YAMAHA

Marine

Water Vehicles

WaveRaider
RA760

SUPPLEMENTARY SERVICE MANUAL E

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.

RA700, RA700A, RA1100 SERVICE MANUAL: GH1-28197-Z5-C1

410001-0*

RA760
SUPPLEMENTARY SERVICE MANUAL

Printed in Japan
P/N GP2-28197-Z6-CX

GENERAL INFORMATION

SPECIFICATIONS

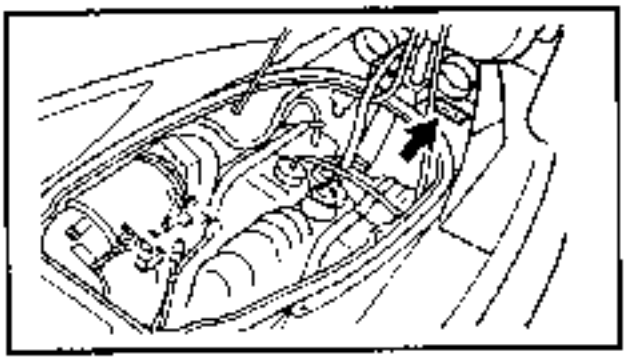
PERIODIC INSPECTION AND ADJUSTMENT

FUEL SYSTEM

POWER UNIT

ELECTRICAL SYSTEM

HULL AND HOOD



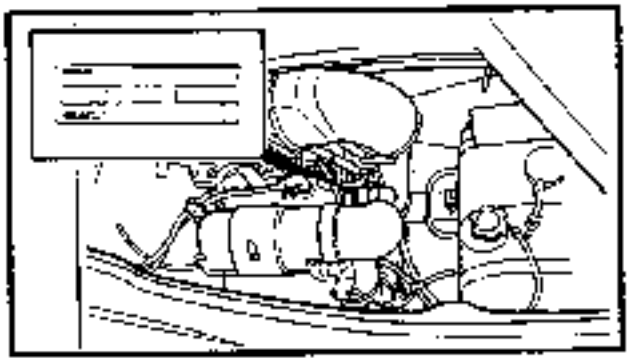
A6C700-0*

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

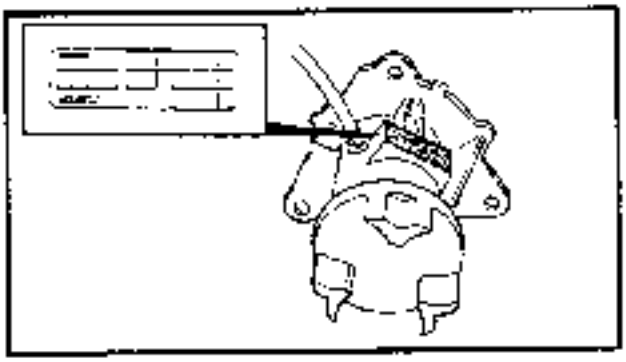
Starting primary I.D. number:
GP2: 800101 ~,
600101 ~ (FRA)



ENGINE SERIAL NUMBER

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

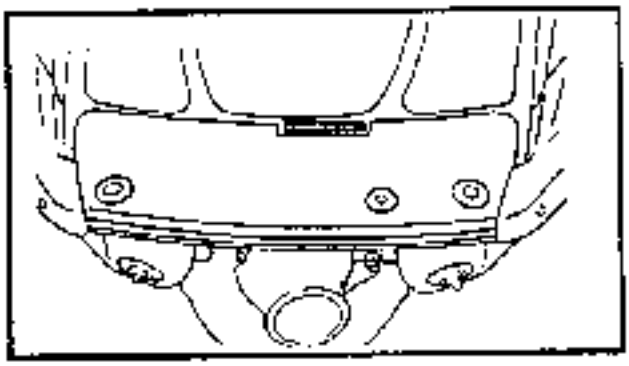
Starting serial number:
64X: 000101 ~



PUMP SERIAL NUMBER

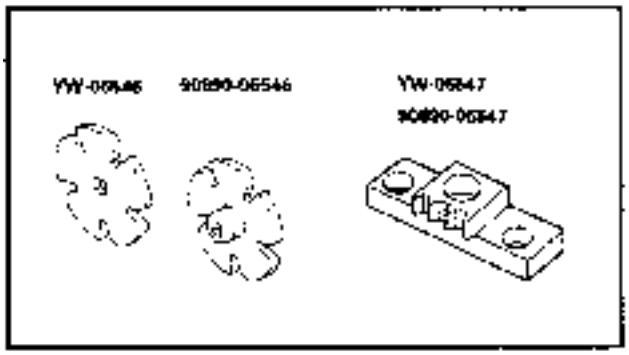
The jet pump unit serial number is stamped on a plate attached to the intermediate housing.

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.



SPECIAL TOOLS
REMOVAL AND INSTALLATION

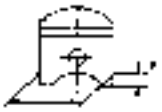
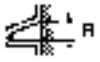
1. Coupler wrench
   P/N. YW-06546
   90890-06546
2. Flywheel holder
   P/N. YW-06547
   90890-06547

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	cm³ (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)	6.8 (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)	mm (in)	1.5 × 3.2 (0.06 × 0.13)
Side clearance		mm (in)	0.02 ~ 0.06 (0.0008 ~ 0.0024)
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)	19.96 (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)
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

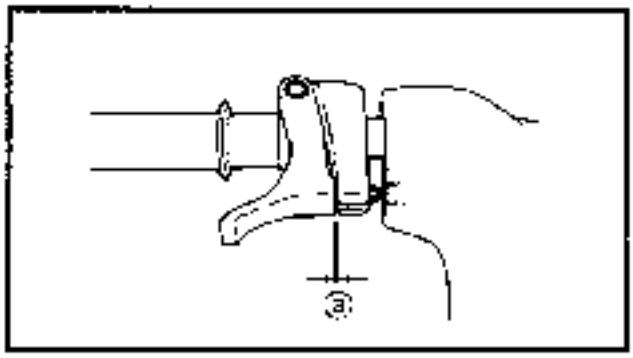
Part to be tightened		Part name	Size	Q'ty	Tightening torque Nm	Tightening torque m·kg	Tightening torque ft·lb	Remarks
ENGINE:								
Electric box		Bolt	M8	3	17	1.7	12	
Mounting bolt		Bolt	M8	4	17	1.7	12	
Reed valve		Screw	M4	16	1	0.1	0.7	
Exhaust ring		Bolt	M8	4	30	3.0	22	
Exhaust ring stay	1st	Bolt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

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 ⓐ
     Out of specification → Adjust.

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

FUEL SYSTEM

Trolling speed inspection and adjustment

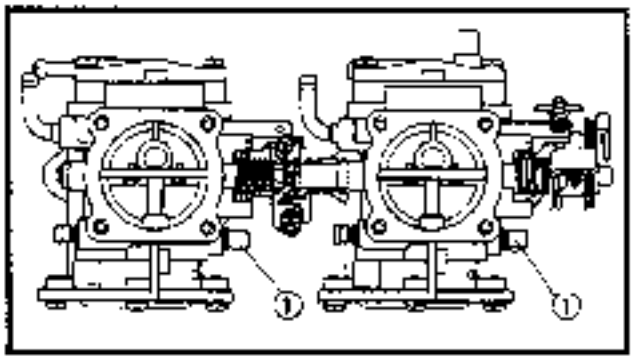
1. Check:
   - Trolling speed
     Out of specification → Adjust.

	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.

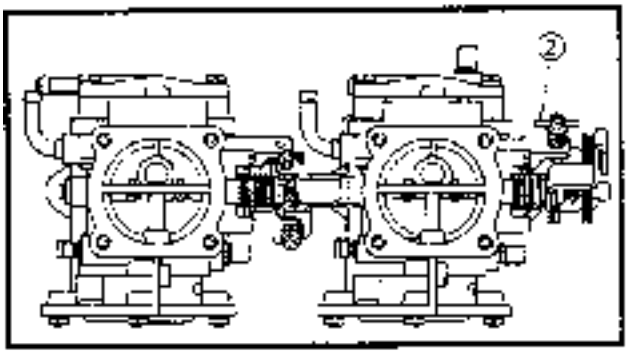
	Engine tachometer: **YU-8036-A/90890-06760**

- Measure the engine trolling speed.



2. Adjust:
   - Trolling speed

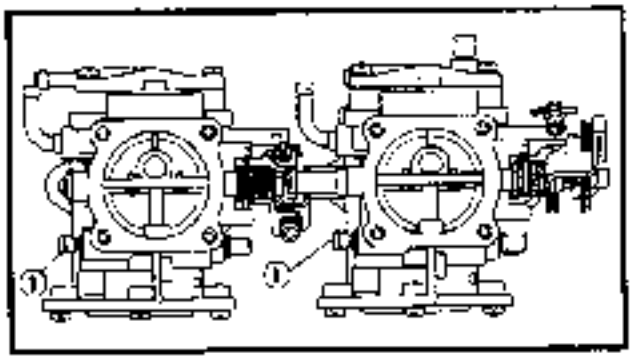
Adjustment steps:
- Screw in the low speed screws ① until they are lightly seated.
- Back the screws out by the specified number of turns.



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

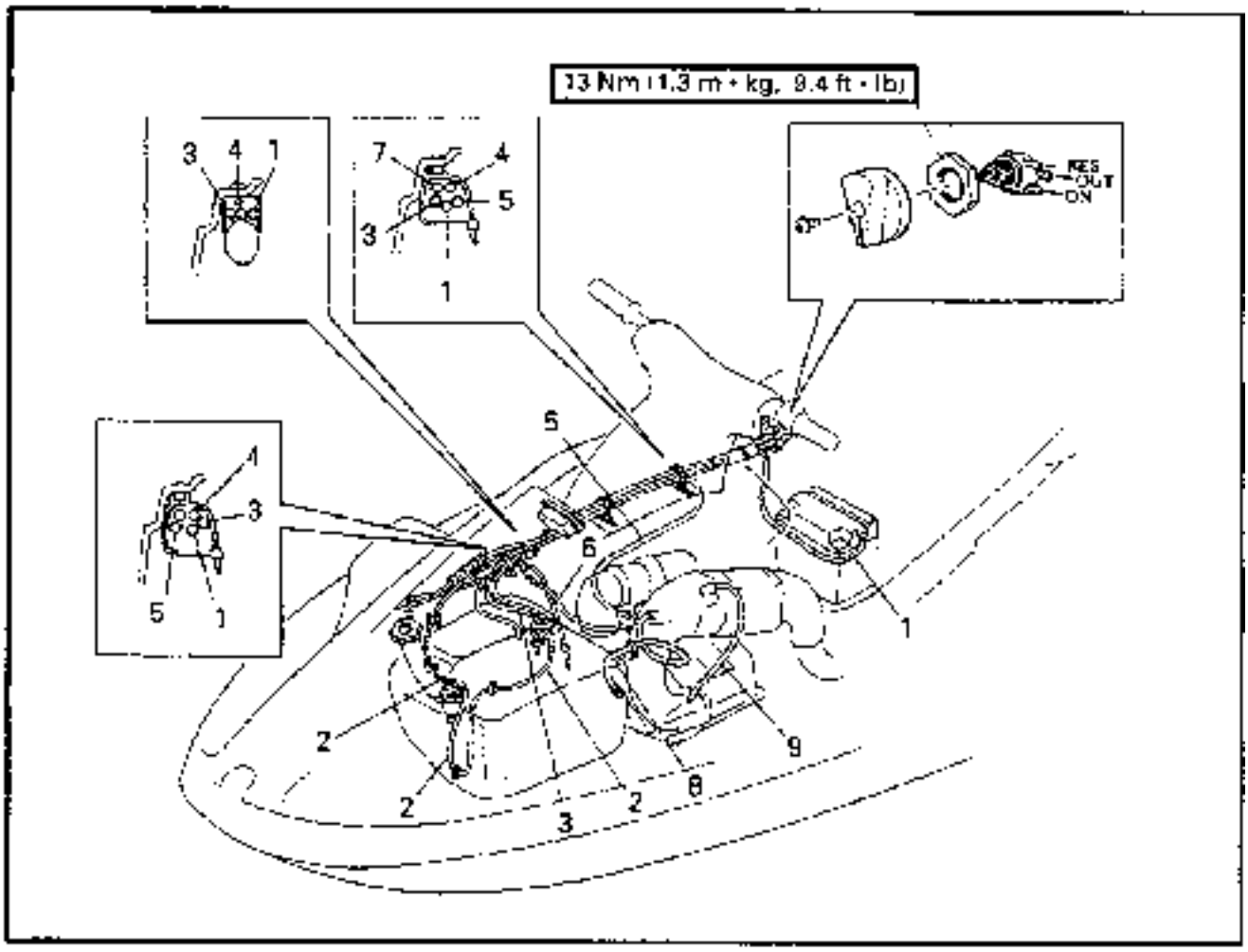
Adjustment steps:
- Screw in the high speed screws ① until they are lightly seated.
- Back the screws out by the specified number of turns.

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

⚠ WARNING

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

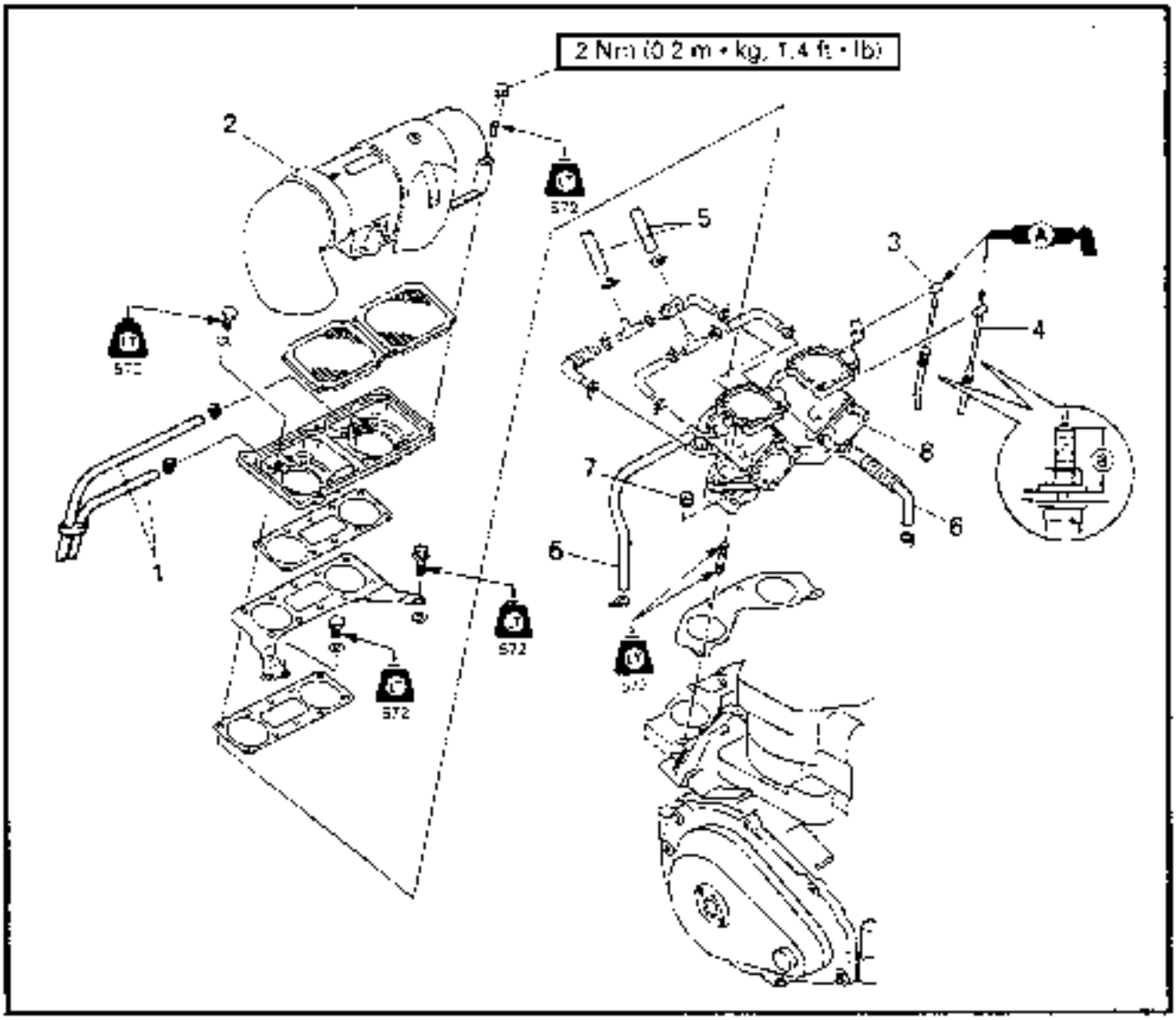
FUEL LINE
EXPLODED DIAGRAM



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.

