WORKSHOP MANUAL

GXZ

ENGINE

6SD1TCN, 6SD1TCS MODEL

SECTION 6

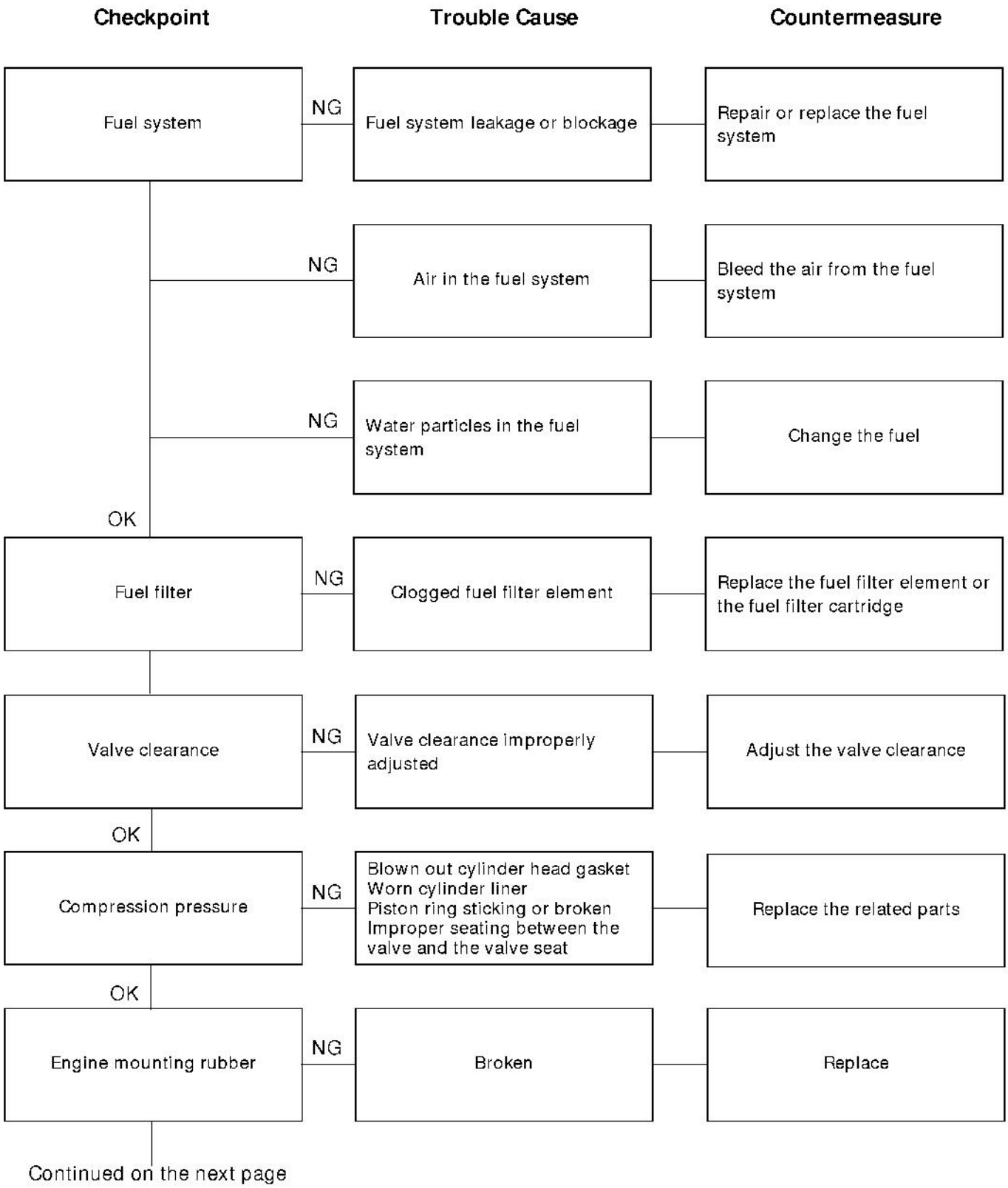
ISUZU

ISUZU

International Service & Parts

Tokyo, Japan

UNSTABLE IDLING



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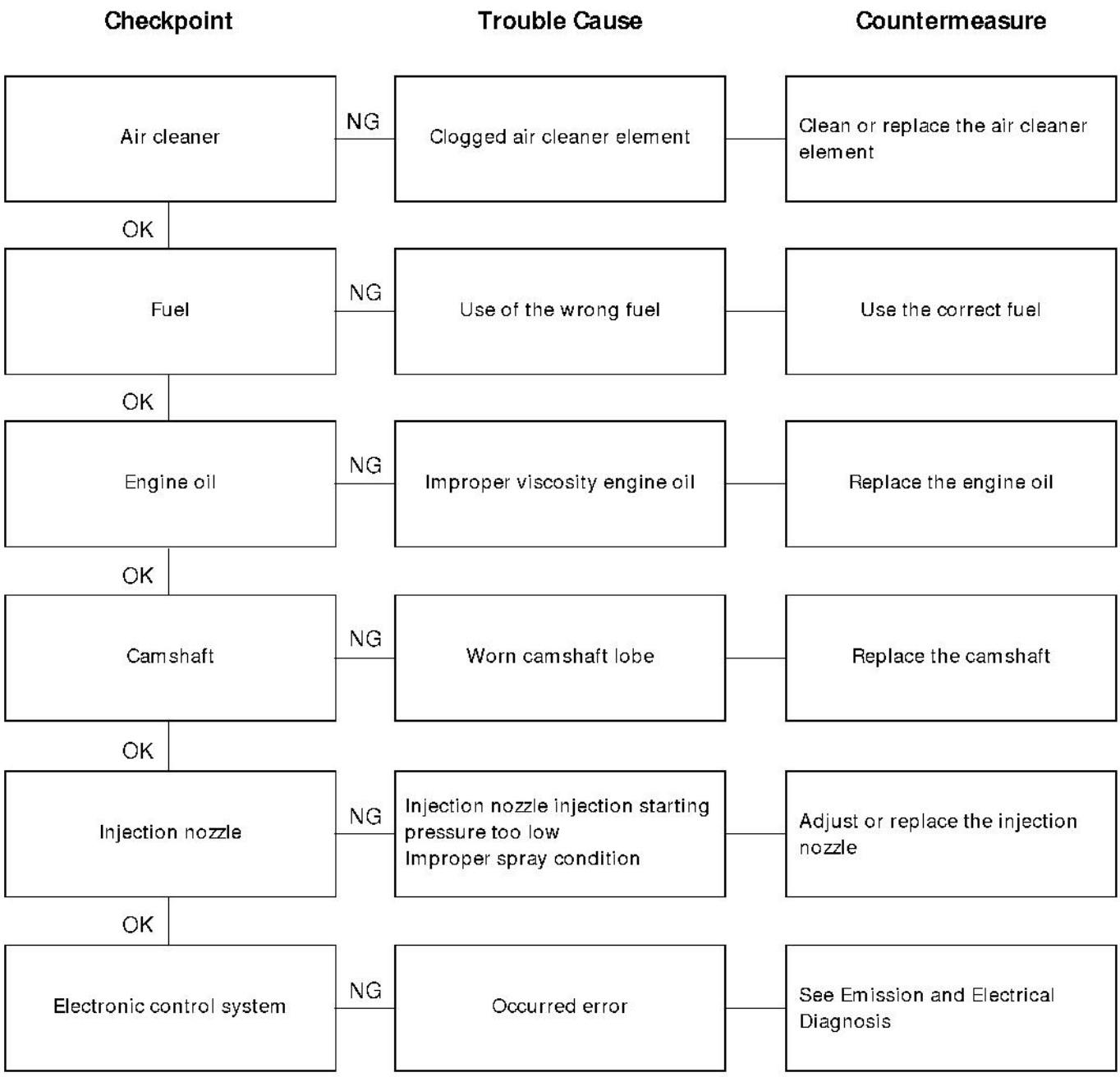
BLACK EXHAUST SMOKE



