# Chapter Five



# Fuel System

This chapter describes removal, repair and installation of fuel system components including the:

1. Fuel tank.
2. Fuel hoses, fuel valves and connectors.
3. Fuel pump.
4. Carburetor.
5. Choke solenoid.
6. Electrothermal valve.
7. Reed housing/intake manifold.
8. Recirculation system.

Refer to the diagrams for help with fuel hose routing and component identification when removing and installing components. Refer to the expanded illustrations of carburetor and fuel pump components to disassemble or assemble the assemblies. Mark all hoses and corresponding fittings and connectors to ease reassembly.

**Table 1** lists torque specifications for most fuel system fasteners. Use the standard tightening torque specifications for fasteners not listed in Chapter One. **Table 2** lists reed valve service specifications. **Table 3** lists float height specifications. **Tables 1-3** are located at the end of this chapter.

## FUEL SYSTEM SAFETY

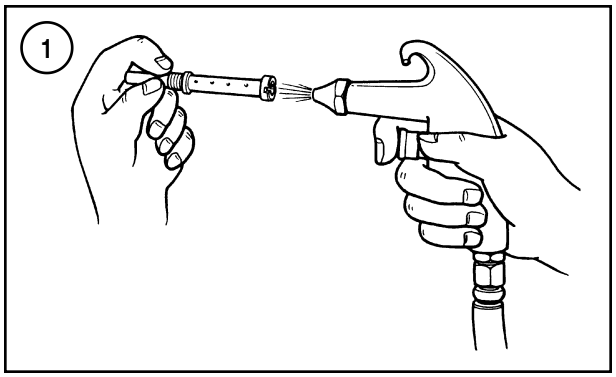
Be careful when working with the fuel system. Never smoke around fuel or fuel vapors. Make sure no flame or source of ignition is present in the work area. Flame or sparks can ignite fuel or fuel vapor resulting in a fire or explosion.

Wear protective eyewear when using compressed air (**Figure 1**) to clean carburetor parts. Work in a well ventilated area when repairing the fuel system. Take all necessary precautions against fires or explosions. Always disconnect the battery *before* servicing the outboard.

## FUEL SYSTEM COMPONENTS SERVICE

### Portable Remote Fuel Tank

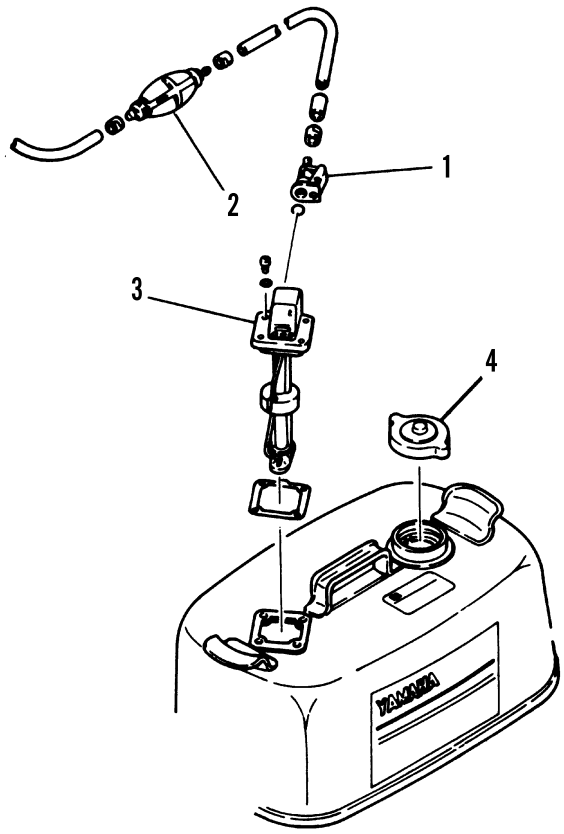
Portable remote fuel tanks (**Figure 2**, typical) are used on 6-90 hp models. Several companies manufacture portable fuel tanks. Purchase replacement parts at a marine dealership or repair shop.



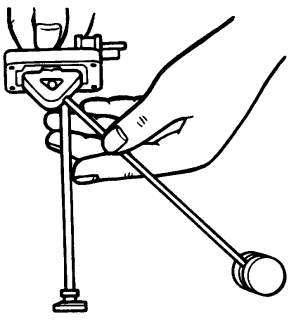
Portable remote fuel tanks require periodic cleaning and inspection. If there is water in the tank, inspect the remainder of the fuel system for potential contamination.

1. Remove the fuel hose connector (1, **Figure 2**) and fill cap (4). Pour the fuel into a suitable container.
2. Remove the screws that hold the fuel gauge assembly (3, **Figure 2**). Carefully remove the assembly from the tank. Never force the assembly or the float arm may be damaged. Remove and discard the gasket between the gauge assembly and the tank.
3. Check for free movement of the float arm on the gauge assembly (**Figure 3**). Replace the assembly if binding cannot be corrected by bending the float arm into the correct position. Inspect the float for deteriorated or physically damaged surfaces. Replace the float if it is damaged or if it appears to be saturated with fuel.
4. Add a small amount of solvent into the fuel tank. Block the fuel gauge opening with a shop towel and install the fill cap. Shake the tank for a few minutes. Drain the solvent and blow dry with compressed air.
5. Replace the tank if there is internal or external rusting, or physical damage. Replace the tank if there is a fuel leak or the tank is suspected of leaking. Repeat Step 4 if there are residual debris or deposits in the tank.
6. Install the fuel gauge assembly into the tank with a new gasket. Install and securely tighten the screws.
7. Check and correct fuel leaks.

**PORTABLE REMOTE FUEL TANK (TYPICAL)**

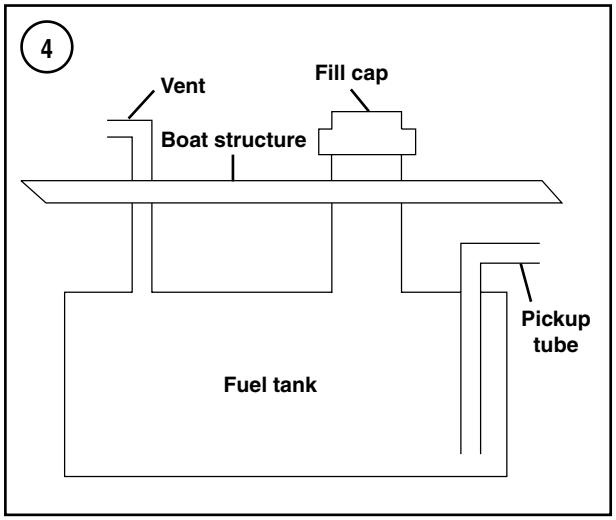



1. Fuel hose connector
2. Primer bulb
3. Fuel gauge assembly
4. Fill cap

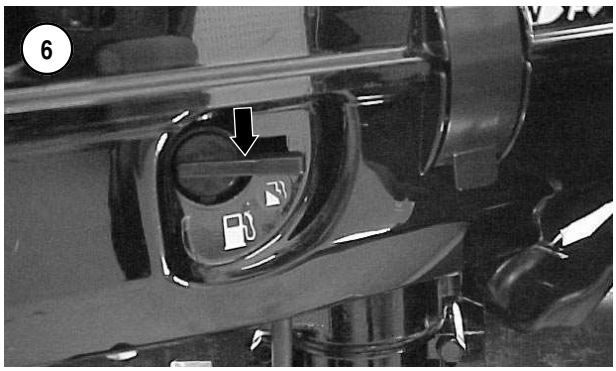


### Vessel Mounted Fuel Tank

Vessel mounted fuel tanks (**Figure 4**) are used on some 6-90 hp models. They can be difficult to access. Removable panels are used in some boats for access to the fitting and sender assembly. The major components that require service include the fuel pickup tube, fuel level sender, fuel fitting and the antisiphon device. These components are available from many different suppliers. Removal, inspection and installation procedures vary with the brand



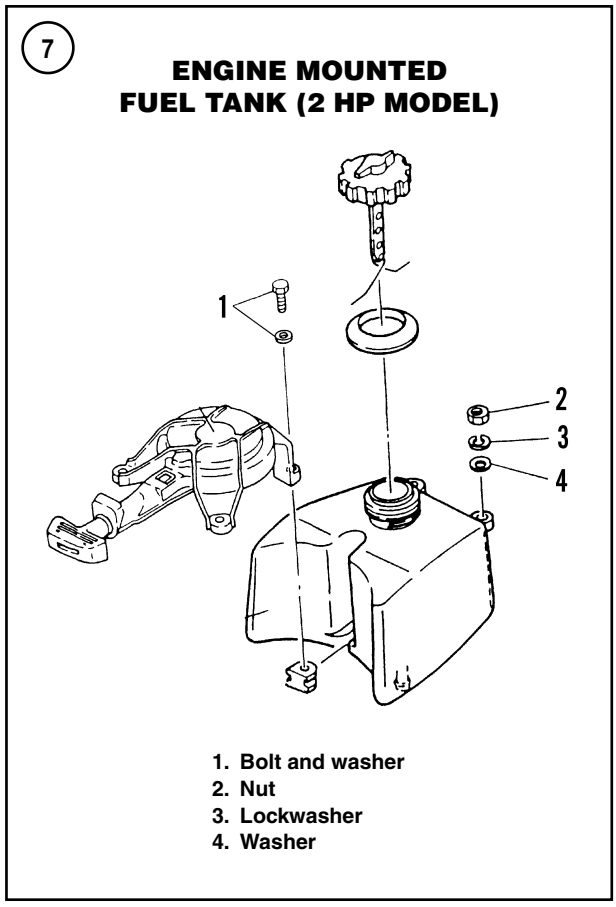





and model of the tank. Contact the tank manufacturer or boat manufacturer for specific instructions.

### Integral Fuel Tank

Integral tanks (**Figure 5**) are mounted on 2-5 hp models. An optional valve (**Figure 6**) that allows the use of a remote or integral valve is available for 4 and 5 hp models. Refer to **Figures 7-9**.




1. Turn the fuel valve to the OFF position.

2. Disconnect and ground the spark plug lead to prevent accidental starting.

3. Disconnect the fuel hose and clamp from the fuel tank fitting or valve (**Figure 10**). Use a shop towel for residual fuel that may spill from the valve, fitting or disconnected hose.

4A. On 2 hp models, remove the bolt and washer (1, **Figure 7**) from the manual starter mounting leg. Remove the two nuts (2, **Figure 7**) and washers (3 and 4), then lift the tank from the power head mount. Remove the grommet from the front mounting bolt opening in the tank.

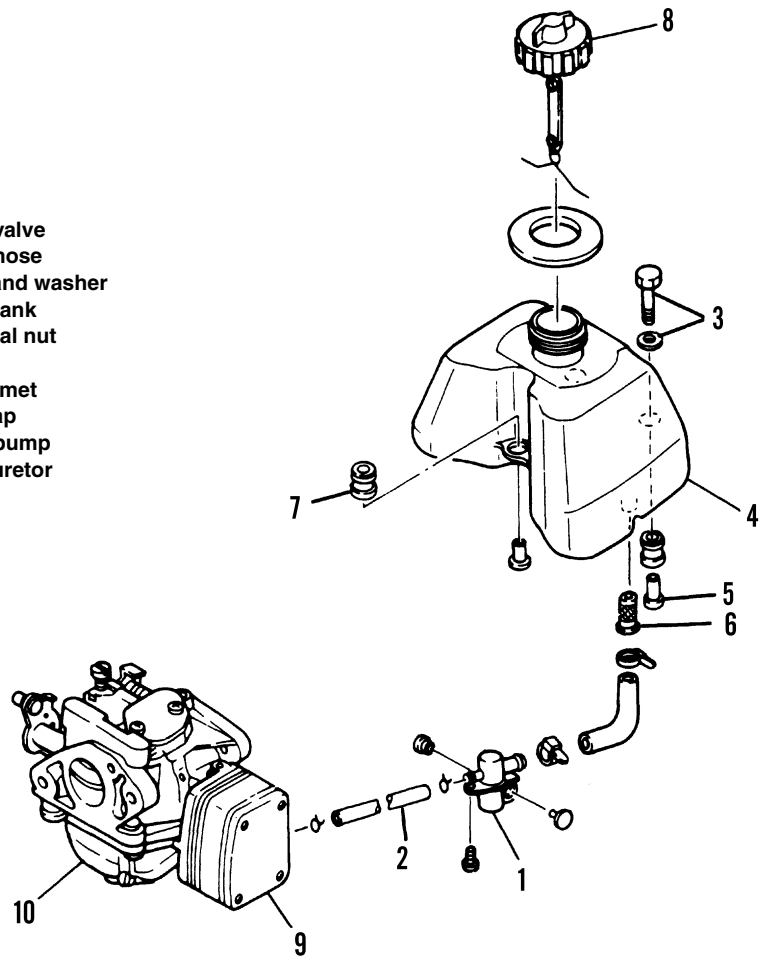
4B. On 3 hp models, remove the bolt from the rear mounting leg of the manual starter. Remove the bolt and washer (3, **Figure 8**), then lift the tank from the power head mount. Pull the grommets (7, **Figure 8**) form the front and rear bolt openings.

