YAMAHA

Z200Y
LZ200Y

SERVICE MANUAL

LIT-18616-02-10

68F-28197-Z9-11

PREFACE

This manual has been prepared by the Yamaha Motor Company, Ltd. primarily for use by Yamaha dealers and their trained mechanics when performing maintenance procedures and repairs to Yamaha equipment. It has been written to suit the needs of persons who have a basic understanding of the mechanical and electrical concepts and procedures inherent in the work, for without such knowledge attempted repairs or service to the equipment could render it unsafe or unfit for use.

Because the Yamaha Motor Company, Ltd. has a policy of continuously improving its products, models may differ in detail from the descriptions and illustrations given in this publication. Use only the latest edition of this manual. Authorized Yamaha dealers are notified periodically of modifications and significant changes in specifications and procedures, and these are incorporated in successive editions of this manual.

CAUTION

USE UNLEADED STRAIGHT GASOLINE ONLY

- Gasoline containing lead can cause performance lose and engine damage.
- Do not use gasoline mixed with oil (premix).
- Use YAMALUBE 2 stroke outboard oil or another 2-stroke engine oil with a BIA-certified TC-W3 rate.

Z200Y, LZ200Y
SERVICE MANUAL

1st Edition, September 1999

Printed in USA
LIT-18616-02-10

HOW TO USE THIS MANUAL

MANUAL FORMAT

All of the procedures in this manual are organized in a sequential, step-by-step format. The information has been compiled to provide the mechanic with an easy to read, handy reference that contains comprehensive explanations of all disassembly, repair, assembly, and check operations.

In this revised format, the condition of a faulty component will precede an arrow symbol and the course of action required will follow the symbol, e.g.,

- Bearings

  Pitting/scratches → Replace.

To assist you in finding your way through this manual, the section title and major heading is given at the top of every page.

MODEL INDICATION

Multiple models are mentioned in this manual and their model indications are noted as follows.

Model name	Z200NETO	LZ200NETO
USA and Canada name	Z200TR	LZ200TR
Indication	Z200NETO	LZ200NETO

ILLUSTRATIONS

The illustrations within this service manual represent all of the designated models.

CROSS REFERENCES

The cross references have been kept to a minimum. Cross references will direct you to the appropriate section or chapter.

IMPORTANT INFORMATION

In this Service Manual particularly important information is distinguished in the following ways.

⚠ The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

⚠ WARNING

Failure to follow WARNING instructions could result in severe injury or death to the machine operator, a bystander, or a person inspecting or repairing the outboard motor.

CAUTION:

A CAUTION indicates special precautions that must be taken to avoid damage to the outboard motor.

NOTE:

A NOTE provides key information to make procedures easier or clearer.

HOW TO USE THIS MANUAL

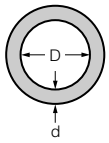
① The main points regarding removing/installing and disassembling/assembling procedures are shown in the exploded views.

② The numbers in the exploded views indicate the required sequence of the procedure and should be observed accordingly.

③ Symbols are used in the exploded views to indicate important aspects of the procedure. A list of meanings for these symbols is provided on the following page.

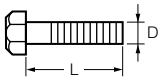
④ It is important to refer to the job instruction charts at the same time as the exploded views. These charts list the sequence that the procedures should be carried out in, as well as providing explanations on part names, quantities, dimensions and important points relating to each relevant task.

Example:
O-ring size 39.5 × 2.5 mm: inside diameter (D) × ring diameter (d)

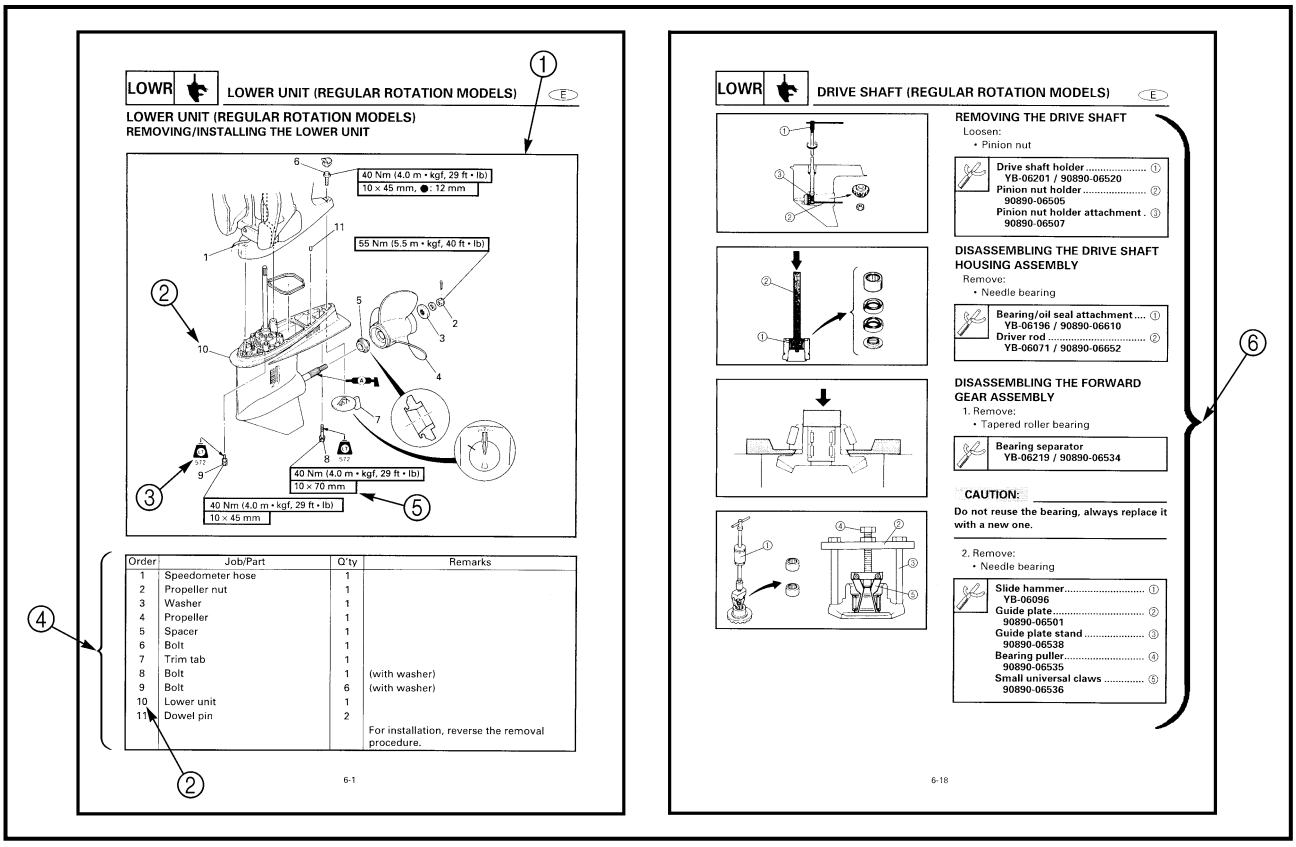


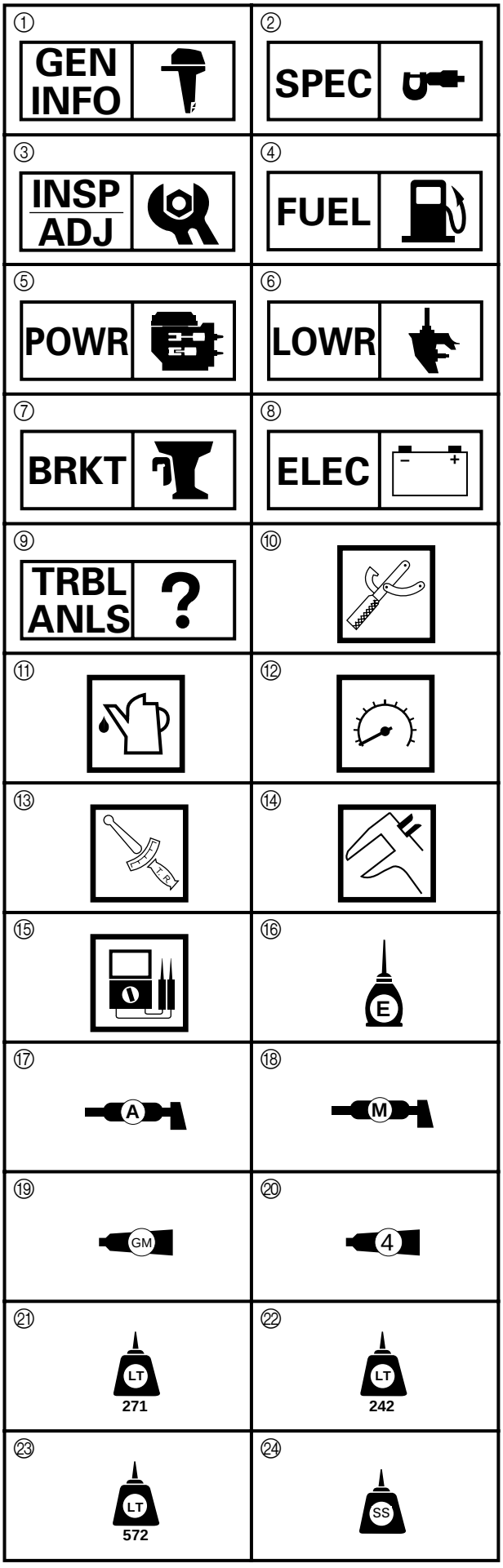
⑤ In addition to tightening torques, the dimensions of the bolts or screws are also mentioned.