Checkpoint	Trouble Cause	Countermeasure

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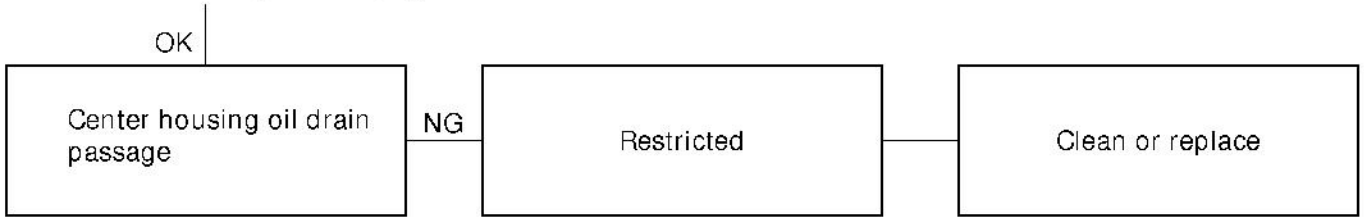
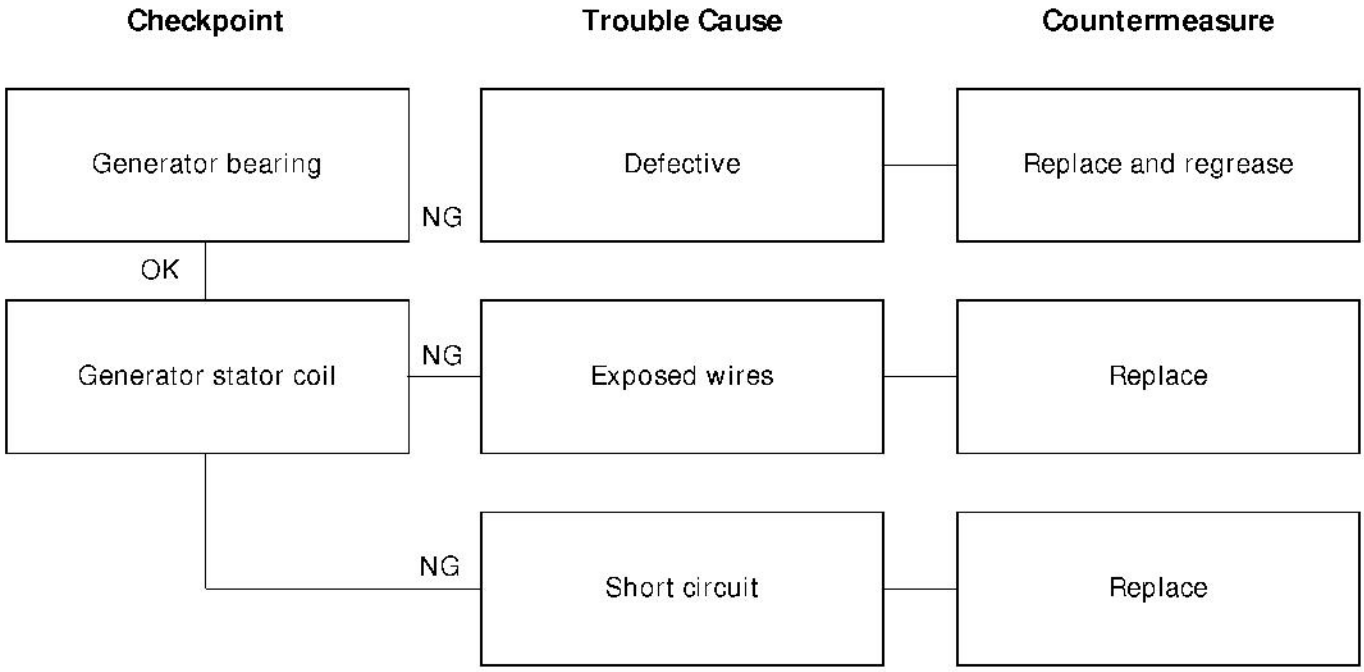
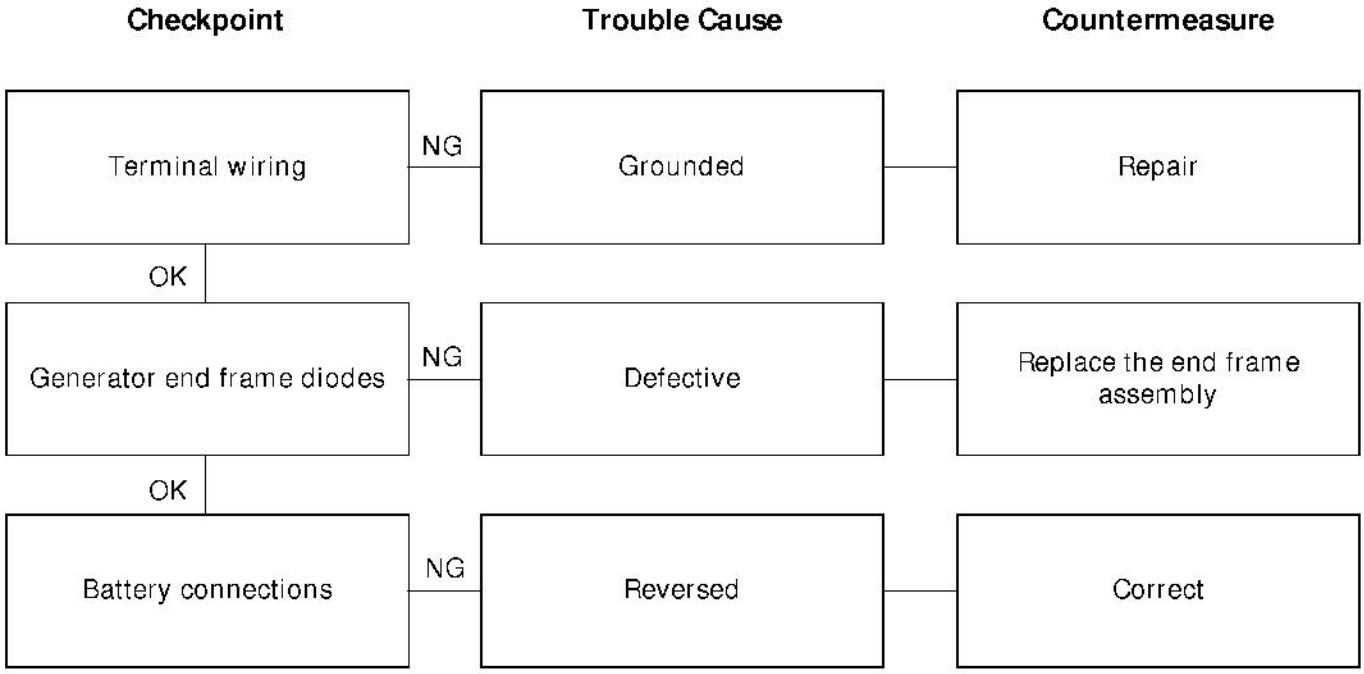


GENERATOR NOISE



CHARGER CIRCUIT FUSE BLOWN



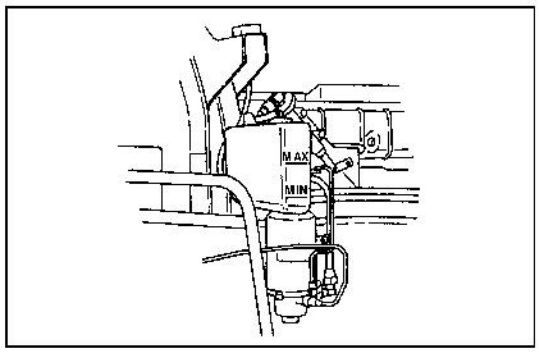
ITEMS	SERVICE STANDARD	SERVICE LIMIT
Valve Spring		
Intake Valve Spring Tension N (kg / lb)		
Compression Height at		
Inner: 46.2mm (1.82 in)	112 (11.4 / 25.14)	
Outer: 48.7mm (1.92in)	289 (29.5 / 64.5)	
Exhaust Valve Spring Tension N (kg / lb)		
Compression Height at		
Inner: 46.2mm (1.82 in)	284 (29 / 63.95)	
Outer: 48.7mm (1.92in)	500 (51 / 112.46)	
Rocker Arm Shaft and Rocker Arm		
Rocker Arm Shaft Run-Out mm (in)		0.30 (0.012)
Rocker Arm Shaft Outside Diameter mm (in)	18.965 – 18.985 (0.7466 – 0.7474)	18.85 (0.742)
Rocker Arm Inside Diameter mm (in)	19.01 – 19.03 (0.748 – 0.749)	19.05 (0.750)
Rocker Arm Shaft and Rocker Arm Clearance mm (in)	0.01 – 0.05 (0.0004 – 0.0020)	0.20 (0.008)
Camshaft		
Camshaft Journal Diameter mm (in)	39.915 – 39.940 (1.5715 – 1.5724)	39.890 (1.5705)
Cam Lobe Height Ⓗ mm (in)	45.92 (1.81)	45.50 (1.79)
Camshaft Run-Out mm (in)	0.05 (0.002)	0.10 (0.004)
Camshaft Bearing Inside Diameter mm (in)	40.00 – 40.25 (1.575 – 1.585)	
Camshaft Bracket Clearance mm (in)	0.06 – 0.11 (0.0024 – 0.0043)	0.16 (0.0063)
Camshaft Gear Backlash mm (in)	0.10 (0.0039)	0.30 (0.012)
Crankshaft		
Crankshaft End Play mm (in)	0.100 – 0.285 (0.004 – 0.011)	0.40 (0.016)
Crankshaft Run-Out mm (in)	0.08 (0.0032) or less	0.15 (0.0059)
Crankshaft Journal and Bearing Clearance mm (in)	0.045 – 0.110 (0.0018 – 0.0043)	0.16 (0.0063)

Cooling System

WARNING:

HOT STEAM UNDER PRESSURE MAY ESCAPE FROM THE RADIATOR IF THE RADIATOR SURGE TANK CAP IS OPENED WHILE THE ENGINE IS HOT. THIS CAN RESULT IN SERIOUS BURNS.

ALLOW THE ENGINE TO COOL BEFORE OPENING THE RADIATOR SURGE TANK CAP.



Coolant Level

Check the coolant level and replenish the radiator surge tank if necessary.

If the coolant level falls below the "MIN" line, carefully check the cooling system for leakage. Then, add additional coolant to raise the level over the "MIN" line.

Engine coolant change procedure

1. To change engine coolant, make sure that the engine is cool.

WARNING:

WHEN THE COOLANT IS HEATED TO A HIGH TEMPERATURE, BE SURE NOT TO LOOSEN OR REMOVE THE RADIATOR CAP. OTHERWISE YOU MIGHT GET SCALDED BY HOT VAPOR OR BOILING WATER. TO OPEN THE RADIATOR CAP, PUT A PIECE OF THICK CLOTH ON THE CAP AND LOOSEN THE CAP SLOWLY TO REDUCE THE PRESSURE WHEN THE COOLANT HAS BECOME COOLER.

2. Open radiator cap and drain the cooling system by loosening the drain valve on the radiator and on the cylinder body.

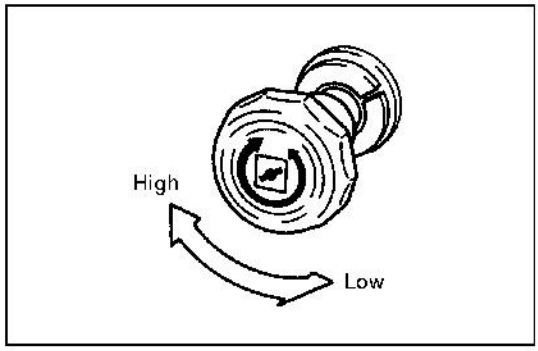
NOTE:

For best result it is suggested that the engine cooling system be flushed at least once a year. It is advisable to flush the interior of the cooling system including the radiator before using anti-freeze (ethylene-glycol based).

Replace damaged rubber hoses as the engine anti-freeze coolant is liable to leak out even minor cracks. Isuzu recommends to use Isuzu genuine anti-freeze (ethylene-glycol based) or equivalent, for the cooling system and not add any inhibitors or additive.

CAUTION:

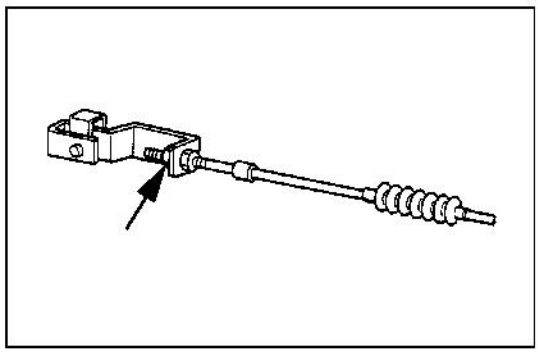
A failure to correctly fill the engine cooling system in changing or topping up coolant may sometimes cause the coolant to overflow from the filter neck even before the engine and radiator are completely full. If the engine runs under this condition, shortage of coolant may possibly result in engine overheating. To avoid such trouble, the following precautions should be taken in filling the system.



Final Engine Control Adjustment Check

1. Start the engine and allow it to warm up.
2. Turn the idling control knob fully to the left.
3. Check that the idling speed is within the specified range.

Engine Idling Speed	rpm
560-600	



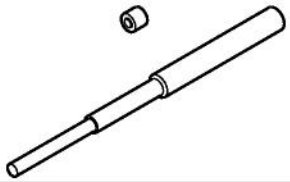
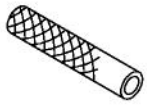
If the idling speed is outside the specified range, loosen the engine control cable end turnbuckle (arrow) to adjust it.

