YAMAHA

Outboards

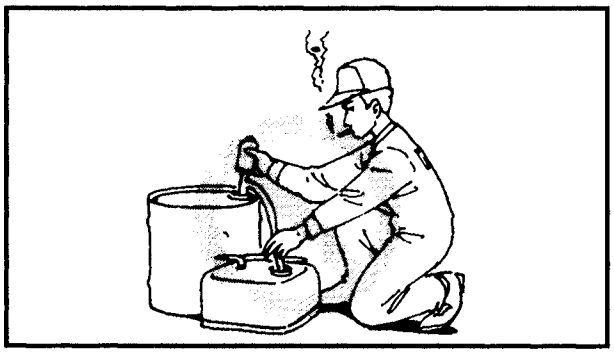
40W, 50W

SERVICE MANUAL

LIT-18616-01-81

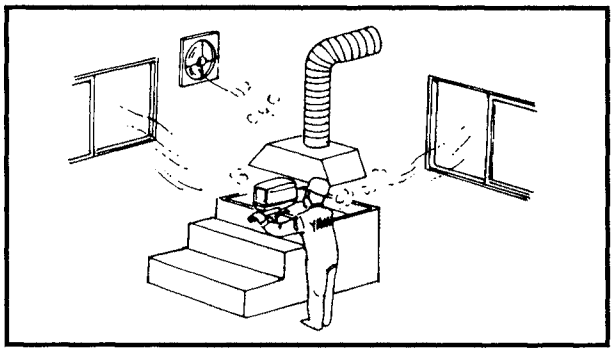
SAFETY WHILE WORKING

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



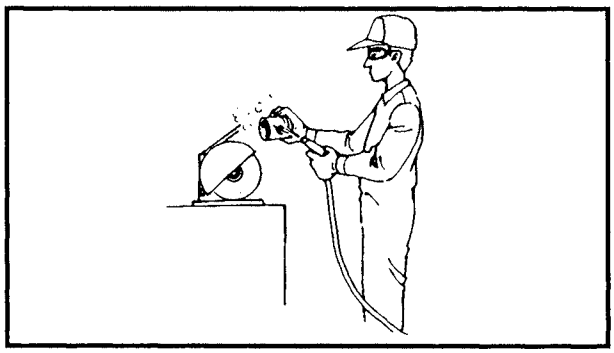
FIRE PREVENTION

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



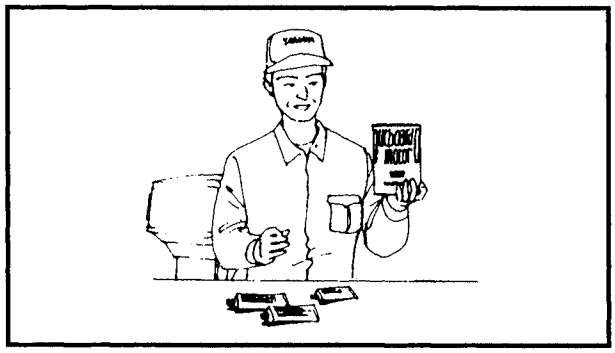
VENTILATION

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



SELF-PROTECTION

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

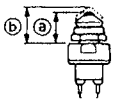


OILS, GREASES AND SEALING FLUIDS

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

CHAPTER 2
SPECIFICATIONS

ELECTRICAL

Item	Unit	Model	
		40 hp	50 hp
IGNITION TIMING:			
Ignition timing (full retarded)	degree	A.T.D.C. 7 ± 1	
(full advanced)	degree	B.T.D.C. 25 $^{+3}_{-1}$	
(cam roller pick-up)	degree	A.T.D.C. 7	
Piston position (full advanced)	mm (in)	B.T.D.C. 3.93 $^{+0.97}_{-0.30}$ ($0.155\ ^{+0.038}_{-0.012}$)	
STARTER MOTOR:			
Type		Bendix	
Output	kW	0.6	
Brush length	mm (in)	12.5 (0.49)	
Wear limit	mm (in)	9.0 (0.35)	
Commutator diameter	mm (in)	30.0 (1.18)	
Limit	mm (in)	29.0 (1.14)	
Commutator under cut	mm (in)	0.8 (0.03)	
Limit	mm (in)	0.2 (0.01)	
Clutch type		Over running	
Pinion-ring gear gap	mm (in)	3.0 ~ 5.0 (0.12 ~ 0.20)	
Rating	Sec.	30	
RECTIFIER REGURATOR:			
Output peak voltage (R – B)			
@ cranking	V	8.5	
@ 1,500 r/min	V	25	
@ 3,500 r/min	V	25	
NEUTRAL SWITCH: 			
Length ⓐ (on)	mm (in)	18.5 ~ 19.5 (0.73 ~ 0.77)	
Length ⓑ (off)	mm (in)	19.5 ~ 20.5 (0.77 ~ 0.81)	
FUSE:			
Rating	V-A	12-10	
THERMO SWITCH (Pink lead):			
On temperature	°C (°F)	90 ~ 96 (194.0 ~ 204.8)	
Off temperature	°C (°F)	76 ~ 90 (168.0 ~ 194.0)	
THERMO SWITCH (Orange lead):			
On temperature	°C (°F)	38 ~ 52 (100.4 ~ 125.6)	
Off temperature	°C (°F)	26 ~ 34 (78.8 ~ 93.2)	
WARNING LAMP:			
Rating	V	1.7	
TRIM SENSOR:			
Resistance 1 (max)	Ω (color)	360 ~ 540 (P — B)	
Resistance 2 (max)	Ω (color)	800 ~ 1,200 (O — B)	
STATOR ASSEMBLY:			
Pulser coil resistance 1	Ω (color)	168 ~ 252 (W/R — B)	
Pulser coil resistance 2	Ω (color)	168 ~ 252 (W/B — B)	
Pulser coil resistance 3	Ω (color)	168 ~ 252 (W/G — B)	

CHAPTER 3
PERIODIC INSPECTION AND ADJUSTMENT

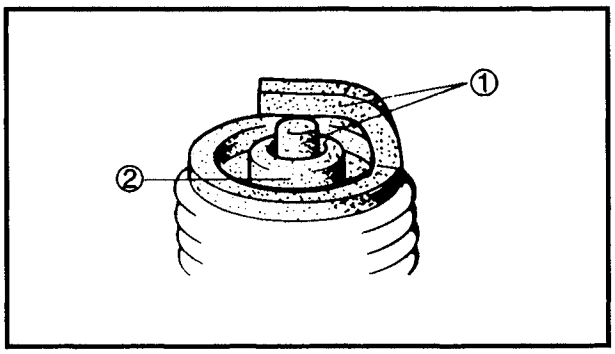
NOTE:

- Batteries vary among manufacturers. Therefore the following procedures may not always apply. Consult your battery manufacturer's instructions.
- Disconnect the black negative lead first to prevent the risk of shorting.

1. Inspect:
   - Battery fluid level
   - Battery fluid specific gravity

Spark plug

1. Inspect:
   - Electrode ①
     Worn/Damaged → Replace.
   - Insulator color ②
     Distinctly different color → Check the engine condition.



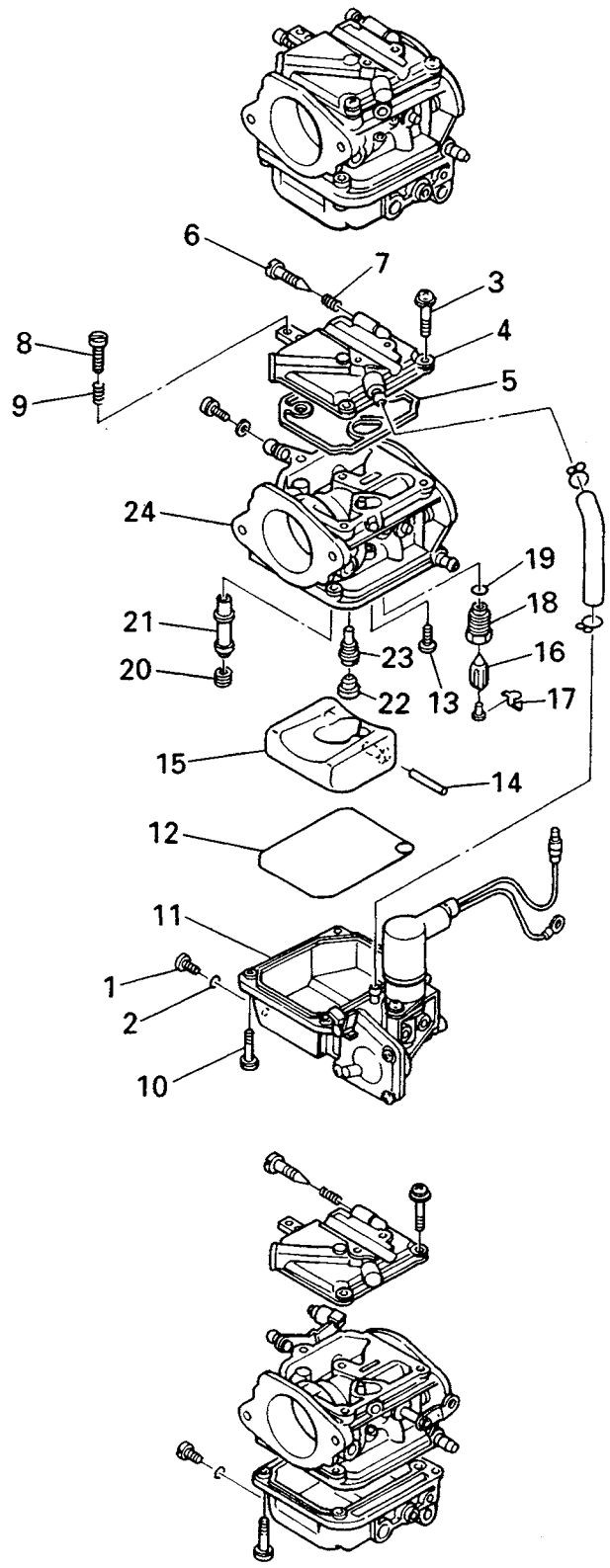
Color guide:
Normal:
Medium to light tan color
Whitish color: Lean fuel mixture
- **Plugged fuel mixture**
- **Air leak**
- **Wrong setting**

