YAMAHA

Marine

Water Vehicles

WaveRunner
XL760
XL1200

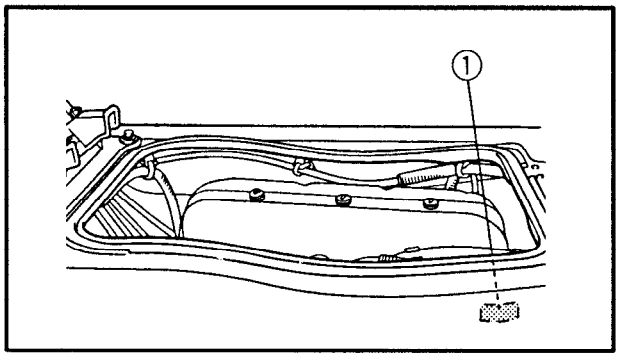
SERVICE MANUAL

LIT-18616-01-88

460043

INDEX

CHAPTER 1
GENERAL INFORMATION

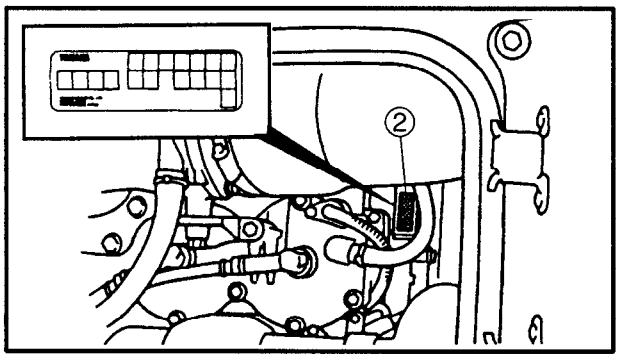


IDENTIFICATION NUMBERS

PRIMARY I.D. NUMBER

The primary I.D. number is stamped on a label ① attached to the inside of the engine compartment.

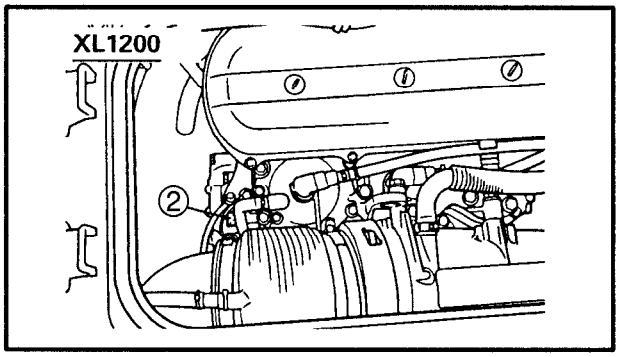
Starting primary I.D. number:
GU2: 800101 ~, 600101 ~ (EUR)
GU3: 800101 ~, 600101 ~ (EUR)

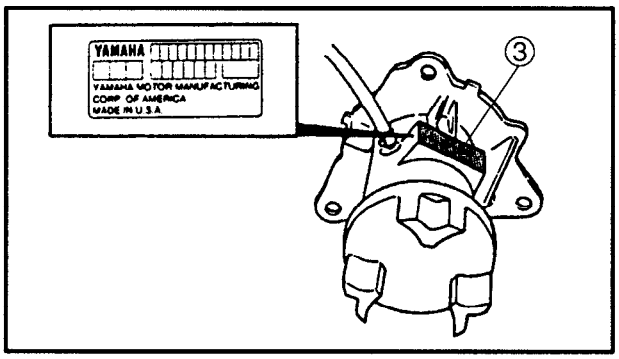


ENGINE SERIAL NUMBER

The engine serial number is stamped on a label ② attached to the crankcase.

Starting serial number:
66D: 000101 ~
66F: 000101 ~

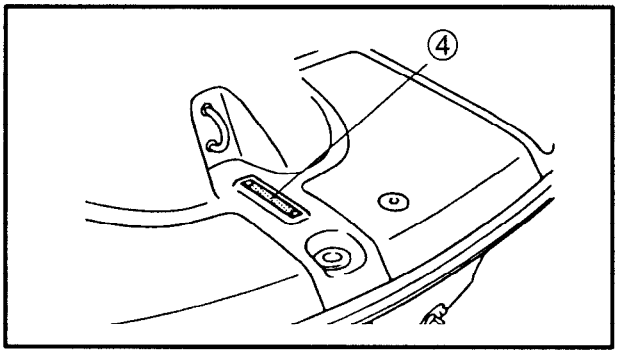




PUMP SERIAL NUMBER

The jet pump unit serial number is stamped on a label ③ attached on the intermediate housing.

