

HINSHI-H7004

**SERVICE MANUAL**

**6LY (M) -UTE - STE**

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# **YANMAR**

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# **SERVICE MANUAL**

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# **MARINE DIESEL ENGINE**

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**MODEL 6LY(M)-UTE·STE**

## Foreword

This service manual describes the construction and functions of the major parts of the 6LY(M)-UTE.STE engine and illustrates the disassembly and assembly procedures (standard servicing procedures) necessary for maintaining and servicing the engine.

Please read this manual carefully so that you are completely familiar with the construction and function of each part before you start actual servicing work.

The construction and servicing procedures described in this manual may be slightly modified for the improvement of quality and performance without prior notice. Please do not hesitate to contact us if you have any queries or suggestions.

## Prepare before you work !

For accurate and efficient service work, check and prepare the following:

1. Check the customer's service ledger
  - 1) When was the machine last serviced?
  - 2) How many months or hours has the machine been used since the previous servicing?
  - 3) What was the previous trouble, and what parts were replaced?
  - 4) Which parts should you replace this time?
2. Prepare the parts  
Check the stock of parts which are needed for servicing.
3. Prepare the recording forms  
Check sheets, parts measurement record sheet, and operation test record sheet.
4. Prepare the servicing measurement tools, containers, etc.

# MODEL 6LY(M)-UTE.STE

1. Specifications .....	1-1
1-1. Specifications .....	1-1
1-2. Identification of Important Parts .....	1-3
2. Performance Curves .....	2-1
3. Disassembly and Reassembly.....	3-1
3-1. Preparation Before Disassembly and Reassembly	
3-2. Tools, Measurement Instruments, and Other Equipment Required for Service.....	3-2
3-3. Assembly Procedure .....	3-6
4. Inspection and Service Procedure for Each Part .....	4-1
4-1. Inspection of Cylinder Head .....	4-1
4-2. Piston and Piston Pin .....	4-9
4-3. Connecting Rod .....	4-11
4-4. Cylinder Sleeve .....	4-14
4-5. Crankshaft and Main Metal .....	4-15
4-6. Cam Shaft and Tappet .....	4-17
4-7. Timing Gear .....	4-19
4-8. Cylinder Block .....	4-21
4-9. Lube Oil System .....	4-22
4-10. Cooling Water System .....	4-29
4-11. Fuel Oil System .....	4-36
4-12. Electrical Equipment .....	4-46
4-13. Marine Gears .....	4-53
4-14. Turbocharger .....	4-65
4-15. Intercooler .....	4-72
5. Troubleshooting .....	5-1
6. Standard Service Data .....	6-1
7. Main Bolt and Nut Tightening Torque .....	7-1

