

# YAMAHA

## Marine

# Water Vehicles

## *WaveRunner* **XL700**

SUPPLEMENTARY SERVICE MANUAL (E)  
SUPPLEMENT AU MANUEL D'ATELIER (F)  
ERGÄNZUNG ZUR WARTUNGSANLEITUNG (D)  
MANUAL DE SERVICIO SUPLEMENTARIO (ES)

462007

F0M-28197-Z8-CX

## PREFACE

This Supplementary Service Manual has been prepared to introduce new service and data for the XL700. For complete service information procedures, it is necessary to use this Supplementary Service Manual together with the following manual:

**XL760, XL1200 SERVICE MANUAL: GU2-28197-Z7-C1**

For what is not mentioned in this manual, please refer to the descriptions for XL760 in the above SERVICE MANUAL.

A10010

**XL700  
SUPPLEMENTARY SERVICE MANUAL**

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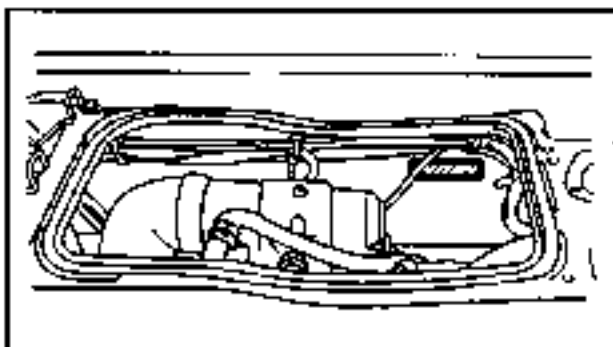
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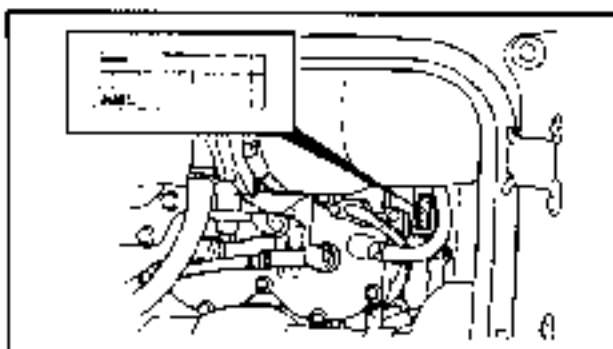
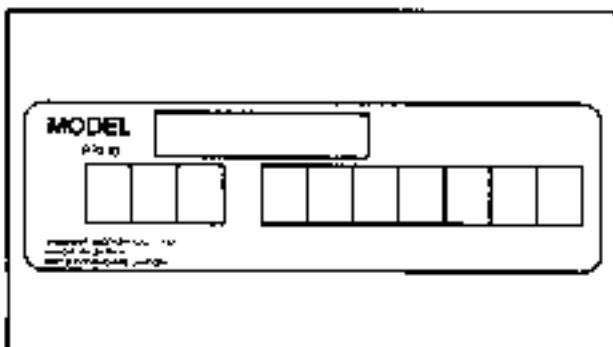


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**IDENTIFICATION NUMBERS  
PRIMARY I.D. NUMBER**

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

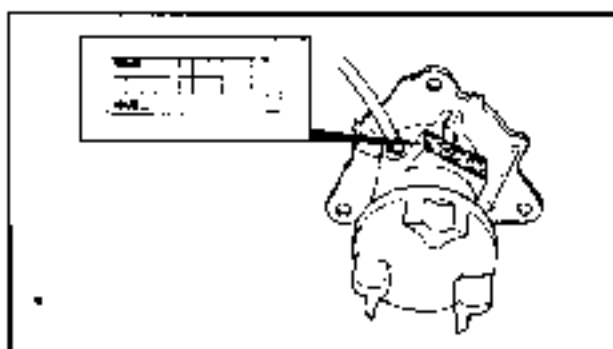
**Starting primary I.D. number:  
FOM: 800101 -**



**ENGINE SERIAL NUMBER**

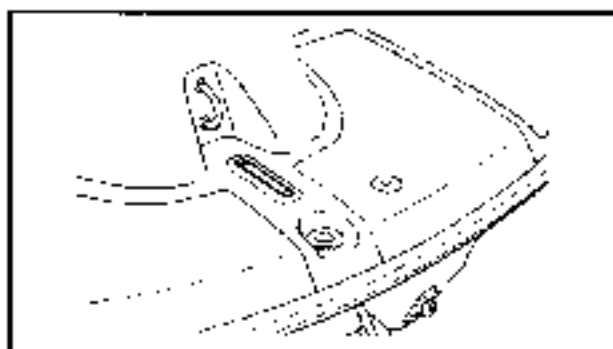
The engine serial number is stamped on a plate attached to the crankcase.

**Starting serial number:  
67E : 300101 -**



**PUMP SERIAL NUMBER**

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



**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**

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.

① 90890-03169

**MEASURING**

1. Peak voltage adaptor  
P/N. 90890-03169

① YW-38741



90890-06425

**REMOVAL AND INSTALLATION**

1. Coupler wrench  
P/N YW-38741  
90890-06425





## GENERAL SPECIFICATIONS

Item	Unit	XL700
<b>MODEL CODE:</b> Hull Engine		FOM 67E
<b>DIMENSIONS:</b> Length Width Height Dry weight	mm (in) mm (in) mm (in) kg (lb)	3,150 (124.0) 1,250 (49.2) 1,100 (43.3) 245 (54.0)
<b>PERFORMANCE:</b> Maximum speed Maximum output Maximum fuel consumption Cruising range (at full throttle)	km/h (mph) kW (hp)/rpm Vh (US gal/h, Imp gal/h) hr	74 (46) 58.8 (80)/6250 34 (8.98, 7.48) 1.5
<b>ENGINE:</b> Engine type Number of cylinders Displacement Bore and stroke Compression ratio Intake system Carburetor type Number of carburetor Carburetor starting system Scavenging system Lubrication system Cooling system Starting system Ignition system Ignition timing Spark plug (NGK) Battery capacity Lighting coil	cm <sup>3</sup> (cu.in) mm(in)             Degree  V/kC (A·h) A/rpm	2-stroke 2 701 (42.78) 81 × 68 (3.19 × 2.68) 7.2 : 1 Reed valve Floatless 2 Choke valve Loop charged Oil injection Water-cooled Electric starter C/D I 15 BTDC - 21 BTDC BR8HS 12/68.4 (19) 2 - 4/5,500
<b>DRIVE UNIT:</b> Propulsion system Jet pump type Impeller rotation (rear view) Transmission Nozzle angle	    Degree	Jet pump Axial flow, single stage Counterclockwise Direct drive from engine 24 ± 1
<b>FUEL AND OIL</b> Fuel Oil Fuel and oil mixing ratio (Wide open throttle) Fuel tank capacity Oil tank capacity	l (US gal, Imp gal) l (US gal, Imp gal) Reserve l (US gal, Imp gal) l (US gal, Imp gal)	Unleaded regular gasoline 2 stroke outboard motor oil 50 : 1 50 (13.2, 11.0) 12 (3.17, 2.64) 3.8 (1.0, 0.8)




**MAINTENANCE SPECIFICATIONS**  
**ENGINE**

Item	Unit	XL700
Cylinder head: Warpage limit	mm (in)	0.1 (0.004)
Cylinder: Bore size Wear limit Taper limit Out of round limit	mm (in) mm (in) mm (in) mm (in)	81.00 $\pm$ 0.02 (3.189 $\pm$ 0.001) 81.7 (3.193) 0.06 (0.003) 0.05 (0.002)
Piston: Piston size Measuring point* Piston clearance Wear limit Offset	 (exhaust side)	80.925 $\pm$ 0.005 (3.186 $\pm$ 0.002) 10 (0.39) 0.080 $\pm$ 0.005 (0.0031 $\pm$ 0.0033) 0.135 (0.0053) 0.5 (0.02)
Piston ring Type Sectional sketch Side clearance End gap	 (installed)	Keystone 1.2 $\pm$ 0.1 (0.05 $\pm$ 0.11) 0.02 $\pm$ 0.07 (0.001 $\pm$ 0.003) 0.2 $\pm$ 0.4 (0.008 $\pm$ 0.016)
Piston pin: Outside diameter Limit	mm (in) mm (in)	19.995 $\pm$ 0.005 (0.7872 $\pm$ 0.0002) 19.98 (0.786)
Crankshaft: Crank width "A" Run out limit "B" Connecting rod big end side clearance "C" Small end free play limit "D"	mm (in) mm (in) mm (in) mm (in)	61.95 $\pm$ 0.05 (2.439 $\pm$ 0.002) 0.05 (0.002) 0.25 $\pm$ 0.75 (0.010 $\pm$ 0.030) 2.0 (0.08)
Carburetor: Stamped mark Main nozzle Main jet (M.J.) Pilot jet (P.J.) Low speed screw Throttle valve (Th.V.) Valve seat (V.S.) High speed screw Idling speed	mm (in) Turns out Turns out r/min	62T02F/R 2.5 (0.10) 120 (F), 130 (R) 67.5 5/8, 1/4 190 1.5 (0.06) 5/8 (F), 1/8 (R) + 1/4 1,250 $\pm$ 50
Reed valve Thickness Valve lift Bending limit	mm (in) mm (in) mm (in)	0.2 (0.01) 9.0 $\pm$ 0.2 (0.35 $\pm$ 0.01) 0.2 (0.008)



## JET UNIT

Item	Unit	XL700
Jet pump:		
Impeller clearance	mm (in)	0.25 - 0.35 (0.010 - 0.014)
Service limit	mm (in)	0.6 (0.024)
Impeller shaft run-out	mm (in)	0.3 (0.012)

## ELECTRICAL

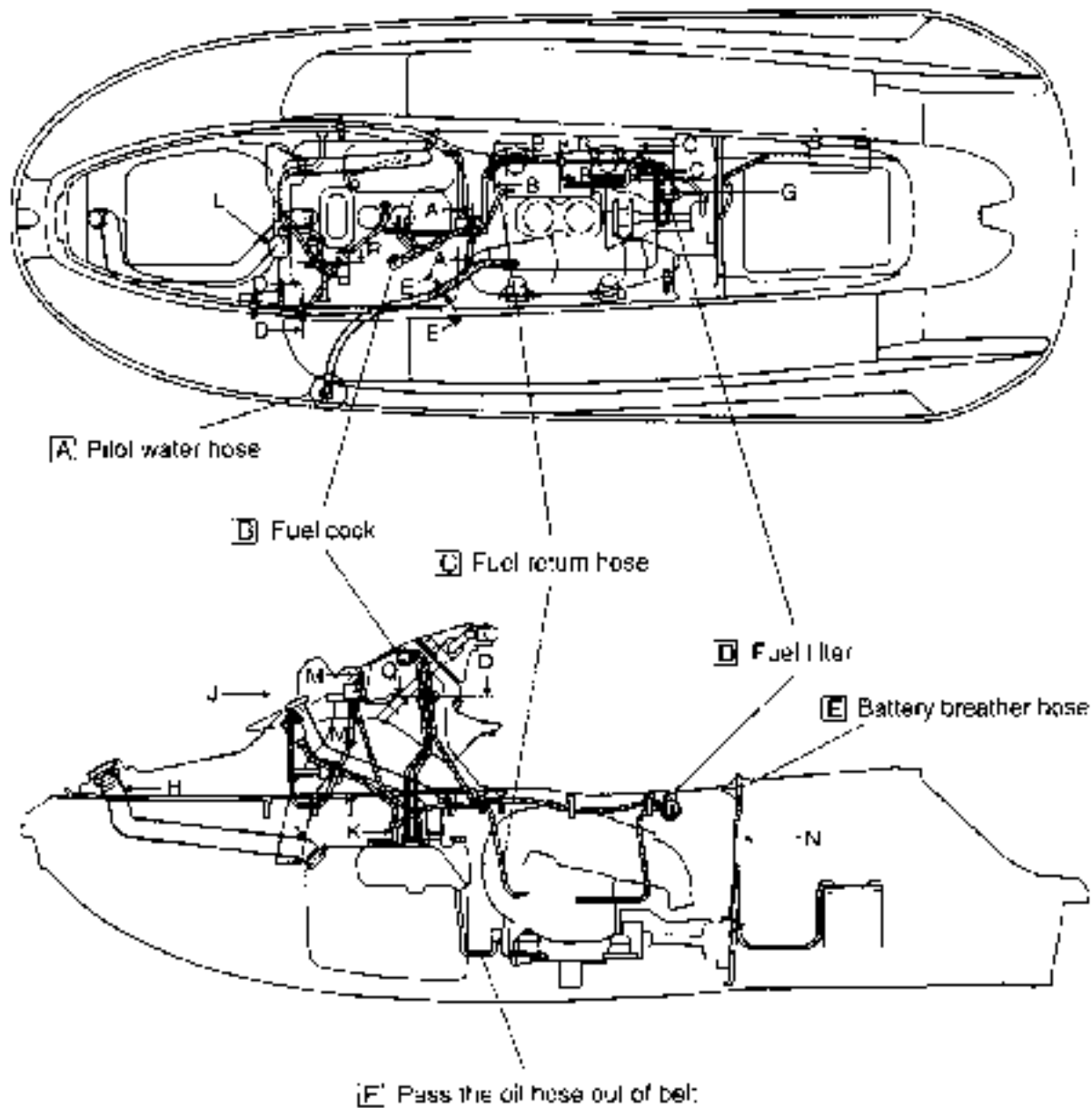
Item	Unit	XL700
Ignition system:		
Type		CDI magneto
Ignition timing	at 1,200 rpm at 5,500 rpm	Degree Degree
		15 BTDC 2° BTDC
Stator:		
Model/Manufacturer		F4T31671/MITSUBISHI
Pulser coil resistance (color)	Ω	12.6 - 15.4 (W/R - B)
Charging coil resistance (color)	Ω	497.7 - 608.3 (R/W - B)
CDI unit:		
Stamped mark		62T-01
Model/Manufacturer		F8T13175/MITSUBISHI
Over revolution limit	r/min	7,000 - 7,400
Overheat revolution control	r/min	3,000 - 3,800
Ignition coil:		
Stamped mark		62F-11
Model/Manufacturer		F6T532/MITSUBISHI
Primary winding resistance	Ω	0.078 - 0.106 (Or - 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		SH589-127/SHINDENGEN
Regulator voltage	V	14.3 - 15.3
Thermo switch		
	ON	°C (°F)
	OFF	°C (°F)
		76 - 84 (169 - 183) 63 - 77 (145 - 171)
Starter motor:		
Model/Manufacturer		SM13237/MITSUBA
Brush length	mm (in)	12.5 (0.44)
Wear limit	mm (in)	6.5 (0.26)
Commutator under cut	mm (in)	0.7 (0.028)
Limit	mm (in)	0.2 (0.008)
Commutator diameter	mm (in)	28.0 (1.10)
Limit	mm (in)	27.0 (1.06)
Fuse:		
Rating	V - A	12-10

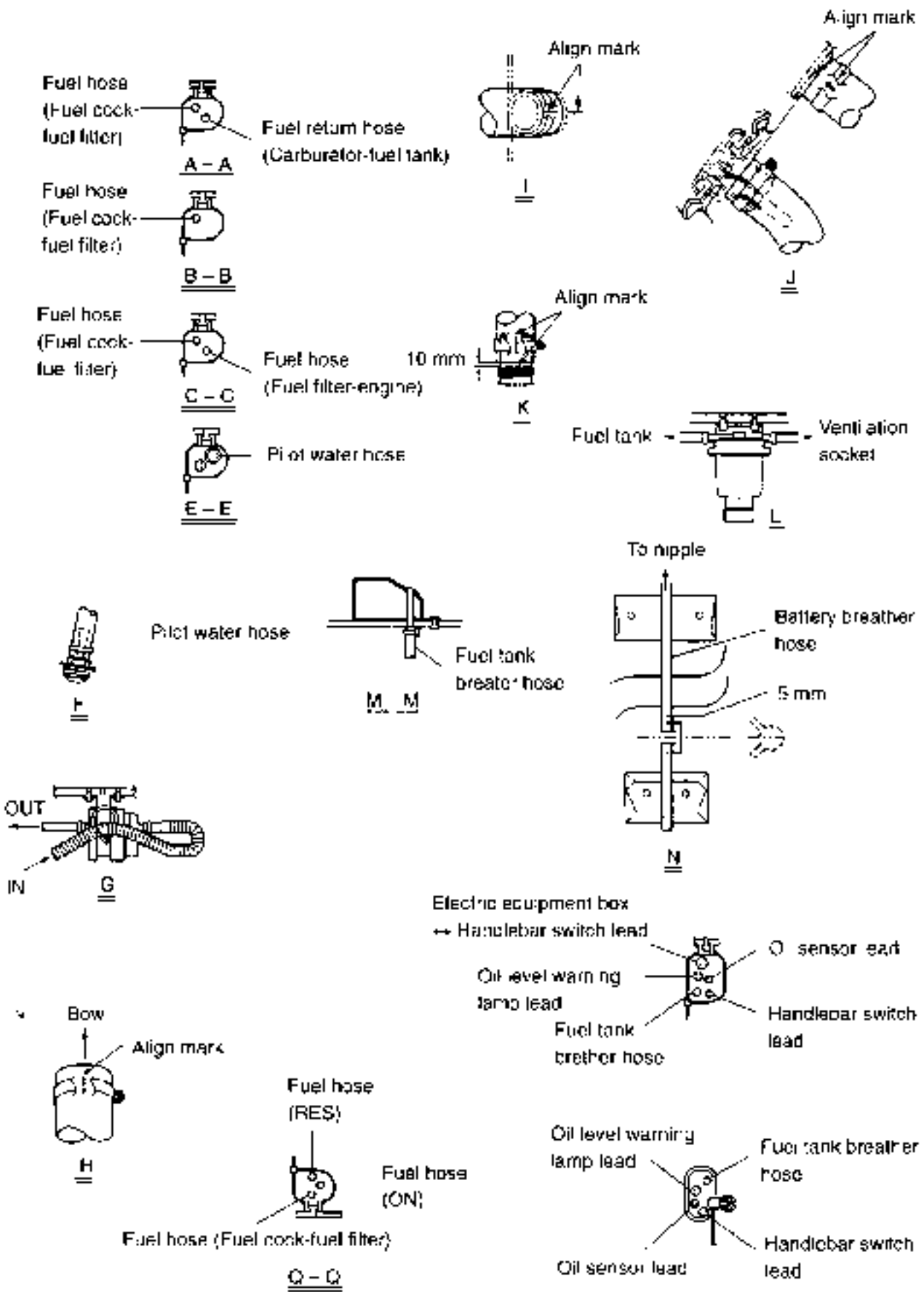


**TIGHTENING TORQUE  
SPECIFIED TORQUE**

Part to be tightened	Part name	Size	Qty	Tightening torque			Remark	
				Nm	m•kg	ft•lb		
<b>ENGINE:</b>								
Electric box	Bolt	M8	2	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 chamber	Bolt	M10	2	40	4.0	29		
Muffler stay	Bolt	M10	4	40	4.0	29		
Exhaust chamber- Muffler stay	1st	Bolt	M10	2	7	0.2	1.4	
	2nd				47	4.7	34	
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	25	
Spark plug	Bolt	M14	2	25	2.5	18		
Flywheel bolt	Bolt	M10	1	70	7.0	50		
Coupling	Nut	M27	1	37	3.7	27		
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	
Flame arrester cover	Bolt	M6	6	2	0.2	1.4		
Starter motor terminal nut	Nut	M6	1	5	0.5	3.6		
<b>JET UNIT:</b>								
Mounting bolt	Bolt	M10	4	34	3.4	24		
	Bolt	M6	2	7	0.7	5.1		
Ride plate	Bolt	M8	6	17	1.7	12		
Impeller	Bolt	M20	1	18	1.8	13		
Coupling	Nut	M27	1	37	3.7	27		
Intermediate housing	Bolt	M8	3	17	1.7	12		
Housing	Bolt	M10	4	34	3.4	25		