4C. On 4 and 5 hp models, remove the two bolts (7, **Figure 9**), then lift the tank from the lower engine cover. Re-

8

## ENGINE MOUNTED FUEL TANK (3 HP MODEL)

1. Fuel valve
2. Fuel hose
3. Bolt and washer
4. Fuel tank
5. Special nut
6. Filter
7. Grommet
8. Fill cap
9. Fuel pump
10. Carburetor




move the two cushions (4, **Figure 9**), grommets (5) and sleeves (6) from the tank or lower engine cover.

5. Remove the fill cap and empty the fuel into a suitable container.

6. Put a small amount of solvent into the fuel tank and install the fill cap. Shake the tank for a few minutes, then empty the tank. Thoroughly drain the fuel tank and dry it with compressed air. Inspect the tank for residual debris or contamination. Repeat the cleaning process until the tank is completely clean.

7. Remove the fuel valve or fitting from the fuel tank. Inspect the screen for debris or damage. Clean debris from the screen with a suitable solvent. Replace the screen if it is damaged. Open and close the valve to check for proper operation. Direct solvent into the opening, then open and close the valve. Replace the valve if it fails to block solvent flow when in the off position or allows flow in the on position. Replace the valve if solvent or fuel is leaking from the valve lever.

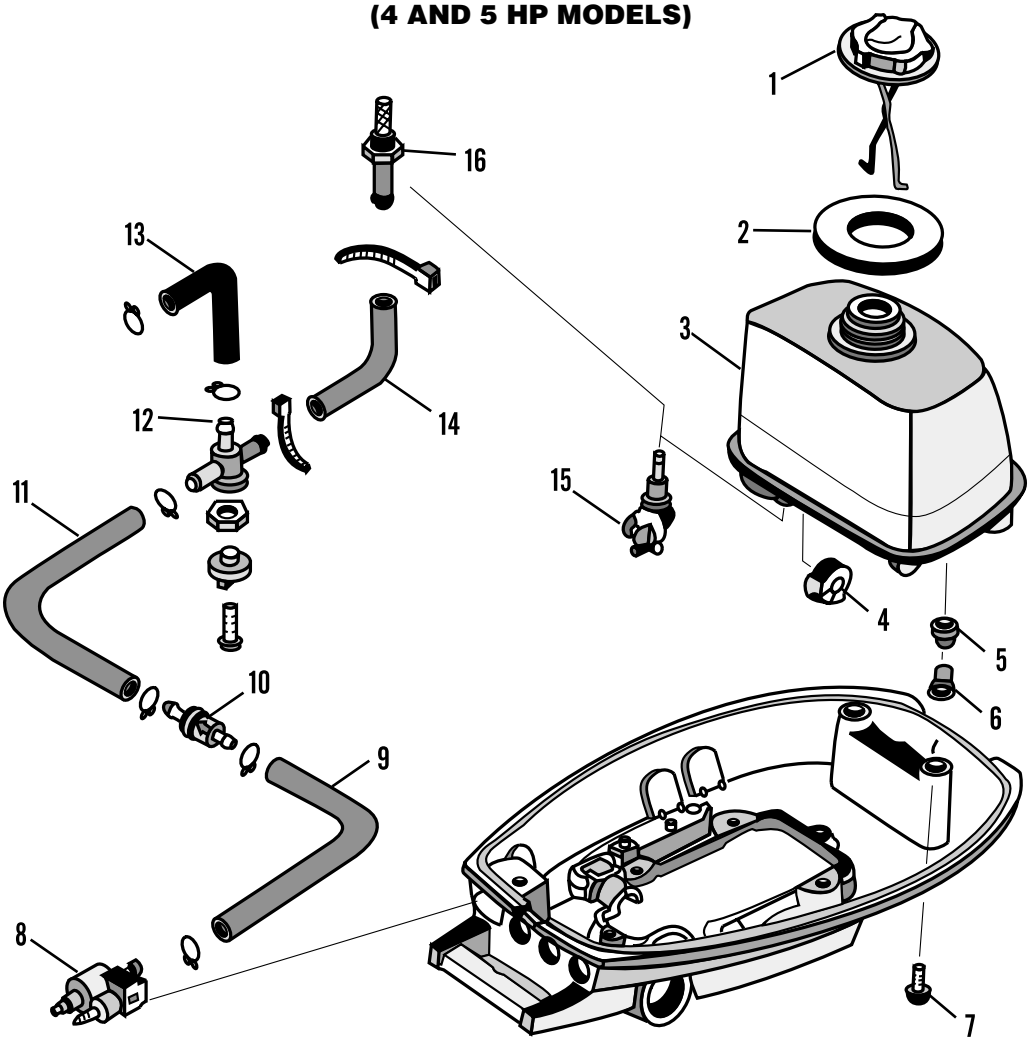
8. Inspect the tank for cracking or other physical damage. Replace the tank if damaged or suspected of leaking.

9. Tank installation is the reverse of removal. Inspect all fuel hoses and clamps. Replace fuel hoses that have cracks, holes or possible leaks. Replace any hose clamp that is corroded, distorted or has lost spring tension. Install all grommets, cushions, sleeves and washers onto the tank mounting surface during installation. Securely tighten the tank mounting bolts and nuts.

10. Fill the tank with a fresh fuel and oil mixture. Check for and correct any fuel leak. Connect the spark plug lead.

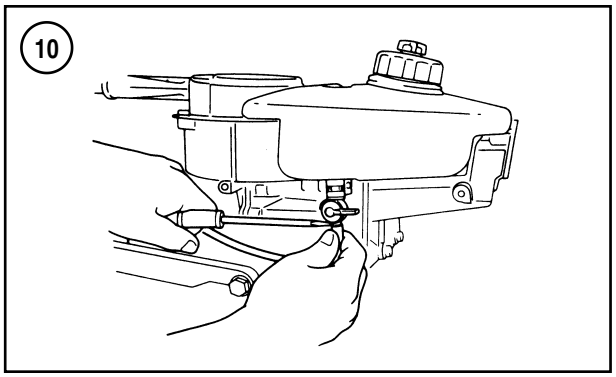
9

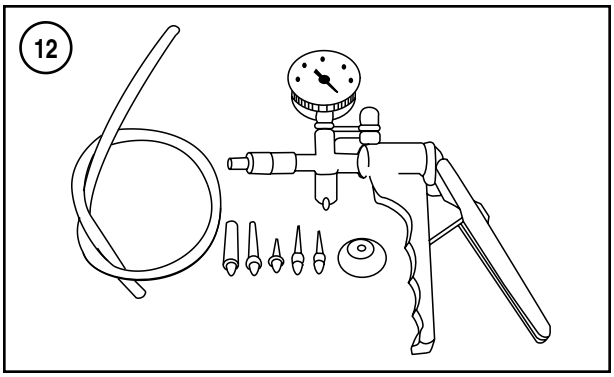
## ENGINE MOUNTED FUEL TANK (4 AND 5 HP MODELS)

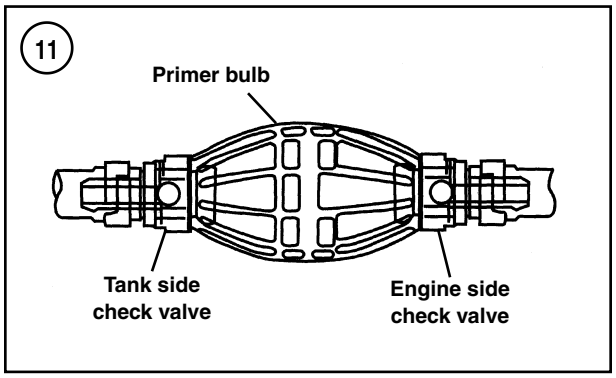


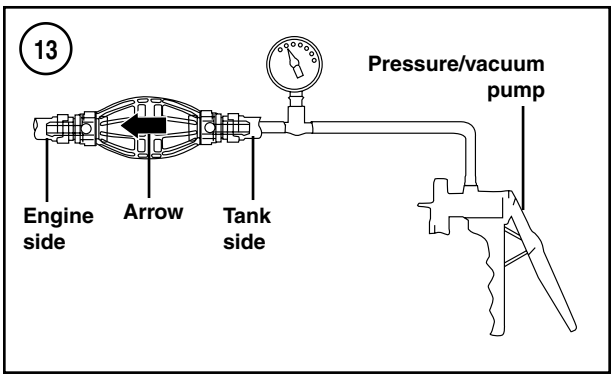

1. Full cap
2. Seal
3. Fuel tank
4. Cushions (2)
5. Grommet
6. Sleeve
7. Bolt
8. Quick connect fitting*
9. Fuel hose (fitting to fuel filter)*
10. In line fuel filter*
11. Fuel hose (filter to fuel valve)*
12. Three-way fuel valve*
13. Fuel hose to carburetor/fuel pump
14. Fuel hose (three-way fuel valve to fitting)*
15. On-off fuel valve
16. Fuel filter

*Used on models with a portable remote fuel tank



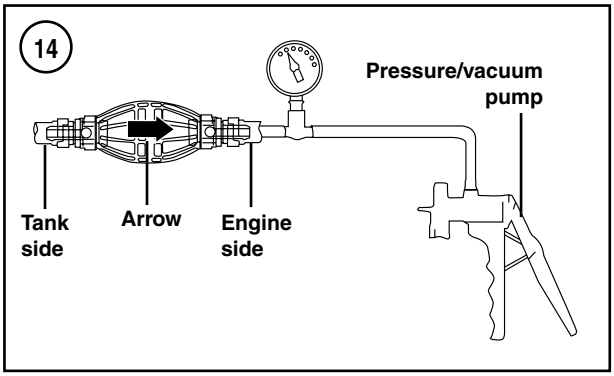



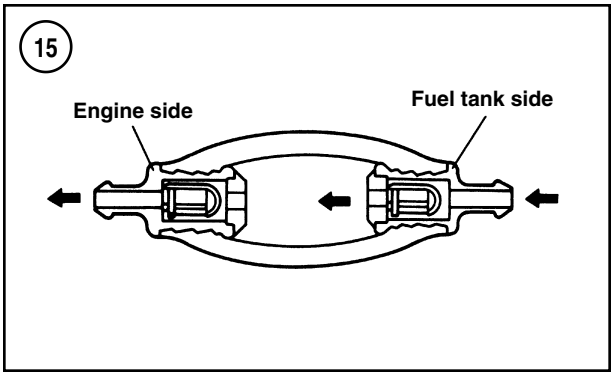



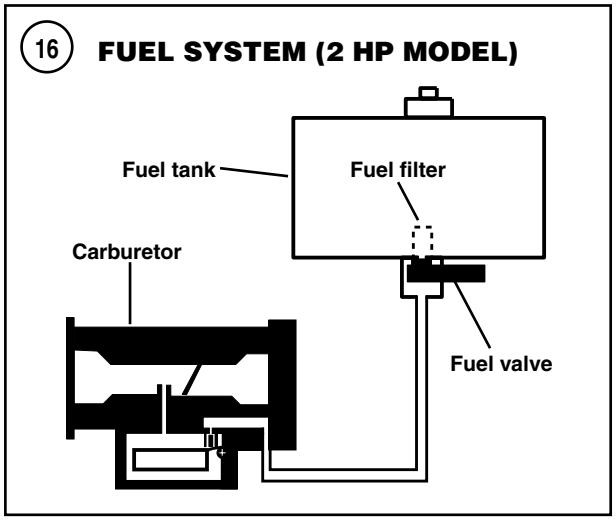

### Primer Bulb

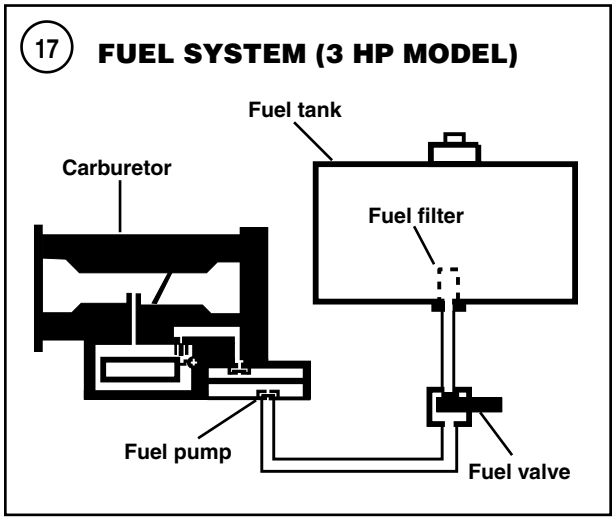
The primer bulb (**Figure 11**) is located in the fuel supply hose between the fuel tank and the engine. See **Figure 2**. A hand-operated pressure pump (**Figure 12**) is required to test the primer bulb. Purchase the pump (Miti-Vac or Yamaha part No. YB-35956/90890-06756) from an automotive parts store, tool supplier or Yamaha dealership.

