04892P04

Fig. 104 Fiberglass, vinyl and rubber care products, such as those available from Meguiar's are available to protect every part of your boat

severe cold of far off northern seas, and in sunny tropic remote rivers of primitive islands or continents, fiberglass boats can be found performing their daily task with a minimum of maintenance.

A fiberglass hull has almost no internal stresses. Therefore, when the hull is broken or stove-in, it retains its true form. It will not dent to take an out-of-shape set. When the hull sustains a severe blow, the impact will be either absorbed by deflection of the laminated panel or the blow will result in a definite, localized break. In addition to hull damage, bulkheads, stringers, and other stiffening structures attached to the hull may also be affected and therefore, should be checked. Repairs are usually confined to the general area of the rupture.

➦The best way to care for a fiberglass hull is to wash it thoroughly, immediately after hauling the boat while the hull is still wet.

A foul bottom can seriously affect boat performance. This is one reason why racers, large and small, both powerboat and sail, are constantly giving attention to the condition of the hull below the waterline.

In areas where marine growth is prevalent, a coating of vinyl, anti-fouling bottom paint should be applied. If growth has developed on the bottom, it can be removed with a solution of Muriatic acid applied with a brush or swab and then rinsed with clear water. Always use rubber gloves when working with Muriatic acid and take extra care to keep it away from your face and hands. The fumes are toxic. Therefore, work in a well-ventilated area, or if outside, keep your face on the windward side of the work.

Barnacles have a nasty habit of making their home on the bottom of boats which have not been treated with anti-fouling paint. Actually they will not harm the fiberglass hull, but can develop into a major nuisance.

If barnacles or other crustaceans have attached themselves to the hull, extra work will be required to bring the bottom back to a satisfactory condition. First, if practical, put the boat into a body of fresh water and allow it to remain for a few days. A large percentage of the growth can be removed in this manner. If this remedy is not possible, wash the bottom thoroughly with a high-pressure fresh water source and use a scraper. Small particles of hard shell may still hold fast. These can be removed with sandpaper.

Trim Tabs, Anodes and Lead Wires

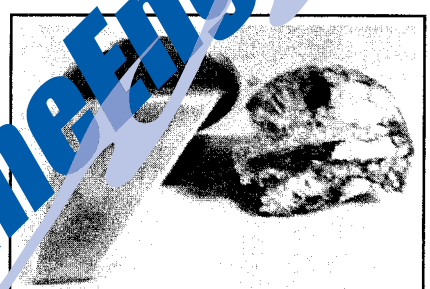
See Figures 105 through 112

Check the trim tabs and the anodes (zinc). Replace them, if necessary. The trim tabs must have a good ground inside the lower unit. Therefore, the trim tab and [illegible] not be painted. In addition to trimming the boat, the trim tab [illegible] zinc electrode to prevent electrolysis from acting on more expensive [illegible] normal for the tab to show signs of erosion. The tabs are inexpensive [illegible] be replaced frequently.

[illegible] exterior surface of the unit thoroughly. Inspect the finish for dam-

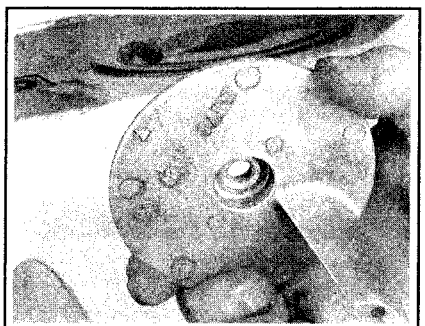
[illegible]8P02

Fig. 105 What a trim tab should look like when it's in good condition



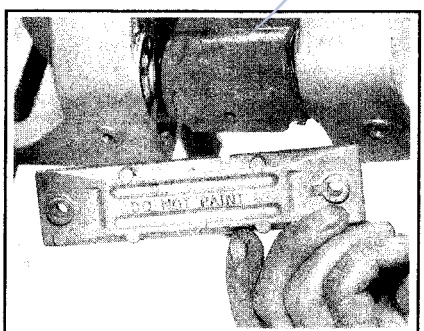
04703P08

Fig. 106 Such extensive erosion of a trim tab compared with a new tab suggests an electrolysis problem or complete disregard for periodic maintenance



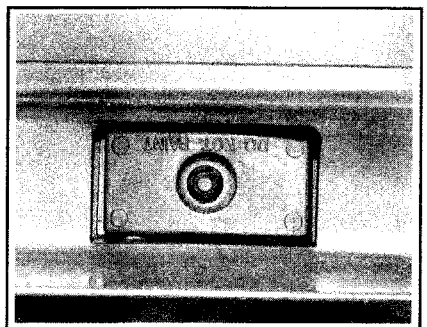
04898P05

Fig. 107 Although many outboards use the trim tab as an anode . . .



