6LPA
series

OPERATION MANUAL

6LPA-STP2
6LPA-STZP2

P/N: 0A6LP-G00101

YAMAHA®

MARINE ENGINES

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SAFETY

Yanmar considers safety of great importance and recommends that anyone that comes into close contact with its products, such as those who install, operate, maintain or service Yanmar products exercise care, common sense and comply with the safety information in this manual and on the engine's safety decals. Keep the decals from becoming dirty or torn and replace them if they are lost or damaged. Also, if you need to replace a part that has a decal attached to it, make sure you order the new part and decal at the same time.



This safety alert symbol appears with most safety statements. It means attention, become alert, your safety is involved! Please read and abide by the message that follows the safety alert symbol.

⚠ DANGER

Indicates a hazardous situation which, if not avoided, *will* result in death or serious injury.

⚠ WARNING

Indicates a hazardous situation which, if not avoided, *could* result in death or serious injury.

⚠ CAUTION

Indicates a hazardous situation which, if not avoided, *could* result in minor or moderate injury.

NOTICE

Indicates a situation which can cause damage to the engine, personal property and / or the environment or cause the equipment to operate improperly.

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WIRING DIAGRAMS

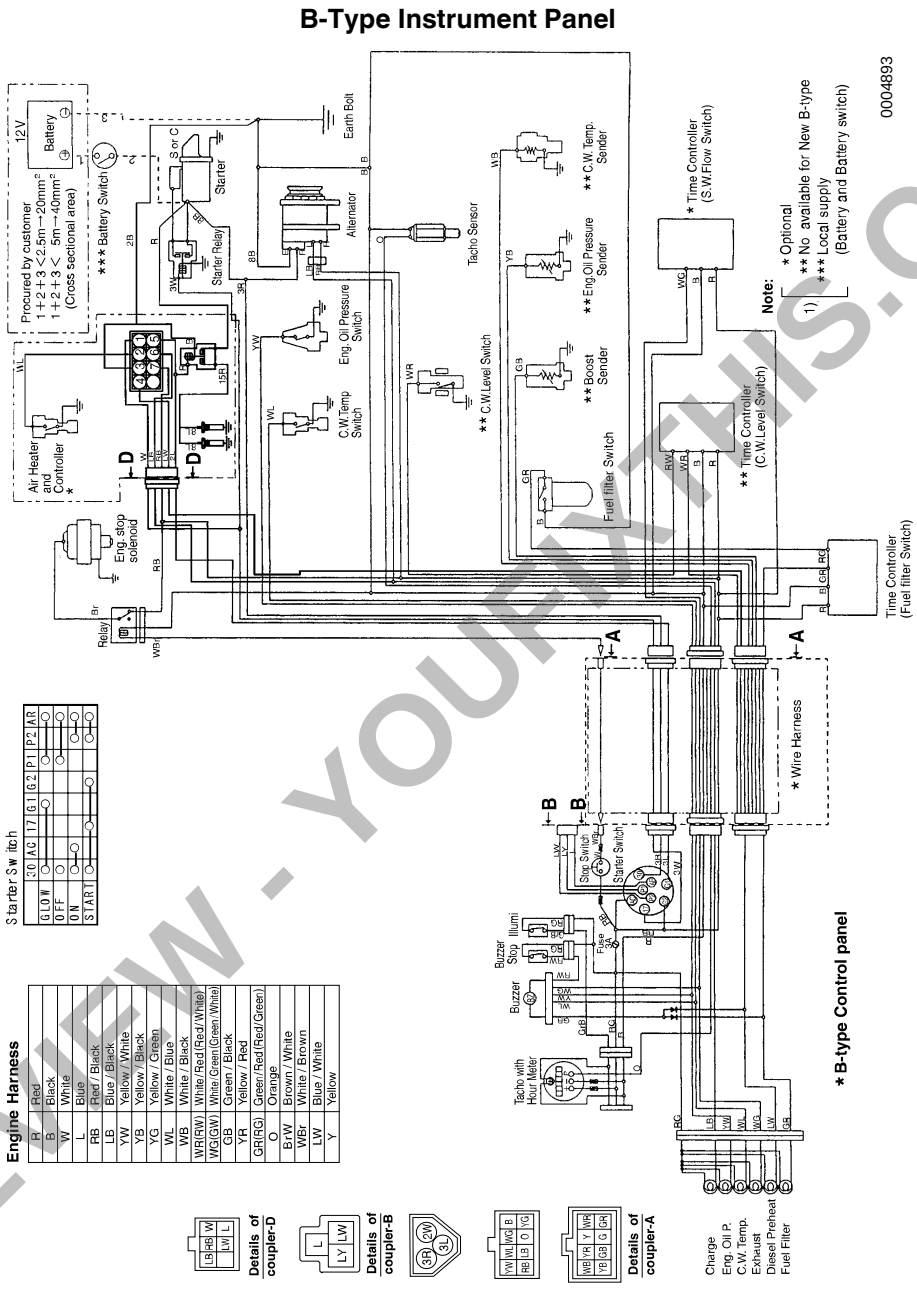


Figure 3

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COMPONENT IDENTIFICATION

Service Side (Left Side as Viewed from Propeller)

*Note: 6LPA-STZP2 with stern drive shown. Components marked with an * are for 6LPA-STZP2 only.*

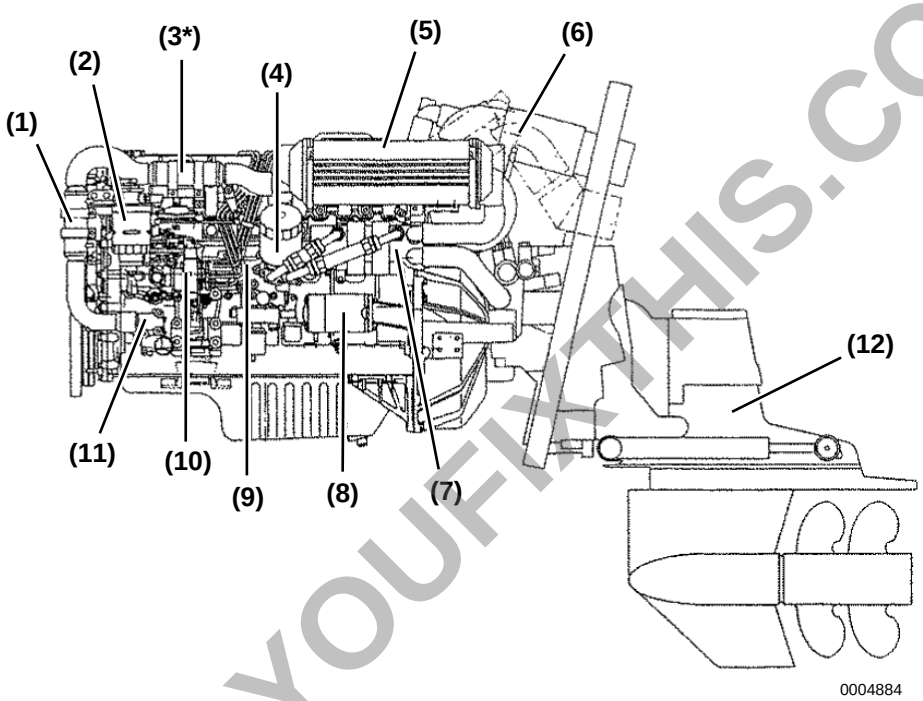


Figure 1

1 – Fuel Cooler
2 – Fuel Filter
3 – Power Steering Oil Cooler*
4 – Engine Oil Filter
5 – Intercooler
6 – Mixing Elbow
7 – Engine Oil Cooler
8 – Starter
9 – Engine Oil Cooler
10 – Fuel Injection Pump
11 – Seawater Pump
12 – Stern Drive

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Tightening Fasteners

Use the correct amount of torque when you tighten fasteners. Applying excessive torque may damage the fastener or component and not enough torque may cause a leak or component failure.

