

YAMAHA

290 pgs



SERVICE MANUAL

RA700S, T ('94~'95)

RA700AT ('95)

RA700BU, BV ('96~'97)

RA760U ('96)

RA1100T, U ('95~'96)

PREFACE

This manual has been prepared by the Yamaha Motor Company 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.

**RA700S,T/RA700AT/RA700BU,BV/RA760U/RA1100T,U
SERVICE MANUAL**

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1st Edition, January 1996

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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 inspection 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/Damage → Replace.

To assist you to find your way about this manual, the Section Title and Major Heading is given at the head of every page.

An Index to contents is provided on the first page of each Section.

MODEL INDICATION

Multiple models are shown in this manual. These indications are noted as follows.

	WaveRaider	WaveRaider-DX	WaveRaider-1100
Model Name	RA700	RA700A	RA1100
Indication	RA700	RA700A	RA1100

THE ILLUSTRATIONS

Some illustrations in this manual may differ from the model you have. This is because a procedure described may relate to several models, though only one may be illustrated. (The name of model described will be mentioned in the description).

REFERENCES

These have been kept to a minimum; however, when you are referred to another section of the manual, you are told the page number to go to.

WARNINGS, CAUTIONS AND NOTES

Attention is drawn to the various Warnings, Cautions and Notes which distinguish important information in this manual 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 water vehicle.

CAUTION

A CAUTION indicates special precautions that must be taken to avoid damage to the water vehicle.

NOTE:

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

IMPORTANT:

This part has been subjected to change of specification during production.

SPECIFICATIONS

These are given in bold type at each procedure. It is not necessary to leave the section dealing with the procedure in order to look up the specifications.

It is important to note the differences in specifications of models. When a procedure relates to more than one model, the main differences in specifications will be shown in a following table.

Model name	RA700	RA700A	RA1100
Number of cylinder	2	2	3
Speed meter	—	○	○

HOW TO READ DESCRIPTIONS

1. A disassembly installation job mainly consists of the exploded diagram ①.
2. The numerical figures represented by the number ② indicates the order of the job steps.
3. The symbols represented by the number ③ indicates the contents and notes of the job.
For the meanings of the symbols, refer to the next page(s).
4. The REMOVAL AND INSTALLATION CHART ④ is attached to the exploded diagram and explains the job steps, part names, notes for the jobs, etc.
5. The SERVICE POINTS, other than the exploded diagram, explains in detail the items difficult to explain in the exploded diagram or REMOVAL AND INSTALLATION CHART, the Service points requiring the detailed description ⑤, etc.

JET PUMP **NOZZLE, DUCT AND INTAKE**

**NOZZLE, DUCT AND INTAKE
EXPLODED DIAGRAM**

























6-3

JET PUMP **NOZZLE, DUCT AND INTAKE**

REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
NOZZLE, DUCT AND INTAKE DISASSEMBLY			Follow the left "Step" for removal. Refer to the "JET PUMP UNIT REMOVAL" section.
	Jet pump unit		
1	Bolt (with washer)	2	
2	Collar	2	
3	Nozzle deflector assembly	1	
4	Bolt	4	
5	Intake duct	1	
6	Pin	2	
7	Housing	1	
8	Pin	2	
9	Impeller duct assembly	1	
10	Pin	2	
11	Nozzle	1	
12	Bolt (with washer)	1	
13	Spacer	1	
14	Oil seal	2	
15	Bushing	1	
16	Bolt (with washer)	6	
17	Intake screen	1	
NOZZLE DEFLECTOR DISASSEMBLY			
①	Bolt (with washer)	2	6 × 20 mm
②	Collar	2	
③	Nut	1	M6
④	Plate washer	2	
⑤	Ball joint	1	M6
⑥	Nozzle deflector	1	
⑦	Nut	1	M8
⑧	Plate washer	2	
⑨	Ball joint	1	M8
⑩	Trim ring	1	
			Reverse the removal steps for installation.

6-4

① GEN INFO 	② SPEC 
③ INSP ADJ 	④ FUEL 
⑤ POWR 	⑥ JET PUMP 
⑦ ELEC 	⑧ HULL HOOD 
⑨ TRBL ANLS 	⑩ 
⑪ 	⑫ 
⑬ 	⑭ 
⑮ 	⑯ 
⑰ 	⑱ 
⑲ 	⑳ 
㉑ 	㉒ 
㉓ 	㉔ 

SYMBOLS

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

- ① General Information
- ② Specifications
- ③ Periodic Inspection and Adjustment
- ④ Fuel System
- ⑤ Power Unit
- ⑥ Jet pump Unit
- ⑦ Electrical System
- ⑧ Hull and Hood
- 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 valve
[Resistance (Ω), Voltage (V), Electric current (A)]

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

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









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

- ⑲ Apply Gasket maker®
- ㉑ Apply Yamahabond #4 (Yamaha bond No.4)
- ㉒ Apply LOCTITE® No. 271 (Red LOCTITE)
- ㉓ Apply LOCTITE® No. 242 (Blue LOCTITE)
- ㉔ Apply LOCTITE® No. 572
- ㉕ Apply Silicon sealant

NOTE:

In this manual, the above symbols may not be used in every case.

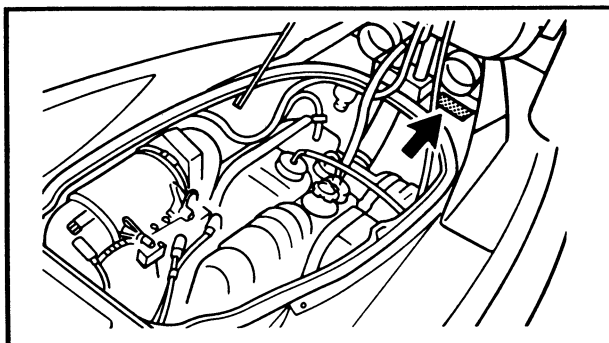
INDEX

GENERAL INFORMATION	 GEN INFO	1
SPECIFICATIONS	 SPEC	2
PERIODIC INSPECTION AND ADJUSTMENT	 INSP ADJ	3
FUEL SYSTEM	 FUEL	4
POWER UNIT	 POWR	5
JET PUMP UNIT	 JET PUMP	6
ELECTRICAL UNIT	 ELEC	7
HULL AND HOOD	 HULL HOOD	8
TROUBLE-ANALYSIS	? TRBL ANLS	9

CHAPTER 1

GENERAL INFORMATION

IDENTIFICATION NUMBERS	1-1
PRIMARY I.D. NUMBER	1-1
ENGINE SERIAL NUMBER	1-1
PUMP SERIAL NUMBER	1-1
HULL IDENTIFICATION NUMBER (H.I.N.)	1-2
 SAFETY WHILE WORKING	 1-3
FIRE PREVENTION	1-3
VENTILATION	1-3
SELF-PROTECTION	1-3
OILS, GREASES AND SEALING FLUIDS	1-3
GOOD WORKING PRACTICES	1-4
DISASSEMBLY AND ASSEMBLY	1-5
 SPECIAL TOOLS	 1-6
MEASURING	1-6
REMOVAL AND INSTALLATION	1-7

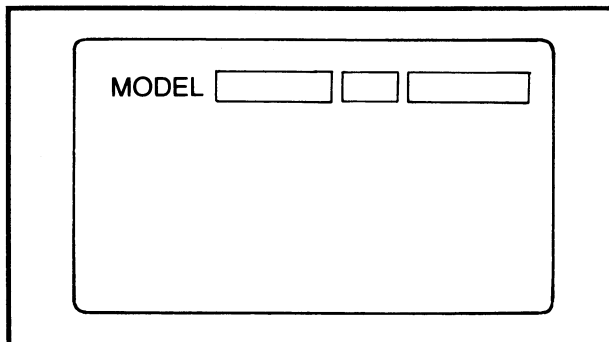


A60700-0*

IDENTIFICATION NUMBERS

PRIMARY I.D. NUMBER

The primary I.D. number is stamped on a plate attached to the hull on the front of the engine hood.

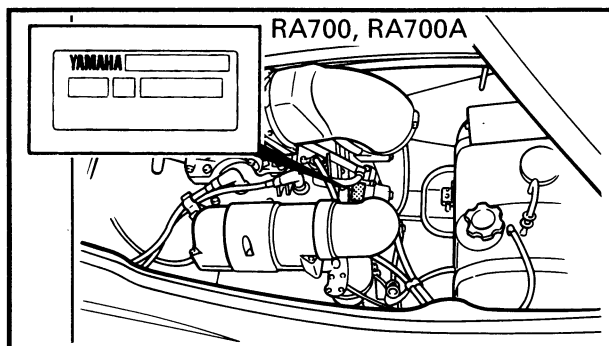


Starting primary I.D. number:

GH1: 900101 ~

GH6: 800101 ~, 600101 ~ (FRA)

GJ1: 800101 ~, 600101 ~ (FRA)

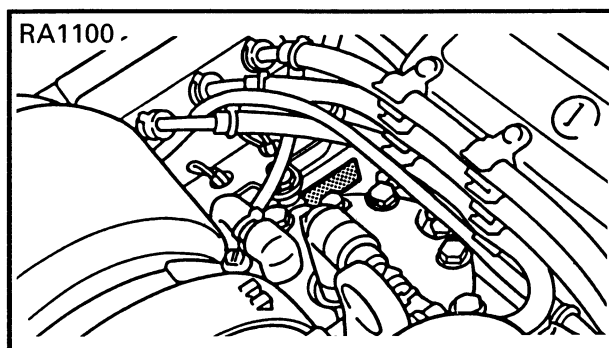


ENGINE SERIAL NUMBER

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

Starting serial number:

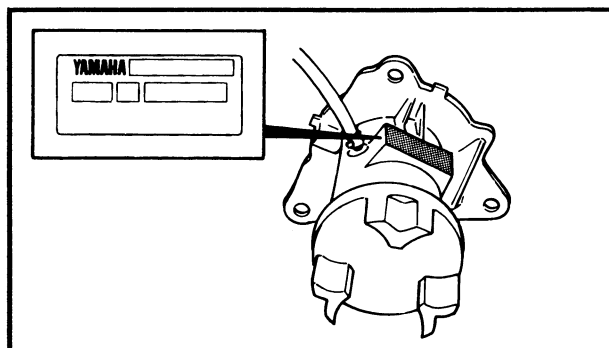
62T: 000101 ~



The engine serial number is stamped on a label attached on the back side of the electrical box.

Starting serial number:

63M: 000101 ~



PUMP SERIAL NUMBER

The jet pump unit serial number is stamped on a plate attached to the intermediate housing.

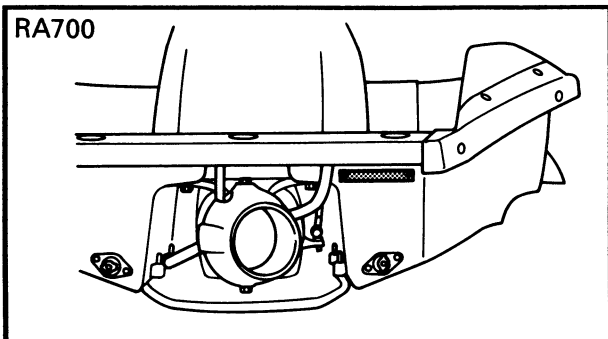
Starting serial number:

62T: 500101 ~

63M: 500101 ~



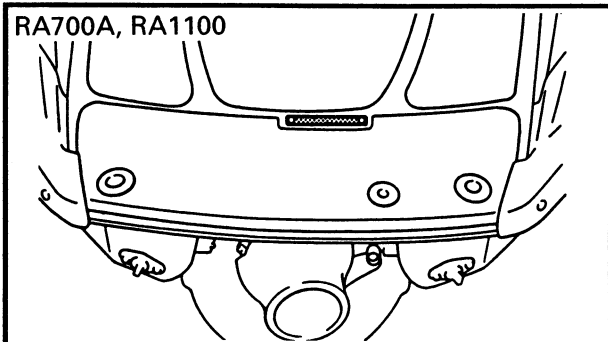
RA700



**HULL IDENTIFICATION NUMBER
(H.I.N.)**

The H.I.N. is stamped on a plate attached to the hull beside the jet nozzle.

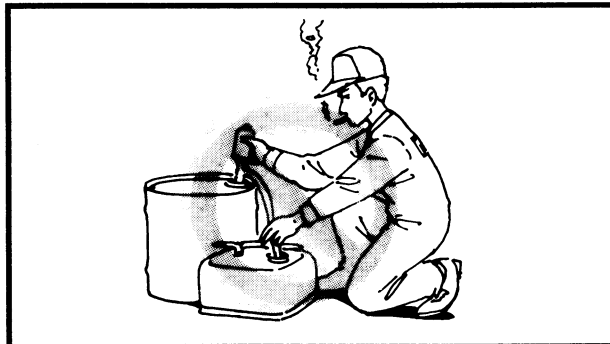
RA700A, RA1100



The H.I.N. is stamped on a plate 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.

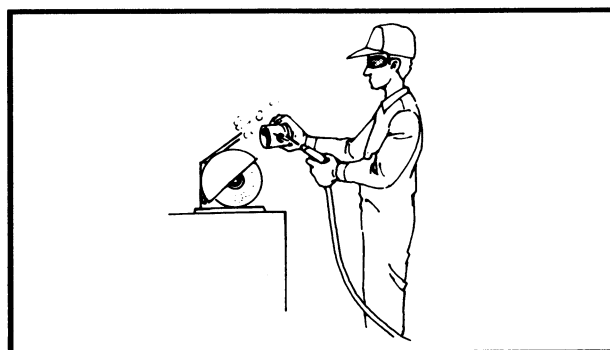


FIRE PREVENTION

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

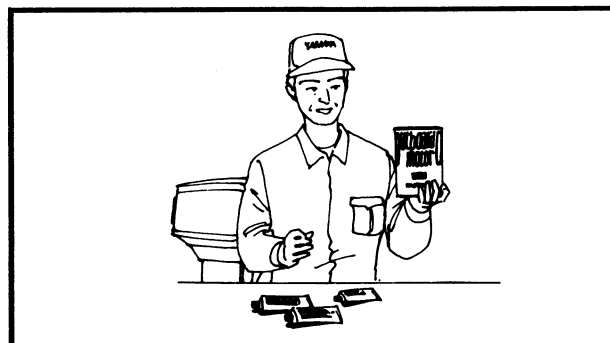
Petroleum vapor is heavier than air and if inhaled in large quantities will not support life. Engine exhaust gases are harmful to breathe. When test-running an engine indoors, maintain good ventilation.



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.

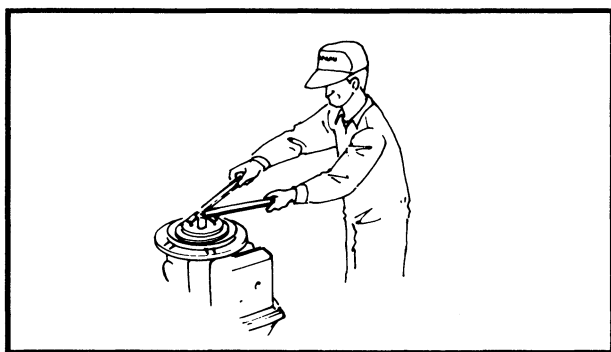


OILS, GREASES AND SEALING FLUIDS

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

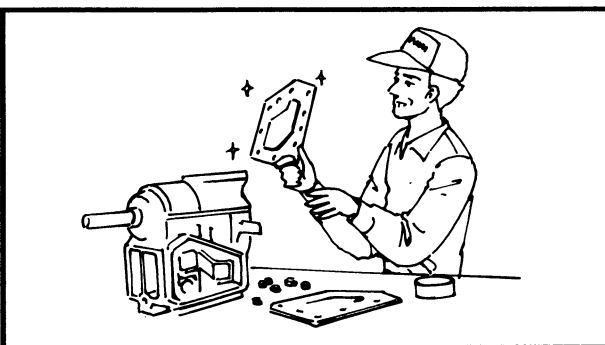
Under normal conditions of use, there should be no hazards from the use of the lubricants mentioned in this manual, but safety is all-important, and by adopting good safety practises, any risk is minimized. A summary of the most important precautions is as follows

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.



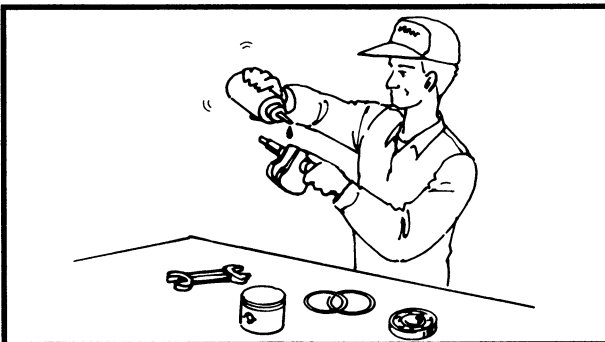
GOOD WORKING PRACTICES

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.



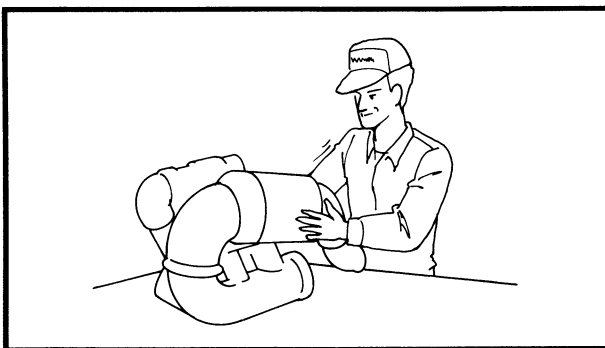
3. Non-reusable items

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.

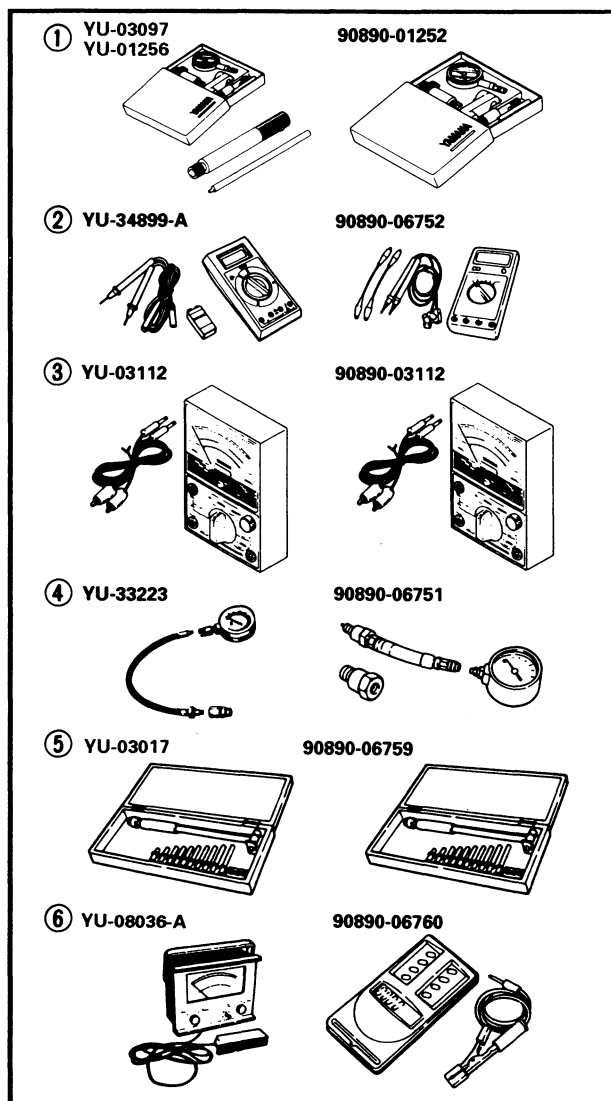
5. When installing oil seals, apply a light coating of water-resistant grease to the outside diameter.

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.

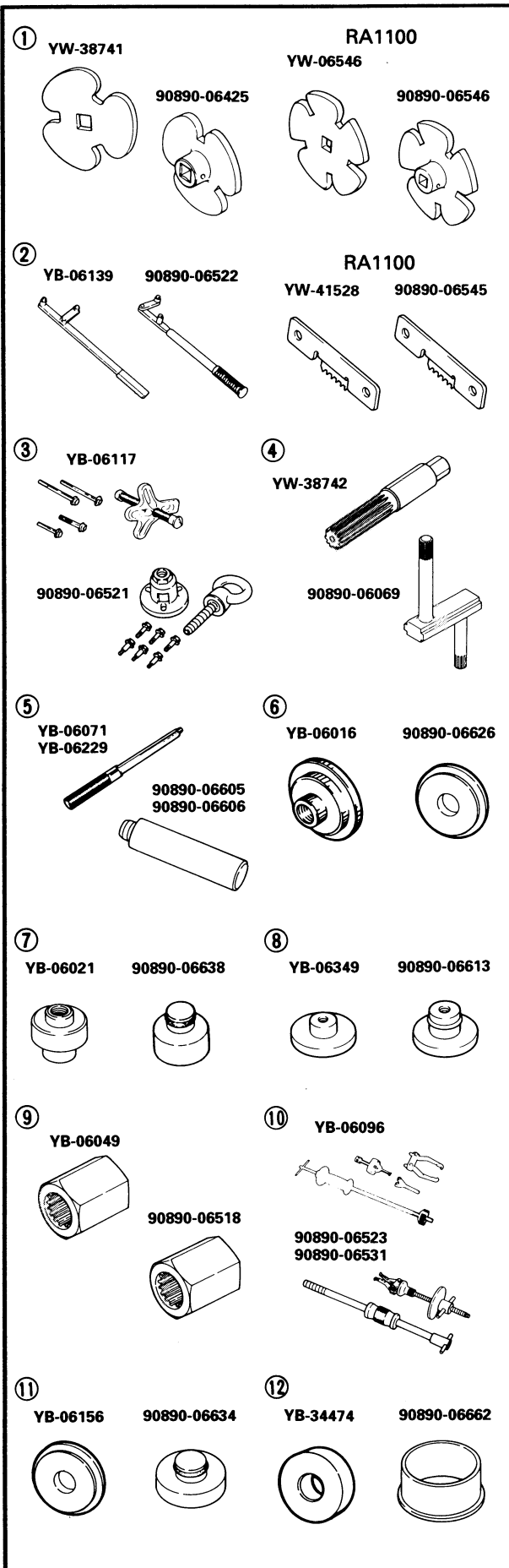
NOTE:

- 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


REMOVAL AND INSTALLATION

1. Coupler wrench
P/N. YW-38741
90890-06425
RA1100
P/N. YW-06546
90890-06546
2. Flywheel holder
P/N. YB-06139
90890-06522
RA1100
P/N. YW-41528
90890-06545
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
90890-06605
90890-06606
6. Bearing outer race attachment
(Intermediate shaft)
P/N. YB-06016
90890-06626
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-06349
90890-06613
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
90890-06662

CHAPTER 2

SPECIFICATIONS

GENERAL SPECIFICATIONS	2-1
MAINTENANCE SPECIFICATIONS	2-3
ENGINE	2-3
ELECTRICAL	2-5
TIGHTENING TORQUE	2-6
SPECIFIED TORQUE	2-6
GENERAL TORQUE	2-7


GENERAL SPECIFICATIONS

Item	Unit	Model		
		RA700	RA700A	RA1100
MODEL CODE:				
Hull		GH1	GH6	GJ1
Engine		62T		63M
DIMENSIONS:				
Length	mm (in)	2,860 (112.6)		
Width	mm (in)	1,120 (44.1)		
Height	mm (in)	970 (38.2)		
Dry weight	kg (lb)	176 (388)	219 (483)	245 (540)
PERFORMANCE:				
Maximum speed	km/h (mph)	83 (51.6)	81 (50.3)	91 (56.5)
Minimum turning radius	m (ft)	0		
Maximum output	kW (hp)/rpm	58.8 (80)/6,250		80.9 (110)/6,500
Maximum fuel consumption	l/h (US gal/h, Imp gal/h)	34 (9.0, 7.5)		46 (12.2, 10.1)
Cruising range (at full throttle)	hr.	1.2	1.5	1.1
ENGINE:				
Engine type		2-stroke		
Number of cylinders		2	3	
Displacement	cm ³ (cu. in)	701 (42.78)	1,051 (64.14)	
Bore and stroke	mm (in)	81 × 68 (3.19 × 2.68)		
Compression ratio		7.2 : 1	5.8 : 1	
Intake system		Reed valve		
Carburetor type		Floatless type		
Number of carburetors		2	3	
Carburetor starting system		Choke		
Scavenging system		Loop charged		
Lubrication system*		Oil Injection/Premix		
Cooling system		Water-cooled		
Starting system		Electric starter		
Ignition system		C.D.I.		
Ignition timing	Degrees	15 BTDC ~ 21 BTDC	15 BTDC ~ 19 BTDC	
Spark plug (NGK)		BR8HS		
Battery capacity	V/kC (A•h)	12/68.4 (19)		
Lighting coil	A/rpm	3 ± 1/5,500	7 ± 1/6,500	
DRIVE UNIT:				
Propulsion system		Jet pump		
Jet pump type		Axial flow, single stage		
Impeller rotation (rear view)		Counterclockwise		
Transmission		Direct drive from engine		
Steering (nozzle) angle	Degrees	23 ± 1		

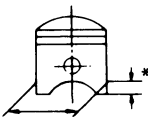

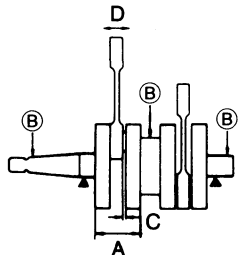
Item	Unit	Model		
		RA700	RA700A	RA1100
FUEL AND OIL:				
Fuel		Regular gasoline		
Oil		2 stroke outboard motor oil		
Fuel and oil mixing ratio*		50 : 1		
Fuel tank capacity reserve	l (US gal, Imp gal)	40 (10.6, 8.8) 11.6 (3.1, 2.6)	50 (13.2, 11.0) 8.8 (2.3, 1.9)	
Oil tank capacity (oil injection system model)*	l (US gal, Imp gal)	4.0 (1.1, 0.9)	3.8 (1.0, 0.8)	

*Differs according to specification.



MAINTENANCE SPECIFICATIONS

ENGINE

Item	Unit	Model		
		RA700	RA700A	RA1100
Cylinder head: Warpage limit	mm (in)	0.1 (0.004)		
Cylinder:				
Bore size	mm (in)	81.00 ~ 81.02 (3.189 ~ 3.190)		
Wear limit	mm (in)	81.10 (3.193)		
Taper limit	mm (in)	0.08 (0.003)		
Out of round limit	mm (in)	0.05 (0.002)		
Piston:				
Piston size	mm (in)	80.925 ~ 80.950 (3.186 ~ 3.187)		80.885 ~ 80.890 (3.184 ~ 3.185)
Measuring point*	mm (in)	10 (0.4)		
 Piston clearance	mm (in)	0.080 ~ 0.085 (0.0031 ~ 0.0033)		0.110 ~ 0.115 (0.0043 ~ 0.0045)
Limit	mm (in)	0.13 (0.005)		0.16 (0.006)
Offset (exhaust side)	mm (in)	0.5 (0.02)		1.5 (0.06)
Piston ring:				
Type		Keystone		
Sectional sketch (B × T) 	mm (in)	1.2 × 2.9 (0.047 × 0.114)		
Side clearance	mm (in)	0.02 ~ 0.06 (0.001 ~ 0.002)		
End gap (installed)	mm (in)	0.2 ~ 0.4 (0.008 ~ 0.016)		
Piston pin:				
Outside diameter	mm (in)	19.995 ~ 20.000 (0.7872 ~ 0.7874)		
Limit	mm (in)	19.98 (0.786)		
Crankshaft:				
Crank width "A"	mm (in)	61.95 ~ 62.00 (2.439 ~ 2.441)		
Runout limit "B"	mm (in)	0.05 (0.002)		
Connecting rod big end side clearance "C"	mm (in)	0.25 ~ 0.75 (0.010 ~ 0.030)		
Small end free play limit "D"	mm (in)	2.0 (0.08)		
				



Item	Unit	Model		
		RA700	RA700A	RA1100
Carburetor: Stamped mark		62T01F (#1) 62T01R (#2)		63M00F (#1) 63M00C (#2) 63M00R (#3)
Main nozzle	ø mm (in)	2.5 (0.10)		
Main jet 2 (M.J.2)		120(#1), 130(#2)		107.5(#1,3), 95(#2)
Pilot jet (P.J.)		67.5		75
Low speed screw	Turns out	5/8 ± 1/4		1-1/8 ± 1/4
Throttle valve (Th.V.)		190		145
Valve seat (V.S.)	ø mm (in)	1.5 (0.06)		
High speed screw	Turns out	5/8(#1), 1-1/8(#2) ± 1/4		7/8 ± 1/4
Trolling speed	rpm	1,250 ± 50		
Reed valve: Thickness	mm (in)	0.2 (0.008)		0.42 (0.017)
Valve lift	mm (in)	9.0 ± 0.2 (0.35 ± 0.01)		
Bending limit	mm (in)	0.2 (0.008)		
Jet pump:				
Impeller clearance	mm (in)	0.3 ~ 0.4 (0.01 ~ 0.02)		
Service limit	mm (in)	0.6 (0.024)		
Impeller shaft run out	mm (in)	0.3 (0.012)		




























ELECTRICAL

Item	Unit	Model		
		RA700	RA700A	RA1100
Ignition system: Type	Degrees	CDI magneto		
Ignition timing at 1,200 rpm at 5,500 rpm	Degrees	BTDC 15 BTDC 21		BTDC 15 BTDC 19
Stator:				
Model/Manufacturer		F3T30572/MITSUBISHI	63M-00/ YAMAHA	
Pulser coil resistance (color)	Ω	12.6 ~ 15.4 (W/R – B)	248 ~ 372 (W/R – B) (W/B – B) (W/G – B)	
Charging coil resistance (color)	Ω	497.7 ~ 608.3 (B/W – B)	172 ~ 258 (Br/R – Br) 656 ~ 984 (Br/R – L)	
CDI unit:				
Stamped mark		6M6-01	63M-00	
Model/Manufacturer		F-6192X/MITSUBISHI	63M00/ YAMAHA	
Over revolution limit	r/min	7,200 ± 200	7,100 ± 200	
Overheat revolution control	r/min	3,400 ± 400	3,500 ± 200	
Ignition coil:				
Model/Manufacturer		F6T53293/MITSUBISHI	63M-X0/ YAMAHA	
Primary winding resistance	Ω	0.078 ~ 0.106 (O – B)	0.18 ~ 0.24 (B/W – B)	
Secondary winding resistance	kΩ	14.3 ~ 30.5 (High tension cords)	2.7 ~ 4.1 (B/W – High tension cord)	
Charging system:		Flywheel magneto		
Type				
Lighting coil resistance (color)	Ω	1.14 ~ 1.40 (G – G)		0.56 ~ 0.84 (G – G)
Rectifier regulator:				
Model/Manufacturer		SH589-12/SHINDENGEN	SH643A-12/ SHINDENGEN	
Regulator voltage	V	14.3 ~ 15.3	14.2 ~ 15.2	
Thermo sensor:				
ON	°C (°F)	66 ~ 74 (100.4 ~ 125.6)	93 (199.4)	
OFF	°C (°F)	43 ~ 57 (78.8 ~ 93.2)	83 (181.4)	
Starter motor:				
Model/Manufacturer		SM13237/MITSUBA	SM13453/ MITSUBA	
Brush length limit	mm (in)	5.0 (0.20)	6.5 (0.26)	
Commutator undercut limit	mm (in)	0.2 (0.01)		
Commutator diameter limit	mm (in)	27 (1.06)		
Fuse:	A	10		



TIGHTENING TORQUE SPECIFIED TORQUE

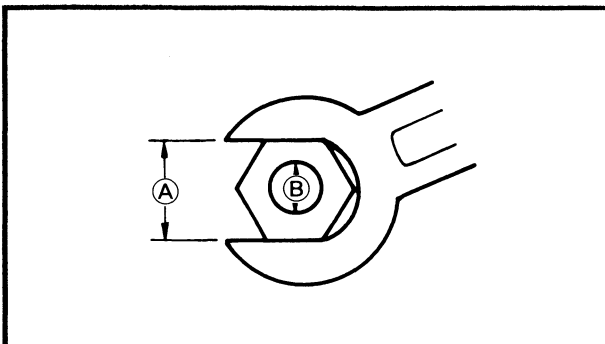
Part to be tightened		Part name	Size	Q'ty		Tightening torque			Remarks
				700	1100	Nm	m•kg	ft•lb	
ENGINE:									
Electric box		Bolt	M8	3	–	16	1.6	11	 271
Mounting bolt		Bolt	M8	4		17	1.7	12	 271
Reed valve		Screw	M4	16	24	1	0.1	0.7	 242
Exhaust ring		Bolt	M8	4		30	3.0	22	 271
Exhaust chamber		Bolt	M10	2		40	4.0	29	 271
Muffler stay		Bolt	M10	4		40	4.0	29	 271
Exhaust chamber - Muffler stay	1st	Bolt	M10	2		2	0.2	1.4	 271
	2nd					47	4.7	34	
Exhaust outer cover	1st	Bolt	M8	–	6	15	1.5	11	 271
	2nd					30	3.0	22	
Muffler 1	1st	Bolt	M10	8	–	22	2.2	16	 271
	2nd					40	4.0	29	
	1st	Bolt	M10	–	12	15	1.5	11	 271
	2nd					30	3.0	22	
Cylinder body	1st	Bolt	M10	6	8	23	2.3	17	 572
	2nd					40	4.0	29	
Cylinder head cover	1st	Bolt	M8	–	13	15	1.5	11	 572
	2nd					30	3.0	22	
	1st	Bolt	M6	–	2	4	0.4	29	 572
	2nd					8	0.8	5.8	
Cylinder head	1st	Bolt	M8	10	14	15	1.5	11	 572
	2nd					36	3.6	25	
Spark plug		Bolt	M14	2	3	20	2.0	14	
Flywheel bolt		Bolt	M10	1		70	7.0	50	 E
Coupling		Nut	M27	1		37	3.7	27	 572
Crankcase	1st	Bolt	M8	8	12	15	1.5	11	 572
	2nd					28	2.8	20	
Mount bracket	1st	Bolt	M10	7	9	23	2.3	17	 271
	2nd					53	5.3	38	
Flame arrester cover		Bolt	M6	6	8	2	0.2	1.4	
Starter motor terminal nut		Nut	M6	1		5	0.5	3.6	
JET UNIT:									
Mounting bolt		Bolt	M10	4		34	3.4	24	 271
			M6	2		7	0.7	5.1	
Ride plate		Bolt	M8	4	6	17	1.7	12	 242
Speed sensor		Screw	M5	4		4	0.4	2.9	 242
Intake screen		Bolt	M6	6		11	1.1	8.0	 242
Impeller (left-hand threads)		Bolt	M20	1		18	1.8	13	 572
Coupling		Nut	M27	1		37	3.7	27	 572
Intermediate housing		Bolt	M8	3		17	1.7	12	 242



Nut (A)	Bolt (B)	General torque specifications		
		Nm	m•kg	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

GENERAL TORQUE

This chart specifies the torques 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.



CHAPTER 3

PERIODIC INSPECTION AND ADJUSTMENT

MAINTENANCE INTERVAL CHART	3-1
PERIODIC SERVICE.....	3-3
CONTROL SYSTEM	3-3
Pivot shaft bearing inspection.....	3-3
Steering cable inspection and adjustment.....	3-3
Throttle cable inspection and adjustment.....	3-4
Choke cable inspection and adjustment.....	3-5
Trim control cable inspection and adjustment	3-5
FUEL SYSTEM.....	3-8
Fuel filter inspection.....	3-8
Trolling speed inspection and adjustment.....	3-8
Carburetor adjustment.....	3-9
OIL INJECTION SYSTEM	3-10
Oil filter inspection	3-10
Oil injection pump air bleeding.....	3-10
POWER UNIT.....	3-11
Spark plug inspection	3-11
ELECTRICAL	3-12
Battery inspection.....	3-12
JET PUMP UNIT	3-14
Impeller inspection.....	3-14
Bilge strainer inspection	3-14
GENERAL.....	3-15
Drain plug inspection	3-15
Greasing point	3-15

MAINTENANCE INTERVAL CHART

The following chart should be considered strictly as a guide to general maintenance intervals.

Depending on operating conditions, the intervals of maintenance may need to be adjusted.

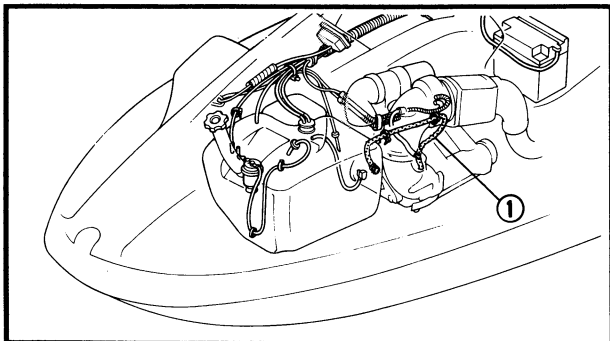
Item	Remarks	Initial		Every		Refer page
		10 hours (Break-in)	50 hours (3 months)	100 hours (6 months)	200 hours (1 year)	
CONTROL SYSTEM:						
Steering cable	Inspection/Adjustment			○		3-3
Throttle cable	Inspection/Adjustment			○		3-4
Carburetor throttle shaft	Inspection			○		—
Choke cable	Inspection/Adjustment			○		3-5
Quick shift trim cable	Inspection/Adjustment			○		3-5
Quick shift trim system	Inspection/Adjustment			○		3-5
FUEL SYSTEM:						
Fuel tank	Cleaning				○	4-7
Fuel filter	Cleaning/Replacement	○			○	3-8
Fuel line	Inspection			○		4-2
Trolling speed	Inspection/Adjustment			○		3-8
Carburetor setting	Inspection/Adjustment	○		○		3-9
OIL INJECTION SYSTEM:						
Oil injection system	Inspection/Cleaning	○			○	4-21
POWER UNIT:						
Spark plug	Inspection/Cleaning/ Adjustment	○	○	○		3-11
Cooling-water passage	Cleaning/Flashing		○			—
Coupling rubber	Inspection				○	5-48
ELECTRICAL:						
Battery	Inspection	○				3-12
JET PUMP UNIT:						
Impeller	Inspection		○	○		3-14
Bilge strainer	Cleaning		○	○		3-14
GENERAL:						
Bolt and nut	Retightening	○		○		—
Drain plug	Inspection/Replacement				○	3-15
Greasing point	Greasing			○		3-15
Bearing housing	Greasing	○ *1		○ *2		3-15
Starter motor idle gear	Greasing	○ *3		○ *4		3-15

*1: Grease capacity 33.0 ~ 35.0 cm³ (1.11 ~ 1.18 oz.)

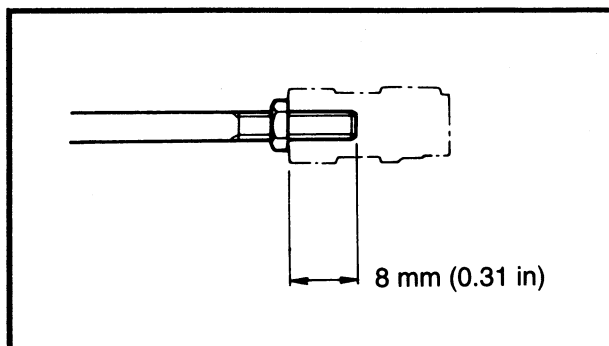
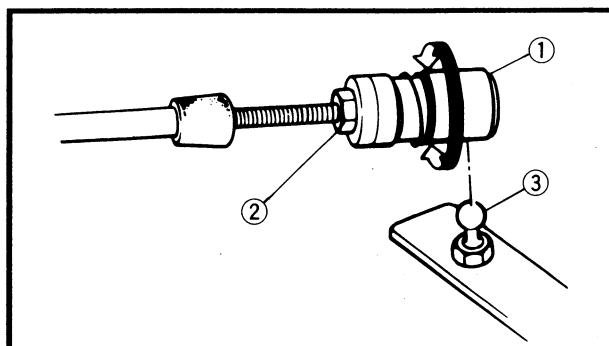
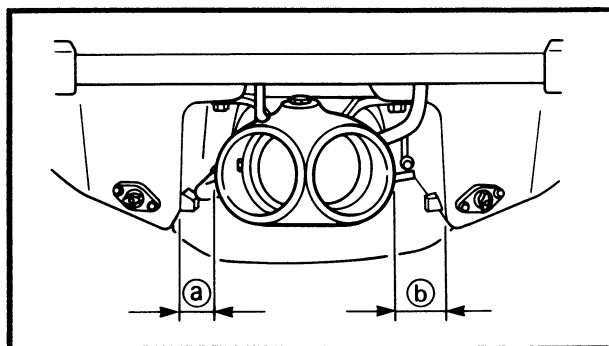
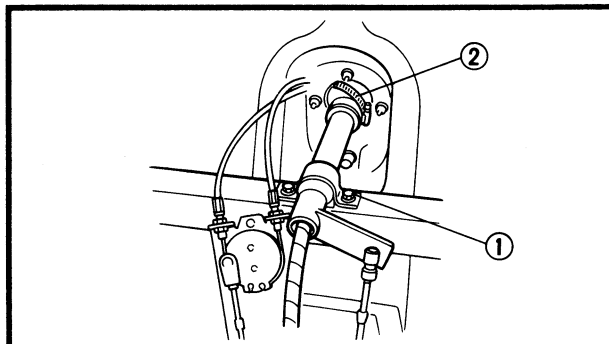
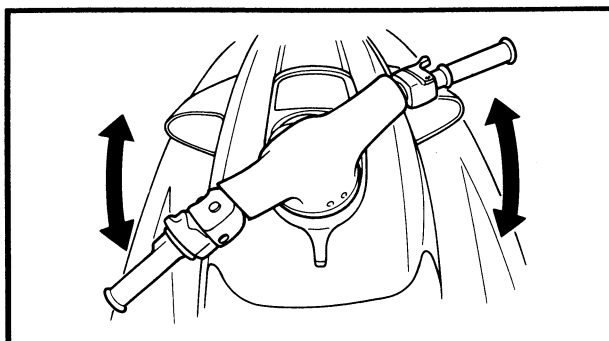
*2: Grease capacity 6.0 ~ 8.0 cm³ (0.20 ~ 0.27 oz.)

*3: Grease capacity for 1100 model: 8.0 cm³ (0.27 oz.)

*4: Grease capacity for 1100 model: 2.0 cm³ (0.07 oz.)

**CAUTION:**

- For the RA700, RA700A:
Kink the pilot hose ① when running the engine at full throttle for more than 15 seconds as the water vehicle is moored or is in a test tank.
 - For the RA1100:
Do not run the engine at full throttle when the water vehicle is moored or is in a test tank.
-



PERIODIC SERVICE

CONTROL SYSTEM

Pivot shaft bearing inspection

1. Inspect:

- Pivot shaft bearing
Excessive play → Replace bearings.
Refer to the “STEERING SYSTEM” section in chapter 8.

Inspection steps:

- Move the handlebar up and down.
- Move the handlebar back and forth.

NOTE:

Check that the pivot shaft support bolt ① is secured first.

- If the pivot shaft becomes loose, retighten the clamp ② until a satisfactory feel is obtained.

Steering cable inspection and adjustment

1. Inspect:

- Jet nozzle clearance ①, ②

Inspection steps:

- Turn the handlebar lock to lock.
- Measure the clearances ① and ②.
- If the ① and ② clearances are not even, adjust the clearances.

2. Adjust:

- Cable joint (handle side) ①

Adjustment steps:

- Disconnect the cable joint from the ball joint ③.
- Loosen the lock nut ②.
- Turn the cable joint to adjust.

Turn in

Clearance ① is increased.

Turn out

Clearance ② is increased.

⚠ WARNING

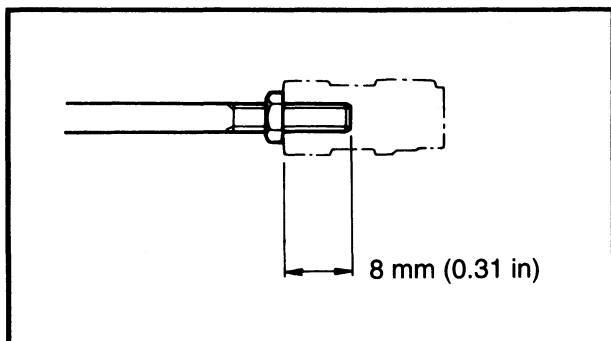
The cable joint must be screwed in more than 8 mm (0.31 in).

- Tighten the lock nut and connect the cable joint.



Lock nut:

3 Nm (0.3 m • kg, 2.2 ft • lb)



NOTE: _____

If correct adjustment cannot be obtained using the cable joint at the handlebar end adjust the cable joint at the steering nozzle end.

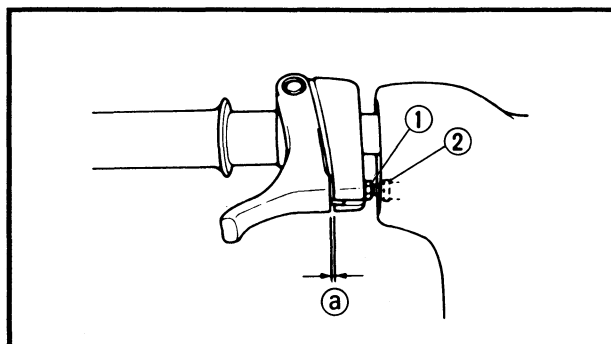
Throttle cable inspection and adjustment

NOTE: _____

Before adjusting the throttle lever free play, the trolling speed should be adjusted.

1. Measure:

- Throttle lever free play ①
- Out of specification → Adjust.



Throttle lever free play:
RA700, RA700A
 7 ~ 10 mm (0.28 ~ 0.39 in)
RA1100
 4 ~ 7 mm (0.16 ~ 0.28 in)

2. Adjust:

- Throttle lever free play

Adjustment steps:

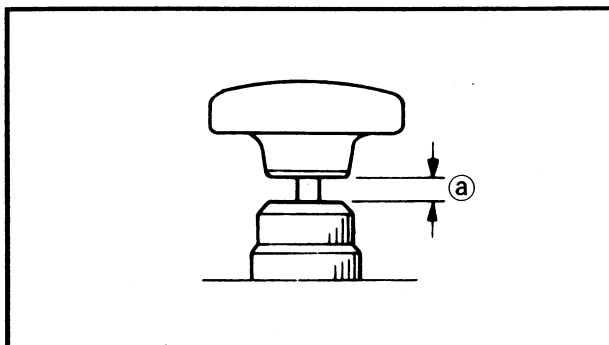
- Loosen the lock nut ①.
- Turn the adjuster ② in/out until the specified free play is obtained.

Turn in	Free play is increased.
Turn out	Free play is decreased.

- Tighten the lock nut.

⚠ WARNING _____

After adjusting the free play, turn the handlebar to right and left, and make sure that the trolling speed does not increase.



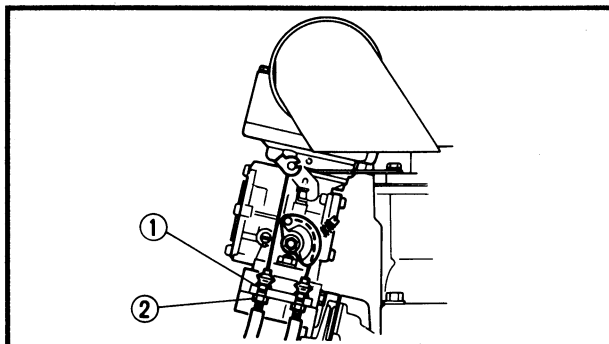
Choke cable inspection and adjustment

1. Measure:

- Choke cable free play ①
- Out of specification → Adjust.



Choke cable free play:
1 ~ 6 mm (0.04 ~ 0.24 in)



2. Adjust:

- Choke cable free play

Adjustment steps:

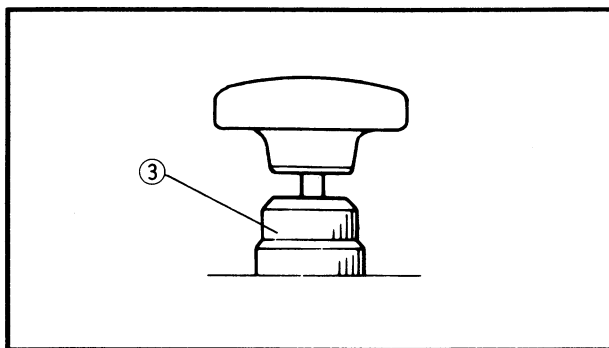
- Loosen the lock nut ①.
- Turn the adjuster ② in/out until the specified free play is obtained.

Turn in	Free play is increased.
Turn out	Free play is decreased.

- Tighten the lock nut.



Lock nut:
9 Nm (0.9 m • kg, 6.5 ft • lb)

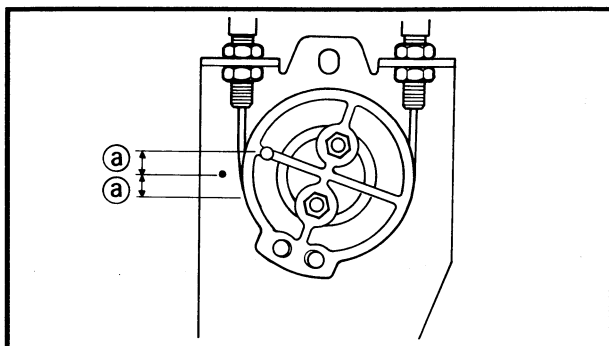


3. Inspect:

- Pull knob farthest toward
- Knob automatically returns → Adjust.

4. Adjust:

- Adjust nut ③
- Turn in to stop automatic return.



Trim control cable inspection and adjustment

1. Measure:

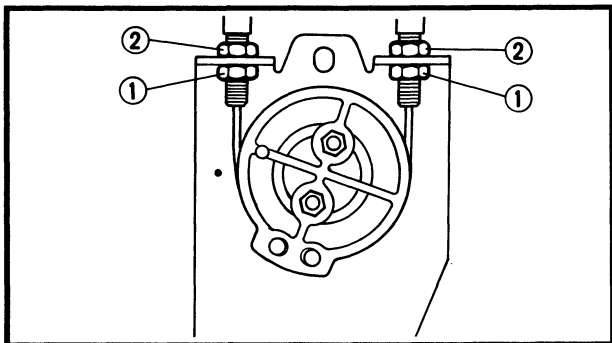
- Wheel free play ①
- Out of specification → Adjust.



Wheel free play:
1.5 ~ 3.5 mm (0.06 ~ 0.14 in)

NOTE: _____

- Set the grip handle in the neutral position.
- Disconnect the trim control cable.



2. Adjust:


- Pull cable

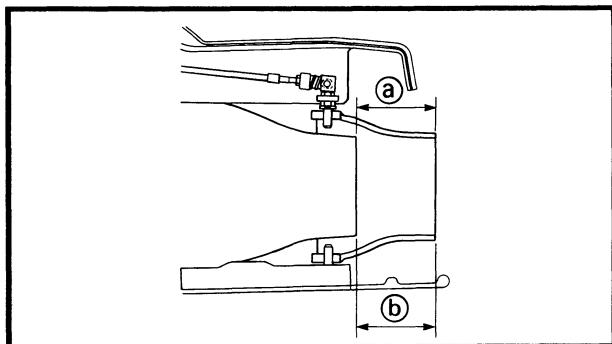
Adjustment steps:

- Loosen the lock nut ①.
- Turn the adjust nut ② in/out until the specified free play is obtained.

Turn in	Free play is decreased.
Turn out	Free play is increased.


- Tighten the lock nut.

	Lock nut: 16 Nm (1.6 m • kg, 11 ft • lb)
---	--



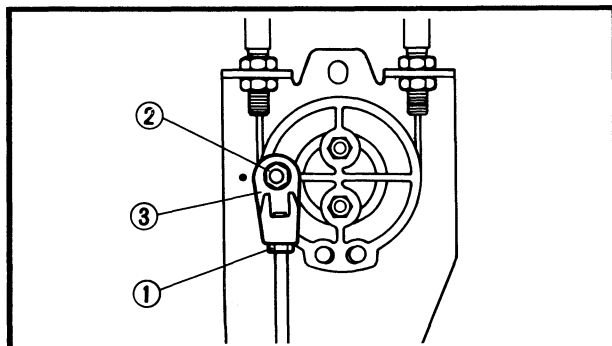
3. Measure:

- Nozzle deflector set length ①, ②
- Out of specification → Adjust.

	Nozzle deflector set length ①, ②: ① = 68 ± 1 mm (2.68 ± 0.04 in) ② = 72 ± 1 mm (2.83 ± 0.04 in)
---	--

NOTE:

- Set the handle grip in the neutral position.
- Set the handlebar in the neutral position.



4. Adjust:

- Trim control cable

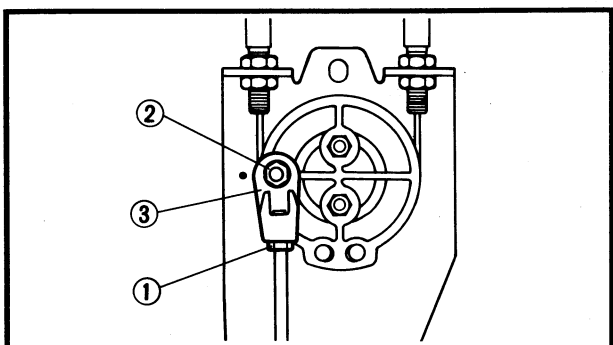
Adjustment steps:

- Loosen the lock nut ①.
- Remove the lock nut ② and cable joint ③.
- Turn the cable joint to adjust.

Turn in	Length ② is increased.
Turn out	Length ① is increased.

⚠ WARNING

The cable joint must be screwed in more than 8 mm (0.31 in).



- Connect the cable joint and tighten the lock nut ②.
- Tighten the lock nut ①



Lock nut:
4 Nm (0.4 m • kg, 2.9 ft • lb)

NOTE: _____
If correct adjustment cannot be obtained using the cable joint at the wheel end adjust the cable joint at the trim nozzle end.

FUEL SYSTEM

⚠ WARNING

- Stop the engine, set the fuel cock to "OFF" and loosen the fuel filler cap before a fuel system service.
- When removing fuel system parts, hold them in a cloth and take care that no fuel spills into the engine compartment.

Fuel filter inspection

1. Inspect:

- Filter element
Contamination → Replace.
- Filter body
Cracks/Damage → Replace.
- Filter assembly
Water contamination → Replace and check the fuel tank.

Trolling speed inspection and adjustment

1. Check:

- Trolling speed
Out of specification → Adjust.



Trolling speed:
1,250 ± 50 r/min

Checking steps: (vehicle on water)

- Start the engine and allow it to warm up for a few minutes.
- Attach the engine tachometer to the spark plug lead.



Engine tachometer:
YU-8036-A/90890-06760

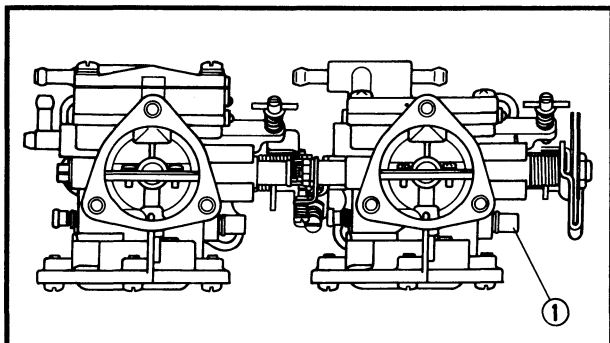
- Measure the engine trolling speed.

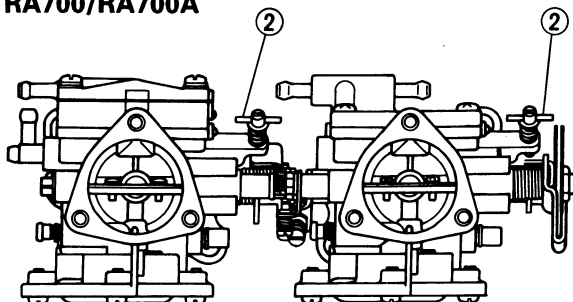
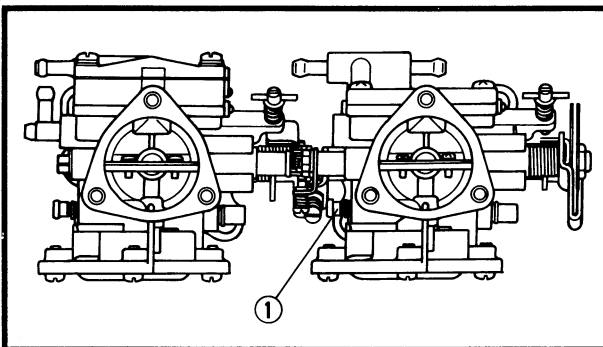
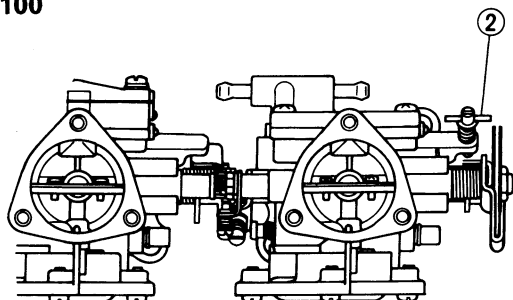
2. Adjust:

- Trolling speed

Adjustment steps:

- Screw in the low speed screws ① until they are lightly seated.




RA700/RA700A

RA1100


- Back the screws out by the specified number of turns.


Low speed screw:
RA700, RA700A
 $5/8 \pm 1/4$ (turns out)
RA1100
 $1-1/8 \pm 1/4$ (turns out)

- Start the engine and allow it to warm up for a few minutes.
- Turn the throttle stop screw(s) ② in or out until the specified speed is obtained.

Turning in
Increase trolling speed.
Turning out
Decrease trolling speed.
Carburetor adjustment
1. Adjust:

- High speed screw

Adjustment steps:

- Screw in the high speed screws ① until they are lightly seated.
- Back the screws out by the specified number of turns.


High speed screw:
RA700, RA700A
 $5/8$ (#1), $1-1/8$ (#2) $\pm 1/4$ (turns out)
RA1100
 $7/8 \pm 1/4$ (turns out)

OIL INJECTION SYSTEM

Oil filter inspection

1. Inspect:
 - Oil filter
Fray/Tear → Replace.
Muddy/Dirt → Clean.
 - Seal rubber
Wear/Crack → Replace.

Oil injection pump air bleeding

NOTE:

Bleed the oil injection system if:

- The system has been disassembled.
- The oil has been completely used up during operation.

1. Bleed:

- Air

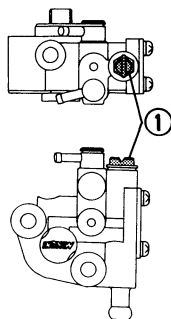
Air bleeding steps:

- a. Make sure the oil hose is connected.
- b. Refill the oil tank with oil.
- c. Hold a rag under the oil pump to catch any oil that spills out.
- d. To bleed, loosen the air bleeding screw ① on the oil injection pump. Oil will flow into the pump.
- e. Keep letting oil run out into the rag until there are no bubbles in the oil. If oil does not run out, squeeze the oil hose near the pump inlet several times.
- f. Tighten the screw firmly and wipe up any spilled oil.

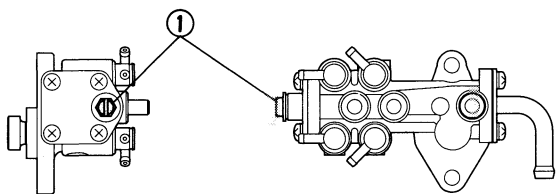


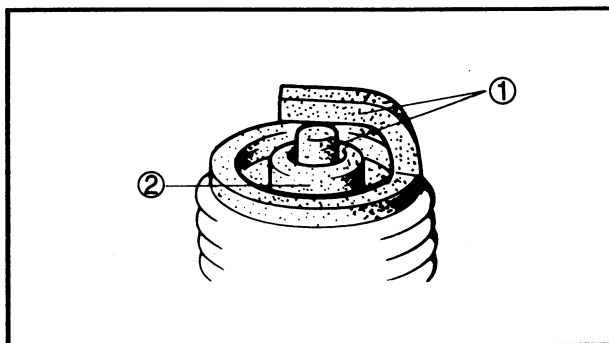
Screw:
5 Nm (0.5 m • kg, 3.6 ft • lb)

RA700, RA700A



RA1100





POWER UNIT

Spark plug inspection

1. Inspect:

- Electrode ①
Wear/Damage → Replace.
- Insulator color ②
Discolor → Check the engine condition.

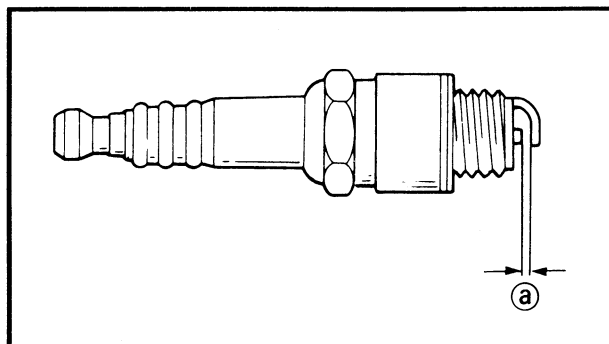


Color guide:

Medium to light tan color:
Normal

Whitish color:
Lean fuel mixture
Plugged fuel mixture
Air leak
Incorrect settings

Blackish color:
Overly rich mixture
Electrical malfunction
Excess oil used
Defective spark plug



2. Clean:

- Spark plug
Clean the spark plug with a spark plug cleaner or wire brush.

3. Measure:

- Spark plug gap ①
Out of specification → Alter gap.
Use a wire gauge.



Spark plug gap:

0.6 ~ 0.7 mm (0.024 ~ 0.028 in)

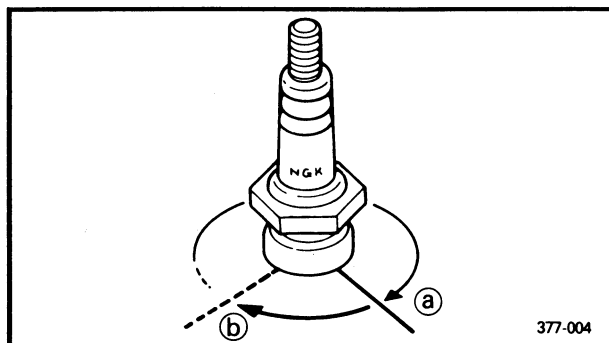
4. Tighten:

- Spark plug



Spark plug:

20 Nm (2.0 m • kg, 14 ft • lb)



NOTE:

- Before installing a spark plug, clean the gasket surface and plug surface. Also it is advisable to apply a thin film of Anti Seize Compound to the spark plug threads to prevent future thread seizure.
- If a torque wrench is not available, a good estimate of the correct torque for the spark plug is a further 1/4 to 1/2 turns ② on from finger tightness ①.

ELECTRICAL
Battery inspection
CAUTION:

Be careful not to place the battery on its side. Before adding the battery fluid or recharging, be sure to remove it from the engine compartment. When checking the battery, make sure the breather hose is connected to the battery and is not pinched shut anywhere in the engine compartment.

⚠ WARNING

- Battery electrolyte is poisonous and dangerous, causing severe burns, etc. Contains sulfuric acid.
- Avoid contact with skin, eyes or clothing.
- Antidote: EXTERNAL-Flush with water.
- INTERNAL-Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg or vegetable oil. Call a physician immediately. Eyes: Flush with water for 15 minutes and get prompt medical attention. Batteries produce explosive gases.
- Keep sparks, flame, cigarettes, etc., away. Ventilate when charging or using in an enclosed space. Always shield your eyes when working near batteries.
- KEEP OUT OF REACH OF CHILDREN.

1. Remove:

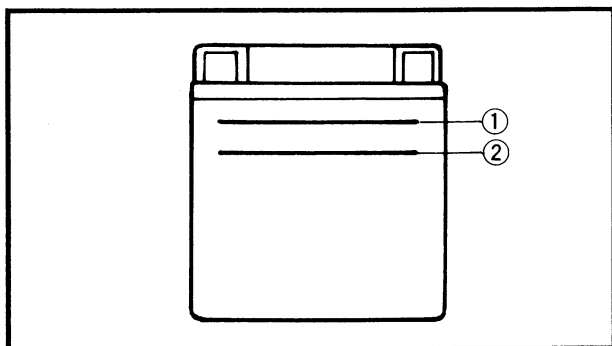
- Battery

⚠ WARNING

- When removing the battery, disconnect the negative lead first.
- Remove the battery to prevent acid loss during the impeller service.

2. Inspect:

- Battery fluid level
 Battery fluid level low → Top up with distilled water.
 Fluid level should be between upper ① and lower ② level marks.



Filling steps:

- Remove each filler cap using pliers.
- Fill with distilled water using a jug.
- When the acid is up to the UPPER LEVEL, allow the cell to stand for 20 minutes. If the acid level has dropped, add more acid up to the UPPER LEVEL once again.

CAUTION:

Water other than distilled water contains minerals which are harmful to a battery; top up only with distilled water.

3. Inspect:

- Battery fluid specific gravity
Out of specification → Charge.



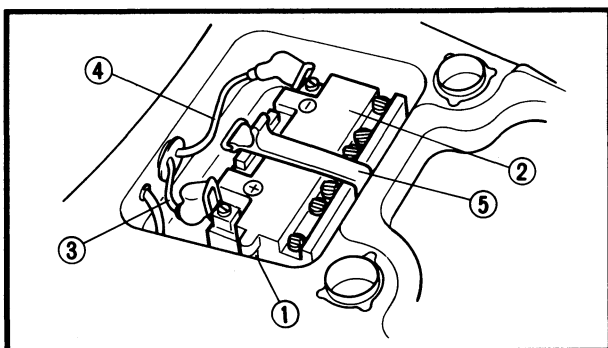
Specific gravity at 20°C (68°F):
1.28
Charging current:
68.4 kC (1.9 Amps × 10 Hrs)

4. Install:

- Filler cap

CAUTION:

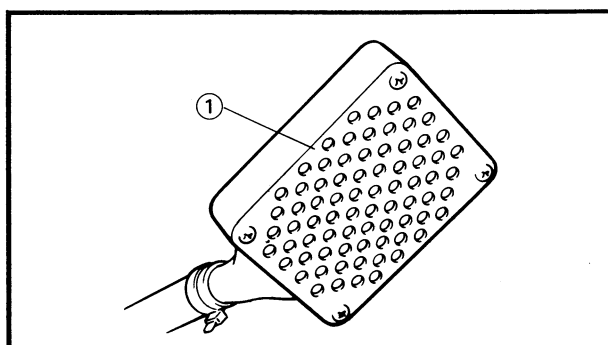
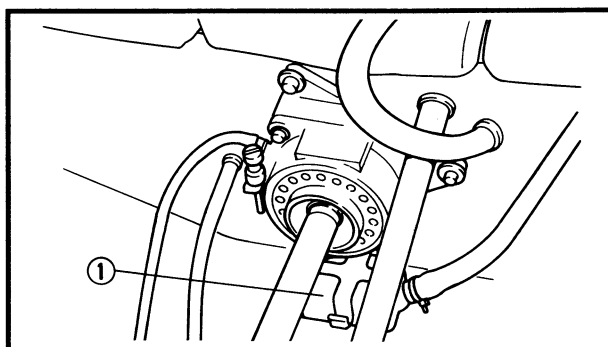
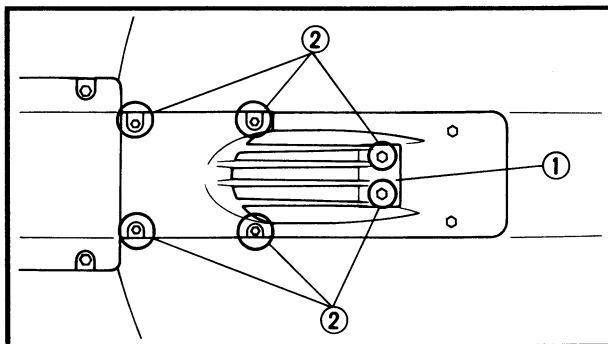
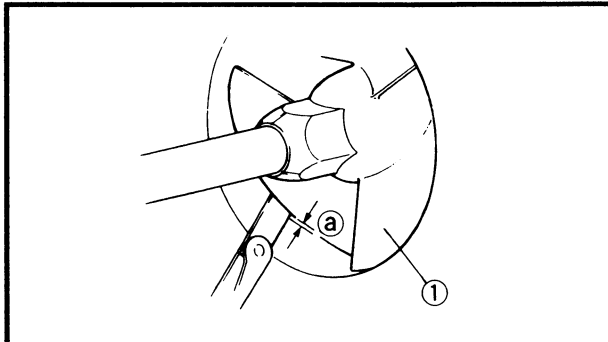
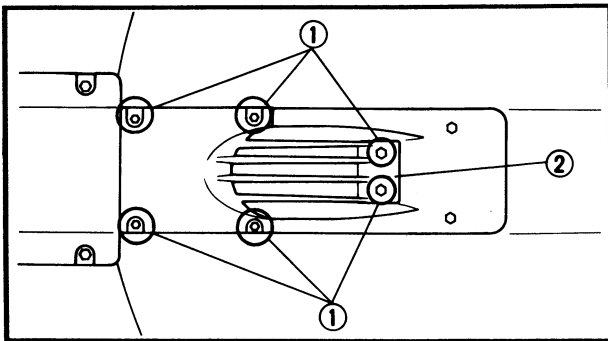
Rinse off any acid from the battery case and wipe the battery dry prior to installation.


5. Install:

- Breather hose ①
- Battery ②
- Positive lead ③
- Negative lead ④
- Battery band ⑤

CAUTION:

- **Connect the positive red lead ⊕ to the battery terminal first.**
- **Make sure the battery leads are connected properly. Reversing the leads can seriously damage the electrical system.**
- **Make sure the breather hose is properly connected and is not obstructed.**
- **Coat the terminals with a water resistant grease to minimize terminal corrosion.**



JET PUMP UNIT

Impeller inspection

- Remove:
 - Battery
Refer to "BATTERY" section.
- Remove:
 - Bolt ①
 - Intake screen ②
- Check:
 - Impeller ①
Wear/Damage → Replace.
Scratch/Nick → File/Grind.
- Measure:
 - Impeller clearance ③
Out of specification → Replace.



Measure at all four points.
Impeller clearance limit:
0.6 mm (0.024 in)

- Install:
 - Intake screen ①
 - Bolt ②



Bolt:
11 Nm (1.1 m • kg, 8.0 ft • lb)

- Install:
 - Battery
Refer to the "BATTERY" section.

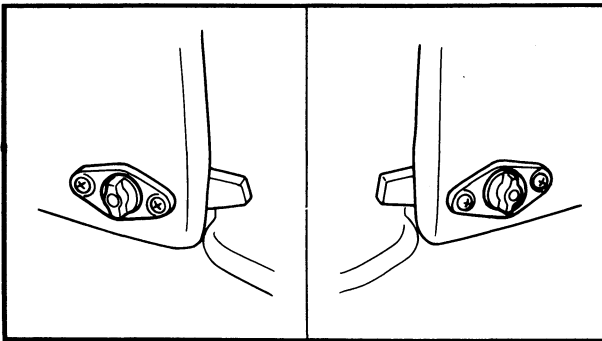
Bilge strainer inspection

- Remove:
 - Bilge strainer ①
(located under the coupling)

Removal steps:

- Remove the coupling cover.
- Disconnect the bilge strainer from the strainer holder.

- Inspect:
 - Strainer ①
Contamination → Clean.
Crack/Damage → Replace.



GENERAL

Drain plug inspection

1. Inspect:

- Drain plug
Crack/Damage → Replace.
- O-ring
Crack/Wear → Replace.
- Screw threads
Dirt/Sandy → Clean.

Greasing point

1. Apply:

- Throttle cable inner wire

NOTE:

Squeeze the throttle lever and remove the seal. Spray a rust-inhibitor into the outer cable.

- Pull cable inner wire



**Recommended fluid:
Rust-inhibitor**

- Throttle cable inner wire
- Choke cable inner wire
- Trim control cable
- Cable joint
- Steering cable

NOTE:

Remove the cable joint and apply a small amount of grease to the following parts.

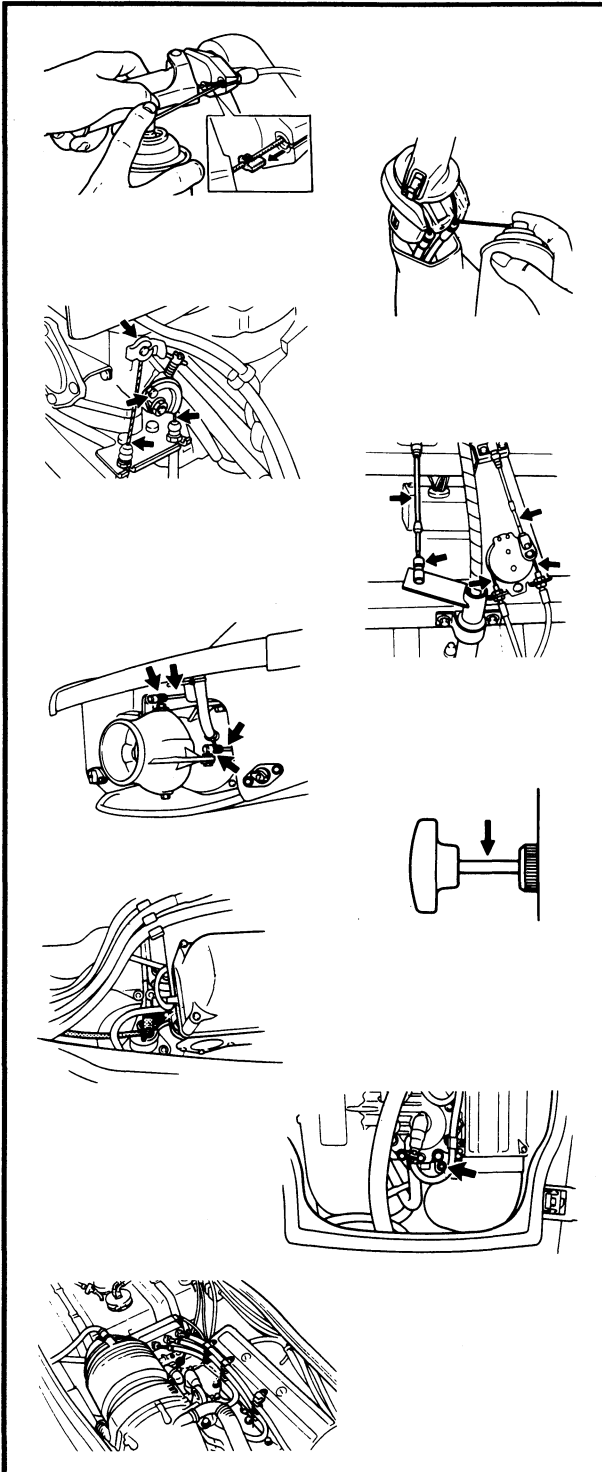
- Nozzle pivot shaft collar
- Steering pivot shaft bearing
- Choke knob shaft
- Bearing housing
- Starter idle gear



**Recommended grease:
Water resistant grease**

NOTE:

- Fill in the bearing housing with water resistant grease from a nipple.
- Fill the grease slowly and carefully, as it can damage the hose and the joints.
- Refer to the "MAINTENANCE INTERVAL CHART".





CHAPTER 4

FUEL SYSTEM

AIR VENTILATION HOSE, WATER SEPARATOR, FUEL COCK AND

FUEL FILTER.....	4-1
EXPLODED DIAGRAM	4-1
REMOVAL AND INSTALLATION CHART.....	4-2
SERVICE POINTS	4-2
Fuel filter and water separator inspection.....	4-2
Fuel cock inspection	4-2

OIL TANK AND FUEL TANK REMOVAL.....

EXPLODED DIAGRAM	4-3
REMOVAL AND INSTALLATION CHART.....	4-4

OIL TANK AND FUEL TANK.....

EXPLODED DIAGRAM	4-5
REMOVAL AND INSTALLATION CHART.....	4-6
SERVICE POINTS	4-6
Check valve inspection.....	4-6
Oil level sensor and fuel level sensor inspection	4-7
Oil tank and fuel tank inspection.....	4-7
Pipe joint inspection.....	4-7
Pipe joint installation.....	4-7

CARBURETOR REMOVAL.....

EXPLODED DIAGRAM (RA700, RA700A)	4-8
REMOVAL AND INSTALLATION CHART.....	4-9
EXPLODED DIAGRAM (RA1100)	4-10
REMOVAL AND INSTALLATION CHART.....	4-11

CARBURETOR.....

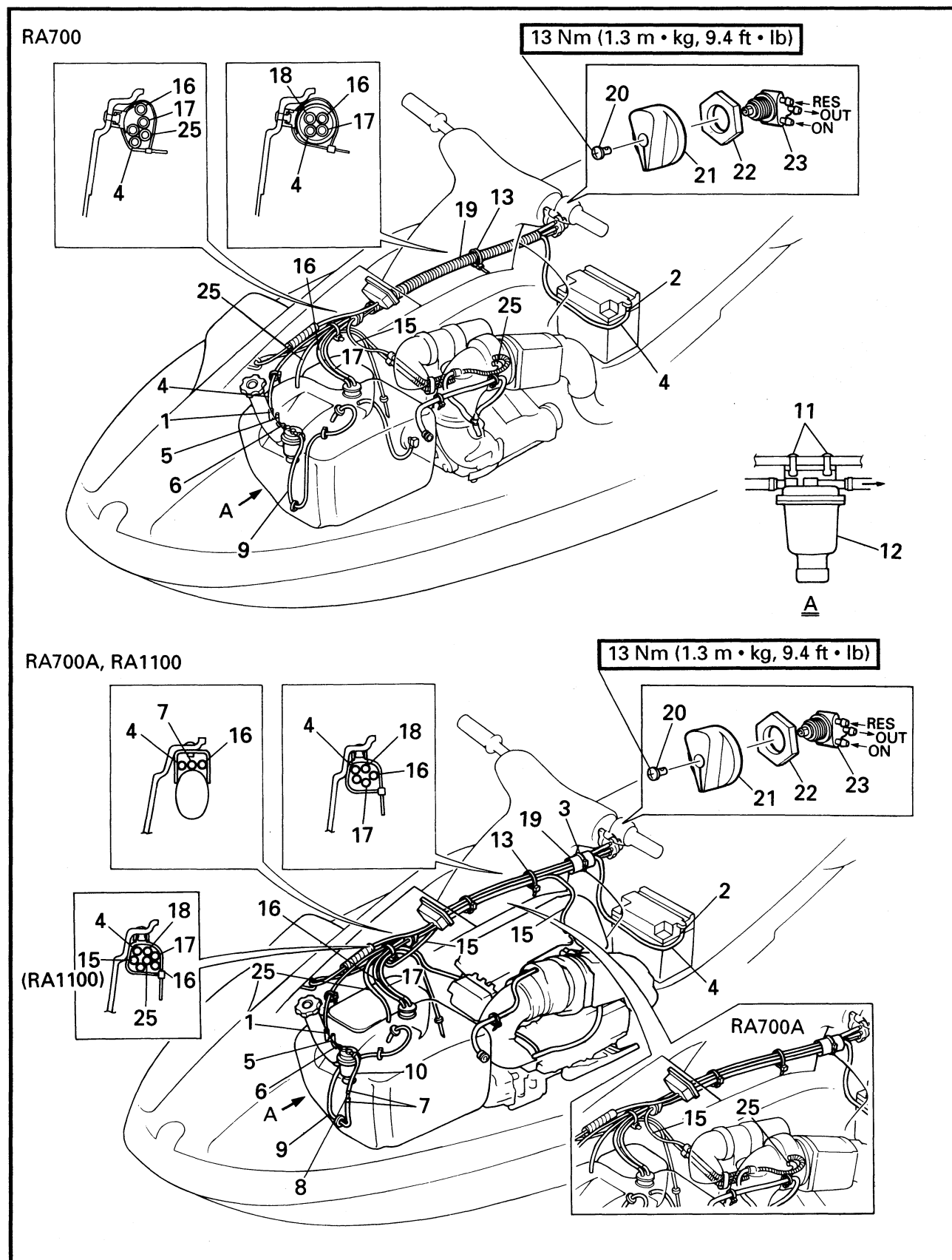
EXPLODED DIAGRAM (RA700, RA700A)	4-12
REMOVAL AND INSTALLATION CHART.....	4-13
EXPLODED DIAGRAM (RA1100)	4-14
REMOVAL AND INSTALLATION CHART.....	4-15
SERVICE POINTS	4-16
Diaphragm inspection.....	4-16
Float arm inspection.....	4-16
Body assembly inspection.....	4-16
Fuel pump inspection (RA700, RA700A).....	4-16
Filter inspection	4-16
Needle valve inspection.....	4-17
Jet and carburetor body inspection.....	4-17
High and low speed screws inspection	4-17
High and low speed screws adjustment.....	4-17
Throttle valve synchronization inspection and adjustment	4-18
Choke valve synchronization inspection and adjustment	4-19
Carburetor assembly	4-19

FUEL PUMP (RA1100)	4-20
EXPLODED DIAGRAM	4-20
REMOVAL AND INSTALLATION CHART.....	4-21
SERVICE POINTS	4-21
Fuel pump inspection.....	4-21
 OIL PUMP	4-22
EXPLODED DIAGRAM	4-22
REMOVAL AND INSTALLATION CHART.....	4-23
SERVICE POINTS	4-23
Oil pump inspection	4-23
Oil hose inspection.....	4-23



AIR VENTILATION HOSE, WATER SEPARATOR, FUEL COCK AND FUEL FILTER

AIR VENTILATION HOSE, WATER SEPARATOR, FUEL COCK AND FUEL FILTER EXPLODED DIAGRAM




REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty		Service points
	AIR VENTILATION HOSE AND WATER SEPARATOR REMOVAL	700	700A 1100	Follow the left "Step" for removal.
1	Hose tie	1	1	
2	Clip	1	1	
3	Clamp	–	1	
4	Battery air ventilation hose	1	1	
5	Hose tie	2	2	
6	Air ventilation hose	1	1	
7	Hose tie	2	4	
8	Hose joint	–	1	
9	Air ventilation hose	1	1	
10	Air ventilation hose	–	1	
11	Rivet	2	2	
12	Water separator	1	1	
	FUEL COCK AND FUEL FILTER REMOVAL			
13	Clamp	2	4	
14	Hose tie	8	8	
15	Fuel hose	1	1	
16	Fuel hose (ON)	1	1	
17	Fuel hose (RES)	1	1	
18	Fuel hose (OUT)	1	1	
19	Hose protector	1	1	
20	Screw	1	1	
21	Cock lever	1	1	
22	Nut	1	1	
23	Fuel cock body	1	1	
24	Hose tie	2	2	
25	Fuel hose (return)	1	1	
				Reverse the removal steps for installation.