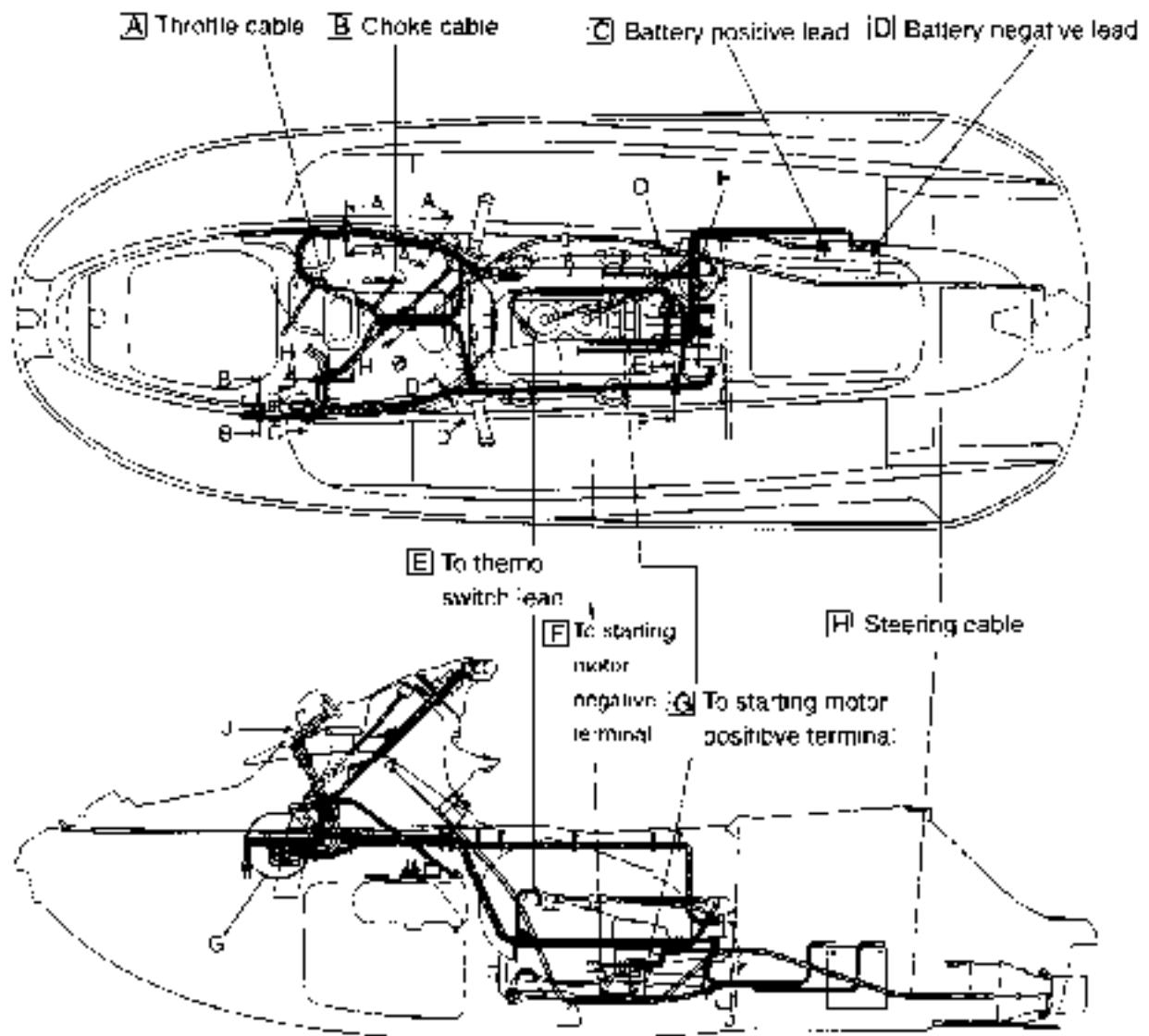
FUEL LINE ROUTING

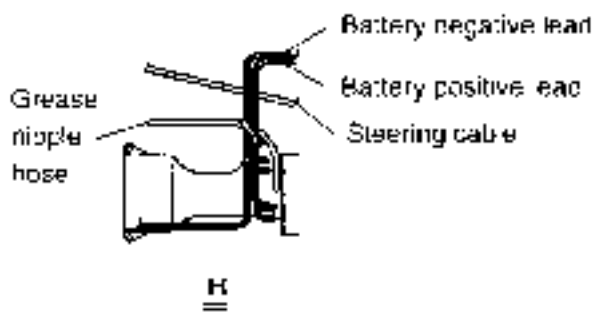
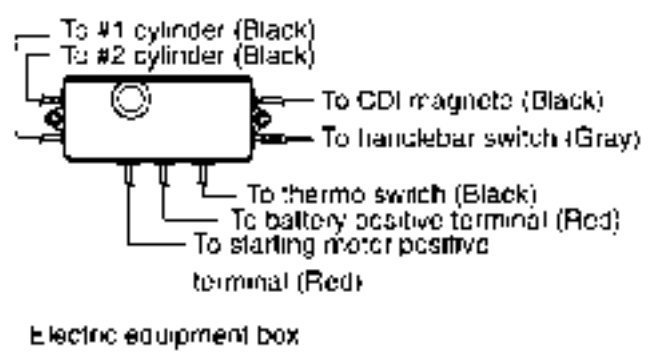
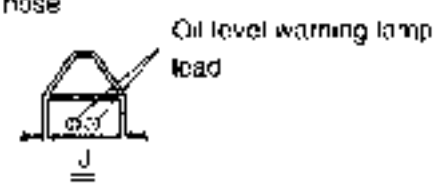
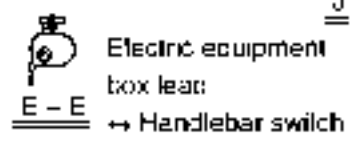
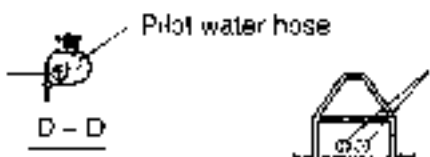
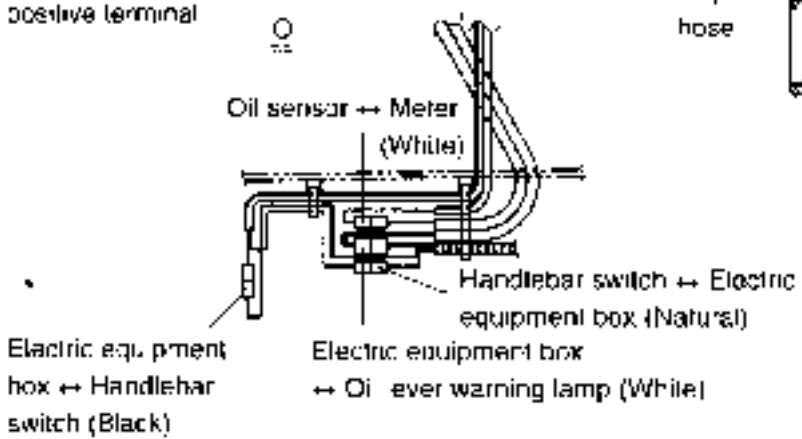
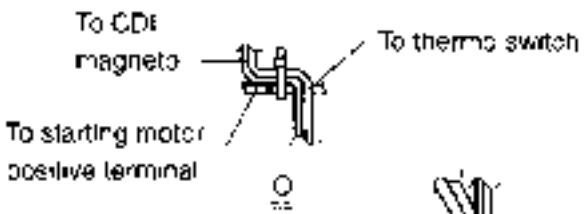
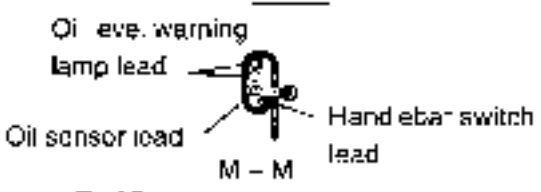
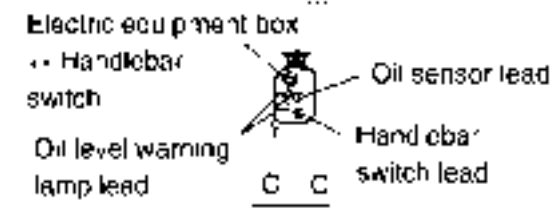
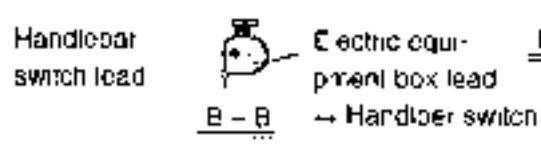
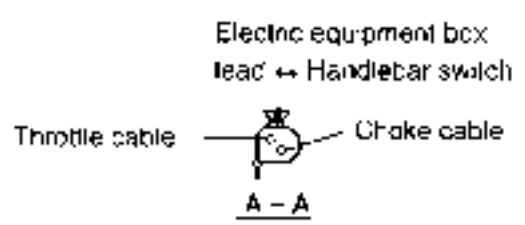






CABLE LINE ROUTING







**MAINTANCE INTERVAL CHART**

The following chart should be considered strictly as a guide to general maintenance intervals. Depending on operating conditions, the intervals of maintenance should be changed.

Item	Remarks	Initial		Every		Refer to page
		10 hours (Break-in)	50 hours (3 months)	100 hours (6 months)	200 hours (1 year)	
<b>CONTROL SYSTEM</b>						
Steering cable	Inspection/Adjustment			○		3-2
Throttle cable	Inspection/Adjustment			○		3-3
Carburetor throttle shaft	Inspection			○		-
Choke cable	Inspection/Adjustment			○		3-4
<b>FUEL SYSTEM</b>						
Fuel tank	Cleaning				○	4-7
Fuel filter	Cleaning/Replacement	○			○	3-6
Fuel line	Inspection			○		13
Idling speed	Inspection/Adjustment			○		12
Carburetor setting	Inspection/Adjustment	○		○		12
<b>OIL INJECTION SYSTEM:</b>						
Oil injection system	Inspection/Cleaning	○			○	3-8
<b>POWER UNIT:</b>						
Spark plug	Inspection/Cleaning/Adjustment	○	○	○		3-10
Cooling-water passage	Cleaning/Flashing		○			-
Coupling rubber	Inspection				○	-
<b>ELECTRICAL:</b>						
Battery	Inspection	○				3-11
<b>JLT PUMP UNIT</b>						
Impeller	Inspection			○		3-13
Bilge strainer	Cleaning			○		3-13
<b>GENERAL:</b>						
Bolt and nut	Retightening	○		○		-
Drain plug	Inspection/Replacement				○	3-14
Greasing point	Greasing			○		3-14
Bearing housing	Greasing	○ <sup>1</sup>		○ <sup>2</sup>		3-15

<sup>1</sup>: Grease capacity 33.0 ~ 35.0 cm<sup>3</sup> (1.11 ~ 1.18 oz.)

<sup>2</sup>: Grease capacity 6.0 ~ 8.0 cm<sup>3</sup> (0.20 ~ 0.27 oz.)






**PERIODIC SERVICE**


**FUEL SYSTEM**

**Trolling speed inspection and adjustment**

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

	<b>Trolling speed:</b> 1,250 ± 50 r/min
---	--


<b>Checking steps: (vehicle on water)</b>	
• Start the engine and allow it to warm up for a few minutes.	
• Attach the engine tachometer to the spark plug lead	

	<b>Engine tachometer:</b> YU-8036-A/90890-06760
---	--

- Measure the engine trolling speed.

2. Adjust:
  - Trolling speed

<b>Adjustment steps:</b>	
• Screw in the low speed screws (1) until they are lightly seated.	
• Back the screws out by the specified number of turns.	

	<b>Low speed screw:</b> 5/8 ± 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.

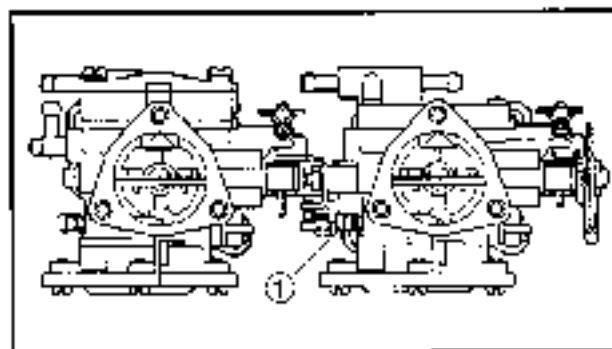
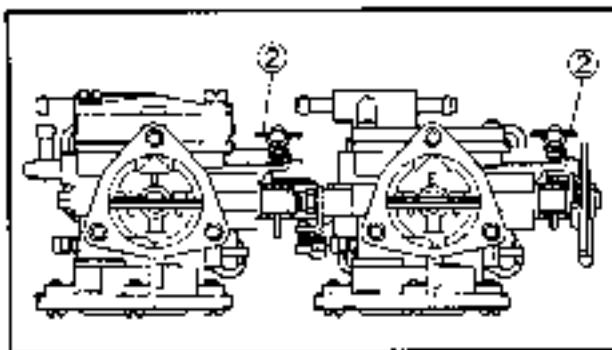
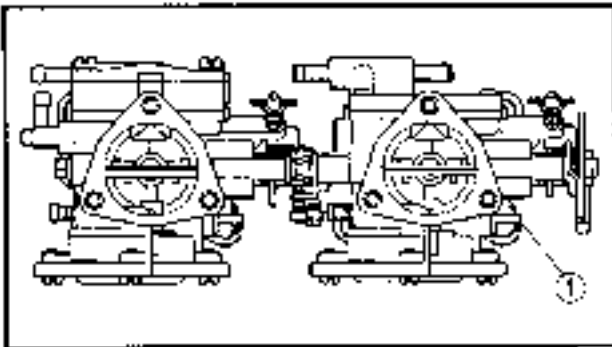
Turning in	Increase trolling speed.
Turning out	Decrease trolling speed.

**Carburetor adjustment**

1. Adjust:
  - High speed screw

<b>Adjustment steps:</b>	
• Screw in the high speed screws (1) until they are lightly seated.	
• Back the screws out by the specified number of turns.	

	<b>High speed screw:</b> 5/8 (F), 1-1/8 (R) ± 1/4 (turns out)
---	--



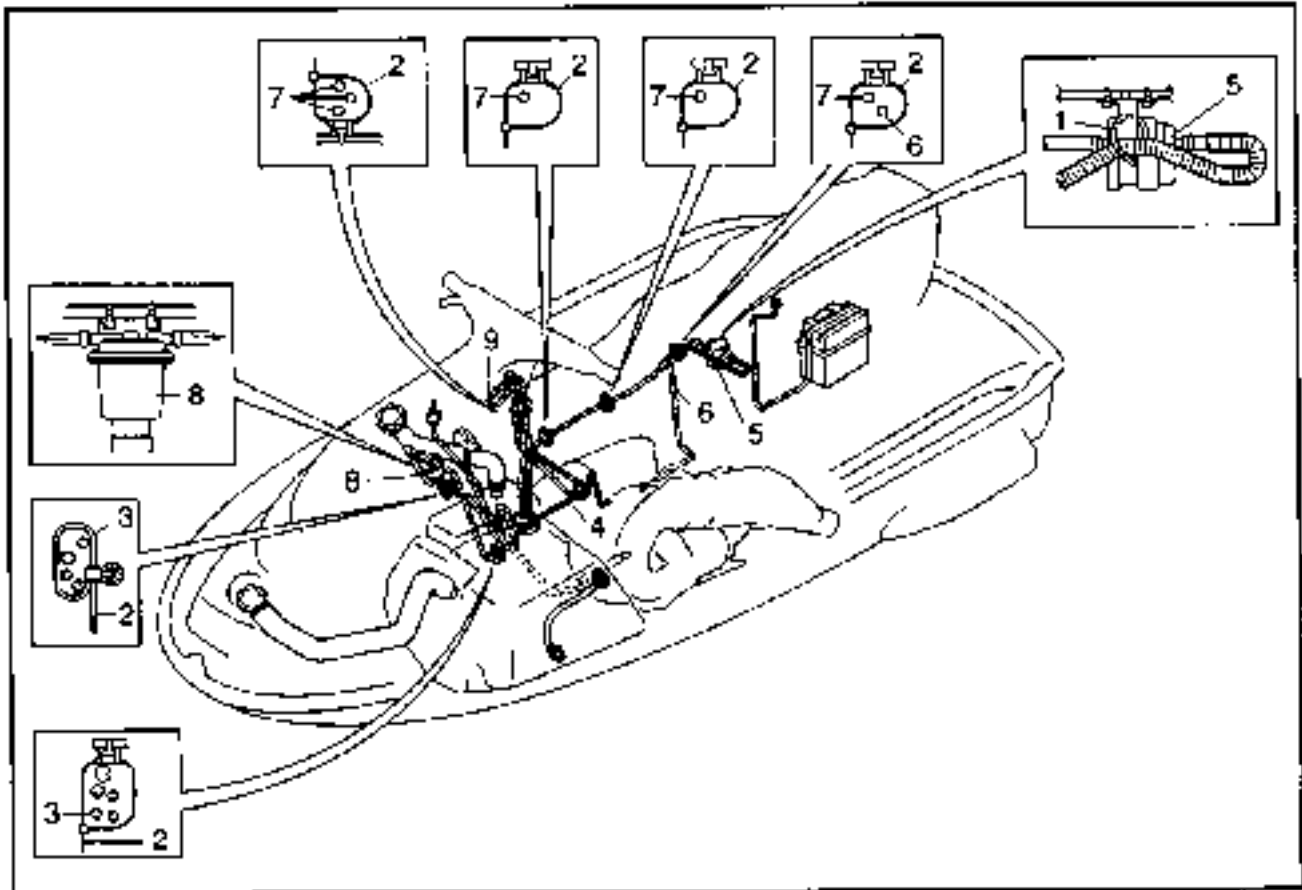


FUEL LINE

**WARNING**

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

EXPLODED DIAGRAM

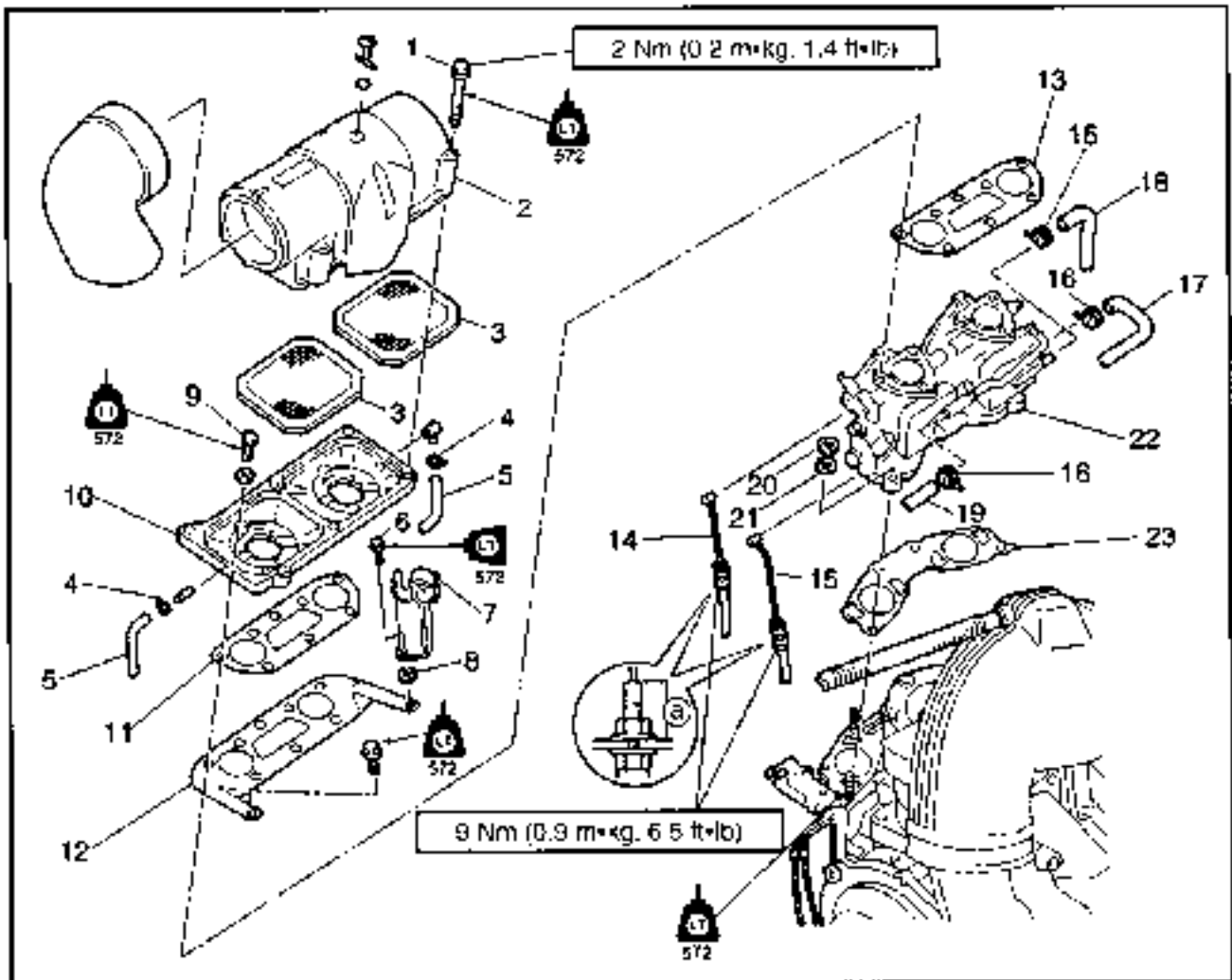


REMOVAL AND INSTALLATION CHART

Step	Procedure/Part name	Q'ty	Service points
	<b>AIR VENTILATION HOSE, FUEL COCK AND FUEL FILTER REMOVAL</b>		Follow the left "Step" for removal.
1	Hose tie	1	
2	Clamp	6	
3	Air ventilation hose	1	
4	Fuel hose (RETURN)	1	
5	Fuel filter	1	
6	Fuel hose	1	
7	Fuel hose	3	
8	Check valve	1	
9	Fuel cock body	1	
			Reverse the removal steps for installation.