NOTICE: ***The tightening torque in the Standard Torque Chart should be applied only to the bolts with a "7" head (JIS strength classification: 7T). Apply 60% torque to bolts that are not listed. Apply 80% torque when tightened to aluminum alloy.***

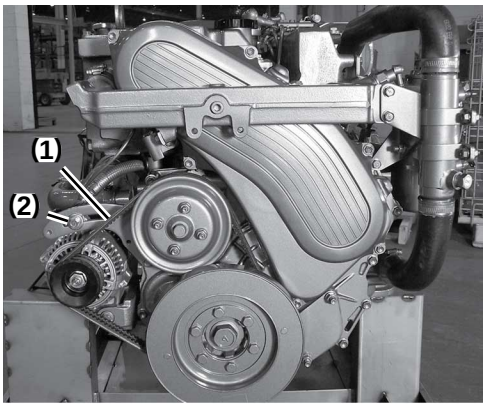


Bolt diameter x pitch (mm)		M6 x 1.0	M8 x 1.25	M10 x 1.5	M12 x 1.75	M14 x 1.5	M16 x 1.5
Tightening Torque	N·m	11.0 ± 1.0	26.0 ± 3.0	50.0 ± 5.0	90.0 ± 10.0	140.0 ± 10.0	230.0 ± 10.0
	kgf-m	1.1 ± 0.1	2.7 ± 0.3	5.1 ± 0.5	9.2 ± 1.0	14.3 ± 1.0	23.5 ± 1.0
	lb-ft	–	19.0 ± 2.1	37 ± 3.6	66.0 ± 7.2	103 ± 7.2	170 ± 7.2
	lb-in.	96 ± 9.0	–	–	–	–	–

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Checking and Adjusting the Alternator V-Belt Tension



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Figure 15

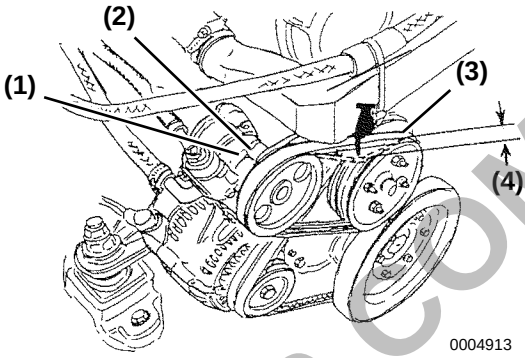
NOTICE: ***NEVER get any oil on the belt(s). Oil on the belt causes slipping and stretching. Replace the belt if it is damaged. NEVER over-tighten the belt(s). Engine damage will result.***

1. Check the belt by pushing on the middle of the belt **(Figure 15, (1))** with your finger.
   With proper tension, the belt should deflect 8 - 10 mm (approximately 3/8 in.).
2. Loosen the alternator bolt **(Figure 15, (2))** and move the alternator to adjust the V-belt tension.
3. Replace the V-belt if required.

Alternator V-Belt Part Number
119775–77260

Checking and Adjusting the Power Steering Oil Pump Belt (6LPA-STZP2 Models)

NOTICE: ***NEVER get any oil on the belt(s). Oil on the belt causes slipping and stretching. Replace the belt if it is damaged. NEVER over-tighten the belt(s). Engine damage will result.***



0004913

Figure 16

1. Check the belt by pushing on the middle of the belt **(Figure 16, (3))** with your finger.
   With proper tension, the belt should deflect 8 - 10 mm (approximately 3/8 in.) **(Figure 16, (4))**.
2. Loosen the power steering pump bolt **(Figure 16, (2))** and move the oil pump **(Figure 16, (1))** to adjust the belt tension.
3. Replace the belt if required.

