

DB33 DIESEL ENGINE

Shop Manual
65.99897-8024

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This documentation may include attachments and optional equipment that is not available in your machine's package. Please call your distributor for additional items that you may require.

Illustrations used throughout this manual are used only as a representation of the actual piece of equipment, and may vary from the actual item.

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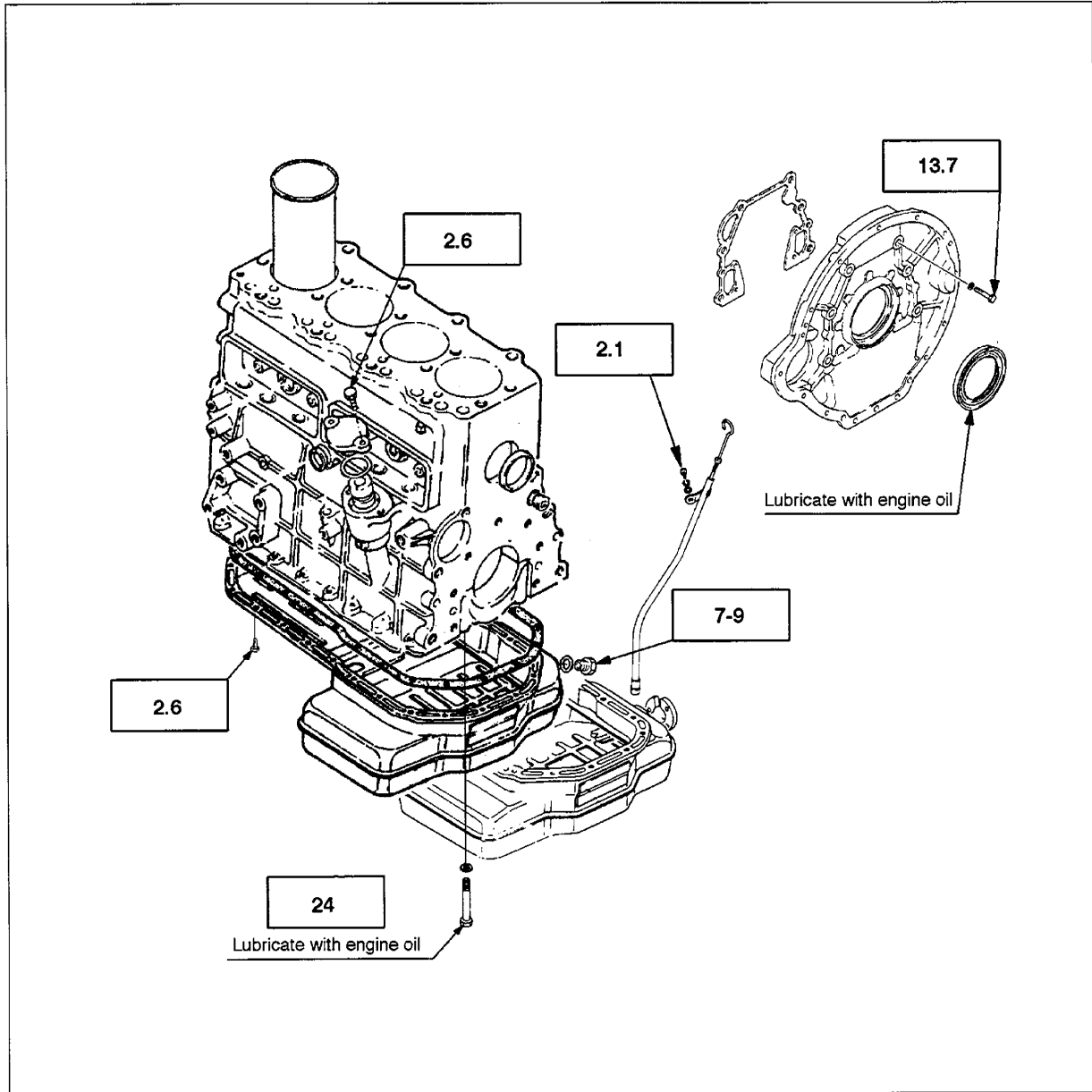


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● Cylinder block and others

(unit : kg · m)





10. Remove the delivery valve holder and reinstall the internal parts(seat, spring, valve.)
Tighten it to the specified torque.