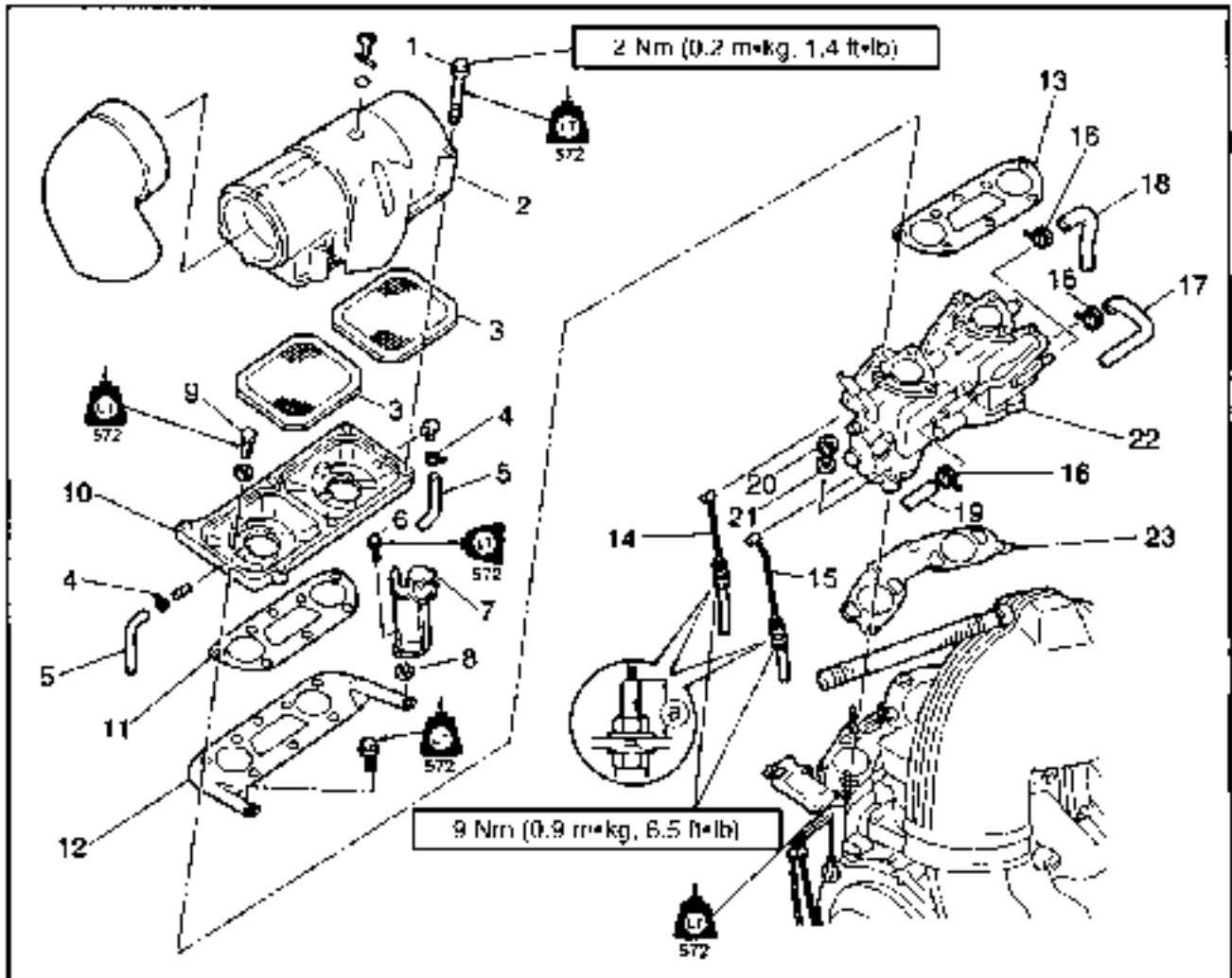


**CARBURETOR UNIT REMOVAL**  
EXPLODED DIAGRAM



**REMOVAL AND INSTALLATION CHART**

Step	Procedure/Part name	Qty	Service points
<b>CARBURETOR REMOVAL</b>			Follow the left "Step" for removal. <b>NOTE:</b> Turn the fuel cock to "OFF".
	Fuel cock		
1	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	

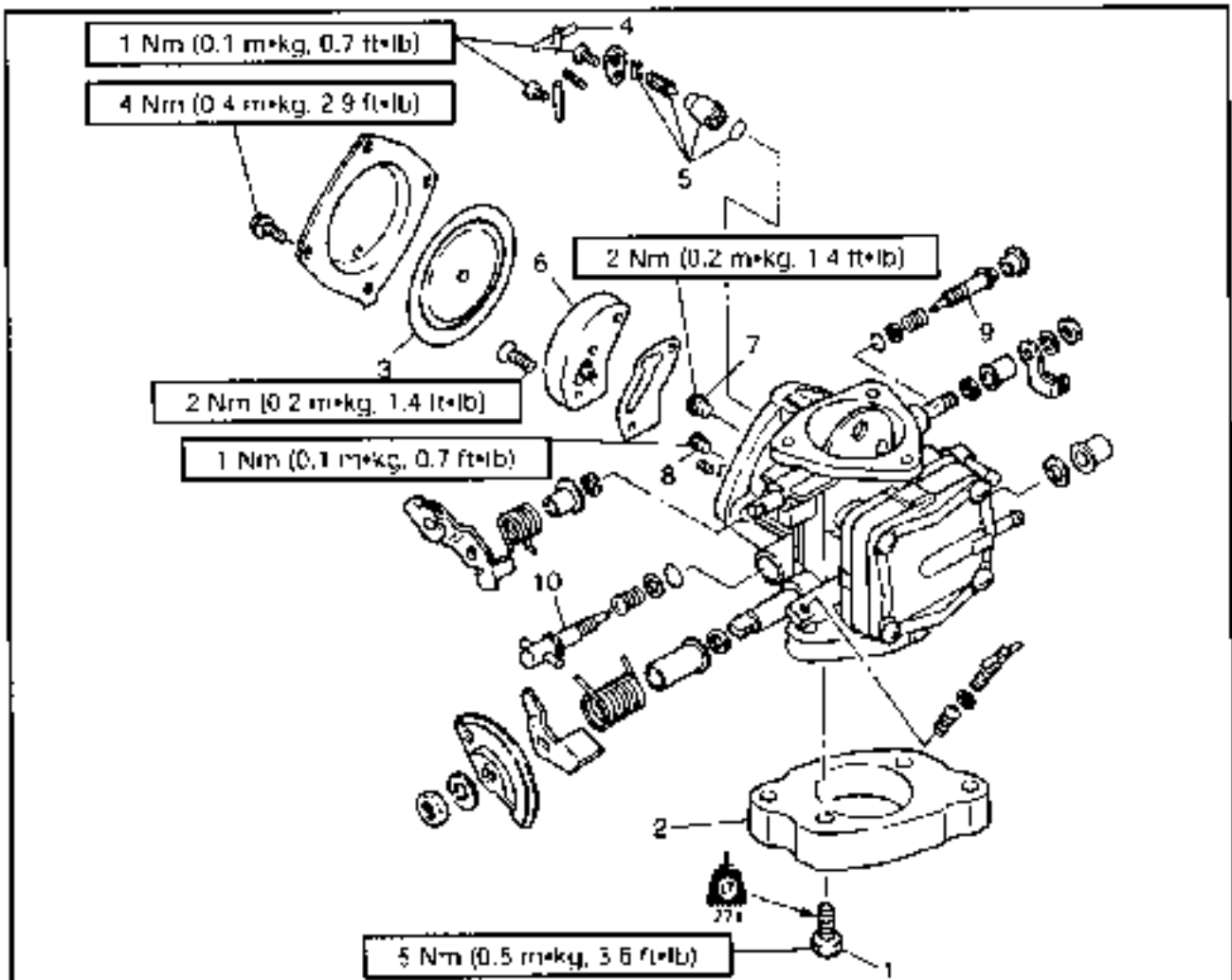


Step	Procedure/Part name	Qty	Service parts
13	Cover gasket	1	<p><b>Cable guide set position<sup>(a)</sup> :</b>  <b>17 mm (0.67 in)</b>  <b>Between cable guide top</b>  <b>and plate top.</b></p>
14	Choke cable	1	
15	Throttle cable	1	
-			
16	Hose tie	3	
17	Fuel hose (fuel filter-fuel pump)	1	
18	Pulse 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.

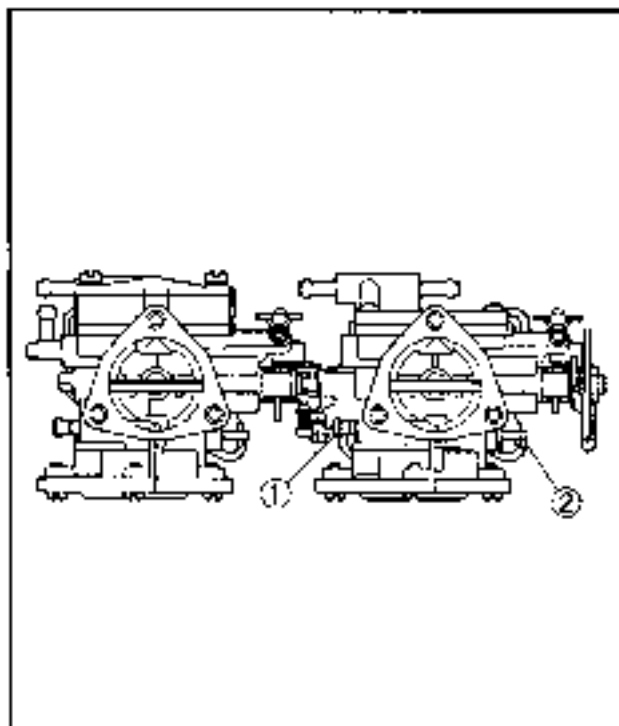


**CARBURETOR  
EXPLODED DIAGRAM**



**REMOVAL AND INSTALLATION CHART**

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

**SERVICE POINTS****High and low speed screws adjustment**

- Adjust:
  - High speed screw
  - Low speed screw

**Adjustment steps:**

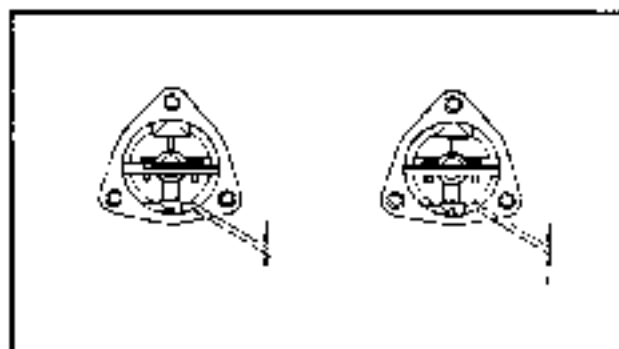
- Screw in the high speed screw (1) or low speed screw (2) until it is lightly seated.
- Back out by the specified number of turns.

**High speed screw:**

5/8 (#1), 1-1/8 (#2) - 1/4 turns out

**Low speed screw:**

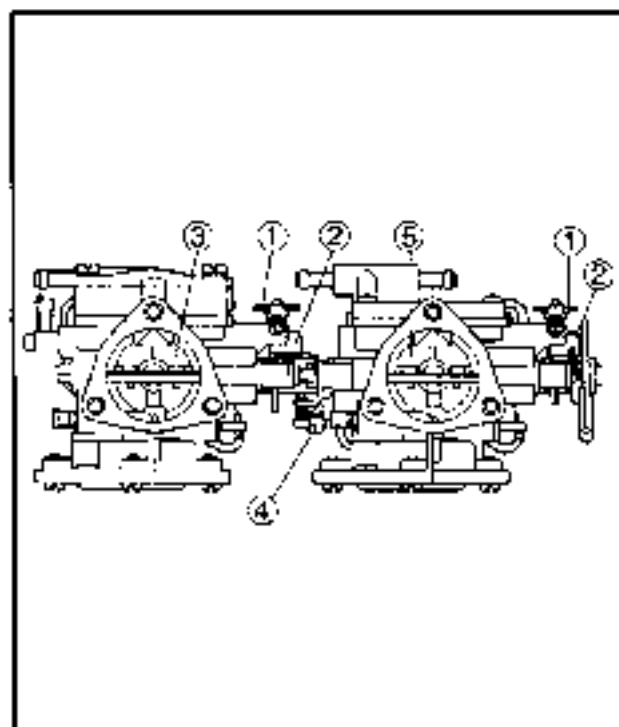
5/8 (#1) + 1/4 turns out

**Throttle valve synchronization inspection and adjustment**

- Check:
  - Throttle valve synchronization
 Out of specification → Adjust.

**Checking steps:**

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



- Adjust:

- Throttle valve synchronization

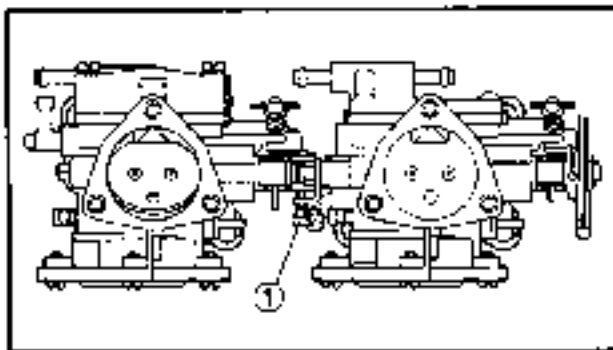
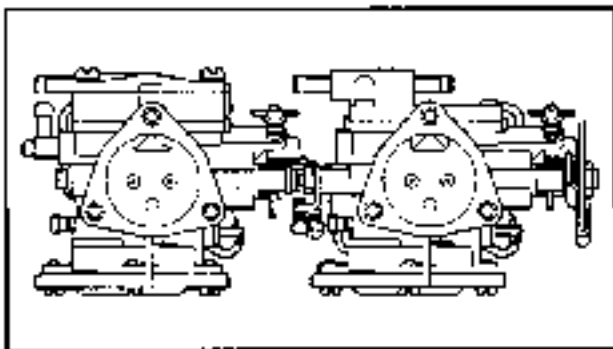
**Adjustment steps:**

- 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 throttle valve "R" (3) is fully closed.
- Turn the synchronization screw (4) in or out until the throttle valve "F" (5) is fully closed.
- Turn in the idle adjust screws 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:

- 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.

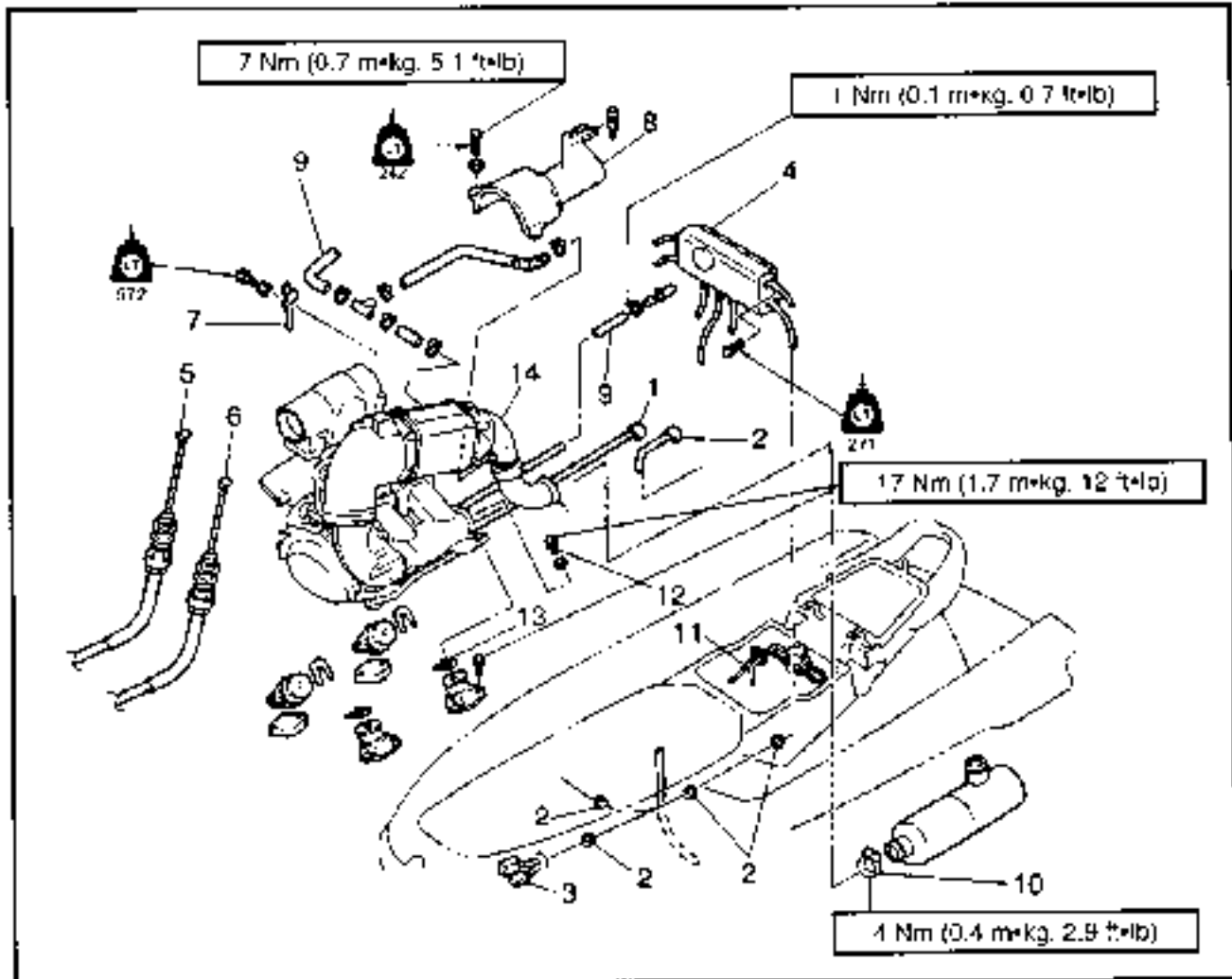
### Carburetor assembly

#### 1. Adjust:

- Trolling speed

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

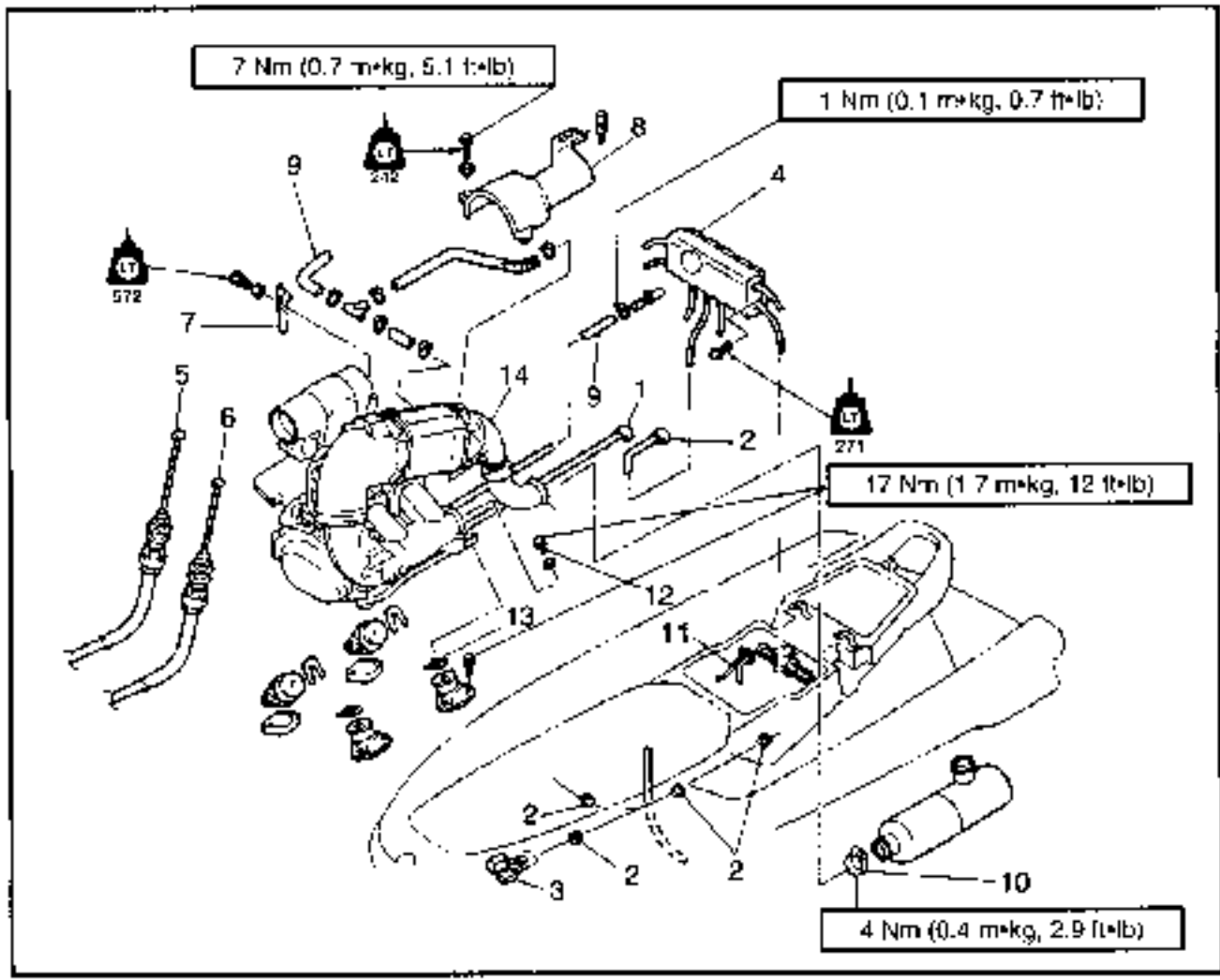
**ENGINE UNIT REMOVAL**  
**EXPLODED DIAGRAM**



**REMOVAL AND INSTALLATION CHART**

Step	Procedure/Part name	Q'ty	Service points
	<b>ENGINE UNIT REMOVAL</b>		
	Engine hood assembly		Follow the left "Step" for removal. Refer to the "ENGINE HOOD REMOVAL" section in chapter 8.
	Oil tank assembly		Refer to the "OIL TANK AND FUEL TANK REMOVAL" section in chapter 4.
	Fuel tank assembly		
	Ventilation nose		Refer to the "DECK" section in chapter 8.
1	Battery lead	2	
2	Wire clamp	4	
3	Lead coupler	2	
4	Electrical box	1	
5	Choke cable	1	
6	Throttle cable	1	
7	Housing grease nipple plate	1	
8	Coupling cover	1	
9	Water hose	3	

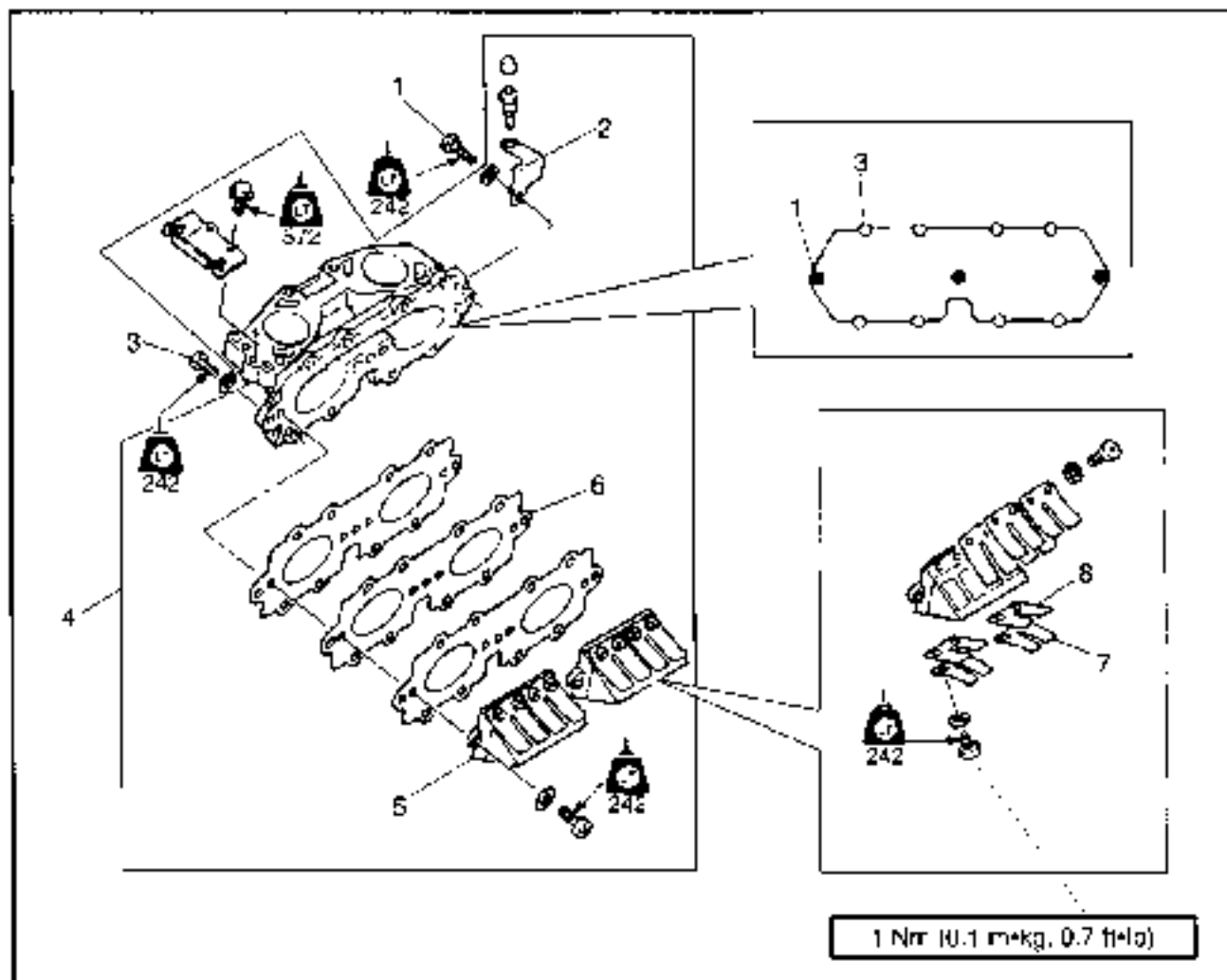




Step	Procedure/Par. name	Qty	Service points
10	Clamp	1	Reverse the removal steps for installation.
11	Fuel hose	2	
12	Engine mounting bolt	4	
13	Shim	*	
*14	Engine unit	1	