Blackish color:
Electrical malfunction
- **Defective spark plug**
- **Defective ignition system**
- **Rich mixture**
- **Excessive idling**

2. Clean:
   - Spark plug
     Clean the spark plug with a plug cleaner or wire brush.
3. Inspect:
   - Spark plug type

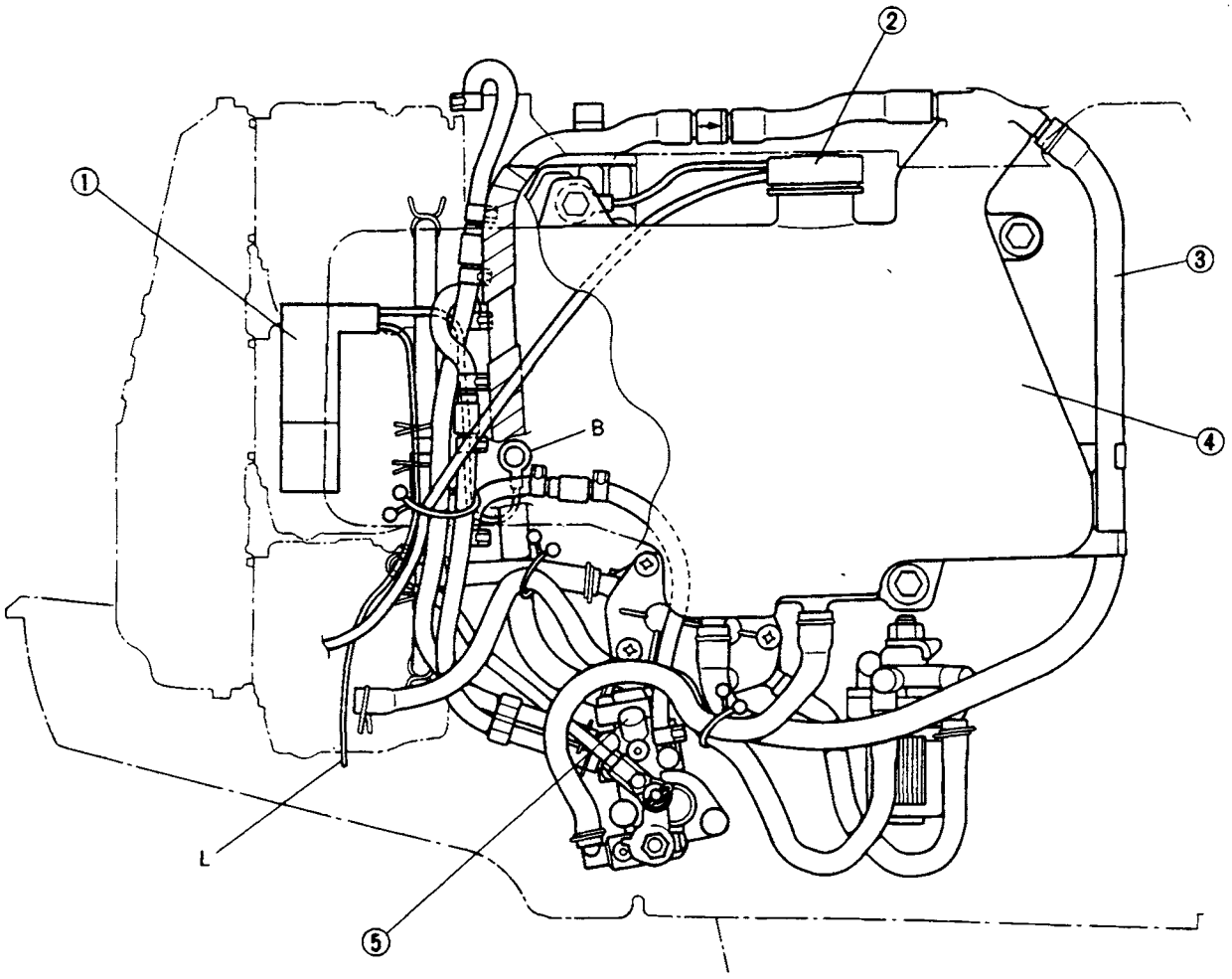
Standard spark plug:
40hp: B7HS-10
For CANADA and Europe: BR7HS-10
50hp: B8HS-10
For CANADA and Europe: BR8HS-10

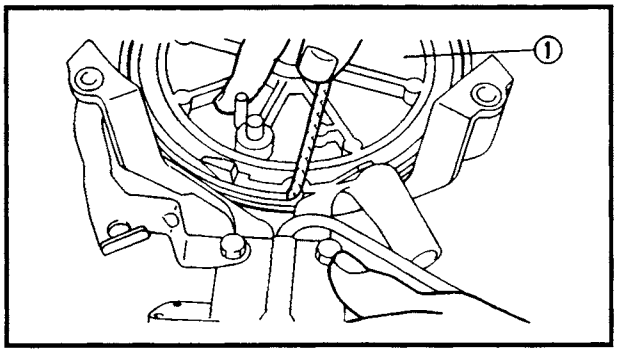
CARBURETOR
EXPLODED DIAGRAM



OIL LINE LAYOUT

① Electrothermal valve (EM, E model)
② Oil level sensor
③ Oil drain hose
④ Oil tank
⑤ Oil pump





SERVICE POINTS

Sheave drum removal

1. Turn:
   - Sheave drum ①
     Turn the sheave drum clockwise until the spiral spring is free.

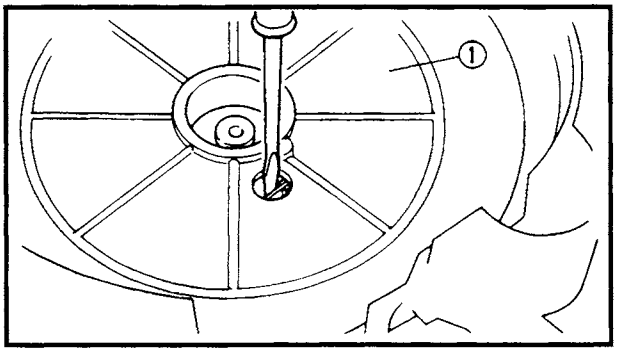
NOTE:

- Turn the sheave drum so that the cutaway on the outer surface of the sheave drum faces toward the starter handle.
- Pass the starter rope through the cut.

2. Remove:
   - Sheave drum ①

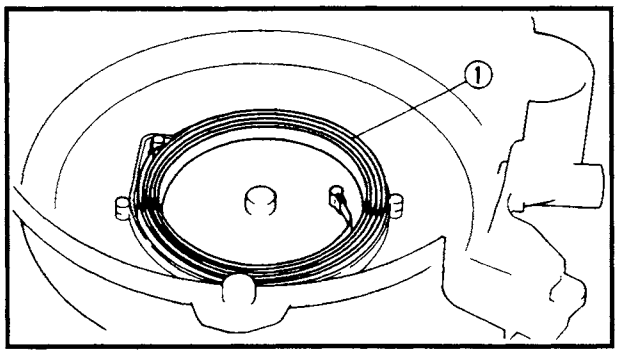
⚠ WARNING

When removing the sheave drum, be sure to turn the sheave drum upside down to prevent the spiral spring from popping up at you.



NOTE:

Insert a slotted-head screwdriver into the hole in the sheave drum, and remove the spiral spring from the sheave drum by pushing the spring.



