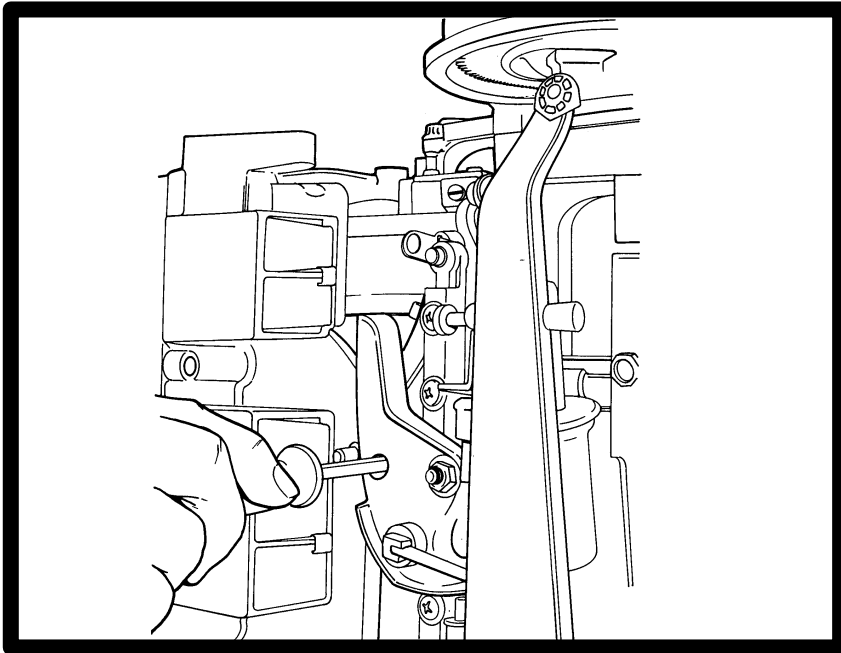




FUEL SYSTEM AND CARBURETION



3

A



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Fuel Pumps

General Information

FUEL PUMP DESCRIPTION/OPERATION

The fuel pump is a crankcase-pressure-operated, diaphragm-type pump. Crankcase pulsating pressure (created by the up-and-down movement of piston) is transferred to fuel pump by way of a passage (hole) between crankcase and fuel pump.

When piston is in an upward motion, a vacuum is created in the crankcase, thus pulling in a fuel/air mixture (from carburetor) into crankcase. This vacuum also pulls in on the fuel pump diaphragm, thus the inlet check valve (in fuel pump) is opened and fuel (from fuel tank) is drawn into fuel pump.

Downward motion of the piston forces the fuel/air mixture out of the crankcase into the cylinder. This motion also forces out on the fuel pump diaphragm, which, in turn, closes the inlet check valve (to keep fuel from returning to fuel tank) and opens the outlet check valve, thus forcing fuel to the carburetors.

CHECKING FOR RESTRICTED FUEL FLOW CAUSED BY ANTI-SIPHON VALVES

While anti-siphon valves may be helpful from a safety stand-point, they clog with debris, they may be too small, or they may have too heavy a spring. Summarizing, the pressure drop across these valves can, and often does, create operational problems and/or powerhead damage by restricting fuel to the fuel pump and carburetor(s). Some symptoms of restricted (lean) fuel flow, which could be caused by use of an anti-siphon valve, are:

- Loss of fuel pump pressure
- Loss of power
- High speed surging
- Preignition/detonation (piston dome erosion)
- Outboard cuts out or hesitates upon acceleration
- Outboard runs rough
- Outboard quits and cannot be restarted
- Outboard will not start
- Vapor lock

Since any type of anti-siphon device must be located between the outboard fuel inlet and fuel tank outlet, a simple method of checking [if such a device (or bad fuel) is a problem source] is to operate the outboard with a separate fuel supply which is known to be good, such as a remote fuel tank.

If, after using a separate fuel supply, it is found that the anti-siphon valve is the cause of the problem, there are 2 solutions to the problem; either (1) remove the anti-siphon valve or (2) replace it with a solenoid-operated fuel shutoff valve.

Testing

Install clear fuel hose(s) between fuel pump and carburetor(s). Run engine, and inspect fuel passing thru hose(s) for air bubbles. If air bubbles are found, see "Air Bubbles in Fuel Line," below. If air bubbles are NOT found, see "Lack of Fuel Pump Pressure," continued on next page.

Troubleshooting Fuel Pump

PROBLEM: AIR BUBBLES IN FUEL LINE	
Possible Cause	Corrective Action
Low fuel in fuel tank.	Fill tank with fuel.
Loose fuel line connection.	Check and tighten all connections.
Fuel pump fitting loose.	Tighten fitting.
A hole or cut in fuel line.	Check condition of all fuel lines and replace any found to be bad.
Fuel pump anchor screw(s) loose.	Tighten all screws evenly and securely.
Fuel pump gasket(s) worn out.	Rebuild fuel pump.

PROBLEM: LACK OF FUEL PUMP PRESSURE	
Possible Cause	Corrective Action
An anti-siphon valve.	Read "Checking for Restricted Fuel Flow, Caused by Anti-Siphon Valves" preceding.
Air in fuel line.	"Air Bubbles in Fuel Line", preceding.
A dirty or clogged fuel filter.	Clean or replace fuel filter.
The fuel pickup in fuel tank clogged or dirty.	Clean or replace pickup.
Worn out fuel pump diaphragm.	Rebuild fuel pump.
Defective (hole or crack) check valve(s) in fuel pump (unlikely).	Rebuild fuel pump.
Broken check valve retainer.	Rebuild fuel pump.
Pulse hole plugged.	Remove fuel pump and clean out hole.

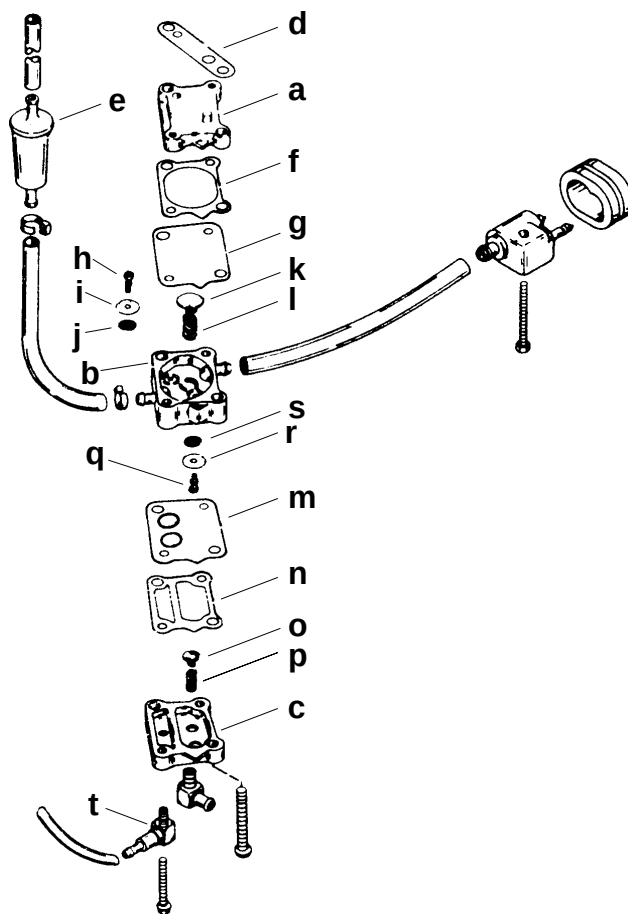


Troubleshooting Fuel Pump (continued)

PROBLEM: LACK OF FUEL PUMP PRESSURE	
Possible Cause	Corrective Action
Hole in pulse hose (1 pulse hose).	Replace pulse hose.
Loose pulse hose.	Tighten connection.
Boost diaphragm gasket distorted or out of place.	Check seal between mating surfaces where "rib" divides pulse chamber – gasket must align with rib; check for distorted gasket. Align or replace gasket if necessary.

Fuel Pump Components (Design 1)

NOTE: In fuel pump reassembly, remember that respective diaphragms go against the mating surfaces of the fuel pump body, and respective gaskets are between the diaphragms and end caps. Gaskets should always be replaced on fuel pump assembly.

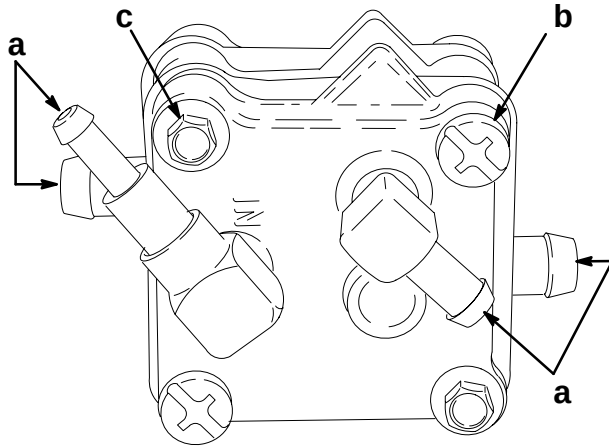


- a - Fuel Pump Base
- b - Fuel Pump Body
- c - Chamber Plate
- d - Gasket, Base
- e - Fuel Filter – Inline
- f - Gasket, Pulse Chamber
- g - Diaphragm, Fuel Pump
- h - Retainer, Check Valve
- i - Check Valve
- j - Check Valve Rubber Disc
- k - Main Compression Spring End Cap
- l - Main Compression Spring
- m - Boost Diaphragm
- n - Boost Chamber Gasket
- o - Boost Compression Spring End Cap
- p - Boost Compression Spring
- q - Retainer, Check Valve
- r - Check Valve
- s - Check Valve Rubber Disc
- t - Check Valve Assembly



Fuel Pump Removal/Installation (Design 1)

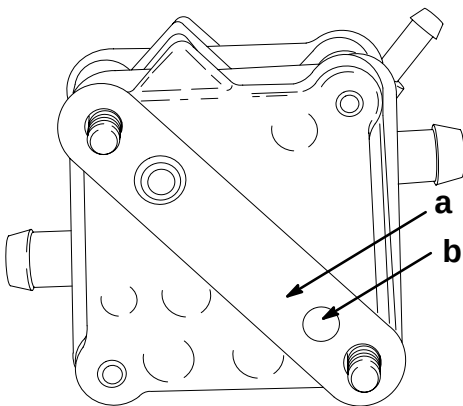
- Remove 4 hoses from fuel pump.
- Remove 2 phillips-head screws -- lift off fuel pump.
- Remove 2 hex-head bolts to disassemble fuel pump.



20427

- a - Fuel Pump
- b - Screws (2 Each)
- c - Bolts (2 Each)

- Remove gasket from backside (fuel pump base) -- replace gasket as necessary -- check gasket in port area carefully.