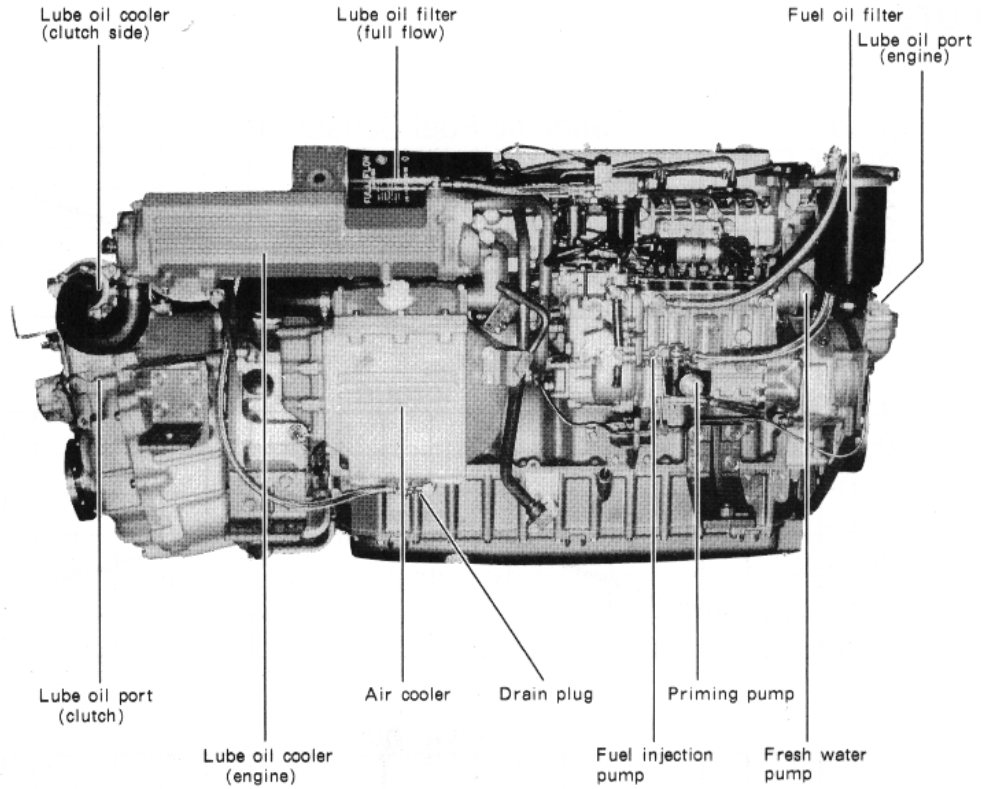
## 1-1. Specification

Model			6LY(M)-UTE	6LY(M)-STE	
Type			Vertical 4-cycle water cooled diesel engine		
Combustion system			Direct injection		
Aspiration			Turbocharger with intercooler		
Number of cylinder-bore×stroke		mm	6-100×110		
Displacement		ℓ	5.184		
Continuous rating	Output/crankshaft speed	KW/rpm (HP/rpm)	191.2/3100(260/3100)at flywheel	213.3/3100(290/3100)at flywheel	
	Brake mean effective pressure	MPa (kgf/cm <sup>2</sup> )	1.43(14.6)	1.59(16.2)	
	Piston speed	m/s	11.4		
Maximum rating	Output/crankshaft speed	KW/rpm (HP/rpm)	231.7/3300(315/3300)at flywheel	257.4/3300(350/3300)at flywheel	
	Brake mean effective pressure	MPa (kgf/cm <sup>2</sup> )	1.62(16.6)	1.81(18.4)	
	Piston speed	m/s	12.1		
Max speed at no load		rpm	3720±25		
Min speed at no load			700±25		
Starting system and capacity		kw	Electric starting; Starter motor : 12 VDC,4kw ; Alternator :12 VDC,800w		
Compression ratio			15.02 (Effective ratio : 13.83)		
Firing order			1-4-2-6-3-5-1		
Direction of rotation	Crankshaft		Counter clockwise viewed from stern side		
	Propeller shaft		Counter clockwise viewed from stern side for sailing ahead		
Oil pan	Total capacity	ℓ	20 (18 ℓ for replacement)		
	Effective capacity	ℓ	8		
Marine gear 1)	Model		KMH6A		
	Type		Constant mesh gear with hydraulic multi-disc clutch (wet type)		
	Reduction rate (ahead/astern)		1.58/1.58	1.92/1.92	2.26/2.26
	Propeller speed at maximum rating	rpm	2087	1718	1457
	Lubrication system		Forced lubrication using gear pump		
	Lube oil pan capacity	ℓ	Total : 4.0 ; Effective : 0.3		
	Cooling system		Seawater		
Dry weight	kg	102			

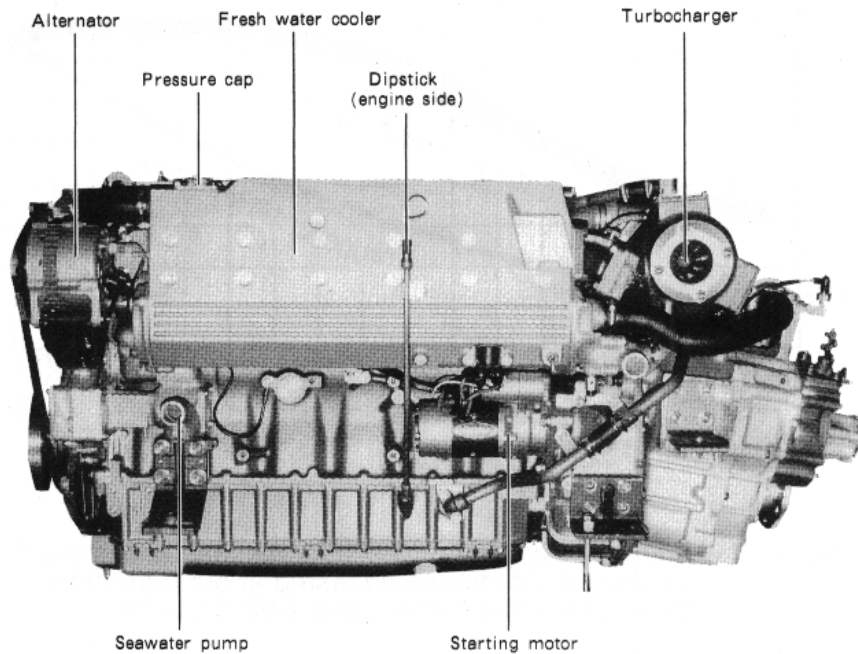
- 1) The 6LYM-UTE-STE, does not have a marine gear.
- 2) Rating condition: ISO3046/1