Spiral spring removal

1. Remove:
   - Spiral spring ①

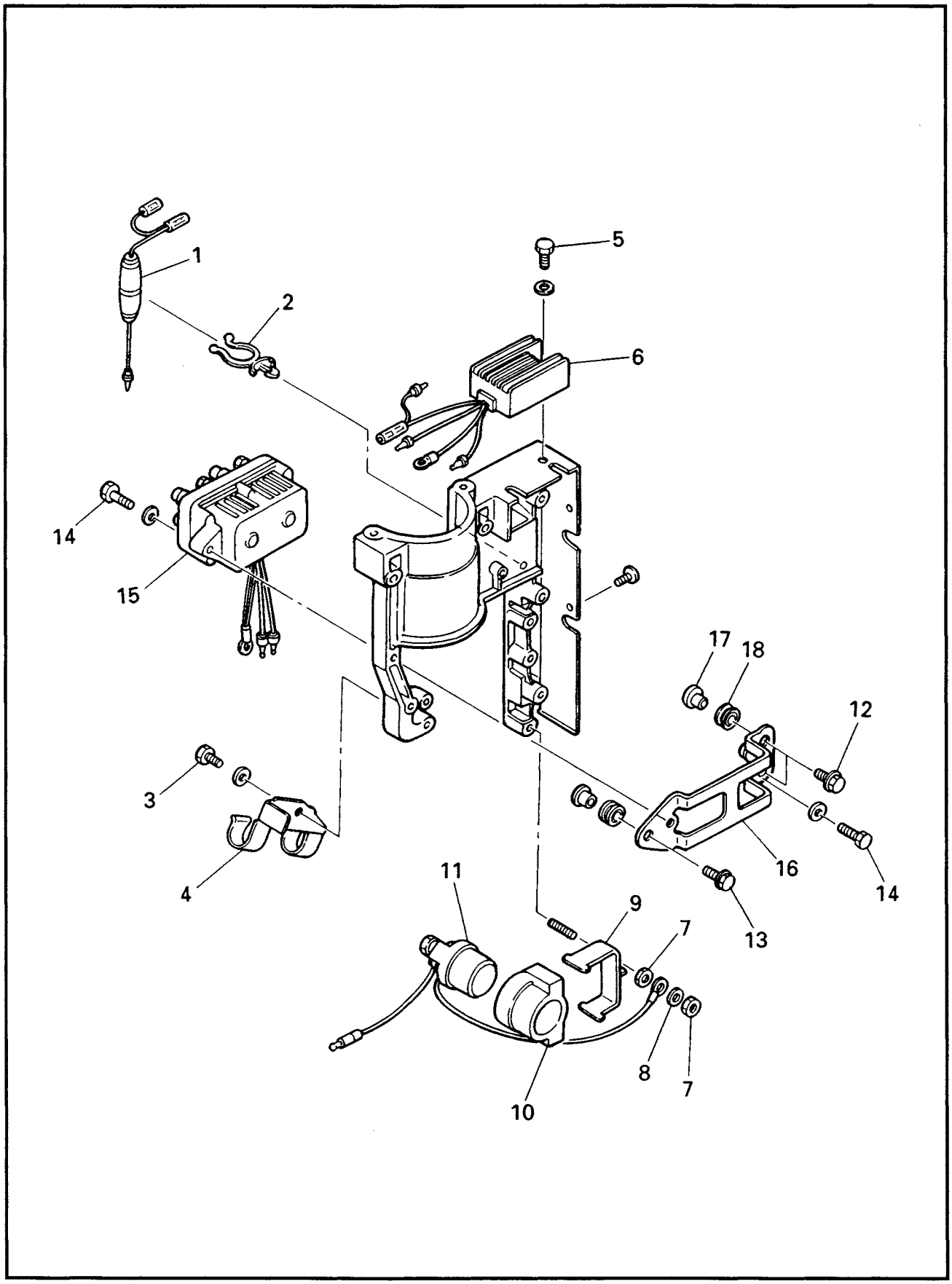
⚠ WARNING

Be careful so that the spiral spring does not pop out when removing it. Remove it by allowing it out one turn of the winding each time.