Power Steering Oil Pump Belt Part Number (6LPA-STZP2 only)
119787–26540

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SPECIFICATIONS

PRINCIPAL ENGINE SPECIFICATIONS

Specification		6LPA-STP2	6LPA-STZP2
Type		Vertical water-cooled 4–cycle diesel engine	
Number of cylinders		6	
Bore x stroke		94 mm x 100 mm 3.7 in. x 3.94 in.	
Displacement		4.164 L	
Continuous power at crankshaft		211 kW (286 hp) / 3682 rpm	
Maximum output rating*		232 kW (315 hp) / 3800 rpm*	
High idle		4280 ± 25 rpm	
Low idle		750 + 25 / 0	
Combustion system		Direct injection	
Starting system		Electric start (12 V - 2.5 kW)	
Charging system		Alternator with built-in regulator 12V DC - 80A	
Direction of rotation		Counterclockwise (viewed from flywheel)	
Cooling system		Constant high temperature fresh water cooling (2 systems: seawater and fresh water cooling)	
• Cooling water capacity		13.5 L (14.3 qt) engine 1.6 L (1.7 qt) coolant recovery tank	
Lubrication system		Forced lubrication system with trochoid gear pump	
• Engine (lube) oil capacity	Total	10.5 L (11.0 qt)	
	Oil Pan	8.4 L (8.9 qt)	
Turbocharger	Model	RHE62W (IHI made)	
	Type	Water-cooled turbine housing	
Dimensions (less gear)	L x W x H	1065 x 671 x 729 mm 41.9 x 26.4 x 28.7 in.	1145 x 752 x 799 mm 45.1 x 29.6 x 31.5 in.
Weight (less gear)		408 kg (899 lb)	428 kg (944 lb)
Recommended battery capacity		12V x 120 Ah	
Recommended remote control handle		Single lever-type only	
Engine installation		Flexible engine mount	

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⚠ WARNING

Welding Hazard

Make welding repairs safely.

- ALWAYS turn off the battery switch (if equipped) or disconnect the negative battery cable and the leads to the alternator when welding on the equipment.
- Remove the multi-pin connectors to the engine electronics or engine control unit. Connect the weld clamp to the component to be welded and as close as possible to the welding point.
- NEVER connect the weld clamp to the engine or in a manner which would allow current to pass through a mounting bracket.
- When welding is completed, reconnect the leads to the alternator and engine electronics or engine control unit prior to reconnecting the batteries.

Exhaust Hazard



ALWAYS ensure that all connections are tightened to specifications after repair is made to the exhaust system. All internal combustion engines create carbon monoxide gas during operation and special precautions are required to avoid carbon monoxide poisoning.

Shock Hazard



ALWAYS turn off the battery switch (if equipped) or disconnect the negative battery cable before servicing the equipment.

ALWAYS keep the electrical connectors and terminals clean. Check the electrical harnesses for cracks, abrasions, and damaged or corroded connectors.

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ENGINE OPERATION

⚠ WARNING

Fire and Explosion Hazard



NEVER jump-start the engine. Sparks caused by shorting the battery to the starter terminals may cause a fire or explosion. ONLY use the key switch to start the engine.

Sudden Movement Hazard

Be sure the boat is in open water away from other boats, docks or other obstructions before increasing rpm. Avoid unexpected equipment movement. Shift the marine gear into the NEUTRAL position any time the engine is at idle.

To prevent accidental equipment movement, NEVER start the engine in gear.

Sever Hazard



Keep children and pets away while the engine is operating.

Exhaust Hazard



NEVER block windows, vents or other means of ventilation if the engine is operating in an enclosed area. All internal combustion engines create carbon monoxide gas during operation and special precautions are required to avoid carbon monoxide poisoning.

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CONTROL EQUIPMENT

The control equipment at the helm makes remote control operation possible. It consists of the instrument panel, which is connected to the engine by a wire harness, and the remote control (throttle) handle, which is connected by control cables to the engine control lever.

Instrument Panel (Optional)

Equipment and Functions

The instrument panel has the following gauges and alarm devices.