Starting serial number:
500101 ~

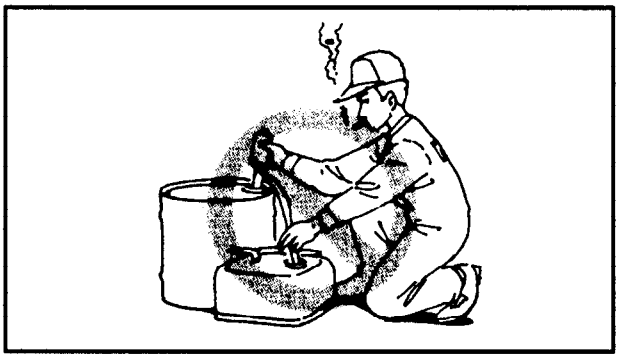


HULL IDENTIFICATION NUMBER (H.I.N.)

The H.I.N. is stamped on a plate ④ attached to the rear end of the footrest floor.

SAFETY WHILE WORKING

The procedures given in this manual are those recommended by Yamaha to be followed by Yamaha dealers and their mechanics.

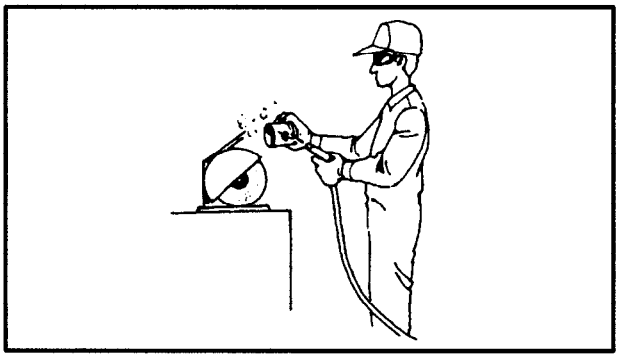


FIRE PREVENTION

Gasoline (petrol) is highly flammable.
Petroleum vapor is explosive if ignited. Do not smoke while handling gasoline (petrol), and keep it away from heat, sparks, and open flames.

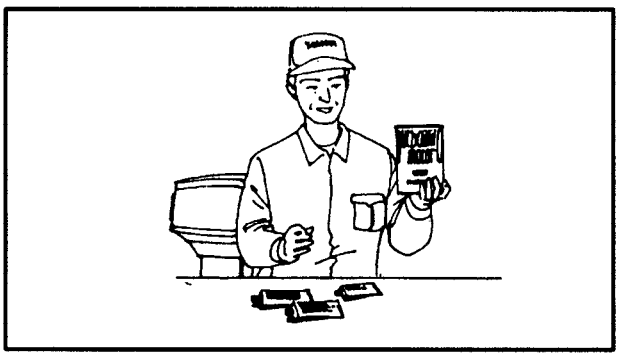
VENTILATION

Petroleum vapor is heavier than air and if inhaled in large quantities will not support life. Engine exhaust gases are harmful to breathe. When test-running an engine indoors, maintain good ventilation.



SELF-PROTECTION

Protect your eyes with suitable safety spectacles or safety goggles when using compressed air, when grinding or when doing any operation which may cause particles to fly off.
Protect hands and feet by wearing safety gloves or protective shoes if appropriate to the work you are doing.

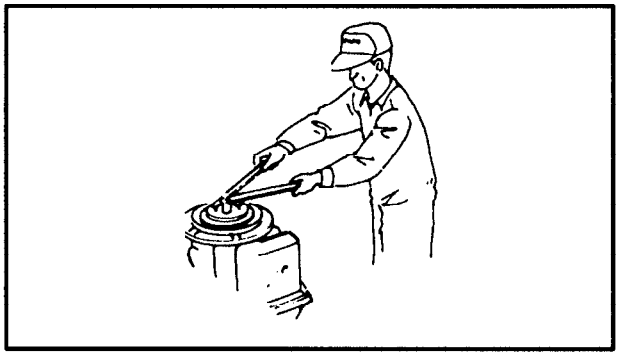


OILS, GREASES AND SEALING FLUIDS

Use only genuine Yamaha oils, greases and sealing fluids or those recommended by Yamaha.