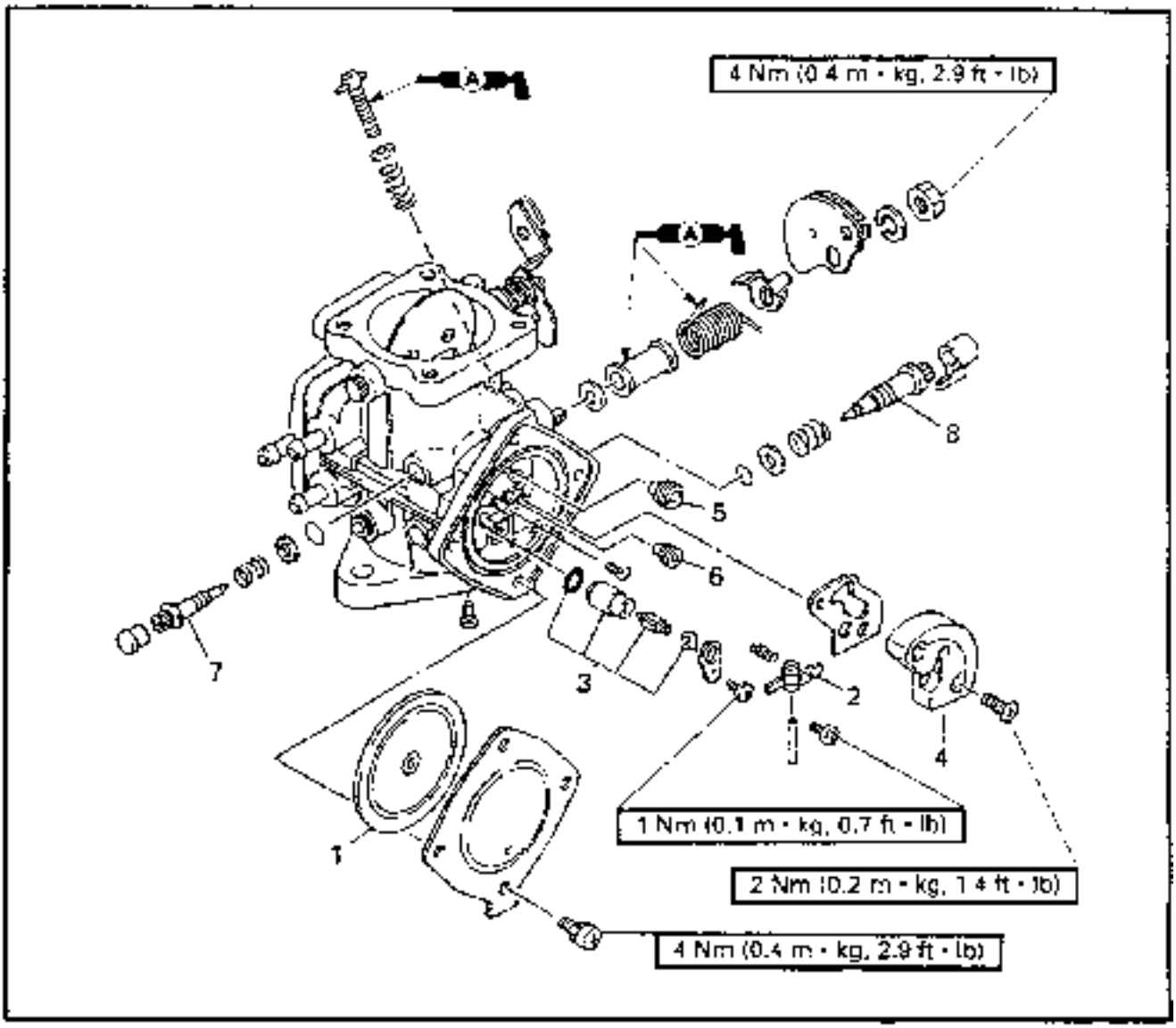
CARBURETOR REMOVAL
EXPLODED DIAGRAM



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	
			Cable guide set position ⓐ: 17 mm (0.67 in)
5	Fuel hose	2	
6	Pulse hose	2	
7	Nut	4	
8	Carburetor assembly	1	
			Reverse the removal steps for installation.

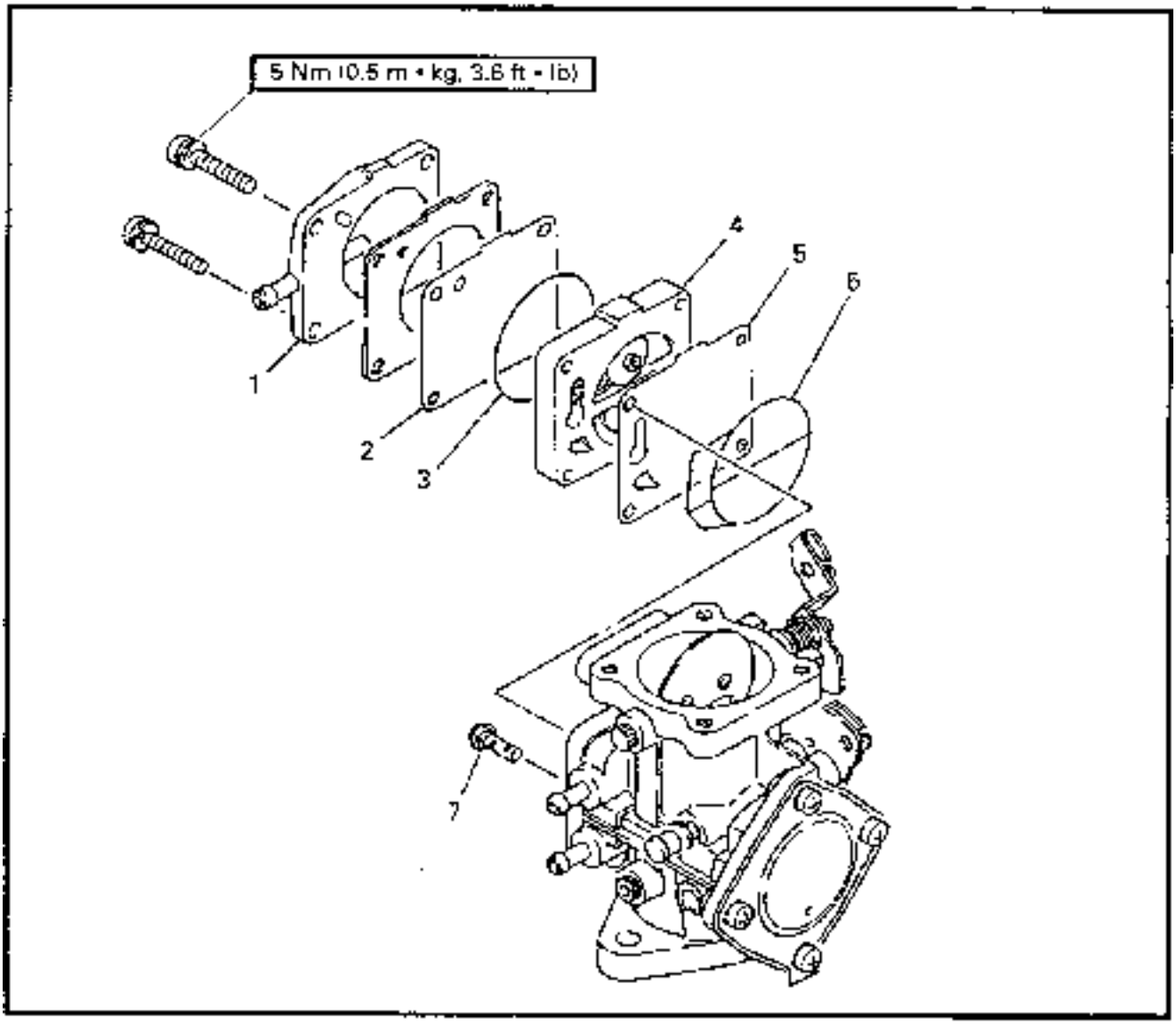
CARBURETOR
EXPLODED DIAGRAM



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	CARBURETOR DISASSEMBLY		Follow the left "Step" for removal.
	Carburetor assembly		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.

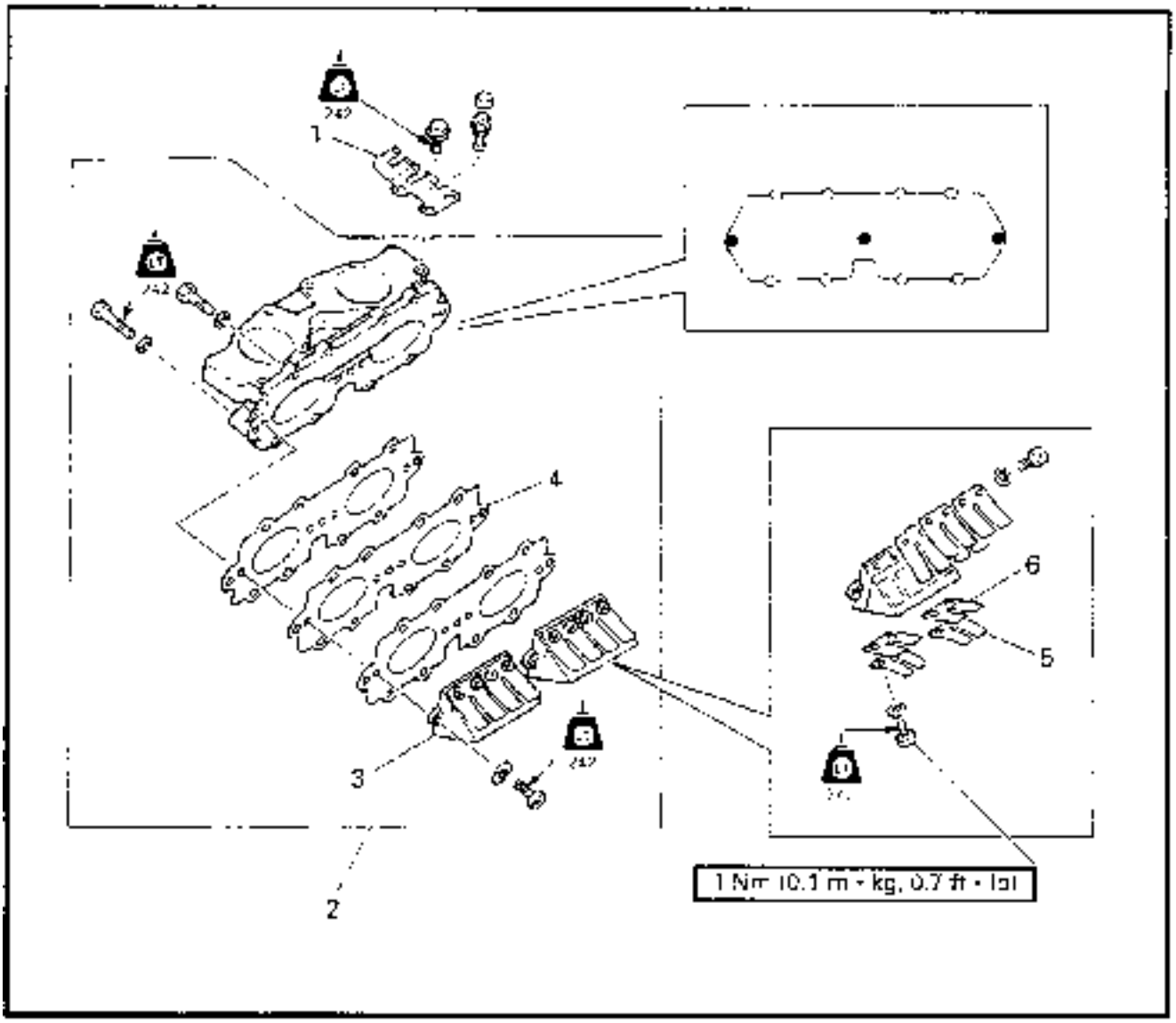
FUEL PUMP
EXPLODED DIAGRAM



REMOVAL AND INSTALLATION CHART

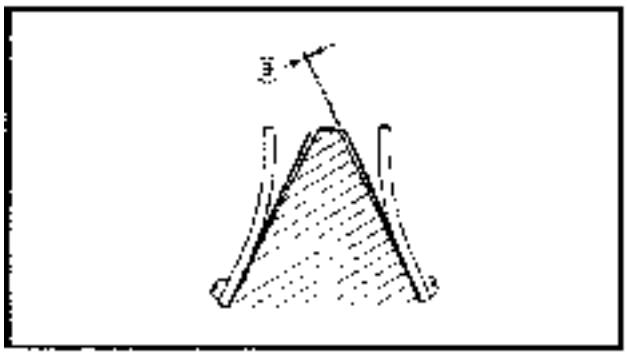
Step	Procedure/Part name	Q'ty	Service points
	FUEL PUMP DISASSEMBLY		Follow the left "Step" for removal.
	Carburetor assembly		Refer to "CARBURETOR REMOVAL".
1	Pump cover	1	
2	Diaphragm	1	
3	O-ring	1	
4	Diaphragm body assembly	1	
5	Diaphragm	1	
6	O-ring	1	
7	Filter	1	
			Reverse the removal steps for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

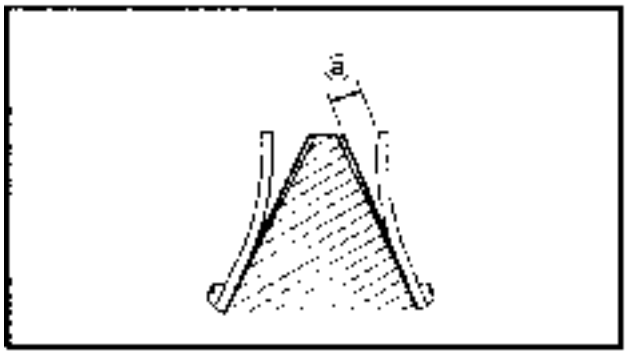
REED VALVE
EXPLODED DIAGRAM



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	REED VALVE REMOVAL		Follow the left "Step" for removal.
	Carburetor assembly		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