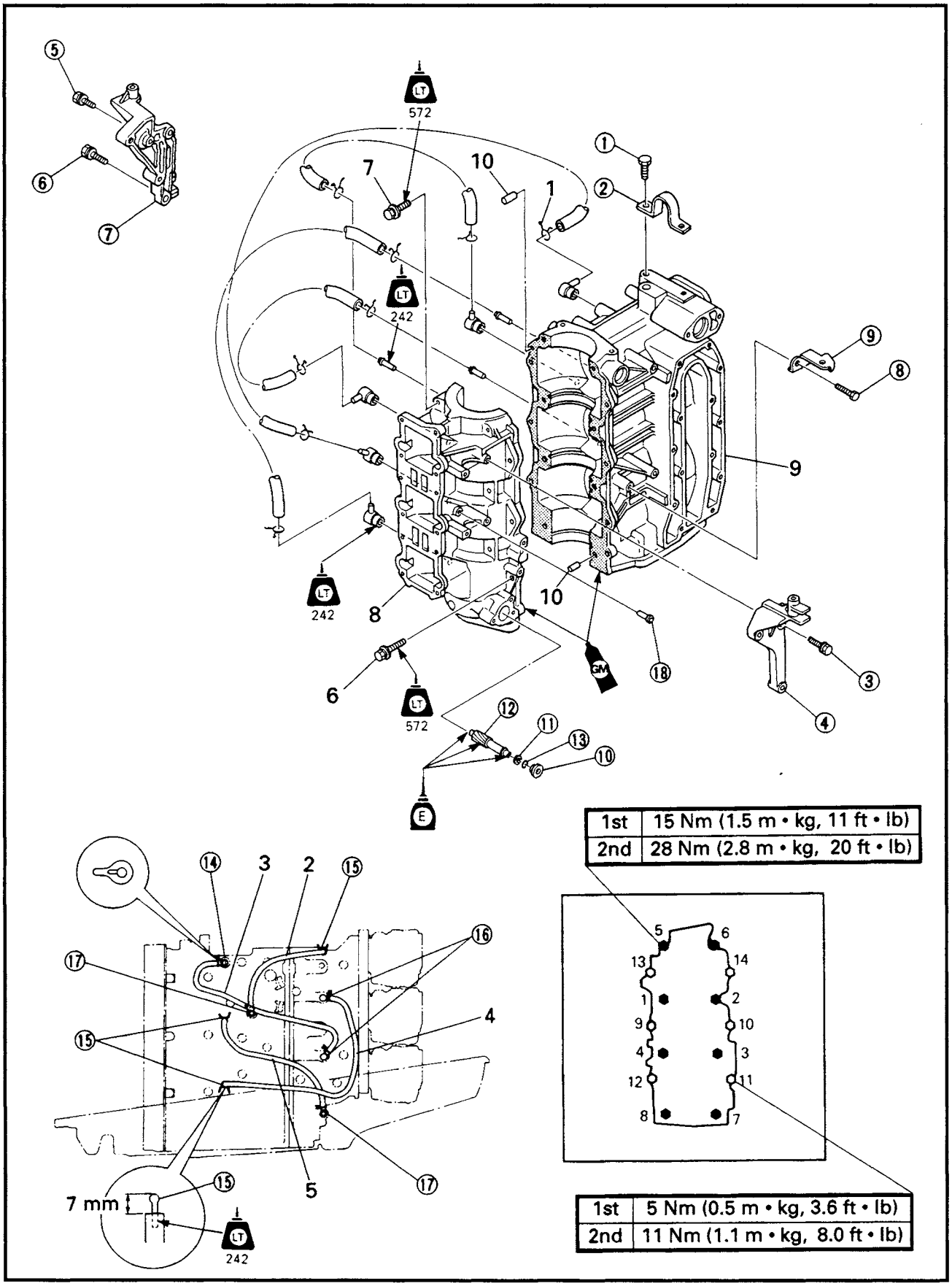
Starter stopping plunger inspection

1. Inspect:
   - Starter stopping plunger
     Crack/Wear/Damage → Replace.

ELECTRICAL UNIT
EXPLODED DIAGRAM

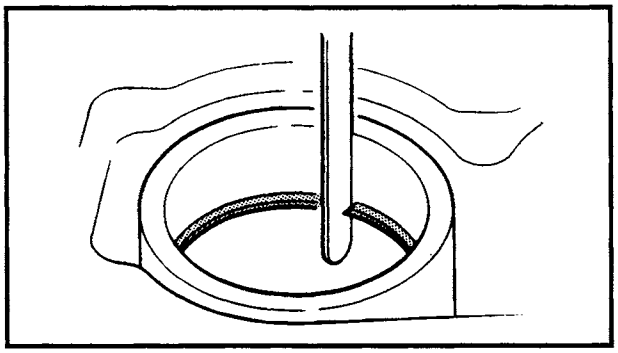


CRANKCASE AND CYLINDER BODY
EXPLODED DIAGRAM



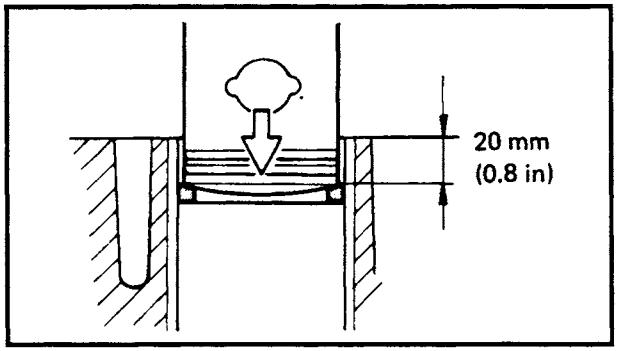
Piston ring inspection

1. Inspect:
   - Piston ring
     Breakage/Damage → Replace.

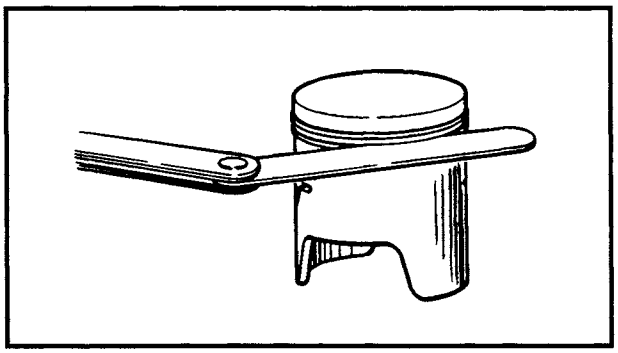


2. Measure:
   - End gap
     Use a feeler gauge.
     Out of specification → Replace.

End gap:
Top: 0.40 ~ 0.60 mm
(0.016 ~ 0.024 in)
2nd: 0.40 ~ 0.60 mm
(0.016 ~ 0.024 in)
End gap limit:
Top: 0.80 mm (0.031 in)
2nd: 0.80 mm (0.031 in)
Measuring point
20 mm (0.8 in)

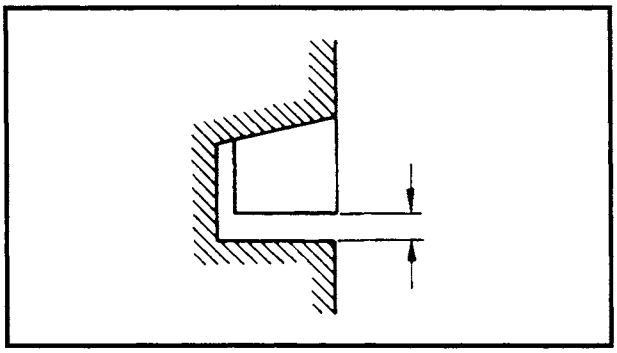


NOTE:
Install the piston ring into the cylinder. Push the ring with the piston crown.

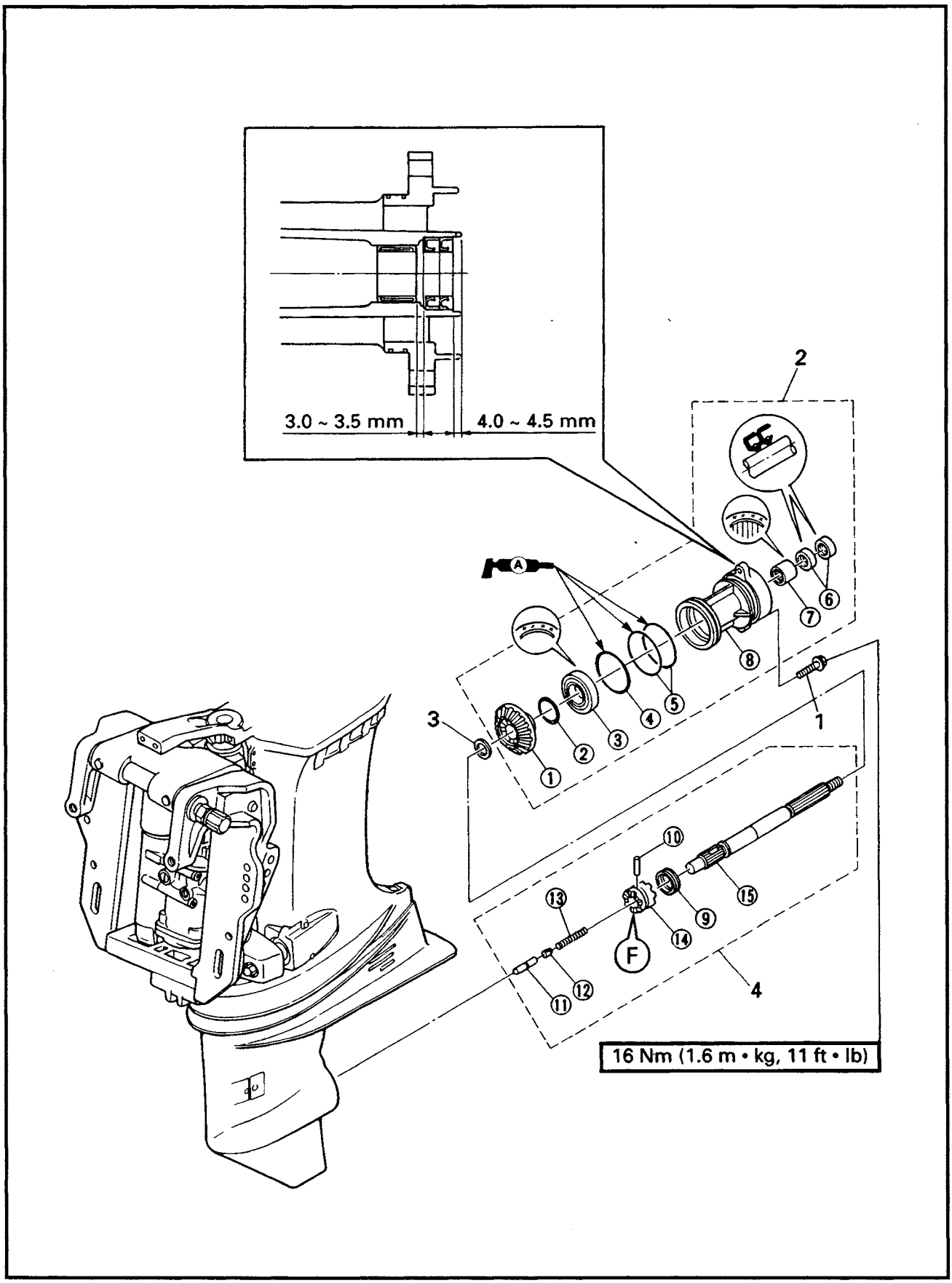


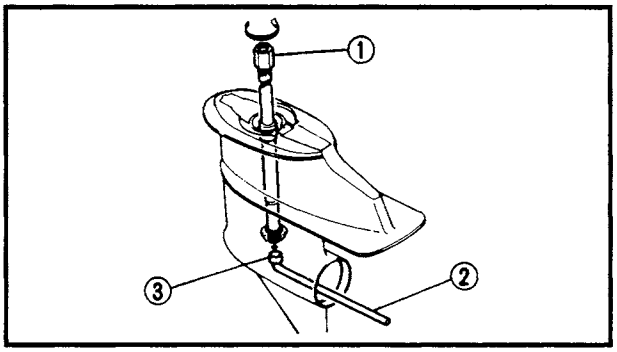
3. Measure:
   - Side clearance
     Use a thickness gauge.
     Out of specification → Replace piston and/or ring.