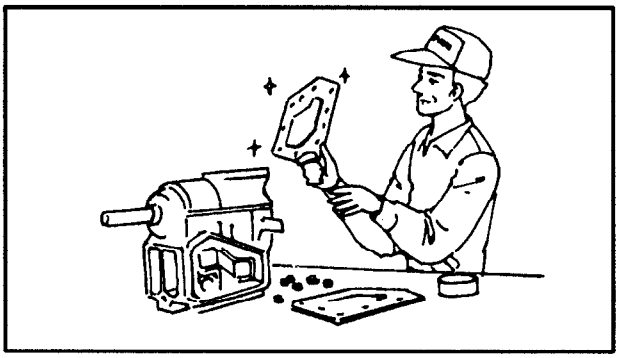
Under normal conditions of use, there should be no hazards from the use of the lubricants mentioned in this manual, but safety is all-important, and by adopting good safety practises, any risk is minimized. A summary of the most important precautions is as follows

1. While working, maintain good standards of personal and industrial hygiene.
2. Clothing which has become contaminated with lubricants should be changed as soon as practicable, and laundered before further use.
3. Avoid skin contact with lubricants; do not, for example, place a soiled wiping-rag in one's pocket.
4. Hands, and any other part of the body which have been in contact with lubricants or lubricant-contaminated clothing, should be thoroughly washed with hot water and soap as soon as practicable.
5. To protect the skin, the application of a suitable barrier cream to the hands before working is recommended.
6. A supply of clean lint-free cloths should be available for wiping purposes.

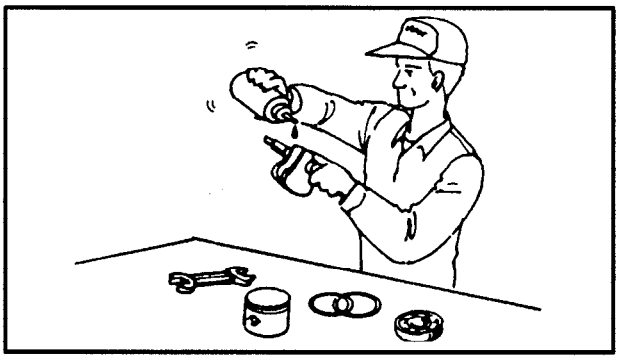


GOOD WORKING PRACTICES

1. The right tools
   Use the special tools that are designed to protect parts from damage. Use the right tool in the right manner – don't improvise.
2. Tightening torque
   Follow the torque tightening instructions. When tightening bolts, nuts and screws, tighten the larger sizes first, and tighten inner-positioned fixings before outer-positioned ones.

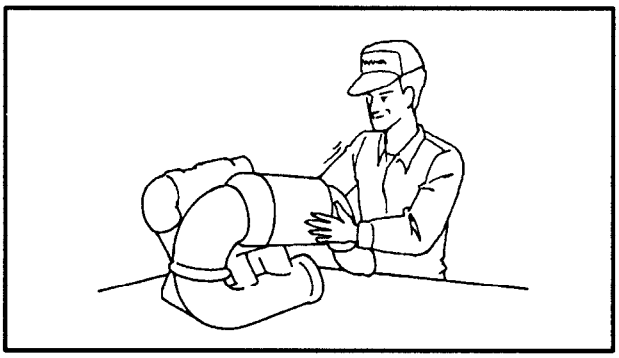


3. Non-reusable items
   Always use new gaskets, packings, O-rings, oil seals, split-pins and circlips etc. on reassembly.



DISASSEMBLY AND ASSEMBLY

1. Clean parts with compressed-air on disassembling them.
2. Oil the contact surfaces of moving parts on assembly.



3. After assembly, check that moving parts operate normally.

4. Install bearings with the manufacturer's markings on the side exposed to view, and liberally oil the bearings.

CAUTION:

Do not use compressed air to spin the bearings dry. This causes damage to the bearing surfaces.