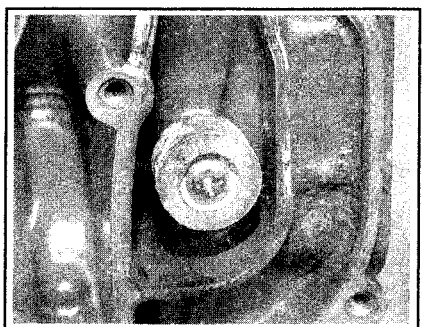
04899P21

Fig. 108 . . . other types of anodes are also used throughout the outboard, like this one on the stern bracket . . .



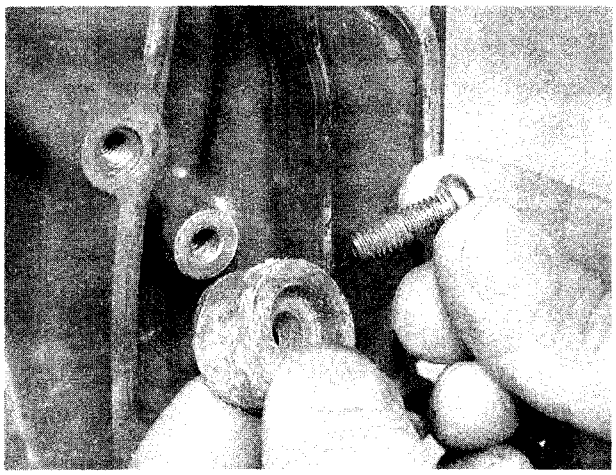
04893P80

Fig. 109 . . . and this one on the lower unit



04891P02

Fig. 110 Anodes installed in the water jacket of a powerhead provide added protection against corrosion



04891P03

Fig. 111 Most anodes are easily removed by loosening and removing their attaching fasteners

04703P42

Fig. 112 One of the many lead wires used to connect bracketed parts. Lead wires are used as an assist in reducing corrosion

age or corrosion. Clean any damaged or corroded areas, and then apply primer and matching paint.

Check the entire unit for loose, damaged, or missing parts.

An anode is attached across both clamp brackets. It also serves as protection for the coil of hydraulic hoses beneath the trim/tilt unit between the brackets.

Lead wires provide good electrical continuity between various brackets which might be isolated from the trim tab by a coating of lubricant between moving parts.

Battery

Difficulty in starting accounts for almost half of the service required on boats each year. A survey by Champion Spark Plug Company indicated that roughly one third of all boat owners experienced a "won't start" condition in a given year. When an engine won't start, most people blame the battery when, in fact, it may be that the battery has run down in a futile attempt to start an engine with other problems.

Maintaining your battery in peak condition may be though of as either tune-up or maintenance material. Most wise boaters will consider it to be both. A complete check up of the electrical system in your boat at the beginning of the boating season is a wise move. Continued regular maintenance of the battery will ensure trouble free starting on the water.

A complete battery service procedure is included in the "Maintenance" section of this manual. The following are a list of basic electrical system service procedures that should be performed as part of any tune-up.

- Check the battery for solid cable connections
- Check the battery and cables for signs of corrosion damage
- Check the battery case for damage or electrolyte leakage
- Check the electrolyte level in each cell
- Check to be sure the battery is fastened securely in position
- Check the battery's state of charge and charge as necessary
- Check battery voltage while cranking the starter. Voltage should remain above 9.5 volts
- Clean the battery, terminals and cables
- Coat the battery terminals with dielectric grease or terminal protector

Batteries which are not maintained on a regular basis can fall victim to parasitic loads (small current drains which are constantly drawing current from the battery). Normal parasitic loads may drain the battery on boat that is in storage and not used frequently. Boats that have additional accessories with increased parasitic load may discharge a battery sooner. Some boats come with the negative battery cable disconnected or battery switches provided to minimize discharge due to parasitic loads.

