



CHAPTER 3

PERIODIC INSPECTION AND ADJUSTMENT

PERIODIC SERVICE	3-1
MAINTENANCE SCHEDULE	3-1
ANODE.....	3-1
BATTERY	3-2
CARBURETOR	3-3
CARBURETOR LINK ADJUSTMENT.....	3-3
CYLINDER HEAD BOLTS, ENGINE MOUNTING BOLTS, AND FLYWHEEL NUT	3-4
FUEL FILTER.....	3-4
FUEL TANK AND FUEL LINE.....	3-4
GEAR OIL.....	3-5
IDLE-SPEED	3-5
IGNITION TIMING ADJUSTMENT.....	3-6
TIMING PLATE POSITION ADJUSTMENT	3-6
THROTTLE SENSOR CONTROL LINK ADJUSTMENT.....	3-7
IGNITION TIMING ADJUSTMENT	3-8
PICK-UP TIMING ADJUSTMENT	3-9
OIL INJECTION PUMP	3-10
OPERATIONAL TEST	3-10
CHECKING THE OIL LEVEL WARNING SYSTEM	3-11
OIL PUMP LINK ADJUSTMENT.....	3-12
POWER TRIM AND TILT FLUID (PTT model).....	3-12
PROPELLER	3-13
SPARK PLUG.....	3-13
GREASING POINTS	3-14

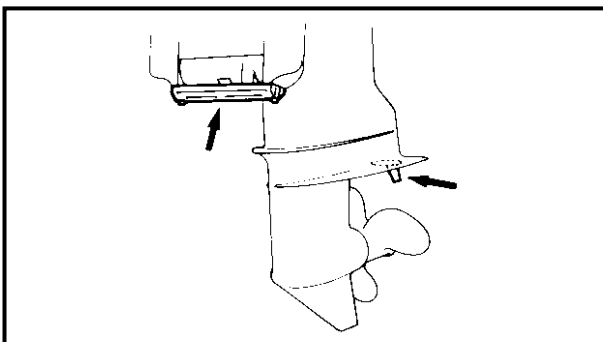


D30000-1*

PERIODIC SERVICE MAINTENANCE SCHEDULE

The following chart may be taken as a helpful guide to the intervals between maintenance procedures.

Item	Intervals	Initial		Every		Refer page
		10 hours (Break-in)	50 hours (3 months)	100 hours (6 months)	200 hours (1 year)	
Anode			○	○		3-1
Battery	○ (every month)		○	○		3-2
Carburetor	○	○	○	○		3-3
Carburetor link	○				○	
Cylinder head bolts, engine mounting bolts, and flywheel nut	○			○		3-4
Fuel filter	○		○	○		3-4
Fuel tank and fuel line	○			○	○	
Gear oil	○			○		3-5
Idle-speed	○			○		
Ignition timing	○			○		3-6
Oil injection pump	○					3-10
Oil level warning system	○			○		3-11
Oil pump link	○					3-12
Power trim and tilt system	○		○	○	○	
Propeller	○		○	○		3-13
Spark plug	○		○	○		



D31000-0

ANODE

Inspect the anode. If it is worn out, replace it with a new one. If scaling of the surface is evident, remove the anode, clean it with a wire brush and remove all trace of oil or grease. After cleaning, polish the contact surfaces of the anode mount and re-install.

CAUTION:

Never paint the anode. To ensure good electrical contact, keep the anode contact surface clean of oil or grease.



D31305-0*

BATTERY

⚠ WARNING

Battery electrolyte is dangerous; it contains sulfuric acid which is poisonous and highly caustic.

Always follow these preventive measures:

- Avoid bodily contact with electrolyte as it can cause severe burns or permanent eye injury.
- Wear protective eye gear when handling or working near batteries.

Antidote (EXTERNAL):

- SKIN - Wash with water.
- EYES - Flush with water for 15 minutes and get immediate medical attention.

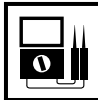
Antidote (INTERNAL):

- Drink large quantities of water or milk followed with milk of magnesia, beaten egg or vegetable oil. Get immediate medical attention.

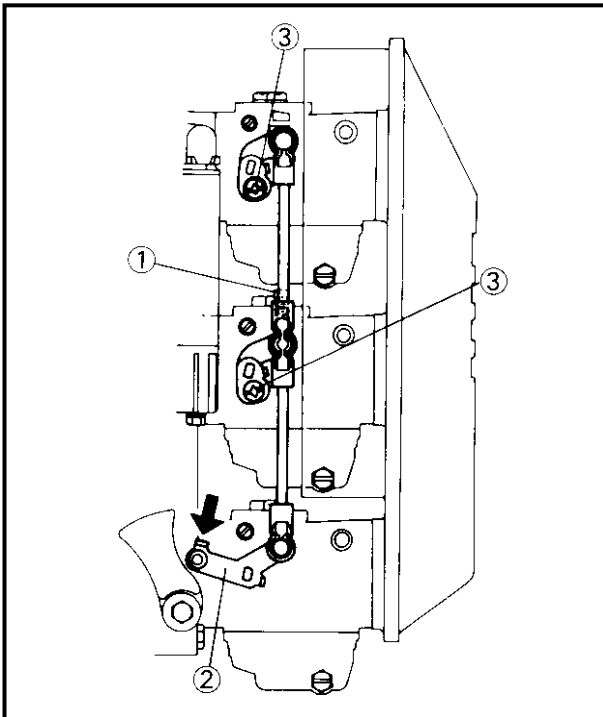
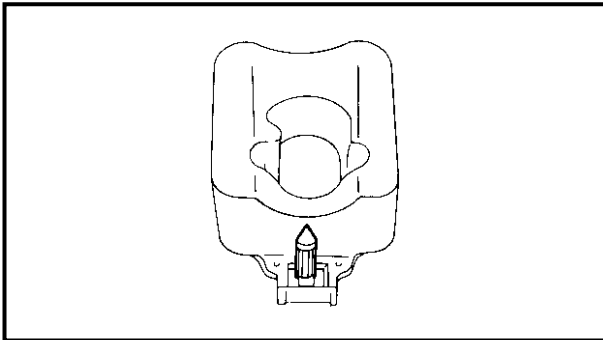
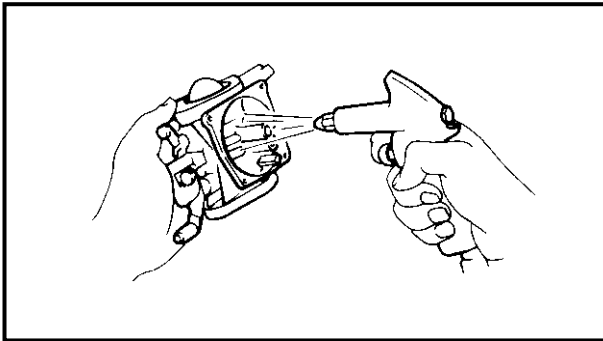
Batteries generate explosive, hydrogen gas. Always follow these preventive measures:

