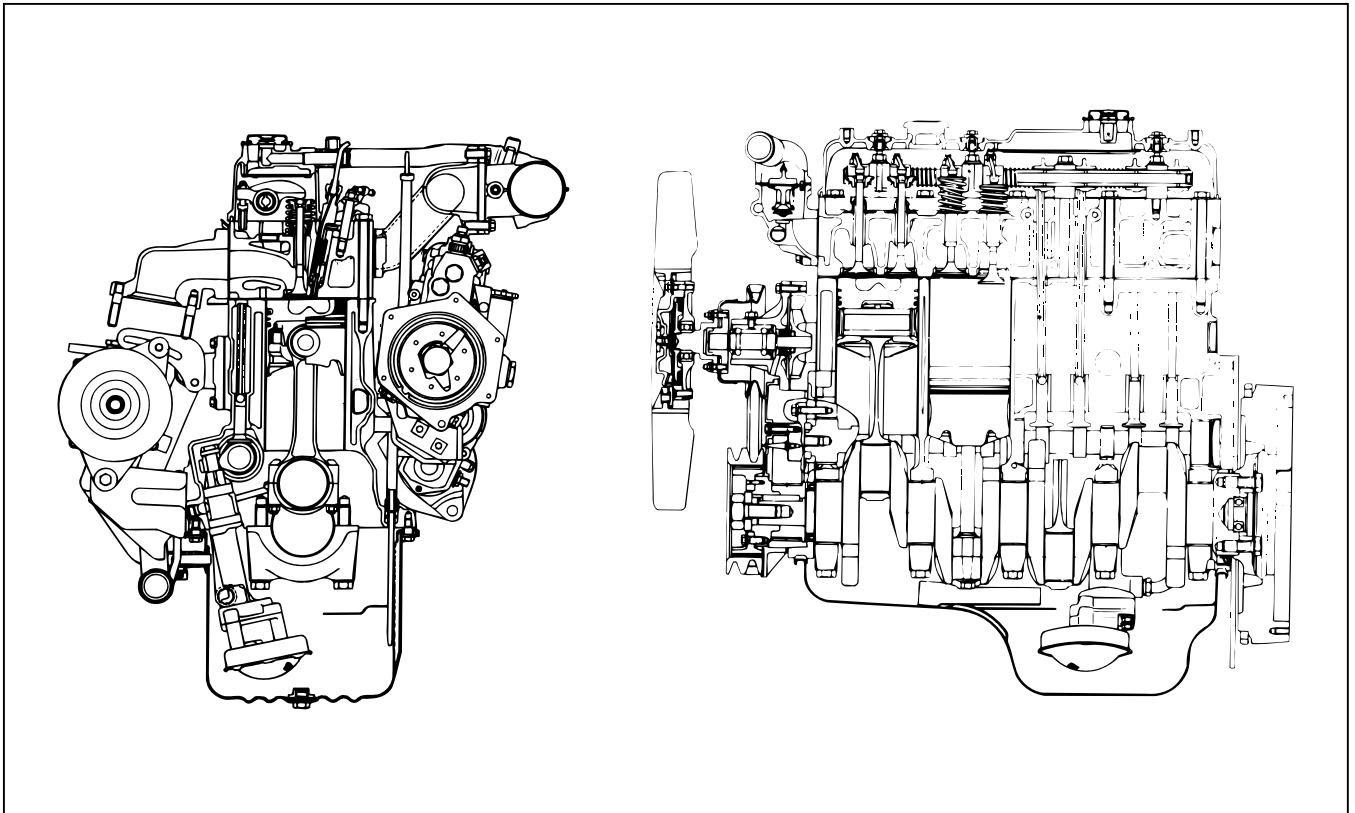


## ENGINE ASSEMBLY GENERAL DESCRIPTION

This illustration is based on the A-4JA1 engine.



The A-4J Series of industrial engines features the unique ISUZU troidal square combustion chamber. This design provides superior fuel economy for a wide range.

Auto-thermatic pistons with cast steel struts are used to reduce thermal expansion and resulting engine noise when the engine is cold.

Chrome plated dry type cylinder liners provide the highest durability.

The laminated steel sheet cylinder head gasket is very durable.

This type of gasket eliminates cylinder head bolt retightening.