20417

- a - Gasket
- b - Port Area

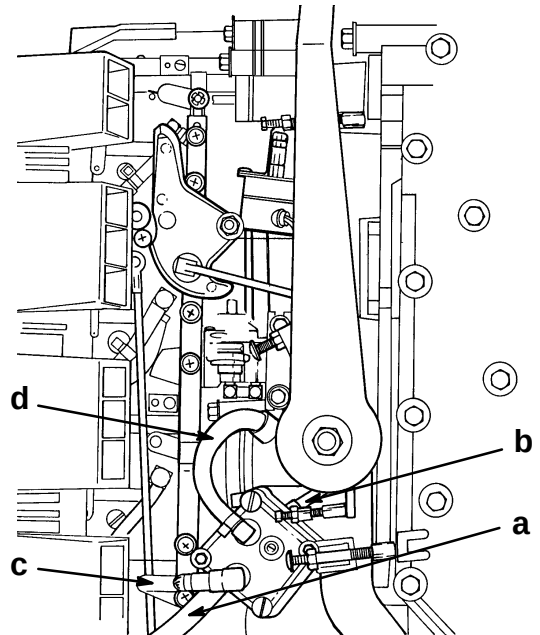
Reinstall Fuel Pump (Design 1)

⚠ CAUTION

After reinstalling fuel pump, ALWAYS check all fuel line connections for leaks, with engine running.

- Reinstall fuel pump to powerhead, as shown, with 2 phillips-head screws.

- Attach fuel lines (inlet and outlet).
- Attach oil injection hose.
- Attach pulse hose.
- Secure each hose connection with a sta-strap.



- a - Inlet Fuel Hose
- b - Outlet Fuel Hose
- c - Oil Injection Hose
- d - Pulse Hose

Fuel Pump Cleaning, Inspection, Disassembly and Reassembly (Design 1 and 2)

- Disassemble by removing 2 hex-head bolts; remove/disassemble fuel pump parts.

Fuel Pump – Cleaning/Inspection

Clean fuel pump housing, check valves, pulse chamber, and pump base in solvent, and dry all but check valves with compressed air.

Inspect each check valve (2 ea.), for cracks and/or holes. Check each black rubber disc (2 ea.) to see that the black coating is not coming off. Unless damaged while disassembled, replacement is seldom necessary. Inspect the Check Valve Assembly on Chamber Plate (check by both pressure and suction to hose barb), to see that check ball is moving and functioning (1-3 psi required).

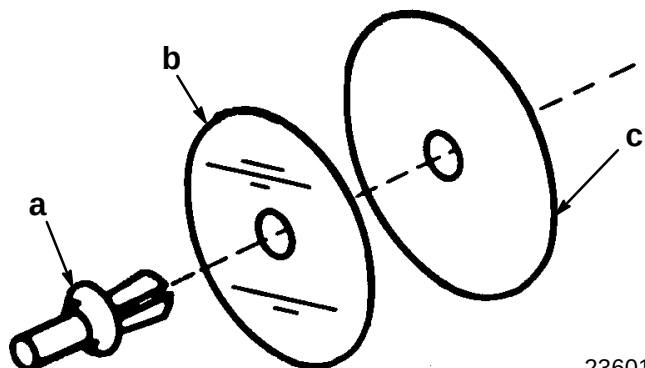
Inspect fittings on fuel pump housing for looseness or any signs of fuel or air leaks. Replace or tighten fitting if leak is found, or replace chamber Plate Assembly.



Check Valve Reassembly

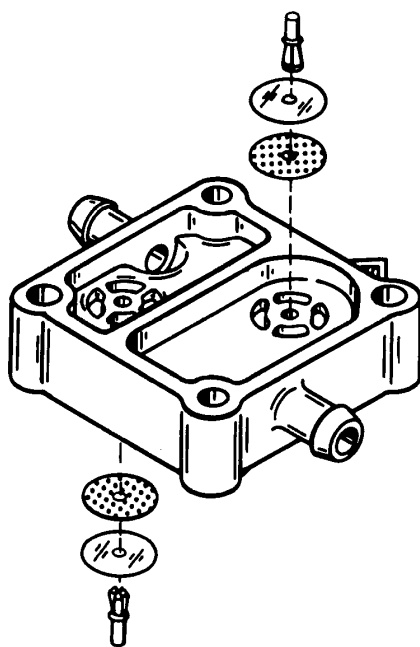
ASSEMBLY (DESIGN I)

1. Insert retainer thru plastic disc and rubber check valve.



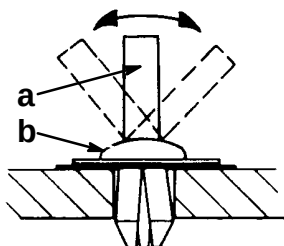
- a - Retainer
- b - Plastic Disc
- c - Check Valve

2. Install check valves and retainers into fuel pump body.



24514

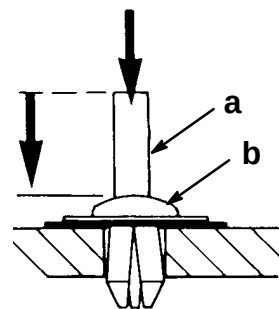
3. With retainer installed in pump body, break retainer rod from retainer by bending sideways.



23601

- a - Retainer Rod
- b - Retainer

4. Reinstall rod into retainer cap and, use a small hammer or hammer and punch to tap rod down into retainer until flush with top of retainer.



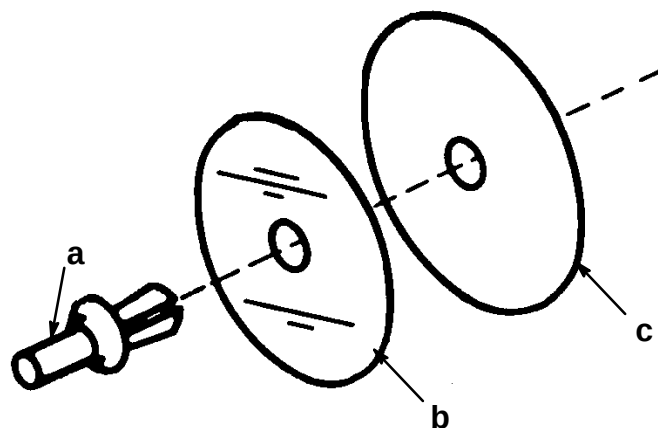
23601

- a - Rod
- b - Retainer Cap

Check Valve Reassembly

ASSEMBLY (DESIGN II)

1. Insert retainer thru plastic disc and rubber check valve.

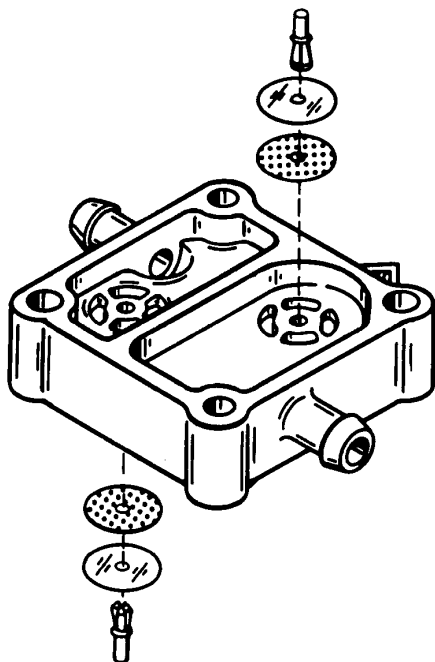


51530

- a - Retainer
- b - Plastic Disc
- c - Check Valve

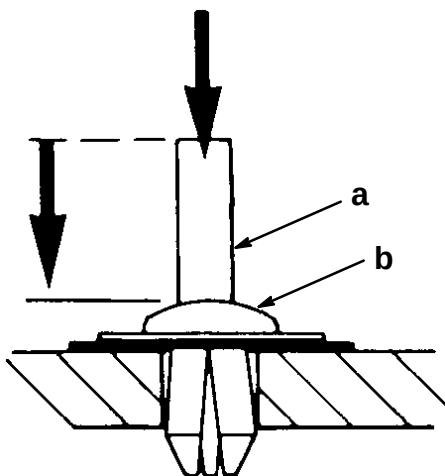


2. Install check valves and retainers into fuel pump body.



51530

3. Reinstall rod into retainer cap and, use a small hammer or hammer and punch to tap rod down into retainer until flush with top of retainer.



a - Rod
b - Retainer Cap

Step-by-Step Reassembly

IMPORTANT: ALWAYS REPLACE GASKETS.

STEP-BY-STEP FUEL PUMP REASSEMBLY

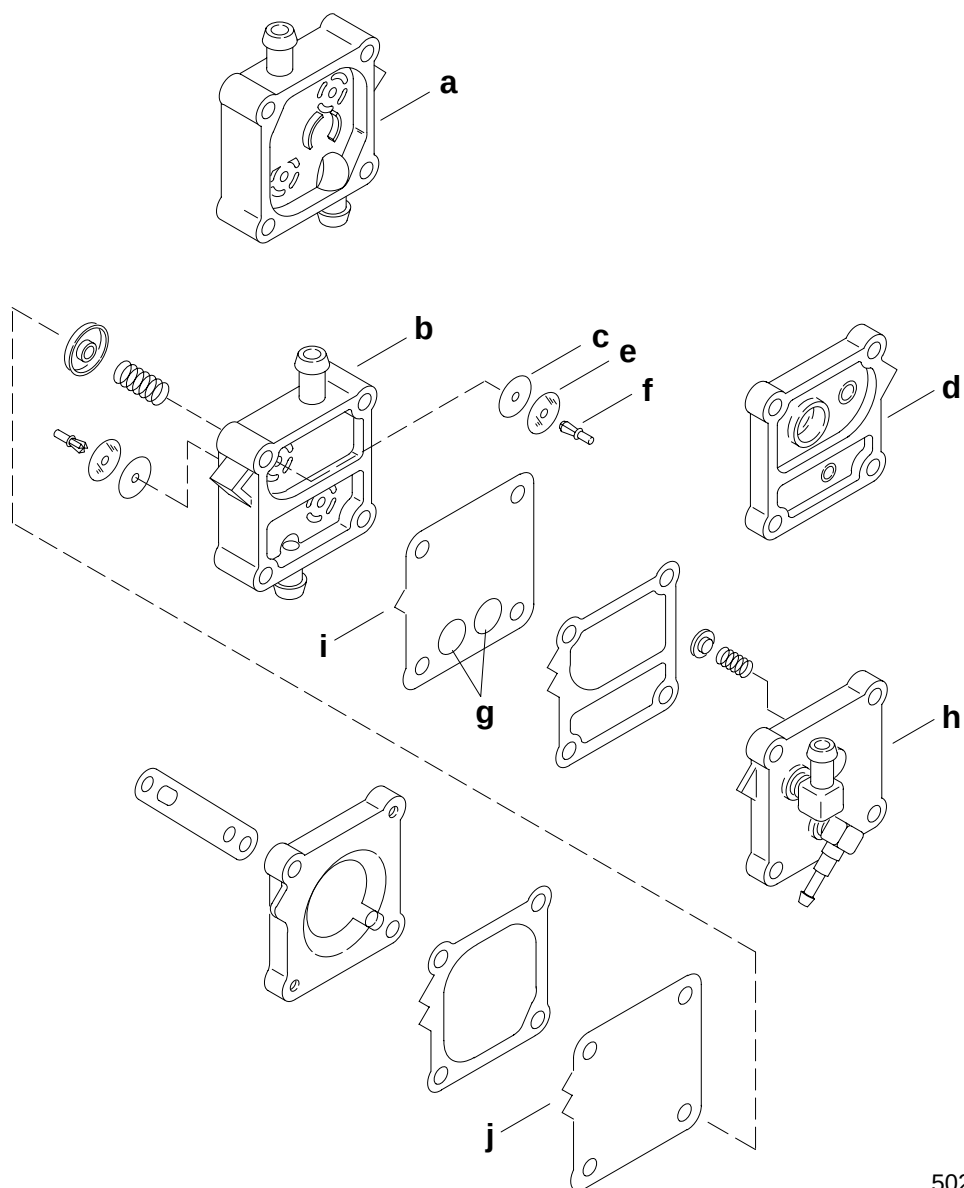
After reassembling check valve in fuel pump body, using the following procedure will help insure proper reassembly:

1. Insert two 3 in. minimum length 1/4" bolts (not the fuel pump bolts) OR 1/4" dowels, through the opposite large holes (6mm bolt holes) in the chamber plate, as locating dowels, and turn plate upside down so that the inner side is facing up.
2. Insert coil spring and cap in place.
3. Place Boost Chamber GASKET over dowels (bolts) and lower onto Chamber Plate -- BE SURE that gasket directional alignment is correct and that "V-tabs" are aligned.
4. Place Boost DIAPHRAGM over dowels, and lower to assembly.
5. Place Fuel Pump Body over dowels, and lower to assembly.
6. Insert Coil Spring and Cap in pump body.
7. Place Fuel Pump DIAPHRAGM over dowels, and lower to assembly.
8. Place Pulse Chamber GASKET over dowels, and lower to assembly.
9. Place Fuel Pump Base over dowels, and lower to assembly.
10. Grasp assembly firmly and clamp together with hands--turn over, and insert the 5mm Fuel Pump BOLTS (hex-head); After tightening, remove dowels (1/4" bolts) used for locators.
11. Check that the directional alignment of all parts is correct and that the "V-Tabs" are aligned.



