N·m (159 lb ft)

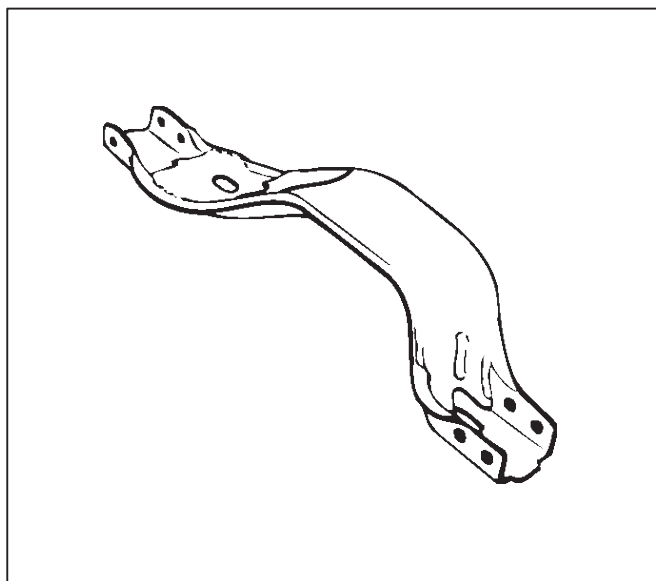


Legend

- (1) Pitman Arm
- (2) Relay Lever

7. Install suspension cross member and tighten fixing bolts to the specified torque.

Torque : 78 N·m (58 lb ft)



013RV007

8. Install radiator under fan shroud.
9. Install under cover.
10. Install engine oil level dipstick.
11. Fill engine oil until full level on engine oil gauge dipstick.

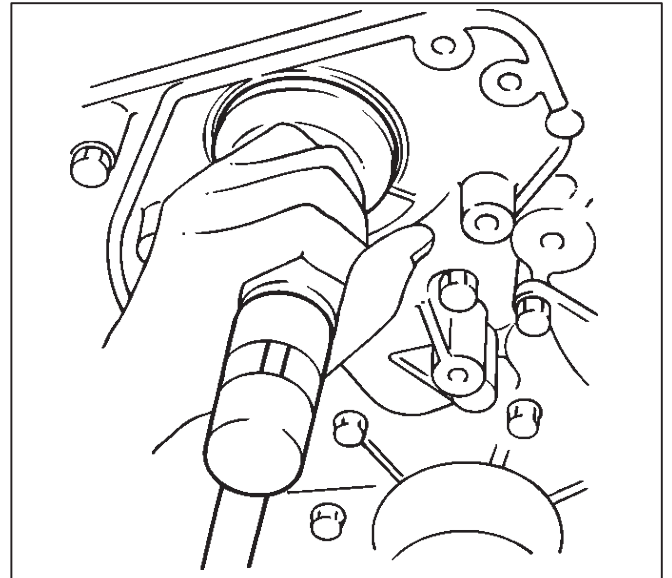
Oil Pump

Removal

1. Disconnect battery ground cable.
2. Drain engine oil.
3. Remove crankcase assembly.
 - Refer to removal procedure for Oil Pan and Crankcase in this manual.
4. Remove crankshaft pulley.
 - Refer to removal procedure for Crankshaft Pulley in this manual.
5. Remove timing belt.
 - Refer to removal procedure for Timing Belt in this manual.
6. Remove timing pulley from crankshaft.
7. Remove four fixing bolts from oil filter assembly.
8. Remove oil strainer fixing bolts, remove oil strainer assembly with O-ring.
9. Remove three bolts from oil pipe and O-ring.
10. Remove eight oil pump fixing bolts, then oil pump assembly.
11. Remove sealant from mounting surface of oil pump assembly, cylinder block and take care not to damage mounting surfaces of oil pump and cylinder block.

- Use J-39202 installer when installing new oil seal.
- Apply engine oil to oil seal lip.
- Install oil pump assembly to the cylinder block.

NOTE: Do not damage oil seal during installation of oil pump assembly.