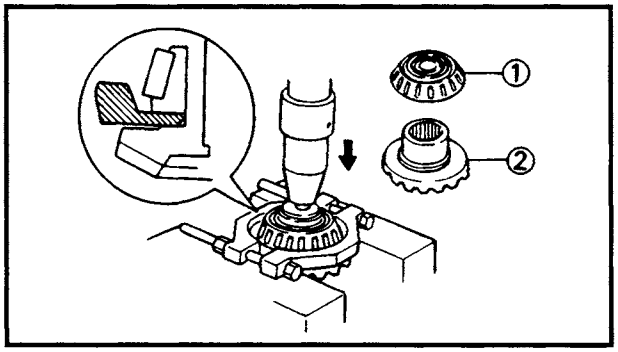
Side clearance:
Top: 0.04 ~ 0.08 mm
(0.002 ~ 0.003 in)
2nd: 0.03 ~ 0.07 mm
(0.001 ~ 0.003 in)



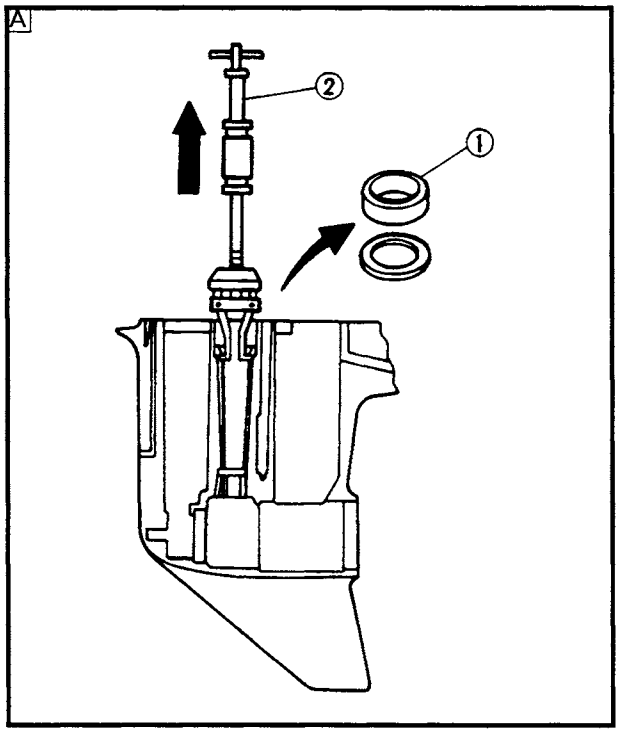
PROPELLER SHAFT AND REVERSE GEAR
EXPLODED DIAGRAM



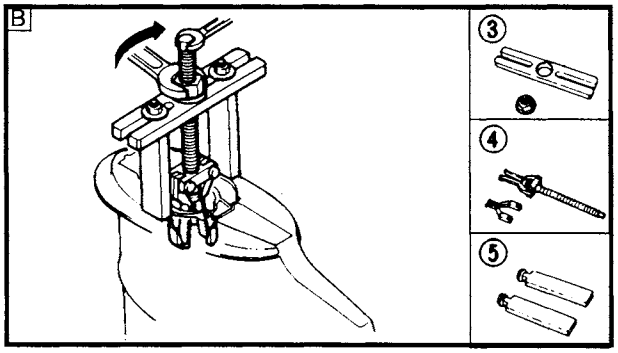




A



B



SERVICE POINTS

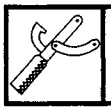
Pinion nut removal

1. Remove:
   - Pinion nut

Drive shaft holder:
YB-06079/90890-06517 ..... ①
Pinion nut wrench:
90890-06505 ..... ②
Socket adapter:
90890-06506 ..... ③

Forward gear disassembly

1. Remove:
   - Taper roller bearing ①
   - Forward gear ②



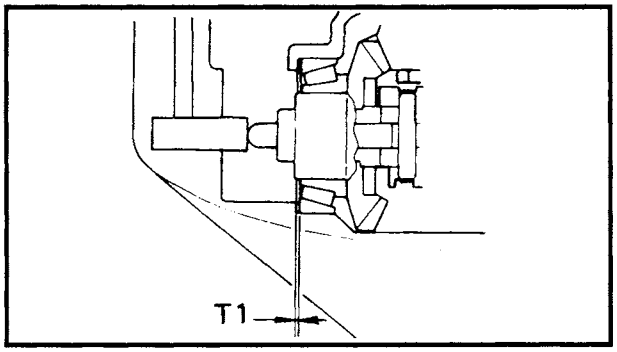
Bearing separator:
YB-06219/90890-06534

Lower case disassembly

1. Remove:
   - Drive shaft bearing outer race ①

Slide hammer set:
YB-06096 ..... ②
Stopper guide plate:
90890-06501 ..... ③
Bearing puller:
90890-06535 ..... ④
Stopper guide stand:
90890-06538 ..... ⑤

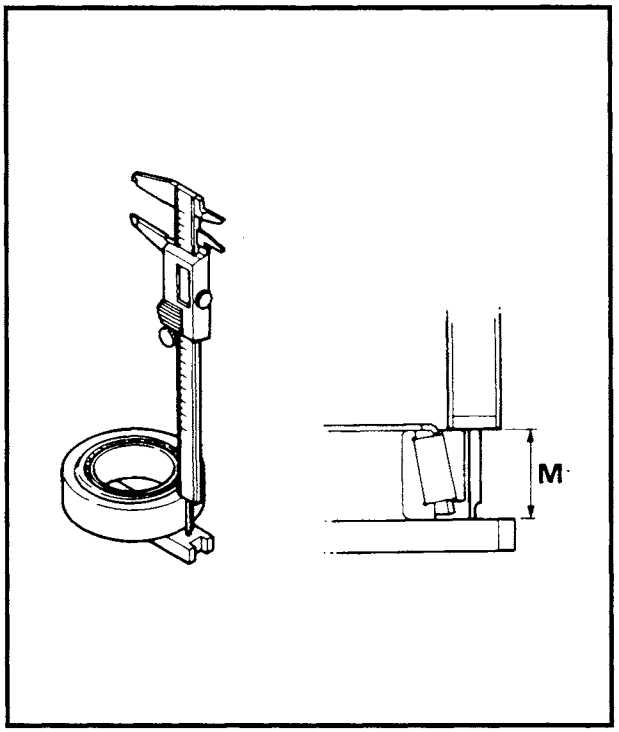
A For USA and CANADA
B Except for USA and CANADA



Forward gear shim

NOTE:

Find forward gear shim thickness (T1) by selecting shims until the specified measurement (M) is obtained with the special tool.



1. Measure:
   - Measurement (M)

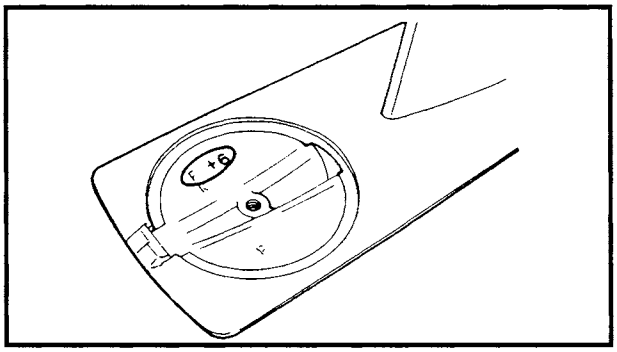
Shimming Plate:
90890-06701
Digital caliper:
90890-06704

NOTE:

Measure the length between the shimming plate and the bearing outer race after turning the outer race 2 to 3 times.