70-75-80-90 (3 cyl.) (Design 1)

Previous body with rubber check valve retainers was colored black.



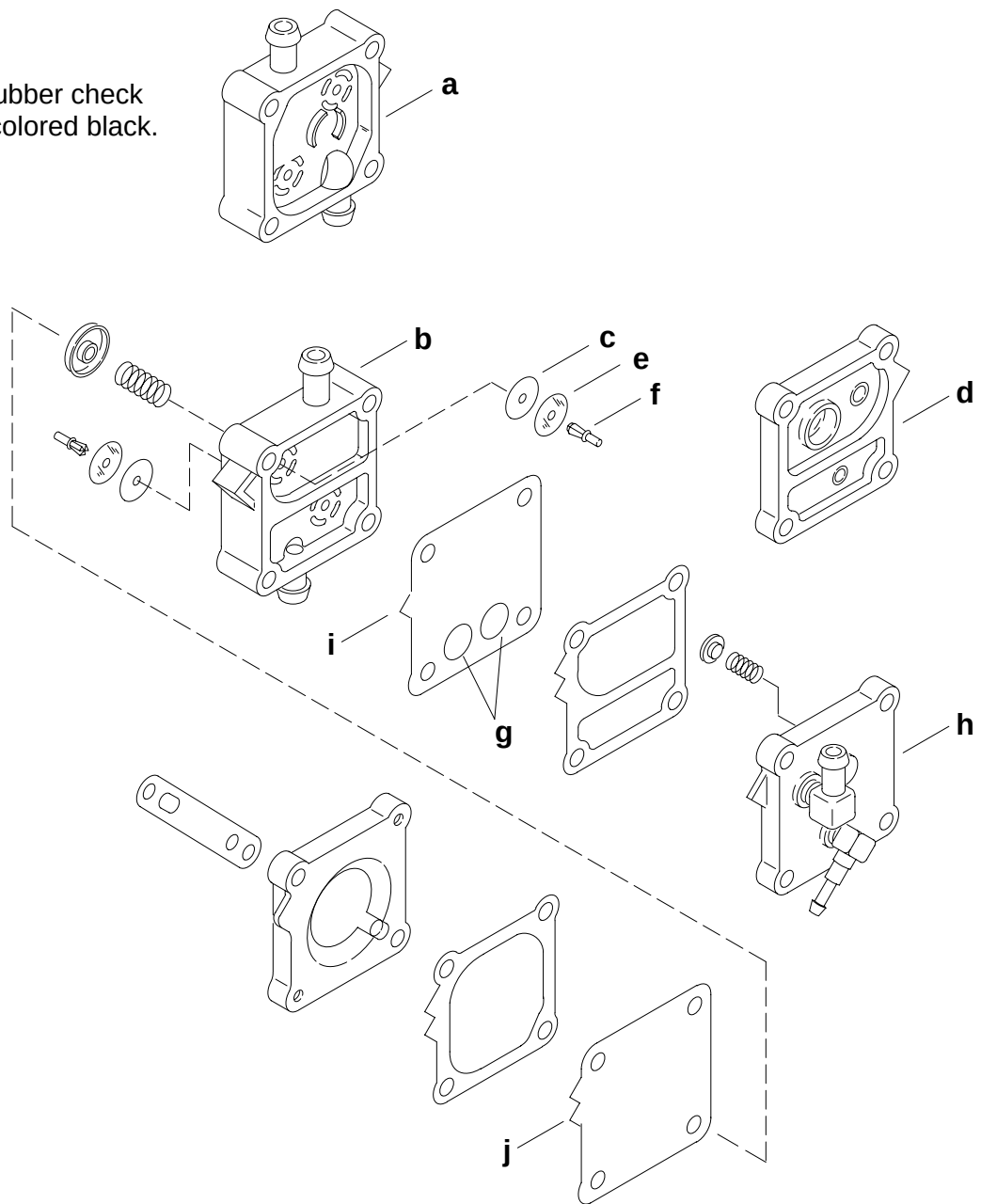
50289

- a - Body (Opposite Side View)
- b - Natural Body (Off White)
- c - Rubber Valve
- d - Cover (Opposite Side View)
- e - Plastic Disc
- f - Plastic Check Valve Retainer
- g - Two Oil Passage Holes
- h - Cast Aluminum Cover
- i - One Tab
- j - Two Tabs



100-115 (4 cyl.) (Design 1)

Previous body with rubber check valve retainers was colored black.



50291

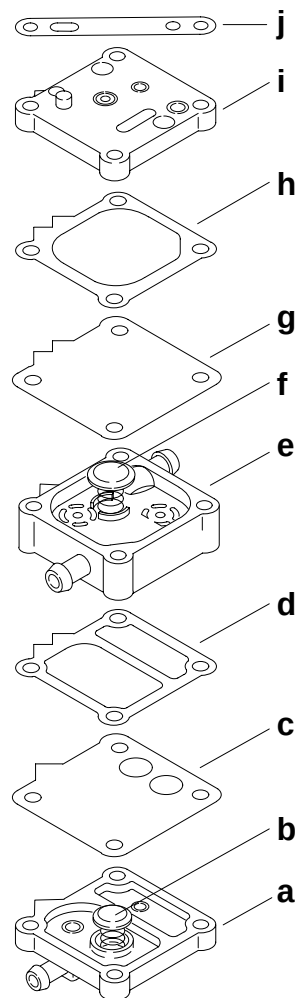
- a - Body (Opposite Side View)
- b - Natural Body (Off White)
- c - Rubber Valve
- d - Cover (Opposite Side View)
- e - Plastic Disc
- f - Plastic Check Valve Retainer
- g - Two Oil Passage Holes
- h - Cast Aluminum Cover
- i - One Tab
- j - Two Tabs



REASSEMBLY SEQUENCE (DESIGN 1)

⚠ CAUTION

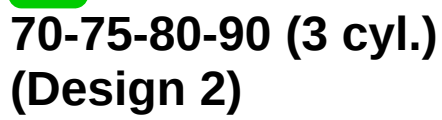
Observe position of both Pulse Chamber DIAPHRAGM and GASKET. The two larger holes allow oil injection output to enter the gas flow. Failure to reinstall as shown **WILL** result in extensive damage to engine.



51119

- a - Chamber Plate (Step 1)
- b - Boost Compression Spring & Cap (Step 2)
- c - Boost Chamber Gasket (Step 3)
- d - Boost Diaphragm (Step 4)
- e - Fuel Pump Body (Step 5)
- f - Main Compression Spring & Cap (Step 6)
- g - Fuel Pump Diaphragm (Step 7)
- h - Pulse Chamber Gasket (Step 8)
- i - Fuel Pump Base (Step 9)
- j - Fuel Pump to Powerhead Gasket - Shown for Identification Purposes Only

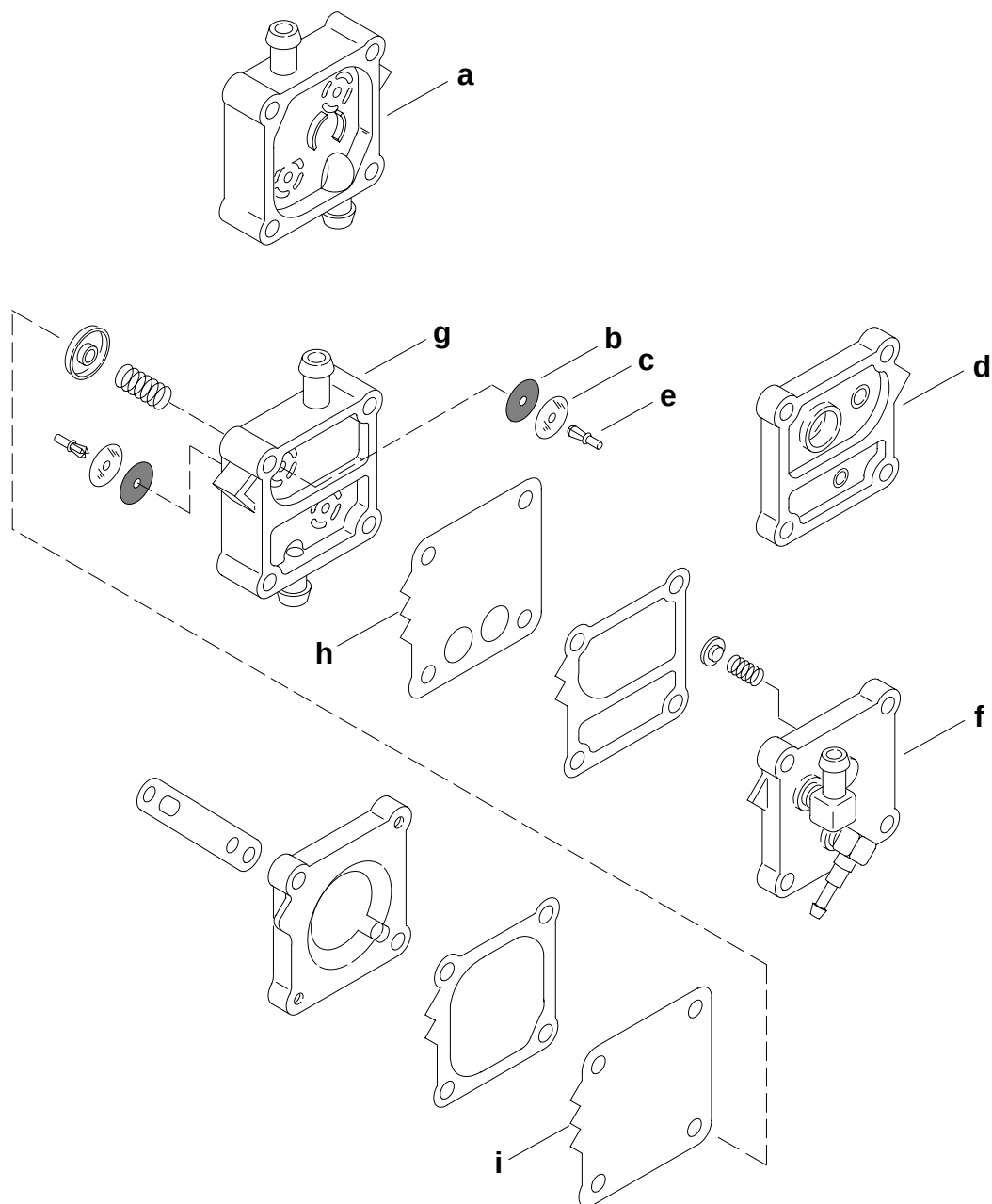
**Reinstalling Fuel Pump to Powerhead -
see preceding page**