Example:
Bolt or screw size 10 × 25 mm : diameter (D) × length (L)



⑥ In addition to the exploded views and job instruction charts, this manual provides individual illustrations when further explanations are required to explain the relevant procedure.





SYMBOLS

Symbols ① to ⑨ are designed as thumb-tabs to indicate the content of a chapter.

① General information
② Specifications
③ Periodic inspections and adjustments
④ Fuel system
⑤ Power unit
⑥ Lower unit
⑦ Bracket unit
⑧ Electrical systems
⑨ Trouble analysis

Symbols ⑩ to ⑮ indicate specific data.

⑩ Special tool
⑪ Specified liquid
⑫ Specified engine speed
⑬ Specified torque
⑭ Specified measurement
⑮ Specified electrical value
[Resistance (Ω), Voltage (V), Electric current (A)]

Symbol ⑯ to ⑱ in an exploded diagram indicate the grade of lubricant and the location of the lubrication point.

⑯ Apply Yamaha 2-stroke outboard motor oil (TC-W3)
⑰ Apply water resistant grease
(Yamaha grease A, Yamaha marine grease)
⑱ Apply molybdenum disulfide oil

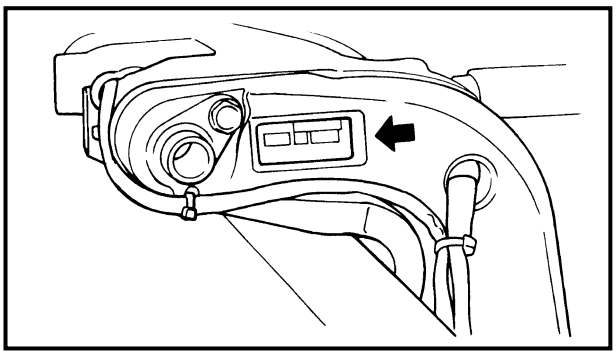
Symbols ⑲ to ㉔ in an exploded diagram indicate the grade of the sealing or locking agent and the location of the application point.

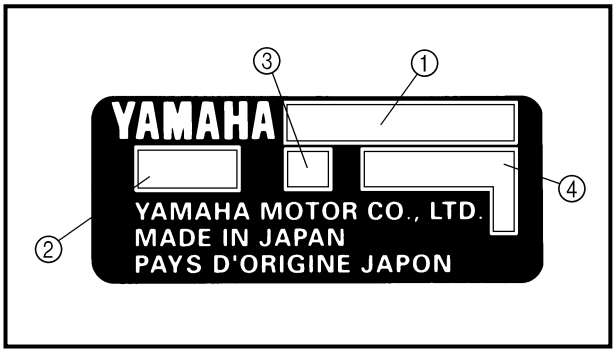
⑲ Apply Gasket Maker®
⑳ Apply Yamabond #4
(Yamaha bond number 4)
㉑ Apply LOCTITE® No. 271 (Red LOCTITE)
㉒ Apply LOCTITE® No. 242 (Blue LOCTITE)
㉓ Apply LOCTITE® No. 572
㉔ Apply silicon sealant

E

CONTENTS

CHAPTER 1
GENERAL INFORMATION





IDENTIFICATION

SERIAL NUMBER

The outboard motor's serial number is stamped on a label which is attached to the port side of the clamp bracket.

NOTE:

If the serial number label is removed, "VOID" marks will be appear on the label.

① Model name
② Approved model code
③ Transom height
④ Serial number

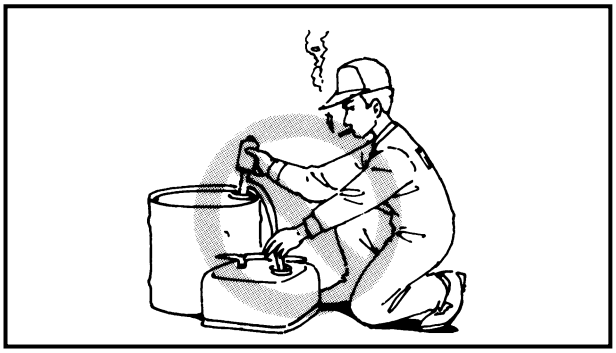
STARTING SERIAL NUMBERS

The starting serial number blocks are as follows:

Model name			Approved model code	Starting serial number
Worldwide	USA	Canada		
Z200NETO	Z200TR	Z200TR	6G6	X: 100101 -
LZ200NETO	LZ200TR	—	6K1	X: 100101 -

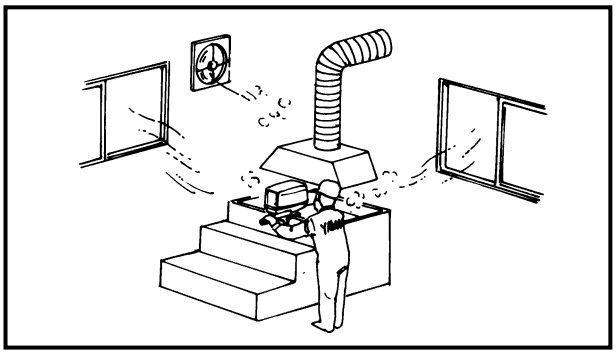
SAFETY WHILE WORKING

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



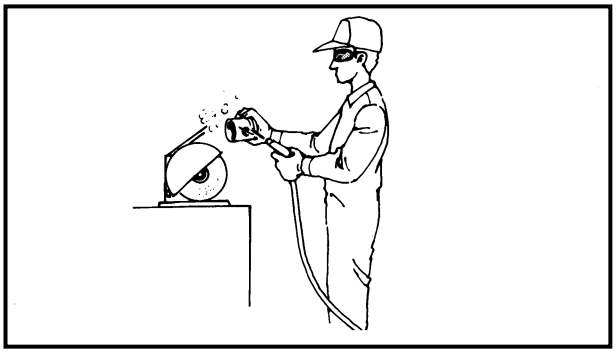
FIRE PREVENTION

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



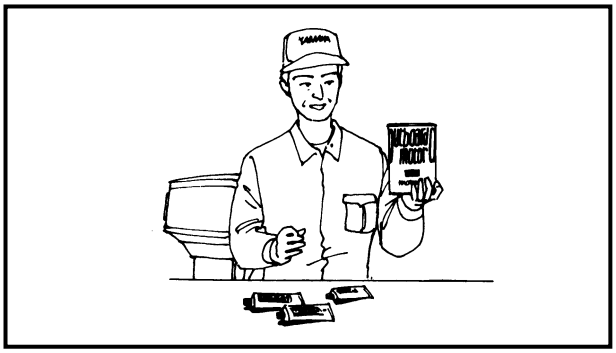
VENTILATION

Petroleum vapor is heavier than air and is deadly if inhaled in large quantities. Engine exhaust gases are harmful to breathe.
When test-running an engine indoors, maintain good ventilation.



SELF-PROTECTION

Protect your eyes with suitable safety glasses or safety goggles, 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.



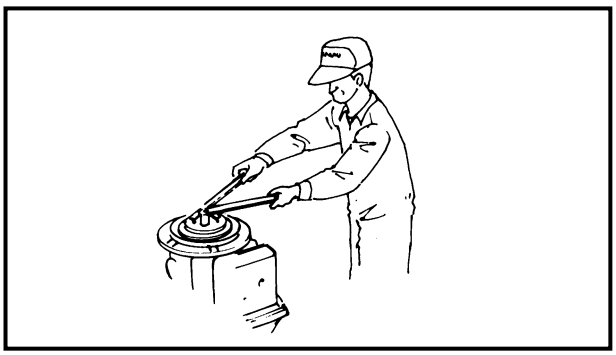
OILS, GREASES AND SEALING FLUIDS

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

SAFETY WHILE WORKING

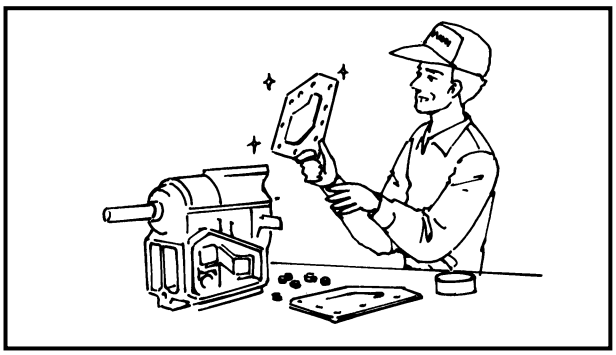
Under normal conditions of use, there should be no hazards from the use of the lubricants mentioned in this manual, but safety is all-important, and by adopting good safety practices, any risk is minimized. A summary of the most important precautions is as follows:

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 your 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.