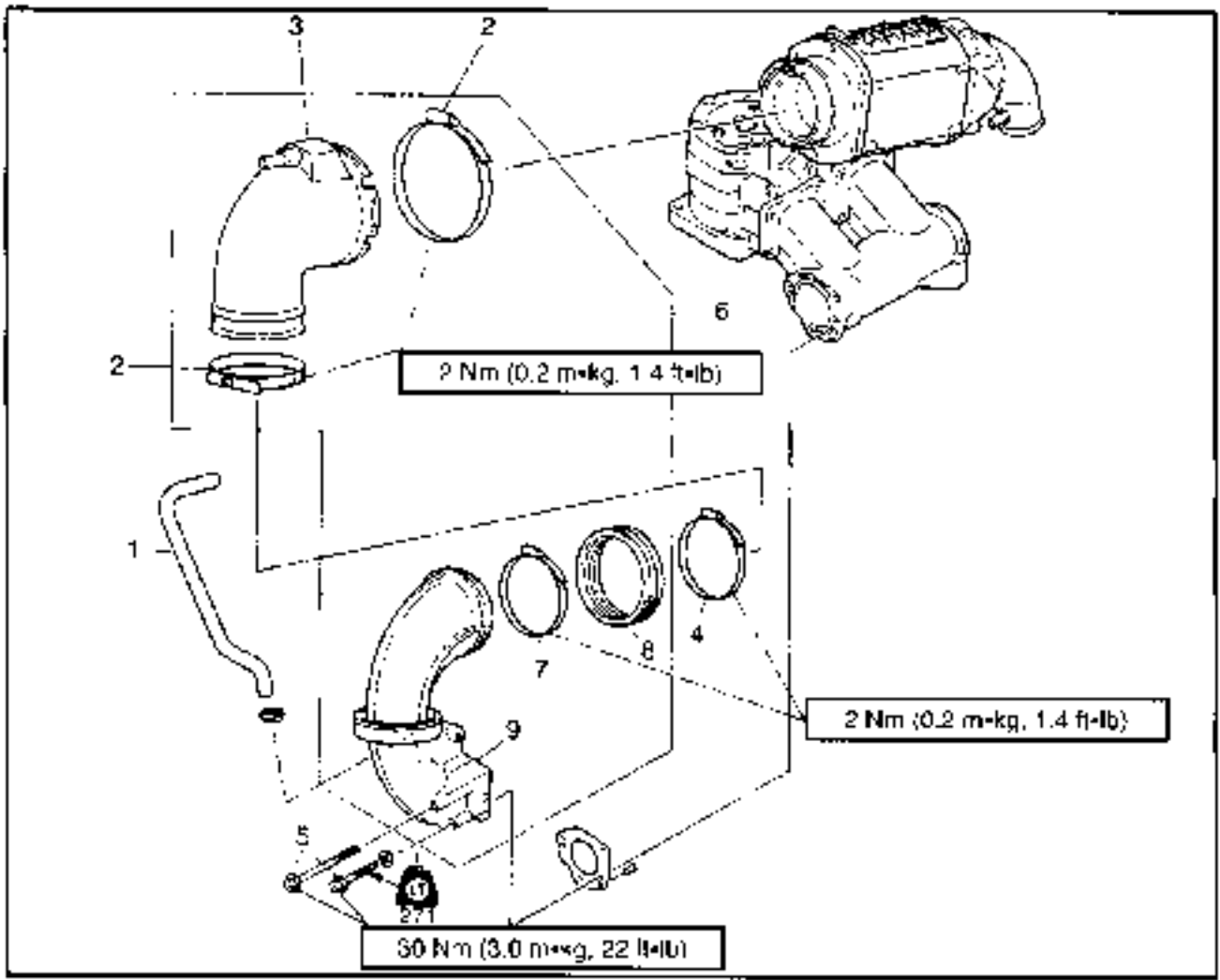
**REED VALVE  
EXPLODED DIAGRAM**



**REMOVAL AND INSTALLATION CHART**

Step	Procedures/Part name	Q'ty	Service points
	<b>REED VALVE REMOVAL</b> Carburetor assembly		Follow the left "Step" for removal. Refer to the "CARBURETOR REMOVAL" section in chapter 4.
1	Bolt (with washer)	3	6 x 35 mm
2	Plate	1	
3	Bolt (with washer)	8	6 x 25 mm
4	Intake manifold assembly	1	
5	Reed valve assembly	2	
6	Plate	1	
7	Valve stopper	4	
8	Reed valve	4	
			Reverse the removal steps for installation

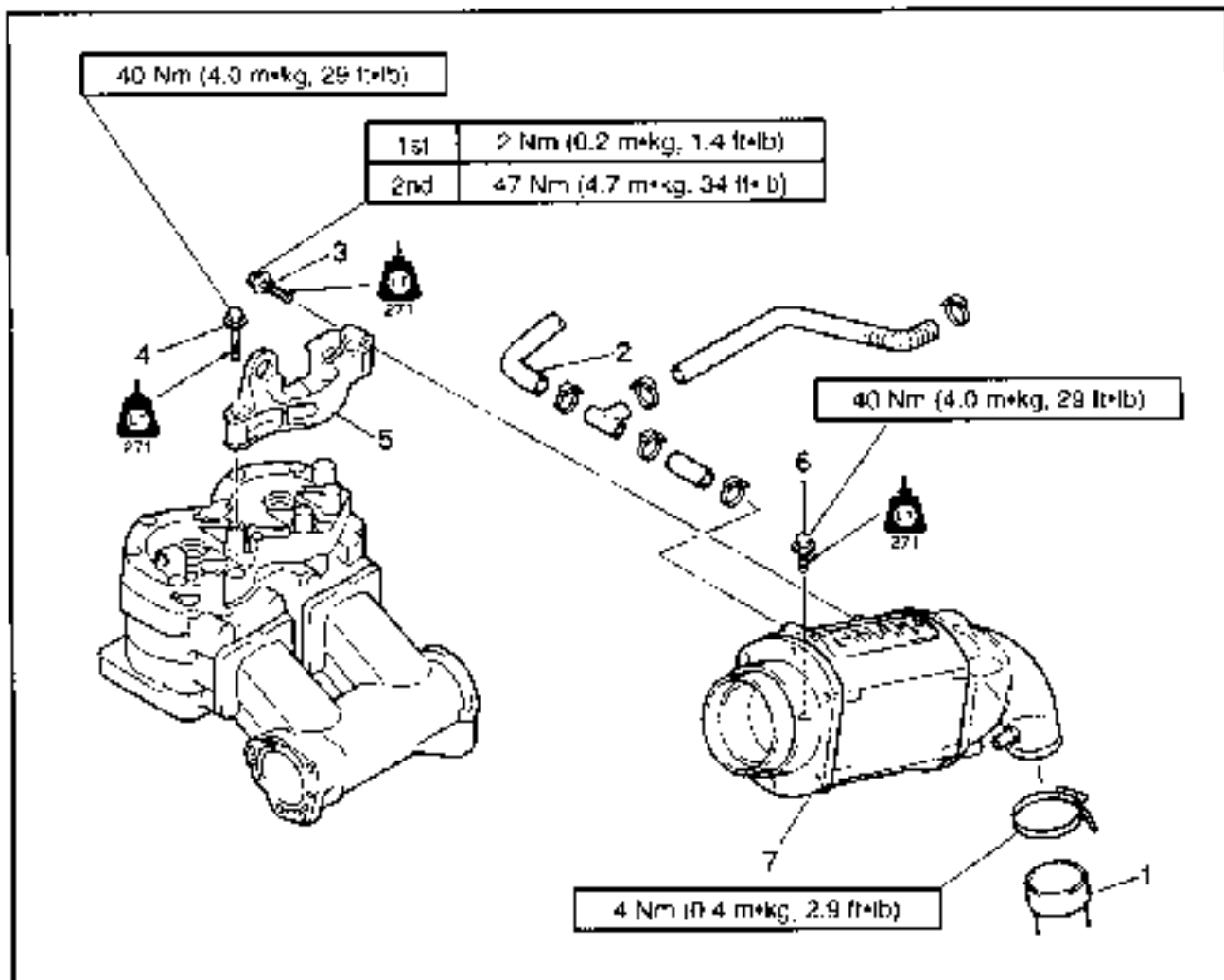
**EXHAUST RING  
EXPLODED DIAGRAM**



**REMOVAL AND INSTALLATION CHART**

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

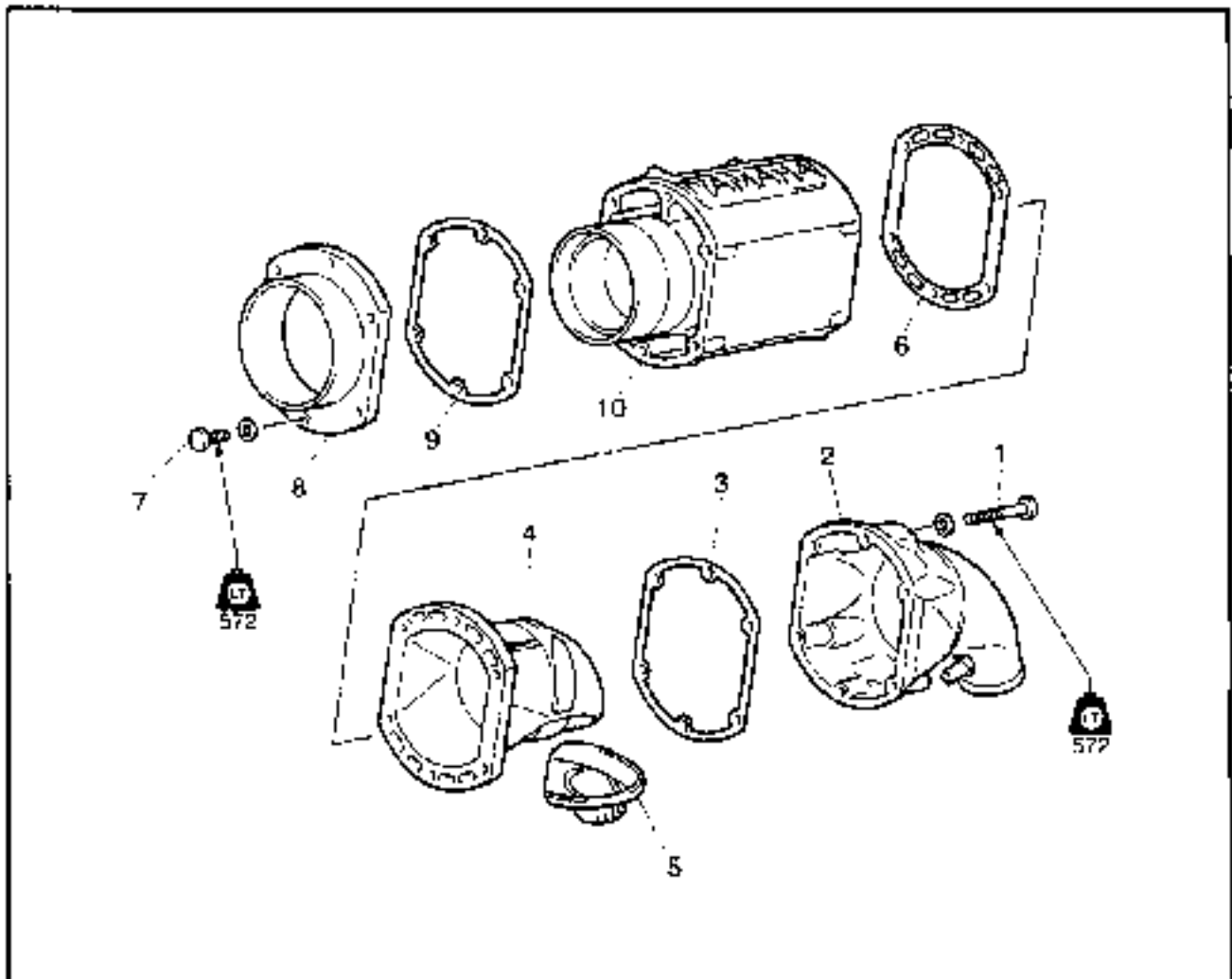
**EXHAUST CHAMBER REMOVAL  
EXPLODED DIAGRAM**



**REMOVAL AND INSTALLATION CHART**

Step	Procedure/Part name	Qty	Service points
<b>EXHAUST CHAMBER REMOVAL</b>			
	Ring		Follow the left "Step" for removal. Refer to "EXHAUST RING".
1	Exhaust hose	1	
2	Water outlet hose	1	
3	Bolt (exhaust chamber)	2	<b>NOTE:</b> _____ Tighten the bolts in sequence.
4	Bolt (muffler stay)	4	
5	Muffler stay	1	
6	Bolt	2	
7	Exhaust chamber assembly	1	Reverse the removal steps for installation

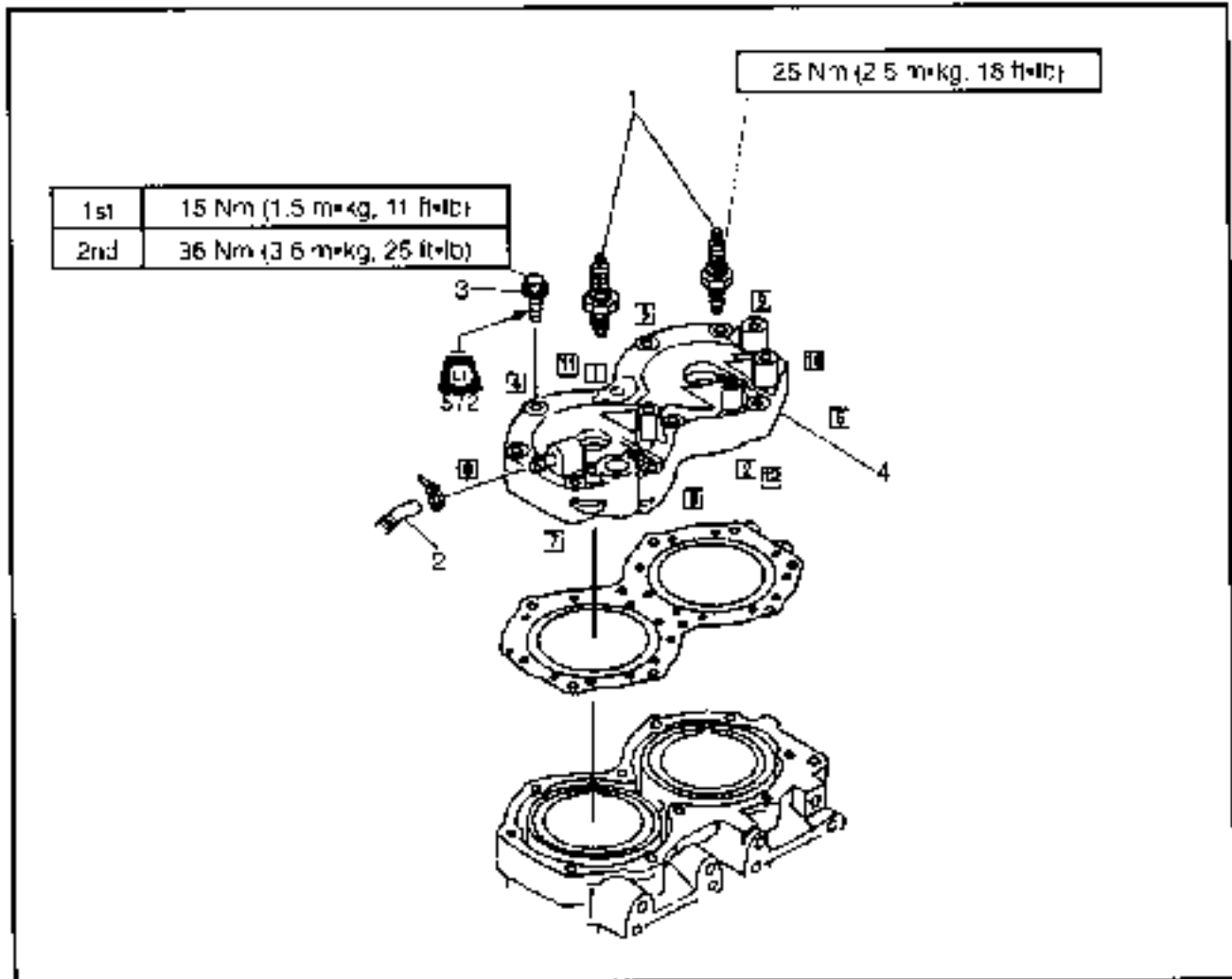
**EXHAUST CHAMBER  
EXPLODED DIAGRAM**



**REMOVAL AND INSTALLATION CHART**

Step	Procedure/Part name	Q'ty	Service points
	<b>CHAMBER DISASSEMBLY</b> Exhaust chamber assembly		Follow the left "Step" for removal Refer to "EXHAUST CHAMBER REMOVAL"
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.

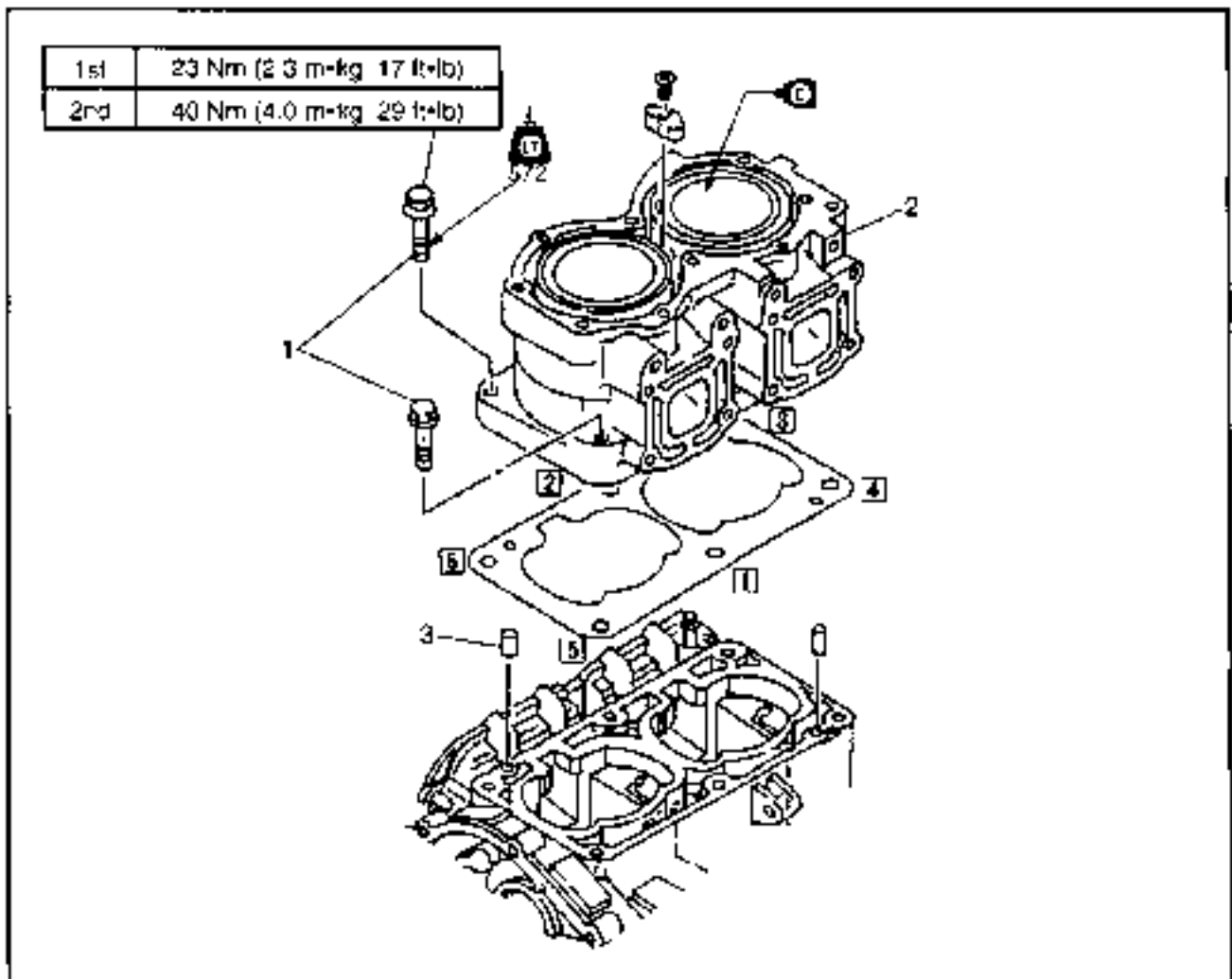
**CYLINDER HEAD  
EXPLODED DIAGRAM**



**REMOVAL AND INSTALLATION CHART**

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

**CYLINDER  
EXPLODED DIAGRAM**



**REMOVAL AND INSTALLATION CHART**

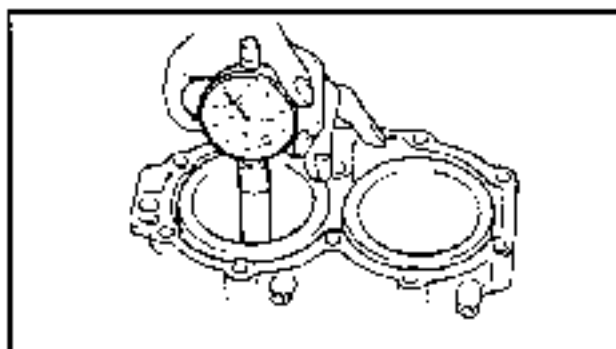
Step	Procedure/Part name	Q'ty	Service points
1	<b>CYLINDER REMOVAL</b>		
	Cylinder head	6	Follow the left "Step" for removal. Refer to "CYLINDER HEAD"
	Bolt (with washer)		<b>NOTE:</b> Tighten the bolts in sequence and in two steps of torque.
2	Cylinder	1	<b>NOTE:</b> After installing, check the smooth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



**SERVICE POINTS**

**Cylinder Inspection**

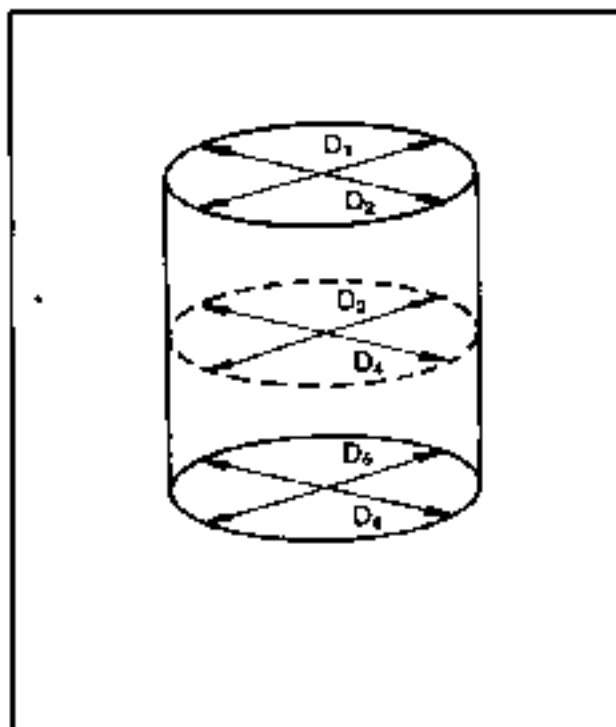
1. Eliminate:
  - Carbon deposits  
Use a rounded scraper (1).
  