2. Calculate:
   - Forward gear shim thickness (T1)

Forward gear shim thickness
(T1) = 22.75 + F/100 – M

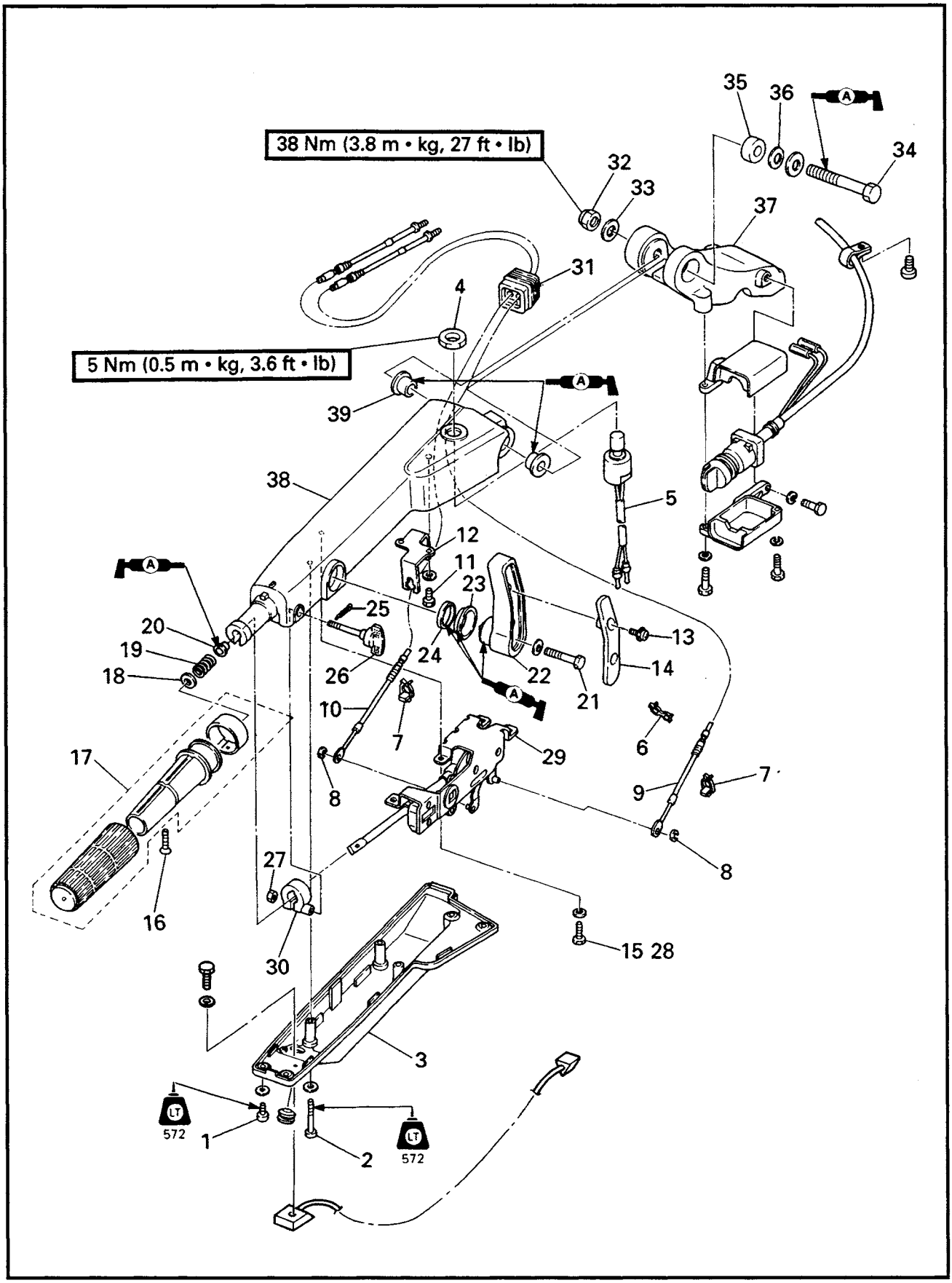


NOTE:

- F is the deviation of the lower case dimension from standard. It is stamped on the trim tab mounting surface of the lower case in 0.01 mm units. If the F mark is missing or unreadable, assume an F mark of "0", and check the backlash when the unit is assembled.
- If the F value is negative (–), then subtract the F value from the measurement.

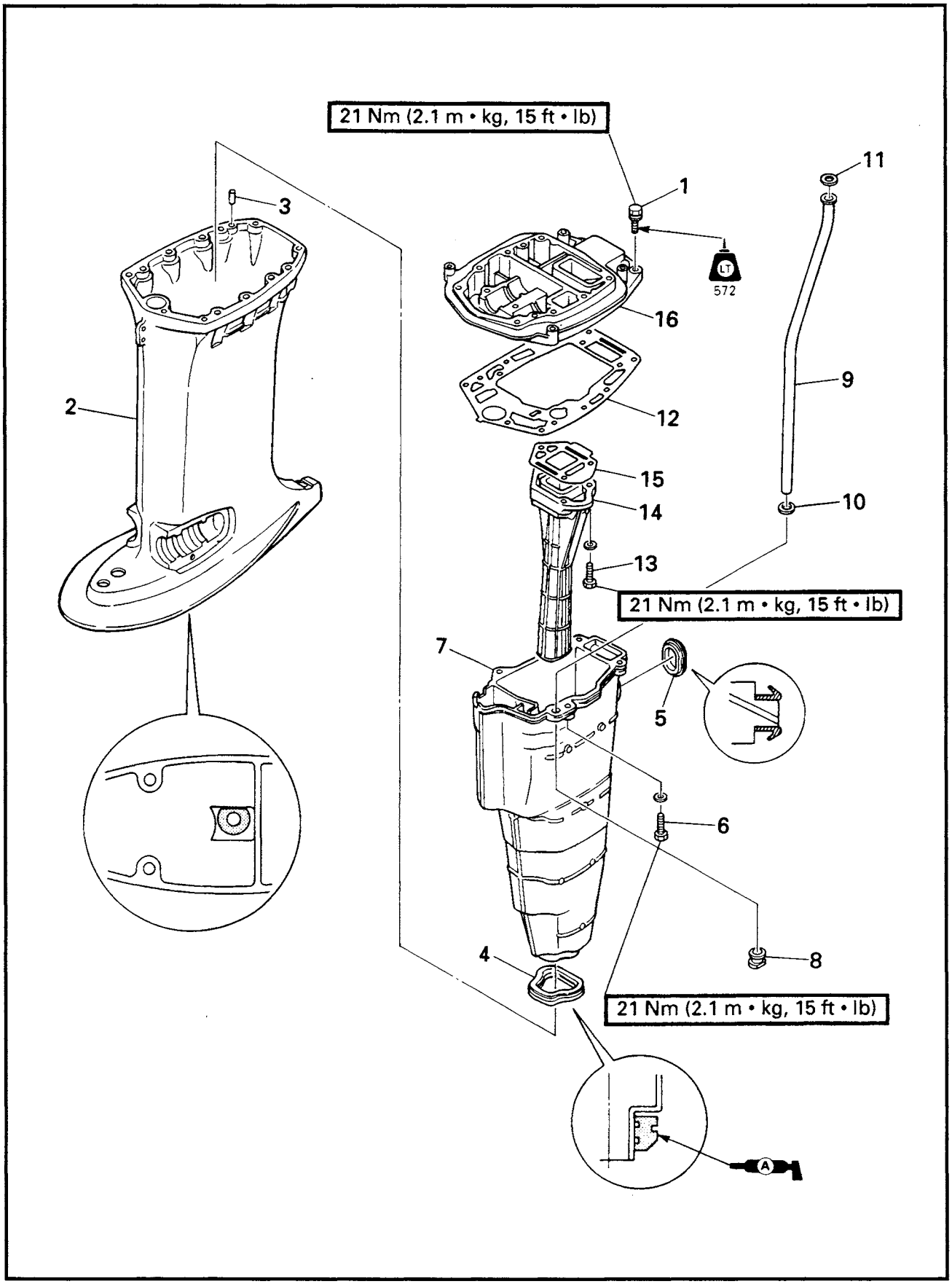
Example:
If M is "22.30 mm" and F mark is "+5",
then T1 = 22.75 mm + (+5)/100 – 22.30
= 0.45 + 0.05 mm
= 0.50 mm
If M is "22.30 mm" and F mark is "–5",
then T1 = 22.75 mm + (–5)/100 – 22.30
= 0.45 – 0.05 mm
= 0.40 mm