Model			6LY(M)-UTE	6LY(M)-STE
Fuel system	Injection pump		YPES-6AL ; Advance timer angle: 2.5° (cam angle)	YPES-6AL;Advance timer angle: 2.1° (cam angle)
	Injection timing	b.T.D.C	13°±1	
	Injection nozzle		YDLLA145° PL345KO	YDLLA145° PL355KO
	Injection pressure	MPa (kgf/cm <sup>2</sup> )	$23.52^{+0.98}_0 \left( 240^{+10}_0 \right)$	$25.48^{+0.98}_0 \left( 260^{+10}_0 \right)$
	Applicable fuel oil		Diesel oil	
	Fuel oil filter		Paper type (1piece)	
Engine lube system	Lubrication system		Forced lubrication with gear pump	
	Lube oil delivery	ℓ /h	≥5670 at 3200rpm	
	Lube oil pressure	MPa (kgf/cm <sup>2</sup> )	0.441±0.049(4.5±0.5) at 3000rpm	
	Lube oil filter		Paper type (full-flow,cartridge type)	
	Applicable lube oil		API Class CD (SAE J183 15w40)	
Cooling system	Cooling water pump	Seawater	Rubber impeller, gear driven	
		Fresh water	Centrifugal pump, V-belt driven	
	Cooling system		Constant high temperature fresh water cooling	
	Cooling water delivery	ℓ /h	Fresh water:17,000 at 3200rpm Seawater:8,300 at 3200rpm	
	Fresh water capacity of engine	ℓ	24	
	Fresh water capacity of subtank	ℓ	0.8	
Turb ocharger	Model		IHI (RHC7W)	
	Cooling system		Water cooling	
	Lubrication system		Forced lubrication,utilizing engine lube oil	
Intercooler	Type	m <sup>2</sup>	Corrugated fin	
	Cooling system		Seawater cooling	
Engine dimensions (L)×(W)×(H)		mm	1316×716×709 (with marine gear), 1013×716×709 (without marine gear)	
Engine dry weight		kg	620 (with marine gear), 518 (without marine gear)	