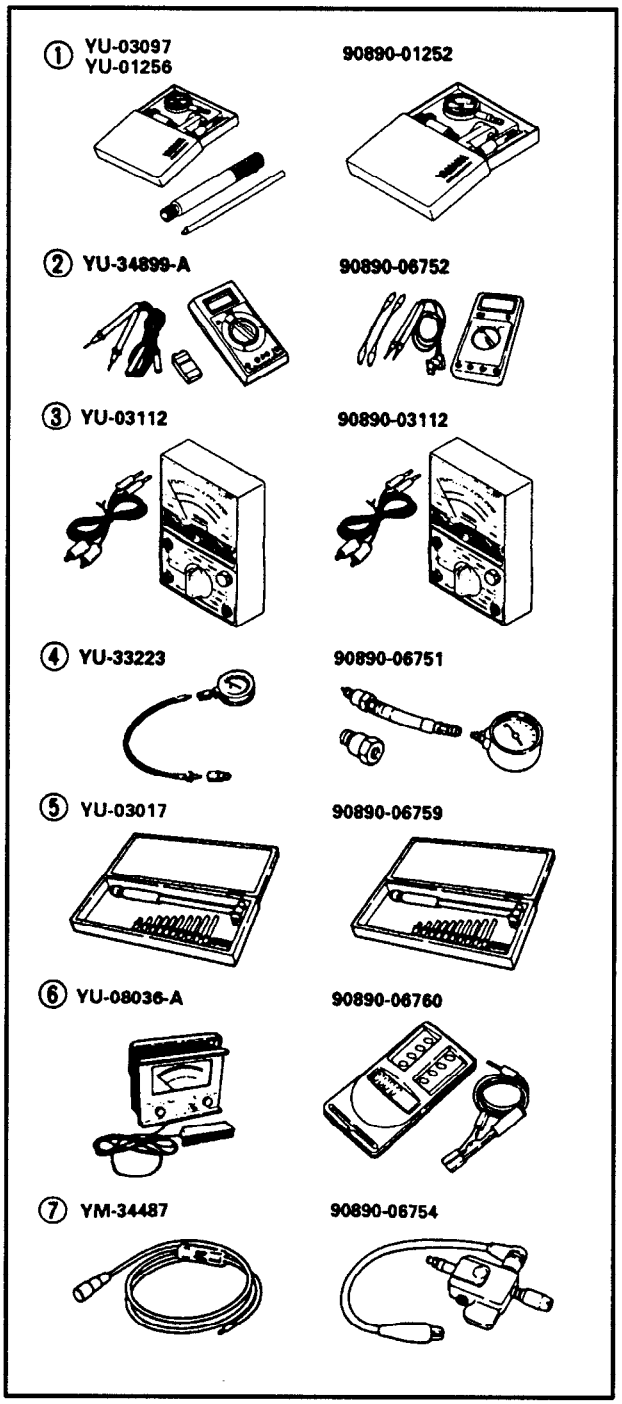
5. When installing oil seals, apply a light coating of water-resistant grease to the outside diameter.

SPECIAL TOOLS

Use of the correct special tools recommended by Yamaha will aid the work and enable accurate assembly and tune-up. Improvisations and use of improper tools can cause damage to the equipment.

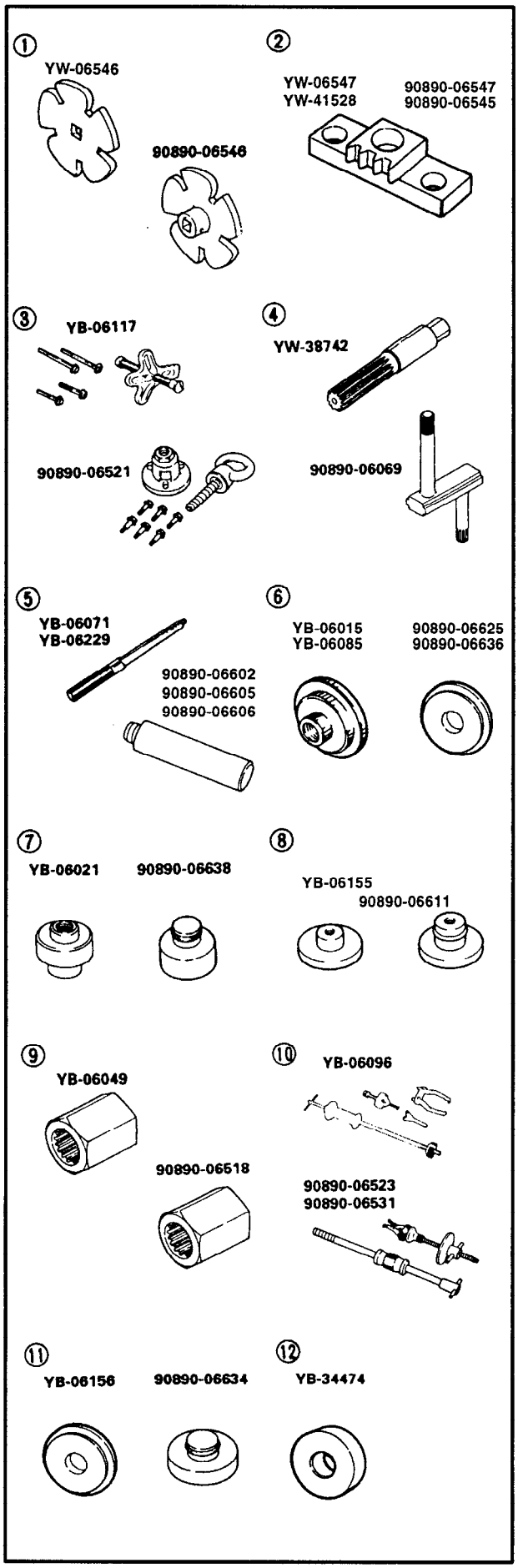
NOTE:

- For U.S.A. and Canada, use part numbers starting with "YB-", "YU-" or "YW-".
- For other countries, use part numbers starting with "90890-".