Gauge or Switch		New B-Type Panel See Figure 4	New C-Type Panel See Figure 5	New D-Type Panel See Figure 6
Switches	Key (Starter) Switch	X	X	X
	Engine Stop Button	X	X	X
	Alarm (Buzzer)	X	X	X
	Alarm (Buzzer) Stop Switch	X	X	X
	Backlight Switch for Gauges	X	X	X
Warning Indicators	Battery Low Charge	X	X	X
	Fresh Water (Coolant) High Temperature	X	X	X
	Engine (Lube) Oil Low Pressure	X	X	X
	Fresh Water (Coolant) Level	—	X	X
	Exhaust (Cooling Seawater Flow)	X	X	X
	Fuel Filter (Water Separator)	X	X	X
	Gear Oil (6LPA-STZP2 Only)	—	X	X
Gauges	Tachometer with Hourmeter	X	X	X
	Engine (Lube) Oil Pressure Gauge	—	X	X
	Fresh Water (Coolant) Temperature Gauge	—	X	X
	Turbocharger Boost Pressure Gauge	—	—	X
Clock	Quartz Clock	X (Option)	X (Option)	X
Indicator	Preheat Indicator	X (Option)	X (Option)	X
X = Available	— = Not Available			

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Fuel System

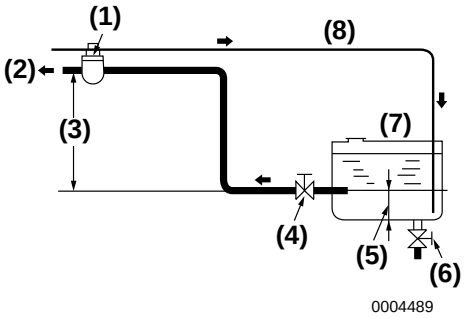


Figure 3

1 – **Fuel Filter**
2 – **To Fuel Injection Pump**
3 – **Less than 500 mm (20 in.)**
4 – **Fuel Cock**
5 – **20 - 30 mm (0.75 - 1.125 in.) Approximately**
6 – **Drain Cock**
7 – **Fuel Tank**
8 – **Fuel Return Line**

Install a fuel line from the fuel tank to the fuel pump. See **Figure 3**.

Filling the Fuel Tank

Before filling fuel tank for the first time:

Rinse fuel tank with kerosene or diesel fuel. Dispose of waste properly.

To fill the fuel tank:

1. Clean the area around the fuel cap.
2. Remove the fuel cap from the fuel tank.
3. Fill the tank with clean fuel free of oil and dirt. **WARNING!** ***Hold the hose nozzle firmly against the filler port while filling. This prevents static electricity buildup which could cause sparks and ignite fuel vapors.***
4. Stop fueling when the gauge shows the fuel tank is full. **NOTICE:** ***NEVER overfill the fuel tank.***
5. Replace the fuel cap and hand-tighten. Over-tightening the fuel cap will damage it.

Bleeding the Fuel System

Bleeding must be done if any fuel system maintenance has been performed (replacement of fuel filter, etc.) or if the engine does not start after several attempts.

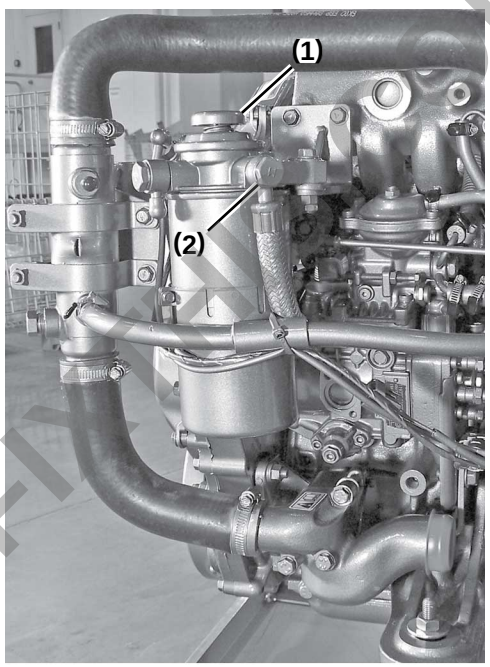


Figure 4

1. Check the fuel level in the fuel tank. Refill if necessary.
2. Open the fuel cock of the fuel tank. **WARNING!** ***ALWAYS wear safety glasses when bleeding the fuel system.***
3. Loosen the air bleed screw **(Figure 4, (2))** 2 - 3 turns.
4. Push up and down on the priming pump **(Figure 4, (1))** to release air out of the air bleed screw.
5. Continue pumping until a solid stream of fuel with no air bubbles begins to flow.
6. Tighten the air bleed screw.

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