2. Inspect:
  - Cylinder water jacket  
Mineral deposits/Corrosion → Clean.
  - Cylinder inner surface  
Score marks → Repair or replace.  
Use #600 - 800 grit wet sandpaper.




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.

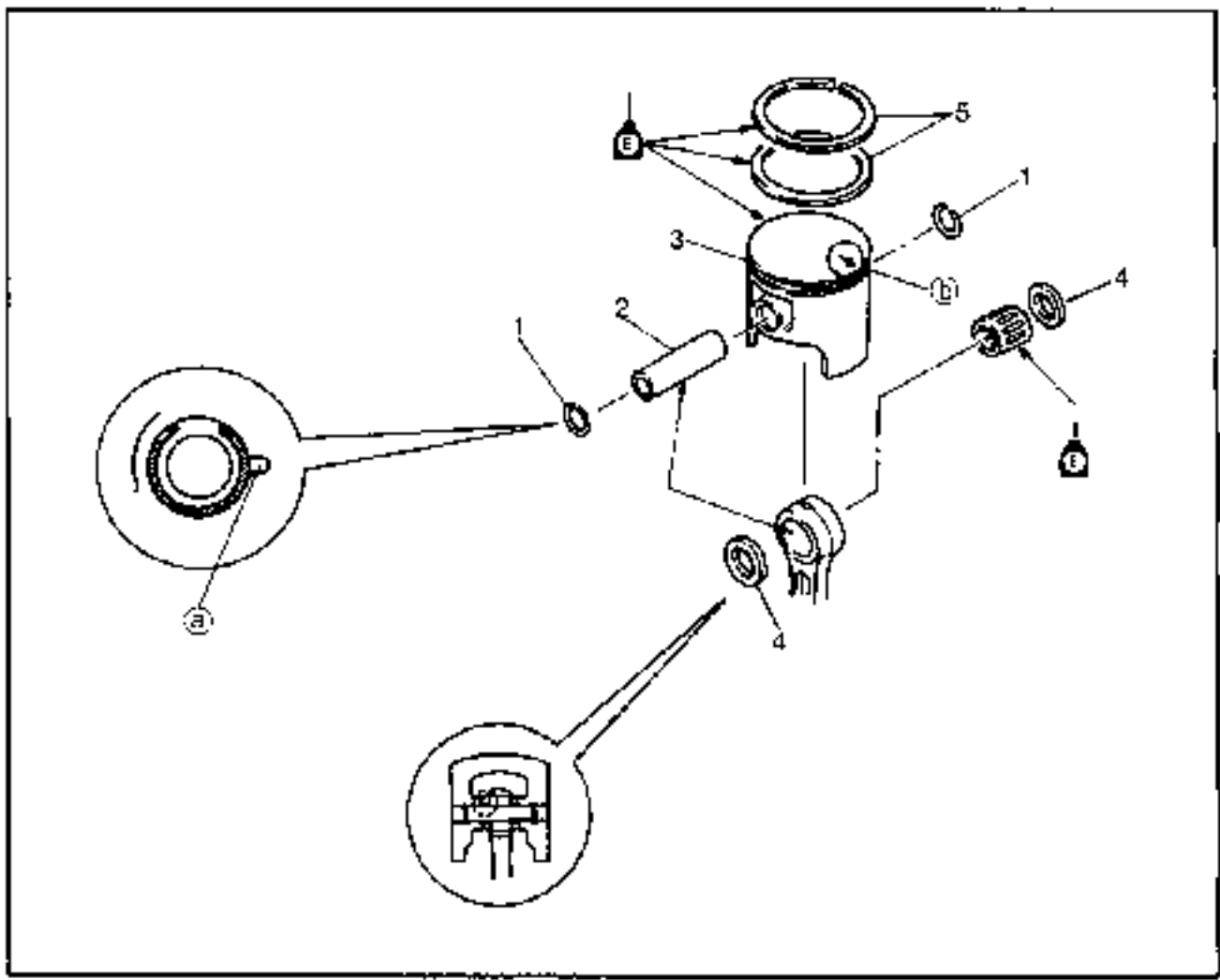


	Standard	Limit
Cylinder bore "D"	81.00 - 81.02 mm (3.189 - 3.190 in)	81.10 mm (3.193 in)
Taper "T"		0.08 mm (0.003 in)
Out of round "R"	-	0.05 mm (0.002 in)

D = Maximum (D<sub>1</sub> - D<sub>6</sub>)  
 T = (Maximum D<sub>1</sub> or D<sub>2</sub>) - (Maximum D<sub>5</sub> or D<sub>6</sub>)  
 R = (Maximum D<sub>1</sub>, D<sub>3</sub> or D<sub>5</sub>) - (Minimum D<sub>2</sub>, D<sub>4</sub> or D<sub>6</sub>)



**PISTON  
EXPLODED DIAGRAM**



**REMOVAL AND INSTALLATION CHART**

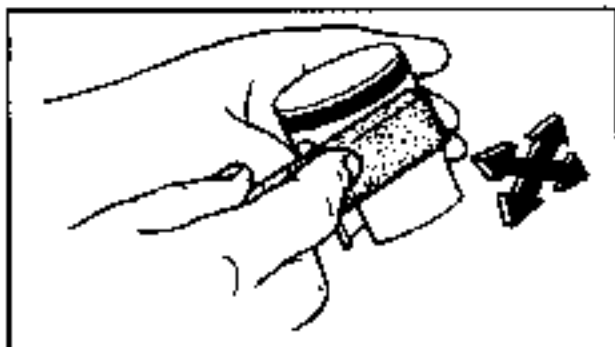
Step	Procedure/Part name	Qty	Service points
	<b>PISTON REMOVAL</b> Cylinder		Follow the left "Step" for removal. Refer to "CYLINDER"
1	Piston pin clip	4	<b>CAUTION:</b> _____
2	Piston pin	2	<b>Do not allow the clip open ends to meet the piston pin slot (a).</b>
3	Piston	2	<b>NOTE:</b> _____
4	Washer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



**SERVICE POINT**

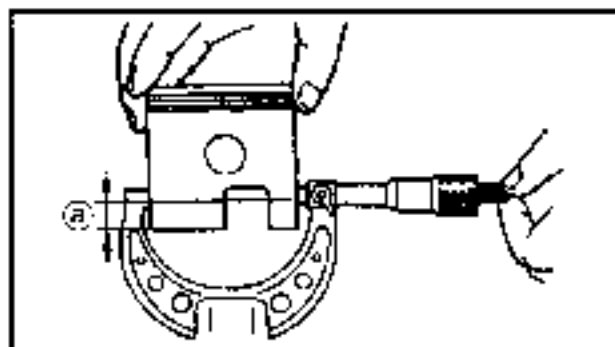
**Piston Inspection**

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.

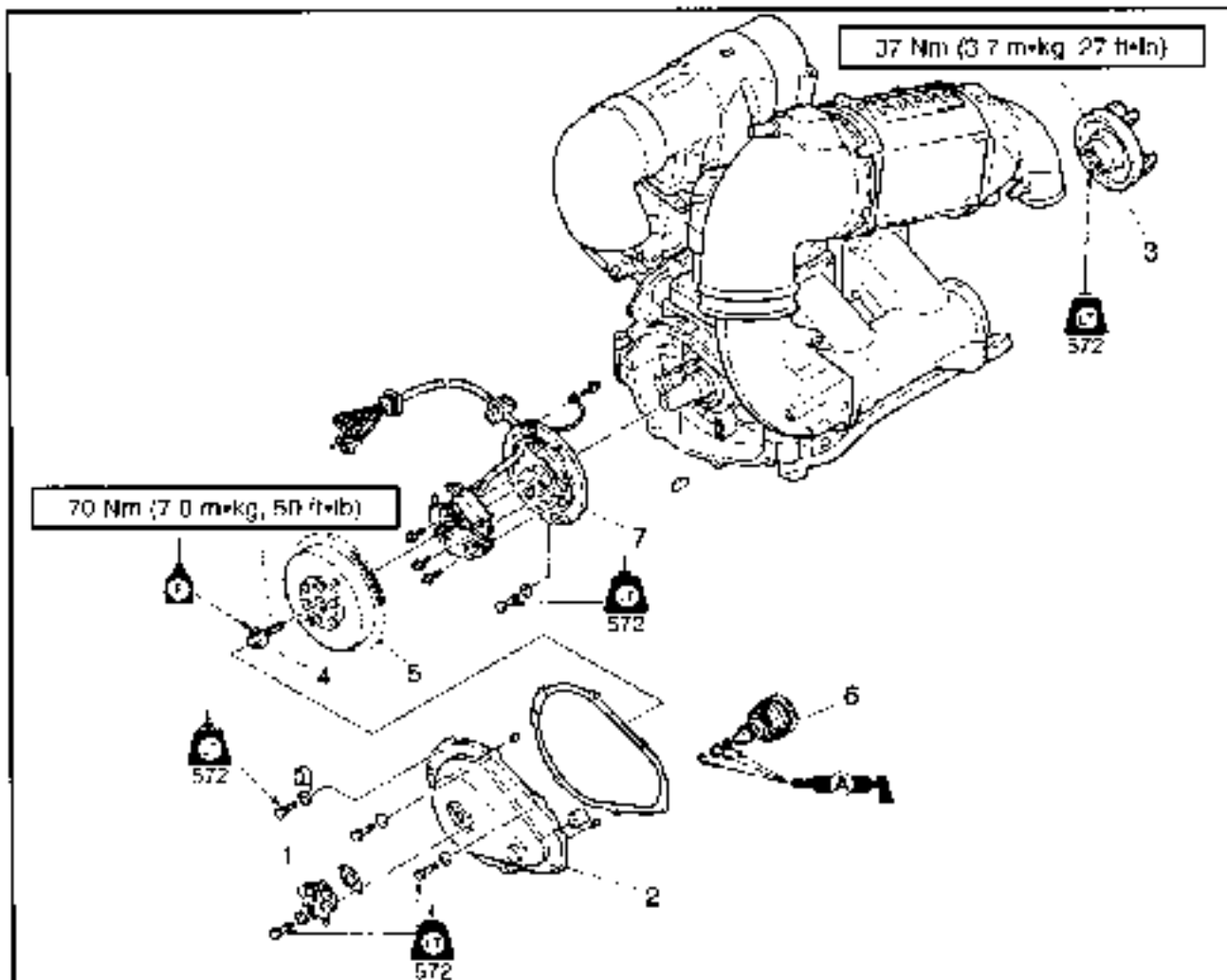
 Piston diameter	Distance (a)
80.925 – 80.950 mm (3.186 – 3.187 in)	10 mm (0.39 in)

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

<b>PISTON CLEARANCE</b>	=	<b>CYLINDER BORE</b>	-	<b>PISTON DIAMETER</b>
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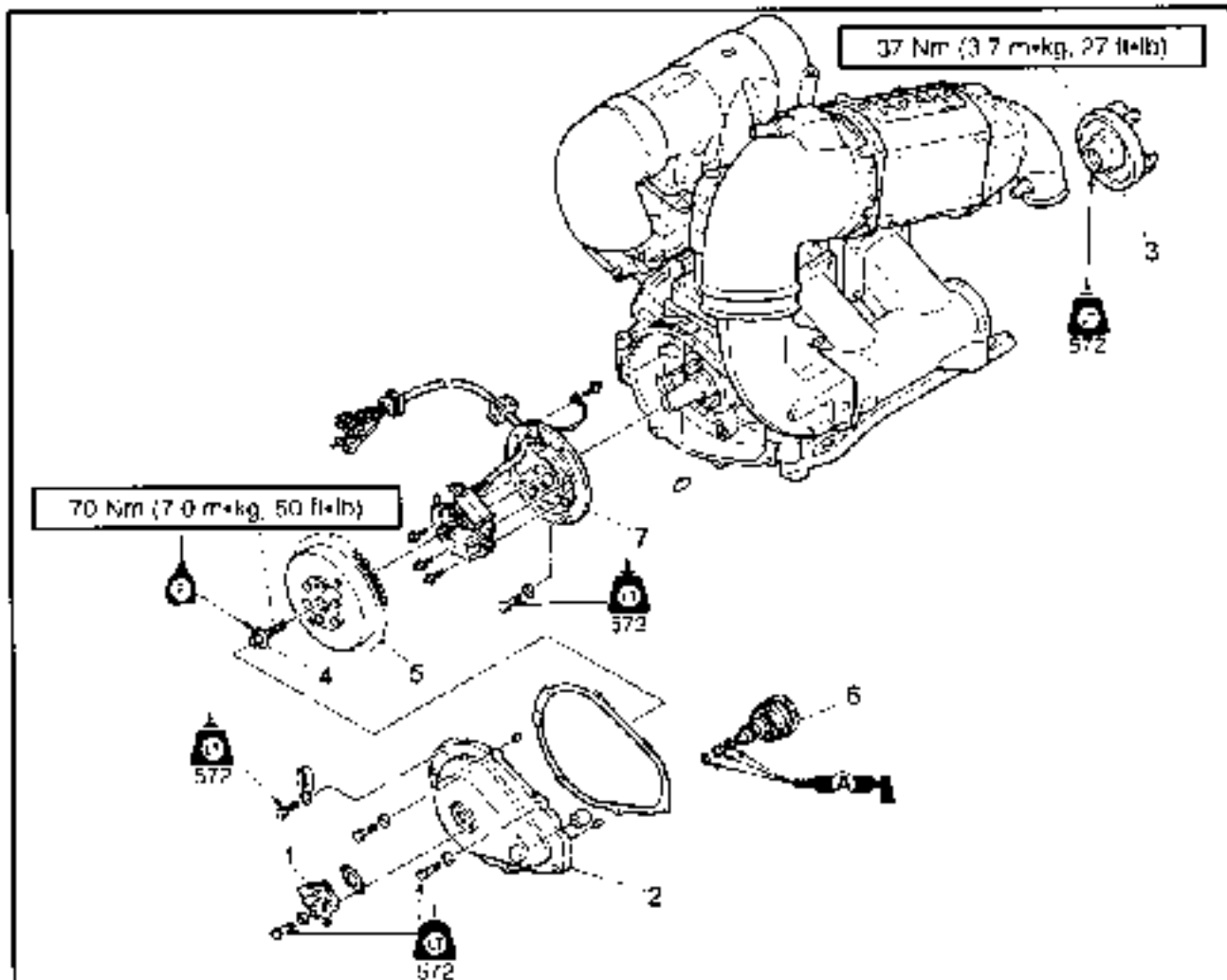
 <b>Piston clearance:</b> 0.080 – 0.085 mm (0.0031 – 0.0033 in)
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**FLYWHEEL MAGNETO AND BASE  
EXPLODED DIAGRAM**

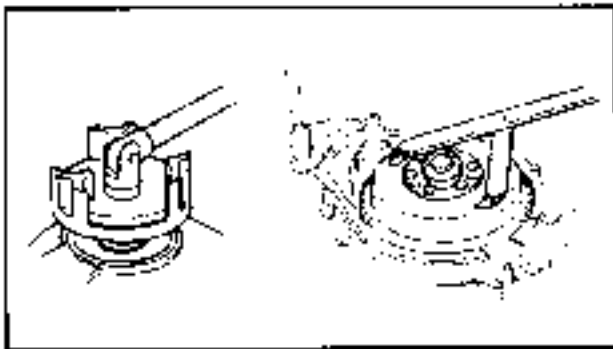


**REMOVAL AND INSTALLATION CHART**

Step	Procedure/Part name	Qty	Service points
	<b>FLYWHEEL MAGNETO AND BASE REMOVAL</b> Engine unit		Follow the left "Step" for removal.  Refer to the "ENGINE UNIT REMOVAL" section.
1	Oil pump	1	<b>NOTE:</b> When installing the flywheel magneto make sure that the woodruff key is properly seated in the keyway of the crankshaft.
2	Flywheel cover	1	
3	Coupling flange	1	
4	Flange bolt	1	
5	Flywheel magneto	1	



Step	Procedure/Part name	Q'ty	Service points
E	Idle gear assembly	1	<b>NOTE:</b> _____ Fill the flywheel cover groove with water resistant grease.
7	Base assembly	1	<b>NOTE:</b> _____ Align the punch mark on the crankcase with the punch mark on the base assembly.  Reverse the removal steps for installation.