SERVICE POINTS
Fuel filter and water separator inspection

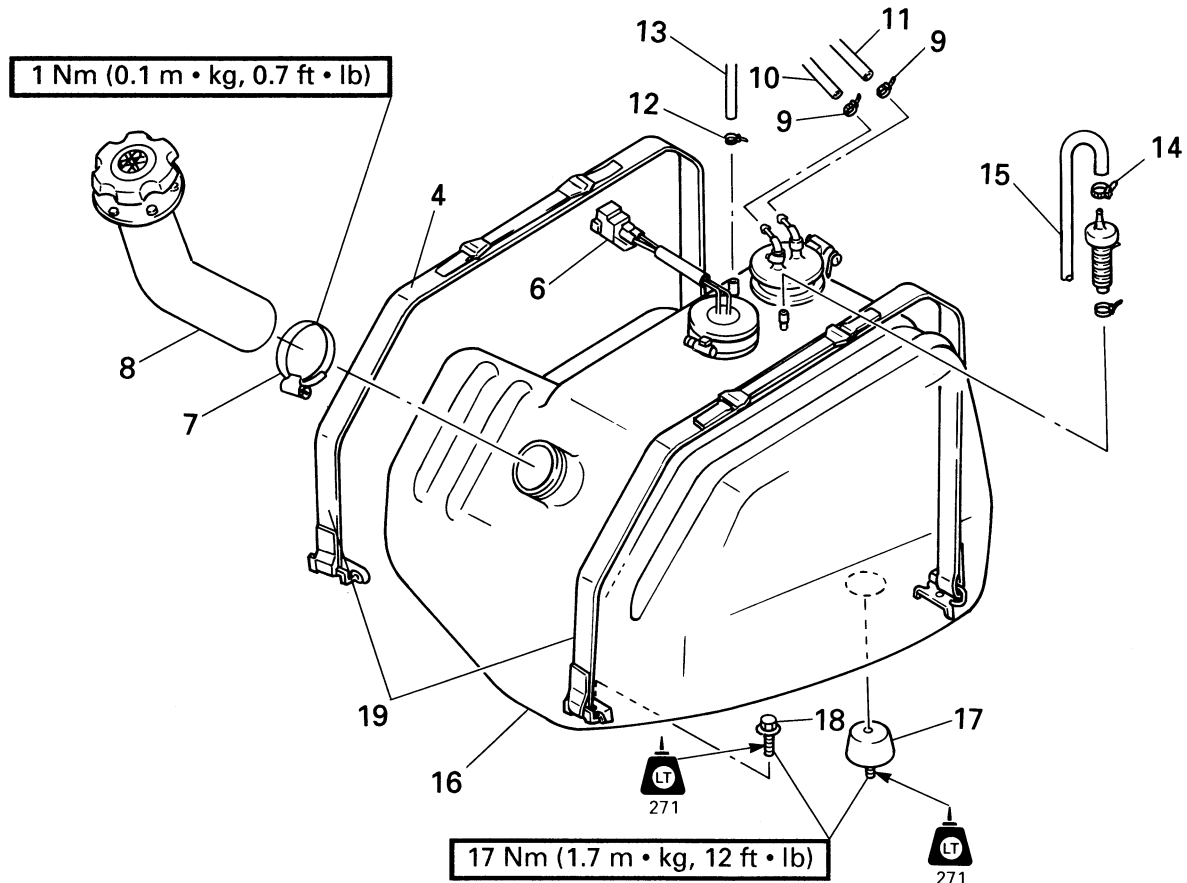
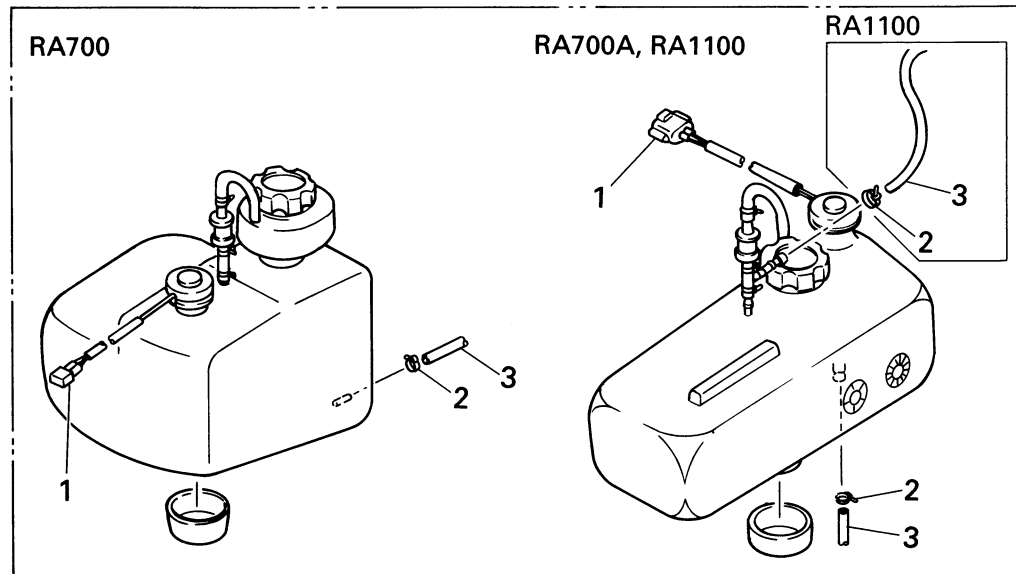
Refer to the "FUEL SYSTEM" section in chapter 3.

Fuel cock inspection
1. Check:

- Fuel cock
- Unsmooth movement → Replace.
- Clog → Clean.

OIL TANK AND FUEL TANK REMOVAL

OIL TANK AND FUEL TANK REMOVAL EXPLODED DIAGRAM





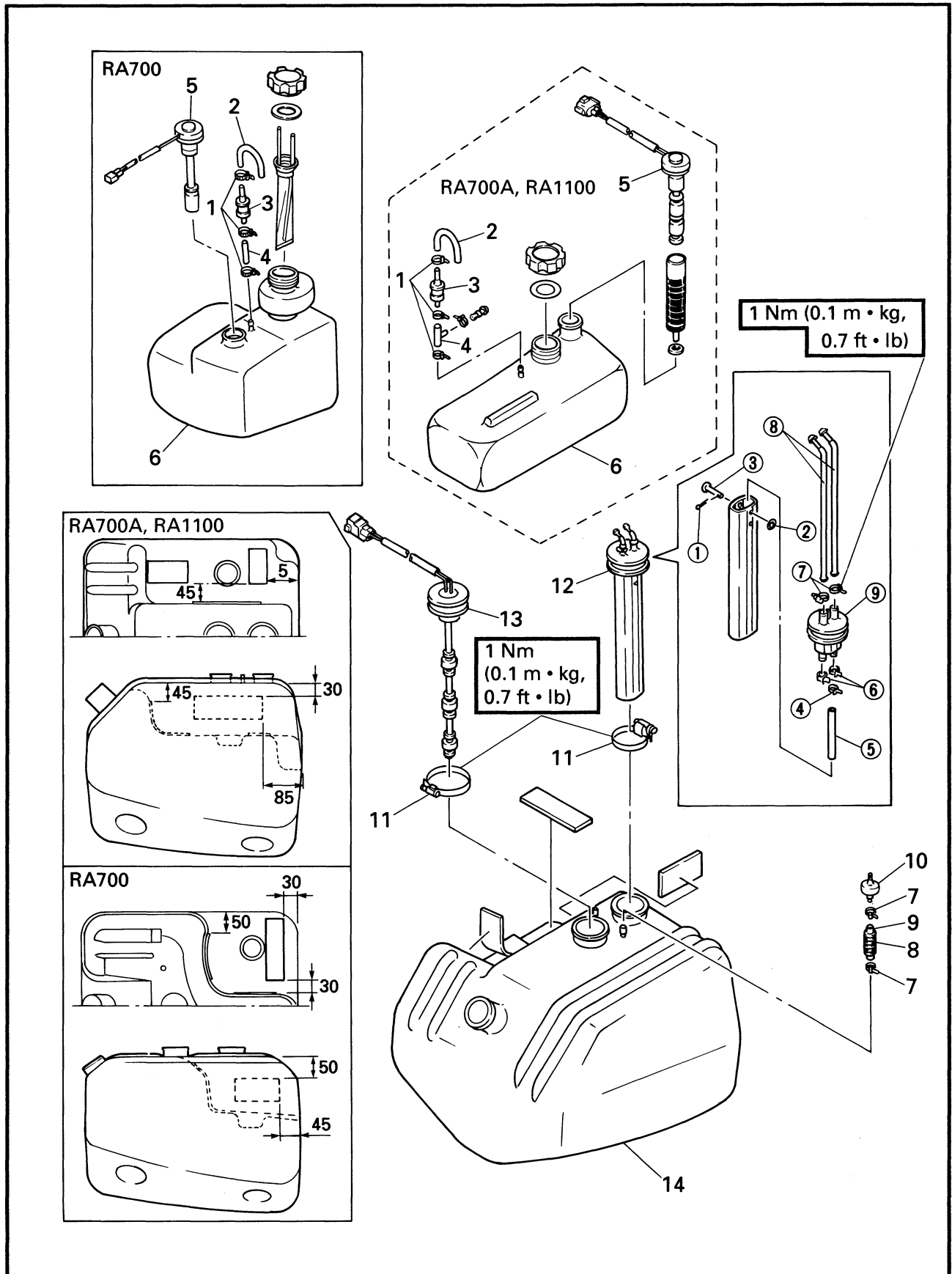
REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty		Service points
	OIL TANK AND FUEL TANK REMOVAL	700	700A 1100	Follow the left "Step" for removal. ⚠ WARNING Gasoline (Petrol) is highly flammable and explosive. Handle with special care.
1	Oil sensor lead coupler	1	1	
2	Hose tie	1	2	
3	Oil hose	1	2	
4	Tank band	2	2	
5	Oil tank assembly	1	1	
6	Fuel level sensor lead coupler	1	1	
7	Clamp	1	1	
8	Fuel filler hose	1	1	
9	Hose tie	2	2	
10	Fuel hose (ON)	1	1	
11	Fuel hose (RES)	1	1	
12	Hose tie	1	1	
13	Fuel hose (return)	1	1	
14	Hose tie	1	1	
15	Air ventilation hose	1	1	
16	Fuel tank assembly	1	1	
17	Fuel tank damper	4	4	
18	Bolt (with washer)	4	4	
19	Tank band	2	2	
				Reverse the removal steps for installation.



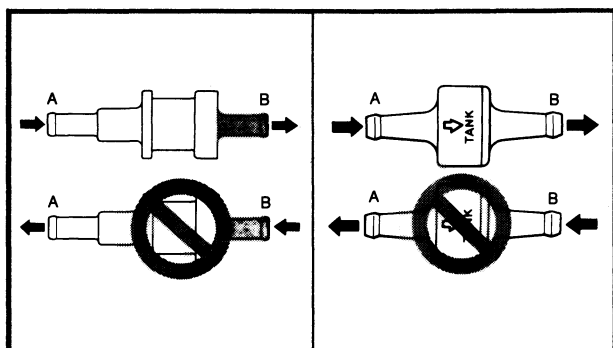
OIL TANK AND FUEL TANK

OIL TANK AND FUEL TANK EXPLODED DIAGRAM




REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty		Service points
OIL TANK DISASSEMBLY				Follow the left "Step" for removal.
1	Hose tie	3		
2	Air ventilation hose	1		
3	Check valve	1		
4	Air ventilation hose	1		
5	Oil level sensor	1		
6	Oil tank	1		
FUEL TANK DISASSEMBLY		700	700A 1100	
7	Hose tie	2	2	
8	Tube	—	1	
9	Air ventilation hose	1	1	
10	Check valve	1	1	
11	Clamp	2	2	
12	Pipe joint assembly	1	1	
13	Fuel level sensor	1	1	
14	Fuel tank	1	1	
PIPE JOINT DISASSEMBLY				Reverse the removal steps for installation.
①	Circlip	1		
②	Plate washer	1		
③	Pin	1		
④	Clip	1		
⑤	Hose	1		
⑥	Clip	2		
⑦	Clamp	2		
⑧	Pipe	2		
⑨	Pipe joint	1		


SERVICE POINTS
Check valve inspection
1. Check:

- Check valve

Out of specification → Replace.


Flow from A to B


Oil level sensor and fuel level sensor inspection

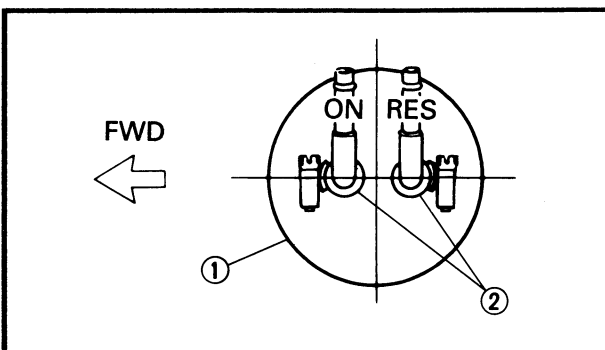
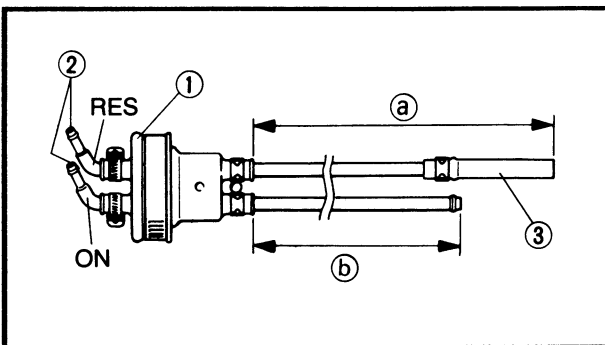
Refer to the "INDICATION SYSTEM" section in chapter 7.

Oil tank and fuel tank inspection
1. Inspect:

- Oil tank
 - Fuel tank
- Cracks/Damage → Replace.

Pipe joint inspection
1. Inspect:

- Pipe
- Bending/Damage → Replace.
Contamination → Clean.
- Pipe joint
- Wear/Crack → Replace.


Pipe joint installation
1. Install:

- Pipe joint ①
- Pipe ②
- Hose ③
- Clamp


Length ①:
RA700

$266 \pm 2 \text{ mm (10.5} \pm 0.08 \text{ in)}$

RA700A, RA1100

$320 \pm 2 \text{ mm (12.6} \pm 0.08 \text{ in)}$

Length ②:
RA700

$180 \pm 2 \text{ mm (7.1} \pm 0.08 \text{ in)}$

RA700A, RA1100

$245 \pm 2 \text{ mm (9.7} \pm 0.08 \text{ in)}$

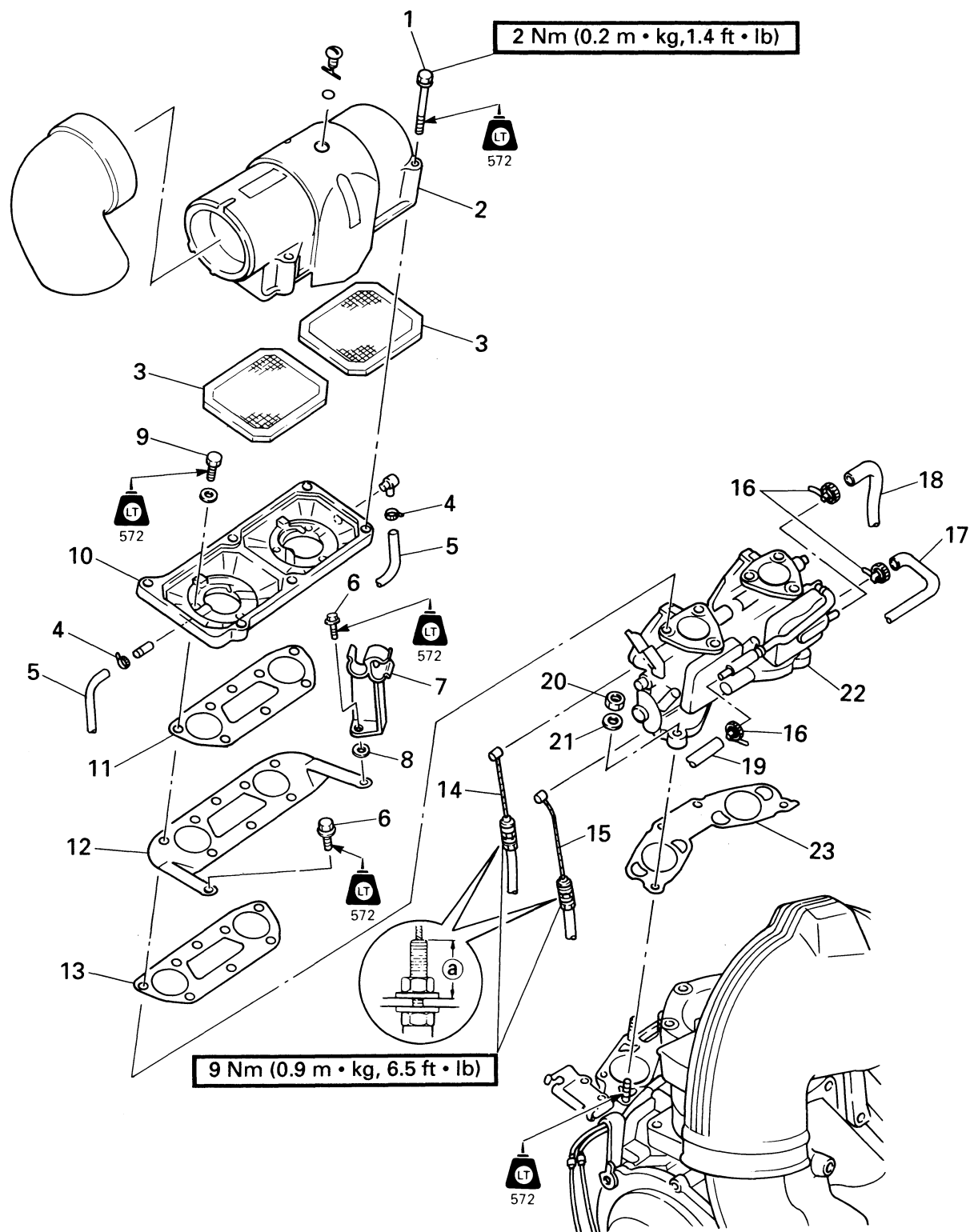
NOTE:

Connect the hose for "RES" on the pipe side.

CARBURETOR REMOVAL

CARBURETOR REMOVAL

EXPLODED DIAGRAM (RA700, RA700A)





REMOVAL AND INSTALLATION CHART

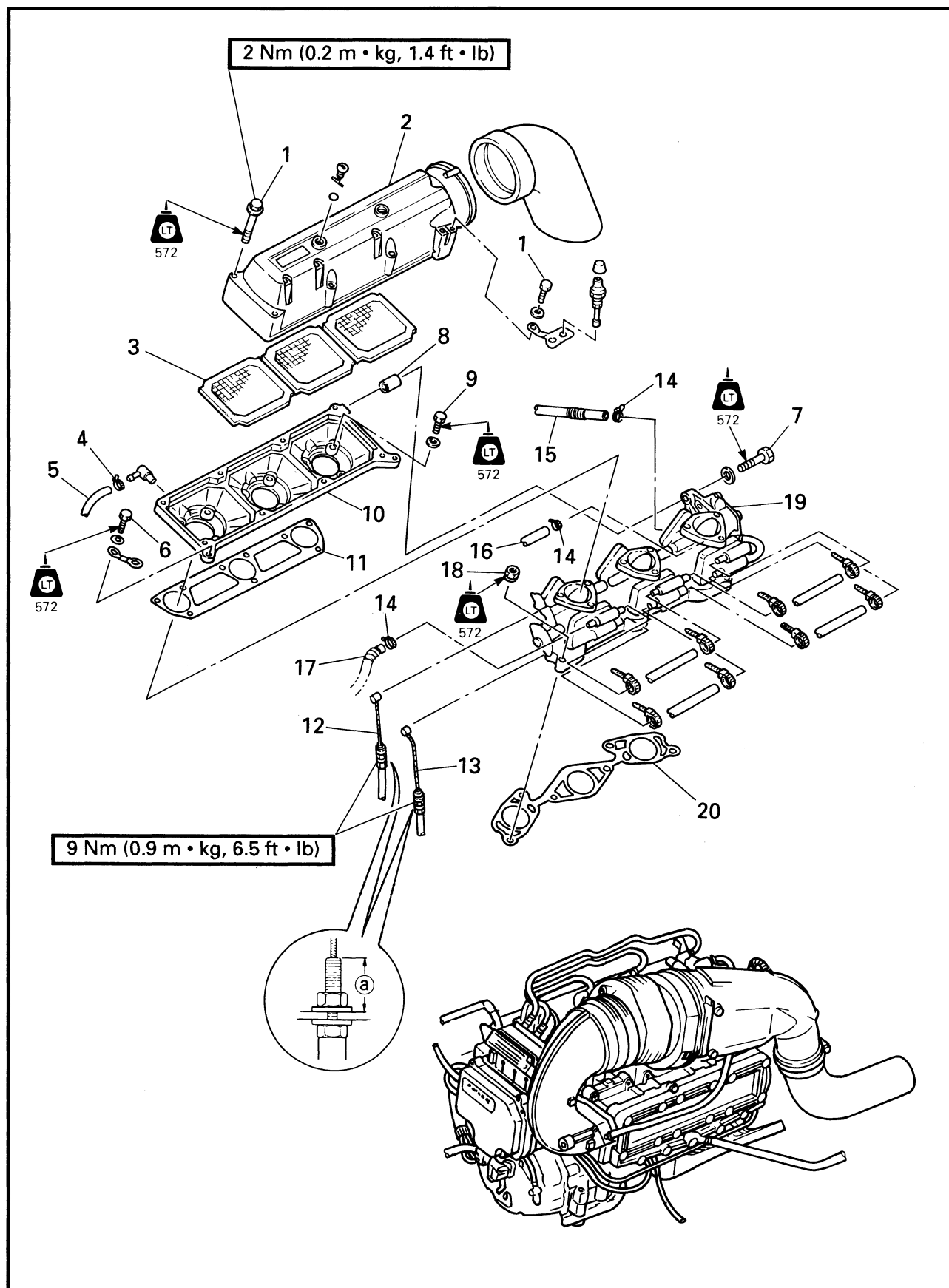
Step	Procedure/Part name	Q'ty	Service points
	CARBURETOR REMOVAL		Follow the left "Step" for removal.
	Fuel cock		NOTE: _____ Turn the fuel cock to "OFF". _____
	High tension cord		
1	Bolt	6	
2	Cover 1	1	
3	Flame arrester	2	
4	Hose tie	2	
5	Oil delivery hose	2	
6	Bolt (with washer)	2	
7	Cord clamp	1	
8	Plate washer	1	
9	Bolt (with washer)	6	
10	Cover 2	1	
11	Cover gasket	1	
12	Plate	1	
13	Cover gasket	1	
14	Choke cable	1	
15	Throttle cable	1	
16	Hose tie	3	
17	Fuel hose (fuel filter - fuel pump)	1	
18	Pulse hose (fuel pump - crank case)	1	
19	Fuel hose (carburetor - fuel tank)	1	
20	Nut	4	
21	Plate washer	4	
22	Carburetor assembly	1	
23	Gasket	1	
			Reverse the removal steps for installation.



Cable guide set position @:
17 mm (0.67 in)
Between cable guide top and
plate top.


CARBURETOR REMOVAL

EXPLODED DIAGRAM (RA1100)





REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	CARBURETOR REMOVAL		Follow the left "Step" for removal.
	Fuel cock		NOTE: _____ Turn the fuel cock to "OFF".
	High tension cord		
1	Bolt (with washer)	8	
2	Cover 1	1	
3	Flame arrester	3	
4	Hose tie	3	
5	Oil delivery hose	3	
6	Bolt (with washer)	1	
7	Bolt (with washer)	1	
8	Collar	1	
9	Bolt (with washer)	9	
10	Cover 2	1	
11	Cover gasket	1	
12	Choke cable	1	
13	Throttle cable	1	
			 Choke cable guide set position @: 17 mm (0.67 in) Throttle cable guide set position @: 14 mm (0.55 in)
14	Hose tie	3	
15	Fuel hose (fuel filter - fuel pump)	1	
16	Pulse hose (fuel pump - crank case)	1	
17	Fuel hose (carburetor - fuel tank)	1	
18	Nut	6	
19	Carburetor assembly	1	
20	Gasket	1	
			Reverse the removal steps for installation.

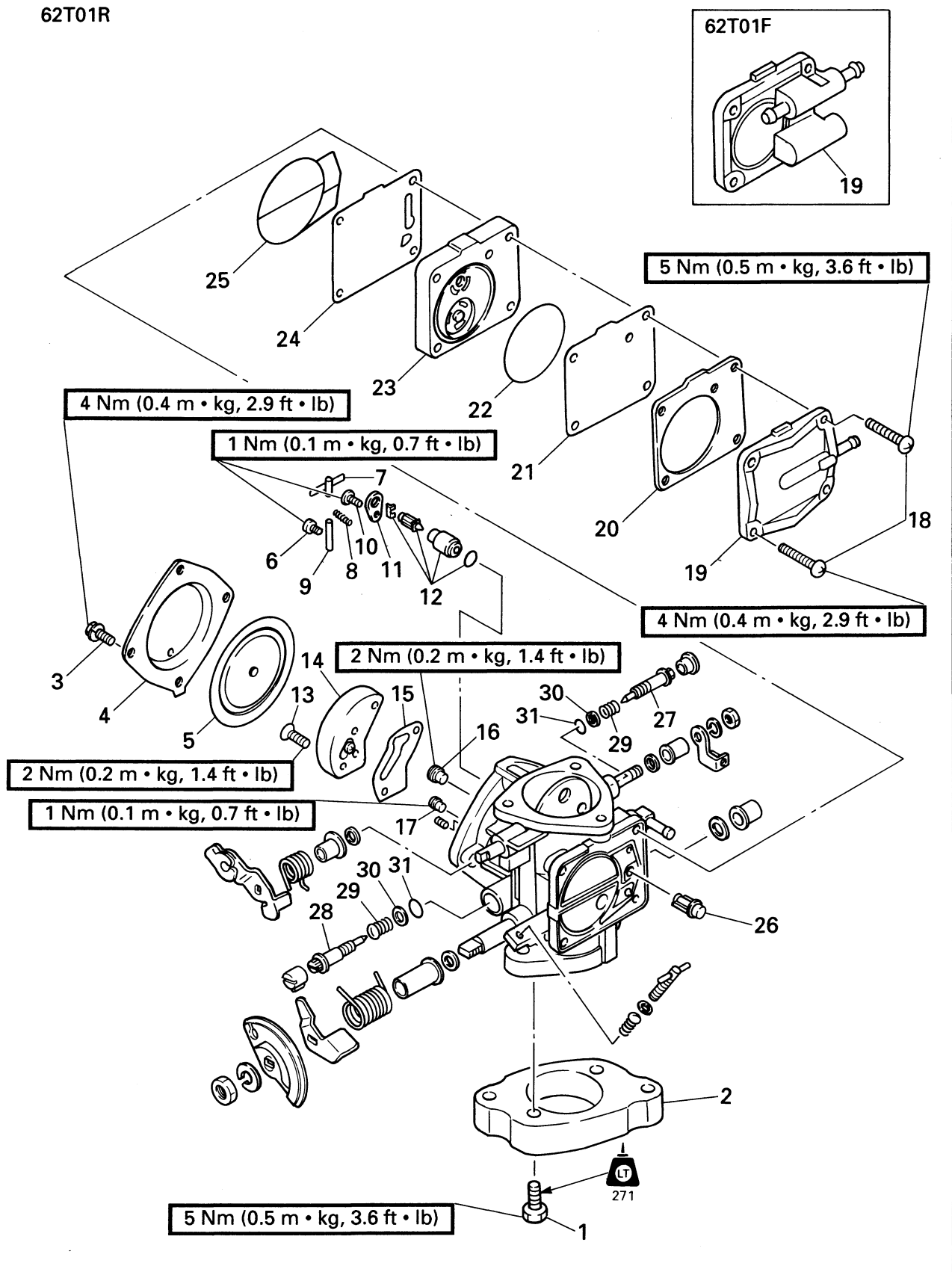


CARBURETOR

CARBURETOR EXPLODED DIAGRAM (RA700, RA700A)

62T01R

62T01F





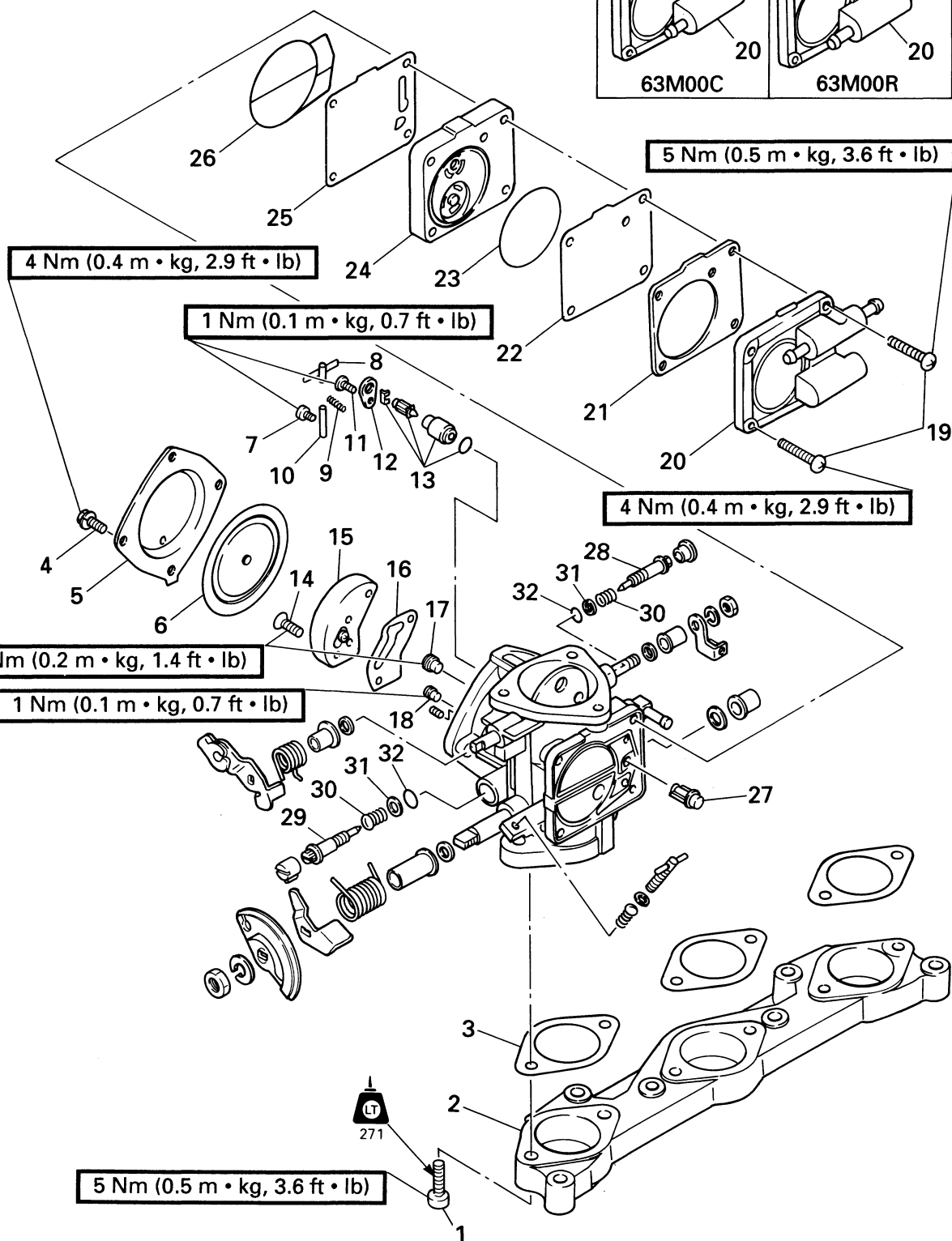
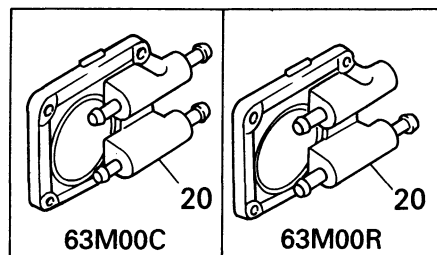
REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	CARBURETOR DISASSEMBLY		Follow the left "Step" for removal. Refer to "CARBURETOR REMOVAL".
	Carburetor assembly		
1	Bolt	4	
2	Collar	2	
3	Screw	8	
4	Cover 3	2	
5	Diaphragm assembly	2	
6	Screw	2	
7	Float arm	2	
8	Spring	2	
9	Pin	2	
10	Screw	2	
11	Plate	2	
12	Needle valve assembly	2	
13	Screw	4	
14	Body assembly	2	
15	Packing	2	
16	Main jet	2	
17	Pilot jet	2	
18	Screw	8	
19	Pump cover	2	
20	Pump cover gasket	1	
21	Diaphragm	1	
22	O-ring	1	
23	Diaphragm body assembly	1	
24	Diaphragm	1	
25	O-ring	2	
26	Filter	2	
27	High speed screw	2	
28	Low speed screw	2	
29	Spring	4	
30	Plate washer	4	
31	O-ring	4	
			Reverse the removal steps for installation.



EXPLODED DIAGRAM (RA1100)

63M00F





REMOVAL AND INSTALLATION CHART

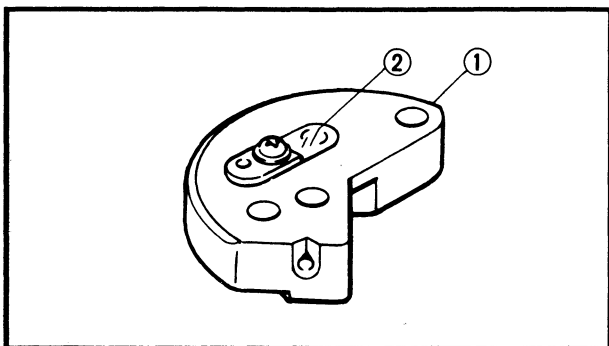
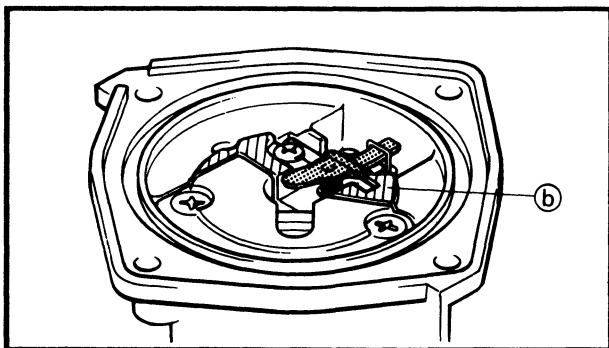
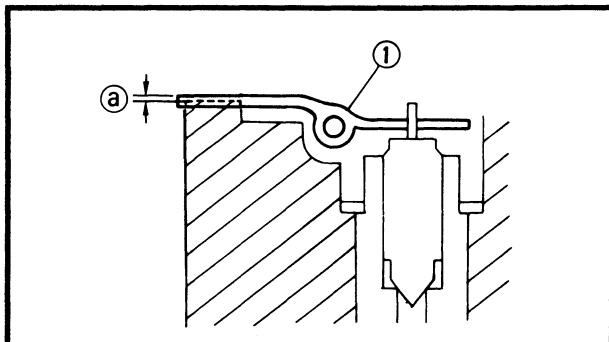
Step	Procedure/Part name	Q'ty	Service points
	CARBURETOR DISASSEMBLY		Follow the left "Step" for removal. Refer to "CARBURETOR REMOVAL".
	Carburetor assembly		
1	Bolt	6	
2	Collar	1	
3	Cover gasket	3	
4	Screw	12	
5	Cover 3	3	
6	Diaphragm assembly	3	
7	Screw	3	
8	Float arm	3	
9	Spring	3	
10	Pin	3	
11	Screw	3	
12	Plate	3	
13	Needle valve assembly	3	
14	Screw	6	
15	Body assembly	3	
16	Packing	3	
17	Main jet	3	
18	Pilot jet	3	
19	Screw	12	
20	Pump cover	3	
21	Pump cover gasket	1	
22	Diaphragm	1	
23	O-ring	1	
24	Diaphragm body assembly	1	
25	Diaphragm	1	
26	O-ring	3	
27	Filter	3	
28	High speed screw	3	
29	Low speed screw	3	
30	Spring	6	
31	Plate washer	6	
32	O-ring	6	
			Reverse the removal steps for installation.



SERVICE POINTS

CAUTION:

Do not use steel wire for cleaning the jets as this may enlarge the jet diameters and seriously affect performance.



Diaphragm inspection

1. Inspect:

- Diaphragm assembly
Damage → Replace.

Float arm inspection

1. Inspect:

- Float arm ①
Bend/Damage → Repair or replace.

2. Measure:

- Float arm height ②



Float arm height:
0 ~ 0.2 mm (0 ~ 0.008 in)

NOTE:

- Measure the distance between the surface ② of the carburetor body and the top surface of the float arm.
- The float arm should be resting on the needle valve, but not compressing the needle valve.

Body assembly inspection

1. Inspect:

- Body assembly ①
Contamination → Clean.
- Valve ②
Damage → Replace.

Fuel pump inspection (RA700, RA700A)

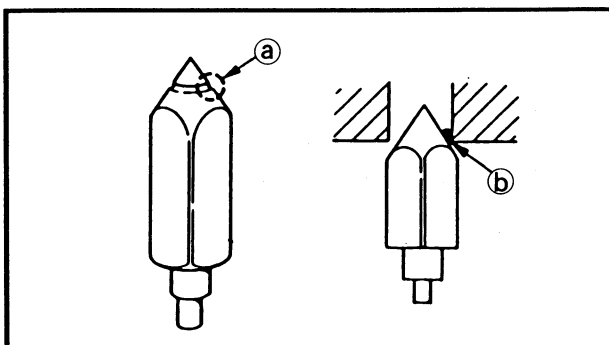
1. Inspect:

- Diaphragm
- Diaphragm body assembly
Damage → Replace.

Filter inspection

1. Inspect:

- Filter
Contamination → Clean.
Damage → Replace.



Needle valve inspection

1. Inspect:

- Needle valve
- Valve seat

Grooved wear ① → Replace.

Dust ② → Clean.

NOTE:

Always replace the needle valve and valve seat as a set.

Jet and carburetor body inspection

1. Inspect:

- Main jet
- Pilot jet
- Carburetor body

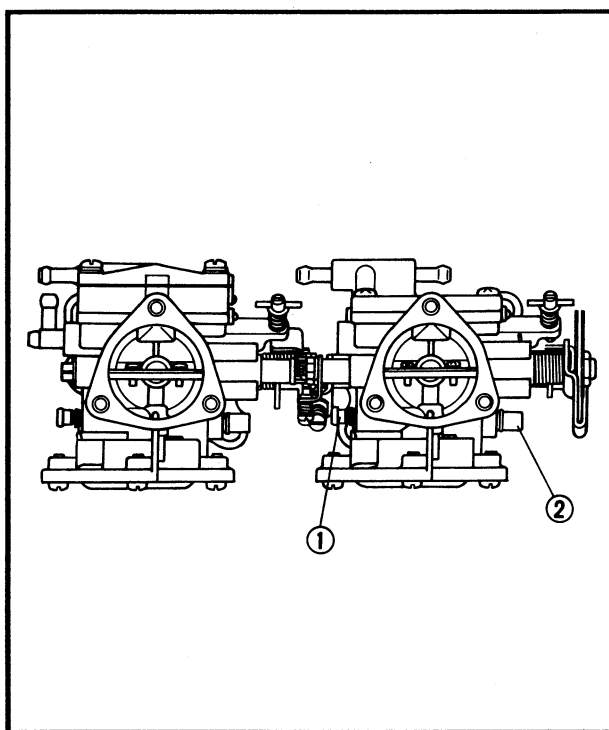
Contamination → Clean.

High and low speed screws inspection

1. Inspect:

- High speed screw
- Low speed screw

Bend/Wear → Replace.



High and low speed screws adjustment

1. Adjust:

- High speed screw
- Low speed screw

Adjustment steps:

- Screw in the high speed screw ① or lower speed screw ② until it is lightly seated.
- Back out by the specified number of turns.



High speed screw:

RA700, RA700A

5/8 (#1), 1-1/8 (#2) ± 1/4 turns out

RA1100

7/8 (#1) ± 1/4 turns out

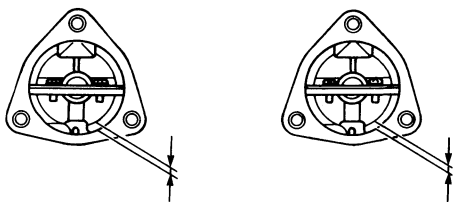
Low speed screw:

RA700, RA700A

5/8 (#1) ± 1/4 turns out

RA1100

1-1/8 (#1) ± 1/4 turns out



Throttle valve synchronization inspection and adjustment

1. Check:

- Throttle valve synchronization
Out of specification → Adjust.

Checking steps:

- While turning the throttle lever, check the opening of all throttle valves.

2. Adjust:

- Throttle valve synchronization

Adjustment steps: RA700, RA700A

- Turn out the idle adjust screws ① until their tips are apart from the throttle lever ②.

NOTE:

Record the set position of the idle adjust screw.

- Check that the #2 throttle valve ③ is fully closed.
- Turn the synchronization screw ④ in or out until the #1 throttle valve ⑤ is fully closed.
- Turn in the idle adjust screws to the set position.

Adjustment steps: RA1100

- Turn out the idle adjust screws ① until its tip is apart from the throttle lever ②.

NOTE:

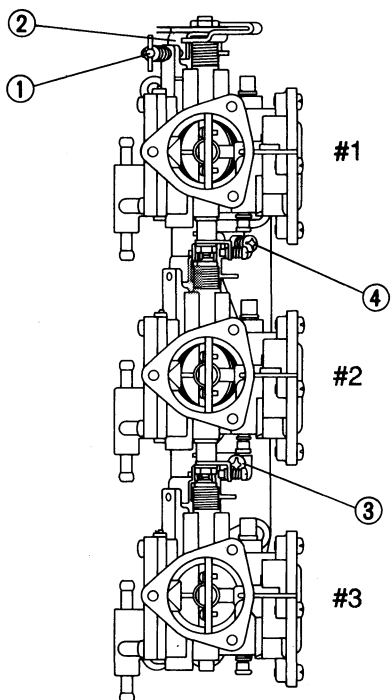
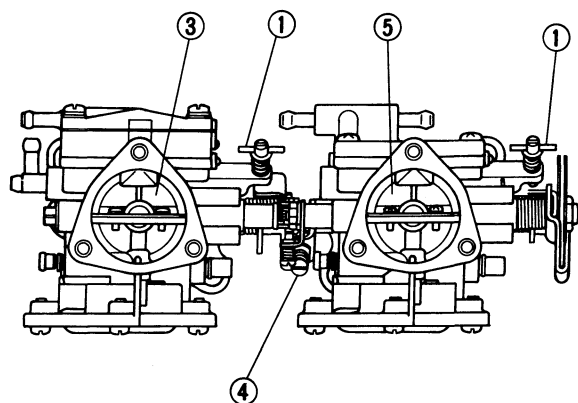
Record the set position of the idle adjust screw.

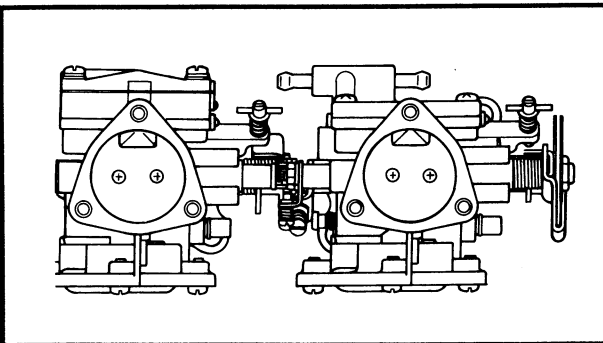
- Turn out the synchronization screws ③ and ④ until their tips are apart from the connecting lever.
- Turn in the synchronization screw ③ until the #2 and #3 throttle valves are fully closed.

NOTE:

Turning in the screw ③ further causes the #3 throttle valve to open again.

- Turn in the synchronization screw ④ until the #1 throttle valve is fully closed.
- Check that the all throttle valves are fully closed. If not, do step a through e again.
- Turn in the idle adjust screw to the set position.





Choke valve synchronization inspection and adjustment

1. Check:

- Choke valve synchronization
Out of specification → Adjust.

Checking steps:

- While turning the choke lever, check the opening of all choke valves.

2. Adjust:

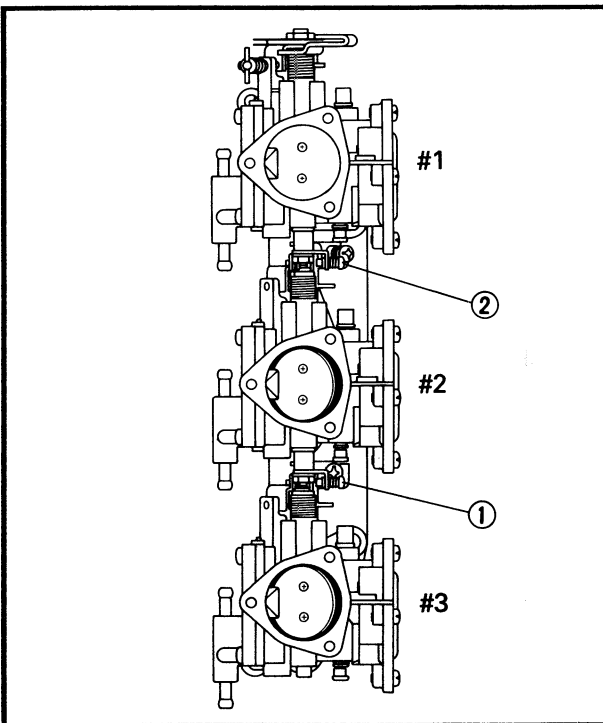
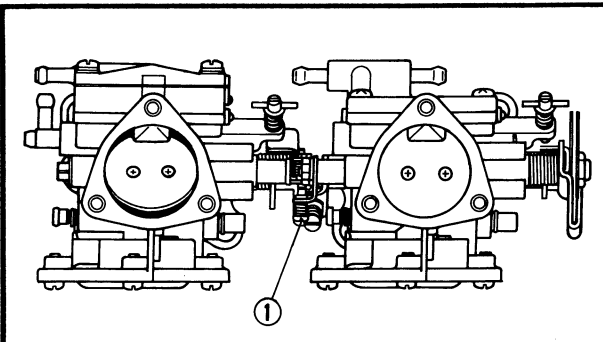
- Choke valve synchronization

Adjustment steps: RA700, RA700A

- Turn in or out the synchronization screw ① to bring all the choke valves into a fully closed position when the choke lever is turned on the closed side.

Adjustment steps: RA1100

- Turn out the synchronization screws ① and ② until their tips are apart from the synchronization lever.
- Turn in the synchronization screw ① to bring #3 and #2 choke valves into a fully closed position when the choke lever is turned on the closed side.
- Turn in the synchronization screw ② to bring #1 choke valve into a fully closed position when the choke lever is turned on the closed side.
- Check that the all choke valves are fully closed. If not, do step a through d again.



Carburetor assembly

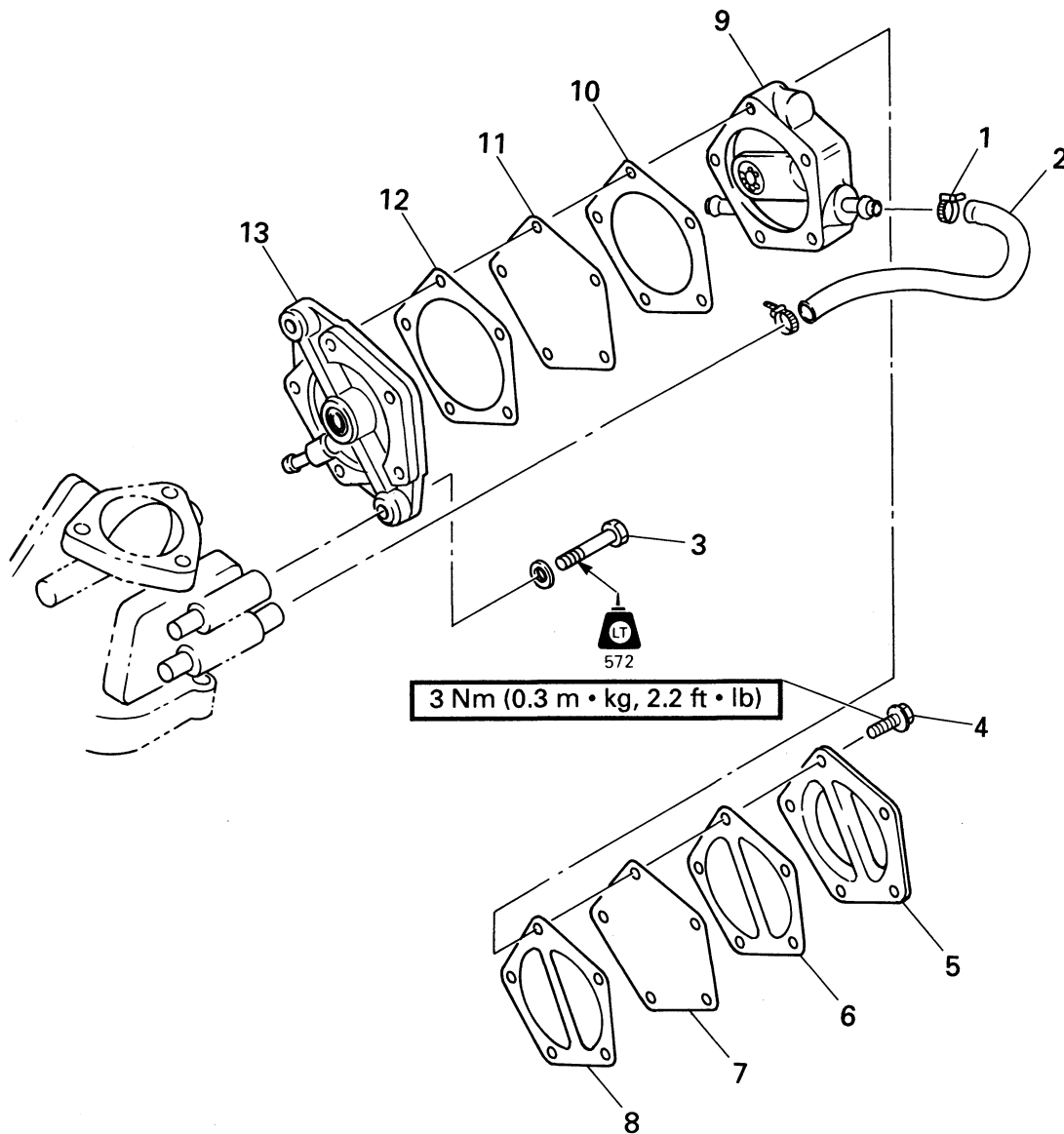
1. Adjust:

- Trolling speed
Refer to the "FUEL SYSTEM" section in chapter 3.



FUEL PUMP

FUEL PUMP (RA1100) EXPLODED DIAGRAM



**REMOVAL AND INSTALLATION CHART**

Step	Procedure/Part name	Q'ty	Service points
	FUEL PUMP DISASSEMBLY		Follow the left "Step" for removal. Refer to "CARBURETOR REMOVAL".
	Carburetor assembly		
1	Hose tie	1	
2	Fuel hose	1	
3	Bolt (with washer)	1	
4	Screw	5	
5	Pump cover	1	
6	Pump cover gasket	1	
7	Diaphragm	1	
8	Pump cover gasket	1	
9	Diaphragm body assembly	1	
10	Diaphragm body gasket	1	
11	Diaphragm	3	
12	Diaphragm body gasket	1	
13	Pulser cover	1	
			Reverse the removal steps for installation.

SERVICE POINTS**Fuel pump inspection**

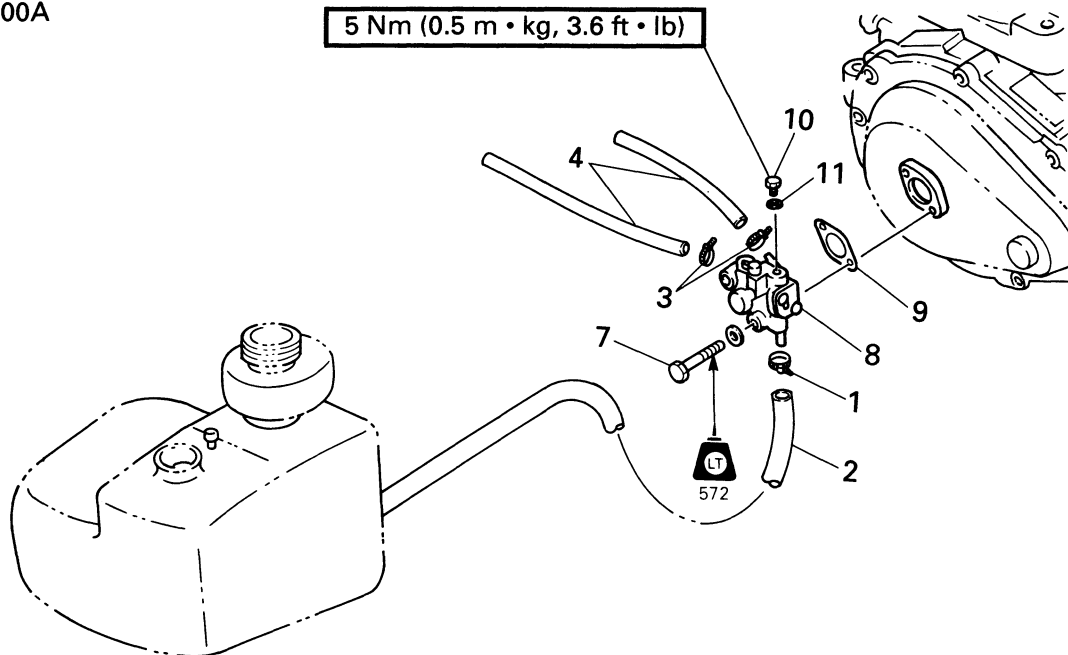
1. Inspect:

- Diaphragm
 - Diaphragm body assembly
- Damage → Replace.

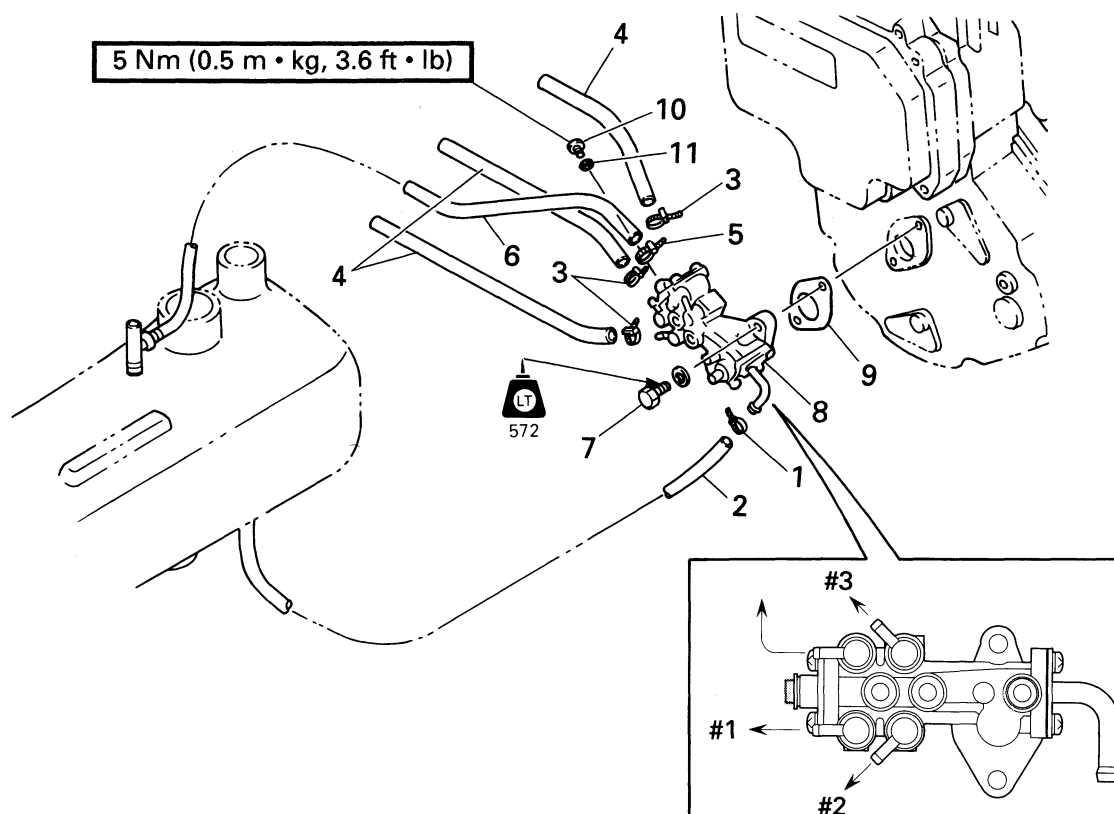


OIL PUMP EXPLODED DIAGRAM

RA700
RA700A



RA1100





REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty		Service points
	OIL PUMP REMOVAL	700 700A	1100	Follow the left "Step" for removal.
1	Hose tie	1	1	
2	Oil hose	1	1	
3	Hose tie	2	3	
4	Oil delivery hose	2	3	
5	Hose tie	–	1	
6	Oil return hose	–	1	
7	Bolt (with washer)	2	2	
8	Oil pump	1	1	
9	Oil pump gasket	1	1	
10	Air bleeding screw	1	1	
11	Gasket	1	1	
				Reverse the removal steps for installation.

SERVICE POINTS**Oil pump inspection**

1. Inspect:

- Oil pump
Clog → Clean.
- Driving tooth
Wear/Damage → Replace.

Oil hose inspection

1. Inspect:

- Oil hose
Wear/Crack → Replace.

CAUTION:

After installing the oil injection system,
bleed the system of air.

CHAPTER 5

POWER UNIT

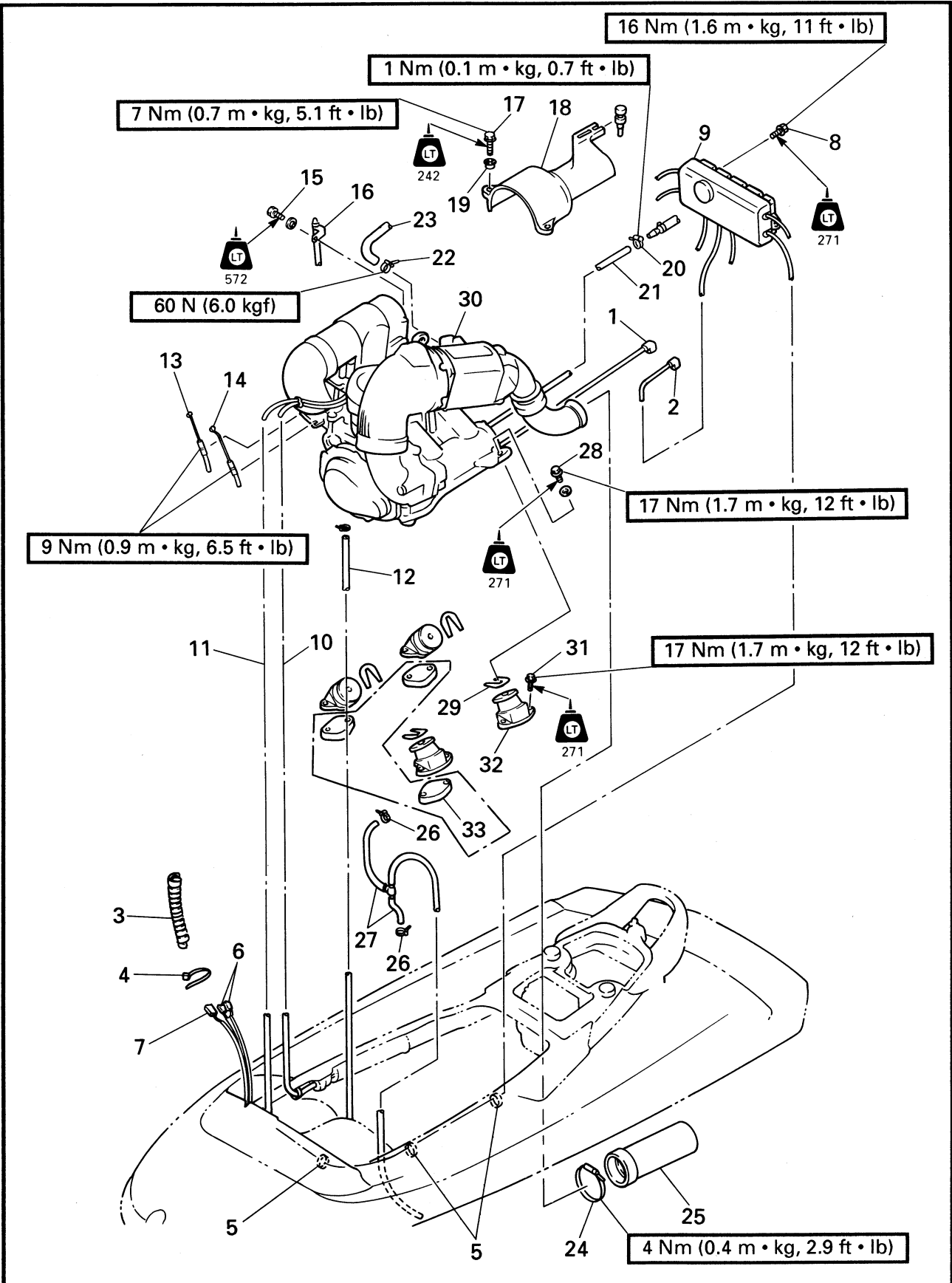
ENGINE UNIT REMOVAL	5-1
EXPLODED DIAGRAM (RA700, RA700A)	5-1
REMOVAL AND INSTALLATION CHART.....	5-2
EXPLODED DIAGRAM (RA1100)	5-3
REMOVAL AND INSTALLATION CHART.....	5-4
SERVICE POINTS	5-5
Mount bracket inspection	5-5
Coupling clearance inspection	5-5
 REED VALVE	5-6
EXPLODED DIAGRAM	5-6
REMOVAL AND INSTALLATION CHART.....	5-7
SERVICE POINTS	5-7
Reed valve inspection	5-7
 EXHAUST RING	5-8
EXPLODED DIAGRAM (RA700, RA700A)	5-8
REMOVAL AND INSTALLATION CHART.....	5-9
EXPLODED DIAGRAM (RA1100)	5-10
REMOVAL AND INSTALLATION CHART.....	5-11
 EXHAUST CHAMBER	5-12
EXPLODED DIAGRAM (RA700, RA700A)	5-12
REMOVAL AND INSTALLATION CHART.....	5-13
EXPLODED DIAGRAM (RA1100)	5-14
REMOVAL AND INSTALLATION CHART.....	5-15
 MUFFLER	5-16
EXPLODED DIAGRAM (RA700, RA700A)	5-16
REMOVAL AND INSTALLATION CHART	5-17
EXPLODED DIAGRAM (RA1100)	5-18
REMOVAL AND INSTALLATION CHART.....	5-19
 CYLINDER HEAD, CYLINDER AND PISTON	5-20
EXPLODED DIAGRAM (RA700, RA700A)	5-20
REMOVAL AND INSTALLATION CHART.....	5-21
EXPLODED DIAGRAM (RA1100)	5-22
REMOVAL AND INSTALLATION CHART.....	5-23
SERVICE POINTS	5-24
Cylinder head inspection	5-24
Cylinder inspection.....	5-24
Piston inspection	5-25
Piston ring inspection	5-26
Piston pin and bearing inspection	5-27

FLYWHEEL MAGNETO AND BASE (RA700, RA700A)	5-28
EXPLODED DIAGRAM	5-28
REMOVAL AND INSTALLATION CHART.....	5-29
 FLYWHEEL COVER AND FLYWHEEL MAGNETO (RA1100)	5-30
EXPLODED DIAGRAM	5-30
REMOVAL AND INSTALLATION CHART.....	5-31
SERVICE POINTS	5-32
Coupling flange removal and installation	5-32
Flywheel magneto removal and installation	5-32
Coupling flange inspection	5-32
Flywheel magneto inspection	5-32
Idle gear assembly inspection	5-33
 ELECTRICAL UNIT	5-34
EXPLODED DIAGRAM (RA700, RA700A)	5-34
REMOVAL AND INSTALLATION CHART.....	5-35
EXPLODED DIAGRAM (RA1100)	5-36
REMOVAL AND INSTALLATION CHART	5-37
EXPLODED DIAGRAM (RA1100)	5-38
REMOVAL AND INSTALLATION CHART	5-39
 CRANKCASE AND CRANKSHAFT	5-40
EXPLODED DIAGRAM (RA700, RA700A)	5-40
REMOVAL AND INSTALLATION CHART.....	5-41
EXPLODED DIAGRAM (RA1100)	5-42
REMOVAL AND INSTALLATION CHART.....	5-43
SERVICE POINTS	5-44
Crankshaft inspection.....	5-44
Crankcase inspection	5-45
 INTERMEDIATE SHAFT AND HOUSING	5-46
EXPLODED DIAGRAM	5-46
REMOVAL AND INSTALLATION CHART.....	5-47
SERVICE POINTS	5-48
Coupling removal and installation	5-48
Bearing removal and installation	5-48
Bearing inspection.....	5-48
Coupling inspection	5-48
Oil seal installation	5-48



ENGINE UNIT REMOVAL

EXPLODED DIAGRAM (RA700, RA700A)

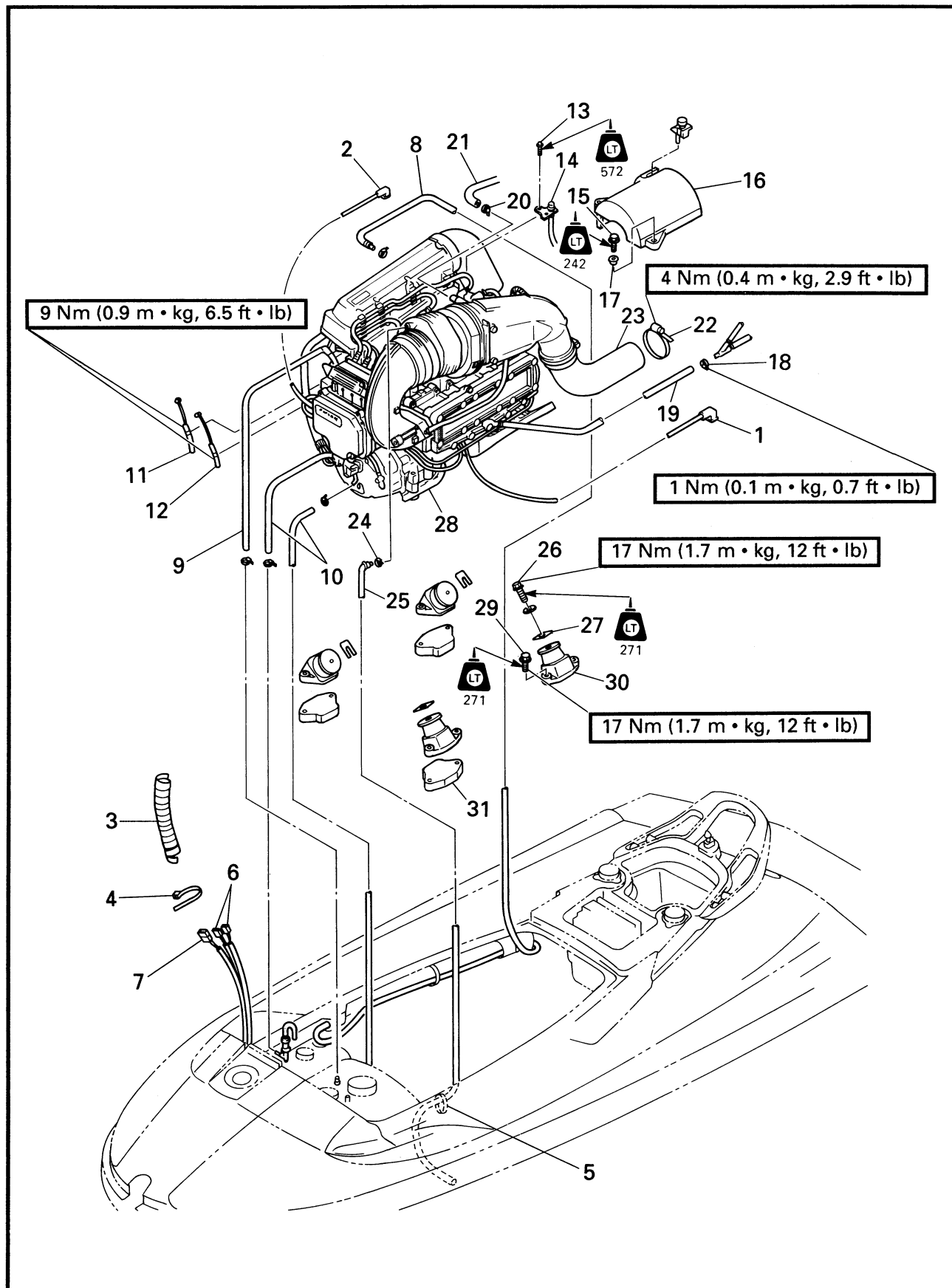


REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	ENGINE UNIT REMOVAL		Follow the left "Step" for removal.
1	Battery negative lead	1	
2	Battery positive lead	1	
3	Spiral tube	1	
4	Band	1	NOTE: _____ Clamp the handle switch leads and meter leads with the band.
5	Wire clamp	3	
6	Handle switch lead coupler	2	
7	Meter lead coupler	1	
8	Bolt (with washer)	3	
9	Electrical box	1	
10	Fuel hose	1	
11	Fuel hose (return)	1	
12	Oil hose	1	
13	Choke cable	1	
14	Throttle cable	1	
15	Bolt (with washer)	1	
16	Plate	1	
17	Bolt (with washer)	2	
18	Coupling cover	1	
19	Collar	2	
20	Clamp	1	
21	Water inlet hose	1	
22	Hose tie	1	
23	Water outlet hose	1	
24	Clamp	1	
25	Exhaust hose	1	
26	Hose tie	2	
27	Water hose	2	
28	Engine mounting bolt	4	NOTE: _____
29	Shim	*	Before removing the mounting bolt, mark the engine mounting shim packs for ease of reassembly and coupling alignment.
30	Engine unit	1	
31	Bolt (with washer)	8	
32	Mount bracket	4	
33	Mount bracket spacer	3	For RA700A Reverse the removal steps for installation.

*: As required

EXPLODED DIAGRAM (RA1100)



REMOVAL AND INSTALLATION CHART

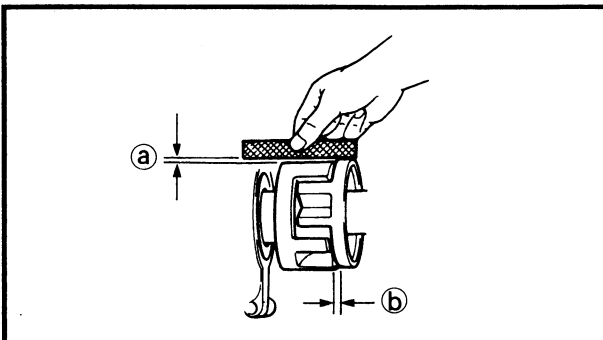
Step	Procedure/Part name	Q'ty	Service points
	ENGINE UNIT REMOVAL		Follow the left "Step" for removal.
1	Negative lead	1	
2	Positive lead	1	
3	Spiral tube	1	
4	Band	1	NOTE: _____ Clamp the handle switch leads and meter leads with the band.
5	Wire clamp	1	
6	Handle switch lead coupler	2	
7	Meter lead coupler	1	
8	Fuel hose	1	
9	Fuel hose (return)	1	
10	Oil hose	2	
11	Choke cable	1	
12	Throttle cable	1	
13	Bolt (with washer)	2	
14	Plate	1	
15	Bolt (with washer)	2	
16	Coupling cover	1	
17	Collar	2	
18	Clamp	1	
19	Water inlet hose	1	
20	Hose tie	1	
21	Water outlet hose	1	
22	Clamp	1	
23	Exhaust hose	1	
24	Hose tie	1	
25	Pilot water hose	1	
26	Engine mounting bolt	4	NOTE: _____ Before removing the mouting bolt, mark the engine mounting shim packs for ease of reassembly and coupling alignment.
27	Shim	*	
28	Engine unit	1	
29	Bolt (with washer)	8	
30	Mount bracket	4	
31	Mount bracket spacer	3	
			Reverse the removal steps for installation.

*: As required

SERVICE POINTS

Mount bracket inspection

1. Inspect:
 - Mount bracket
 - Crack/Damage → Replace.



Coupling clearance inspection

1. Measure:
 - Clearance ①
 - Clearance ②

Out of specification → Adjust using shim.

NOTE: _____

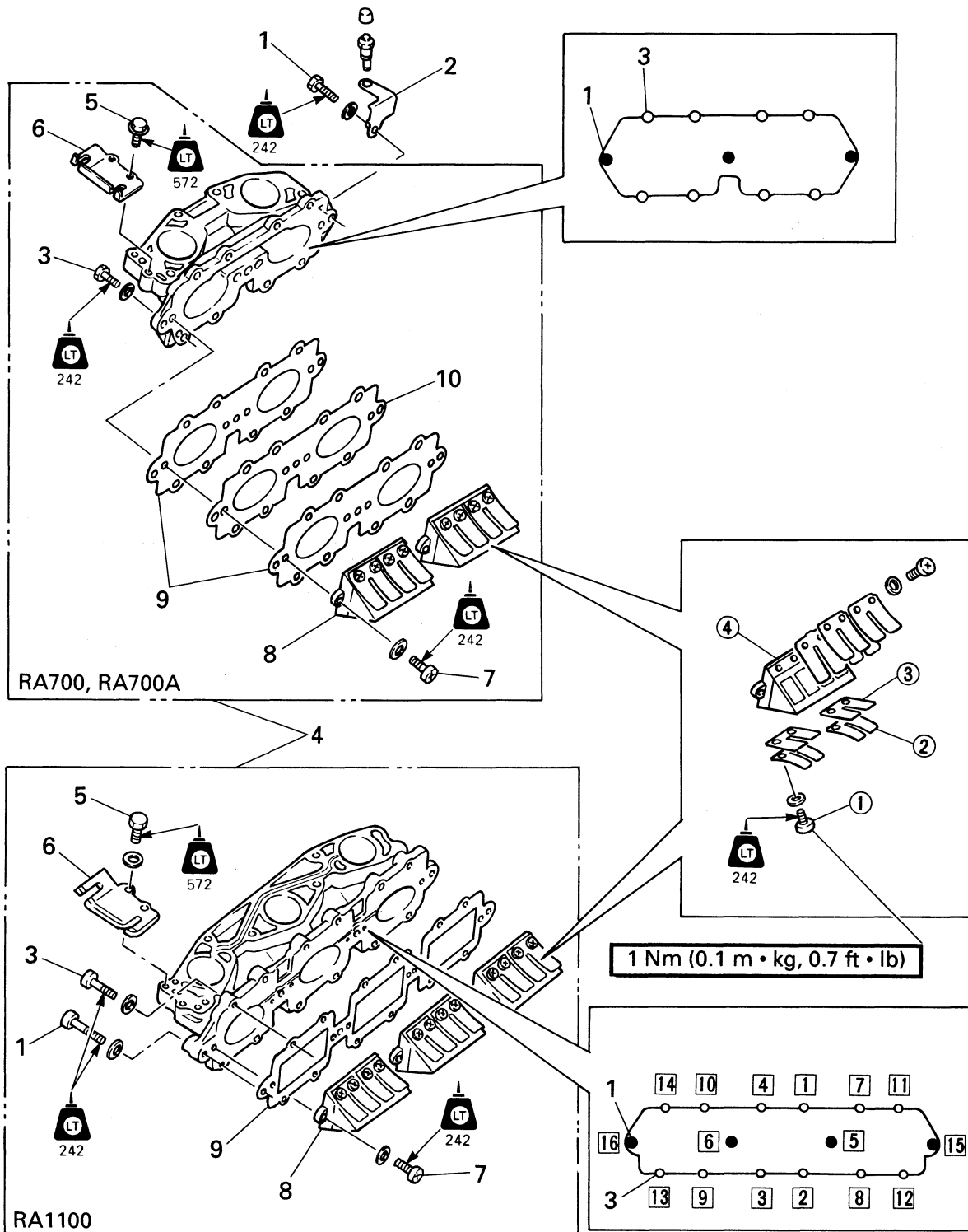
- Before measuring the clearance, remove the coupling rubber.
- Attach a straight edge and a thickness gauge.



Clearance ①:
0 ~ 0.5 mm (0 ~ 0.020 in)

Clearance ②:
2 ~ 4 mm (0.079 ~ 0.157 in)

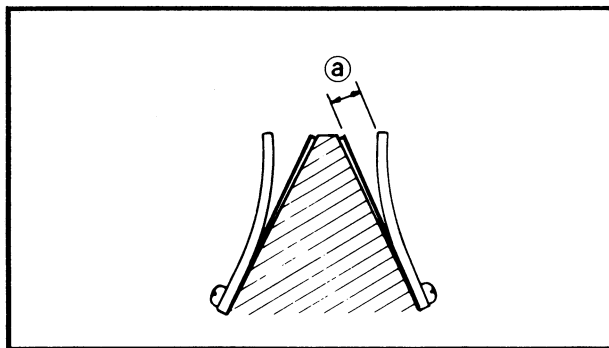
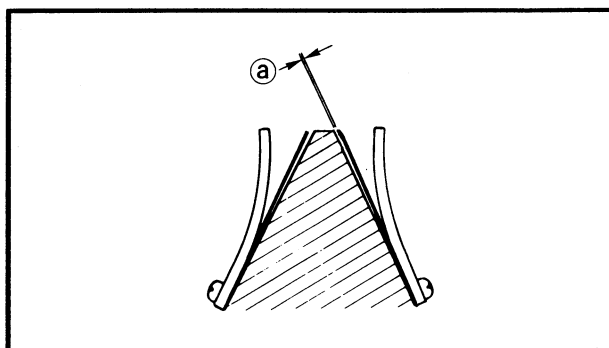
**REED VALVE
EXPLODED DIAGRAM**





REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty		Service points
	REED VALVE REMOVAL	700 700A	1000	Follow the left "Step" for removal.
	Carburetor assembly			Refer to the "CARBURETOR REMOVAL" section in chapter 4.
1	Bolt (with washer)	3	4	6 × 35 mm
2	Plate	1	—	
3	Bolt (with washer)	8	12	6 × 25 mm
				CAUTION: _____
				Tighten the bolts in sequence.
4	Intake manifold assembly	1	1	
5	Bolt (with washer)	2	2	6 × 16 mm
6	Cable bracket	1	1	
7	Screw	4	6	5 × 16 mm
8	Reed valve assembly	2	3	
9	Gasket	2	1	
10	Plate	1	—	
	REED VALVE DISASSEMBLY			
①	Screw	8		
②	Valve stopper	4		
③	Reed valve	4		
④	Reed valve body	1		
				Reverse the removal steps for installation.



SERVICE POINTS

Reed valve inspection

1. Inspect:
 - Reed valve
Crack/Damage → Replace.
2. Measure:
 - Valve bending ①
Out of specification → Replace.



Valve bending limit:
0.2 mm (0.008 in)

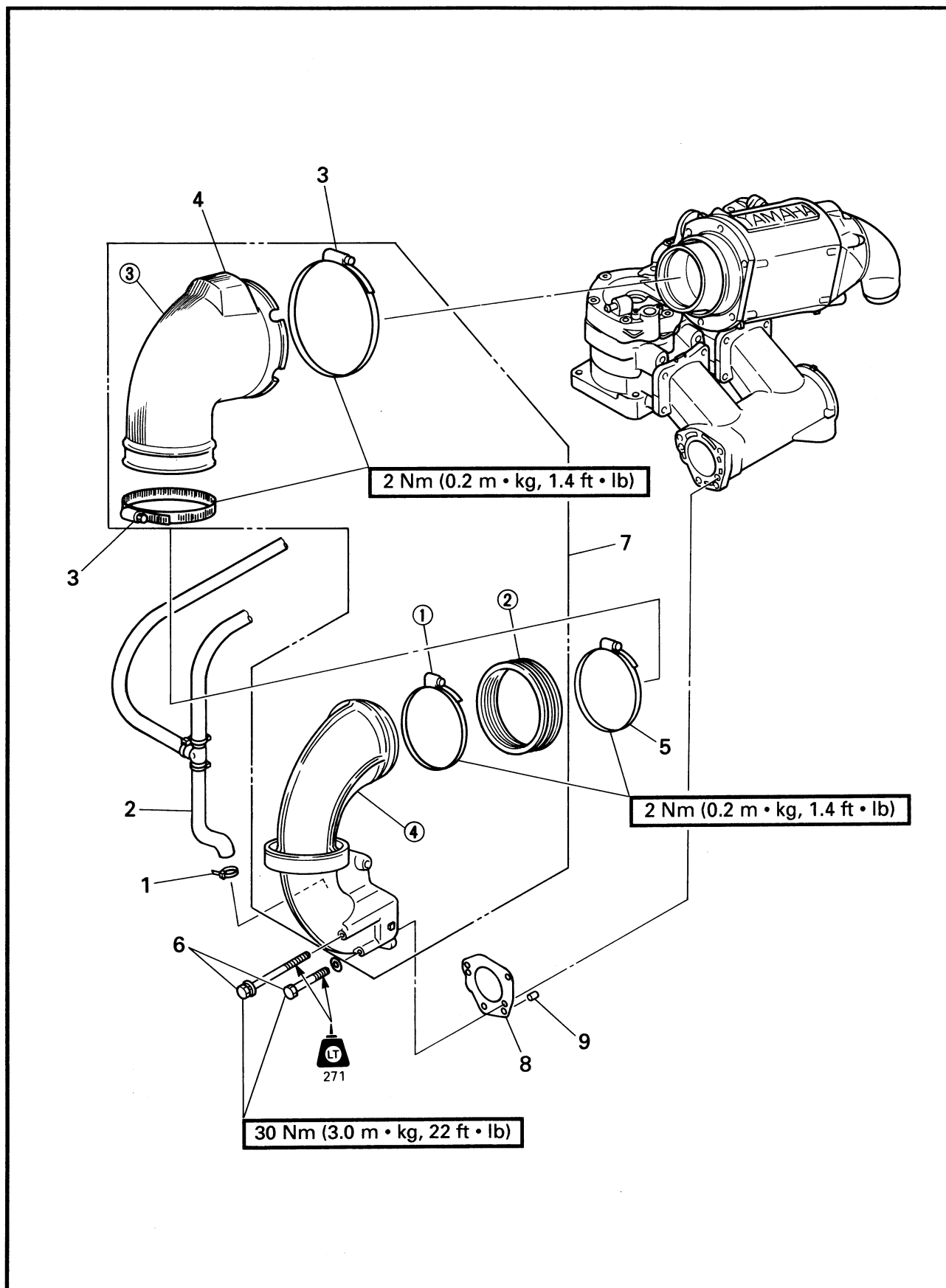
3. Measure:
- Valve stopper height ③
Out of specification → Adjust or replace.