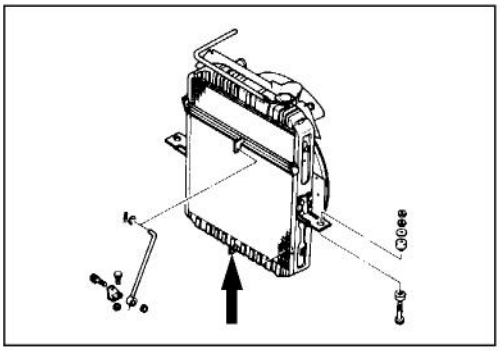
4. Depress the accelerator pedal until it reaches the accelerator pedal stopper.

   Check that the injection pump control lever is making contact with the full load stopper.

   If the injection pump control lever is not making contact with the full load stopper, readjust the accelerator pedal stopper and the engine control cable.

SPECIAL TOOLS

ILLUSTRATION	PART NO.	PARTS NAME
	5-85317-001-0	Compression gauge adapter
	1-85235-007-0	Valve spring compressor
	9-85231-202-2	Valve guide remover & installer
	1-85231-021-0	Cylinder liner remover
	1-85221-073-0	Cylinder liner installer
	1-85210-047-0	Water pump impeller remover
	9-85221-289-0	Valve stem oil seal installer
	1-85220-037-0	Connecting rod bushing replacer
	1-85221-072-0	Crankshaft gear installer



2. Coolant

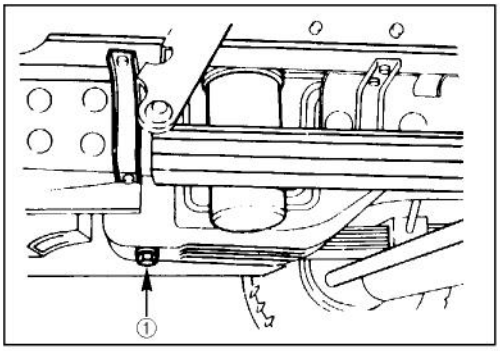
Remove the water drain plug (at the left side of the engine) and the radiator drain plug and allow the coolant to drain completely.

WARNING:

HOT STEAM UNDER PRESSURE MAY ESCAPE FROM THE RADIATOR IF THE COOLANT IS DRAINED WHILE THE ENGINE IS HOT. THIS CAN RESULT IN SERIOUS BURNS. ALLOW THE ENGINE TO COOL BEFORE DRAINING THE COOLANT.

If long life coolant is used, drain the coolant into a clean container so that it can be reused.

Refer to the Maintenance Schedule in Section 00, "GENERAL INFORMATION."

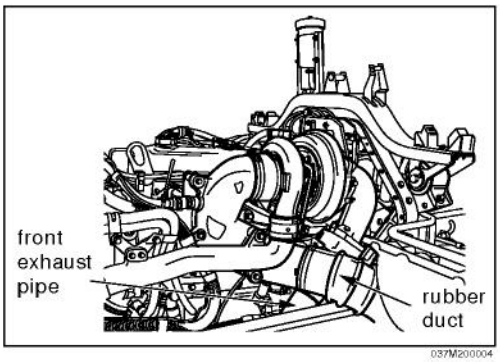


3. Engine Oil Draining

1) Remove the oil pan drain plug ①.

WARNING:

HOT ENGINE OIL CAN CAUSE SEVERE SKIN BURNS. ALLOW THE ENGINE TO COOL BEFORE DRAINING THE ENGINE OIL.

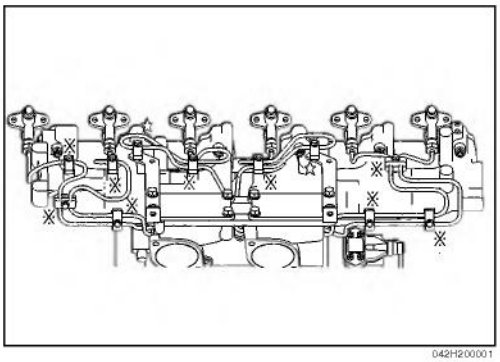


4. Air Cleaner

Disconnect the air inlet rubber duct from the turbocharger.

Disassembly Steps

1. Cooling fan drive belt
2. Generator and adjusting plate
3. Air duct
4. Intake pipe
5. Oil return pipe
6. Fuel pipe (Fuel filter leak off)
7. Fuel suction pipe
8. Fuel pipe (Fuel filter to injection pump)
9. Fuel pipe (Feed pump to fuel filter)
10. Air pipe (Charge)
11. Air compressor air intake pipe
12. Air compressor water pipe
13. Oil feed pipe
14. Partial oil filter return pipe
15. Fuel filter
- ▲ 16. Injection pipe with clip
- ▲ 17. Injection nozzle
- ▲ 18. Power steering oil pump
- ▲ 19. Injection pump
- ▲ 20. Air compressor
21. Intake cover
22. Partial oil filter and bracket
23. Oil level gauge and guide tube
24. Air intale duct
25. Exhaust brake assembly
26. Exhaust duct
- ▲ 27. Turbocharger oil return pipe
28. Water feed pipe
- ▲ 29. Turbocharger
30. Exhaust manifold
31. Water duct
32. Starter motor
33. Oil filter
- ▲ 34. Oil cooler
35. Engine foot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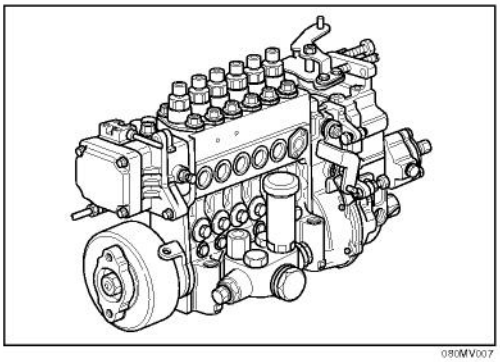
Important Operations

16. Injection Pipe with Clip

1) Loosen the injection pipe sleeve nuts at the delivery valve side.

   Do not apply excessive force to the injection pipes.
2) Loosen the injection pipe clips.
3) Remove the injection pipes.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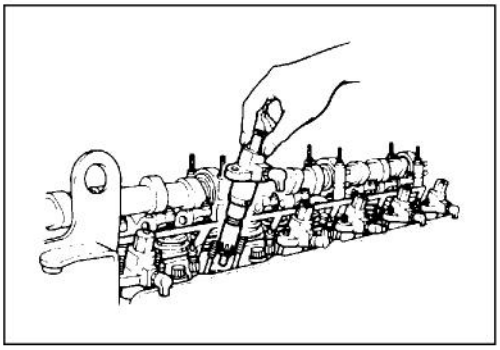
Note:

Plug the delivery holder ports with the shipping caps or the equivalent to prevent the entry of foreign material.

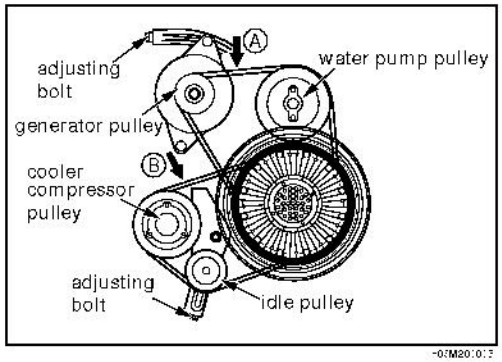


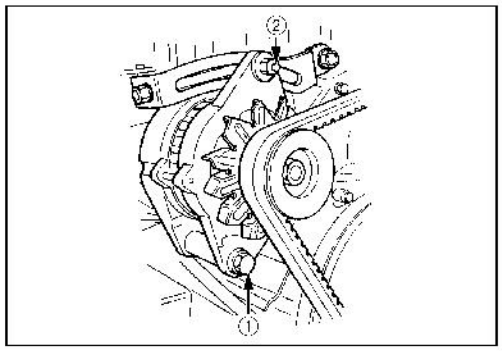
17. Injection Nozzle Holder

The injection nozzles protrude from the lower side of the cylinder head.

They are easily damaged.

Remove the injection nozzles before removing the cylinder head.





35. Cooling Fan Drive Belt

1) Install the cooling fan drive belt.
2) Turn the adjusting bolt to move the generator or idle pump and adjust the drive belt tension.
3) Apply a force of 98 N (10 kg/22 lb) to the drive belt mid-portion to check the belt deflection.

Drive Belt Deflection	mm(in)
Ⓐ, Ⓑ	8 – 11 (0.3 – 0.4)

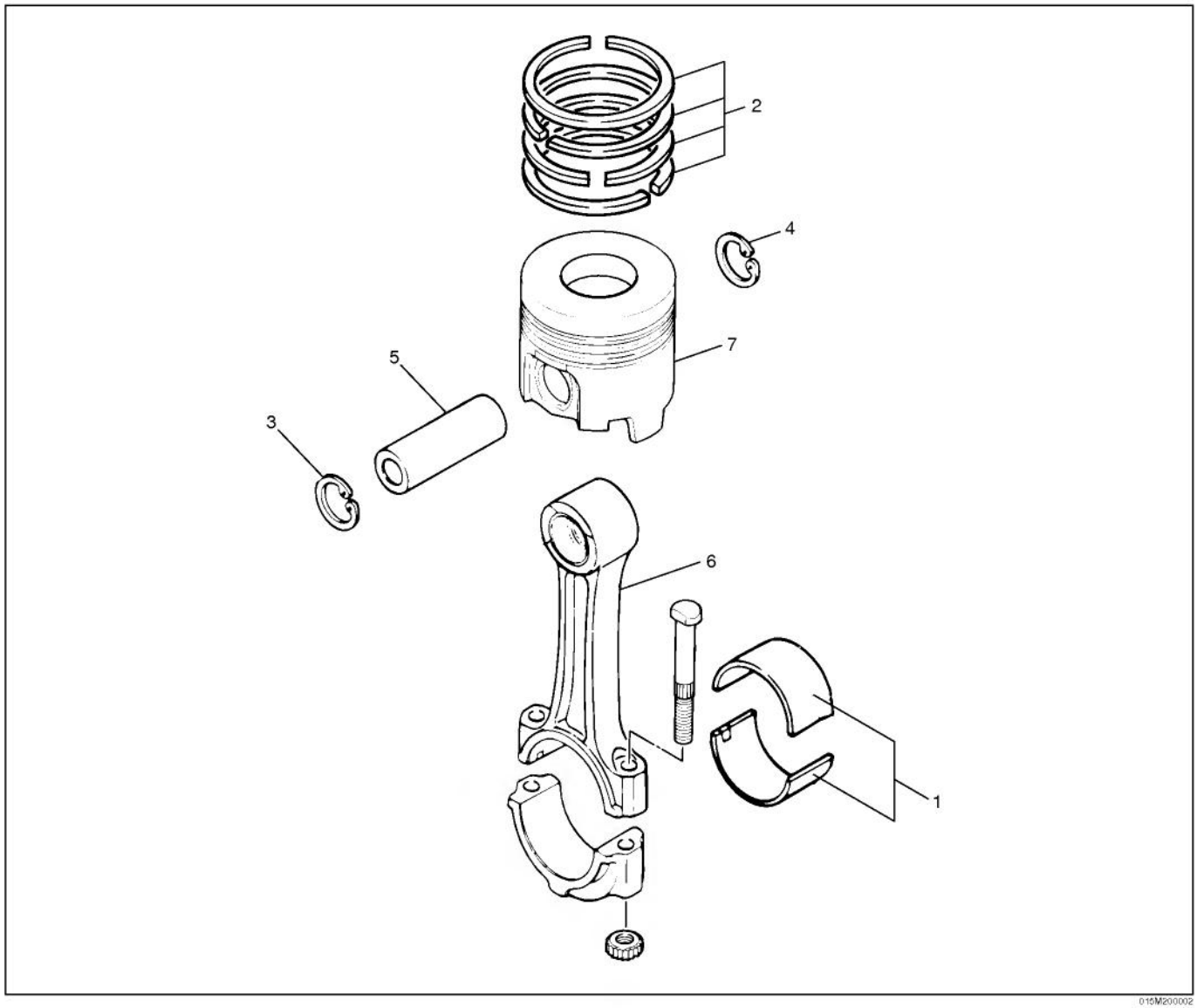
Check the drive belts for cracking and other damage

4) Tighten the generator bolt ① and the adjusting plate nut ② to the specified torque.