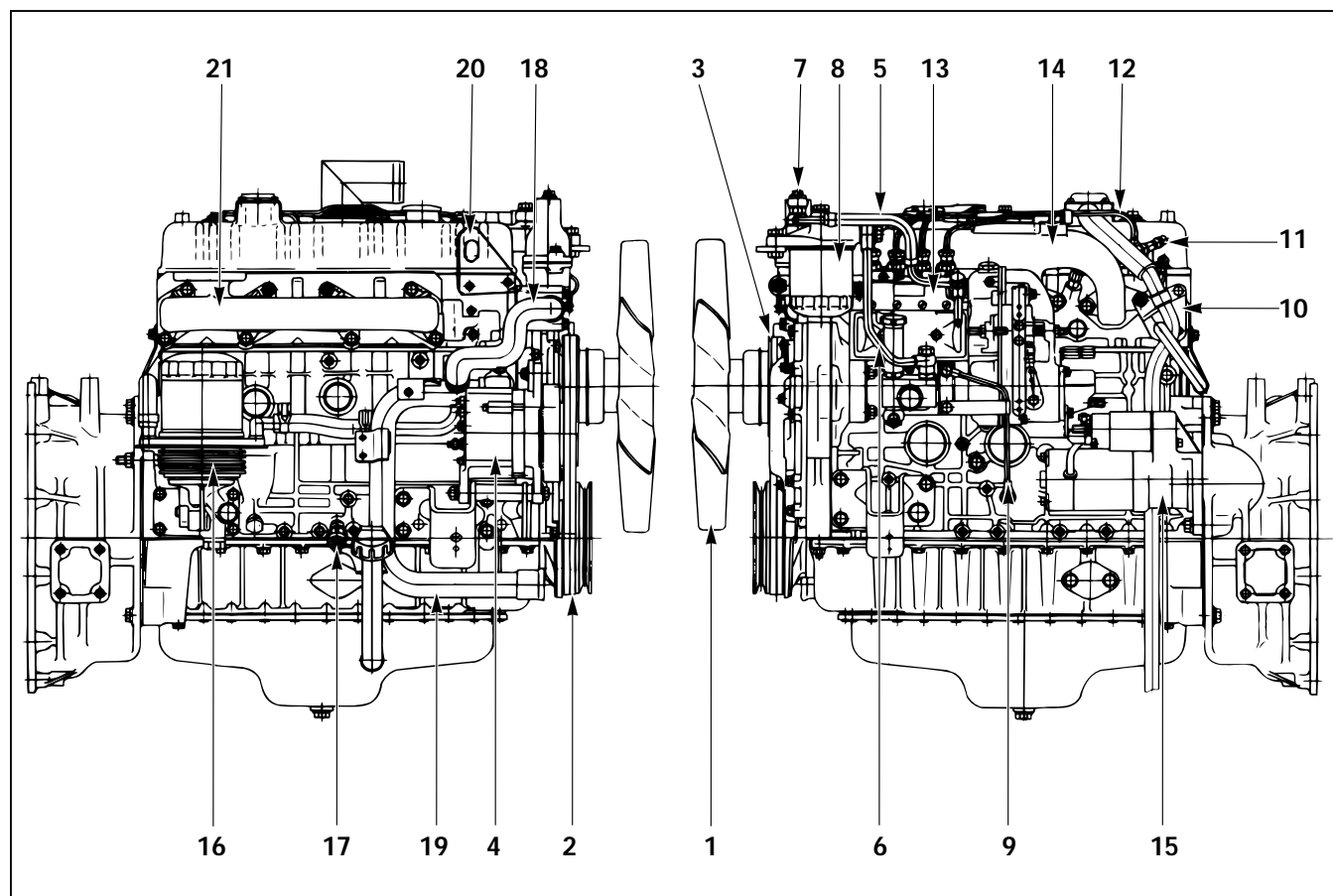
The tufftrided crankshaft has a long service life. Because it is tufftrided, it cannot be reground.

The crankshaft main bearings and the connecting rod bearings are aluminum plated. These bearings are especially sensitive to foreign material such as metal scraps. It is very important that the oil ports and other related parts be kept clean and free of foreign material.



## DISASSEMBLY

These disassembly steps are based on the A-4JA1 engine.