CLEANING

Keep the battery clean, as a film of dirt can help discharge a battery that is not used for long periods. A solution of baking soda and water mixed into a paste can be used for cleaning, but be careful to flush this off with clear water.

Do not let any of the solution into the filler holes on non-sealed batteries. Baking soda neutralizes battery acid and will de-activate a battery cell.

CHECKING SPECIFIC GRAVITY

The electrolyte fluid (sulfuric acid solution) contained in the battery cells will tell you many things about the condition of the battery. Because the cell plates must be kept submerged below the fluid level in order to operate, maintaining the fluid level is extremely important. In addition, because the specific gravity of the acid is an indication of electrical charge, testing the fluid can be an aid in determining if the battery must be replaced. A battery in a boat with a properly operating charging system should require little maintenance, but careful, periodic inspection should reveal problems before they leave you stranded.

⁂ CAUTION

Battery electrolyte contains sulfuric acid. If you should splash any on your skin or in your eyes, flush the affected area with plenty of clear water. If it lands in your eyes, get medical help immediately.

As stated earlier, the specific gravity of a battery's electrolyte level can be used as an indication of battery charge. At least once a year, check the specific gravity of the battery. It should be between 1.20 and 1.26 on the gravity scale. Most parts stores carry a variety of inexpensive battery testing hydrometers. These can be used on any non-sealed battery to test the specific gravity in each cell.

Conventinal Battery

See Figures 113 and 114

A hydrometer is required to check the specific gravity on all batteries that are not maintenance-free. The hydrometer has a squeeze bulb at one end and a nozzle at the other. Battery electrolyte is sucked into the hydrometer until the float or pointer is lifted from its seat. The specific gravity is then read by noting the position of the float/pointer. If gravity is low in one or more cells, the battery should be slowly charged and checked again to see if the gravity has come up. Generally, if after charging, the specific gravity of any two cells varies more than 50 points (0.50), the battery should be replaced, as it can no longer produce sufficient voltage to guarantee proper operation.

Check the battery electrolyte level at least once a month, or more often in hot

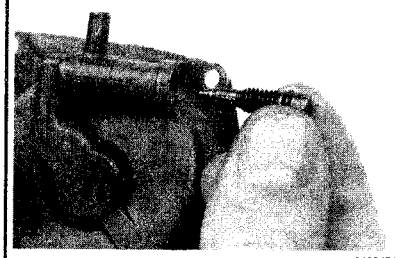

04894P14

Fig. 34 . . . and reinstall into the carburetor body

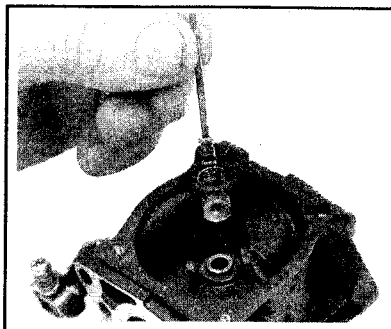

04894P15

Fig. 35 Install the Jet Set Assembly into the main well area . . .

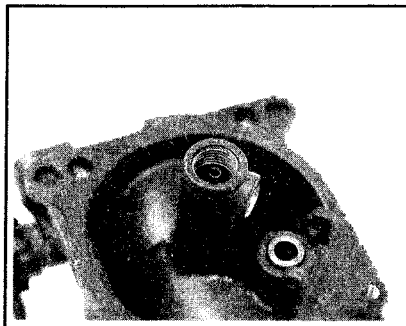

04894P16

Fig. 36 . . . take a look at the condition of the threads and make sure that there is no dirt or other debris inside . . .

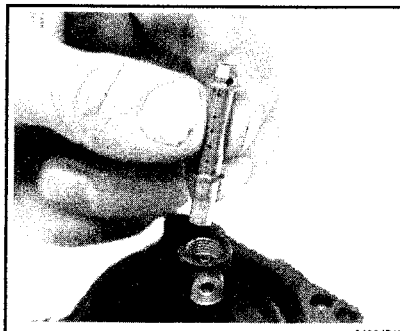

04894P17

Fig. 37 . . . then install the main nozzle . . .

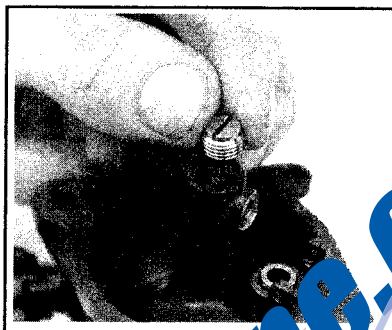

4P18

Fig. 38 . . . don't forg[illegible] the plug screw . .