**SERVICE POINTS**

**Coupling flange removal and installation**

1. Remove and install:
  - Coupling flange



**Coupler wrench:**  
 YW-38741/90890-06425  
**Flywheel holder:**  
 YB-06139/90890-06522

**Flywheel magneto removal and installation**

1. Remove and install:
  - Bolt

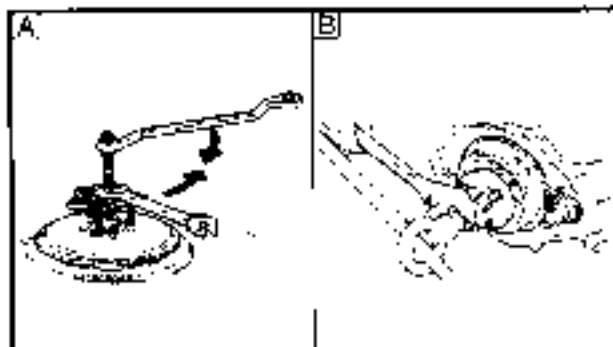


**Flywheel holder:**  
 YB-06139/90890-06522

2. Remove.
  - Flywheel magneto



**Flywheel puller:**  
 YB-06117/90890-06521  
**Bolt:**  
 M8 × 60 mm

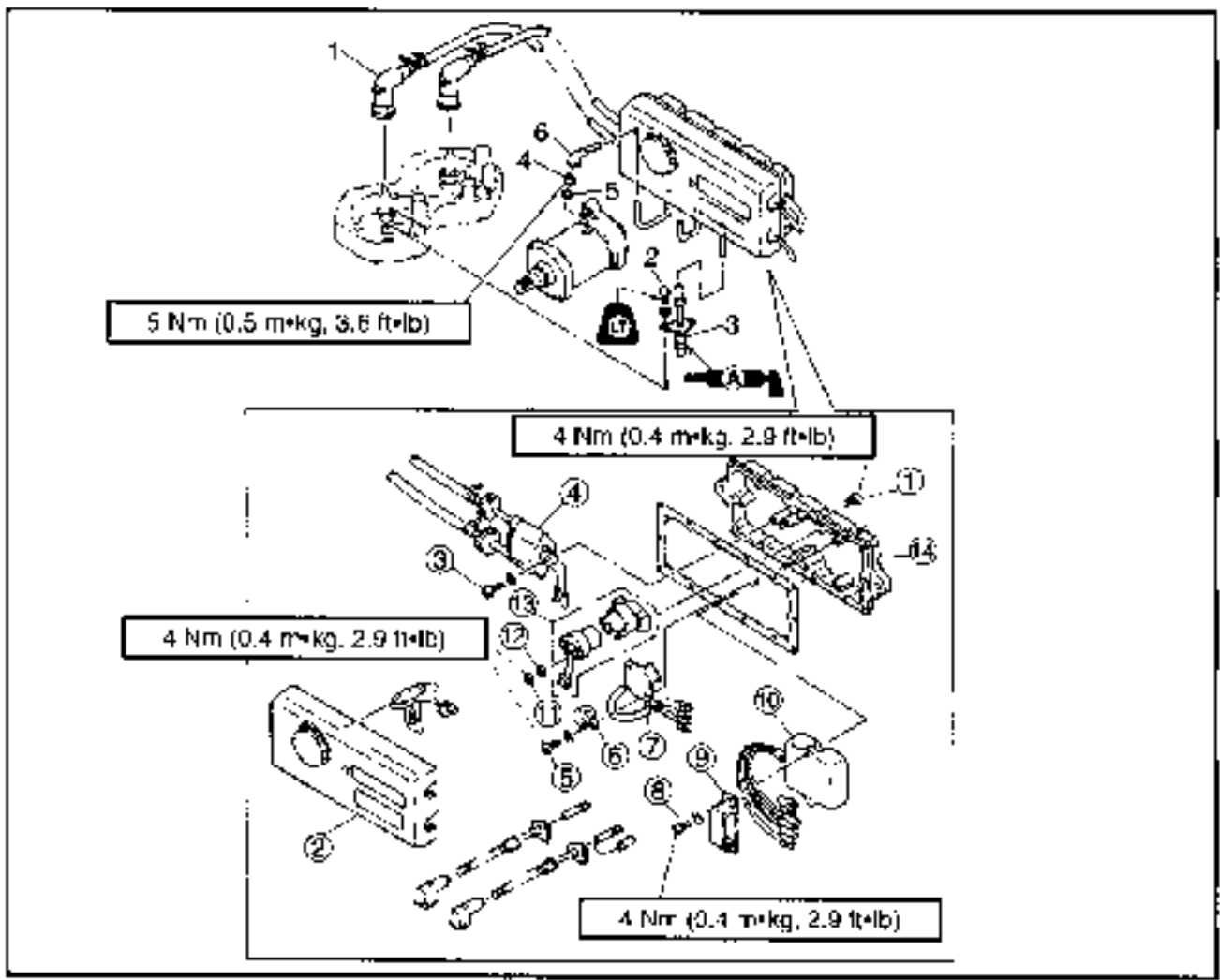


- A** For USA and CANADA  
**B** Except for USA and CANADA

**CAUTION:**

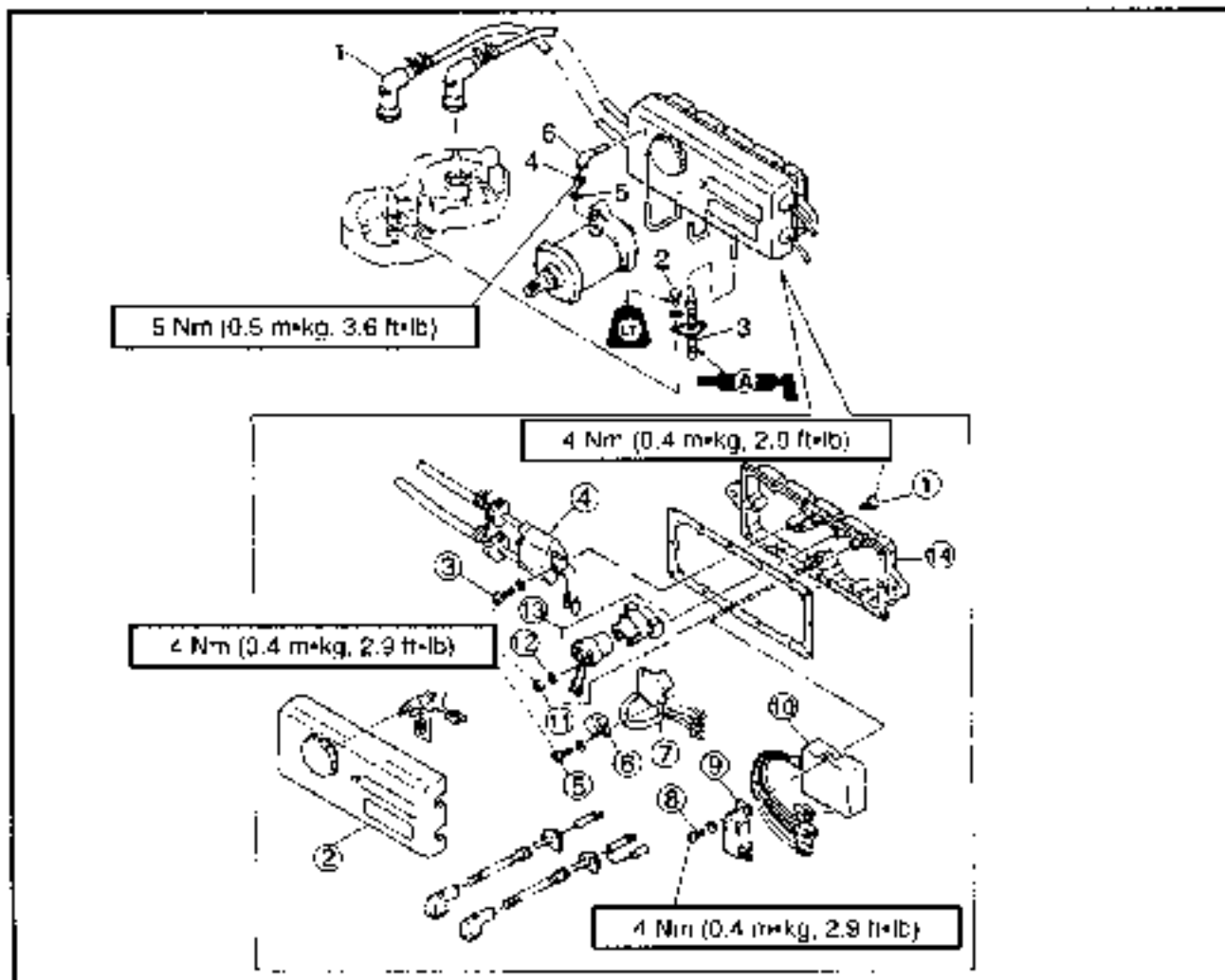
To prevent damage to the engine or tools, screw in the flywheel puller set- bolts evenly and completely so that the puller plate is parallel to the flywheel.

**ELECTRICAL UNIT  
EXPLODED DIAGRAM**



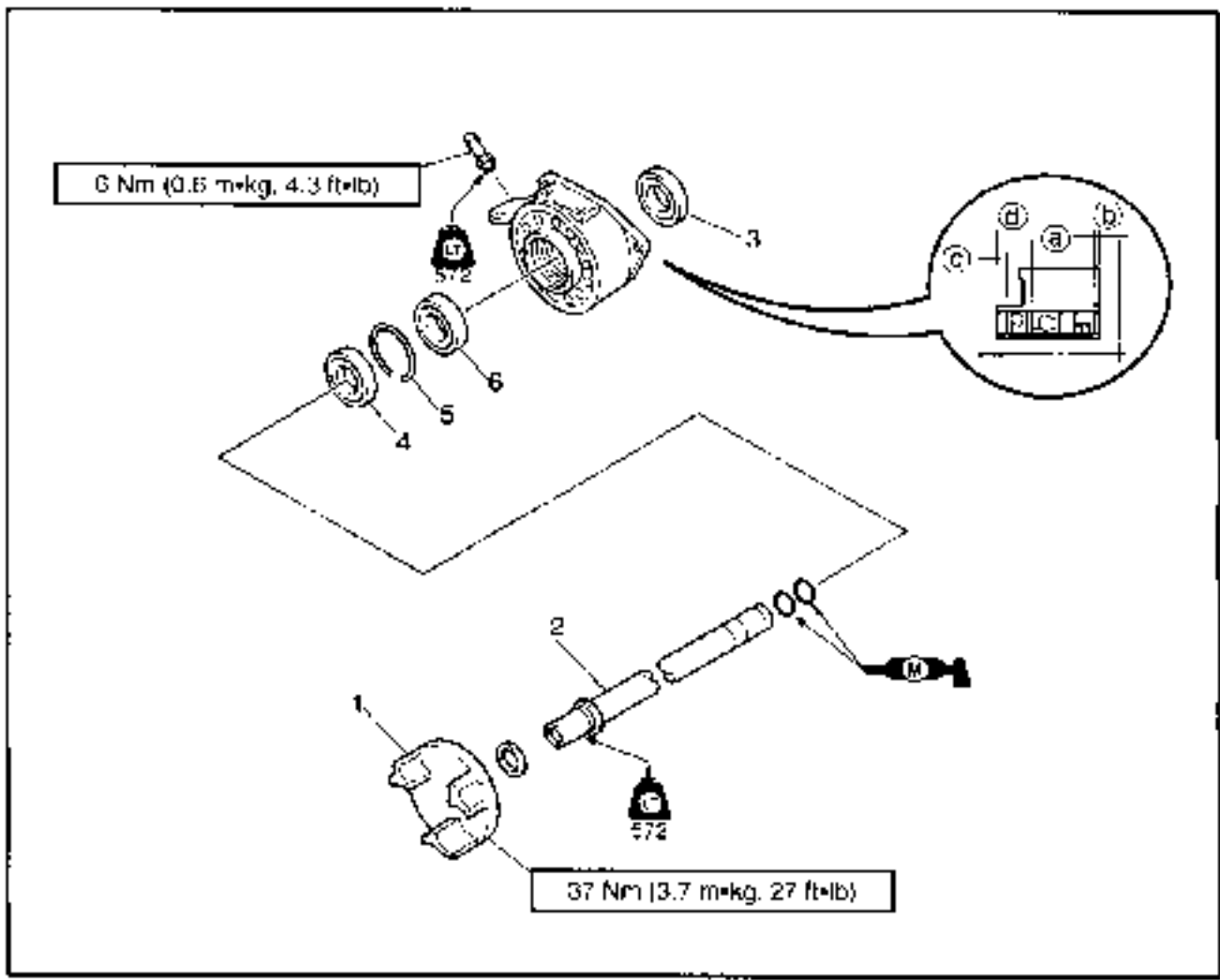
**REMOVAL AND INSTALLATION CHART**

Step	Procedure/Part name	Qty	Service points
<b>ELECTRICAL UNIT REMOVAL</b>			Follow the left "Step" for removal. Refer to the "ENGINE UNIT REMOVAL" section. Refer to the "FLY WHEEL 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	




Step	Procedure/Part name	Q'ty	Service points
	<b>ELECTRICAL UNIT DISASSEMBLY</b>		
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.

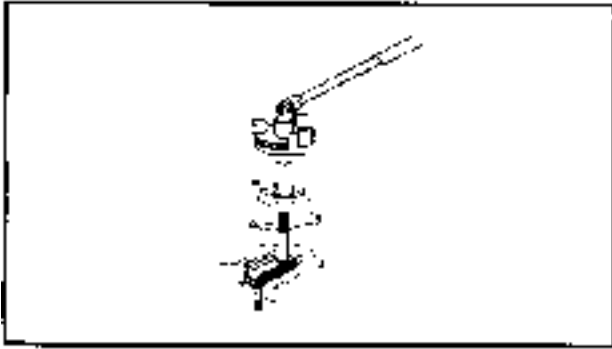
**INTERMEDIATE HOUSING  
EXPLODED DIAGRAM**



**REMOVAL AND INSTALLATION CHART**

Step	Procedure/Part name	Qty	Service points
	<b>INTERMEDIATE HOUSING DISASSEMBLY</b> Bearing housing assembly		Follow the left "Step" for removal. Refer to "INTERMEDIATE HOUSING REMOVAL".
1	Coupling	1	 <b>Distance:</b> (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	
			Reverse the removal steps for installation.





**SERVICE POINT**

**Coupling removal and installation**

1. Remove and install:

- Coupling



**Coupler wrench:**

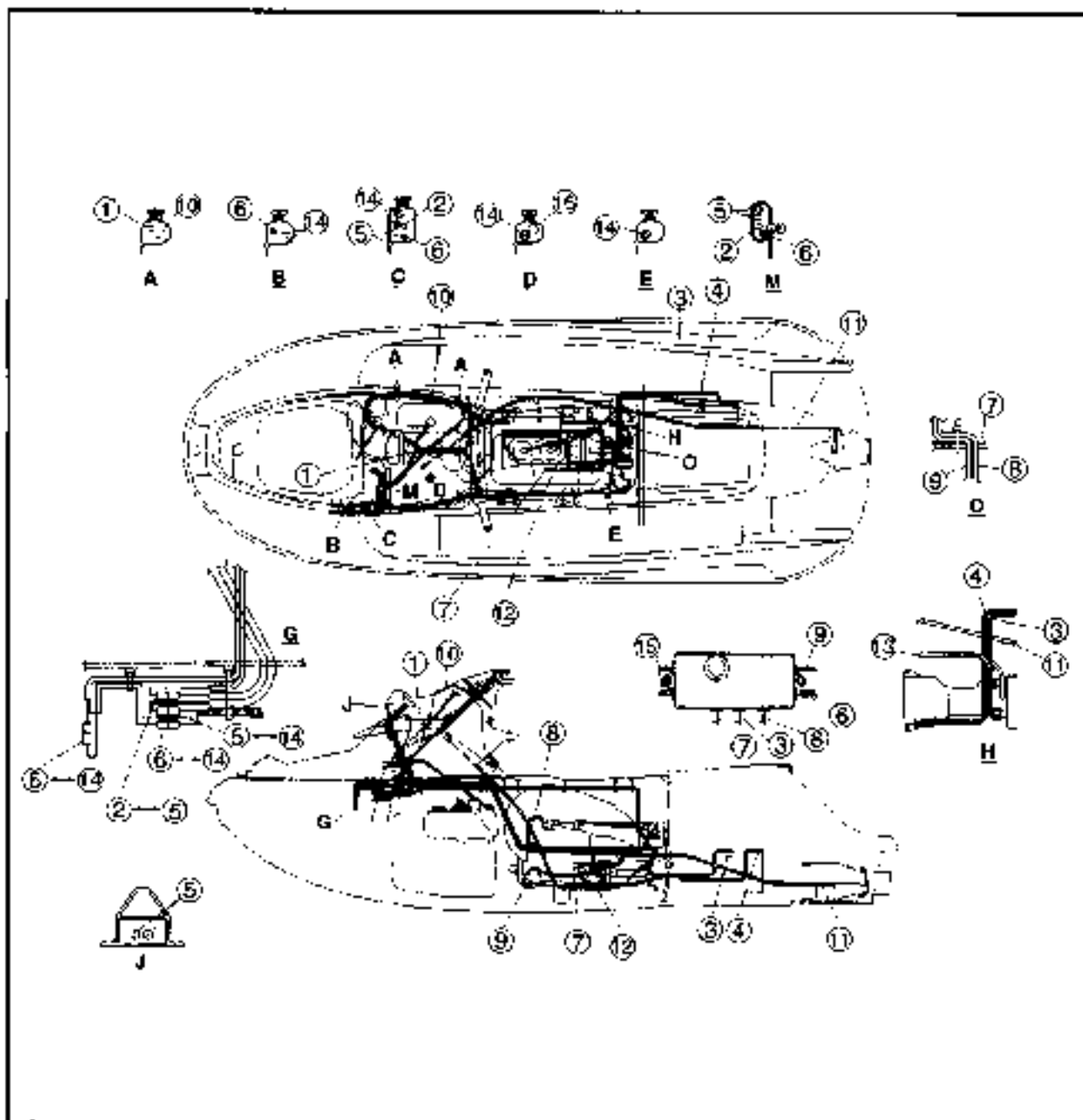
**YW-38741/90890-06425**

**Shaft holder:**

**YW-38742/90890-06069**



## ELECTRICAL COMPONENTS

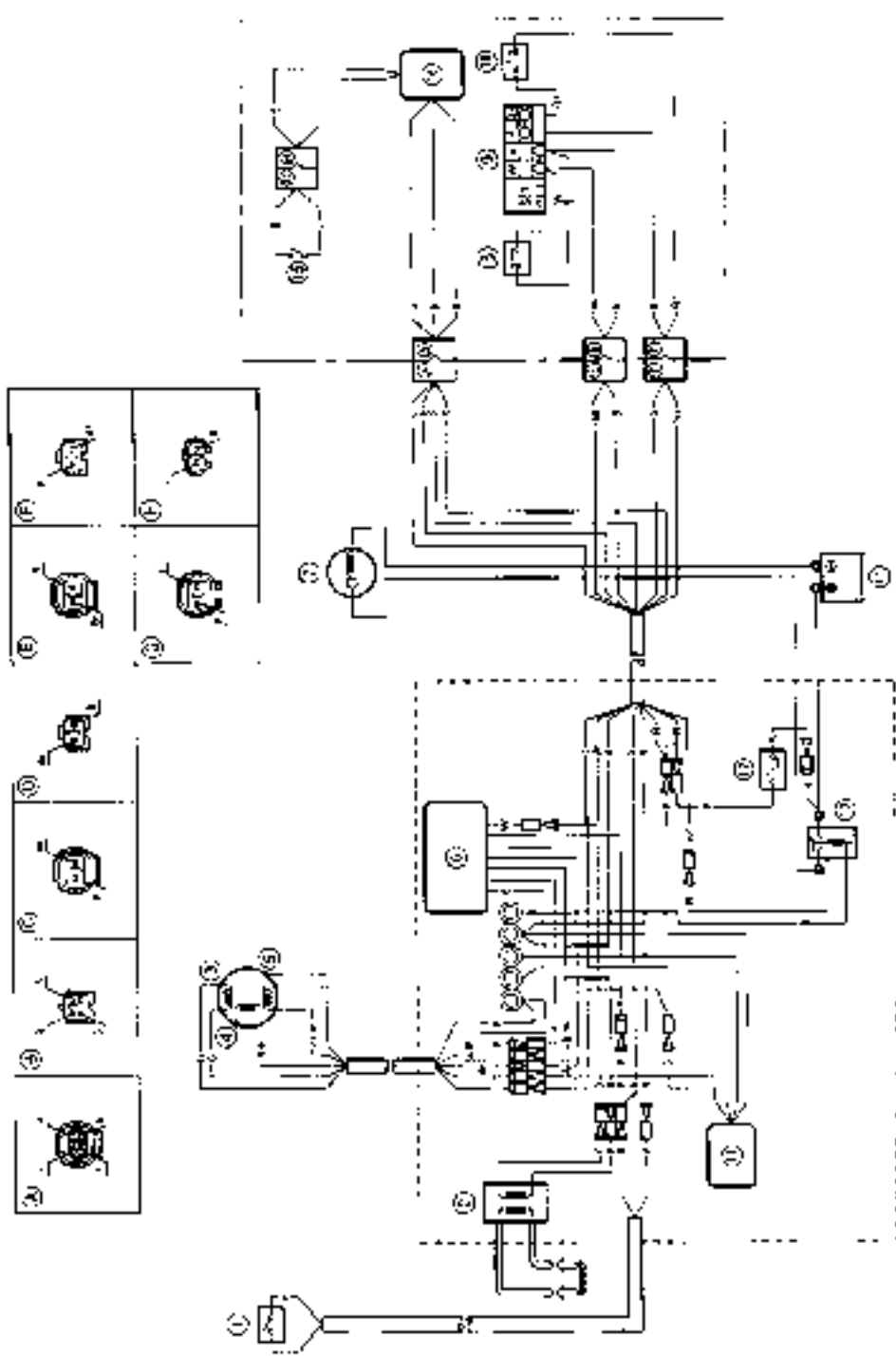


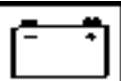
- |                                 |                                 |
|---------------------------------|---------------------------------|
| ① Throttle cable                | ⑨ CDI magneto lead              |
| ② Oil level sensor lead         | ⑩ Choke cable                   |
| ③ Battery load (positive)       | ⑪ Steering cable                |
| ④ Battery lead (negative)       | ⑫ Starter motor lead (negative) |
| ⑤ Oil level warning lamp lead   | ⑬ Grease nipple hose            |
| ⑥ Handlebar switch lead         | ⑭ Electrical box                |
| ⑦ Starter motor lead (positive) | ⑮ High tension cord             |
| ⑧ Thermo sensor lead            | ⑯ Pilot water hose              |

**ELECTRICAL DIAGRAM**

- ① Thermo switch
- ② Ignition coil
- ③ Lighting coil
- ④ Pulser coil
- ⑤ Charge coil
- ⑥ CDI unit
- ⑦ Starter motor
- ⑧ Stop switch
- ⑨ Engine stop switch
- ⑩ Starter switch
- ⑪ Battery
- ⑫ Fuse
- ⑬ Starter relay
- ⑭ Rectifier regulator
- ⑮ Oil level sensor
- ⑯ Oil level warning lamp

- U : Black
- Br : Brown
- Br/W : Brown/White
- G : Green
- L : Blue
- O : Orange
- P : Pink
- R : Red
- W : White
- W/R : White/Red



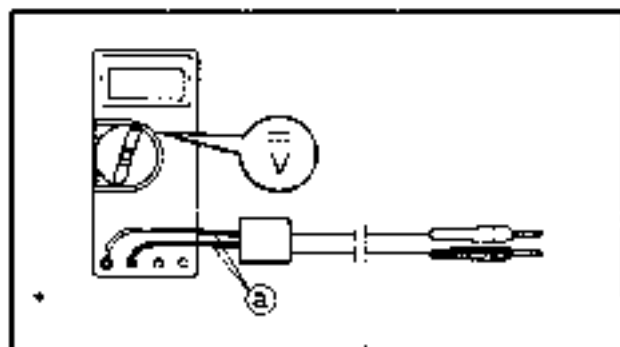
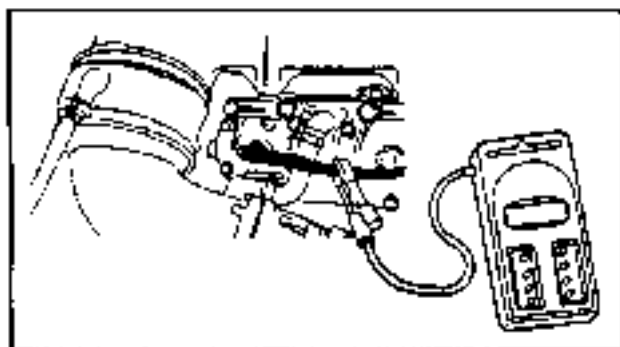


## ELECTRICAL ANALYSIS

### PEAK VOLTAGE MEASUREMENT

#### NOTE:

- If the spark produces no sparks, check the wiring for any disconnection, looseness, insufficient contact, etc. Then measure the peak voltage.
- The peak voltages are listed for the connected and the open state. The "connected value" is used for measuring a normally operating system and the "open valve" for measuring a coil disconnected from the system.
- The peak voltage value measured at cranking is the one at which no load is applied to the jet pump.
- To measure the peak voltage of lighting coil and rectifier regulator, take off the output wire of the rectifier regulator.