- a - Body (Opposite Side View)
- b - Rubber Valve
- c - Plastic Disc
- d - Cover (Opposite Side View)
- e - Plastic Check Valve Retainer
- f - Cast Aluminum Cover
- g - Three Tabs
- h - Three Tabs



100-115 (4 cyl.) (Design 2)



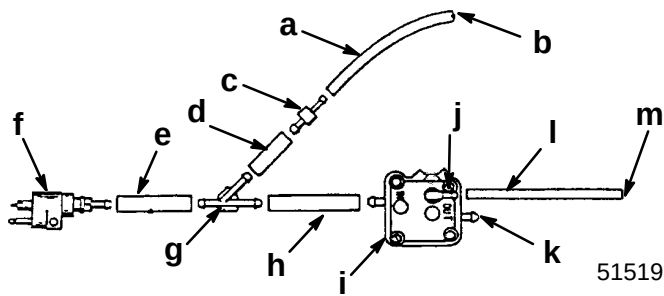
51548

- a - Body (Opposite Side View)
- b - Rubber Valve
- c - Plastic Disc
- d - Cover (Opposite Side View)
- e - Plastic Check Valve Retainer
- f - Cast Aluminum Cover
- g - Body
- h - Three Tabs
- i - Three Tabs



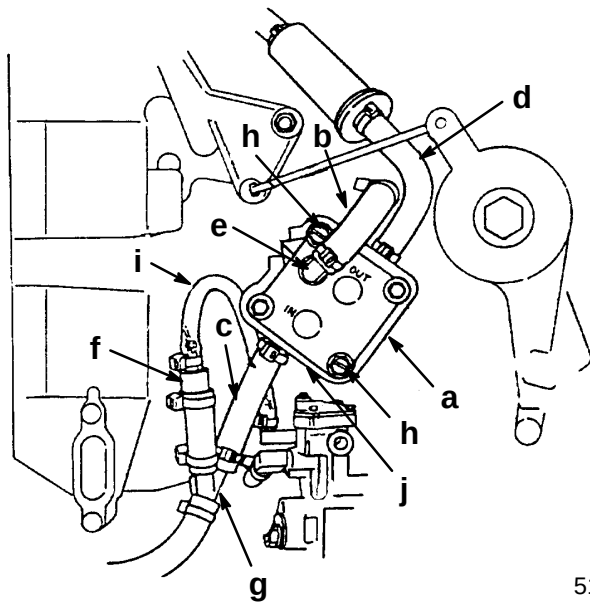
Installation of Design 2 Fuel Pump

MODEL 70, 75, 80, 90



- a - Clear Tube [5.5 in. (139.7mm)]
- b - To Oil Pump Outlet
- c - Check Valve
- d - Hose [1.5 in. (38.1mm)]
- e - Hose [2.5 in. (63.5mm)]
- f - Fuel Line Connector
- g - Y-Fitting
- h - Hose [3 in. (76.2mm)]
- i - Fuel Pump
- j - 90 Degree Elbow
- k - Fuel Outlet to Filter
- l - Hose [2.5 in. (63.5mm)]
- m - To Pulse Fitting on Powerhead

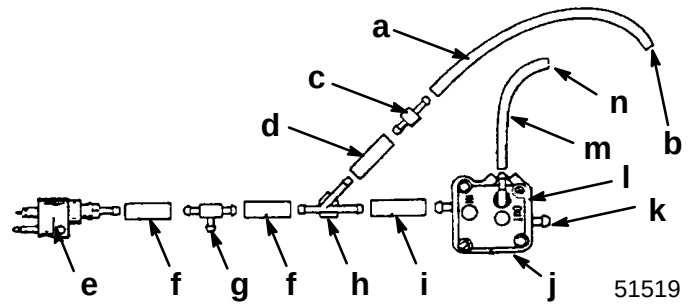
MODEL 70, 75, 80, 90



- a - Fuel Pump
- b - Pulse Hose
- c - Inlet Hose
- d - Outlet Hose (Replace with Molded Hose)
- e - Elbow [Apply PERFECT SEAL (92-34227--1) to threads]
- f - Check Valve
- g - Y-Connector
- h - Screws [Torque to 55 lb. in. (6.2 N·m)]
- i - Clear Tubing [5.5 in. (139.7mm)]
- j - Gasket (Cylinder Block to Fuel Pump) (HIDDEN)

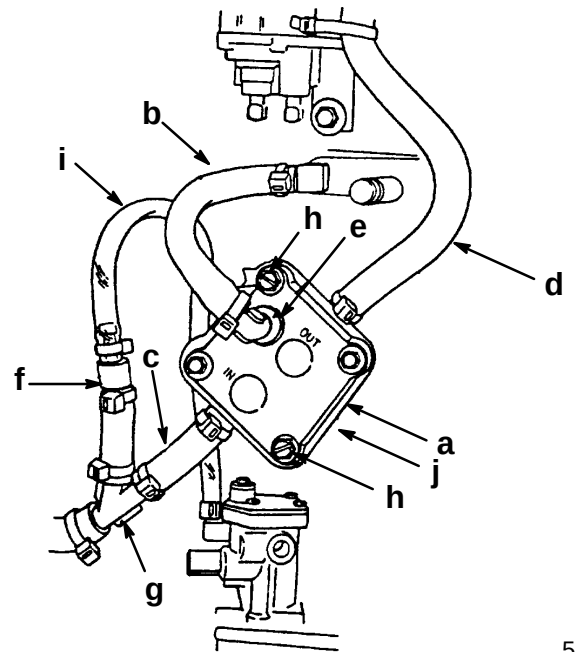
51516

MODEL 100, 115



- a - Clear Tube [8 in. (203.2mm)]
- b - To Oil Pump Outlet
- c - Check Valve
- d - Hose [1.5 in. (38.1mm)]
- e - Fuel Connector
- f - Hose [1.5 in. (38.1mm)]
- g - T-Fitting (EXISTING)
- h - Y-Fitting
- i - Hose [1.75 in. (44.5mm)]
- j - Fuel Pump
- k - Fuel Outlet to Filter
- l - 90 Degree Elbow
- m - Hose [4 in. (101.6mm)]
- n - To Pulse Fitting on Powerhead

MODEL 100, 115



- a - Fuel Pump
- b - Pulse Hose
- c - Inlet Hose
- d - Outlet Hose
- e - Elbow [Apply PERFECT SEAL (92-34227--1) to threads]
- f - Check Valve
- g - Y-Connector
- h - Screws [Torque to 55 lb. in. (6.2 N·m)]
- i - Clear Tubing [8 in. (203.2mm)]
- j - Gasket (Cylinder Block to Fuel Pump) (HIDDEN)

51516



Carburetion

Fuel System Troubleshooting

Troubles, that are caused by items 1-thru-5, listed below, may give the impression that a problem exists in the fuel system:

1. Spark plugs
2. Ignition spark voltage
3. Cylinder compression
4. Reed valves
5. Ignition timing

Troubleshooting Charts

PROBLEM 1: ENGINE TURNS OVER BUT WILL NOT START OR STARTS HARD WHEN COLD

Possible Cause	Corrective Action
Improper starting procedure.	Check procedure, as outlined in "Operation and Maintenance Manual."
Fuel tank empty; improperly mixed fuel; contaminants (water, dirt, etc.) in fuel.	Check fuel in fuel tank and replace or add.
Fuel tank air vent closed or restricted.	Air vent must be open and free from contaminants.
A pinched or restricted fuel line.	Check, and replace as needed.
Dirty or restricted fuel filter.	Check, replace or clean.
Enrichener valve not operating.	Check enrichener system. (Refer to "Enrichener System" following.)
An inlet needle (in carburetor) that is stuck open or closed. (A needle stuck open, will cause a flooding condition. A needle stuck closed, will prevent fuel from entering carburetor.)	Remove, clean, or replace.
Anti-Siphon valve restricting fuel flow.	Refer to "Checking for Restricted Fuel Flow caused by Anti-Siphon Valves", following.

See "Checking for Restricted Fuel Flow caused by Anti-Siphon Valves", page 3A-1.

PROBLEM: ENGINE FLOODS

Possible Cause	Corrective Action
Dirt or foreign particles are preventing inlet needle from seating.	Flush out inlet seat and clean inlet needle.
Worn inlet needle.	Replace.
Punctured float.	Replace.
Incorrect float setting.	Reset float.

PROBLEM: ENGINE RUNS TOO LEAN

Possible Cause	Corrective Action
Carburetor is loose. Air leaks past mixing chamber cover.	Tighten bolts securely. Tighten cover or replace gasket.
Fuel level too low.	Reset float level.
Clogged high speed jet.	Check and clean.
Restricted fuel flow to carburetor.	Check fuel lines and filter(s) for restricted flow.
Incorrect high speed jet.	Refer to main jet chart and replace with proper jet.
Idle mixture set too lean.	Adjust to run richener.
Air leakage into fuel system.	Check fuel line connections, hose clamps, fuel pump, and fuel outlet tube (located in fuel tank) for loose fittings.
Anti-Siphon valve restricting fuel flow.	Refer to "Checking for restricted fuel flow caused by Anti-Siphon valves."

PROBLEM: ENGINE RUNS TOO RICH

Possible Cause	Corrective Action
Fuel level too high.	Reset float to correct level.
Carburetor floods.	See preceding "Engine Floods"
Idle nozzle air holes plugged.	Blow out with compressed air.
Restricted air flow.	Check cowl air inlet and carburetor for obstructions.
Main Fuel Jet loose.	Retighten Jet.



PROBLEM 1: ENGINE IDLES ROUGH AND STALLS	
PROBLEM 2: ENGINE RUNS UNEVEN OR SURGES	
PROBLEM 3: ENGINE WILL NOT ACCELERATE	
Possible Cause	Corrective Action
Fuel tank air vent closed or restricted.	Check - Air vent must be open all-the-way and free from restrictions.
A pinched, cut or restricted fuel line; also loose fuel line connection.	Check all fuel lines and replace as needed. Check and tighten all fuel line connections.
A dirty or restricted fuel filter.	Check, replace, or clean all fuel filters.
Restricted filter in fuel tank.	Clean by rinsing in clean lead-free gasoline or kerosene.
Improperly mixed fuel; contaminants (water, dirt, etc.) in fuel.	Check fuel and replace, if necessary.
An inlet needle (in carburetor) that is either stuck open or closed. (A needle, that is stuck open, will cause a flooding condition. A needle, that is stuck closed, will prevent fuel from entering carburetor.)	Remove and replace with new inlet needle.
Incorrect idle mixture adjustment.	Re-adjust.
Damaged fuel pump diaphragm.	Replace.
Carburetor is loose.	Tighten bolts securely.
Chamber cover leaking air.	Tighten or replace gasket.
Off idle holes plugged.	Blow out with compressed air.
Main nozzle or idle nozzle air bleed holes plugged.	Blow out with compressed air.
Improper main jet or restricted jet.	Clean or replace with proper jet (refer to "Main Jet Chart").
Damaged reed(s).	Inspect reeds as outlined in Section 4A.
A crack in the fuel pick-up outlet tube (located in fuel tank).	Replace.