MEASURING

1. Dial gauge and stand
   P/N. YU-03097, YU-01256
   90890-01252
2. Digital multi meter
   P/N. YU-34899-A
   90890-06752
3. Pocket tester
   P/N. YU-03112
   90890-03112
4. Compression gauge
   P/N. YU-33223
   90890-06751
5. Cylinder gauge set
   P/N. YU-03017
   90890-06759
6. Engine tachometer
   P/N. YU-08036-A
   90890-06760
7. Spark gap tester
   P/N. YM-34487
   90890-06754



REMOVAL AND INSTALLATION

1. Coupler wrench
   P/N. YW-06546
   90890-06546
2. Flywheel holder
   P/N. YW-06547 (XL760)
   YW-41528 (XL1200)
   90890-06547 (XL760)
   90890-06545 (XL1200)
3. Flywheel puller
   P/N. YB-06117
   90890-06521
4. Shaft holder (Intermediate shaft)
   P/N. YW-38742
   90890-06069
5. Driver rod
   (Intermediate shaft and jet pump)
   P/N. YB-06071, YB-06229
   90890-06602
   90890-06605
   90890-06606
6. Bearing outer race attachment
   (Intermediate shaft)
   P/N. YB-06015, YB-06085
   90890-06636, 90890-06625
7. Bearing attachment
   (Jet pump bushing and oil seal)
   P/N. YB-06021
   90890-06638
8. Needle bearing attachment
   (Jet pump oil seal)
   P/N. YB-06155
   90890-06611
9. Drive shaft holder (Impeller)
   P/N. YB-06049
   90890-06518
10. Slide hammer set (Jet pump bearing)
    P/N. YB-06096
    90890-06523
    90890-06531
11. Ball bearing attachment
    (Jet pump oil seal)
    P/N. YB-06156
    90890-06634
12. Bearing inner race attachment
    (Jet pump bearing)
    P/N. YB-34474

CHAPTER 2
SPECIFICATIONS

GENERAL SPECIFICATIONS

Item	Unit	Model	
		XL760	XL1200
MODEL CODE:			
Hull		GU2	GU3
Engine		66D	66F
DIMENSIONS:			
Length	mm (in)	3,150 (124.0)	3,150 (124.0)
Width	mm (in)	1,250 (49.2)	1,250 (49.2)
Height	mm (in)	1,100 (43.3)	1,100 (43.3)
Dry weight	kg (lb)	250 (551)	277 (611)
Vehicle capacity		3	3
PERFORMANCE:			
Maximum output	kW (HP)/r/min	66.2 (90)/6,350	99.3 (135)/6,750
Maximum fuel consumption	l/h (US gal/h, Imp (gal/h)	38 (10.04, 8.36)	53 (14.0, 11.7)
Crusing range	hr.	1.5	0.9
ENGINE:			
Engine type		2-stroke	2-stroke
Number of cylinders		2	3
Displacement	cm^3 (cu. in)	754 (46.0)	1,131 (69.0)
Bore × stroke	mm (in)	84.0×68.0 (3.31×2.68)	84.0×68.0 (3.31×2.68)
Compression ratio		F: 7.2, R: 6.8 : 1	6 : 1
Intake system		Reed valve	Reed valve
Carburetor type		Mikuni BN44	Mikuni BN44
Number of carburetors		2	3
Enrichment control		Choke valve	Choke valve
Scavenging system		Loop charge	Loop charge
Lubrication system		Oil injection	Oil injection
Cooling system		Water	Water
Starting system		Electric	Electric
Ignition system		Digital CDI	Digital CDI
Ignition timing	Degree	15 BTDC ~ 22 BTDC	15 BTDC ~ 20 BTDC
Spark plug (NGK)		BR8HS	BR8HS
Battery capacity	V/kC (A·h)	12 – 68.4 (19)	12 – 68.4 (19)
Lighting coil	A/rpm	2 ~ 4/5500	6 ~ 8/6500
Propulsion system		Jet pump	Jet pump
DRIVE UNIT:			
Jet pump type		Axial flow single stage	Axial flow single stage
Impeller rotation		Counter clockwise	Counter clockwise
Transmission		Direct drive from engine	Direct drive from engine
Nozzle angle (horizontal)	Degree	24 ± 1	24 ± 1
Trim angle	Degree	5	5
Trim system		N/A	N/A
Reverse system		Reverse gate	Reverse gate

