YAMAHA

Marine

Outboards

P60V, C60V, 70V
P75V, C80V,
90V, B90V

SERVICE MANUAL

LIT-18616-01-69

CHAPTER 1
GENERAL INFORMATION

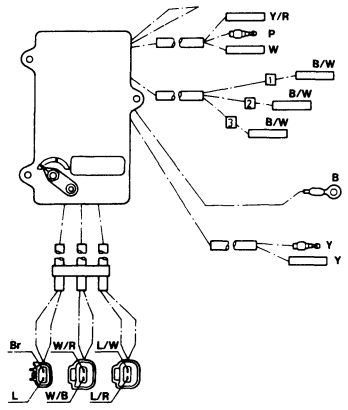
SPECIAL TOOLS

	Tool name	Tool No.		Use for:
		USA and Canada ⓐ	Except for USA and Canada	
21	Bearing depth plate	N.A.	90890-06603	Propeller shaft needle bearing Drive shaft needle bearing
22	Oil seal attachment	YB-06269	N.A.	Propeller shaft oil seal
23	Needle bearing depth stop	YB-34473	N.A.	Drive shaft needle bearing
24	Driver rod	YB-06071	90890-06606	Drive shaft outer bearing
25	Bearing outer race attachment	YB-06156	90890-06626 90890-06627	Drive shaft outer bearing
26	Driver rod	YB-06071	90890-06605	Forward gear outer bearing
27	Bearing outer race attachment	YB-06276-B	90890-06621 90890-06622	Forward gear outer bearing
28	Bearing inner race attachment	N.A.	90890-06640 90890-06662	Forward gear inner bearing
29	Shift rod wrench	YB-06052	N.A.	Shift rod
30	Cylinder end screw wrench	YB-06175-1A	90890-06542	PTT
31	Cylinder end screw wrench	YB-06175-2B	90890-06544	PTT
32	Flywheel holder	YB-06139	90890-06522	Flywheel
33	Flywheel puller	YB-06117	90890-06521	Flywheel

MAINTENANCE SPECIFICATIONS

Item	Unit	Model					
		50hp	60hp	70hp	75hp	80hp	90hp

C.D.I. unit:



50, 60, 70 hp

For charge coil — **Unit: kΩ**

⊖ \ ⊕	Br	L	B
Br		12 ~ 29	8 ~ 18
L	15 ~ 40		9.5 ~ 22
B	2.5 ~ 6.7	2.7 ~ 70	

For pulser coil — **Unit: kΩ**

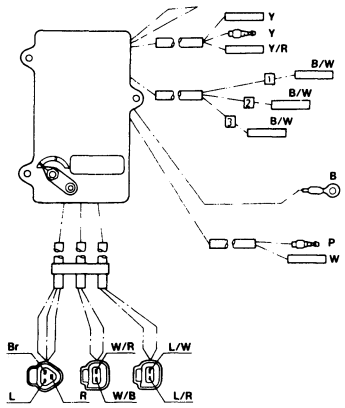
⊖ \ ⊕	W/R	W/B	B
W/R		35 ~ 500	37.5 ~ 1,000
W/B	37.5 ~ 1,000		28 ~ 175
B	2.7 ~ 7.0	2.7 ~ 7.0	

For ignition coil

B/W — B 2.7 ~ 7.0kΩ

For crank position sensor — **Unit: kΩ**

⊖ \ ⊕	L/W	L/R	B
L/W		∞	∞
L/R	8.9 ~ 20		0
B	2.7 ~ 7.0	8.9 ~ 20	



75, 80, 90 hp

For charge coil — **Unit: kΩ**

⊖ \ ⊕	Br	R	L	B
Br		13 ~ 37	13 ~ 37	8 ~ 17
R	∞		∞	∞
L	15 ~ 40	15 ~ 40		9.5 ~ 22
B	2.4 ~ 6.3	2.8 ~ 7.4	2. 5 ~ 6.7	

For pulser coil — **Unit: kΩ**

⊖ \ ⊕	W/R	W/B	B
W/R		35 ~ 400	23 ~ 90
W/B	37.5 ~ 1,000		28 ~ 140
B	3 ~ 7	3 ~ 7	

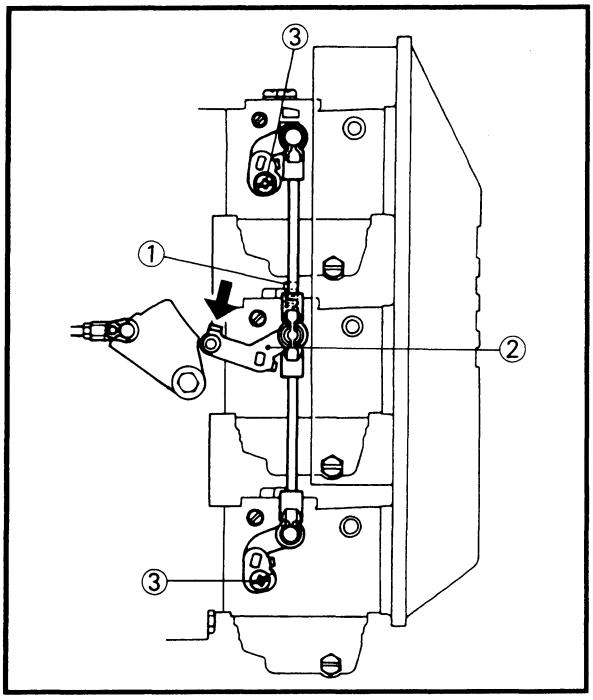
For ignition coil

B/W — B 2.5 ~ 6.7kΩ

For crank position sensor — **Unit: kΩ**

⊖ \ ⊕	L/W	L/R	B
L/W		∞	∞
L/R	10 ~ 24		0
B	10 ~ 24	0	

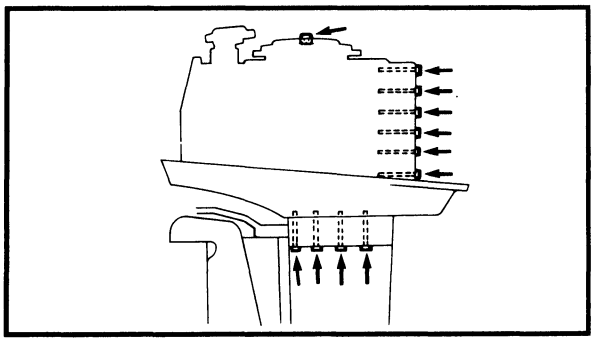
B : Black
Br : Brown
L : Blue
R : Red
W/R : White/Red
W/B : White/Black
W/G : White/Green
B/W : Black/White
L/W : Blue/White
L/R : Blue/Red



(75, 80, 90 hp)

1. Loosen the idle adjust screw and fully close the throttle valve.
2. Loosen the throttle lever securing screws of upper and lower carburetors by turning clockwise.
3. While lightly pushing the throttle lever of the middle carburetor in the direction of the arrow (full-closed), tighten the throttle lever securing screw of the upper and lower carburetors by turning counterclockwise.