A crack in the fuel outlet tube (located in fuel tank.)	Replace.
Anti-Siphon valve restricting fuel flow.	Refer to "Checking for Restricted Fuel Flow Caused by Anti-Siphon Valves," following.

PROBLEM: FUEL BLOW-BACK OUT OF CARBURETOR	
Possible Cause	Corrective Action
Chipped/Broken (reed-block) Reeds	Replace Reeds.
PROBLEM: ROUGH IDLE	
If related to reed-block, indicates excessive preload in reeds.	Replace Reeds.
PROBLEM: CAN'T REDUCE ENGINE RPM TO SLOW IDLE	
Multiple Chipped Reeds.	Replace Reeds.

Checking for Restricted Fuel Flow Caused by Anti-Siphon Valves

While anti-siphon valves are helpful from a safety standpoint, they clog, they may be too small, or they may have too heavy a spring. The pressure drop across these valves can, create operational problems and/or powerhead damage by restricting fuel. Some symptoms of restricted (lean) fuel flow, are:

1. Loss of fuel pump pressure
2. Loss of power
3. High speed surging
4. Preignition/detonation (piston dome erosion)
5. Outboard cuts out or hesitates upon acceleration
6. Outboard runs rough
7. Outboard quits and cannot be restarted
8. Outboard will not start
9. Vapor lock

Any type of anti-siphon device must be located between the outboard fuel inlet and fuel tank outlet. A method of checking [if such a device (or bad fuel) is a problem source] is to operate the outboard with a separate fuel supply which is known to be good.

If, it is found that the anti-siphon valve is the cause of the problem, either 1) replace the anti-siphon valve or 2) replace it with a solenoid-operated fuel shutoff valve.



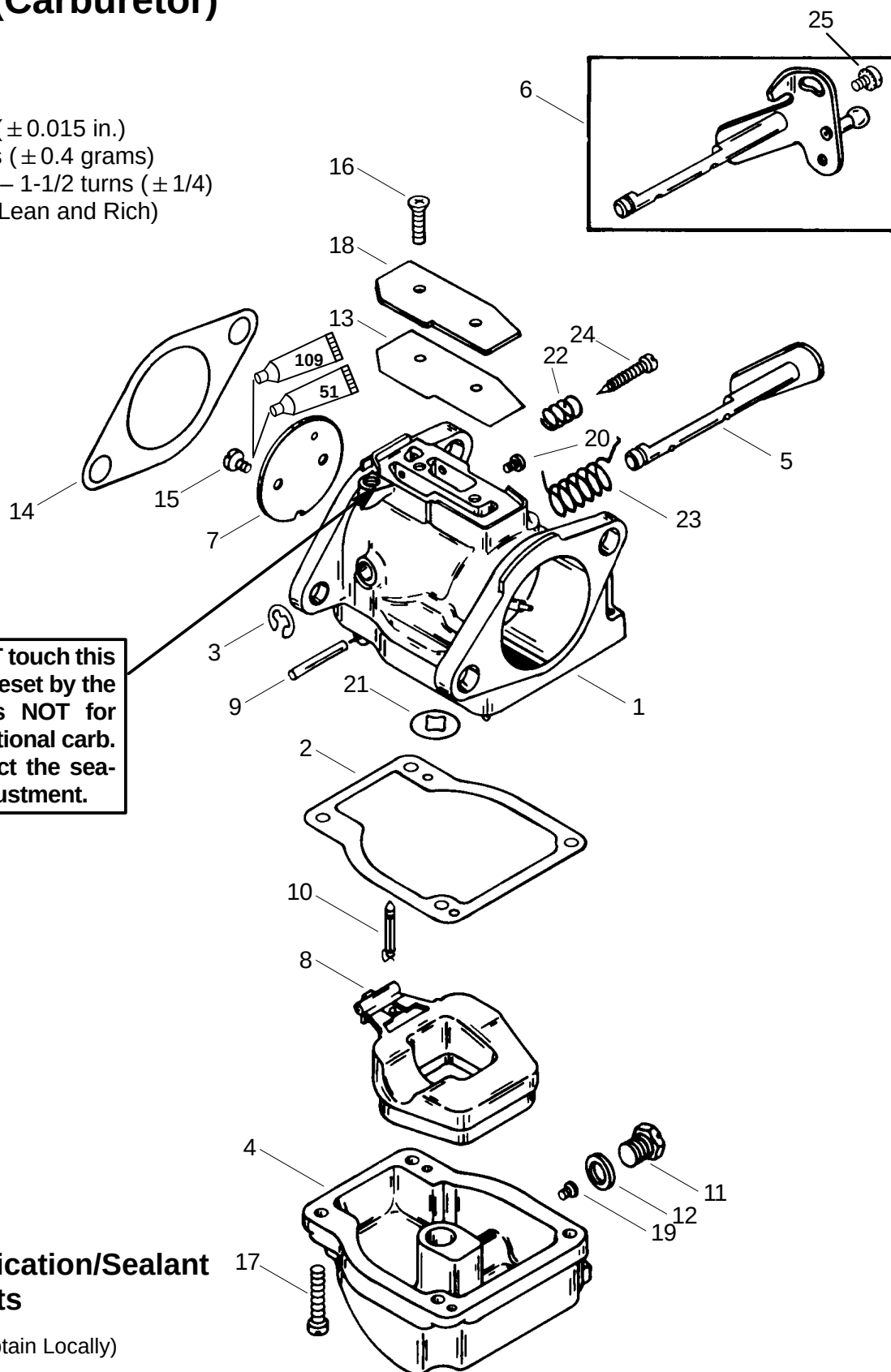
Fuel System (Carburetor)

Specifications

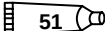
Float Setting – 7/16 in (± 0.015 in.)

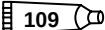
Float Weight – 7 grams (± 0.4 grams)

Idle Adjustment Screw – 1-1/2 turns ($\pm 1/4$)
(Set Halfway Between Lean and Rich)



Quicksilver Lubrication/Sealant Application Points

 51 Loctite 222 (Obtain Locally)

 109 Loctite Primer "T" (92-59327-1)



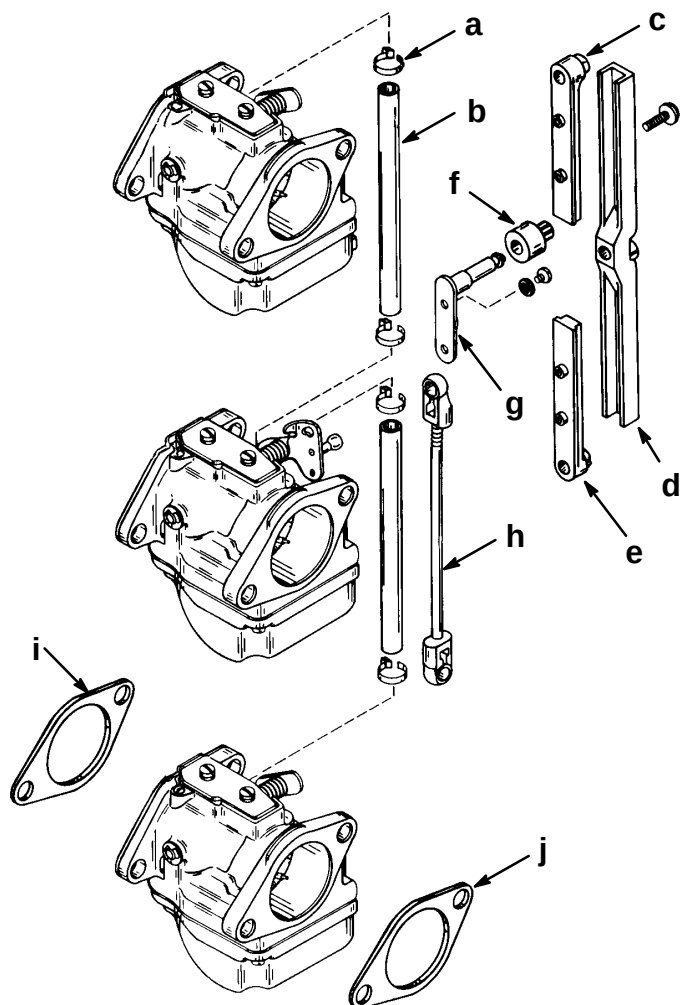
Fuel System (Carburetor) (Continued)

REF. NO.	QUAN.	DESCRIPTION	TORQUE		
			lb. in.	lb. ft.	N·m
1	1	Carburetor Body			
2	1	Gasket			
3	1	Retaining Ring			
4	1	Fuel Bowl			
5	1	Throttle Shaft (Upper/Bottom)			
6	1	Throttle Shaft (Center)			
7	1	Throttle Valve			
8	1	Float			
9	1	Float Shaft			
10	1	Inlet Needle Valve			
11	1	Plug	22		2.5
12	1	Gasket			
13	1	Gasket			
14	1	Gasket			
15	2	Screw	6		0.7
16	2	Screw	18		2.1
17	2	Screw	18		2.1
18	1	Cover Plate			
19	1	Main Jet	14		1.6
20	1	Vent Jet	6		0.7
21	1	Gasket			
22	1	Spring			
23	1	Spring			
24	1	Idle Mixture Screw			
25	1	Screw			



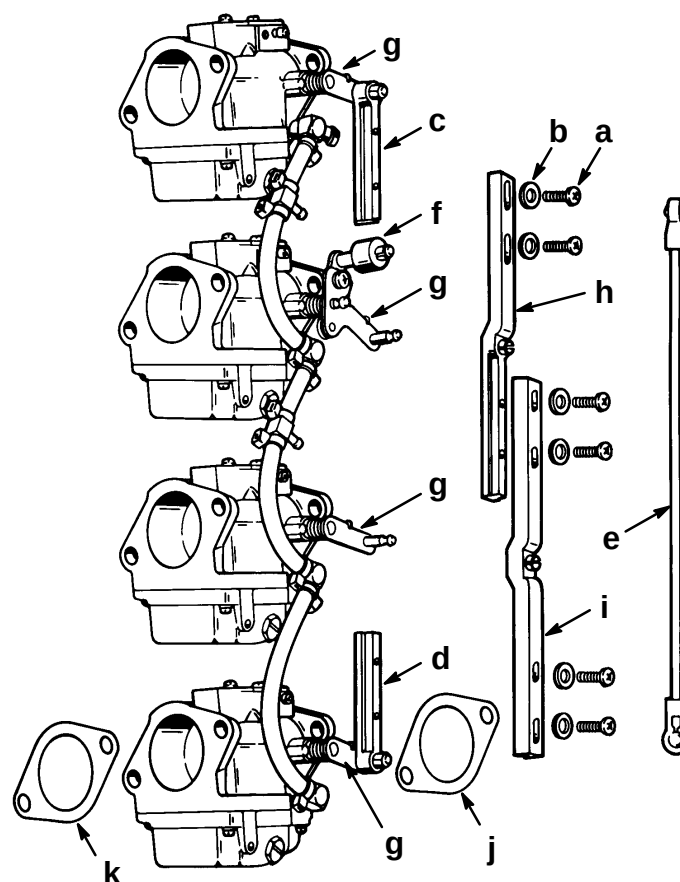
Fuel System (Linkage)

