

YANMAR

SERVICE MANUAL

MARINE DIESEL ENGINE

MODEL

2TD
3TD
4TD

Models 2TD·3TD·4TD

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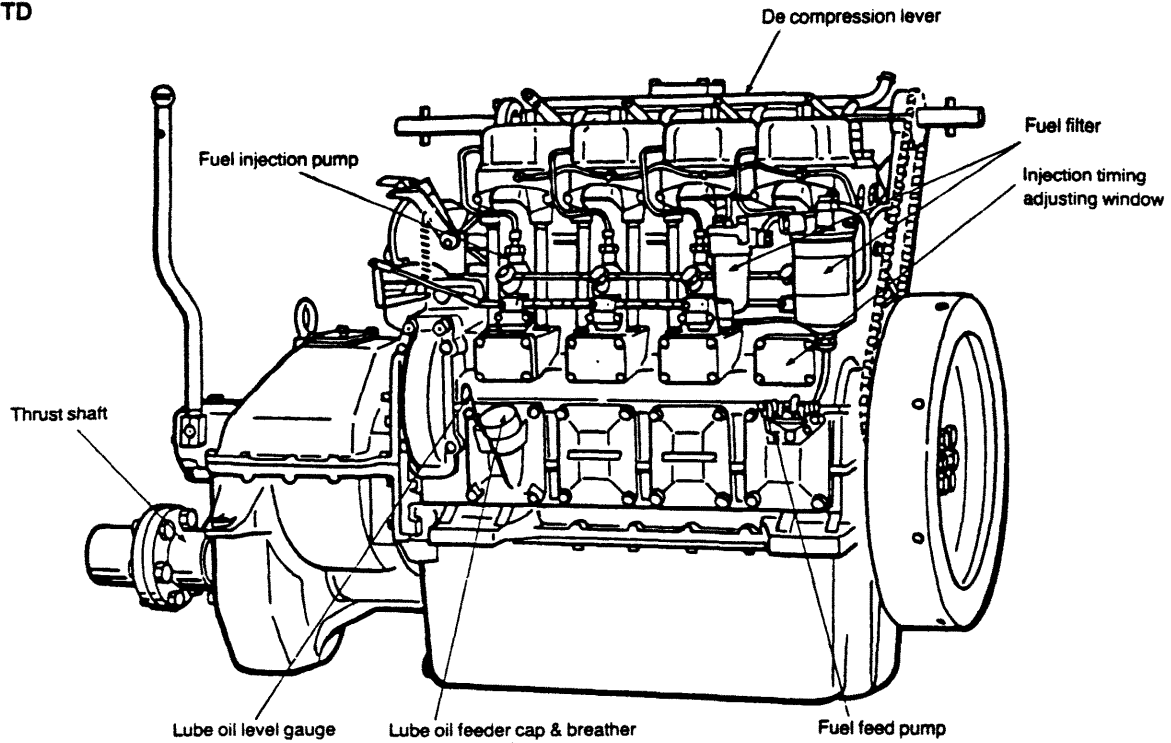
CHAPTER 1

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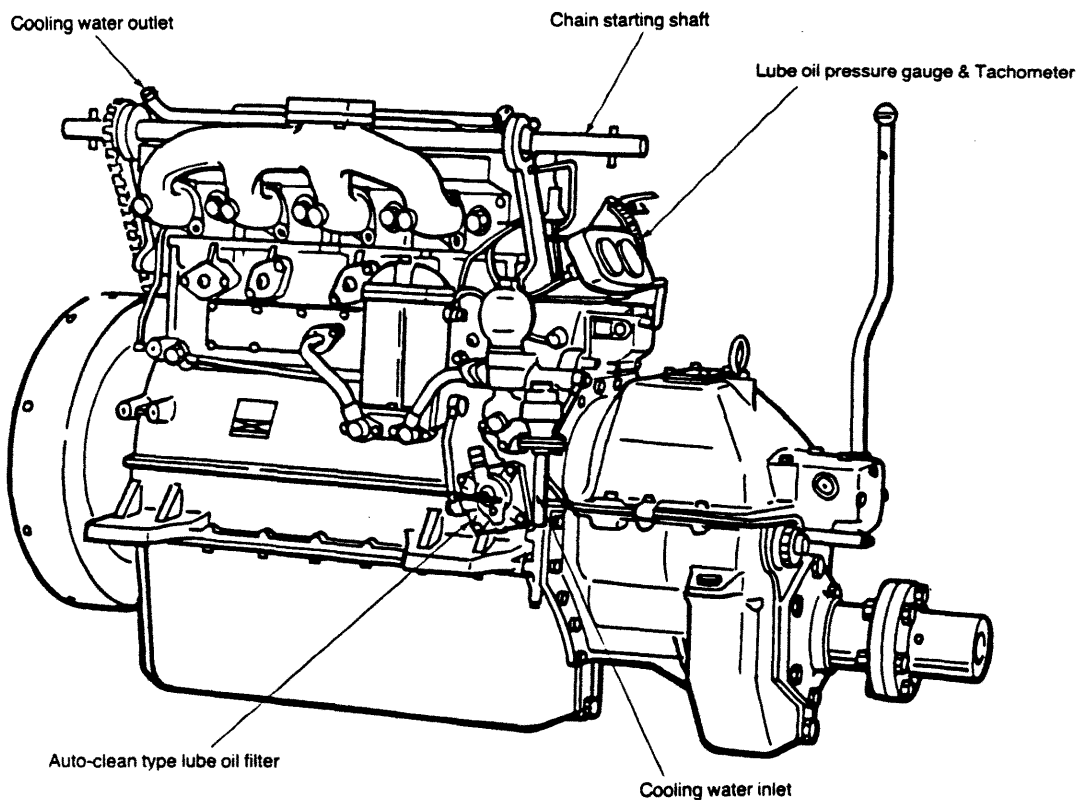
1. External View

1-1 4TD



Operation side of 4TD (Chain starting)

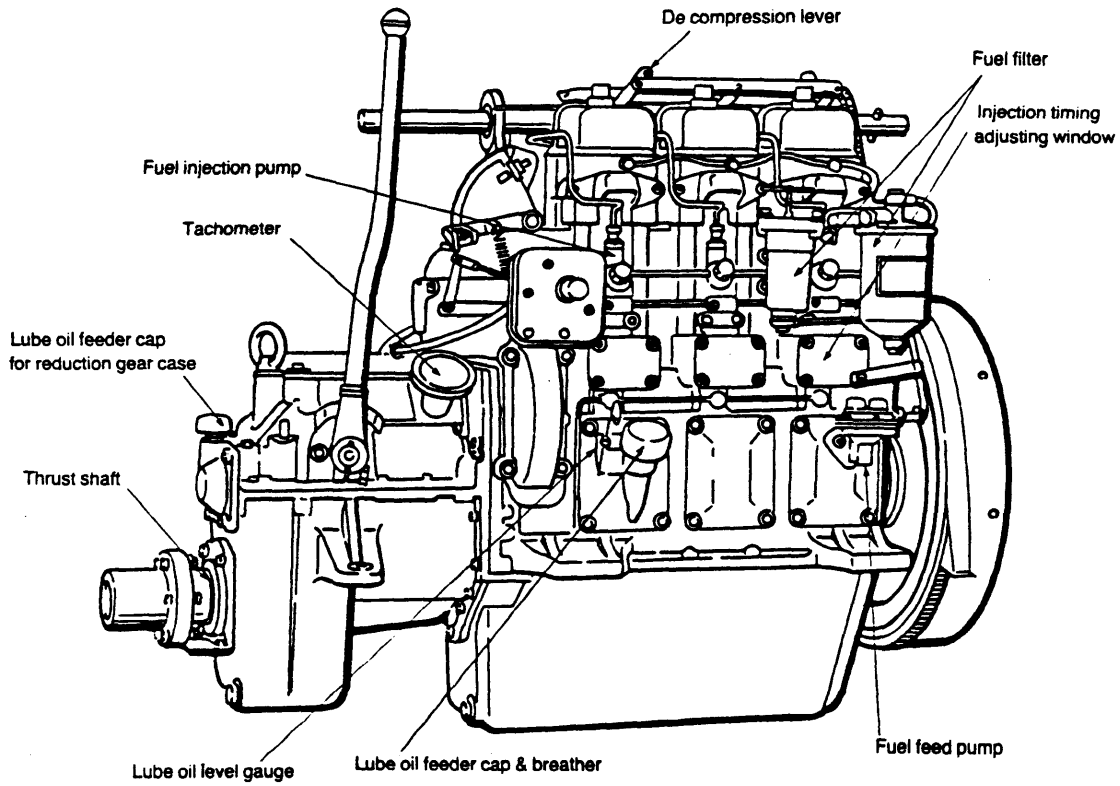
TD0001



Exhaust side of 4TD (Chain starting)