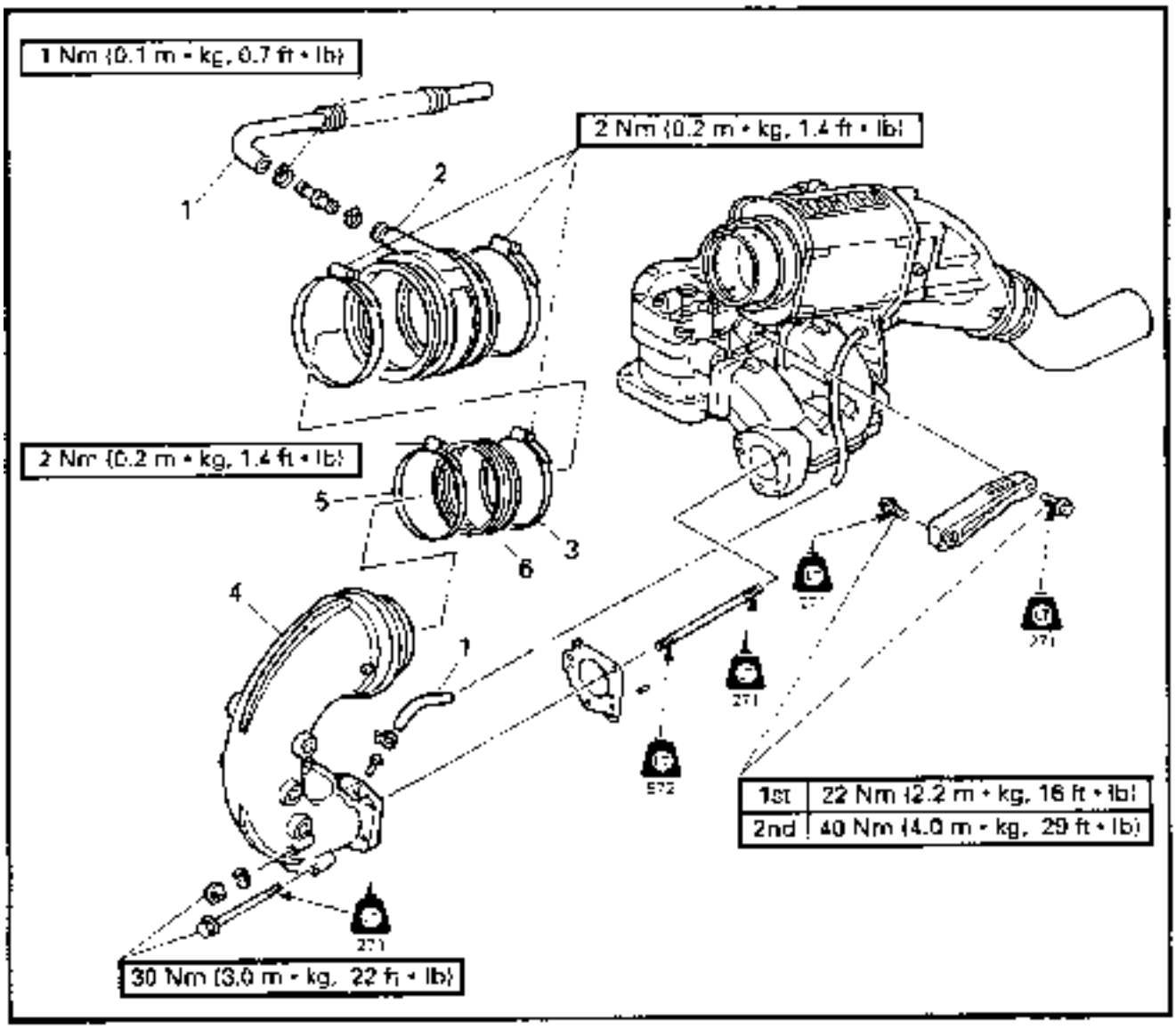
1. Inspect:
   - Reed valve
     Crack/Damage → Replace.
2. Measure:
   - Valve bending ⓐ
     Out of specification → Replace.

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)

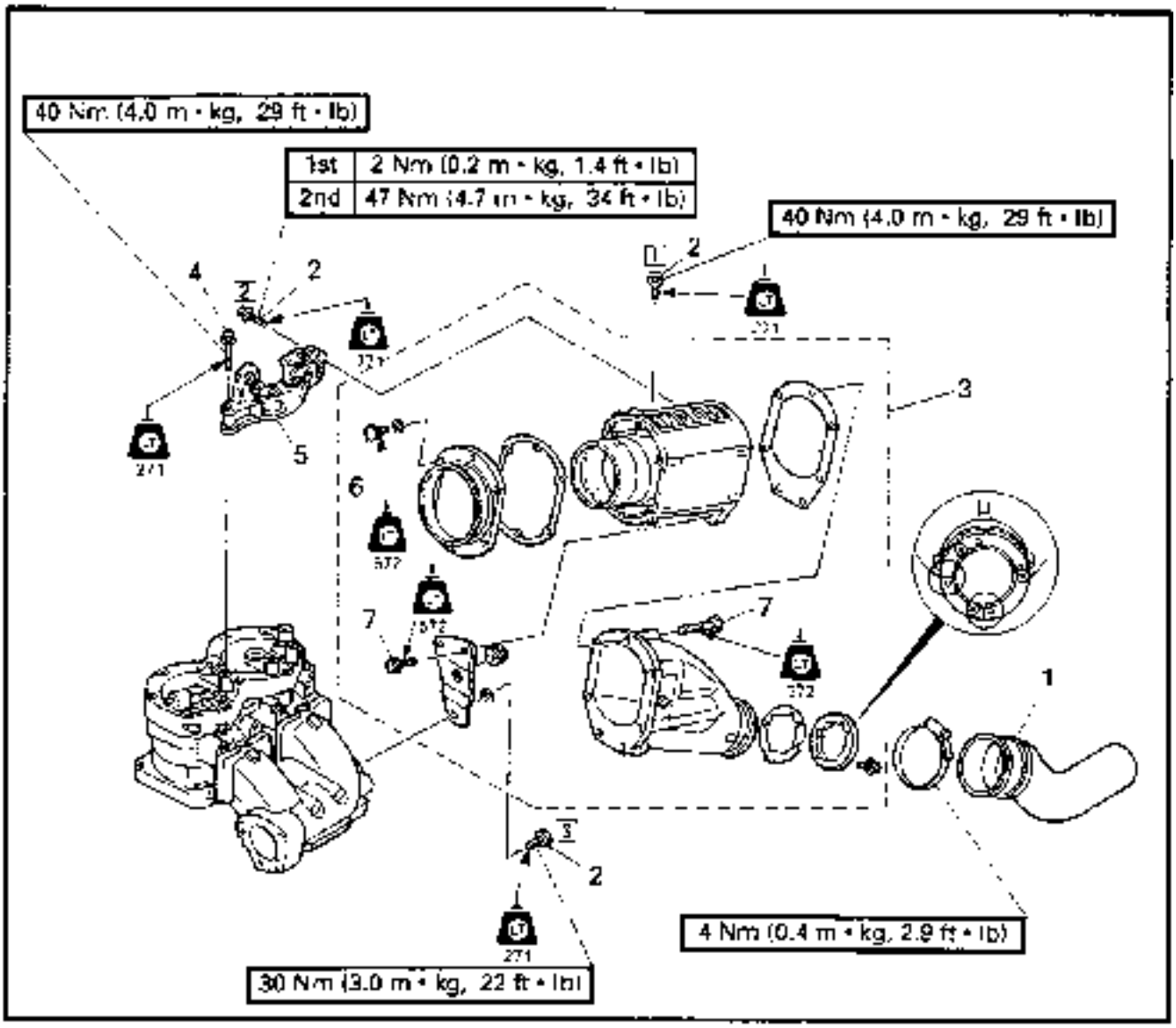
EXHAUST RING
EXPLODED DIAGRAM



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	EXHAUST RING REMOVAL		Follow the left "Step" for removal
1	Water hose	2	
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:** **Tighten the clamp, before installing the ring on the muffler.**
6	Joint	1	Reverse the removal steps for installation.

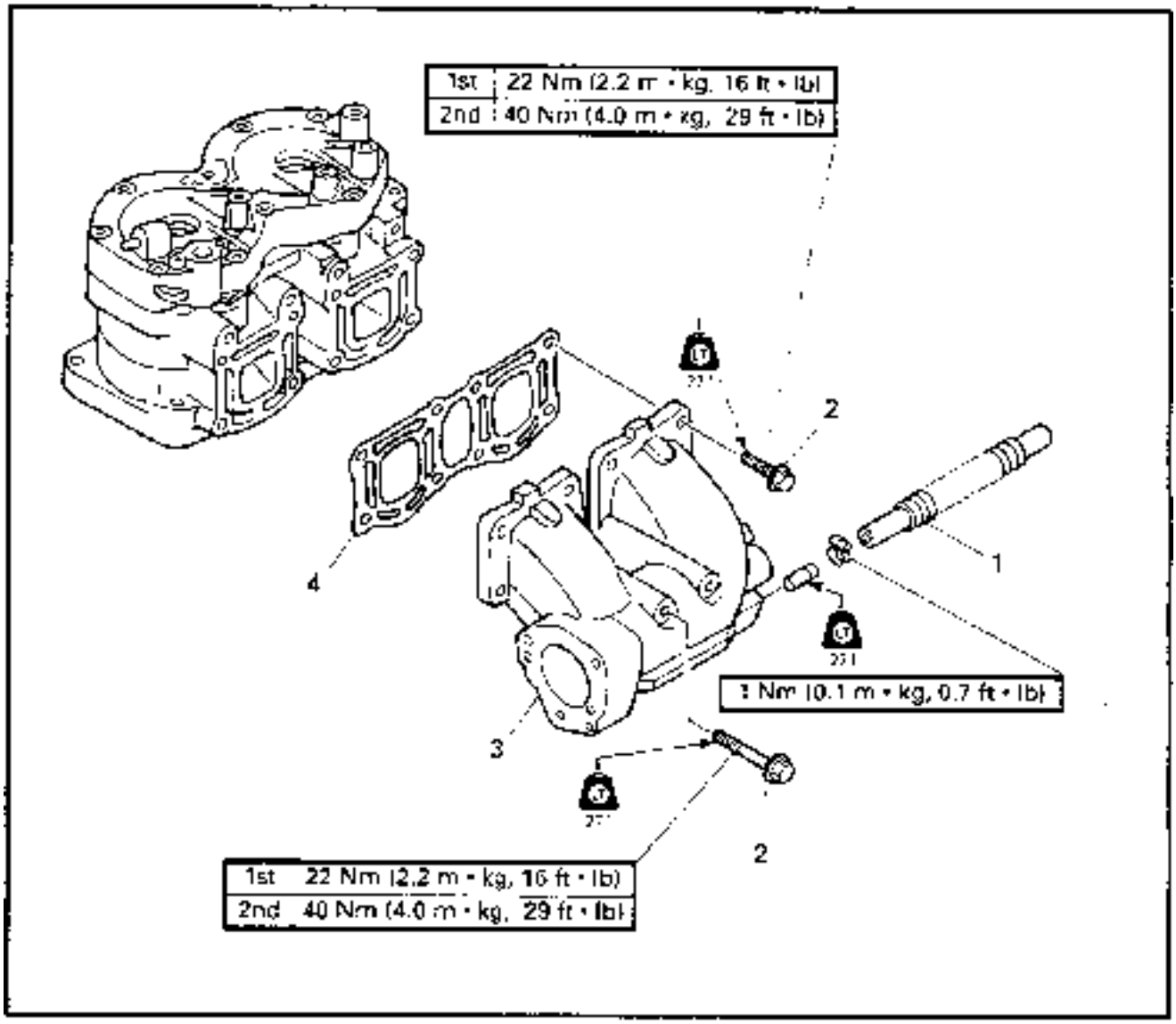
EXHAUST CHAMBER
EXPLODED DIAGRAM



REMOVAL AND INSTALLATION CHART

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

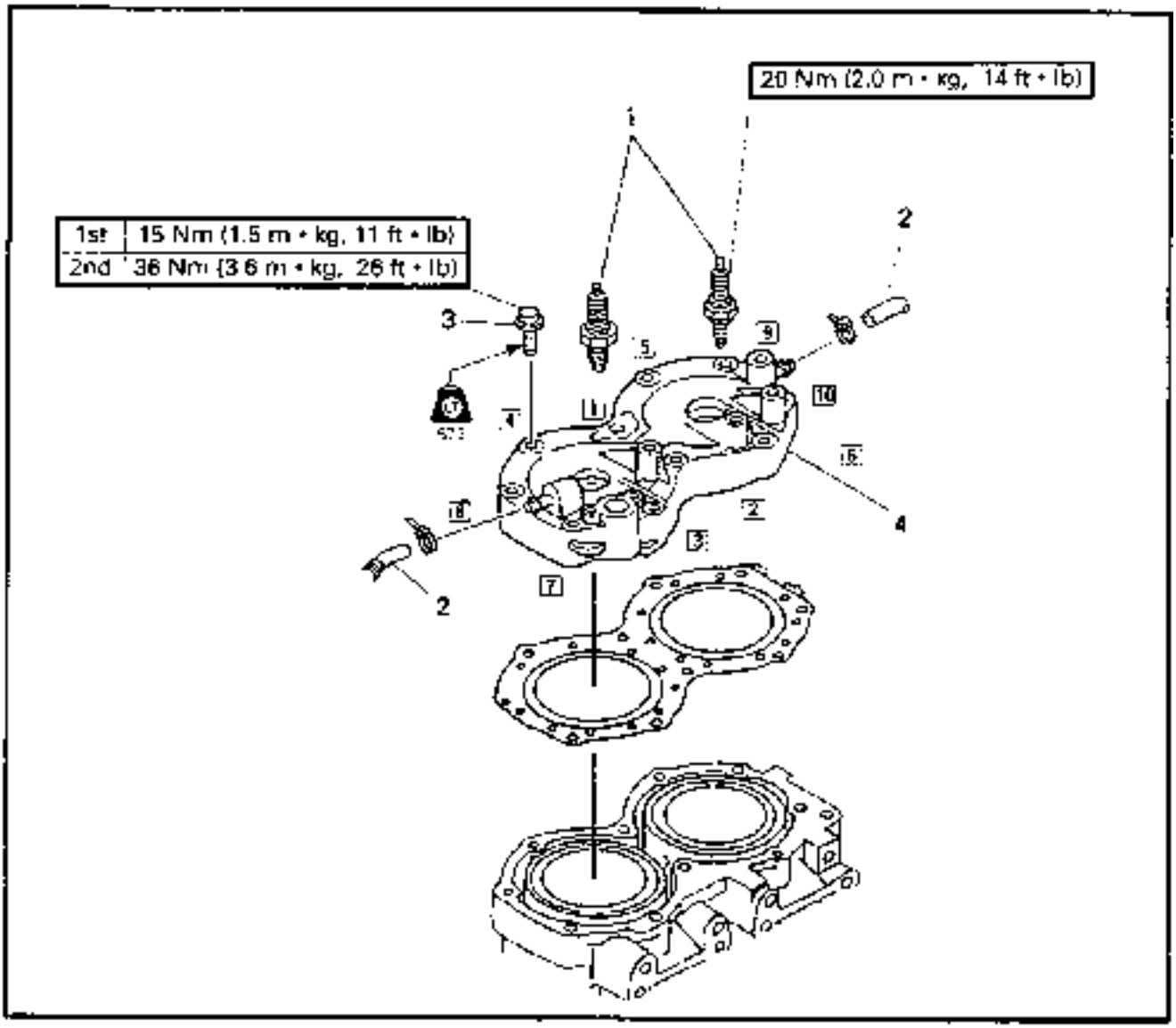
MUFFLER
EXPLODED DIAGRAM



REMOVAL AND INSTALLATION CHART

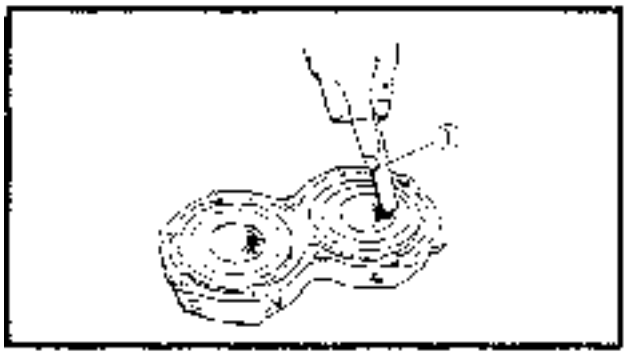
Step	Procedure/Part name	Q'ty	Service points
	MUFFLER REMOVAL		Follow the left "Step" for removal.
	Exhaust chamber		Refer to "EXHAUST CHAMBER".
1	Water inlet hose	1	
2	Bolt (with washer)	8	
3	Muffler	1	
4	Gasket	1	
			Reverse the removal steps for installation

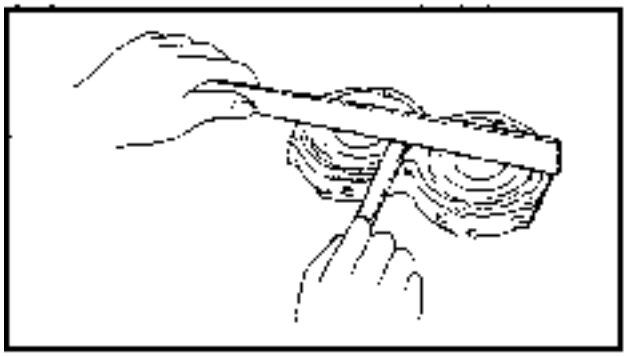
CYLINDER HEAD
EXPLODED DIAGRAM



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	CYLINDER HEAD REMOVAL		Follow the left "Step" for removal.
	Muffler		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 treads. 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.