Valve stopper height:
 9.0 ± 0.2 mm (0.35 ± 0.01 in)

EXHAUST RING

EXPLODED DIAGRAM (RA700, RA700A)



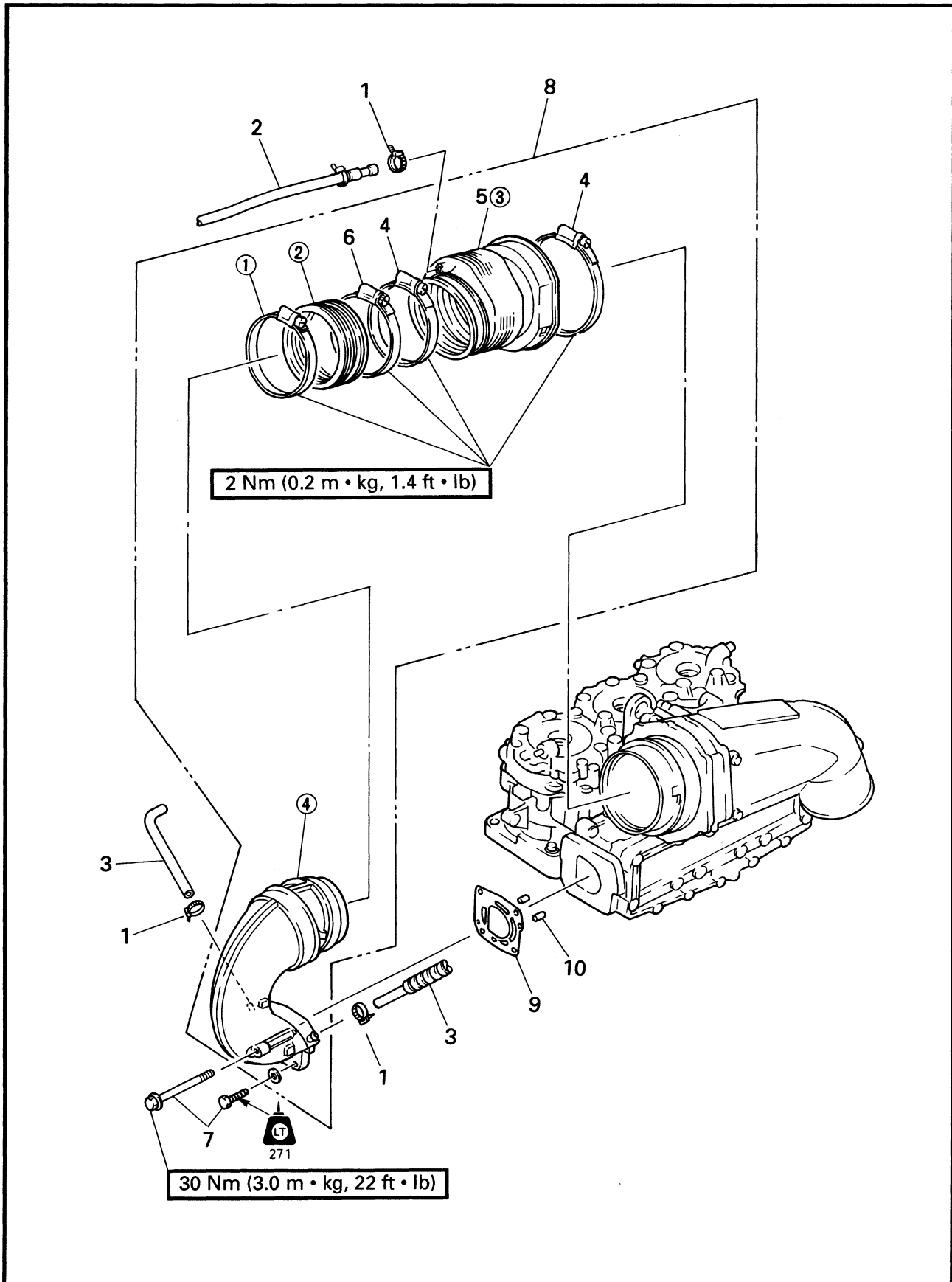


EXHAUST RING

REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	EXHAUST RING REMOVAL		Follow the left "Step" for removal.
1	Hose tie	1	NOTE: _____ ● Pull and side the exhaust joint. ● Loosen the clamp on the chamber side. _____
2	Pilot water hose	1	
3	Clamp	2	
4	Exhaust joint	1	
5	Clamp	1	
6	Bolt (with washer)	4	
7	Ring assembly	1	
8	Gasket	1	
9	Pin dowel	2	
①	RING DISASSEMBLY Clamp	1	CAUTION: _____ Tighten the clamp before installing the ring on the muffler. _____ Reverse the removal steps for installation.
②	Joint	1	
③	Exhaust joint	1	
④	Ring	1	

EXPLODED DIAGRAM (RA1100)



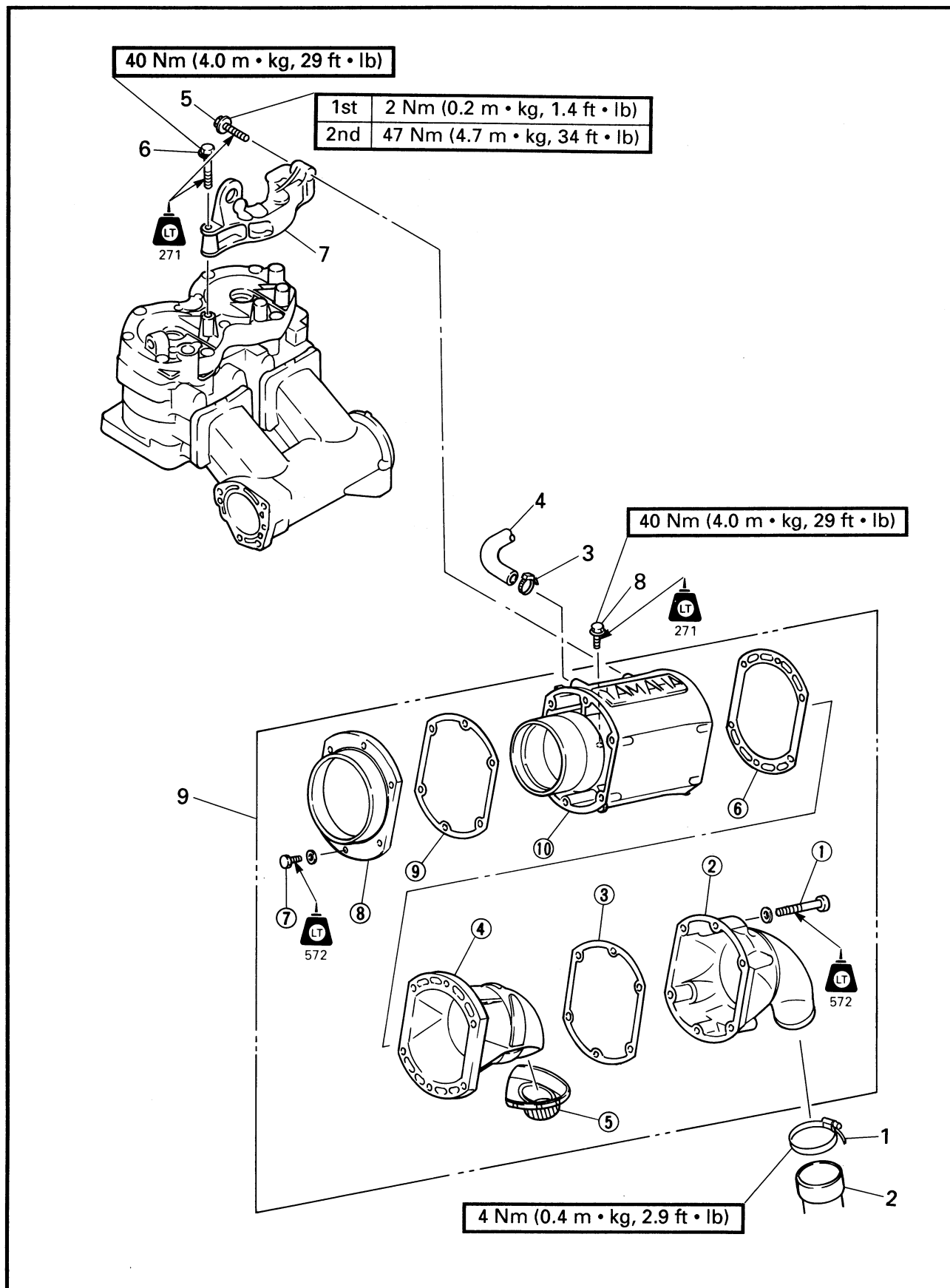


EXHAUST RING

REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	EXHAUST RING REMOVAL		Follow the left "Step" for removal.
1	Hose tie	3	
2	Pilot water hose	1	
3	Water hose	2	
4	Clamp	2	
5	Exhaust joint	1	NOTE: _____ ● Pull and side the exhaust joint. ● Loosen the clamp on the chamber side.
6	Clamp	1	
7	Bolt (with washer)	4	
8	Ring assembly	1	
9	Gasket	1	
10	Pin dowel	2	
	RING DISASSEMBLY		
①	Clamp	1	CAUTION: _____ Tighten the clamp before installing the ring on the muffler.
②	Joint	1	
③	Exhaust joint	1	
④	Ring	1	
			Reverse the removal steps for installation.

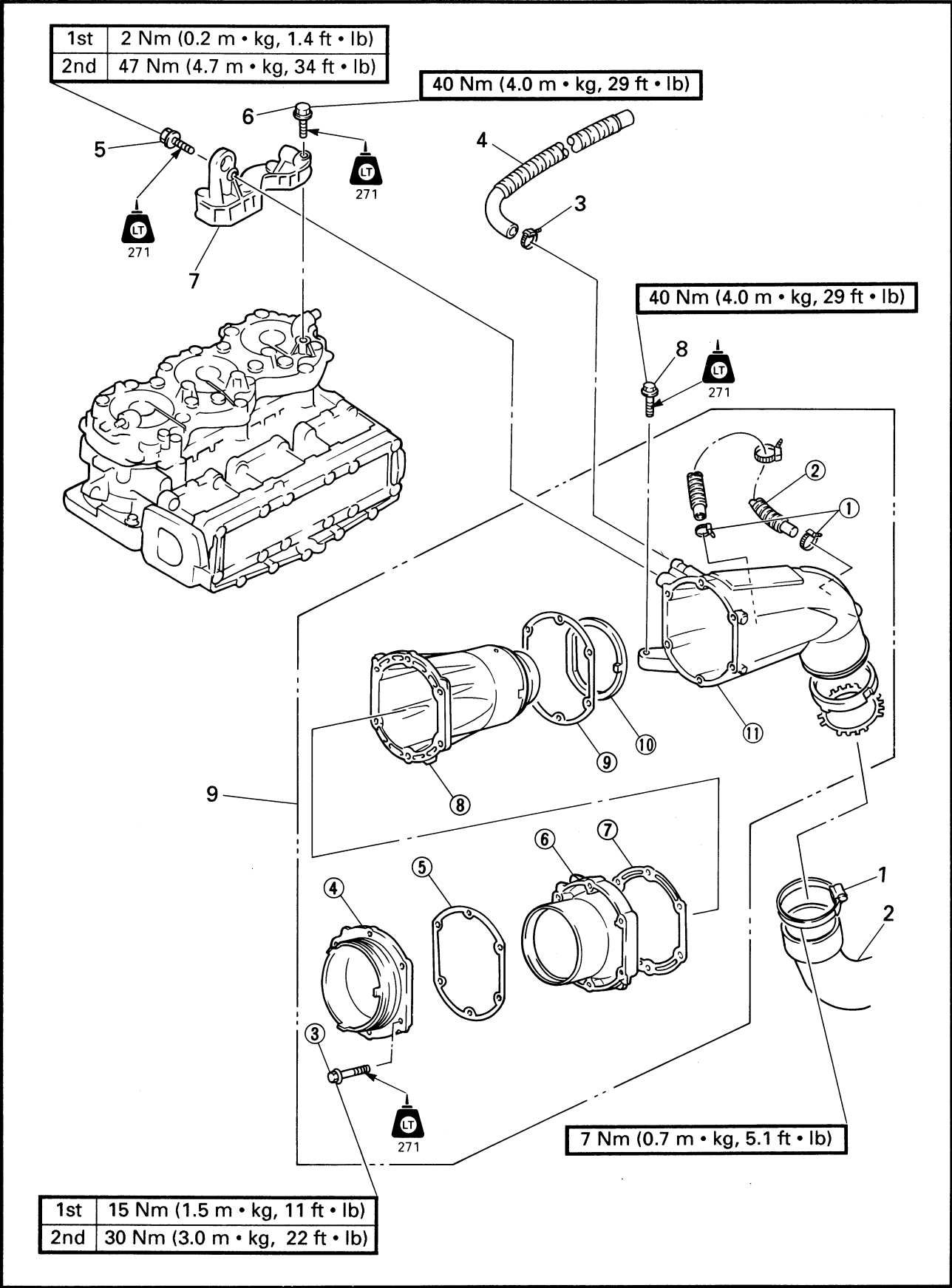
**EXHAUST CHAMBER
EXPLODED DIAGRAM (RA700, RA700A)**




REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	EXHAUST CHAMBER REMOVAL		Follow the left "Step" for removal. Refer to the "EXHAUST RING" section.
	Ring assembly		
1	Clamp	1	
2	Exhaust hose	1	
3	Hose tie	1	
4	Water outlet hose	1	
5	Bolt (exhaust chamber)	2	
6	Bolt (muffler stay)	4	
7	Muffler stay	1	
8	Bolt	2	
9	Exhaust chamber assembly	1	
	CHAMBER DISASSEMBLY		
①	Bolt (with washer)	6	
②	Exhaust outer cover 1	1	
③	Gasket	1	
④	Exhaust inner cover	1	
⑤	Seal	1	
⑥	Gasket	1	
⑦	Bolt (with washer)	6	
⑧	Exhaust outer cover 2	1	
⑨	Gasket	1	
⑩	Exhaust chamber	1	
			Reverse the removal steps for installation.

EXPLODED DIAGRAM (RA1100)





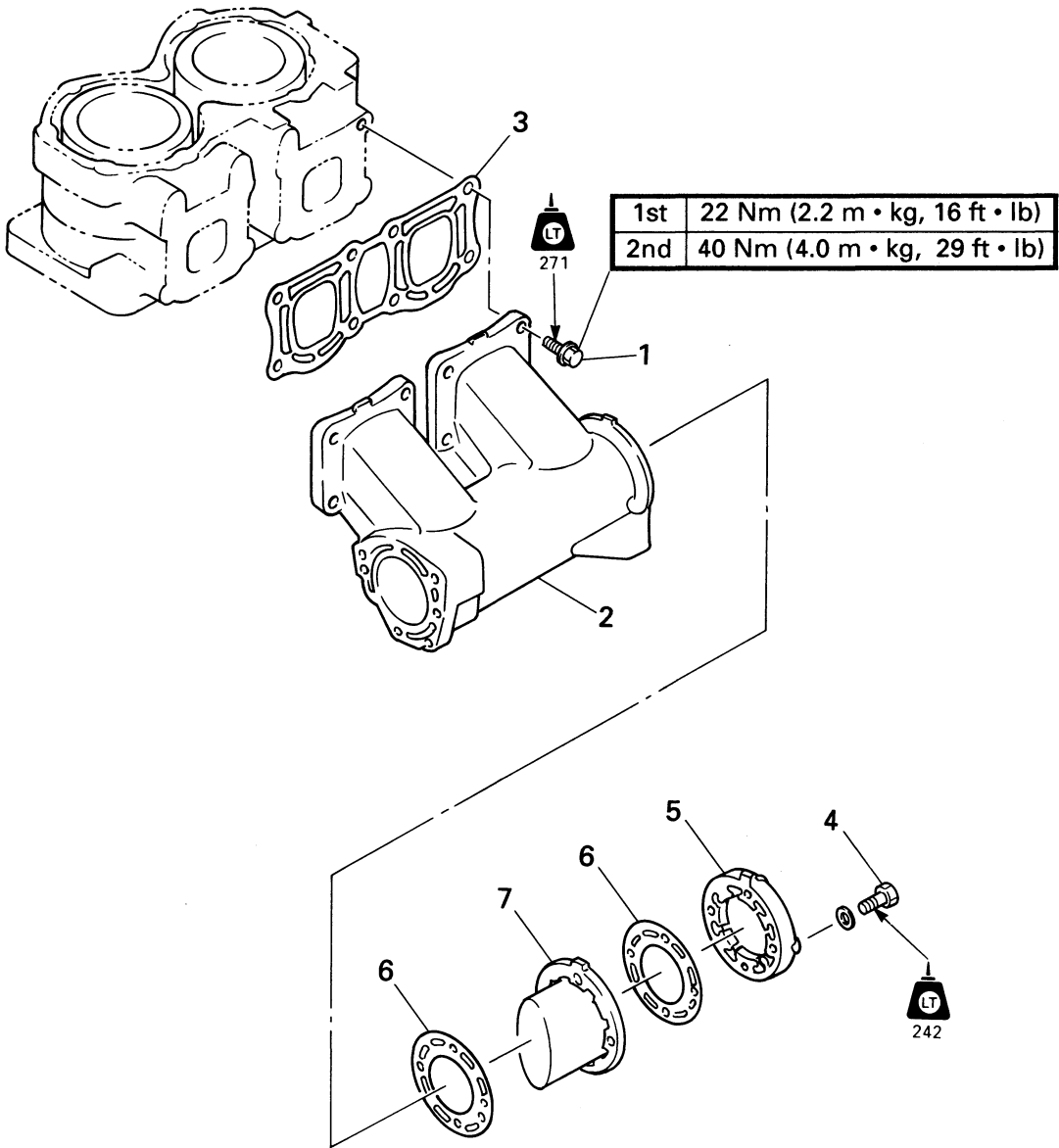
EXHAUST CHAMBER

REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	EXHAUST CHAMBER REMOVAL		Follow the left "Step" for removal. Refer to the "EXHAUST RING" section.
1	Ring assembly		
1	Clamp	1	
2	Exhaust hose	1	
3	Hose tie	1	
4	Water outlet hose	1	
5	Bolt (exhaust chamber)	2	
6	Bolt (muffler stay)	4	
7	Muffler stay	1	
8	Bolt	2	
9	Exhaust chamber assembly	1	
	CHAMBER DISASSEMBLY		
①	Hose tie	2	
②	Water hose	1	
③	Bolt (with washer)	6	
④	Exhaust outer cover 1	1	
⑤	Gasket	1	
⑥	Muffler 2	1	
⑦	Gasket	1	
⑧	Exhaust inner cover	1	
⑨	Gasket	1	
⑩	Seal	1	
⑪	Exhaust chamber	1	
			Reverse the removal steps for installation.

MUFFLER

EXPLODED DIAGRAM (RA700, RA700A)



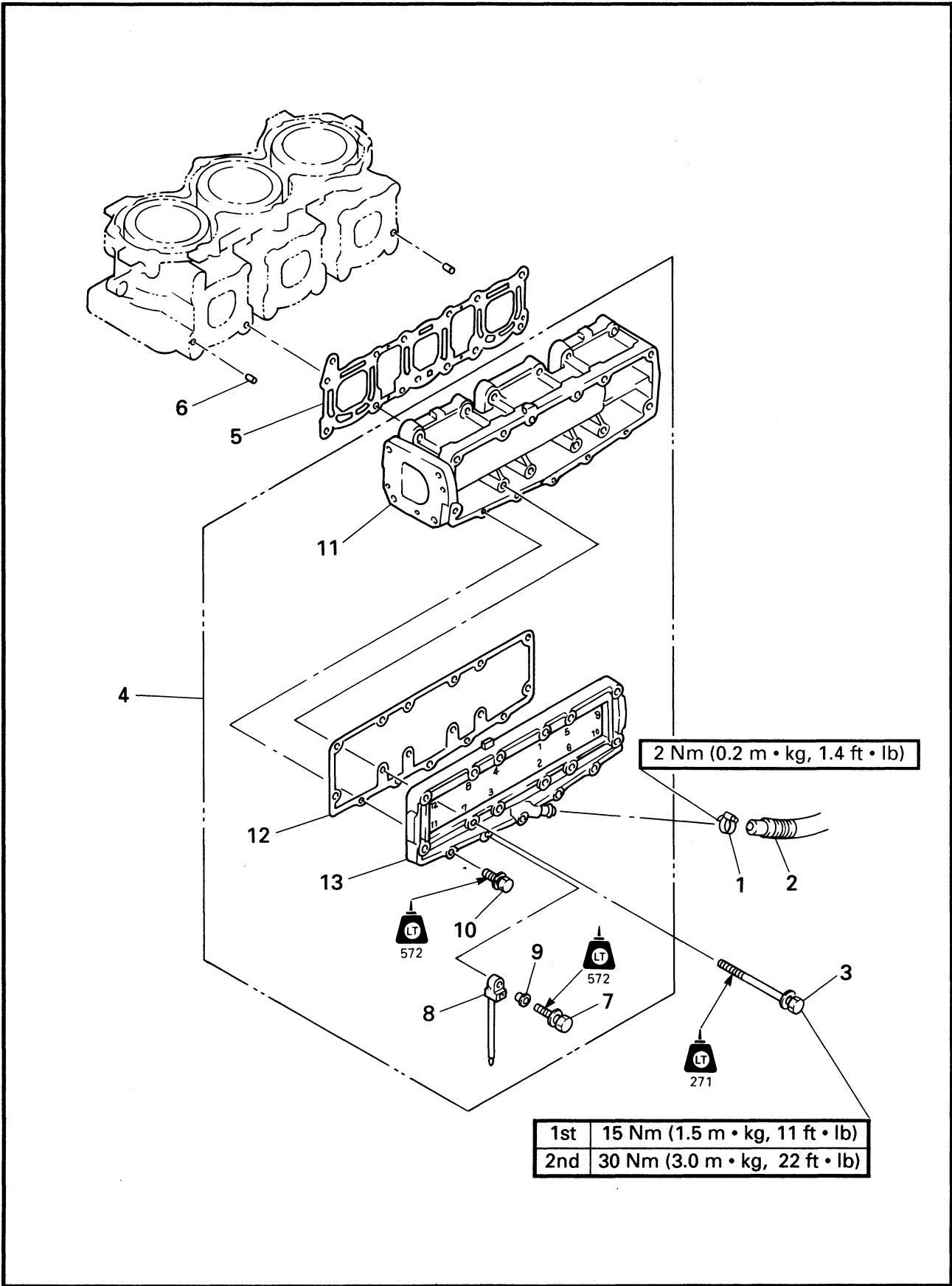


MUFFLER

REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	MUFFLER REMOVAL		Follow the left "Step" for removal. Refer to the "EXHAUST CHAMBER" section. Reverse the removal steps for installation.
	Exhaust chamber		
1	Bolt (with washer)	8	
2	Muffler	1	
3	Gasket	1	
4	Bolt (with washer)	4	
5	Protector	1	
6	Gasket	2	
7	Inner cover	1	

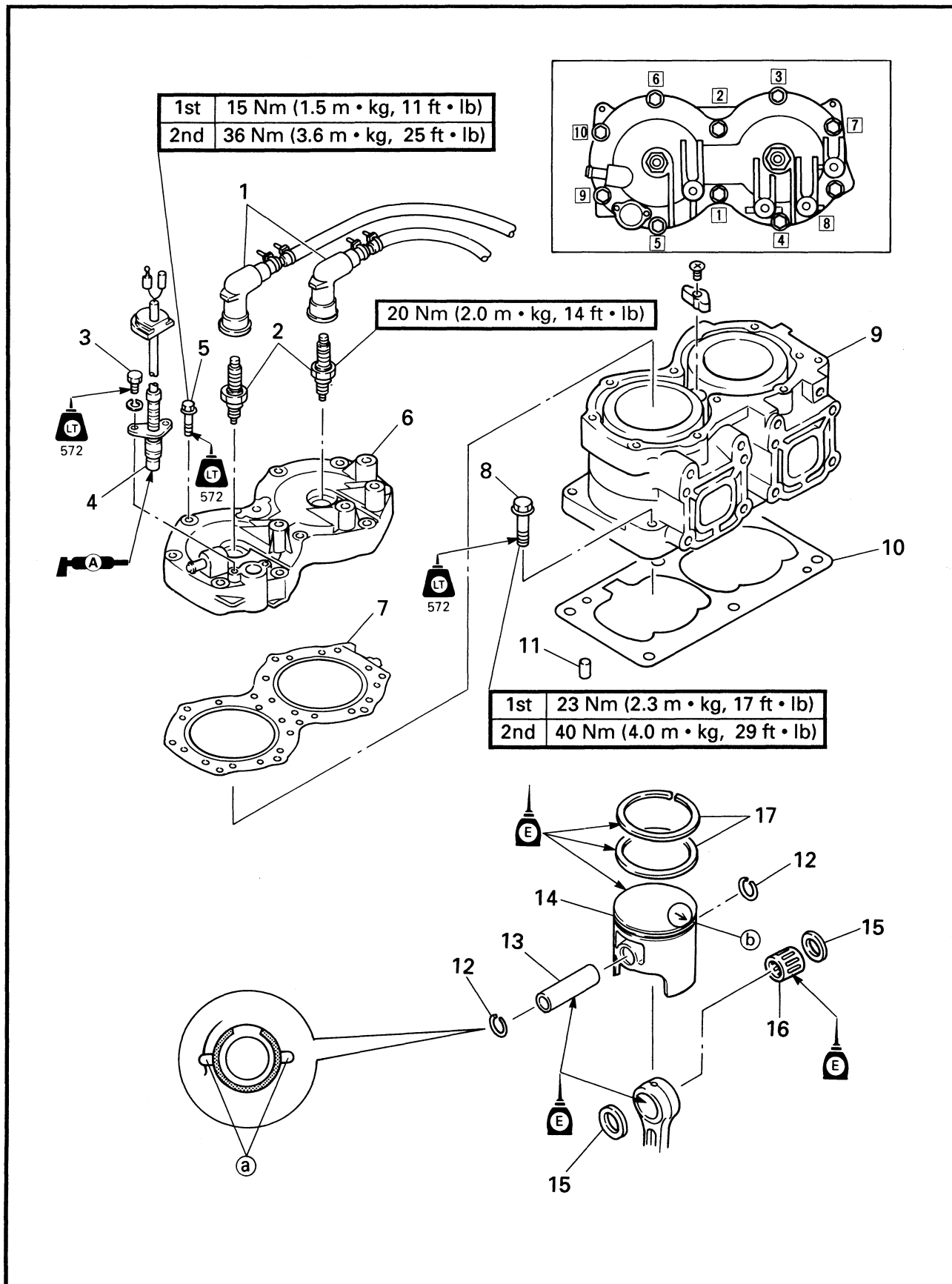
EXPLODED DIAGRAM (RA1100)



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	MUFFLER REMOVAL		Follow the left "Step" for removal.
	Exhaust chamber		Refer to the "EXHAUST CHAMBER" section.
1	Clamp	1	
2	Water inlet hose	1	
3	Bolt (with washer)	12	<div>CAUTION:</div> <div>Tighten the bolts in sequence and in two steps of torque.</div>
4	Muffler assembly	1	
5	Gasket	1	
6	Pin	2	
7	Bolt (with washer)	1	
8	Clamp	1	
9	Collar	1	
10	Bolt (with washer)	4	
11	Muffler 1	1	
12	Gasket	1	
13	Muffler cover	1	
			Reverse the removal steps for installation.

**CYLINDER HEAD, CYLINDER AND PISTON
EXPLODED DIAGRAM (RA700, RA700A)**



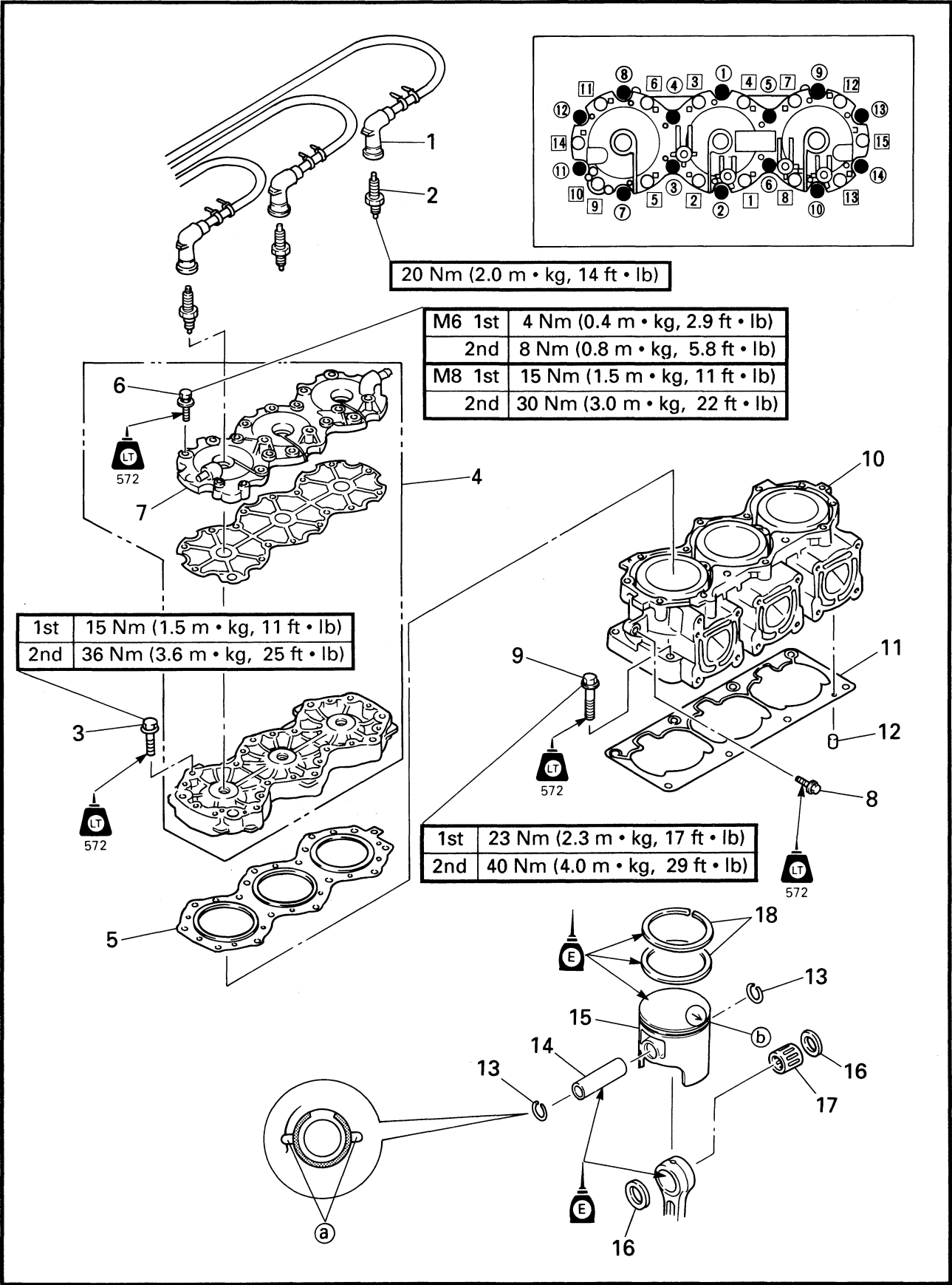


CYLINDER HEAD, CYLINDER AND PISTON

REMOVAL AND INSTALLATION CHART

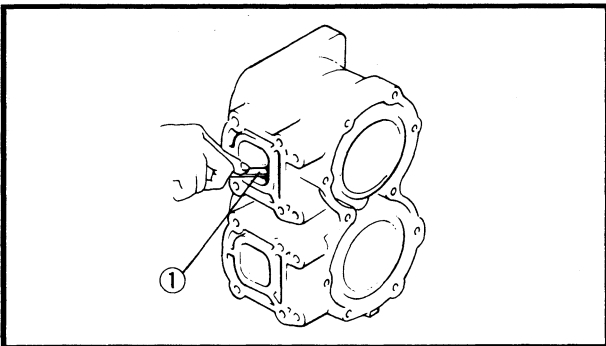
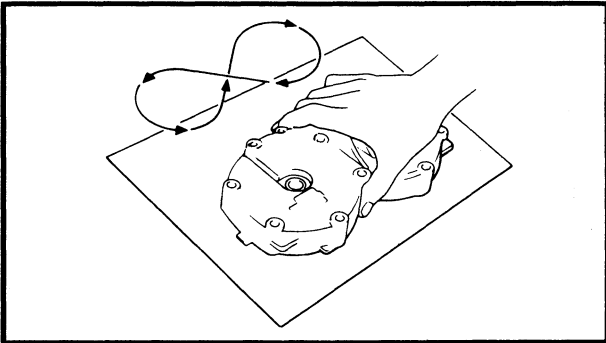
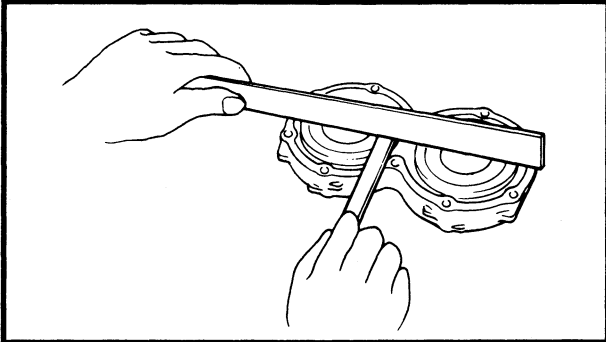
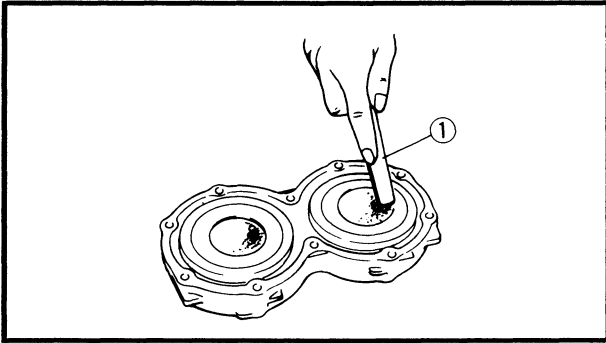
Step	Procedure/Part name	Q'ty	Service points
	CYLINDER HEAD, CYLINDER AND PISTON REMOVAL		Follow the left "Step" for removal.
	Muffler		Refer to the "MUFFLER" section.
1	Spark plug cap	2	
2	Spark plug	2	
3	Bolt (with washer)	2	
4	Thermo switch assembly	1	
5	Bolt (with washer)	10	CAUTION: _____ Tighten the bolts in sequence and in two steps of torque.
6	Cylinder head	1	
7	Cylinder head gasket	1	
8	Bolt (with washer)	6	CAUTION: _____ Tighten the bolts in two steps of torque.
9	Cylinder	1	CAUTION: _____ After installing, check that the piston moves smoothly.
10	Cylinder gasket	1	
11	Pin	2	
12	Piston pin clip	4	NOTE: _____ Before installing the piston pin clip, cover the crankcase with a clean rag to prevent the piston pin clip from falling into the crankcase cavity.
			CAUTION: _____ Do not allow the open ends of the clip to touch the piston pin slot ①.
13	Piston pin	2	
14	Piston	2	NOTE: _____ Be sure that the arrow ② is positioned on the exhaust side.
15	Washer	4	
16	Bearing	2	
17	Piston ring	4	CAUTION: _____ Align each end gap with the locating pin.
			Reverse the removal steps for installation.

EXPLODED DIAGRAM (RA1100)




REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	CYLINDER HEAD, CYLINDER AND PISTON REMOVAL		Follow the left "Step" for removal.
	Muffler		Refer to the "MUFFLER" section.
1	Spark plug cap	3	
2	Spark plug	3	
3	Bolt (with washer)	14	CAUTION: _____ Tighten the bolts in sequence and in two steps of torque.
4	Cylinder head cover	1	
5	Cylinder head gasket	1	
6	Bolt (with washer)	15	CAUTION: _____ Tighten the bolts in sequence and in two steps of torque.
7	Cylinder head cover	1	
8	Bolt (with washer)	1	
9	Bolt (with washer)	8	CAUTION: _____ Tighten the bolts in two steps of torque.
10	Cylinder	1	CAUTION: _____ After installing, check that the piston moves smoothly.
11	Cylinder gasket	1	
12	Pin	2	
13	Piston pin clip	6	NOTE: _____ Before installing the piston pin clip, cover the crankcase with a clean rag to prevent the piston pin clip from falling into the crankcase cavity.
			CAUTION: _____ Do not allow the open ends to of the clip to touch the piston pin slot ①.
14	Piston pin	3	
15	Piston	3	NOTE: _____ Be sure that the arrow ② is positioned on the exhaust side.
16	Washer	6	
17	Bearing	3	
18	Piston ring	6	CAUTION: _____ Align each end gap with the locating pin.
			Reverse the removal steps for installation.



SERVICE POINTS

Cylinder head inspection

1. Eliminate:
 - Carbon deposits
 - Use a rounded scraper ①.

NOTE:

Take care to avoid damaging the spark plug threads. Do not use a sharp instrument. Avoid scratching the aluminum.

2. Inspect:
 - Cylinder head water jacket
 - Mineral deposits/Corrosion → Clean.
3. Measure:
 - Cylinder head warpage
 - Out of specification → Resurface.



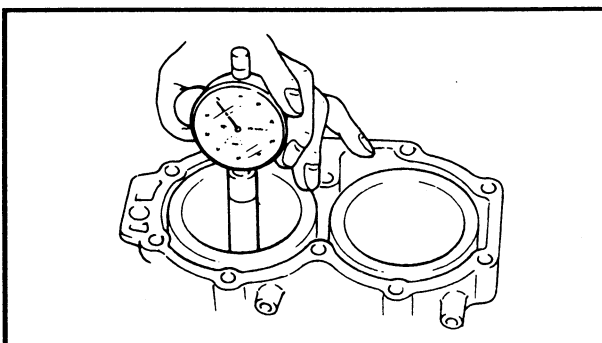
Warpage limit:
0.1 mm (0.004 in)

Warpage measurement and resurfacing steps:

- Attach a straight edge and a thickness gauge to the cylinder head.
- Measure the warpage.
- If the warpage is out of specification, resurface the cylinder head.
- Place a piece of 400 ~ 600 grit wet sandpaper on the surface plate, and resurface the head using a figure-eight sanding pattern.

Cylinder inspection

1. Eliminate:
 - Carbon deposits
 - Use a rounded scraper ①.
2. Inspect:
 - Cylinder water jacket
 - Mineral deposits/Corrosion → Clean.
 - Cylinder inner surface
 - Score marks → Repair or replace.
 - Use #600 ~ 800 grit wet sandpaper.

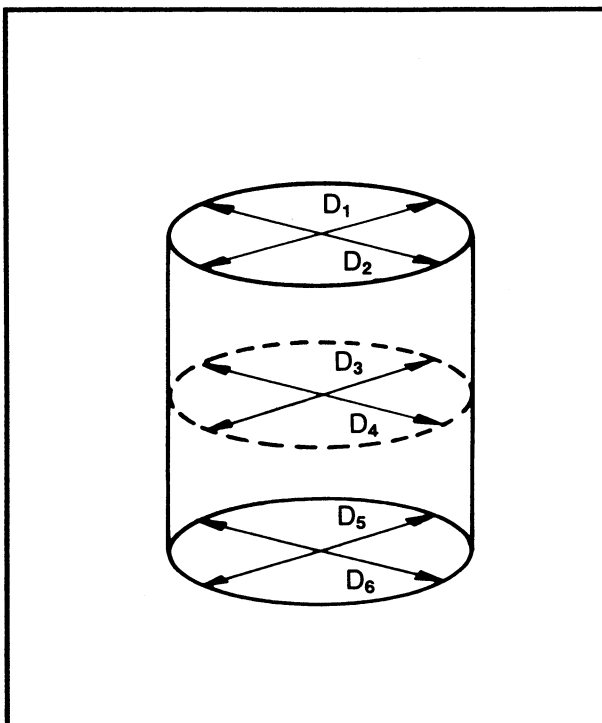



3. Measure:

- Cylinder bore "D"
Use cylinder gauge.
Out of specification → Replace.

NOTE:

Measure the cylinder bore "D" in several different directions. Then find the average of the measurements.



	Standard	Limit
Cylinder bore "D"	81.00 ~ 81.02 mm (3.189 ~ 3.190 in)	81.10 mm (3.193 in)
Taper "T"	—	0.08 mm (0.003 in)
Out of round "R"	—	0.05 mm (0.002 in)
D = Maximum (D ₁ ~ D ₆) T = (Maximum D ₁ or D ₂) – (Maximum D ₅ or D ₆) R = (Maximum D ₁ , D ₃ or D ₅) – (Minimum D ₂ , D ₄ or D ₆)		

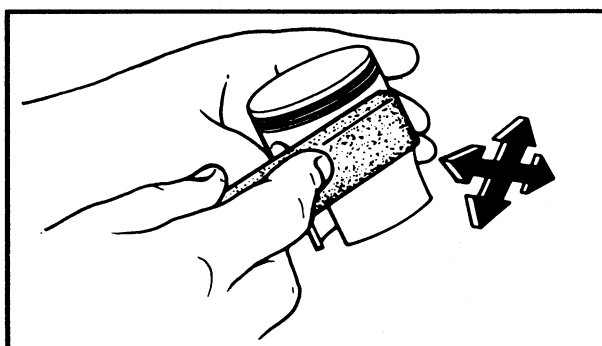
Piston inspection

1. Eliminate:

- Carbon deposits
From the piston crown and ring groove.

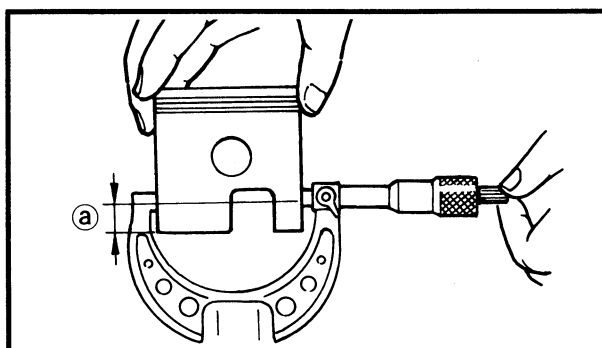
2. Inspect:

- Piston wall
Score marks → Repair or replace.
Use #600 ~ 800 grit wet sandpaper.




NOTE:

Sand in a criss-cross pattern. Do not sand excessively.



3. Measure:

- Piston skirt diameter
Use micrometer.
Out of specification → Replace.

	Piston diameter	Distance ①
	80.925 ~ 80.950 mm (3.186 ~ 3.187 in)	10 mm (0.39 in)
	RA1100: 80.885 ~ 80.890 mm (3.184 ~ 3.185 in)	



4. Calculate:

- Piston clearance

Out of specification → Replace piston, piston rings as a set.

**PISTON
CLEARANCE**

**= CYLINDER
BORE**

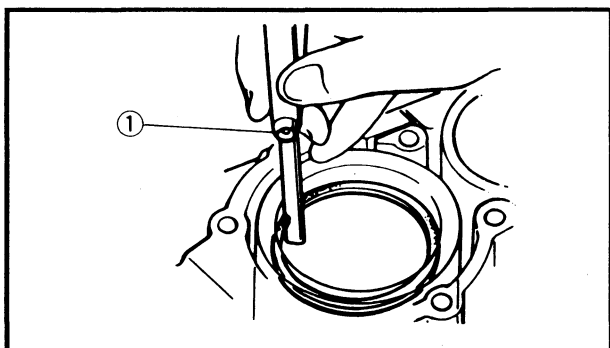
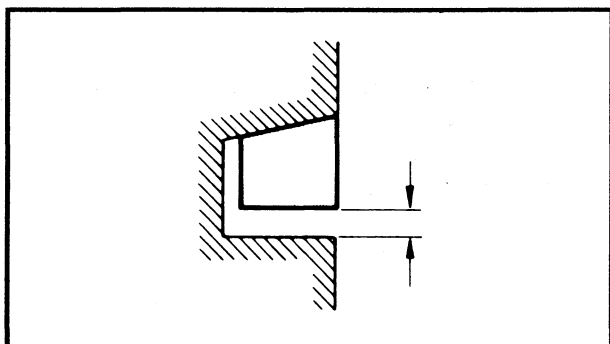
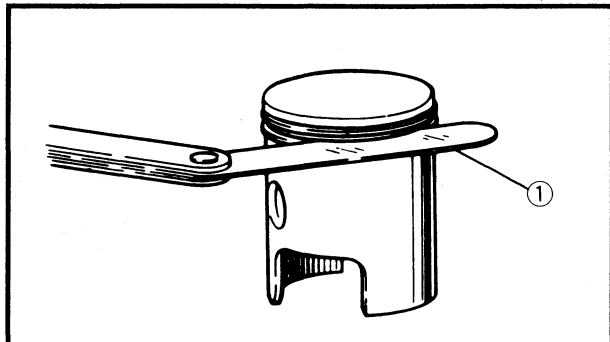
**- PISTON
DIAMETER**

**Piston clearance:**

0.080 ~ 0.085 mm
(0.0031 ~ 0.0033 in)

RA1100:

0.110 ~ 0.115 mm
(0.0043 ~ 0.0045 in)

**Piston ring inspection**

1. Measure:

- Side clearance

Out of specification → Replace piston and/or ring.

Use a thickness gauge ①.

**Side clearance:**

Top

2nd

0.02 ~ 0.06 mm
(0.0008 ~ 0.0024 in)

2. Measure:

- End gap

Out of specification → Replace rings as a set.

Use a thickness gauge ①.

**End gap:**

Top

2nd

0.2 ~ 0.4 mm (0.008 ~ 0.016 in)

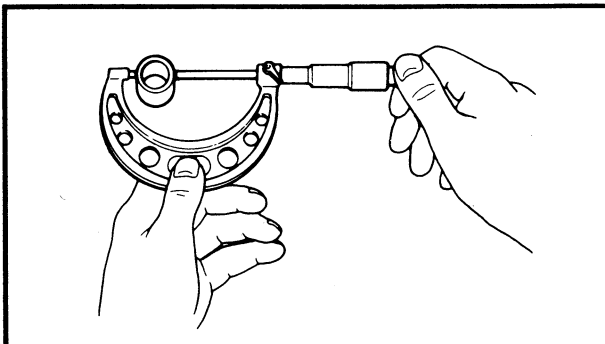
NOTE:

- Install the piston ring in the cylinder.
- Push the ring with the piston crown.

Piston pin and bearing inspection

1. Inspect:

- Piston pin
 - Bearing
- Signs of heat discoloration → Replace.



2. Measure:

- Piston pin outside diameter
- Use micrometer.
Out of limit → Replace.



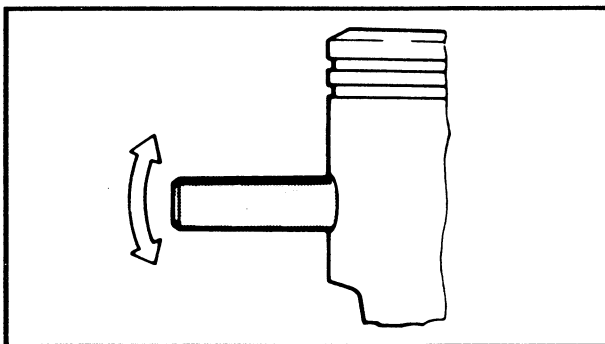
Piston pin outside diameter:

Standard

19.995 ~ 20.000 mm
(0.7872 ~ 0.7874 in)

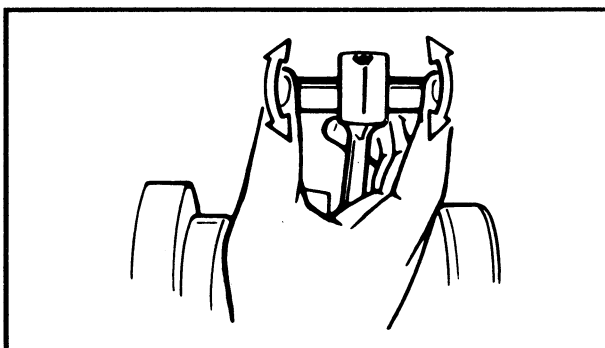
Limit

19.98 mm (0.786 in)



3. Check:

- Free play (when the piston pin is in place in the piston)
- There should be no noticeable free play.
Free play is noticeable → Replace piston pin and/or piston.



4. Check:

- Free play
- There should be no noticeable free play.
Free play is noticeable → Inspect the connecting rod for wear/Replace the pin and/or connecting rod as required.



REMOVAL AND INSTALLATION CHART

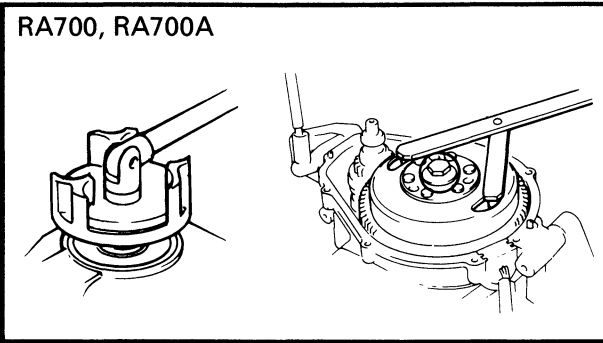
Step	Procedure/Part name	Q'ty	Service points
	FLYWHEEL MAGNETO AND BASE REMOVAL		Follow the left "Step" for removal.
	Engine unit		Refer to the "ENGINE UNIT REMOVAL" section.
1	Bolt (with washer)	2	
2	Oil pump	1	
3	Gasket	1	
4	Bolt (with washer)	1	
5	Clamp	1	
6	Bolt (with washer)	6	
7	Flywheel cover	1	
8	Flywheel cover gasket	1	
9	Pin	1	
10	Plate washer	2	NOTE: _____
11	Spring	1	Fill the flywheel cover groove with water resistant grease.
12	Coupling flange	1	
13	Flange bolt	1	
14	Flywheel magneto	1	NOTE: _____ When installing the flywheel magneto make sure that the woodruff key is properly seated in the keyway of the crankshaft.
15	Woodruff key	1	
16	Screw	2	
17	Base assembly	1	NOTE: _____ Align the punch mark on the crankcase with the punch mark on the base assembly.
18	Idle gear assembly	1	Reverse the removal steps for installation.



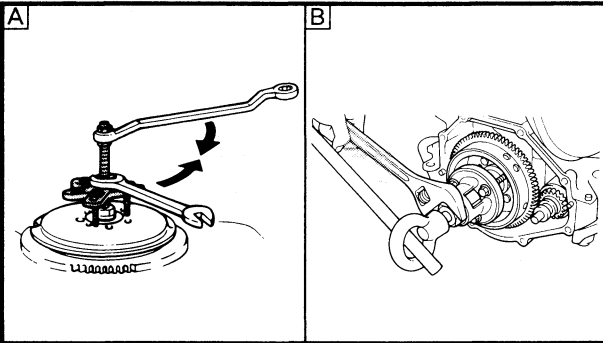
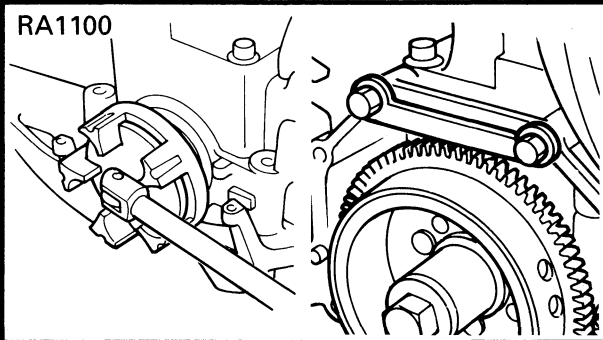
REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	FLYWHEEL COVER AND FLY-WHEEL MAGNETO REMOVAL		Follow the left "Step" for removal.
	Engine unit		Refer to the "ENGINE UNIT REMOVAL" section.
1	Spark plug cap	3	
2	Bolt (with washer)	2	
3	Thermo switch	1	
4	Nut	1	
5	Spring washer	1	
6	Starter motor positive lead	1	
7	Battery positive lead	1	
8	Bolt (with washer)	2	
9	Oil pump	1	
10	Gasket	1	
11	Bolt (with washer)	1	8 × 25 mm
12	Bolt (with washer)	1	8 × 55 mm
13	Bolt (with washer)	7	8 × 30 mm
14	Flywheel cover assembly	1	
15	Flywheel cover gasket	1	
16	Pin	2	
17	Plate washer	2	NOTE: _____
18	Spring	1	Fill the flywheel cover groove with water resistant grease. _____
19	Coupling flange	1	
20	Flange bolt	1	
21	Flywheel magneto	1	NOTE: _____ When installing the flywheel magneto make sure that the woodruff key is properly seated in the keyway of the crankshaft. _____
22	Woodruff key	1	
23	Idle gear assembly	1	
			Reverse the removal steps for installation.

RA700, RA700A



RA1100



SERVICE POINTS

Coupling flange removal and installation

1. Remove and install:
 - Coupling flange



Coupler wrench:

RA700/RA700A

YW-38741/90890-06425

RA1100

YW-06546/90890-06546

Flywheel holder:

RA700/RA700A

YB-06139/90890-06522

RA1100

YW-41528/90890-06545

Flywheel magneto removal and installation

1. Remove and install:
 - Bolt



Flywheel holder:

YB-06139/90890-06522

RA1100:

YW-41528/90890-06545

2. Remove:
 - Flywheel magneto



Flywheel puller:

YB-06117/90890-06521

Bolt:

M8 × 80 mm

A For USA and CANADA

B Except for USA and CANADA

CAUTION:

To prevent damage to the engine or tools, screw in the flywheel puller set-bolts evenly and completely so that the puller plate is parallel to the flywheel.

Coupling flange inspection

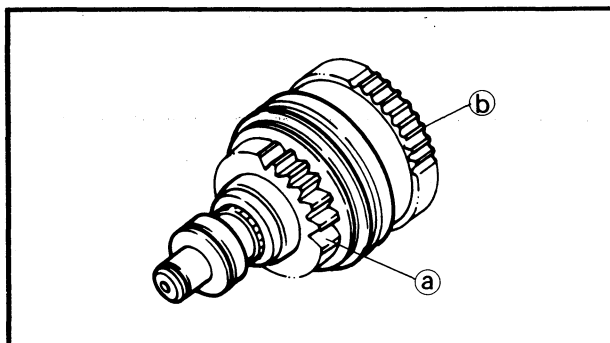
1. Inspect:
 - Coupling flange

Wear/Damage → Replace.

Flywheel magneto inspection

1. Inspect:
 - Flywheel gear

Wear/Damage → Replace.

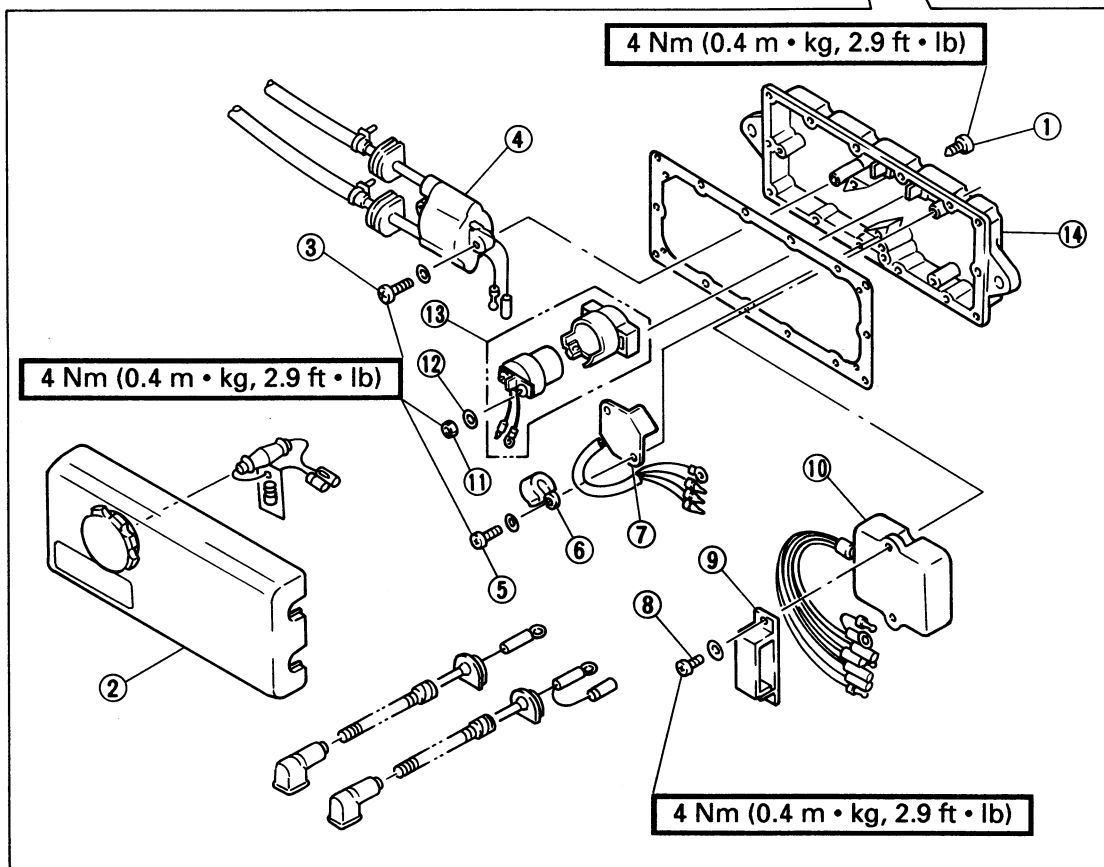
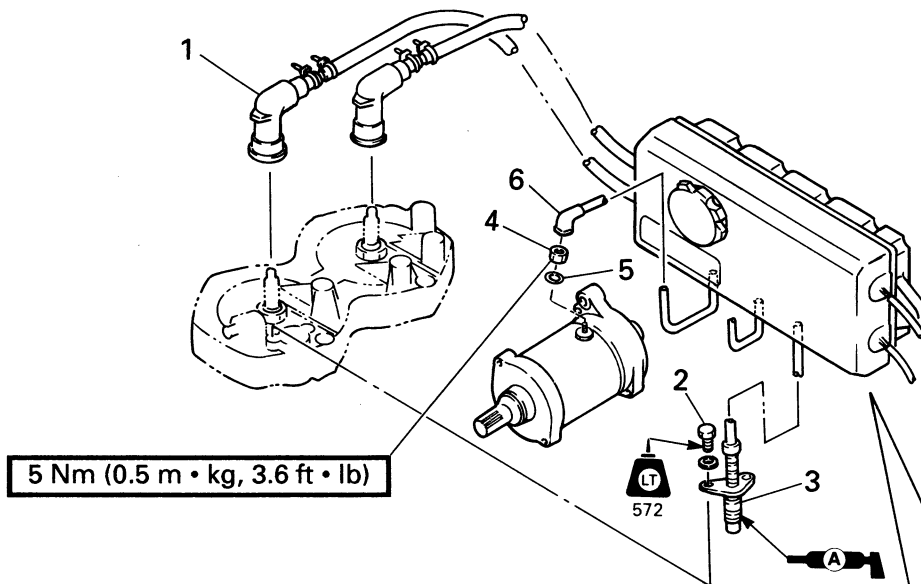
**Idle gear assembly inspection****1. Inspect:**

- Pinion gear ①
- Inner gear ②
Wear/Damage → Replace.

2. Check:

- Clutch movement
Unsmooth movement → Replace.

**ELECTRICAL UNIT
EXPLODED DIAGRAM (RA700, RA700A)**

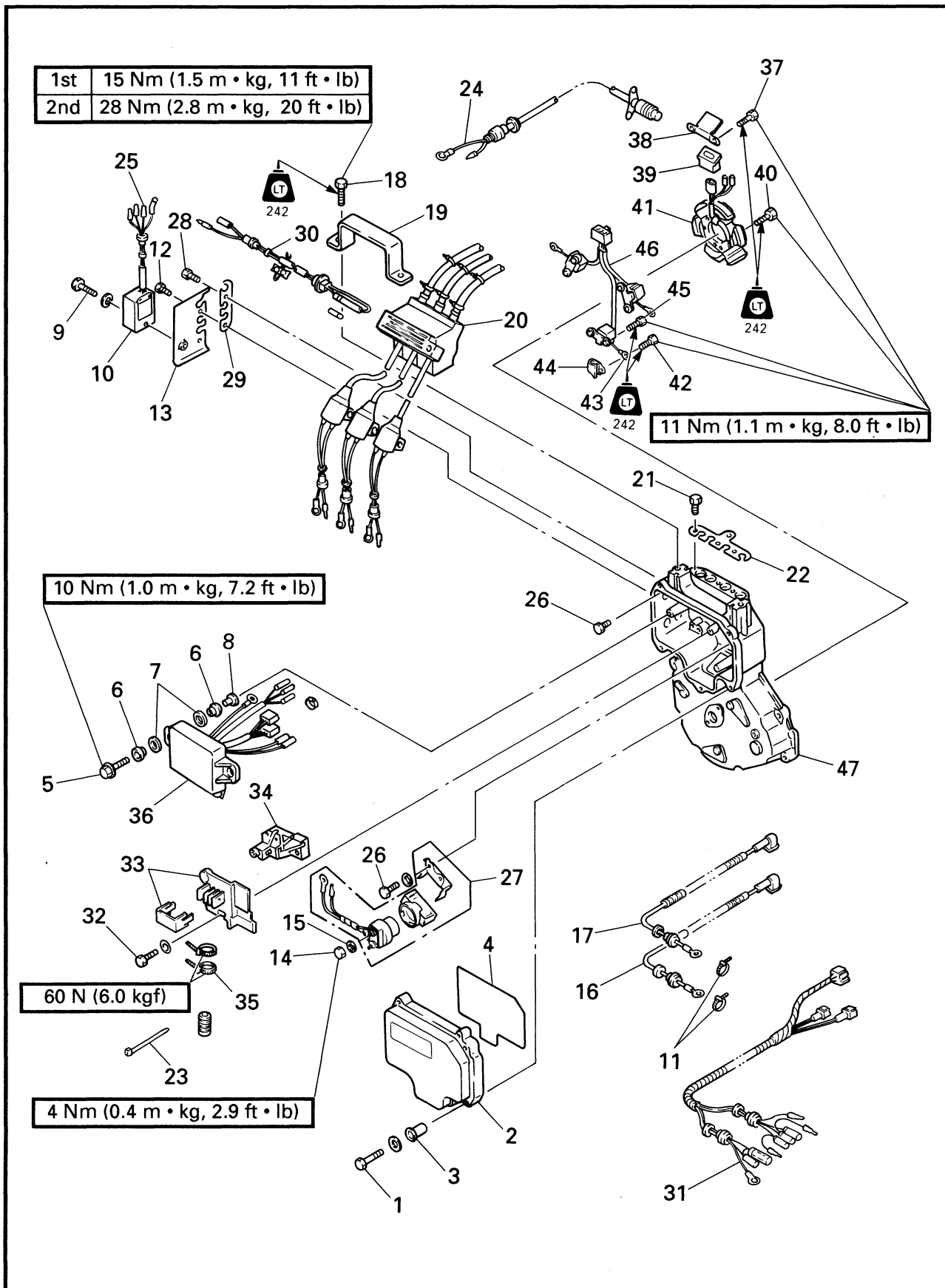


REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	ELECTRICAL UNIT REMOVAL		Follow the left "Step" for removal. Refer to the "ENGINE UNIT REMOVAL" section. Refer to the "FLYWHEEL MAGNETO AND BASE" section.
	Electrical box		
	Base assembly		
1	Spark plug cap	2	
2	Bolt (with washer)	2	
3	Thermo switch	1	
4	Nut	1	
5	Spring washer	1	
6	Starter motor negative lead	1	
	ELECTRICAL UNIT DISASSEMBLY		
①	Screw	14	
②	Case cover	1	
③	Screw	2	
④	Ignition coil	1	
⑤	Screw	3	
⑥	Clamp	1	
⑦	Rectifier-regulator	1	
⑧	Screw	3	
⑨	Clamp bracket	1	
⑩	CDI unit	1	
⑪	Nut	2	
⑫	Spring washer	2	
⑬	Starter relay	1	
⑭	Housing	1	
			Reverse the removal steps for installation.



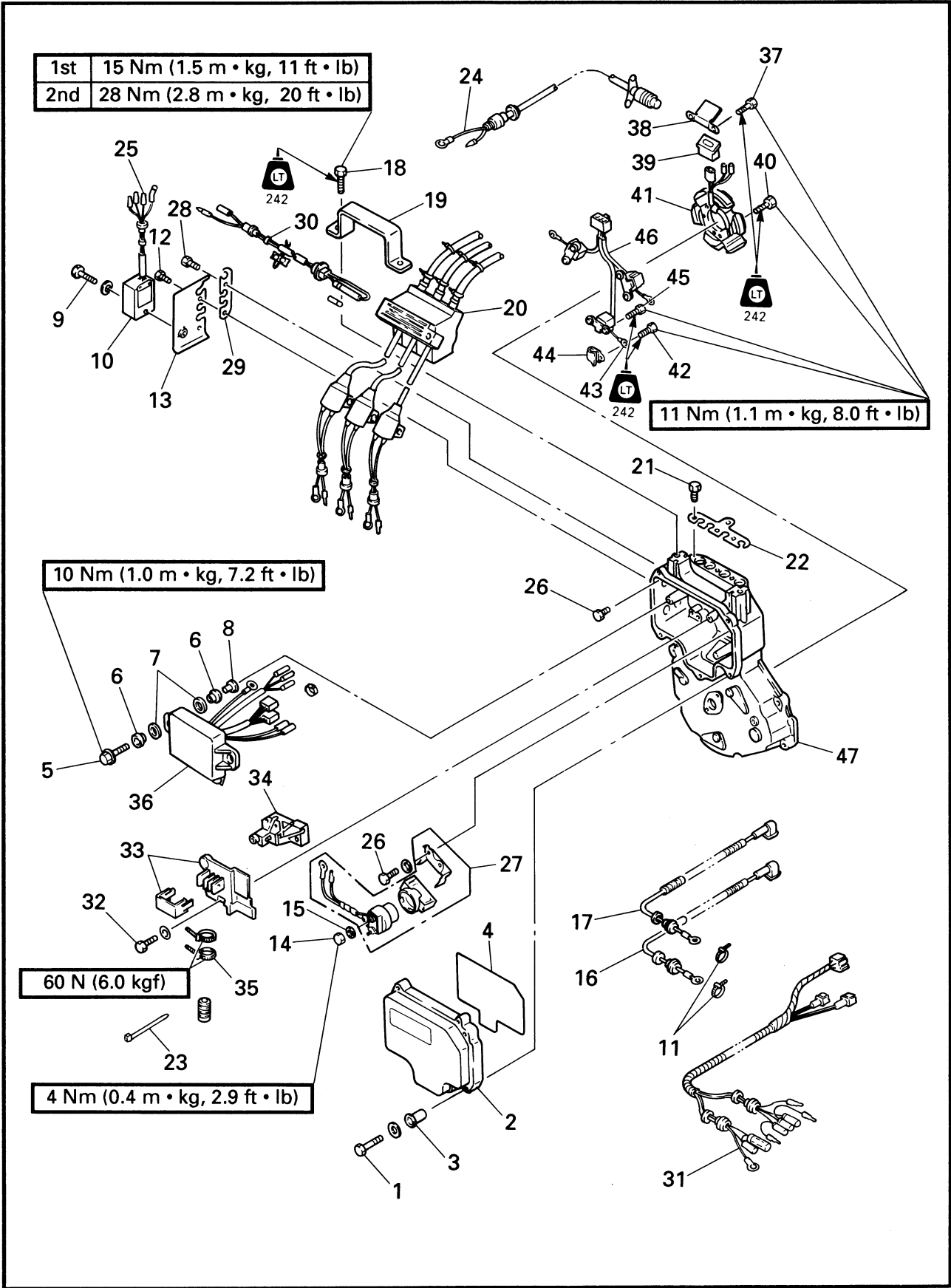
EXPLODED DIAGRAM (RA1100)



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	ELECTRICAL UNIT DISASSEMBLY		Follow the left "Step" for removal.
	Flywheel cover assembly		Refer to the "FLYWHEEL COVER AND FLYWHEEL MAGNETO" section.
1	Bolt (with washer)	5	
2	Ignition coil cover	1	
3	Collar	5	
4	Packing	1	
5	Bolt (with washer)	3	
6	Grommet	6	
7	Washer	6	
8	Collar	3	
9	Bolt (with washer)	1	6 × 12 mm
10	Rectifier-regulator	1	
11	Lead tie	2	
12	Bolt	2	6 × 12 mm
13	Plate	1	
14	Nut	2	
15	Spring washer	2	
16	Starter motor positive lead	1	
17	Battery positive lead	1	
18	Bolt (with washer)	2	
19	Bracket	1	
20	Damper (ignition coil)	1	
21	Bolt	3	6 × 12 mm
22	Plate (ignition coil and thermo switch)	1	
23	Lead tie	3	
24	Thermo switch	1	
25	Rectifier-regulator	1	
26	Bolt (with washer)	2	6 × 16 mm
27	Starter relay assembly	1	
28	Bolt	2	6 × 12 mm
29	Plate (extension wire and fuse holder lead)	1	
30	Fuse holder lead	1	
31	Extension wire	1	
32	Bolt (with washer)	2	6 × 14 mm

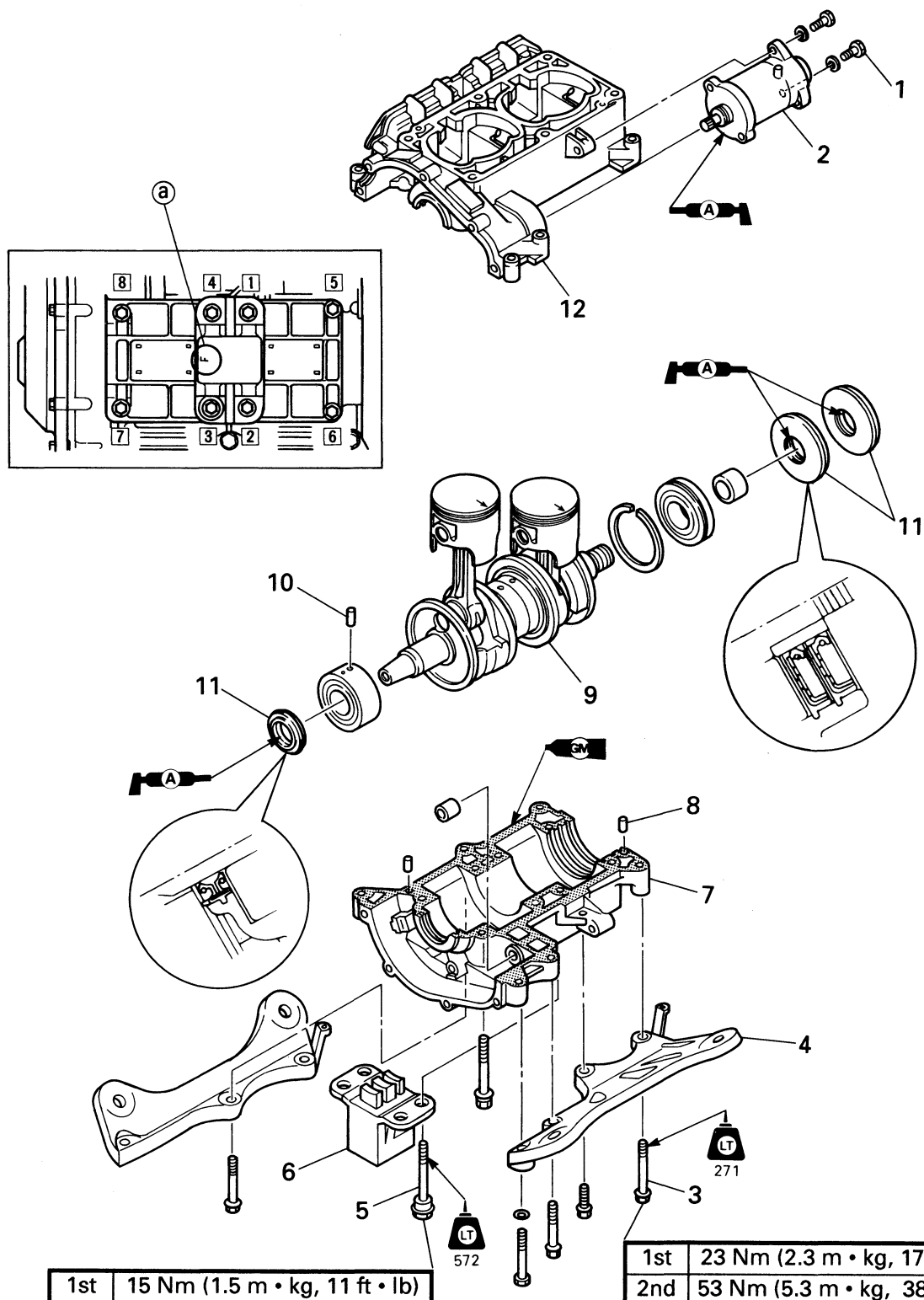
EXPLODED DIAGRAM (RA1100)



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
33	Wire holder	1	Reverse the removal steps for installation.
34	Grommet	1	
35	Clamp	2	
36	CDI unit	1	
37	Socket bolt	2	
38	Clamp	1	
39	Grommet	1	
40	Socket bolt	3	
41	Base assembly	1	
42	Socket bolt	3	
43	Pulser coil ground lead	3	
44	Clamp	3	
45	Socket bolt	6	
46	Pulser coil assembly	1	
47	Flywheel cover	1	

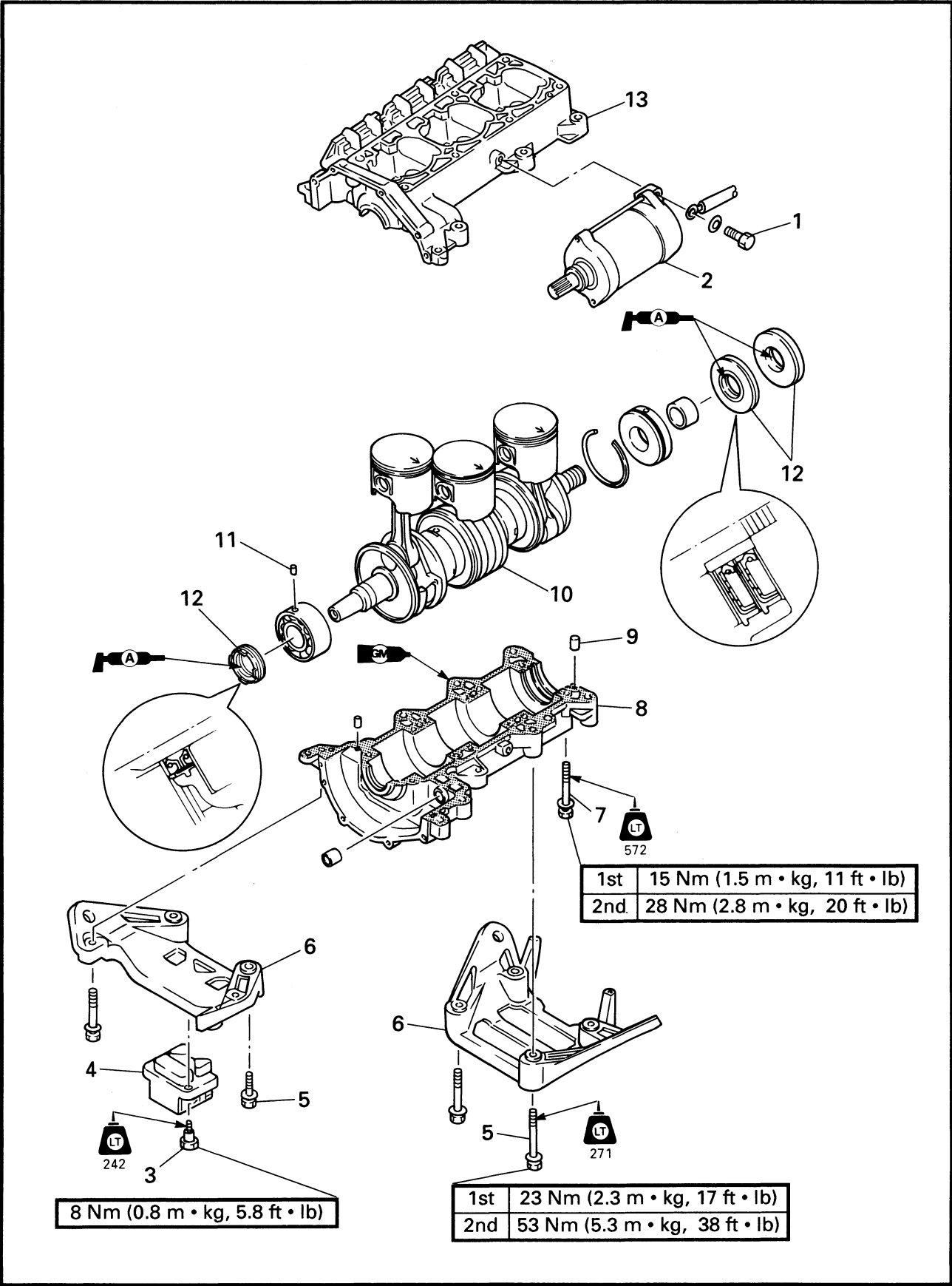
**CRANKCASE AND CRANKSHAFT
EXPLODED DIAGRAM (RA700, RA700A)**



REMOVAL AND INSTALLATION CHART

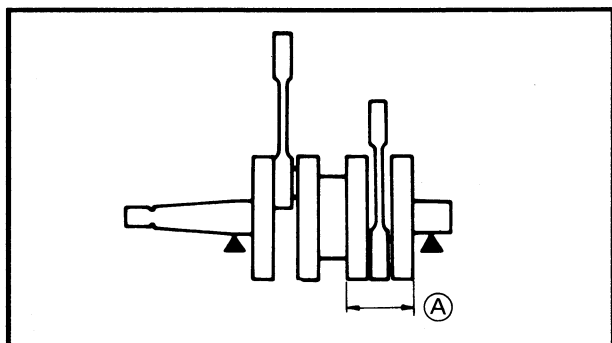
Step	Procedure/Part name	Q'ty	Service points
	CRANKCASE AND CRANKSHAFT DISASSEMBLY		Follow the left "Step" for removal.
	Base assembly		Refer to the "FLYWHEEL MAGNETO AND BASE" section.
	Carburetor assembly		Refer to the "CARBURETOR REMOVAL" section in chapter 4.
	Reed valve assembly		Refer to the "REED VALVE" section.
	Cylinder		Refer to the "CYLINDER HEAD, CYLINDER AND PISTON" section.
1	Bolt (with washer)	2	
2	Starter motor	1	
3	Bolt (with washer)	7	NOTE: _____ Tighten the bolts in two steps of torque.
4	Engine mount bracket	2	
5	Bolt (with washer)	8	NOTE: _____ Tighten the bolts in sequence and in two steps of torque.
6	Mount rubber	1	NOTE: _____ Be sure that the "F" mark ⓐ is on the fly-wheel side.
7	Crankcase	1	
8	Pin	2	
9	Crankshaft assembly	1	NOTE: _____ After installing, check the smooth movement of the crankshaft.
			CAUTION: _____ <ul style="list-style-type: none"> ● Do not allow the open ends of the bearing clip to meet the crankcase contacting surface. ● Place the locating pins on the bearing in the crankcase body groove.
10	Dowel pin	4	
11	Oil seal	3	
12	Case body	1	
			Reverse the removal steps for installation.

EXPLODED DIAGRAM (RA1100)




REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	CRANKCASE AND CRANKSHAFT DISASSEMBLY		Follow the left "Step" for removal.
	Base assembly		Refer to the "FLYWHEEL MAGNETO AND BASE" section.
	Carburetor assembly		Refer to the "CARBURETOR REMOVAL" section in chapter 4.
	Reed valve assembly		Refer to the "REED VALVE" section.
	Cylinder		Refer to the "CYLINDER HEAD, CYLINDER AND PISTON" section.
1	Bolt (with washer)	2	
2	Starter motor	1	
3	Bolt (with washer)	2	
4	Mount rubber	1	NOTE: _____ Be sure that the "F" mark ⓐ is on the fly-wheel side.
5	Bolt (with washer)	9	
6	Engine mount bracket	2	
7	Bolt (with washer)	12	NOTE: _____ Tighten the bolts in sequence and in two steps of torque.
8	Crankcase	1	
9	Pin	2	
10	Crankshaft assembly	1	NOTE: _____ After installing, check the smooth movement of the crankshaft.
			CAUTION: _____ <ul style="list-style-type: none"> ● Do not allow the open ends of the bearing clip to meet the crankcase contacting surface. ● Place the locating pins on the bearing in the crankcase body groove.
11	Dowel pin	8	
12	Oil seal	3	
13	Case body	1	
			Reverse the removal steps for installation.

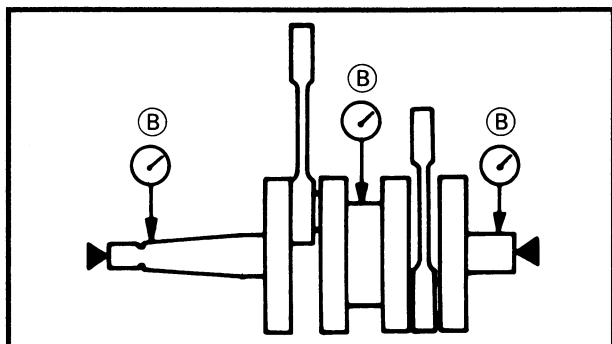
**SERVICE POINTS****Crankshaft inspection**

1. Measure:

- Crank width ①
- Out of specification → Replace.



Crank width:
61.95 ~ 62.00 mm
(2.439 ~ 2.441 in)

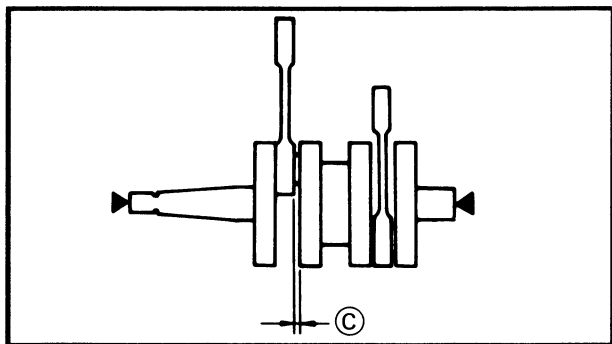


2. Measure:

- Deflection ②
- Use a dial gauge.
 Out of specification → Replace.



Maximum deflection:
0.05 mm (0.002 in)

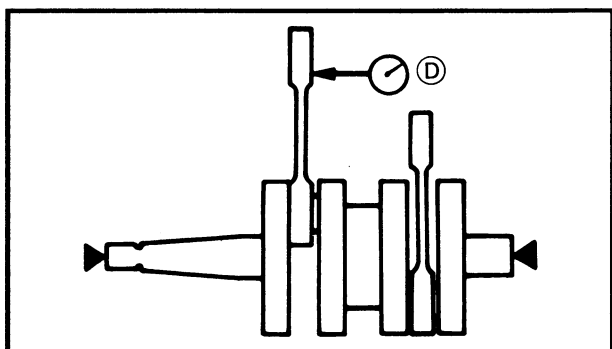


3. Measure:

- Big end side clearance ③
- Use a thickness gauge.
 Out of specification → Replace.



Big end side clearance:
0.25 ~ 0.75 mm
(0.010 ~ 0.030 in)

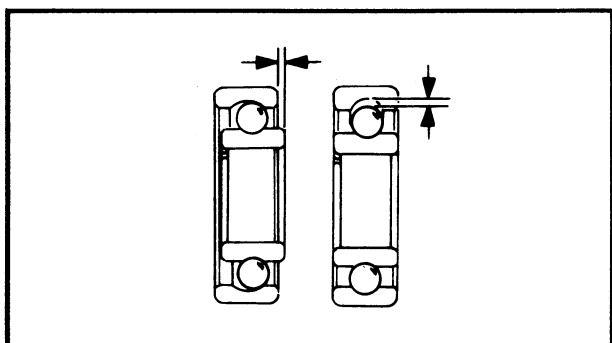


4. Measure:

- Small end free play ④
- Use a dial gauge.
 Out of specification → Replace.



Small end free play:
2.0 mm (0.08 in)



5. Inspect:

- Crankshaft bearing
- Pitting/Damage → Replace.

NOTE: _____
 Lubricate the bearings immediately after examining them to prevent rusting.

6. Inspect:

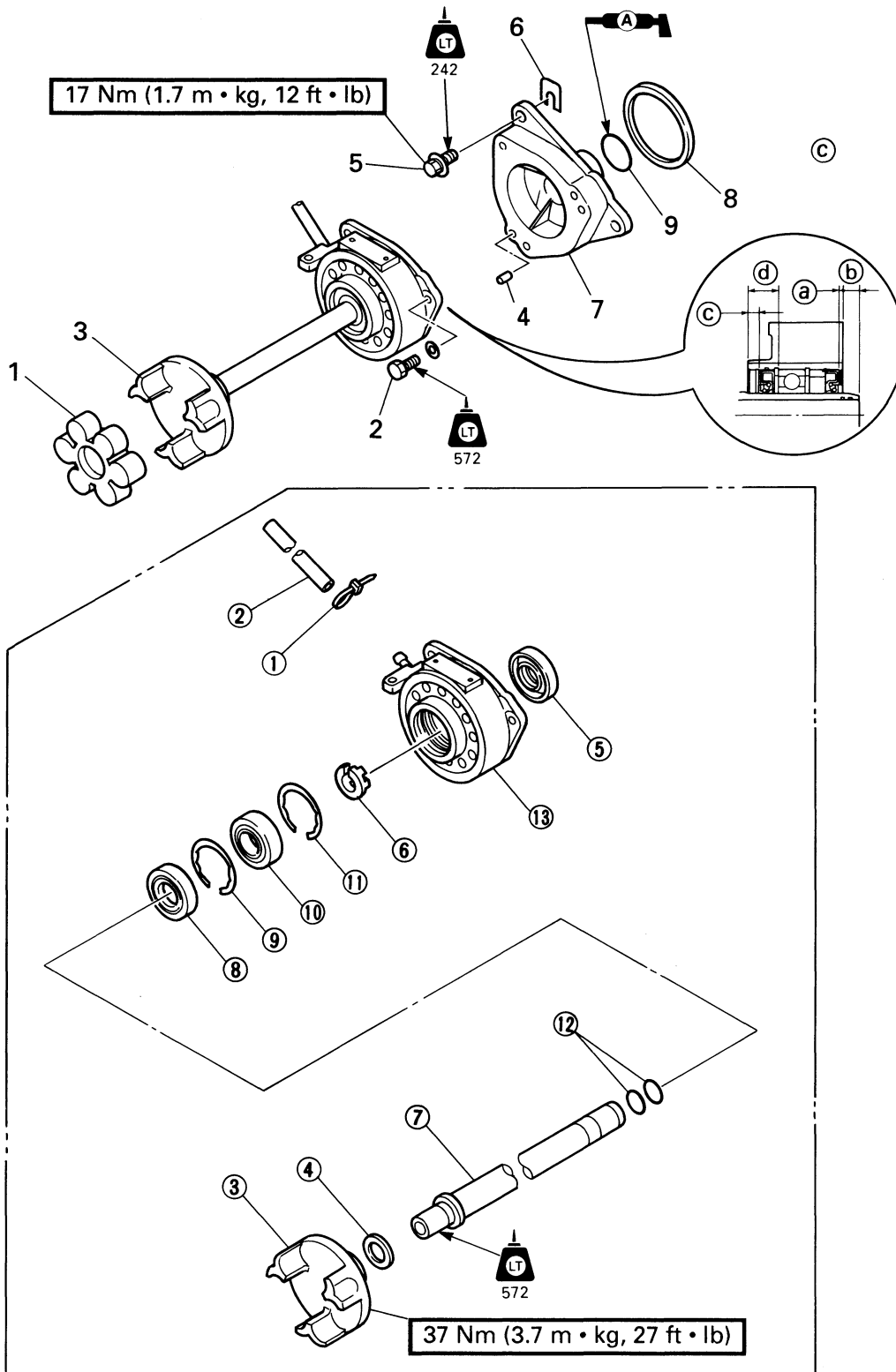
- Crankshaft oil seal
Wear/Damage → Replace.

Crankcase inspection





1. Inspect:

- Contacting surface
Scratch → Replace.
- Crankcase
Crack/Damage → Replace.

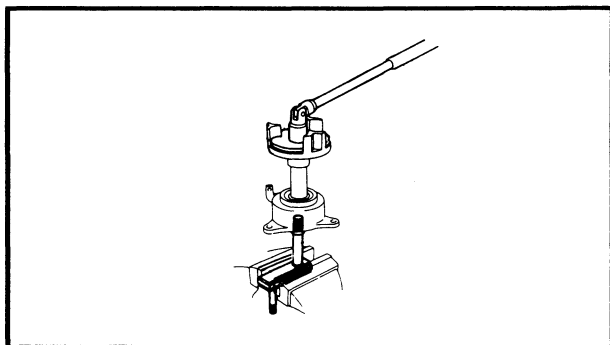
**INTERMEDIATE SHAFT AND HOUSING
EXPLODED DIAGRAM**



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	INTERMEDIATE SHAFT AND HOUSING REMOVAL Engine unit		Follow the left "Step" for removal. Refer to the "ENGINE UNIT REMOVAL" section.
1	Coupling rubber	1	
2	Bolt (with washer)	3	
3	Bearing housing assembly	1	
4	Pin	2	
5	Bolt (with washer)	3	
6	Shim	*	
7	Housing	1	
8	Rubber seal	1	
9	O-ring	1	
	HOUSING DISASSEMBLY		
①	Hose tie	1	
②	Grease hose	1	
③	Coupling	1	
④	Washer	1	
⑤	Oil seal	1	NOTE: _____ Fill the with water resistant grease clip inner circumference before installing the oil seal.
			 Distance ①: 1.6 ~ 2.0 mm (0.06 ~ 0.08 in)
⑥	Spacer	1	
⑦	Shaft	1	 Distance ②: RA700, RA700A 14.5 ~ 15.5 mm (0.57 ~ 0.61 in) RA1100 9.5 ~ 10.5 mm (0.37 ~ 0.41 in)
⑧	Oil seal	1	NOTE: _____ Fill the with water resistant grease clip inner circumference before installing the oil seal.
			 Distance ③: 6.8 ~ 7.2 mm (0.27 ~ 0.28 in)
⑨	Clip	1	
⑩	Bearing	1	 Distance ④: 17.6 ~ 17.7 mm (0.69 ~ 0.70 in)
⑪	Clip	1	
⑫	O-ring	2	
⑬	Housing	1	
			Reverse the removal steps for installation.