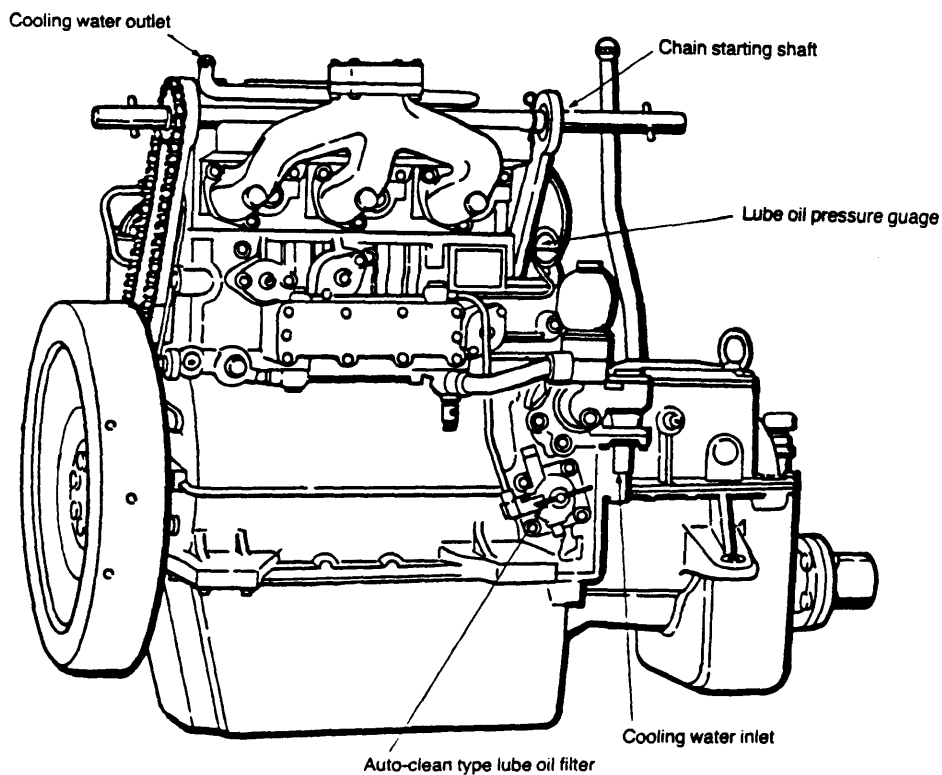
TD0002

1-2 3TD



TD0003

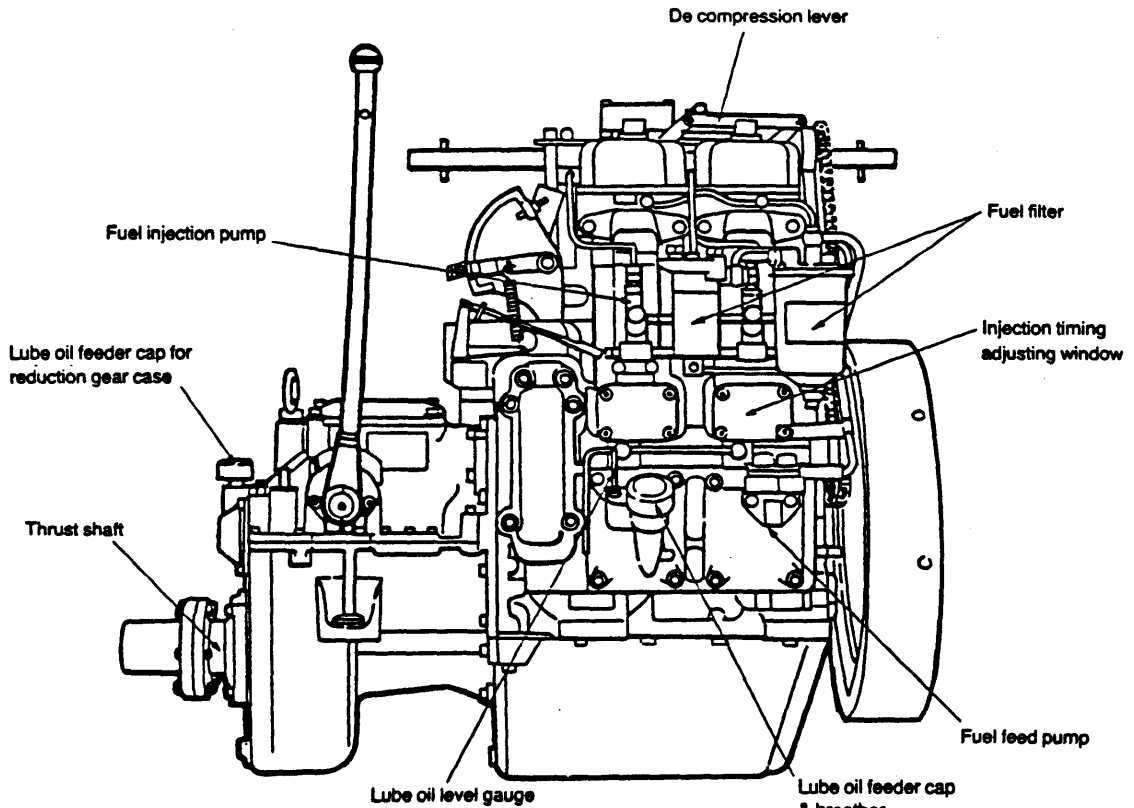
Operation side of 3TD (Electric and Chain Starting)



TD0004

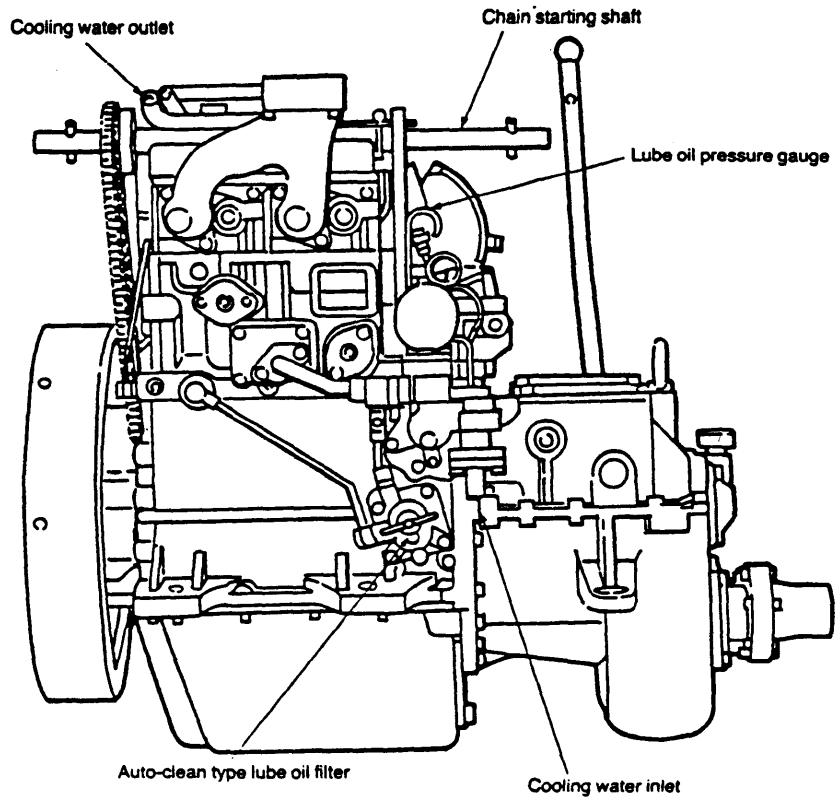
Exhaust side of 3TD (Electric and Chain starting)

1-3 2TD



Operation side of 2TD (Chain Starting)

TD0005



Exhaust side of 2TD (Chain Starting)