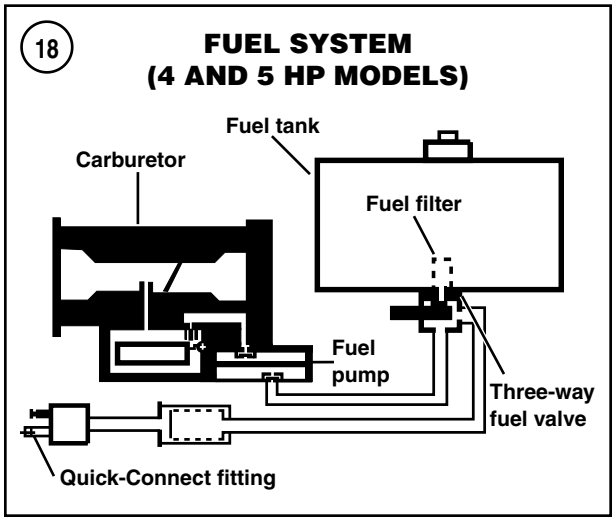
1. Disconnect the fuel supply hose from the engine. Drain the fuel from the hose into a suitable container. Remove the hose clamps from both connections to the primer bulb. Pull the hoses from the primer bulb fittings.
2. Place the primer bulb over a container suitable for holding fuel. Direct the outlet side toward the container, then squeeze the primer bulb until it is fully collapsed. Replace the primer bulb if it does not freely expand when released or sticks together on the inner surfaces. Replace the primer bulb if it appears weathered, has surface cracking or is hard to squeeze.
3. Connect a hand-operated air pump to the check valve fitting on the fuel tank side of the primer bulb (**Figure 13**). The arrow molded into the bulb points toward the engine side check valve fitting. If air does not exit the check valve fitting on the engine side of the primer bulb as the pressure pump is operated, replace the primer bulb.

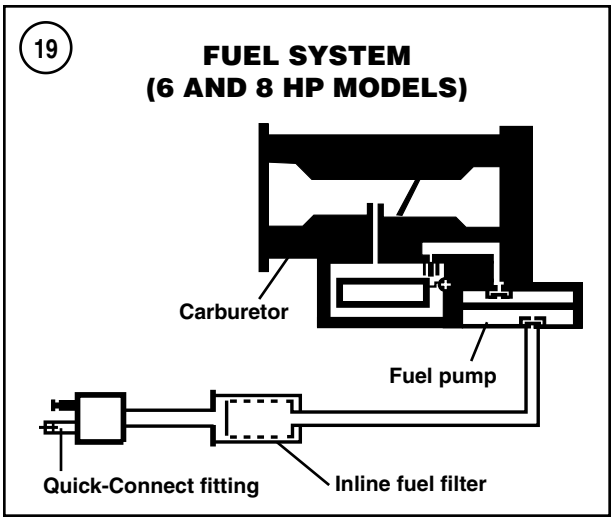




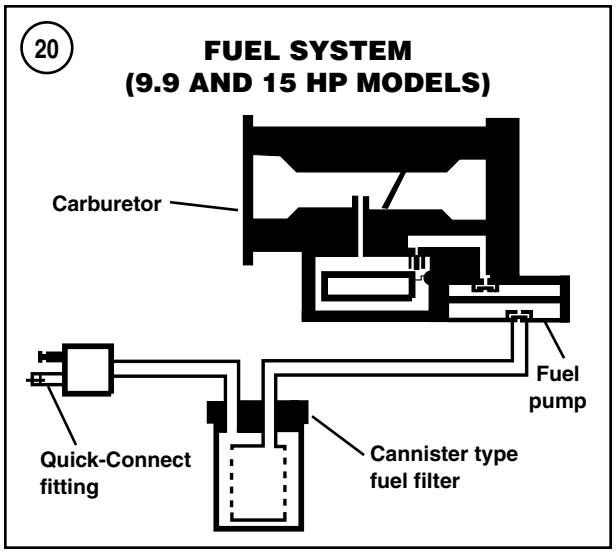

4. Connect the pressure pump to the check valve fitting on the engine side of the primer bulb (**Figure 14**). The arrow molded into the bulb points toward the engine side check valve fitting. Air should not exit the fuel tank side check valve fitting as the pump is operated. Replace the primer bulb if air exits the fitting.
5. Submerge the primer bulb, with the air pump hose attached to the engine side, into clear water. Block the fuel tank fitting with a finger. Operate the pump and check for bubble formation on the primer bulb surface and fittings. Replace the primer bulb if leaking is indicated from the surfaces or leaking from the fittings cannot be corrected by installing new clamps. Thoroughly dry the primer bulb before installation.
6. Connect the fuel hoses to the primer bulb fittings. Note the direction of fuel flow before connecting the hoses (**Figure 15**). Use the arrow molded into the primer bulb for correct orientation.

### Fuel Hoses

Fuel hose sizes and routing vary by model. Refer to **Figures 16-23** for correct routing and connection of hoses.

Only use the Yamaha replacement fuel hoses or other hoses that meet U.S. Coast Guard requirements for marine applications. Never install a fuel hose that is smaller in diameter than the original hose. Replace all fuel hoses at the same time unless unusual circumstances create the need to replace only one fuel hose. If one hose fails, other hoses are suspect.

Replace hoses that feel sticky to the touch, feel spongy, are hard and brittle, or have surface cracking. Always replace hoses that split on the end instead of cutting off the end and reattaching the hose. The hose will probably split




again. To avoid hoses kinking or interfering with other components, never cut replacement hoses shorter or longer than the original.

**Fuel Hose Connectors**

Connectors used on the fuel hoses include the plastic locking type hose clamps, spring type hose clamp and quick-connector.

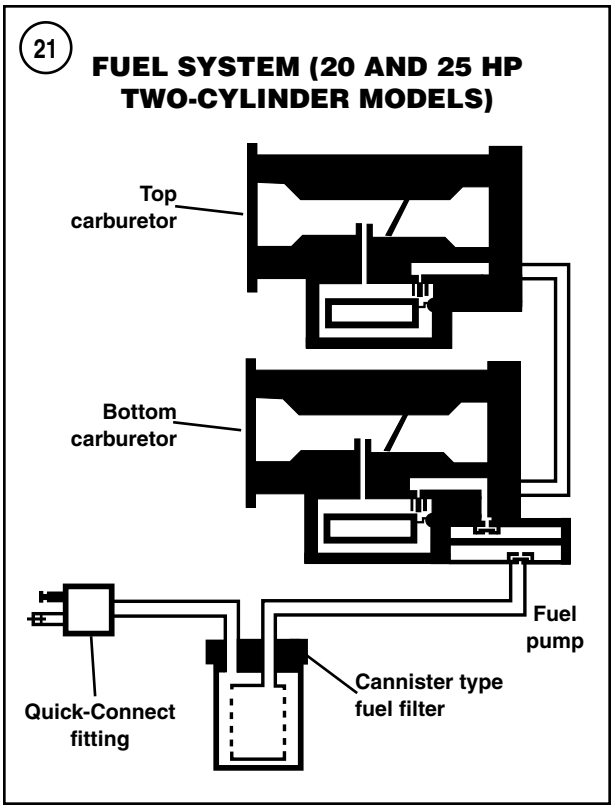
*Plastic locking type clamp*

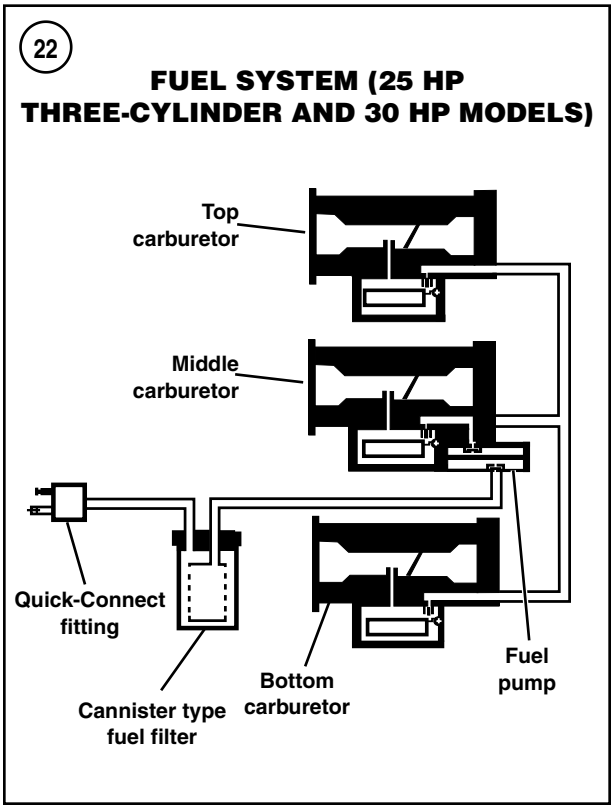
The plastic locking type clamps (**Figure 24**) must be cut for removal. Replace them with the correct Yamaha clamps. Some plastic locking type clamps are not suitable for the application and will fail. Always use the same width as the removed plastic locking clamp. A larger clamp may not clamp tightly to a smaller hose. A smaller clamp may not withstand the load and allow the hose to come off the fitting.

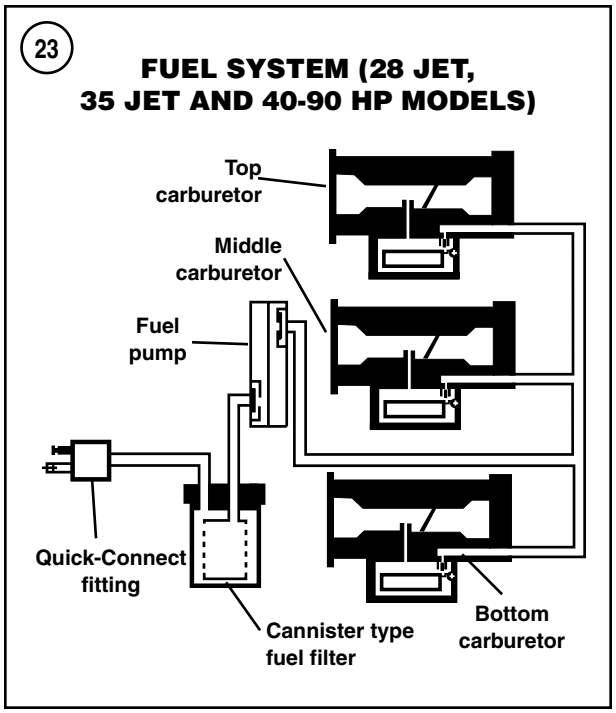
Pull the end through the clamp (**Figure 25**) until the hose is securely fastened and will not rotate on the fitting. Avoid pulling too tightly as the clamp may fail or be weakened and eventually loosen.