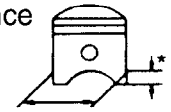
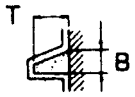
GENERAL SPECIFICATIONS

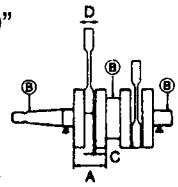
Item	Unit	Model	
		XL760	XL1200
FUEL AND OIL:			
Fuel		Regular unleaded gasoline	Regular unleaded gasoline
Fuel rating	PON*1/RON*2	86/90	86/90
Oil		2-stroke outboard motor oil	2-stroke outboard motor oil
Fuel and oil mixing ratio (wide open throttle)		50 : 1	45 : 1
Fuel tank capacity	l (US gal, Imp gal)	50 (13.2, 11.0)	50 (13.2, 11.0)
Reserve capacity	l (US gal, Imp gal)	12 (3.17, 2.64)	12 (3.17, 2.64)
Oil tank capacity	l (US gal, Imp gal)	3.8 (1.00, 0,84)	3.8 (1.00, 0.84)

*1: Pump Octane Number
*2: Research Octane Number

MAINTENANCE SPECIFICATIONS

ENGINE

Item	Unit	Model	
		XL760	XL1200
Cylinder head:			
Warpage limit	mm (in)	0.1 (0.004)	0.1 (0.004)
Compression pressure	kPa (kg/cm^2)	–	–
Cylinder:			
Bore size	mm (in)	84.00 ~ 84.02 (3.307 ~ 3.308)	84.00 ~ 84.02 (3.307 ~ 3.308)
Taper limit	mm (in)	0.08 (0.003)	0.08 (0.003)
Out of round limit	mm (in)	0.05 (0.002)	0.05 (0.002)
Wear limit	mm (in)	84.10 (3.31)	84.10 (3.31)
Piston:			
Diameter	mm (in)	83.902 ~ 83.921 (3.3032 ~ 3.3040)	83.902 ~ 83.921 (3.3032 ~ 3.3040)
Measuring point*	mm (in)	10 (0.39)	10 (0.39)
piston clearance 	mm (in)	0.100 ~ 0.105 (0.0039 ~ 0.0041)	0.100 ~ 0.105 (0.0039 ~ 0.0041)
Wear limit	mm (in)	0.155 (0.0061)	0.155 (0.0061)
Piston pin bore inside diameter	mm (in)	20.004 ~ 20.025 (0.7876 ~ 0.7884)	20.004 ~ 20.025 (0.7876 ~ 0.7884)
Piston ring:			
Top			
Type		Keystone	Keystone
Dimensions (B × T)	mm (in)	1.5×3.2 (0.06×0.13)	1.5×3.0 (0.06×0.12)
End gap (installed) 	mm (in)	0.20 ~ 0.40 (0.008 ~ 0.016)	0.20 ~ 0.40 (0.008 ~ 0.016)
Ring groove clearance (installed)	mm (in)	0.02 ~ 0.07 (0.001 ~ 0.003)	0.02 ~ 0.07 (0.001 ~ 0.003)
2nd			
Type		Keystone	Keystone
Dimensions (B × T)	mm (in)	1.5×3.2 (0.06×0.13)	1.5×3.0 (0.06×0.12)
End gap (installed)	mm (in)	0.20 ~ 0.40 (0.008 ~ 0.016)	0.20 ~ 0.40 (0.008 ~ 0.016)
Ring groove clearance (installed)	mm (in)	0.02 ~ 0.07 (0.0008 ~ 0.0028)	0.02 ~ 0.07 (0.0008 ~ 0.0028)
Piston pin:			
Diameter	mm (in)	19.995 ~ 20.000 (0.7872 ~ 0.7874)	19.995 ~ 20.000 (0.7872 ~ 0.7874)
Wear limit	mm (in)	–	–