TD0006

2. Specifications

2-1 Engine

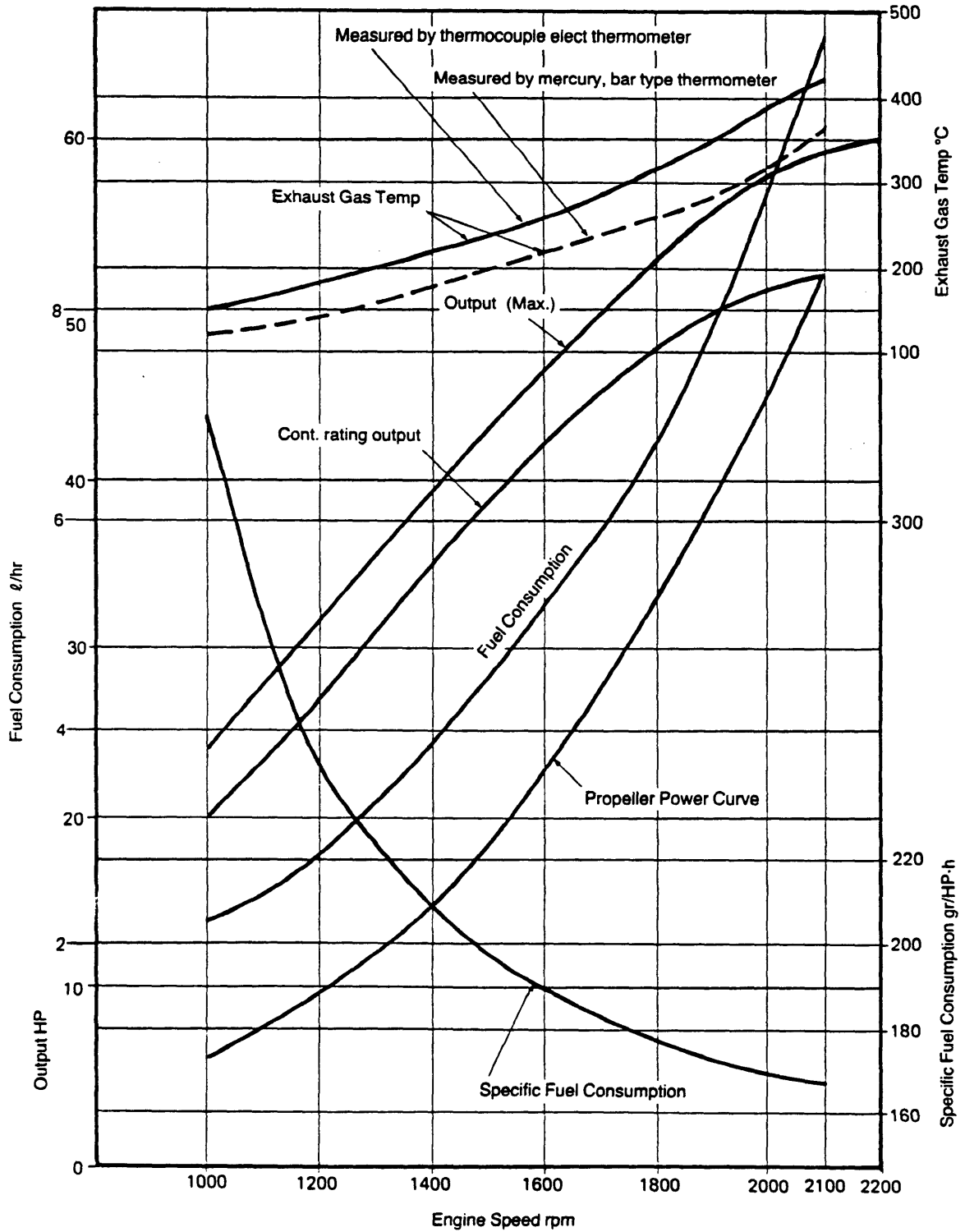
Model name			2TD (G, GG)	3TD (G, GG)	4TD (G, GG, GGG)
Type		4-cycle, vertical, natural aspirated diesel engine			
Combustion system		Direct injection			
No. of cylinders			2	3	4
Piston bore x stroke		mm	Ø100 x 115		
Displacement		ℓ	1.806	2.710	3.613
Continuous rating output		HP/rpm	26/2100	39/2100	52/2100
Max. output		HP/rpm	30/2200	45/2200	60/2200
Idling speed	High	rpm	2400 ~ 2450		
	Low	rpm	450		
Starting system		Manual chain (Electric, Electric with manual available as optional)			
Firing order			1-2-1	1-2-3-1	1-2-4-3-1
Operation side		Starboard of engine			
Direction of rotation	Crankshaft		Counterclockwise viewed from stern		
	Propeller shaft		Clockwise viewed from stern		
Engine lube oil sump	Total	ℓ	8	12	18
	Effective	ℓ	4	5.5	9
Fuel injection pump type		Bosch type, each cylinder individual			
Fuel injection timing		b.T.D.C.	18 ~ 20 deg. (19 ± 1 deg.)		
Fuel injection valve		Hole valve (5-0.27Ø-140°)			
Fuel injection pressure		kg/cm ²	200 ~ 210		
Lubrication system		Forced lubrication with trochoid pump			
Lube oil pressure		kg/cm ²	3 ~ 4 at 2200 rpm		
Cooling system		Raw water cooling with reciprocating type pump			
Cooling water capacity at 2,100rpm point		ℓ/Hr	1,350	1,700	
Bilge pump		Manual type			
Dry weight (approx.)	Manual start	kg.	330	400	510
	Electric start	kg.	345	415	525
Dimension manual st. (electric st.)	Length	mm	874 (936)	1,010 (1072)	1,236 (1,298)
	Breadth	mm	526 (602)	526 (602)	526 (602)
	Height	mm	805 (805)	825 (825)	526 (855)

2-2 Marine Gear

Engine model		2TD	2TDG	2TDGG	3TD	3TDG	3TDGG	4TD	4TDG	4TDGG	4TDGGG
Type		Wet, single friction plate (ahead)						Wet, friction plates (V-lever type)			
Reduction ratio	Ahead	2.14	2.50	3.14	2.14	2.50	3.14	2.13	2.59	3.22	3.80
	Astern	2.53	2.95	3.71	2.53	2.95	3.71	2.20	2.68	3.33	3.93
Propeller shaft speed at engine 2,100 rpm	Ahead rpm	982	840	670	982	840	670	986	810	653	553
	Astern rpm	831	711	567	831	711	567	953	783	631	534
Lubrication system		Forced lubrication									
Reduction gear case lube oil sump	Total ℓ	1.5						Common oil with engine oil sump			
	Effective ℓ	0.5									