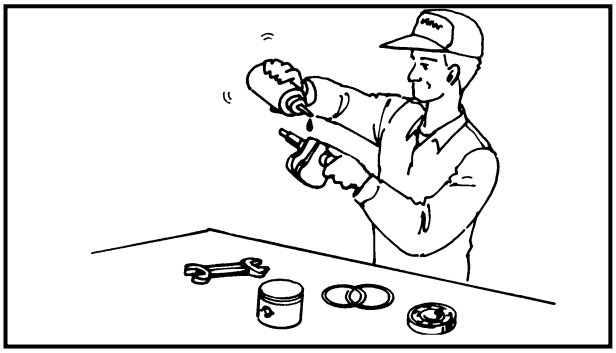


GOOD WORKING PRACTICES

1. The right tools
   Use the recommended special tools to protect parts from damage. Use the right tool in the right manner – do not improvise.
2. Tightening torque
   Follow the tightening torque instructions. When tightening bolts, nuts and screws, tighten the large sizes first, and tighten inner-positioned fixings before outer-positioned ones.

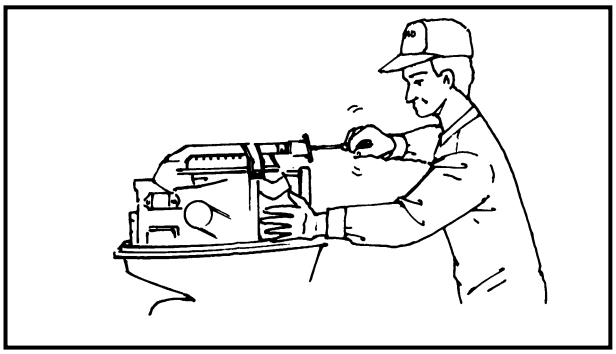


3. Non-reusable items
   Always use new gaskets, packings, O-rings, split-pins, circlips, etc., on reassembly.



DISASSEMBLY AND ASSEMBLY

1. Clean parts with compressed air when disassembling.
2. Oil the contact surfaces of moving parts before assembly.



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

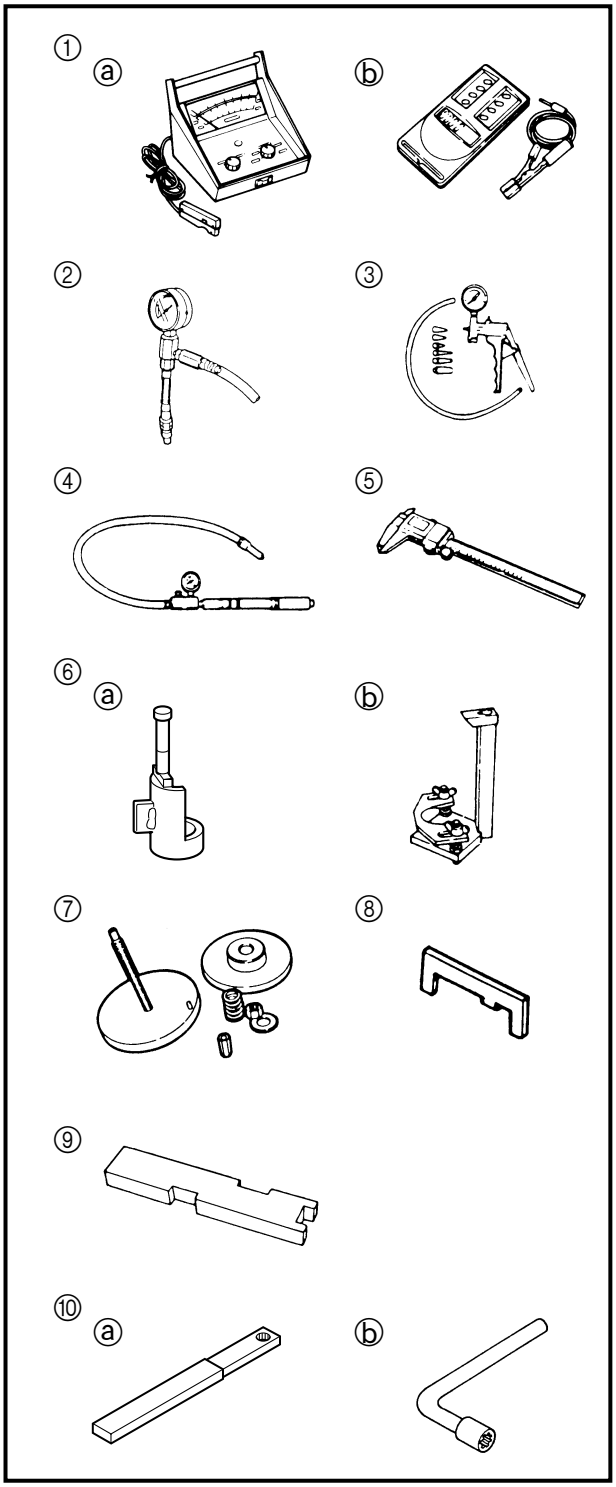
4. Install bearings with the manufacturer's markings on the side exposed to view, and liberally oil the bearings.
5. When installing oil seals, apply a light coating of water-resistant grease to the outside diameter.

SPECIAL TOOLS

Using the correct special tools recommended by Yamaha, will aid the work and enable accurate assembly and tune-up. Improvising and using improper tools can damage the equipment.

NOTE:

- For USA and Canada, use part numbers that start with "J-", "YB-", "YM-", "YS-", "YU-" or "YW-".
- For worldwide, use part numbers that start with "90890-".



MEASURING

① Tachometer
P/N. YU-08036-A ..... ⓐ
90890-06760 ..... ⓑ

② Fuel pressure gauge
P/N. YB-06766
90890-06786

③ Mity vac
P/N. YB-35956
90890-06756

④ Pressure tester
P/N. YB-35956
90890-06762

⑤ Digital caliper
P/N. 90890-06704

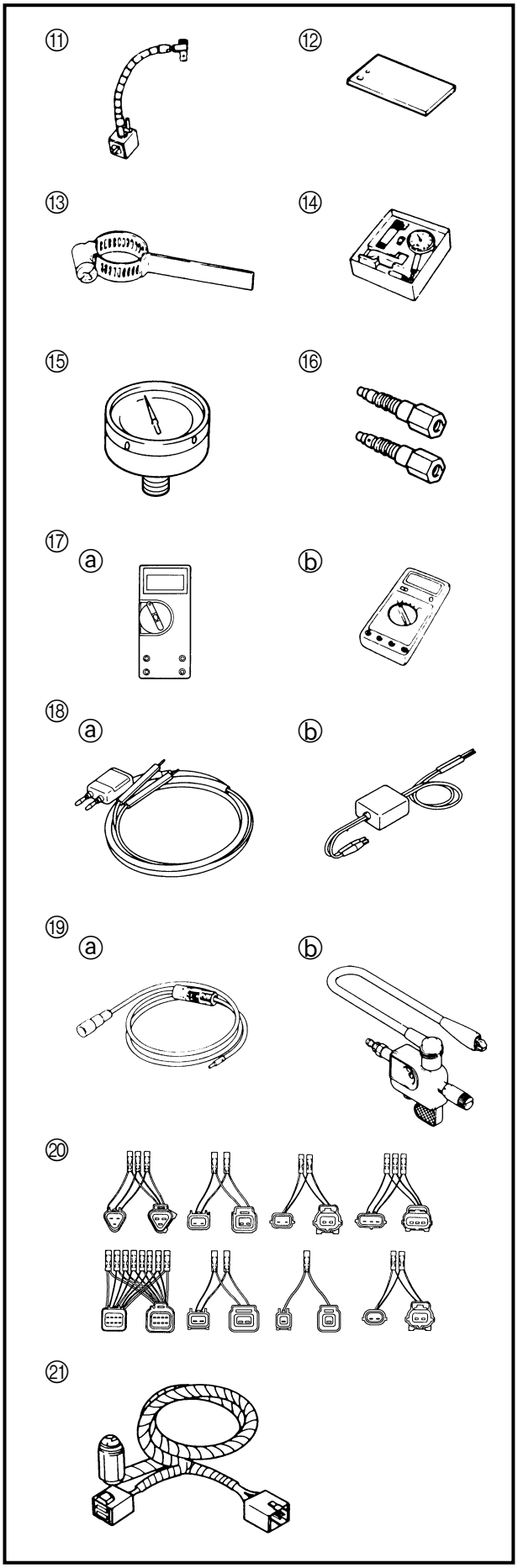
⑥ Pinion height gauge
P/N. YB-34432-7, YB-34432-11 ..... ⓐ
90890-06702 ..... ⓑ