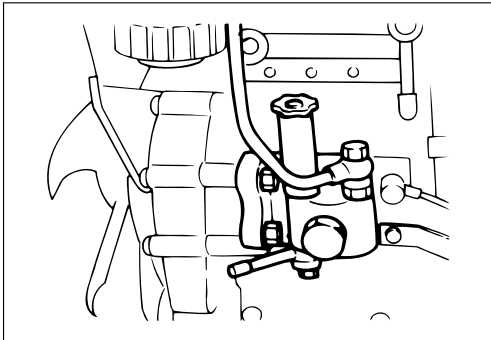
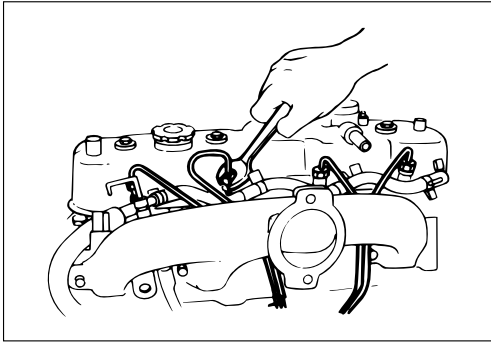


## Disassembly Steps - 1

- |   |                                     |
|---|-------------------------------------|
| 1. Cooling fan and spacer                     | 11. Fuel leak off pipe              |
| 2. Cooling fan drive belt                     | ▲ 12. Fuel injection pipe with clip |
| 3. Cooling fan drive pulley                   | ▲ 13. Injection pump                |
| 4. Alternator and adjusting plate             | 14. Intake manifold                 |
| 5. Fuel pipe (Fuel filter to injection pump)  | 15. Starter                         |
| 6. Fuel pipe (Fuel filter to feed pump)       | 16. Oil filter                      |
| 7. Fuel pipe (Fuel filter leak off)           | 17. Oil pressure switch             |
| 8. Fuel filter                                | 18. Cooling water rubber hose       |
| 9. Oil pipe (Injection pump to cylinder body) | 19. Cooling water intake pipe       |
| 10. Rear engine hanger                        | 20. Front engine hanger             |
|   | ▲ 21. Exhaust manifold              |

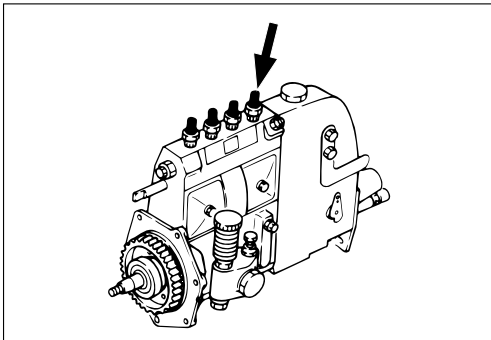


**Important Operations (Disassembly Steps - 1)**



**12. Fuel 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.

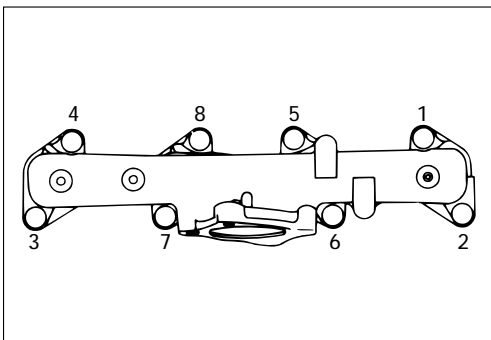
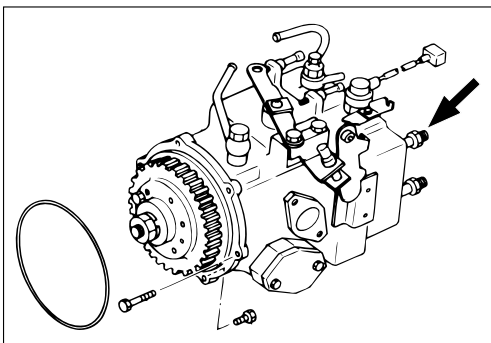


**13. Injection Pump**

- 1) Remove the six injection pump bracket bolts from the cylinder body timing gear case.
- 2) Remove the injection pump rear bracket bolts from the rear bracket.
- 3) Pull the injection pump with the injection pump timing gear free from the rear.