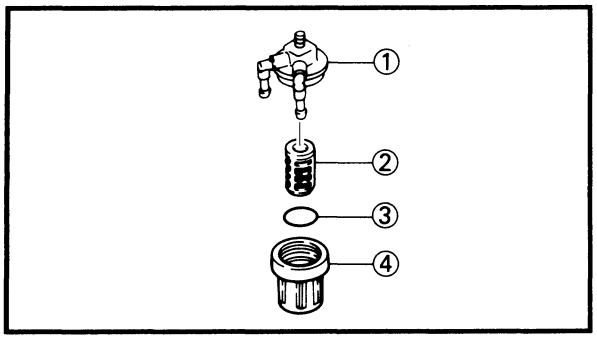
① Idle adjust screw
② Throttle lever
③ Throttle lever securing screw



D32000-0

CYLINDER HEAD BOLTS, ENGINE MOUNTING BOLTS, AND FLYWHEEL NUT

1. Retighten to specifications.
2. Check other fixings and tighten if necessary.

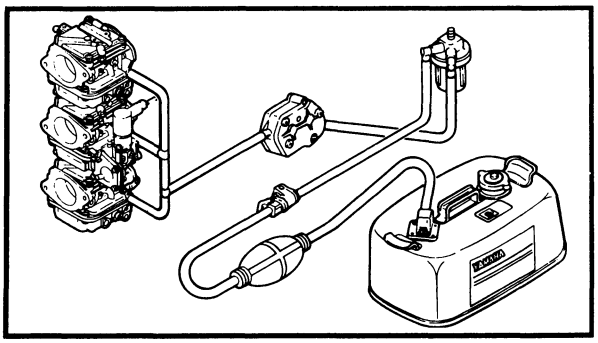


D32300-0

FUEL FILTER

Clean the strainer of dust and impurities.

① Strainer body
② Strainer
③ O-ring
④ Strainer cup



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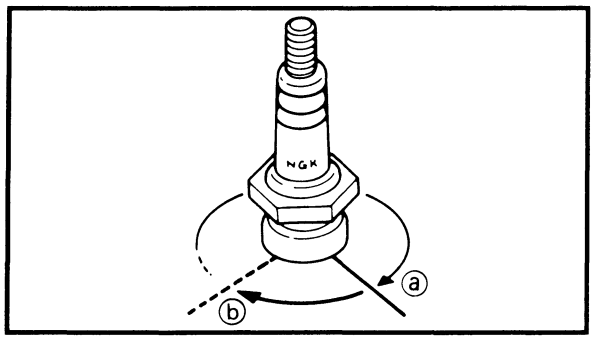
FUEL TANK AND FUEL LINE

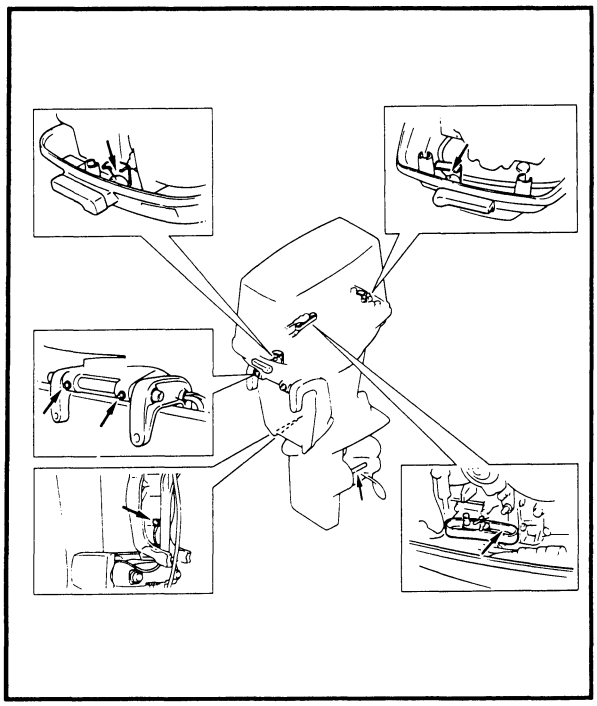
1. Check the fuel tank and fuel line for leaks.
2. Clean the fuel tank thoroughly.



4. When installing the spark plug, clean the gasket surface, wipe off any grime that may be on the surface of the plug and screw in the spark plug to the correct torque.

	Tightening torque: **25 Nm (2.5 m • kg, 18 ft • lb)**

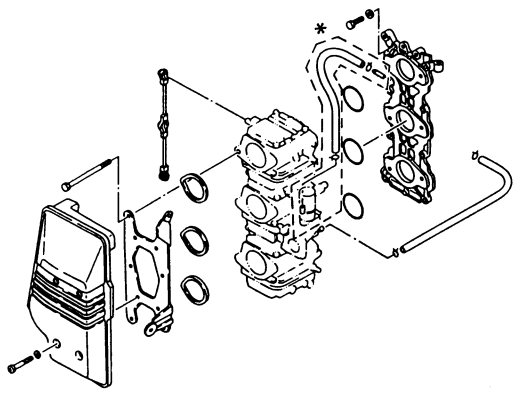
NOTE:
If a torque wrench is not available, a good estimate of the correct torque is a further 1/4 to 1/2 turns b on finger-tightened a spark plug.



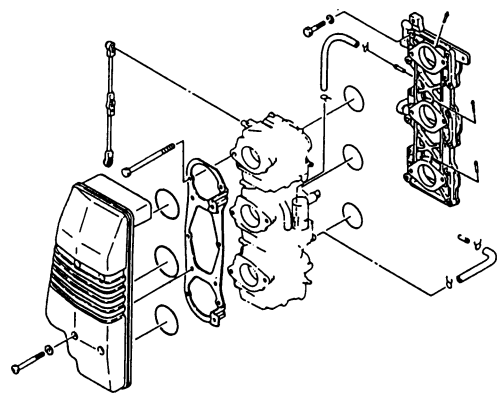
GREASING POINTS

1. Apply:
   - Water resistant grease

50, 60, 70 hp



75, 80, 90 hp



REMOVAL AND DISASSEMBLY

⚠ WARNING

At this step, ensure there is no spillage of gasoline on removing the connections.