3 Cylinder Carburetor/Linkage Arrangement



- a - Sta-Straps (4)
- b - Fuel Liners (2)
- c - Throttle Link
- d - Throttle Arm
- e - Throttle Link
- f - Roller
- g - Arm
- h - Oil Injection Pump Link
- i - Gasket
- j - Gasket

4 Cylinder Carburetor/Linkage Arrangement



- a - Screw (6)
- b - Washer (6)
- c - Carburetor Link
- d - Carburetor Link
- e - Oil Injection Pump Link Rod
- f - Roller
- g - Throttle Shaft
- h - Throttle Link
- i - Throttle Link
- j - Gasket
- k - Gasket



Carburetor Adjustments

INITIAL STARTING ADJUSTMENT

After service or replacement of carburetor, turn low speed mixture screw adjustment in (CLOCKWISE) until it seats **LIGHTLY** – then back off (each carburetor) the number of turns per model as indicated, following:

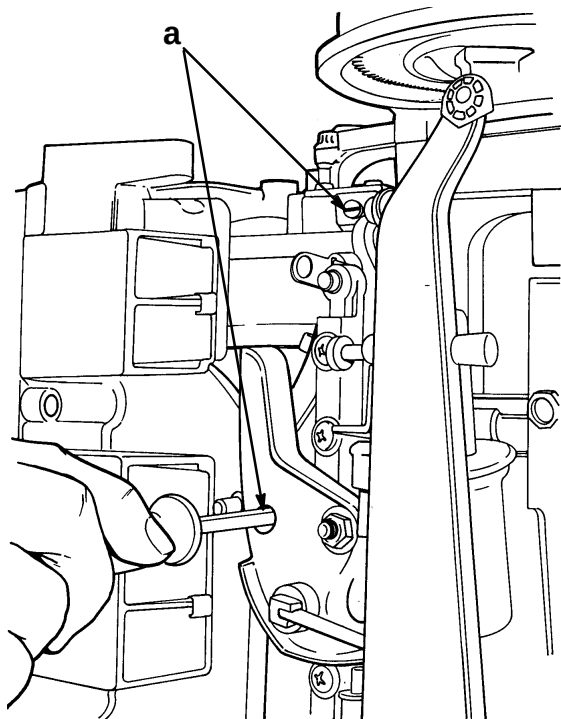
70 H.P. --- 1-1/4	90 H.P. --- 1-1/2
75 H.P. --- 1-1/2	100 H.P. --- 1-3/4
80 H.P. --- 1-1/2	115 H.P. --- 1-1/2

This adjustment will permit engine startup.

LOW SPEED MIXTURE ADJUSTMENT

NOTE: Only the top two carburetors on four cylinder models have adjustable idle mixture screws.

1. Start engine and allow to warm-up (run for several minutes). Throttle back engine to idle for about one minute to allow RPMs to stabilize.
2. With engine running at idle speed -- in water -- IN FORWARD GEAR (prop on) -- turn low speed mixture screw IN (clockwise) until engine starts to "bog" down and misfire. Back out 1/4 turn or more.

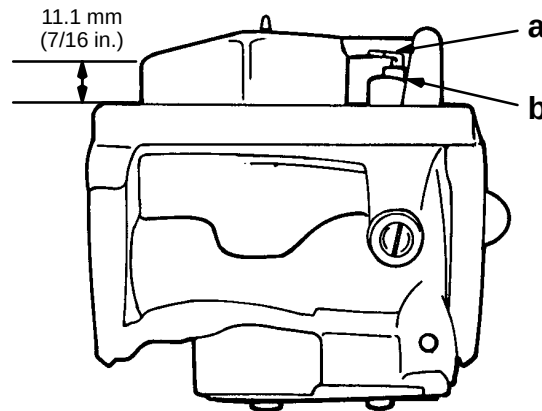


a - Low Speed Mixture Screw

3. Check for too lean mixture on acceleration.
4. **DO NOT** adjust leaner than necessary to attain reasonably smooth idling. When in doubt, stay on the slightly rich side of the adjustment.

CARBURETOR FLOAT ADJUSTMENT

1. If installed, remove carburetor as outlined in "Carburetor Removal", following.
2. Remove fuel bowl and gasket and check float level as shown.
3. If necessary, adjust float level by bending metal tab on float to which inlet needle is clipped.



a - Metal Tab
b - Inlet Needle



Specification Sheet - WME Carburetors

Carburetor Number Stamped at TOP of carburetor mounting flange.

NOTE: Early model engines may have identification stamped on face of air box mounting flange.

Carburetor Number	Location	Model H.P.	Main Jet*	Bowl Vent Jet*
WME-9 - 1 2 3	Top Carburetor Center Carburetor Bottom Carburetor	80	.064	.094
WME-7 - 1 2 3	Top Carburetor Center Carburetor Bottom Carburetor	70	.072	.094
WME-10 - 1 2 3	Top Carburetor Center Carburetor Bottom Carburetor	90	.072	.094
WME-8 - 1 2 3	Top Carburetor Center Carburetor Bottom Carburetor	75	.068	.094
WME-11 - 1 2 3 4	Top Carburetor Top Center Carburetor Bottom Carburetor Bottom Carburetor	100	.054	NONE
WME-14 - 1 2 3 4	Top Carburetor Top Center Carburetor Bottom Carburetor Bottom Carburetor	115	.076	NONE

* Standard Jets listed are for operation of engine from 0'-2500 ft. (0-762 M) of elevation.
See page 3A-12 (this section) for jet-size chart.

CARBURETOR FASTENER TORQUES:

Main Jet	14 lb. in. (1.6 N·m)
Main Jet Cap Plug	22 lb. in. (2.5 N·m)
Float Bowl	18 lb. in. (2.1 N·m)
Throttle Plate Screw	6 lb. in. (0.7 N·m)
	(Loctite® 609 used, OR: RC-35 – WITH PRIMER OR: Loctite 222 – WITH PRIMER)
Cover Plate Screw	18 lb. in. (2.1 N·m)
Back Drag Jet	6 lb. in. (0.7 N·m)
Carb. (Air Box) Stud Nuts (6)	100 lb. in. (11.3 N·m)

SETTINGS:

Float Setting	7/16° (±.015) See photo/diagram (this section), page 3A-18
Float Weight	7 grams (± 1 gr.) (.4 gr./cc)
Idle Adjust Screw	1-1/2 turns (± 1/4 turn) (set half-way between lean and rich).

FUEL PUMP SPECIFICATIONS:

Fuel Pump Assembly Bolts	55 lb. in. (6.2 N·m)
Fuel Pump Mounting Screws	55 lb. in. (6.2 N·m)

FUEL PUMP PRESSURE:

Engine Side at W.O.T.	4-6 psi. (depending on RPMs)
-----------------------	---------------------------------

SEALANTS:

Fuel Pump Check Valve Assembly	Loctite® Pipe Sealant w/teflon
Carb Throttle Plate Screw:	Loctite® 609 OR: RC-35 WITH PRIMER OR Loctite 222 WITH PRIMER

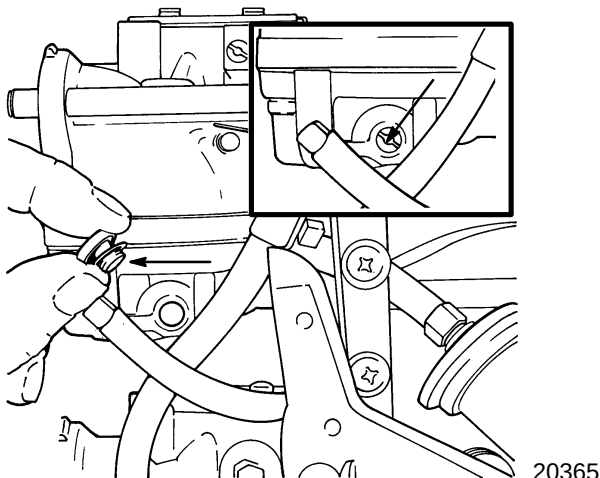


IDLE SPEED ADJUSTMENT

Adjust engine idle RPM as outlined in Section 2C "Timing/Synchronizing/Adjusting".

MAIN (HIGH SPEED) JET ADJUSTMENT

The carburetor is equipped with a fixed high speed jet and normally no adjustment is required. However, extreme changes in weather (temperature and humidity) and/or elevation may result in a too lean or rich fuel mixture at wide-open-throttle, which may require a change in the high speed jet. A smaller size main jet will lean the fuel mixture, and a larger size jet will enrichen the fuel mixture.



STANDARD HIGH SPEED JET CHART

Model	Carburetor Number	Main Jet Size (inch)	Bowl Vent Jet (inch)
70	WME-7	.072	.094
75	WME-8, 17	.068	.094
80	WME-9	.064	.094
90	WME-10 WME-19	.072 .066	.094 .094
100	WME-11, 20	.054	NONE
115	WME-14, 21	.076	NONE

REJETTING CARBURETORS FOR HIGH ALTITUDE OPERATION

The carburetor jet installed at the factory is for engine operation at sea level through an elevation of 5000 feet (1524m) above sea level. If the engine is to be operated at an altitude higher than 5000 feet (1524m), then it will be necessary to rejet the carburetors. Refer to the jet chart following for jet recommendations at approximate altitudes.

Normally, for every 1000 feet (304.8m) of altitude increase, main jet size is reduced by 2%. However, this does not always hold true for all situations; different boat, motor, load and ambient air temperature conditions may require different jets – I.E. – going a jet size richer than recommended for a particular altitude may improve acceleration. It may also be noted that no noticeable improvement in engine performance was achieved by changing the standard main jet at altitudes up to 5000 feet (1524m). Above 5000 feet, however, changing jets did improve performance.

Several additional changes to improve engine performance at higher altitudes are as follows:

1. Idle timing should be advanced 2-3 degrees at 5000 feet (1524m) and above.
2. Prop engine at the top of the recommended RPM scale +/-150 RPM.
3. Reset idle mixture screws for best idle. With standard idle mixture setting (sea level) considered to be at the 12 o'clock position, adjust the mixture screw leaner for all models as follows:

5000 ft. (1524m)	7500 ft. (2286m)	10000 ft. (3048m)
1 o'clock	1 o'clock	2 o'clock

4. Change gear ratio:

Model	Above 5000 ft. (1524m)
70, 75, 80, 90 – Std. Ratio – 2.33:1	None Available
100, 115 – Std. Ratio – 2.08:1	2.33:1

HIGH ALTITUDE JET CHART

Model	Carb	Std. Jet	5000 ft. (1524m)	7500 ft. (2286m)	10000 ft. (3048m)
70	WME-7	.072	.072	.070	.068
75	WME-8, 17	.068	.068	.066	.064
80	WME-9	.064	.064	.062	.060
90	WME-10 WME-19	.072 .066	.072 .066	.068 .062	.066 .060
100	WME-11, 20	.054	.054	.050	.048
115	WME-14, 21	.076	.076	.072	.068



JET ORIFICE SIZE/PART NUMBER CHART

NOTE: Thread size for jets is 10-32.