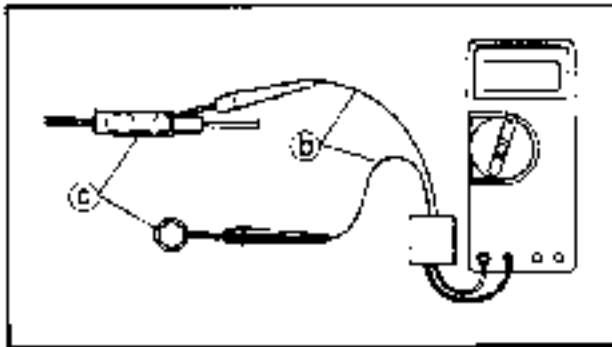


#### Measuring step:

- Remove the electrical box and disassemble it. Refer to "ENGINE UNIT REMOVAL".
- Attach the tachometer to the high tension lead of the cylinder #1. (No need during cranking measurement).
- Set the peak voltage adaptor to the tester.

#### NOTE:

The peak voltage adaptor plugs (a) have polarity. Connect the red plug of the peak voltage adaptor to the volt test plug of the tester.



- Set the digital tester dial at the DCV position
- Connect the peak voltage adaptor leads (b) to the correct terminals to be measured.

**NOTE:**

- The peak voltage leads have no polarity. Connection of either lead to either terminal (c) for measurement will result in the same measurement.
- Wire colors for connection purposes will be indicated

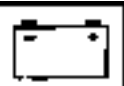
- Connect the water vehicles to a fully charged battery (In cranking measurement)
- Start or crank the engine and read the indication.

**CAUTION:**

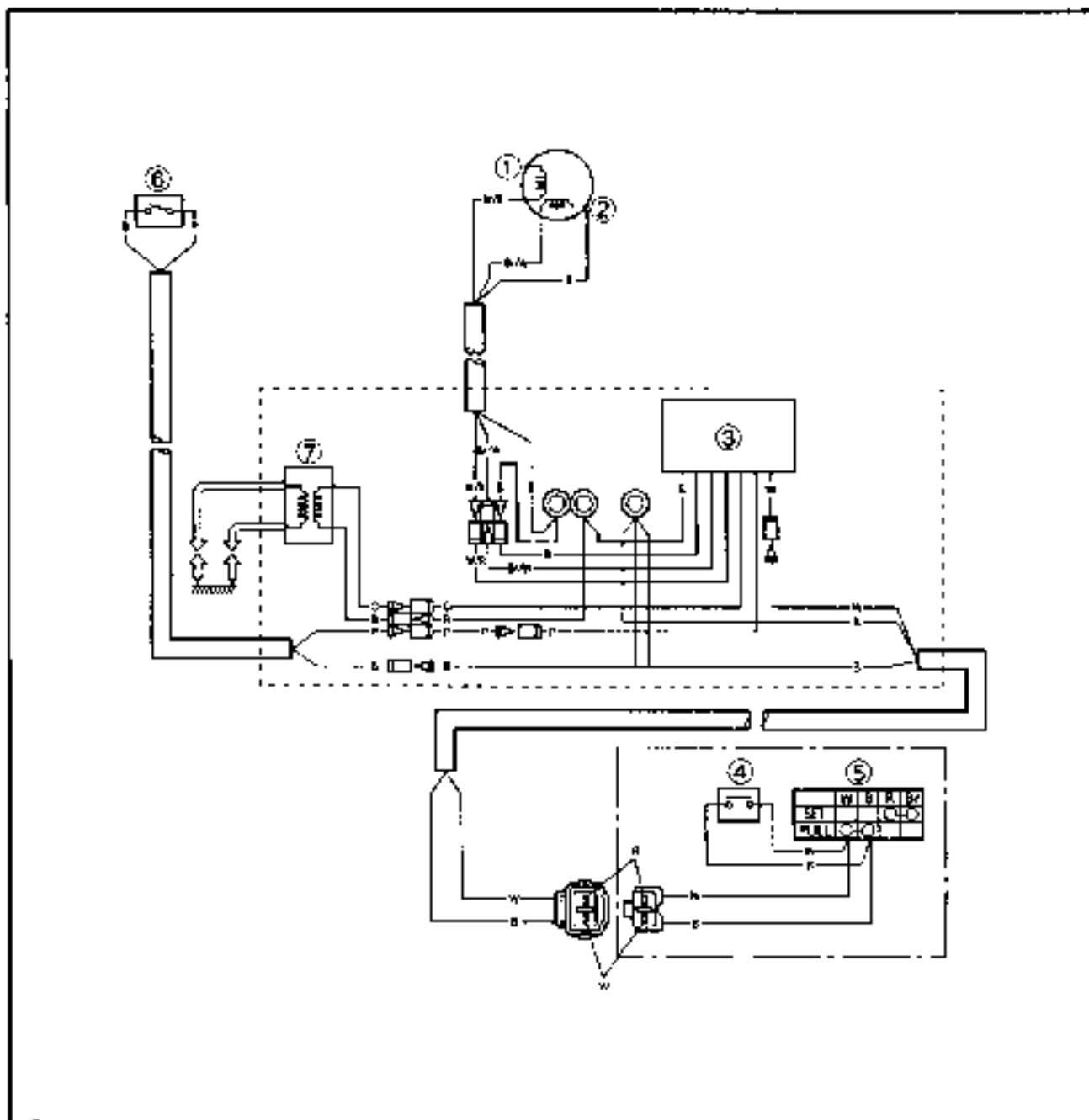
When the peak voltage is measured during engine operation, measure it with cooling water passing through the engine cooling water passage.

**NOTE:**

- Before measuring cranking, remove the spark plug caps from the spark plug.
- Cranking speed changes the output measurement
- The specified values shown in the manuals will be indicated as the lower limit of the specification. If the meter's reading is higher, then there is no problem with the tested component.
- If the output reading is lower, then the component is probably faulty, as long as the component's input voltages are correct at the time when testing.

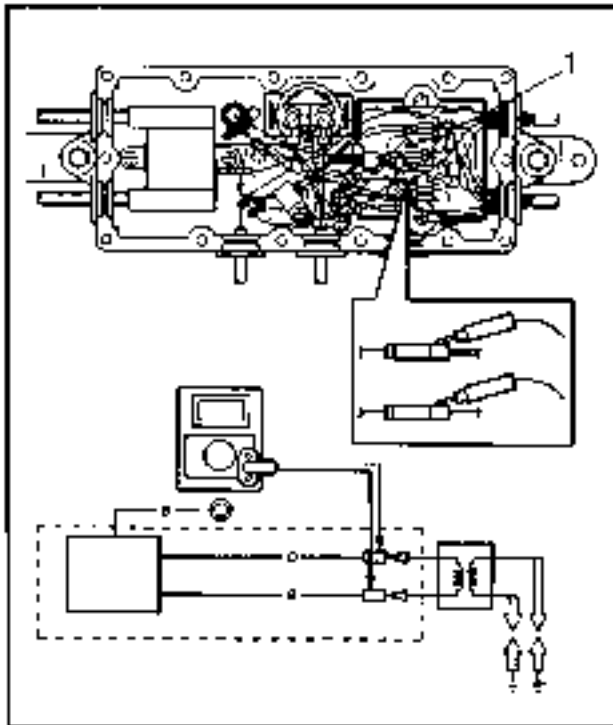
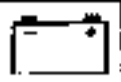


## IGNITION SYSTEM WIRING DIAGRAM



- 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/W** : Brown/White  
**O** : Orange  
**P** : Pink  
**w** : White  
**W/R** : White/Red



## IGNITION SYSTEM

## Peak voltage

**⚠ WARNING**

When checking the peak voltage do not touch any of the connections of the digital tester lead wires.

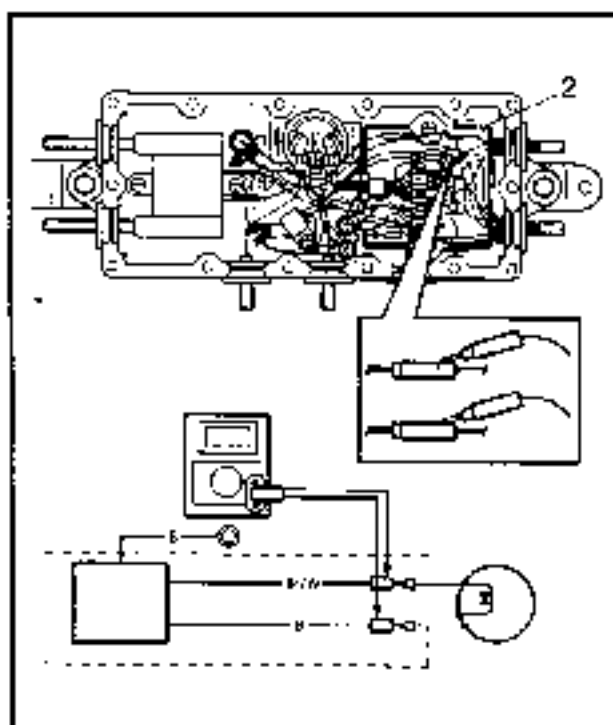
**NOTE:**

- If there is no spark or the spark is weak, continue with the ignition system test.
- If a good spark is obtained, the problem is not with the ignition system, but possibly with the spark plug(s) or another component.

## 1. Measure:

- CDI unit output peak voltage  
Above specification → Replace the ignition coil.  
Below specification → Measure the charge coil output peak voltage.

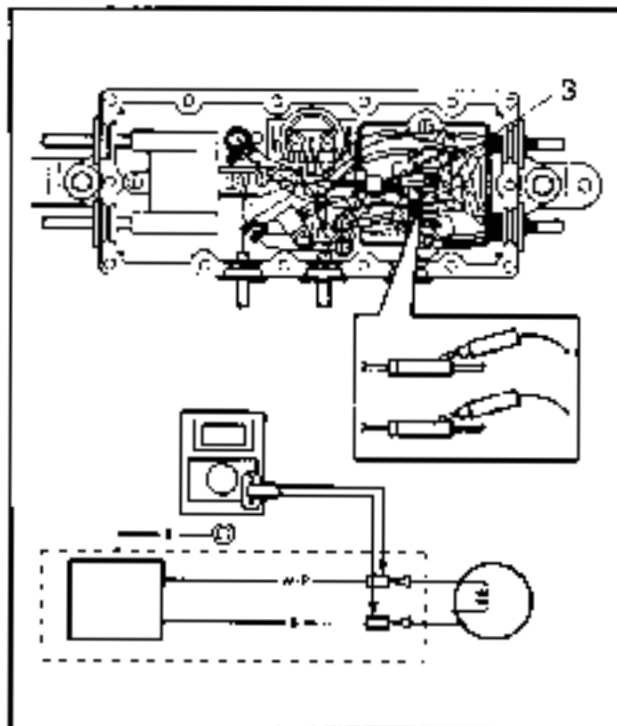
r/min	CDI unit output peak voltage Orange (O) - Black (B)		
	Circuit Cranking	Loaded 1,500    3,500	
V	-	105	175    135



## 2. Measure:

- Charge coil output peak voltage  
Above specification → Measure the pulser coil output peak voltage  
Below specification → Replace the charge coil.

r/min	Charge coil output peak voltage Brown/White (Br/W) - Black (B)		
	Circuit Cranking	Loaded 1,500    3,500	
V	120	115	205    150

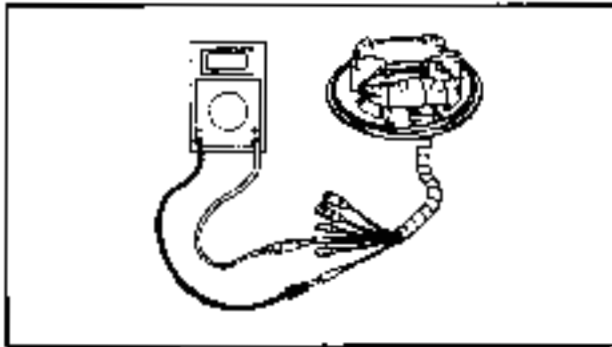


## 3 Measure:

- Pulser coil output peak voltage  
Above specification → Replace the CDI unit.  
Below specification → Replace the pulser coil.

		Pulser coil output peak voltage White/red (W/R) – Black (B)			
		Circuit		Loaded	
r/min	Cranking		1,500	3,500	
		V	3.0	3.0	17.0

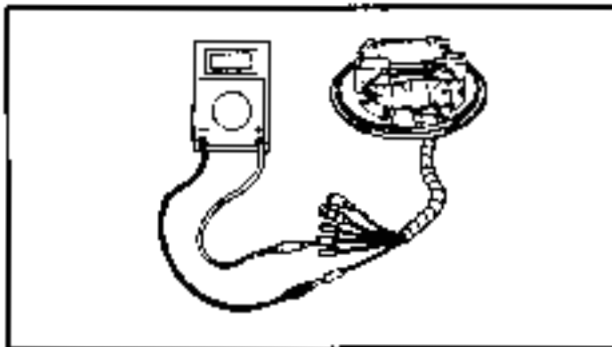


**CHARGE COIL**

- Measure:
  - Charge coil resistance
  - Out of specification - Replace.



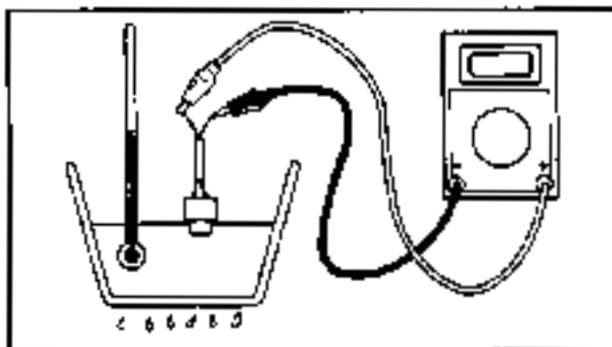
**Charge coil resistance:**  
**Brown/White**  
**(Br/W) - Black (B)**  
 497.7 - 608.3  $\Omega$  at 20 °C  
 (68 °F)

**PULSER COIL**

- Measure:
  - Pulser coil resistance
  - Out of specification → Replace.



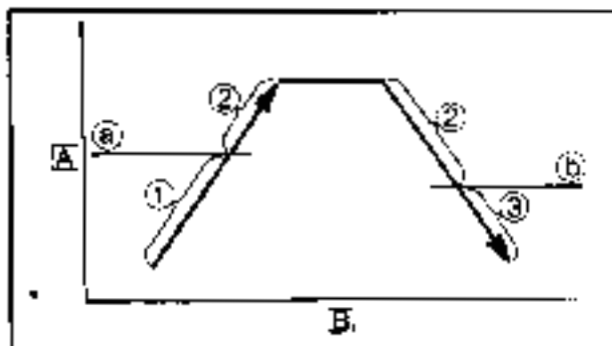
**Pulser coil resistance:**  
**White/Red (W/R) - Black (B)**  
 12.6 - 15.4  $\Omega$  at 20 °C  
 (68 °F)

**THERMO SWITCH**

- Measure
  - Thermo switch continuity
  - Out of specification → Replace.



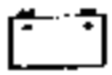
**Thermo switch continuity**  
**temperature:**  
**Pink (P) - Black (B)**  
 (a) 65 - 74 °C  
 (100.4 - 125.6 °F)  
 (b) 57 - 43 °C (93.2 - 78.8 °F)



- |                   |                 |
|-------------------|-----------------|
| (1) Discontinuity | [A] Temperature |
| (2) Continuity    | [B] Time        |
| (3) Discontinuity |                 |

**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:

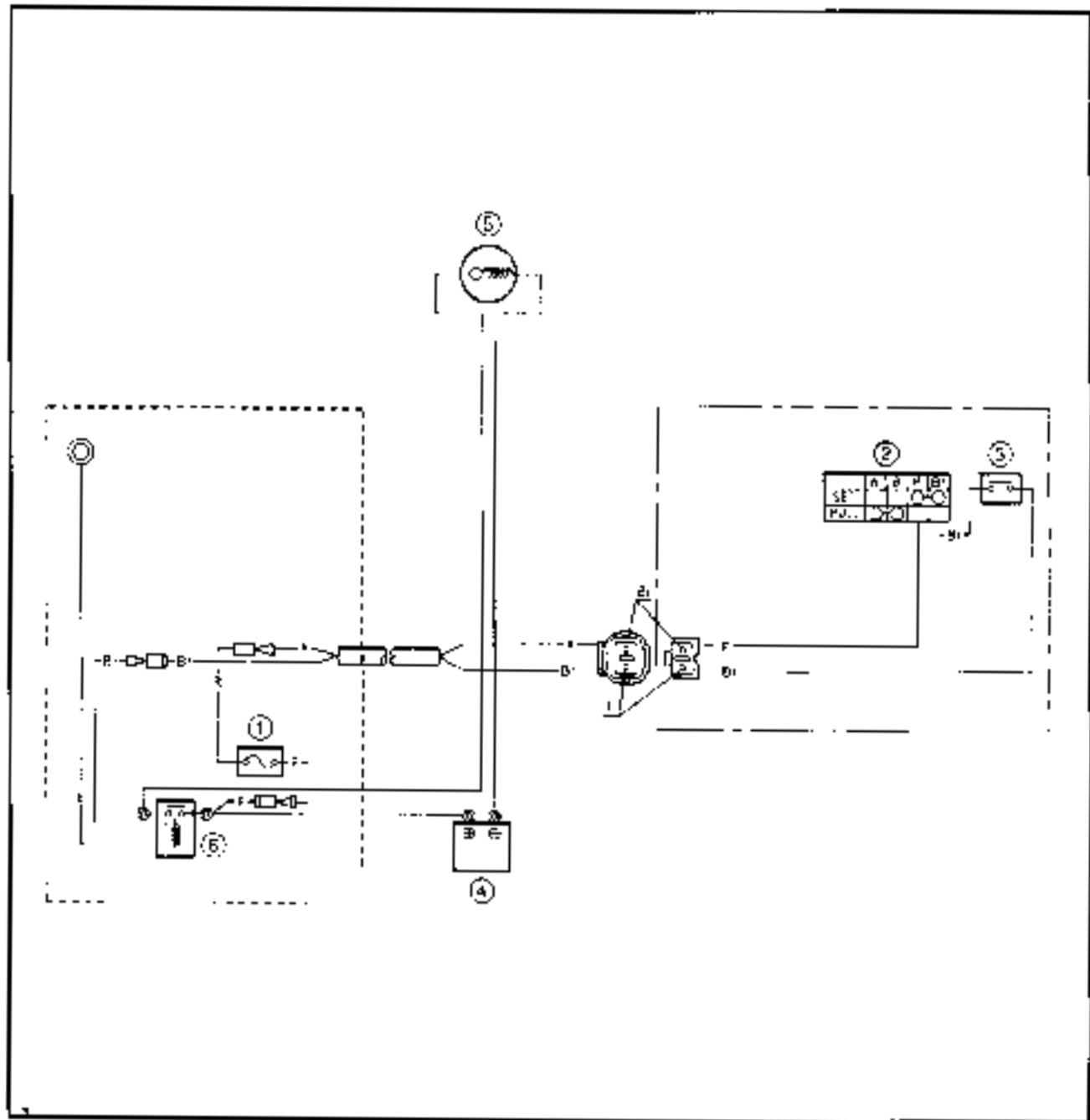
- The resistance values will vary from meter to meter, especially with electronic digital meters. For some testers, the polarity of the leads is reversed.
- The needle swings once to the "\*" mark and then returns to the home position.
- The "∞" mark stands for discontinuity.