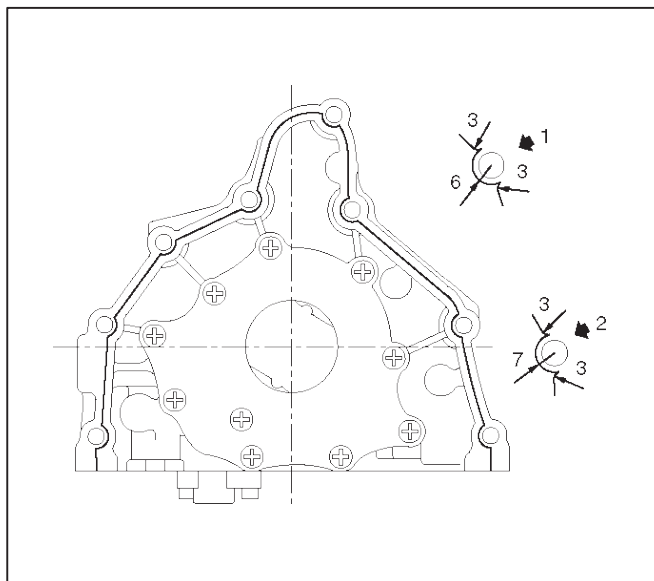


015RS001

Installation

1. Install oil pump assembly
 - Apply sealant (TB-1207B or equivalent) to the oil pump mounting surfaces as shown in the illustration.
 - The oil pump assembly must be installed within 5 minutes after sealant application before the sealant hardens.

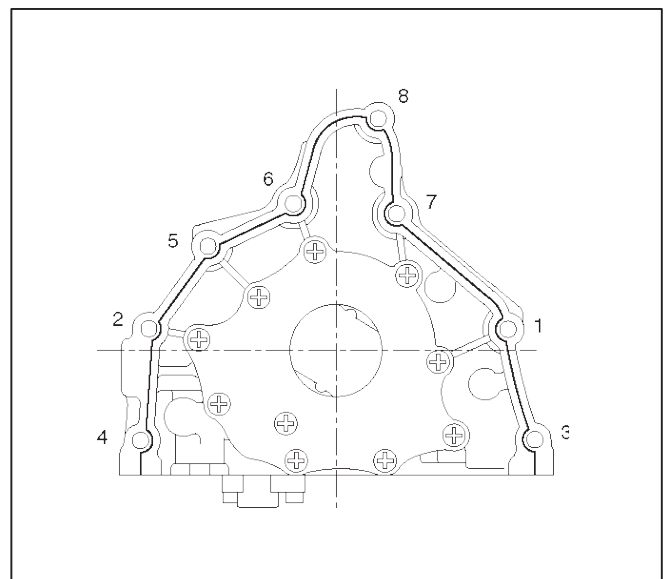
NOTE: Do not apply sealant to the oil ports.



051RW002

- Tighten fixing bolts to the specified torque.

Torque : 25 N·m (18 lb ft)



051RW001

2. Install oil pipe with O-ring, tighten fixing bolt to the specified torque.

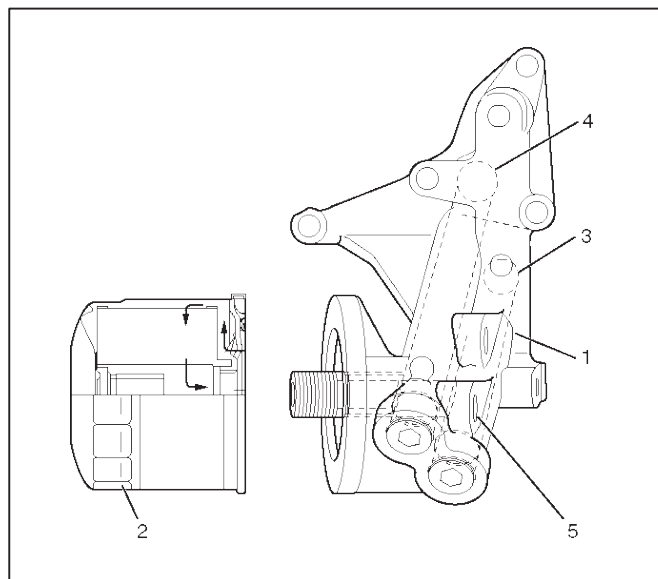
Torque : 10 N·m (89 lb in)

3. Install oil strainer with O-ring, tighten fixing bolt to the specified torque.

Torque : 25 N·m (18 lb ft)

4. Install oil filter assembly and tighten bolts to the specified torque.

Torque : 25 N·m (18 lb ft)



Legend

- (1) Oil Pump
- (2) Oil Filter
- (3) Oil Gallery
- (4) From Oil Filter
- (5) To Oil Filter

5. Install timing pulley on crankshaft.

Install timing belt.

- Refer to installation procedure for Timing Belt in this manual.

6. Install crankshaft pulley.

- Refer to install procedure for Crankshaft Pulley in this manual.