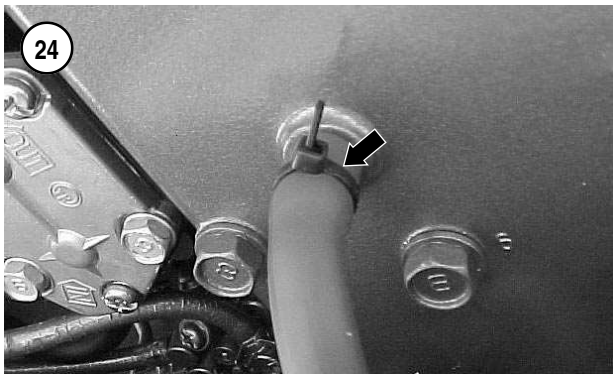
*Spring type hose clamp*

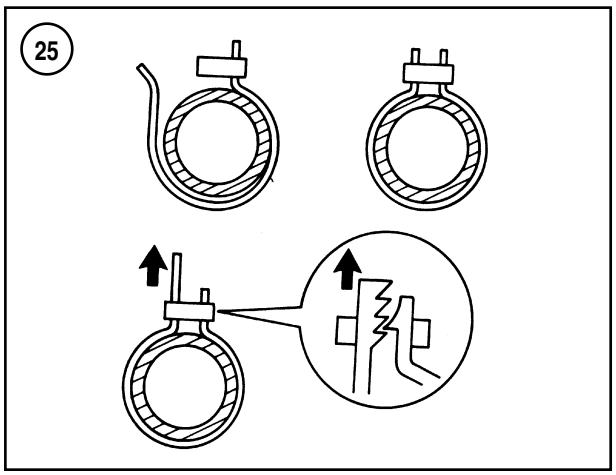
Remove spring type hose clamps by squeezing the ends together with pliers (**Figure 26**) while carefully moving the clamp away from the fitting. Replace spring type hose clamps that are corroded, bent, deformed or have lost spring tension.

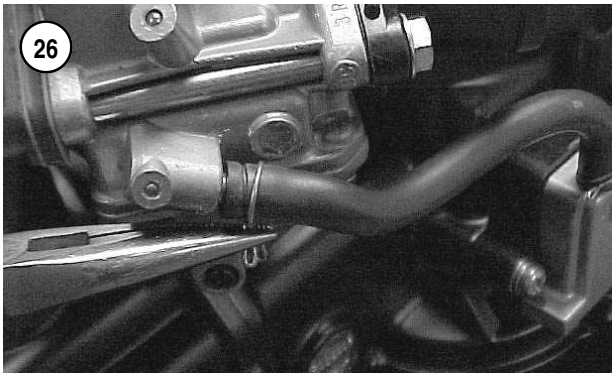


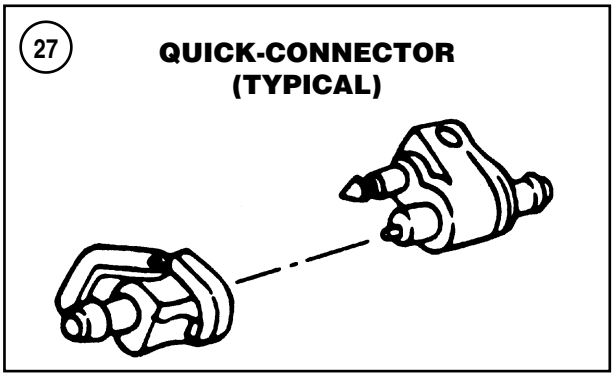






***Quick-connector***

A quick-connector type clamp (**Figure 27**) is used on 5-90 hp models to connect the fuel supply hose to the engine.

To disconnect this type of clamp, push on the locking lever, then pull the fuel supply hose from the engine fitting.

To connect the clamp, depress the locking lever, then carefully push the fuel supply hose onto the engine fitting. Make sure to align the lever side with the solid pin on the engine fitting. The pin with the check valve must fit into the opening in the connector that aligns with the fuel hose. Push firmly on the fitting, then release the locking lever. Pull on the hose to make sure the locking lever engages the groove in the solid pin.

Check for leaking at the quick-connector fittings on a frequent basis. Observe the connection while squeezing the primer bulb. Replace both fittings if there is leaking at the connection. Replace quick-connectors as follows:

1. On electric start models, disconnect the battery cables.
2. Disconnect and ground the spark plug lead(s) to prevent accidental starting.
3. Remove the hose clamps then pull the hose from the connector fittings.

4. Remove the mounting bolt. Pull the engine fitting from the lower engine cover.
5. Fit the replacement quick-connector on the lower engine cover. Align the fitting with the opening and install the mounting bolt. Securely tighten the bolt.
6. Connect the fuel supply quick-connector to the engine quick-connector.
7. Push the engine and fuel supply hoses onto their respective quick-connector fittings. Secure the hoses with the appropriate clamps. Route the hoses to avoid interference with moving components.
8. Squeeze the primer bulb while checking for leaks. Correct leaking as necessary.
9. Connect the spark plug lead(s).
10. On electric start models, connect the battery cables.

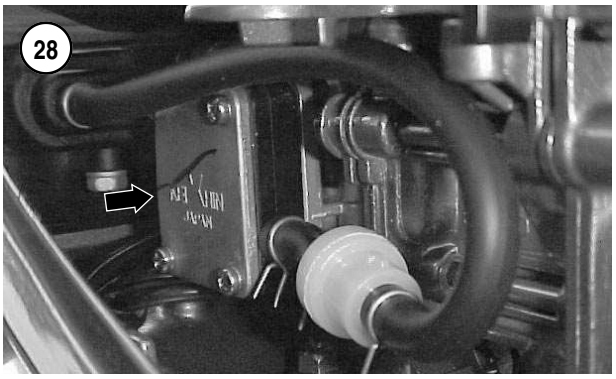
### Fuel Valves

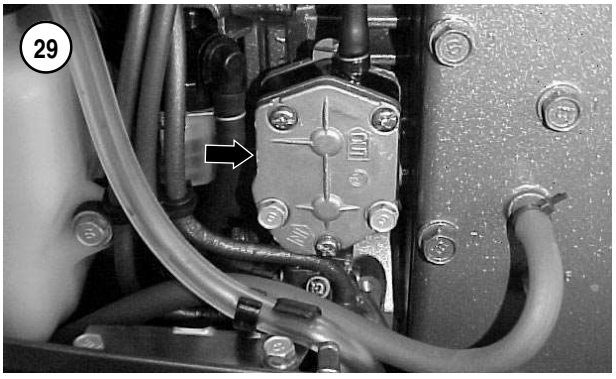
Fuel valves are used on 2-5 hp models. The valve is mounted into the fuel tank on 2 hp, 4 hp and 5 hp models. Remove and drain the tank to replace the valve. Refer to *Integral Fuel Tank* in this chapter for replacement instructions on these models.

On 3 hp models, the valve is located in the fuel hoses connecting the fuel tank to the carburetor. Replace the valve as follows:
1. Disconnect and ground the spark plug lead to prevent accidental starting.
2. Place the valve lever in the OFF position.
3. Disconnect the fuel hose from the carburetor fitting. Direct the hose into a container suitable for holding fuel.
4. Move the valve lever to the ON position and drain the fuel tank. If the tank will not drain, remove the integral fuel tank as described in this chapter.
5. Connect the fuel hose to the carburetor fitting and secure it with a suitable clamp. Remove the clamps and pull both hoses from the fuel valve fittings. Remove the screw to free the valve from the power head.
6. Open and close the valve to check for proper operation.
7. Install the replacement valve onto the power head and secure it with the screw. Tighten the screw to the specification in **Table 1**.

### Fuel Pumps

Two types of fuel pumps are used on Yamaha outboards. A gravity fuel delivery system is used on the 2 hp model. A carburetor mounted fuel pump (**Figure 28**) is used on 3-30 hp (except 28 jet) models. A power head mounted fuel pump (**Figure 29**) is used on 28 jet and 40-60 hp models. Refer to the appropriate diagram (**Figures 16-23**) to assist with fuel hose routing and connections. Replace all gaskets, diaphragms, check valves and seals when servicing the fuel pump. Check for proper engine operation and correct any fuel leaks before putting the engine into service.



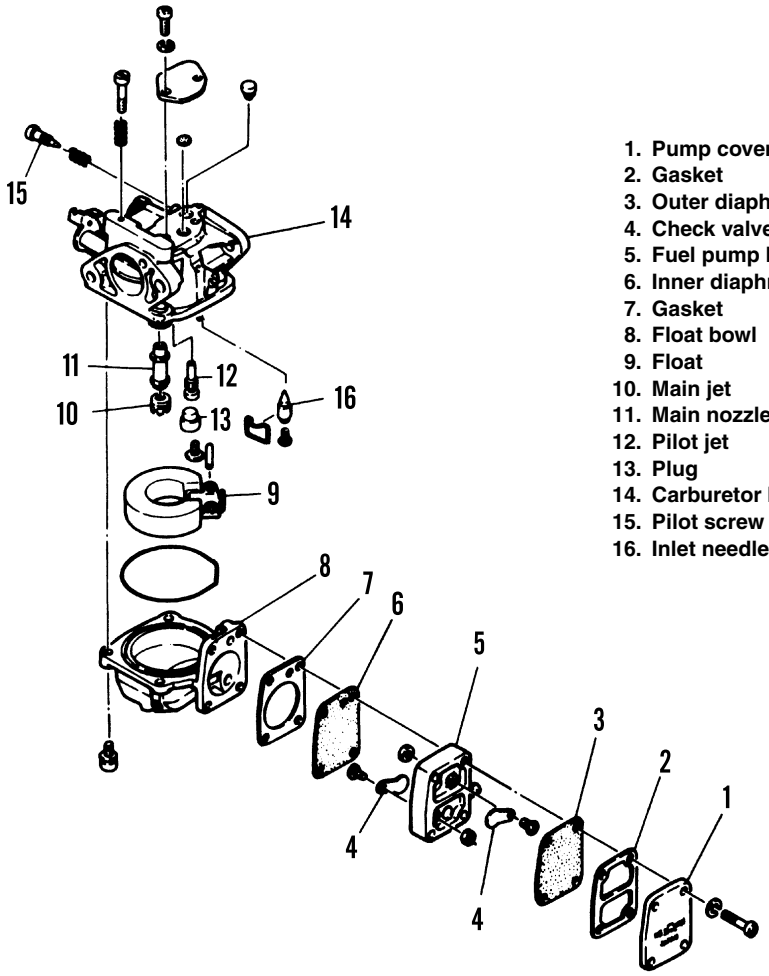




#### *Carburetor mounted fuel pump*

It is possible to repair the carburetor mounted fuel pump without removing the carburetor. However, it is difficult to access the carburetor that probably needs cleaning and repairs if debris, varnish-like deposits or brittle gaskets caused fuel pump failure. Repair only the fuel pump if the carburetor is in good condition. Refer to **Figures 30-34** for fuel pump component locations. Mark all components during disassembly to ensure proper orientation during assembly.
1. Remove the silencer cover and carburetor as described in this chapter.
2. Remove the four screws and carefully remove the fuel pump cover, outer gasket and outer diaphragm. Some models do not use an outer diaphragm.
3. Carefully remove the fuel pump body from the carburetor. Remove the check valve screws and check valves from the body.

30

**CARBURETOR MOUNTED FUEL PUMP (3, 6 AND 8 HP MODELS)**




1. Pump cover
2. Gasket
3. Outer diaphragm
4. Check valve
5. Fuel pump body
6. Inner diaphragm
7. Gasket
8. Float bowl
9. Float
10. Main jet
11. Main nozzle
12. Pilot jet
13. Plug
14. Carburetor body
15. Pilot screw
16. Inlet needle

4. On 4 and 5 hp models, remove the boost spring (13, **Figure 31**) and cap (14) from the body.

5. Remove the inner diaphragm and gasket from the body or carburetor surfaces.

6. Clean all components with a suitable solvent. Carefully scrape gasket material from the fuel pump body, cover and carburetor surfaces. Never scratch or damage the gasket mating surfaces. Inspect the check valves and valve contact surfaces on the fuel pump body. Replace the body and valves if either surface is damaged or deteriorated.

7. Assembly is the reverse of disassembly. Note the following:

a. Replace all gaskets, diaphragms and seals when assembling the fuel pump.

b. Refer to the appropriate illustration during assembly to help ensure proper component orientation.

d. Handle the diaphragm with care to avoid tearing the openings where the screws pass through the diaphragm and gaskets.

e. Securely tighten the mounting screws.