- Charge batteries in a well-ventilated area.
- Keep batteries away from fire, sparks or open flames (e.g., welding equipment, lighted cigarettes).
- DO NOT SMOKE when charging or handling batteries.

KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.



Recommended battery capacity:
Rating..... 12V 70AH (252 kC)
Minimum cold crank performance
..... 380 Amps at -17.8°C (0°F)
Minimum reserve capacity
..... 124 minutes at 26.7°C (80°F)



D31600-1

CARBURETOR

1. Check the fuel passages and air passages for fouling or clogging. Clean fouled parts with suitable cleaning solvent and blow out clogged passages with compressed air.

⚠ WARNING

Protect your eyes with suitable safety glasses or safety goggles when using compressed air.

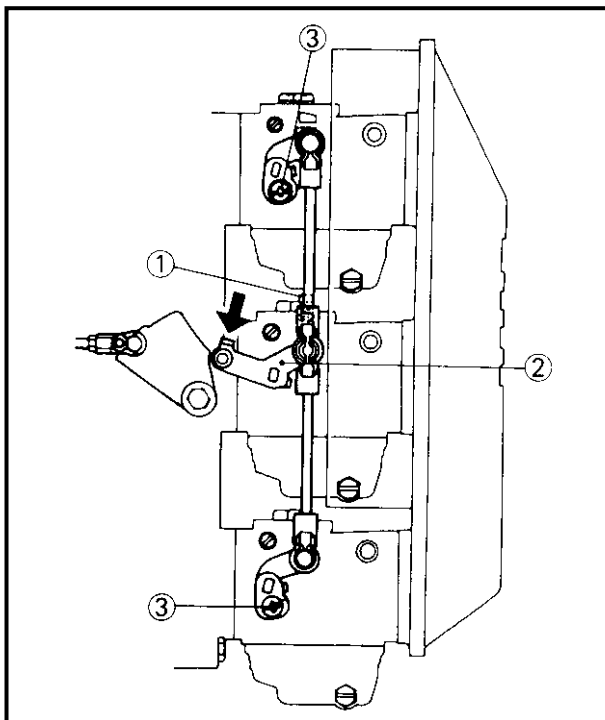
2. Check the needle-valve for wear and replace it if worn.

D31902-1*

**CARBURETOR LINK ADJUSTMENT
(50, 60, 70 hp)**

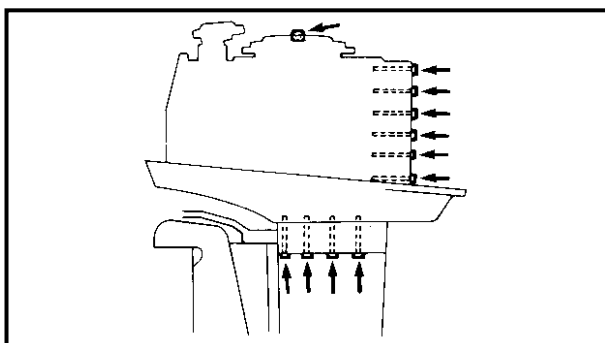
1. Loosen the idle adjust screw and fully close the throttle valve.
2. Loosen the throttle lever securing screws of upper and middle carburetors by turning clockwise.
3. While lightly pushing the throttle lever of the lower carburetor in the direction of the arrow (full-closed), tighten the throttle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

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


(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.

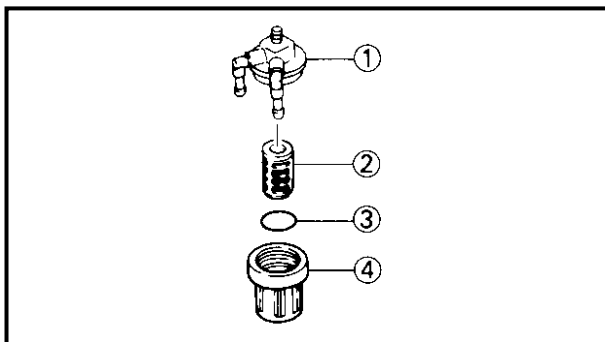
- ① Idle adjust screw
- ② Throttle lever
- ③ Throttle lever securing screw



D32000-0

CYLINDER HEAD BOLTS, ENGINE MOUNTING BOLTS, AND FLYWHEEL NUT

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

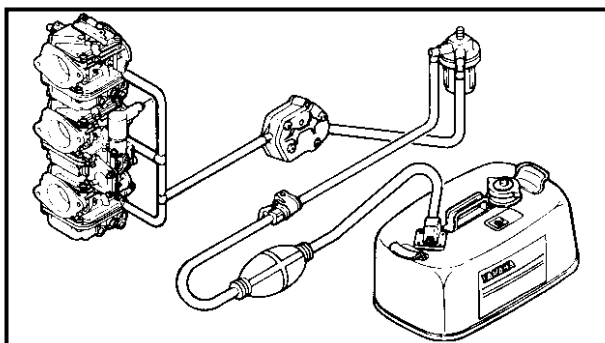


D32300-0

FUEL FILTER

Clean the strainer of dust and impurities.