7. Install crankcase assembly.

- Refer to installation procedure for Oil Pan and Crankcase in this manual.

8. Refill engine oil until full level on engine oil dipstick.

Oil Pump Oil Seal

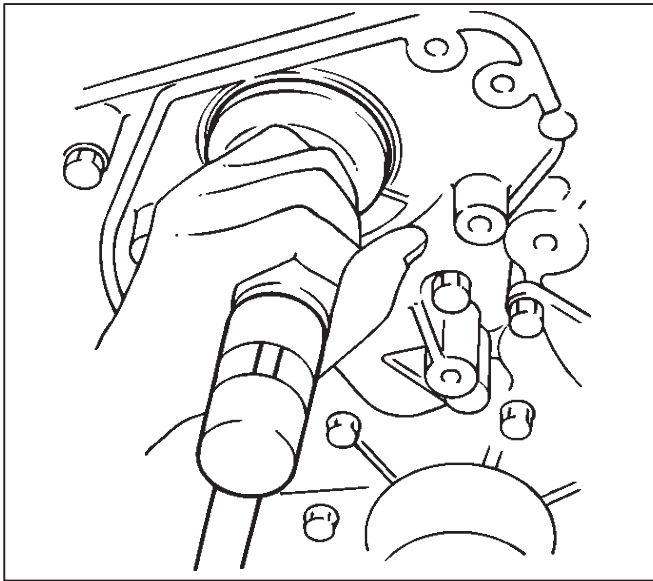
Removal

1. Disconnect battery ground cable.
2. Drain engine oil.
3. Remove crankshaft pulley.
 - Refer to removal procedure for Crankshaft Pulley in this manual.
4. Remove timing belt.
 - Refer to removal procedure for Timing Belt in this manual.
5. Remove timing pulley from crankshaft.
6. Remove oil pump oil seal using a sealer puller.

NOTE: Take care not to damage sealing surfaces of oil pump and crankshaft when removing oil seal.

Installation

1. Install oil pump oil seal, apply engine oil to oil seal lip, then install oil seal using J-39202 installer.



2. Install timing pulley to crankshaft.
3. Install timing belt.
 - Refer to installation procedure for Timing Belt in this manual.
4. Install crankshaft pulley.
 - Refer to installation procedure for Crankshaft Pulley in this manual.
5. Refill engine oil until full level.

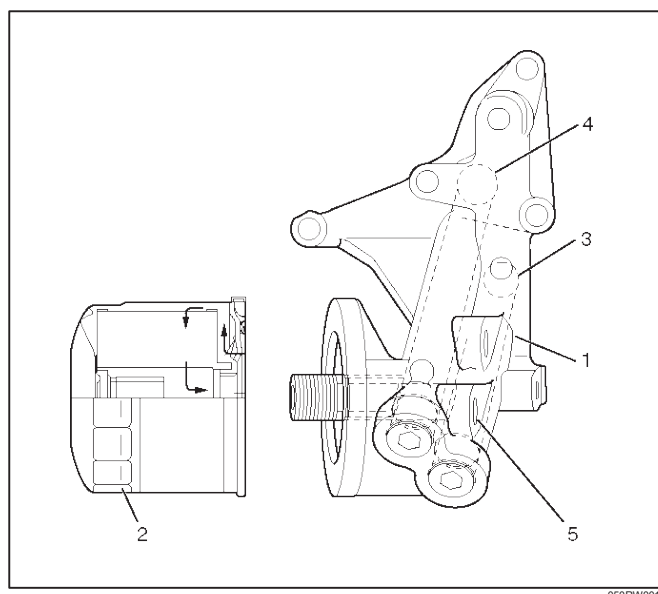
Oil Filter

Removal

1. Disconnect battery ground cable.
2. Drain engine oil.
3. Remove oil filter using J-36390 filter wrench.

Installation

1. Clean filter fitting surface and apply small amount of engine oil to sealing surface.
2. Install oil filter cartridge by hand until it comes in contact with sealing surface then rotate additional 2/3 turn to tighten using J-36390 filter wrench.



Legend

- (1) Oil Pump
- (2) Oil Filter
- (3) Oil Gallery
- (4) From Filter
- (5) To Filter

3. Fill engine oil until full level on dipstick.
4. Reconnect battery ground cable.

Main Data and Specification

General Specification

Item	Specifications
	6VE1
Oil capacity	5.3 liters

Torque Specifications

Crankcase, Oil pan, Timing belt tensioner, Timing pulley, timing belt cover, Oil pump, Oil gallery, Oil strainer