⑦ Shimming gauge
P/N. YB-34446-1, YB-34446-3,
YB-34446-4, YB-34446-7,
YB-34446-8

⑧ Shimming gauge
P/N. YB-34468-1, YB-34468-2

⑨ Shimming plate
P/N. 90890-06701

⑩ Shift rod wrench
P/N. YB-06052 ..... ⓐ
90890-06052 ..... ⓑ



⑪ Magnetic base
P/N. YU-34481
90890-06705

⑫ Magnetic base attaching plate
P/N. YB-07003
90890-07003

⑬ Backlash indicator
P/N. YB-06265
90890-06706

⑭ Dial gauge set
P/N. YU-03097
90890-01252

⑮ Hydraulic pressure gauge
P/N. 90890-06776

⑯ Up-relief valve attachment
P/N. 90890-06773
Down-relief valve attachment
P/N. 90890-06774

⑰ Digital tester
P/N. J-39299 ..... ⓐ
90890-06752 ..... ⓑ

⑱ Peak voltage adapter
P/N. YU-39991 ..... ⓐ
90890-03169 ..... ⓑ

⑲ Spark gap tester
P/N. YM-34487 ..... ⓐ
90890-06754 ..... ⓑ

⑳ Test harness
P/N. YB-06443, YB-06767,
YB-06768, YB-06769,
YB-06779, YB-06787,
YB-06788
90890-06757, 90890-06767,
90890-06768, 90890-06769,
90890-06779, 90890-06787,
90890-06788

㉑ Diagnostic indicator
P/N. YB-06765
90890-06765

㉒ Diagnostic unit
Check the engine condition by using a personal computer when it is connected to the Electronic Control Unit (ECU).

Diagnosis:
Indicates the name of a failed part.

Diagnosis record:
Displays the name of the part whose diagnosis is detected, along with the engine running total hours.

Static test:
Checks operation sound and ignition sparks by activating the electric fuel pump, electric oil pump, injector and spark plug while the engine is stopped.

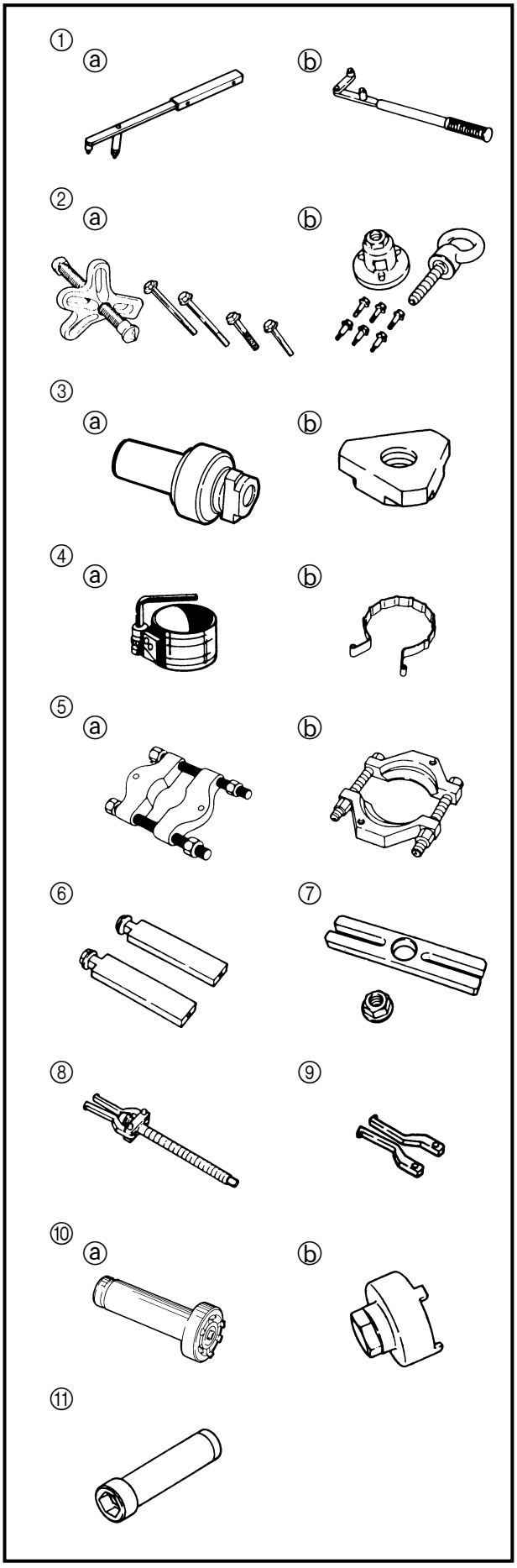
Dynamic test:
Checks the engine for operation through any change in its speed by stopping the operation of the spark plug on each cylinder while the engine is in the neutral position.

Engine monitor:
Indicates information on the sensors and switches by converting it to each value while the engine is running.

Data logger:
Indicates in numeric values the engine speed, throttle opening voltage, oxygen density sensor voltage, water temperature sensor voltage and fuel pressure sensor voltage that occurred within 13 minutes.

ECU information:
Displays the ECU identification number.

NOTE:
To use any of these functions a personal computer, connection cables, adapter and communication software are required.
The personal computer should be compatible with Windows® 95/98, equipped with a CD-ROM and the RS232C terminal.