1. Remove the silencer cover, disconnect the fuel hose, then remove the carburetor.

* Except for C60ER/60FE, C60TR/60FET

2. Referring to the diagram, use a screwdriver to disassemble the carburetor.
3. Using solvent, clean the components thoroughly and blow-dry them with compressed air.

⚠ WARNING

Protect your eyes with suitable safety glasses or safety goggles when using compressed air. Protect your eyes and the eyes of others by directing the flow of compressed-air downward, noting that solvent and small parts may be blown off.

CAUTION:

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

CHAPTER 5
POWER UNIT

G62501-0*

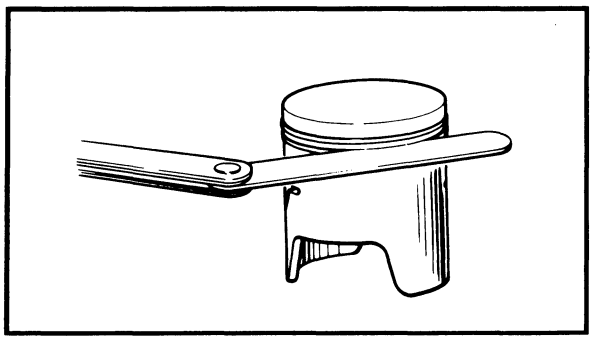
PISTON RING

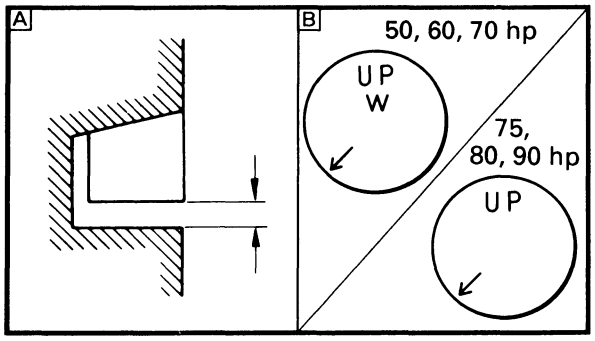
INSPECTION

1. Using a thickness gauge, measure the clearance between the piston ring and the groove land.

Side clearance:
50, 60, 70 hp:
Top/2nd ring:
0.03 ~ 0.07 mm
(0.0012 ~ 0.0028 in)
75, 80, 90 hp:
Top/2nd ring:
0.03 ~ 0.06 mm
(0.0012 ~ 0.0024 in)

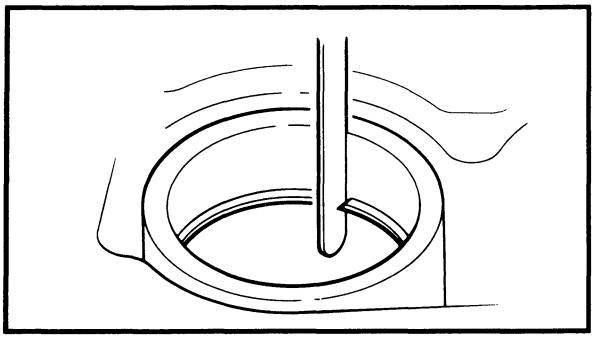
If the clearance is not within the specifications, replace the piston.





A Top/2nd: Keystone type
B Piston marked with "W" (50, 60, 70 hp)

2. Insert the piston ring into the cylinder. Using a piston, push the piston ring a little beyond the bottom of the ring travel to a depth of 20 mm (0.8 in) from the top of the cylinder block.

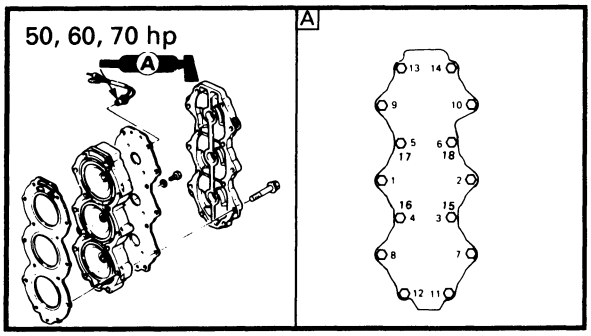


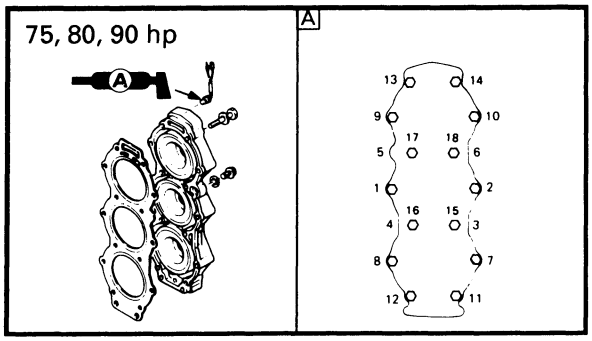
CAUTION:
Take care not to scratch the piston. Using a thickness gauge, measure the end-gap.

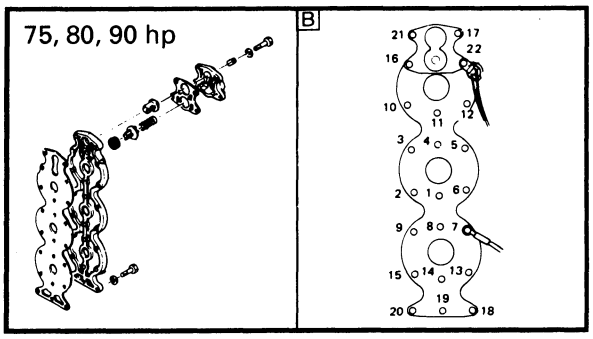
Ring end gap (installed):
50, 60, 70 hp:
0.3 ~ 0.5 mm (0.012 ~ 0.020 in)
75, 80, 90 hp:
0.4 ~ 0.6 mm (0.016 ~ 0.024 in)

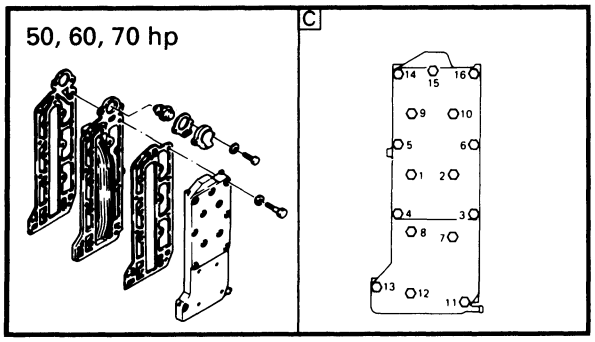
If the clearance is not within the specifications, replace the piston-ring.