TILLER HANDLE
EXPLODED DIAGRAM



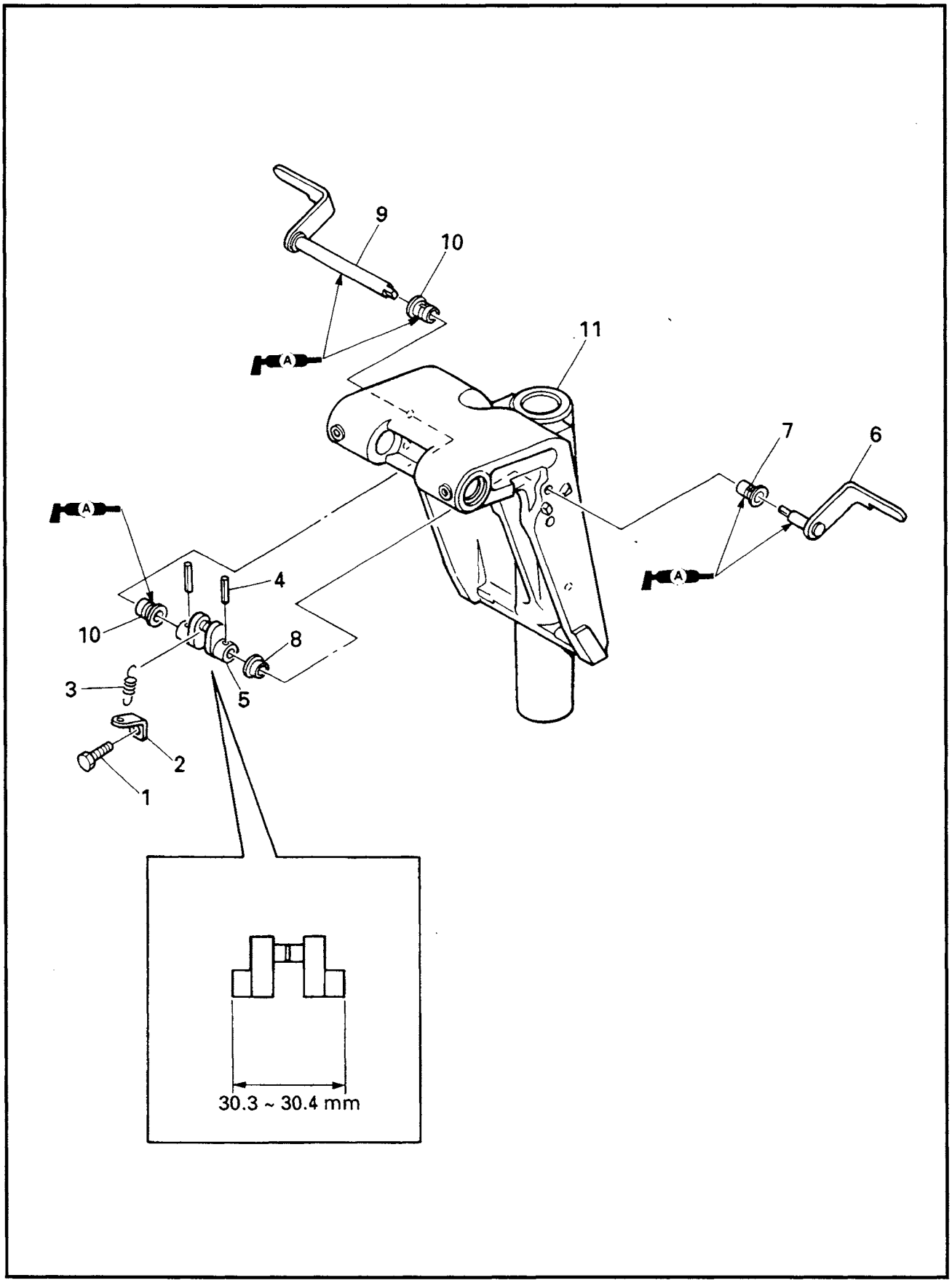
UPPER CASE AND EXHAUST MANIFOLD

EXPLODED DIAGRAM

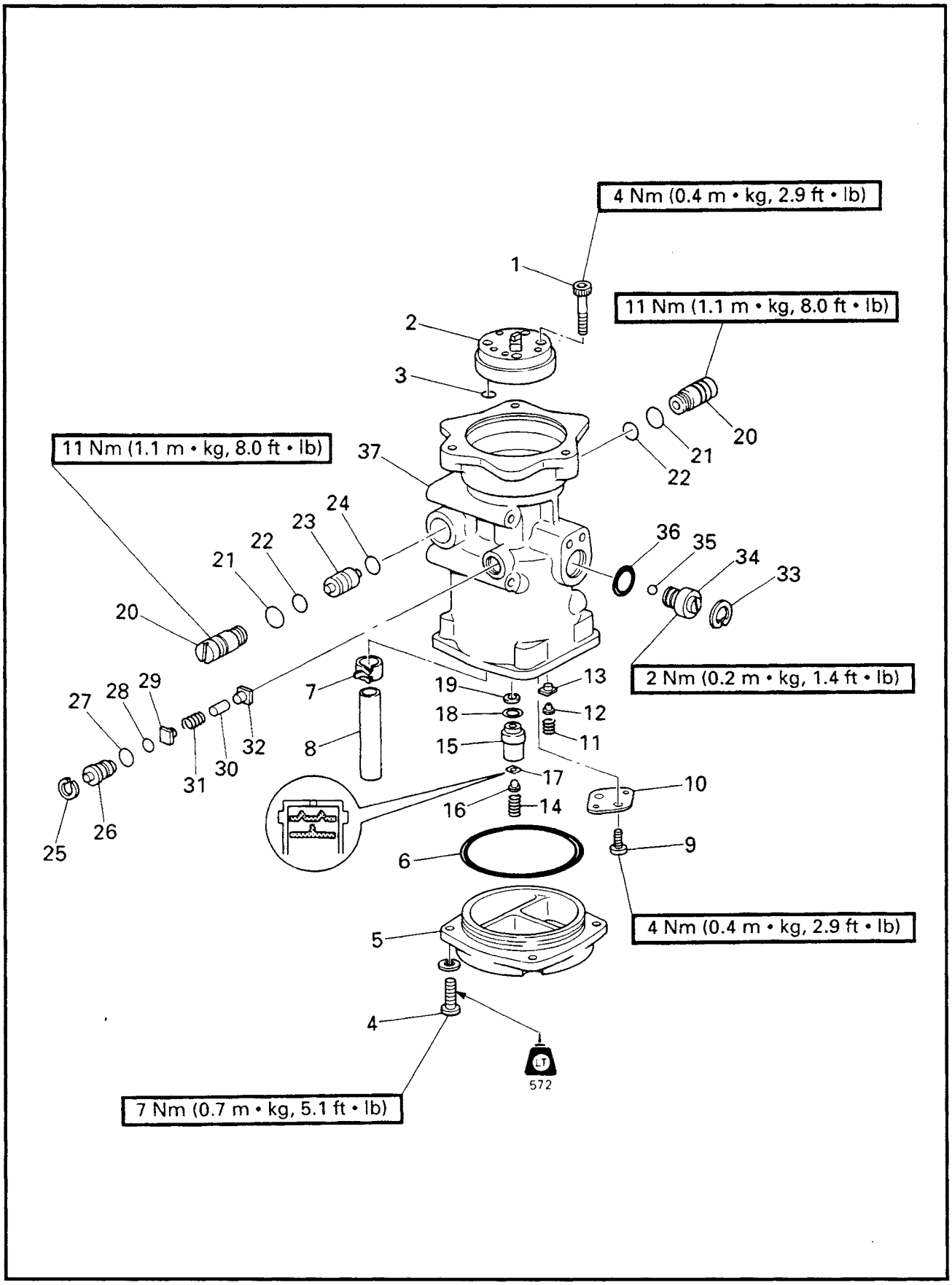


SWIVEL BRACKET DISASSEMBLY

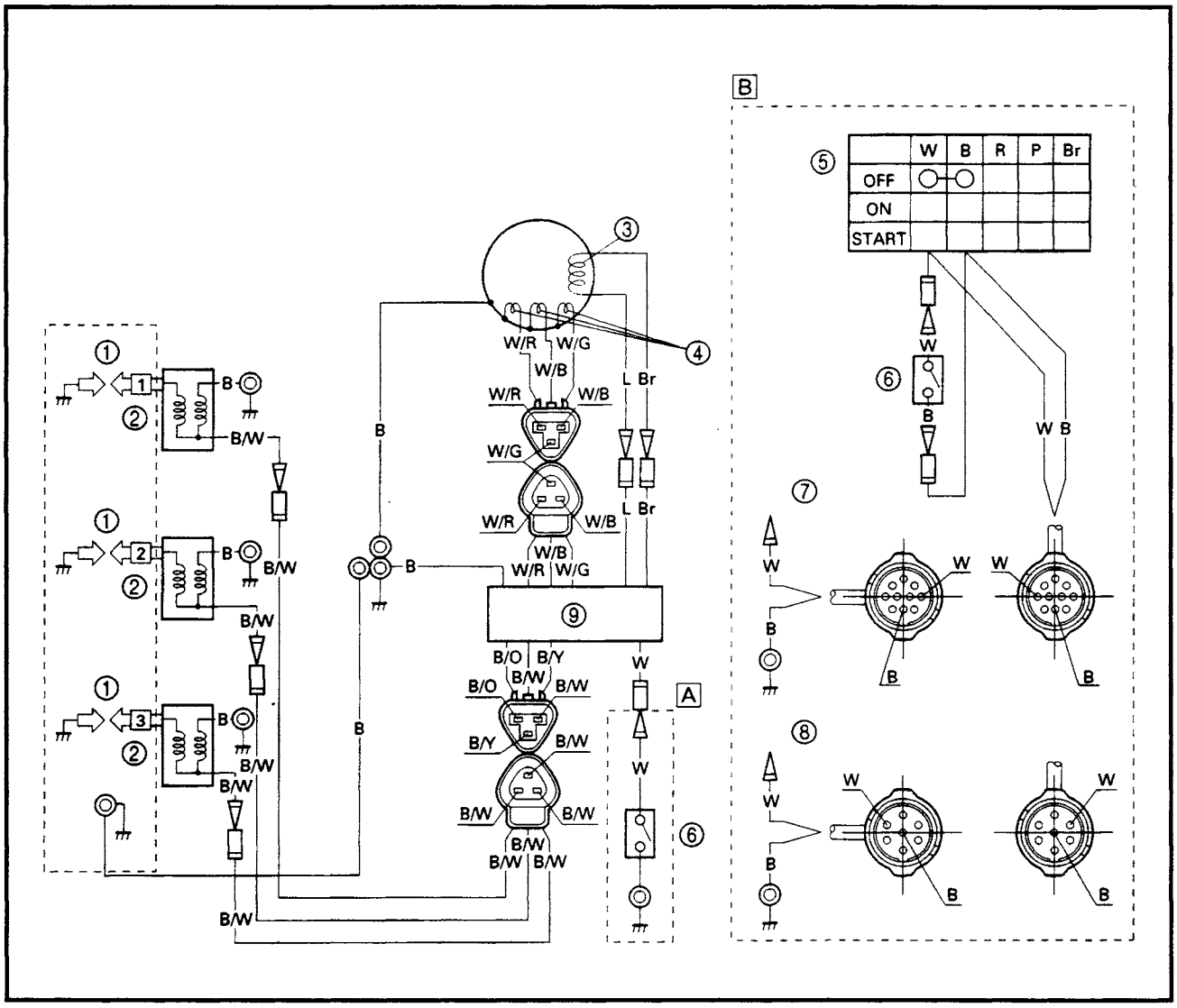
EXPLODED DIAGRAM



PUMP HOUSING
EXPLODED DIAGRAM



IGNITION SYSTEM

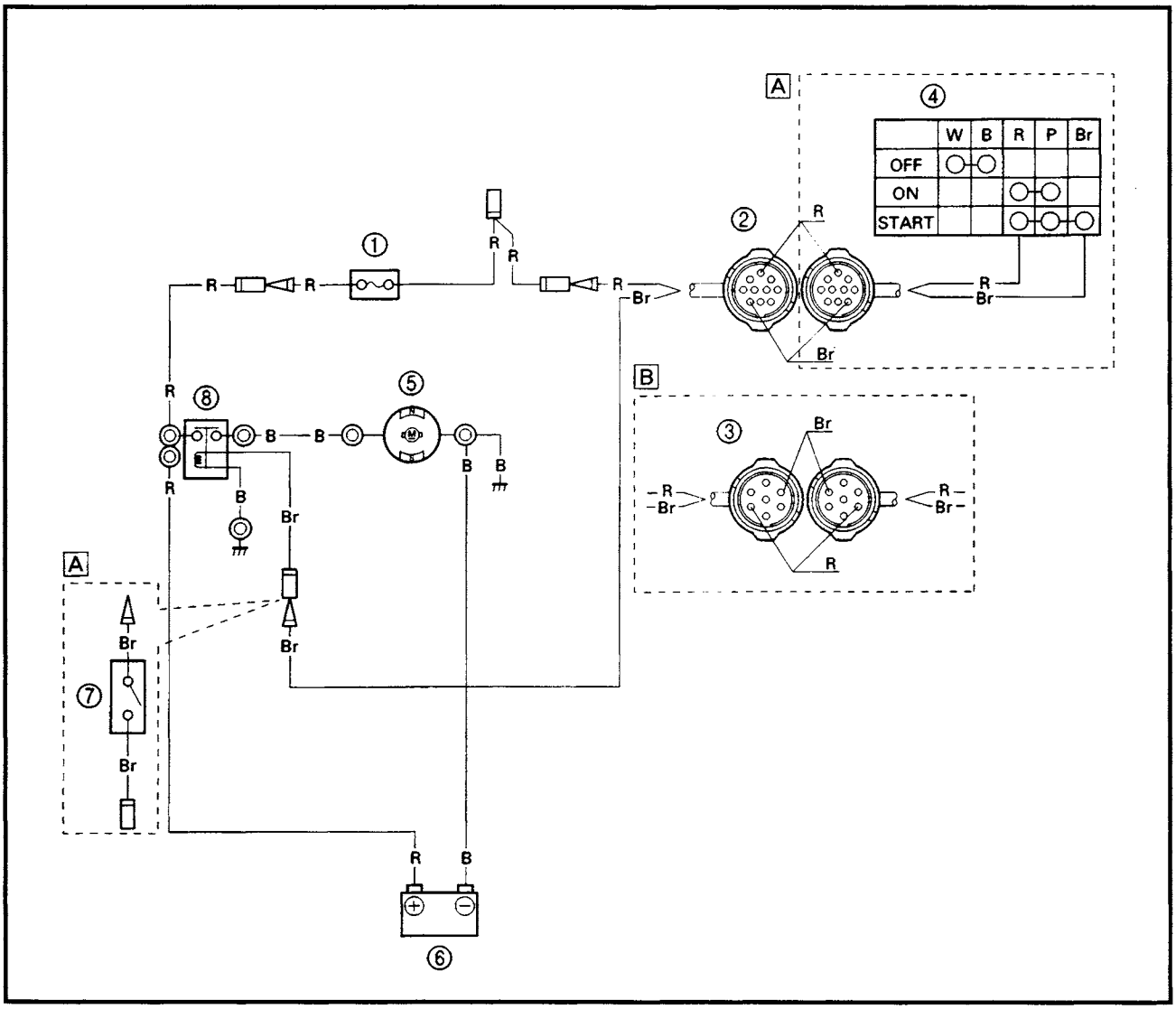


① Spark plug
② Ignition coil
③ Charge coil
④ Pulser coil
⑤ Main switch
⑥ Engine stop switch
⑦ 10P coupler
⑧ 7P coupler
⑨ CDI unit

A Manual starter model
B Electrical starter model

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

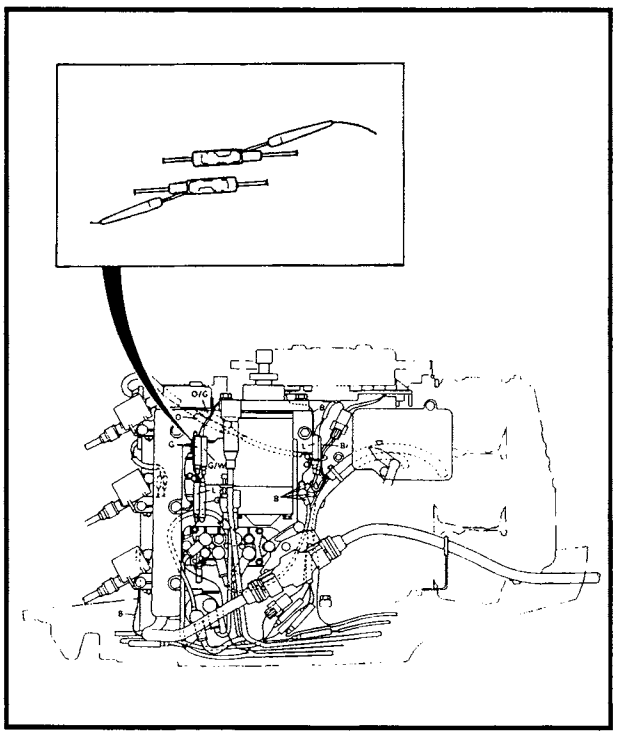
STARTING SYSTEM



① Fuse
② 10P coupler
③ 7P coupler
④ Main switch
⑤ Starter motor
⑥ Battery
⑦ Neutral switch
⑧ Starter relay

A Except for remote control model
B Remote control model

B : Black
Br : Brown
R : Red