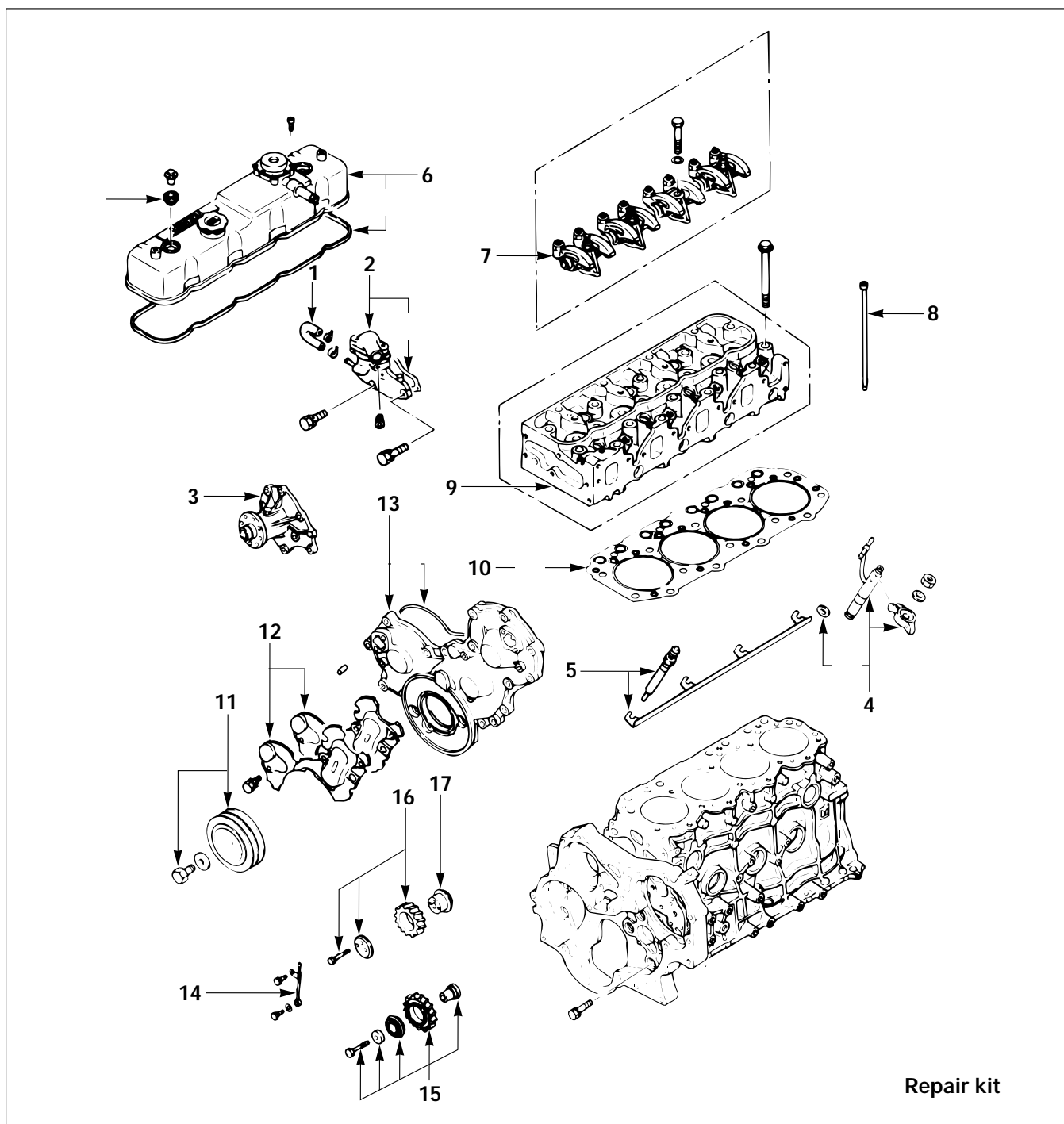
**Note:**

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



**21. Exhaust Manifold**

Loosen the exhaust manifold bolts a little at a time in the numerical order shown in the illustration.



**Disassembly Steps - 2**

- |                                      |   |
|--------------------------------------|---|
| 1. Water by-pass hose                | 10. Cylinder head gasket                      |
| 2. Thermostat housing                | ▲ 11. Crankshaft damper pulley with dust seal |
| 3. Water pump                        | 12. Timing gear case cover                    |
| ▲ 4. Injection nozzle holder         | 13. Timing gear cover                         |
| 5. Glow plug and glow plug connector | 14. Timing gear oil pipe                      |
| 6. Cylinder head cover               | 15. Idler gear "B" and shaft                  |
| ▲ 7. Rocker arm shaft and rocker arm | ▲ 16. Idler gear "A"                          |
| 8. Push rod                          | 17. Idler gear shaft                          |
| ▲ 9. Cylinder head                   |   |

Inverted Engine