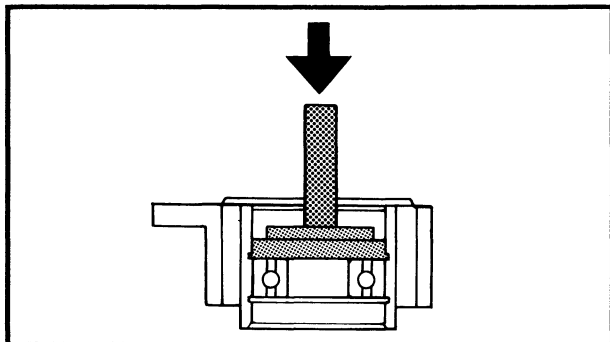
*: As required


SERVICE POINTS
Coupling removal and installation

1. Remove and install:
 - Coupling



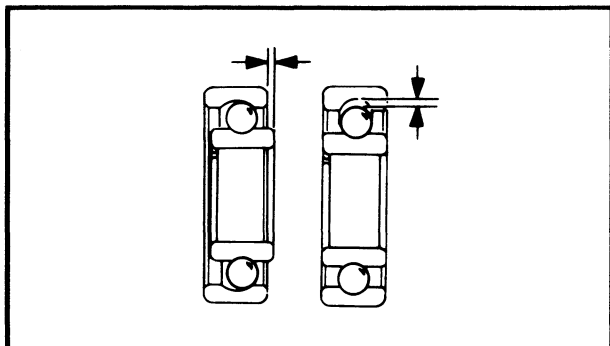
Coupler wrench:
YW-38741/90890-06425
RA1100:
YW-06546/90890-06546
Shaft holder:
YW-38742/90890-06069


Bearing removal and installation

1. Remove and install:
 - Bearing



Driver rod:
YB-06071/90890-06606
Bearing outer race attachment:
YB-06016/90890-06626


Bearing inspection

1. Inspect:
 - Bearing
 - Rotate inner race by hand.
 - Rough spots/Seizure → Replace.
 - Shaft
 - Pitting/Damage → Replace.
 - Hose
 - Wear/Cracks → Replace.

Coupling inspection

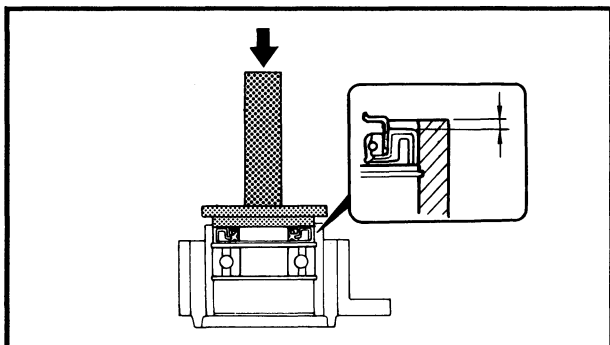
1. Inspect:
 - Coupling flange
 - Coupling rubber
 - Wear/Damage → Replace.

Oil seal installation

1. Install:
 - Oil seal [T = 10 mm (0.38 in)]



Driver rod:
YB-06071/90890-06606
Bearing outer race attachment:
YB-06016/90890-06626


NOTE:

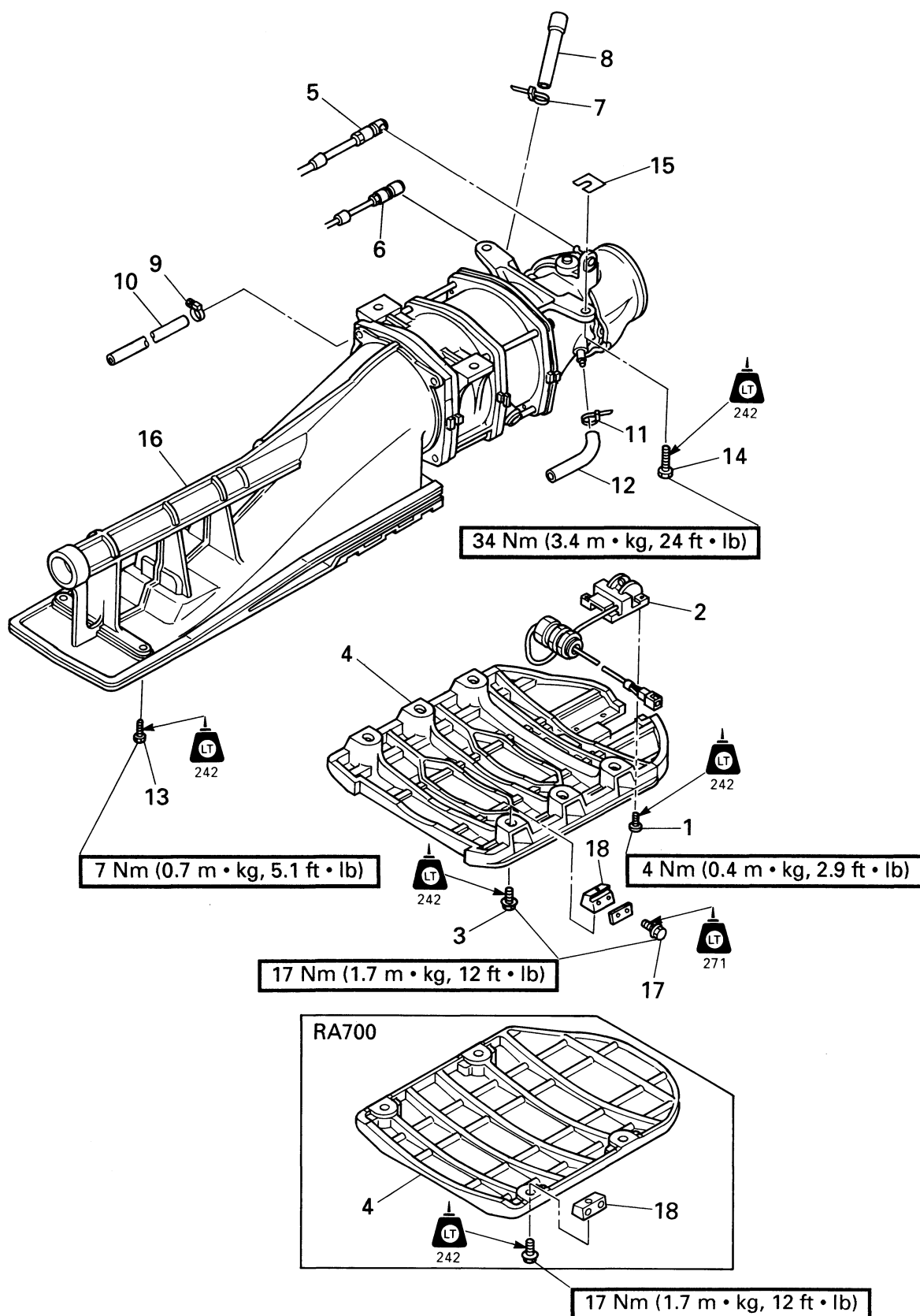
Install the oil seal with the manufacturer's numbers facing outward.

CHAPTER 6

JET PUMP UNIT

JET PUMP UNIT REMOVAL	6-1
EXPLODED DIAGRAM	6-1
REMOVAL AND INSTALLATION CHART.....	6-2
 NOZZLE, DUCT AND INTAKE	 6-3
EXPLODED DIAGRAM	6-3
REMOVAL AND INSTALLATION CHART.....	6-4
SERVICE POINTS	6-5
Oil seal and bushing removal.....	6-5
Housing inspection.....	6-5
Seal rubber inspection	6-5
Bushing and oil seal installation	6-5
 IMPELLER AND DRIVE SHAFT	 6-6
EXPLODED DIAGRAM	6-6
REMOVAL AND INSTALLATION CHART.....	6-7
SERVICE POINTS	6-8
Impeller removal	6-8
Drive shaft and bearing removal	6-8
Impeller inspection	6-8
Drive shaft inspection	6-8
Bearing inspection.....	6-8
Oil seal and bearing installation.....	6-9
Impeller installation.....	6-9
 COOLING AND BILGE SYSTEM	 6-10
EXPLODED DIAGRAM	6-10
REMOVAL AND INSTALLATION CHART.....	6-11
SERVICE POINTS	6-11
Bilge strainer inspection	6-11
Hose inspection	6-11

**JET PUMP UNIT REMOVAL
EXPLODED DIAGRAM**





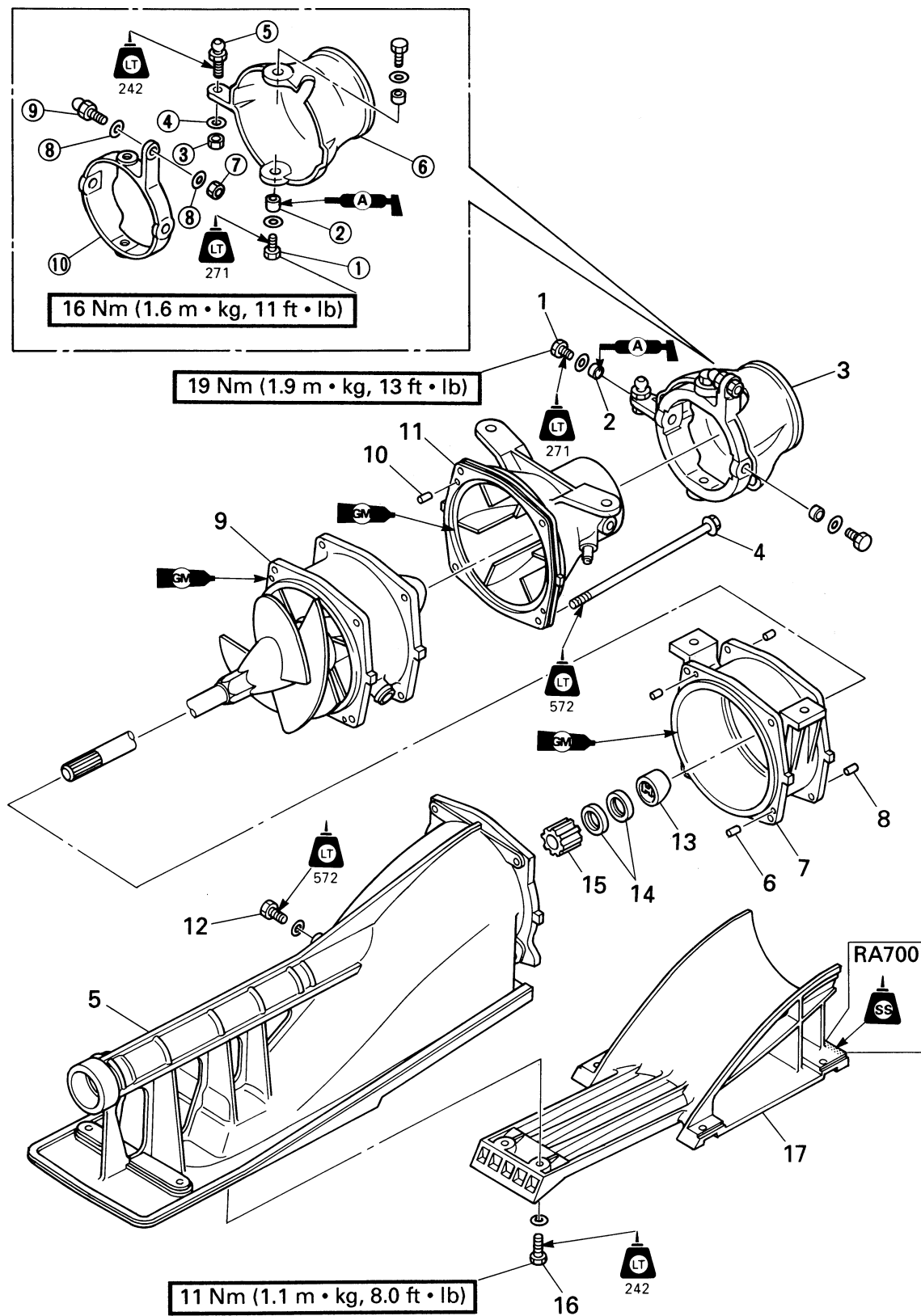
JET PUMP UNIT REMOVAL

REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty		Service points
	JET PUMP UNIT REMOVAL	700	700A 1100	Follow the left "Step" for removal.
1	Screw	—	4	
2	Speed sensor	—	1	
3	Bolt (with washer)	4	6	
4	Ride plate	1	1	
5	Trim control cable joint	1	1	
6	Steering cable joint	1	1	
7	Hose tie	1	1	
8	Spout hose	1	1	
9	Clamp	1	1	
10	Engine cooling hose	1	1	
11	Hose tie	1	1	
12	Bilge hose	1	1	
13	Bolt (with washer)	2	2	
14	Bolt (with washer)	4	4	
15	Shim	*	—	NOTE: _____ ● Before removing the mounting bolt, mark the jet pump mounting shim packs for ease of reassembly. ● Install the previously marked shims back in their original locations. (The original shim thickness is indicated on the back of the mounting bolts.)
16	Jet pump unit	1	1	NOTE: _____ ● Pull the jet pump unit straight backward. ● When installing the jet pump unit, align the drive shaft spline (male) with the intermediate shaft spline (female).
17	Bolt (with washer)	8	12	
18	Ride plate nut	4	6	
				Reverse the removal steps for installation.

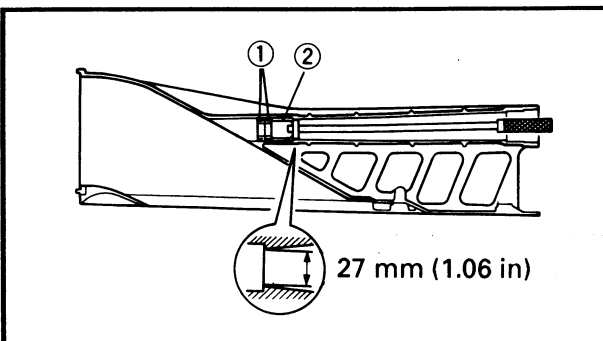
*: As required

**NOZZLE, DUCT AND INTAKE
EXPLODED DIAGRAM**



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	NOZZLE, DUCT AND INTAKE DISASSEMBLY		Follow the left "Step" for removal.
	Jet pump unit		Refer to the "JET PUMP UNIT REMOVAL" section.
1	Bolt (with washer)	2	
2	Collar	2	
3	Nozzle deflector assembly	1	
4	Bolt	4	
5	Intake duct	1	
6	Pin	2	
7	Housing	1	
8	Pin	2	
9	Impeller duct assembly	1	
10	Pin	2	
11	Nozzle	1	
12	Bolt (with washer)	1	
13	Spacer	1	
14	Oil seal	2	
15	Bushing	1	
16	Bolt (with washer)	6	
17	Intake screen	1	
	NOZZLE DEFLECTOR DISAS- SEMBLY		
①	Bolt (with washer)	2	6 × 20 mm
②	Collar	2	
③	Nut	1	M6
④	Plate washer	2	
⑤	Ball joint	1	M6
⑥	Nozzle deflector	1	
⑦	Nut	1	M8
⑧	Plate washer	2	
⑨	Ball joint	1	M8
⑩	Trim ring	1	
			Reverse the removal steps for installation.



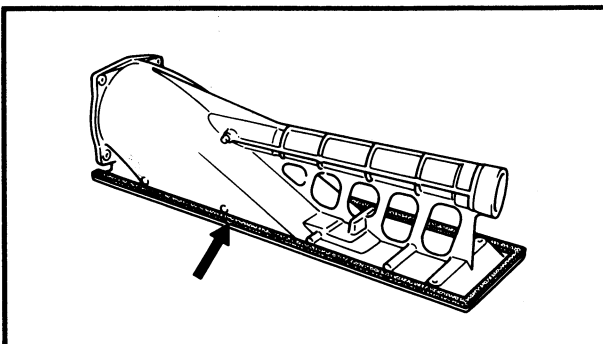
SERVICE POINTS

Oil seal and bushing removal

1. Remove:
 - Oil seal ①
 - Bushing ②



Driver rod:
YB-06229/90890-06605
Ball bearing attachment:
YB-06021/90890-06638



Housing inspection

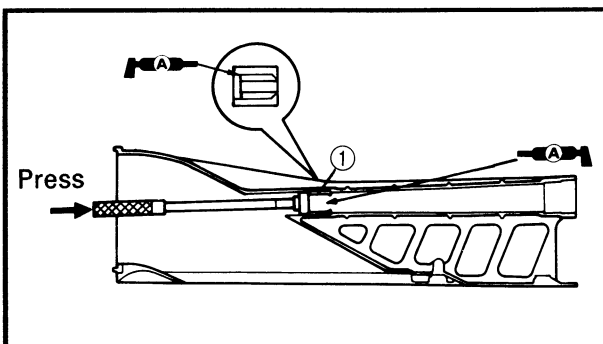
1. Inspect:
 - Housing inner surface
 Wear/Damage → Replace.

Seal rubber inspection

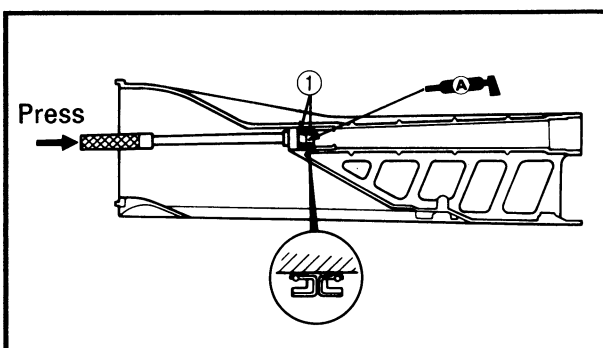
1. Inspect:
 - Seal rubber
 Crack/Wear → Replace.

Bushing and oil seal installation

1. Install:
 - Bushing



Driver rod:
YB-06229/90890-06605
Needle bearing attachment:
YB-06349/90890-06613

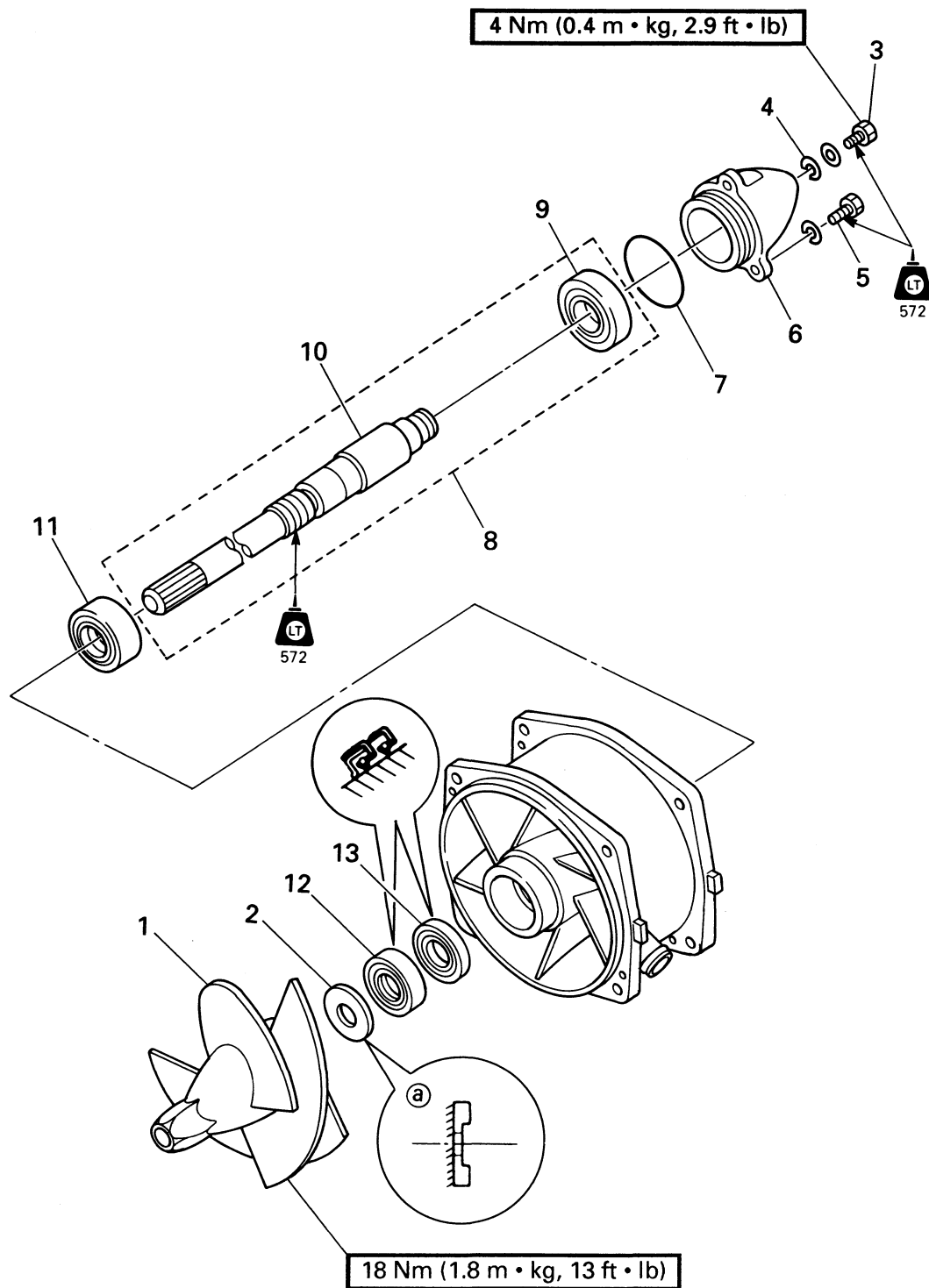


2. Install:
 - Oil seal



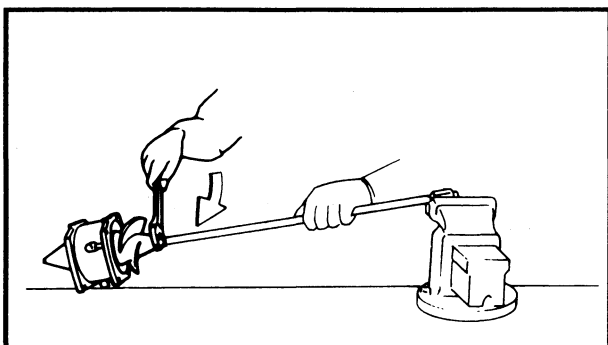
Driver rod:
YB-06229/90890-06605
Needle bearing attachment:
YB-06349/90890-06613

**IMPELLER AND DRIVE SHAFT
EXPLODED DIAGRAM**



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	IMPELLER AND DRIVE SHAFT DISASSEMBLY		Follow the left "Step" for removal.
	Impeller duct assembly		Refer to the "NOZZLE, DUCT AND INTAKE" section.
1	Impeller	1	NOTE: _____ The impeller has a left-hand thread. Turn the impeller clockwise to loosen it.
2	Washer	1	NOTE: _____ Plane face ③ of the washer should be positioned on the impeller side.
3	Bolt (with washer)	1	
4	Gasket	1	
5	Bolt (with washer)	3	
6	Cap	1	
7	O-ring	1	
8	Drive shaft assembly	1	
9	Bearing (rear)	1	NOTE: _____ Install the bearing with its manufacturer's numbers facing outward.
10	Drive shaft	1	
11	Bearing (front)	1	NOTE: _____ Install the bearing with its manufacturer's numbers facing outward.
12	Oil seal	1	NOTE: _____
13	Oil seal	1	Install the oil seal with its manufacturer's numbers facing outward.
			Reverse the removal steps for installation.



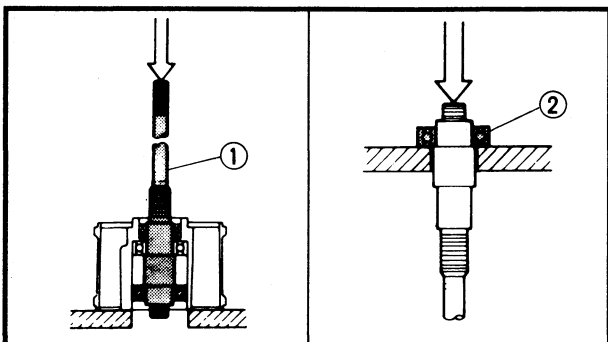
SERVICE POINTS

Impeller removal

1. Remove:
 - Impeller



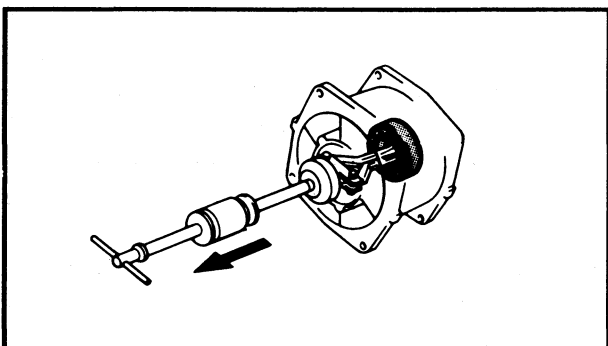
Drive shaft holder:
YB-06049/90890-06518



Drive shaft and bearing removal

1. Remove:
 - Drive shaft and bearing (rear) ①
 - Bearing (rear) ②

NOTE: _____
Use a press.



2. Remove:
 - Bearing (front)



Slide hammer set:
90890-06523
YB-06096/90890-06531

Impeller inspection

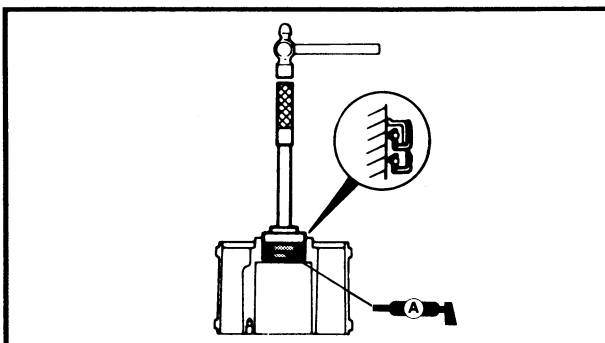
Refer to the "JET PUMP UNIT" section in chapter 3.

Drive shaft inspection

1. Inspect:
 - Drive shaft
 Wear/Damage → Replace.

Bearing inspection

1. Inspect:
 - Bearing (front and rear)
 Rotate inner race by hand.
Rough spot/Seizure → Replace.



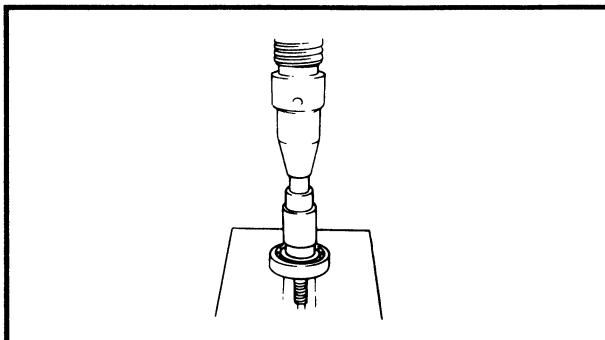
Oil seal and bearing installation

1. Install:

- Oil seal



Driver rod:
YB-06071/90890-06606
Ball bearing attachment:
YB-06156/90890-06634



2. Install:

- Bearing (front)
- Drive shaft and bearing

NOTE: _____

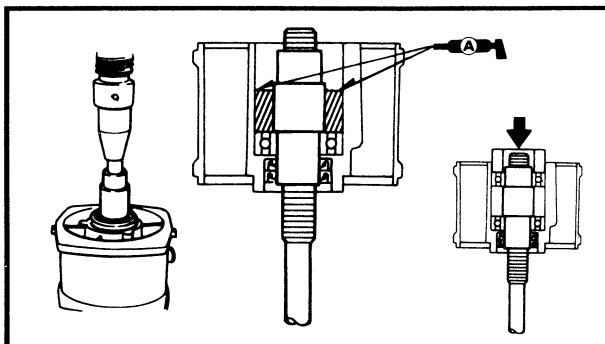
Use a press.

3. Fill:

- Between the drive shaft and duct



Water resistant grease:
24 cm³ (1.45 cu. in)

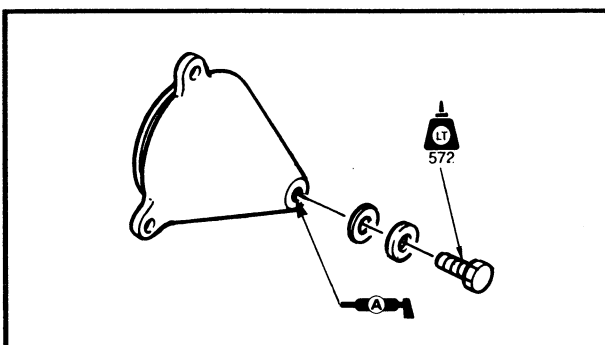


4. Install:

- Bearing (rear)



Bearing inner race attachment:
YB-34474/90890-06662

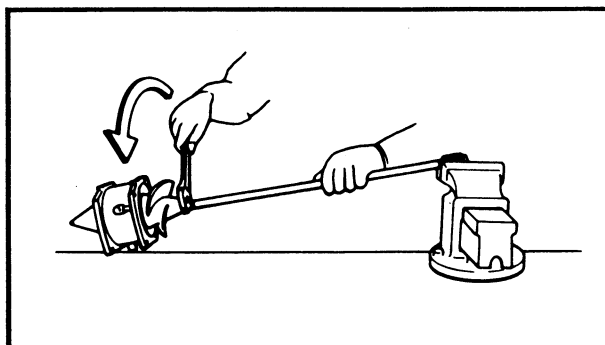


5. Fill:

- Into the cap



Water resistant grease:
21 cm³ (1.3 cu. in)



Impeller installation

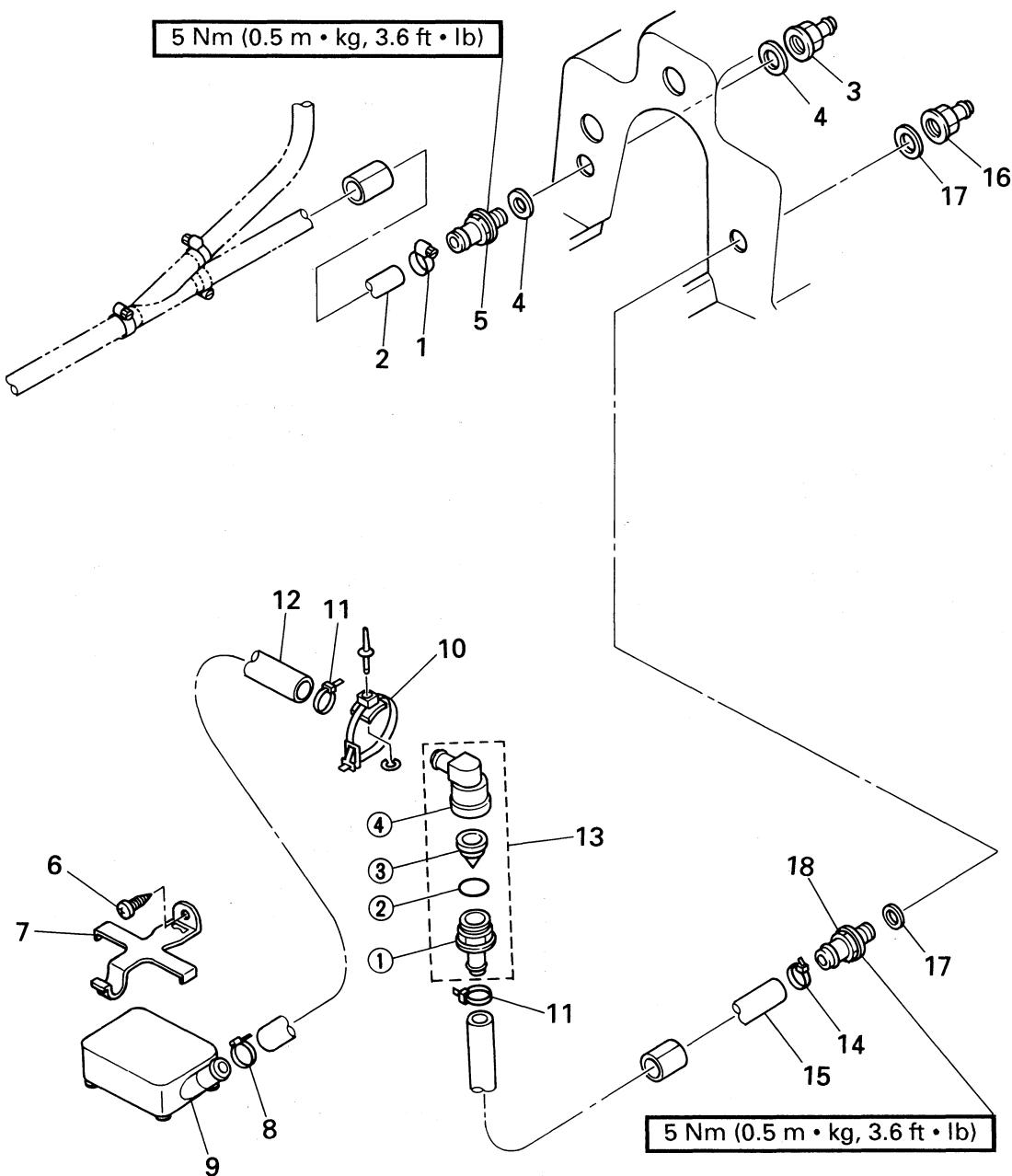
1. Install:

- Impeller



Drive shaft holder:
YB-06049/90890-06518

COOLING AND BILGE SYSTEM EXPLODED DIAGRAM



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	COOLING AND BILGE SYSTEM REMOVAL		Follow the left "Step" for removal.
	Jet pump unit		Refer to the "JET PUMP UNIT REMOVAL" section.
1	Clamp	1	
2	Water inlet hose	1	
3	Connection nut	1	
4	Packing	2	
5	Connection bolt	1	
6	Tapping screw	1	
7	Strainer bracket	1	
8	Hose tie	1	
9	Bilge strainer	1	
10	Clamp	1	
11	Hose tie	2	
12	Bilge hose	1	
13	Hose joint	1	
14	Hose tie	1	
15	Bilge hose	1	
16	Connection nut	1	
17	Packing	2	
18	Connection bolt	1	
	HOSE JOINT DISASSEMBLY		RA1100
①	Joint bolt	1	
②	O-ring	1	
③	Valve	1	
④	Joint body	1	
			Reverse the removal steps for installation.

SERVICE POINTS

Bilge strainer inspection

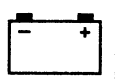
Refer to the "BILGE SYSTEM" section in chapter 3.

Hose inspection

1. Inspect:

- Hose

Crack/Wear/Damage → Replace.

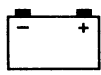
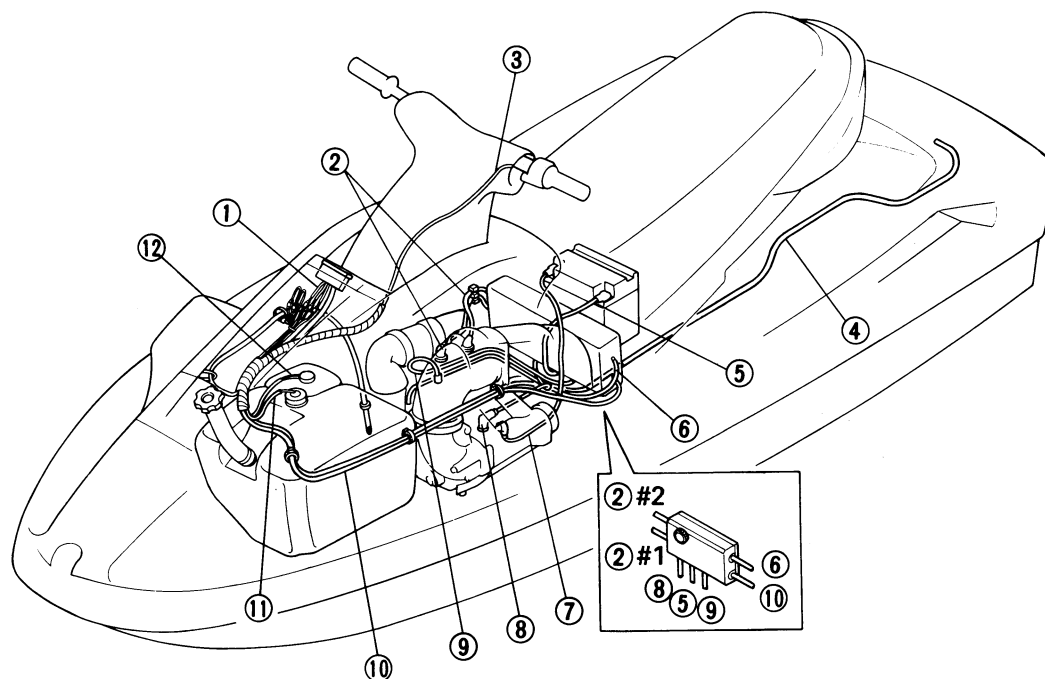
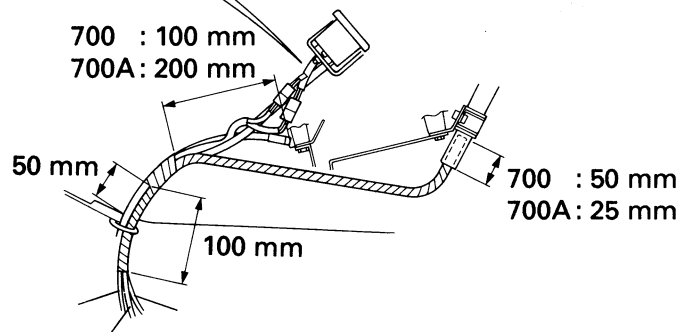
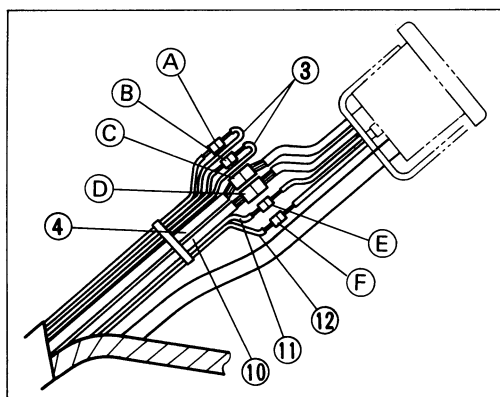


CHAPTER 7

ELECTRICAL SYSTEM

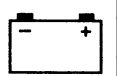
ELECTRICAL COMPONENTS	7-1
RA700, RA700A	7-1
RA1100	7-2
 ELECTRICAL UNIT	 7-3
RA1100	7-3
 ELECTRICAL ANALYSIS	 7-5
INSPECTION	7-5
Low resistance measurement	7-5
 IGNITION SYSTEM	 7-6
WIRING DIAGRAM	7-6
RA700, RA700A	7-6
RA1100	7-7
IGNITION SPARK GAP	7-8
SPARK PLUG	7-9
SPARK PLUG CAP	7-9
IGNITION COIL	7-9
ENGINE STOP SWITCH	7-10
CHARGE COIL	7-10
PULSER COIL	7-11
THERMO SWITCH	7-11
CDI UNIT	7-12
 STARTING SYSTEM	 7-13
WIRING DIAGRAM	7-13
BATTERY	7-14
WIRING CONNECTION	7-14
FUSE	7-14
STARTER SWITCH	7-14
STARTER RELAY	7-14
 STARTER MOTOR	 7-15
EXPLODED DIAGRAM	7-15
REMOVAL AND INSTALLATION CHART	7-16
SERVICE POINTS	7-17
Pinion inspection	7-17
Armature inspection	7-17
Brush holder inspection	7-18
Cover inspection	7-18
 CHARGING SYSTEM	 7-19
WIRING DIAGRAM	7-19
FUSE	7-20
BATTERY	7-20
LIGHTING COIL	7-20
RECTIFIER REGULATOR	7-20

INDICATION SYSTEM	7-21
WIRING DIAGRAM	7-21
OIL LEVEL SENSOR	7-22
FUEL LEVEL SENSOR	7-22
MULTI FUNCTION METER	7-23
FUSE	7-25
BATTERY	7-25
LIGHTING COIL	7-25
RECTIFIER REGULATOR	7-25

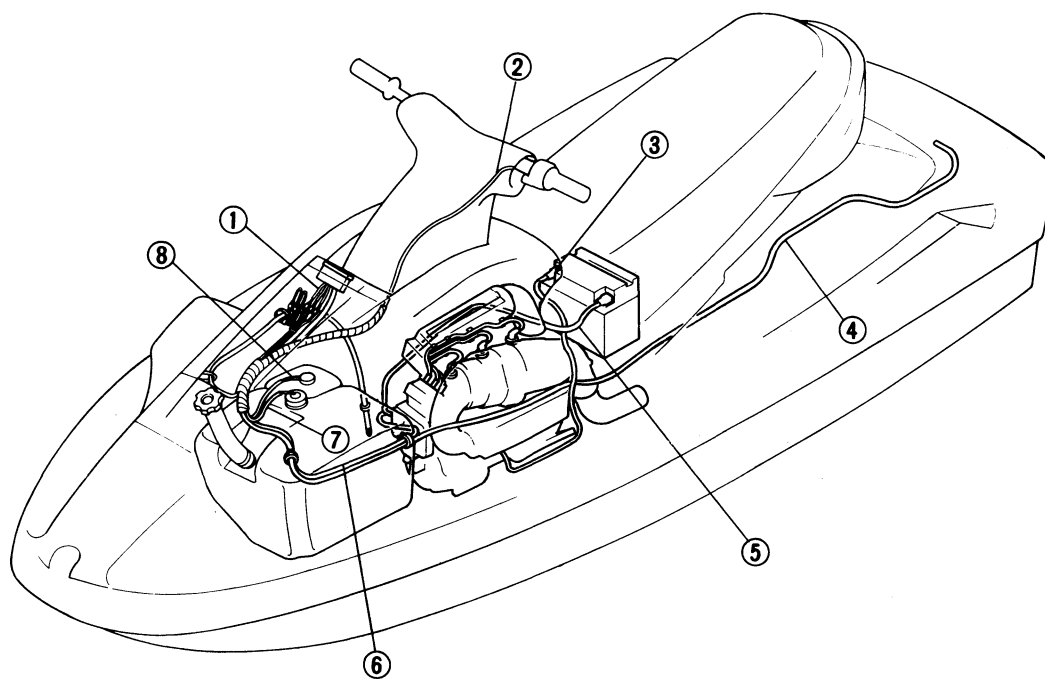
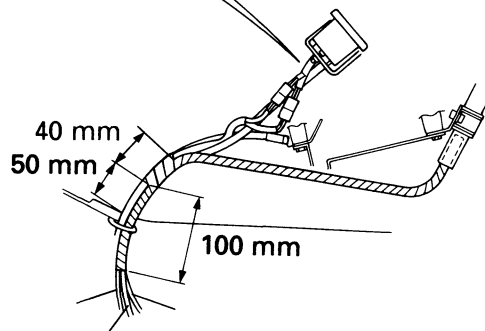
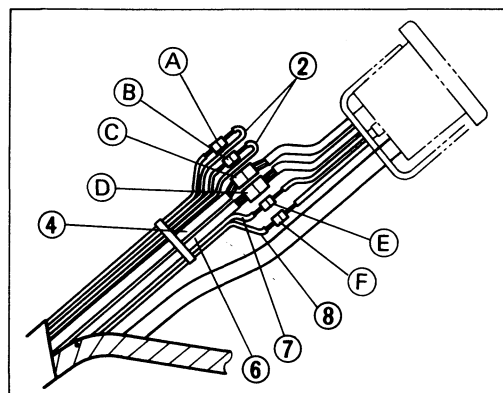

ELECTRICAL COMPONENTS
RA700, RA700A


- ① Multi function meter lead
- ② High tension cord
- ③ Handle switch lead
- ④ Speed sensor lead (for RA700A)
- ⑤ Battery (positive) lead
- ⑥ Flywheel magneto base lead
- ⑦ Battery (negative) lead
- ⑧ Starter motor (positive) lead
- ⑨ Thermo sensor lead

- ⑩ Handle switch and meter extension lead
- ⑪ Fuel level sensor lead
- ⑫ Oil level sensor lead
- A: 2P connector (Black)
- B: 2P connector (White)
- C: 3P connector (White) (for RA700)
- D: 4P connector (White)
- E: 2P connector (Green)
- F: 2P connector (White)



RA1100



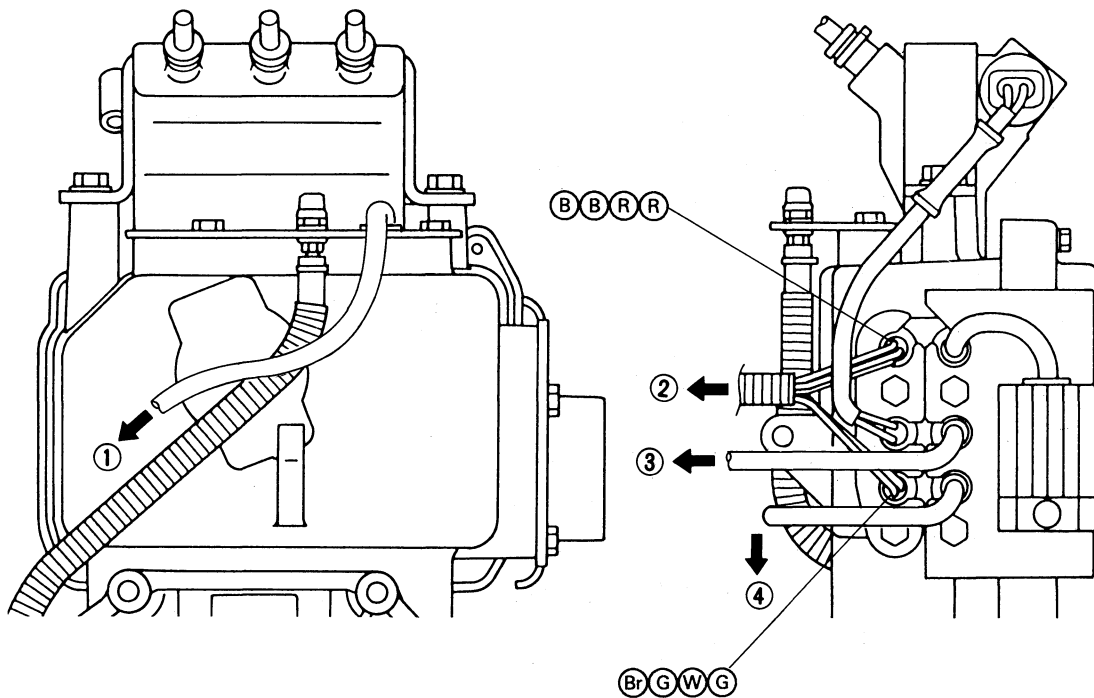
- ① Multi function meter lead
- ② Handle switch lead
- ③ Battery (negative) lead
- ④ Speed sensor lead
- ⑤ Battery (positive) lead
- ⑥ Handle switch and meter extension lead
- ⑦ Fuel level sensor lead
- ⑧ Oil level sensor lead

- Ⓐ: 2P connector (Black)
- Ⓑ: 2P connector (White)
- Ⓒ: 3P connector (White)
- Ⓓ: 4P connector (White)
- Ⓔ: 2P connector (Green)
- Ⓕ: 2P connector (White)



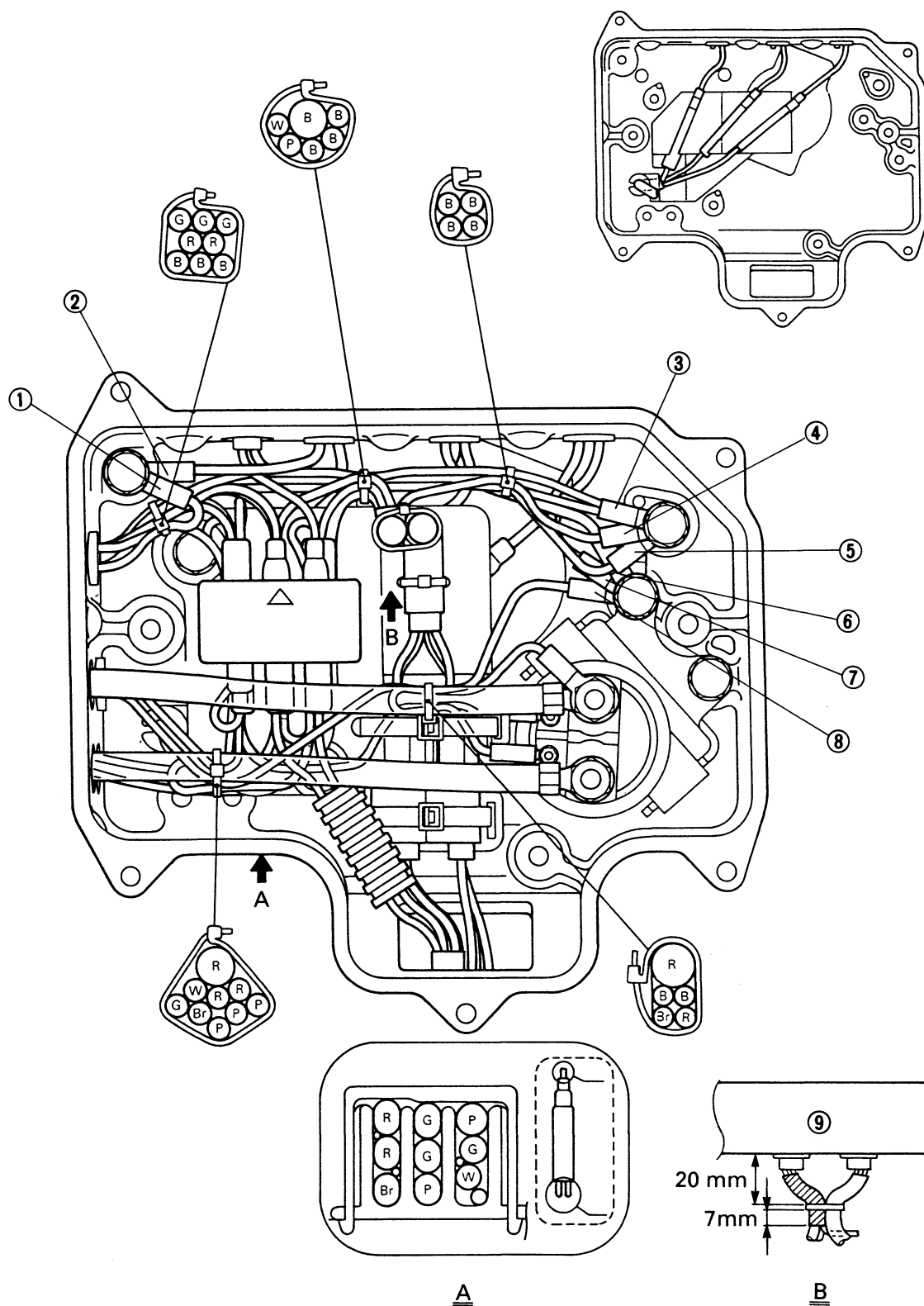
ELECTRICAL UNIT

RA1100



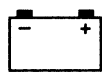
- ① Thermo switch
- ② Handle switch and meter
- ③ Battery (positive)
- ④ Starter motor (positive)

B: Black
Br: Brown
G: Green
P: Pink
R: Red
W: White



- ① Rectifier-regulator ground
- ② Ignition coil #3 ground
- ③ Handle switch and meter ground
- ④ CDI ground

- ⑤ Thermo switch ground
- ⑥ Ignition coil #2 ground
- ⑦ Ignition coil #1 ground
- ⑧ Starter relay ground
- ⑨ CDI unit



ELECTRICAL ANALYSIS INSPECTION

CAUTION:

All measuring instruments should be handled with special care, or correct measurement is impossible.

On an instrument powered by dry batteries, the batteries' voltage should be checked periodically and the batteries replaced, if necessary.

NOTE:

"○—○" indicates the terminals between which there is electrical continuity; i.e., a closed circuit in the given switch position.

Low resistance measurement

When measuring resistance of 10 Ω or less using the digital tester, the correct measurement cannot be obtained because of the tester's internal resistance.

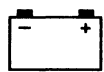
To obtain the correct value, subtract this internal resistance from the displayed measurement.



Correct value =
Displayed measurement –
Internal resistance

NOTE:

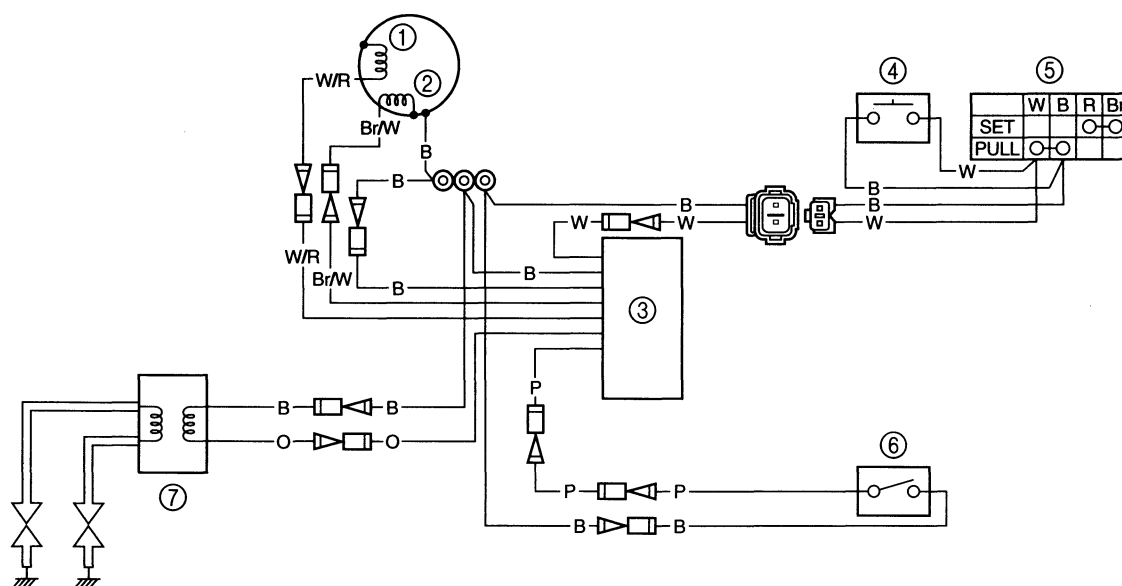
The internal resistance of the tester can be obtained by connecting both of its terminals.



IGNITION SYSTEM

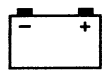
WIRING DIAGRAM

RA700, RA700A

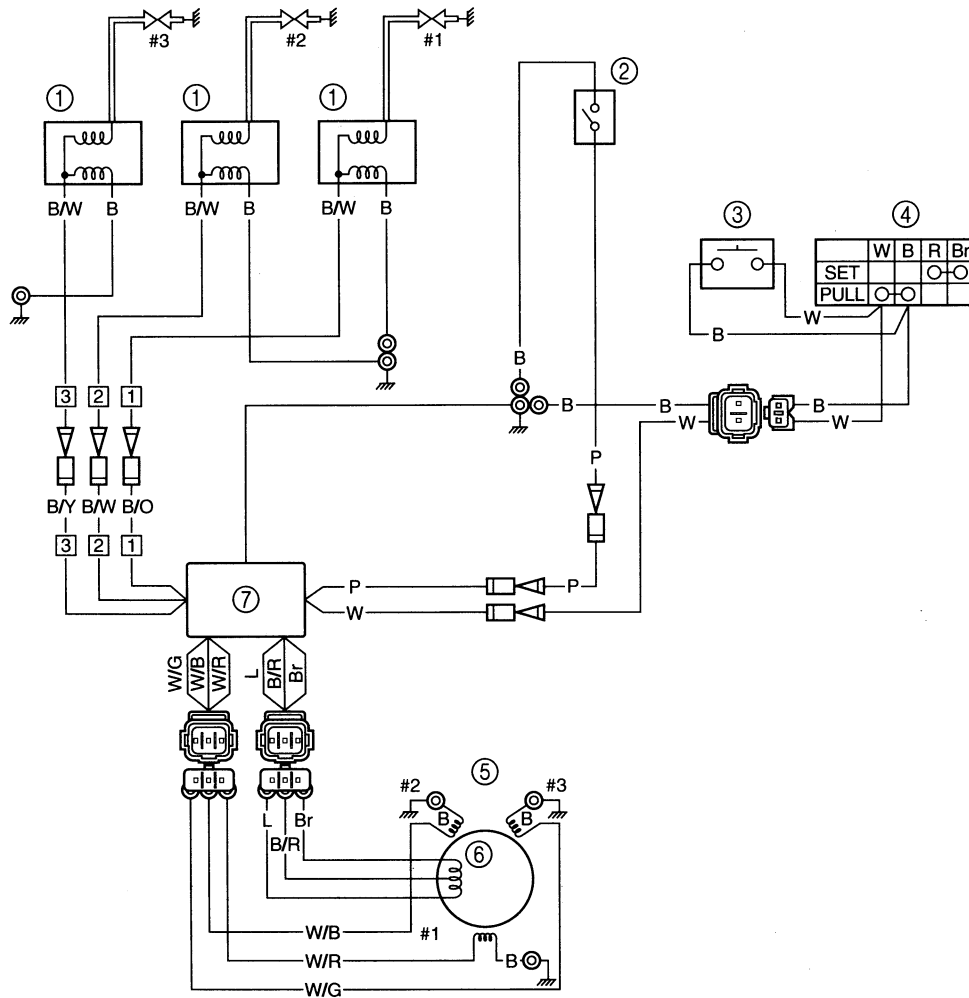


- ① Pulser coil
- ② Charge coil
- ③ CDI unit
- ④ Stop switch
- ⑤ Engine stop switch
- ⑥ Thermo switch
- ⑦ Ignition coil

B : Black
 Br/W: Brown/White
 O : Orange
 P : Pink
 W : White
 W/R : White/Red

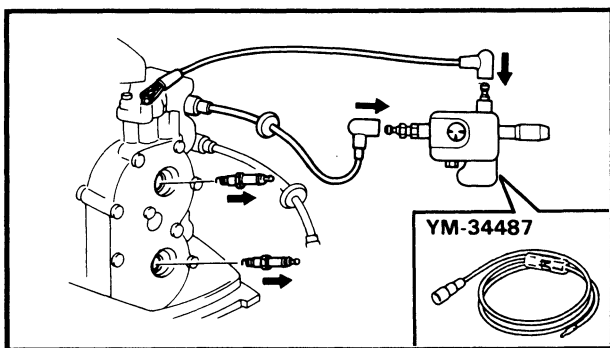
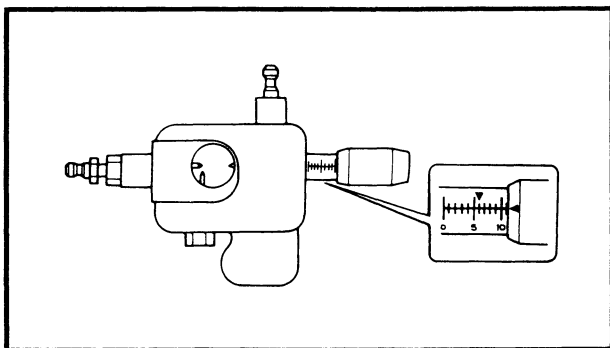
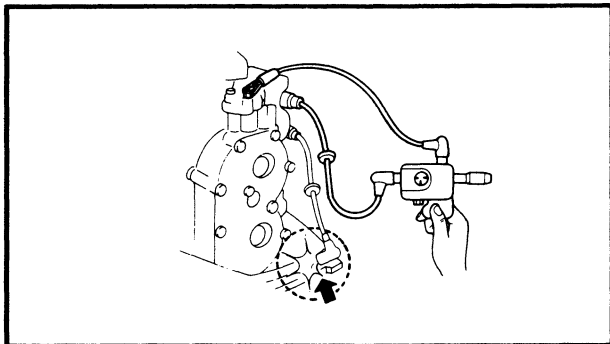
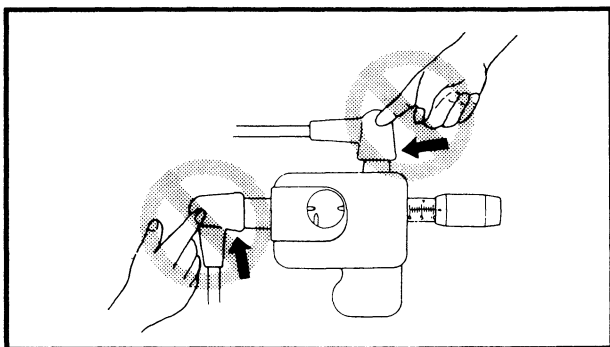
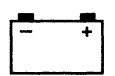


RA1100



- ① Ignition coil
- ② Thermo switch
- ③ Stop switch
- ④ Engine stop switch
- ⑤ Pulser coil
- ⑥ Charge coil
- ⑦ CDI unit

B : Black
 B/O : Black/Orange
 B/R : Black/Red
 B/W : Black/White
 B/Y : Black/Yellow
 Br : Brown
 L : Blue
 P : Pink
 W : White
 W/B : White/Black
 W/G : White/Green
 W/R : White/Red



IGNITION SPARK GAP

⚠ WARNING

- While making a spark check be careful not to touch any of the "Ignition spark gap tester" lead wires.
- When doing the spark test, take special care not to allow leakage from the removed plug cap.
- This check is likely to produce sparks, so be sure that no flammable gas or fluid is in the vicinity.

1. Check:

- Ignition spark gap
Out of specification → Replace.



Spark gap:
9 mm (0.35 in)

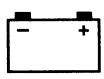
Checking steps:

- Adjust the spark gap to specification by turning the adjusting knob.



Spark gap tester:
YM-34487/90890-06754

- Connect the spark plug cap to the spark gap tester.
- Remove the spark plugs from the engine.
- Crank the engine and check the sparks from the ignition system through the discharge window.



SPARK PLUG

Refer to the "GENERAL" section in CHAPTER 3.

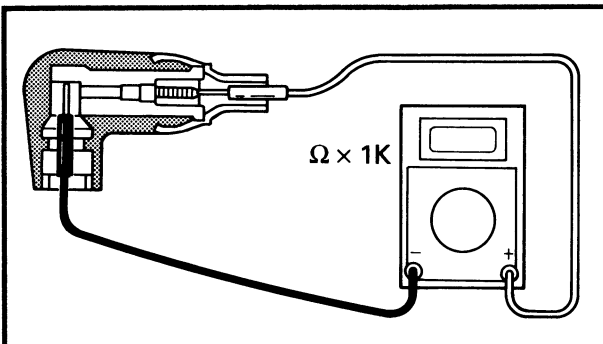
SPARK PLUG CAP

1. Inspect:

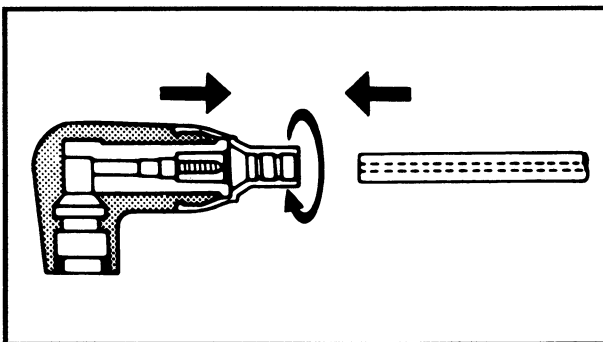
- Spark plug cap
Loosen → Tighten.
Crack/Damage → Replace.

2. Measure: (For RA1100)

- Spark plug cap resistance
Out of specification → Replace.



Spark plug cap resistance:
4.0 ~ 6.0 kΩ



Replacement steps: (For RA1100)

- Remove the spark plug cap by turning the cap counterclockwise.
- Install the spark plug cap by turning the cap clockwise until it stops.

IGNITION COIL

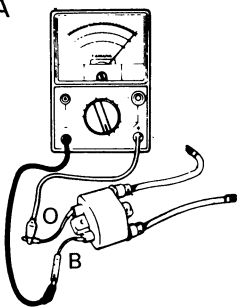
1. Inspect:

- High tension cord
Cracks/Damage → Replace.

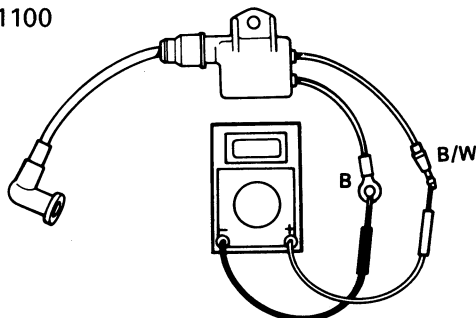
2. Measure:

- Primary coil resistance
Out of specification → Replace.

RA700, RA700A



RA1100



Primary coil resistance:

RA700/RA700A

Orange (O) – Black (B)

0.078 ~ 0.106 Ω at 20°C (68°F)

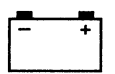
RA1100

Black/White (B/W) – Black (B)

0.18 ~ 0.24 Ω at 20°C (68°F)

NOTE:

When measuring the resistance of 10 Ω or less using the digital tester, the correct measurement cannot be obtained. Refer to "Lower resistance measurement".

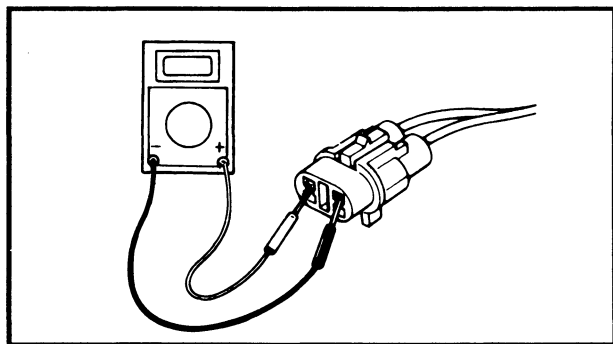


3. Measure:

- Secondary coil resistance
- Out of specification → Replace.

**Secondary coil resistance:****RA700/RA700A****High tension cords****14.3 ~ 30.5 k Ω at 20°C (68°F)****RA1100****Black/White (B/W) – High tension cord****2.7 ~ 4.1 k Ω at 20°C (68°F)****NOTE:**

Remove the spark plug from the high tension cord.

**ENGINE STOP SWITCH**

1. Check:

- Continuity
- Out of specification → Replace.

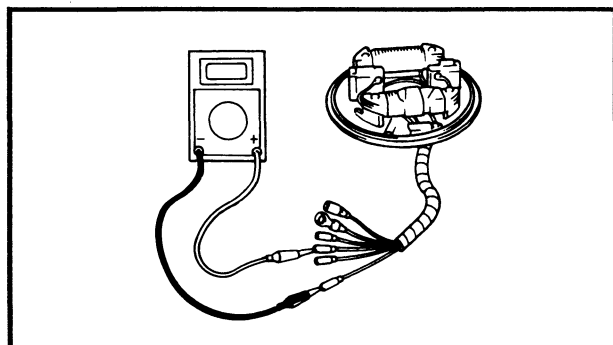
**Engine stop continuity:
(Black coupler)**

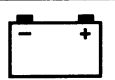
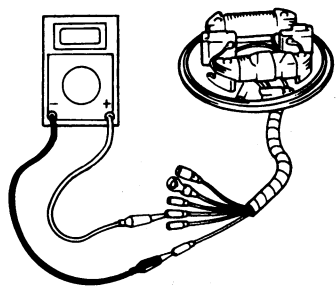
Lock plate	Position	Leads	
		White	Black
Installed	Free		
	Push	○—○	○—○
Removed	Free	○—○	○—○
	Push	○—○	○—○

CHARGE COIL

1. Measure:

- Charge coil resistance
- Out of specification → Replace.

**Charge coil resistance:****RA700/RA700A****Brown/White (Br/W) – Black (B)****497.7 ~ 608.3 Ω at 20°C (68°F)****RA1100****Black/Red (B/R) – Brown (Br)****172 ~ 258 Ω at 20°C (68°F)****Blue (L) – Black/Red (B/R)****356 ~ 984 Ω at 20°C (68°F)**

 $\Omega \times 100$ **PULSER COIL**

1. Measure:

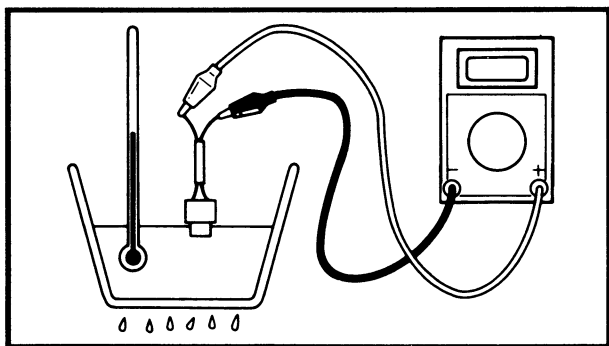
- Pulser coil resistance

Out of specification → Replace.

**Pulser coil resistance:****RA700/RA700A**White/Red (W/R) – Black (B)
12.6 ~ 15.4 Ω at 20°C (68°F)**RA1100**

White/Red (W/R) – Black (B)

White/Black (W/B) – Black (B)

White/Green (W/G) – Black (B)
248 ~ 372 Ω at 20°C (68°F)**THERMO SWITCH**

1. Measure:

- Thermo switch continuity

Out of specification → Replace.

**Thermo switch continuity temperature:****RA700/RA700A**

Pink (P) – Black (B)

Ⓐ 66 ~ 74 °C (100.4 ~ 125.6°F)

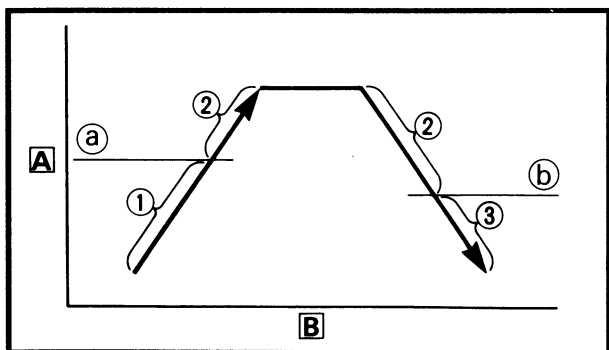
Ⓑ 43 ~ 57 °C (78.8 ~ 93.2°F)

RA1100

Pink (P) – Black (B)

Ⓐ 93 °C (199.4°F)

Ⓑ 83 °C (181.4°F)



① Discontinuity

② Continuity

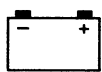
③ Discontinuity

Ⓐ Temperature

Ⓑ Time

Measurement steps:

- Suspend thermostat in a vessel.
- Place known reliable thermometer in water.
- Heat water slowly.
- Observe thermometer, while stirring water continually.



CDI UNIT

1. Measure:

- CDI unit resistance

Out of specification → Replace.



Pocket tester:

YU-03112/90890-03112

NOTE:

- The resistance values will vary from meter to meter, especially with electronic digital meters. For some testers, the polarity of the leads is reversed.
- The needle swings once to the “•” mark and then returns to the home position.
- The “∞” mark stands for discontinuity.

62T00

Unit: kΩ

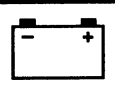
⊕	⊖	B	Br/W	O	P	W	W/R
B			2~6	•	3~11	10~40	150~600
Br/W		20~80		•	50~200	15~60	500
O		•	•		•	•	•
P		∞	∞	∞		∞	∞
W		∞	∞	∞	∞		∞
W/R		9~36	17~70	•	10~40	50~200	

63M00

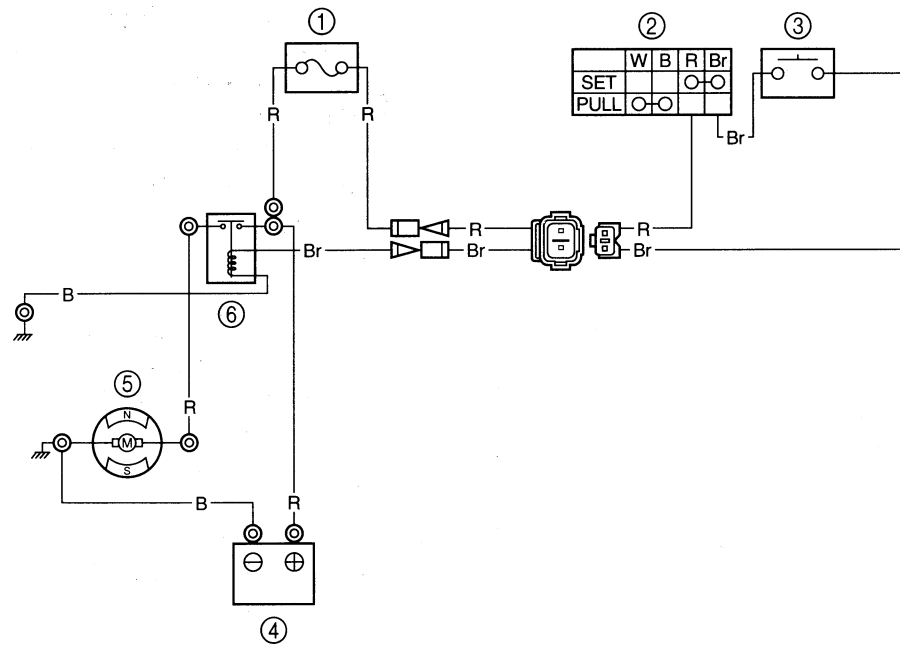
Unit: kΩ

⊕	⊖	B	B/O	B/R	B/W	B/Y	Br	L	P	W	W/B	W/G	W/R
B			280~420	14.4~21.6	280~420	280~420	∞	2.9~4.3	280~420	280~420	60~90	60~90	60~90
B/O		∞		∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
B/R		∞	∞		∞	∞	∞	∞	∞	∞	∞	∞	∞
B/W		∞	∞	∞		∞	∞	∞	∞	∞	∞	∞	∞
B/Y		∞	∞	∞	∞		∞	∞	∞	∞	∞	∞	∞
Br		76~114	120~180	200~300	120~180	120~180		144~216	120~180	120~180	184~276	184~276	184~276
L		19.2~28.8	48~72	240~360	48~72	48~72	∞		56.0~84.0	45.6~68.4	168~252	168~252	168~252
P		∞	∞	∞	∞	∞	∞	∞		∞	∞	∞	∞
W		∞	∞	∞	∞	∞	∞	∞	∞		∞	∞	∞
W/B		200~300	280~420	400~600	280~420	280~420	∞	280~420	280~420	280~420		320~480	320~480
W/G		200~300	280~420	400~600	280~420	280~420	∞	280~420	280~420	280~420	320~480		320~480
W/R		200~300	280~420	400~600	280~420	280~420	∞	280~420	280~420	280~420	320~480	320~480	

B : Black
 B/O : Black/Orange
 B/R : Black/Red
 B/W : Black/White
 B/Y : Black/Yellow
 Br : Brown
 Br/W: Brown/White
 O : Orange
 L : Blue
 P : Pink
 W : White
 W/B : White/Black
 W/G : White/Green
 W/R : White/Red

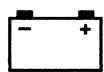


STARTING SYSTEM WIRING DIAGRAM



- ① Fuse
- ② Engine stop switch
- ③ Starter switch
- ④ Battery
- ⑤ Starter motor
- ⑥ Starter relay

B : Black
Br : Brown
R : Red



BATTERY

Refer to the "GENERAL" section in chapter 3.

WIRING CONNECTION

1. Check:

- Wiring connection

Poor connection → Correct.

FUSE

1. Check:

- Fuse

Blown → Replace.



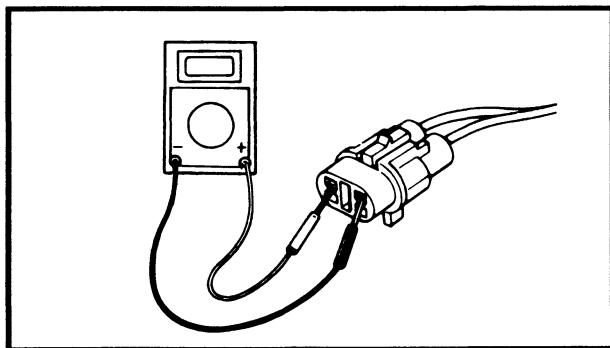
Fuse rating:
12 V/10 A

STARTER SWITCH

1. Check:

- Continuity

Out of specification → Replace.



Starter continuity:
(White coupler)

Lock plate	Position	Leads	
		Red	Brown
Installed	Free		
	Push	○—○	○—○
Removed	Free		
	Push		

STARTER RELAY

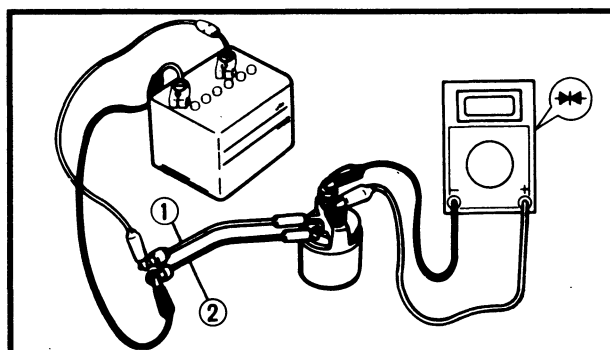
1. Inspect:

- Brown lead terminal
 - Black lead terminal
- Loose → Tighten.

2. Check:

- Relay operation

Does not function → Replace.

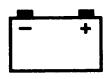


Checking steps:

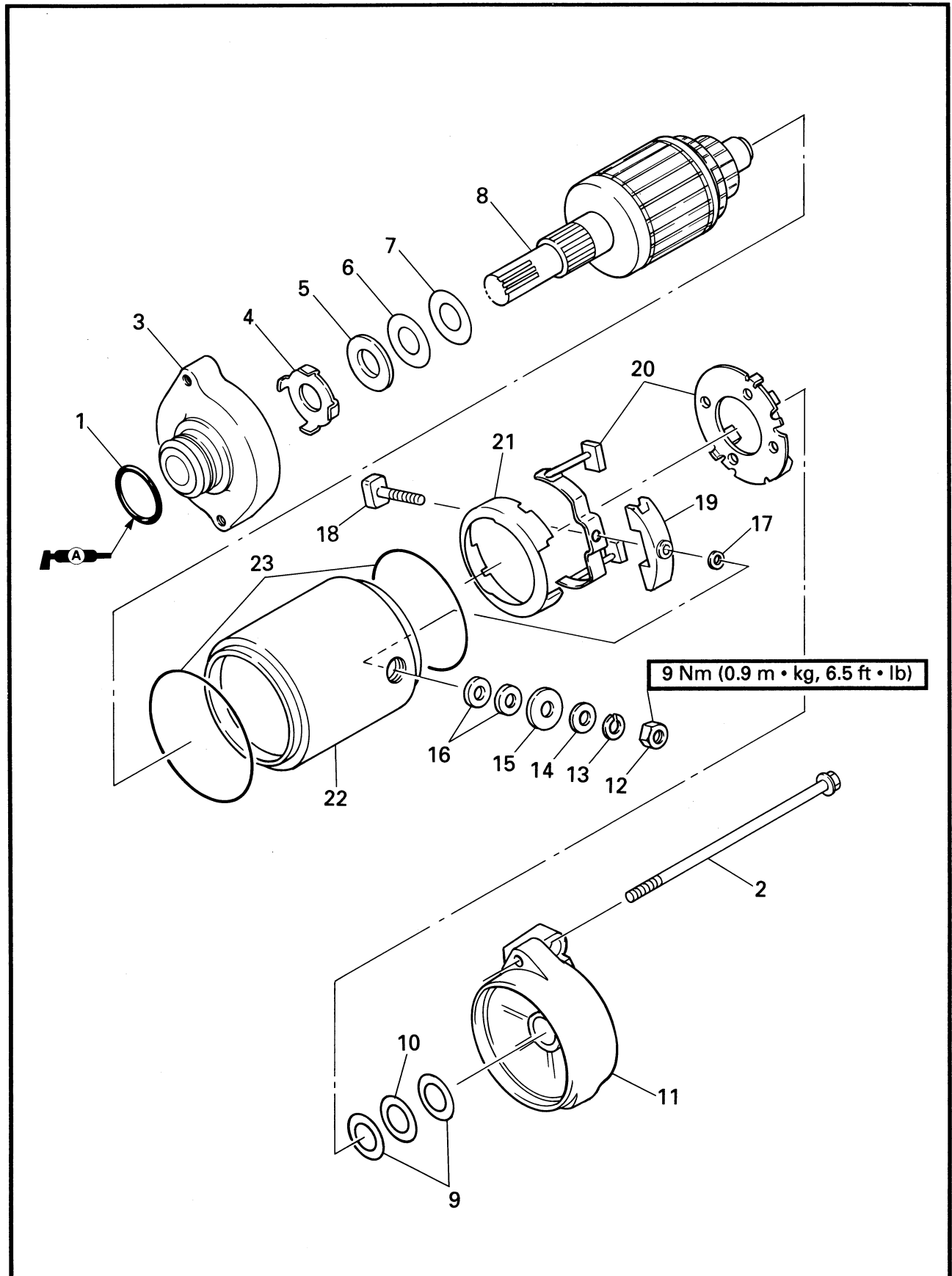
- Connect the tester between the terminals of the starter relay as shown.
- Connect a 12 V battery.

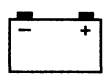
Brown lead ① → Positive terminal
Black lead ② → Negative terminal

- Check that there is continuity between the starter relay terminals.



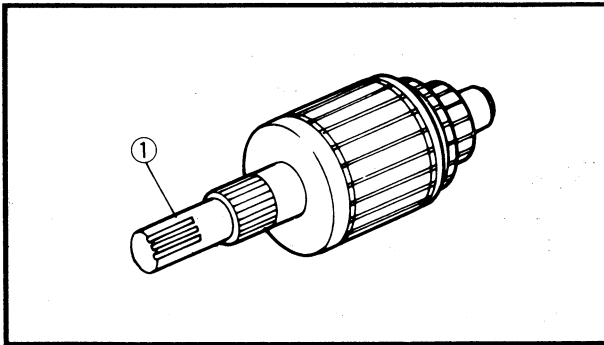
**STARTER MOTOR
EXPLODED DIAGRAM**



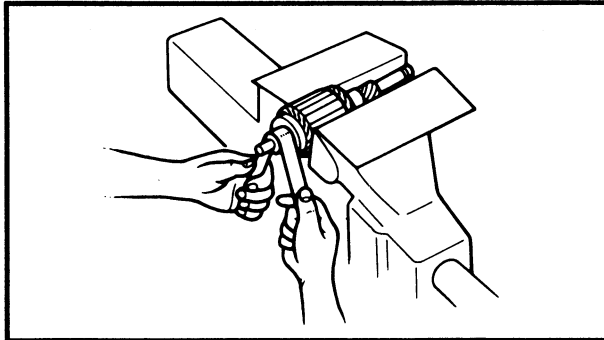


REMOVAL AND INSTALLATION CHART

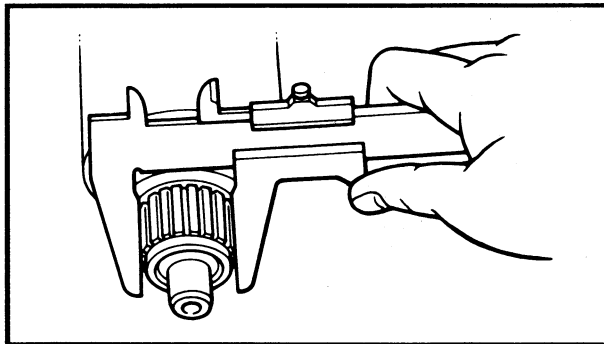
Step	Procedure/Part name	Q'ty	Service points
	STARTER MOTOR DISASSEMBLY		
	Starter motor assembly		Follow the left "Step" for removal. Refer to the "CRACKCASE AND CRANK-SHAFT" section in chapter 5.
1	O-ring	1	
2	Through bolt	2	
3	Front bracket	1	
4	Thrust supporter	1	
5	Insulator washer	1	
6	Washer	1	0.2 mm
7	Washer	1	0.5 mm
8	Armature assembly	1	
9	Washer	2	0.2 mm
10	Washer	1	0.8 mm
11	Rear bracket	1	
12	Nut	1	
13	Spring washer	1	
14	Plate washer	1	
15	Insulator washer	1	
16	Insulator washer	2	
17	O-ring	1	
18	Bolt	1	
19	Terminal insulator	1	
20	Brush holder	1	
21	Plate cover	1	
22	York assembly	1	
23	Packing	2	
			Reverse the removal steps for installation.