REMOVING AND INSTALLING

① Flywheel magnet assembly holder
P/N. YB-06139 ..... ⓐ
90890-06522 ..... ⓑ

② Universal puller
P/N. YB-06117 ..... ⓐ
90890-06521 ..... ⓑ

③ Bearing/oil seal attachment
P/N. YB-06205 ..... ⓐ
90890-06663 ..... ⓑ

④ Piston ring compressor
P/N. YU-33294 ..... ⓐ
90890-06530 ..... ⓑ

⑤ Bearing separator
P/N. YB-06219 ..... ⓐ
90890-06534 ..... ⓑ

⑥ Guide plate stand
P/N. 90890-06538

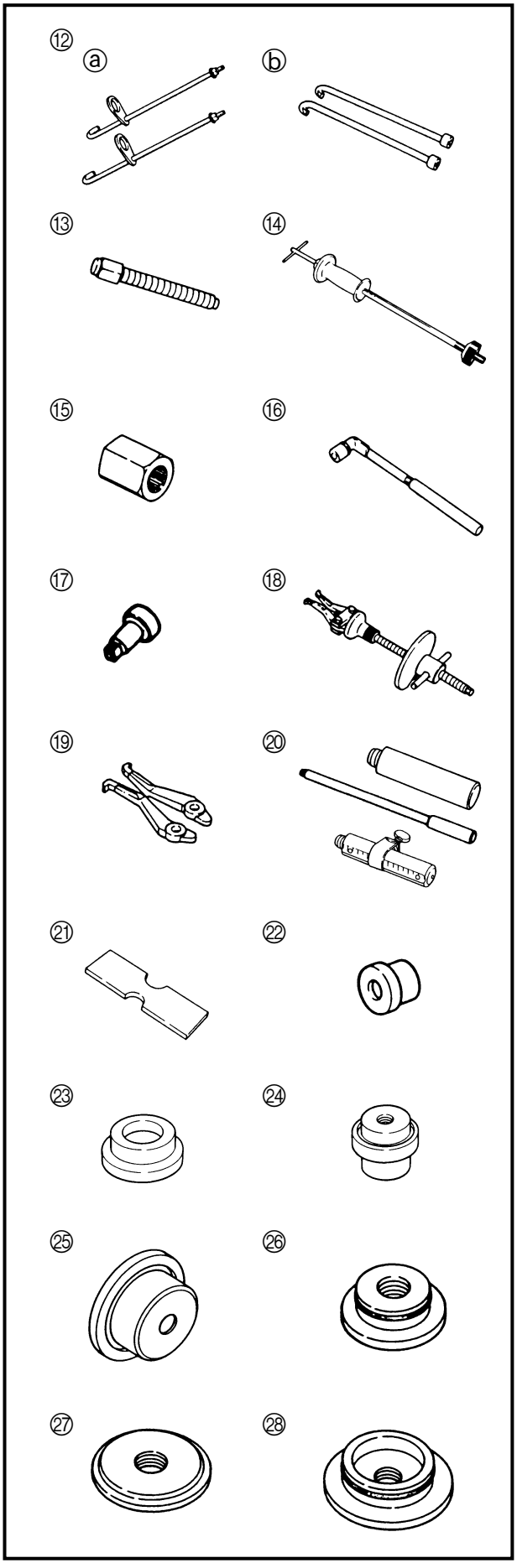
⑦ Guide plate
P/N. 90890-06501

⑧ Bearing puller
P/N. 90890-06535

⑨ Small universal claws
P/N. 90890-06536

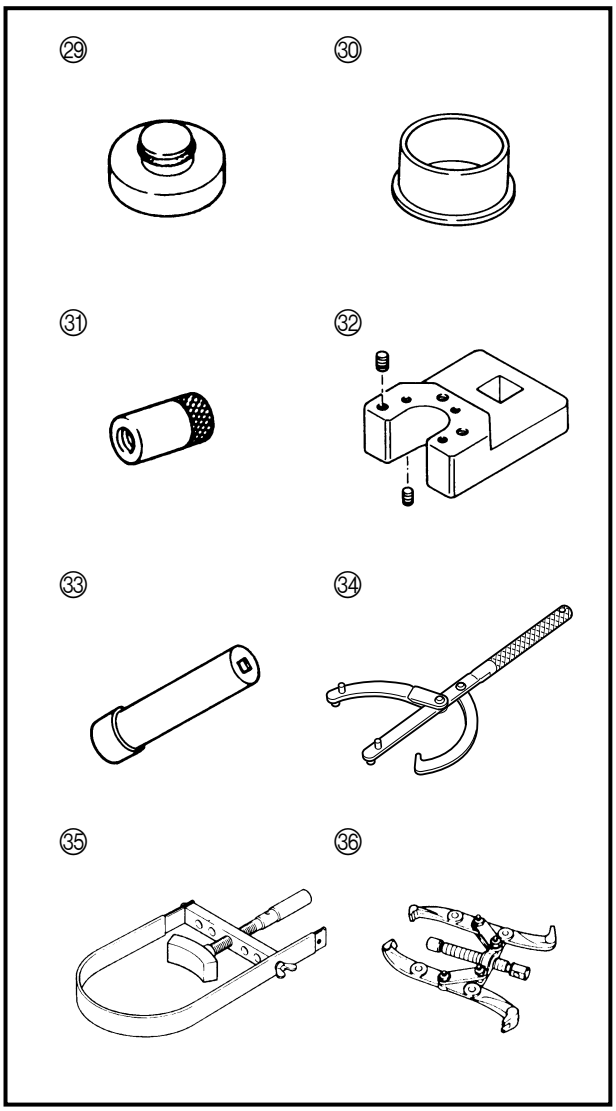
⑩ Ring nut wrench
P/N. YB-34447 ..... ⓐ
90890-06512 ..... ⓑ

⑪ Ring nut wrench extension
P/N. 90890-06513



⑫ Propeller shaft housing puller
P/N. YB-06207 ..... ⓐ
90890-06502 ..... ⓑ
⑬ Center bolt
P/N. 90890-06504
⑭ Slide hammer
P/N. YB-06096
90890-06531
⑮ Drive shaft holder
P/N. YB-06201
90890-06520
⑯ Pinion nut holder
P/N. 90890-06505
⑰ Pinion nut holder attachment
P/N. 90890-06508
⑱ Bearing puller
P/N. YB-06029, YB-06247
90890-06523
⑲ Large universal claws
P/N. 90890-06532
⑳ Driver rod
P/N. YB-06071
90890-06604, 90890-06605,
90890-06606, 90890-06652
㉑ Bearing/oil seal depth plate
P/N. 90890-06603
㉒ Bearing/oil seal attachment
P/N. YB-06194, YB-06196, YB-06246
㉓ Bearing/oil seal attachment
P/N. YB-06195, YB-06258
㉔ Bearing/oil seal attachment
P/N. YB-06200
㉕ Bearing/oil seal attachment
P/N. YB-06336
㉖ Bearing/oil seal attachment
P/N. 90890-06610, 90890-06612,
90890-06631, 90890-06633,
90890-06636, 90890-06653,
90890-06654
㉗ Bearing/oil seal attachment
P/N. 90890-06619, 90890-06622
㉘ Bearing/oil seal attachment
P/N. 90890-06629

SPECIAL TOOLS



29 Bearing/oil seal attachment
P/N. 90890-06637
30 Bearing/oil seal attachment
P/N. 90890-06659, 90890-06660,
90890-06661, 90890-06662
31 Slide hammer attachment
P/N. YB-06335
90890-06514
32 End screw wrench
P/N. YB-06548
90890-06548
33 End screw wrench
P/N. YB-06175-1A
34 Universal holder
P/N. YU-01235
90890-01235
35 Sheave holder
P/N. YS-1880-A
90890-01701
36 Universal puller
P/N. YB-06540
90890-06540

CHAPTER 2
SPECIFICATIONS

GENERAL SPECIFICATIONS

Item		Unit	Model	
	Worldwide		Z200NETO	LZ200NETO
	USA		Z200TR	LZ200TR
	Canada		Z200TR	—
DIMENSION				
Overall length		mm (in)	792 (31.2)	
Overall width		mm (in)	554 (21.8)	
Overall height (X)		mm (in)	1,782 (70.2)	
Boat transom height (X)		mm (in)	635 (25.0)	
WEIGHT				
(with aluminum propeller) (X)		kg (lb)	218 (480.6)	
(with stainless steel propeller) (X)		kg (lb)	222 (489.4)	
PERFORMANCE				
Maximum output (ISO)		kW (hp) @ 5,000 r/min	147.1 (200)	
Full throttle operating range		r/min	4,500 - 5,500	
Maximum fuel consumption		L (US gal, Imp gal)/hr @ 5,500 r/min	68 (18.0, 15.0)	
POWER UNIT				
Type			2 stroke - V	
Number of cylinders			6	
Displacement		cm^3 (cu. in)	2,596 (158.4)	
Bore × stroke		mm (in)	90.0 × 68.0 (3.54 × 2.68)	
Compression ratio			Cylinders #1 - #4: 6.4 Cylinders #5 - #6: 6.1	
Fuel system			Electronic fuel injection	
Fuel injection system			Sequential injection	
Intake system			Reed valve	
Induction system			Loop charge	
Starting system			Electric	
Ignition control system			Microcomputer	
Alternator output		V - A	12 - 45	
Spark plugs (NGK)			BKR7ES-11	
Cooling system			Water	
Exhaust system			Through propeller boss	
Lubrication system			Oil injection	

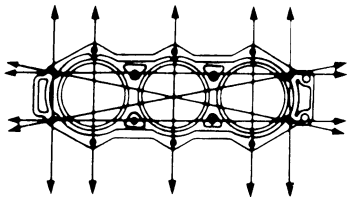
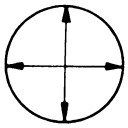
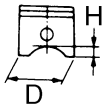
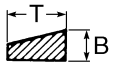
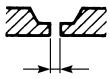
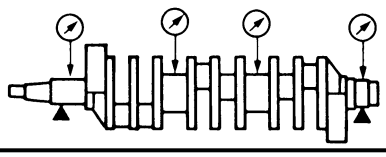
GENERAL SPECIFICATIONS

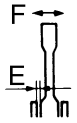
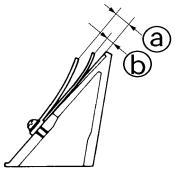
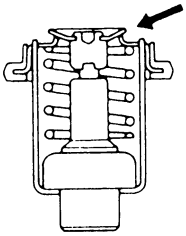
Item		Unit	Model	
	Worldwide		Z200NETO	LZ200NETO
	USA		Z200TR	LZ200TR
	Canada		Z200TR	—
FUEL AND OIL				
Fuel type			Unleaded regular gasoline	
Fuel rating		*PON	86	
		RON	91	
Engine oil type			2-stroke outboard engine oil	
Engine oil grade			TC-W3	
Engine oil capacity				
(engine oil tank)		L (US qt, Imp qt)	0.9 (0.95, 0.79)	
(sub-oil tank)		L (US qt, Imp qt)	10.5 (11.1, 9.2)	
Gear oil type			Hypoid gear oil SAE 90	
Gear oil total quantity		cm^3 (US oz, Imp oz)	980 (33.1, 34.5)	870 (29.4, 30.6)
BRACKET				
Trim angle (at 12° boat transom)		Degree	–4 - 16	
Tilt-up angle		Degree	70	
Steering angle		Degree	32 + 32	
DRIVE UNIT				
Gear shift positions			F-N-R	
Gear ratio			1.86 (26/14)	
Reduction gear type			Spiral bevel gear	
Clutch type			Dog clutch	
Propeller shaft type			Spline	
Propeller direction (rear view)			Clockwise	Counterclockwise
Propeller mark			M	ML
ELECTRICAL				
Battery capacity		Ah (kC)	100 (360)	
Minimum cold cranking performance		A	512	