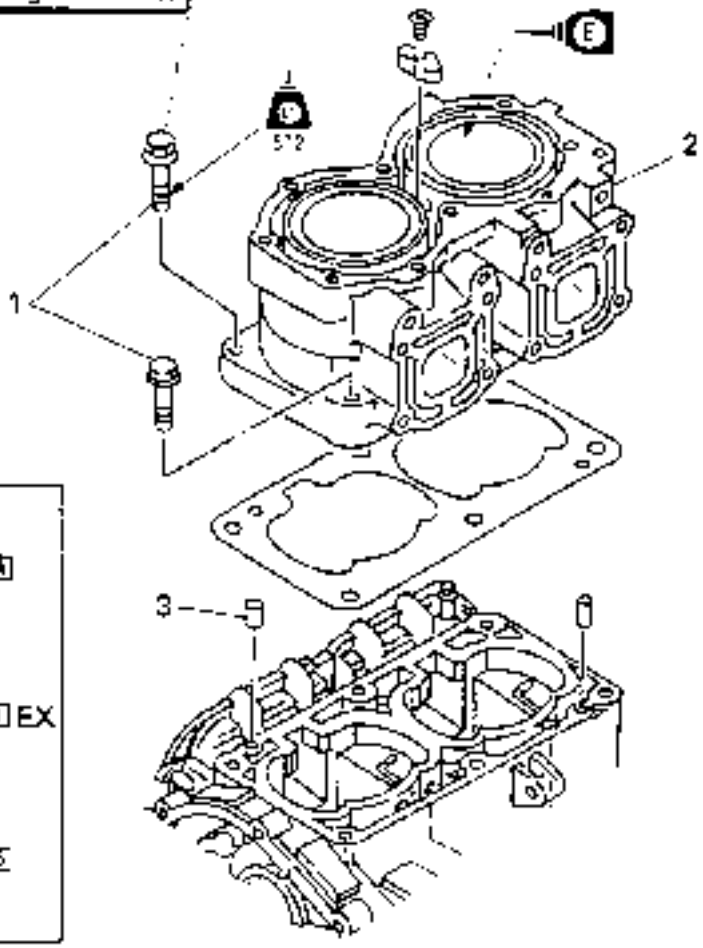
Warpage limit:
0.1 mm (0.004 in)

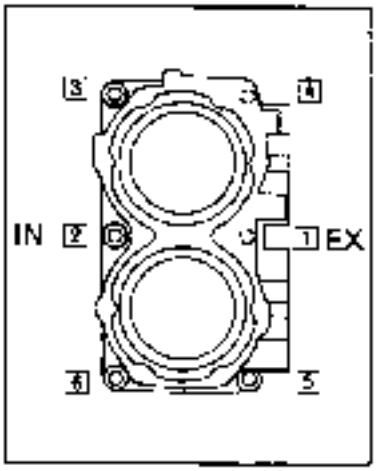
Warpage measurement and resurfacing steps:

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

CYLINDER
EXPLODED DIAGRAM

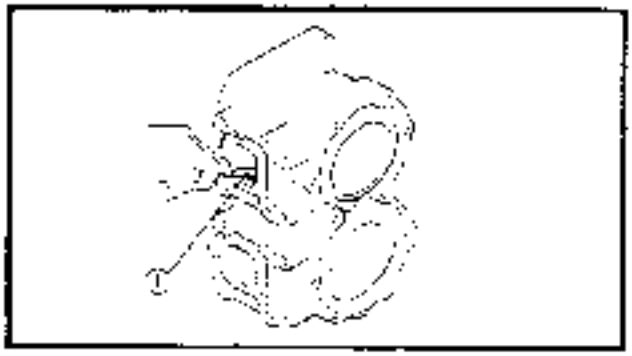
1st	23 Nm (2.3 m • kg, 17 ft • lb)
2nd	40 Nm (4.0 m • kg, 29 ft • lb)





REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	CYLINDER REMOVAL		Follow the left "Step" for removal.
	Cylinder head		Refer to "CYLINDER HEAD".
1	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.

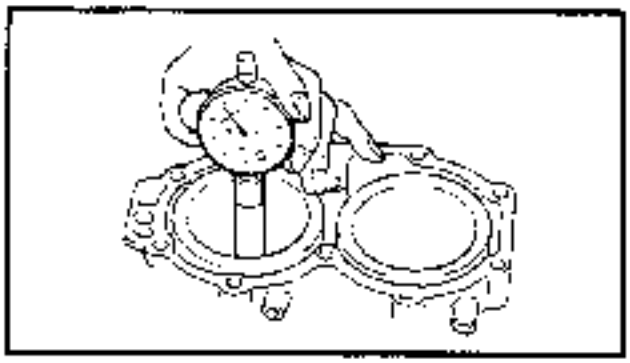


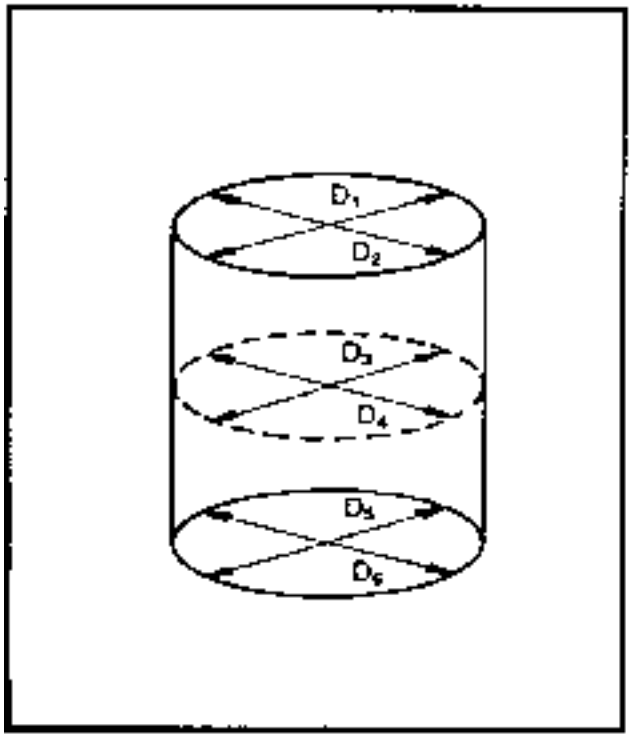
SERVICE POINTS

Cylinder Inspection

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

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





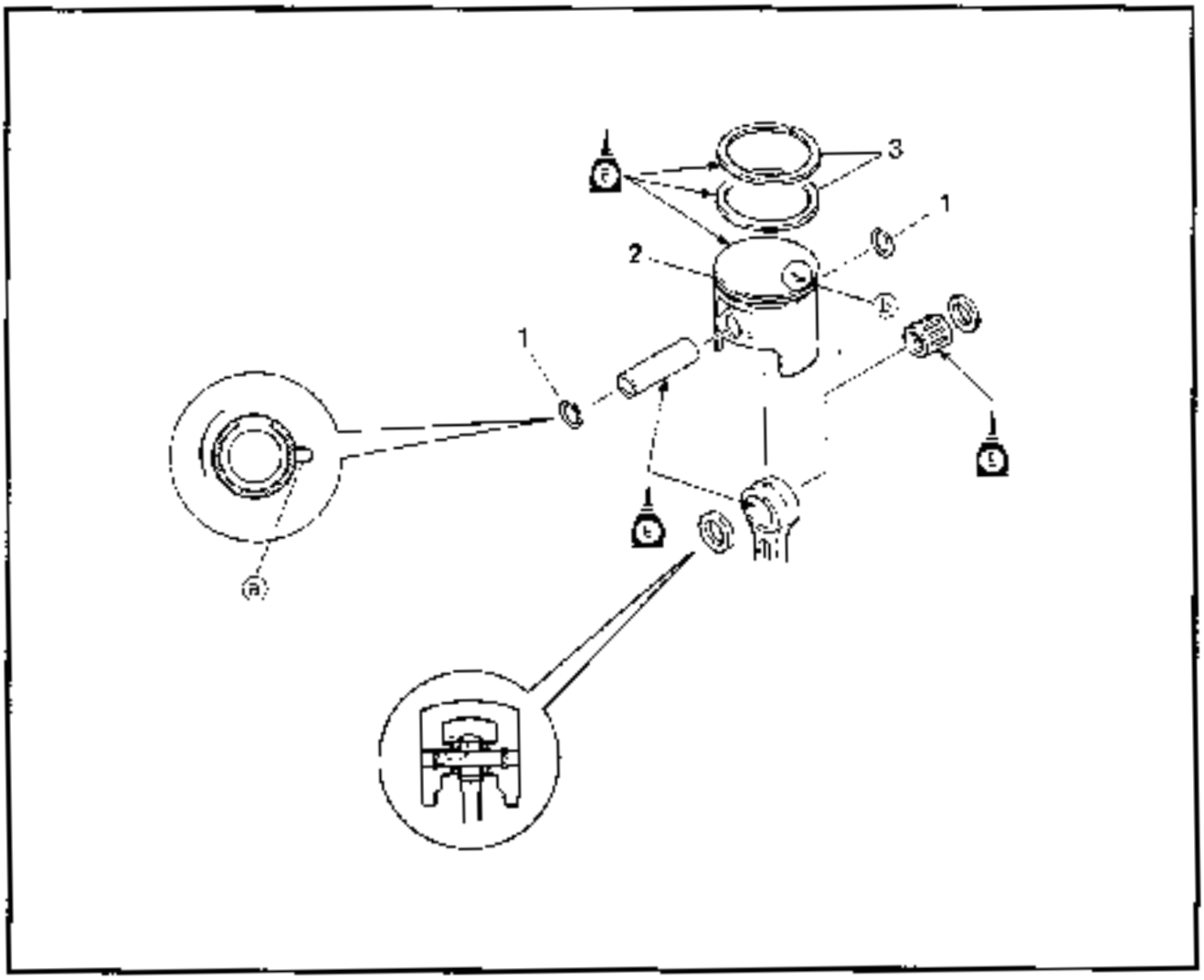
3. Measure:
   - Cylinder bore "D"
     Use cylinder gauge.
     Out of limit → Replace.

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 (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
EXPLODED DIAGRAM



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	PISTON REMOVAL		Follow the left "Step" for removal.
	Cylinder		Refer to "CYLINDER".
1	Piston pin clip	4	**CAUTION:** **Do not allow the clip open ends to meet the piston pin slot ⓐ.**
2	Piston	2	**NOTE:** Be sure the arrow ⓑ 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

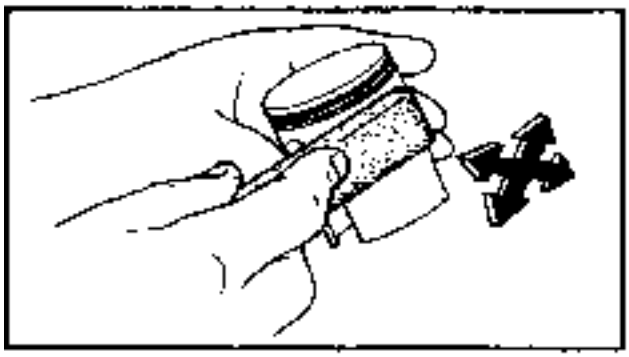
NOTE:

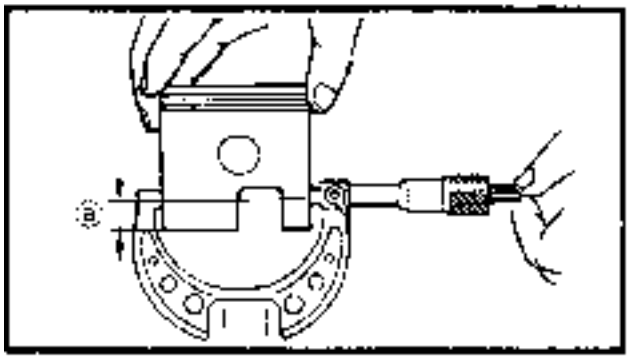
Before removing and installing piston pin clip, cover crankcase with a clean rag to prevent piston pin clip from falling into crankcase cavity.

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.

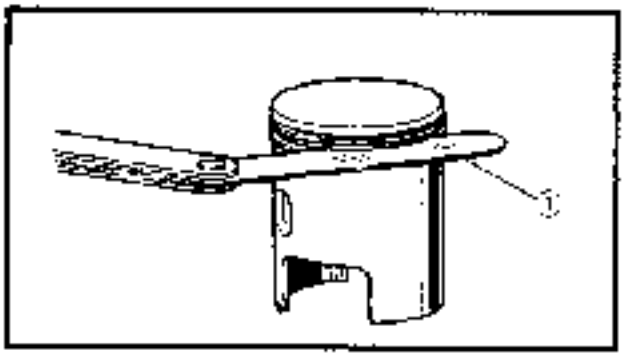
Piston diameter	Distance ⓐ
83.897 ~ 83.916 mm (3.3030 ~ 3.3038 in)	10 mm (0.39 in)

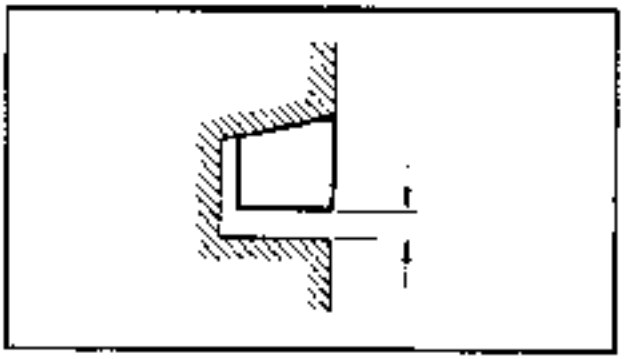
4. Calculate:
   - Piston clearance

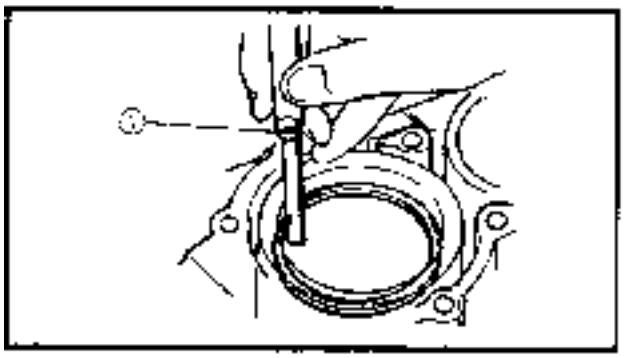
   Out of limit → Replace piston, piston rings as a set.