**SERVICE POINTS****Pinion inspection**

1. Inspect:
 - Pinion teeth ①
 - Wear/Damage → Replace.

**Armature inspection**

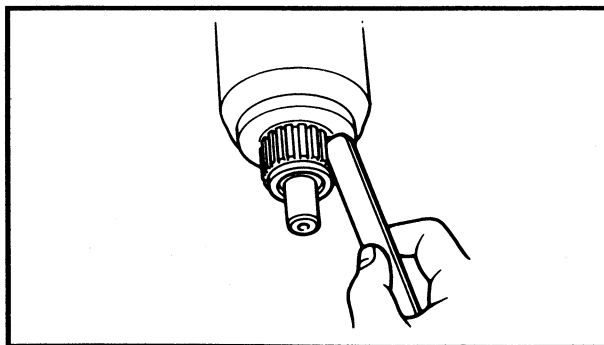
1. Inspect:
 - Commutator
 - Dirty → Clean with #600 abrasive paper.



2. Measure:
 - Commutator diameter
 - Out of specification → Replace.

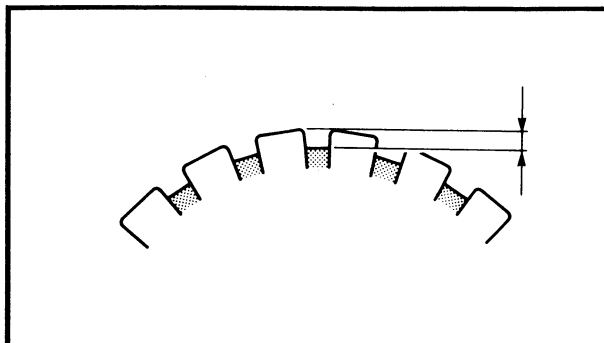


Commutator diameter:
Limit 27 mm (1.06 in)



3. Check:
 - Commutator undercut
 - Clog/Dirt → Clean.

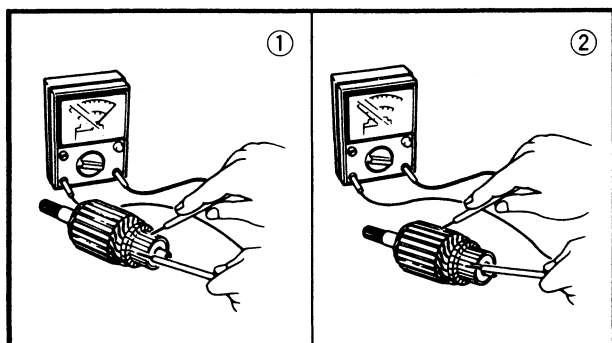
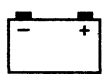
NOTE: _____
Remove all particles of mica and metal using compressed air.



4. Measure:
 - Commutator undercut
 - Out of specification → Replace.



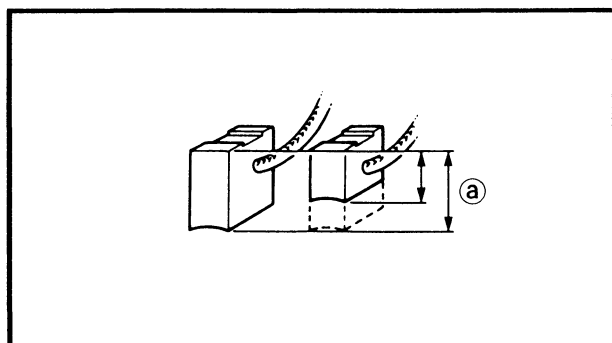
Commutator undercut:
Limit 0.2 mm (0.01 in)



5. Inspect:

- Armature coil continuity
Out of specification → Replace.

Armature coil continuity:	
Commutator segments ①	Continuity
Segment - Laminations ②	Discontinuity
Segment - Shaft	Discontinuity

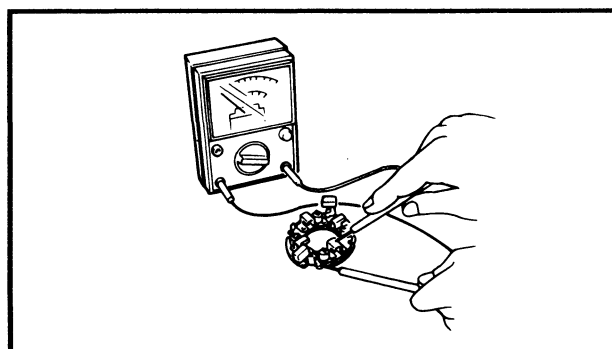


Brush holder inspection

1. Measure:

- Brush length ②
Out of specification → Replace.

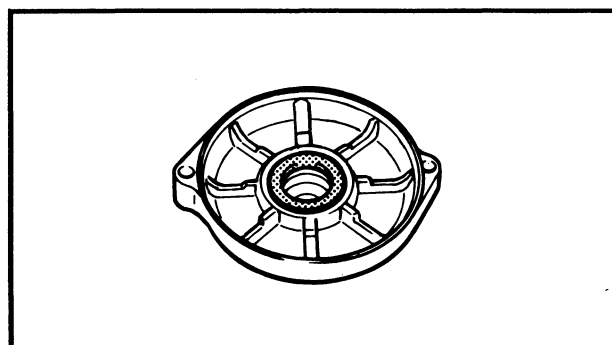
	Brush length:
	Limit 5.0 mm (0.20 in)
	RA1100: Limit 6.5 mm (0.26 in)



2. Check:

- Brush holder continuity
Out of specification → Replace.

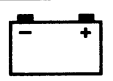
Brush holder continuity:	
Brush holder - Base	Discontinuity



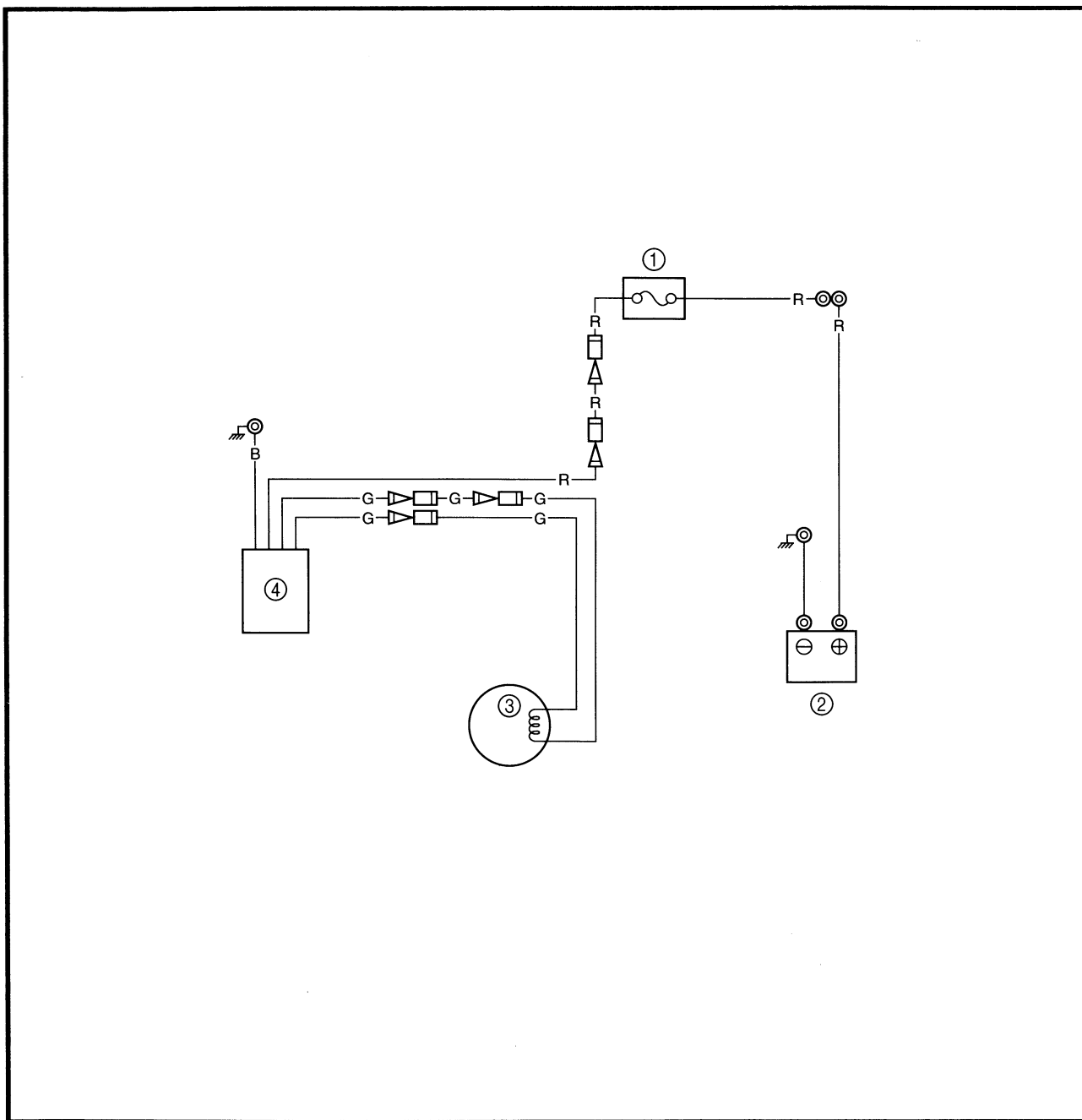
Cover inspection

1. Inspect:

- Cover bushing
Wear/Damage → Replace the cover.

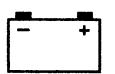


**CHARGING SYSTEM
WIRING DIAGRAM**



- ① Fuse
- ② Battery
- ③ Lighting coil
- ④ Rectifier regulator

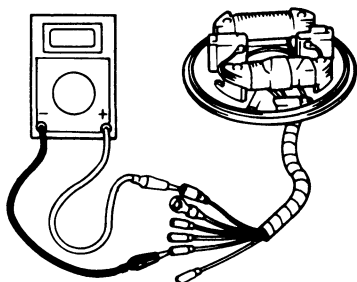
B : Black
G : Green
R : Red

**FUSE**

Refer to the "STARTING SYSTEM" section.

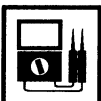
BATTERY

Refer to the "ELECTRICAL" section in chapter 3.

 $\Omega \times 1$
**LIGHTING COIL**

1. Measure:

- Lighting coil resistance
- Out of specification → Replace.



Lighting coil resistance:

RA700/RA700A

Green (G) – Green (G)

1.14 ~ 1.40 Ω at 20°C (68°F)

RA1100

Green (G) – Green (G)

0.56 ~ 0.84 Ω at 20°C (68°F)

NOTE:

When measuring the resistance of 10 Ω or less using the digital tester, the correct measurement cannot be obtained. Refer to "Lower resistance measurement".

RECTIFIER REGULATOR

1. Check:

- Continuity

Out of specification → Replace.



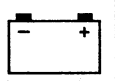
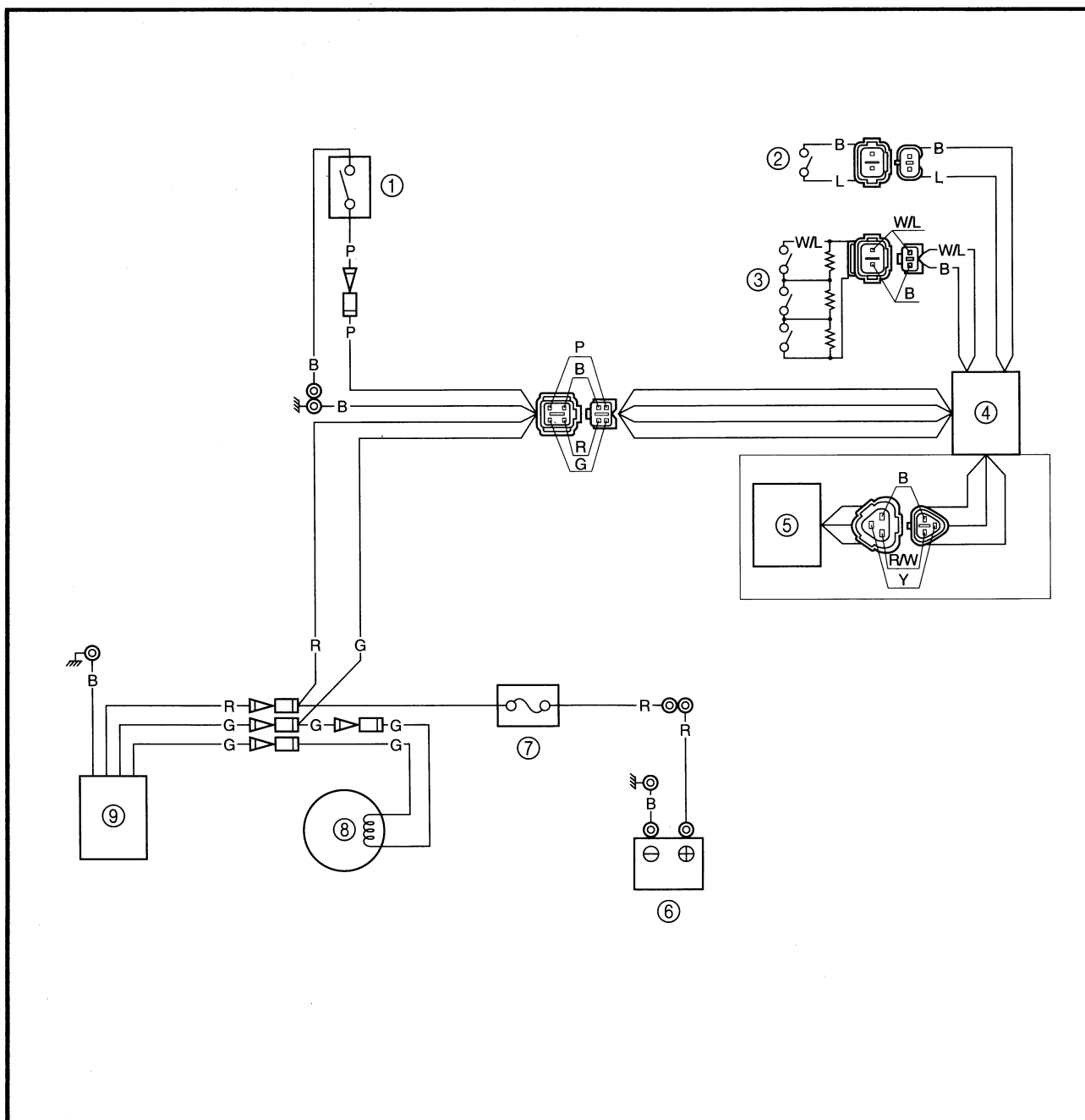
Pocket tester:

YU-03112/90890-03112

∞ : Discontinuity

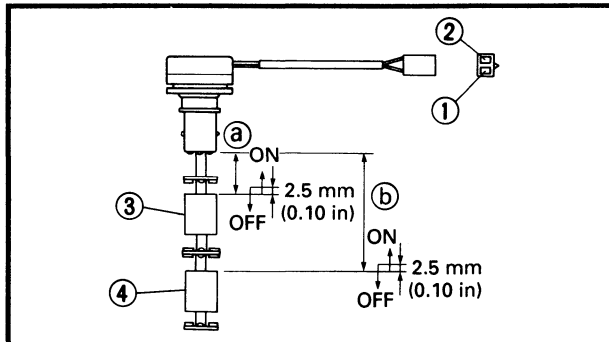
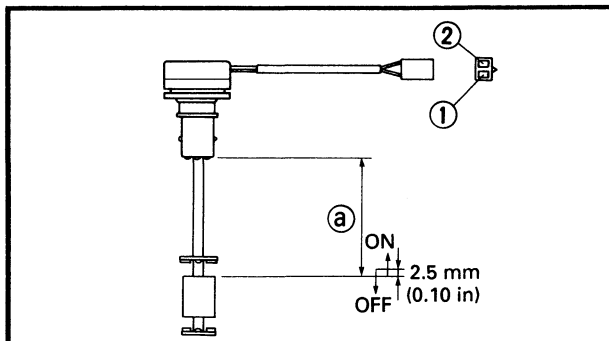
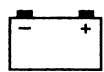
Unit: k Ω

\oplus	\ominus	R	B	G	G
R			∞	∞	∞
B		2~20		1~10	1~10
G		1~10	2~15		3~30
G		1~10	2~15	3~30	


**INDICATION SYSTEM
WIRING DIAGRAM**


- ① Thermo switch
- ② Oil level sensor
- ③ Fuel level sensor
- ④ Multi function meter
- ⑤ Speed sensor (Except for RA700)
- ⑥ Battery
- ⑦ Fuse
- ⑧ Lighting coil
- ⑨ Rectifier regulator

B : Black
 G : Green
 L : Blue
 P : Pink
 R : Red
 R/W : Red/White
 W/L : White/Blue
 Y : Yellow



OIL LEVEL SENSOR

1. Measure: (RA700)

- Oil level sensor continuity
- Out of specification → Replace.

Float position	Leads	
	Blue ①	Black ②
OFF		
ON	○	○

Float length ②:
56.8 ~ 58.8 mm (2.24 ~ 2.31 in)

1. Measure: (RA700A, RA1100)

- Oil level sensor resistance
- Out of specification → Replace.

① Blue lead → Positive terminal.
② Black lead → Negative terminal.

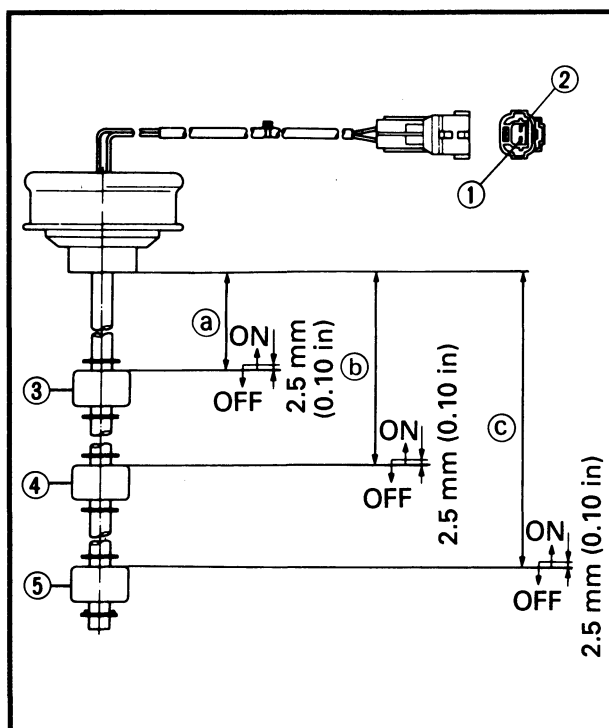
Float position	Resistance (Ω)
③, ④ :ON	0 ~ 2
③ :OFF ④ :ON	97 ~ 103
③, ④ :OFF	292 ~ 308

Float distance:
 ②: 2 ~ 6 mm (0.08 ~ 0.24 in)
 ③: 37 ~ 41 mm (1.46 ~ 1.61 in)

FUEL LEVEL SENSOR

1. Measure:

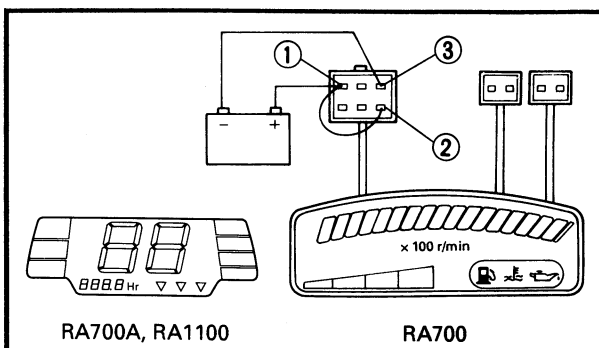
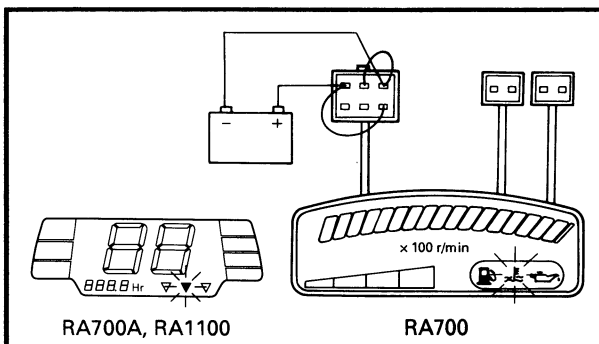
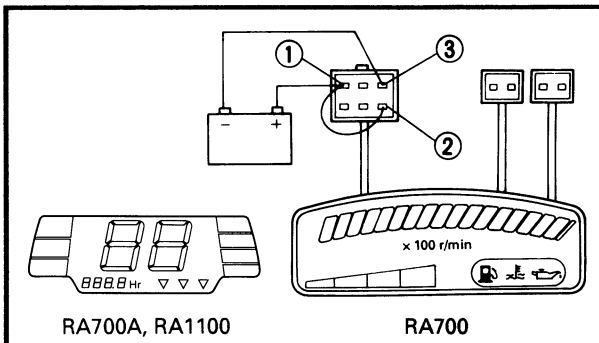
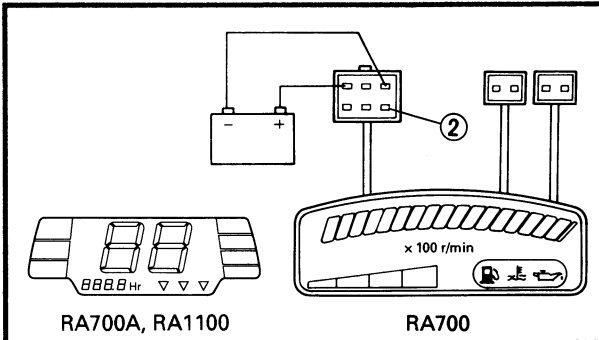
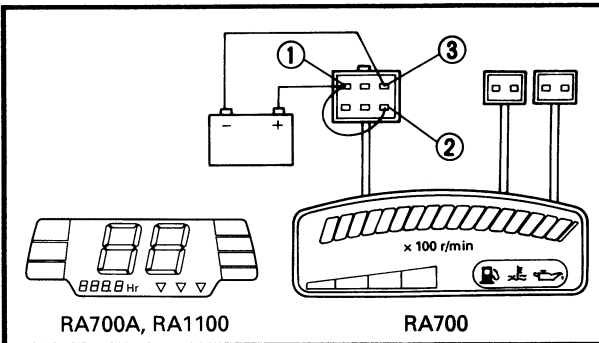
- Fuel level sensor resistance
- Out of specification → Replace.



① White/Blue lead → Positive terminal.
② Black lead → Negative terminal.

Float position	Resistance (Ω)
③, ④, ⑤ :ON	0 ~ 2
③ :OFF ④, ⑤ :ON	97 ~ 103
③, ④ :OFF ⑤ :ON	292 ~ 308
③, ④, ⑤ :OFF	667 ~ 713

Float distance:
 RA700
 ②: 74 ~ 79 mm (2.91 ~ 3.11 in)
 ③: 134 ~ 139 mm (5.28 ~ 5.47 in)
 ④: 195 ~ 198 mm (7.68 ~ 7.80 in)
 RA700A/RA1100
 ②: 91 ~ 96 mm (3.58 ~ 3.78 in)
 ③: 175 ~ 180 mm (6.89 ~ 7.09 in)
 ④: 260 ~ 263 mm (10.24 ~ 10.35 in)



MULTI FUNCTION METER

1. Check:

- Display function
Not working → Replace.

Checking steps:

- Connect the battery.



Voltage range:
10 ~ 16 V

- ① Red lead → Positive terminal.
- ② Green lead → Positive terminal.
- ③ Black lead → Negative terminal.

- After the battery is connected all segments light up for 2 seconds.
- Disconnect the green lead.
- After the lead is disconnected, the fuel meter only will continue to operate for 30 seconds, and all the other segments will disappear.

2. Check:

- Overheat segment
Not working → Replace.

Checking steps:

- Connect the battery.

- ① Red lead → Positive terminal.
- ② Green lead → Positive terminal.
- ③ Black lead → Negative terminal.

- Connect the pink and black terminals and check that the overheat segment starts blinking.

3. Check:

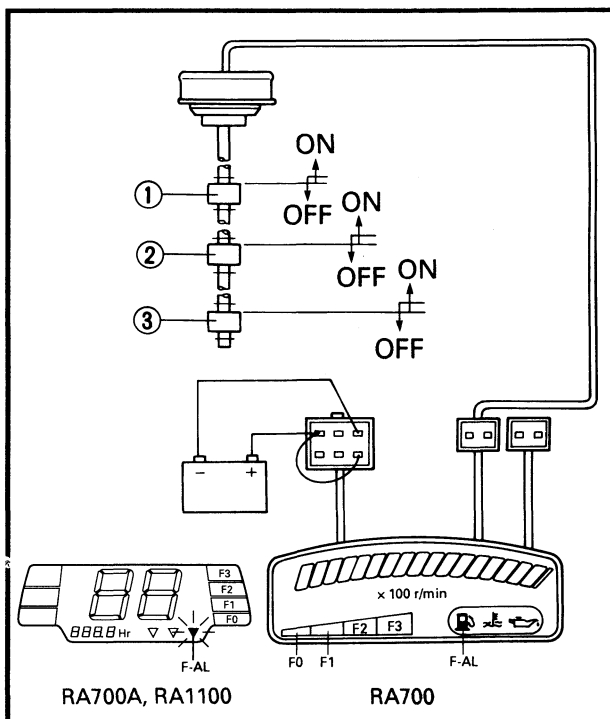
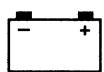
- Fuel meter
Not working → Replace.

Checking steps:

- Connect the battery.

- ① Red lead → Positive terminal.
- ② Green lead → Positive terminal.
- ③ Black lead → Negative terminal.

- Connect the fuel level sensor.

**NOTE:**

The fuel meter should be checked properly before checking the fuel level sensor resistance.

- Slide the float of fuel level sensor.
- Check the fuel meter and warning segments.

**Float position**

①, ②, ③: ON

Display

F0, F1, F2, F3, : ON

①

: OFF

②, ③

: ON

F0, F1, F2: ON

①, ②

: OFF

③

: ON

F0, F1: ON

①, ②, ③

: OFF

F0, F-AL: Blinking

NOTE:

The fuel meter display remains unchanged for 20 seconds after the float is slid.

4. Check: (RA700)

- Oil warning segment
Not working → Replace.

Checking steps:

- Connect the battery.

① **Red lead** → **Positive terminal.**② **Green lead** → **Positive terminal.**③ **Black lead** → **Negative terminal.**

- Check that the oil warning segment blinks.

- Connect the blue and black terminals and check that the oil warning segment stops blinking.

4. Check: (RA700A, RA1100)

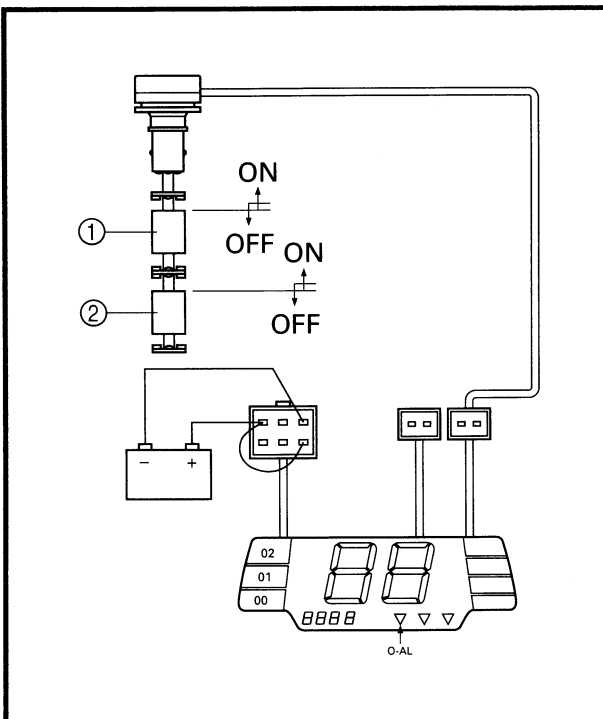
- Oil meter
Not working → Replace.

Checking steps:

- Connect the battery.

① **Red lead** → **Positive terminal.**② **Green lead** → **Positive terminal.**③ **Black lead** → **Negative terminal.**

- Connect the oil sensor.

**NOTE:**

The oil meter should be checked properly before checking the oil level sensor resistance.

- Slide the float of oil sensor.
- Check the oil meter and warning segments.



Float position
①, ②: ON

Display
00, 01, 02: ON

① :OFF
② :ON

00, 01: ON

①, ② :OFF

00, O-AL: Blinking

NOTE:

The oil meter display remains unchanged for 20 seconds after the float is slid.

- Connect the blue and black terminals and check that the oil warning segment stops blinking.

FUSE

Refer to the "STARTING SYSTEM" section.

BATTERY

Refer to the "CHARGING SYSTEM" section.

LIGHTING COIL

Refer to the "CHARGING SYSTEM" section.

RECTIFIER REGULATOR

Refer to the "CHARGING SYSTEM" section.

CHAPTER 8

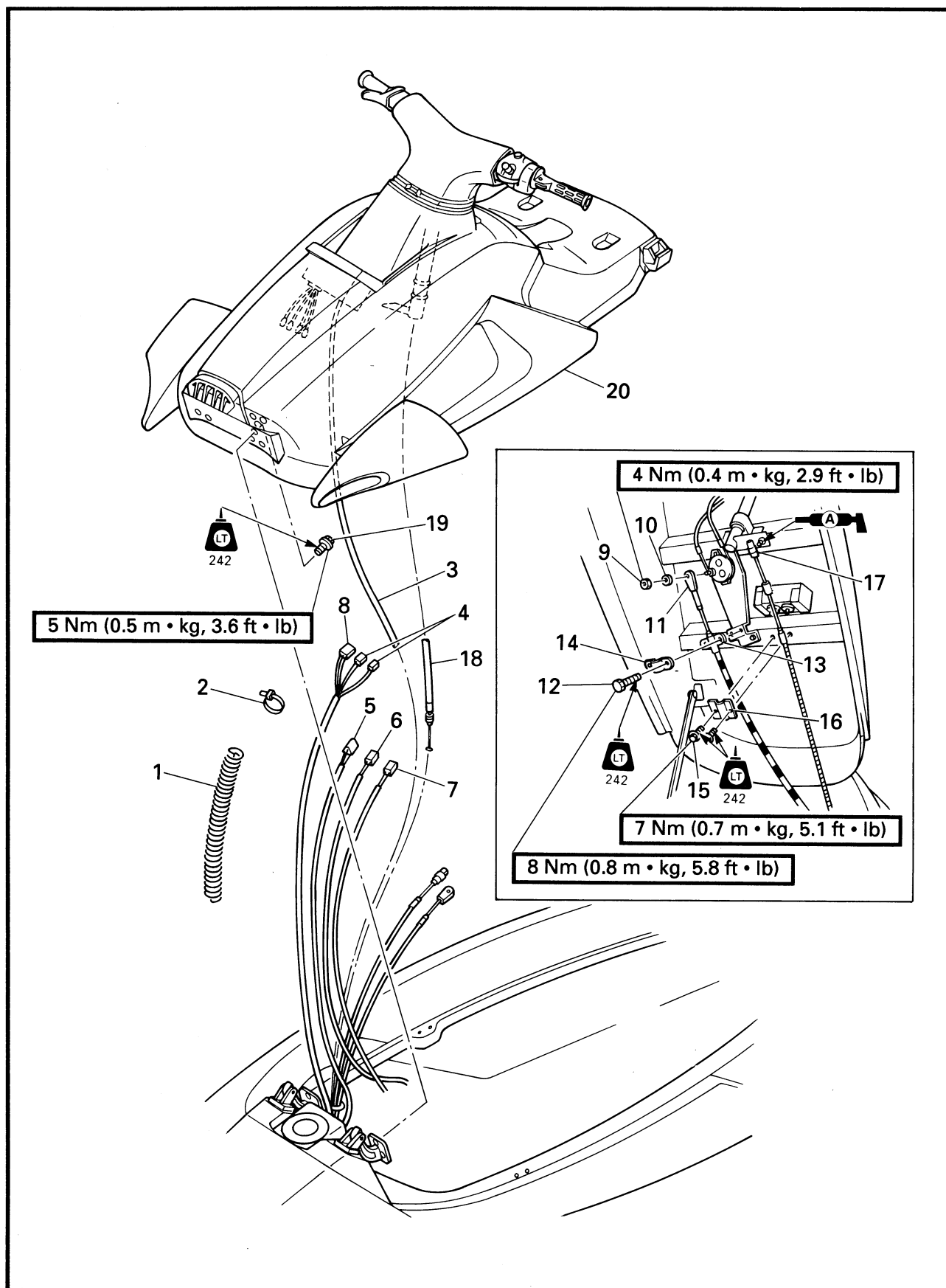
HULL AND HOOD

ENGINE HOOD REMOVAL	8-1
EXPLODED DIAGRAM	8-1
REMOVAL AND INSTALLATION CHART	8-2
 HANDLE	 8-3
EXPLODED DIAGRAM	8-3
REMOVAL AND INSTALLATION CHART	8-4
SERVICE POINTS	8-5
Handle inspection	8-5
 TRIM CONTROL GRIP AND CABLE	 8-6
EXPLODED DIAGRAM	8-6
REMOVAL AND INSTALLATION CHART	8-7
SERVICE POINTS	8-7
Housing and cable inspection	8-7
 HANDLE COLUMN	 8-8
EXPLODED DIAGRAM	8-8
REMOVAL AND INSTALLATION CHART	8-9
SERVICE POINTS	8-9
Handle column inspection	8-9
Bearing inspection	8-9
 ENGINE HOOD	 8-10
EXPLODED DIAGRAM	8-10
REMOVAL AND INSTALLATION CHART	8-11
SERVICE POINTS	8-12
Hood support inspection	8-12
Engine hood inspection	8-12
 STEERING CABLE, THROTTLE CABLE AND CHOKE CABLE	 8-13
EXPLODED DIAGRAM	8-13
REMOVAL AND INSTALLATION CHART	8-14
SERVICE POINTS	8-16
Cable inspection	8-16
 TRIM CABLE	 8-17
EXPLODED DIAGRAM	8-17
REMOVAL AND INSTALLATION CHART	8-18
SERVICE POINTS	8-18
Cable inspection	8-18

SEAT, STORAGE BOX, FIRE EXTINGUISHER BOX AND BATTERY CASE	8-19
EXPLODED DIAGRAM	8-19
REMOVAL AND INSTALLATION CHART.....	8-20
SERVICE POINTS	8-20
Seat inspection	8-20
Storage box inspection	8-20
 EXHAUST SYSTEM	 8-21
EXPLODED DIAGRAM (RA700)	8-21
REMOVAL AND INSTALLATION CHART.....	8-22
EXPLODED DIAGRAM (RA700A, RA1100)	8-23
REMOVAL AND INSTALLATION CHART.....	8-24
SERVICE POINTS	8-24
Exhaust system inspection	8-24
 VENTILATION SYSTEM	 8-25
EXPLODED DIAGRAM	8-25
REMOVAL AND INSTALLATION CHART.....	8-26
SERVICE POINTS	8-26
Ventilation system inspection	8-26
 DECK	 8-27
EXPLODED DIAGRAM	8-27
REMOVAL AND INSTALLATION CHART.....	8-28
 GUNWALE AND MAT	 8-29
EXPLODED DIAGRAM	8-29
REMOVAL AND INSTALLATION CHART.....	8-30
SERVICE POINTS	8-30
Gunwale and mat inspection.....	8-30
 HULL	 8-31
EXPLODED DIAGRAM	8-31
REMOVAL AND INSTALLATION CHART.....	8-32
HULL REPAIR.....	8-32
Light scratching	8-32
Deep scratching	8-32
Hull damage (punctured)	8-33
Insert nut	8-34
Removing a graphic	8-36
Applying a graphic	8-36



**ENGINE HOOD REMOVAL
EXPLODED DIAGRAM**

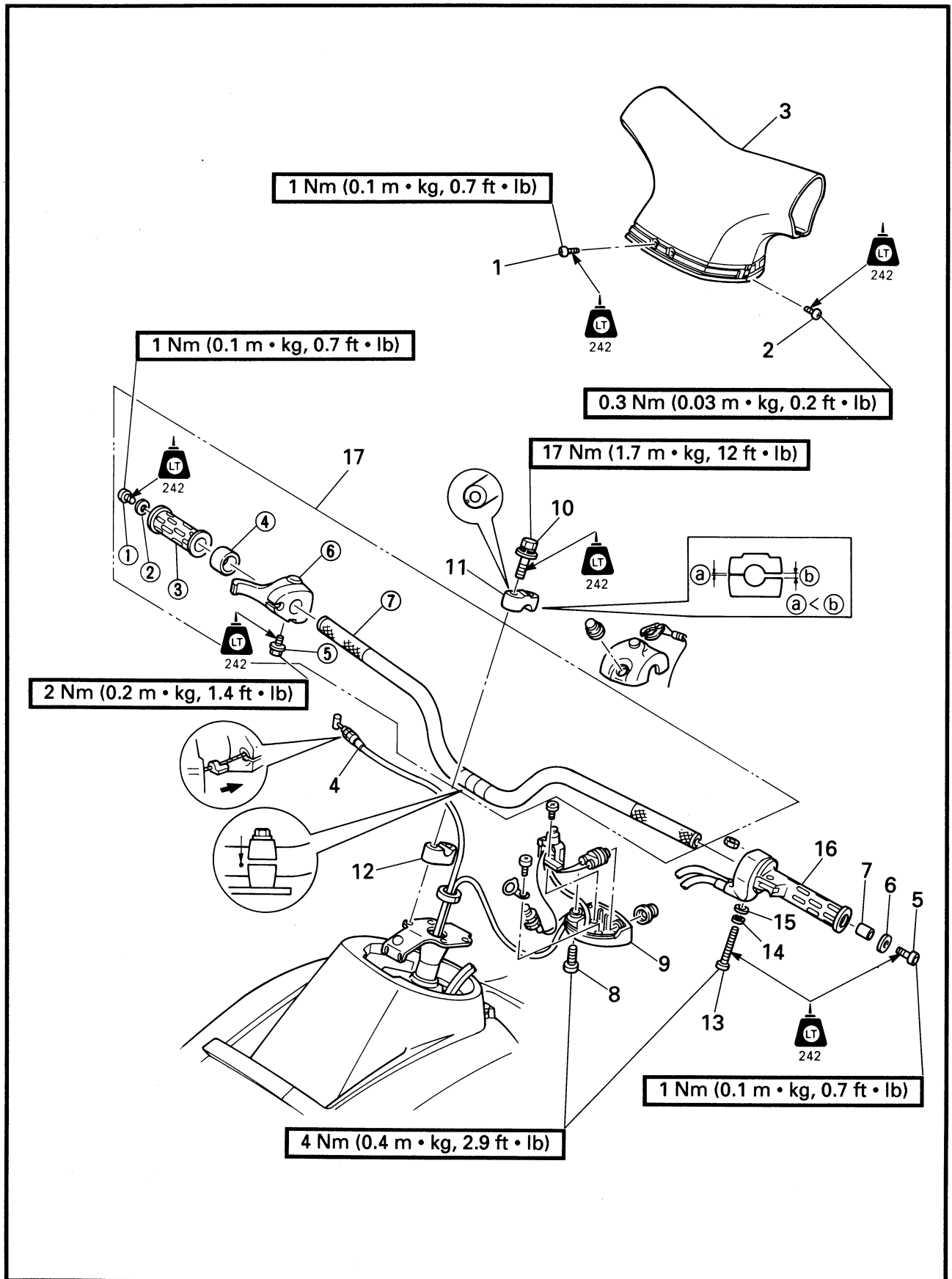


REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	ENGINE HOOD REMOVAL		Follow the left "Step" for removal.
1	Spiral tube	1	
2	Band	1	NOTE: _____ Clamp the handle switch leads and meter leads with the band.
3	Meter breather hose	1	NOTE: _____ Pass the meter breather hose through the cable guide and clamp it with the band.
4	Handle switch lead coupler	2	
5	Speed sensor lead coupler	1	Except for RA700
6	Oil sensor lead coupler	1	
7	Fuel sender lead coupler	1	
8	Meter lead coupler	1	
9	Nut	1	
10	Plate washer	1	
11	Cable joint (trim cable)	1	
12	Bolt	2	6 × 12 mm
13	Plate	1	⚠ WARNING _____
14	Cable stopper	1	Be sure to fit the projection on the cable stopper into the groove on the outer cable.
15	Bolt (with washer)	2	6 × 18 mm
16	Cable stopper	1	⚠ WARNING _____ Be sure to fit the projection on the cable stopper into the groove on the outer cable.
17	Cable joint (steering cable)	1	
18	Throttle cable	1	NOTE: _____ ● Disconnect the throttle cable from the carburetor. ● Pass the steering cable through the cable guide.
19	Bolt (with washer)	6	6 × 22 mm ⚠ WARNING _____ The hood support end pin must be secured in its holder otherwise the engine hood may be damaged or injury may be caused by the hood slamming shut.
20	Engine hood assembly	1	Reverse the removal steps for installation.



**HANDLE
EXPLODED DIAGRAM**





HANDLE

REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	HANDLE REMOVAL		For removal, follow the steps on the left.
1	Screw	4	5 × 16 mm
2	Screw	4	4 × 8 mm
3	Steering pad	1	
4	Throttle cable	1	NOTE: _____ Disconnect the throttle cable from the throttle lever.
5	Screw	1	
6	Washer	1	
7	Collar	1	
8	Screw	2	NOTE: _____ Tighten the screw at the stop button side first.
9	Handle switch assembly	1	
10	Bolt (with washer)	4	8 × 55 mm NOTE: _____ When tightening the bolt, clearance ③ should be narrower than clearance ⑥.
11	Handlebar holder (upper)	2	
12	Handlebar holder (lower)	2	NOTE: _____ Align the punched mark on the handlebar with the top surface of the handlebar holder (lower).
13	Screw	1	6 × 65 mm
14	Spring washer	1	
15	Plate washer	1	
16	Trim control grip assembly	1	
17	Handlebar assembly	1	
	HANDLEBAR DISASSEMBLY		
①	Screw	1	
②	Plate washer	1	
③	Handle grip	1	NOTE: _____ Apply adhesive to the handlebar and the inner surface of the grip.
④	Spacer	1	
⑤	Screw	1	
⑥	Throttle lever assembly	1	
⑦	Handlebar	1	
			Reverse the removal steps for installation.



HANDLE

SERVICE POINTS

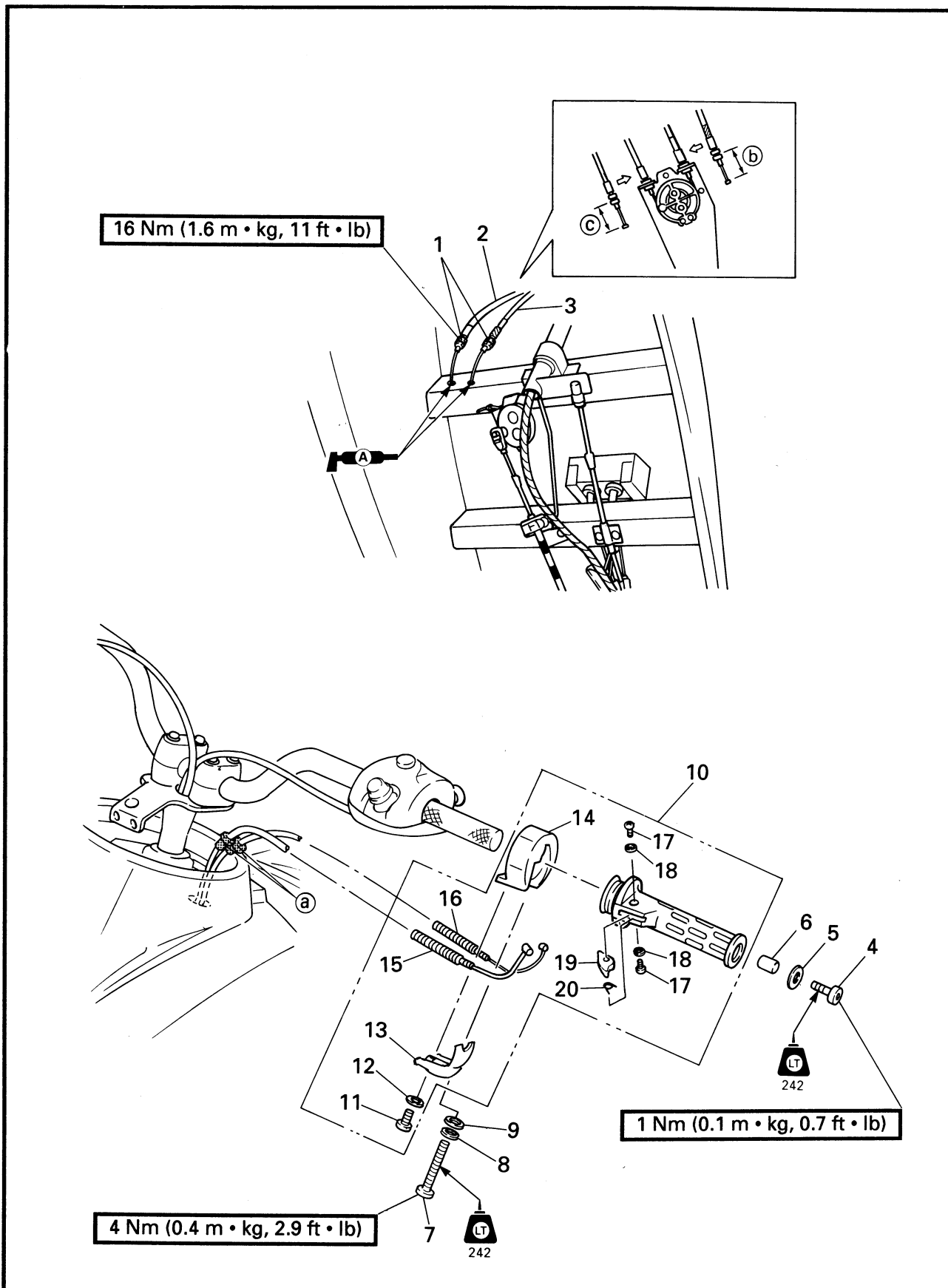
Handle inspection

1. Inspect:

- Handlebar

Bend/Crack/Damage → Replace.

**TRIM CONTROL GRIP AND CABLE
EXPLODED DIAGRAM**



REMOVAL AND INSTALLATION CHART

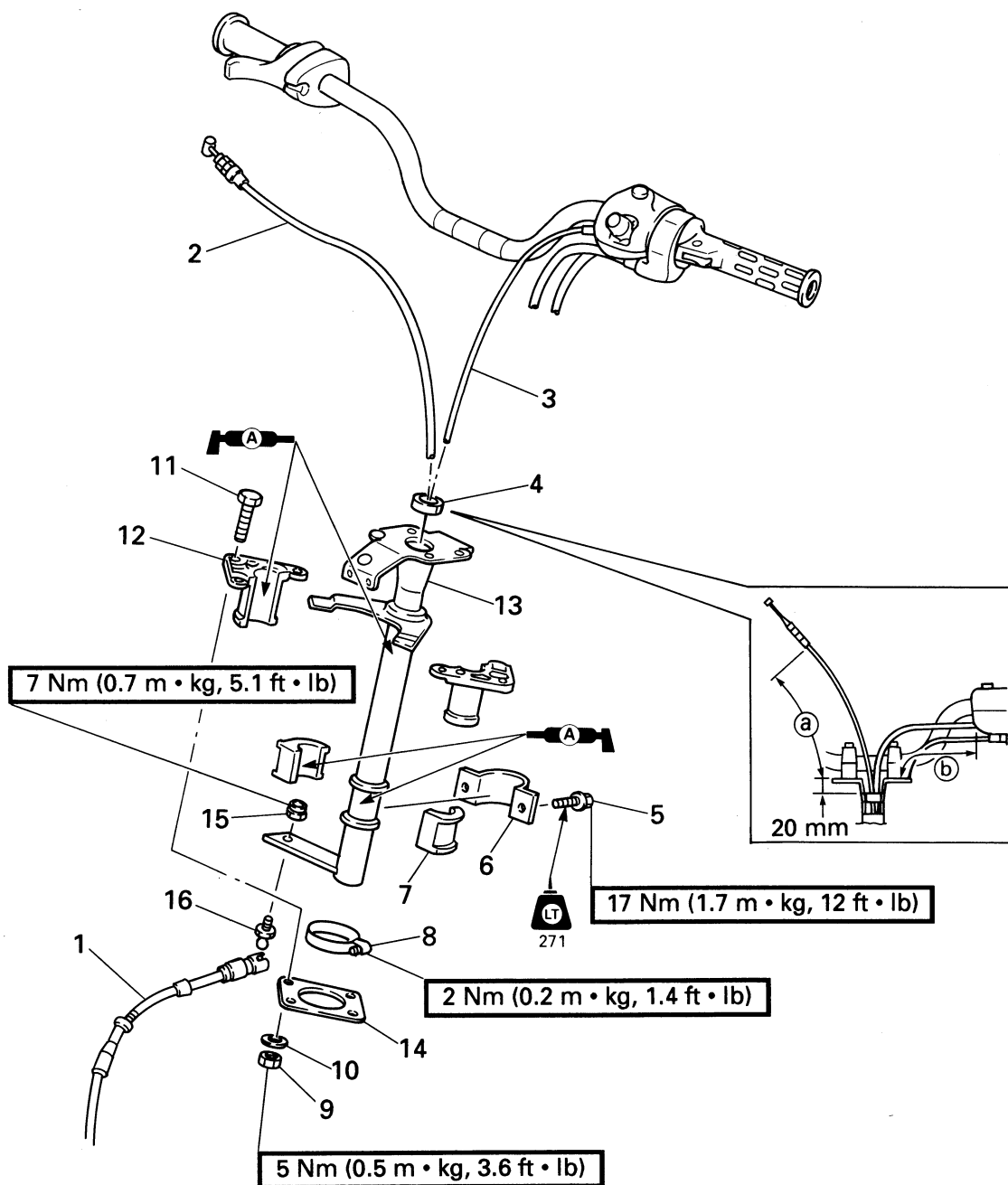
Step	Procedure/Part name	Q'ty	Service points
	TRIM CONTROL GRIP AND CABLE REMOVAL		Follow the left "Step" for removal.
	Steering pad		Refer to the "HANDLE" section.
1	Lock nut	2	NOTE: _____ ● Install the white taped cable on the side of the base marked "D". ● After inserting the cables into the engine hood, make the insertion opening water tight using the packing ③. ● Before installing cables 1 and 2, with the grip handle in neutral, adjust the inner cable lengths ⑥ and ⑦ to 77 mm (3.03 in) to take up the slack.
2	Nozzle control cable 1	1	
3	Nozzle control cable 2 (white taped)	1	
4	Screw	1	
5	Plate washer	1	
6	Collar	1	
7	Screw	1	
8	Spring washer	1	
9	Plate washer	1	
10	Trim control grip assembly	1	
11	Screw	1	
12	Plate washer	1	
13	Cover	1	
14	Housing	1	
15	Nozzle control cable 1	1	
16	Nozzle control cable 2 (white taped)	1	
17	Screw	2	
18	Plate washer	2	
19	Release button	1	
20	Spring	1	
			Reverse the removal steps for installation.

SERVICE POINTS
Housing and cable inspection

1. Inspect:

- Housing
Wear/Damage → Replace.
- Trim control cable
Kink/Fray/Stick → Replace.

**HANDLE COLUMN
EXPLODED DIAGRAM**




REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	HANDLE COLUMN REMOVAL		Follow the left "Step" for removal. Refer to the "HANDLE" section.
	Handlebar assembly		
1	Steering cable	1	
2	Throttle cable	1	
3	Handle switch lead	2	
4	Seal packing	1	NOTE: _____ ● Adjust the throttle cable length ① and handle switch lead length ② to 200 mm (7.9 in). ● Seal the steering shaft with the seal packing at a point 20 mm (0.79 in) from the end of the steering column.
5	Bolt (with washer)	2	NOTE: _____ Check for smooth action of the handle column when tightening the bolt.
6	Bushing joint	1	
7	Bushing	2	
8	Clamp	1	
9	Nut	4	
10	Plate washer	4	
11	Bolt	4	
12	Column bushing	2	
13	Handle column	1	
14	Seal rubber	1	
15	Nut	1	
16	Ball joint	1	
			Reverse the removal steps for installation.

SERVICE POINTS
Handle column inspection

1. Inspect:

- Handle column

Bend/Crack/Damage → Replace.

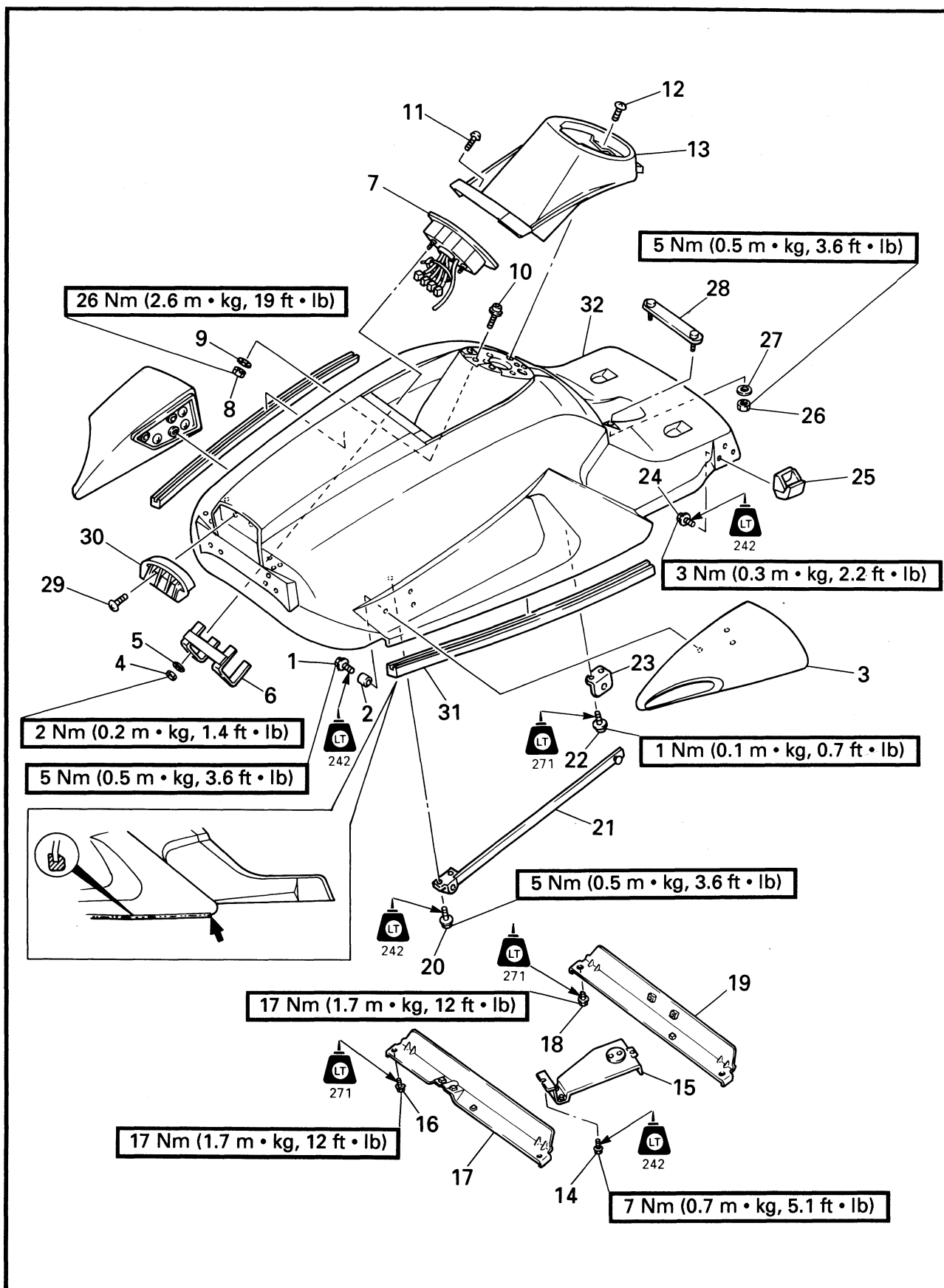
Bearing inspection

1. Inspect:

- Bushing

Wear/Damage → Replace.

ENGINE HOOD EXPLODED DIAGRAM





ENGINE HOOD

REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	ENGINE HOOD DISASSEMBLY		Follow the left "Step" for removal.
	Engine hood assembly		Refer to the "ENGINE HOOD REMOVAL" section.
	Handle column		Refer to the "HANDLE COLUMN" section.
	Trim control cable		Refer to the "TRIM CONTROL GRIP AND CABLE" section.
1	Bolt (with washer)	6	
2	Collar	6	
3	Rear view mirror assembly	2	
4	Nylon nut	2	
5	Plate washer	1	
6	Meter bracket	1	
7	Meter assembly	1	
8	Nylon nut	1	
9	Plate washer	1	
10	Stopper pin	1	
11	Tapping screw	2	
12	Tapping screw	4	
13	Engine hood cover	1	
14	Bolt (with washer)	2	
15	Base	1	
16	Bolt (with washer)	2	
17	Cable stopper bracket	1	
18	Bolt (with washer)	2	
19	Bearing bracket	1	
20	Screw (with washer)	2	
21	Hood support	1	
22	Screw (with washer)	2	
23	Fix plate	1	
24	Bolt (with washer)	6	
25	Hood lock hook	2	
26	Nylon nut	2	
27	Plate washer	2	
28	Seat hook stay	1	
29	Tapping screw	2	
30	Air intake cover	1	
31	Trim	2	NOTE: _____ ● Apply cyano-acrylate adhesive to the trim. ● Attach the trim to the hatch as shown.
32	Engine hood	1	Reverse the removal steps for installation.



ENGINE HOOD

SERVICE POINTS

Hood support inspection

1. Inspect:

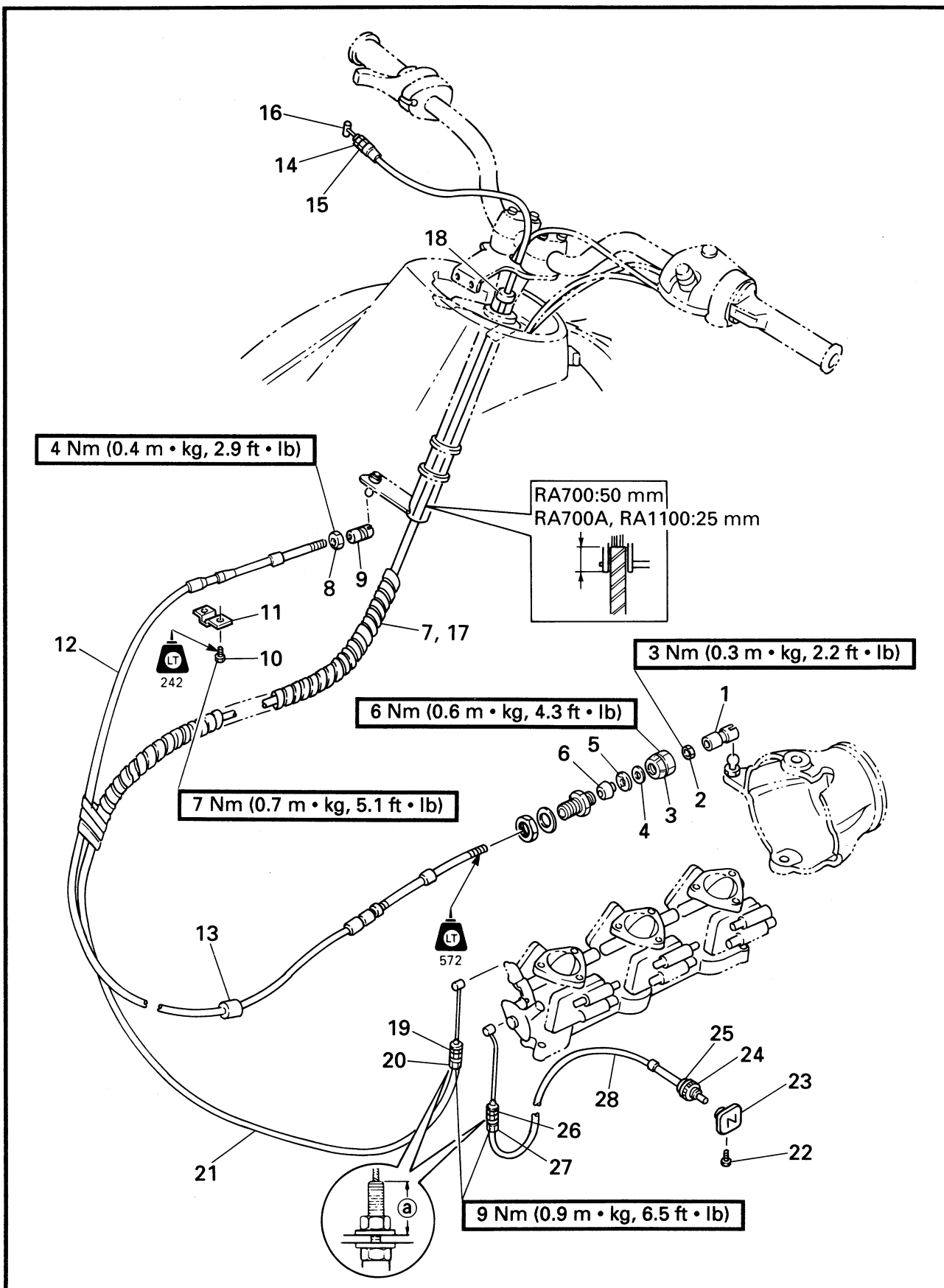
- Hood support
 - Hood lock hook
- Bend/Damage → Replace.

Engine hood inspection

1. Inspect:

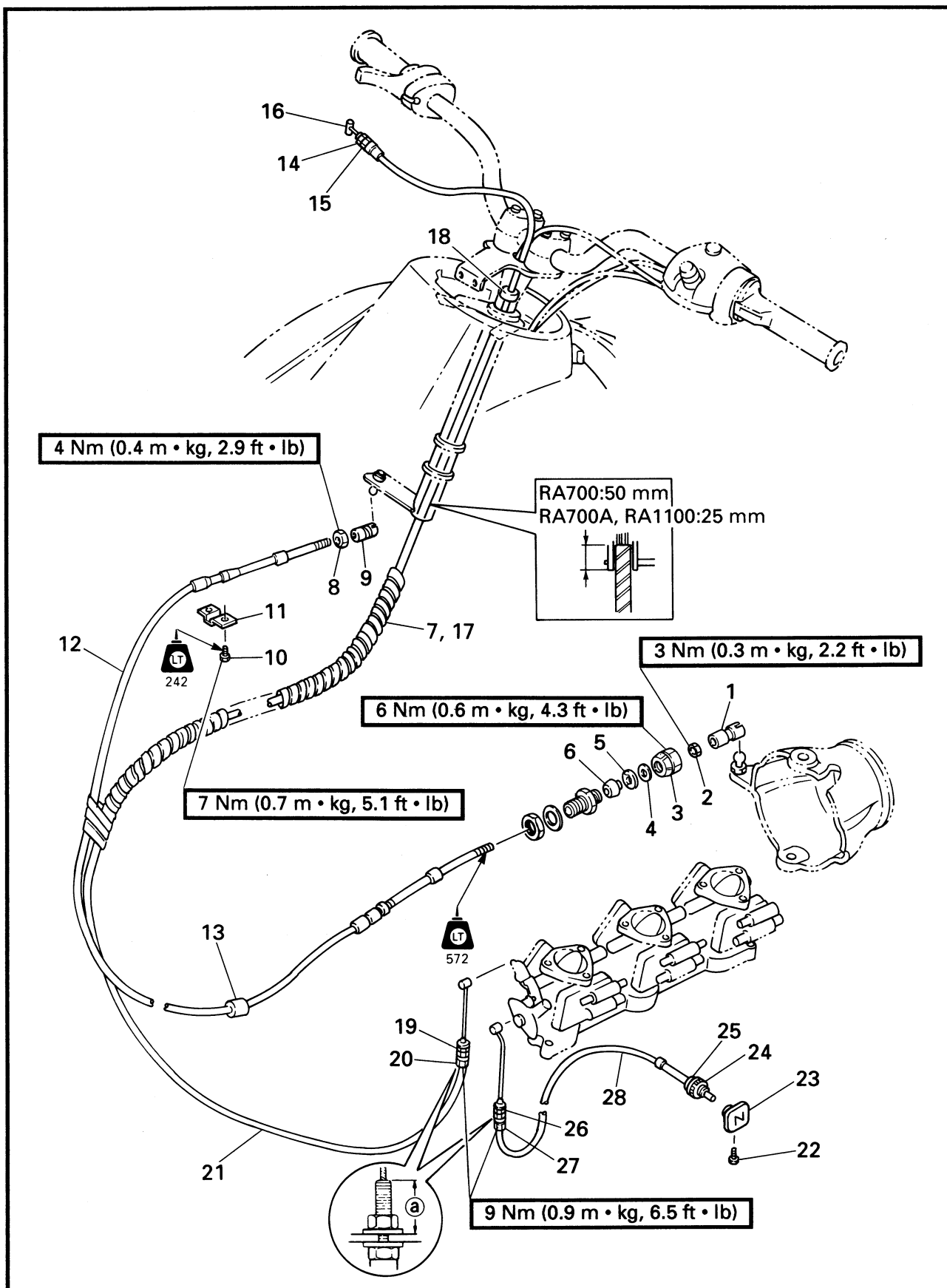
- Engine hood
- Crack/Damage → Replace.



**STEERING CABLE, THROTTLE CABLE AND CHOKE CABLE
EXPLODED DIAGRAM**



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	STEERING CABLE REMOVAL		
	Ride plate		Follow the left "Step" for removal. Refer to the "JET PUMP UNIT REMOVAL" section in chapter 6.
1	Cable joint	1	NOTE: _____ Screw the steering cable end 13.8 mm (0.54 in) into the cable joint and tighten the lock nut.
2	Lock nut	1	
3	Cap	1	
4	Washer	1	
5	Stopper	1	
6	Seal	1	
7	Spiral tube	1	NOTE: _____ Wind the spiral tube around all cables, leads, the meter breather hose and the steering cable.
8	Lock nut	1	
9	Cable joint	1	⚠ WARNING _____ The cable joint must be screwed in more than 8 mm (0.31 in).
10	Bolt (with washer)	2	
11	Cable stopper	1	⚠ WARNING _____ Be sure to fit the projection on the cable stopper into the slit in the outer cable.
12	Steering cable	1	NOTE: _____ Insert the cable into the clamp.
13	Packing	1	
	THROTTLE CABLE REMOVAL		
	Steering pad		Refer to the "HANDLE" section.
14	Throttle cable lock nut	1	
15	Throttle cable adjusting bolt	1	
16	Throttle cable barrel	1	
17	Spiral tube	1	NOTE: _____ ● Wind the spiral tube around the throttle cable and handle switch leads. ● Insert the end of the spiral tube at least specified into the steering shaft.
18	Packing	1	



Step	Procedure/Part name	Q'ty	Service points
19	Throttle cable lock nut	1	 Cable guide set position @: RA700, RA700A: 17 mm (0.67 in) RA1100: 14 mm (0.55 in)
20	Throttle cable adjusting nut	1	
21	Throttle cable	1	
	CHOKE CABLE REMOVAL		
22	Screw	1	 Cable guide set position @: 17 mm (0.67 in)
23	Choke knob	1	
24	Adjuster	1	
25	Lock nut	1	
26	Choke cable lock nut	1	
27	Choke cable adjusting nut	1	
28	Choke cable	1	
			Reverse the removal steps for installation.

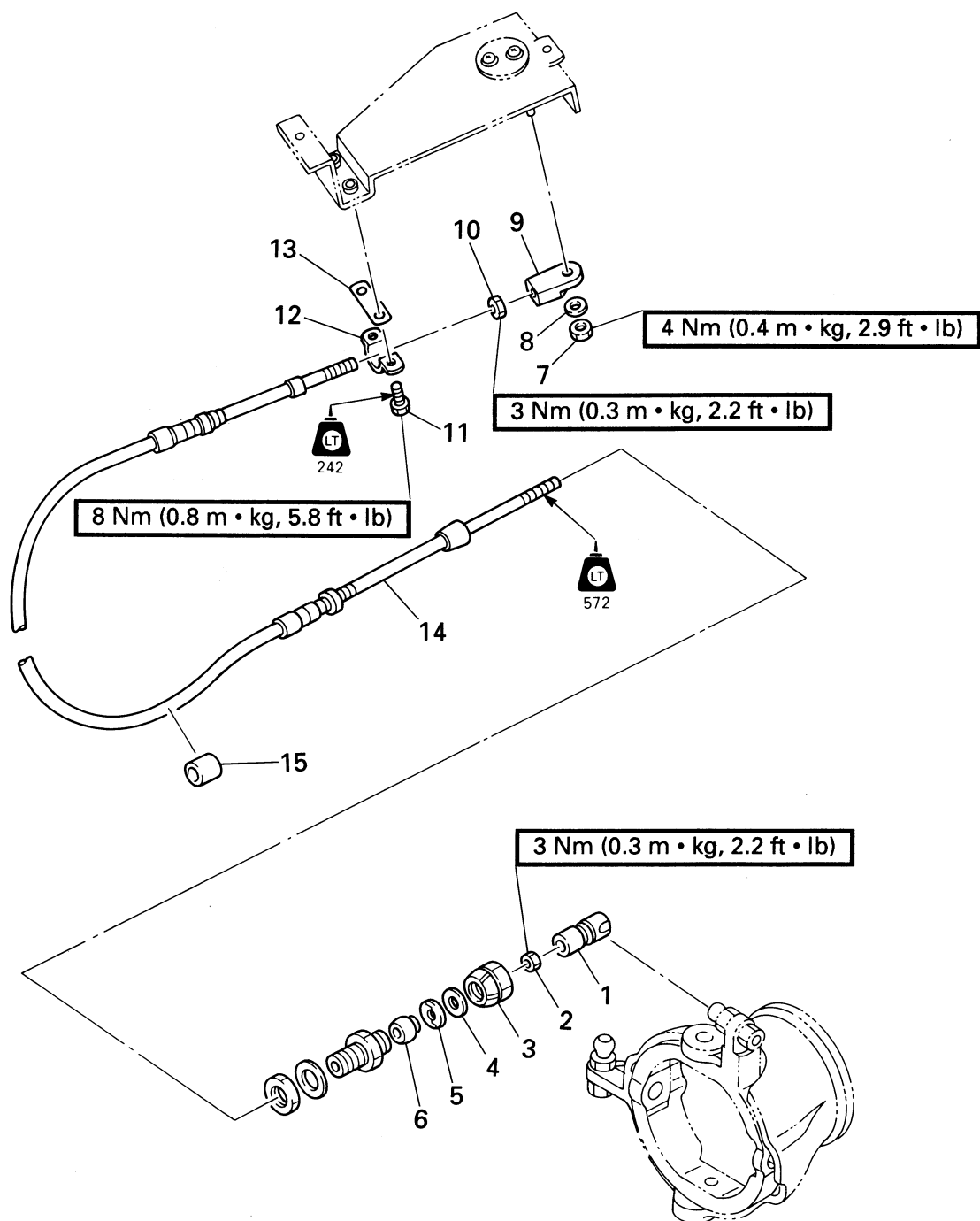
SERVICE POINTS

Cable inspection

1. Inspect:

- Steering cable
 - Throttle cable
 - Choke cable
- Kink/Fray/Stick → Replace.

TRIM CABLE EXPLODED DIAGRAM



REMOVAL AND INSTALLATION CHART

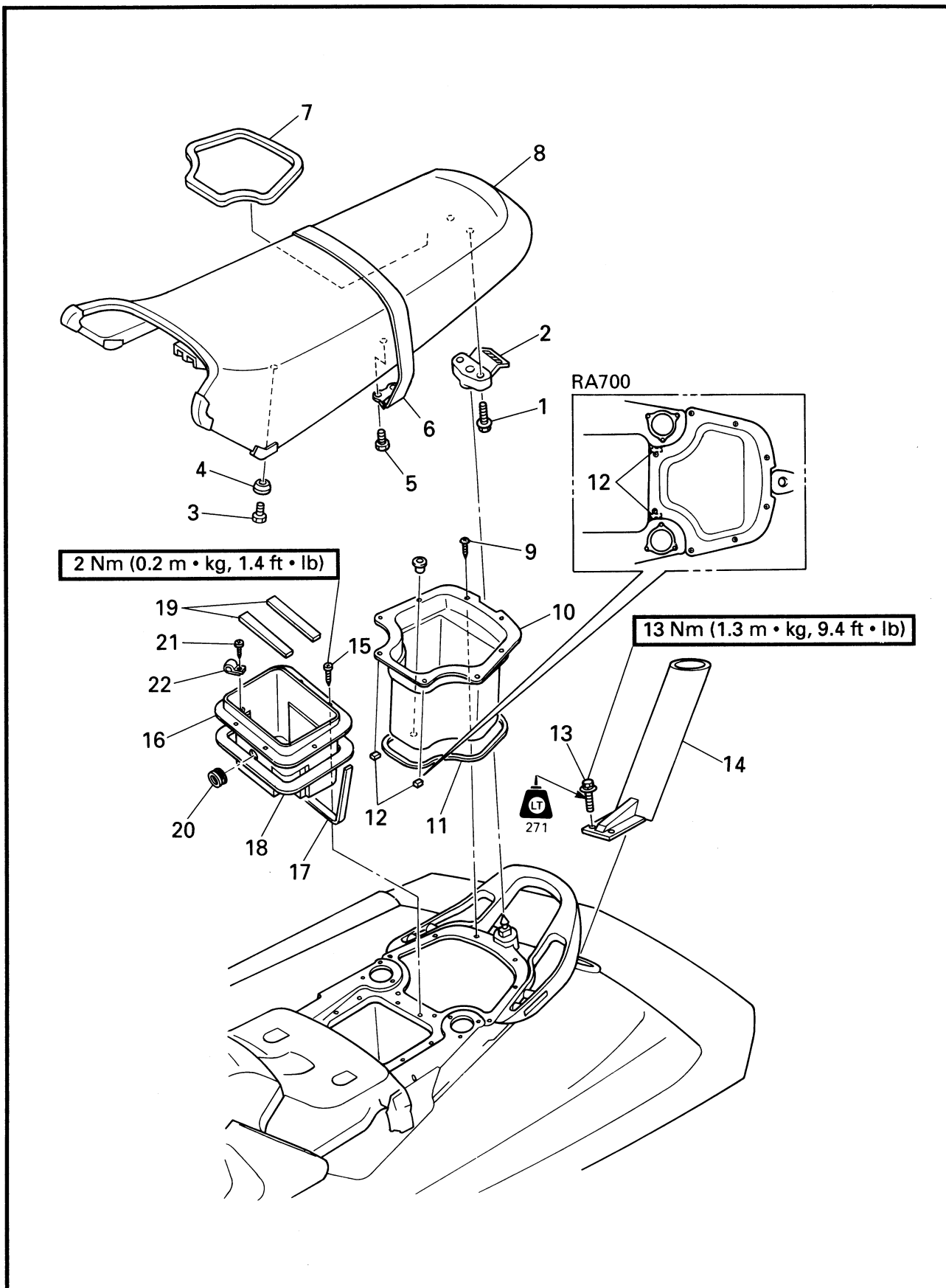
Step	Procedure/Part name	Q'ty	Service points
	TRIM CABLE REMOVAL		
	Ride plate		Follow the left "Step" for removal. Refer to the "JET PUMP UNIT REMOVAL" section in chapter 6.
1	Cable joint	1	NOTE: _____ Screw the steering cable end 13.8 mm (0.54 in) into the cable joint and tighten the lock nut.
2	Lock nut	1	
3	Cap	1	
4	Washer	1	
5	Stopper	1	
6	Seal	1	
7	Nylon nut	1	
8	Plate washer	1	
9	Cable joint	1	⚠ WARNING _____ The cable joint must be screwed in more than 8 mm (0.31 in).
10	Lock nut	1	
11	Bolt	2	
12	Cable stopper	1	⚠ WARNING _____ Be sure to fit the projection on the cable stopper into the slit in the outer cable.
13	Plate	1	
14	Trim cable	1	NOTE: _____ Insert the cable into the clamp.
15	Packing	1	Reverse the removal steps for installation.

SERVICE POINTS
Cable inspection
1. Inspect:

- Trim cable
Kink/Fray/Stick → Replace.



**SEAT, STORAGE BOX, FIRE EXTINGUISHER BOX AND BATTERY CASE
EXPLODED DIAGRAM**





SEAT, STORAGE BOX, FIRE EXTINGUISHER BOX AND BATTERY CASE

REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
SEAT DISASSEMBLY			Follow the left "Step" for removal.
1	Bolt (with washer)	2	
2	Seat lock	1	
3	Screw (with washer)	2	
4	Seat stopper	2	
5	Bolt (with washer)	4	
6	Band	1	
7	Packing	1	
8	Seat	1	
FIRE EXTINGUISHER BOX REMOVAL			For RA700
9	Tapping screw	8	
10	Storage box	1	
11	Packing	1	
12	Packing	2	
13	Bolt (with washer)	2	
14	Fire extinguisher box	1	
BATTERY CASE REMOVAL			For RA700A and RA1100
15	Tapping screw	6	
16	Battery case	1	
17	Pad	1	
18	Packing	1	
19	Pad	2	
20	Grommet	1	
21	Tapping screw	1	
22	Clamp	1	
			Reverse the removal steps for installation.

SERVICE POINTS

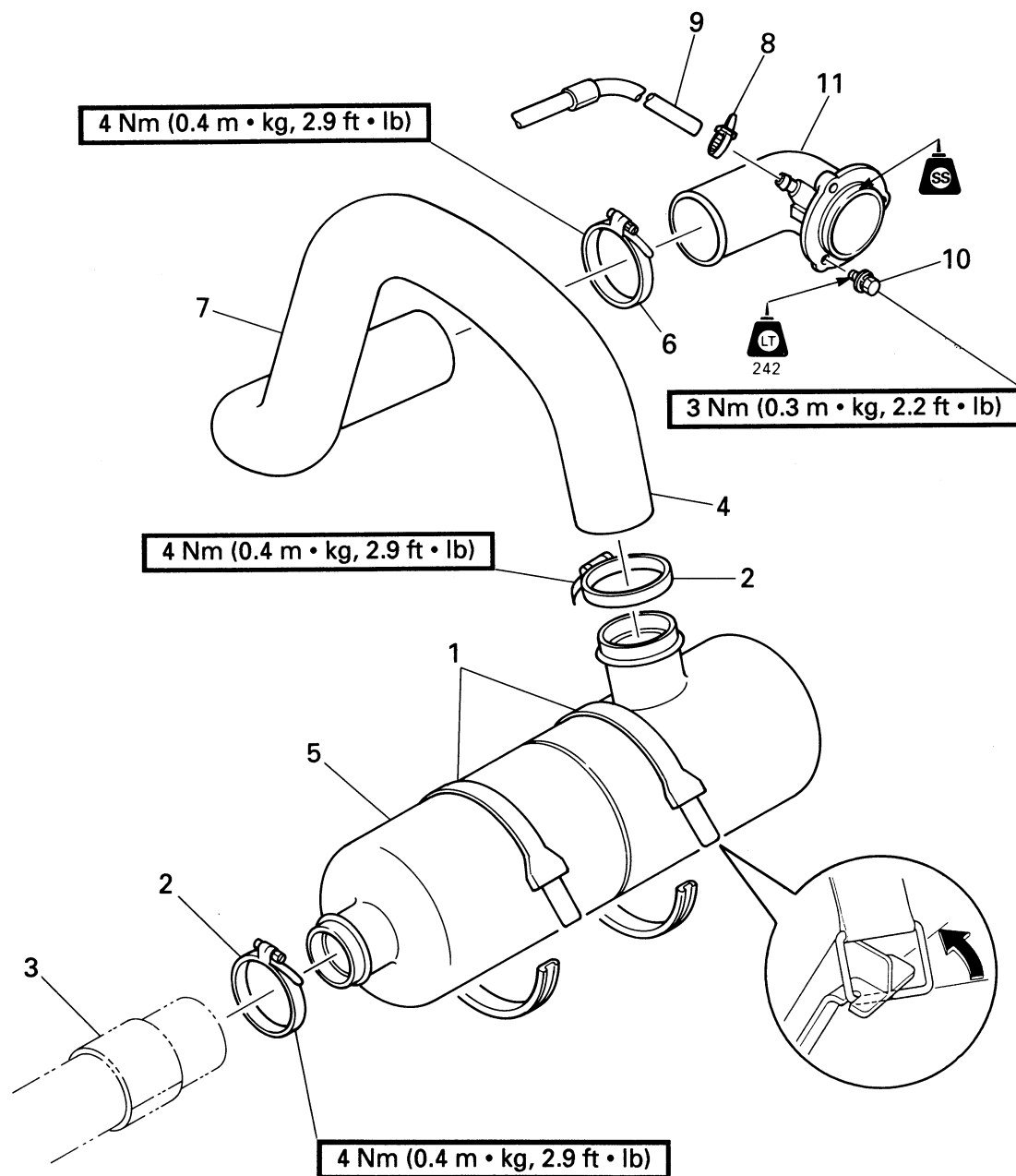
Seat inspection

- Inspect:
 - Packing
Damage → Replace.
 - Seat lock
Wear/Damage → Replace.

Storage box inspection

- Inspect:
 - Storage box
Crack/Damage → Replace.

**EXHAUST SYSTEM
EXPLODED DIAGRAM (RA700)**





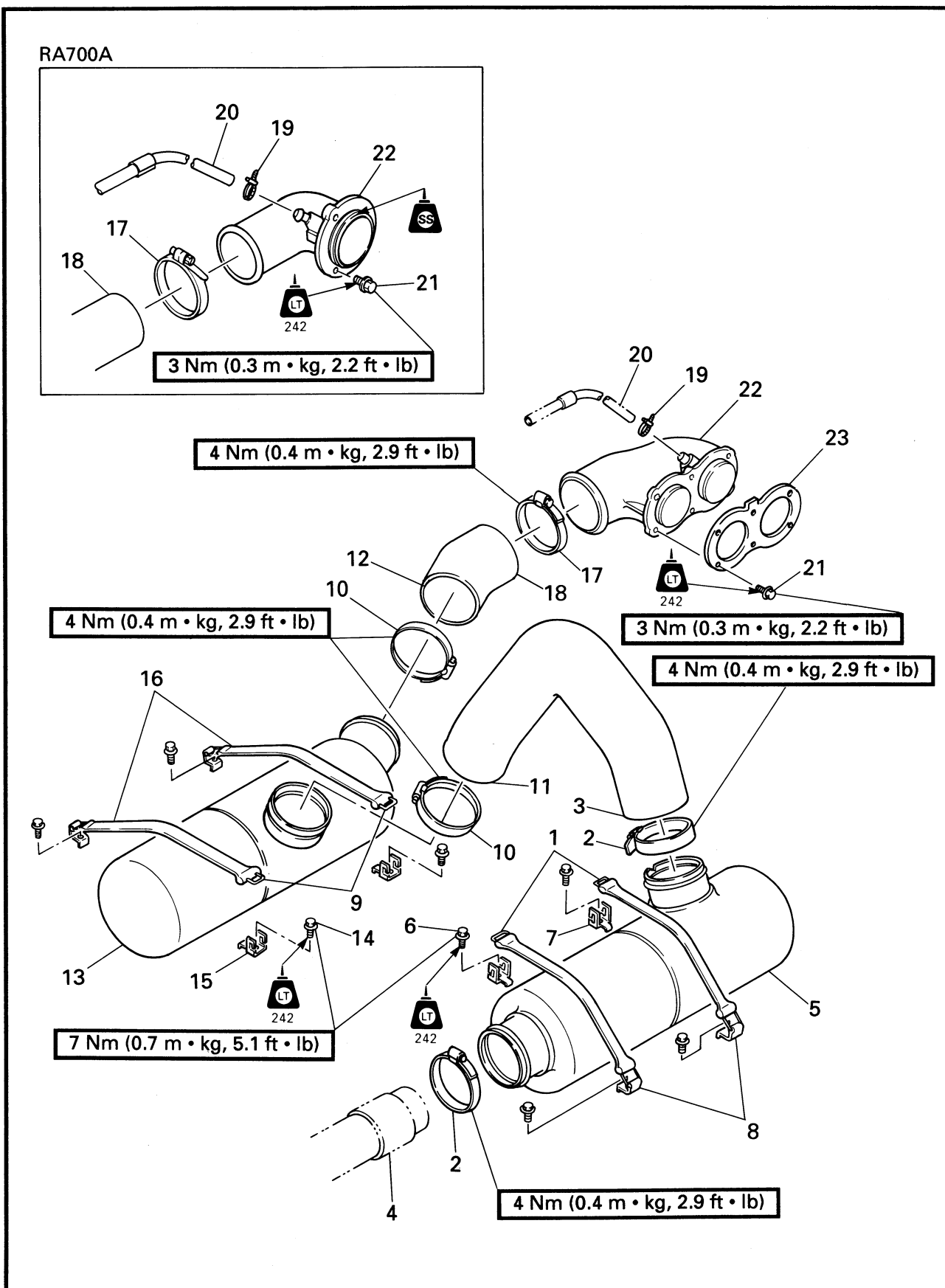
EXHAUST SYSTEM

REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	EXHAUST SYSTEM REMOVAL		
	Fire extinguisher box		Follow the left "Step" for removal. Refer to the "SEAT, STORAGE BOX AND FIRE EXTINGUISHER BOX" section.
1	Band	2	NOTE: _____ Insert the corner of the band's metal frame into the hook slit, then secure it by giving it a twist.
2	Clamp	2	
3	Exhaust hose	1	
4	Exhaust hose	1	
5	Water lock	1	
6	Clamp	1	
7	Exhaust hose	1	
8	Hose tie	1	
9	Water outlet hose	1	
10	Bolt (with washer)	3	
11	Exhaust guide	1	
			Reverse the removal steps for installation.