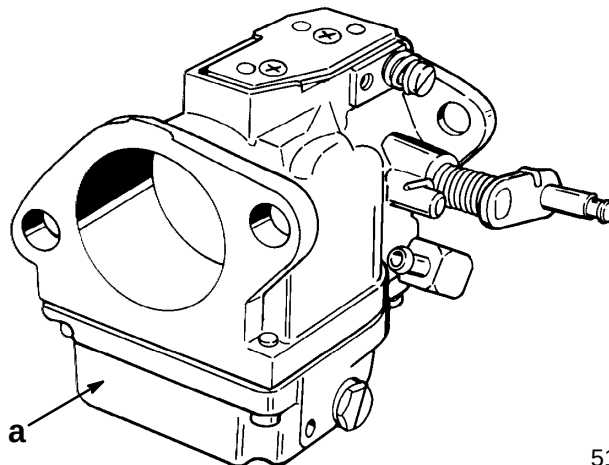
JET ORIFICE SIZE/PART NUMBER CHART			
Jet Orifice Size (Inches)	Part Number	Jet Orifice Size (Inch)	Part Number
.040	19266040	.058	1395-7831
.042	1399-5315	.060	1395-6487
.044	1395-7394	.062	1399-4217
.046	1399-5317	.064	1399-4216
.048	1395-6246	.066	1399-4215
.050	1395-6028	.068	1395-6029
.052	1395-6359	.070	1395-6030
.054	1399-5225	.072	1395-6207
.056	1399-5213	.074	1399-3794
.076	1399-3796	.094	1395-8423
.078	1395-6680	.096	1399-6249
.080	1395-6201	.098	1395-7335
.082	1399-3518		
.084	1399-3517		
.086	1395-5815		
.088	1395-6202		
.090	1395-6247		
.092	1395-5733		

CARBURETOR REMOVAL AND DISASSEMBLY

Carburetor Removal - remove the six nuts (on carb studs), and lift off carburetor assembly. See Section 4A, this manual, for step-by-step procedure.

To Disassemble

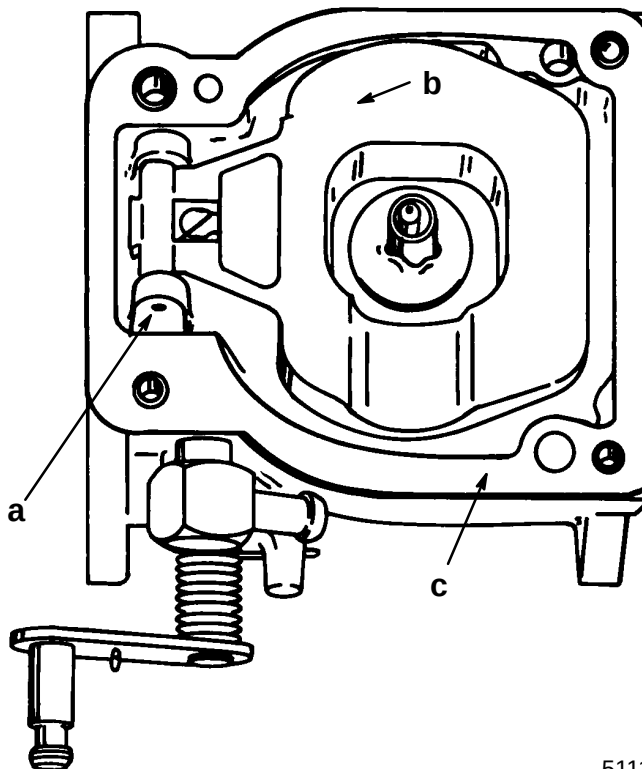
- Remove fuel bowl.



51119

a - Fuel Bowl

- Remove float pin and remove float.
- Remove fuel bowl gasket.

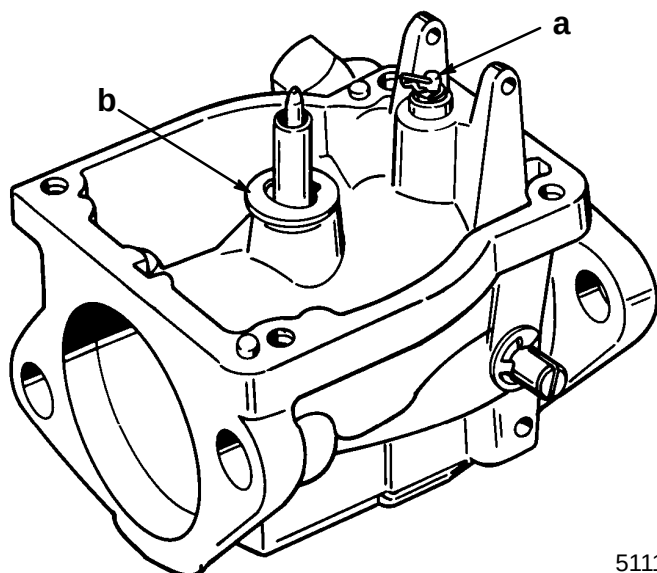


51115

a - Float Pin
b - Float
c - Gasket

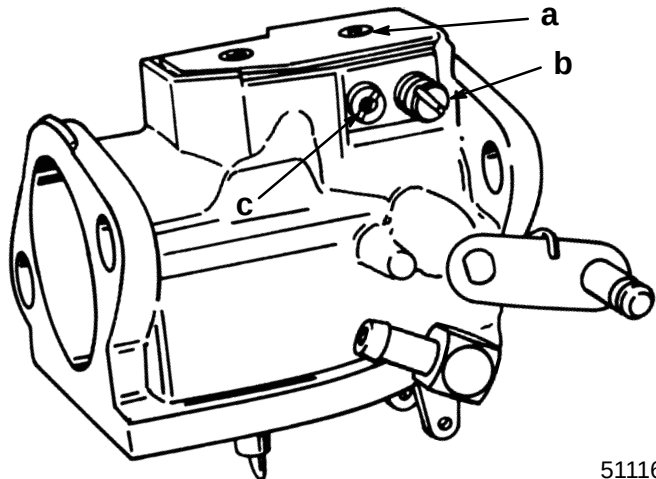


- Remove fuel inlet needle.
- Remove stem gasket.



a - Fuel Inlet Needle
b - Stem Gasket

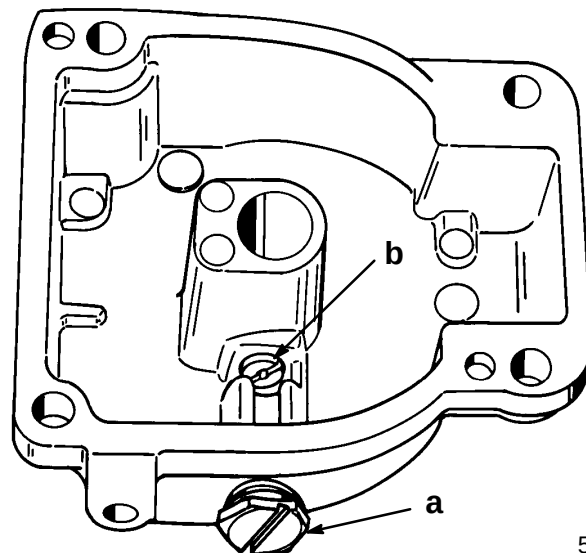
- Remove mixing chamber cover and gasket.
- Remove low speed mixture screw.
- Remove bowl vent jet (black drag) (3-Cylinder Models only).



a - Mixing Chamber Cover and Gasket
b - Idle Mixture Screw
c - Bowl Vent Jet

Carburetor Disassembly

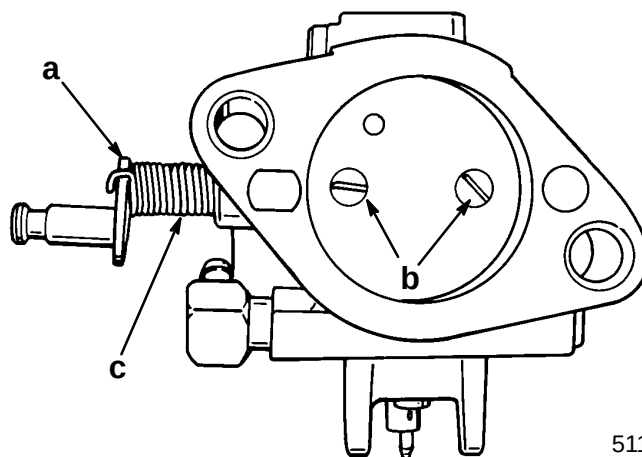
- Remove main jet plug and gasket.
- Remove main jet.



a - Main Jet Plug and Gasket
b - Main Jet

NOTE: It is not necessary to disassemble carburetor beyond this point for cleaning. Examine throttle shaft for wear and inspect for damaged throttle shutter plate.

If removal of throttle shaft and/or throttle shutter plate is necessary, remove 2 screws, which secure throttle shutter plate to throttle shaft. Remove retaining clip from end of throttle shaft, then pull shaft out of carburetor.



a - Throttle Shaft
b - Screw (2)
c - Throttle Shaft Spring

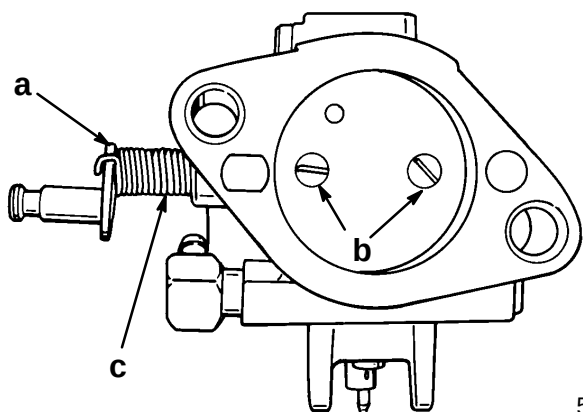


CLEANING AND INSPECTION

1. Carefully inspect carburetor body and fuel bowl for cracks, stripped threads, plugged or restricted passages and passage plugs that show signs of leakage.
2. Thoroughly clean all carburetor parts with a mild cleaning solution (that will not damage rubber or plastic) to remove dirt, gum and varnish that may have accumulated.
3. After washing parts, blow parts dry with compressed air. Be sure to blow air thru all passages, orifices and nozzles.
4. Check float hinge in the float pin area for wear and check float for leaks. Replace parts as necessary.
5. Examine inlet needle for wear. If worn, replace with new inlet needle.

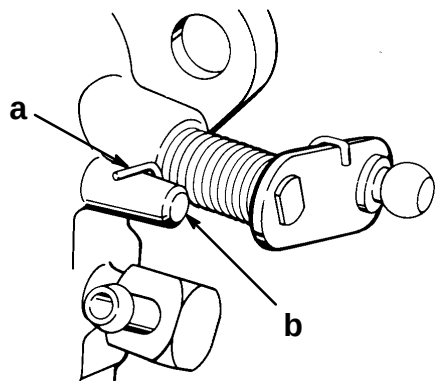
Carburetor Reassembly

- If removed, install throttle shaft throttle shutter plate — 2 screws (use specified Loctite®), and throttle shaft spring as shown. Install retaining clip on other end of shaft.



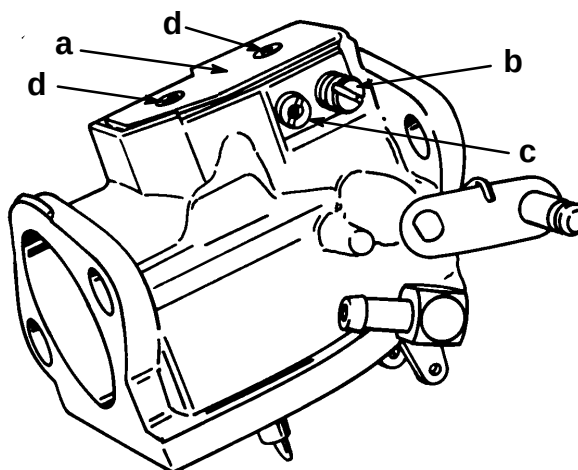
- a - Throttle Shaft
b - Screws (2)
c - Throttle Shaft Spring

- Spring “tensions on stud”.