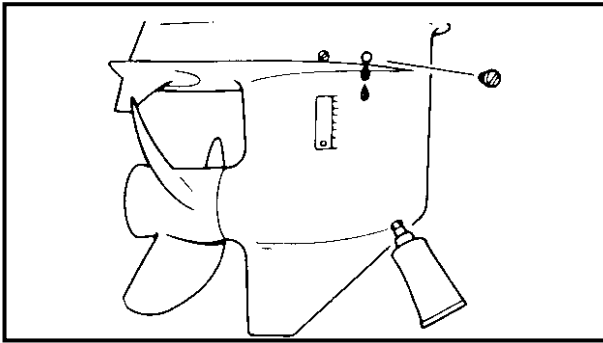
- ① Strainer body
- ② Strainer
- ③ O-ring
- ④ Strainer cup



D32600-0

FUEL TANK AND FUEL LINE

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



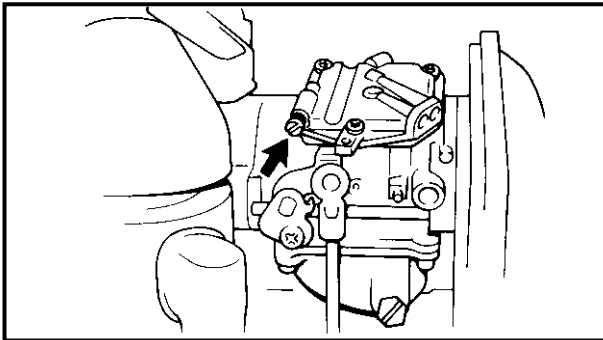
D32900-0

GEAR OIL

1. Drain the gear oil thoroughly and pour in new oil.
2. Check for water or metallic sediment in the drained oil.

NOTE:

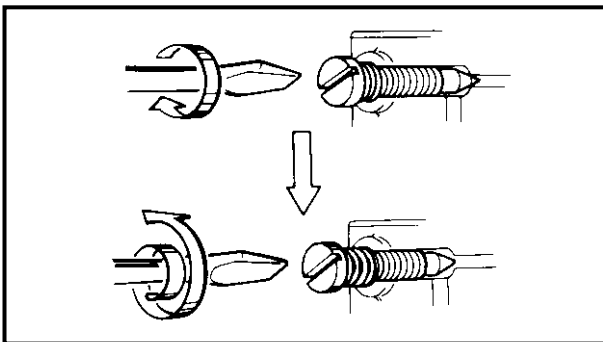
 If the gear oil becomes "milky", check the gear case oil seals and shift boot for water entry.



D33000-0*

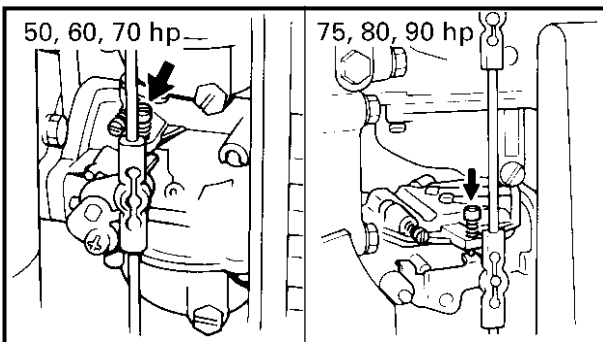
IDLE-SPEED

1. Turn the pilot screw until it is lightly seated.
2. Turn the pilot screw outward to the specified setting.



Pilot screw [stamped mark]:
62F00, 6H210, 6H007, 6H015:
 1-3/8 ± 1/4 turns out
6H20A: 1-1/2 ± 1/4 turns out
6H30A, 6H107:
 1-1/4 ± 1/4 turns out

3. Start the motor and allow it to warm up for a few minutes.



4. Set the idle-speed to the specified level by setting the throttle stop-screw. Use a tachometer for checking the speed when adjusting the motor speed.

NOTE:

 Turning the throttle stop-screw clockwise increases the motor speed; turning it counterclockwise decreases the motor speed.



Tachometer:
YU-8036-A/90890-06760



Idle speed:
800 ± 50 rpm

D33304-0*

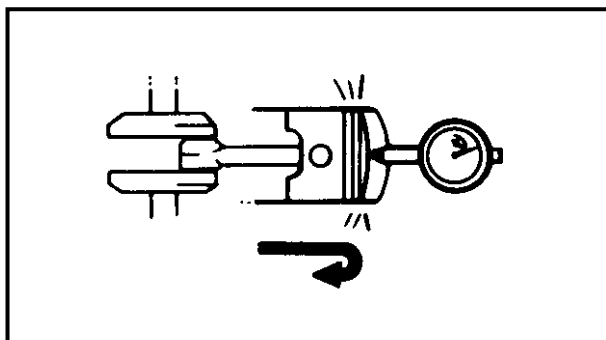
IGNITION TIMING ADJUSTMENT
TIMING PLATE POSITION ADJUSTMENT

If the timing plate is moved even a little during inspection or repair operation, it should be set in the following way:

This adjustment must be made before adjusting the ignition timing.

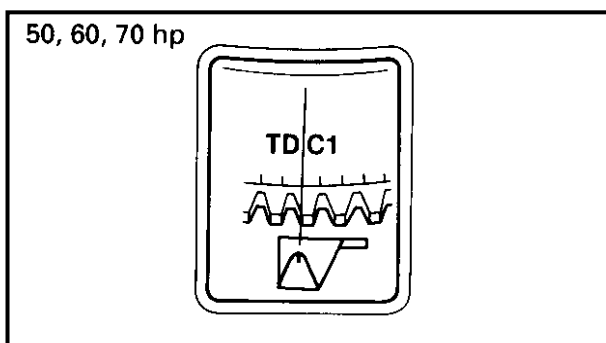
1. Remove the spark plugs from the cylinders.