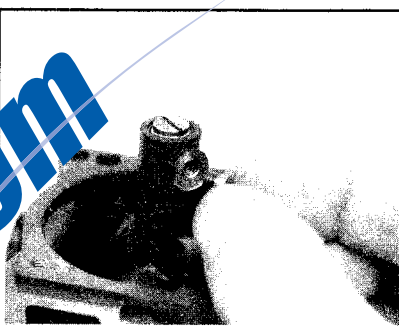

04894P19

Fig. 39 . . . and then install the main jet itself.

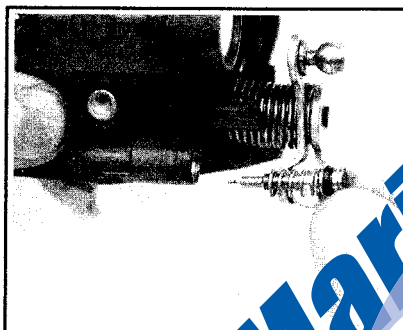

P20

Fig. 40 Check the condi[illegible]er O-ring and spring, then in[illegible]e pilot screw into the carburetor bo[illegible]


04894P21

Fig. 41 Lightly seat the pilot screw. Damage to the pilot screw will occur if it is tightened against the seat

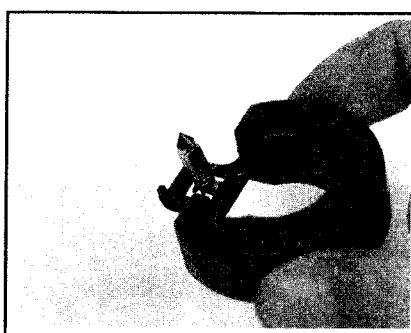

04894P22

Fig. 42 Thoroughly inspect the float and float needle for damage . . .

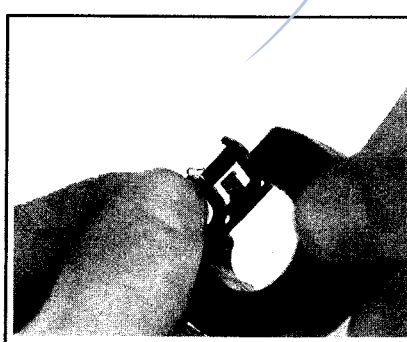

04894P24

Fig. 43 . . . also inspect the float spring and needle retainer for damage or wear

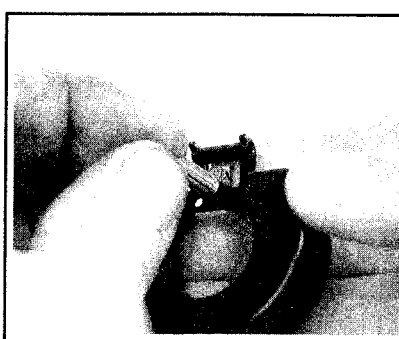

04894P23

Fig. 44 Slide the new needle valve onto the float arm

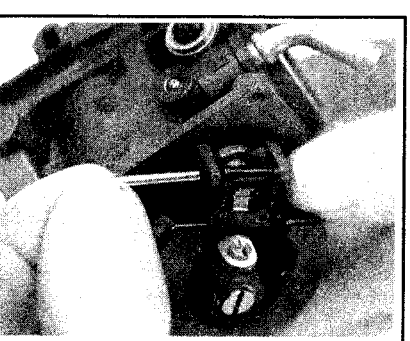

04894P26

Fig. 45 Push the pin into the holes in the carburetor body and float hinge.

Carburetor Float Heights	
Model	**Float Height**
BF20 / BF2A / BF2D	0.413 - 0.531 in. (10.5 - 13.5 mm) non-adjustable
BF50 / BF5A / BF5D	0.35 - 0.43 in. (9.0 -11.0 mm) non-adjustable
BF75 / BF100 / BF8A / BF8D	0.39 in. (10.0 mm) adjustable
BF9.9 / BF15	0.51 - 0.59 in. (13 - 15 mm) non-adjustable
BF25A	0.6 in. (14 mm) adjustable
BF30A	0.5 in. (13 mm) adjustable
BF35A / BF45A	0.6 in. (14 mm) adjustable
BF75A / BF90A	0.45 IN. (11.5 mm) adjustable