EXPLODED DIAGRAM (RA700A, RA1100)



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty		Service points
	EXHAUST SYSTEM REMOVAL	700A	1100	Follow the left "Step" for removal.
	Fire extinguisher box			Refer to the "SEAT, STORAGE BOX AND FIRE EXTINGUISHER BOX" section.
1	Band	2	2	
2	Clamp	2	2	
3	Exhaust hose	1	1	
4	Exhaust hose	1	1	
5	Water lock	1	1	
6	Flange bolt	4	4	
7	Hook	2	2	
8	Hook assembly	2	2	
9	Band	—	2	
10	Clamp	—	2	
11	Exhaust hose	—	1	
12	Exhaust hose	—	1	
13	Muffler	—	1	
14	Flange bolt	—	4	
15	Hook	—	2	
16	Hook assembly	—	2	
17	Clamp	2	2	
18	Exhaust hose	1	1	
19	Hose tie	1	1	
20	Water outlet hose	1	1	
21	Bolt (with washer)	3	6	
22	Exhaust guide	1	1	
23	Packing	—	1	
				Reverse the removal steps for installation.

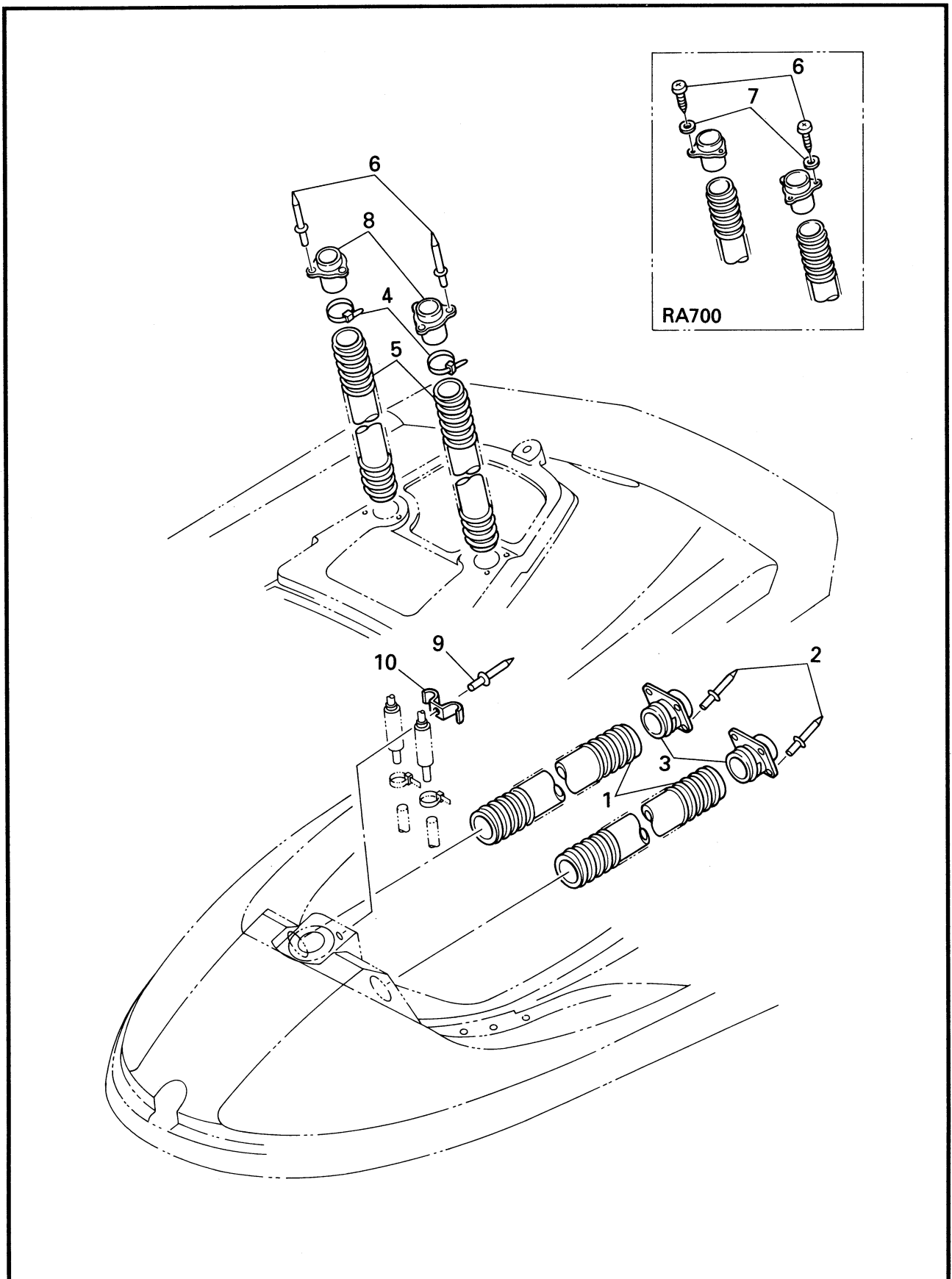
SERVICE POINTS

Exhaust system inspection

1. Inspect:
 - Band
Crack → Replace.
2. Inspect:
 - Exhaust hose
Crack/Wear/Burn → Replace.
3. Inspect:
 - Water lock
 - Muffler
Crack/Leak → Replace.
Collected water → Drain.



**VENTILATION SYSTEM
EXPLODED DIAGRAM**



REMOVAL AND INSTALLATION CHART

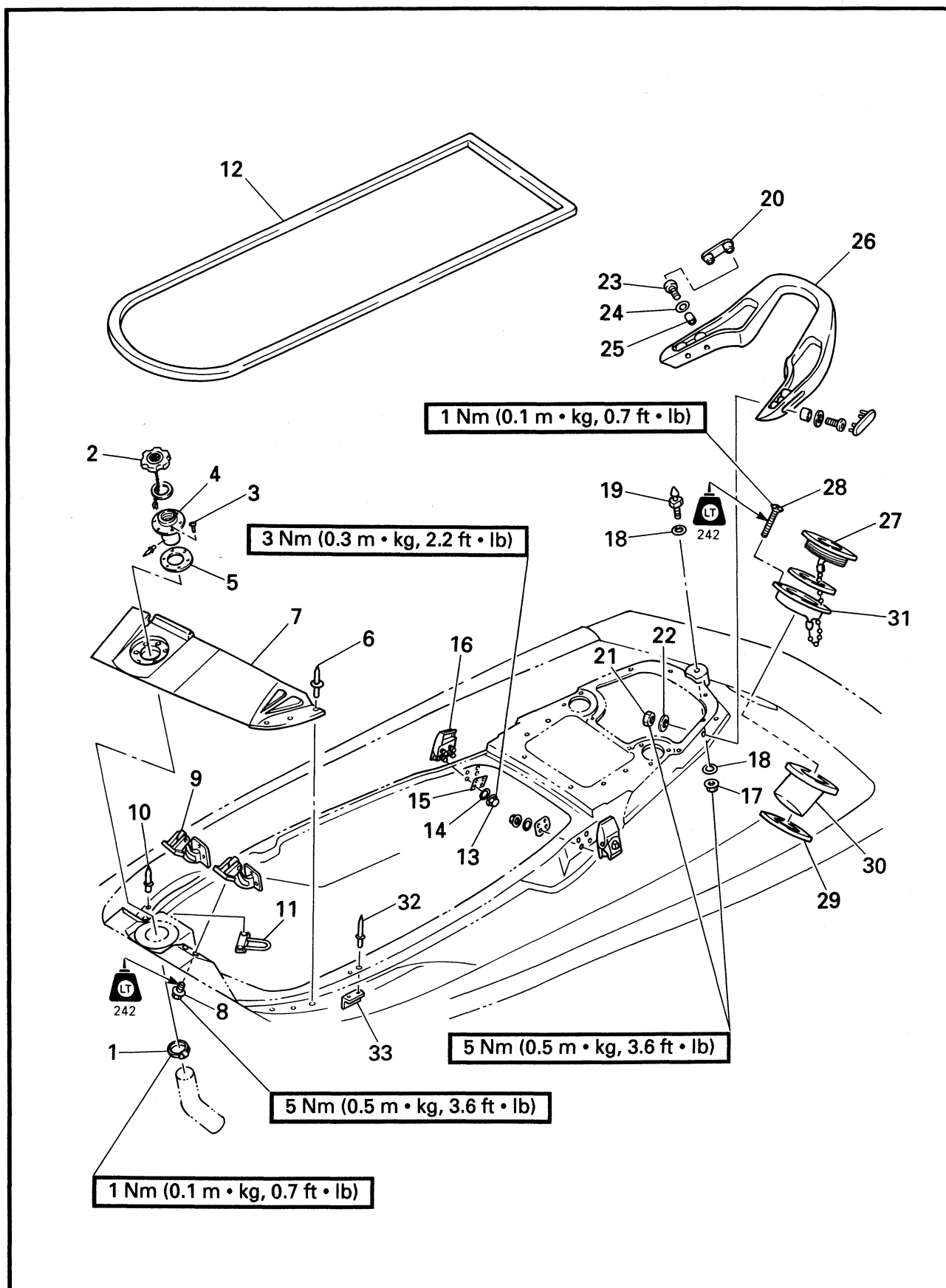
Step	Procedure/Part name	Q'ty		Service points
	VENTILATION SYSTEM REMOVAL	700	700A 1100	Follow the left "Step" for removal.
	Storage box			Refer to the "SEAT, STORAGE BOX, FIRE EXTINGUISHER BOX AND BATTERY CASE" section.
1	Ventilation hose (front)	2	2	NOTE: _____ Screw in the hose until it stops.
2	Rivet	8	8	_____
3	Ventilation hose joint	2	2	
4	Clamp	2	2	
5	Ventilation hose (rear)	2	2	NOTE: _____ Screw in the hose until it stops.
6	Tapping screw/Rivet	6	6	_____
7	Plate washer	6	—	
8	Ventilation hose joint	2	2	
9	Rivet	1	1	
10	Guide plate	1	1	
				Reverse the removal steps for installation.

SERVICE POINTS
Ventilation system inspection
1. Inspect:

- Ventilation hose
Wear/Crack → Replace.
- Ventilation hose joint
Crack/Damage → Replace.



**DECK
EXPLODED DIAGRAM**





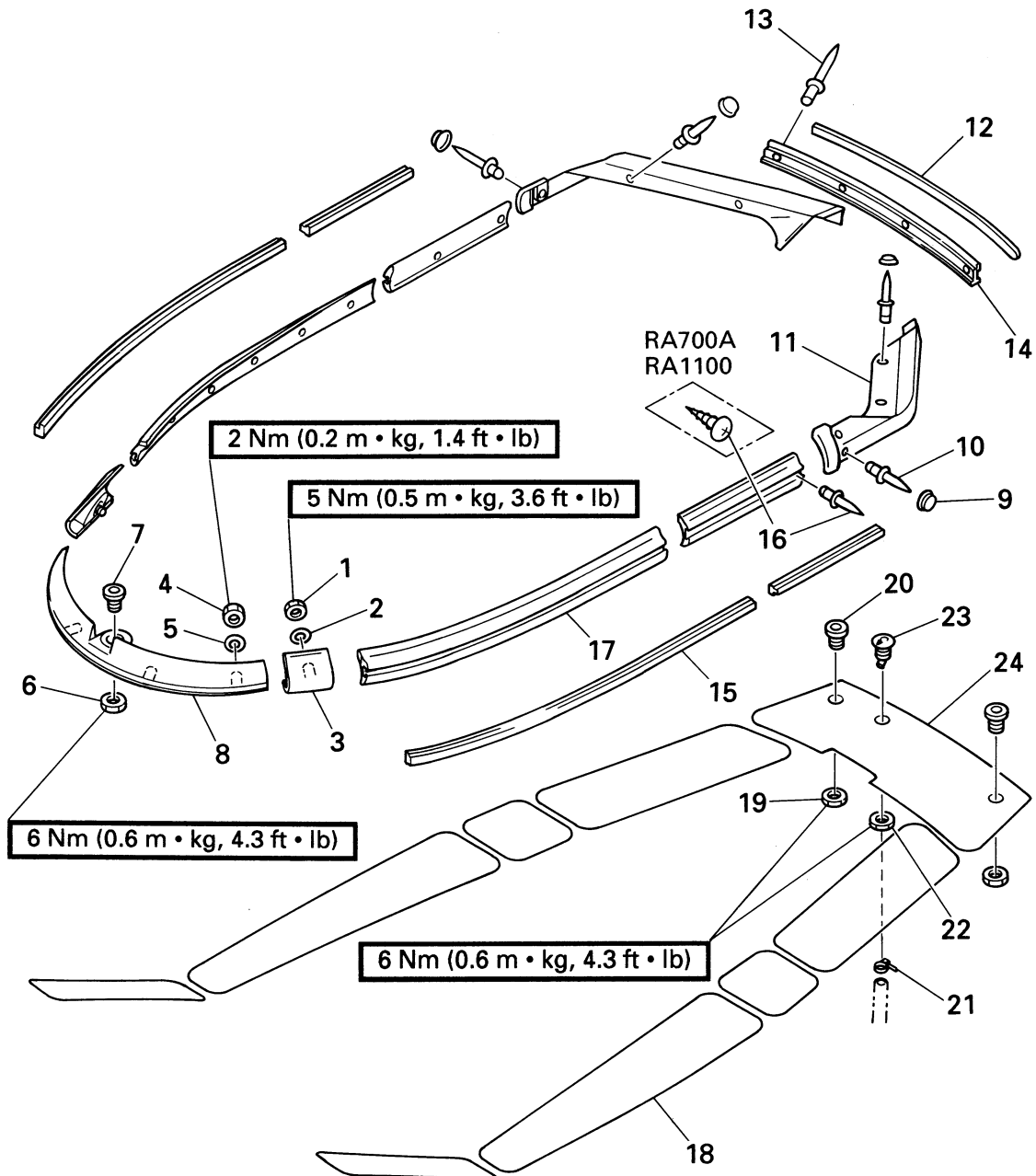
DECK

REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty		Service points
	DECK DISASSEMBLY	700	700A 1100	Follow the left "Step" for removal.
	Engine hood			Refer to the "ENGINE HOOD REMOVAL" section.
1	Clamp	1	1	
2	Filler cap	6	6	
3	Screw	1	1	
4	Fuel filler	1	1	
5	Fuel filler packing	1	1	
6	Rivet	6	6	
7	Bow cover	1	1	
8	Bolt (with washer)	6	6	
9	Hood hinge	2	2	
10	Rivet	2	2	
11	Cable guide	1	1	
12	Hood packing	1	1	NOTE: _____ ● Clean the hood packing groove in the deck. ● Apply cyano-acrylate adhesive to the hood packing.
13	Nylon nut	8	8	
14	Lock plate/Plate washer	2	8	
15	Lock packing	2	2	
16	Hood lock	2	2	
17	Nylon nut	1	1	
18	Plate washer	2	2	
19	Seat lock pin	1	1	
20	Grip handle cover	2	2	
21	Nylon nut	4	4	
22	Plate washer	4	4	
23	Screw	4	4	
24	Plate washer	4	4	
25	Collar	4	4	
26	Grip handle	1	1	
27	Inspection cover	1	1	
28	Screw	6	6	
29	Fire extinguisher plate	1	1	
30	Fire extinguisher grommet	1	1	
31	Cover	1	1	
32	Rivet	2	2	
33	Hood support bracket	1	1	Reverse the removal steps for installation.



**GUNWALE AND MAT
EXPLODED DIAGRAM**



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty		Service points
	GUNWALE REMOVAL	700	700A 1100	Follow the left "Step" for removal.
1	Nylon nut	2	2	
2	Plate washer	2	2	
3	Gunwale joint	2	2	
4	Nylon nut	4	4	
5	Plate washer	4	4	
6	Nut	1	1	
7	Rope hole bolt	1	1	
8	Bow gunwale	1	1	
9	Cap	12	12	
10	Rivet	12	12	
11	Stern gunwale	2	2	
12	Inner gunwale	1	1	
13	Rivet	4	4	
14	Cover gunwale	1	1	
15	Inner gunwale	2	2	
16	Rivet/Tapping screw	32	24	
17	Side gunwale	2	2	
	MAT REMOVAL			NOTE: _____ ● Clean the step surface before installing the mat. ● Apply cyano-acrylate adhesive to the mat. _____ Reverse the removal steps for installation.
18	Upper mat	8		
19	Nut	2		
20	Rope hole bolt	2		
21	Clamp	1		
22	Nut	1		
23	Spout	1		
24	Step mat	1		

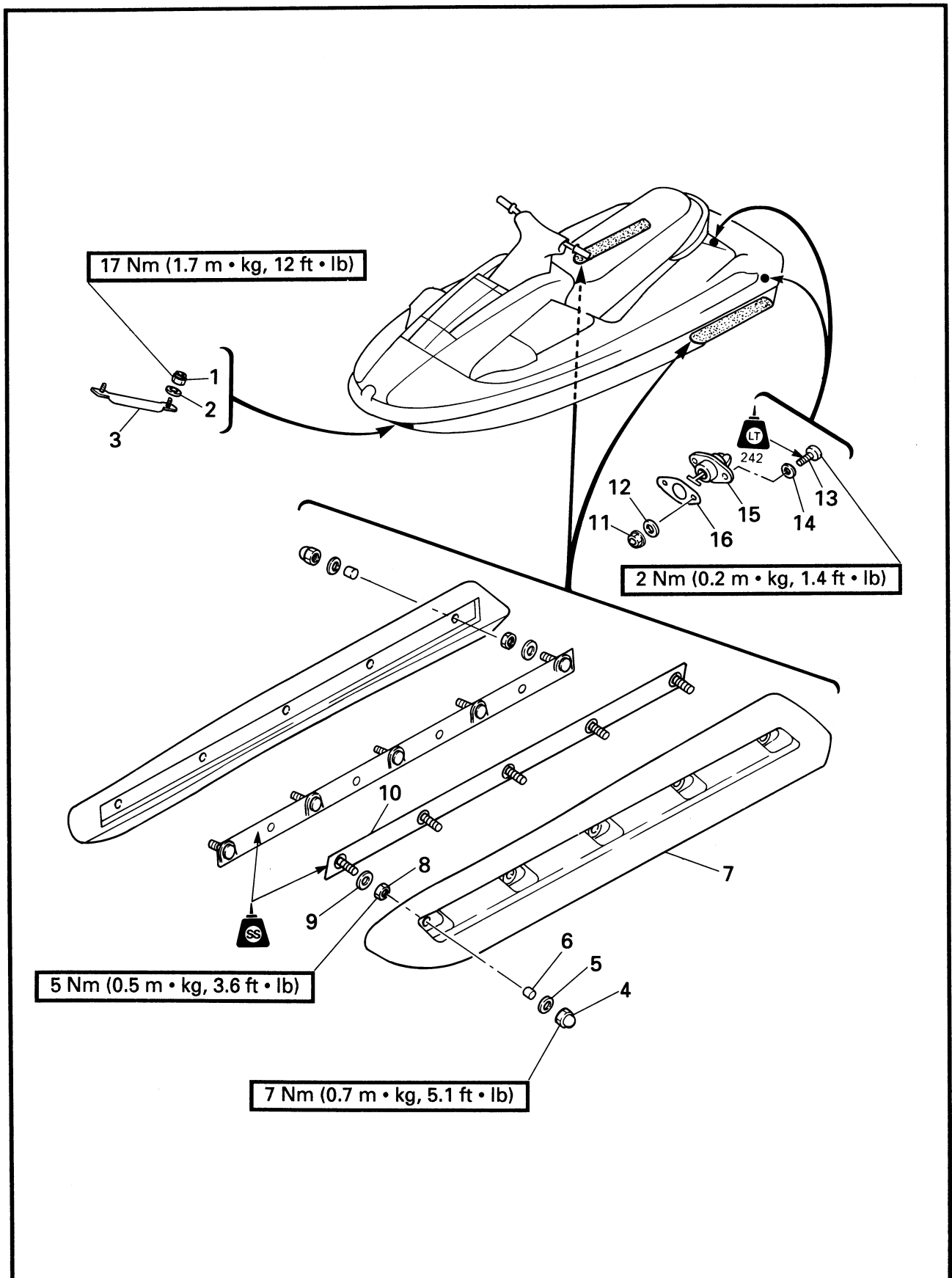
SERVICE POINTS
Gunwale and mat inspection
1. Inspect:

- Bow gunwale
- Stern gunwale
- Side gunwale
- Cover gunwale
- Upper mat
- Step mat

Wear/Damage → Replace.

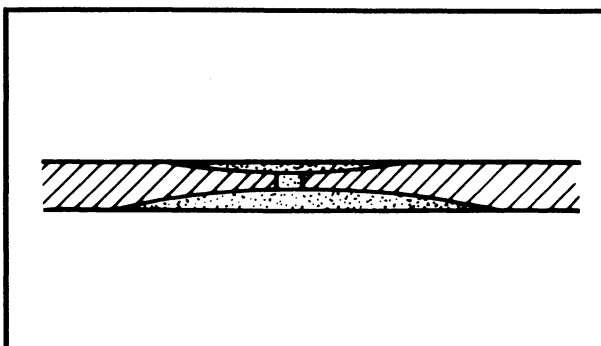
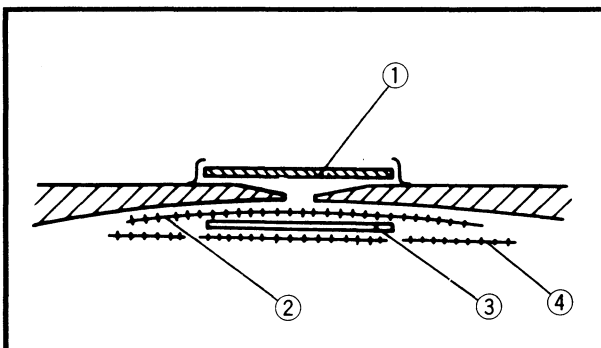
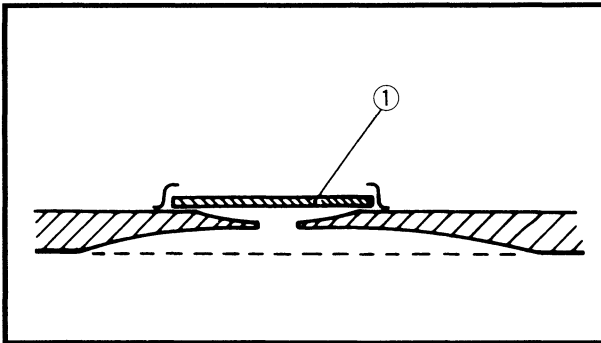
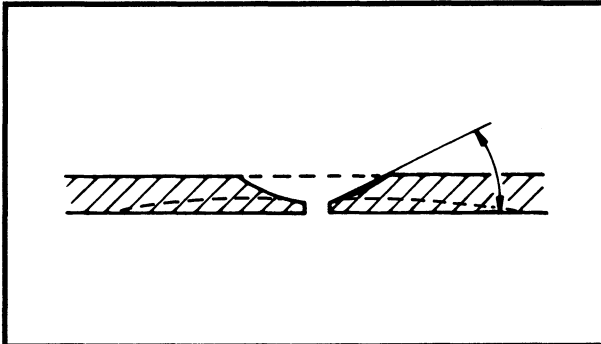


**HULL
EXPLODED DIAGRAM**



⚠ WARNING

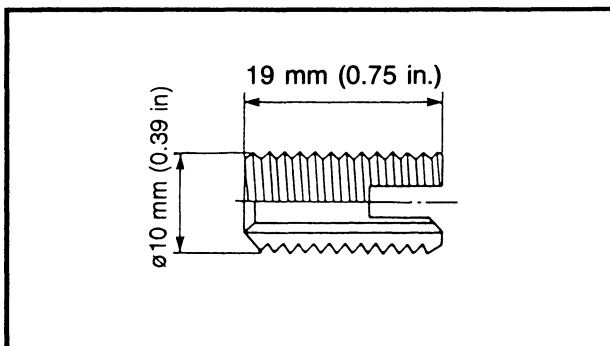
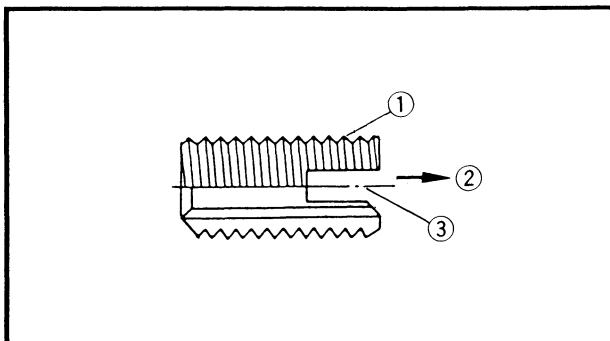
Resin, catalyst and solvent are flammable and toxic. Use only in a well-ventilated area and keep away from open flames and sparks. Observe all warnings given by the manufacturer.


Hull damage (punctured)

1. Remove any damaged fiberglass.
2. Cut and open the crack approximately 1/4 inch.
3. Grind the opened edge less than 30° on the outside.
4. Grind the area from inside the hull approximately 4 inches beyond it.
5. Clean the area with acetone, apply BP-1 or an equivalent primer on both sides of the area and cure for 1/2 hour.
6. Tape a piece of cardboard covered with waxed paper ① over the damaged area.
7. Mix polyester resin and catalyst and apply it to the hull.
8. Apply a glass mat ② (2 inches smaller than the ground area).
9. Apply catalyzed resin.
10. Apply a 20 oz fiberglass cloth ③ (1 inch smaller than the glass mat).
11. Apply catalyzed resin.
12. Apply a final glass mat ④ (1 inch smaller than the ground area).
13. When the resin has hardened, remove the piece of cardboard.
14. Finish the outer surface using steps 3 - 7 in the "Deep scratching" section.

NOTE:

Refer to the "WATER VEHICLE FRP REPAIR MANUAL".



Insert nut

NOTE:

When a pop nut clinched to a hull slipped off or when a bolt fastened to an insert nut or pop nut was broken, use this insert nut.

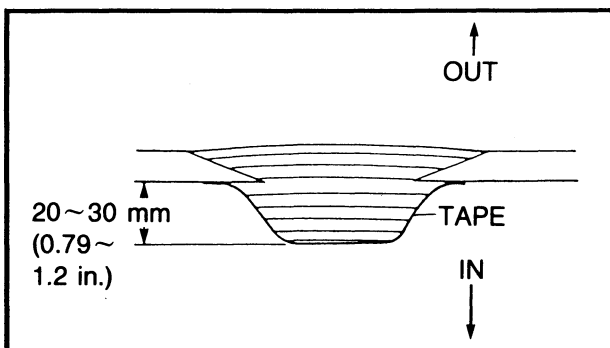
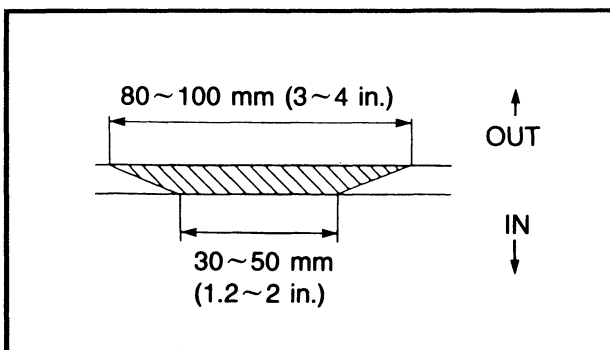
Part No.	Part Name	Remarks
EW2-62733-09	Nut	Stainless steel, M6

- Nut ①
- Direction of thread ②
- Slot to be threaded ③

NOTE:

Drilling size

Material	Pilot hold diameter
FRP or SMC	9.1 ~ 9.2 mm (0.36 in)
Brass	9.4 mm (0.37 in)



Example 1:

The nut is used to repair the pop nut designed for plate 2.

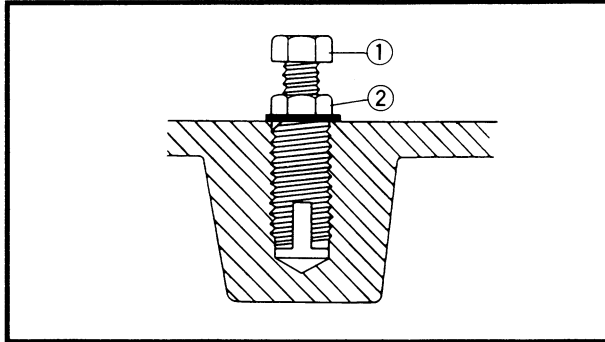
(by repairing the FRP portion, the new-type nut can be used for all models)

For details of repairs to the FRP portion, refer to the "Water Vehicle FRP Repair Manual".

1. Remove:
 - Pop nut
2. Scarf the shaded portion.
3. Clean the surface to be scarfed and the inside of the hull with acetone.
4. As shown, first tape up the inner surface of the hull and then laminate fiberglass mats over the tape using a resin.

NOTE:

When it is possible to work inside the hull, the mats should be laminated from the inside.



5. Smooth out the out surface by sanding it.
6. Install plate 2. Then, using a 9.2 mm (0.36 in) diameter drill, make a hole of depth 20 mm (0.79 in) in the center of the laminated fiberglass layers.
7. Pass the bolt ① through the insert nut, as shown, and lock the bolt with the nut ②. Screw in the insert nut so that the top is flush with the FRP surface. Loosen the lock nut and remove the bolt.

CAUTION:

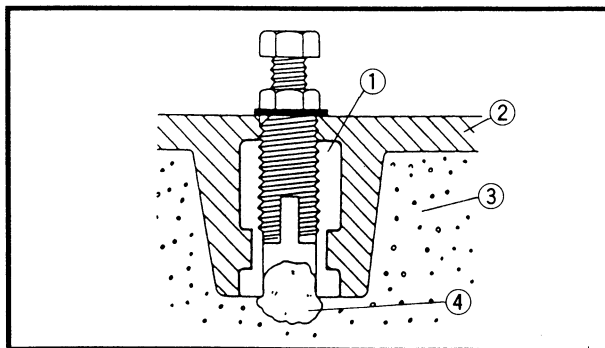
- The bolt should be made of steel and its strength should be 8T or more.
- If the bolt is inferior in strength, or is made of stainless steel, it may break.

- Bolt ① <Strength is 8T or more>
- Lock nut ②

Example 2:

The brass insert nut designed for the Super Jet Plate 2 or the screen intake is used:

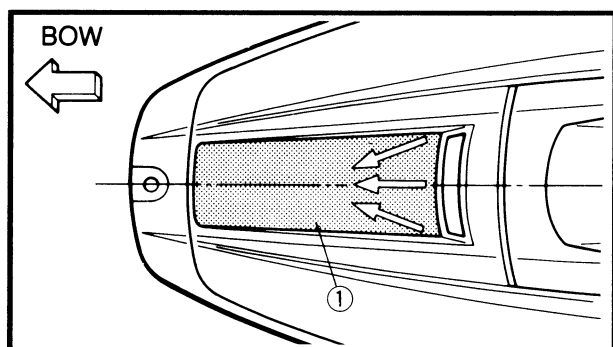
1. If the bolt is broken, remove it using drills.



NOTE:

Use a small-diameter drill first, followed by drills of gradually increasing diameter.

2. Use a 9.4 mm (0.37 in) drill for the final drilling.
3. Apply silicone sealant to the inside of the hole so that no water can enter the urethane foam.
4. As in Example 1 above, screw in the insert nut.
 - Brass insert ①
 - Hull ②
 - Urethane foam ③
 - Silicone sealant ④



Removing a graphic

1. Remove:
 - Graphic ①

NOTE:

- Using a hair dryer, start at one corner and blow heat the graphic, holding the heat source at least 1-1/2" above the graphic.
- Slowly peel off the heated part and continue working towards the other side.

2. Clean:

Once the graphic is removed, clean the entire bow area with Isopropyl Alcohol to remove any residual adhesive.

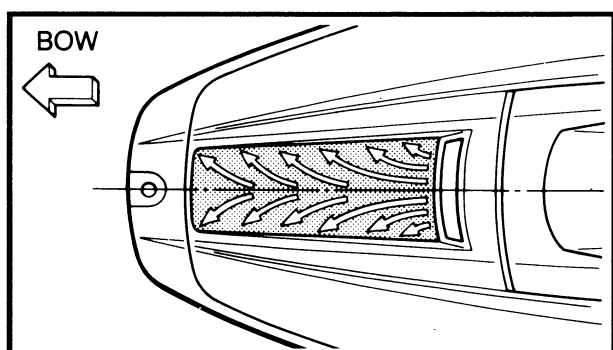
Applying a graphic

1. Preparation:

Mix 1 tablespoon of liquid washing-up detergent with water in a 1qt spray bottle. Remove the backing from the new graphic and spray both sides and the area of the hull to which it is to be fitted.

NOTE:

Spraying the front of the graphic will protect it from being scratched during application.



2. Apply:

Align the graphic on the fitting area and smooth it into position with a small rubber squeegee, removing all air bubbles in the process. Begin at the top of the graphic and work down and outwards from the center line of the graphic area.

3. Dry:

Let the graphic dry in place prior to waxing or using the vehicle.

CHAPTER 9

TROUBLE-ANALYSIS

TROUBLE ANALYSIS	9-1
TROUBLE ANALYSIS CHART	9-1

TROUBLE ANALYSIS
NOTE:

Following items should be obtained before "trouble analysis".

1. Battery is charged and its specified gravity is in specification.
2. There is no incorrect wiring connection.
3. Wiring connections are surely engaged and without any rust.
4. Lanyard is installed to the engine stop switch.
5. Fuel is coming to the carburetor.

TROUBLE ANALYSIS CHART

Trouble mode												Check elements	
ENGINE WILL NOT START	ROUGH IDLING	ENGINE STALLS	ENGINE WILL NOT STOP	POOR PERFORMANCE	OVERHEATING	LOOSE STEERING	BILGE INCREASE	IRREGULAR WARNING INDICATION	POOR BATTERY CHARGING			Relative part	Reference Chapter
												FUEL SYSTEM	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>								Fuel tank	4
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>								Air vent hose	4
<input type="radio"/>		<input type="radio"/>		<input type="radio"/>								Fuel hose	4
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>								Fuel filter	4
<input type="radio"/>		<input type="radio"/>		<input type="radio"/>								Fuel pump	4
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>								Carburetor	4
	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>								Low speed screw setting	4
		<input type="radio"/>		<input type="radio"/>								High speed screw setting	4
		<input type="radio"/>		<input type="radio"/>								Carburetor synchronization	4
		<input type="radio"/>		<input type="radio"/>								Trolling speed	3
												POWER UNIT	
<input type="radio"/>	<input type="radio"/>			<input type="radio"/>								Compression	5
<input type="radio"/>	<input type="radio"/>			<input type="radio"/>								Reed valve	5
<input type="radio"/>	<input type="radio"/>											Cylinder head gasket	5
<input type="radio"/>				<input type="radio"/>								Piston ring	5
<input type="radio"/>				<input type="radio"/>								Cylinder block	5
<input type="radio"/>				<input type="radio"/>								Seal	5
<input type="radio"/>				<input type="radio"/>								Crank case	5
<input type="radio"/>				<input type="radio"/>								Piston	5
<input type="radio"/>				<input type="radio"/>								Bearing	5
<input type="radio"/>				<input type="radio"/>								Intermediate housing	5
				<input type="radio"/>								Coupling	5
				<input type="radio"/>								Coupling rubber	5

Trouble mode											Check elements	
ENGINE WILL NOT START	ROUGH IDLING	ENGINE STALLS	ENGINE WILL NOT STOP	POOR PERFORMANCE	OVERHEATING	LOOSE STEERING	BILGE INCREASE	IRREGULAR WARNING INDICATION	POOR BATTERY CHARGING		Relative part	Reference Chapter
					○		○				Pilot water hose	5
					○		○				Water hose	5
					○		○				Water passage	5
											JUT PUMP UNIT	
				○	○		○				Duct	6
				○							Impeller	6
				○							Intake screen	6
				○							Bearing	6
				○							Duct intake	6
					○		○				Water inlet hose	6
							○				Bilge hose	6
							○				Bilge strainer	6
							○				Bilge hose joint	6
											ELECTRICAL	
○	○	○	○	○	○						Ignition system	7
○											Starting system	7
								○			Indication system	7
									○		Charging system	7
											HULL AND HOOD	
						○					Column bearing	8
				○			○				Water lock	8
				○			○			○	Exhaust hose	8
				○			○				Muffler	8
							○				Drain plug	8

YAMAHA

Marine

Water Vehicles

WaveRaider
RA700BU

SUPPLEMENTARY SERVICE MANUAL

PREFACE

This Supplementary Service Manual has been prepared to introduce new service and data for the RA700BU. For complete service information procedures, it is necessary to use this Supplementary Service Manual together with the following manual.

RA700S,T/RA700AT/RA700BU/RA1100T,U SERVICE MANUAL: LIT-18616-01-26

**RA700BU
SUPPLEMENTARY SERVICE MANUAL
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LIT-18616-01-45

GENERAL INFORMATION

IDENTIFICATION NUMBERS	1
PRIMARY I.D. NUMBER	1
ENGINE SERIAL NUMBER	1
PUMP SERIAL NUMBER	1
HULL IDENTIFICATION NUMBER (H.I.N.)	1

SPECIFICATIONS

GENERAL SPECIFICATIONS	2
MAINTENANCE SPECIFICATIONS	3
ENGINE	3
JET UNIT	4
ELECTRICAL	4
TIGHTENING TORQUE	5
SPECIFIED TORQUE	5

PERIODIC INSPECTION AND ADJUSTMENT

PERIODIC SERVICE	6
FUEL SYSTEM	6
Trolling speed adjustment	6
Carburetor adjustment	6

FUEL SYSTEM

FUEL LINE	7
EXPLODED DIAGRAM	7
REMOVAL AND INSTALLATION CHART	7
CARBURETOR REMOVAL	8
EXPLODED DIAGRAM	8
REMOVAL AND INSTALLATION CHART	8
CARBURETOR	9
EXPLODED DIAGRAM	9
REMOVAL AND INSTALLATION CHART	9
SERVICE POINTS	10
High and low speed screws adjustment	10
Carburetor assembly	10
FUEL PUMP	11
EXPLODED DIAGRAM	11
REMOVAL AND INSTALLATION CHART	11

POWER UNIT

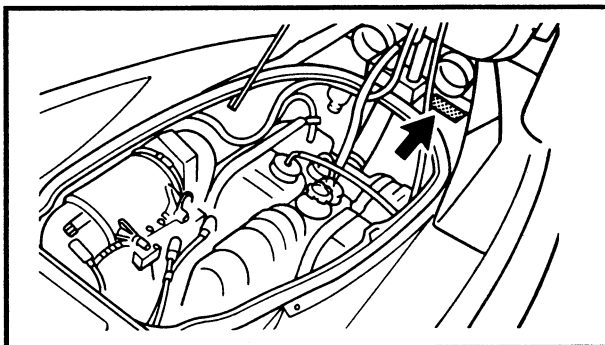
REED VALVE	12
EXPLODED DIAGRAM	12
REMOVAL AND INSTALLATION CHART	12
SERVICE POINTS	13
Reed valve inspection	13
EXHAUST RING	14
EXPLODED DIAGRAM	14
REMOVAL AND INSTALLATION CHART	14
EXHAUST CHAMBER	15
EXPLODED DIAGRAM	15
REMOVAL AND INSTALLATION CHART	15
MUFFLER	16
EXPLODED DIAGRAM	16
REMOVAL AND INSTALLATION CHART	16
CYLINDER HEAD, CYLINDER AND PISTON	17
SERVICE POINTS	17
Piston inspection	17

JET PUMP UNIT

JET PUMP UNIT REMOVAL	18
EXPLODED DIAGRAM	18
REMOVAL AND INSTALLATION CHART	18
NOZZLE, DUCT AND INTAKE	19
EXPLODED DIAGRAM	19
REMOVAL AND INSTALLATION CHART	19
IMPELLER AND DRIVE SHAFT	20
EXPLODED DIAGRAM	20
REMOVAL AND INSTALLATION CHART	20

ELECTRICAL SYSTEM

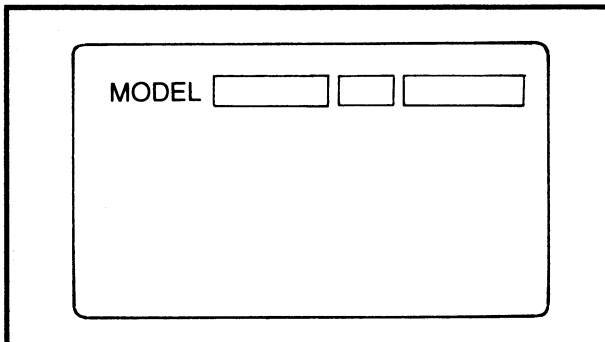
IGNITION SYSTEM	21
IGNITION COIL	21
INDICATION SYSTEM	21
OIL LEVEL SENSOR	21
MULTI FUNCTION METER	21



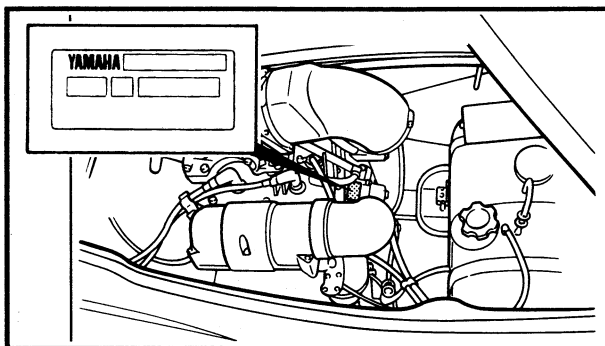
A60700-0*

IDENTIFICATION NUMBERS PRIMARY I.D. NUMBER

The primary I.D. number is stamped on a plate attached to the hull on the front of the engine hood.



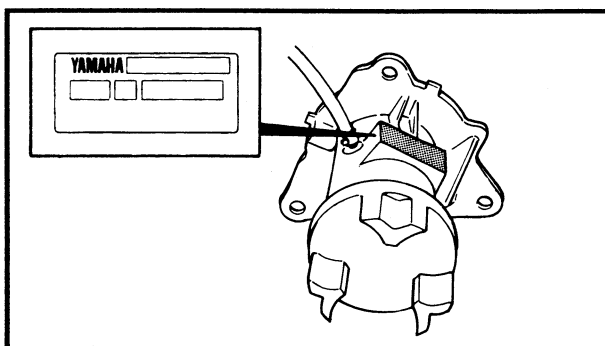
Starting primary I.D. number:
GJ8: 800101 ~, 600101 ~ (FRA)



ENGINE SERIAL NUMBER

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

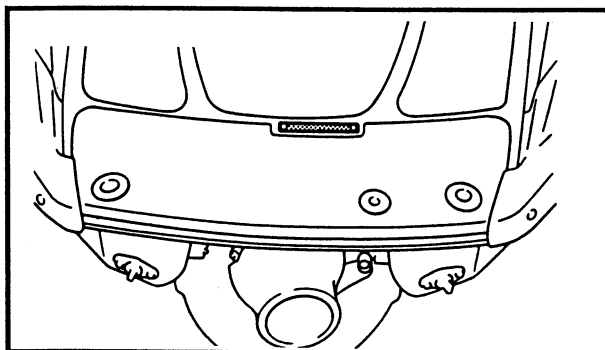
Starting serial number:
64R: 000101 ~



PUMP SERIAL NUMBER

The jet pump unit serial number is stamped on a plate attached to the intermediate housing.

Starting serial number:
64R: 500101 ~



HULL IDENTIFICATION NUMBER (H.I.N.)

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

GENERAL SPECIFICATIONS

Item	Unit	RA700B
MODEL CODE:		
Hull		GJ8
Engine		64R
DIMENSIONS:		
Length	mm (in)	2,860 (112.6)
Width	mm (in)	1,120 (44.1)
Height	mm (in)	970 (38.2)
Dry weight	kg (lb)	214 (472)
PERFORMANCE:		
Maximum speed	km/h (mph)	73 (45.4)
Maximum output	kW (hp)/rpm	51.5 (70)/6,300
Maximum fuel consumption	l/h (US gal/h, Imp gal/h)	27 (7.1, 5.9)
Cruising range (at full throttle)	hr.	1.9
ENGINE:		
Engine type		2-stroke
Number of cylinders		2
Displacement	cm ³ (cu. in)	701 (42.78)
Bore and stroke	mm (in)	81 × 68 (3.19 × 2.68)
Compression ratio		7.2 : 1
Intake system		Reed valve
Carburetor type		Floatless type
Number of carburetor		1
Carburetor starting system		Choke
Scavenging system		Loop charged
Lubrication system		Oil Injection
Cooling system		Water-cooled
Starting system		Electric starter
Ignition system		C.D.I.
Ignition timing	Degree	15 BTDC ~ 21 BTDC
Spark plug (NGK)		B8HS/BR8HS
Battery capacity	V/kC (A•h)	12/68.4 (19)
Lighting coil	A/rpm	2 ~ 4/5,500
DRIVE UNIT:		
Propulsion system		Jet pump
Jet pump type		Axial flow, single stage
Impeller rotation (rear view)		Counter clockwise
Transmission		Direct drive from engine
Nozzle angle	Degree	23 ± 1
FUEL AND OIL:		
Fuel		Regular gasoline
Oil		2 stroke outboard motor oil
Fuel and oil mixing ratio (wide open throttle)		50 : 1
Fuel tank capacity	l (US gal, Imp gal)	50 (13.2, 11.0)
Reserve		8.8 (2.3, 1.9)
Oil tank capacity	l (US gal, Imp gal)	3.8 (1.0, 0.8)



MAINTENANCE SPECIFICATIONS

ENGINE

Item	Unit	RA700B
Cylinder head:		
Warpage limit	mm (in)	0.1 (0.004)
Cylinder:		
Bore size	mm (in)	81.00 ~ 81.02 (3.189 ~ 3.190)
Wear limit	mm (in)	81.10 (3.193)
Taper limit	mm (in)	0.08 (0.003)
Out of round limit	mm (in)	0.05 (0.002)
Piston:		
Piston size	mm (in)	80.93 ~ 80.95 (3.186 ~ 3.187)
Measuring point*	mm (in)	10 (0.4)
Piston clearance	mm (in)	0.070 ~ 0.075 (0.0028 ~ 0.0030)
Wear limit	mm (in)	0.13 (0.005)
Offset (exhaust side)	mm (in)	0.5 (0.02)
Piston ring:		
Type		Keystone
Sectional sketch (B × T)	mm (in)	1.2 × 2.9 (0.047 × 0.114)
Side clearance	mm (in)	0.02 ~ 0.06 (0.001 ~ 0.002)
End gap (installed)	mm (in)	0.2 ~ 0.4 (0.008 ~ 0.016)
Piston pin:		
Outside diameter	mm (in)	19.995 ~ 20.000 (0.7872 ~ 0.7874)
Limit	mm (in)	19.98 (0.786)
Crankshaft:		
Crank width "A"	mm (in)	61.95 ~ 62.00 (2.439 ~ 2.441)
Run out limit "B"	mm (in)	0.05 (0.002)
Connecting rod big end side clearance "C"	mm (in)	0.25 ~ 0.75 (0.010 ~ 0.030)
Small end free play limit "D"	mm (in)	2.0 (0.08)
Carburetor:		
Stamped mark		61X01
Main nozzle	∅ mm (in)	3.2 (0.13)
Main jet (M.J.)		135
Pilot jet (P.J.)		115
Low speed screw	Turns out	1-7/8 ± 1/4
Throttle valve (Th.V.)		120
Valve seat (V.S.)	∅ mm (in)	1.5 (0.06)
High speed screw	Turns out	1-5/8 ± 1/4
Trolling speed	r/min	1,250 ± 50
Reed valve:		
Thickness	mm (in)	0.2 (0.008)
Valve lift	mm (in)	10.9 ± 0.2 (0.429 ± 0.008)
Bending limit	mm (in)	0.2 (0.008)



JET UNIT




















Item	Unit	RA700B
Jet pump:		
Impeller clearance	mm (in)	0.3 ~ 0.4 (0.01 ~ 0.02)
Service limit	mm (in)	0.6 (0.024)
Impeller shaft run out	mm (in)	0.3 (0.012)

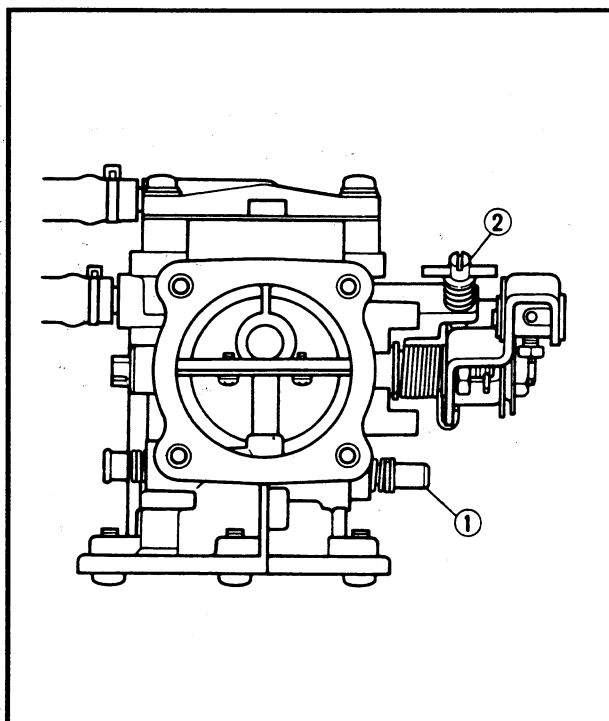
ELECTRICAL

Item	Unit	RA700B
Ignition system:		
Type		CDI magneto
Ignition timing at 1,200 rpm	Degree	BTDC 15
at 5,500 rpm	Degree	BTDC 21
Stator:		
Model/Manufacturer		F4T31671/MITSUBISHI
Pulser coil resistance (color)	Ω	12.6 ~ 15.4 (W/R – B)
Charging coil resistance (color)	Ω	497.7 ~ 608.3 (Br/W – B)
CDI unit:		
Stamped mark		62T-00
Model/Manufacturer		F-6192X/MITSUBISHI
Over revolution limit	r/min	7,000 ~ 7,400
Overheat revolution control	r/min	3,000 ~ 3,800
Ignition coil:		
Stamped mark		62E-10
Model/Manufacturer		F6T532/MITSUBISHI
Primary winding resistance	Ω	0.078 ~ 0.106 (O – B)
Secondary winding resistance	kΩ	14.3 ~ 30.5 (High tension cords)
Charging system:		
Type		Flywheel magneto
Lighting coil resistance (color)	Ω	1.14 ~ 1.40 (G – G)
Rectifier regulator:		
Model/Manufacturer		SH589-12/SHINDENGEN
Regulator voltage	V	14.3 ~ 15.3
Thermo sensor:		
ON	°C (°F)	76 ~ 84 (169 ~ 183)
OFF	°C (°F)	63 ~ 77 (145 ~ 171)
Starter motor:		
Model/Manufacturer		SM13237/MITSUBA
Brush length limit	mm (in)	6.5 (0.26)
Commutator undercut limit	mm (in)	0.2 (0.01)
diameter limit	mm (in)	27 (1.06)
Fuse:		
Rating	A	10



TIGHTENING TORQUE SPECIFIED TORQUE

Part to be tightened		Part name	Size	Q'ty	Tightening torque			Remarks
					Nm	m•kg	ft•lb	
ENGINE:								
Electric box		Bolt	M8	3	17	1.7	12	 271
Mounting bolt		Bolt	M8	4	17	1.7	12	 271
Reed valve		Screw	M4	16	1	0.1	0.7	 242
Muffler stay	1st	Bolt	M10	5	4	0.4	2.9	 271
	2nd				40	4.0	29	
Muffler 2 - Muffler stay	1st	Bolt	M10	3	28	2.8	20	 271
	2nd				53	5.3	38	
Muffler 1	1st	Bolt	M10	8	15	1.5	11	 271
	2nd				30	3.0	22	
Cylinder body	1st	Bolt	M10	6	23	2.3	17	 572
	2nd				40	4.0	29	
Cylinder head	1st	Bolt	M8	10	15	1.5	11	 572
	2nd				36	3.6	26	
Spark plug		Bolt	M14	2	20	2.0	14	
Flywheel bolt		Bolt	M10	1	70	7.0	51	 572
Crankcase	1st	Bolt	M8	8	15	1.5	11	 572
	2nd				28	2.8	20	
Mount bracket	1st	Bolt	M10	7	23	2.3	17	 271
	2nd				47	4.7	34	
Coupling		Nut	M27	1	37	3.7	27	 572
Flame arrester cover		Bolt	M6	6	2	0.2	1.4	
Starter motor terminal nut		Nut	M6	1	5	0.5	3.6	
JET UNIT:								
Mounting bolt		Bolt	M10	4	34	3.4	25	 271
			M6	2	12	0.7	9	 242
Ride plate		Bolt	M8	4	17	1.7	12	 271
Speed sensor cover		Screw	M5	4	4	0.4	2.9	 242
Impeller (left-hand threads)		Bolt	M20	1	18	1.8	13	 572
Coupling		Nut	M27	1	37	3.7	27	 572
Intermediate housing		Bolt	M8	3	17	1.7	12	 242



PERIODIC SERVICE FUEL SYSTEM

Trolling speed adjustment

1. Adjust:

- Trolling speed

Adjustment steps:

- Screw in the low speed screw ① until it is lightly seated.
- Back out by the specified number of turns.



Low speed screw:
 $1-7/8 \pm 1/4$ (turns out)

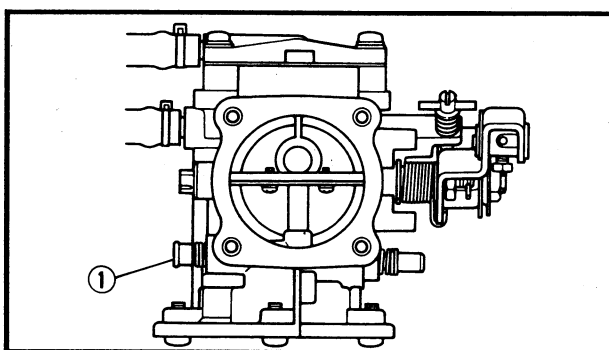
- Start the engine and allow it to warm up for a few minutes.
- Turn the throttle stop screw(s) ② in or out until the specified speed is obtained.

Turning in

Increase trolling speed.

Turning out

Decrease trolling speed.



Carburetor adjustment

1. Adjust:

- High speed screw

Adjustment steps:

- Screw in the high speed screw ① until it is lightly seated.
- Back out by the specified number of turns.

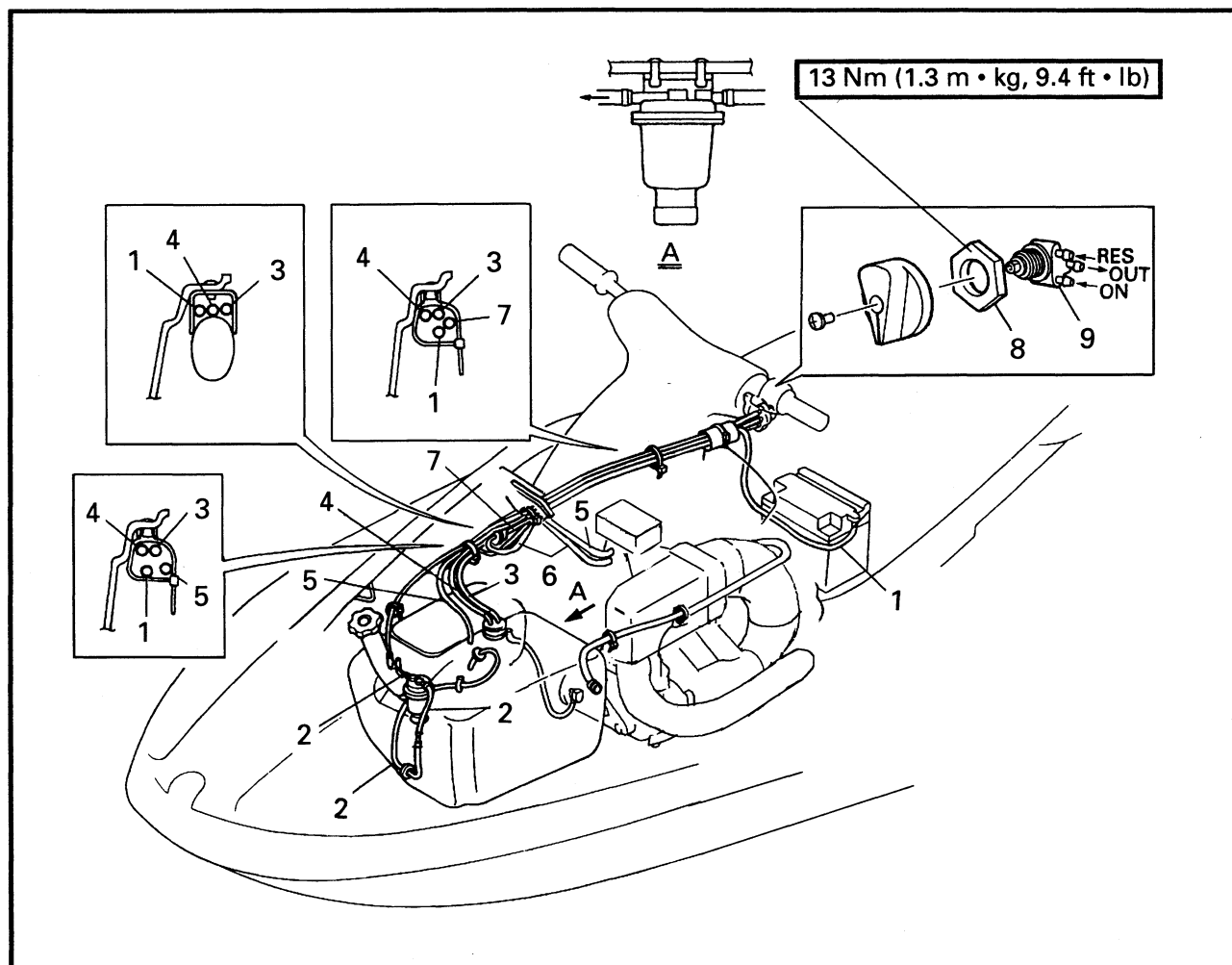


High speed screw:
 $1-5/8 \pm 1/4$ (turns out)


⚠ WARNING

Gasoline (Petrol) is highly flammable and explosive. Handle with special care.

FUEL LINE EXPLODED DIAGRAM



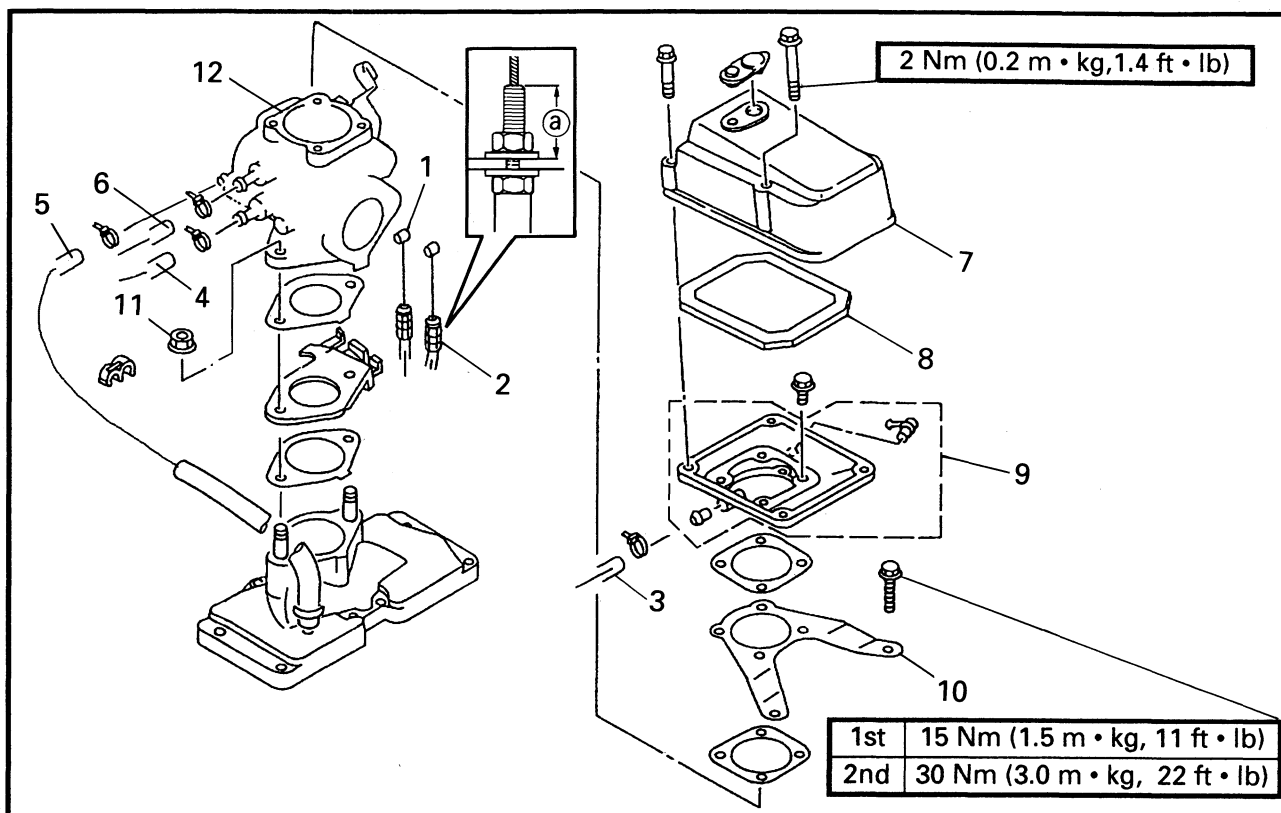
REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	FUEL HOSE REMOVAL		Follow the left "Step" for removal.
1	Battery breather hose	1	
2	Air ventilation hose	3	
3	Fuel hose (RES)	1	
4	Fuel hose (ON)	1	
5	Fuel hose (return)	1	
6	Fuel hose (filter - pump)	1	
7	Fuel hose (OUT)	1	
8	Nut	1	
9	Fuel cock body	1	
			Reverse the removal steps for installation.




CARBURETOR REMOVAL

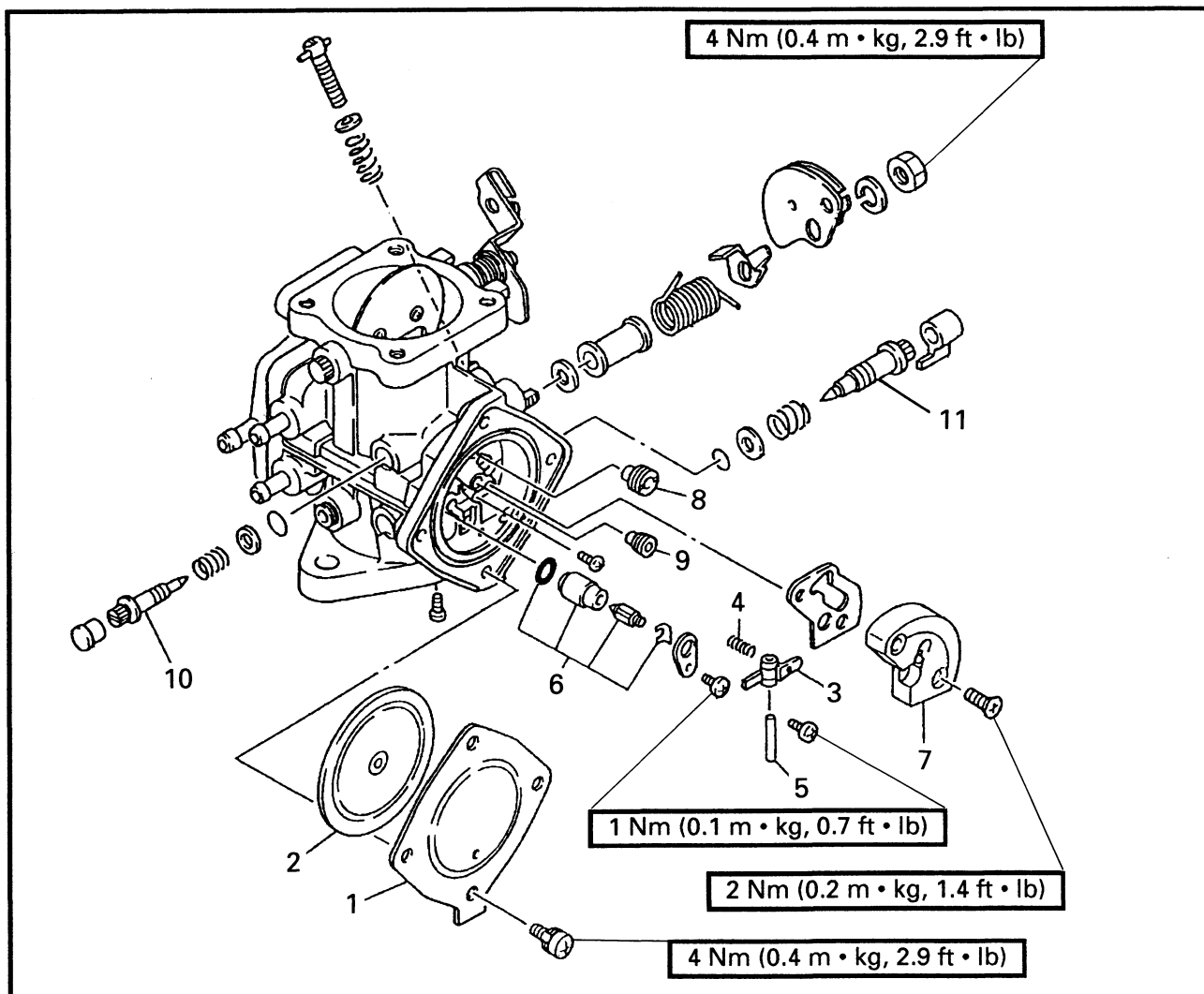
EXPLODED DIAGRAM



REMOVAL AND INSTALLATION CHART

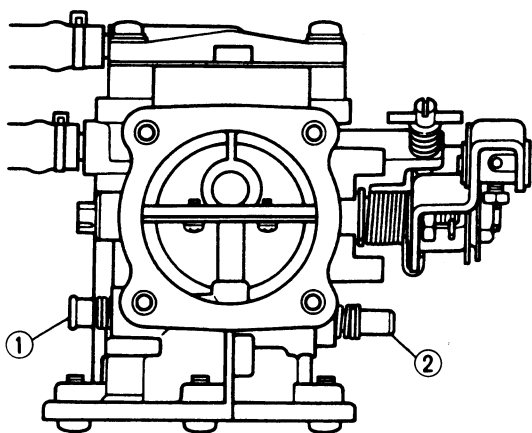
Step	Procedure/Part name	Q'ty	Service points
	CARBURETOR REMOVAL		Follow the left "Step" for removal.
	Fuel cock		NOTE: _____ Turn the fuel cock to "OFF".
1	Choke cable	1	 Cable guide set position ②: 17 mm (0.67 in) Between cable guide top and plate top.
2	Throttle cable	1	
3	Oil delivery hose	2	
4	Fuel hose (fuel filter - fuel pump)	1	
5	Pulse hose (fuel pump - crank case)	1	
6	Fuel hose (carburetor - fuel tank)	1	
7	Cover 1	1	
8	Flame arrester	1	
9	Cover 2	1	
10	Plate	1	
11	Nut	2	
12	Carburetor assembly	1	
			Reverse the removal steps for installation.

CARBURETOR EXPLODED DIAGRAM



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	CARBURETOR DISASSEMBLY		
	Carburetor assembly		Follow the left "Step" for removal. Refer to "CARBURETOR REMOVAL".
1	Cover	1	
2	Diaphragm assembly	1	
3	Float arm	1	
4	Spring	1	
5	Pin	1	
6	Needle valve assembly	1	
7	Body assembly	1	
8	Main jet	1	
9	Pilot jet	1	
10	High speed screw	1	
11	Low speed screw	1	
			Reverse the removal steps for installation.



SERVICE POINTS

High and low speed screws adjustment

1. Adjust:

- High speed screw
- Low speed screw

Adjustment steps:

- Screw in the high speed screw ① or lower speed screw ② until it is lightly seated.
- Back out by the specified number of turns.



High speed screw:

$1-5/8 \pm 1/4$ (turns out)

Low speed screw:

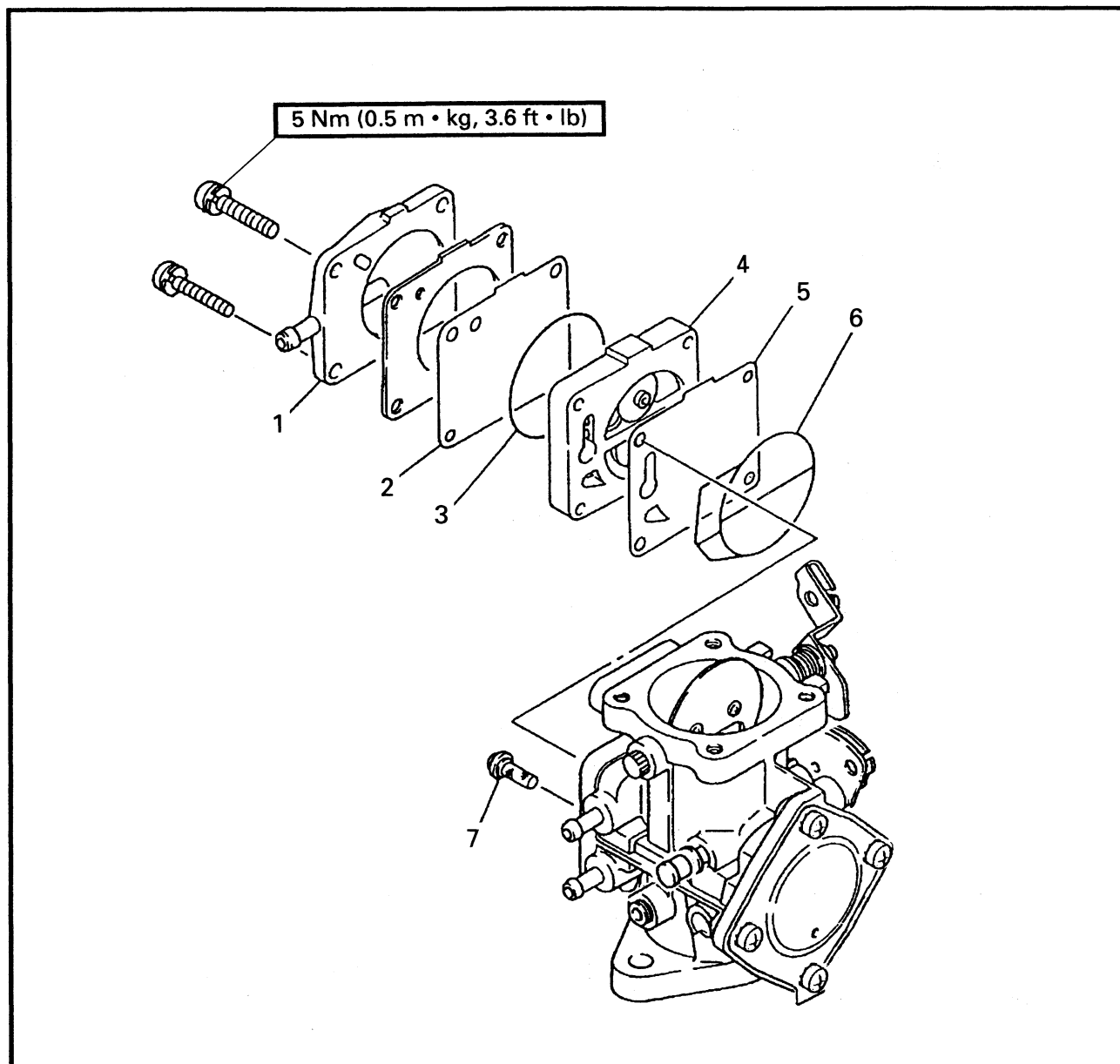
$1-7/8 \pm 1/4$ (turns out)

Carburetor assembly

1. Adjust:

- Trolling speed

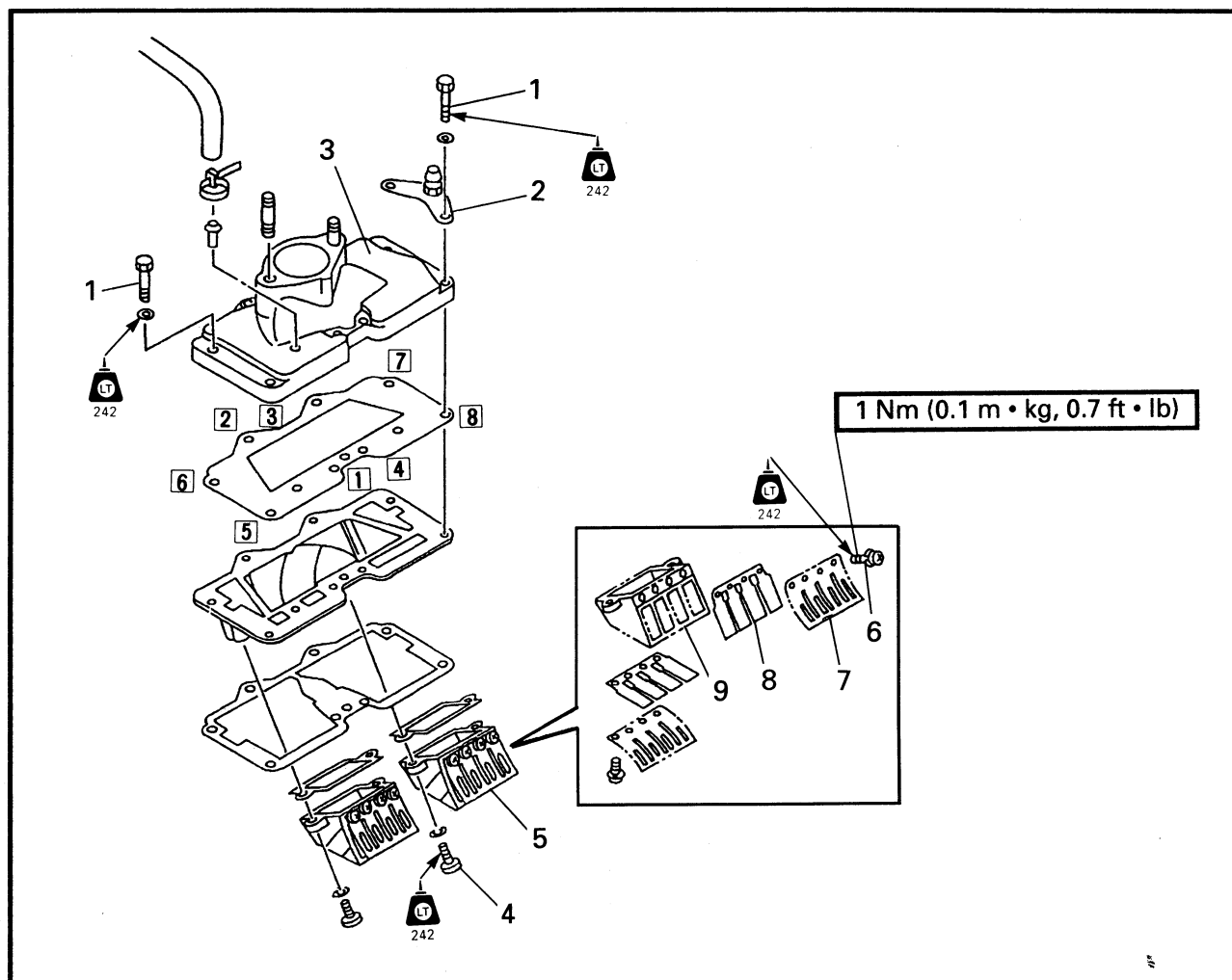
FUEL PUMP EXPLODED DIAGRAM



REMOVAL AND INSTALLATION CHART

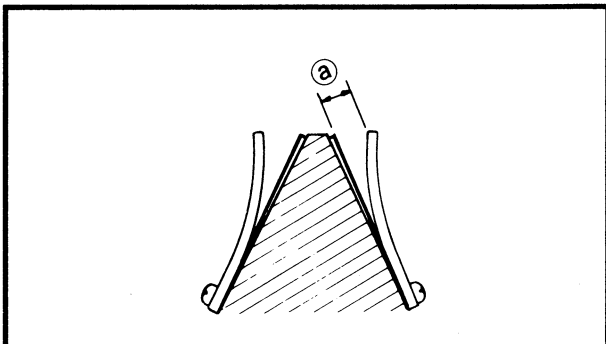
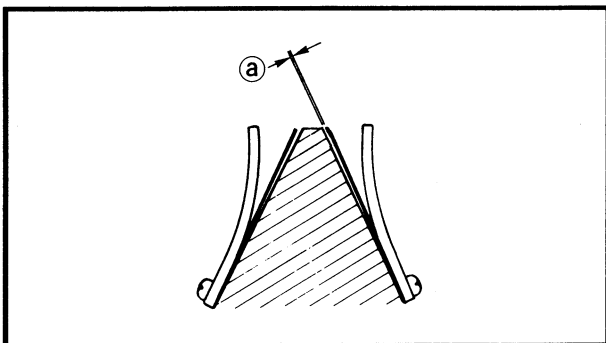
Step	Procedure/Part name	Q'ty	Service points
	FUEL PUMP DISASSEMBLY		
	Carburetor assembly		Follow the left "Step" for removal. Refer to "CARBURETOR REMOVAL".
1	Pump cover	1	
2	Diaphragm	1	
3	O-ring	1	
4	Diaphragm body assembly	1	
5	Diaphragm	1	
6	O-ring	1	
7	Filter	1	
			Reverse the removal steps for installation.

REED VALVE EXPLODED DIAGRAM



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
1	REED VALVE REMOVAL Carburetor assembly Bolt (with washer)	8	Follow the left "Step" for removal. Refer to "CARBURETOR REMOVAL". CAUTION: _____ Tighten the bolts in sequence. _____
2	Plate	1	
3	Intake manifold	1	
4	Screw	4	5 × 16 mm
5	Reed valve assembly	2	
6	REED VALVE DISASSEMBLY Screw	8	
7	Valve stopper	2	
8	Reed valve	2	
9	Reed valve body	1	Reverse the removal steps for installation.

**SERVICE POINTS****Reed valve inspection**

1. Inspect:
 - Reed valve
Crack/Damage → Replace.
2. Measure:
 - Valve bending (a)
Out of specification → Replace.



Valve bending limit:
0.2 mm (0.008 in)

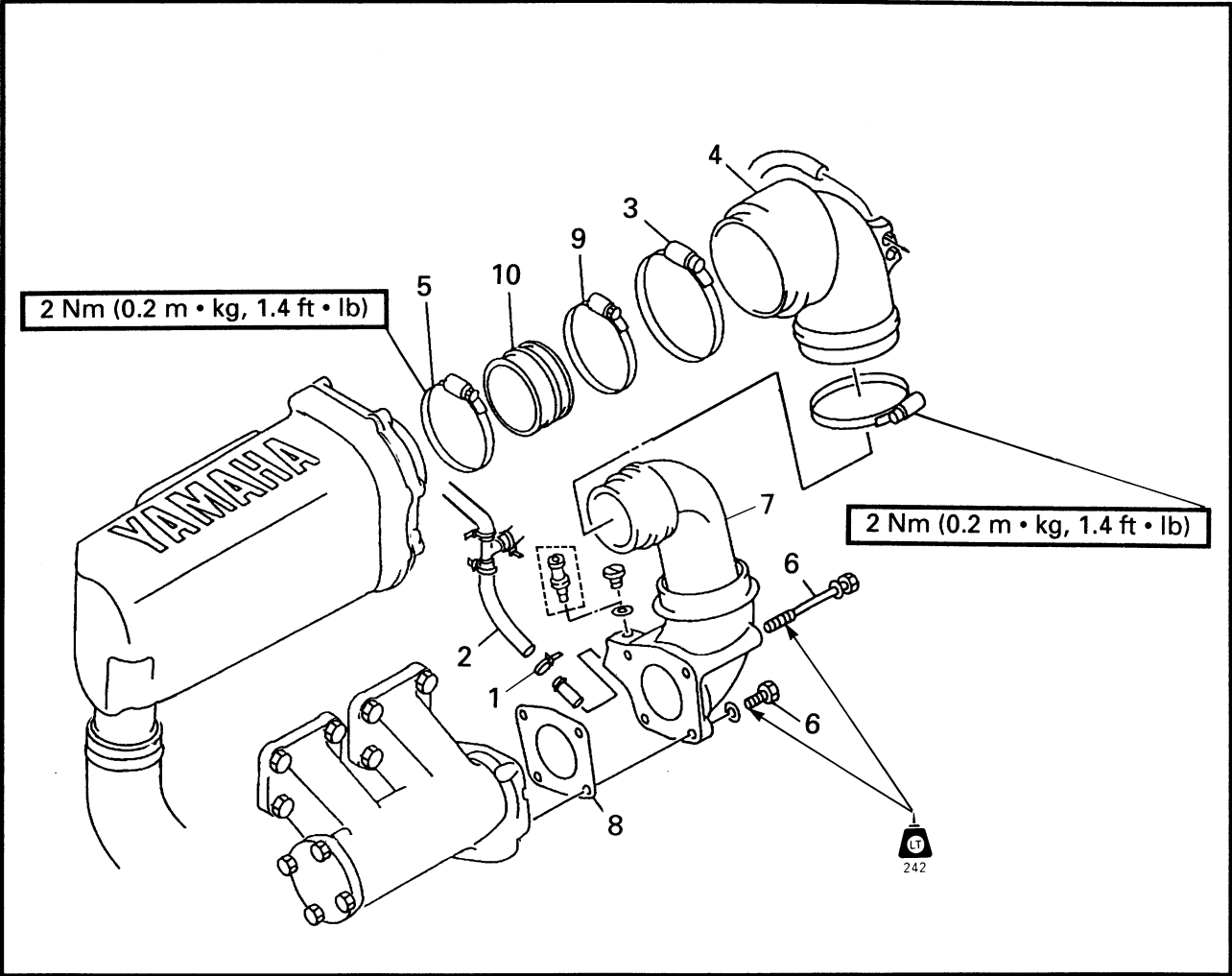
3. Measure:
 - Valve stopper height (a)
Out of specification → Adjust or replace.



Valve stopper height:
10.9 ± 0.2 mm (0.43 ± 0.01 in)

EXHAUST RING

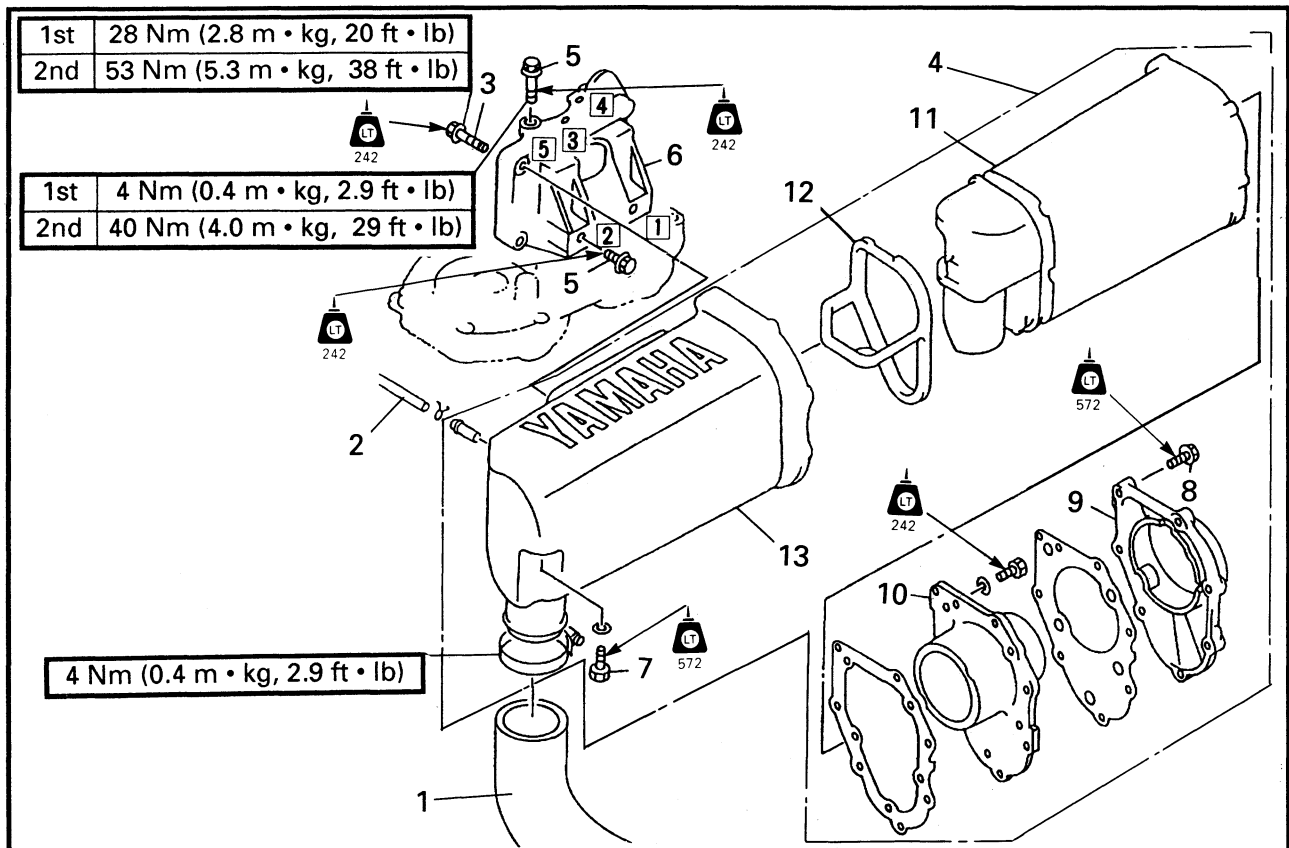
EXPLODED DIAGRAM



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	EXHAUST RING REMOVAL		Follow the left "Step" for removal.
1	Hose tie	1	<div>NOTE:</div> <div> <div>● Pull and side the exhaust joint.</div> <div>● Loosen the clamp at the muffler side.</div> </div> <div>CAUTION:</div> <div>Tighten the clamp, before installing the ring on the muffler.</div>
2	Water hose	1	
3	Clamp	2	
4	Exhaust joint	1	
5	Clamp	1	
6	Bolt (with washer)	4	
7	Ring	1	
8	Gasket	1	
9	Clamp	1	
10	Joint	1	Reverse the removal steps for installation.