* PON: Pump Octane Number (Research octane + Motor octane)/2
RON: Research Octane Number

MAINTENANCE SPECIFICATIONS

POWER UNIT

Item		Unit	Model	
	Worldwide		Z200NETO	LZ200NETO
	USA		Z200TR	LZ200TR
	Canada		Z200TR	—
CYLINDER HEADS				
Warpage limit		mm (in)	0.1 (0.004)	
 (lines indicate straightedge position)				
CYLINDERS				
Bore size		mm (in)	90.00 - 90.02 (3.543 - 3.544)	
Wear limit		mm (in)	90.1 (3.55)	
Taper limit		mm (in)	0.08 (0.003)	
Out-of-round limit		mm (in)	0.05 (0.002)	
PISTONS				
Piston diameter (D)		mm (in)	89.845 - 89.869 (3.5372 - 3.5381)	
Measuring point (H)		mm (in)	10 (0.4)	
Piston-to-cylinder clearance		mm (in)	0.150 - 0.156 (0.0059 - 0.0061)	
<Limit>		mm (in)	0.206 (0.0081)	
Oversize piston diameter				
1st		mm (in)	90.11 (3.548)	
2nd		mm (in)	90.36 (3.557)	
PISTON RINGS				
Type			Keystone	
(B)		mm (in)	2.0 (0.079)	
(T)		mm (in)	2.8 (0.110)	
End gap (installed)		mm (in)	0.30 - 0.40 (0.012 - 0.016)	
<Limit>		mm (in)	0.60 (0.024)	
Side clearance		mm (in)	0.02 - 0.06 (0.001 - 0.002)	
CRANKSHAFT				
Runout limit		mm (in)	0.05 (0.002)	
				

Item		Unit	Model	
	Worldwide		Z200NETO	LZ200NETO
	USA		Z200TR	LZ200TR
	Canada		Z200TR	—
CONNECTING RODS				
Small-end axial play limit (F) 		mm (in)	2.0 (0.08)	
Big-end side clearance (E)		mm (in)	0.12 - 0.26 (0.005 - 0.010)	
OIL INJECTION PUMP				
ID mark			68F00	
Bleeding			Screw type	
REED VALVES				
Reed valve stopper height ⓐ		mm (in)	9.0 ± 0.35 (0.35 ± 0.01)	
				
Warpage limit ⓑ		mm (in)	0.2 (0.008)	
THERMOSTATS				
Opening temperature		˚C (˚F)	48 - 52 (118 - 126)	
Full-open temperature		˚C (˚F)	60 (140)	
				
Valve open lower limit		mm (in)	3 (0.12)	
ENGINE SPEED				
Idling speed		r/min	700 ± 30	

LOWER UNIT

Item		Unit	Model	
	Worldwide		Z200NETO	LZ200NETO
	USA		Z200TR	LZ200TR
	Canada		Z200TR	—
GEAR BACKLASH				
Pinion - forward gear		mm (in)	0.25 - 0.46 (0.010 - 0.018)	0.21 - 0.43 (0.008 - 0.017)
Pinion - reverse gear		mm (in)	0.74 - 1.29 (0.029 - 0.051)	0.97 - 1.29 (0.038 - 0.051)
Pinion shims		mm	0.10, 0.12, 0.15, 0.18, 0.30, 0.40, 0.50	
Forward gear shims		mm	0.10, 0.12, 0.15, 0.18, 0.30, 0.40, 0.50	
Reverse gear shims		mm	0.10, 0.12, 0.15, 0.18, 0.30, 0.40, 0.50	

ELECTRICAL

Item		Unit	Model	
	Worldwide		Z200NETO	LZ200NETO
	USA		Z200TR	LZ200TR
	Canada		Z200TR	—
IGNITION SYSTEM				
Ignition timing (#1)		Degree	ATDC 3 - BTDC 17	
Fuse 1		V-A	12-80	
Fuse 2		V-A	12-30	
Fuse 3		V-A	12-20	
Control unit (B/O, B/Y, B/L, B/Br, B/G, B/W – R/Y)				
Output peak voltage lower limit				
@ cranking 1		V	—	
@ cranking 2		V	140	
@ 1,500 r/min		V	205	
@ 3,500 r/min		V	220	
Pulser coil (W/R, W/Y, W/G, W/B, W/L, W/Br – B)				
Output peak voltage lower limit				
@ cranking 1		V	5.0	
@ cranking 2		V	5.0	
@ 1,500 r/min		V	20	
@ 3,500 r/min		V	35	

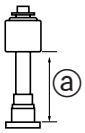
* Cranking 1: Open circuit voltage.
  Cranking 2: Loaded circuit voltage.

Item	Unit	Model	
Worldwide		Z200NETO	LZ200NETO
USA		Z200TR	LZ200TR
Canada		Z200TR	—
IGNITION CONTROL SYSTEM			
Crank position sensor (G/L)			
Crank-position-sensor-to-flywheel gap	mm (in)	1.0 ± 0.5 (0.04 ± 0.02)	
Output peak voltage lower limit			
@ cranking 1	V	4.5	
@ cranking 2	V	4.0	
@ 1,500 r/min	V	13	
@ 3,500 r/min	V	20	
Engine cooling water temperature sensor			
Resistance (B/Y – B/Y)			
@ 5°C (41°F)	kΩ	128	
@ 20°C (68°F)	kΩ	54 - 69	
@ 100°C (212°F)	kΩ	3.02 - 3.48	
Throttle position sensor			
Input voltage (O – R)	V	4.75 - 5.25	
Output voltage (P – O)	V	0.50 ± 0.02	
Thermo switch (P – B)			
OFF → ON	°C (°F)	84 - 90 (183 - 194)	
ON → OFF	°C (°F)	60 - 74 (140 - 165)	
FUEL CONTROL SYSTEM			
Oxygen density sensor			
Heater resistance (R/W – B)	Ω	2 - 100	
Output voltage (Gy – B/W)	V	0.0 - 1.0	
Atmospheric pressure sensor			
Output voltage (at 101.32 kPa) (P – B)	V	3.2 - 4.6	
Intake air temperature sensor			
Resistance (B/Y – B/Y)	kΩ	1.5 - 4.0	
Injector driver (O/R – Pu/R, O/B – Pu/B, O/Y – Pu/Y, O/G – Pu/G, O/L – Pu/L, O/W – Pu/W)			
Output peak voltage lower limit			
@ cranking 1	V	65	
@ cranking 2	V	60	
@ 1,500 r/min	V	65	
@ 3,500 r/min	V	65	

* Cranking 1: Open circuit voltage.
  Cranking 2: Loaded circuit voltage.

MAINTENANCE SPECIFICATIONS

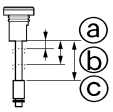
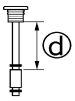
E

Item	Unit	Model	
Worldwide		Z200NETO	LZ200NETO
USA		Z200TR	LZ200TR
Canada		Z200TR	—
Fuel pressure sensor			
Output voltage (P – B)	V	2.8 - 3.2	
Water detection switch			
Float position ⓐ "ON" 	mm (in)	47	
STARTER MOTOR			
Type		Sliding gear	
Output	kW	1.4	
Cranking time limit	Second	30	
Brushes			
Standard length	mm (in)	15.5 (0.61)	
Wear limit	mm (in)	9.5 (0.37)	
Commutator			
Standard diameter	mm (in)	29.0 (1.14)	
Wear limit	mm (in)	28.0 (1.10)	
Mica			
Standard undercut	mm (in)	0.5 - 0.8 (0.02 - 0.03)	
Wear limit	mm (in)	0.2 (0.01)	
CHARGING SYSTEM			
Rectifier/regulator (R – B)			
Output peak voltage lower limit			
@ cranking 1	V	—	
@ cranking 2	V	7.5	
@ 1,500 r/min	V	12.7	
@ 3,500 r/min	V	12.7	
Lighting coil (G – G)			
Output peak voltage lower limit			
@ cranking 1	V	7.5	
@ cranking 2	V	8.0	
@ 1,500 r/min	V	12	
@ 3,500 r/min	V	12	