3. Performance Curves

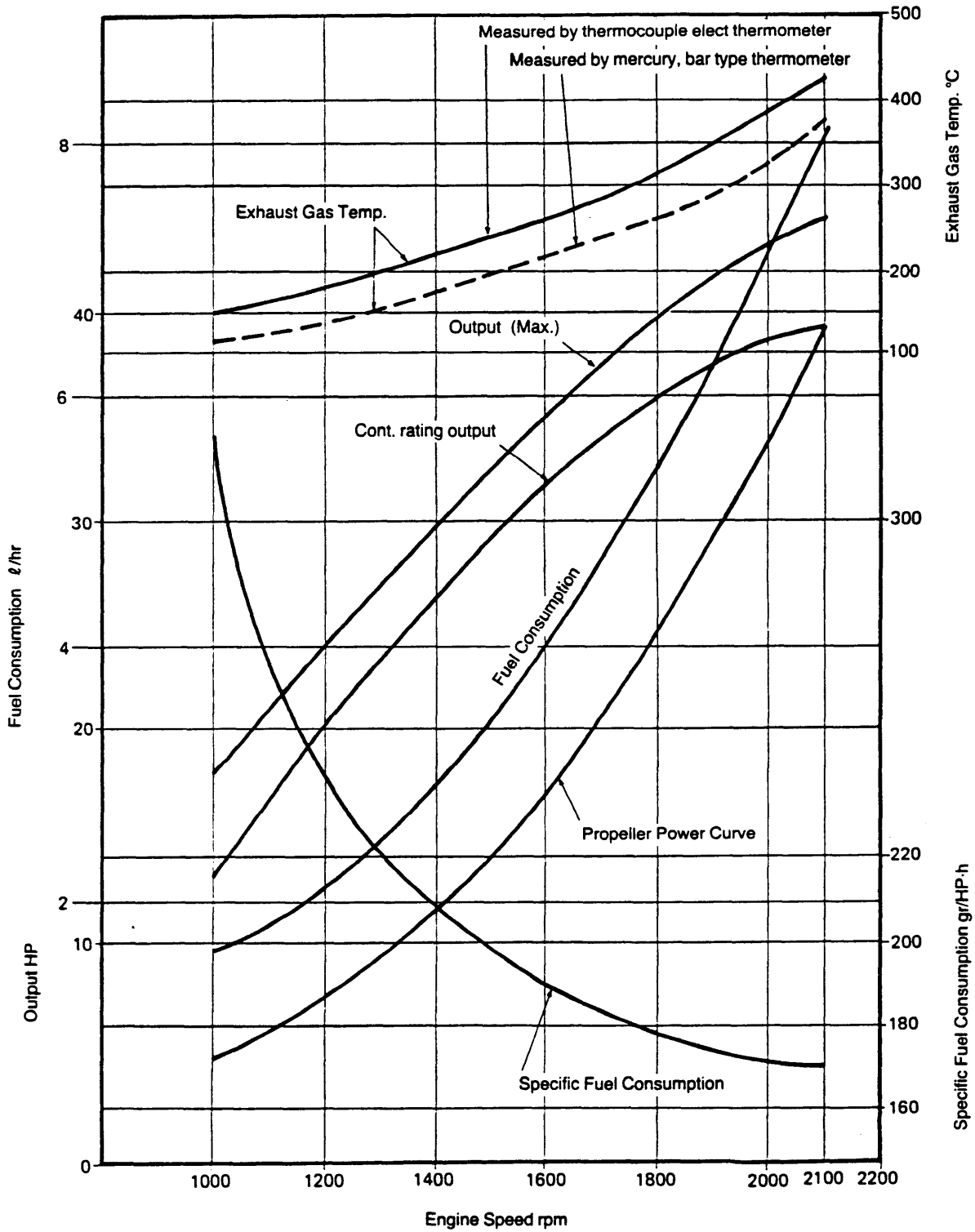
3-1 4TD



4TD Performance curves

TD0007

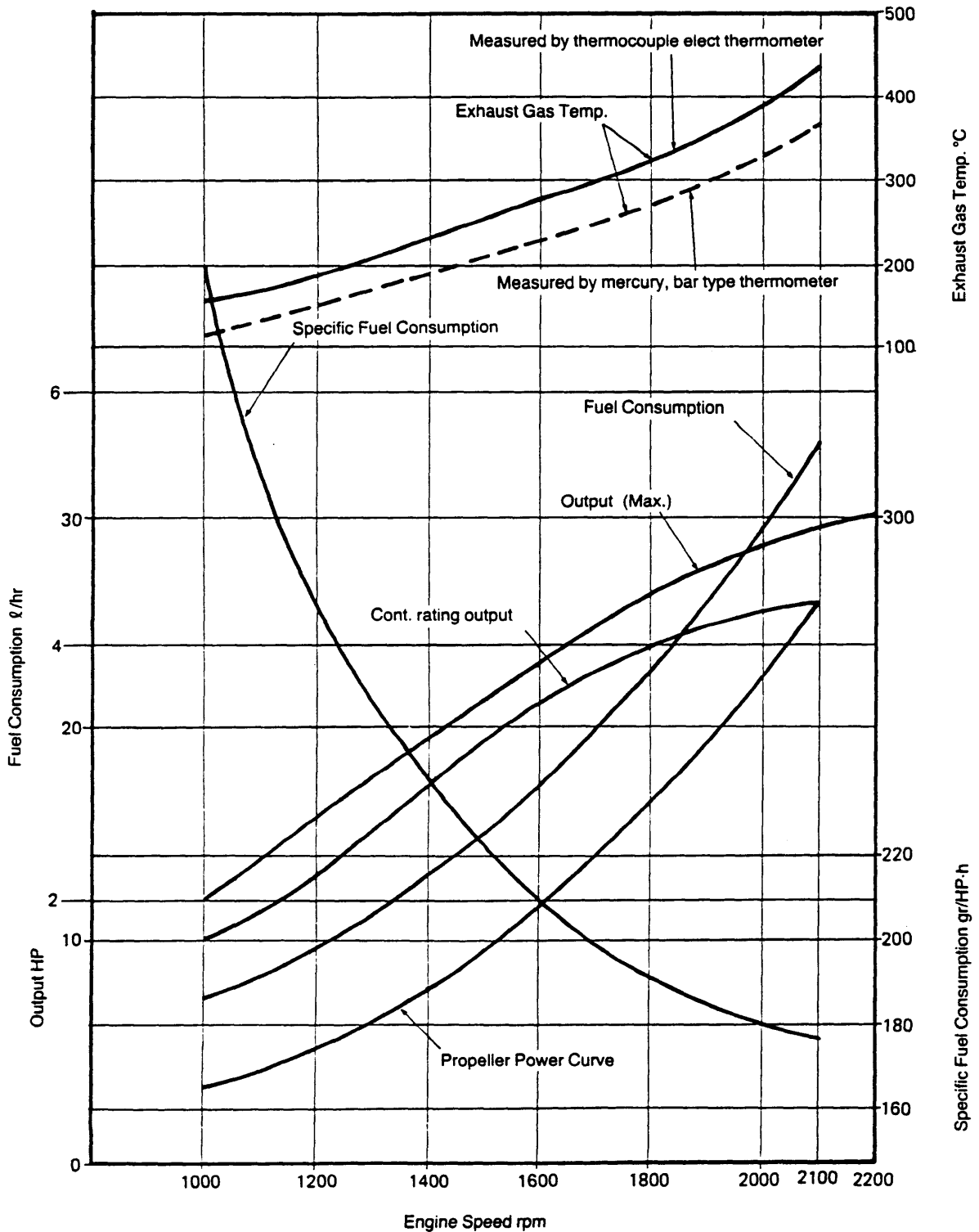
3-2 3TD



3TD Performance curves

TD0008

3-3 2TD

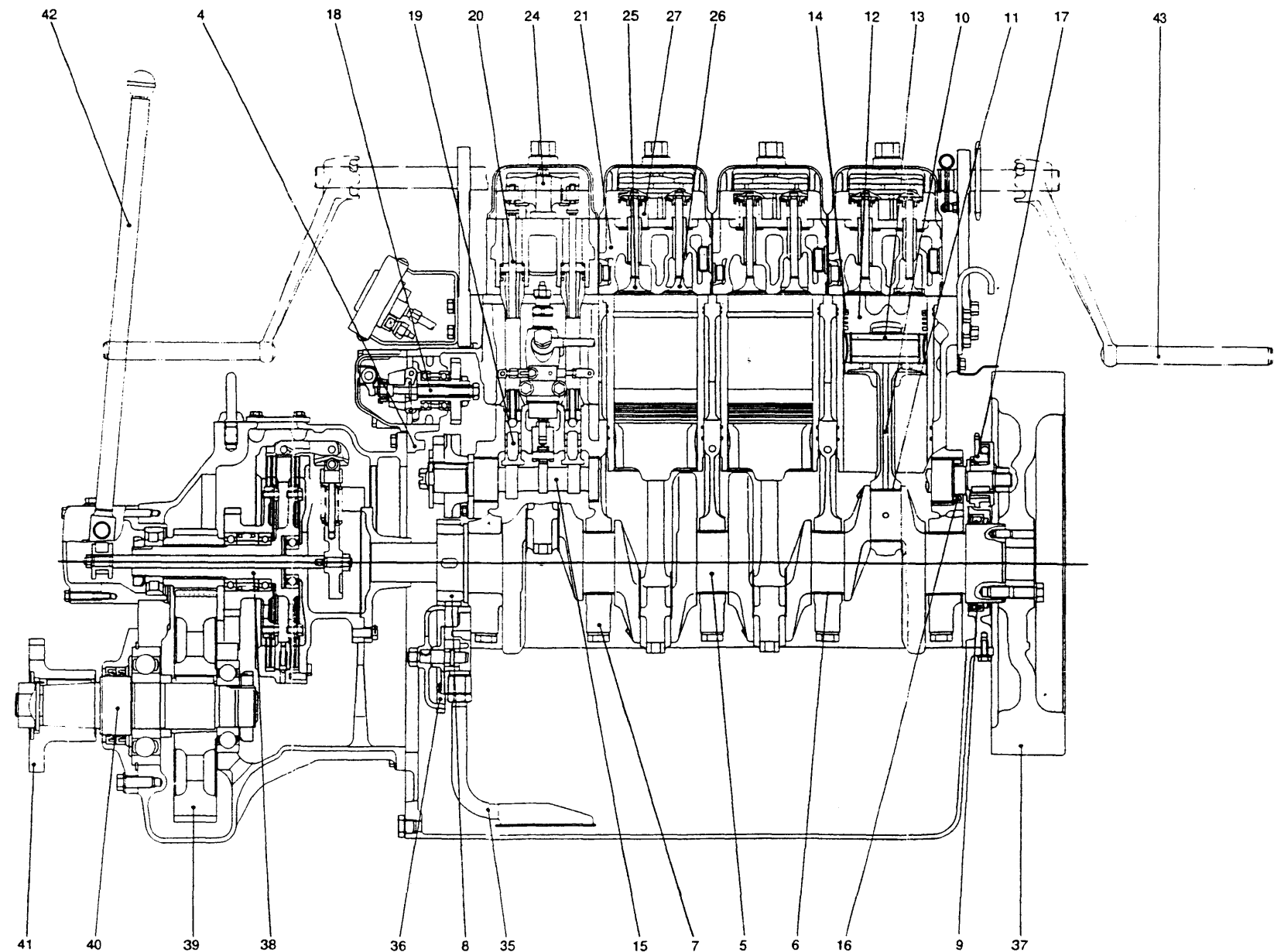
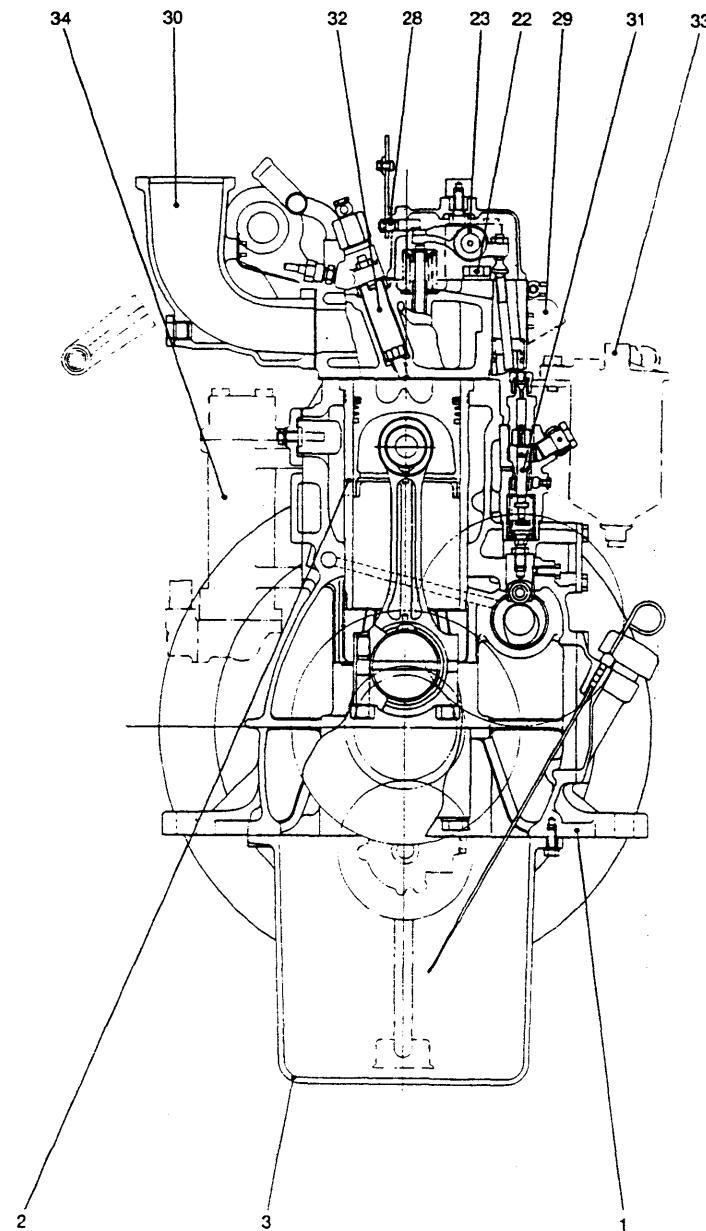


2TD Performance curves

TD0009

4. Engine Cross-section

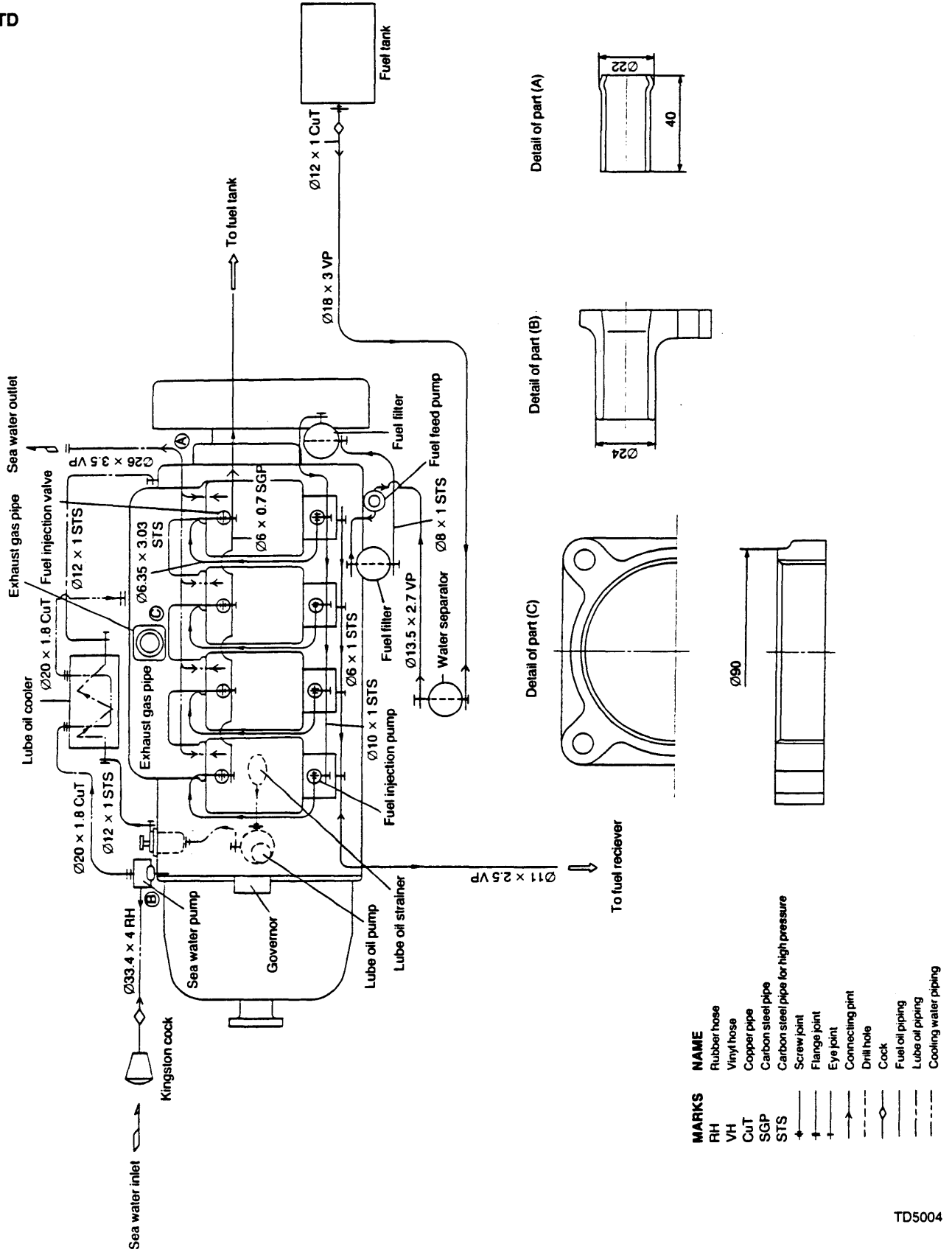
4-1 4TD



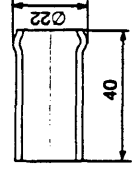
- | | | | | |
|-------------------------|-----------------------|-------------------------|---------------------------|---------------------|
| 1. Cylinder block | 11. Crank pin bushing | 21. Cylinder head | 31. Fuel injection pump | 41. Output coupling |
| 2. Cylinder liner | 12. Piston | 22. Cylinder head bolt | 32. Fuel injection nozzle | 42. Clutch lever |
| 3. Oil pan | 13. Piston pin | 23. Valve rocker arm | 33. Fuel filter | 43. Start handle |
| 4. Timing gear case | 14. Piston ring | 24. Rocker arm support | 34. Lub. oil cooler | |
| 5. Crankshaft | 15. Camshaft | 25. Suction valve | 35. Lub. oil suction tube | |
| 6. Main bearing bushing | 16. Camshaft oil seal | 26. Exhaust valve | 36. Lub. oil pump | |
| 7. Main bearing cap | 17. Free wheel | 27. Valve spring | 37. Flywheel | |
| 8. Crankshaft gear | 18. Governor assembly | 28. Decompression shaft | 38. Forward shaft | |
| 9. Crankshaft oil seal | 19. Tappet | 29. Intake port | 39. Thrust gear | |
| 10. Connecting rod | 20. Push rod | 30. Exhaust manifold | 40. Thrust shaft | |