8. Install the carburetor and silencer cover as described in this chapter.

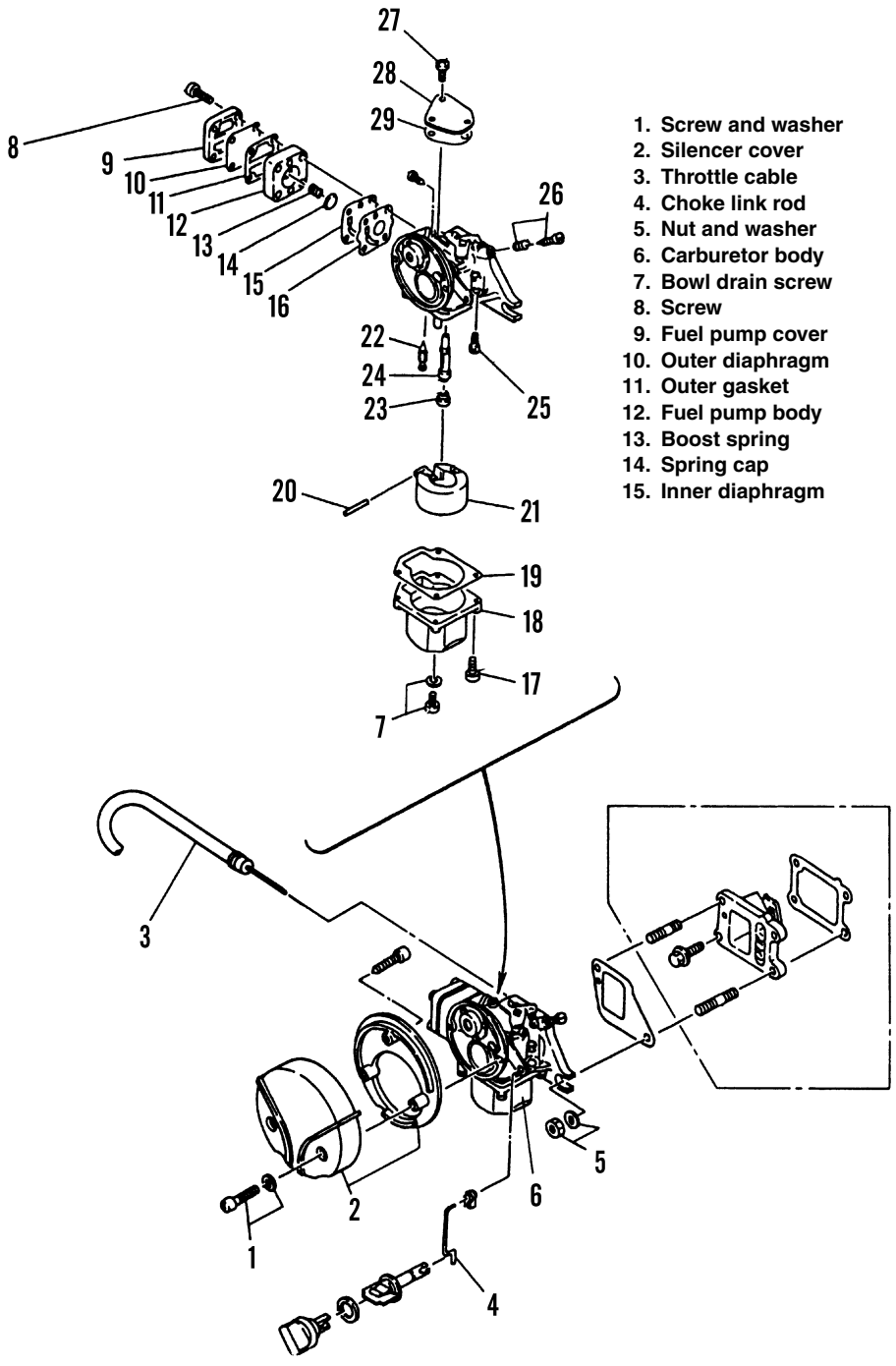
9. Check for and correct any fuel leaks before putting the engine into service.

### *Power head mounted fuel pump*

Deformed or damaged diaphragms, brittle gaskets and faulty check valves are some common causes of fuel

31

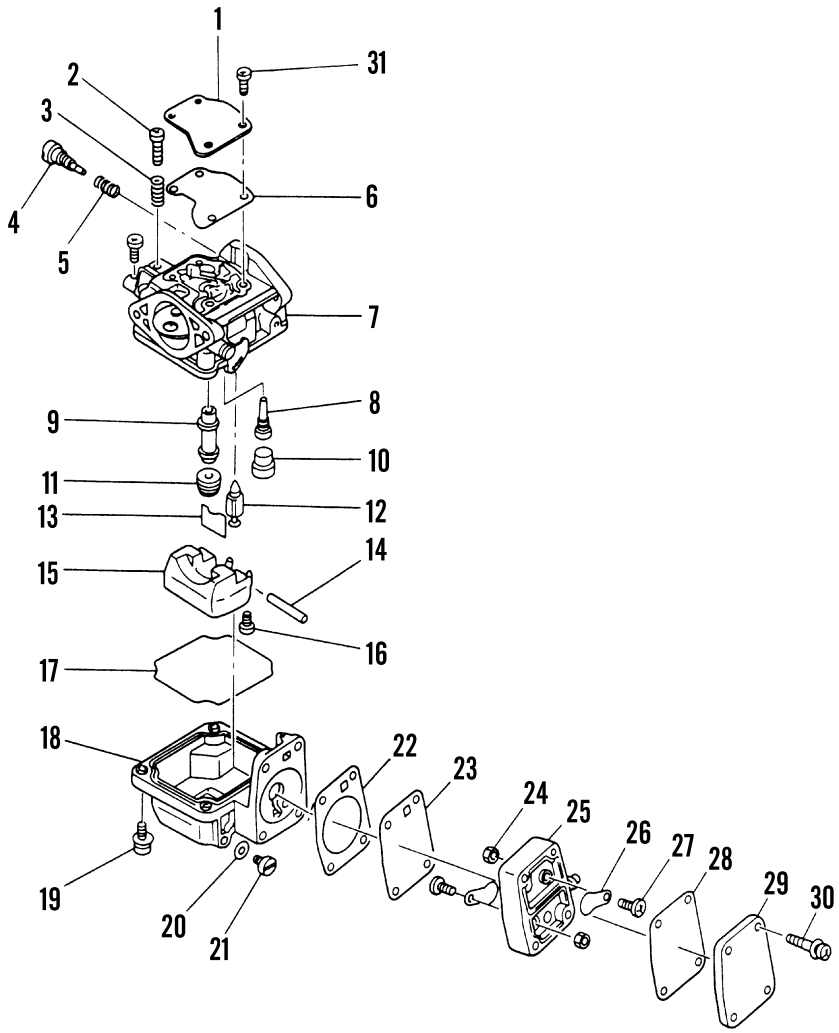
## CARBURETOR MOUNTED FUEL PUMP (4 AND 5 HP MODELS)




1. Screw and washer
2. Silencer cover
3. Throttle cable
4. Choke link rod
5. Nut and washer
6. Carburetor body
7. Bowl drain screw
8. Screw
9. Fuel pump cover
10. Outer diaphragm
11. Outer gasket
12. Fuel pump body
13. Boost spring
14. Spring cap
15. Inner diaphragm
16. Inner gasket
17. Screw
18. Float bowl
19. Gasket
20. Float pin
21. Float
22. Inlet needle
23. Main jet
24. Main nozzle
25. Pilot jet
26. Pilot screw
27. Screw
28. Cover
29. Gasket

32

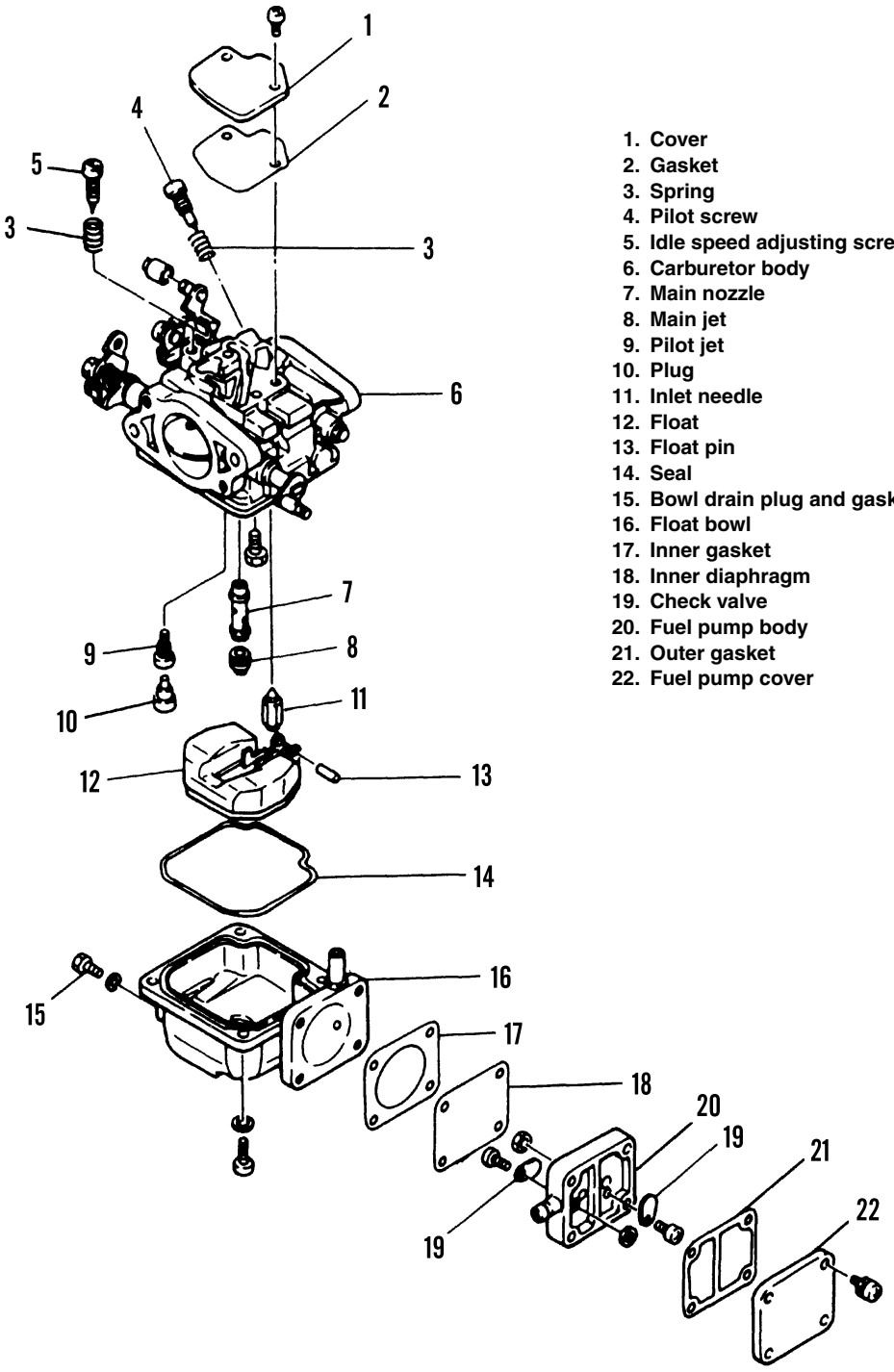
## CARBURETOR MOUNTED FUEL PUMP (9.9 AND 15 HP MODELS)




1. Cover
2. Idle speed adjusting screw
3. Spring
4. Pilot screw
5. Spring
6. Gasket
7. Carburetor body
8. Pilot jet
9. Main nozzle
10. Plug
11. Main jet
12. Inlet needle
13. Clip
14. Float pin
15. Float
16. Float pin screw
17. Seal
18. Float bowl
19. Screw
20. Gasket
21. Bowl drain screw
22. Inner gasket
23. Inner diaphragm
24. Nut
25. Fuel pump body
26. Check valve
27. Screw
28. Outer diaphragm
29. Fuel pump cover
30. Screw