2. Install a dial-gauge in the spark-plug hole of No. 1 cylinder.

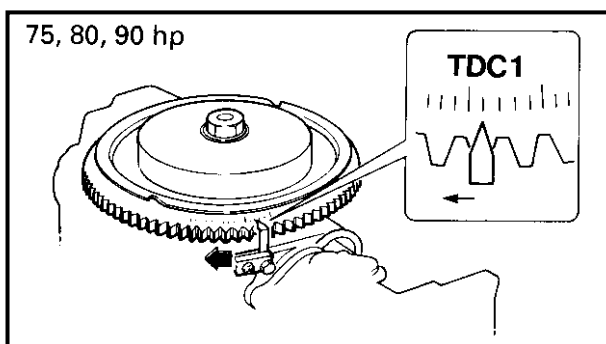


NOTE: _____

For easy timing-plate adjustment, it is advisable to remove the spark plugs from all the cylinders.



3. Slowly turn the flywheel **CLOCKWISE**, and stop it when the piston is at TDC.

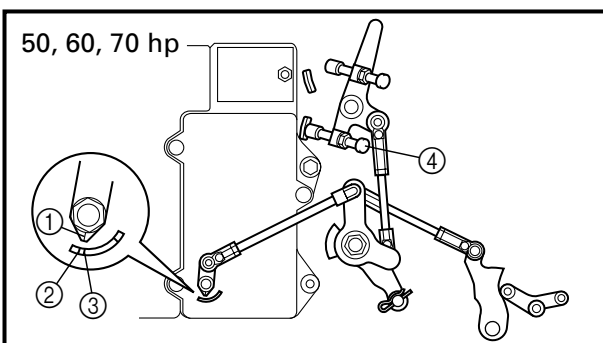
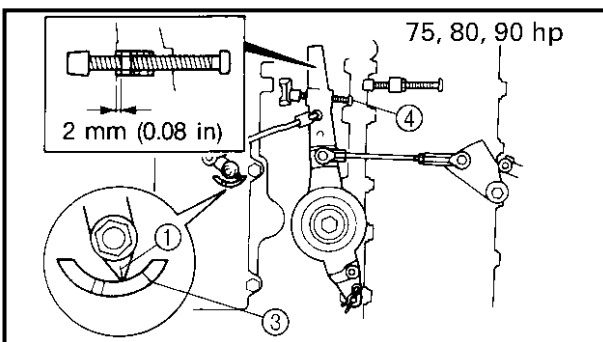
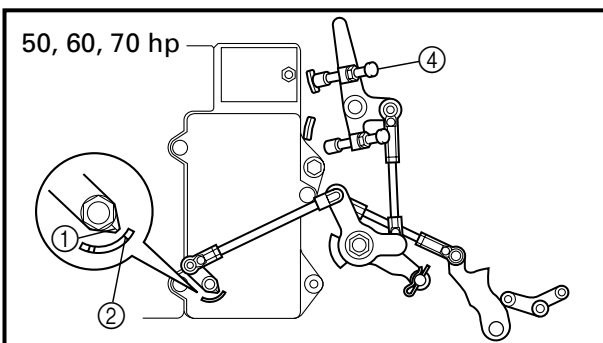
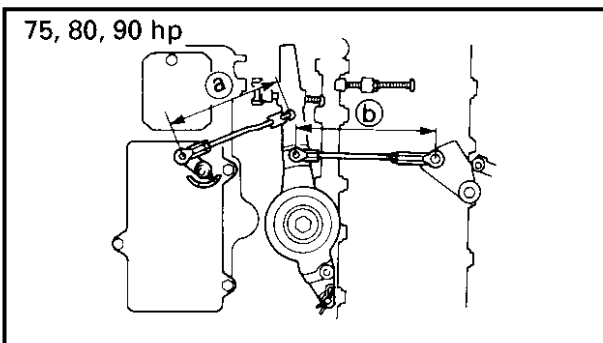
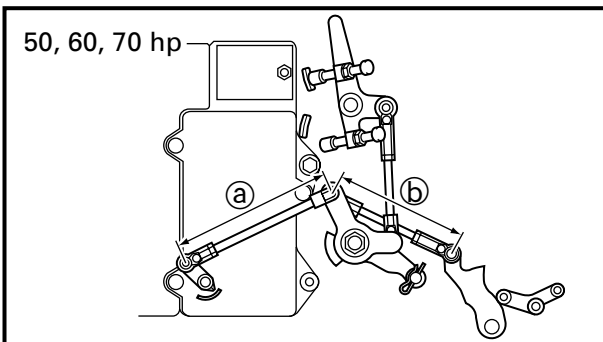


4. If the end of the timing plate is not aligned with the TDC mark on the CDI magneto rotor, loosen the timing plate set screw, align the timing plate end with the TDC mark, then tighten the screw.

5. Remove the dial gauge from the No. 1 cylinder and install the spark plugs for each cylinder.

NOTE: _____

After tightening the screw, paint over the screw-head to discourage tampering with the adjustment.



**THROTTLE SENSOR CONTROL LINK
ADJUSTMENT**

1. Adjust the lengths of the throttle sensor control link and throttle cam control link to specifications.



Throttle sensor control link length (a):

50, 60, 70 hp: 120 ± 0.5 mm
(4.72 ± 0.02 in)

75, 80, 90 hp: 93.5 ± 0.5 mm
(3.68 ± 0.02 in)

Throttle cam link length (b):

50, 60, 70 hp: 95 mm (3.74 in)

75, 80, 90 hp: 120.5 mm (4.74 in)

2. Adjust the length of the full-retard adjusting screw so that when the full-retard adjusting screw contacts the stopper, the full-retard indication on the CDI unit aligns with the timing indicator.