1-2. Identification of Important Parts  
Operating side

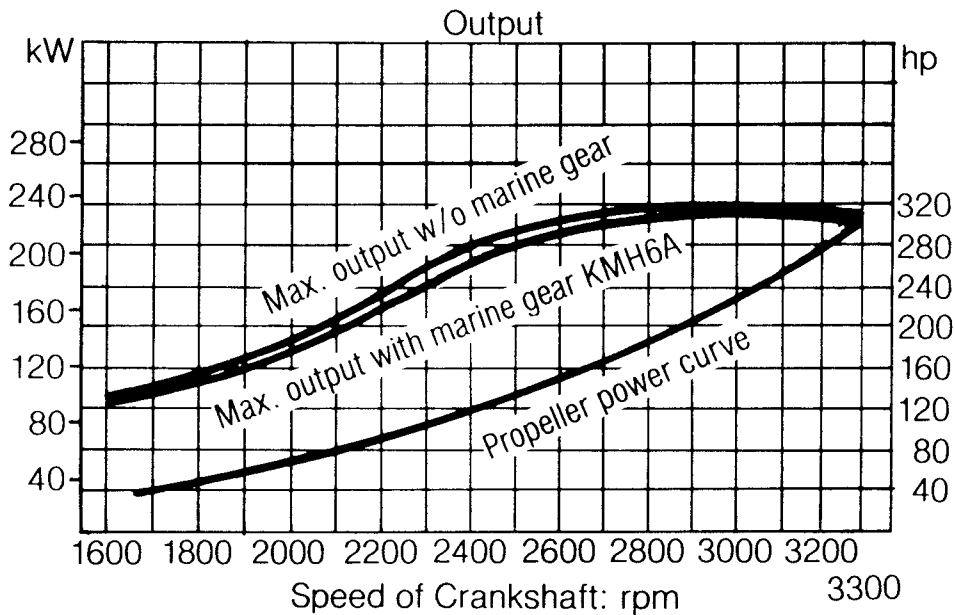
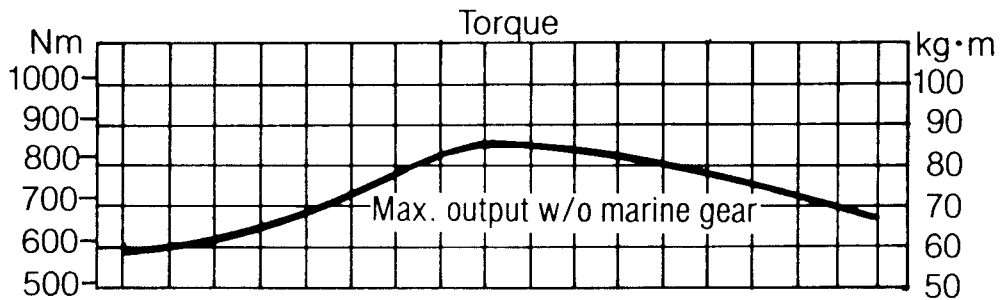
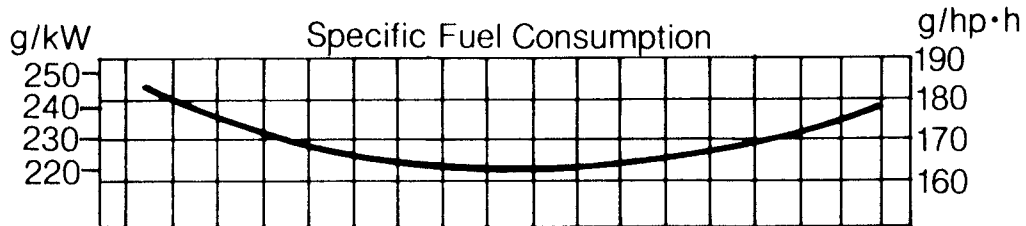