Torque (kg • m)	4~4.5
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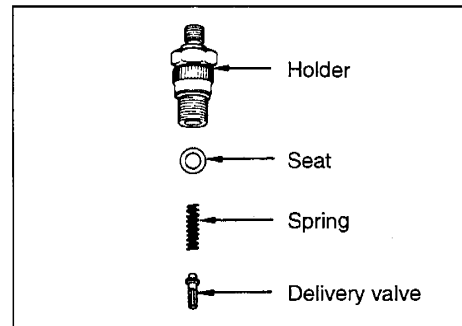


11. Install the No. 1 injection pipe and tighten it specified torque.

Injection pipe nut torque (kg • m)	3~3.5
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Do not overtighten the delivery valve holder. It will distort the injection pump body shape and adversely affect control rack operation.



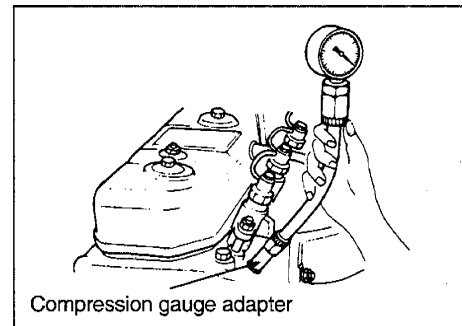
1.6.4. Compression Pressure



Remove the glow plugs from all cylinders, then check the compression pressure in each cylinder with a compression gauge by engaging starter.

(kg/cm², 200 rpm)

Standard	Limit
30	22~23



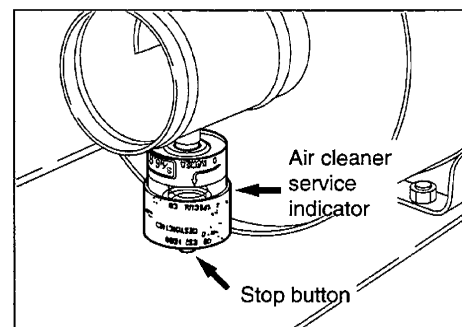
Compression gauge adapter

1.6.5. Air Cleaner



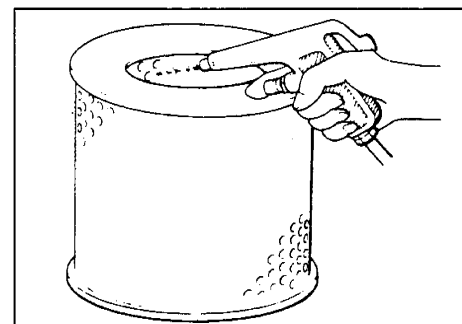
Dry type air cleaner

- Observe the air cleaner service indicator
- Clean the air cleaner element and dust pan when the RED band in the service indicator looks in the visible position.