Generator Bolt Torque	N·m(kg·m/lb.ft)
①	137 (14.0 / 101)

Adjusting Plate Nut Torque	N·m(kg·m/lb.ft)
②	93 (9.5 / 70)

PISTON AND CONNECTING ROD



Disassembly Steps

- ▲ 1. Connecting rod bearing
- ▲ 2. Piston ring
- ▲ 3. Piston pin snap ring
- ▲ 4. Piston pin snap ring
- ▲ 5. Piston pin
- 6. Connecting rod
- ▲ 7. Piston

Cylinder Liner Bore mm(in)

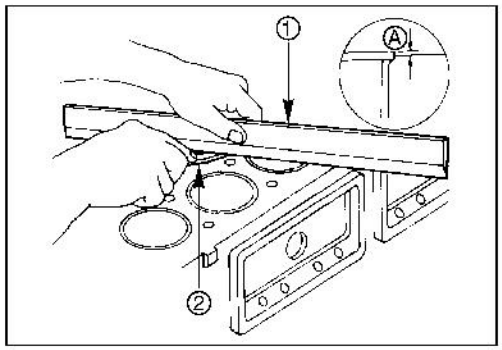
Standard	Limit
120.001 - 120.041 (4.7244 - 4.7260)	120.300 (4.7362)

Note:

The inside of the dry type cylinder liner is super tarkalloyed with plateau honing.

It cannot be rebored or honed.

If the inside of the cylinder liner is scored or scorched, the cylinder liner must be replaced.



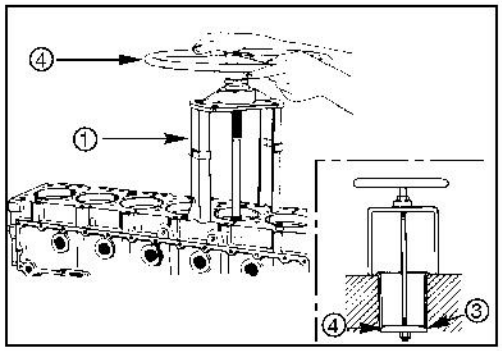
Cylinder Liner Projection Inspection

1. Hold a straight edge ① along the top edge of the cylinder liner to be measured.
2. Use a feeler gauge ② to measure each cylinder liner projection Ⓐ

Cylinder Liner Projection Ⓐ mm(in)

Standard
0.10 - 0.14 (0.0039 - 0.0055)

The difference in the cylinder liner projection height between any two adjacent cylinders must not exceed 0.03 mm (0.0012 in).

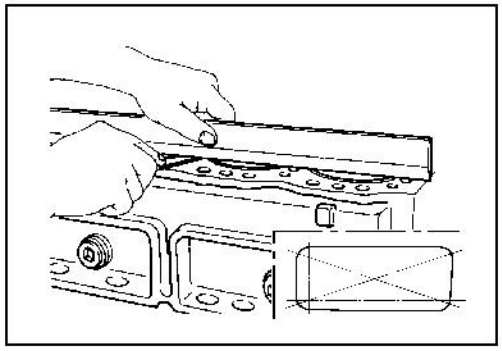


Cylinder Liner Replacement

Cylinder Liner Removal

1. Set the cylinder liner remover ① to the cylinder liner.
2. Check that the remover shaft ankle ② is firmly gripping the cylinder liner bottom edge ③.
3. Slowly turn the remover shaft handle ④ clockwise to pull the cylinder liner free.

   Cylinder Liner Remover: 1-85231-021-0

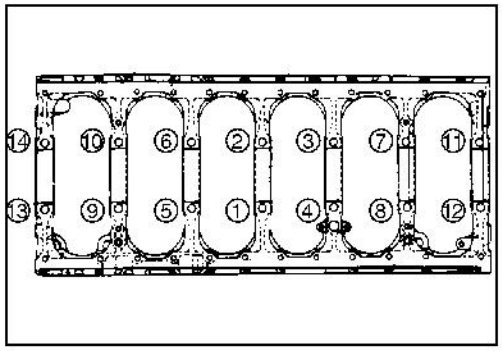


Note:

Take care not to damage the cylinder body bore during the cylinder liner removal procedure.

4. Measure the cylinder body upper face warpage.

   Refer to "Cylinder Body Upper Face Warpage."



Crankshaft Bearing Inside Diameter

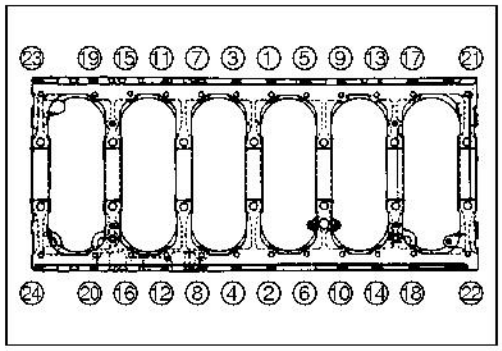
1. Clean the cylinder body journals, the lower crankcase, the bearing fitting surfaces, and the bearing contact surfaces.
2. Install the lower crankcase with the bearings to the cylinder body.
3. Apply molybdenum disulfide grease to the lower crankcase bolt threads and setting faces.
4. Tighten the lower crankcase M14 bolts in three steps using the angular tightening method.

Lower Crankcase M14 Bolt Torque N·m(kg·m/ft.lb)

1st step	2nd step	3rd step
98 (10.0/72)	132 (13.5 / 98)	30° – 60°

Note:

Ladder frame fixing bolts can be reused up to 7 times.

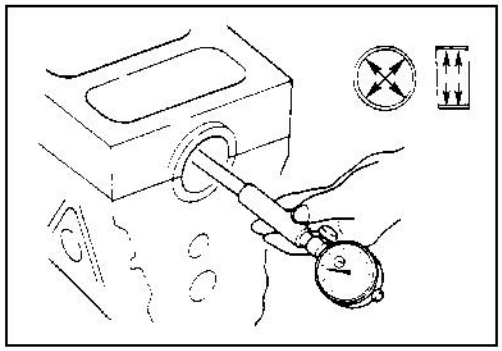


5. Tighten the lower crankcase M10 bolts to the specified torque.

Lower Crankcase M10 Bolt Torque N·m(kg·m/ft.lb)

38 (3.9 / 28)

6. Use an inside dial indicator to measure the crankshaft bearing inside diameter.

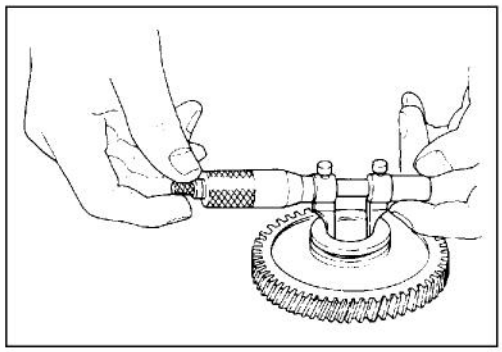


Crankshaft Journal and Bearing Clearance

If the clearance between the measured bearing inside diameter and the crankshaft journal diameter exceeds the specified limit, the crankshaft and/or the bearing must be replaced.

Crankshaft Journal and Bearing Clearance mm(in)

Standard	Limit
0.045 - 0.110 (0.0018 - 0.0043)	0.16 (0.0063)



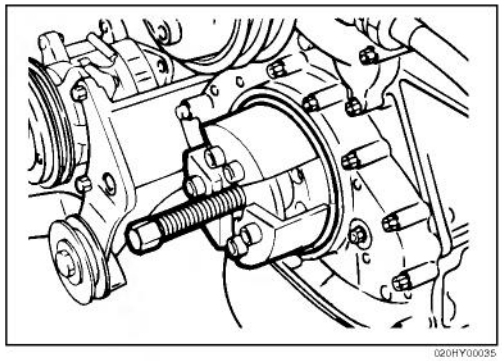
Idler Gear Inside Diameter

Use an inside dial indicator or an inside micrometer to measure the idler gear inside diameter.

If the clearance between the idler gear shaft outside diameter and the idler gear inside diameter exceeds the limit, the idler gear must be replaced.

Idler Gear Shaft and Idler Gear Clearance mm(in)

	Standard	Limit
Shaft "A" Shaft "B"	0.020 - 0.062 (0.0008 - 0.0024)	0.12 (0.0047)
Shaft "C"	0.010 - 0.051 (0.0004 - 0.0020)	0.15 (0.0059)



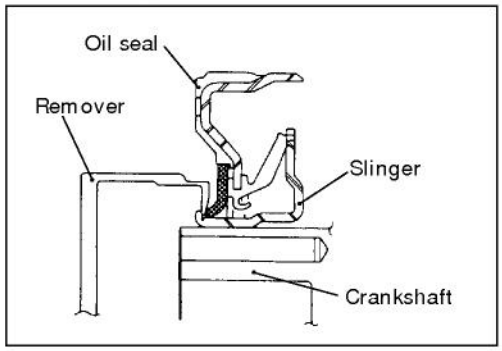
FRONT COVER

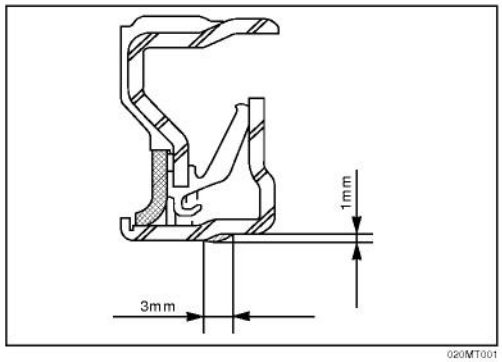
Front Cover Oil Seal Replacement

Oil Seal Removal

Set oil seal remover on slinger of oil seal.