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)

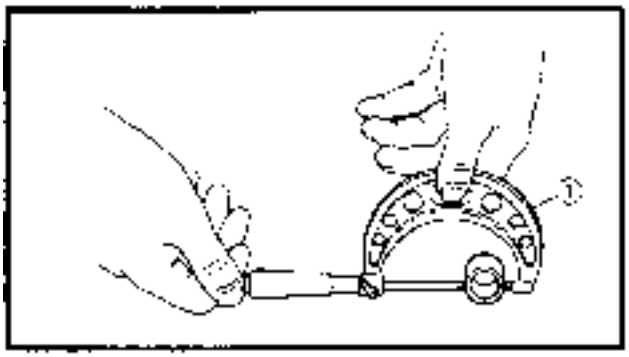
2. Measure:
   - End gap
     Out of specification → Replace rings as a set.
     Use a thickness gauge ①.

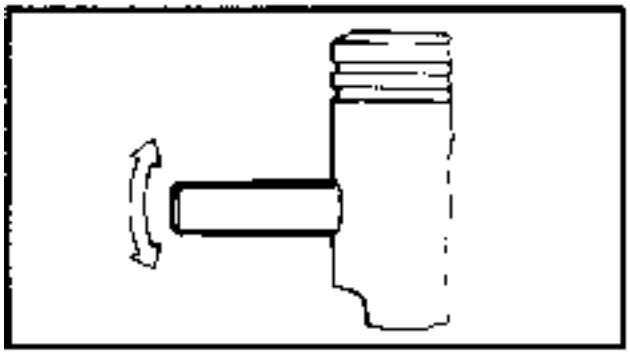
End gap:
Top
2nd
0.2 ~ 0.4 mm (0.008 ~ 0.016 in)

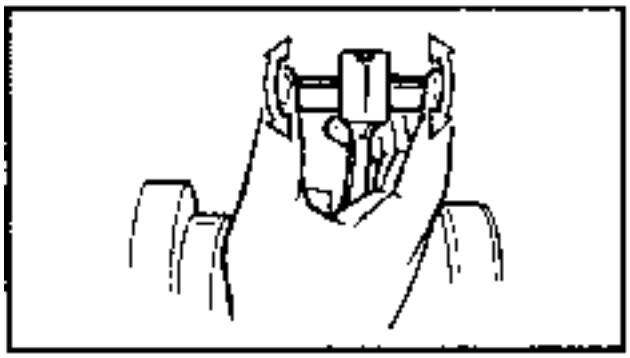
NOTE:
- Install the piston ring into the cylinder.
- Push the ring with the piston crown.

Piston pin and bearing inspection

1. Inspect:
   - Piston pin
   - Bearing
     Signs of heat discoloration → Replace.







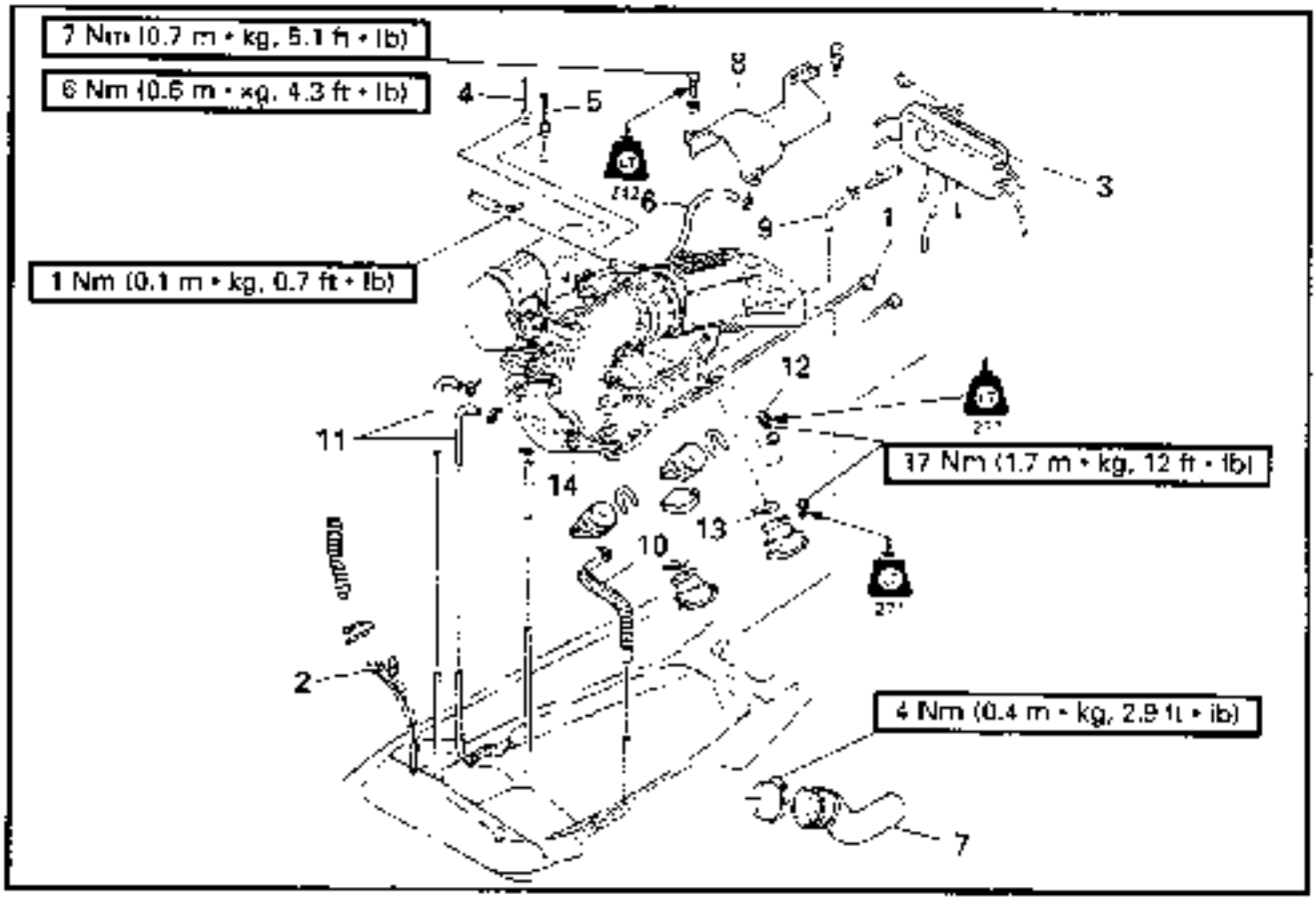
2. Measure:
   - Piston pin outside diameter
     Use micrometer ①.
     Out of limit → Replace.

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

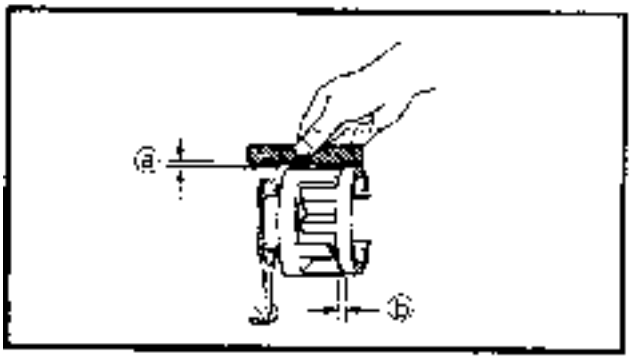
NOTE:

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 bracket

   Crack/Damage → Replace.



Coupling clearance inspection

1. Check:
   - Clearance ⓐ
   - Clearance ⓑ

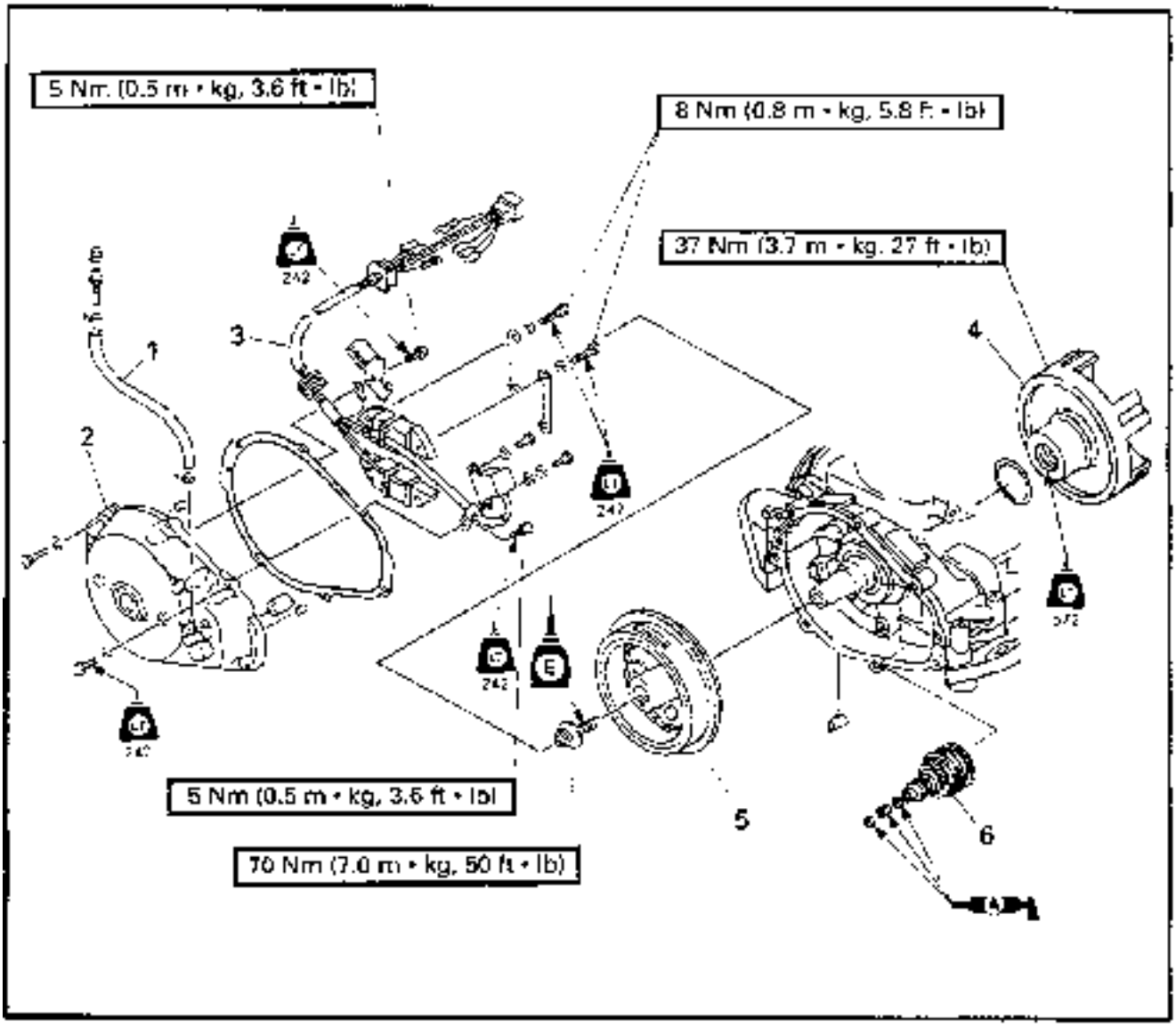
   Out of specification → Adjust using shim.

NOTE:

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

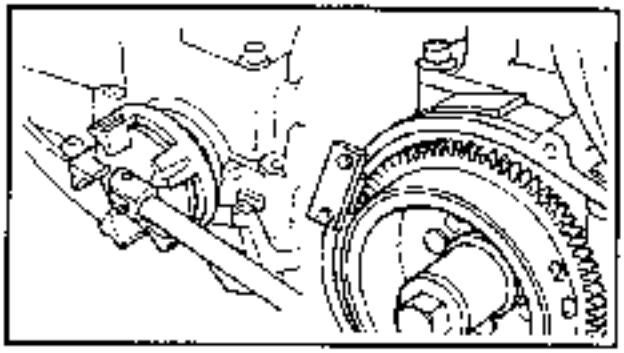
Clearance ⓐ:
0 ~ 1.0 mm (0 ~ 0.039 in)
Clearance ⓑ:
2 ~ 4 mm (0.079 ~ 0.157 in)

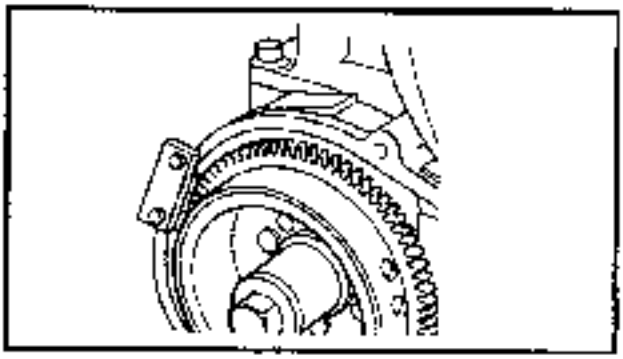
FLYWHEEL MAGNETO AND BASE
EXPLODED DIAGRAM

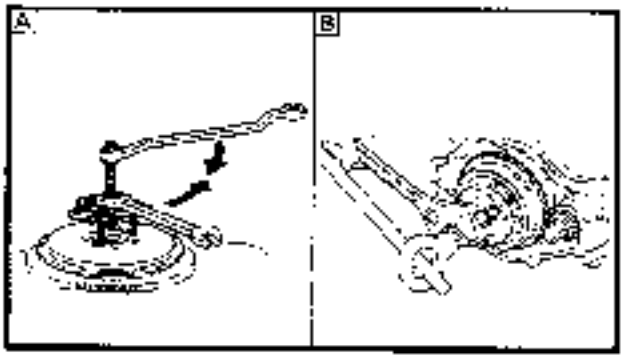


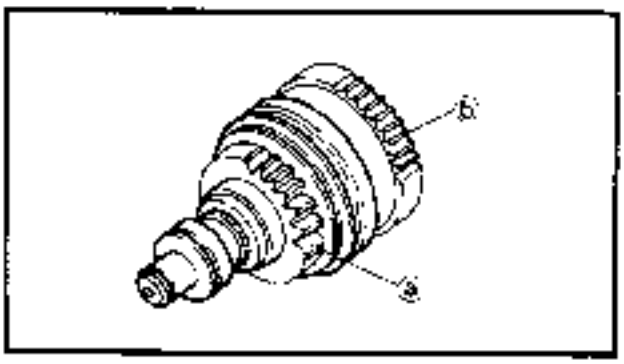
REMOVAL AND INSTALLATION CHART

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.