5. Slide a new needle valve into the groove of the float arm.
6. Lower the float arm into position with the needle valve sliding into the needle valve seat. Now, push the float pin through the holes in the carburetor body and hinge using a small awl or similar tool if needed.
7. Hold the carburetor body in a perfect upright position. Measure the distance from the float top to the carburetor body. If the measurement is out of specification, carefully bend the hinge, to achieve the required measurement

■ **BF 20A, BF2A, BF50, BF5A, BF9.9 and BF15 are non-adjustable and the entire float assembly must be replaced).**

This is a very important procedure, as it will determine how much fuel is maintained in the float bowl and will prevent fuel starvation and flooding.
8. Install the float valve assembly and check for free movement.

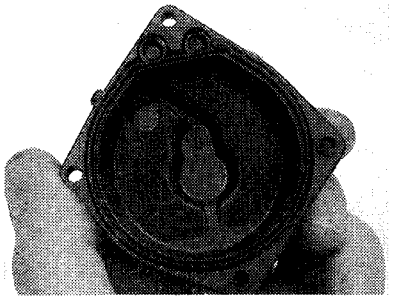


Fig. 46 Inspect the inside of the float bowl for dirt and debris. Also check the condition of the rubber O-ring

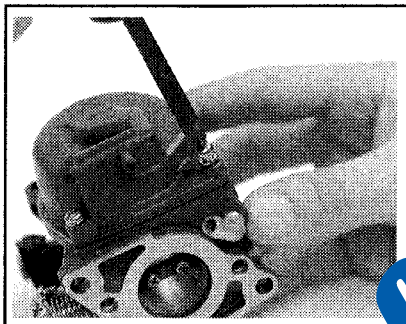


Fig. 47 Do not over tighten the fl[illegible]owl screws. If you don't break the s[illegible] i[illegible] the carburetor body, it is po[illegible] [illegible] the float bowl itself

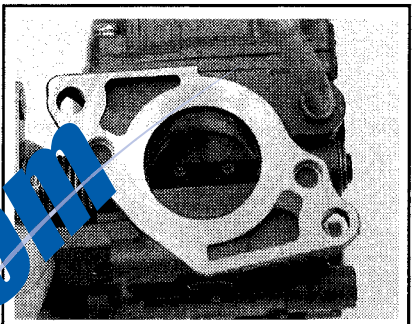


Fig. 48 Clean the carburetor gasket surface, making sure there is no old gasket material left to create a potential air leak

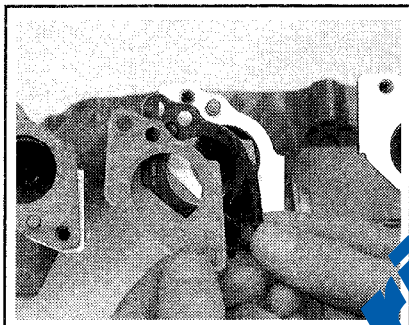


Fig. 49 Make sure the gaskets are installed in their correct posi[illegible] to installation

Fig. 50 To synchronize the carburetors, remove the screw and sealing washer on each intake manifold . . .

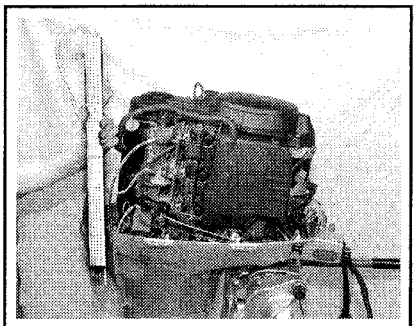


Fig. 51 . . . and install the vacuum gauges to each cylinder intake manifold with the correct adapters