33

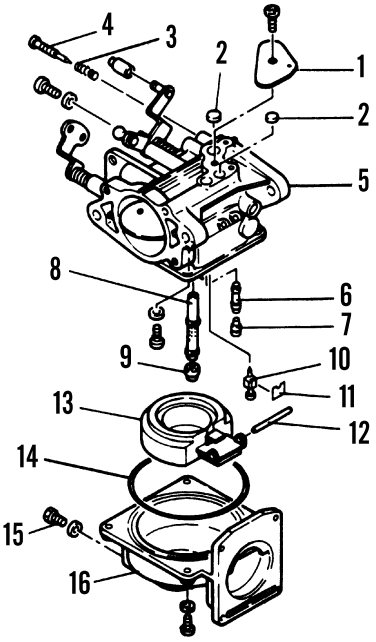
## CARBURETOR MOUNTED FUEL PUMP
## (20 AND 25 HP TWO-CYLINDER MODELS)

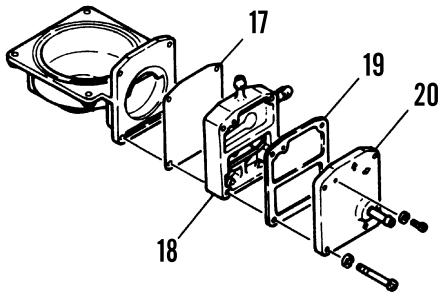



1. Cover
2. Gasket
3. Spring
4. Pilot screw
5. Idle speed adjusting screw
6. Carburetor body
7. Main nozzle
8. Main jet
9. Pilot jet
10. Plug
11. Inlet needle
12. Float
13. Float pin
14. Seal
15. Bowl drain plug and gasket
16. Float bowl
17. Inner gasket
18. Inner diaphragm
19. Check valve
20. Fuel pump body
21. Outer gasket
22. Fuel pump cover

34

## CARBURETOR MOUNTED FUEL PUMP (25 HP THREE-CYLINDER AND 30 HP MODELS)




1. Cover
2. Seal
3. Spring
4. Pilot screw
5. Carburetor body
6. Pilot jet
7. Plug
8. Main nozzle
9. Main jet
10. Inlet needle
11. Clip
12. Float pin
13. Float
14. Seal
15. Bowl drain screw and gasket
16. Float bowl
17. Inner diaphragm
18. Fuel pump body
19. Outer gasket
20. Fuel pump cover

pump failure. Mark all components during disassembly to ensure proper orientation during assembly.

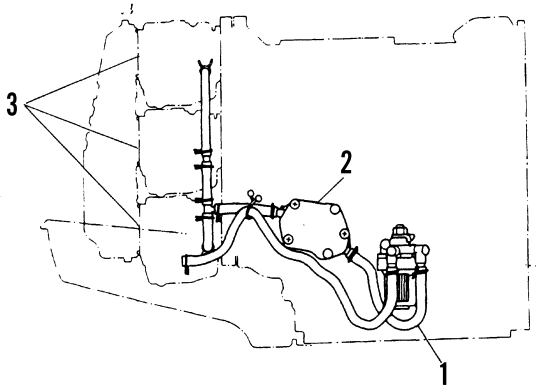
A pressure/vacuum tester (Miti-Vac or Yamaha part No. YB-35956/90890-06756) is required to pressure test the fuel pump upon assembly. Use a shop towel or suitable container to capture residual fuel that spills from disconnected hoses.

Refer to **Figure 35** or **Figure 36** for fuel pump mounting and hose routing.

1. On electric start models, disconnect the battery cables.
2. Disconnect and ground the spark plug lead(s) to prevent accidental starting.
3. Locate the inlet and outlet fittings on the fuel pump body. Cut and dispose of the plastic locking type clamps

35

**POWER HEAD MOUNTED FUEL PUMP**
**(28 JET, 35 JET, 40 HP AND 50 HP MODELS)**




1. Fuel filter assembly
2. Fuel pump
3. Carburetors

used on some models. Remove spring type hose clamps by squeezing the ends together.

4. Position a container or shop towel under the fuel pump hoses, then carefully push the hoses from the fittings. Work carefully and do not tug on the hoses or use side force against the fittings. The fittings will break if excessive force is used. Gently twist difficult hoses to free them from the fittings.

5. Drain residual fuel from the hoses. Remove the two fuel pump mounting screws (5, **Figure 36**) and carefully pull the pump from the power head.

6. Remove the gasket (4, **Figure 36**) from the power head or fuel pump surfaces. Discard the gasket.

7. Remove the three screws (1, **Figure 37**) that hold the assembly together. Being careful to avoid damaging gasket surfaces, pry the fuel pump cover (2, **Figure 37**) from the fuel pump body (7).

8. Remove the outer gasket (4, **Figure 37**) and diaphragm (3) from the body. Be careful to avoid damaging the gasket mating surfaces if the gaskets must be scraped for removal. Discard all gaskets and diaphragms.

9. Use the same procedures to remove the back cover, diaphragm and gasket from the pump body.

10. Remove the boost spring (10, **Figure 37**) and cap (11). Inspect the spring for bending or corrosion. Replace as needed.

11. Remove the screws and nuts that hold the check valves. Inspect the check valves (6, **Figure 37**) for bent or corroded surfaces. Inspect the valve contact surfaces on the fuel pump body for wear or deterioration. Replace the fuel pump body and/or check valves unless they are in excellent condition.

12. Use a straightedge to check the fuel pump body, outer cover and inner cover for warped surfaces. Replace warped components.

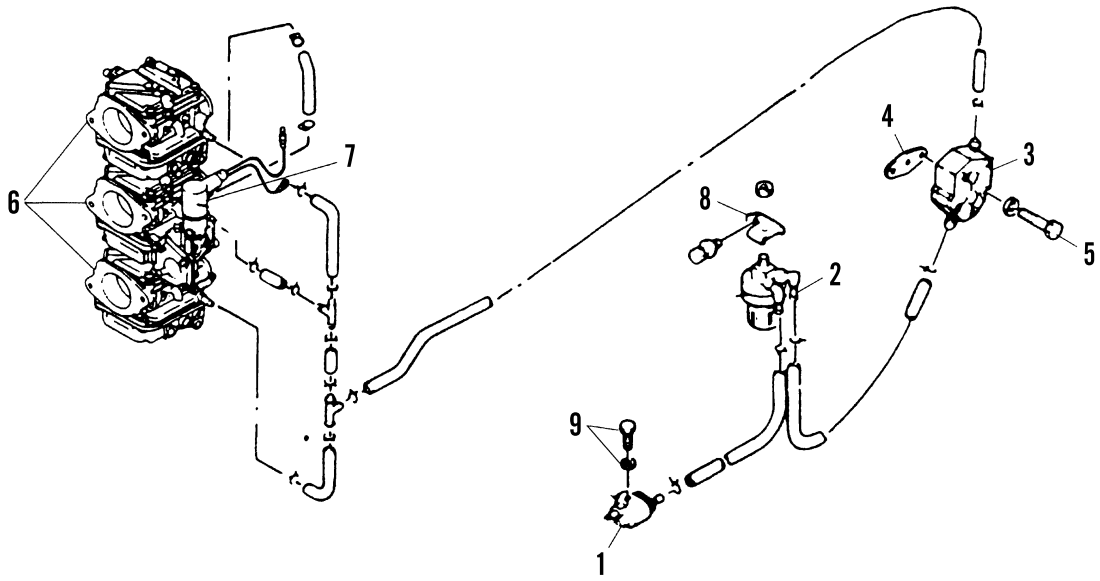
13. Inspect gasket and diaphragm contact surfaces on the body and covers for scratches, nicks or deteriorated surfaces. Replace components that have damaged surfaces.

14. Assembly is the reverse of disassembly. Note the following:

a. Install new gaskets and diaphragms during assembly.
b. Use the screw openings in the diaphragms and gaskets to assist with proper orientation.
c. Carefully position the diaphragm over the boost spring and cap. The spring and cap are easily dislodged.
d. Align the screw openings while holding the components together.

36

**FUEL PUMP AND FUEL HOSE ROUTING (60-90 HP MODELS)**




1. Quick connector
2. Fuel filter assembly
3. Fuel pump
4. Gasket
5. Mounting screw (2)
6. Carburetors
7. Electrothermal valve
8. Fuel filter bracket
9. Bolt and washer

e. Evenly and securely tighten the three screws to hold the assembly together.

15. Pressure test the fuel pump as described in this section.

16. Install a new gasket (4, **Figure 36**) onto the back cover of the fuel pump. Slip the two mounting screws through the pump and gasket to hold the gasket.

17. Install the fuel pump onto the power head. Make sure the mounting gasket is not dislodged during installation. Thread the mounting screws (5, **Figure 36**) into the power head openings. Evenly and securely tighten the mounting screws.

18. Connect the fuel hoses to the fuel pump fittings. The hose connected to the outlet side must be connected to the carburetors. The hose connected to the inlet side must be connected to the fuel filter.

19. Observe the fuel pump for indication of leaking while squeezing the primer bulb. Correct leaks before putting the engine into service.

20. Connect the spark plug leads.

21. On electric start models, connect the battery cables.

***Fuel pump pressure test***

A pressure/vacuum tester (Miti-Vac or Yamaha part No. YB-35956/90890-06756) is required for this procedure. Purchase the tester from an automotive or marine parts store or Yamaha dealership.

*NOTE*

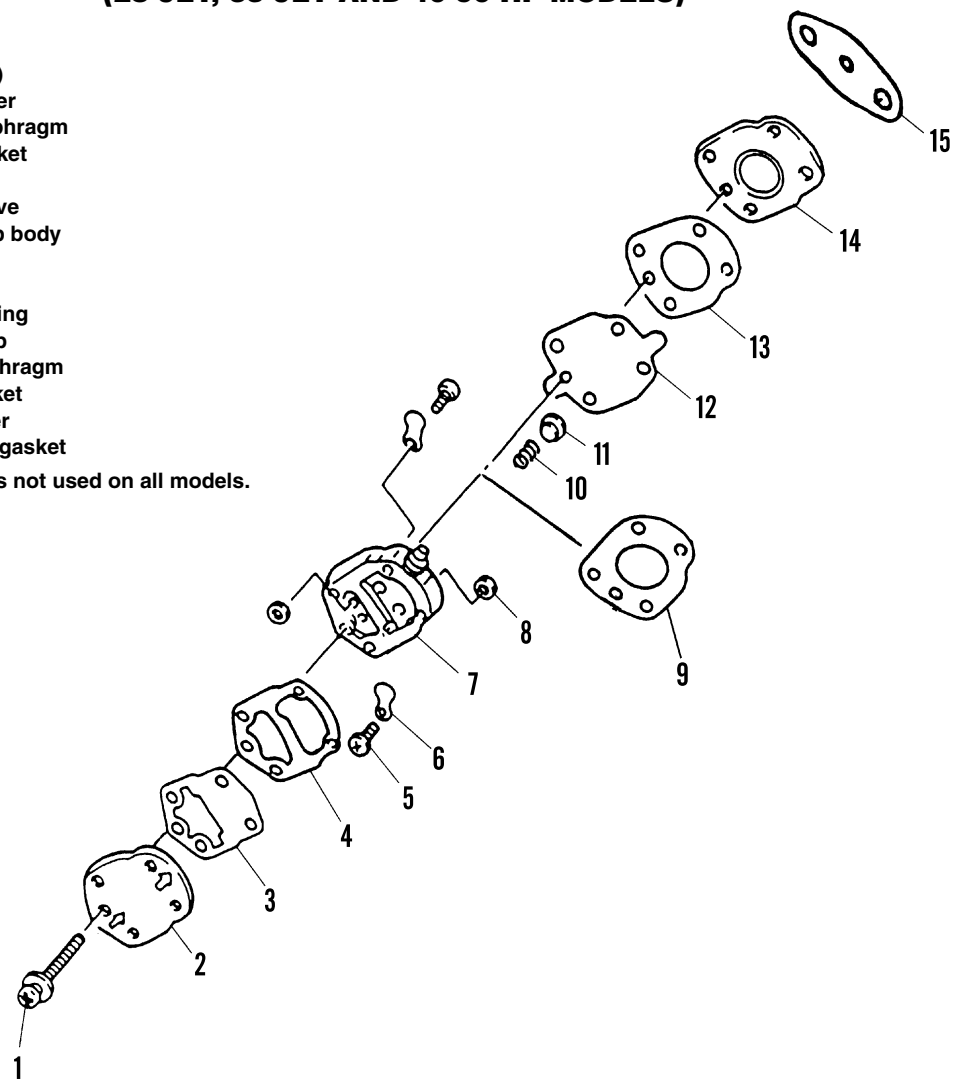
*Put a small amount of fuel in the fuel pump fittings before pressure testing the fuel*

37

**FUEL PUMP ASSEMBLY**
**(28 JET, 35 JET AND 40-90 HP MODELS)**

1. Screws (3)
2. Outer cover
3. Outer diaphragm
4. Outer gasket
5. Screw
6. Check valve
7. Fuel pump body
8. Nut
9. Gasket*
10. Boost spring
11. Spring cap
12. Inner diaphragm
13. Inner gasket
14. Back cover
15. Mounting gasket

*This gasket is not used on all models.