CHARGING SYSTEM PEAK VOLTAGE

1. Measure:
   - Rectifier regulator input
     Below specification → Lighting coil measurement.

Rectifier regurator input:
(electrical model)
8.5 V @ cranking
25 V @ 1,500 r/min
25 V @ 3,500 r/min

Measuring steps:
- Connect the tester to the rectifier/regulator as shown.
- Set the tester dial to specification.

Range:
V

- Crank or start the engine.

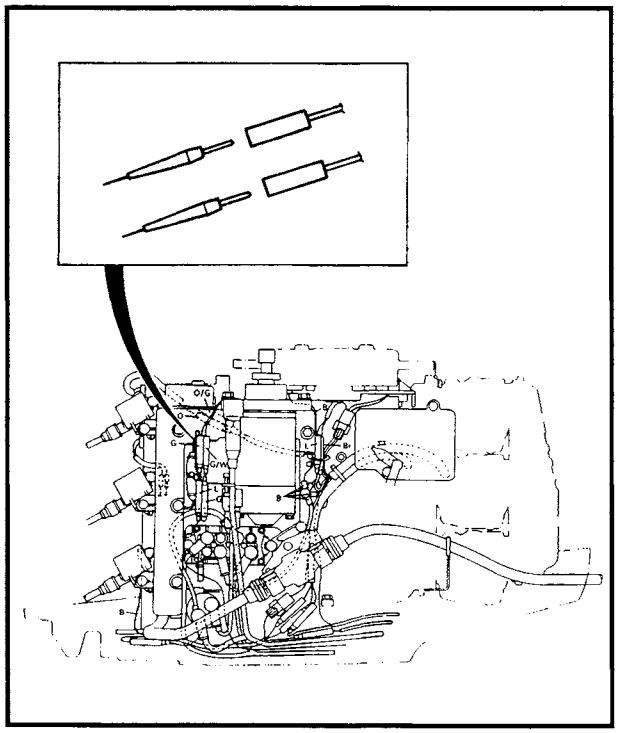
2. Measure:
   - Lighting coil output
     Beyond specification → Replace rectifier/regulator.
     Below specification → Replace lighting coil.

Lighting coil output:
9.0 V @ cranking
25 V @ 1,500 r/min
25 V @ 3,500 r/min

Measuring steps:
- Connect the tester to the lighting coil as shown.
- Set the tester dial to specification.

Range:
V

- Start the engine.



FUSE

Refer to "STARTING SYSTEM".

BATTERY

Refer to "GENERAL" in chapter 3.