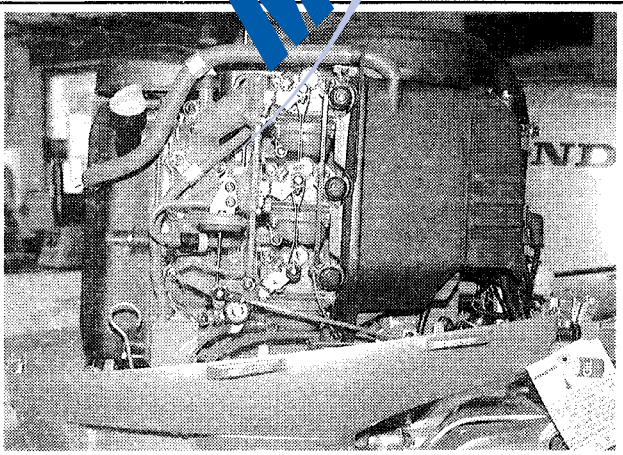


Fig. 52 Final installation on one model of the 3-cylinder on the engines

Carburetor Pilot Screw Specifications

Horsepower	Carb Pilot Screw Turns Out
BF130A	-
BF115A	-
BF90A	2 1/4
BF75A	1 7/8
BF50A	1
BF45A	2 1/8
BF40A	2 1/4
BF35A	2 1/8
BF30A	3
BF25A	2
BF15A / BF15D	1 5/8
BF9.9A / BF9.9D	2 3/4
BF75 / BF100	2 1/2
BF8A / BF80 / BF8D	2 1/2
BF5A / BF50 / BF5D	2 3/8
BF2A / BF20	2 1/8
BF2D	2

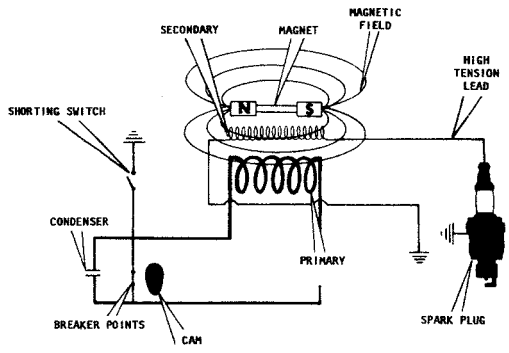
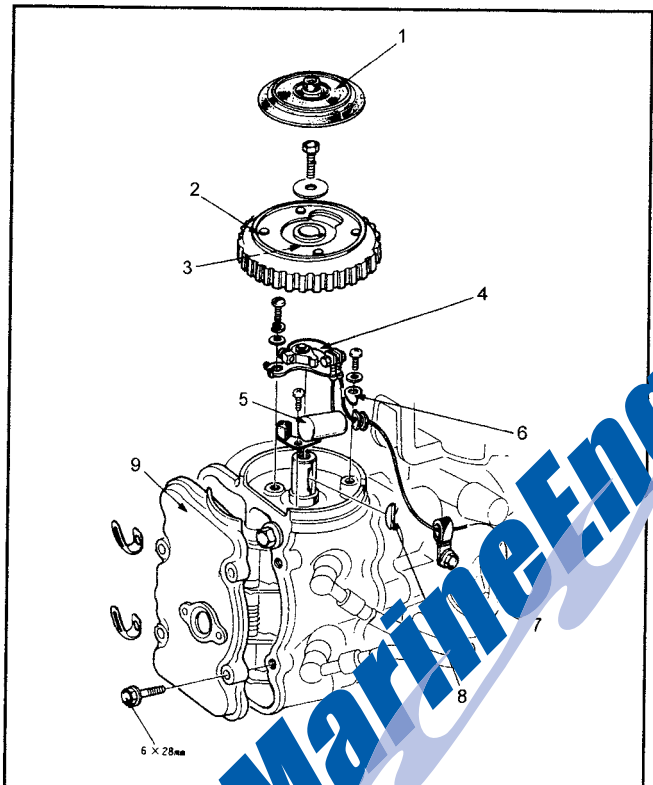


Fig. 10 Schematic of a typical magneto ignition system installed on an outboard



1. Point Cover
2. Cam Pulley
3. Spark Advance
4. Contact Breaker
5. Condenser
6. Wire Clamp Plate
7. To Ignition Coil
8. Woodruff Key
9. Cylinder Head Cover