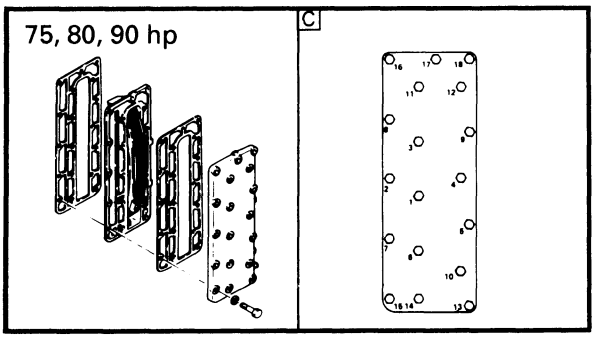
NOTE:
If the clearance is greater than maximum, even with a new piston ring, rebore the cylinder and use an over-size piston and piston-ring.











G75000-0*

CYLINDER HEAD AND EXHAUST COVER

1. Install the gaskets cylinder-head cover and exhaust cover.
2. Tighten the bolts to the specified torque in sequence and in two steps.

A Tightening sequence

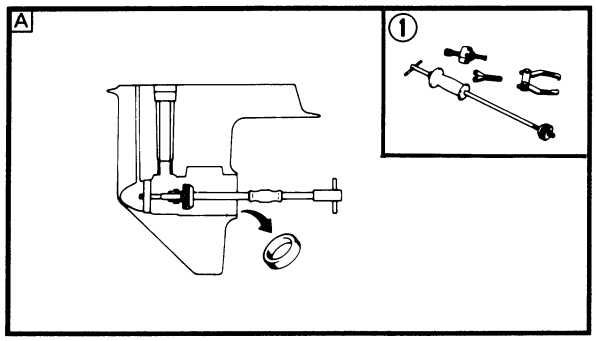
Cylinder head (50, 60, 70 hp):
1st step:
15 Nm (1.5 m • kg, 11 ft • lb)
2nd step:
32 Nm (3.2 m • kg, 23 ft • lb)
Cylinder head (75, 80, 90 hp):
1st step:
15 Nm (1.5 m • kg, 11 ft • lb)
2nd step:
30 Nm (3.0 m • kg, 22 ft • lb)

B Tightening sequence

C Tightening sequence

Exhaust cover (50, 60, 70 hp):
1st step:
3 Nm (0.3 m • kg, 2.2 ft • lb)
2nd step:
8 Nm (0.8 m • kg, 5.8 ft • lb)
Exhaust cover (75, 80, 90 hp):
1st step:
9 Nm (0.9 m • kg, 6.5 ft • lb)
2nd step:
18 Nm (1.8 m • kg, 13 ft • lb)

3. Install the thermostat, gasket and cover.

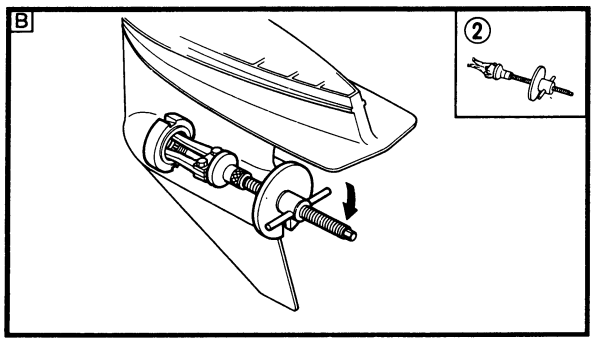


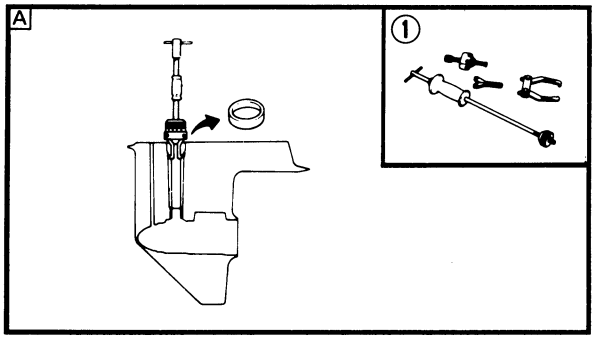
12) Forward gear bearing outer race

Slide hammer set:	
YB-6096	①
Bearing outer race puller:	
90890-06523	②

A For U.S.A. and CANADA
B Except for U.S.A. and CANADA

NOTE:
For ease of reassembly and adjustment, keep shim packs in their groups as removed.

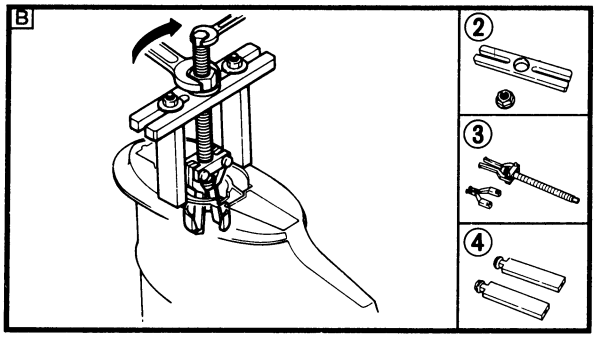


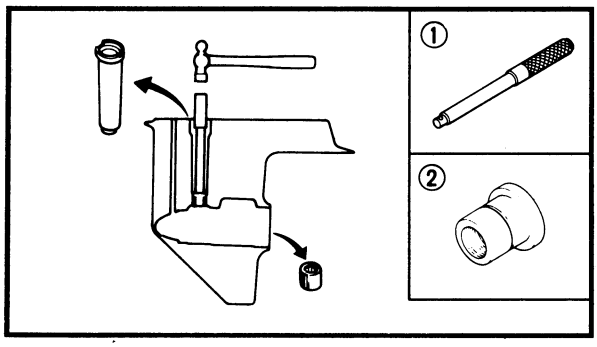


13) Drive shaft bearing outer race

Slide hammer set:	
YB-6096	①
Stopper guide plate:	
90890-06501	②
Bearing puller:	
90890-06535	③
Stopper guide stand:	
90890-06538	④