EXHAUST CHAMBER EXPLODED DIAGRAM

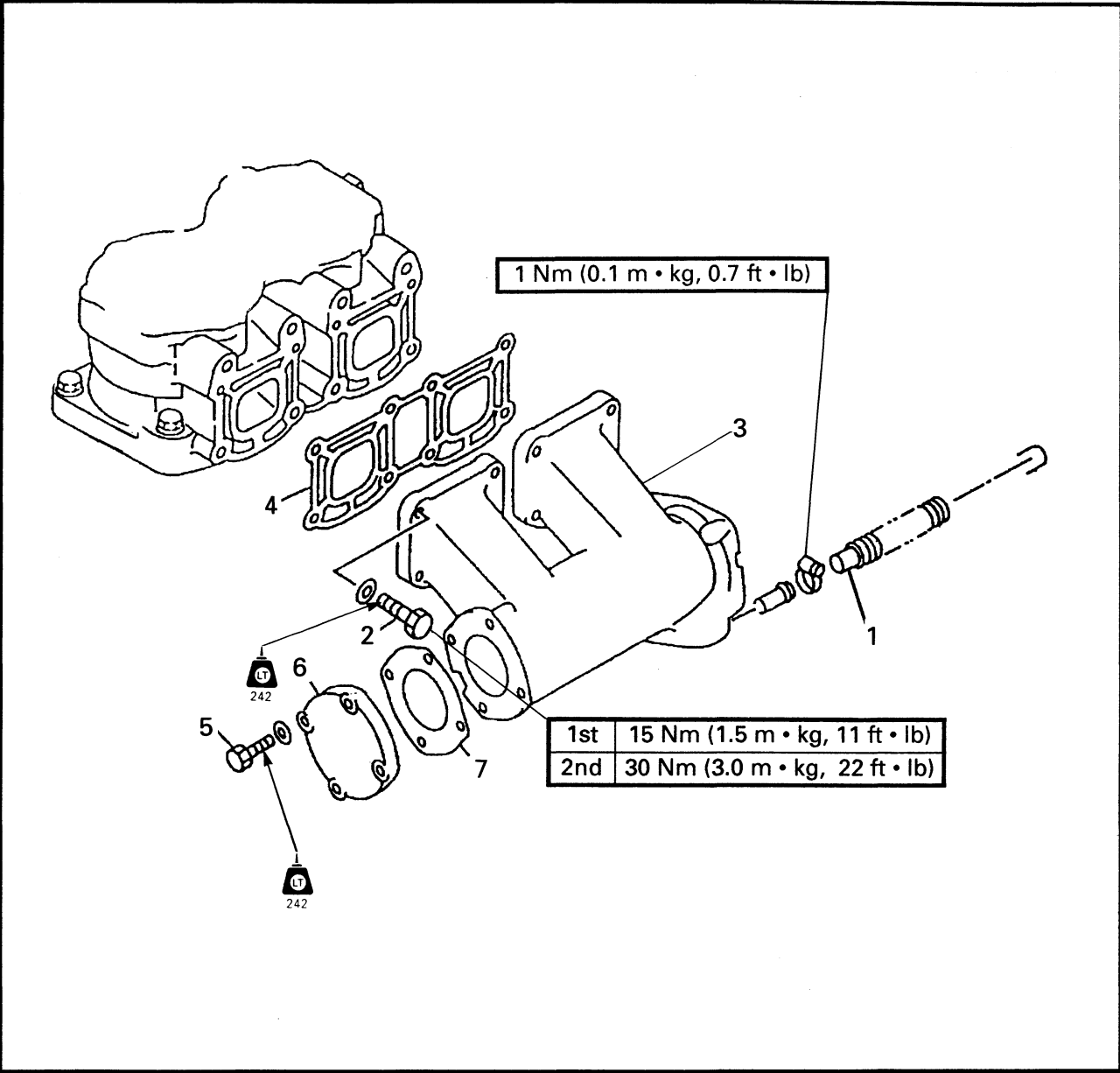


REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	EXHAUST CHAMBER REMOVAL		Follow the left "Step" for removal. Refer to "EXHAUST RING".
	Ring		
1	Exhaust hose	1	
2	Water hose	1	
3	Bolt (muffler)	3	
4	Chamber assembly	1	CAUTION: _____ Tighten the bolts in sequence. _____
5	Bolt (muffler stay)	5	
6	Muffler stay	1	
	CHAMBER DISASSEMBLY		
7	Bolt (with washer)	1	
8	Bolt (with washer)	7	
9	Exhaust outer cover	1	
10	Exhaust inner cover	1	
11	Chamber	1	
12	Seal	1	
13	Muffler	1	
			Reverse the removal steps for installation.

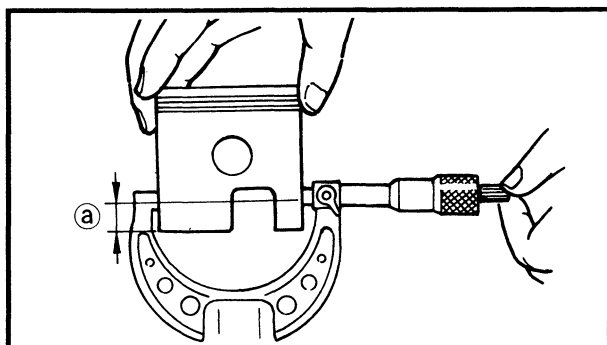
MUFFLER

EXPLODED DIAGRAM



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	MUFFLER REMOVAL		
	Exhaust chamber		Follow the left "Step" for removal. Refer to "EXHAUST CHAMBER".
1	Water inlet hose	1	
2	Bolt (with washer)	8	
3	Muffler	1	
4	Gasket	1	
5	Bolt (with washer)	4	
6	Protector	1	
7	Gasket	1	
			Reverse the removal steps for installation.



CYLINDER HEAD, CYLINDER AND PISTON

SERVICE POINTS


Piston inspection

1. Measure:

- Piston skirt diameter

Use micrometer.

Out of specification → Replace.


 Piston diameter	Distance ②
80.93 ~ 80.95 mm (3.186 ~ 3.187 in)	10 mm (0.39 in)

2. Calculate:

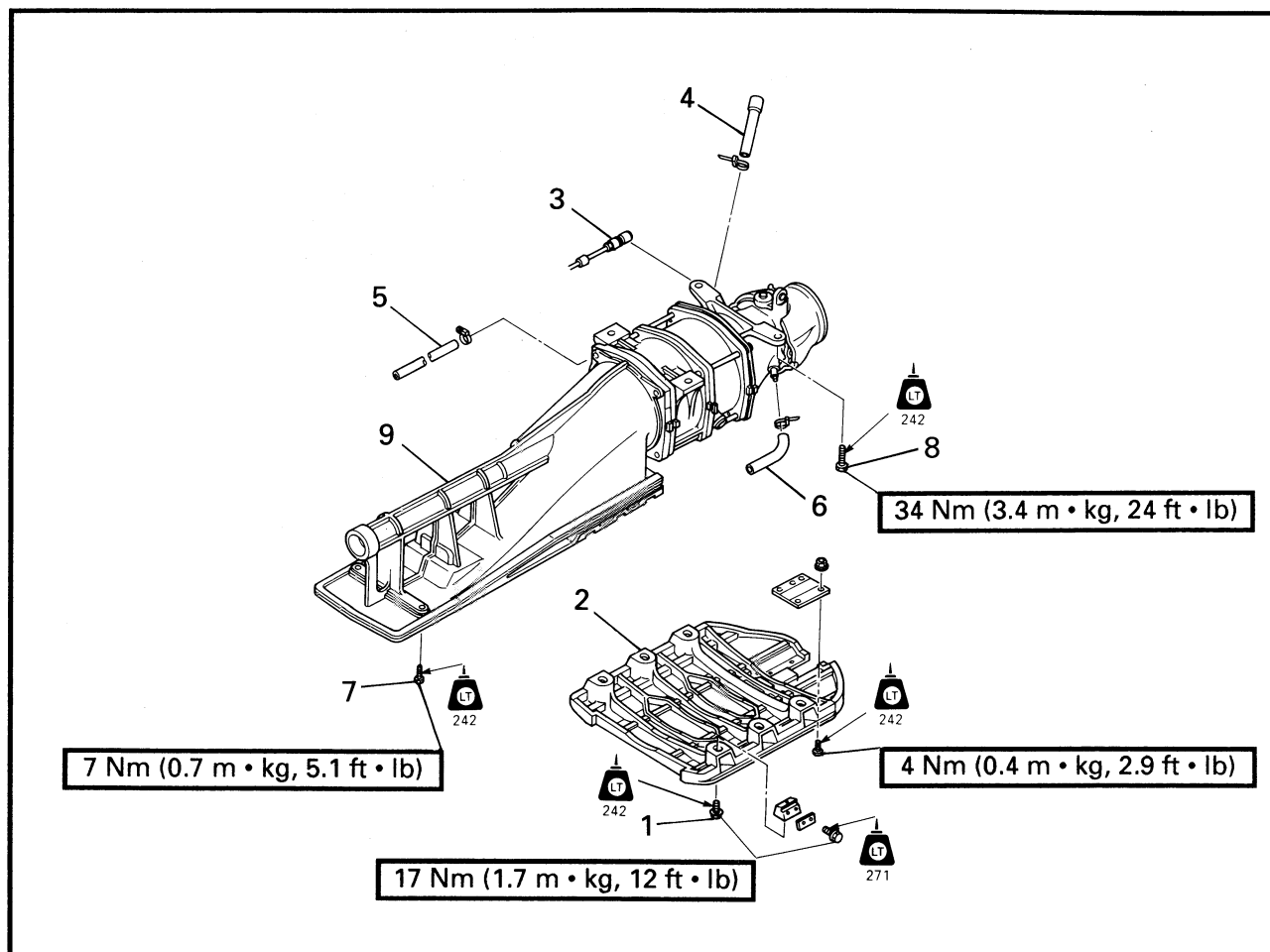
- Piston clearance

Out of limit → Replace piston, piston rings as a set.

PISTON CLEARANCE	=	CYLINDER BORE	-	PISTON DIAMETER
---------------------	---	------------------	---	--------------------

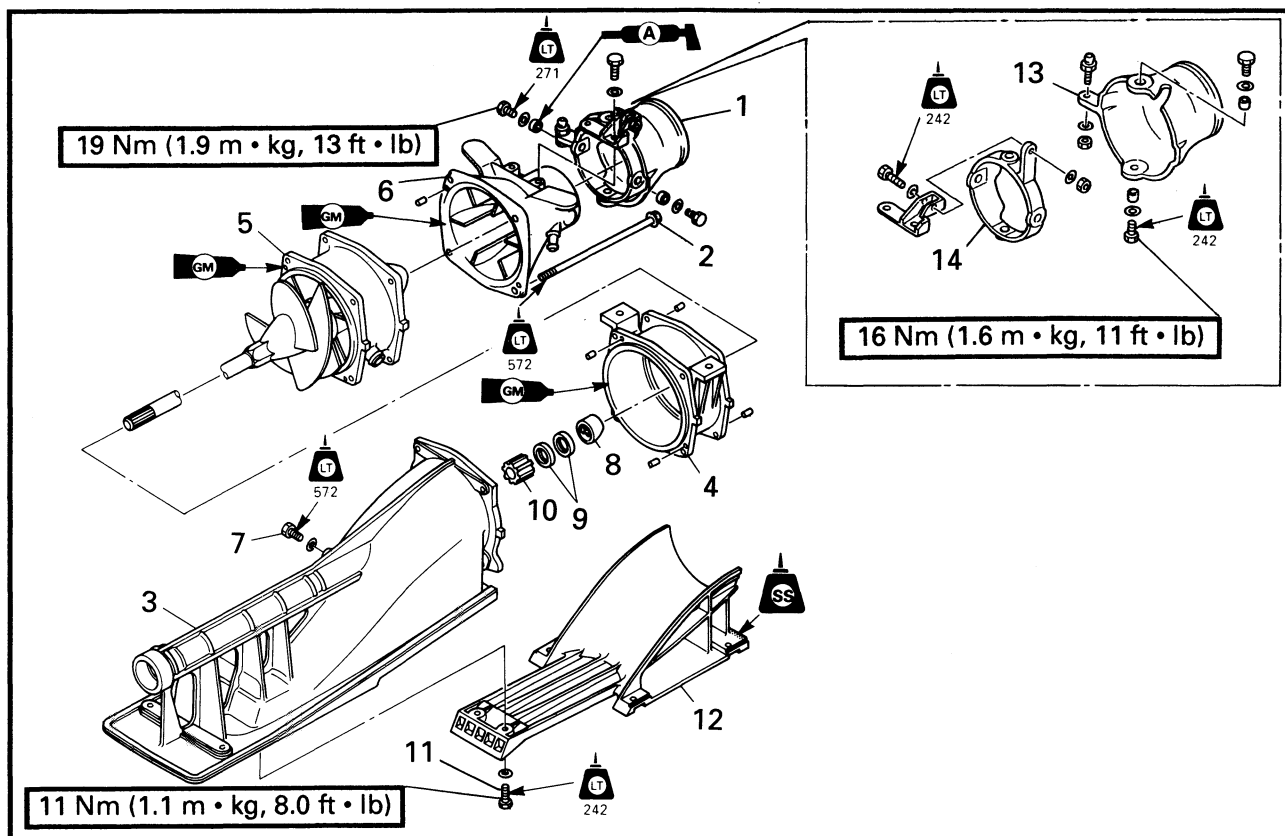
 Piston clearance: 0.070 ~ 0.075 mm (0.0028 ~ 0.0030 in)
--

JET PUMP UNIT REMOVAL EXPLODED DIAGRAM

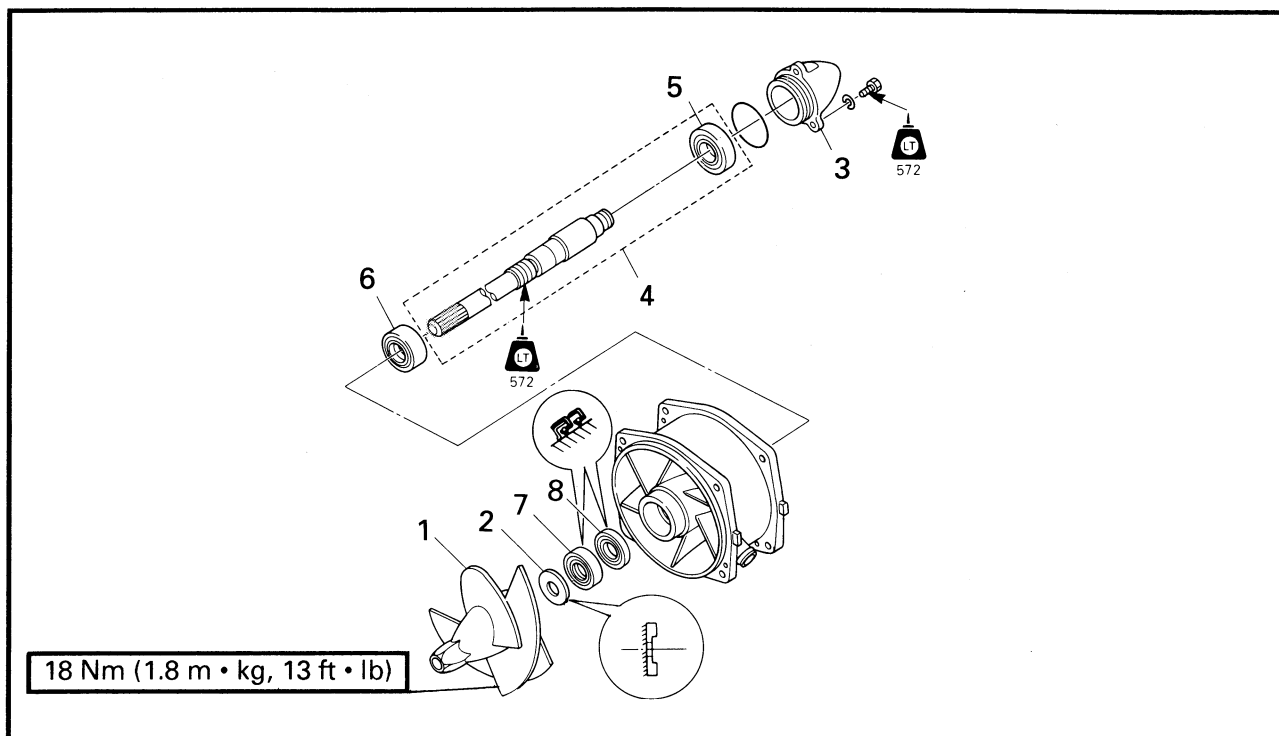


REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	JET PUMP UNIT REMOVAL		Follow the left "Step" for removal.
1	Bolt (with washer)	6	
2	Ride plate	1	
3	Steering cable joint	1	
4	Spout hose	1	
5	Engine cooling hose	1	
6	Bilge hose	1	
7	Bolt (with washer)	2	
8	Bolt (with washer)	4	
9	Jet pump unit	1	
			NOTE: _____ ● Pull the jet pump unit straight back-ward. ● When installing the jet pump unit, align the drive shaft spline (male) with the intermediate shaft spline (female). _____ Reverse the removal steps for installation.

**NOZZLE, DUCT AND INTAKE
EXPLODED DIAGRAM**

REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	NOZZLE, DUCT AND INTAKE DISASSEMBLY		Follow the left "Step" for removal.
	Jet pump unit		Refer to "JET PUMP UNIT REMOVAL".
1	Nozzle deflector assembly	1	
2	Bolt	4	
3	Intake duct	1	
4	Housing	1	
5	Impeller duct assembly	1	
6	Nozzle	1	
7	Bolt (with washer)	1	
8	Spacer	1	
9	Oil seal	2	
10	Bushing	1	
11	Bolt (with washer)	6	
12	Intake screen	1	
	NOZZLE DEFLECTOR DISASSEMBLY		
13	Nozzle deflector	1	
14	Trim ring	1	
			Reverse the removal steps for installation.

**IMPELLER AND DRIVE SHAFT
EXPLODED DIAGRAM**

REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	IMPELLER AND DRIVE SHAFT DISASSEMBLY		Follow the left "Step" for removal.
1	Impeller duct assembly Impeller	1	Refer to "NOZZLE, DUCT AND INTAKE". NOTE: _____ The impeller has a left-hand thread. Turn the impeller clockwise to loosen it.
2	Washer	1	NOTE: _____ Plane face of the washer should be positioned on the impeller side.
3	Cap	1	
4	Drive shaft assembly	1	
5	Bearing (rear)	1	NOTE: _____ Install the bearing with its manufacturer's numbers facing outward.
6	Bearing (front)	1	NOTE: _____ Install the bearing with its manufacturer's numbers facing outward.
7	Oil seal	1	
8	Oil seal	1	
			Reverse the removal steps for installation.



IGNITION SYSTEM

IGNITION COIL

1. Measure:

- Secondary coil resistance
Out of specification → Replace.



Secondary coil resistance:
(high tension cords)
14.3 ~ 30.5 k Ω at 20°C (68°F)

NOTE:

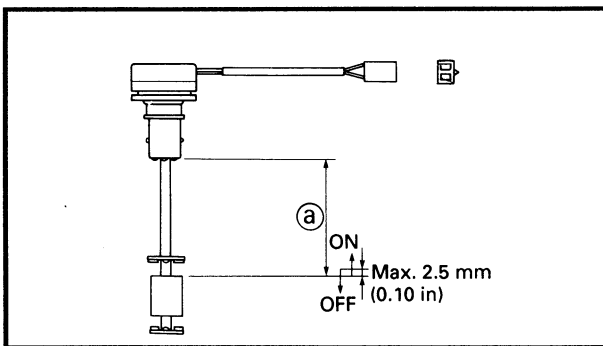
Remove the spark-plug cap from high tension cord.



INDICATION SYSTEM

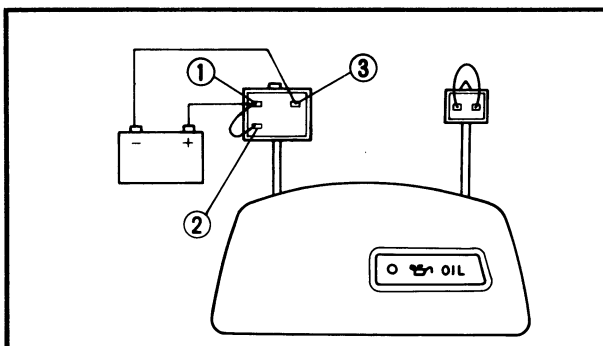
OIL LEVEL SENSOR

1. Measure:

- Oil level sensor continuity
Out of specification → Replace.



	Float position	Checking leads	
		L	B
	OFF		
	ON	○	○
	Float length ①: 37.0 ~ 41.0 mm (1.46 ~ 1.61 in)		



MULTI FUNCTION METER

1. Check:

- Display function
Not working → Replace.

Checking steps:

- Connect the battery.



Voltage range:
10 ~ 16 V

- ① Red lead → Positive terminal.
- ② Green lead → Positive terminal.
- ③ Black lead → Negative terminal.

- After connecting the battery, oil warning LED starts to light up for 3 seconds and then blinks.
- Connect the blue and black terminals to check the oil warning LED goes off, after blinking for 10 ~ 30 seconds.



Water Vehicles

WaveRaider
RA760

SUPPLEMENTARY SERVICE MANUAL

PREFACE

This Supplementary Service Manual has been prepared to introduce new service and data for the RA760. For complete service information procedures, it is necessary to use this Supplementary Service Manual together with the following manual.

RA700S,T/RA700AT/RA700BU (SUPP)/RA1100T,U (WAVERAIDERS) SERVICE MANUAL: LIT 18616-01-26

A10001-0*

**RA760
SUPPLEMENTARY SERVICE MANUAL
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P/N LIT-18616-01-46

GENERAL INFORMATION

IDENTIFICATION NUMBERS	1
PRIMARY I.D. NUMBER.....	1
ENGINE SERIAL NUMBER	1
PUMP SERIAL NUMBER	1
HULL IDENTIFICATION NUMBER (H.I.N.)	1
SPECIAL TOOLS	2
REMOVAL AND INSTALLATION	2

SPECIFICATIONS

GENERAL SPECIFICATIONS	3
MAINTENANCE SPECIFICATIONS	4
ENGINE	4
JET UNIT	5
ELECTRICAL	5
TIGHTENING TORQUE	6
SPECIFIED TORQUE	6

PERIODIC INSPECTION AND ADJUSTMENT

PERIODIC SERVICE	7
CONTROL SYSTEM	7
Throttle cable inspection and adjustment.....	7
FUEL SYSTEM.....	7
Trolling speed inspection and adjustment.....	7
Carburetor adjustment.....	8

FUEL SYSTEM

FUEL LINE	9
EXPLODED DIAGRAM	9
REMOVAL AND INSTALLATION CHART	9
CARBURETOR REMOVAL	10
EXPLODED DIAGRAM	10
REMOVAL AND INSTALLATION CHART	10
CARBURETOR	11
EXPLODED DIAGRAM	11
REMOVAL AND INSTALLATION CHART	11
FUEL PUMP	12
EXPLODED DIAGRAM	12
REMOVAL AND INSTALLATION CHART	12

POWER UNIT

REED VALVE	13
EXPLODED DIAGRAM	13
REMOVAL AND INSTALLATION CHART	13
SERVICE POINTS	14
Reed valve inspection	14
EXHAUST RING	15
EXPLODED DIAGRAM	15
REMOVAL AND INSTALLATION CHART	15
EXHAUST CHAMBER	16
EXPLODED DIAGRAM	16
REMOVAL AND INSTALLATION CHART	16
MUFFLER	17
EXPLODED DIAGRAM	17
REMOVAL AND INSTALLATION CHART	17
CYLINDER HEAD	18
EXPLODED DIAGRAM	18
REMOVAL AND INSTALLATION CHART	18
SERVICE POINTS	19
Cylinder head inspection	19
CYLINDER	20
EXPLODED DIAGRAM	20
REMOVAL AND INSTALLATION CHART	20
SERVICE POINTS	21
Cylinder inspection	21
PISTON	22
EXPLODED DIAGRAM	22
REMOVAL AND INSTALLATION CHART	22
SERVICE POINTS	23
Piston pin clip removal and installation	23
Piston inspection	23
Piston ring inspection	24
Piston pin and bearing inspection	24
ENGINE UNIT REMOVAL	26
EXPLODED DIAGRAM	26
REMOVAL AND INSTALLATION CHART	26
SERVICE POINTS	27
Shim removal	27
Mount bracket inspection	27
Coupling clearance inspection	27

FLYWHEEL MAGNETO AND BASE	28
EXPLODED DIAGRAM	28
REMOVAL AND INSTALLATION CHART	28
SERVICE POINTS	29
Coupling flange removal and installation	29
Flywheel magneto removal and installation.....	29
Coupling flange inspection.....	29
Flywheel magneto inspection	29
Idle gear assembly inspection.....	29
ELECTRICAL UNIT	30
EXPLODED DIAGRAM	30
REMOVAL AND INSTALLATION CHART	30
CRANKCASE	31
EXPLODED DIAGRAM	31
REMOVAL AND INSTALLATION CHART	31
SERVICE POINTS	32
Crankcase inspection	32
Crankcase installation	32
CRANKSHAFT	33
EXPLODED DIAGRAM	33
REMOVAL AND INSTALLATION CHART	33
SERVICE POINTS	34
Crankshaft inspection	34
INTERMEDIATE HOUSING REMOVAL	35
EXPLODED DIAGRAM	35
REMOVAL AND INSTALLATION CHART	35
INTERMEDIATE HOUSING	36
EXPLODED DIAGRAM	36
REMOVAL AND INSTALLATION CHART	36
SERVICE POINTS	37
Coupling removal and installation.....	37
Bearing removal and installation.....	37
Bearing inspection	37
Coupling inspection	37
Oil seal installation.....	38

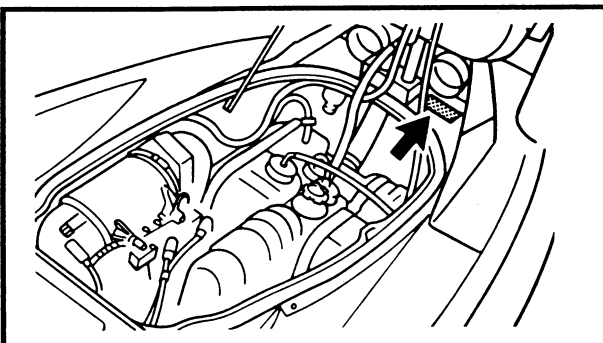
ELECTRICAL SYSTEM

ELECTRICAL COMPONENTS	39
IGNITION SYSTEM	40
CHARGE COIL	40
PULSER COIL	40
CDI UNIT	40

HULL AND HOOD

EXHAUST SYSTEM.....41
EXPLODED DIAGRAM41
REMOVAL AND INSTALLATION CHART41

FLUSHING AND VENTILATION SYSTEM.....42
EXPLODED DIAGRAM42
REMOVAL AND INSTALLATION CHART42

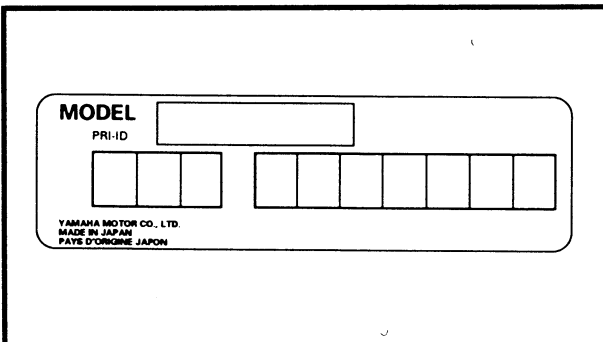


A60700-0*

IDENTIFICATION NUMBERS

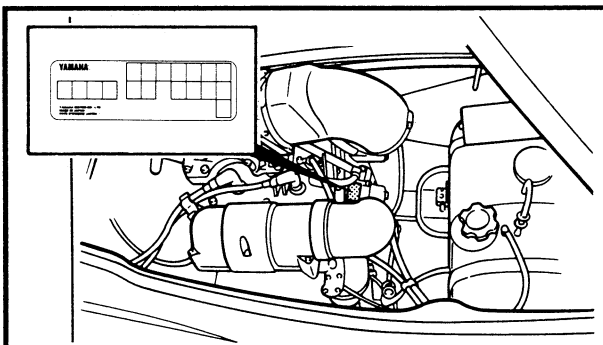
PRIMARY I.D. NUMBER

The primary I.D. number is stamped on a plate attached to the hull on the front of the engine hood.



Starting primary I.D. number:

GP2: 800101 ~,
600101 ~ (FRA)

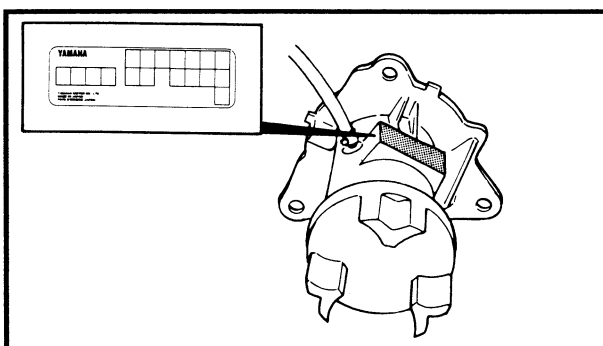


ENGINE SERIAL NUMBER

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

Starting serial number:

64X: 000101 ~

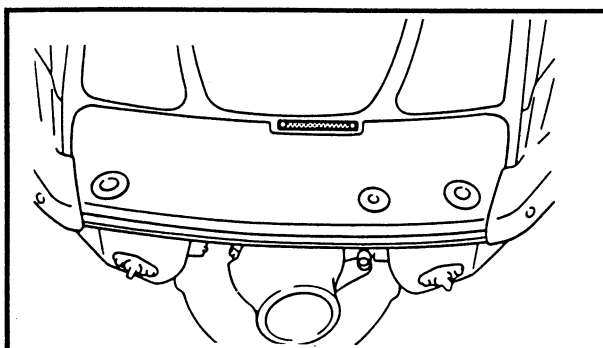


PUMP SERIAL NUMBER

The jet pump unit serial number is stamped on a plate attached to the intermediate housing.

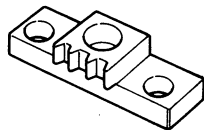
Starting serial number:

64X: 500101 ~



HULL IDENTIFICATION NUMBER (H.I.N.)

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

**YW-06546****90890-06546****YW-06547****90890-06547****SPECIAL TOOLS
REMOVAL AND INSTALLATION**

1. Coupler wrench
P/N. YW-06546
90890-06546
2. Flywheel holder
P/N. YW-06547
90890-06547

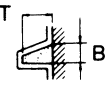


GENERAL SPECIFICATIONS

Item	Unit	RA760
MODEL CODE:		
Hull		GP2
Engine		64X
DIMENSIONS:		
Length	mm (in)	2,860 (112.6)
Width	mm (in)	1,120 (44.1)
Height	mm (in)	970 (38.2)
Dry weight	kg (lb)	211 (465)
PERFORMANCE:		
Maximum speed	km/h (mph)	84 (52.2)
Maximum output	kW (hp) @r/min	66.2 (90) @6,350
Maximum fuel consumption	l/h (US gal/h, Imp gal/h)	38 (10.04, 8.36)
Cruising range (at full throttle)	hr.	1.3
ENGINE:		
Engine type		2-stroke
Number of cylinders		2
Displacement	cm ³ (cu. in)	754 (46.0)
Bore and stroke	mm (in)	84 × 68 (3.31 × 2.68)
Compression ratio		F: 7.2, R: 6.8
Intake system		Reed valve
Carburetor type		Floatless type
Number of carburetors		2
Carburetor starting system		Choke
Scavenging system		Loop charged
Lubrication system		Oil Injection
Cooling system		Water-cooled
Starting system		Electric starter
Ignition system		Digital C.D.I.
Ignition timing	Degree	F: 15 ~ 20 BTDC, R: 15 ~ 18 BTDC
Spark plug (NGK)		BR8HS
Battery capacity	V/kC (A·h)	12/68.4 (19)
Lighting coil	A @r/min	2 ~ 4 @5,500
DRIVE UNIT:		
Propulsion system		Jet pump
Jet pump type		Axial flow, single stage
Impeller rotation (rear view)		Counterclockwise
Transmission		Direct drive from engine
Nozzle angle	Degree	23 ± 1
FUEL AND OIL:		
Fuel		Regular gasoline
Oil		2 stroke outboard motor oil
Fuel and oil mixing ratio (wide open throttle)		50 : 1
Fuel tank capacity	l (US gal, Imp gal)	50 (13.2, 11.0)
Reserve	l (US gal, Imp gal)	8.8 (2.3, 1.9)
Oil tank capacity	l (US gal, Imp gal)	3.8 (1.0, 0.8)

MAINTENANCE SPECIFICATIONS

ENGINE

Item	Unit	RA760
Cylinder head:		
Warpage limit	mm (in)	0.1 (0.004)
Cylinder:		
Bore size	mm (in)	84.00 ~ 84.02 (3.307 ~ 3.308)
Wear limit	mm (in)	84.10 (3.311)
Taper limit	mm (in)	0.08 (0.003)
Out of round limit	mm (in)	0.05 (0.002)
Piston:		
Piston size	mm (in)	83.897 ~ 83.916 (3.3030 ~ 3.3038)
Measuring point*	mm (in)	10 (0.39)
Piston clearance	mm (in)	0.100 ~ 0.105 (0.0039 ~ 0.0041)
Wear limit	mm (in)	0.155 (0.0061)
Piston ring:		
Type		Keystone
Sectional sketch	 (B × T)	1.5 × 3.2 (0.06 × 0.13)
Side clearance	mm (in)	0.02 ~ 0.06 (0.0008 ~ 0.0024)
End gap	(installed)	0.2 ~ 0.4 (0.008 ~ 0.016)
Piston pin:		
Outside diameter	mm (in)	19.995 ~ 20.000 (0.7872 ~ 0.7874)
Limit	mm (in)	19.98 (0.786)
Crankshaft:		
Crank width	"A" mm (in)	61.95 ~ 62.00 (2.439 ~ 2.441)
Runout limit	"B" mm (in)	0.05 (0.002)
Connecting rod big end side clearance	mm (in)	0.25 ~ 0.75 (0.010 ~ 0.030)
	"C"	
Small end free play limit	"D" mm (in)	2.0 (0.08)
Carburetor:		
Stamped mark		64X01 (F)/64X02 (R)
Main nozzle	ø mm (in)	3.2 (0.13)
Main jet	(M.J.)	135 (F)/137.5 (R)
Pilot jet	(P.J.)	115
Low speed screw	Turns out	1-3/4 ± 1/4
Throttle valve	(Th.V.)	160
Valve seat	(V.S.) ø mm (in)	1.5 (0.06)
High speed screw	Turns out	1/2 ± 1/4
Trolling speed	r/min	1,300 ± 50
Reed valve:		
Thickness	mm (in)	0.4 (0.016)
Valve lift	mm (in)	9.0 ± 0.2 (0.35 ± 0.01)
Bending limit	mm (in)	0.2 (0.008)

























JET UNIT

Item	Unit	RA760
Jet pump:		
Impeller clearance	mm (in)	0.3 ~ 0.4 (0.01 ~ 0.02)
Service limit	mm (in)	0.6 (0.024)
Impeller shaft runout	mm (in)	0.3 (0.012)

ELECTRICAL

Item	Unit	RA760
Ignition system:		
Type		CDI magneto
Ignition timing at 1,200 rpm	Degree	15 BTDC
at 5,400 rpm	Degree	F: 20 BTDC, R: 18 BTDC
Stator:		
Model/Manufacturer		F4T32371/MITSUBISHI
Pulser coil resistance (color)	Ω	445.5 ~ 544.5 (W/R – W/B)
Charging coil resistance (color)	Ω	316.8 ~ 387.2 (Br – L)
CDI unit:		
Stamped mark		64X-00
Model/Manufacturer		F8T33671/MITSUBISHI
Over revolution limit	r/min	7,000 ~ 7,400
Overheat revolution control	r/min	3,000 ~ 3,800
Ignition coil:		
Stamped mark		64X-00
Model/Manufacturer		F6T54381/MITSUBISHI
Primary winding resistance	Ω	0.078 ~ 0.106 (O – B)
Secondary winding resistance	kΩ	14.3 ~ 30.5 (High tension cords)
Charging system:		
Type		Flywheel magneto
Lighting coil resistance (color)	Ω	1.14 ~ 1.40 (G – G)
Rectifier/regulator:		
Model/Manufacturer		SH589-12/SHINDENGEN
Regulator voltage	V	14.3 ~ 15.3
Thermo sensor:		
ON	°C (°F)	90 ~ 96 (194 ~ 205)
OFF	°C (°F)	76 ~ 90 (169 ~ 194)
Starter motor:		
Model/Manufacturer		SM13466/MITSUBA
Brush length limit	mm (in)	6.5 (0.26)
Commutator undercut limit	mm (in)	0.2 (0.01)
diameter limit	mm (in)	27 (1.06)
Fuse:		
Rating	A	10

TIGHTENING TORQUE SPECIFIED TORQUE

Part to be tightened		Part name	Size	Q'ty	Tightening torque			Remarks
					Nm	m•kg	ft•lb	
ENGINE:								
Electric box		Bolt	M8	3	17	1.7	12	 271
Mounting bolt		Bolt	M8	4	17	1.7	12	 271
Reed valve		Screw	M4	16	1	0.1	0.7	 242
Exhaust ring		Bolt	M8	4	30	3.0	22	 271
Exhaust ring stay	1st	Bolt	M10	3	22	2.2	16	 271
	2nd				40	4.0	29	
Muffler stay - Cylinder head		Bolt	M10	4	40	4.0	29	 271
Muffler stay - Muffler 2	1st	Bolt	M10	2	2	0.2	1.4	 271
	2nd				47	4.7	34	
Muffler 2		Bolt	M10	2	40	4.0	29	 271
Muffler 1	1st	Bolt	M10	8	22	2.2	16	 271
	2nd				40	4.0	29	
Cylinder body	1st	Bolt	M10	6	23	2.3	17	 672
	2nd				40	4.0	29	
Cylinder head	1st	Bolt	M8	10	15	1.5	11	 672
	2nd				36	3.6	26	
Spark plug		Bolt	M14	2	20	2.0	14	
Flywheel bolt		Bolt	M10	1	70	7.0	51	 E
Crankcase	1st	Bolt	M8	8	15	1.5	11	 672
	2nd				28	2.8	20	
Mount bracket	1st	Bolt	M10	7	23	2.3	17	 271
	2nd				53	5.3	38	
Coupling		Nut	M27	1	37	3.7	27	 672
Flame arrester cover		Bolt	M6	6	2	0.2	1.4	
Starter motor terminal nut		Nut	M6	1	5	0.5	3.6	
JET UNIT:								
Mounting bolt		Bolt	M10	4	34	3.4	25	 271
			M6	2	12	0.7	9	 242
Ride plate		Bolt	M8	6	17	1.7	12	 271
Speed sensor cover		Screw	M5	4	4	0.4	2.9	 242
Impeller (left-hand threads)		Bolt	M20	1	18	1.8	13	 672
Coupling		Nut	M27	1	37	3.7	27	 672
Intermediate housing		Bolt	M8	3	17	1.7	12	 271

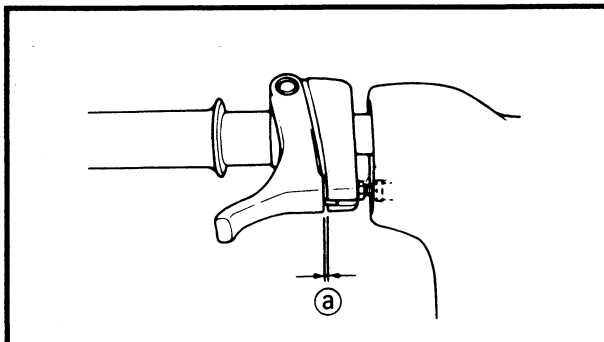
PERIODIC SERVICE

CONTROL SYSTEM

Throttle cable inspection and adjustment

NOTE:

Before adjusting the throttle lever free play, the trolling speed should be adjusted.



1. Measure:

- Throttle lever free play ①
- Out of specification → Adjust.



Throttle lever free play:
7 ~ 10 mm (0.28 ~ 0.39 in)

FUEL SYSTEM

Trolling speed inspection and adjustment

1. Check:

- Trolling speed
- Out of specification → Adjust.



Trolling speed:
1,300 ± 50 r/min

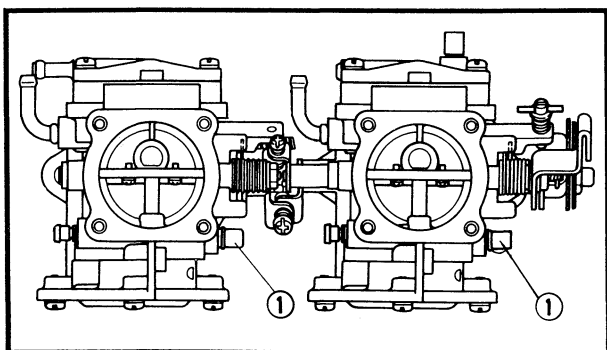
Checking steps: (vehicle on water)

- Start the engine and allow it to warm up for a few minutes.
- Attach the engine tachometer to the spark plug lead.



Engine tachometer:
YU-8036-A/90890-06760

- Measure the engine trolling speed.

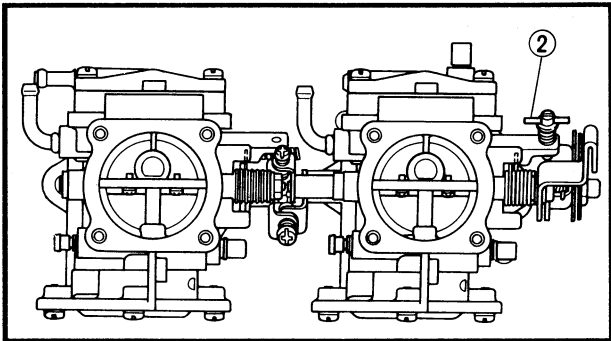


2. Adjust:

- Trolling speed

Adjustment steps:

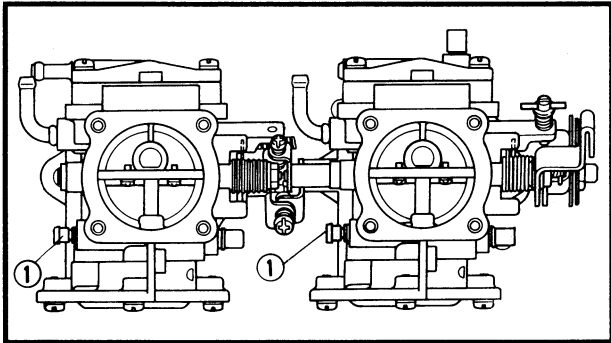
- Screw in the low speed screws ① until they are lightly seated.
- Back the screws out by the specified number of turns.



Low speed screw:
1-3/4 ± 1/4 (turns out)

- Start the engine and allow it to warm up for a few minutes.
- Turn the throttle stop screw ② in or out until the specified speed is obtained.

Turning in	Increase trolling speed.
Turning out	Decrease trolling speed.



Carburetor adjustment

1. Adjust:
- High speed screw

Adjustment steps:

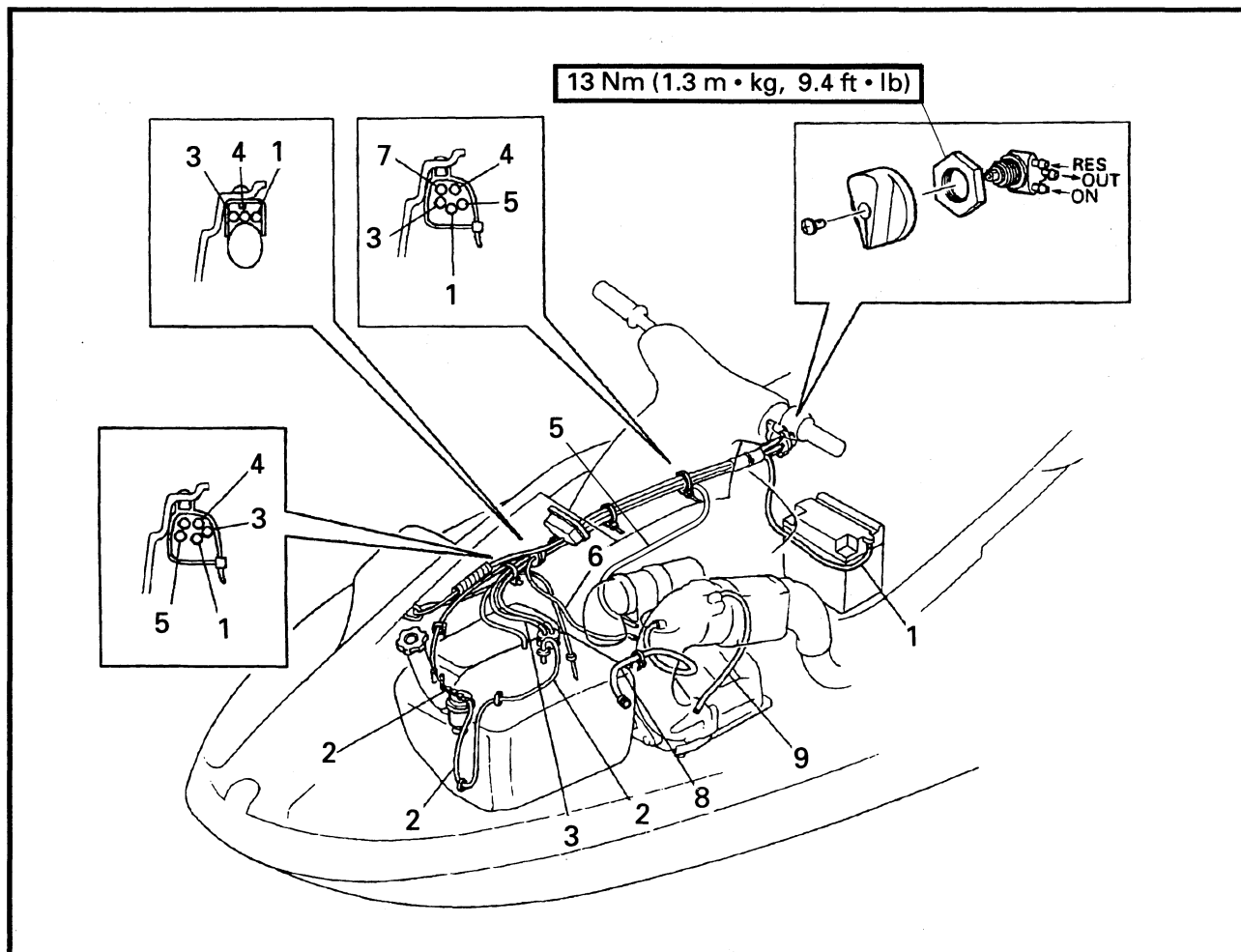
- Screw in the high speed screws ① until they are lightly seated.
- Back the screws out by the specified number of turns.



High speed screw:
1/2 ± 1/4 (turns out)


⚠ WARNING

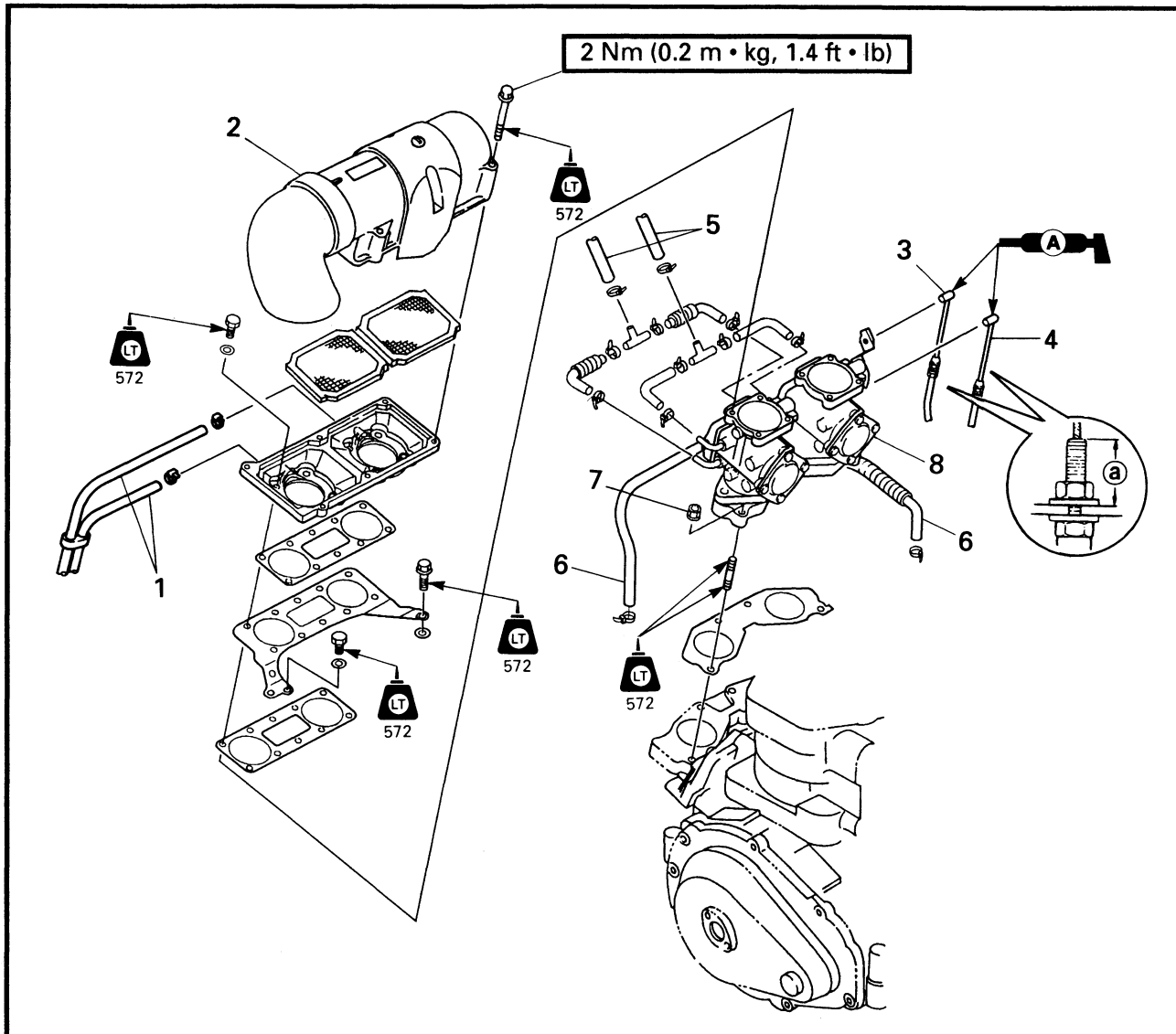
Gasoline (petrol) is highly flammable and explosive. Handle with special care.

**FUEL LINE
EXPLODED DIAGRAM**

REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	FUEL HOSE REMOVAL		Follow the left "Step" for removal.
1	Battery breather hose	1	
2	Air ventilation hose	3	
3	Fuel hose (ON)	1	
4	Fuel hose (RES)	1	
5	Fuel hose (carburetor - fuel tank)	1	
6	Fuel hose (filter - carburetor)	1	
7	Fuel hose (OUT)	1	
8	Pilot water hose	1	
9	Cooling water hose	1	
			Reverse the removal steps for installation.

CARBURETOR REMOVAL

EXPLODED DIAGRAM



REMOVAL AND INSTALLATION CHART

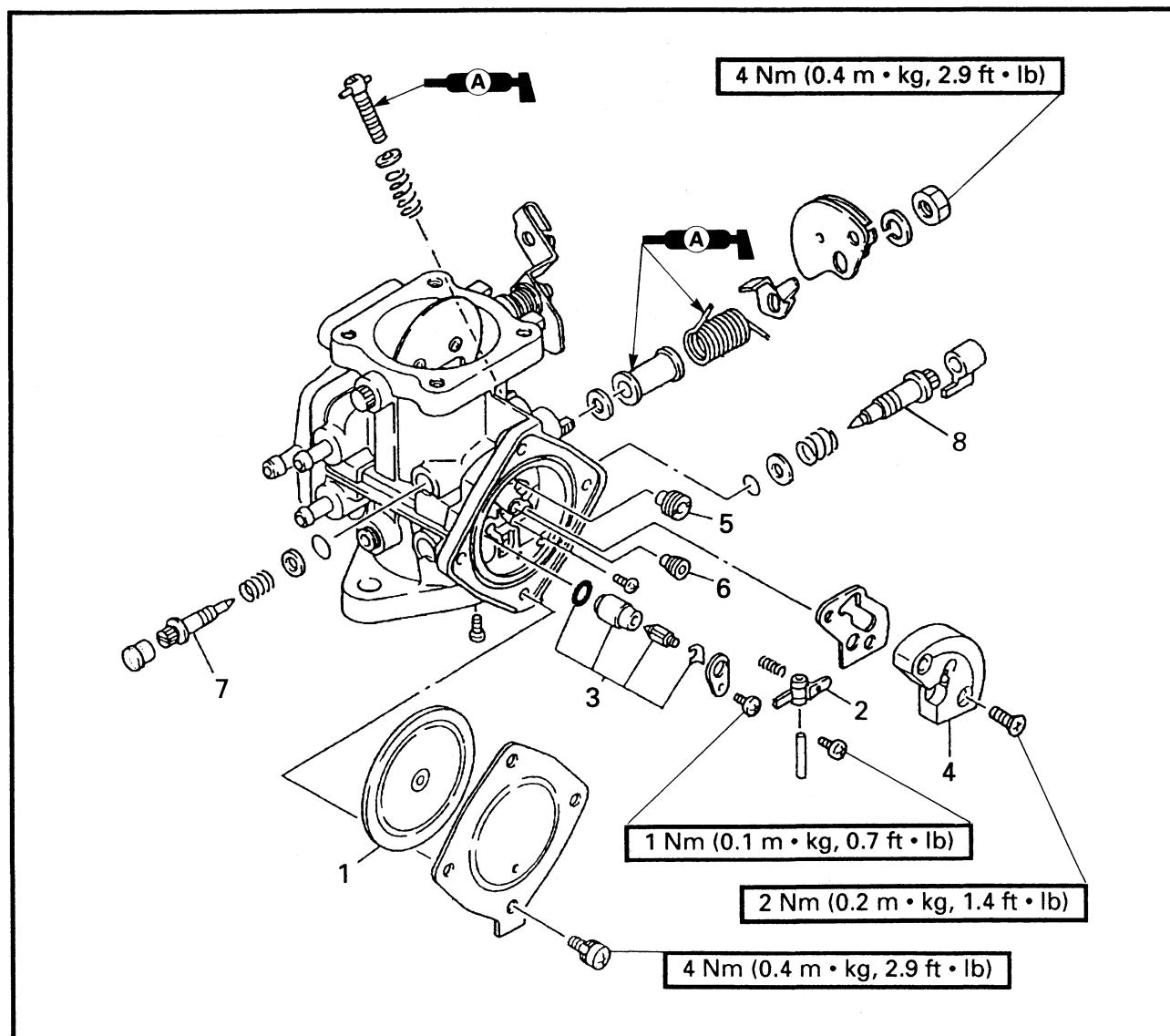
Step	Procedure/Part name	Q'ty	Service points
	CARBURETOR REMOVAL		Follow the left "Step" for removal.
1	Oil delivery hose	2	
2	Carburetor cover	1	
3	Choke cable	1	
4	Throttle cable	1	
5	Fuel hose	2	
6	Pulse hose	2	
7	Nut	4	
8	Carburetor assembly	1	
			Reverse the removal steps for installation.



Cable guide set position ①:
17 mm (0.67 in)



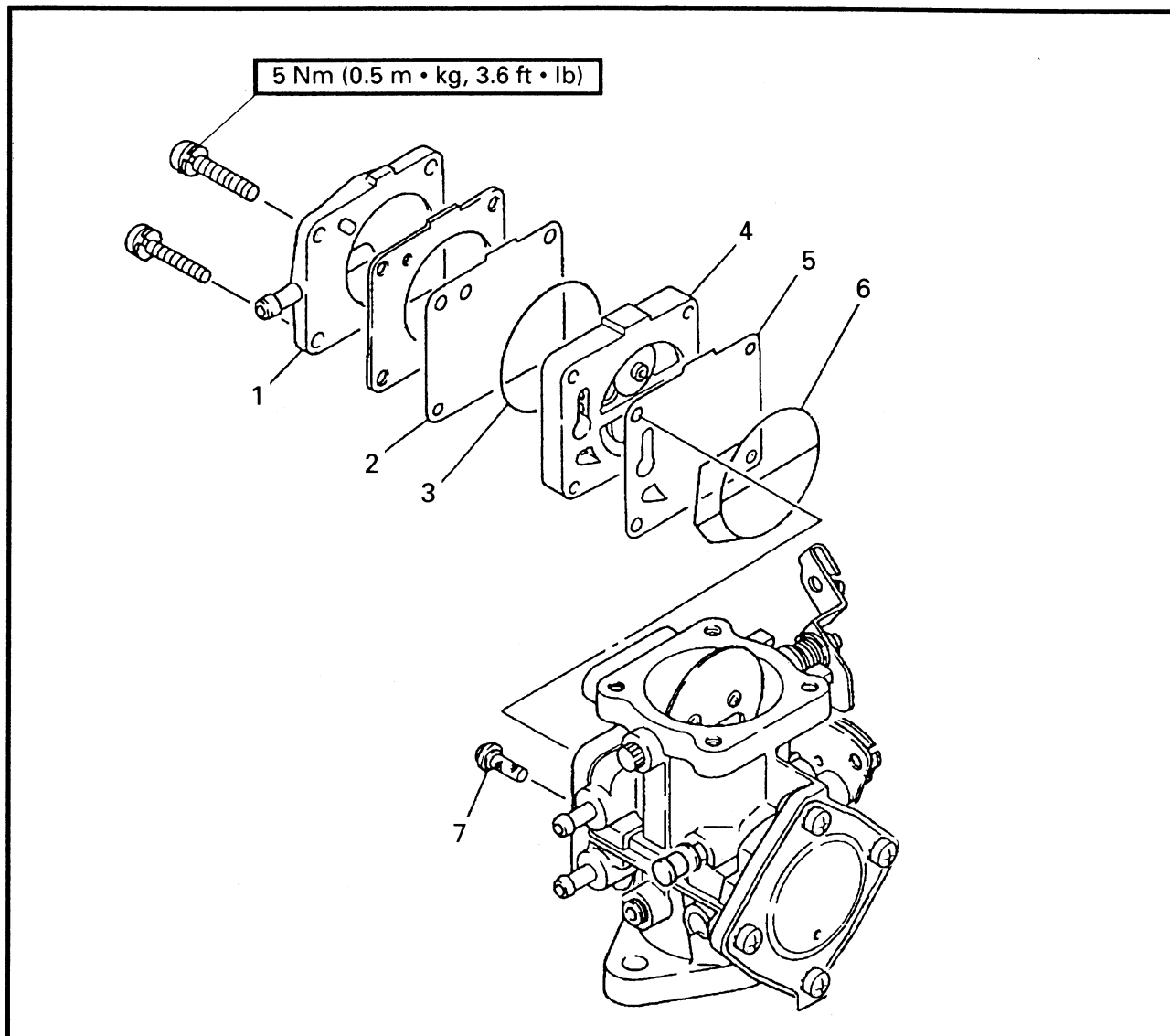
CARBURETOR EXPLODED DIAGRAM



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	CARBURETOR DISASSEMBLY		
	Carburetor assembly		Follow the left "Step" for removal. Refer to "CARBURETOR REMOVAL".
1	Diaphragm assembly	1	
2	Float arm	1	
3	Needle valve assembly	1	
4	Body assembly	1	
5	Main jet	1	
6	Pilot jet	1	
7	High speed screw	1	
8	Low speed screw	1	
			Reverse the removal steps for installation.

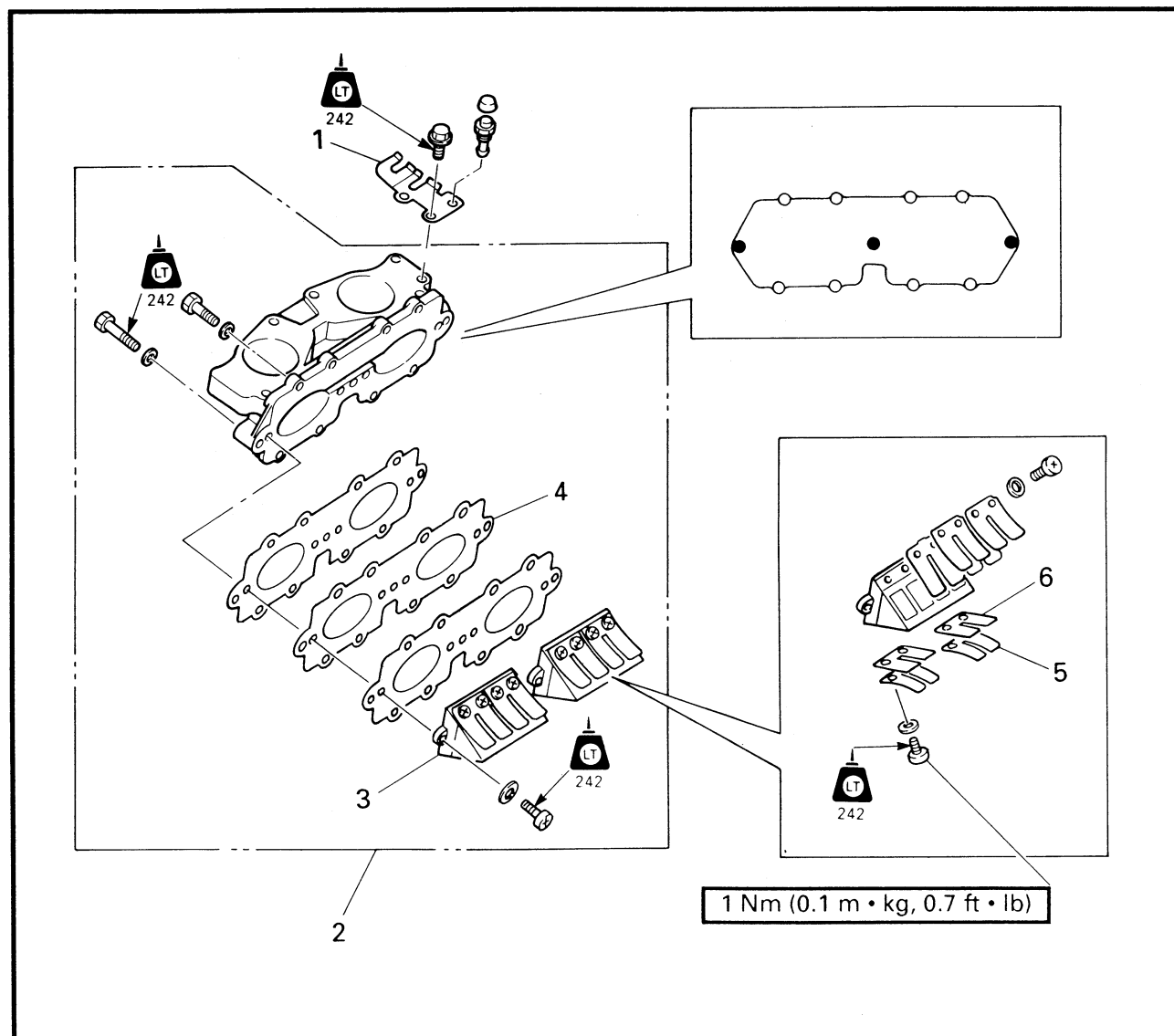
FUEL PUMP EXPLODED DIAGRAM



REMOVAL AND INSTALLATION CHART

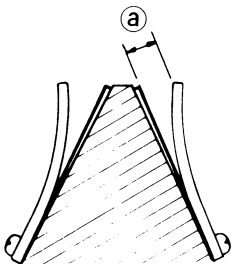
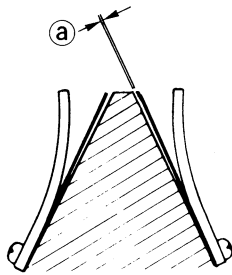
Step	Procedure/Part name	Q'ty	Service points
	FUEL PUMP DISASSEMBLY		
	Carburetor assembly		Follow the left "Step" for removal. Refer to "CARBURETOR REMOVAL".
1	Pump cover	1	
2	Diaphragm	1	
3	O-ring	1	
4	Diaphragm body assembly	1	
5	Diaphragm	1	
6	O-ring	1	
7	Filter	1	
			Reverse the removal steps for installation.

**REED VALVE
EXPLODED DIAGRAM**



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	REED VALVE REMOVAL		
	Carburetor assembly		Follow the left "Step" for removal. Refer to "CARBURETOR REMOVAL" in chapter 4.
1	Plate	1	
2	Intake manifold assembly	1	
3	Reed valve assembly	2	
4	Plate	1	
5	Valve stopper	4	
6	Reed valve	4	
			Reverse the removal steps for installation.

**SERVICE POINTS****Reed valve inspection**

1. Inspect:
 - Reed valve
Crack/Damage → Replace.
2. Measure:
 - Valve bending @
Out of specification → Replace.



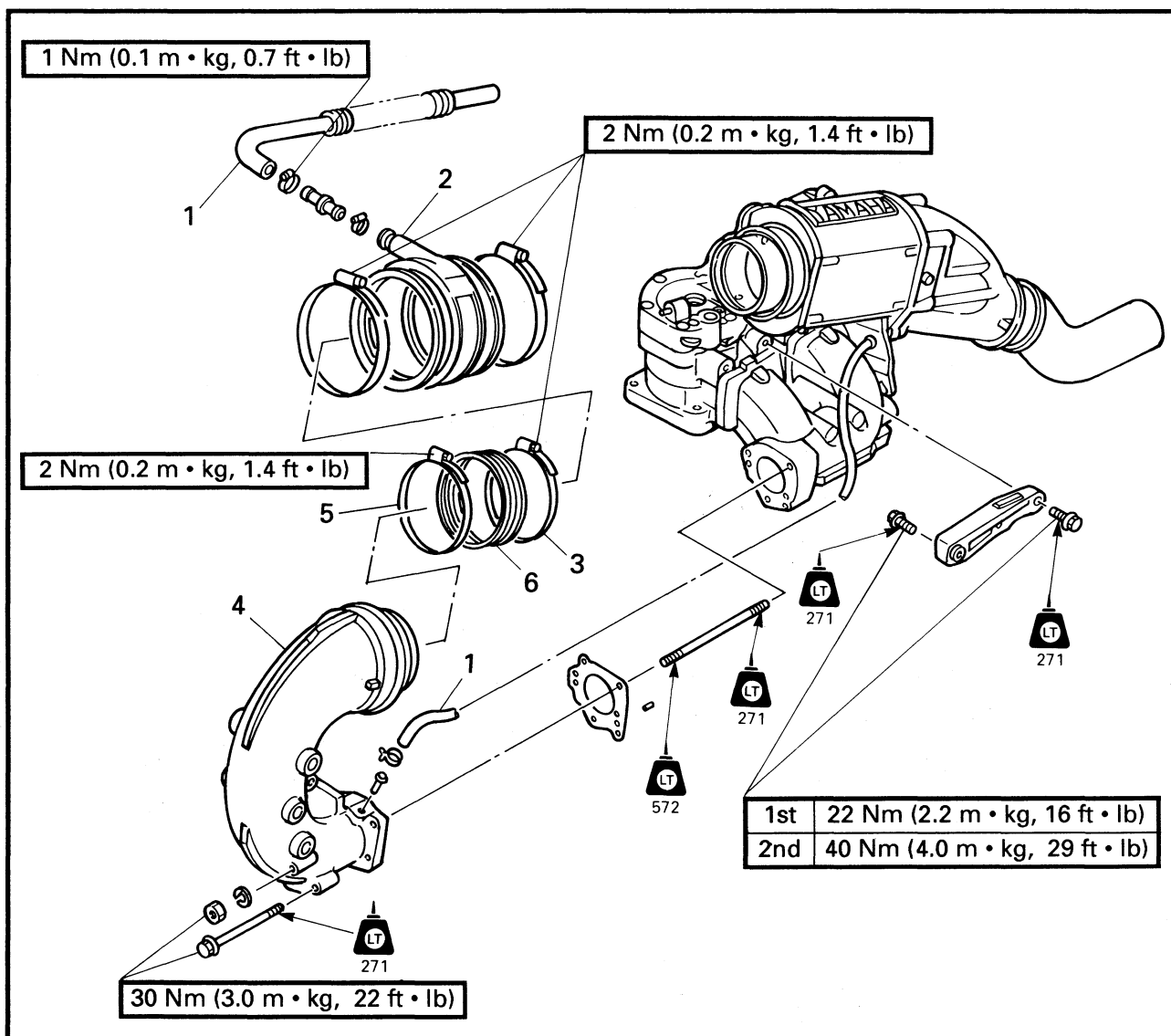
Valve bending limit:
0.2 mm (0.008 in)

3. Measure:
 - Valve stopper height @
Out of specification → Adjust or replace.



Valve stopper height:
 9.0 ± 0.2 mm (0.35 ± 0.01 in)

EXHAUST RING EXPLODED DIAGRAM

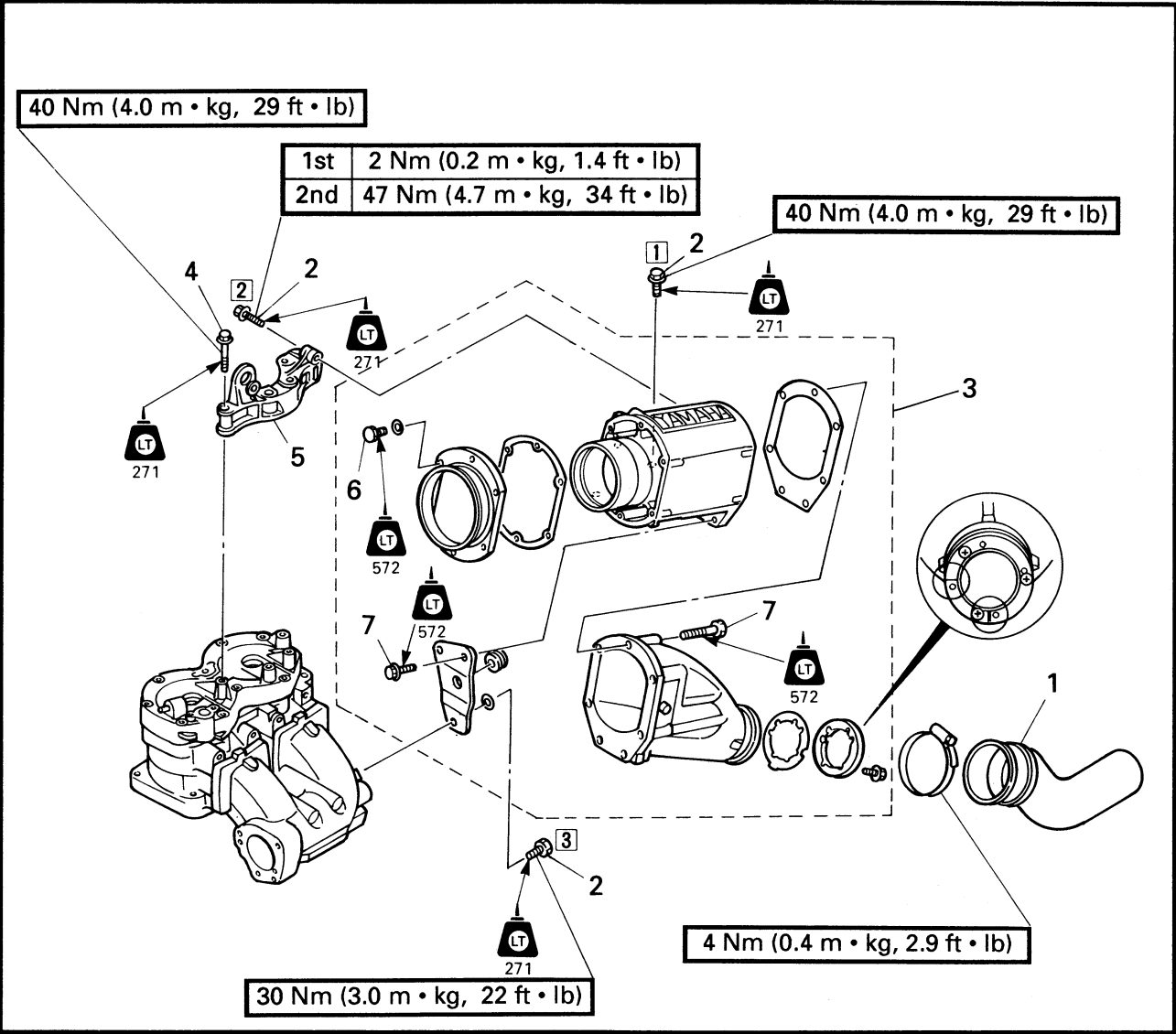


REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	EXHAUST RING REMOVAL		
1	Water hose	2	Follow the left "Step" for removal.
2	Exhaust joint	1	NOTE: _____
3	Clamp	1	● Pull and slide the exhaust joint.
4	Ring	1	● Loosen the clamp at the muffler side.
5	Clamp	1	CAUTION: _____
6	Joint	1	Tighten the clamp, before installing the ring on the muffler.
			Reverse the removal steps for installation.

EXHAUST CHAMBER

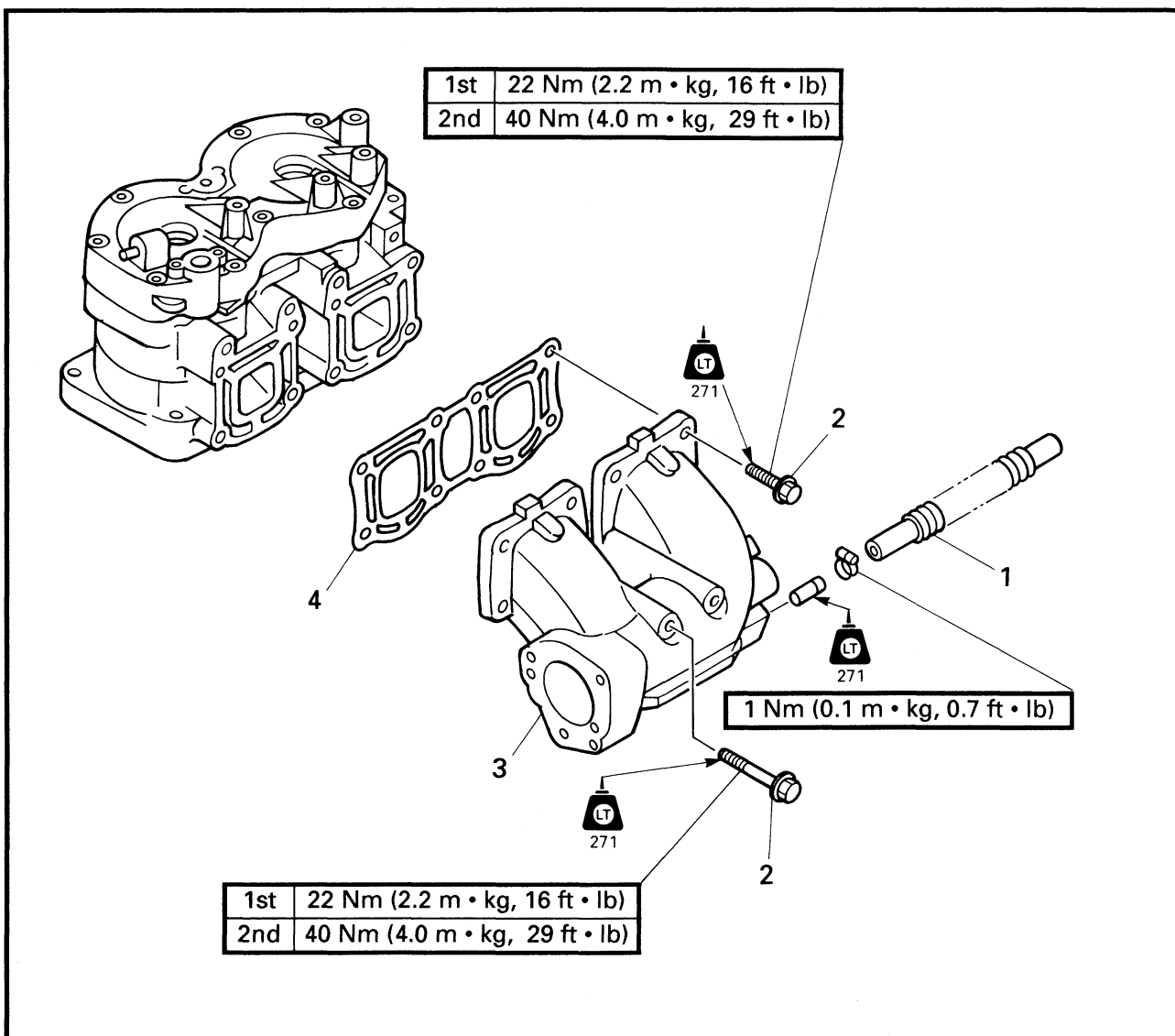
EXPLODED DIAGRAM



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	EXHAUST CHAMBER REMOVAL		Follow the left "Step" for removal. Refer to "EXHAUST RING".
1	Ring	1	<div>CAUTION:</div> <div>Tighten the bolts in sequence.</div>
2	Exhaust hose	1	
3	Bolt (muffler)	5	
4	Chamber assembly	1	
5	Bolt (muffler stay)	4	
6	Muffler stay	1	
7	Bolt (with washer)	6	
	Bolt (with washer)	7	Reverse the removal steps for installation.

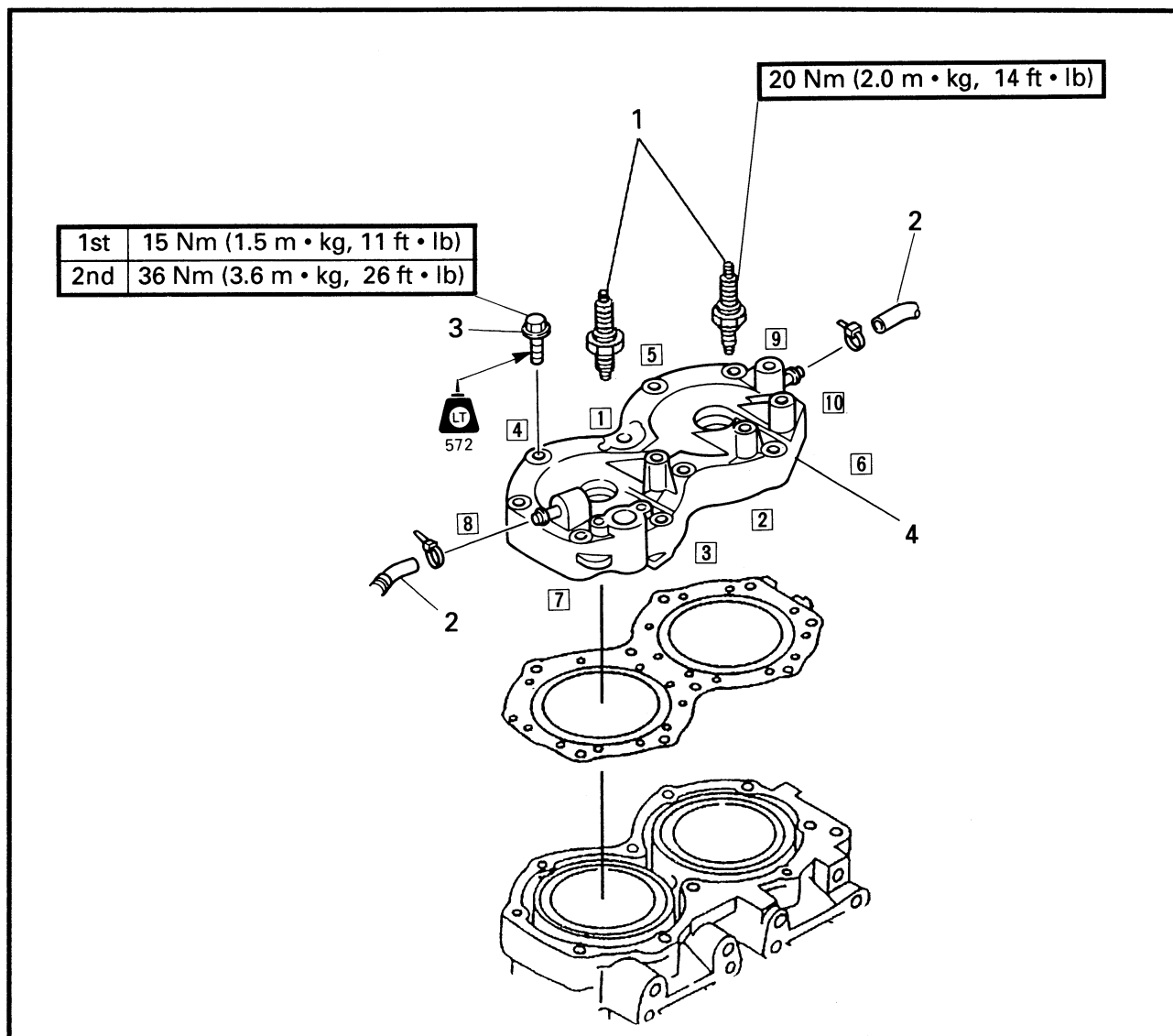
MUFFLER EXPLODED DIAGRAM



REMOVAL AND INSTALLATION CHART

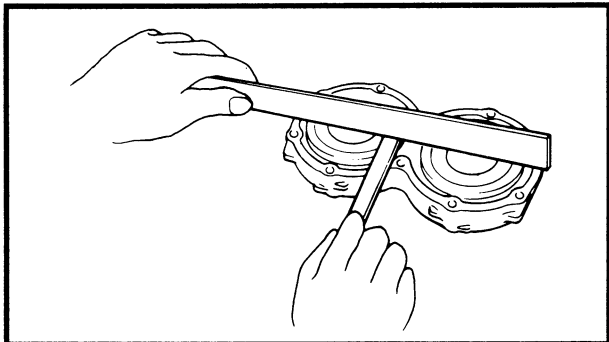
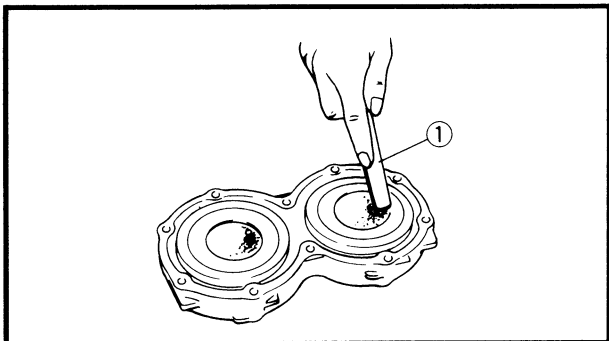
Step	Procedure/Part name	Q'ty	Service points
	MUFFLER REMOVAL		
	Exhaust chamber		Follow the left "Step" for removal. Refer to "EXHAUST CHAMBER".
1	Water inlet hose	1	
2	Bolt (with washer)	8	
3	Muffler	1	
4	Gasket	1	
			Reverse the removal steps for installation.

CYLINDER HEAD EXPLODED DIAGRAM



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	CYLINDER HEAD REMOVAL		
	Muffler		Follow the left "Step" for removal. Refer to "MUFFLER".
1	Spark plug	2	
2	Water hose	2	
3	Bolt (with washer)	10	CAUTION: Tighten the bolts in sequence and in two steps of torque.
4	Cylinder head	1	Reverse the removal steps for installation.



SERVICE POINTS

Cylinder head inspection

1. Eliminate:

- Carbon deposits
- Use a rounded scraper ①.

NOTE:

Take care to avoid damaging the spark plug threads. Do not use a sharp instrument. Avoid scratching the aluminum.

2. Inspect:

- Cylinder head water jacket
- Mineral deposits/Corrosion → Clean.

3. Measure:

- Cylinder head warpage
- Out of specification → Resurface.