04895G01

Fig. 11 Breaker points installation—BF75, BF8A and BF100

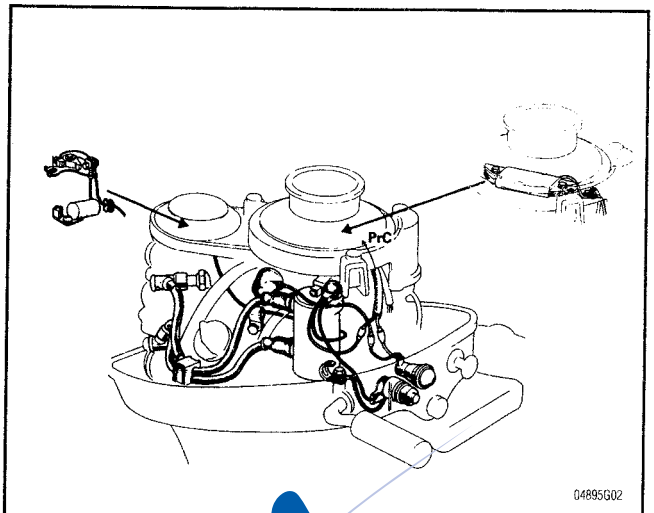


Fig. 12 Breaker points i[illegible]g—BF75, BF8A and BF100

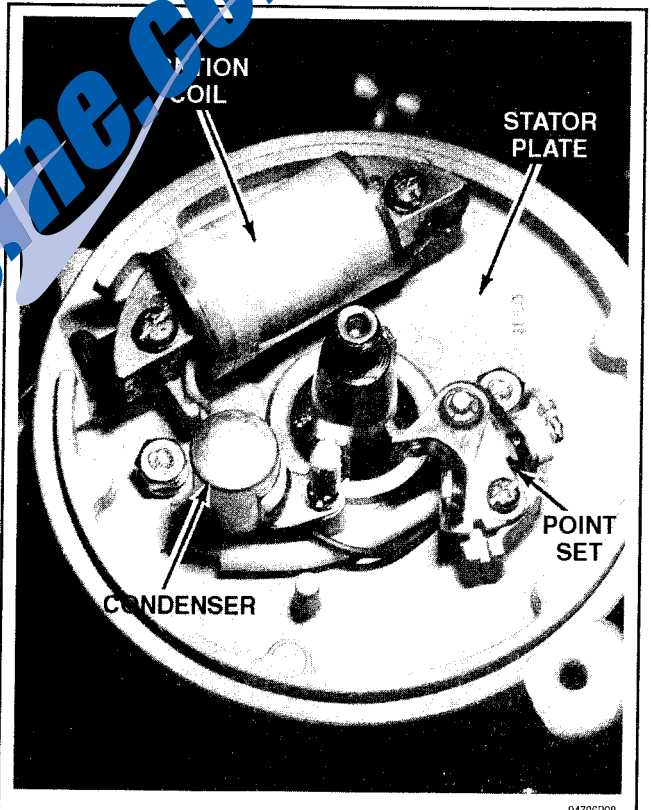


Fig. 13 After the flywheel is removed, components on the stator plate may be easily serviced

Magnetos installed on outboard engines will usually operate over extremely long periods of time without requiring adjustment or repair. However, if ignition system problems are encountered, and the usual corrective actions such as replacement of spark plugs does not correct the problem, the magneto output should be checked to determine if the unit is functioning properly.

Unfortunately, the breaker point set of the contact breaker point ignition system is located under the camshaft pulley. This location requires the hand rewind starter to be removed, and the camshaft pulley to be pulled in order to replace the point set.

However, the manufacturer made provisions for the point gap to be checked with a feeler gauge after the point cover has been removed.

System Testing

SPARK CHECK

Perform a spark test if you suspect the ignition system of not working properly.

WARNING

When checking the spark, make sure there is no fuel on either the engine or the spark plug. Also keep your hands away from high voltage electrical components.

1. Remove the spark plug and ground the plug electrode to the engine.
2. Pull the recoil starter and check for spark at the plug.

If there is a good spark at the plug, the ignition system should be performing properly. If there is no spark, precede to the next step in troubleshooting the ignition system problem.

Breaker Points

GAP CHECK

See Figure 14

The point gap may be checked using a ohmmeter or timing tester (buzz box) without removing the hand rewind starter or the camshaft pulley. This procedure is not necessary if the point gap has already been checked using a feeler gauge.

1. Connect a timing tester or ohmmeter to the primary side wire of the ignition coil and a good engine ground.
2. Remove the points cover on the camshaft pulley.
3. Make sure to align the "F" mark on the flywheel with the index mark on the starter case. The contact breaker points should just be starting to open at 15°BTDC.
4. Loosen the breaker plate locking screw and move the breaker plate to achieve the correct timing. Retighten the locking screw.
5. Rotate the flywheel one full turn and recheck the ignition timing for the other cylinder. If the timing is not correct, readjust so that the timing is correct for both cylinders.