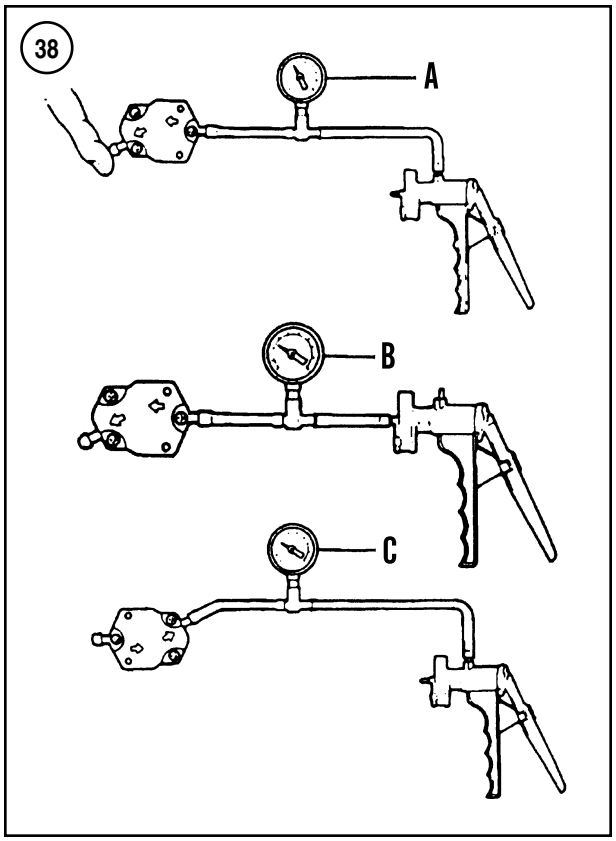

*pump. The fuel is necessary to simulate the fuel present on the sealing surfaces during operation. Use only enough fuel to wet the inner components and check valve surfaces.*

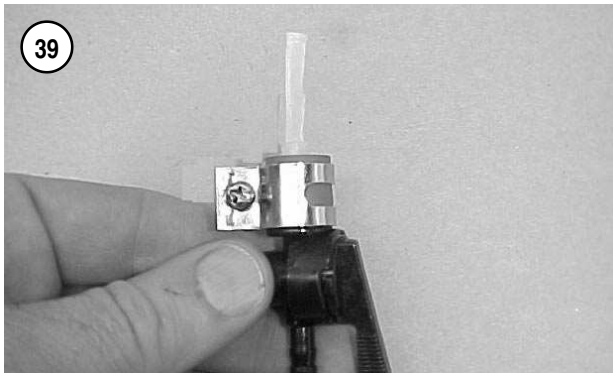
1. Connect a hand-operated vacuum/pressure pump to the *inlet fitting* of the fuel pump. Block the *outlet fitting* with a finger (A, **Figure 38**). Slowly apply pressure until it reaches 50 kPa (7.2 psi.). If the test pressure cannot be attained, the gaskets are faulty or the fuel pump is assembled incorrectly.

2. Connect the vacuum/pressure pump to the *inlet fitting* of the fuel pump. Do not block the *outlet fitting* (B, **Figure 38**). Apply a vacuum until it reaches 30 kPa (4.4 psi). The check valve is faulty if the test vacuum cannot be attained.

3. Connect the vacuum/pressure pump to the *outlet fitting* (C, **Figure 38**) of the fuel pump. Do not block the *inlet fitting*. Slowly apply pressure until it reaches 50 kPa (7.2 psi.). The check valve is faulty if the test pressure cannot be attained.

4. Disassemble, inspect and assemble the fuel pump if it fails the pressure test in Step 1. Disassemble and inspect the check valves and pump body if it fails the tests in Step 2 or



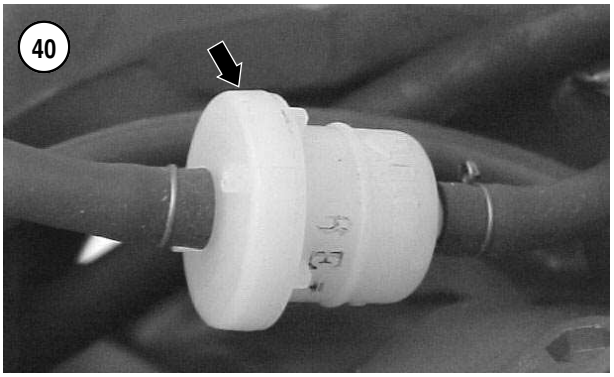



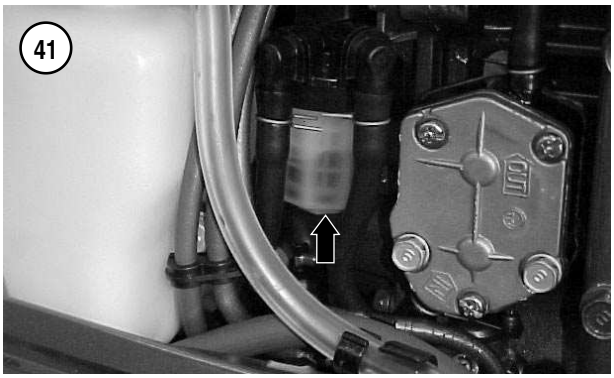

Step 3. Replace the check valves if no faults are found with the pump body. Assemble the pump and retest. Replace the pump body if the pump fails the pressure test again.

### Fuel Filter

Three different types of fuel filter are used on the Yamaha outboards in this manual.

All 2-5 hp models are equipped with a fuel filter mounted in the fuel tank fitting (**Figure 39**). The fuel tank must be removed from the power head and drained so the filter can be cleaned and inspected. Refer to *Integral Fuel Tank* in this chapter for fuel filter removal, inspection and installation procedures.




Some 4 and 5 hp models and all 6 and 8 hp models are equipped with an inline type fuel filter (**Figure 40**). This filter is not serviceable and must be replaced if it is damaged or contaminated. Refer to *Fuel Filter* in Chapter Three to determine the need for replacement. Replace the fuel filter as described in this chapter.

All 20-90 hp models use a canister type fuel filter (**Figure 41**). This filter is fully serviceable. Cleaning and inspection procedures for this type of filter are Chapter Three. If necessary, replace the complete fuel filter assembly as described in this section.

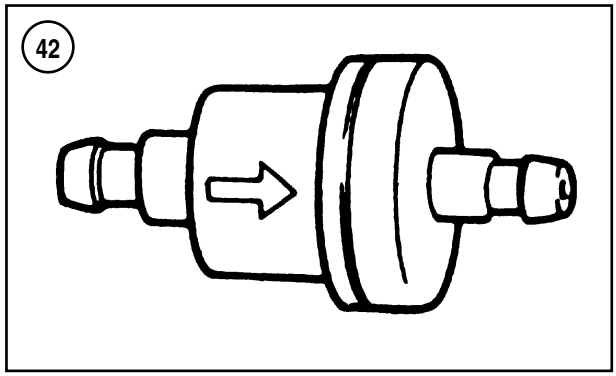
#### *Inline type fuel filter replacement*

1. On electric start models, disconnect the battery cables.
2. Disconnect and ground the spark plug lead(s) to prevent accidental starting.
3. Trace the fuel hose from the quick-connector fitting on the lower engine cover to the inline fuel filter (**Figure 40**).
4. Place a shop towel under the fuel filter to capture spilled fuel. Cut and remove plastic locking type clamps

at the fuel filter fittings. Squeeze the ends of spring type clamps and move them away from the fittings. Replace weak or corroded clamps.
5. Carefully twist and pull to remove the hoses from the filter fittings. Cut stubborn hoses to remove them and replace them with the correct type of fuel hose. Drain residual fuel from the hoses. Discard the fuel filter.
6. Refer to the fuel system diagrams (**Figures 16-19**) to determine the correct fuel flow and connection points.
7. Use the arrow on the filter (**Figure 42**) to determine the direction of fuel flow through the filter, then push the hoses fully onto the fuel filter fittings. The arrow must point toward the hose leading to the fuel pump or carburetor.
8. Install new plastic locking type hose clamps onto the fuel hose. Tighten the clamps until the hoses fit snug on the fittings. To open the spring type clamps, squeeze the ends together, slide them over the fittings, then release the ends. Tug on the hoses to verify a secure connection.
9. Route the fuel hoses and position the filter to prevent contact with any moving components.
10. Observe the fuel filter, fittings and hoses while squeezing the primer bulb. Correct any fuel leak before putting the engine into service.
11. Connect the spark plug leads.
12. On electric start models, connect the battery cables.

***Canister type fuel filter replacement***

1. On electric start models, disconnect the battery cables.
2. Disconnect and ground the spark plug lead(s) to prevent accidental starting.
3. Trace the fuel hose from the quick-connector fitting on the lower engine cover to the fuel filter assembly (**Figure 41**).
4. Place a shop towel under the fuel filter to capture spilled fuel. Cut and remove plastic locking type clamps at the fuel filter fittings. Squeeze the ends of spring type clamps and move them away from the fittings. Replace weak or corroded clamps.
5. Carefully twist and pull to remove the hoses from the filter fittings. Cut stubborn hoses to remove them and replace them with the correct type of fuel hose. Drain residual fuel from the hoses.
6. Remove the fasteners and pull the filter assembly from the power head or filter mounting bracket.
7. Fit the replacement filter assembly to the mount on the bracket or power head. Install the filter assembly mounting bolts and nuts, and tighten them securely.
8. Refer to **Figures 20-23** to determine the correct fuel flow and connection points for the specified model.




9. Note the arrows near the filter housing fittings to determine the direction of fuel flow through the filter, then push the hoses fully onto the fuel filter fittings. The arrow pointing toward the hose fitting is the outlet fitting. The hose connected to this fitting must be connected to the hose leading to the fuel pump or carburetor.
10. Install new plastic locking type hose clamps on the fuel hose. Tighten the clamps until the hoses fit snug on the fittings. To open spring type clamps, squeeze the ends together, slide them over the fittings, then release the ends. Tug on the hose to verify a secure connection.
11. Observe the fuel filter, fittings and hoses while squeezing the primer bulb. Correct any fuel leak before putting the engine into service.
12. Connect the spark plug leads.
13. On electric start models, connect the battery cables.
14. Clean and inspect the filter element at regular intervals as described in Chapter Three.