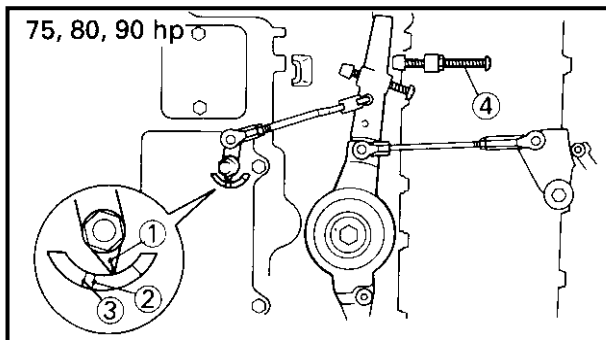
- ① Timing indicator
- ② Full-retard indication (50, 60, 70 hp)
- ③ Full-retard indication (75, 80, 90 hp)
- ④ Full-retard adjusting screw

NOTE:

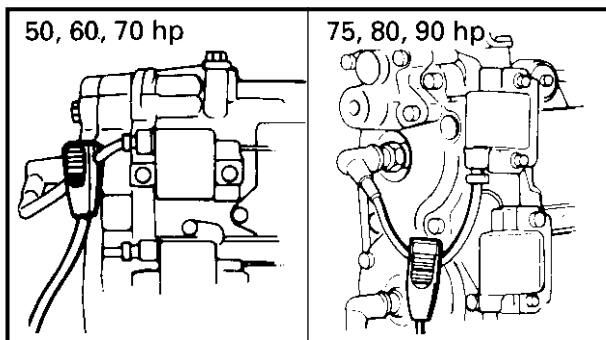
The nut in the magneto control lever should be 2 mm (0.08 in) off from the end of the magneto control lever.

3. Adjust the length of the full-advance adjusting screw so that when the full-advance adjusting screw contacts the stopper, the full-advance indication on the CDI unit aligns with the timing indicator.

- ① Timing indicator
- ② Full-advance indication (50, 60 hp)
- ③ Full-advance indication (70 hp)
- ④ Full-advance adjusting screw



- ① Timing indicator
- ② Full-advance indication (75, 80 hp)
- ③ Full-advance indication (90 hp)
- ④ Full-advance adjusting screw



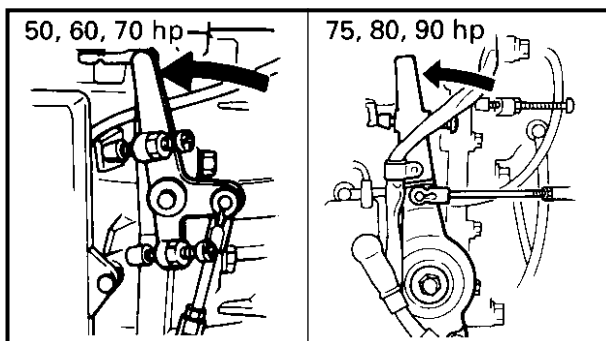
IGNITION TIMING ADJUSTMENT

CAUTION:

When checking ignition timing using a timing light, be sure to replace the propeller with the specified test propeller, and make tests with the machine placed in a test tank.

NOTE:

Before adjusting, be sure to warm up the engine.



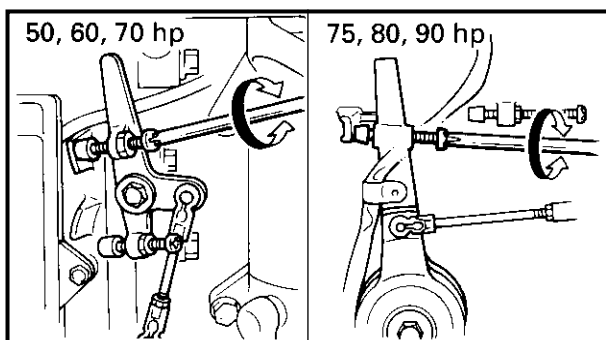
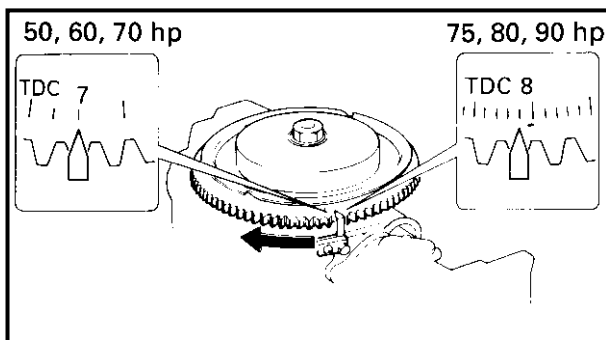
1. Attach the timing light and tachometer to the No. 1 cylinder high tension code.

2. While keeping the stopper in contact with the full-retard adjusting screw, measure the full-retard ignition timing with the timing light.

If the timing is out of specification, adjust it by turning the full-retard adjusting screw.

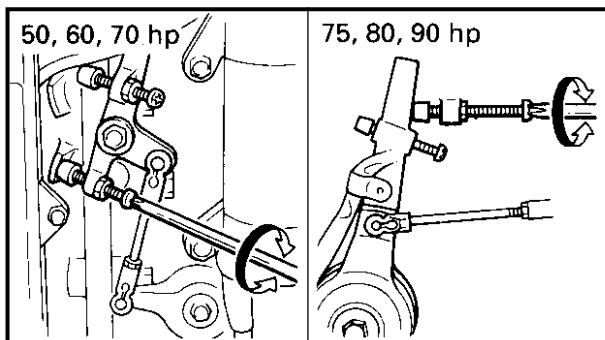
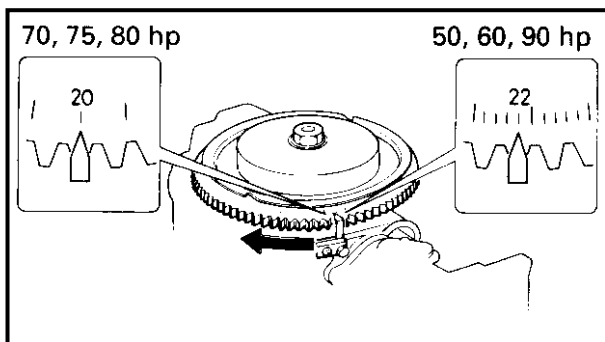
NOTE:

When measuring the full-retard ignition timing, keep the specified engine speed.