When the points are open, creating an open in the circuit, the meter will register an infinite resistance—an air gap. Therefore, the meter needle will move either to the far right or to the far left, depending on the scale of your ohmmeter. If you are using a digital multimeter, read your owners manual to find out what type of infinity reading it will show on the display.

6. Set the point gap with a feeler gauge. Standard point gap is 0.014–0.016 in. (0.3–0.4 mm).
7. If the point gap is incorrect, the gap must be adjusted or the point set replaced.

TCCA6P10

Fig. 14 The infinite reading on this multimeter (1 .) indicates an open circuit

REMOVAL & INSTALLATION

See Figures 15 and 16

1. Remove the engine cover.
2. With a flywheel pulley holder (No. 07925–893000) or a commonly available strap wrench, hold the flywheel and loosen the retaining nut.
3. With the flywheel puller (No. 07935–8050002) remove the flywheel.

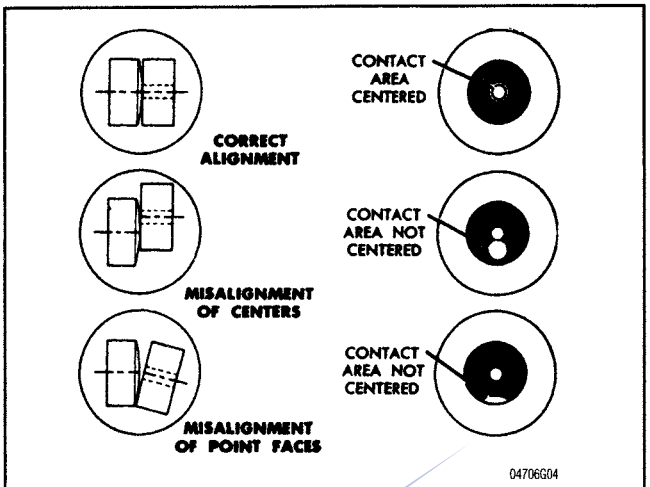


Fig. 15 Prior to setting the breaker point gap, the points must be properly aligned

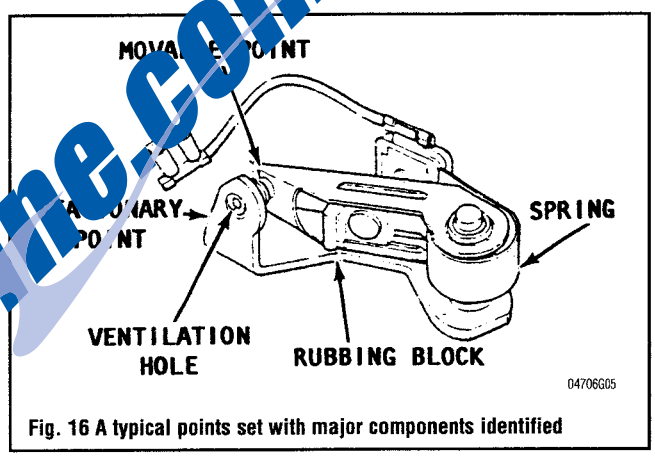


Fig. 16 A typical points set with major components identified

4. Remove the timing belt from the cam pulley with your fingers. DO NOT pry the belt off with a screwdriver or other type of tool.
5. Remove the point cover.
6. Loosen the camshaft pulley bolt and remove the camshaft pulley. DO NOT hammer or bang on the pulley when removing.
7. Disconnet the wire at the primary side of the ignition coil.
8. Remove the screws and lift off the breaker point assembly and condenser.

To install:

9. Install the breaker point assembly and condenser back on the camshaft. Make sure that the Woodruff key is in place and seated properly on the shaft.

Make sure to note the installation direction on the wire clamp plate. If it is not installed properly, the breaker will be grounded and the engine will not start.

10. Align the keyway on the cam pulley onto the camshaft and install the camshaft pulley.
11. Install the retaining bolt and washer, and it to 7 ft. lbs. (100 kg-cm).
12. Align the "T" mark on the flywheel and the punch mark on the pulley to their respective alignment marks.

Prior to it's installation, check the timing belt for cracks or other damage and replace the belt if necessary.

13. Install the timing belt. Do not use force to install the belt, and always make sure that you can read the "HONDA" printed on the belt.
14. Align the keyway on the points cover with the camshaft and install the cover, making sure that it's seated correctly.
15. Connect the wire from the breaker points assembly to the ignition coil primary side.
16. Reinstall the engine cover.