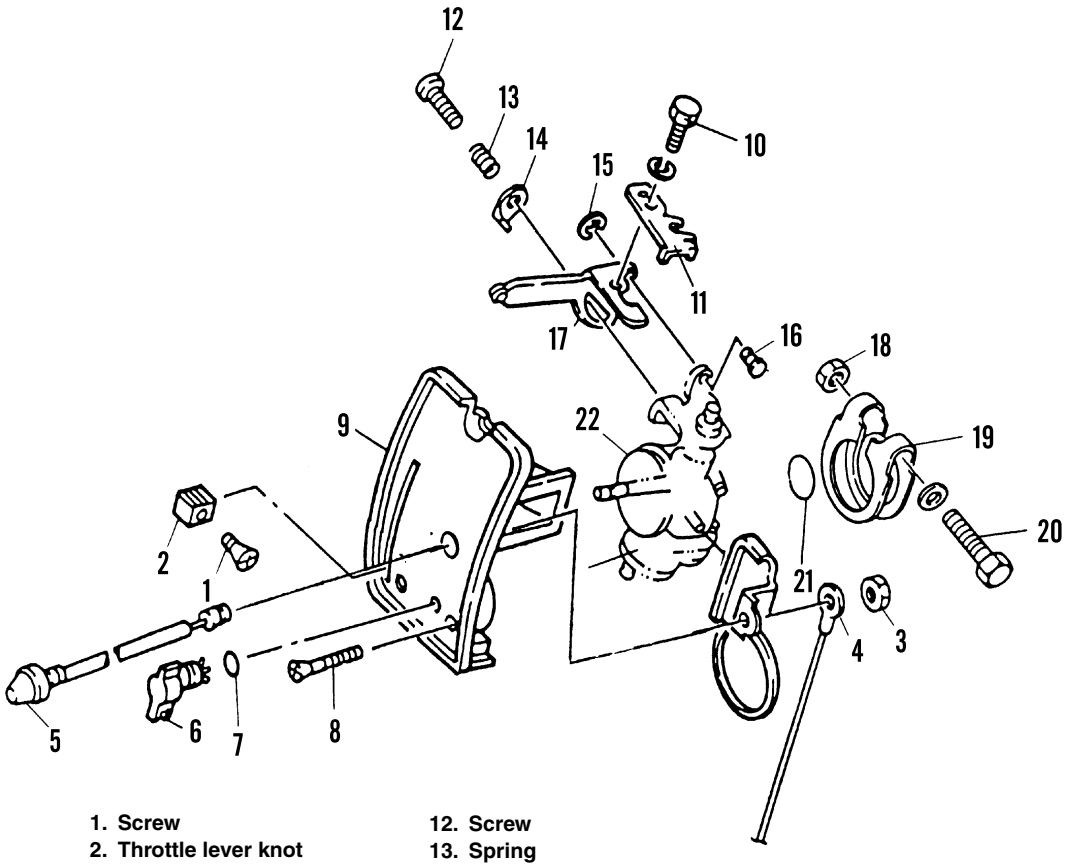
**Silencer Cover Removal/Installation**

Numerous variations exist for the silencer cover. Refer to **Figures 43-53** during the removal and installation procedures.

Note the location and orientation of all fasteners and gaskets before removing the silencer cover. Be careful when pulling the cover from the engine to avoid damaging the cover gasket or seal. Always replace torn or damaged gaskets during assembly.
1. Disconnect and ground the spark plug lead(s) to prevent accidental starting.
2. On electric start models, disconnect the battery cables.
3A. On 2 hp models, remove the screw (1, **Figure 43**) and throttle lever knob (2). Disconnect the black and white stop switch wires (4, **Figure 43**). Pull the choke knob (6, **Figure 43**) and O-ring (7) from the cover.
3B. On 6 and 8 hp models, remove the four screw (5, **Figure 46**) and upper cover from the silencer.

43

**SILENCER COVER AND CARBURETOR (2 HP MODEL)**




1. Screw
2. Throttle lever knot
3. Nut
4. Stop switch wire
5. Stop switch
6. Choke knob
7. O-ring
8. Screws
9. Silencer cover
10. Screw
11. Throttle lever linkage
12. Screw
13. Spring
14. Plate
15. E-clip
16. Pivot
17. Throttle lever
18. Nut
19. Clamp
20. Bolt
21. O-ring
22. Carburetor

3C. On 9.9 and 15 hp models, remove the screw (1, **Figure 47**) and washer (2), then pull the choke lever (3) from the silencer cover (5).

*NOTE*

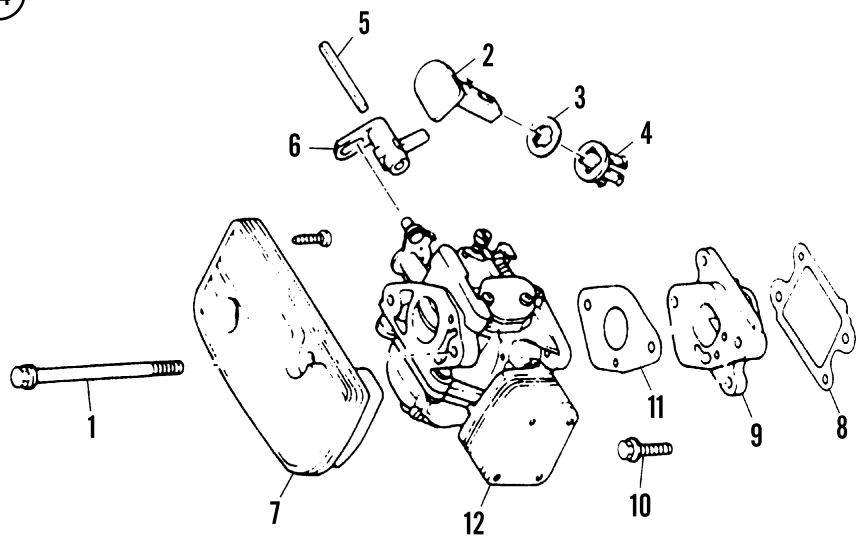
*The bolts that hold the silencer cover on 3 and 6-15 hp models also secure the carburetors to the intake manifold. To avoid unnecessary damage to the carburetor mounting gasket or seal, have an assistant support the carburetor until the bolts can be temporarily reinstalled.*

4A. On 2 hp models, remove the two screws (8, **Figure 43**) and the silencer cover (9).

4B. On 4 and 5 hp models, remove the two screws and washer (1, **Figure 45**) and the silencer cover (2).

4C. On 3 and 6-15 hp models, have an assistant support the carburetor, then remove the two bolts (1, **Figure 44**, 1,

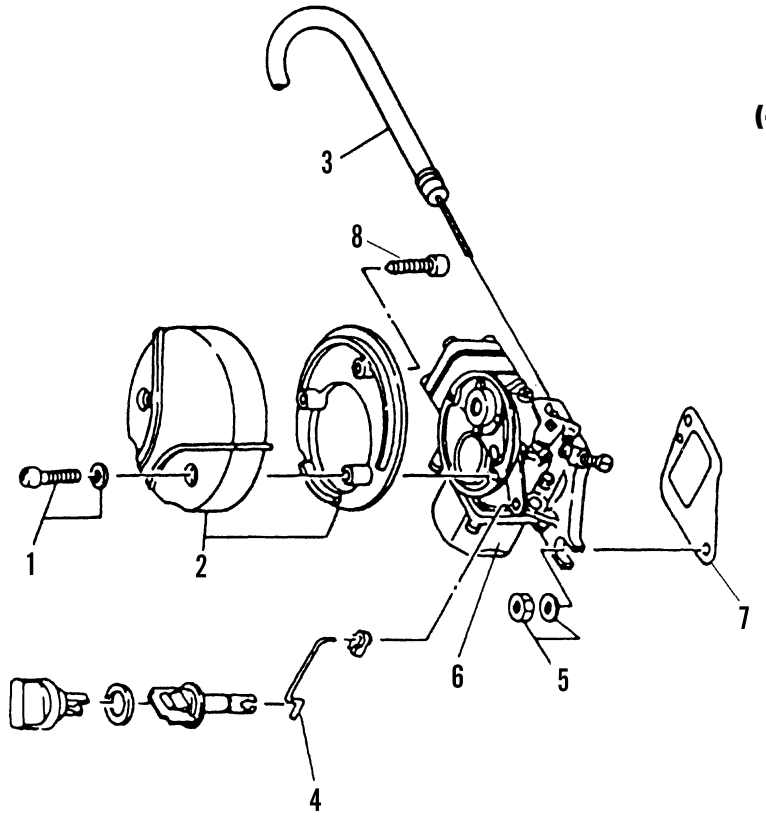
44




**SILENCER COVER AND CARBURETOR (3 HP MODEL)**

1. Bolt
2. Choke knob
3. Washer
4. Retainer
5. Pivot pin
6. Throttle linkage
7. Silencer cover
8. Gasket
9. Adapter
10. Screw
11. Gasket
12. Carburetor

45

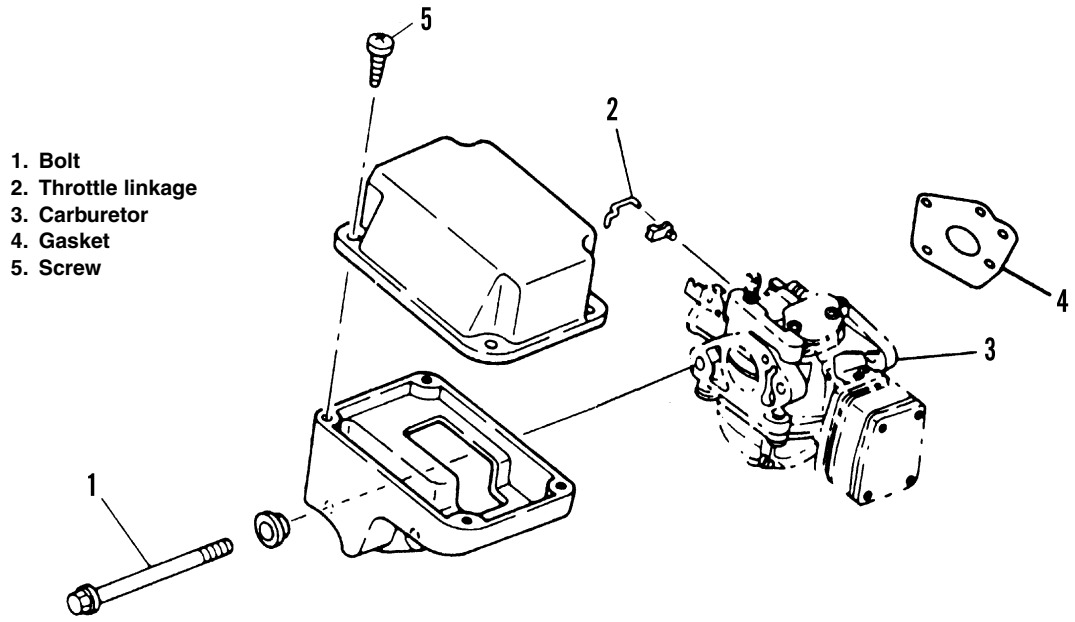



**SILENCER COVER AND CARBURETOR (4 AND 5 HP MODELS)**

1. Screw and washer
2. Silencer cover
3. Throttle cable
4. Choke linkage
5. Nut and washer
6. Carburetor
7. Gasket
8. Screw

46

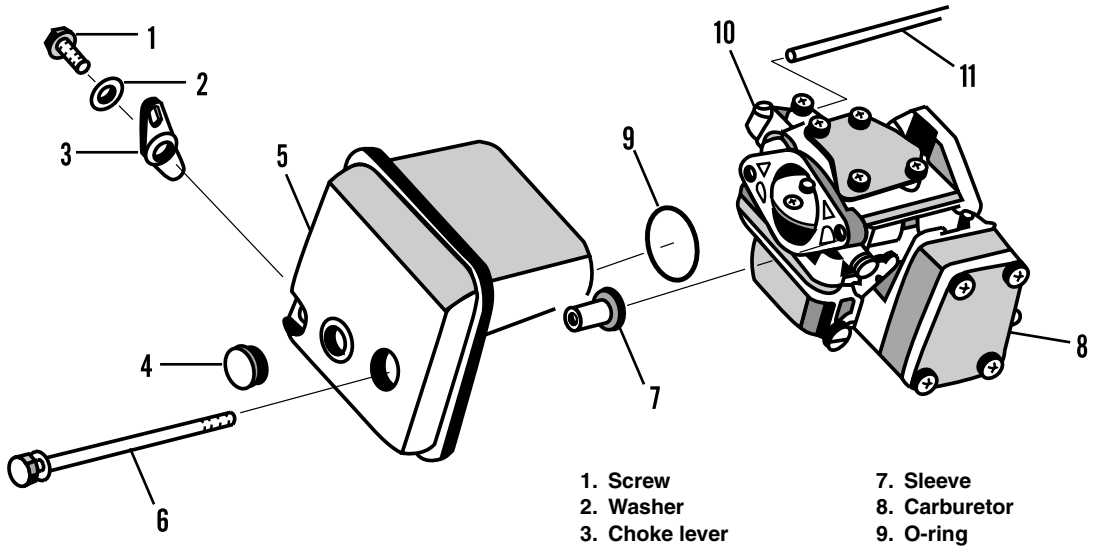
## SILENCER COVER AND CARBURETOR (6 AND 8 HP MODELS)




1. Bolt
2. Throttle linkage
3. Carburetor
4. Gasket
5. Screw

47

## SILENCER COVER AND CARBURETORS (9.9 AND 15 HP MODELS)




1. Screw
2. Washer
3. Choke lever
4. Plug
5. Silencer cover
6. Bolt
7. Sleeve
8. Carburetor
9. O-ring
10. Throttle rod connector
11. Throttle rod