A For U.S.A. and CANADA
B Except for U.S.A. and CANADA





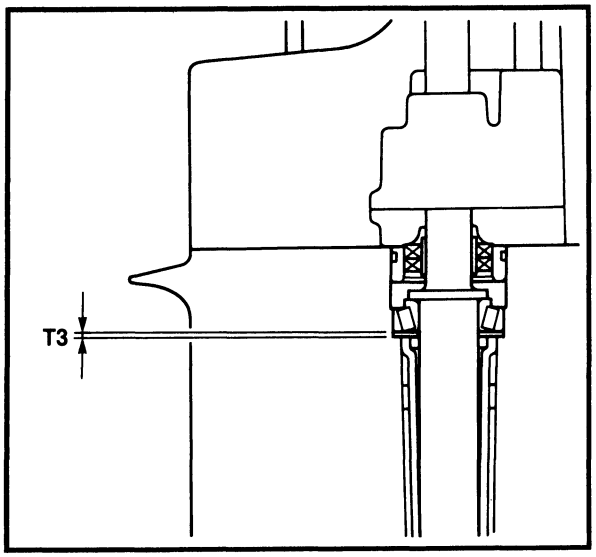
14) Drive shaft sleeve
15) Drive shaft needle bearing

Driver rod:	
YB-6071/90890-06602	①
Needle bearing attachment:	
YB-6155/90890-06611	②

SHIM SELECTION

NOTE:

1. When reassembling the lower unit with the original gear case and inner parts, shim selection is not required.
2. When replacing the gear case only, read the numeral preceded by "F,R,P" and adjust the shims according to the difference between numerals of the original gear-case and the new gear-case.
3. If the bearing(s) and/or gear(s) are replaced, carry out the shim selection.



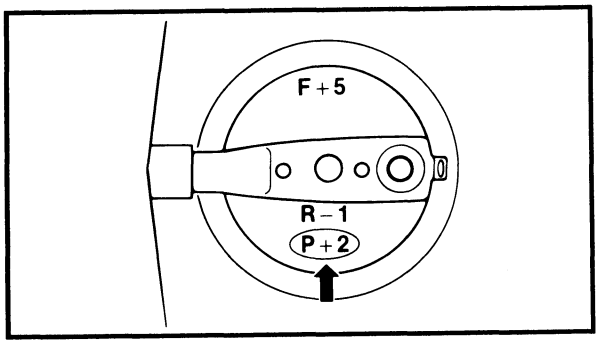
FOR U.S.A. AND CANADA (60, 70, 75, 90 hp)
Pinion Gear Shim

NOTE:

Find pinion gear shim thickness **(T3)** by selecting shims until the specified measurement **(M)** with the special tool is obtained.

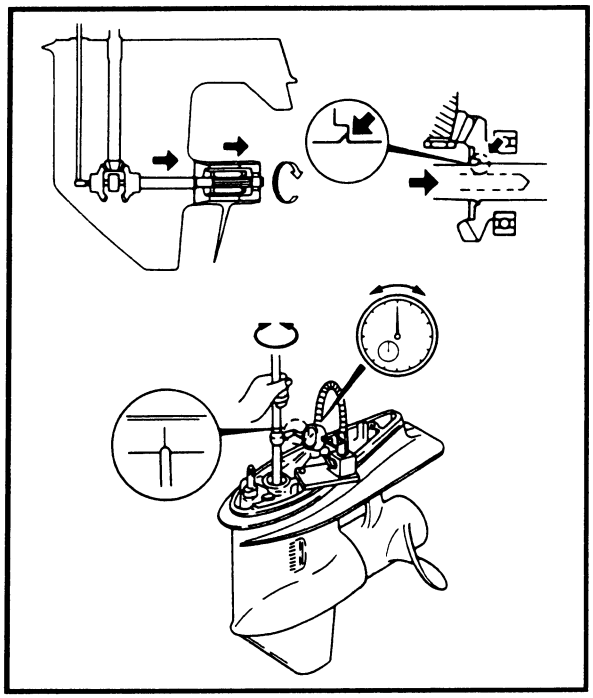
1. Find the specified measurement **(M)**.

Specified Measurement (M) = 0.20 mm + P/100 mm



NOTE:

1. **P** 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 **P** mark is missing or unreadable, assume a **P** mark of "0", and check the backlash when the unit is assembled.
2. If the **P** value is negative (–), then **subtract** the **P** value from the measurement.



Reverse Gear

1. Install a propeller on the propeller shaft, with the front facing backward, fit the nut and tighten.
2. Slowly turn the drive shaft in and out, and read the dial gauge when the drive shaft stops in each direction.
3. Determine the shim size according to the chart.

50 hp

Reverse gear backlash	Decrease or increase
Less than 0.84 mm (0.033 in)	Thickness of shim to be increased (mm) = (1.01 – measurement) × 1.67
0.84 – 1.17 mm (0.033 – 0.046 in)	Decrease or increase will be unnecessary
More than 1.17 mm (0.046 in)	Thickness of shim to be decreased (mm) = (measurement – 1.01) × 1.67

60, 70 hp

Reverse gear backlash	Decrease or increase
Less than 0.75 mm (0.033 in)	Thickness of shim to be increased (mm) = (0.94 – measurement) × 1.86
0.75 – 1.13 mm (0.033 – 0.044 in)	Decrease or increase will be unnecessary
More than 1.13 mm (0.044 in)	Thickness of shim to be decreased (mm) = (measurement – 0.94) × 1.86