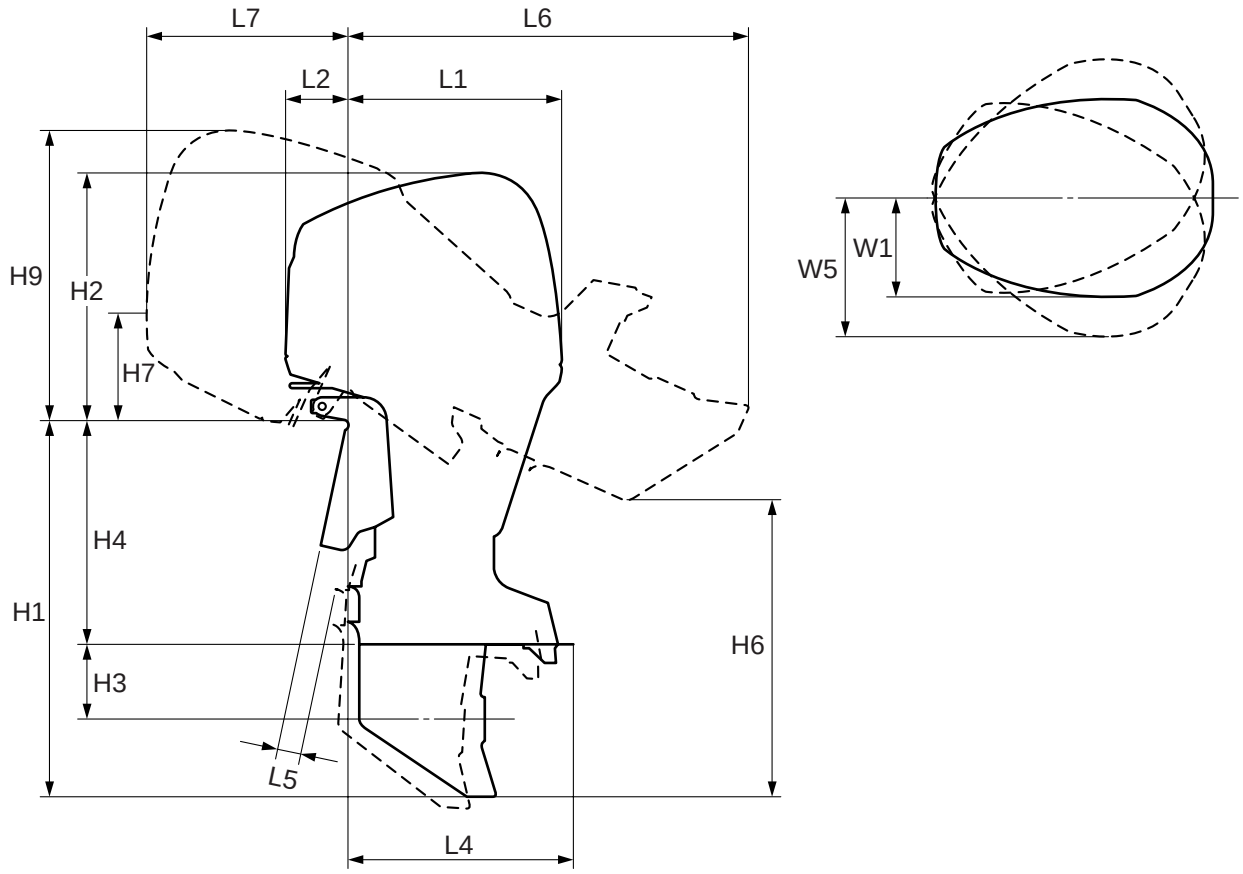
* Cranking 1: Open circuit voltage.
  Cranking 2: Loaded circuit voltage.

MAINTENANCE SPECIFICATIONS

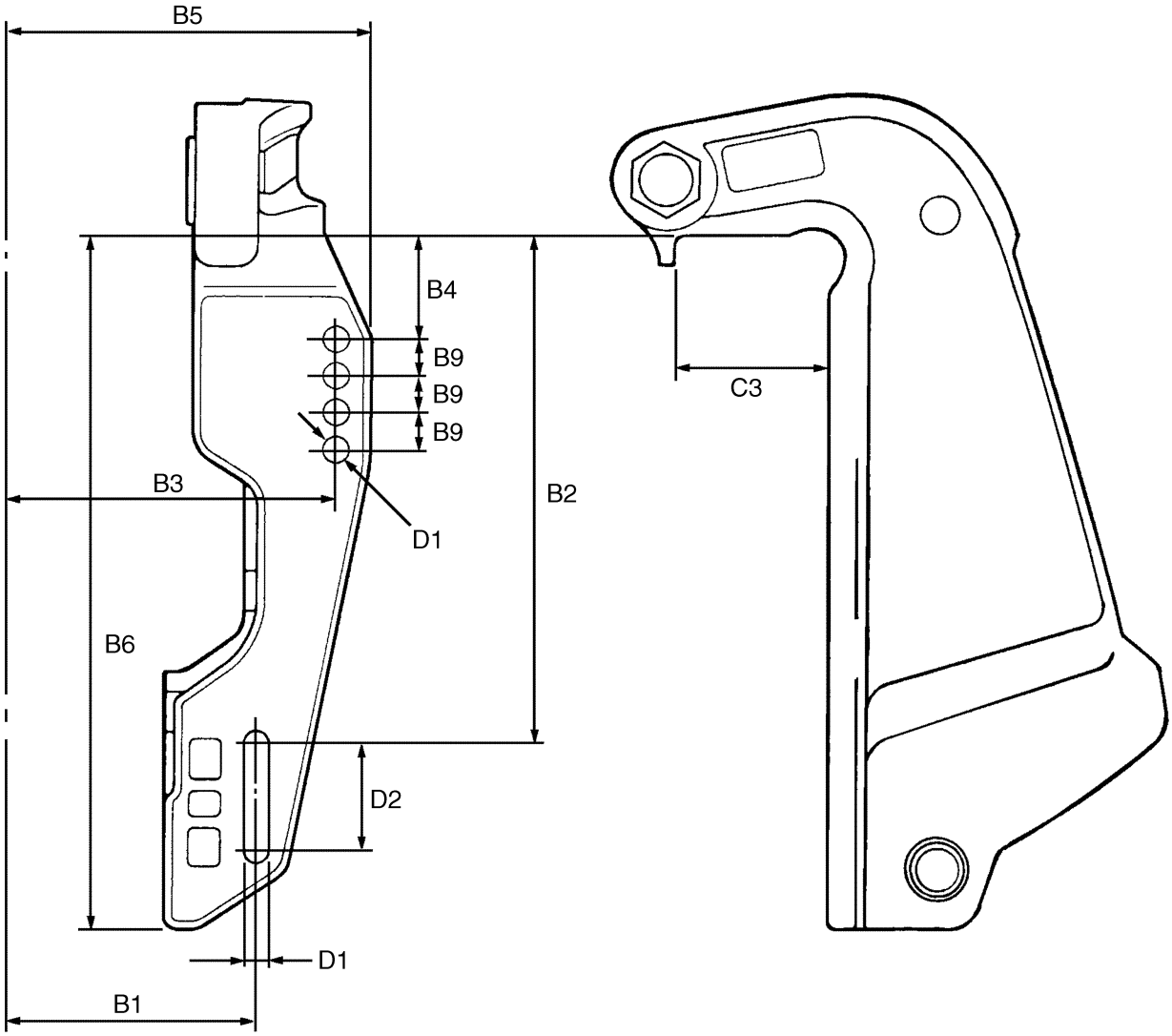
E

Item	Worldwide / USA / Canada	Unit	Model	
			Z200NETO / Z200TR / Z200TR	LZ200NETO / LZ200TR / —
OIL FEED PUMP CONTROL SYSTEM				
Oil level sensor (engine oil tank) 				
Float position ⓐ "OFF"		mm (in)	3 - 6 (0.12 - 0.24)	
Float position ⓑ "ON" 		mm (in)	33 - 36 (1.30 - 1.42)	
Float position ⓒ "ON"		mm (in)	53 - 56 (2.09 - 2.20)	
Oil level switch (sub-oil tank)				
Float position ⓓ "ON"		mm (in)	150 - 153 (5.91 - 6.02)	
POWER TRIM AND TILT SYSTEM				
Trim sensor				
Setting resistance		Ω	80 ± 12	
Resistance	(P – B)	Ω	582 - 873	
Resistance	(O – B)	Ω	800 - 1,200	
POWER TRIM AND TILT MOTOR				
Fluid type			ATF Dexron II	
Brushes				
Standard length		mm (in)	9.8 (0.39)	
Wear limit		mm (in)	4.8 (0.19)	
Commutator				
Standard diameter		mm (in)	22.0 (0.87)	
Wear limit		mm (in)	21.0 (0.83)	
Mica				
Standard undercut		mm (in)	1.35 (0.05)	
Wear limit		mm (in)	0.85 (0.03)	