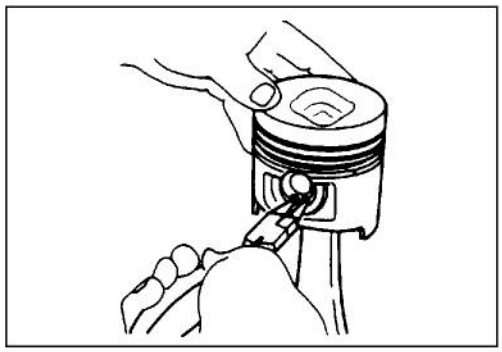
Oil seal remover: 1-85210-077-0





Oil Seal Installation

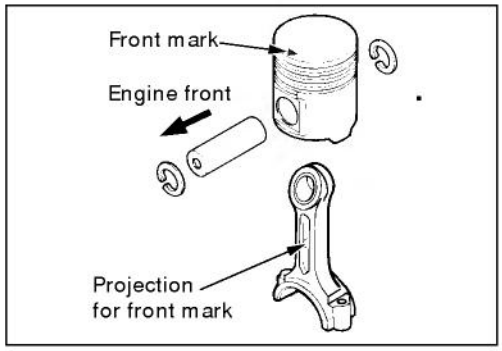
1. If there is some small scratch on the crankshaft after remove the oil seal, apply Threebond 1207C or equivalent on the slinger as shown in the illustration.



Important Operations

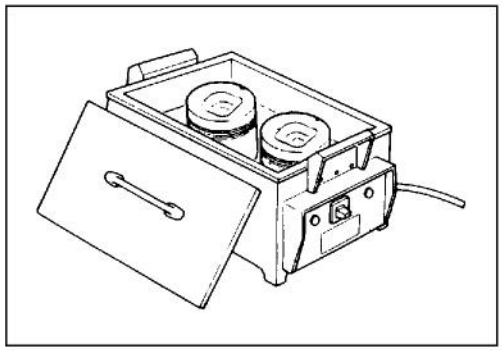
1. **Piston**
2. **Piston Pin Snap Ring**
3. **Connecting Rod**

1) Clamp the connecting rod in a vise.
   Take care not to damage the connecting rod.
2) Use pliers to install a piston pin snap ring to one side of each piston.
3) Install the piston to the connecting rod.



The piston head arrow or dot mark must be facing to the projection mark on the connecting rod.

The connecting rod projection mark must be facing the front of the engine.



4. **Piston Pin**
5. **Piston Pin Snap Ring**

If could not be removed piston pin, it is recommended to remove it by following procedure.

1) Use a piston heater to heat the piston to approximately 80°C (176°F).

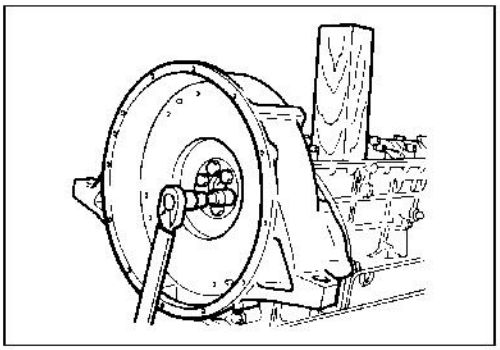
WARNING:

TAKE CARE NOT TO BURN YOURSELF ON THE HEATED PISTON.

2) Apply engine oil to the piston pin.

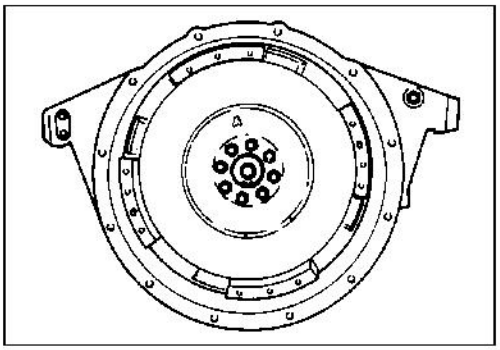
17. Oil Seal Rear

See crankshaft oil seal replacement.



18. Flywheel

1) Block the crankshaft with a piece of hard wood to prevent the flywheel from turning.
2) Apply molybdenum disulfide grease to the flywheel bolt threads and setting faces.
3) Align the flywheel with the crankshaft dowel pin.

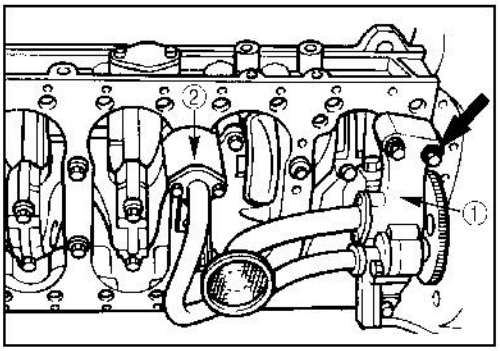


4) Tighten the flywheel bolts to the specified torque in three steps using the angular tightening method.
   Follow the numerical order shown in the illustration.

Flywheel Bolt Torque		N·m(kg·m/lb.ft)
1st step	2nd step	3rd step
78 (8.0 / 58)	60°	30°

Note:

The flywheel bolts can be reused six (6) times.

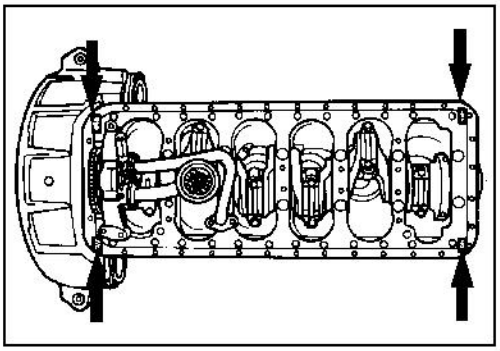


19. Anti-Drain Back Valve

20. Oil Pump

1) Install the oil pump ① together with the anti drain valve ②.
2) Tighten the oil pump and anti drain valve bolts to the specified torque.

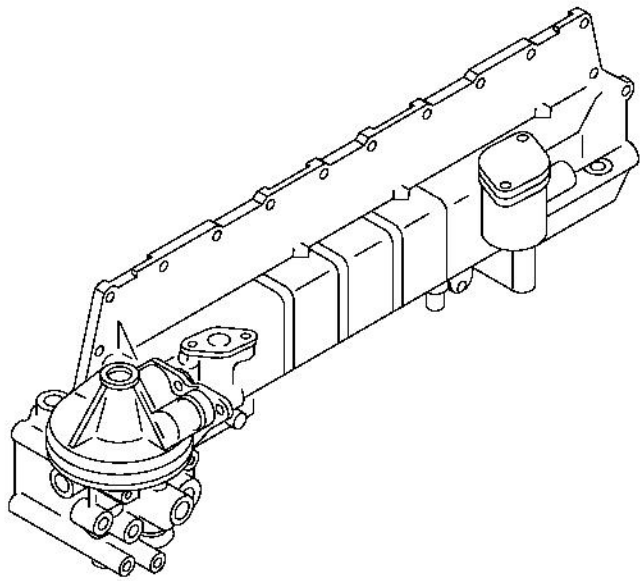
Oil Pump Bolt Torque	N·m(kg·m/lb.ft)
Oil pump ①	38 (3.9 / 28)
Anti drain valve ②	22 (2.2 / 16)



21. Oil Pan and Gasket

1) Apply the recommended liquid gasket or its equivalent to the No. 1 and No. 7 bearing caps at the positions shown in the illustration.
2) Install the oil pan and gasket to the cylinder body.

OIL COOLER



05-12-00:1

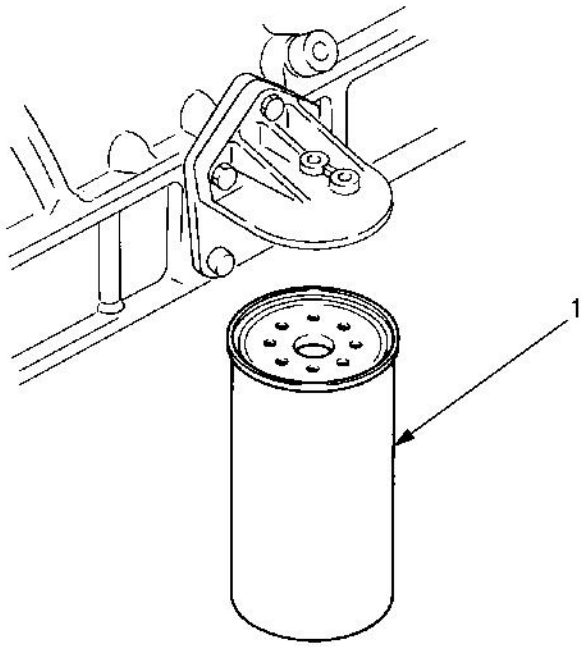
The temperature of the engine oil circulating through the lubricating system tends to rise with an accompanying decrease in lubricating efficiency.

The oil cooler maintains the oil temperature at the optimum level for effective engine lubrication.

The oil cooler consists of the body and the cooling element.

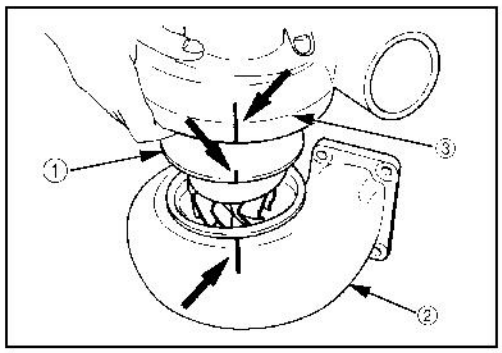
REPLACEABLE CARTRIDGE TYPE PARTIAL OIL FILTER

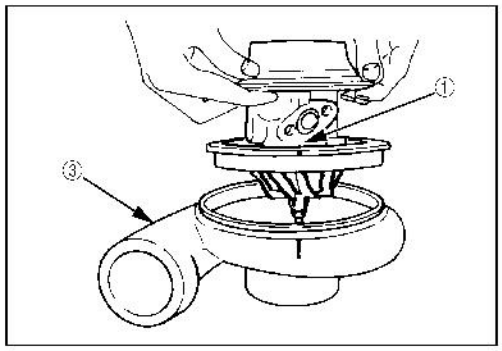
DISASSEMBLY



Disassembly Steps

1. Partial oil filter cartridge





Important Operations

2. Turbine Housing

4. Compressor Housing

5. Center Housing and Rotating Assembly

1) Apply a setting mark across the center housing and rotating assembly ①, the turbine housing ②, and the compressor housing ③.