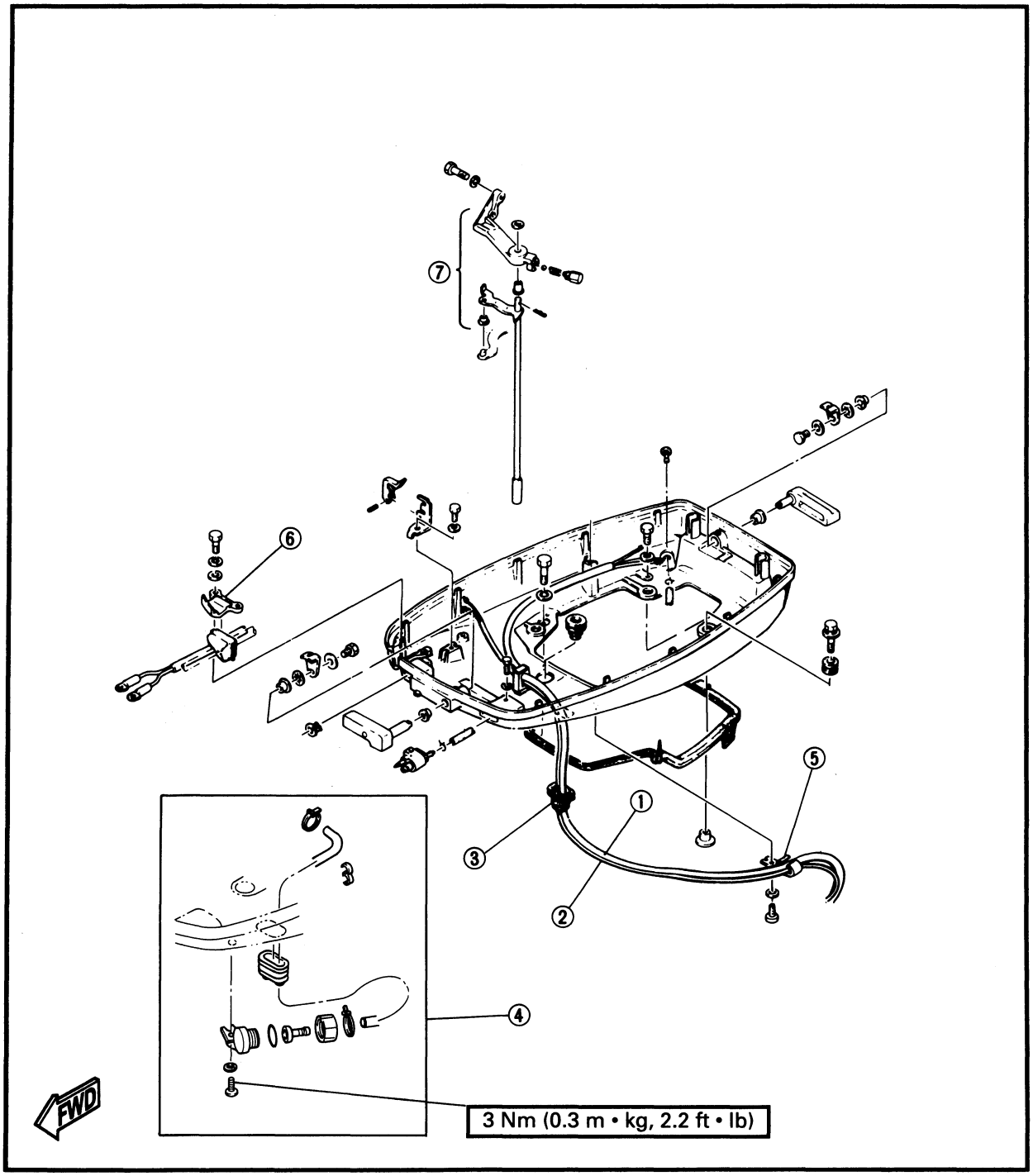
75, 80, 90 hp

Reverse gear backlash	Decrease or increase
Less than 0.67 mm (0.026 in)	Thickness of shim to be increased (mm) = (0.83 – measurement) × 1.67
0.67 – 1.00 mm (0.026 – 0.039 in)	Decrease or increase will be unnecessary
More than 1.00 mm (0.039 in)	Thickness of shim to be decreased (mm) = (measurement – 0.83) × 1.67

K-15300-0

BOTTOM COWLING

① Power trim and tilt motor lead (P.T.T. model)
② Trim sender lead (P.T.T. model)
③ Grommet
④ Flushing kit (B90TR)
⑤ Clamp (P.T.T. model)
⑥ Bottom cowling fitting plate
⑦ Shift actuator



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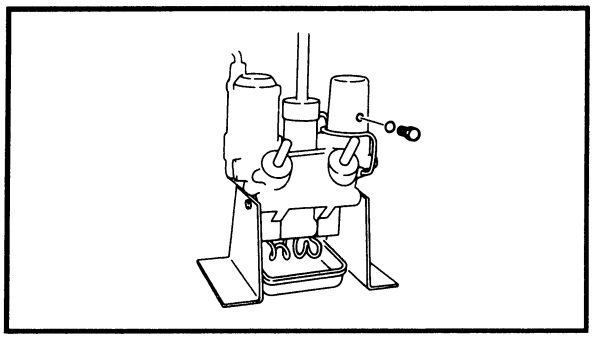
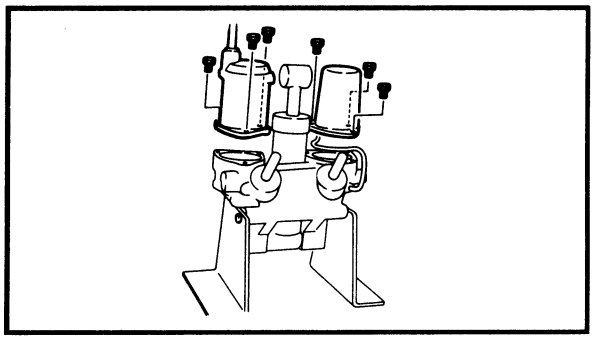
DISASSEMBLY

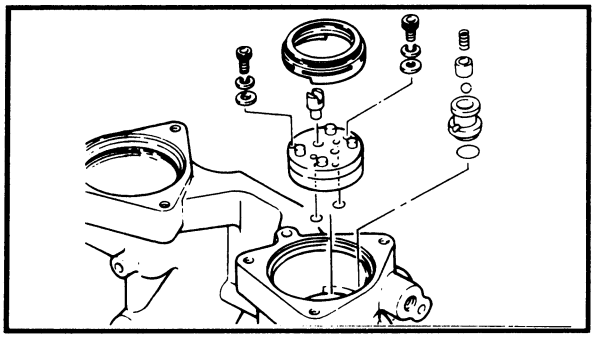
CAUTION:

1. Do not wipe components of the hydraulic system with rags or paper tissues, etc., as fibers from such entering the system will cause malfunction.
2. After removing the tilt-motor or oil-reservoir, do not depress the tilt-rod or trim-rod which may cause hydraulic fluid to be ejected from the port.



1. Turn the manual valve fully towards the manual position.
2. Remove the hydraulic-fluid level-plug and drain the hydraulic-fluid.
3. Remove the delivery pipes and drain the hydraulic-fluid.
4. Remove the hydraulic-fluid reservoir and the tilt-motor.