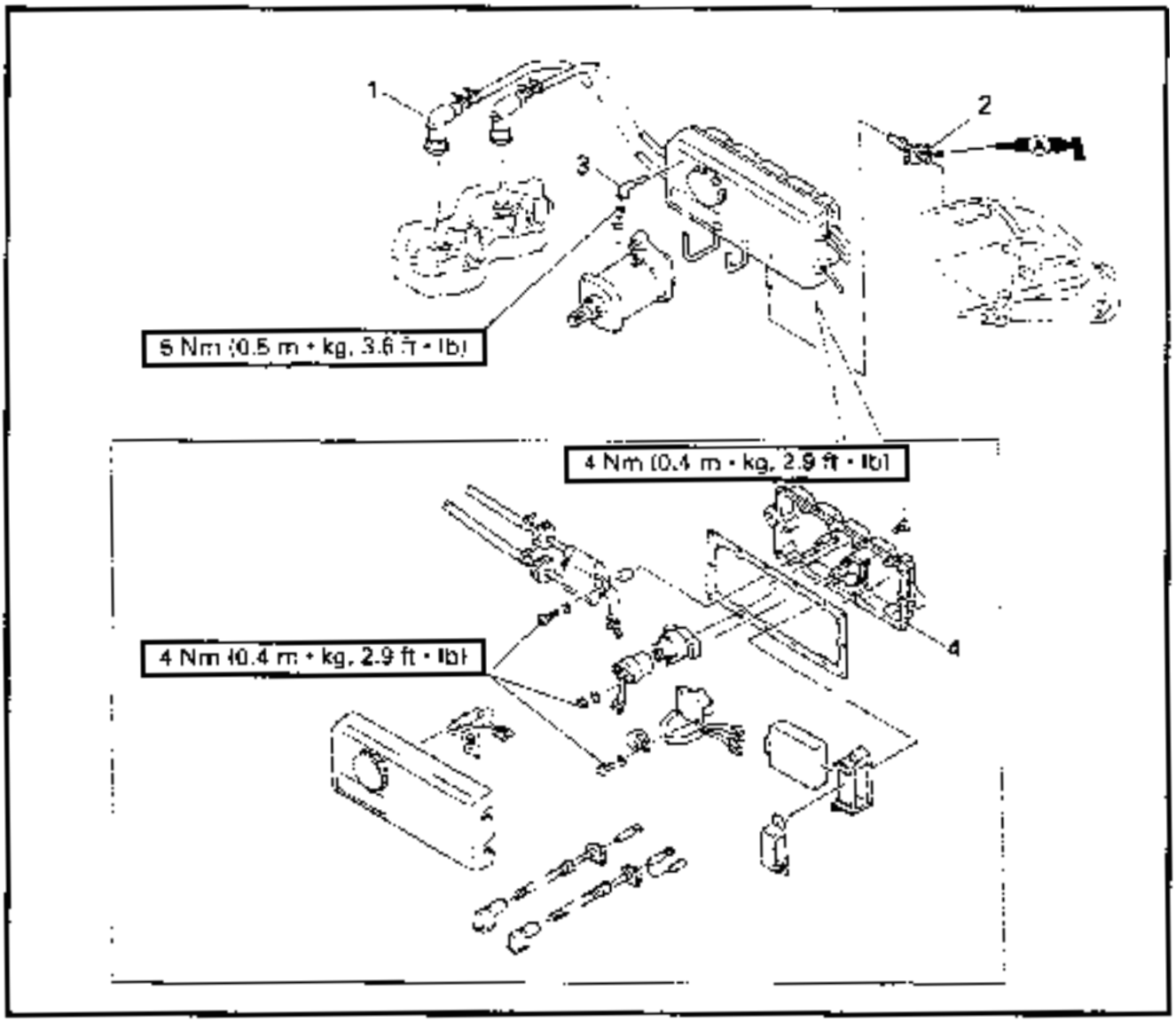
Flywheel magneto inspection

1. Inspect:
   - Flywheel gear
     Wear/Damage → Replace.

Idle gear assembly inspection

1. Inspect:
   - Pinion gear ⓐ
   - Inner gear ⓑ
     Wear/Damage → Replace.
2. Check:
   - Clutch movement
     Unsmooth movement → Replace.

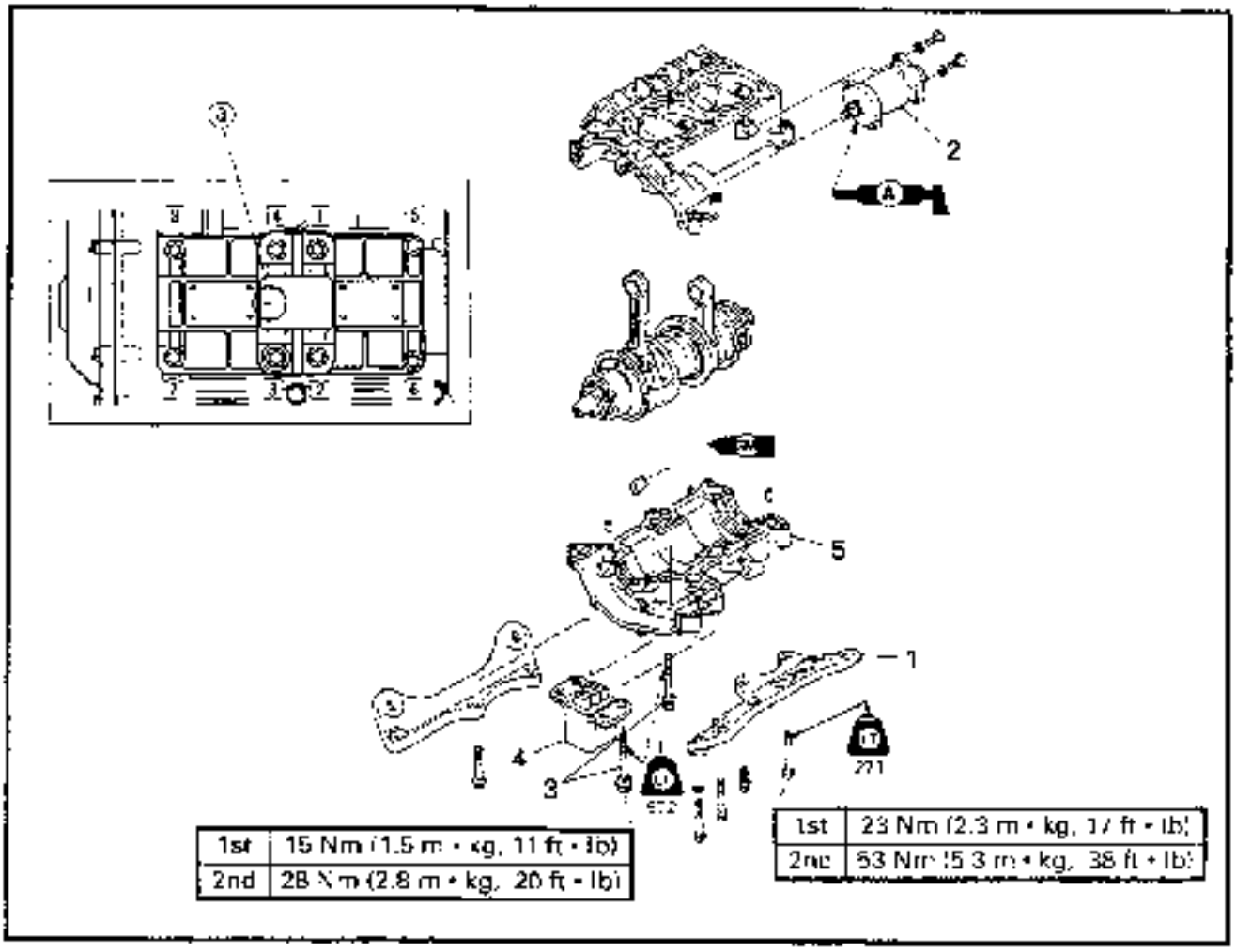
ELECTRICAL UNIT
EXPLODED DIAGRAM



REMOVAL AND INSTALLATION CHART

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

CRANKCASE
EXPLODED DIAGRAM



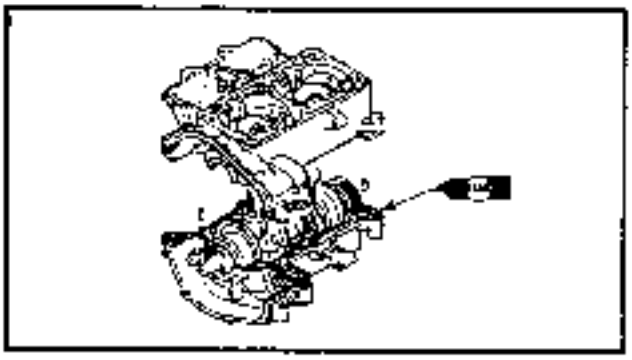
REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	CRANKCASE DISASSEMBLY		Follow the left "Step" for removal.
	Base assembly		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 flywheel 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

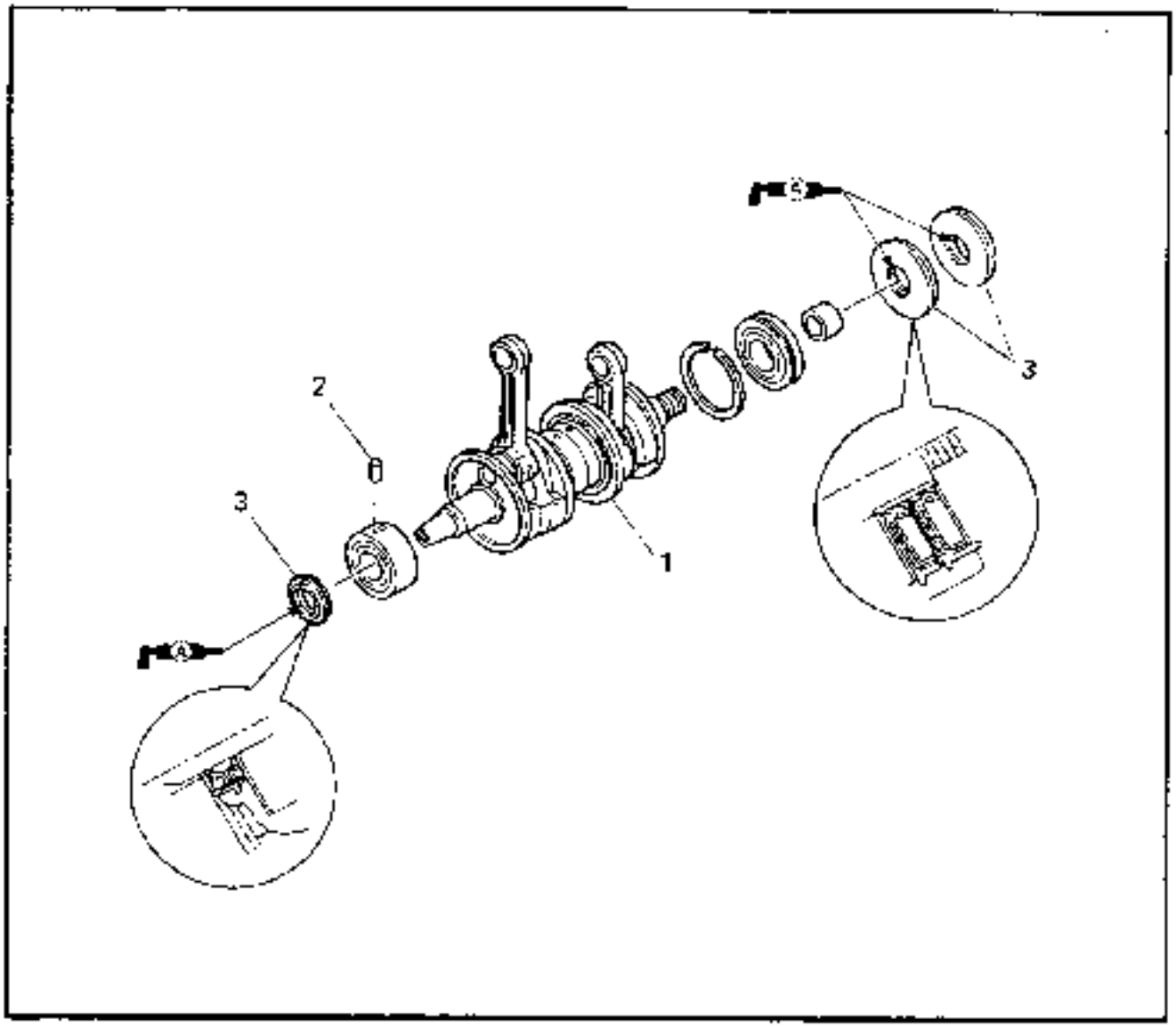
1. Apply:
   - Gasket Maker

NOTE:

Clean the contacting surface of crankcase before applying the Gasket Maker.

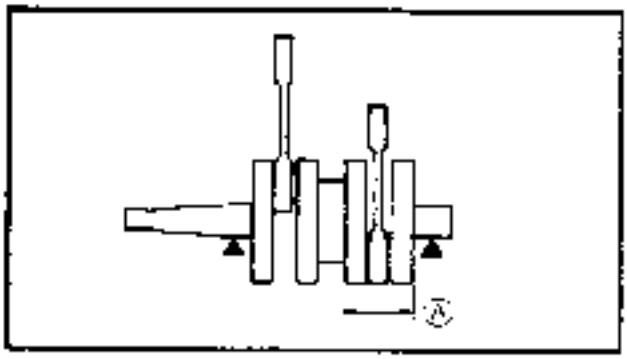
2. Check:
   - Crankshaft
     Rough action → Repair.

CRANKSHAFT
EXPLODED DIAGRAM



REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	CRANKSHAFT REMOVAL		Follow the left "Step" for removal.
	Crankcase		Refer to "CRANKCASE".
1	Crankshaft assembly	1	**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.



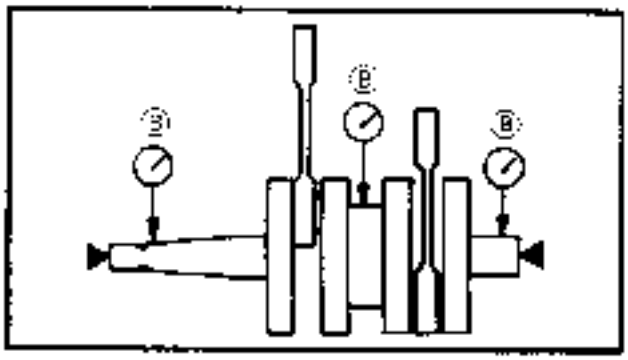
SERVICE POINTS

Crankshaft inspection

1. Measure:
   - Crank width Ⓐ

   Out of specification → Replace.

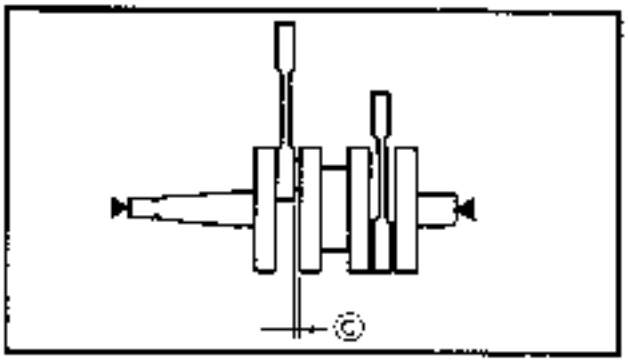
Crank width:
61.95 ~ 62.00 mm
(2.439 ~ 2.441 in)



2. Measure:
   - Deflection Ⓑ

   Use a dial gauge.
   Out of specification → Replace

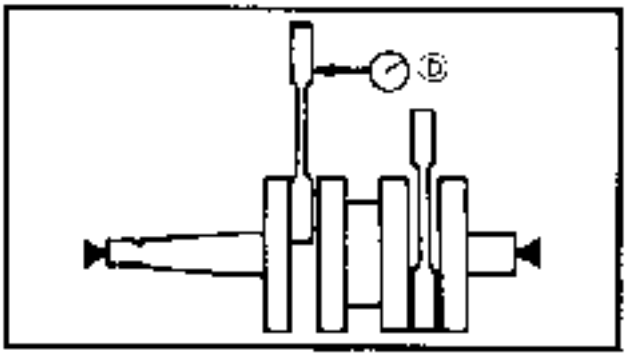
Maximum deflection:
0.05 mm (0.002 in)



3. Measure:
   - Big end side clearance Ⓒ

   Use a thickness gauge.
   Out of specification → Replace.

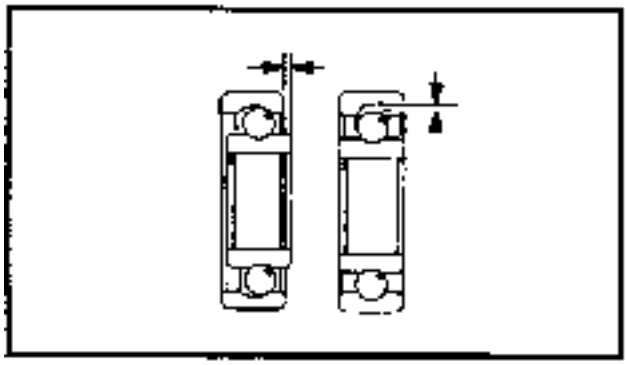
Big end side clearance:
0.25 ~ 0.75 mm
(0.010 ~ 0.030 in)



4. Measure:
   - Small end free play Ⓓ

   Use a dial gauge.
   Out of specification → Replace.