Unit: kΩ

色 記	B	Br/W	O	P	W	W/P
B		2 - 8	*	3 - 11	10 - 40	150 - 600
Br/W	20 - 80		*	50 - 200	15 - 60	250 - 1000
O	*	*		*	*	*
P	*	∞	∞		∞	∞
W	*	∞	∞	∞		∞
W/R	9 - 36	17 - 70	*	10 - 40	50 - 200	

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

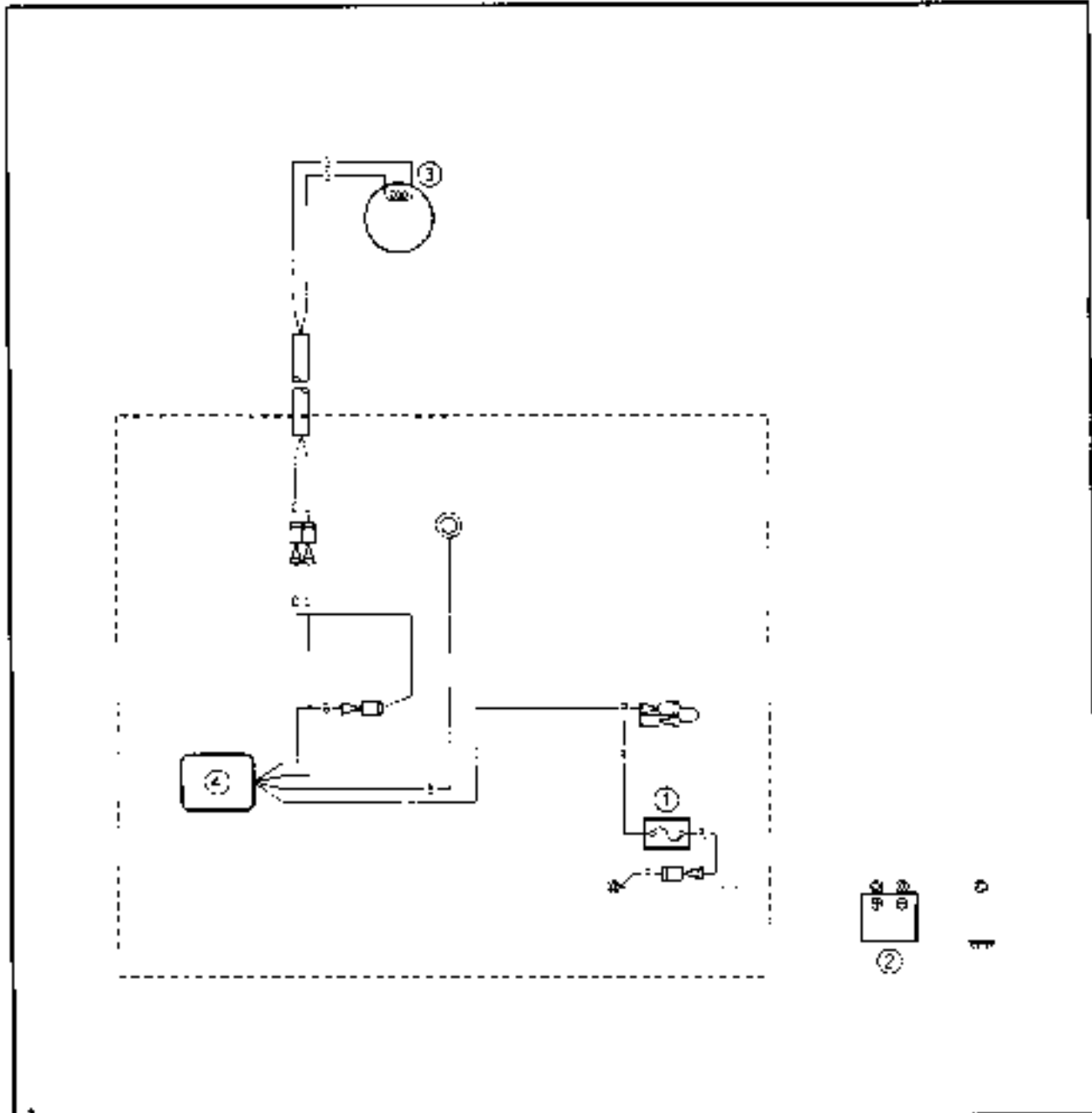
**STARTING SYSTEM  
WIRING DIAGRAM**



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

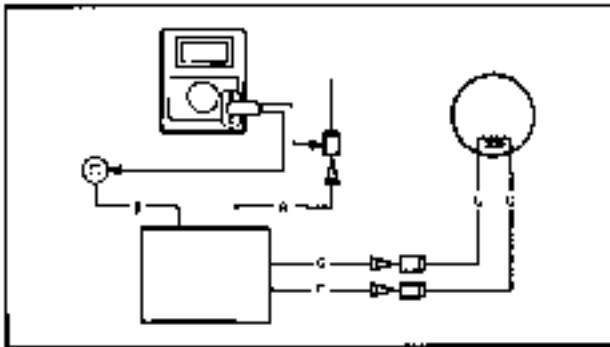
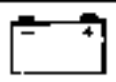
- B : Black
- Br : Brown
- R : Red

CHARGING SYSTEM  
WIRING DIAGRAM



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

- B : Black
- G : Green
- F : Rec



### RECTIFIER/REGULATOR OUTPUT PEAK VOLTAGE

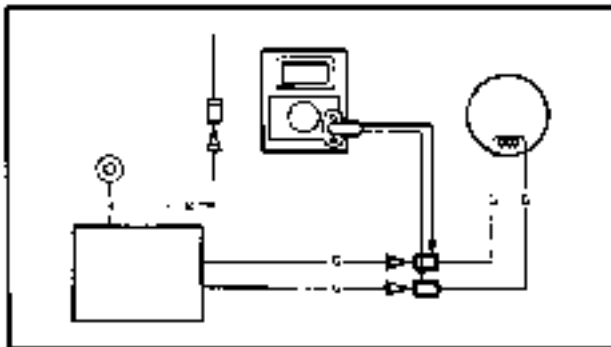
#### 1. Measure:

- Rectifier/regulator output peak voltage Below specification → Check the lighting coil

Rectifier/regulator output peak voltage Red (R) – Black (B)				
r/min	Circuit		Loaded	
	Cranking		1,500	3,500
V	-	-	12,6	12,5

#### NOTE:

Before measuring the rectifier/regulator output peak voltage, disconnect the lighting coil coupler and remove the fuses.



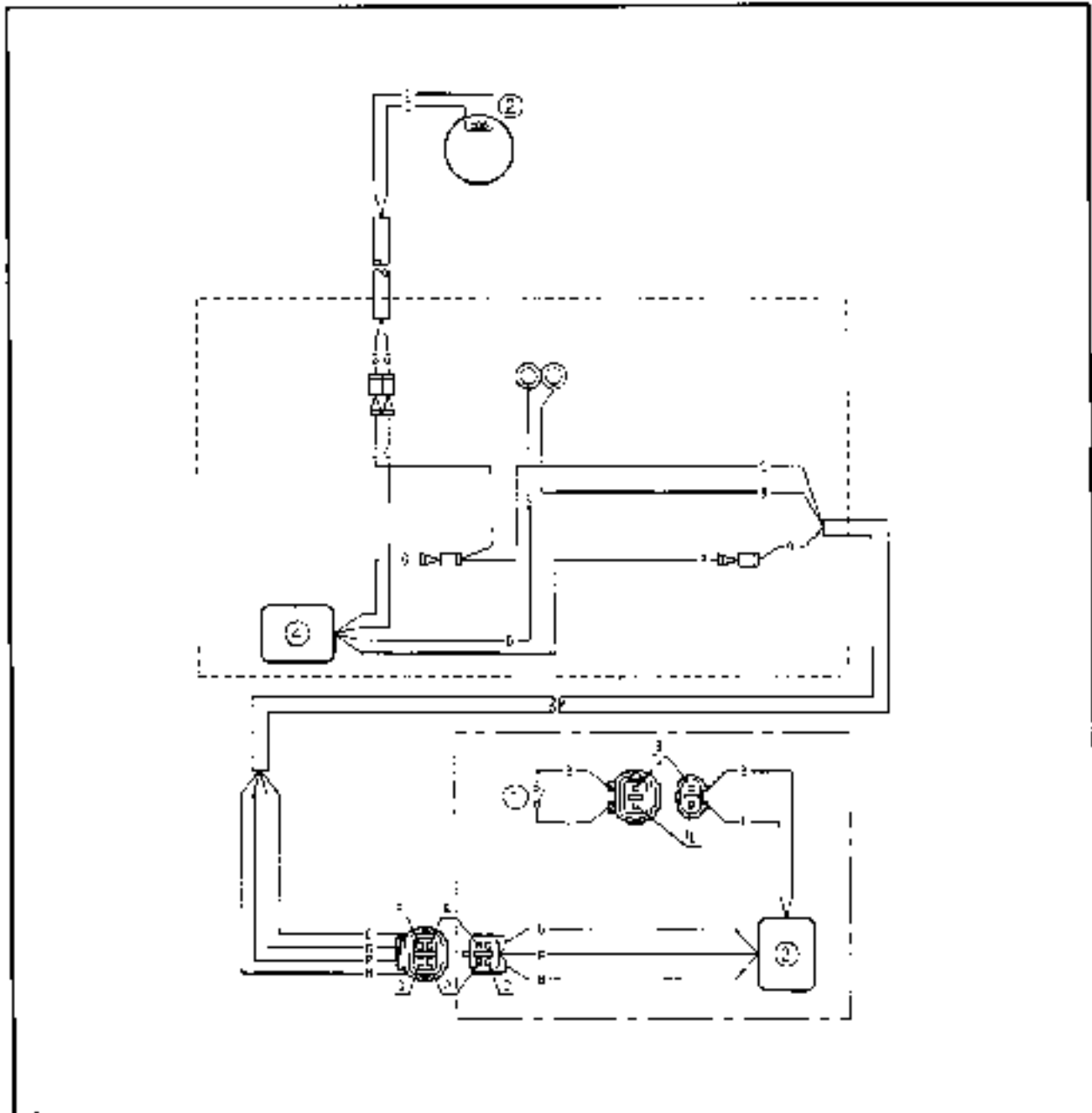
### LIGHTING COIL OUTPUT PEAK VOLTAGE

#### 1. Measure:

- Lighting coil output peak voltage Above specification → Replace the rectifier/regulator.
- Below specification → Replace the lighting coil.

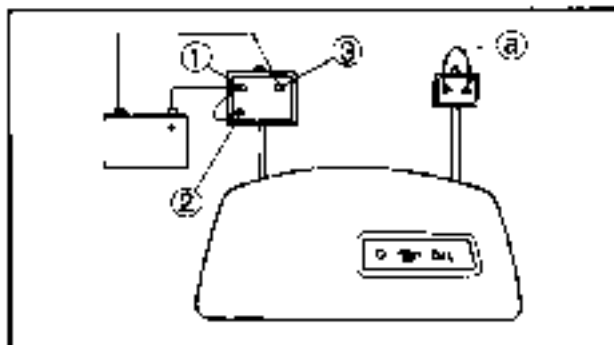
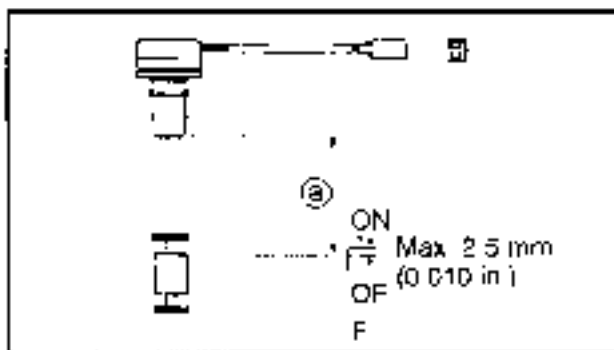
Lighting coil output peak voltage Green (G) – Green (G)				
r/min	Circuit		Loaded	
	Cranking		1,500	3,500
V	7,3	7,3	13,6	12,6

**INDICATION SYSTEM  
WIRING DIAGRAM**



- ① Oil level sensor
- ② Lighting coil
- ③ Oil level warning lamp
- ④ Rectifier regulator

- B** : Black
- G** : Green
- L** : Blue
- R** : Red

**OIL LEVEL SENSOR**

## 1. Measure:

- Oil level sensor continuity Out of specification → Replace.

	Float position	Checking leads	
		L	B
	OFF		
	ON	○	○
	Float length (a): 37,0 – 41,0 mm (1,46 – 1,61 in)		

**OIL LEVEL WARNING LAMP**

## 1. Check.

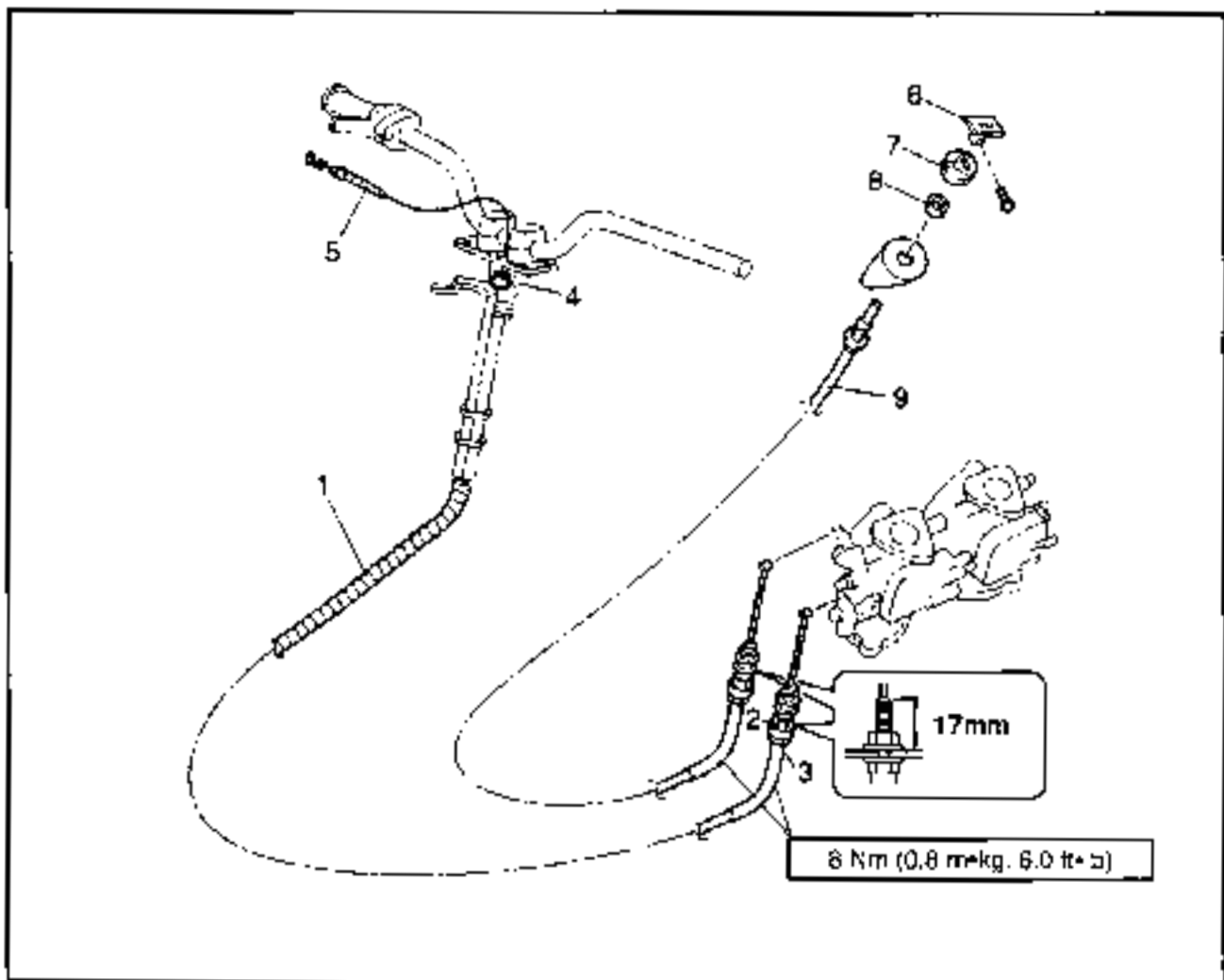
- Display function Not working → Replace.

**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.
	<ul style="list-style-type: none"> <li>• After: connecting the battery, oil warning LED starts to light up for 3 seconds and then blinks.</li> <li>• Connect the jumper lead (a) to the blue and black terminals to check the oil warning LED goes off after blinking for 10 – 30 seconds.</li> </ul>

**THROTTLE CABLE AND CHOKE CABLE  
EXPLODED DIAGRAM**

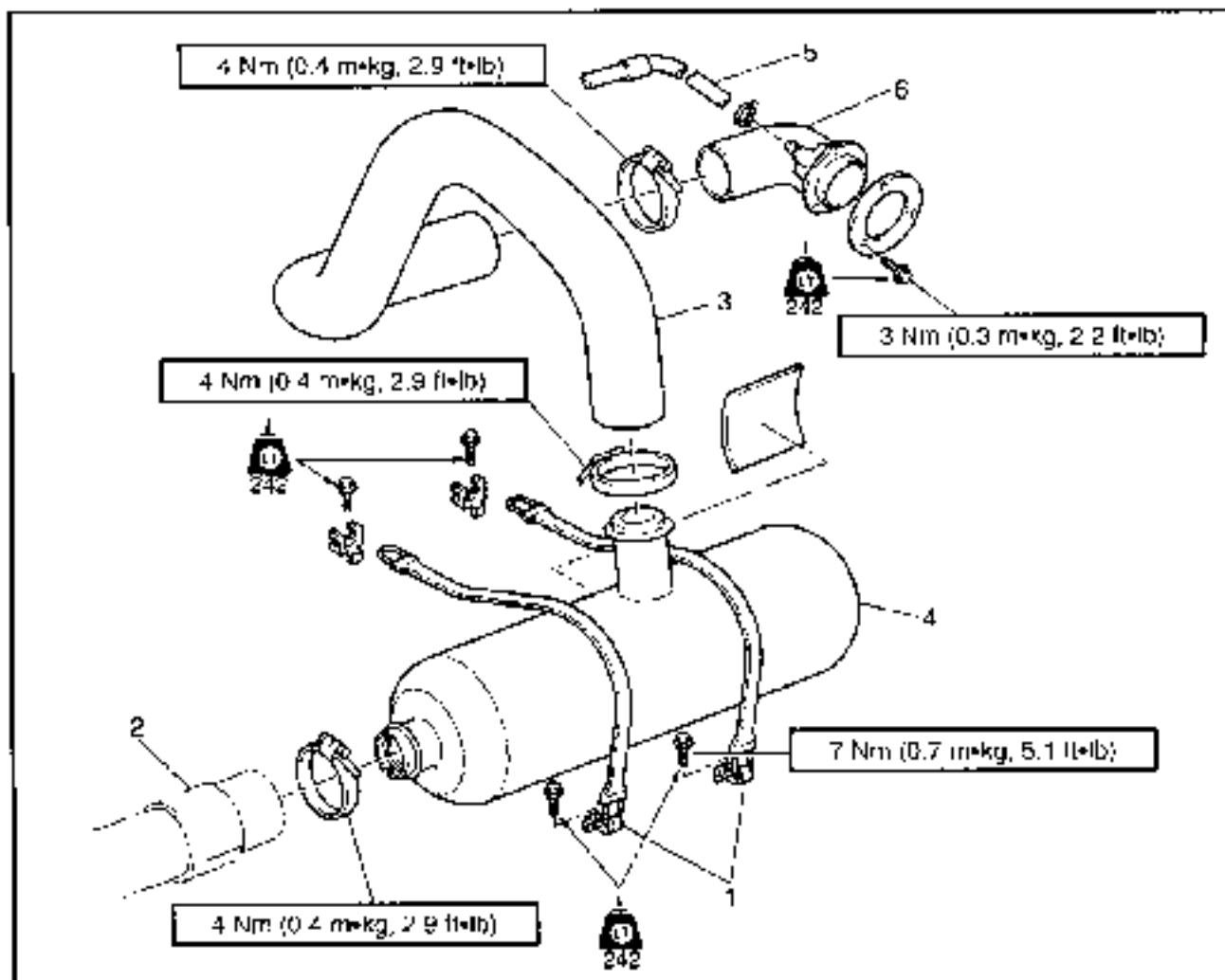


**REMOVAL AND INSTALLATION CHART**

Step	Procedure/Part name	Qty	Service points
	<b>THROTTLE CABLE REMOVAL</b>		Follow the left "Step" for removal.
1	Spiral tube	1	
2	Throttle cable lock nut	1	
3	Throttle cable adjusting	1	
4	Seal packing	1	
5	Throttle cable	1	
6	Choke knob	1	
7	Choke cable lock nut	1	
8	Choke cable adjusting nut	1	
9	Choke cable	1	
			Reverse the removal steps for installation.



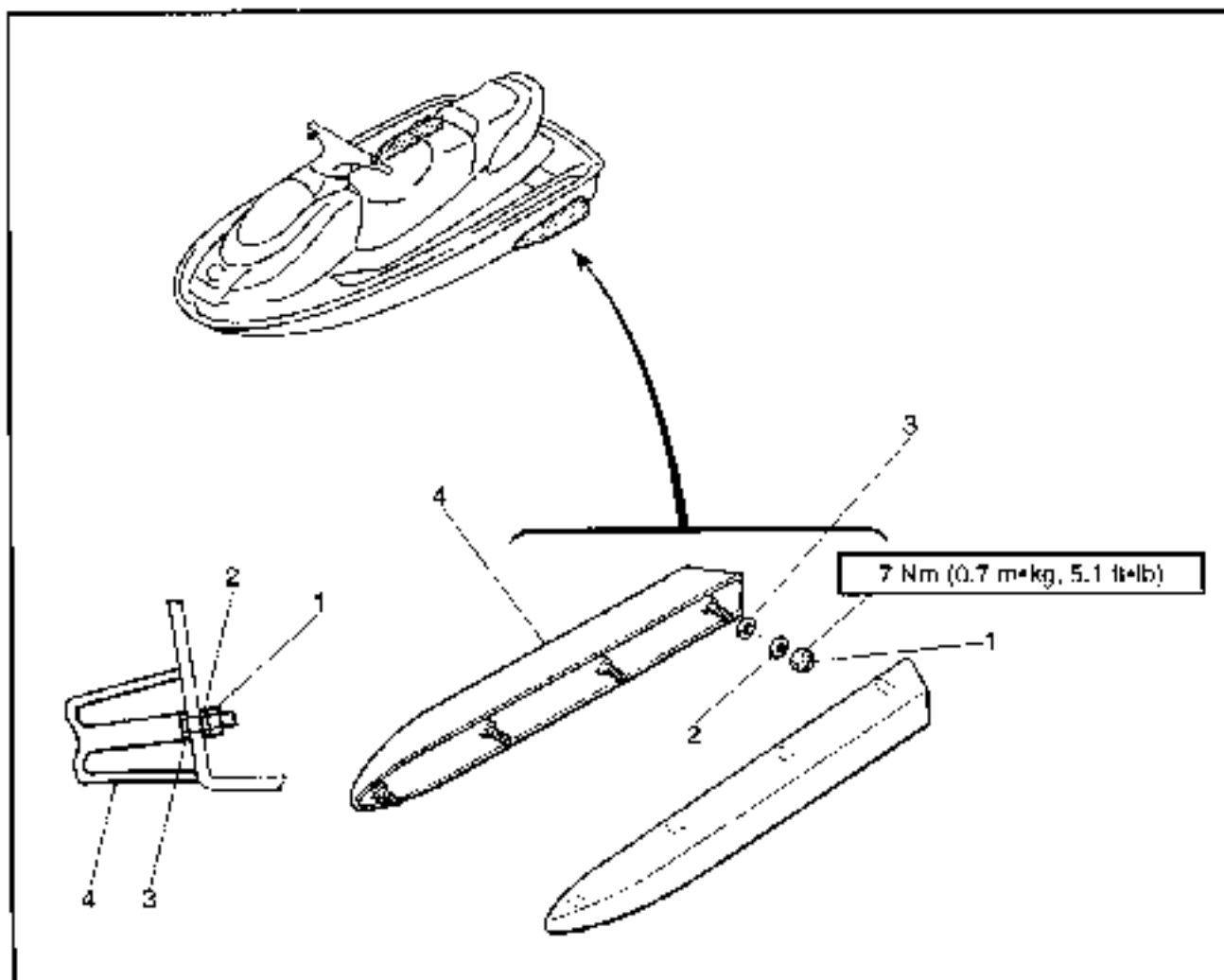
**EXHAUST SYSTEM  
EXPLODED DIAGRAM**



**REMOVAL AND INSTALLATION CHART**

Step	Procedure/Part name	Qty	Service points
	<b>EXHAUST SYSTEM REMOVAL</b>		Follow the list "Step" for removal
	Storage box		
1	Band	2	
2	Exhaust hose	1	
3	Exhaust hose	1	
4	Water lock	1	
5	Water outlet hose	1	
6	Exhaust guide		Reverse the removal steps for installation.

**HULL  
EXPLODED DIAGRAM**



**REMOVAL AND INSTALLATION CHART**

Step	Procedure/Part name	Q'ty	Service points
	<b>HULL DISASSEMBLY</b>		
1	Nut	8	Follow the left "Step" for removal.
2	Plate washer	8	
3	Packing	8	
4	Sponson	2	
			Reverse the removal steps for installation.