5. Piping Diagram

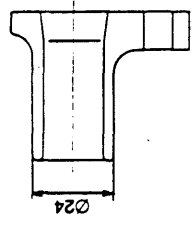
5-1 4TD



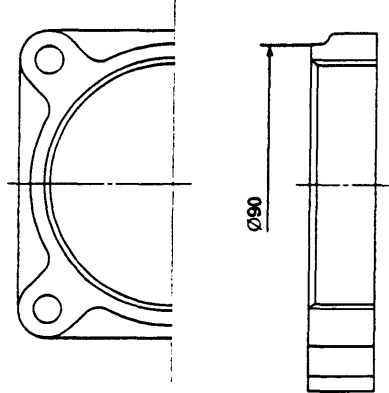
Detail of part (A)



Detail of part (B)

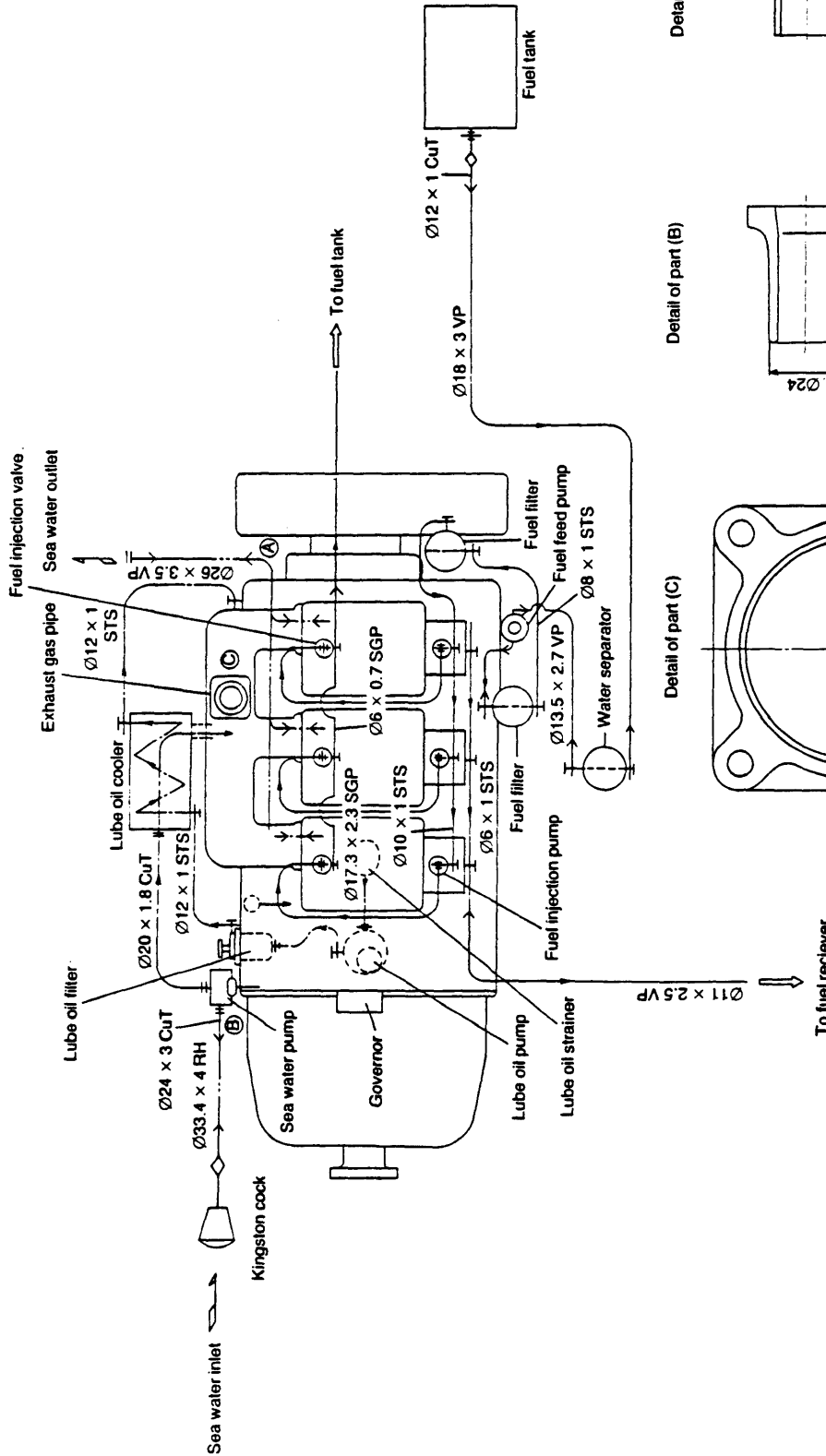


Detail of part (C)

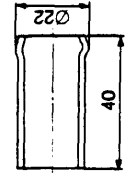


MARKS	NAME
RH	Rubber hose
VH	Vinyl hose
CuT	Copper pipe
SGP	Carbon steel pipe
STS	Carbon steel pipe for high pressure
+	Screw joint
+	Flange joint
+	Eye joint
+	Connecting joint
+	Drill hole
+	Cock
+	Fuel oil piping
+	Lube oil piping
+	Cooling water piping

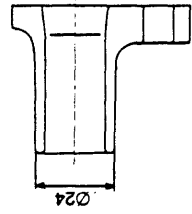
5-2 3TD



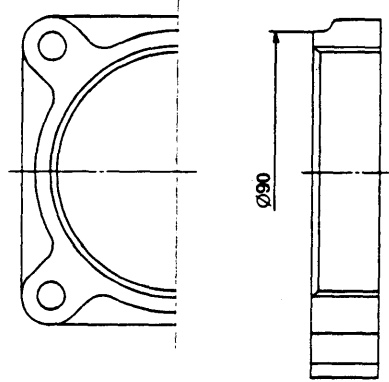
Detail of part (A)



Detail of part (B)