Small end free play:
2.0 mm (0.08 in)



5. Inspect:
   - Crankshaft bearing

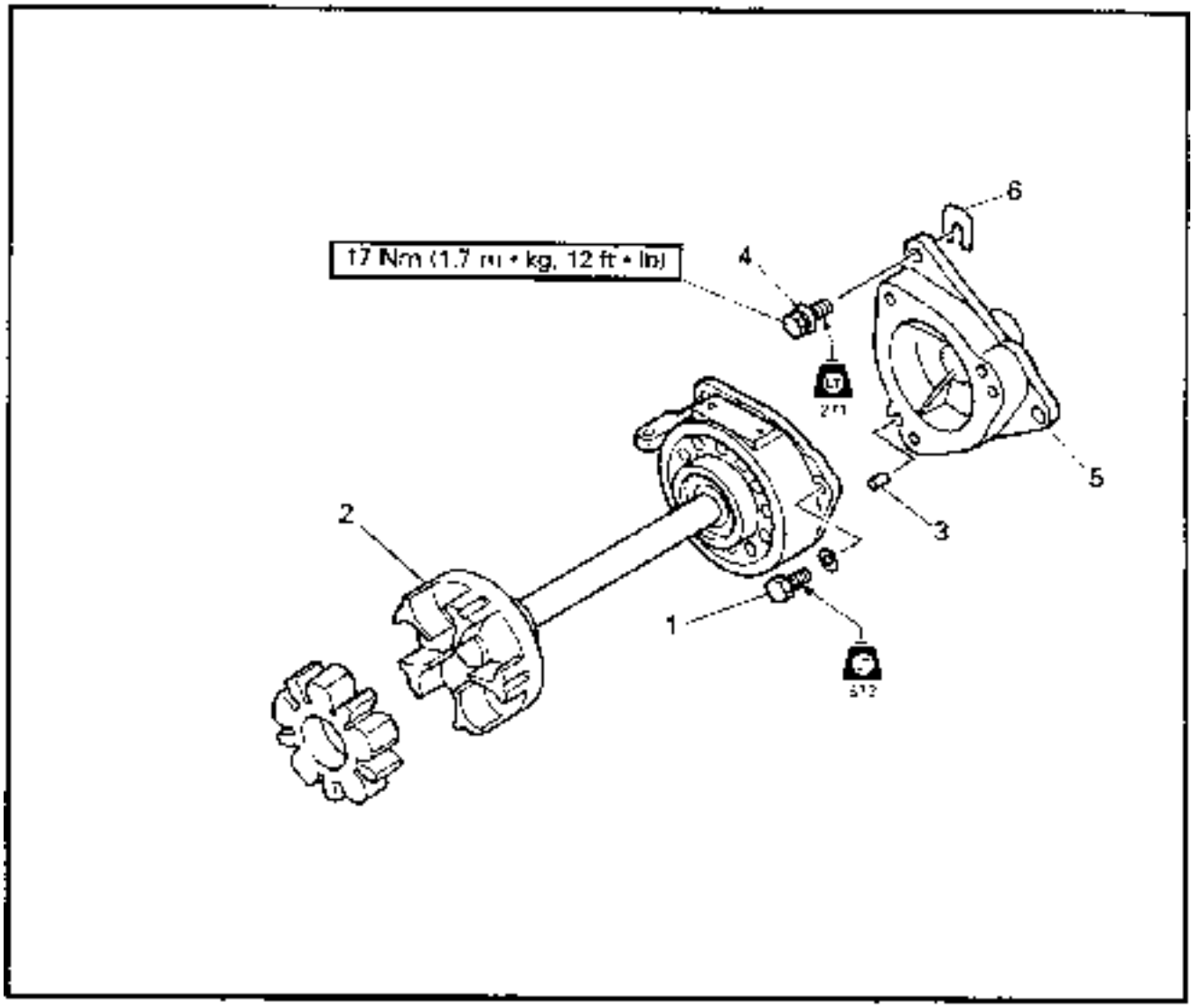
   Pitting/Damage → Replace.

NOTE:

Lubricate the bearings immediately after examining them to prevent rusting.

INTERMEDIATE HOUSING REMOVAL

EXPLODED DIAGRAM



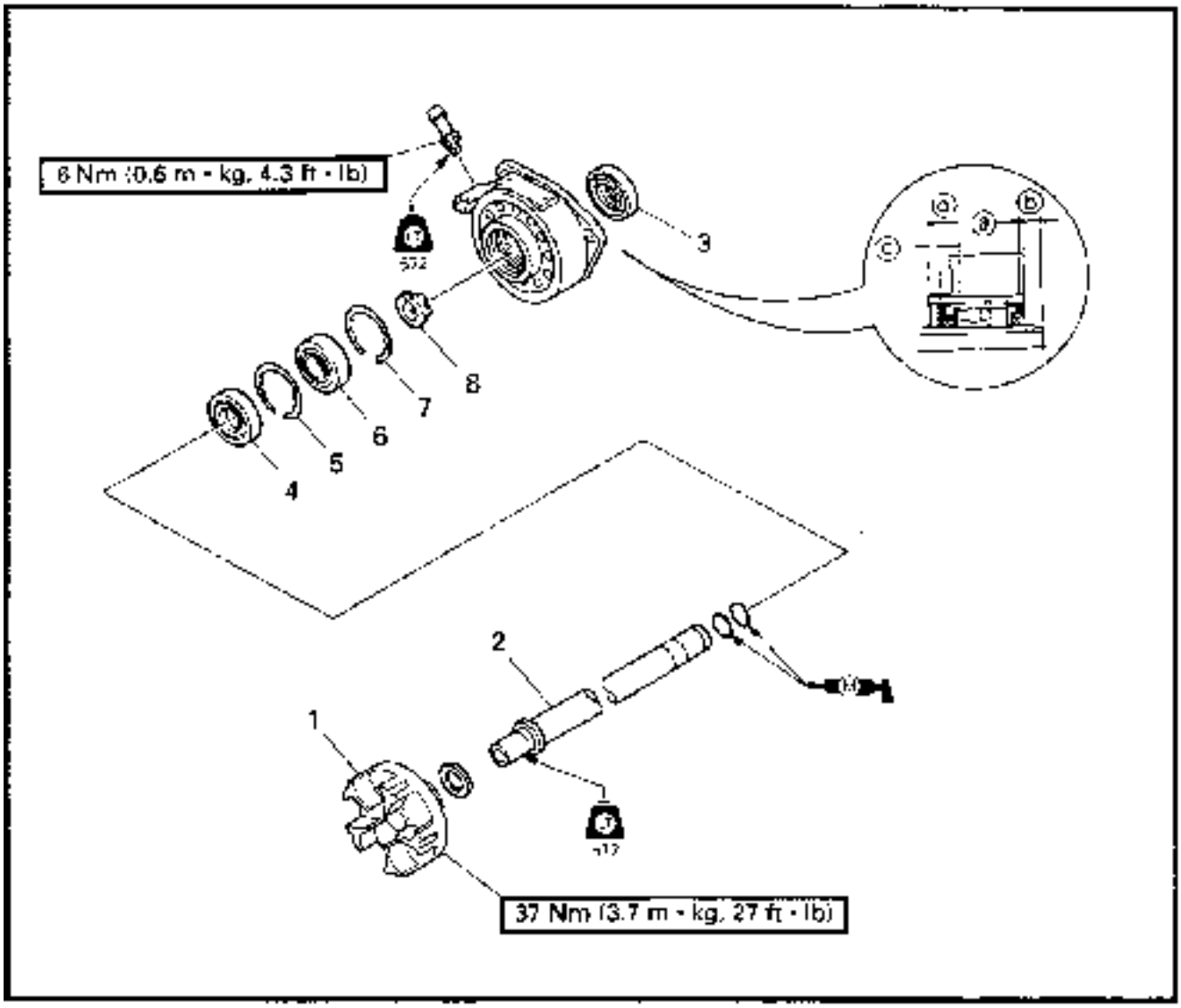
REMOVAL AND INSTALLATION CHART

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

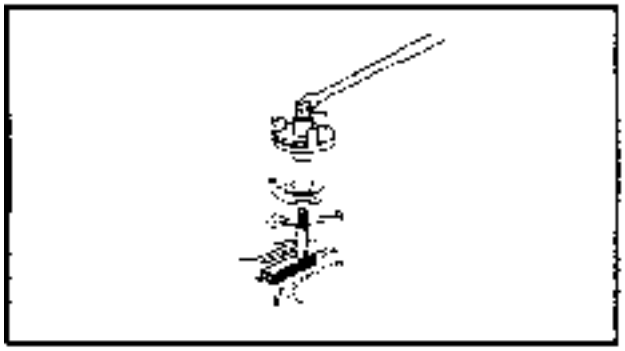
INTERMEDIATE HOUSING

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	
2	Shaft	1	
3	Oil seal	1	**Distance:** **ⓐ: 1.6 – 2.0 mm (0.06 – 0.08 in)** **ⓑ: 14.5 – 15.5 mm (0.57 – 0.61 in)** **ⓒ: 6.8 – 7.2 mm (0.27 – 0.28 in)** **ⓓ: 17.6 – 17.7 mm (0.69 – 0.70 in)**
4	Oil seal	1	
5	Clip	1	
6	Bearing	1	
7	Clip	1	
8	Spacer	1	Reverse the removal steps for installation.

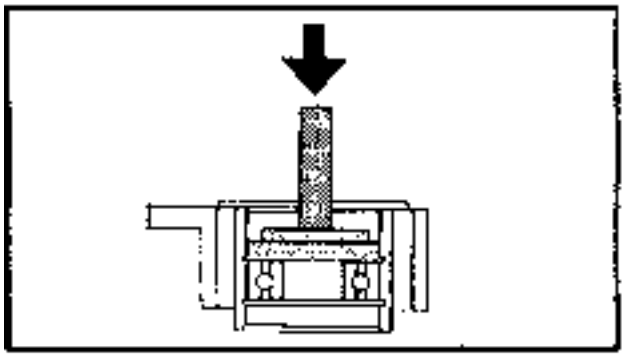


SERVICE POINTS

Coupling removal and installation

1. Remove and install:
   - Coupling

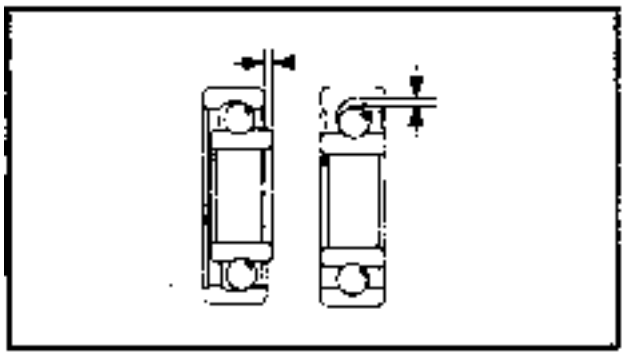
Coupler wrench:
YW-06546/90890-06546
Shaft holder:
YW-38742/90890-06089



Bearing removal and installation

1. Remove and install:
   - Bearing

Driver rod:
YB-06071/90890-06606
Bearing outer race attachment:
YB-06018/90890-06626

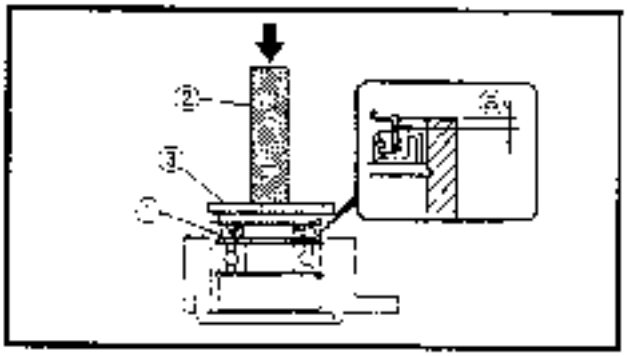


Bearing inspection

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.



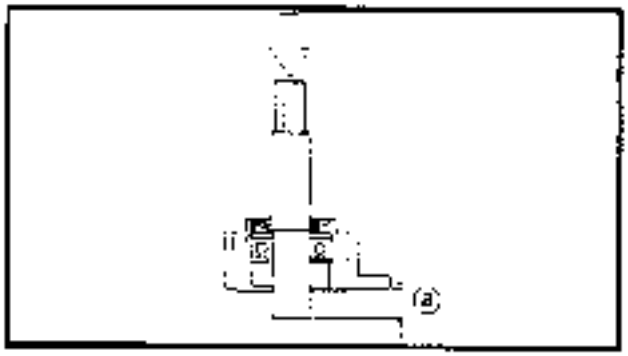
Oil seal installation

1. Install:
   - Oil seal [T = 8 mm (0.31 in)]

Distance ⓐ:
6.8 ~ 7.2 mm (0.27 ~ 0.28 in)

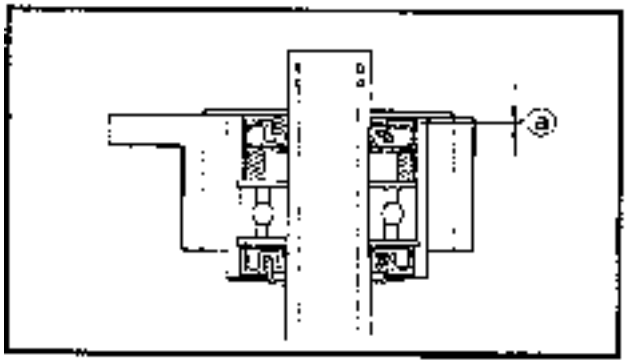
Driver rod:
YB-06071/90890-06606
Bearing outer race attachment:
YB-06016/90890-06626

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



2. Install:
   - Shaft

Distance ⓐ:
14.5 ~ 15.5 mm (0.57 ~ 0.61 in)