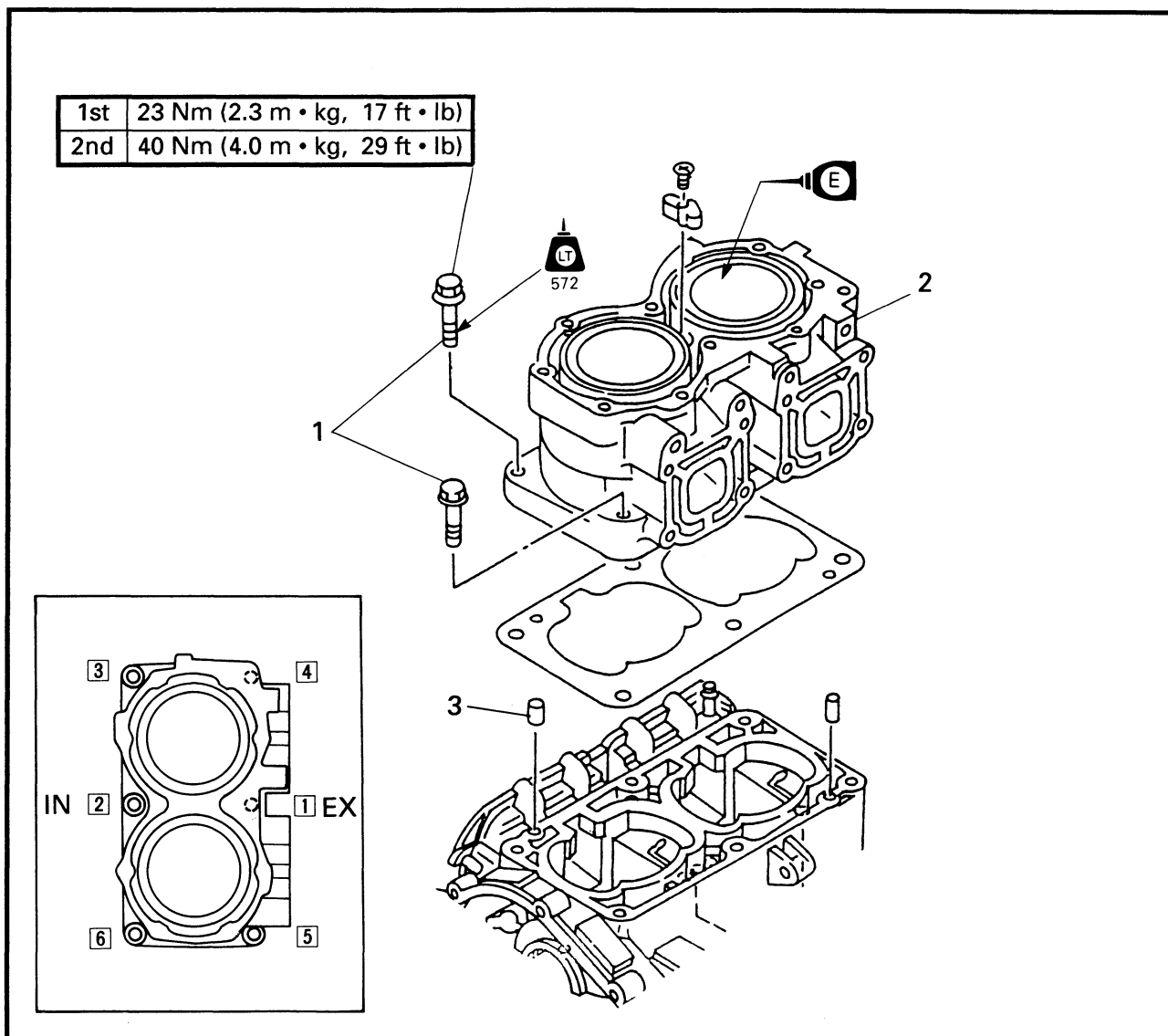


Warpage limit:
0.1 mm (0.004 in)

Warpage measurement and resurfacing steps:

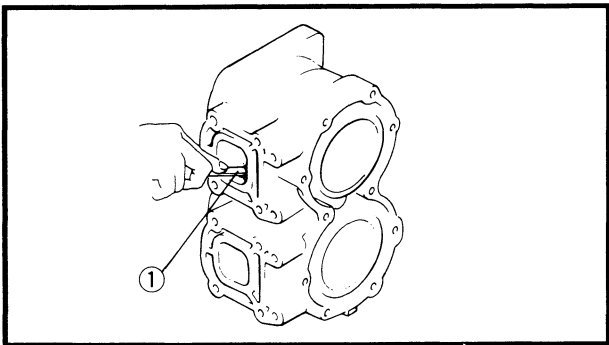
- Attach a straight edge and a thickness gauge on the cylinder head.
- Measure the warpage.

CYLINDER EXPLODED DIAGRAM



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
1	CYLINDER REMOVAL		
	Cylinder head		Follow the left "Step" for removal. Refer to "CYLINDER HEAD".
	Bolt (with washer)	6	CAUTION: _____ Tighten the bolts in sequence and in two steps of torque.
2	Cylinder	1	CAUTION: _____ After installing, check the smooth movement of the piston.
3	Pin	2	Reverse the removal steps for installation.



SERVICE POINTS

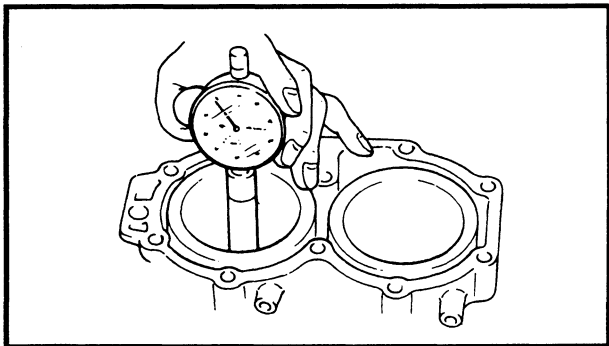
Cylinder inspection

1. Eliminate:

- Carbon deposits
Use a rounded scraper ①.

2. Inspect:

- Cylinder water jacket
Mineral deposits/Corrosion → Clean.
- Cylinder inner surface
Score marks → Repair or replace.
Use #600 ~ 800 grit wet sandpaper.

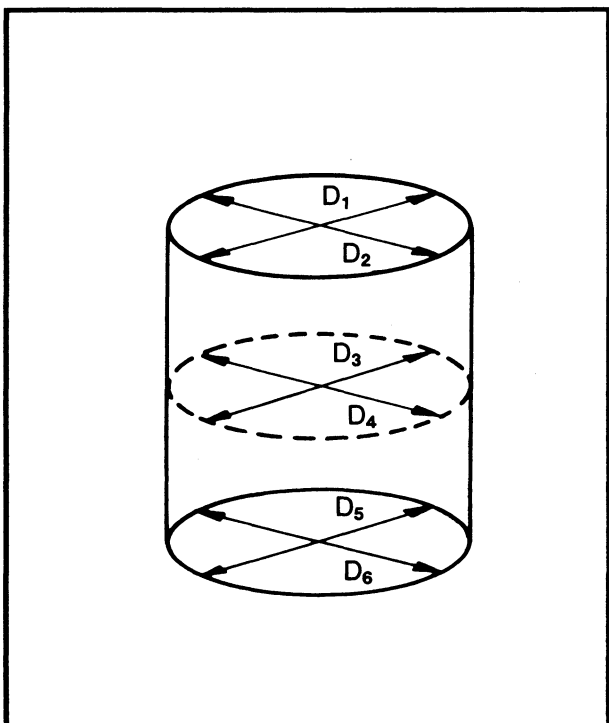



3. Measure:

- Cylinder bore "D"
Use cylinder gauge.
Out of limit → Replace.

NOTE:

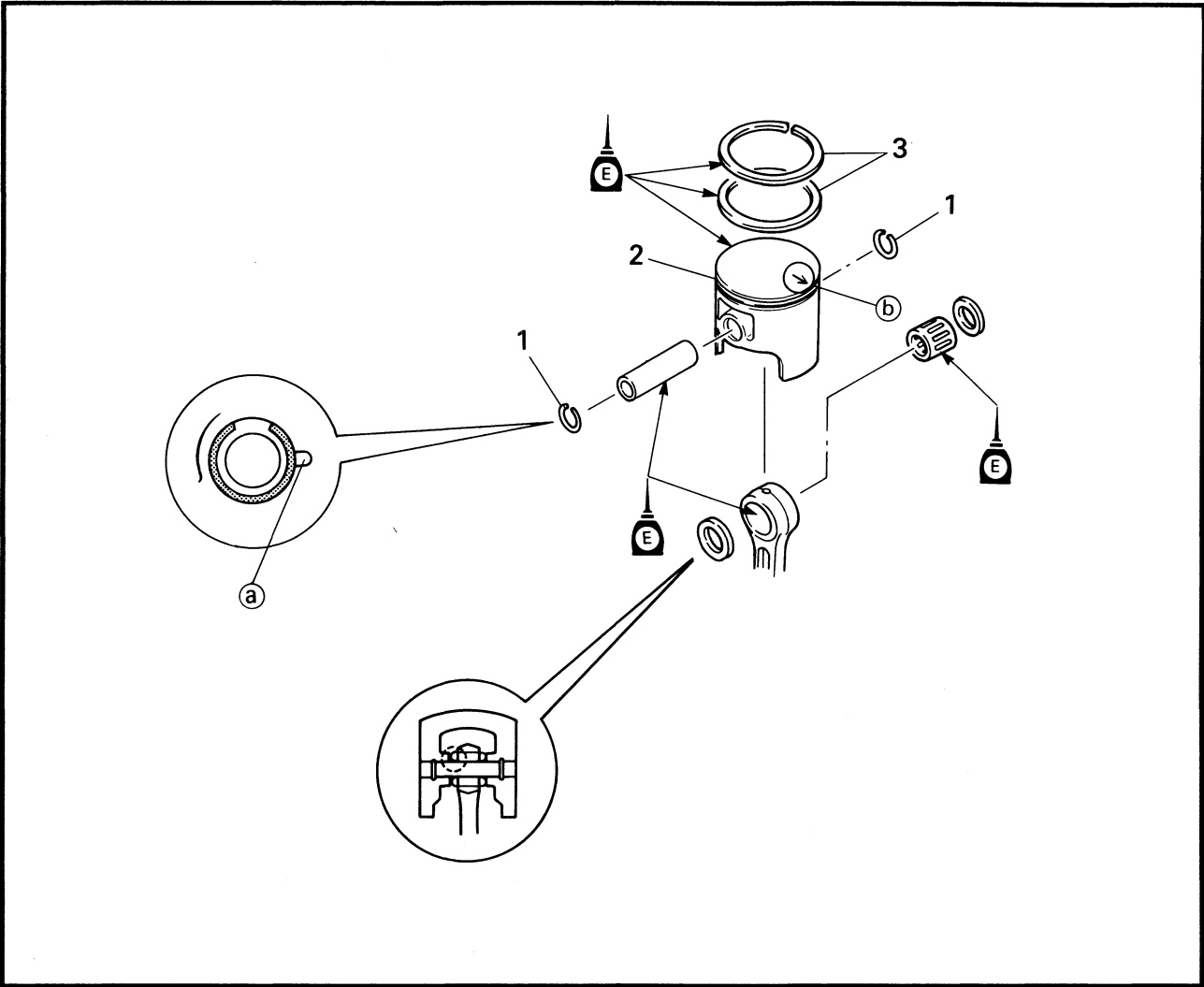
Measure the cylinder bore "D" in parallel.
Then, find the average of the measurement.



	Standard	Limit
Cylinder bore "D"	84.00 ~ 84.02 mm (3.307 ~ 3.308 in)	84.10 mm (3.311 in)
Taper "T"	—	0.08 mm (0.003 in)
Out of round "R"	—	0.05 mm (0.002 in)
D = Maximum (D₁ ~ D₆) T = (Maximum D₁ or D₂) – (Maximum D₅ or D₆) R = (Maximum D₁, D₃ or D₅) – (Minimum D₂, D₄ or D₆)		

PISTON

EXPLODED DIAGRAM



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
PISTON REMOVAL			
1	Cylinder Piston pin clip	4	Follow the left "Step" for removal. Refer to "CYLINDER". CAUTION: _____ Do not allow the clip open ends to meet the piston pin slot (a).
2	Piston	2	NOTE: _____ Be sure the arrow (b) side is positioned exhaust side.
3	Piston ring	4	CAUTION: _____ Align each end gap with the locating pin. Reverse the removal steps for installation.

SERVICE POINTS

Piston pin clip removal and installation

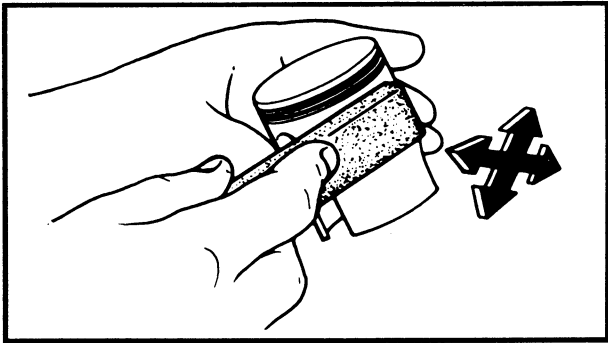
1. Remove and install:
- Piston pin clip

NOTE: _____

Before removing and installing piston pin clip, cover crankcase with a clean rag to prevent piston pin clip from falling into crankcase cavity.

Piston inspection

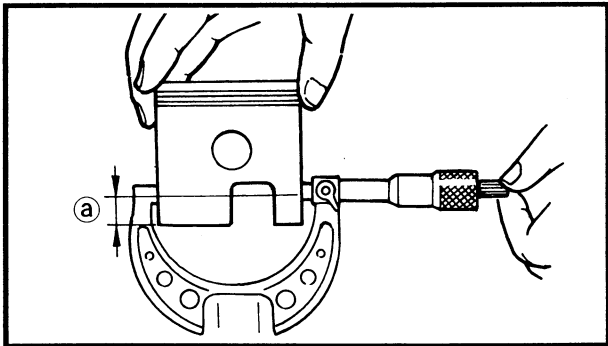
1. Eliminate:
- Carbon deposits
- From the piston crown and ring groove.




2. Inspect:
- Piston wall
- Score marks → Repair or replace.
Use #600 ~ 800 grit wet sandpaper.

NOTE: _____

Sand in a criss-cross pattern. Do not sand excessively.




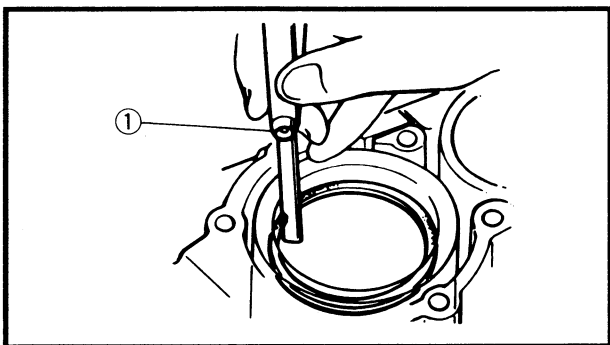
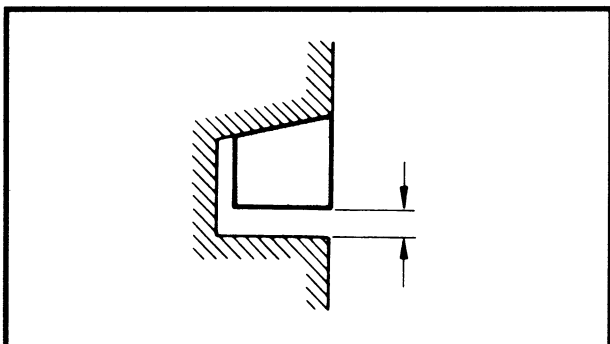
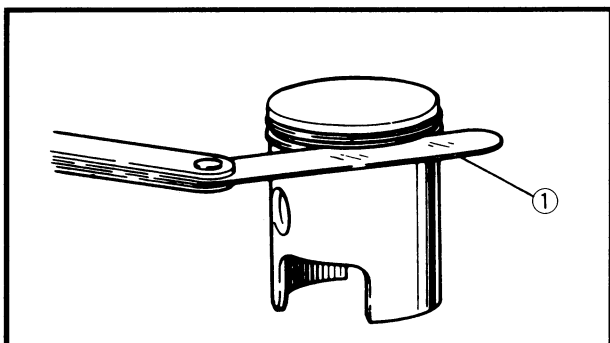
3. Measure:
- Piston skirt diameter
- Use micrometer.
Out of specification → Replace.

	Piston diameter	Distance ①
	83.897 ~ 83.916 mm (3.3030 ~ 3.3038 in)	10 mm (0.39 in)

4. Calculate:
- Piston clearance
- Out of limit → Replace piston, piston rings as a set.

PISTON CLEARANCE	=	CYLINDER BORE	-	PISTON DIAMETER
---------------------	---	------------------	---	--------------------

	Piston clearance: 0.100 ~ 0.105 mm (0.0039 ~ 0.0041 in)
---	---



Piston ring inspection

1. Measure:

- Side clearance
Out of specification → Replace piston and/or ring.
Use a thickness gauge ①.



Side clearance:

Top
2nd
0.02 ~ 0.06 mm
(0.0008 ~ 0.0024 in)

2. Measure:

- End gap
Out of specification → Replace rings as a set.
Use a thickness gauge ①.



End gap:

Top
2nd
0.2 ~ 0.4 mm (0.008 ~ 0.016 in)

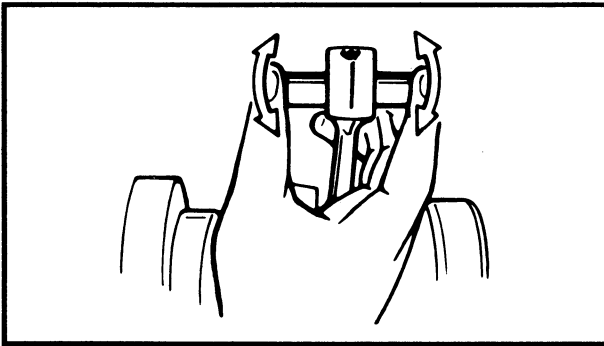
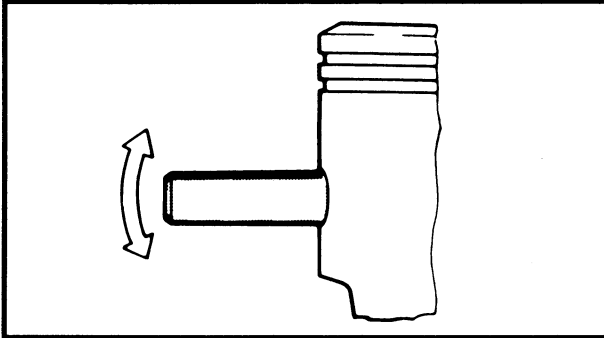
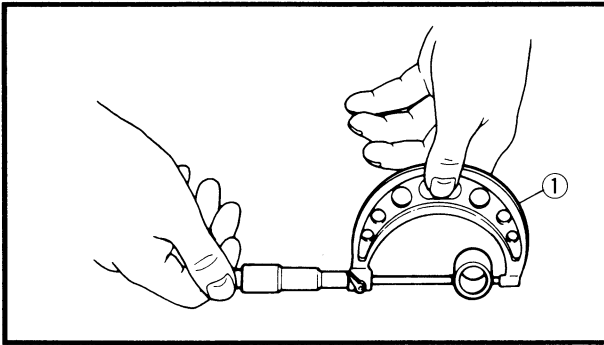
NOTE: _____

- Install the piston ring into the cylinder.
- Push the ring with the piston crown.

Piston pin and bearing inspection

1. Inspect:

- Piston pin
- Bearing
Signs of heat discoloration → Replace.

**2. Measure:**

- Piston pin outside diameter
Use micrometer ①.
Out of limit → Replace.

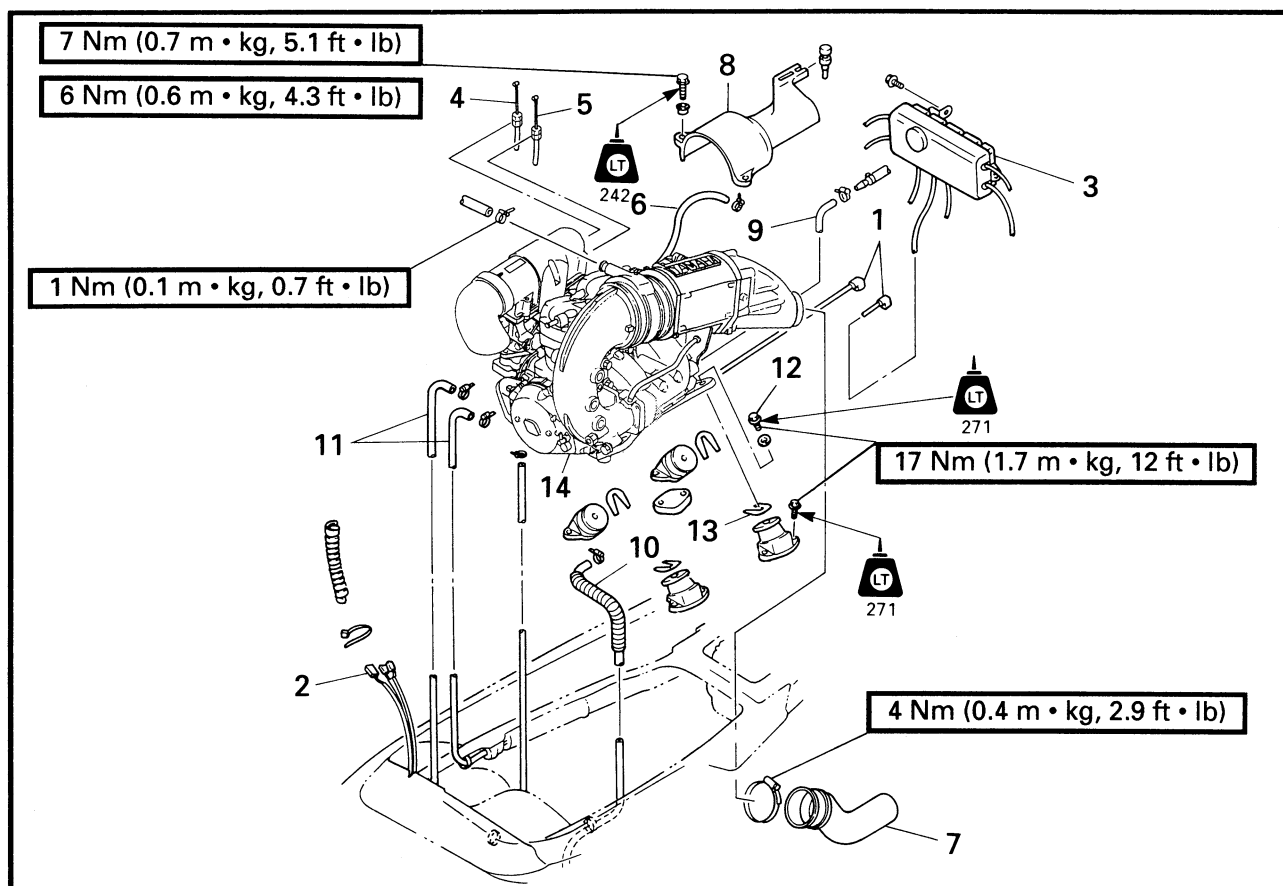
**Piston pin outside diameter:****Standard****19.995 ~ 20.000 mm****(0.7872 ~ 0.7874 in)****Limit****19.98 mm (0.786 in)****3. Check:**

- Free play (when the piston pin is in place in the piston)
There should be no noticeable free play.
Free play exist → Replace piston pin and/or piston.

4. Check:

- Free play
There should be no noticeable free play.
Free play exist → Inspect the connecting rod for wear/Replace the pin and/or connecting rod as required.

ENGINE UNIT REMOVAL EXPLODED DIAGRAM



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	ENGINE UNIT REMOVAL		Follow the left "Step" for removal.
1	Battery lead	2	
2	Handle switch and meter lead coupler	3	
3	Electrical box	1	
4	Choke cable	1	
5	Throttle cable	1	
6	Grease hose	1	
7	Exhaust hose	1	
8	Coupling cover	1	
9	Water inlet hose	1	
10	Pilot water hose	1	
11	Fuel hose	2	
12	Engine mounting bolt	4	
13	Shim	*	
14	Engine unit	1	
			Reverse the removal steps for installation.

*: As required

**SERVICE POINTS****Shim removal**

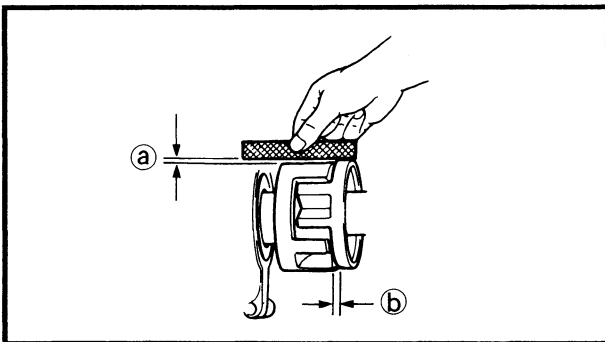
1. Remove:
 - Shim

NOTE:

Mark the engine mounting shim packs prior to the mounting bolt removal for ease of reassembly and coupling alignment.

Mount bracket inspection

1. Inspect:
 - Mount bracketCrack/Damage → Replace.

**Coupling clearance inspection**

1. Check:
 - Clearance ①
 - Clearance ②Out of specification → Adjust using shim.

NOTE:

- Before measuring the clearance, remove the coupling rubber.
- Attach a straight edge and a thickness gauge.

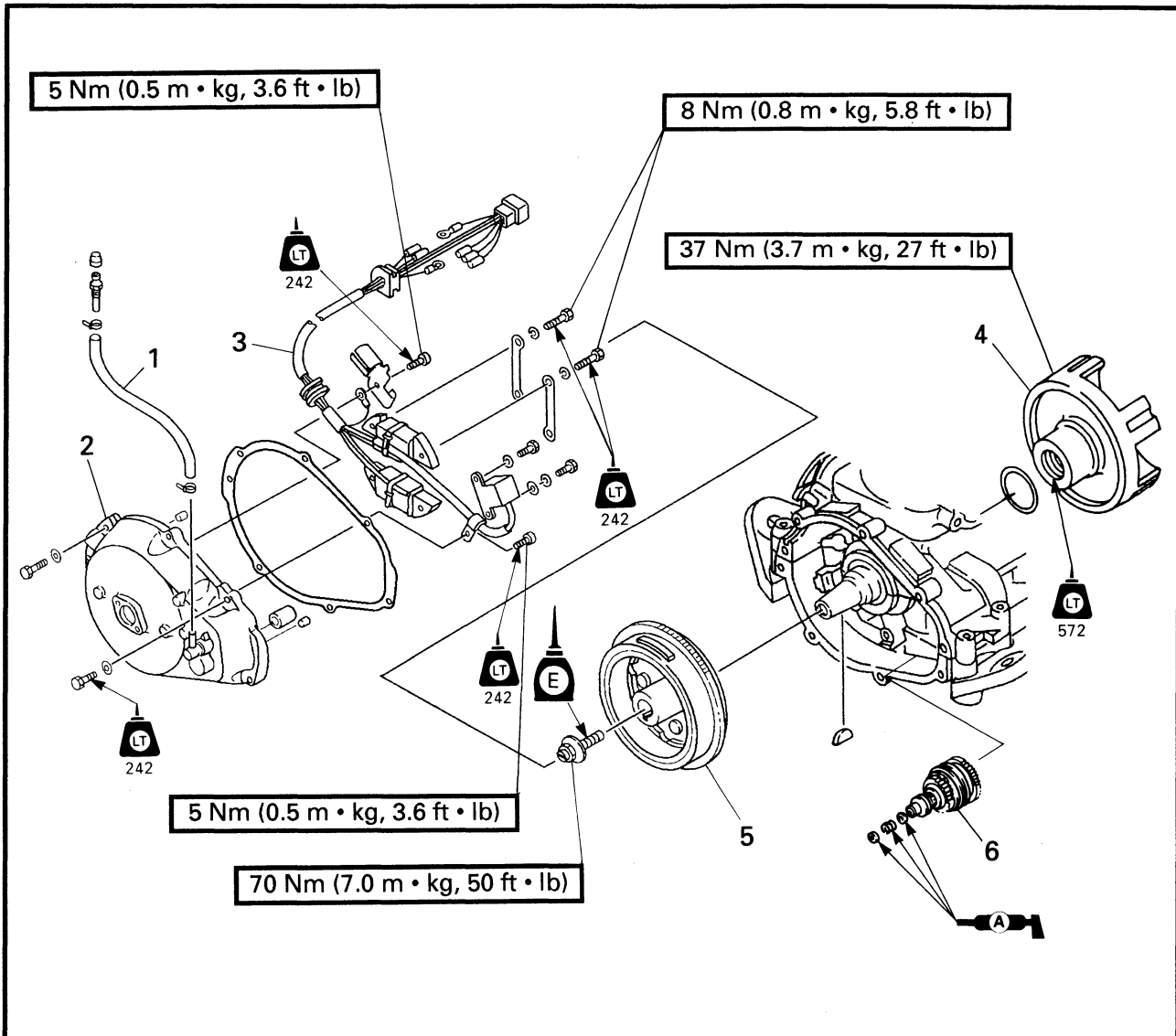
**Clearance ①:**

0 ~ 1.0 mm (0 ~ 0.039 in)

Clearance ②:

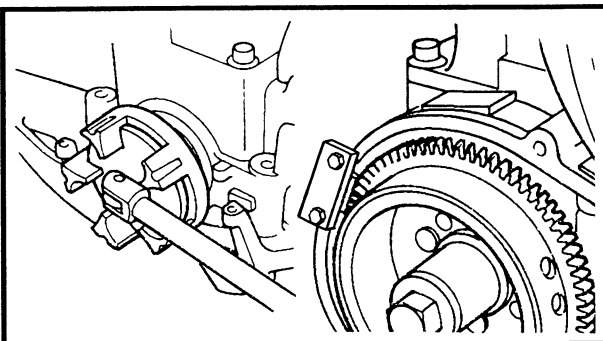
2 ~ 4 mm (0.079 ~ 0.157 in)

**FLYWHEEL MAGNETO AND BASE
EXPLODED DIAGRAM**



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	FLYWHEEL MAGNETO AND BASE DISASSEMBLY		Follow the left "Step" for removal.
	Fuel tank		Refer to "FUEL TANK" in chapter 4.
	Oil pump		Refer to "OIL PUMP" in chapter 4.
1	Grease hose	1	
2	Flywheel cover	1	
3	Base assembly	1	
4	Coupling flange	1	
5	Flywheel magneto	1	
6	Idle gear assembly	1	
			Reverse the removal steps for installation.



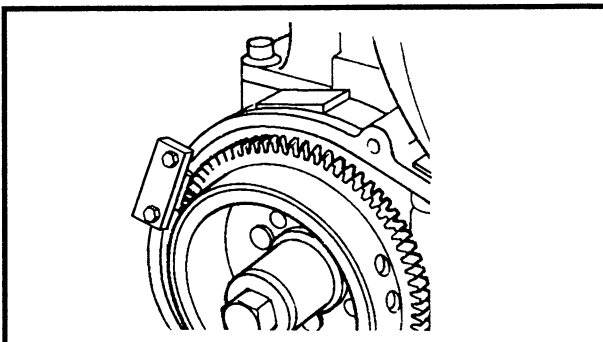
SERVICE POINTS

Coupling flange removal and installation

1. Remove and install:
 - Coupling flange



Coupler wrench:
YW-06546/90890-06546
Flywheel holder:
YW-06547/90890-06547



Flywheel magneto removal and installation

1. Remove and install:
 - Bolt

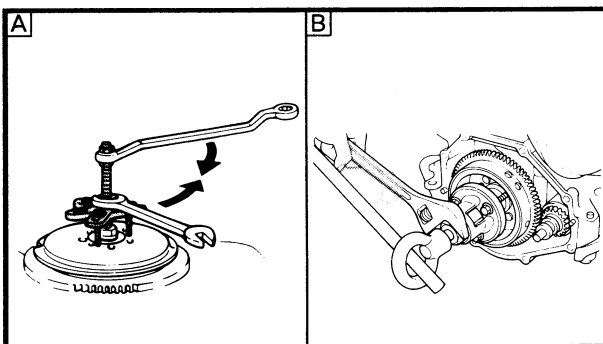


Flywheel holder:
YW-06547/90890-06547

2. Remove:
 - Flywheel magneto



Flywheel puller:
YB-06117/90890-06521



A For USA and CANADA

B Except for USA and CANADA

CAUTION

To prevent damage to the engine or tools, screw in the flywheel puller set- bolts evenly and completely so that the puller plate is parallel to the flywheel.

Coupling flange inspection

1. Inspect:
 - Coupling flange

Wear/Damage → Replace.

Flywheel magneto inspection

1. Inspect:
 - Flywheel gear

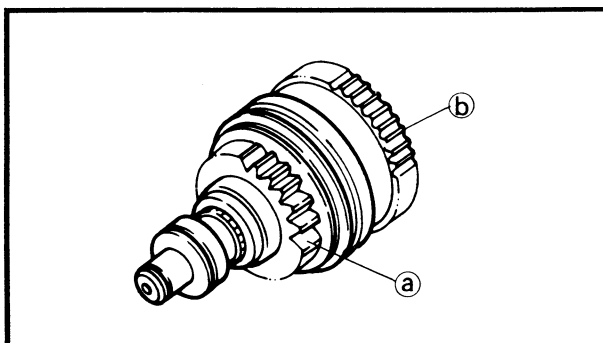
Wear/Damage → Replace.

Idle gear assembly inspection

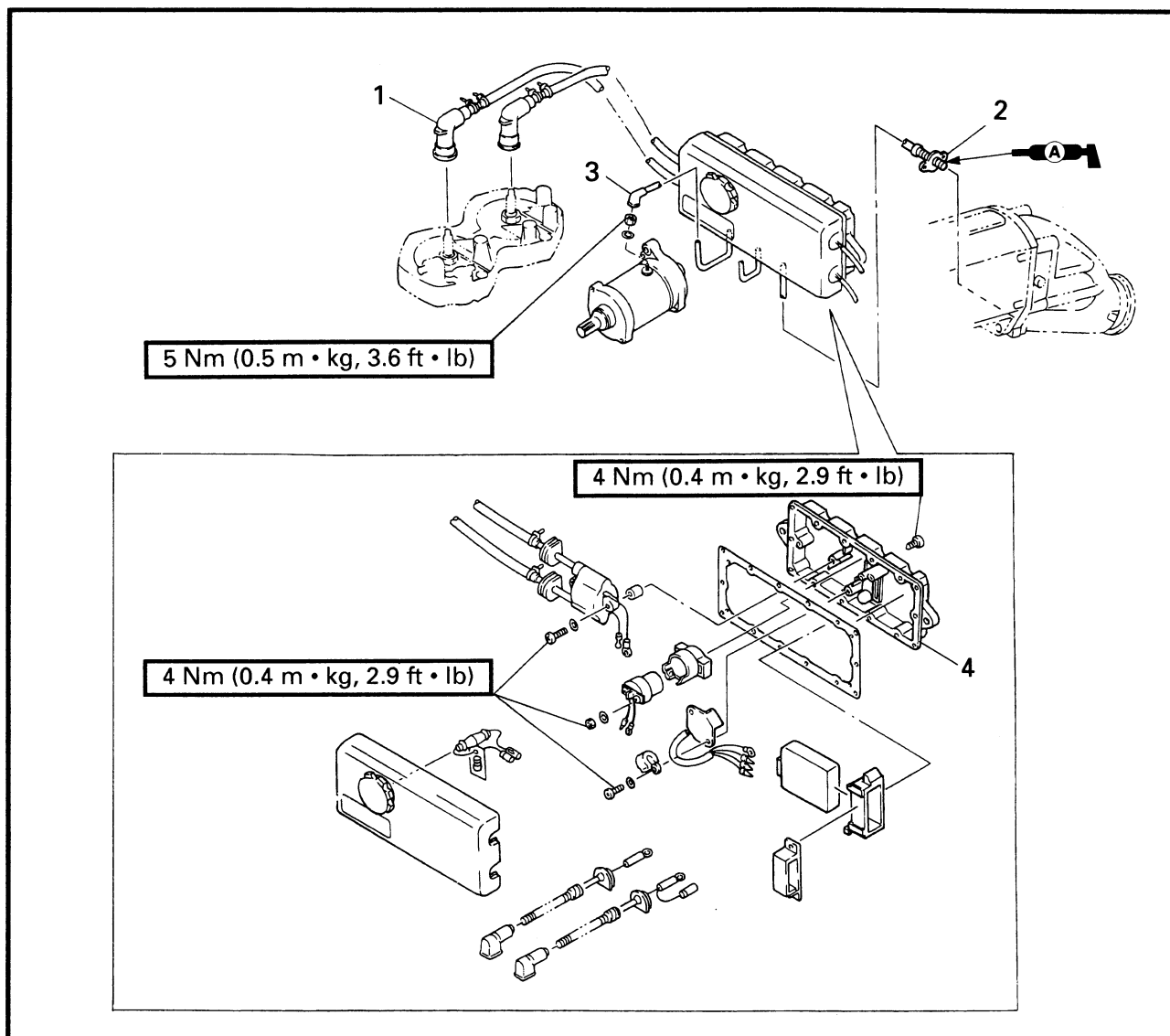
1. Inspect:
 - Pinion gear ①
 - Inner gear ②

Wear/Damage → Replace.
2. Check:
 - Clutch movement

Unsmooth movement → Replace.



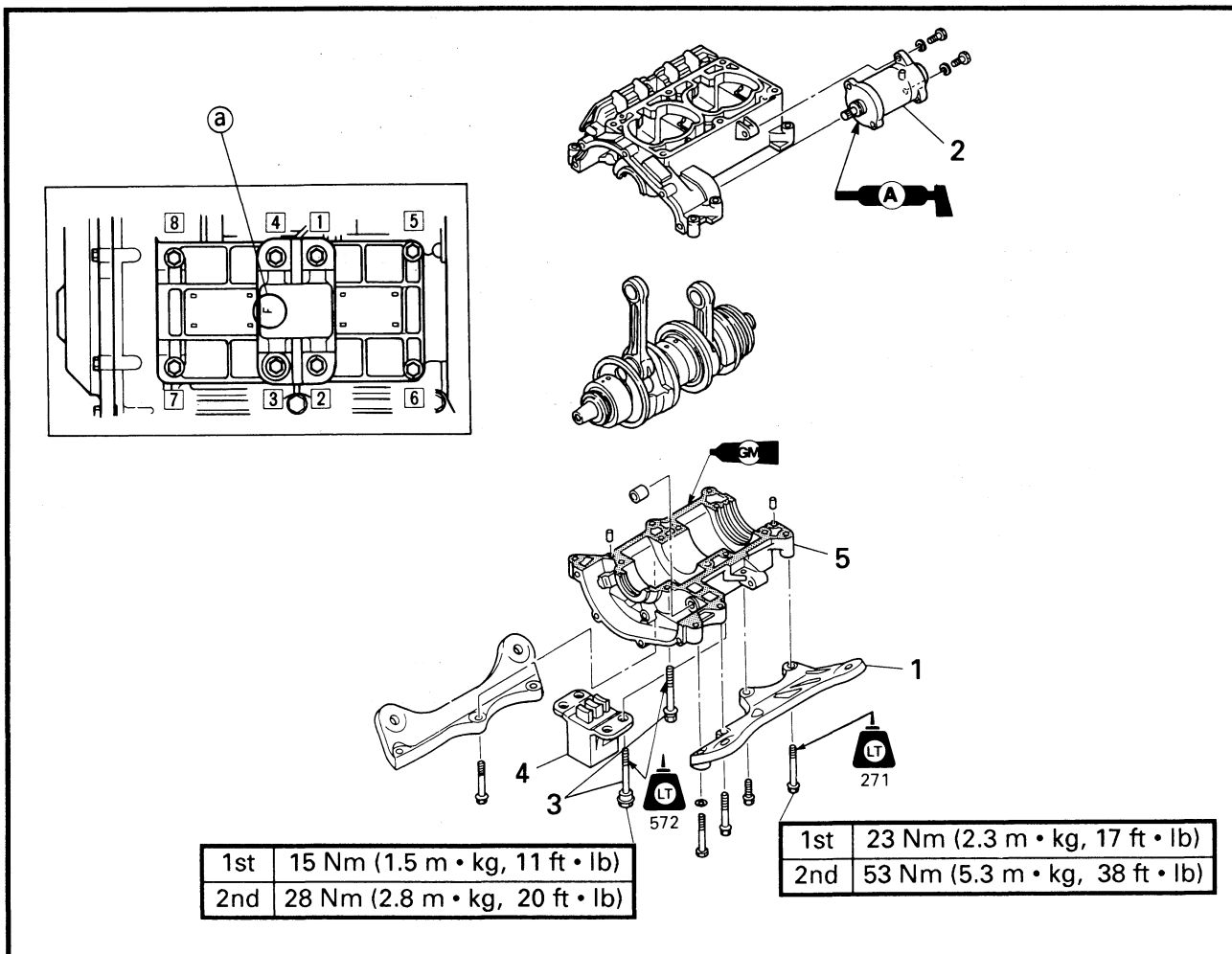
**ELECTRICAL UNIT
EXPLODED DIAGRAM**



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	ELECTRICAL UNIT REMOVAL		
	Electrical box		Follow the left "Step" for removal.
	Base assembly		Refer to "ENGINE UNIT REMOVAL".
1	Spark plug cap	2	Refer to "FLYWHEEL MAGNETO AND BASE".
2	Thermo switch	1	
3	Starter motor negative lead	1	
4	Housing	1	
			Reverse the removal steps for installation.

CRANKCASE EXPLODED DIAGRAM



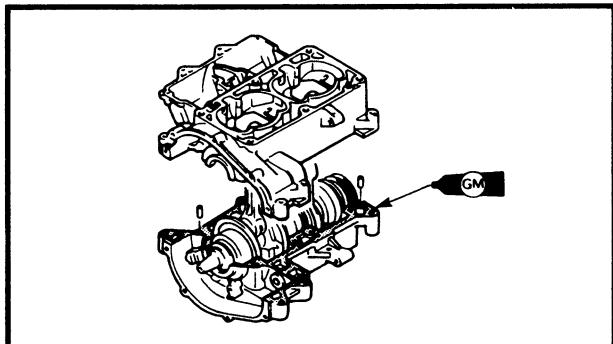
REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	CRANKCASE DISASSEMBLY		
	Base assembly		Follow the left "Step" for removal. Refer to "FLYWHEEL MAGNETO AND BASE".
	Piston		Refer to "PISTON".
1	Engine mount bracket	2	
2	Starter motor	1	
3	Bolt (with washer)	8	NOTE: _____ Tighten the bolts in sequence and in two steps of torque.
4	Mount rubber	1	NOTE: _____ Be sure that the "F" mark @ is on the fly-wheel side.
5	Crankcase	1	Reverse the removal steps for installation.

SERVICE POINTS

Crankcase inspection

1. Inspect:
 - Contacting surface
Scratch → Replace.
 - Crankcase
Crack/Damage → Replace.



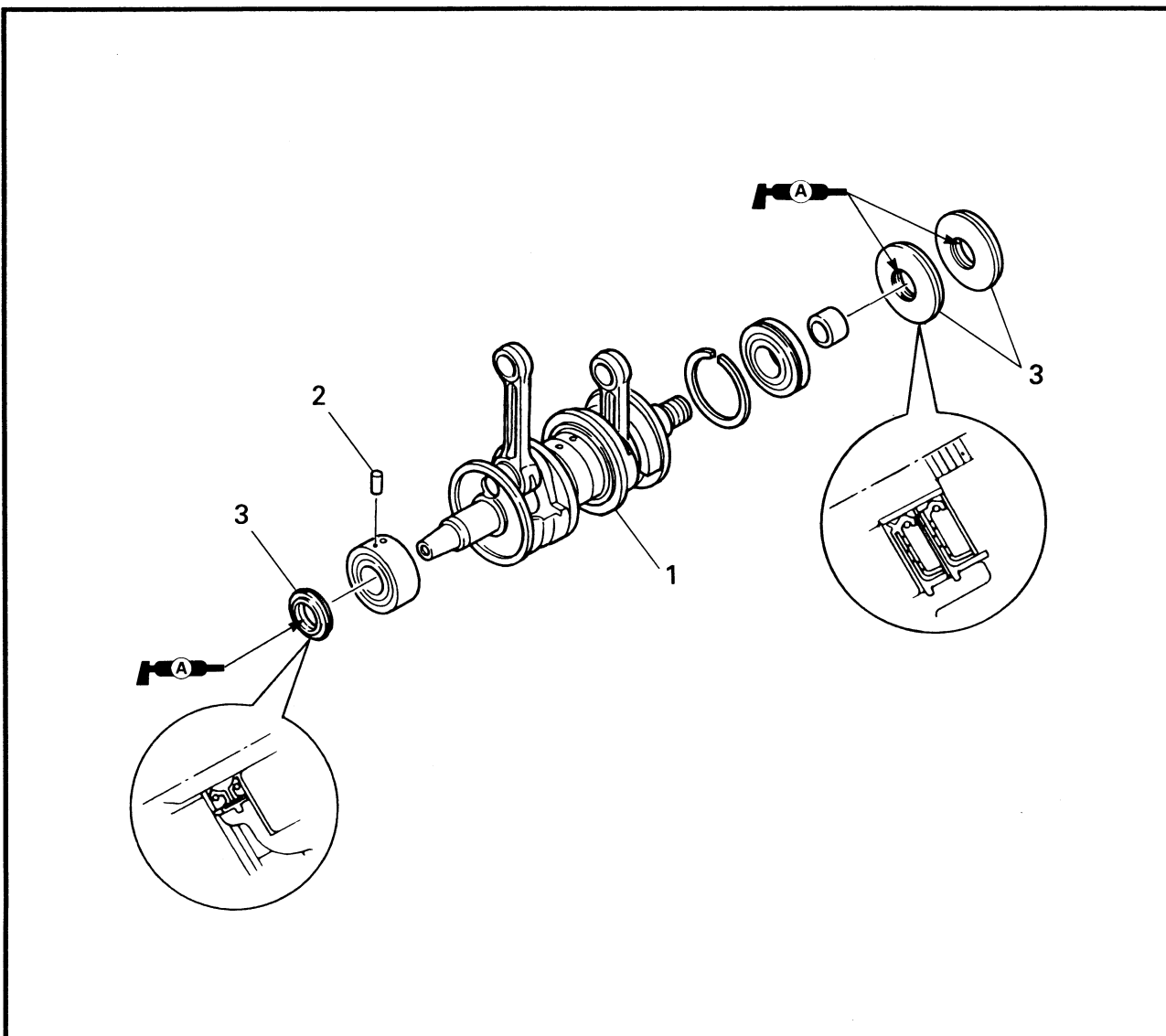
Crankcase installation

1. Apply:
 - Gasket Maker

NOTE: _____
 Clean the contacting surface of crankcase before applying the Gasket Maker.

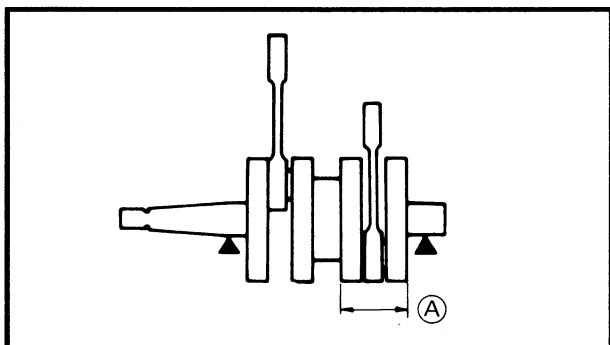
2. Check:
 - Crankshaft
Rough action → Repair.

CRANKSHAFT EXPLODED DIAGRAM



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
1	CRANKSHAFT REMOVAL Crankcase Crankshaft assembly	1	Follow the left "Step" for removal. Refer to "CRANKCASE". CAUTION: ● Do not allow the bearing clip open ends to meet the crankcase contacting surface. ● Place the locating pins on the bearing into the crankcase body groove.
2	Dowel pin	5	
3	Oil seal	3	
			Reverse the removal steps for installation.



SERVICE POINTS

Crankshaft inspection

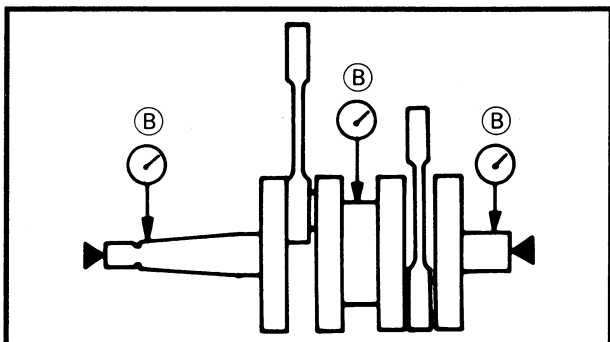
1. Measure:

- Crank width (A)

Out of specification → Replace.



Crank width:
61.95 ~ 62.00 mm
(2.439 ~ 2.441 in)



2. Measure:

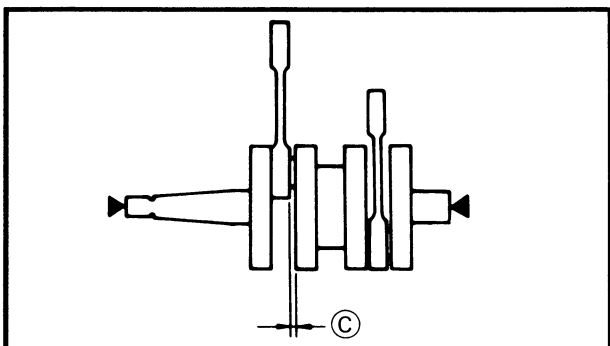
- Deflection (B)

Use a dial gauge.

Out of specification → Replace.



Maximum deflection:
0.05 mm (0.002 in)



3. Measure:

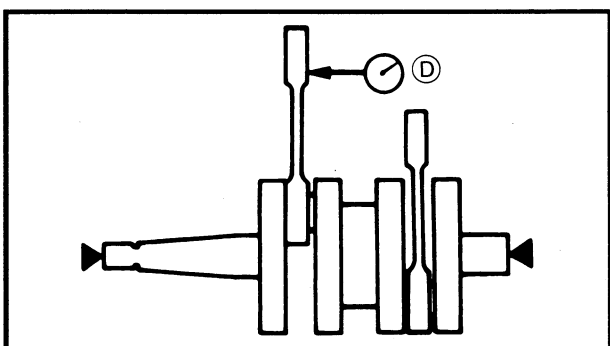
- Big end side clearance (C)

Use a thickness gauge.

Out of specification → Replace.



Big end side clearance:
0.25 ~ 0.75 mm
(0.010 ~ 0.030 in)



4. Measure:

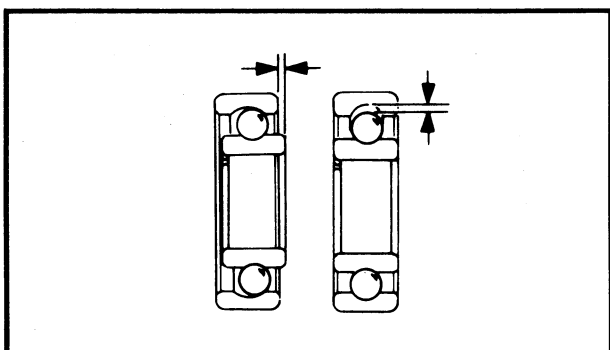
- Small end free play (D)

Use a dial gauge.

Out of specification → Replace.



Small end free play:
2.0 mm (0.08 in)



5. Inspect:

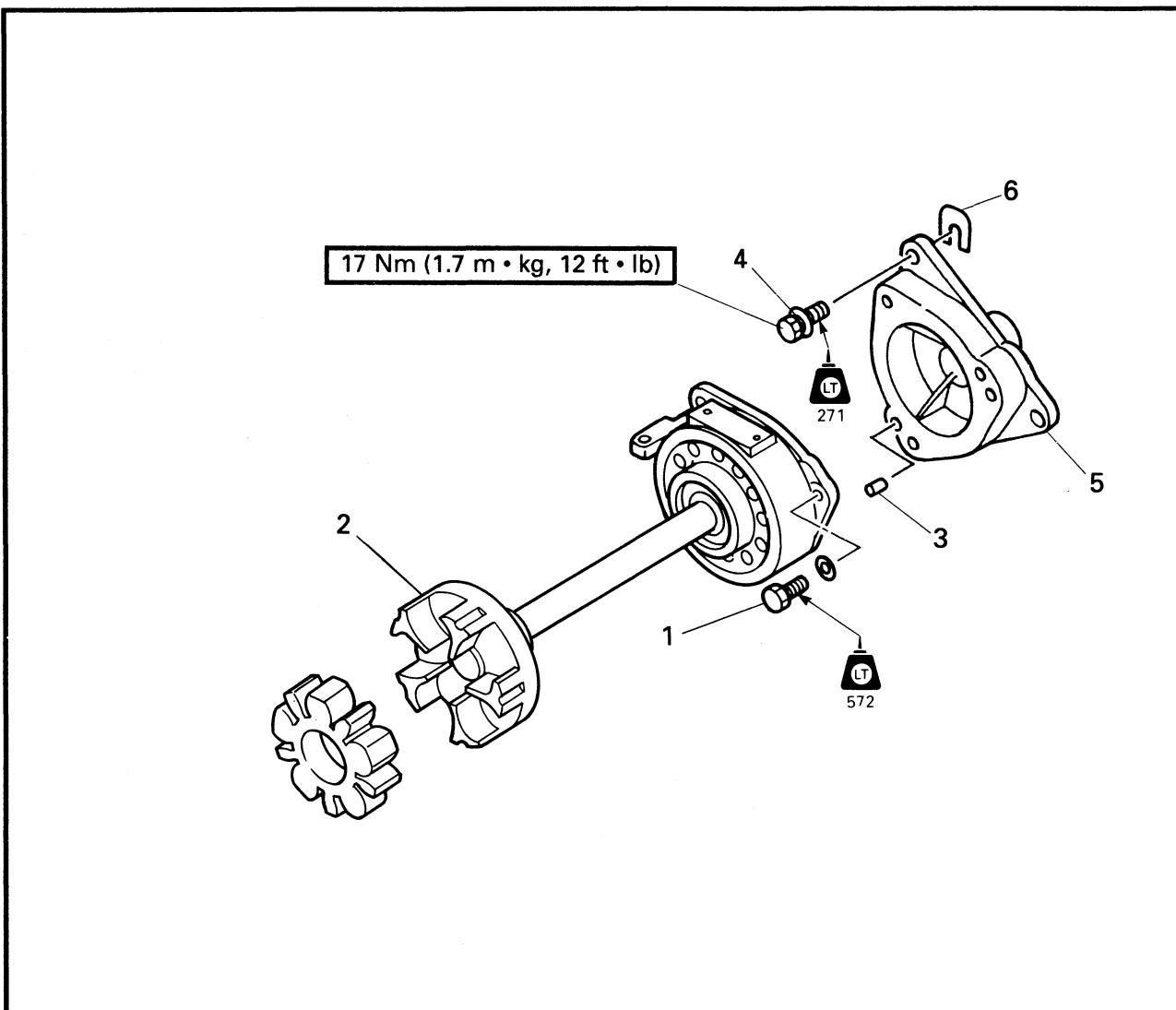
- Crankshaft bearing

Pitting/Damage → Replace.

NOTE: _____

Lubricate the bearings immediately after examining them to prevent rusting.

**INTERMEDIATE HOUSING REMOVAL
EXPLODED DIAGRAM**

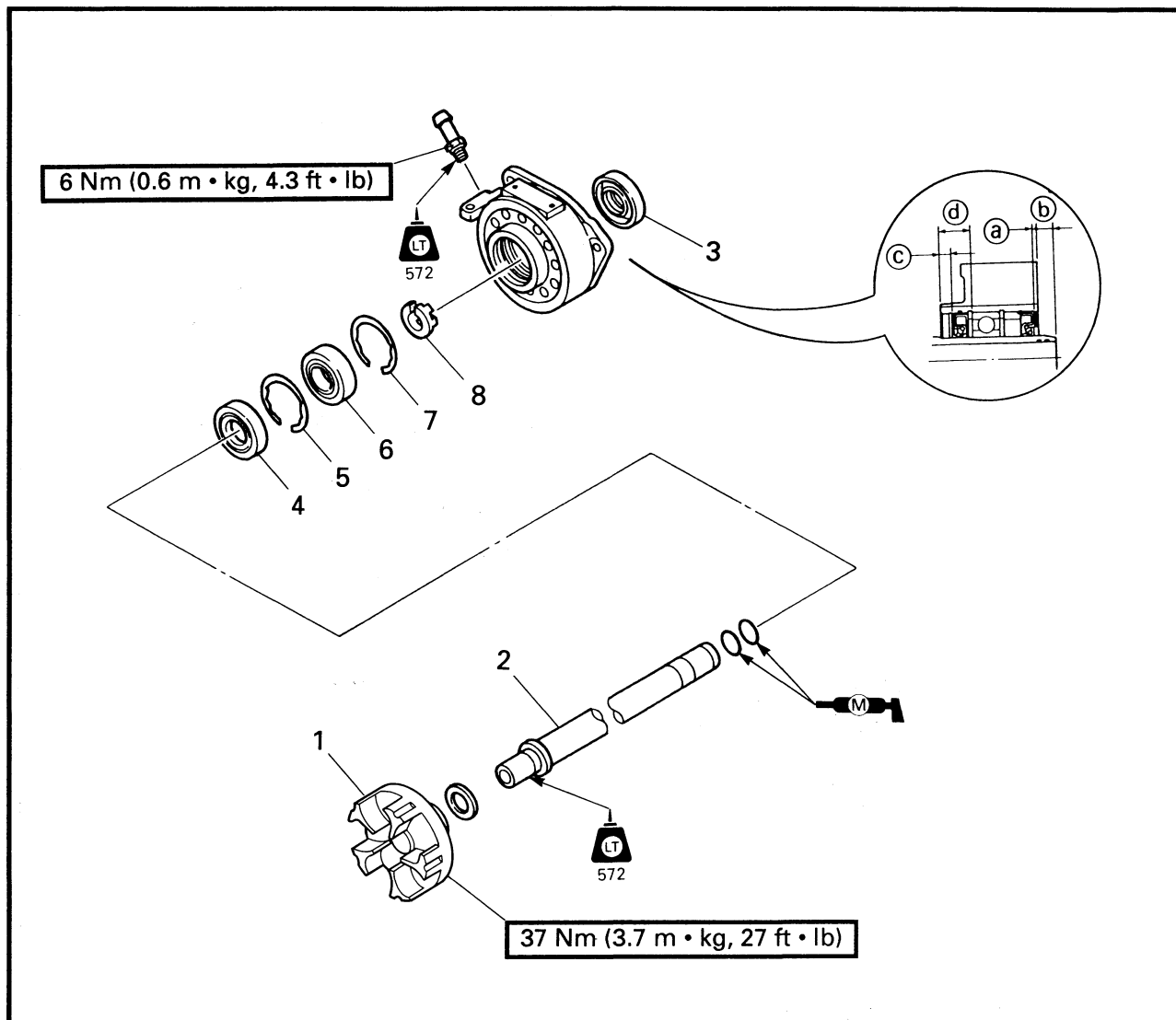


REMOVAL AND INSTALLATION CHART


Step	Procedure/Part name	Q'ty	Service points
	INTERMEDIATE HOUSING REMOVAL		Follow the left "Step" for removal.
	Engine unit		Refer to "ENGINE UNIT REMOVAL".
1	Bolt (with washer)	3	
2	Bearing housing assembly	1	
3	Pin	2	
4	Bolt (with washer)	3	
5	Housing	1	
6	Shim	*	
			NOTE: _____ Install the previously marked shims back into their original location. _____ Reverse the removal steps for installation.

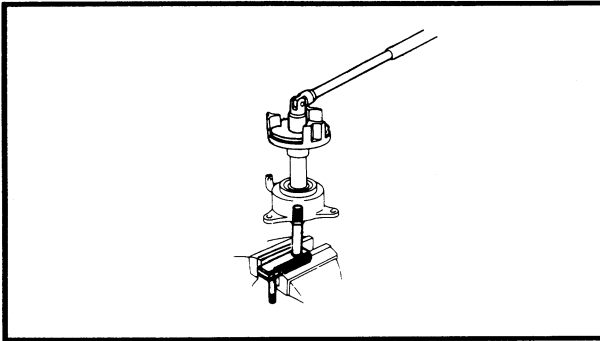
*: As required

**INTERMEDIATE HOUSING
EXPLODED DIAGRAM**



REMOVAL AND INSTALLATION CHART

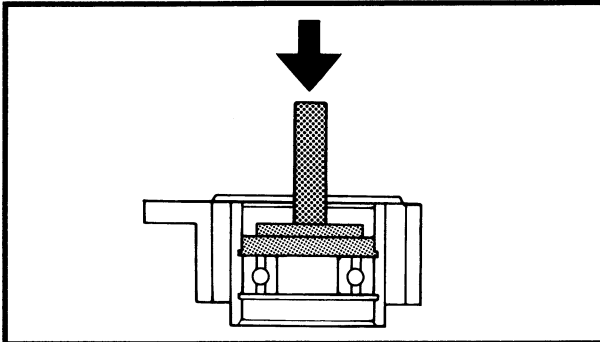
Step	Procedure/Part name	Q'ty	Service points
	INTERMEDIATE HOUSING DISASSEMBLY		Follow the left "Step" for removal.
	Bearing housing assembly		Refer to "INTERMEDIATE HOUSING REMOVAL".
1	Coupling	1	 Distance: a: 1.6 ~ 2.0 mm (0.06 ~ 0.08 in) b: 14.5 ~ 15.5 mm (0.57 ~ 0.61 in) c: 6.8 ~ 7.2 mm (0.27 ~ 0.28 in) d: 17.6 ~ 17.7 mm (0.69 ~ 0.70 in)
2	Shaft	1	
3	Oil seal	1	
4	Oil seal	1	
5	Clip	1	
6	Bearing	1	
7	Clip	1	
8	Spacer	1	
			Reverse the removal steps for installation.

**SERVICE POINTS****Coupling removal and installation**

1. Remove and install:
 - Coupling



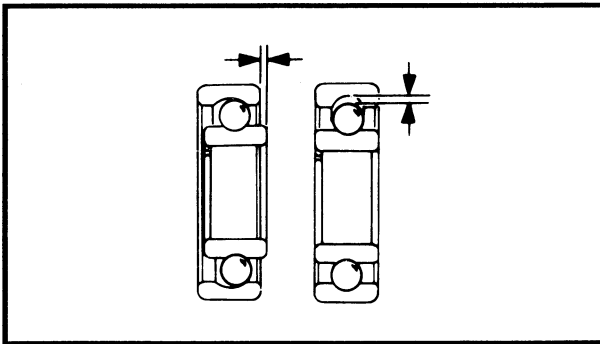
Coupler wrench:
YW-06546/90890-06546
Shaft holder:
YW-38742/90890-06069

**Bearing removal and installation**

1. Remove and install:
 - Bearing



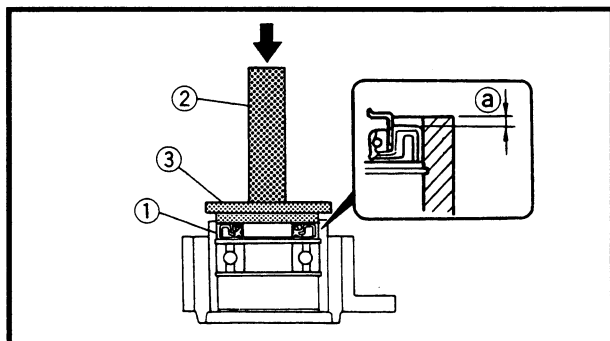
Driver rod:
YB-06071/90890-06606
Bearing outer race attachment:
YB-06016/90890-06626

**Bearing inspection**

1. Inspect:
 - Bearing
 - Rotate inner race by hand.
 - Rough spots/Seizure → Replace.
 - Shaft
 - Pitting/Damage → Replace.
 - Hose
 - Wear/Cracks → Replace.

Coupling inspection

1. Inspect:
 - Coupling flange
 - Coupling rubber
 - Wear/Damage → Replace.

**Oil seal installation****1. Install:**

- Oil seal [T = 8 mm (0.31 in)]

**Distance (a):**

6.8 ~ 7.2 mm (0.27 ~ 0.28 in)

**Driver rod:**

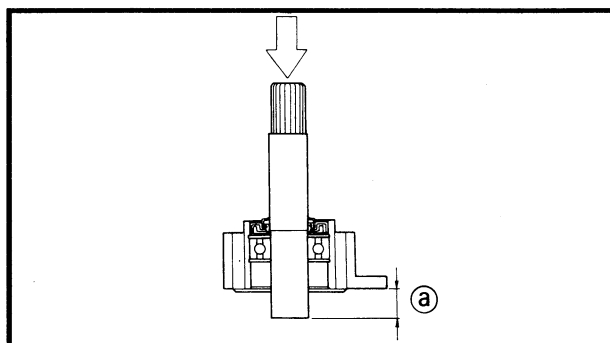
YB-06071/90890-06606

Bearing outer race attachment:

YB-06016/90890-06626

NOTE:

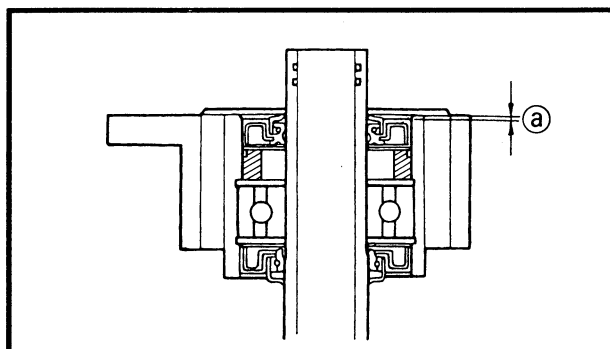
Fill the with water resistant grease clip inner circumference before installing the oil seal.

**2. Install:**

- Shaft

**Distance (a):**

14.5 ~ 15.5 mm (0.57 ~ 0.61 in)

**3. Install:**

- Oil seal [T = 10 mm (0.38 in)]

**Distance (a):**

1.6 ~ 2.0 mm (0.06 ~ 0.08 in)

NOTE:

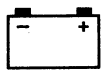
Fill the with water resistant grease clip inner circumference before installing the oil seal.

4. Fill:

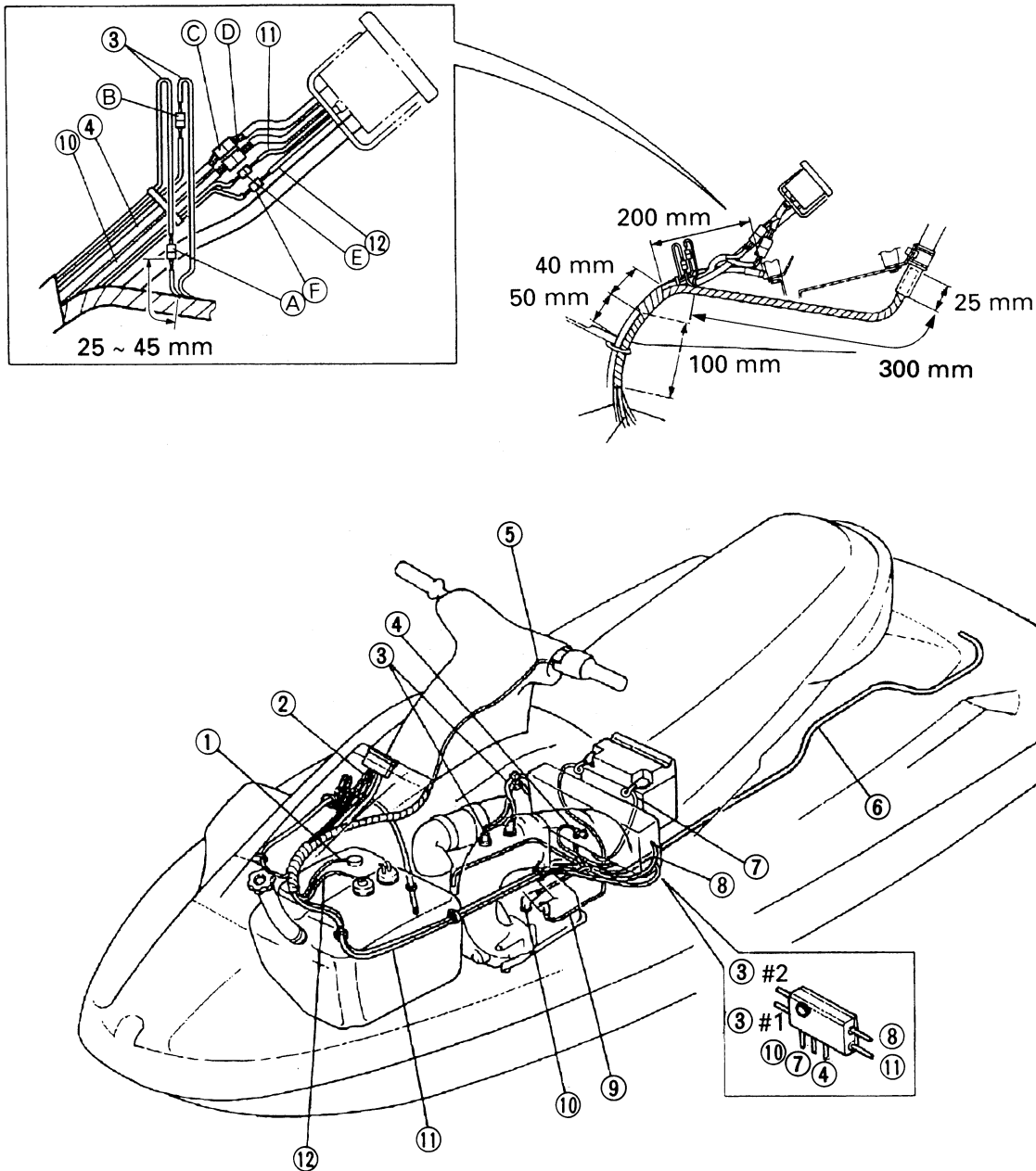
- Shaft

**Water resistant grease:**

8 cm³ (0.5 cu. in)



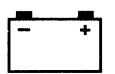
ELECTRICAL COMPONENTS



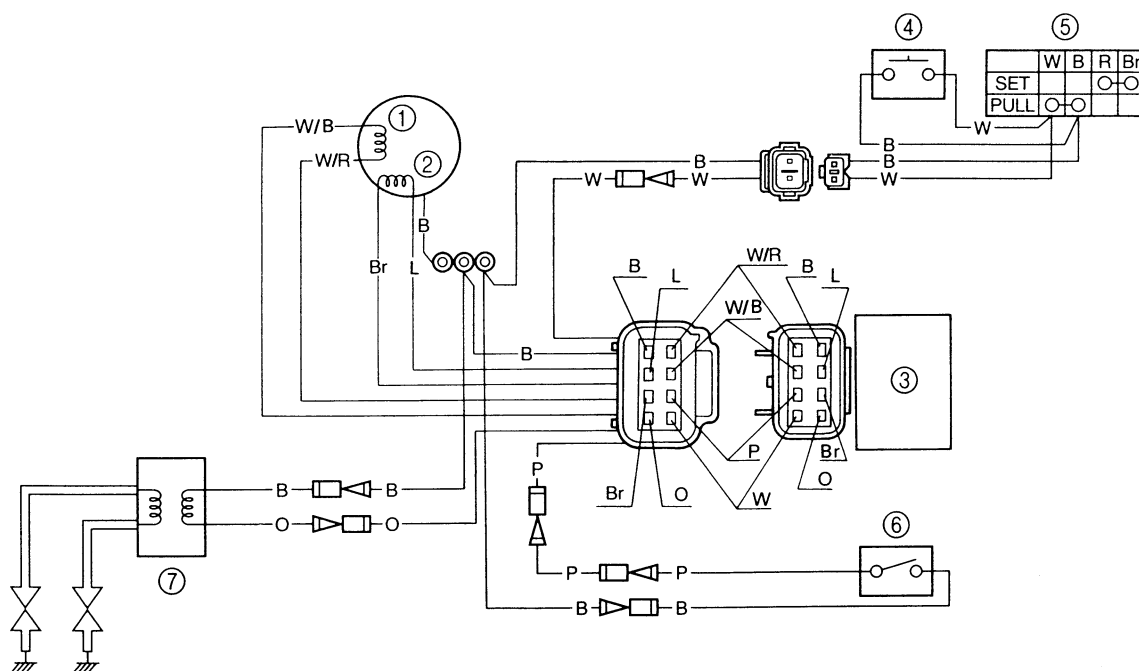
- ① Oil level sensor lead
- ② Multi function meter lead
- ③ High tension cord
- ④ Thermo sensor lead
- ⑤ Handle switch lead
- ⑥ Speed sensor lead
- ⑦ Battery (positive) lead
- ⑧ Flywheel magneto base lead
- ⑨ Battery (negative) lead
- ⑩ Starter motor (positive) lead

- ⑪ Handle switch and meter extension lead
- ⑫ Fuel level sensor lead

- A 2P connector (Black)
- B 2P connector (White)
- C 3P connector (White)
- D 4P connector (White)
- E 2P connector (Green)
- F 2P connector (White)

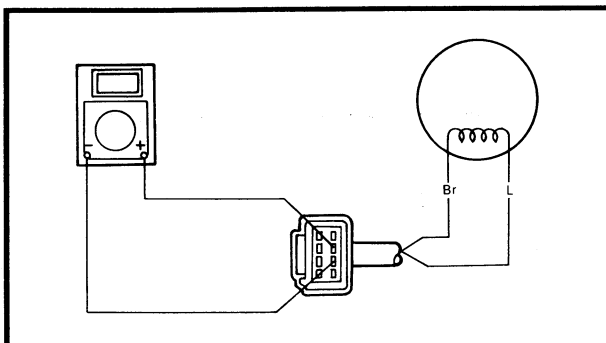
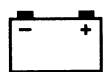


IGNITION SYSTEM WIRING DIAGRAM



- ① Pulser coil
- ② Charge coil
- ③ CDI unit
- ④ Stop switch
- ⑤ Engine stop switch
- ⑥ Thermo switch
- ⑦ Ignition coil

B : Black
 Br : Brown
 L : Blue
 O : Orange
 P : Pink
 W : White
 W/B : White/Black
 W/R : White/Red

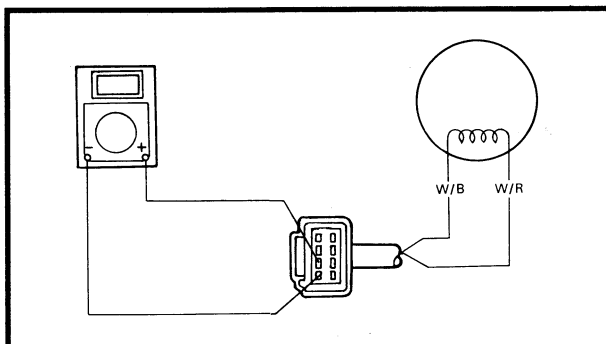
**CHARGE COIL**

1. Measure:

- Charge coil resistance
- Out of specification → Replace.



Charge coil resistance:
Brown (Br) – Blue (L)
316.8 ~ 387.2 Ω at 20°C (68°F)

**PULSER COIL**

1. Measure:

- Pulser coil resistance
- Out of specification → Replace.



Pulser coil resistance:
White/Red (W/R) –
White/Black (W/B)
445.5 ~ 544.5 Ω at 20°C (68°F)

CDI UNIT

1. Measure:

- CDI unit resistance
- Out of specification → Replace.



Pocket tester:
YU-03112/90890-03112

NOTE:

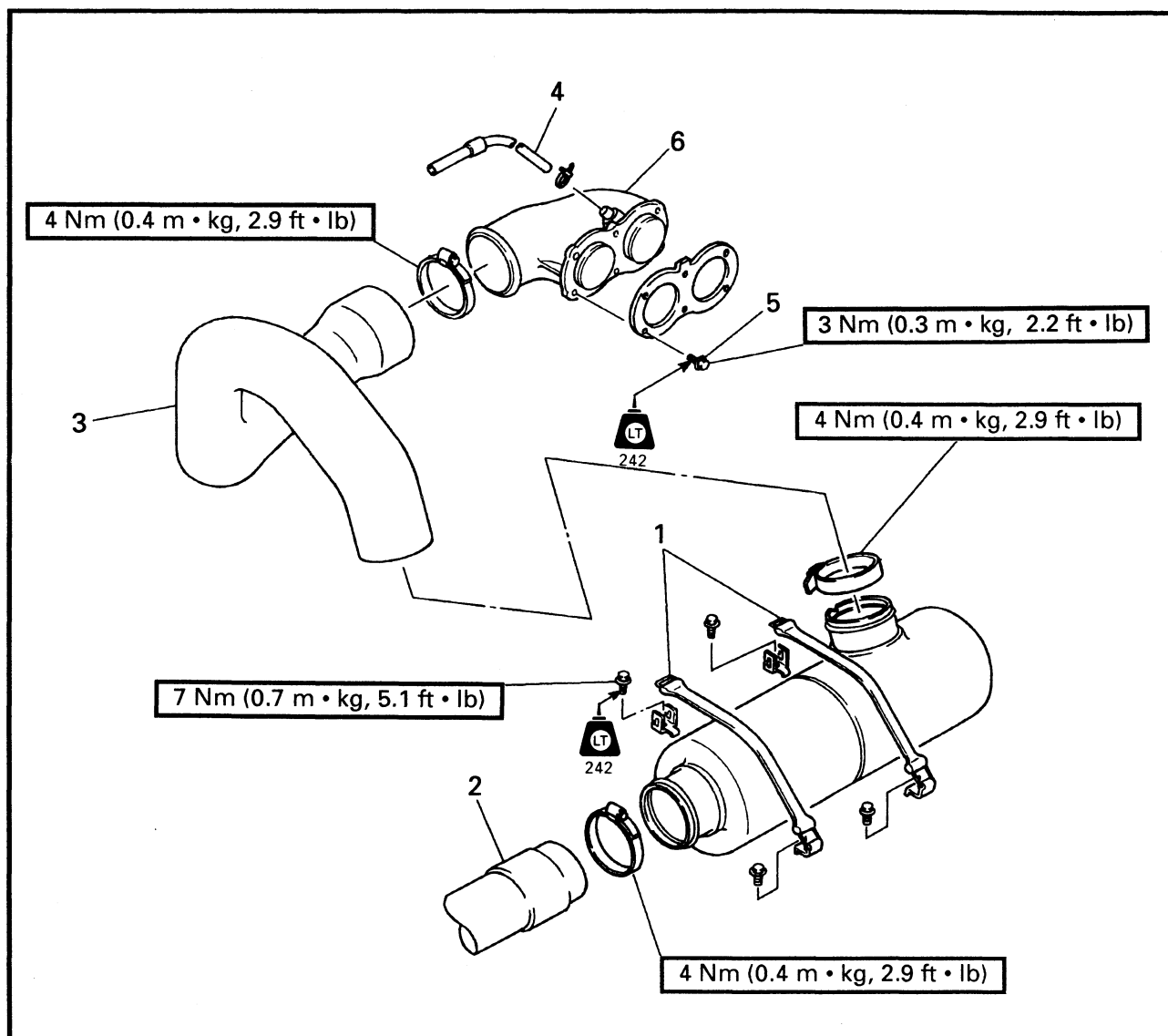
- The resistance values will vary from meter to meter, especially with electronic digital meters. For some testers, the polarity of the leads is reversed.
- The needle swings once to the “•” mark and then returns to the home position.
- The “ ∞ ” mark stands for discontinuity.

B : Black
 Br : Brown
 L : Blue
 O : Orange
 P : Pink
 W : White
 W/B : White/Black
 W/R : White/Red

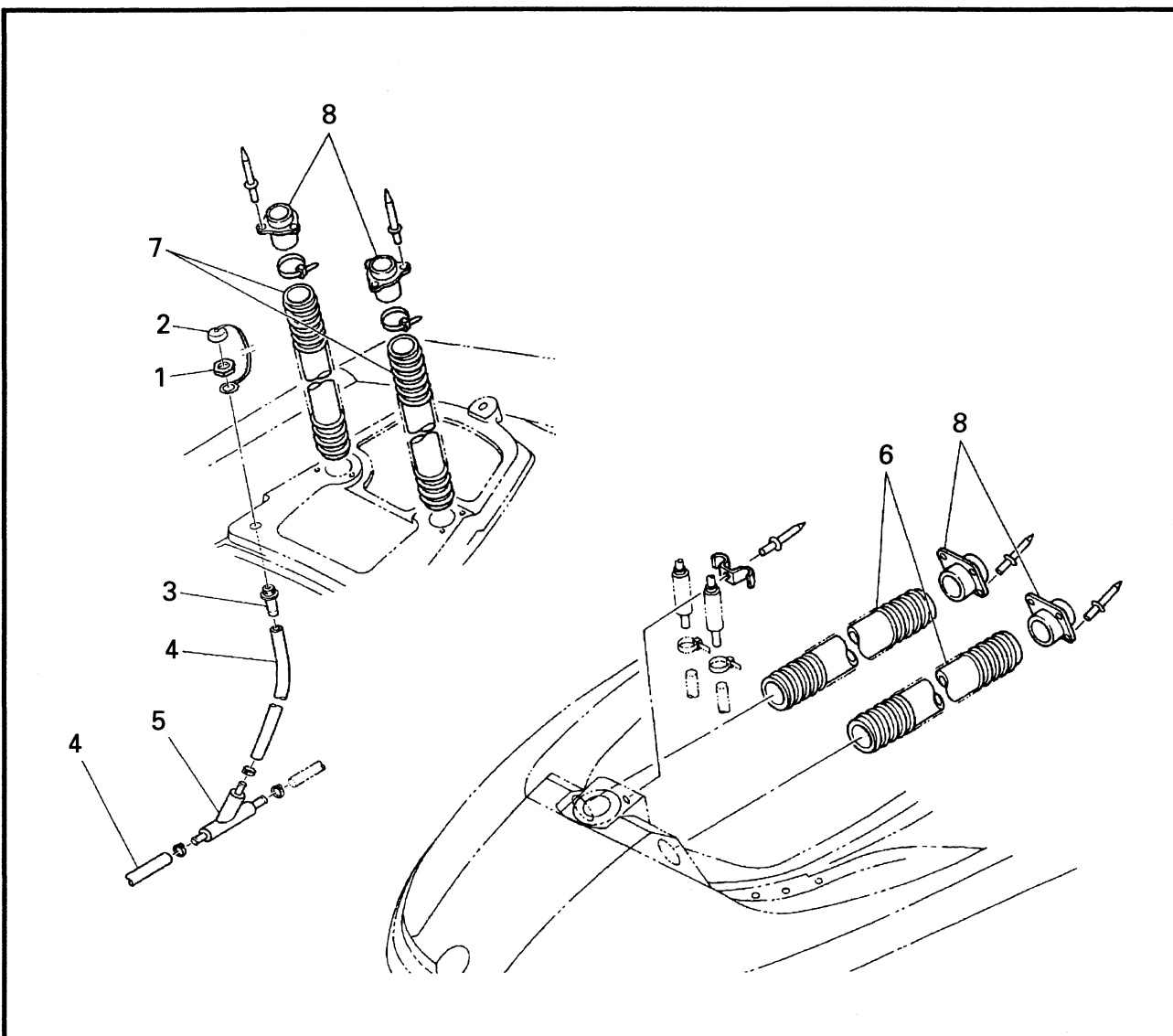
64X00

Unit: k Ω

\oplus	\ominus	W	P	W/B	W/R	O	Br	L	B
W			∞	3.8 ~ 16	9.5 ~ 4.0	11 ~ 45	80 ~ 400	3.4 ~ 14	3.8 ~ 16
P		7.5 ~ 35		17 ~ 70	22 ~ 100	40 ~ 300	70 ~ 1,000	16 ~ 70	17 ~ 80
W/B		10 ~ 45	∞		4.4 ~ 18	2 ~ 9	70 ~ 400	6 ~ 26	0 ~ 0.6
W/R		16 ~ 70	∞	4 ~ 17		8 ~ 35	70 ~ 400	13 ~ 60	4 ~ 17
O		∞	∞	∞	∞		∞	∞	∞
Br		26 ~ 150	∞	2.4 ~ 11	9 ~ 40	7.5 ~ 35		16 ~ 70	2.4 ~ 11
L		26 ~ 150	∞	2.4 ~ 11	9 ~ 40	7.5 ~ 35	80 ~ 500		2.4 ~ 11
B		10 ~ 45	∞	0 ~ 0.6	4.4 ~ 19	2 ~ 8.5	70 ~ 400	6 ~ 26	

**EXHAUST SYSTEM
EXPLODED DIAGRAM**

REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	EXHAUST SYSTEM REMOVAL		
	Fire extinguisher box		Follow the left "Step" for removal. Refer to "SEAT, STORAGE BOX, FIRE EXTINGUISHER BOX AND BATTERY CASE".
1	Band	2	
2	Exhaust hose	1	
3	Exhaust hose	1	
4	Water outlet hose	1	
5	Bolt (with washer)	6	
6	Exhaust guide	1	
			Reverse the removal steps for installation.

**FLUSHING AND VENTILATION SYSTEM
EXPLODED DIAGRAM**

REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	FLUSHING AND VENTILATION SYSTEM REMOVAL		Follow the left "Step" for removal.
1	Nut	1	
2	Cap	1	
3	Flushing hose joint	1	
4	Water inlet hose	2	
5	Hose joint	1	
6	Ventilation hose (front)	2	
7	Ventilation hose (rear)	2	
8	Guide plate	4	
			Reverse the removal steps for installation.