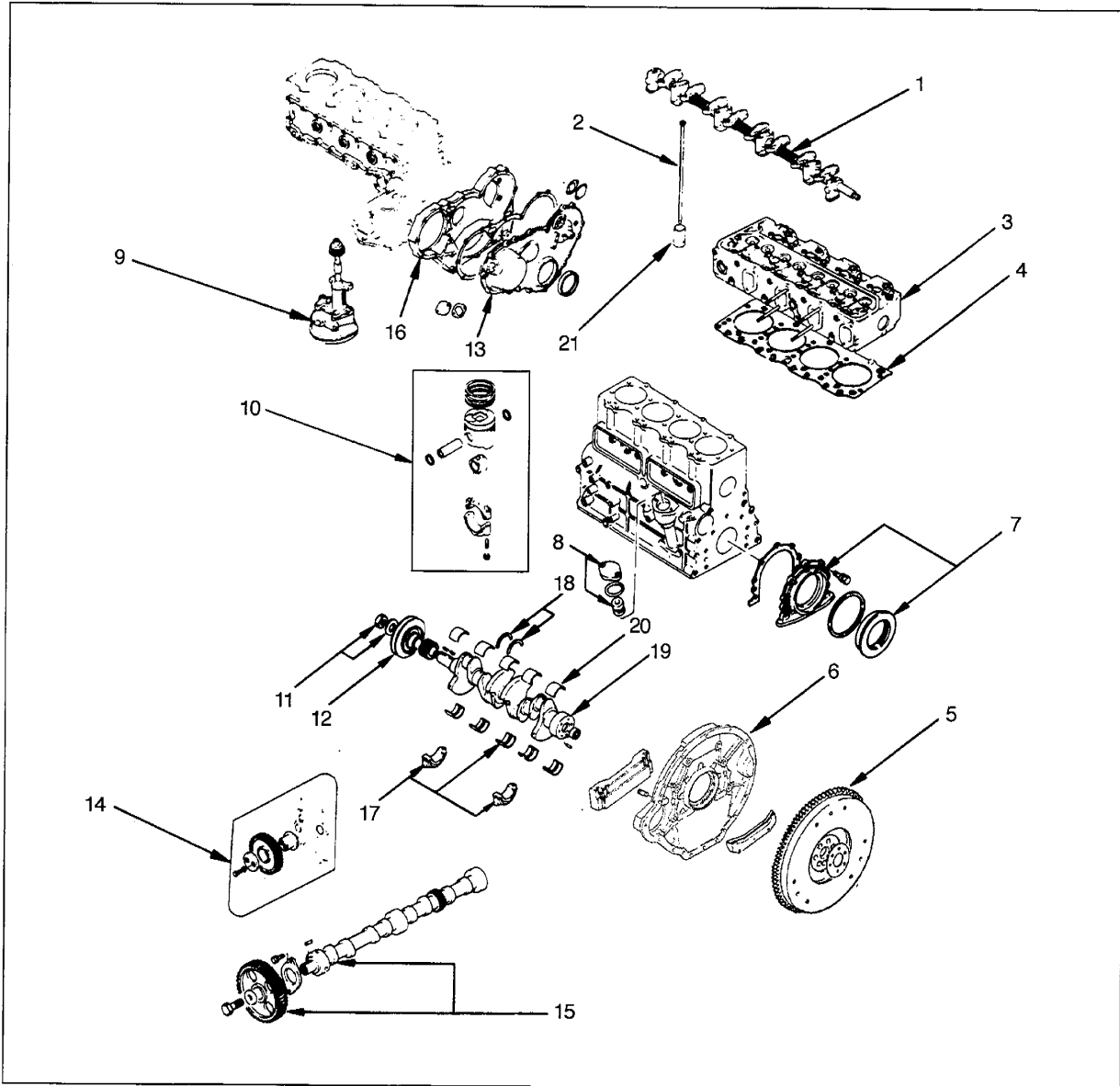
Cleaning element

- Direct air inside of the element and blow out dusts from the pleat completely.
(Maximum air pressure does not exceed 7 kg /cm²)



2.2.3. Internal Parts

• Major Components



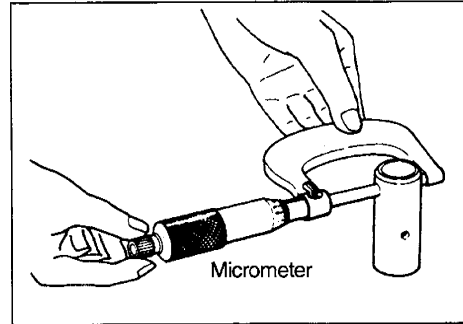
<Disassembly steps>

- ▲ 1. Rocker arm shaft assembly
- ▲ 2. Push rod
- ▲ 3. Cylinder head assembly
- ▲ 4. Cylinder head gasket
- ▲ 5. Fly wheel
- ▲ 6. Fly wheel housing
- ▲ 7. Rear oil seal assembly
- ▲ 8. Oil pump cover
- ▲ 9. Oil pump assembly
- ▲ 10. Piston and connecting-rod assembly
- ▲ 11. Crankshaft front nut and washer
- ▲ 12. Crankshaft pulley
- ▲ 13. Gear case cover
- ▲ 14. Idle gear
- ▲ 15. Camshaft assembly
- ▲ 16. Timing gear case
- ▲ 17. Crankshaft bearing cap and bearing
- ▲ 18. Thrust bearing
- ▲ 19. Crankshaft assembly
- ▲ 20. Crankshaft bearing
- ▲ 21. Tappet