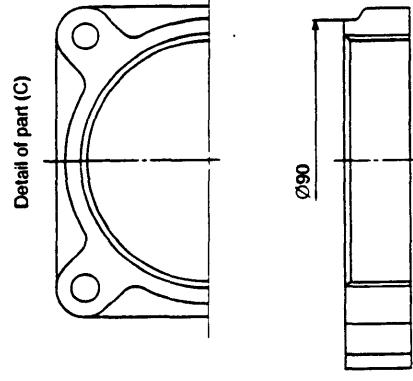
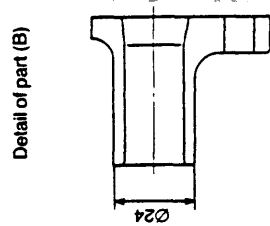
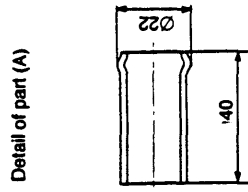
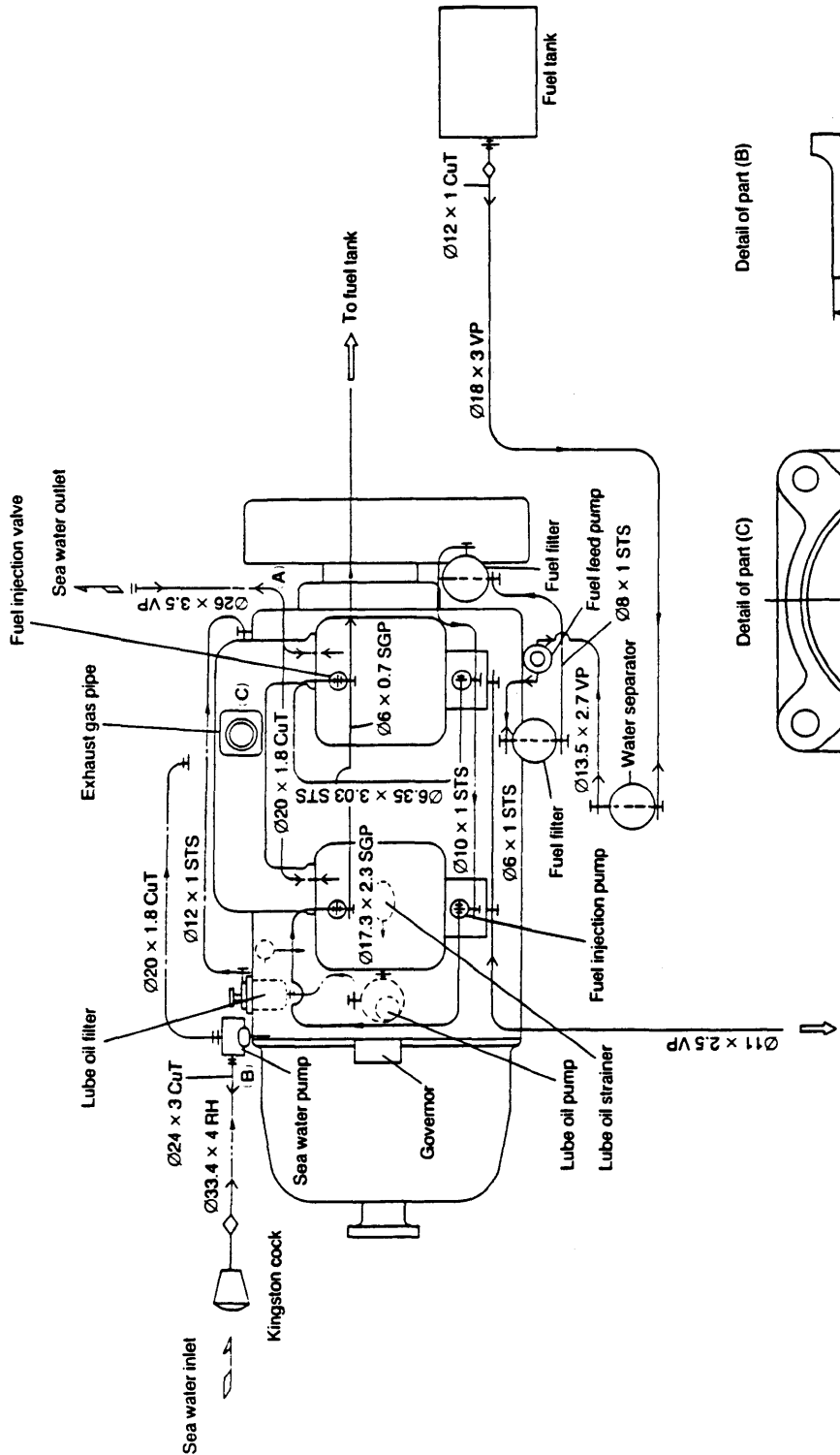


Detail of part (C)



MARKS	NAME
RH	Rubber/hose
VH	Vinyl/hose
CuT	Copper pipe
SGP	Carbon steel pipe
STS	Carbon steel pipe for high pressure
+	Screw joint
+	Flange joint
+	Eye joint
—	Connecting pint
—	Drill hole
—	Cock
—	Fuel oil piping
—	Lube oil piping
—	Cooling water piping

5-3 2TD



MARKS	NAME
RH	Rubber hose
VH	Vinyl hose
CuT	Copper pipe
SGP	Carbon steel pipe
STS	Carbon steel pipe for high pressure
—•—	Screw joint
—+—	Flange joint
— —	Eye joint
—••—	Connecting pint
—•••—	Drill hole
—••••—	Cock
—•••••—	Fuel oil piping
—••••••—	Lube oil piping
—•••••••—	Cooling water piping

6. Disassembly and Reassembly Tools

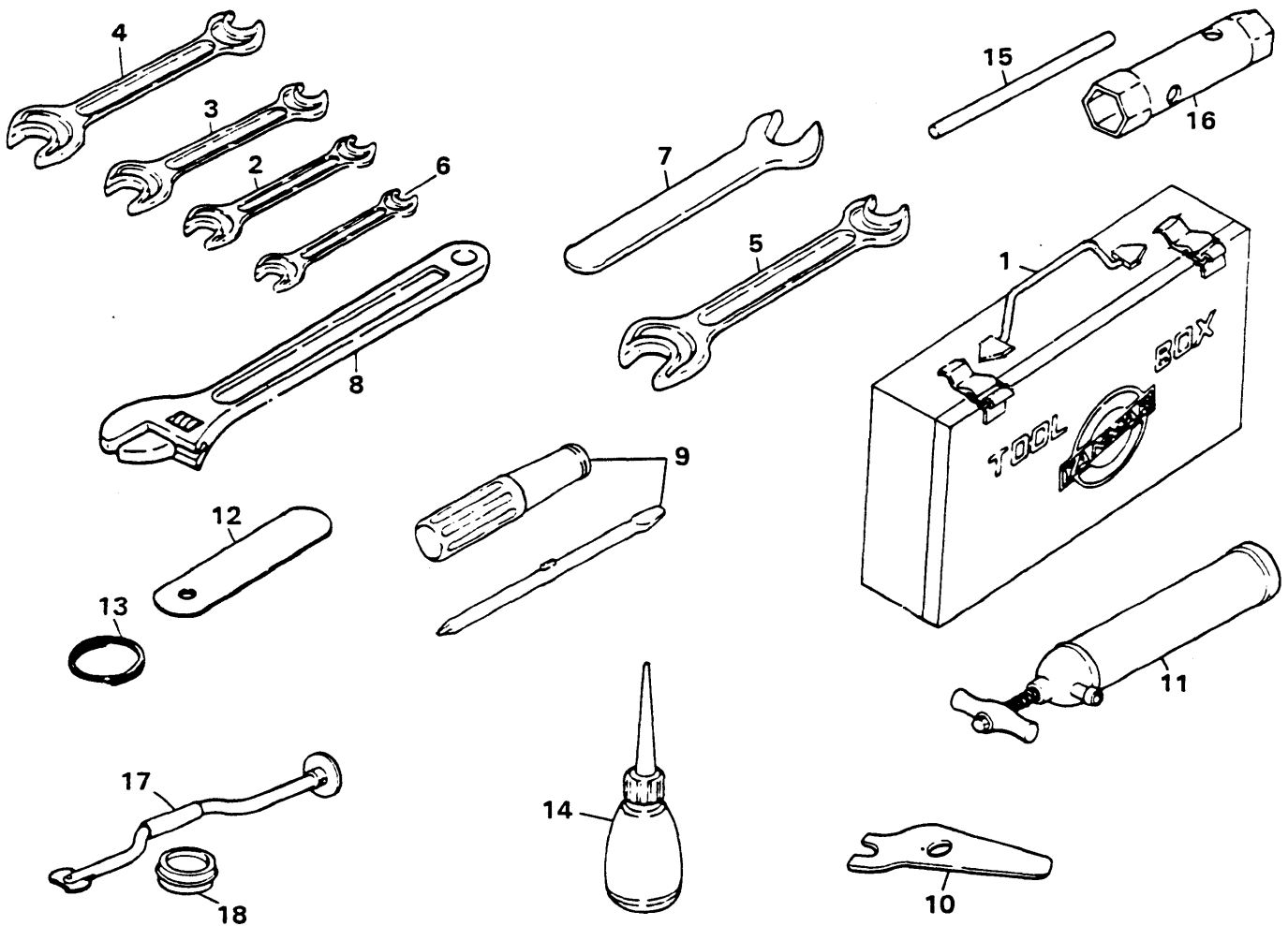
6-1 Standard Tools

Daily maintenance tools

YANMAR's TD-series models contain, as a standard accessory, a complete tool kit for daily maintenance work.

These tools are arranged so as to enable the owner or operator of the boat to do daily maintenance in the engine room by himself.

Advise your customers to take anticorrosive measures and store the tools carefully in the boat. Otherwise, they may become rusted and unusable when needed.