2) Disassemble the parts.

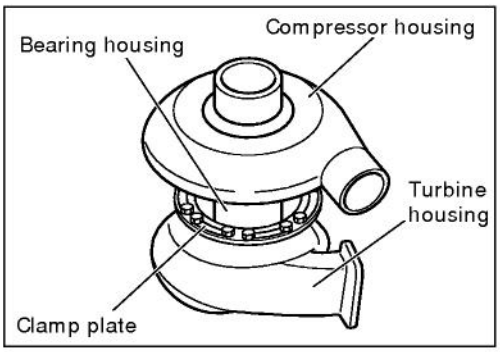
Handle the parts with extreme care.

Be particularly careful not to damage the turbine wheel blades and the compressor wheel blades.

Take care not to allow foreign material to enter the center housing.

Note:

Disassembly and servicing of the center housing and rotating assembly is not recommended.

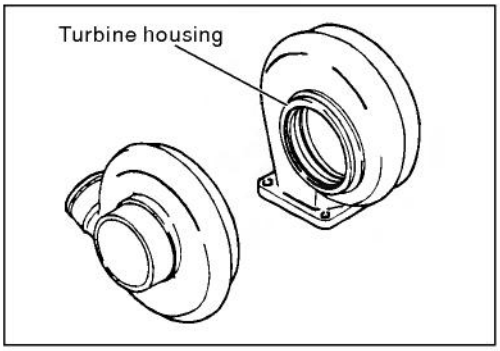


037M200011

6. Clamp plate

Remove the clamp plate.

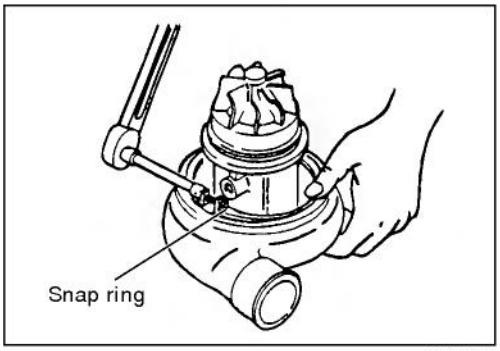
During reassembly, compressor cover, bearing housing, and turbine housing position is very important. Use a punch or marking pencil to apply setting marks to the clamp plate. This ensures reassembly of the components to their original positions.



037M200012

7. Turbine housing

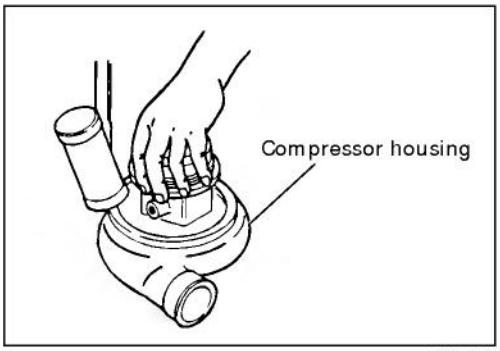
Remove the turbine housing.



037M200013

8. Snap ring

Remove the snap ring.

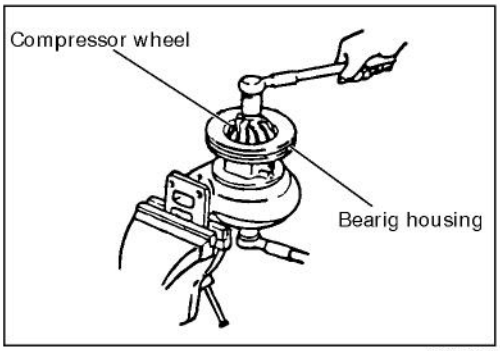


037M200060

9. Compressor cover

Tap lightly around the perimeter of the compressor cover with a plastic hammer to loosen and remove the cover.

Do not allow the compressor wheel to touch the compressor cover.



037M200015

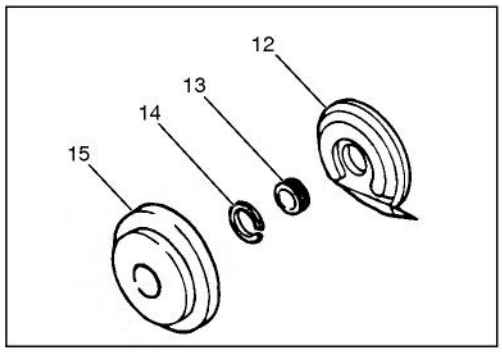
10. Nut

Place the turbine housing in a vise and fit the bearing housing to the turbine housing.

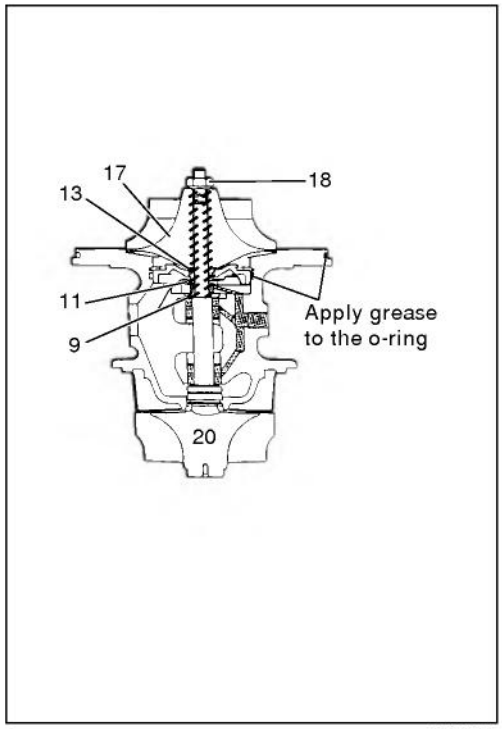
Use a 17 mm box wrench to hold the shaft and turbine wheel boss.

Use a 14 mm box wrench to remove the left hand thread lock nut that has attached the compressor wheel.

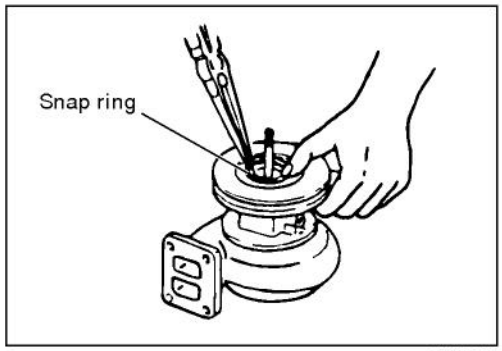
The lock nut has left-hand threads.



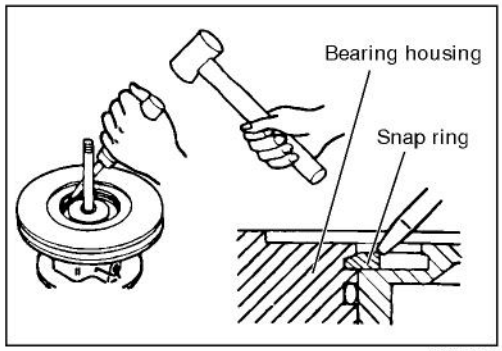
037M200046



037M200047



037M200017



037M200025

- Assemble the sub-assembly of the Insert as following procedure.

12. Oil deflector

13. Plunger sleeve

14. Piston ring

15. Insert

- Carefully install the piston ring to the plunger sleeve. Insert the gap area first.

  Apply a light coat of oil to the piston ring.

  Install the plunger sleeve and piston ring to the insert.

  Do not apply too much oil to the piston ring.

  Take care not to damage the piston ring.
- Carefully clean the 2nd thrust ring and plunger sleeve with dry tissue paper to remove all oil residue and other foreign material.
- Install the insert assembly (insert, plunger sleeve, and piston ring) to the bearing housing.

= areas to be coated with molybdenum, engine oil, or grease.

= areas to be wiped clean of all foreign material (oil, grease, molybdenum, etc.).

16. Snap ring

Use the Snap ring pliers to install the snap ring to the bearing housing. The tapered side of the snap ring must be facing up.

- Pay close attention to snap ring installation direction.
- If necessary, use a wooden hammer and a screwdriver to lightly tap the ends of the snap ring into the bearing housing grooves.
- Do not allow the hammer or screwdriver to strike the inside of the bearing housing.

NOTE

For best result it is suggested that the engine cooling system be flushed at least once a year. It is advisable to flush the interior of the cooling system including the radiator before using anti-freeze (ethylene-glycol based).

Replace damaged rubber hoses as the engine anti-freeze coolant is liable to leak out even minor cracks.

Isuzu recommends to use Isuzu genuine anti-freeze (ethylen-glycol based) or equivalent, for the cooling system and not add any inhibitors or additives.

CAUTION

A failure to correctly fill th e engine cooling system in changing or topping up coolant may sometimes cause the coolant to overflow from the filler neck even before the engine and radiator are completely full.

If the engine runs under this condition, shortage of coolant may possibly result in engine overheating. To avoid such trouble, the following precausions should be taken in filling the system.

3. To refill engine coolant, pour coolant up to filler neck using a filling hose which is smaller in outside diameter of the filler neck. Otherwise air between the filler neck and the filling hose will block entry, preventing the system from completely filling up.
4. Keep a filling rate of 9 liter/min. or less. Filling over this maximum rate may force air inside the engine and radiator.

   And also, the coolant overflow will increase, making it difficult to determine whether or not the system is completly full.
5. After filling the system to the full, pull out the filling hose and check to see if air trapped in the system is disclogged and the coolant level goes down. Should the coolant level go down, repeat topping-up until there is no more drop in the coolant level.
6. After directly filling the radiator, fill the reservoir to the maximum level.
7. Install and tighten radiator cap and start the engine. After idling for 2 to 3 minutes, stop the engine and reopen radiator cap. If the water level is lower, replenish.

WARNING

When the coolant is heated to a high temperature, be sure not to loosen or remove the radiator cap. Otherwise you might get scalded by hot vapor or boiling water. To open the radiator cap, put a piece of thick cloth on the cap and loosen the cap slowly to reduce the pressure when the coolant has become cooler.

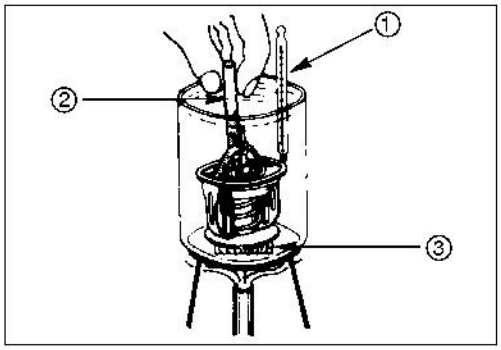
8. After tightening radiator cap, warm up the engine at about 2,000 rpm.