Non-operating side



## 2. Performance Curves

6LY(M)-UTE

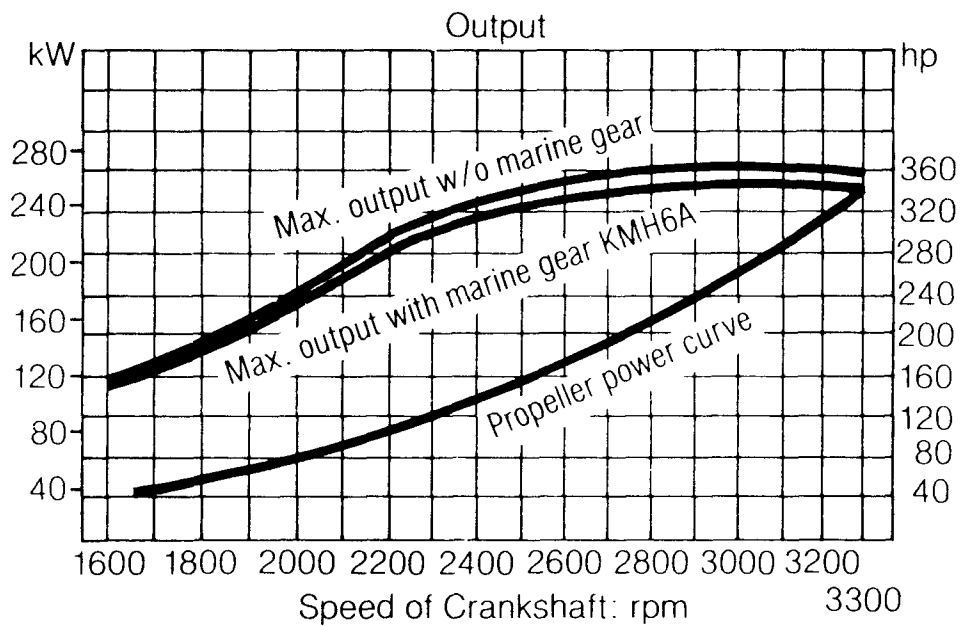
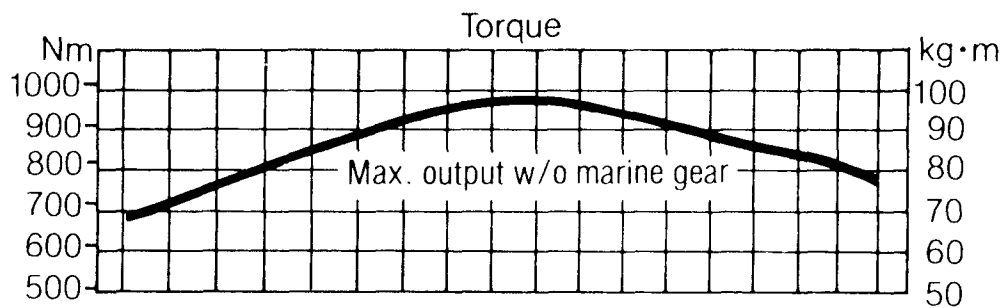
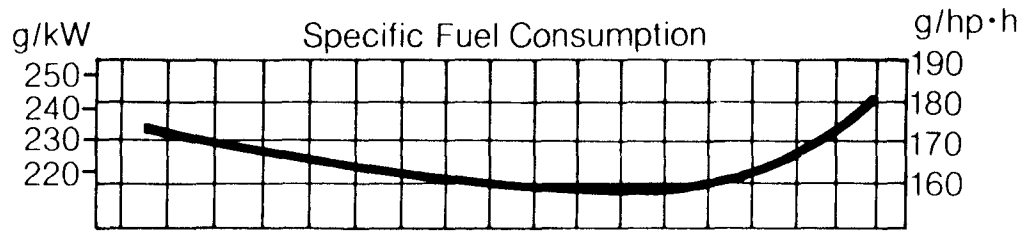


**Note :** 1. Above data are measured at crankshaft and show the averaged performance as tested at our laboratory.  
 2. Power loss of the marine gear KMH6A is 3%.



6LY(M)-STE

6LY(M)-STE


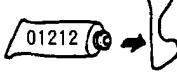





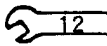


**Note :** 1. Above data are measured at crankshaft and show the averaged performance as tested at our laboratory.  
 2. Power loss of the marine gear KMH6A is 3%.

## 3. Disassembly and Reassembly

### 3-1. Preparation Before Disassembly and Reassembly

#### (1) Visual symbols for disassembly and reassembly

Visual symbol	Description	Visual symbol	Description
	Reference		* 1 Application of liquid gasket
	Caution		Safety
	Measurement		Cleaning
	Oil supply		* 2 Use of torque wrench

- \* 1 Applicable liquid gasket:  
THREE BOND TB1212, YANMAR code 977770-01212
- \* 2 Numeric characters show width across flats.

#### Disassembly

- Prepare tools, instruments, and record sheets.
- Prepare a temporary stocking area and container for removed parts.
- Drain cooling water and lube oil from the engine.
- Carefully store the parts removed from the engine.
- The materials and dimensions of bolts and nuts differ from each other. To prevent mixing them up, insert them loosely in their positions after disassembly.
- If the engine malfunctions, determine the parts to be disassembled before.

#### Reassembly

- Completely clean the parts, and then check their conditions before assembly.
- Apply new engine oil or specified lube oil to sliding parts or moving parts before assembly.
- Replace all gasket and copper packings with new ones.
- To prevent water or oil leakage, be sure to use the specified gaskets.
- For the parts having alignment marks. Fit the parts by aligning the alignment marks. For the parts to be selectively fit, carefully determine the fitting positions.
- Be sure to use specified bolts, nuts, and washers. Tighten the main bolts and nuts by applying the respective torque.  
In particular, tighten aluminum alloy parts carefully.
- For the main bolts and the torque-specified bolt, apply engine oil to the threaded parts and bearing surfaces, be sure to tighten the bolts with the specified torque using a torque wrench.