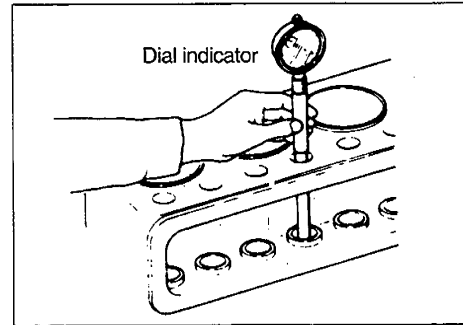
Diameter (mm)

Standard	Limit
27.97~27.98	27.92



Clearance between the tappet and cylinder body (mm)

Standard	Limit
0.02~0.054	0.1



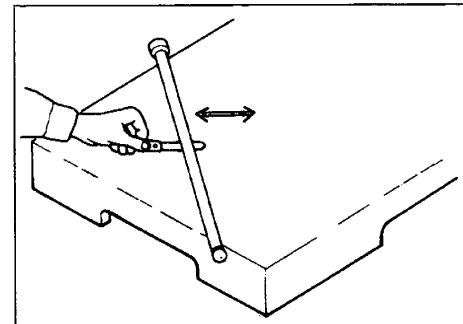
2.3.5. Push Rod



Run-out

Limit (mm)	0.03
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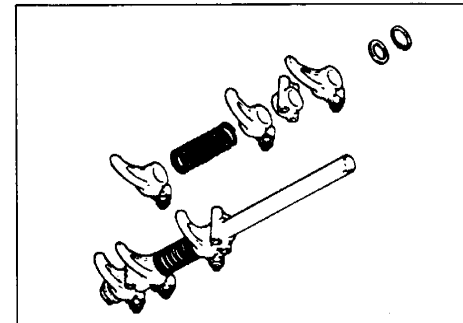
- Use a feeler gauge to measure the push rod run-out
- Roll the push rod along a smooth flat surface as shown in the figure.



2.3.6. Rocker Arm Shaft Assembly

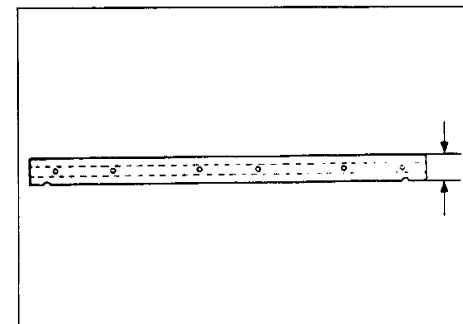


Inspect all disassembled parts for wear, damage and any abnormalities.



Rocker arm shaft (mm)

Standard	Limit
18.98~19.00	18.85

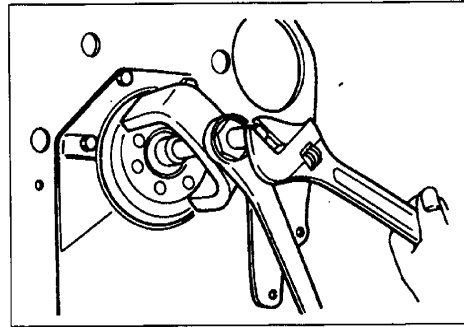




Pilot bearing replacement

Removal : remover

Installation : Use a brass bar and hammer.

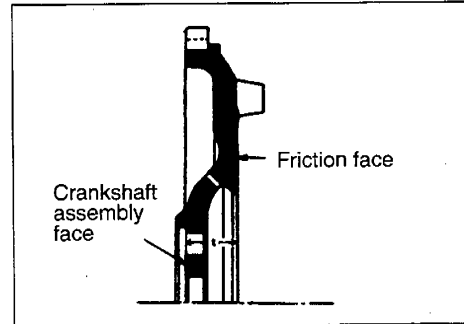


2.3.13. Flywheel and Housing(Rear Oil Seal)



• Flywheel thickness (Friction face) (mm)

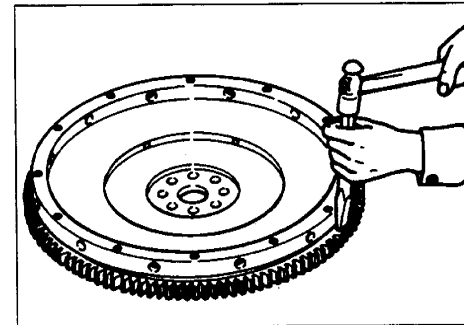
Standard	Limit
33.4~33.6	32.5



Ring gear replacement

Removal : Use a brass bar and hammer

-Strike around the edges of the ring gear with a hammer and brass bar to remove it.