TD0010

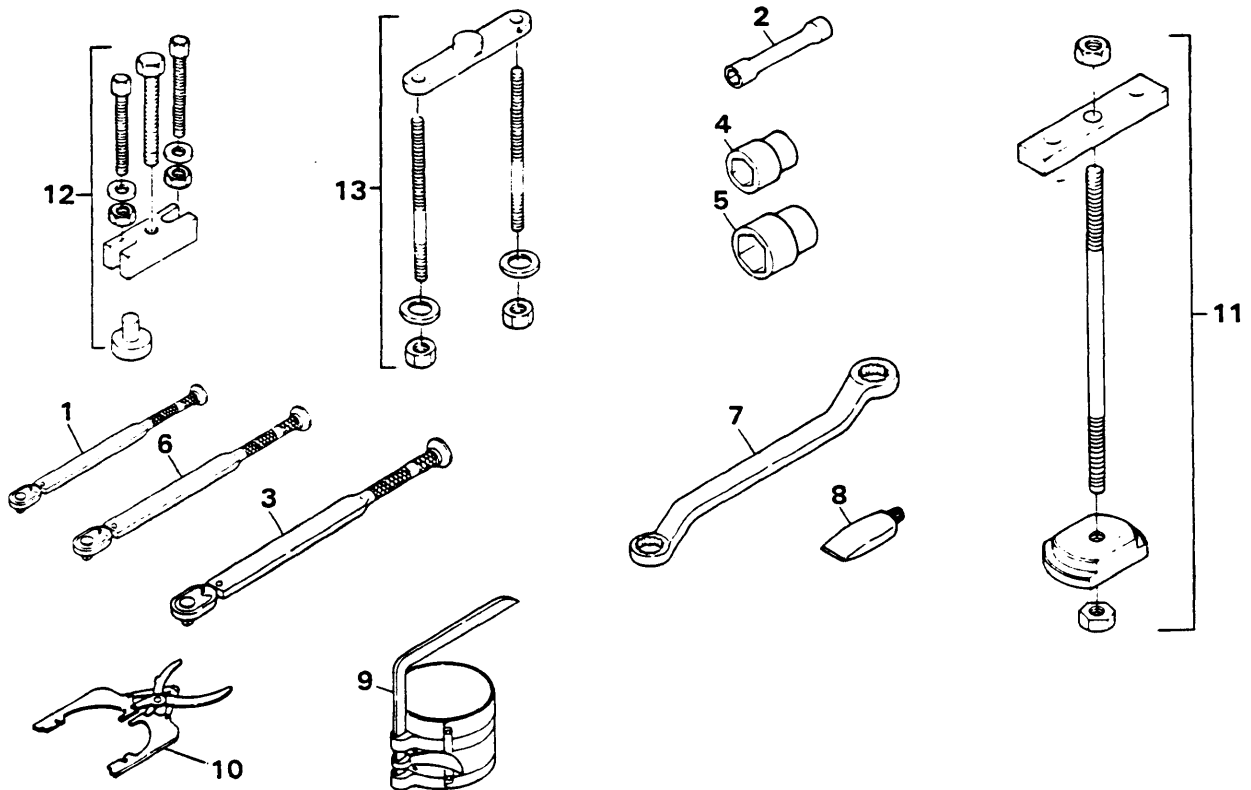
STANDARD TOOLS LIST

No.	Part Name	2TD	3TD	4TD	No.	Part Name	2TD	3TD	4TD
1	Tool box	1	1	1	10	Valve Pull-out device	1	1	1
2	Wrench 12 × 14	1	1	1	11	Manual pump (w/pipe)	1	1	1
3	Wrench 17 × 19	1	1	1	12	Thickness gauge 0.25	1	1	1
4	Wrench 22 × 24	1	1	1	13	Ring (gauge)	1	1	1
5	Wrench 26 × 32	1	1	1	14	Oiler	1	1	1
6	Wrench 10 × 13	1	1	1	15	Turning bar	1	1	1
7	Wrench 27	1	1	1	16	Box wrench 12 × 300	1	1	1
8	Monkey wrench 250	1	1	1	17	Valve lapping tool	1	1	1
9	Screwdriver (replaceable)	1	1	1	18	Lapping powder	1	1	1

6-2 Workshop Tools

For more important overhaul work, use the tools specified by YANMAR or the equivalent. YANMAR engines are designed so that even untrained local mechanics can usually check and

maintain them with tools for general use, without using any special disassembly tools. However, workshops which undertake major overhauling work for TD-series engines should be furnished with at least the following tools.



TD0011

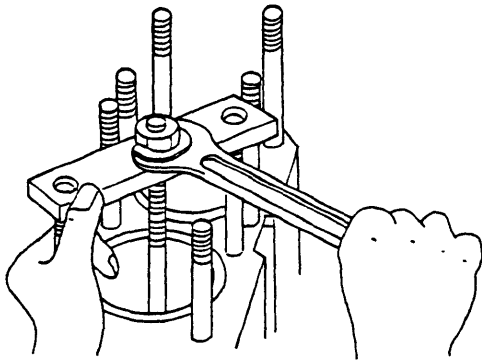
WORKSHOP TOOLS LIST

No.	Yanmar Part No.	Description	No.	Yanmar Part No.	Description
1	123340-92600	Torque wrench 230 QLK 0.7 ~ 2.3 kg-m for F.O. injection valve	7	28160-190220	Eye wrench 19 x 22 for F.O. injection
2	123340-92620	Socket B = 12 for F.O. inj. valve torque wrench	8	97775-500050	Paste type lubricant containing MOS ₂ (MOS ₂ = Molybdenum disulfide) for injection valve etc. 50 gr.
3	123340-92630	Torque wrench 2,800 QLK 6 ~ 28 Kg-m for bearing cap bolt.	9	95550-002476	Piston with ring insert tool 2476N
4	12330-92640	Socket B = 19 VS4190 for con-rod bolt	10	95550-002468	Piston ring removal & insertion tool 2467C
5	123340-92650	Socket B = 22 VS6620 for head nut, bearing cap bolt	11	723340-93590	Cylinder liner remover assy.
6	123340-92670	Torque wrench 1,800 QLK Max. 18 Kg-m for head, con-rod bolt	*12	723210-92530	Clutch spline metal puller assy.
			*13	723210-92540	Reverse gear box puller assy.

Note: * Reverse gear box puller and clutch spline metal puller are only used for 2 & 3TD series.

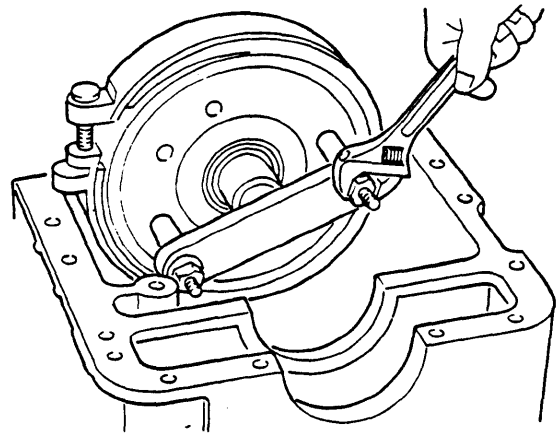
6-2.1 Puller application

(1) Cylinder liner remover

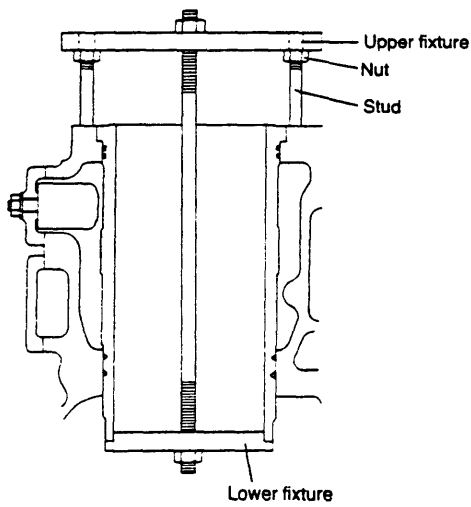


TD5075

(3) Reverse gear box puller

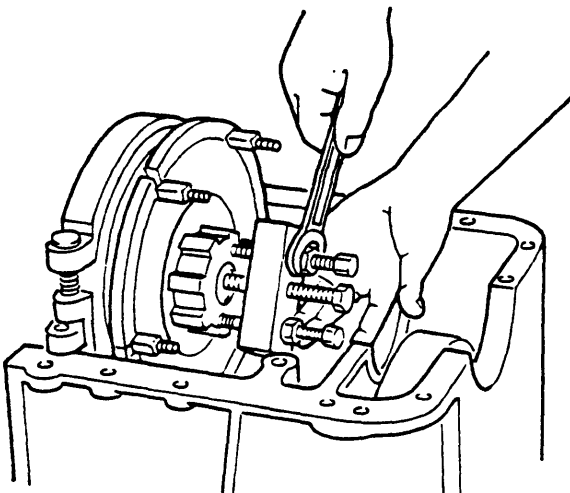


TD5034



TD5141

(2) Spline metal puller



TD5031



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