   Set heater adjustment to the highest temperature position, and let the coolant circulate also into heater water system.
9. Check to see the thermostat has opened through the needle position of water thermometer, conduct a 5-minute idling again and stop the engine.
10. When the engine has been cooled, check filler neck for water level and replenish if required. Should extreme shortage of coolant is found, check the coolant system and reservoir tank hose for leakage.
11. Fill the coolant into the reservoir tank up to "MAX" line.

THERMOSTAT

INSPECTION AND REPAIR

Make the necessary adjustments, repairs, and part replacements if excessive wear or damage is discovered during inspection.



Operating Test

1. Completely submerge the thermostat in water.
2. Heat the water.
   Stir the water constantly to avoid direct heat being applied to the thermostat.
3. Measure the thermostat initial opening temperature.

Thermostat Initial Opening Temperature	℃(℉)
74.5 - 78.5 (166 - 173)	

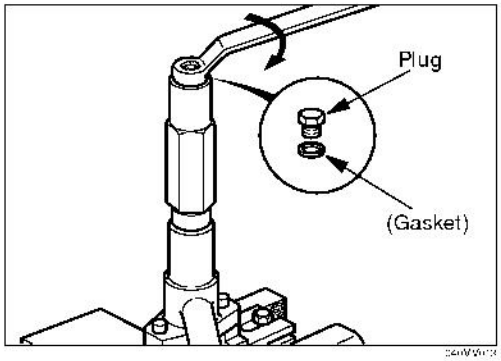
4. Measure the thermostat full opening temperature.

Thermostat Full Opening Temperature	℃(℉)
90 (194)	

5. Measure the valve lift at the valve's fully open position.

Valve Lift At Fully Open Position		mm(in)
6SD1TCN	Approximately 10 (0.39)	
6SD1TCS	Approximately 13 (0.51)	

① Thermometer
② Agitating rod
③ Wooden piece

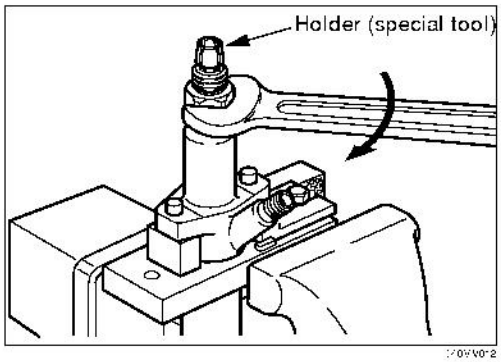


Full needle valve lift confirmation

1. Install the gasket and plug on the adjustment retaining nut.

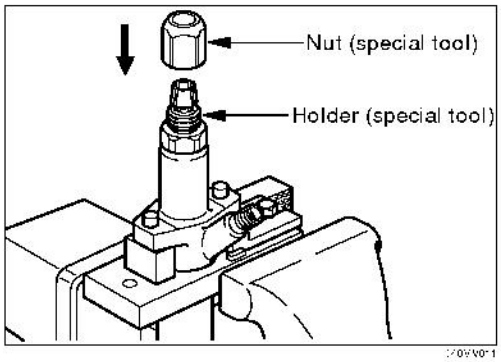
   Gasket: 026508-1140 (Bosch AS)
   894227-6020 (ISUZU)

   Plug: 157892-1600 (Bosch AS)
   5-86777-141-0 (ISUZU)



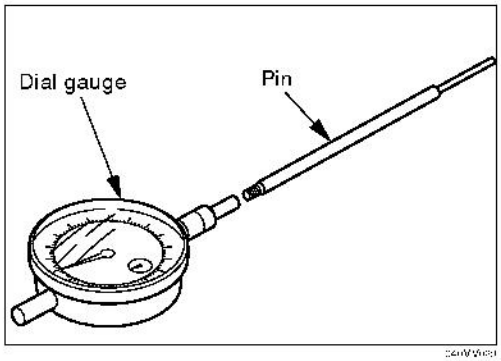
2. Position the nozzle holder with the nozzle facing down and install the dial gauge holder on the nozzle holder.

   Dial gauge holder: 157892-5000 (Bosch AS)
   586777-1420 (ISUZU)



3. Install the nut on the dial gauge holder.

   Nut: 157892-1000 (Bosch AS)
   586777-143-0 (ISUZU)



4. Install the pin to the dial gauge.

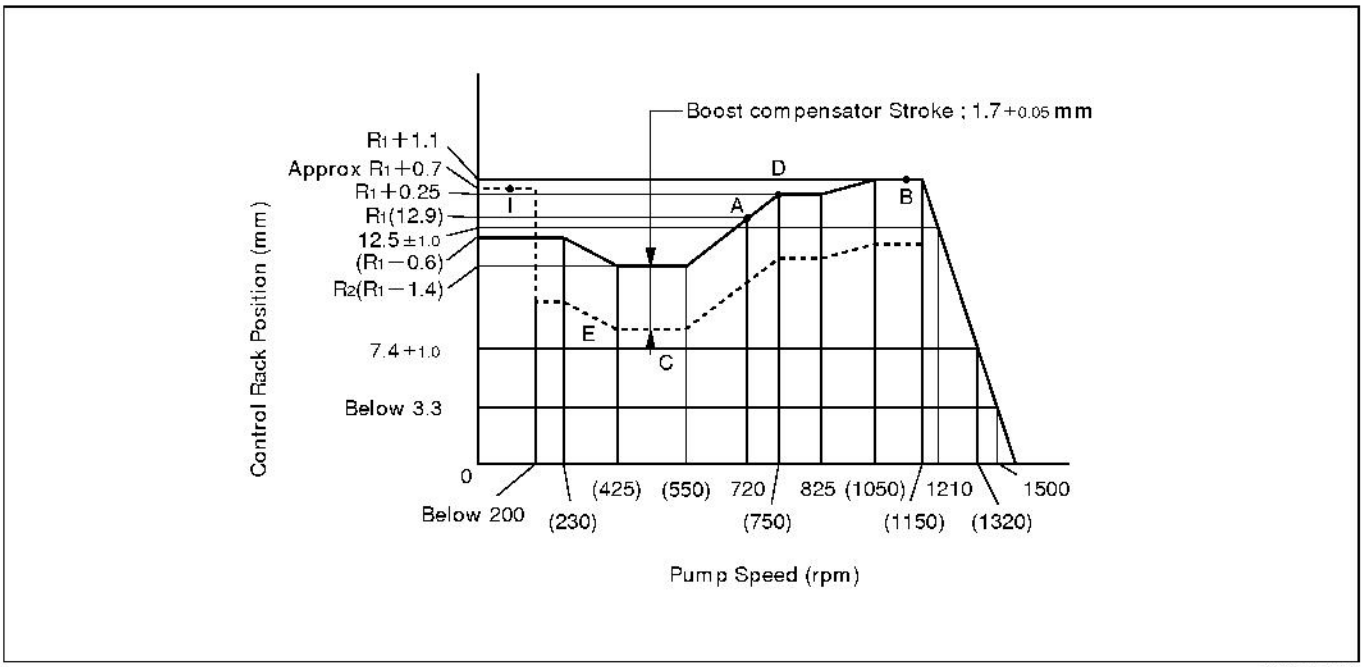
Note:

The lengths of the pins do not include the threaded portions.

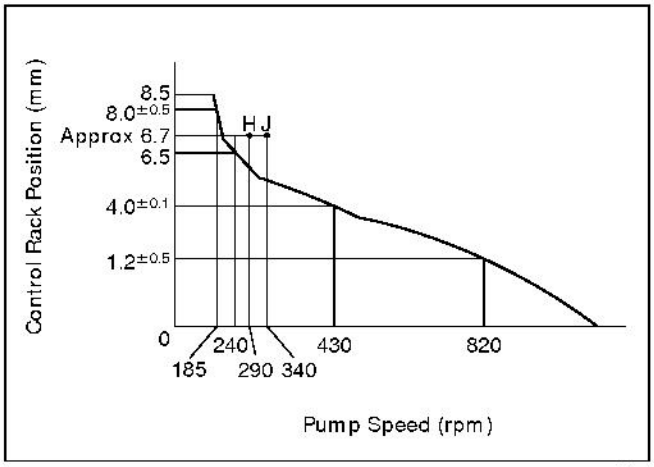
Pin (ℓ=86 mm): 157892-6400 (Bosch AS)

Dial gauge: 157954-3800 (Bosch AS)
(General type)