DIMENSIONS



Symbol		Unit	Models	
	Worldwide		Z200NETO	LZ200NETO
	USA		Z200TR	LZ200TR
	Canada		Z200TR	—
L1		mm (in)	613 (24.1)	
L2		mm (in)	180 (7.1)	
L4		mm (in)	646 (25.4)	
L5		mm (in)	69 (2.7)	
L6		mm (in)	1,150 (45.3)	
L7		mm (in)	574 (22.6)	
H1		mm (in)	1,074 (42.3)	
H2		mm (in)	708 (27.9)	
H3		mm (in)	211 (8.3)	
H4		mm (in)	643 (25.3)	
H6		mm (in)	850 (33.4)	
H7		mm (in)	308 (12.1)	
H9		mm (in)	835 (32.9)	
W1		mm (in)	277 (10.9)	
W5		mm (in)	396 (15.6)	



Symbol		Unit	Models	
	Worldwide		Z200NETO	LZ200NETO
	USA		Z200TR	LZ200TR
	Canada		Z200TR	—
B1		mm (in)	125.4 (4.9)	
B2		mm (in)	254 (10.0)	
B3		mm (in)	163.5 (6.4)	
B4		mm (in)	50.8 (2.0)	
B5		mm (in)	180 (7.1)	
B6		mm (in)	367 (14.4)	
B9		mm (in)	18.5 (0.7)	
C3		mm (in)	82 (3.2)	
D1		mm (in)	13 (0.5)	
D2		mm (in)	55.5 (2.2)	

TIGHTENING TORQUES

SPECIFIED TORQUES

Part to be tightened		Thread size	Tightening torques		
			Nm	m•kgf	ft•lb
POWER UNIT					
Intake silencer		M6	3	0.3	2.2
Electric oil pump		M6	8	0.8	5.8
Fuel injection unit		M6	10	1.0	7.2
Atmospheric pressure sensor		M6	4	0.4	2.9
Electric oil pump bracket		M6	8	0.8	5.8
Throttle position sensor		M5	4	0.4	2.9
Intake air temperature sensor		M12	8	0.8	5.8
Drive belt tensioner		M10	40	4.0	29
Mechanical fuel pump		M8	23	2.3	17
Fuel rail		M8	23	2.3	17
Fuel injector cap		M8	26	2.6	19
Fuel filter nut holder		M6	8	0.8	5.8
Oil pump		M6	7	0.7	5.1
Emergency switch		—	4	0.4	2.9
Flywheel magnet assembly		M20	190	19	137
Negative battery lead		M8	9	0.9	6.5
Positive battery lead		M8	9	0.9	6.5
Apron		M6	8	0.8	5.8
Power unit mount		M8	21	2.1	15
Starter relay holder		M5	3	0.3	2.2
Oxygen density sensor cover		M6	9	0.9	6.5
Oxygen density sensor bracket		M6	14	1.4	10
Oxygen density sensor		M18	49	4.9	35
Reed valve assembly		M6	10	1.0	7.2
Reed valve		M5	3	0.3	2.2
Reed valve stopper		M3	1	0.1	0.7
Shift position switch		M4	3	0.3	2.2
Spark plug		M14	25	2.5	18
Thermostat cover	1st	M6	5	0.5	3.6
	2nd		11	1.1	8.0
Cylinder head cover	1st	M6	5	0.5	3.6
	2nd		11	1.1	8.0
Engine cooling water temperature sensor		—	15	1.5	11
Cylinder head	1st	M8	15	1.5	11
	2nd		30	3.0	22
Cooling water pressure control valve cover	1st	M6	4	0.4	2.9
	2nd		8	0.8	5.8
Exhaust port outer cover	1st	M6	4	0.4	2.9
	2nd		8	0.8	5.8

TIGHTENING TORQUES

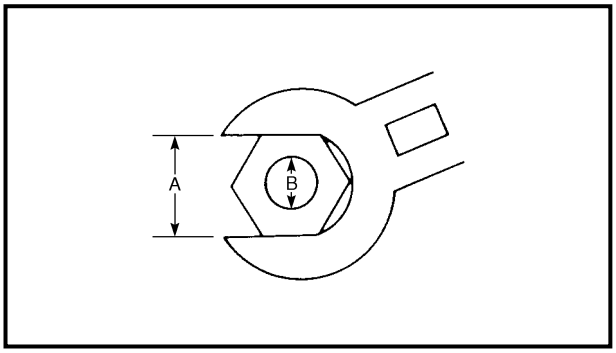
E

Part to be tightened		Thread size	Tightening torques		
			Nm	m•kgf	ft•lb
Crankcase	1st	M8	10	1.0	7.2
	2nd		18	1.8	13
	1st	M10	20	2.0	14
	2nd		40	4.0	29
Connecting rod	1st	M8	19	1.9	14
	2nd		37	3.7	27
	3rd		*		
	4th		19	1.9	14
	5th		37	3.7	27
LOWER UNIT					
Propeller		M18	55	5.5	40
Lower unit		M10	40	4.0	29
Ring nut		—	145	14.5	105
Pinion nut		M22	95	9.5	68
Gear oil drain screw		—	7	0.7	5.1
Gear oil level check screw		—	7	0.7	5.1
BRACKET UNIT					
Flushing hose		M5	5	0.5	3.6
Shift rod detent mechanism screw		—	24	2.4	17
Upper mount		M12	53	5.3	38
Lower mount		M14	73	7.3	53
Exhaust manifold assembly		M8	21	2.1	15
Muffler		M8	18	1.8	13
Exhaust manifold		M8	18	1.8	13
Lower exhaust manifold guide		M8	18	1.8	13
Clamp bracket		M22	15	1.5	11
Trim sensor stopper		M6	2	0.2	1.4
Trim stopper		—	37	3.7	27
POWER TRIM AND TILT UNIT					
Power trim and tilt reservoir cap		—	8	0.8	5.8
Power trim and tilt reservoir		1/4″	5	0.5	3.6
Power trim and tilt motor		1/4″	5	0.5	3.6
Manual valve		—	4	0.4	2.9
Tilt ram end screw		—	130	13	94
Gear pump unit		5/16″	9	0.9	6.5
Gear pump		—	6	0.6	4.3
Trim ram end screw		—	80	8.0	52

*: Loosen

TIGHTENING TORQUES

Nut (A)	Bolt (B)	General torque specifications		
		Nm	m•kgf	ft•lb
8 mm	M5	5	0.5	3.6
10 mm	M6	8	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



GENERAL TORQUES

This chart specifies tightening torques for standard fasteners with a standard ISO thread pitch. Tightening torque specifications for special components or assemblies are provided in applicable sections of this manual. To avoid warpage, tighten multi-fastener assemblies in a crisscross fashion and progressive stages until the specified tightening torque is reached. Unless otherwise specified, tightening torque specifications require clean, dry threads. Components should be at room temperature.

CHAPTER 3
PERIODIC INSPECTIONS AND ADJUSTMENTS

MAINTENANCE INTERVAL CHART

Use the following chart as a guide to general maintenance intervals.
Dependant on operating conditions, adjust the maintenance intervals accordingly.

Item	Remarks	Initial		Every		Refer to page
		10 hours (Break-in)	50 hours (3 months)	100 hours (6 months)	200 hours (1 year)	
TOP COWLING						
Top cowling fit	Check				○	3-3
FUEL SYSTEM						
Fuel line	Check	○	○	○		3-3
Fuel filter	Clean/check	○	○	○		3-4
Mechanical fuel pump oil	Change				○	3-6
Fuel tank	Clean				○	—
POWER UNIT						
Water leakage	Check	○	○	○		—
Motor exterior	Check	○	○	○		—
Exhaust leakage	Check	○	○	○		—
Cooling water passage(*1)	Clean		○	○		—
CONTROL SYSTEM						
Throttle valve synchronization	Check/adjust				○	3-7
Engine idling speed	Check/adjust	○		○		3-9
Throttle position sensor	Check/adjust				○	3-8
Remote control shift cable	Check/adjust				○	3-10
Remote control throttle cable	Check/adjust				○	3-10
Drive belt(*2)	Check/adjust				○	3-11
OIL INJECTION SYSTEM						
Oil tank water drain	Clean	○	○	○		—
Oil pump lever	Check/adjust	○				3-13
POWER TRIM AND TILT UNIT						
Power trim and tilt fluid	Check	○	○	○		3-15
LOWER UNIT						
Gear oil	Change	○		○		3-16
Lower unit leakage	Check				○	3-18
Propeller and cotter pin	Check/replace	○	○	○		6-3, 6-30

(*1) When operating in salt water, turbid or muddy water, the engine should be flushed with clean water after each use.
(*2) Be sure to replace the drive belt after every 1,000 hours (5 years) of operation.