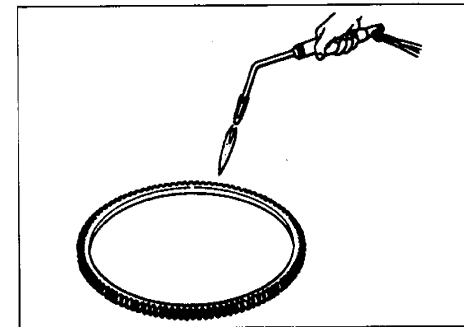


Installation :

-Heat the ring gear evenly with a gas burner to invite thermal expansion.

Do not allow the temperature of the ring gear to exceed 200°C (390°F)

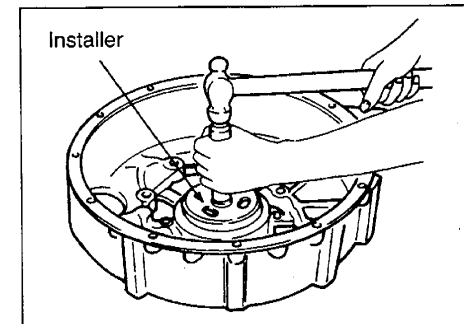
-Use a hammer to install the ring gear when it is sufficiently heated.



Flywheel housing oil seal replacement

Removal : Use a pry bar and hammer.

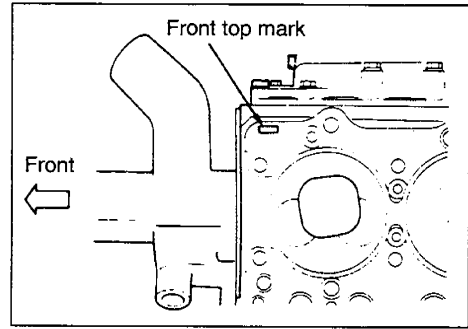
Installation : Use a oil seal installer.





● **Cylinder head gasket (20)**

The gasket "TOP" mark must be facing up and "FRONT" mark is towards the front of the engine.

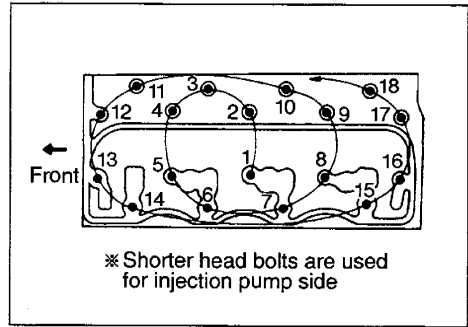


● **Cylinder head assembly (21)**

Carefully place the cylinder head on the cylinder body. Lubricate the head bolts and contact face of the cylinder head.



Tighten the head bolts in the numerical order as shown in the figure.

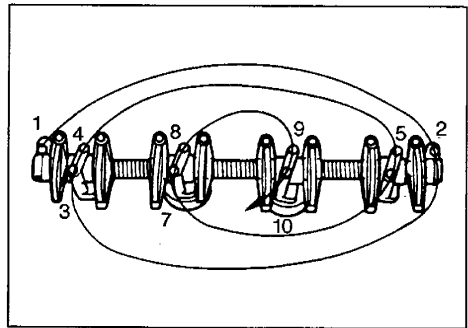


1st step	2nd step
7.0	11.5



● **Rocker arm shaft assembly (23)**

Tighten the rocker arm bracket bolts to the specified torque a little at a time in the numerical order shown in the figure.



Torque (kg · m)	3.1
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Adjust the valve clearance

Refer to MAINTENANCE for the valve clearance adjustment procedure.



Reassembly

To reassemble follow the disassembly procedures in reverse order.

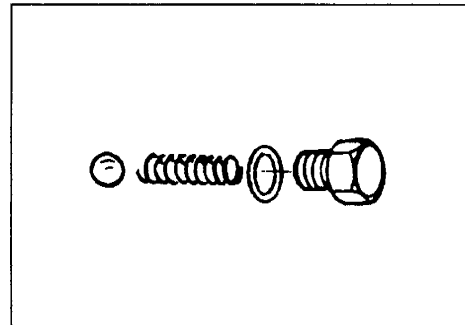


Important operation



• **Overflow Valve (1)**

Torque (kg • m)	2.5
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