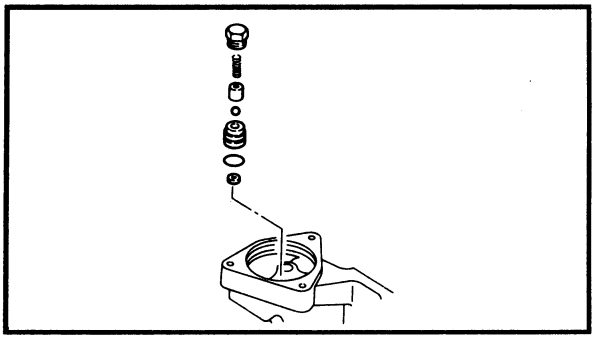




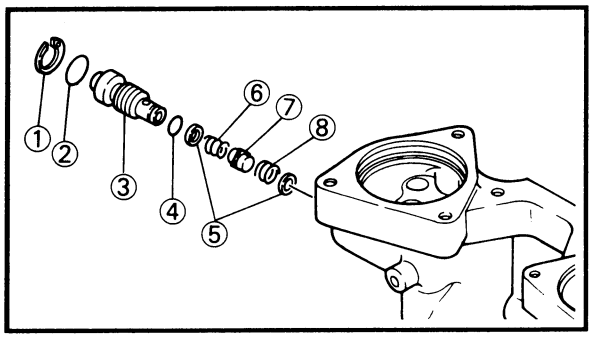
5. Remove the shaft connector.
6. Remove the filter and the gear-pump.
7. Remove the O-rings and the complete down relief-valve.

CAUTION:

Do not disassemble the gear-pump unit which is factory-adjusted, but replace the complete gear-pump unit if necessary.

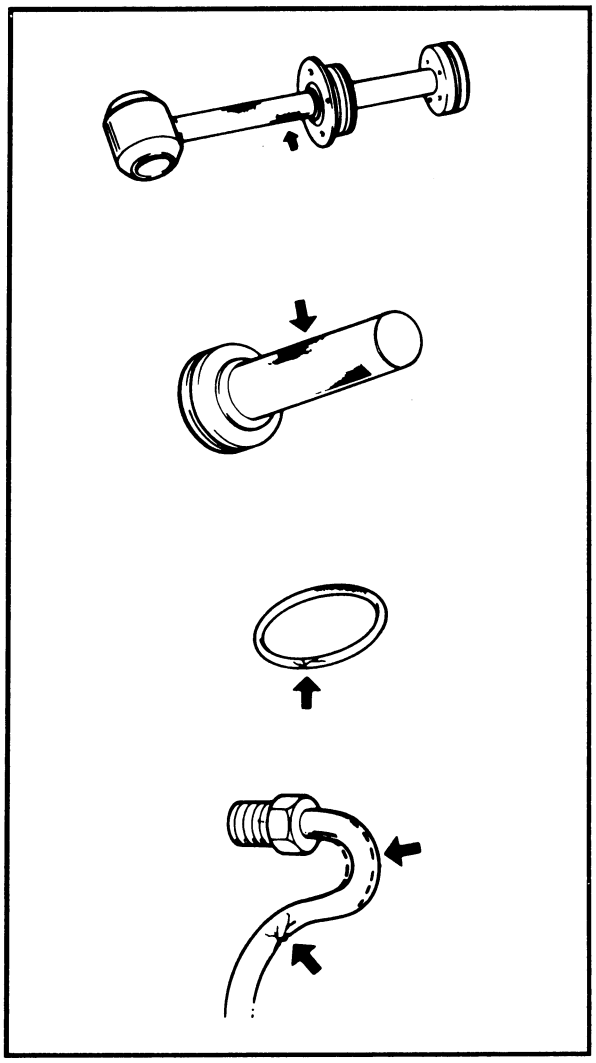


8. Loosen the bolt and remove the complete up-relief valve.



12. Remove the circlip and the manual-valve and components.

① Snap ring
② O-ring
③ Manual release screw
④ O-ring
⑤ Manual valve seat
⑥ Manual release spring 1
⑦ Adapter 1
⑧ Manual release spring 2



K53000-0

INSPECTION

TILT-ROD AND TRIM-ROD

1. Clean these components using a soft brush and solvent and inspect them carefully. If there are light scratches on the surfaces, these may be polished off using fine wet-or-dry sandpaper (440 ~ 600 grit), but if there is excessive scratching, replace the components.
2. Clean all the parts thoroughly using a soft brush and solvent and dry them with compressed air.
3. Inspect the tilt-cylinder and pump-unit and replace them if they are badly corroded.

K54001-0*

ASSEMBLY

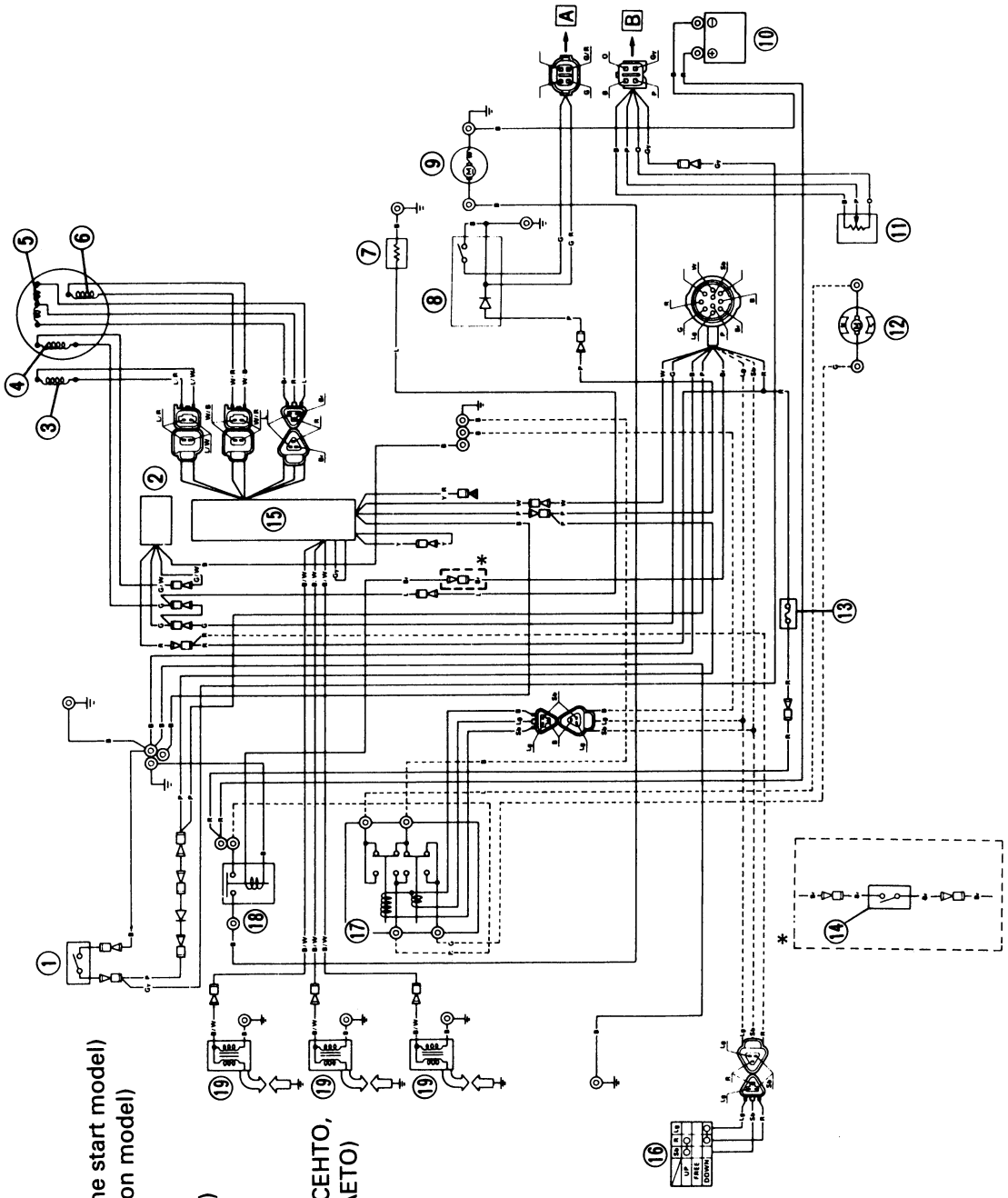
NOTE:

The components in this assembly are to be lightly coated with hydraulic fluid before assembly.

CHAPTER 8
ELECTRICAL SYSTEM

M30000-0

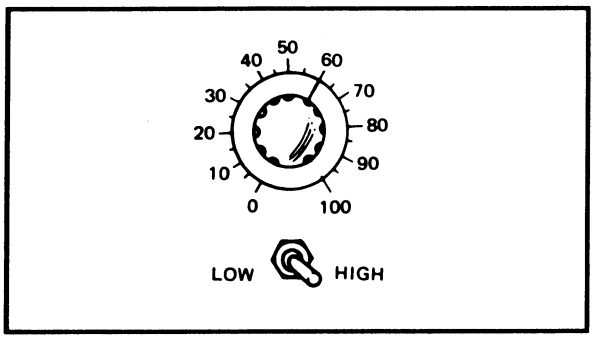
75, 80, 90 hp

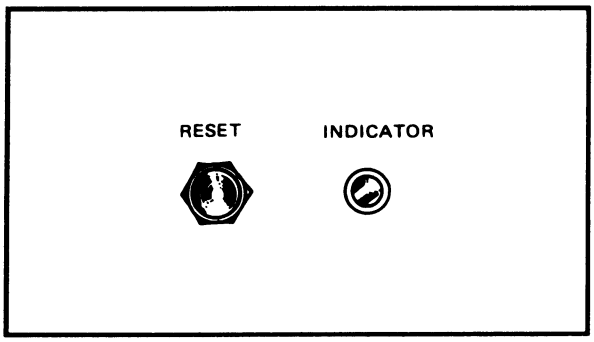


---- : P.T.T. model

① Thermo switch
② Rectifier regulator
③ Crank position sensor
④ Lighting coil
⑤ Charge coil
⑥ Pulser coil
⑦ Electrothermal valve (prime start model)
⑧ Oil level sensor (oil injection model)
⑨ Starter motor
⑩ Battery
⑪ Trim sensor (P.T.T. model)
⑫ Power trim and tilt motor (P.T.T. model)
⑬ Fuse (20A)
⑭ Neutral switch (P75TH/75CEHTO, 90TR/90AETO, B90TR/90AETO)
⑮ C.D.I. unit
⑯ Power trim and tilt switch (P.T.T. model)
⑰ Power trim and tilt relay (P.T.T. model)
⑱ Starter relay
⑲ Ignition coil
Ⓐ To oil level gauge
Ⓑ To trim gauge

B .....Black
Br .....Brown
G .....Green
Gy .....Grey
L .....Blue
Lg .....Light-green
O .....Orange
P .....Pink
R .....Red
Sb .....Sky-blue
W .....White
Y .....Yellow





6. Testing the C.D.I. system
   1) Place the tester range switch to the position indicated on the chart.
   2) Set the dial to the setting shown on the chart.
   3) Crank the engine; if the light comes on, the component is good, so proceed to the next test. If the light does not come on, replace the component.
   4) When the indicator lamp lights in each test, reset the indicator circuit by depressing the RESET button for the next test.

TEST SEQUENCE	TEST LEAD CONNECTIONS		DIAL SETTING		RANGE SWITCH
	"P"	"N"	60 hp 70 hp	75 hp 90 hp	
Test #1 C.D.I. output #1 #3	Black/White (B/W)	Ground	50	60	H Use load coil
Test #2a Charge coil	Brown (Br)	Blue (L)	60	70	H
Test #2b Charge coil	Red (R)	Blue (L)	—	65	H
Test #3 Pulser coil	White/Red (W/R)	White/Black (W/B)	40	45	L

NOTE:

Normally, #2 cylinder will not fire when cranking with starting motor. It powers all ignition coils, except #2, when the engine speed is 500 r/min or less from the cranking speed.
The coil output varies greatly with cranking speed.
Testing with the spark plugs out and good battery.
Cranking the cold engine with the plugs in and a weak battery cannot be found proper readings.

⚠ WARNING

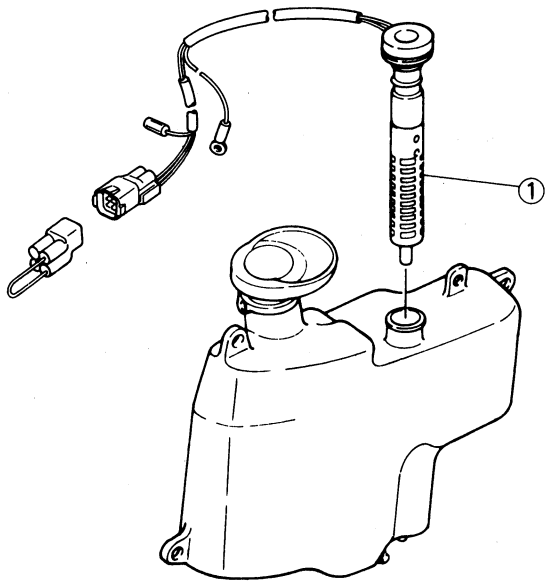
While taking spark check be carefull not to touch any connection of lead wires of the "spark volt checker".

M57500-0

OIL INJECTION SYSTEM (Oil injection model)

① Oil level sensor
② Digital meter
(Oil level warning lamps/control unit)
③ Lead wire
④ Lead wire
⑤ Lead wire assembly

50, 60, 70 hp



75, 80, 90 hp