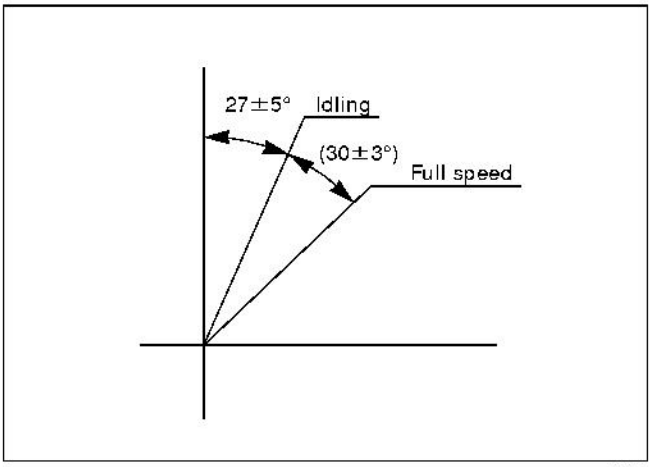
GOVERNOR ADJUSTMENT



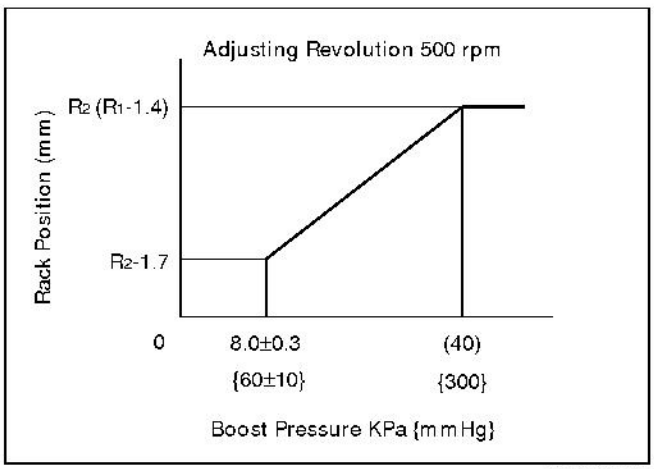
IDLE ADJUSTMENT



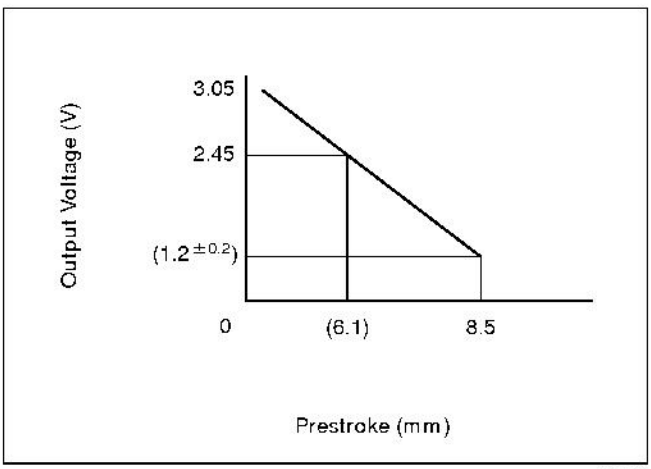
SPEED CONTROL LEVER ANGLE

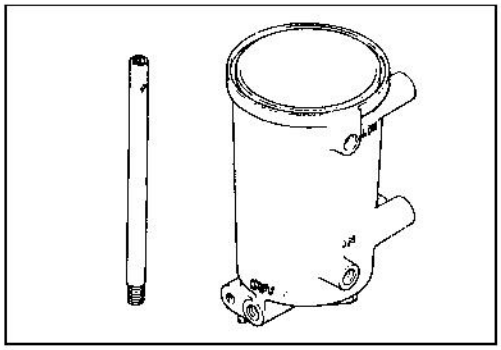


BOOST COMPENSATOR PERFORMANCE



PRESTROKE SENSOR PERFORMANCE



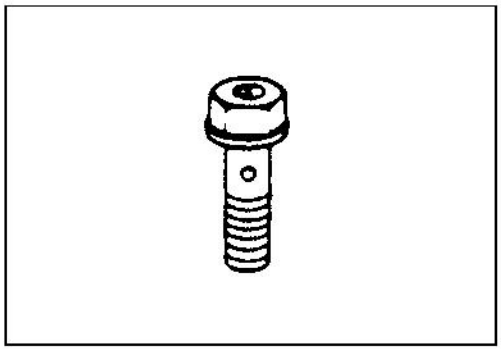


Disassembly Steps

1. Drain Plug
2. Over Flow Valve
3. Breather Plug
4. Center Bolt
5. Upper Cover
6. O-Ring
7. Element
8. Water Strainer
9. Spring
10. Center Tube
11. Fuel Filter Body

INSPECTION AND REPAIR

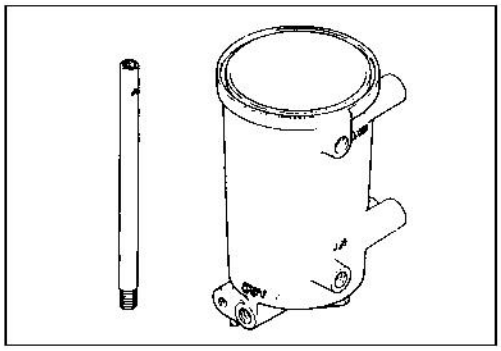
Make the necessary adjustments, repair and part replacements if excessive wear or damage is discovered during inspection.



Over Flow valve

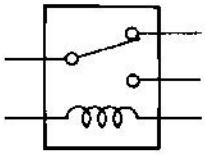
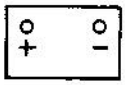
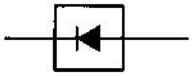
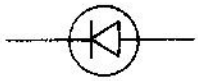
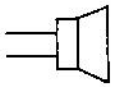
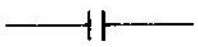
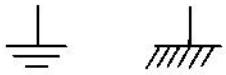
Inspect clogging or leakage on the over flow valve.

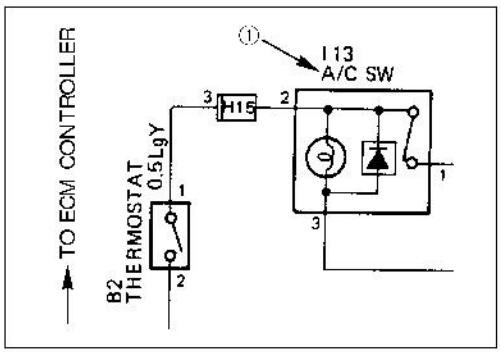
Over Flow Valve Opening Pressure kPa(kg/cm^2/psi)
270 (2.8 – 3.2 / 40 – 46)



Center Tube

Clean the hole for fuel flow.

Symbol	Meaning	Symbol	Meaning
	Contact wiring		Relay **Note:** **Relay contact shown in the wiring diagram indicates condition before actuation.**
	Battery		
	Diode		Connector
	Electronic part		Light emitting diode
	Resistor		Reed switch
	Speaker		Condenser
	Ground		



ABBREVIATIONS

The illustration at the left shows typical abbreviations used in the circuit diagrams.

These same abbreviations may also appear in the text.

Refer to the following table.

ABBREVIATION AND MEANING

Abbreviation	Meaning	Abbreviation	Meaning
RH	Right-hand side	STD	Standard equipment
LH	Left-hand side	OPT	Optional equipment
SW	Switch	W/	With
M/T	Manual transmission	WO/	Without
A/T	Automatic transmission	OD	Overdrive
FT	Front	ACC	Accessories
RR	Rear	A/C	Air conditioner
FLW	Fusible link wire	ATF	Automatic transmission fluid
TEMP	Temperature	VSV	Vacuum switch valve

INSPECTION AND REPAIR

Make the necessary adjustments, repairs, and part replacements if excessive wear or damage is discovered during inspection.

It is most important that electrical components be kept clean and dry at all times.

Always visibly check the fusible links, the fuses, and the indicator lights for damage as the first step in the inspection and repair procedure.

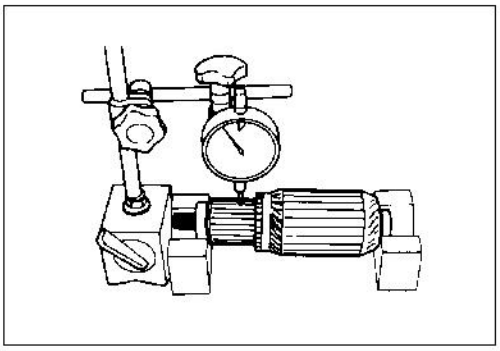
ARMATURE

Commutator Face

Check the commutator face for roughness.

If necessary, dress the commutator face with fine sandpaper (#500 or #600).

Be absolutely sure that there are no metal filings in the segment gaps.



Commutator Run-Out

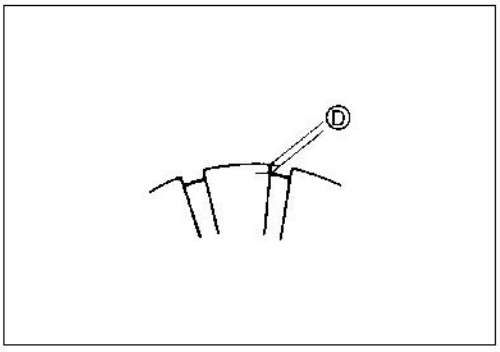
1. Mount the armature assembly on V-blocks.
2. Use a dial indicator to measure the commutator run-out.

   If the run-out is greater than the specified standard but less than the specified limit, the commutator may be turned on a lathe to correct it.

   If the run-out exceeds the specified limit, the armature assembly must be replaced.

Commutator Run-Out mm(in)

Standard	Limit
0.05 (0.002) or less	0.4 (0.016)



Commutator Segment Groove Depth

Use the V-blocks and the dial indicator to measure the depth Ⓓ of each of the commutator segment grooves.

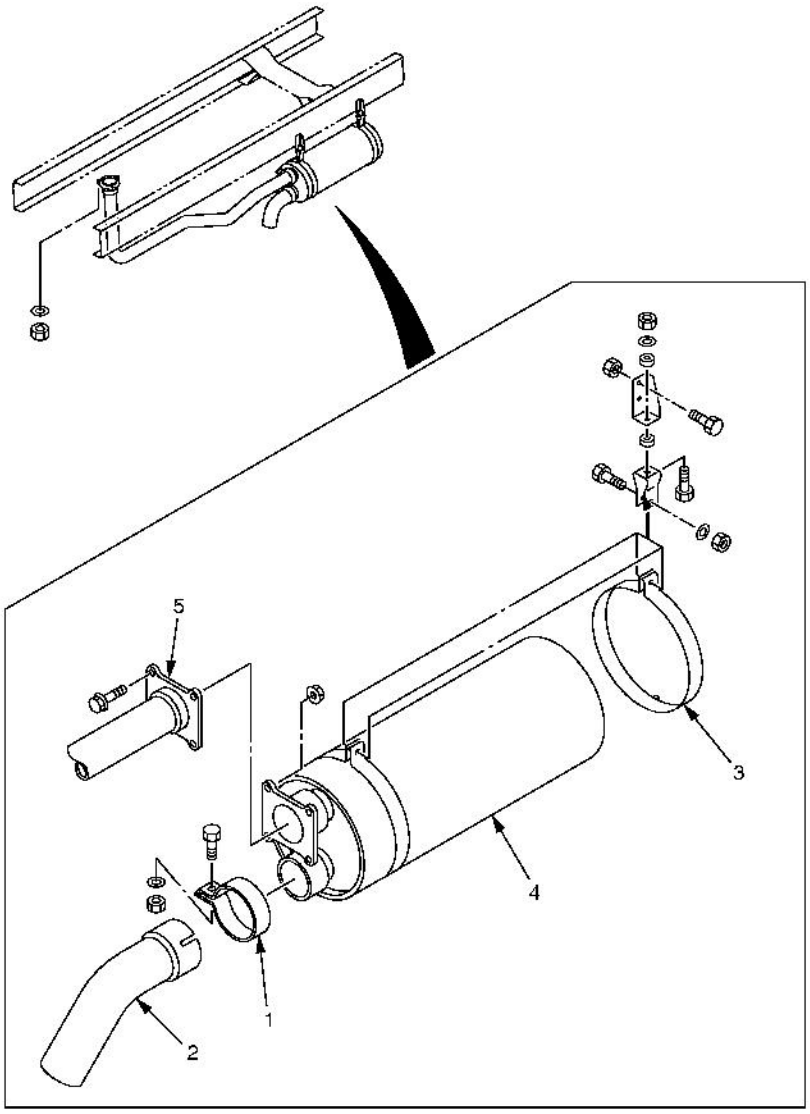
Replace the armature assembly if the commutator segment groove depth is less than the specified limit.

Commutator Segment Groove Depth Ⓓ mm(in)

Standard
0.5 - 0.8 (0.020 - 0.032)

REMOVAL AND INSTALLATION

HORIZONTAL TYPE EXHAUST SYSTEM



Removal Steps

1. Rear exhaust pipe clamp
2. Rear exhaust pipe
3. Silencer clamp
4. Silencer
5. Front exhaust pipe

Installation Steps

5. Front exhaust pipe
4. Silencer
3. Silencer clamp
2. Rear exhaust pipe
1. Rear exhaust pipe clamp