	Full-retard side engine speed: 800 ± 50 rpm
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	Full-retard side ignition timing: 50, 60, 70 hp: 7 ± 1° ATDC 75, 80, 90 hp: 8 ± 1° ATDC
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3. While keeping the stopper in contact with the full-advance adjusting screw, measure the full-retard ignition timing with the timing light.

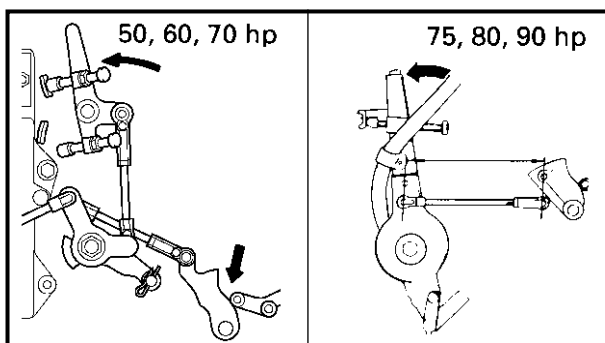
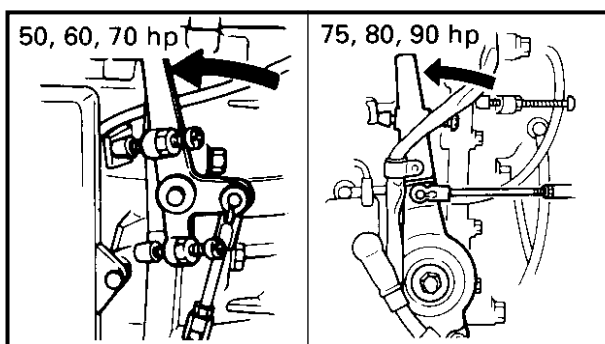
If the timing is out of specification, adjust it by turning the full-advance adjusting screw.

NOTE: _____

When measuring the full-advance ignition timing, keep the specified engine speed.

	Full-advance side engine speed:
	50, 60, 75, 80, 90 hp: 5,000 ± 500 rpm
	70 hp: 5,500 ± 500 rpm

	Full-advance side ignition timing:
	50, 60, 90 hp: 22 ± 1° BTDC
	70, 75, 80 hp: 20 ± 1° BTDC

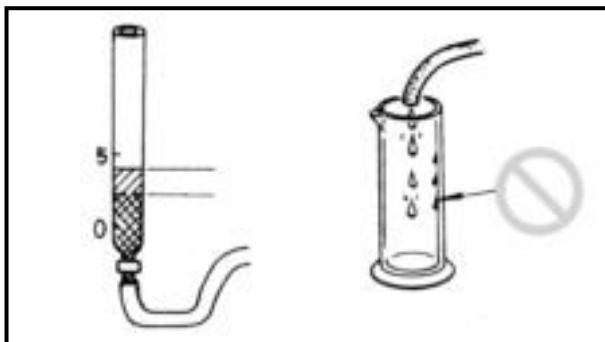


PICK-UP TIMING ADJUSTMENT

NOTE: _____

Engine idle speed should be adjusted properly before adjusting the pick-up timing.

1. Turn the magneto control lever to the full-retard position.
2. Bring the throttle cam to lightly contact the throttle lever roller. (The throttle valve should not open.) Adjust the accelerator link length and connect magneto control lever to the accelerator cam.



D34000-0*

**OIL INJECTION PUMP
OPERATIONAL TEST**

1. Start the engine and set the idling speed at 1,500 rpm by adjusting the throttle-stop lever.

CAUTION:

Use only oil-mixed fuel (50:1) as malfunction or engine seizure may otherwise result.

2. Remove the oil-pump link-rod and fix the oil-pump lever in the full-throttle position.
3. Measure the oil discharge from each port for three minutes using a measuring cylinder graduated in steps of at least 0.1 cc to confirm that the specified amount is discharged.



**Specified discharge:
(3 min/1 cylinder)**

50 hp:

**1.90 ± 0.50 cm³ (0.064 ± 0.017
US oz, 0.067 ± 0.018 Imp oz)**

60, 70 hp:

**2.20 ± 0.50 cm³ (0.074 ± 0.017
US oz, 0.077 ± 0.018 Imp oz)**

75, 80, 90 hp:

**3.10 ± 0.70 cm³ (0.105 ± 0.024
US oz, 0.0109 ± 0.025 Imp oz)**

NOTE:

Oil temperature: 10 ~ 30°C (50 ~ 86°F)

1. Before measuring, bleed the pump completely and ensure no air-bubbles are present in the oil flowing out of the oil feed pipe.
2. When measuring with the measuring cylinder, ensure that no oil clings to the cylinder wall, otherwise the measurement will be inaccurate.
3. Use only genuine Yamaha oil. If the viscosity is too high or too low, the measurement of the discharge will be inaccurate.
4. The longer the time over which measurement is made, the more accurate will be the measurement. Calculate the rate of discharge per minute.

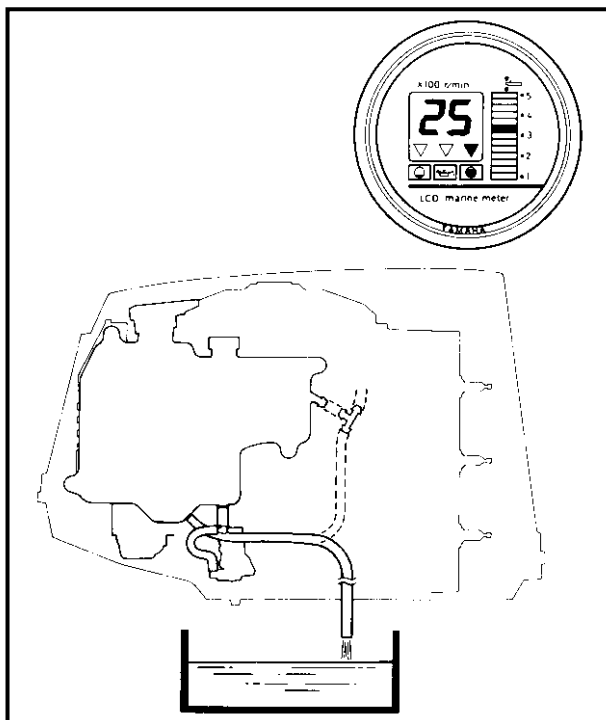
D33900-0*

CHECKING THE OIL LEVEL WARNING SYSTEM

1. Fill the oil-tank with oil.
2. Start the engine.
3. By letting the oil little by little out of the drain-hose, check that the oil-level warning system operates correctly.