Item	Unit	Model	
		XL760	XL1200
Crankshaft assembly:			
Crank width "A"	mm (in)	61.95 ~ 62.00 (2.439 ~ 2.441)	61.95 ~ 62.00 (2.439 ~ 2.441)
Deflection limit "B"	mm (in)	0.05 (0.002)	0.05 (0.002)
Big end side clearance "C"	mm (in)	0.25 ~ 0.75 (0.010 ~ 0.030)	0.25 ~ 0.75 (0.010 ~ 0.030)
Maximum small end axial play "D" 	mm (in)	2.0 (0.08)	2.0 (0.08)
Carburetor:			
Type		Floatless	Floatless
Manufacturer		Mikuni	Mikuni
Number of carburetours		2	3
Identification mark		64X01/02	65U01/02/03
Main nozzle (M.N.)	mm (in)	3.2 (0.13)	3.2 (0.13)
Main jet (M.J.)		135 (01), 137.5 (02)	135
Pilot jet (P.J.)		115	100 (01)/95 (02)/ 97.5 (03)
Low speed screw	turns out	1-3/4 ± 1/4	1 ± 1/4
Throttle valve		160	130
Valve seat	mm (in)	1.5 (0.06)	1.2 (0.05)
High speed screw	turns out	1/2 ± 1/4	3/4 ± 1/4 (01, 03) 1 ± 1/4 (02)
Trolling speed	r/min.	1,300 ± 50	1,300 ± 50
Reed valve:			
Thickness	mm (in)	0.4 (0.02)	0.5 (0.02)
Valve stopper height	mm (in)	9.0 ± 0.2 (0.35 ± 0.01)	12.5 ± 0.2 (0.49 ± 0.01)
Valve warpage limit	mm (in)	0.2 (0.01)	0.2 (0.01)

JET UNIT

Item	Unit	Model	
		XL760	XL1200
Jet pump:			
Impeller material		SUS	SUS
Number of impeller blades		3	3
Impeller pitch	degree	13.4	15.8
Impeller clearance	mm (in)	0.25 ~ 0.35 (0.010 ~ 0.014)	0.25 ~ 0.35 (0.010 ~ 0.014)
Impeller clearance limit	mm (in)	0.6 (0.024)	0.6 (0.024)
Impeller sharf runout limit	mm (in)	0.3 (0.012)	0.3 (0.012)
Nozzle diameter	mm (in)	86.0 (3.39)	86.0 (3.39)

HULL AND HOOD

Item	Unit	Model	
		XL760	XL1200
Free play:			
Throttle lever free play	mm (in)	4 ~ 7 (0.16 ~ 0.28)	4 ~ 7 (0.16 ~ 0.28)
Choke cable free play	mm (in)	1 ~ 6 (0.04 ~ 0.24)	1 ~ 6 (0.04 ~ 0.24)
Trim control wheel free play	mm (in)	–	–

ELECTRICAL

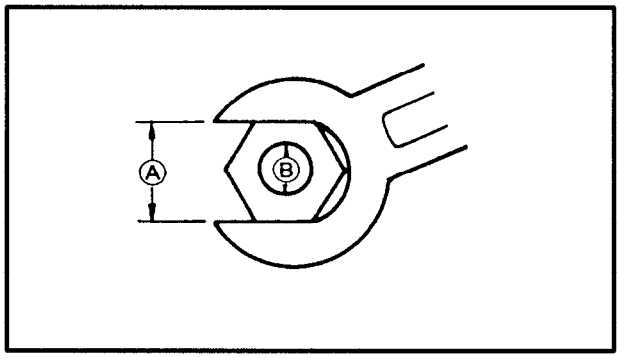
Item	Unit	Model	
		XL760	XL1200
Battery:			
Type		Fluid	Fluid
Capacity	V/kC (A·h)	12/68.4 (19)	12/68.4 (19)
Ignition timing:			
Ignition timing (at 1,200 r/min)	degree	15 BTDC	15 BTDC
Ignition timing (at 5,500 r/min)	degree	F: 20, R: 18 BTDC	21 BTDC
Stator assembly:			
Pulser coil resistance	Ω (color)	445.5 ~ 544.5 (W/R – W/B)	248.0 ~ 372.0 (B-W/R, W/B, W/G)
Charge coil resistance 1	Ω (color)	316.8~387.2 (Br–L)	172.0~258.0 (B/R–Br)
Charge coil resistance 2	Ω (color)	–	656.0~984.0 (L–B/R)
Lighting coil resistance	Ω (color)	1.14 ~ 1.40 (G – G)	0.56 ~ 0.84 (G – G)
Charging current (minimum)	A/r/min.	2 ~ 4/5,500	5.8 ~ 7.8/5,500
Ignition coil:			
Minimum spark gap	mm (in)	–	–
Primary coil resistance	Ω (color)	0.078~0.106 (Or–B)	0.048~0.072 (B/W–B)
Secondary coil resistance	kΩ (color)	14.3 ~ 30.5 (High tension cords)	2.7 ~ 4.1 (High tension cord-B)
Rectifier-regulator:			
Regulated voltage	V	14.3 ~ 15.3	14.5 ~ 15.5
Thermo switch:			
On temperature	°C (°F)	90 ~ 96 (194 ~ 205)	90 ~ 96 (194 ~ 205)
Off temperature	°C (°F)	76 ~ 90 (169 ~ 194)	76 ~ 90 (169 ~ 194)
Starter motor:			
Brush length	mm (in)	12.5 (0.49)	12.5 (0.49)
Wear limit	mm (in)	6.5 (0.26)	6.5 (0.26)
Comutator undercut	mm (in)	0.7 (0.028)	0.7 (0.028)
Limit	mm (in)	0.2 (0.008)	0.2 (0.008)
Comutator diameter	mm (in)	28.0 (1.10)	28.0 (1.10)
Limit	mm (in)	27 (1.06)	27 (1.06)
Fuse:			
Rating	V – A	12-10	12 – 10
SPARK PLUG:			
Spark plug gap	mm (in)	0.6~0.7 (0.024~0.028)	0.6~0.7 (0.024~0.028)