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

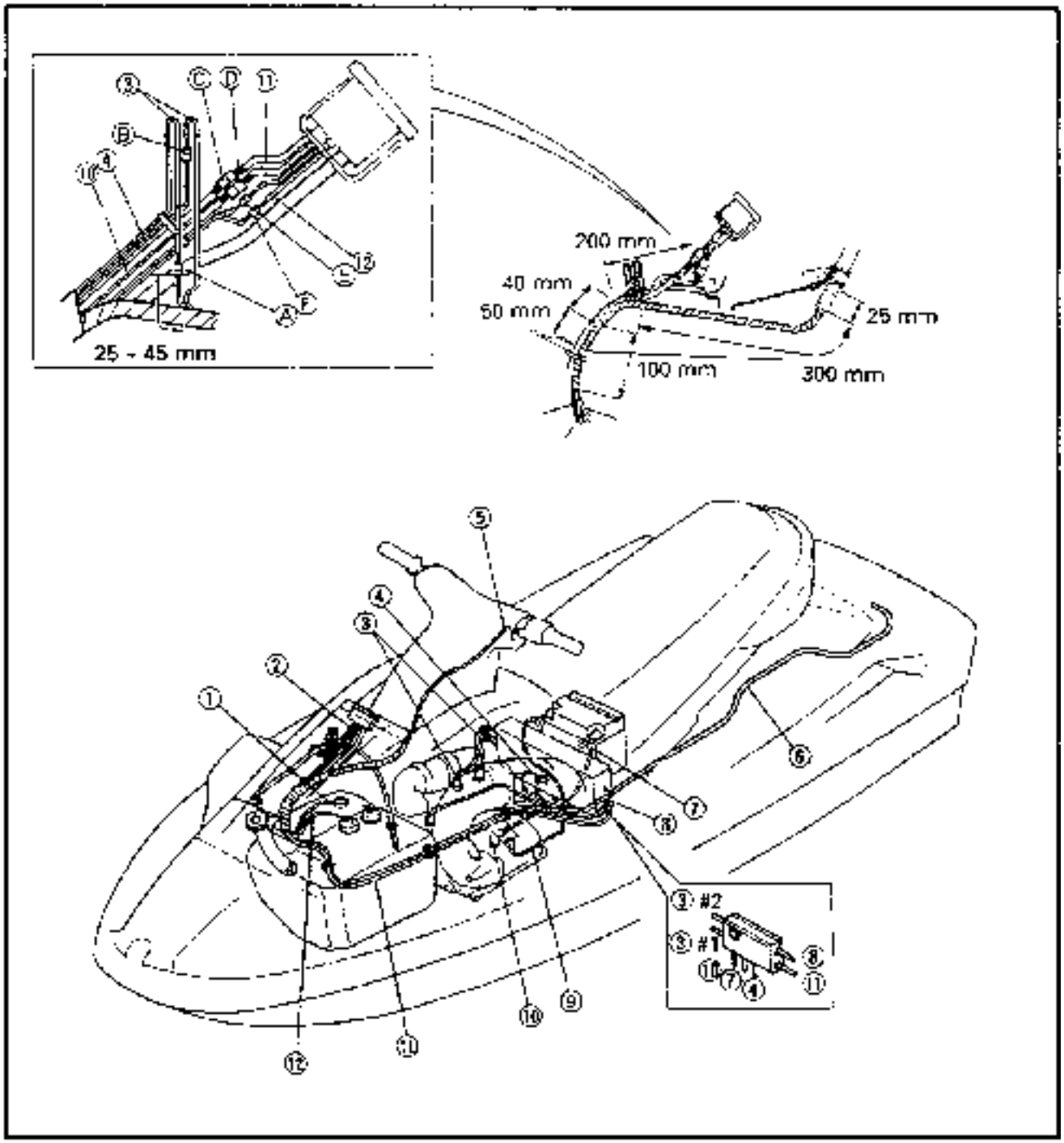
Distance ⓐ:
1.6 ~ 2.0 mm (0.06 ~ 0.08 in)

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)

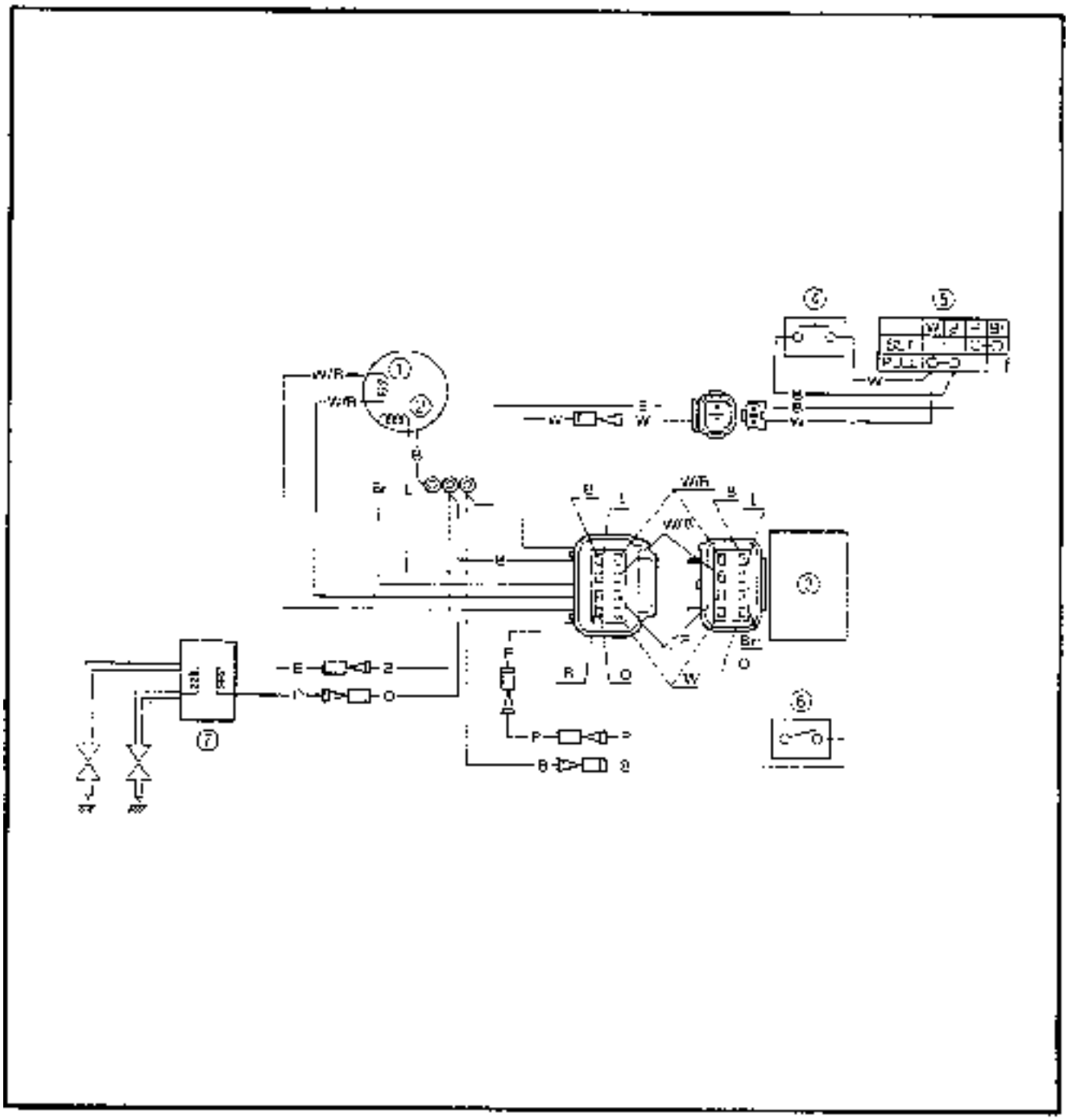
ELECTRICAL COMPONENTS



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

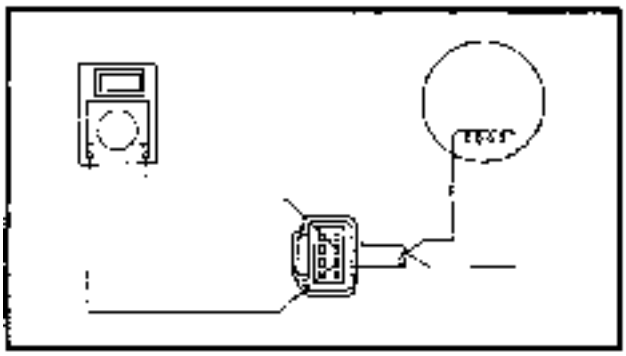
Ⓐ 2P connector (Black)
Ⓑ 2P connector (White)
Ⓒ 3P connector (White)
Ⓓ 4P connector (White)
Ⓔ 2P connector (Green)
Ⓕ 2P connector (White)

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

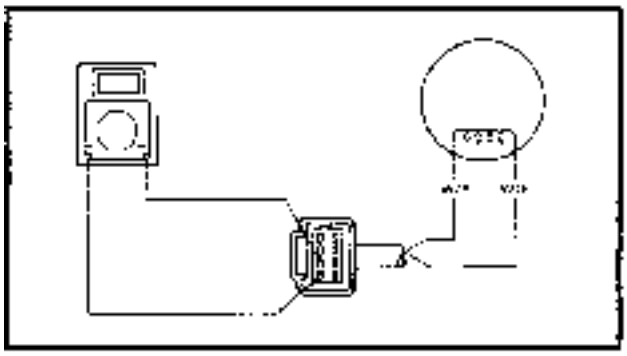
B : Black
Br : Brown
L : Blue
O : Orange
P : Pink
W : White
W/B : White/Black
W/R : White/Red



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.

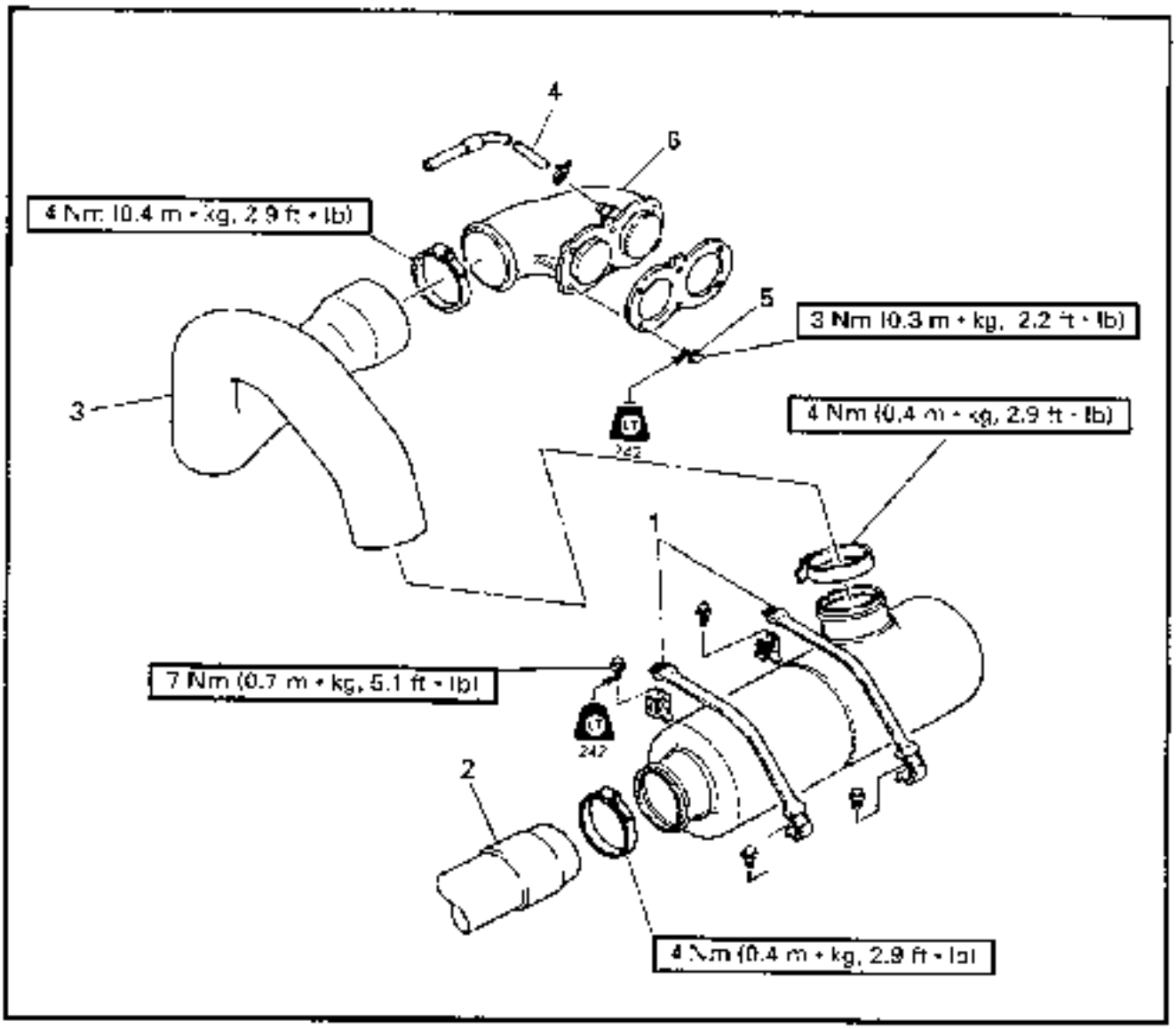
B : Black
Br : Brown
L : Blue
O : Orange
P : Pink
W : White
W/B : White/Black
W/R : White/Red

64X00

Unit: kΩ

⊕ ⊖	W	P	W/B	W/R	O	Br	L	B
W		∞	3.8 ~ 16	9.5 ~ 40	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 ~ 9.5	70 ~ 400	6 ~ 26	

EXHAUST SYSTEM
EXPLODED DIAGRAM

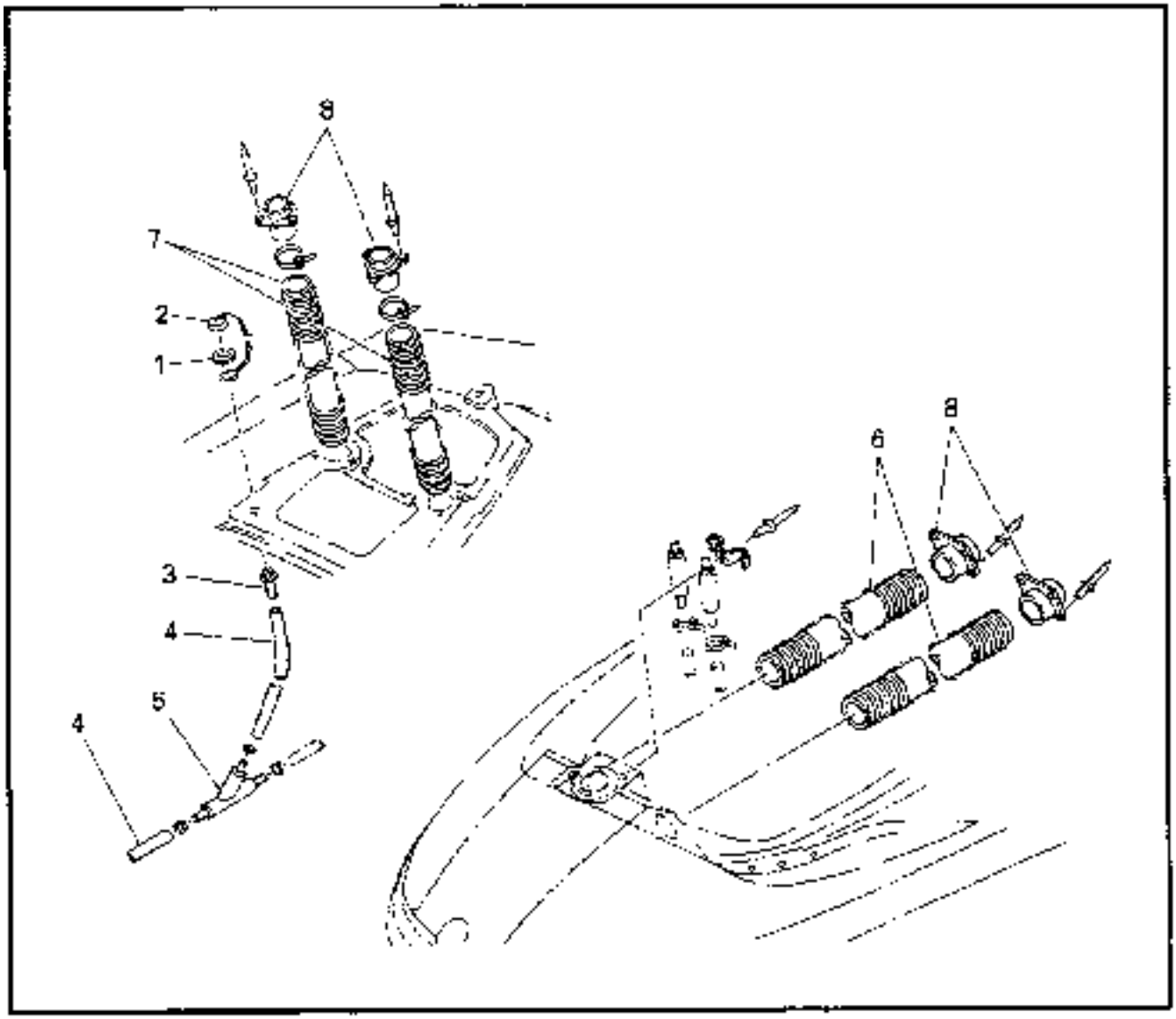


REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	EXHAUST SYSTEM REMOVAL		Follow the left "Step" for removal.
	Fire extinguisher box		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.