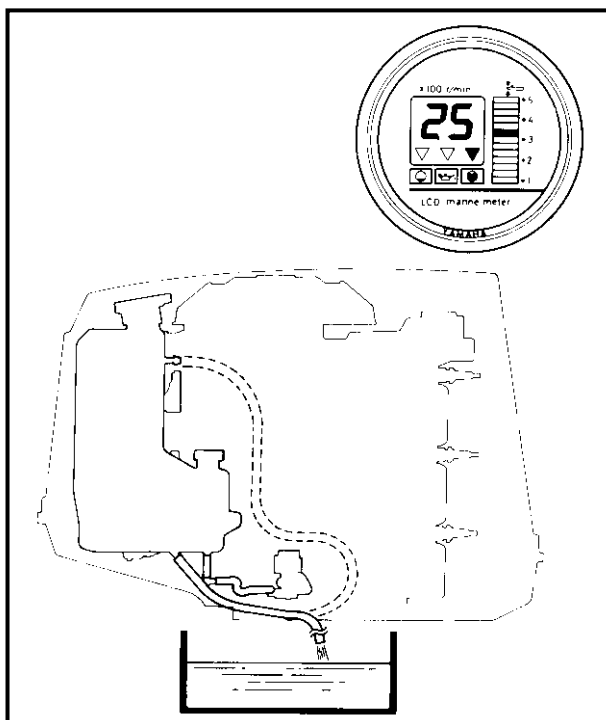
CAUTION:

Do not allow the engine to operate without oil even briefly for this will cause malfunction or engine seizure.



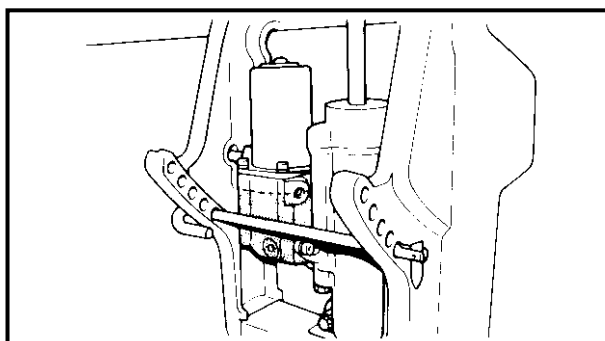
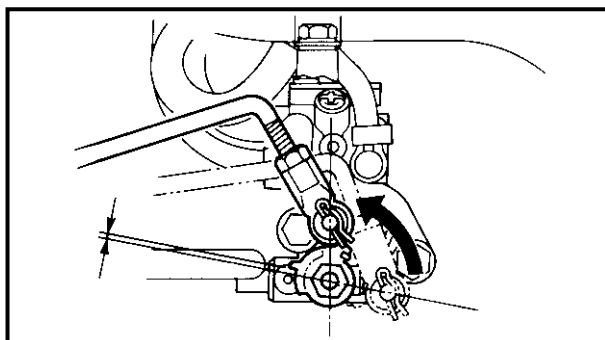
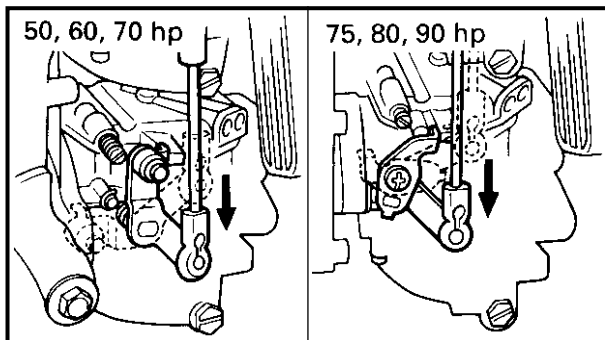
50, 60, 70 hp

Case	Oil level	Oil level warning lamp	Warning buzzer	Speed drop function
1	More than 770 cm ³ (0.81 US qt)	GREEN	OFF	OFF
2	770 cm ³ (0.31 Us qt) ~ 280 cm ³ (0.3 US qt)	YELLOW	OFF	OFF
3	280 cm ³ or less (0.3 US qt)	RED	ON	ON



75, 80, 90 hp

Case	Oil level	Oil level warning lamp	Warning buzzer	Speed drop function
1	More than 1,130 cm ³ (1.19 US qt)	GREEN	OFF	OFF
2	1,130 cm ³ (1.19 Us qt) ~ 310 cm ³ (0.33 US qt)	YELLOW	OFF	OFF
3	310 cm ³ or less (0.33 US qt)	RED	ON	ON



D34300-1

OIL PUMP LINK ADJUSTMENT

1. Fully-open the carburetor throttle valve.
2. Set the oil-pump lever 1 mm off full-open side stopper. With the lever in this position, adjust the length of the rod connecting the oil-pump to the carburetor and tighten the locknut.
3. Install the connecting-rod.
4. By operating the carburetor, check that the throttle-valve opens fully.

D34600-0

POWER TRIM AND TILT FLUID (PTT model)

1. Tilt-up the motor and lock it with the tilt-lock lever.
2. Remove the fluid-level plug to check the fluid level. With the motor tilted-up, the fluid level should be immediately below the fluid-hole. If the fluid level is low, top up with the recommended fluid.