TIGHTENING TORQUE

SPECIFIED TORQUE

Part to tightened		Part name	Size	Q'ty		Tightening torque			Remarks
				760	1200	Nm	kgf·m	ft·lb	
ENGINE:									
Electric box		Bolt	M8	2	3	17	1.7	12	
Mounting bolt		Bolt	M8	4	4	17	1.7	12	
Reed valve		Screw	M4	16	24	1	0.1	0.7	
Exhaust ring		Bolt	M8	4	4	30	3.0	22	
Exhaust ring stay	1st	Bolt	M10	3	–	22	2.2	16	
	2nd					40	4.0	29	
Muffler stay		Bolt	M10	4	4	40	4.0	29	
Muffler stay – Muffler stay 2	1st	Bolt	M10	2	2	2	0.2	1.4	
	2nd					47	4.7	34	
Muffler 2		Bolt	M10	2	2	40	4.0	29	
Muffler 1	1st	Bolt	M10	8	–	22	2.2	16	
	2nd					40	4.0	29	
	1st	Bolt	M8	–	12	15	1.5	11	
	2nd					30	3.0	22	
Cylinder body	1st	Bolt	M10	6	6	23	2.3	17	
	2nd					40	4.0	29	
Cylinder head	1st	Bolt	M8	10	–	15	1.5	11	
	2nd					36	3.6	26	
	1st	Bolt	M8	–	14	15	1.5	11	
	2nd					30	3.0	22	
Cylinder head cover	1st	Bolt	M8	–	15	15	1.5	11	
	2nd					30	3.0	22	
	1st	Bolt	M6	–	2	4	0.4	2.9	
	2nd					8	0.8	5.8	
Spark plug		Bolt	M14	2	3	25	2.5	18	
Flywheel bolt		Nut	M10	1	1	70	7.0	51	
Crankcase	1st	Bolt	M8	8	12	15	1.5	11	
	2nd					28	2.8	20	
Mount bracket	1st	Bolt	M10	7	7	23	2.3	17	
	2nd					53	5.3	38	
Coupling		Nut	M27	1	1	37	3.7	27	
Frame arrestor cover		Bolt	M6	6	–	2	0.2	1.4	
				–	8	5	0.5	3.6	
Starter motor terminal nut		Nut	M6	1	1	5	0.5	3.6	
JET UNIT:									
Mounting bolt		Bolt	M10	4	4	34	3.4	25	
			M6	2	2	12	1.2	8.7	
Ride plate		Bolt	M8	4	4	17	1.7	12	
Impeller (left-hand threads)		Bolt	M20	1	1	18	1.8	13	
Coupling		Nut	M27	1	1	37	3.7	27	
Intermediate housing		Bolt	M8	3	3	17	1.7	12	

Nut Ⓐ	Bolt Ⓑ	General torque specifications		
		Nm	kgf•m	ft•lb
8 mm	M5	5.0	0.5	3.6
10 mm	M6	8.0	0.8	5.8
12 mm	M8	18	1.8	13
14 mm	M10	36	3.6	25
17 mm	M12	43	4.3	31



TIGHTENING TORQUE

GENERAL TORQUE

This chart specifies the torque for tightening standard fasteners with standard clean dry ISO threads at room temperature. Torque specifications for special components or assemblies are given in applicable sections of this manual. To avoid causing warpage, tighten multifastener assemblies in a criss-cross fashion, in progressive stages until the specified torque is reached.