ATF
(automatic transmission fluid)

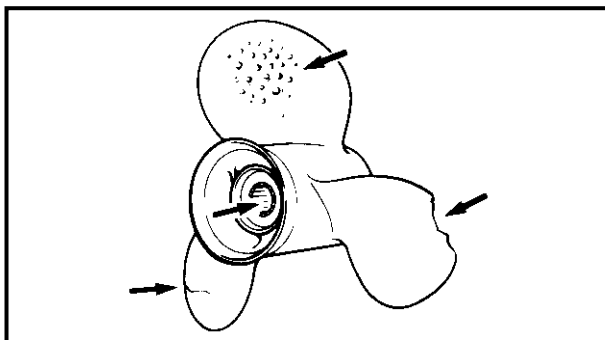
CAUTION:

When checking the fluid level (with the unit removed from the engine), hold the unit in the vertical position and set the tilt-rod in the tilt-up position.

3. Re-fit the fluid-level plug and tighten it.



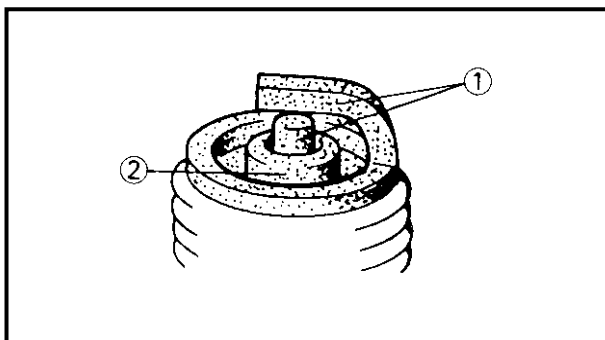
Fluid-level plug:
Short transom [6H308]:
3 Nm (0.3 m • kg, 2.2 ft • lb)
Long transom [6H1-15, 62F-02]:
7 Nm (0.7 m • kg, 5.1 ft • lb)



D34900-0

PROPELLER

1. Check the blades for wear, damage or cavitation erosion.
2. Check the spline for wear and damage.



D35000-0*

SPARK PLUG

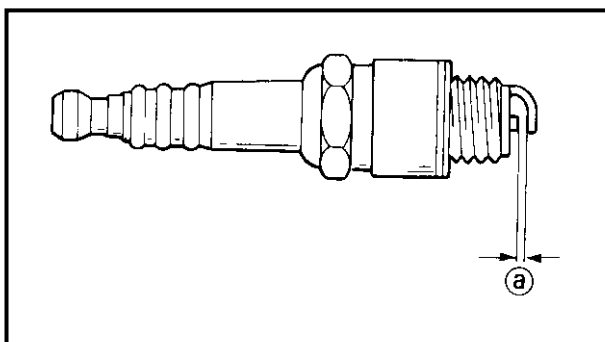
1. Check the electrode ① condition and state of wear, note the insulator ② color and the electrode gap.

Normal condition is a medium to light tan color.

Distinctly different color → Check the engine condition.

- White color : Lean fuel mixture
- Plugged filter, jet
 - Air leak
 - Wrong settings

- Blackish color : Electrical malfunction
- Defective spark plug



2. Clean the spark plug with spark-plug cleaner or wire brush. Use a wire gauge to adjust the plug gap ③ to specification.



Spark plug gap:
0.9 ~ 1.0 mm (0.035 ~ 0.039 in)

3. If the electrode becomes too worn, replace the spark plug.



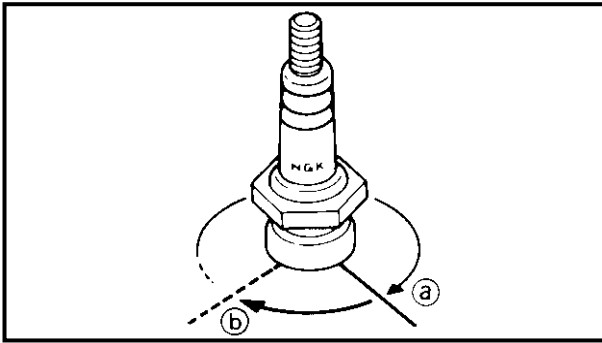
Standard spark plugs:

	Except for Canada, Europe, China and South Africa	For Canada, Europe, China and South Africa
50 hp	BR8HS-10	BR8HS-10
60, 70, 75, 80, 90 hp	B8HS-10	BR8HS-10



PERIODIC SERVICE

E



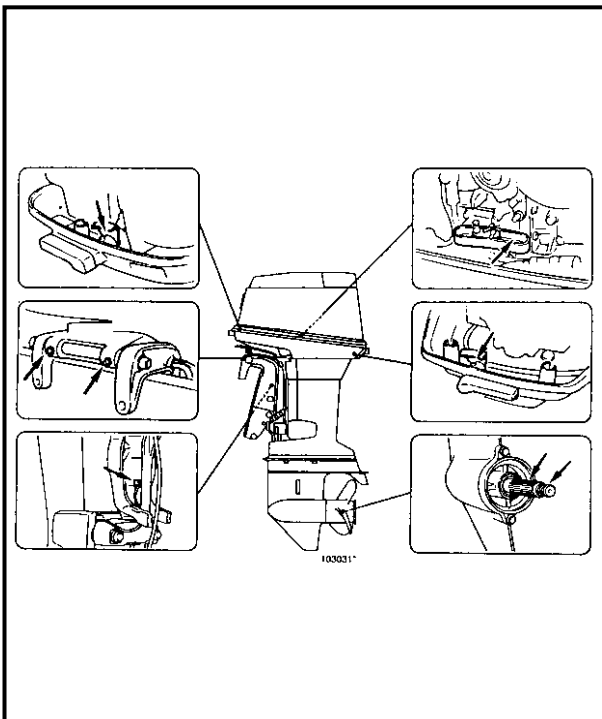
4. When installing the spark plug, clean the gasket surface, wipe off any grime that may be on the surface of the plug and screw in the spark plug to the correct torque.



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