- a - Spring
b - Stud

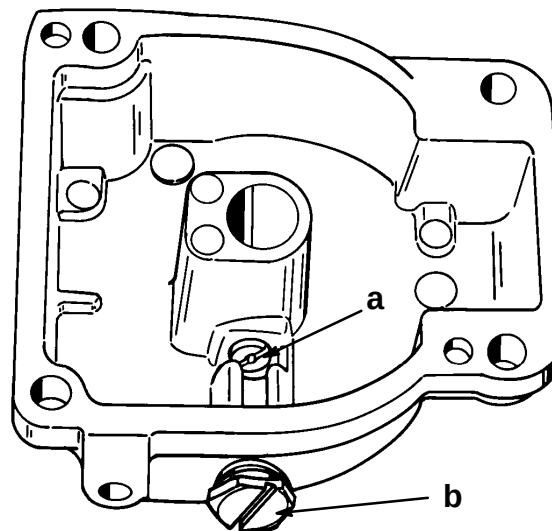
- Install mixing chamber cover and gasket as shown.
- Install low speed mixture screw.
- Install bowl vent jet (back drag) (3-Cylinder Models only).



51116

- a - Mixing Chamber Cover and Gasket
b - Idle Mixture Screw
c - Bowl Vent Jet
d - Screw (2) Torque 18 lb. in. (2.1 N·m)

- Install main jet.
- Install main jet plug and gasket.

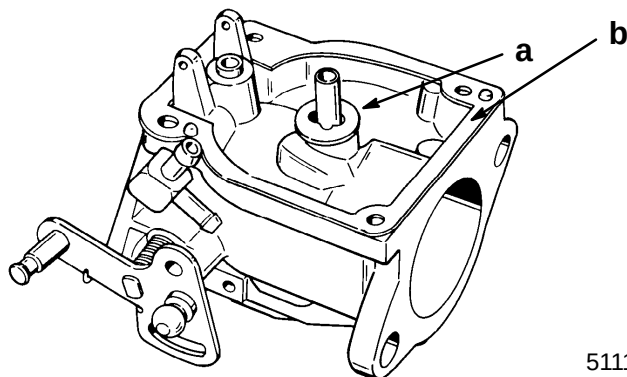


51116

- a - Main Jet [Torque 14 lb. in (1.6 N·m)]
b - Main Jet Plug and Gasket [Torque 22 lb. in. (2.5 N·m)]



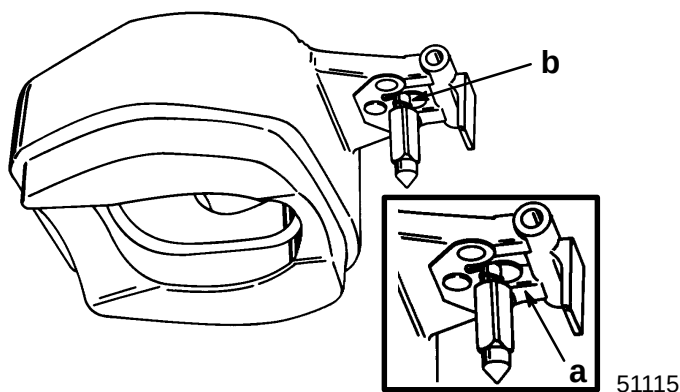
- Install stem gasket.
- Install fuel bowl gasket.



a - Stem Gasket
b - Fuel Bowl Gasket

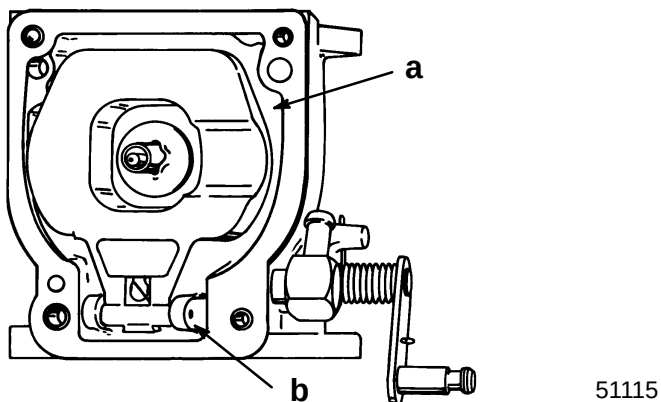
NOTE: If spring clip on inlet needle was removed, or if needle was replaced, be sure spring clip is reattached.

- Attach spring clip on inlet needle to metal float tab and place needle into its seat.



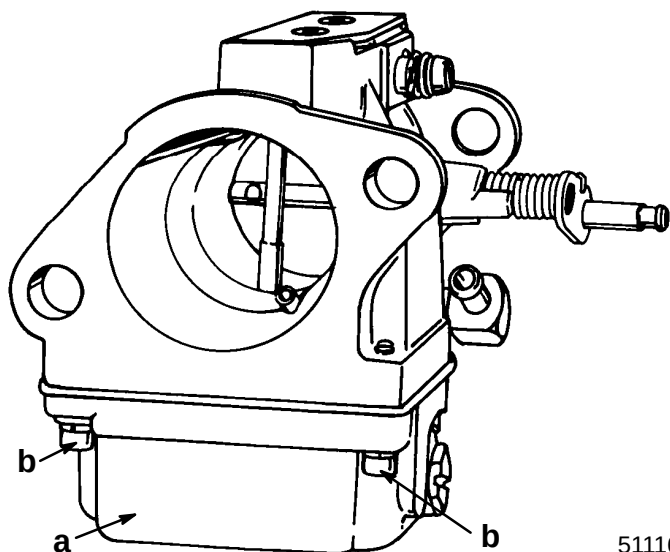
a - Spring Clip
b - Float Tab

- Install float into carburetor with float pin.
- Adjust float following "Float Adjustment," Page 3A-18.



a - Float
b - Float Pin

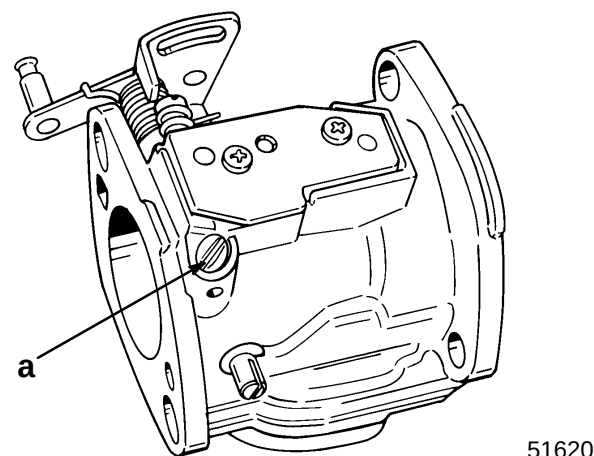
- Install float bowl.



a - Float Bowl
b - Screw (4) Torque 18 lb. in. (2.1 N·m)

IDLE AIR SCREW

Idle air screw is preset by the manufacturer and is NOT for field service. If the idle air screw should become misadjusted, set air screw at 1/4 TURN OUT from a LIGHTLY SEATED position.



a - Idle Air Screw

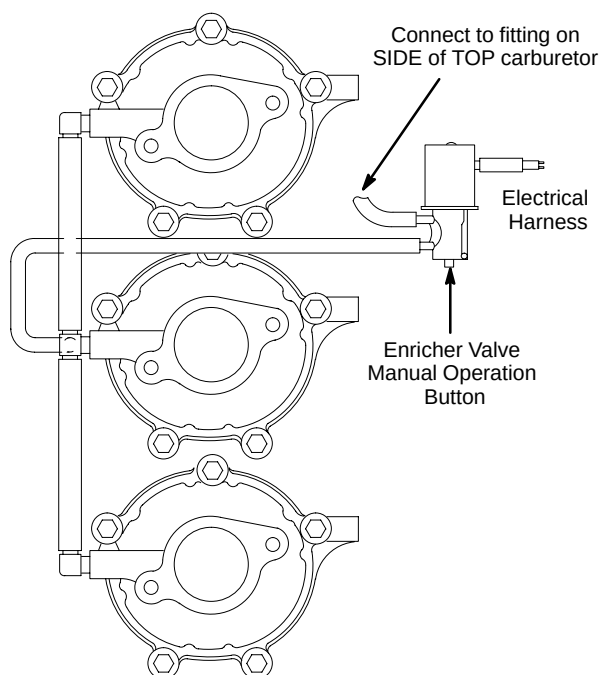


Enrichener System

Description for Three Cylinder Engines

Fuel flows from top carburetor float bowl to fuel enrichment valve. Valve is electrically opened when key is turned to the "ON" position and pushed in (and held in). Fuel is supplied to engine through fittings located in the top, middle, and bottom carburetors. Valve returns to the closed position when key (or choke button) is released. Valve can be operated manually by PRESSING and HOLDING button located at bottom of valve.

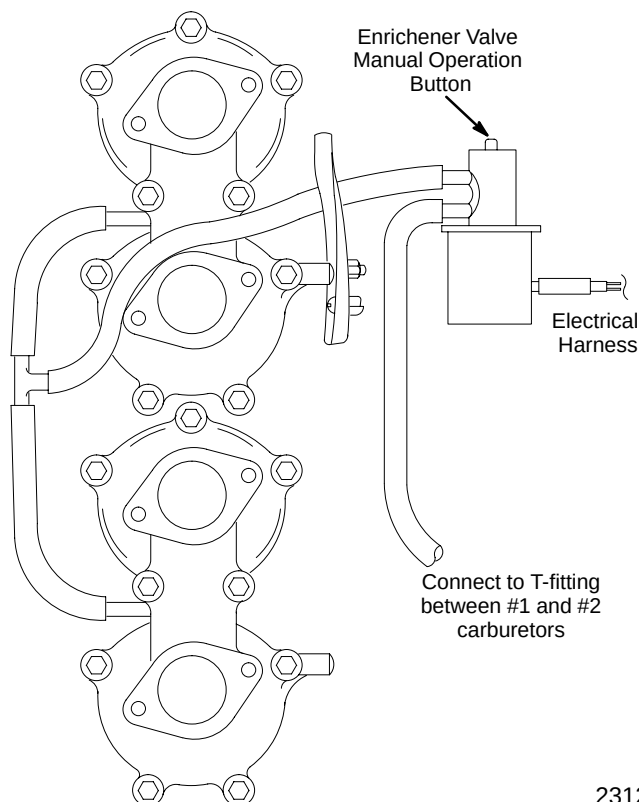
Enrichener Valve Hose Installation - Three Cylinder Engines



Description for Four Cylinder Engines

Enrichener valve receives fuel from a T-fitting between #1 and #2 carburetors. Valve is electrically opened when ignition key is turned to the "ON" position and pushed in (and held in). Fuel is dispensed to T-fittings on intake manifold of cylinders #2 and #4. Internal passages route fuel from cylinders #2 and #4 to cylinders #1 and #3. Valve returns to the closed position when key (or choke button) is released. Valve can be operated manually by PRESSING and HOLDING button located on top of valve.

Enrichener Valve Hose Installation - Four Cylinder Engines

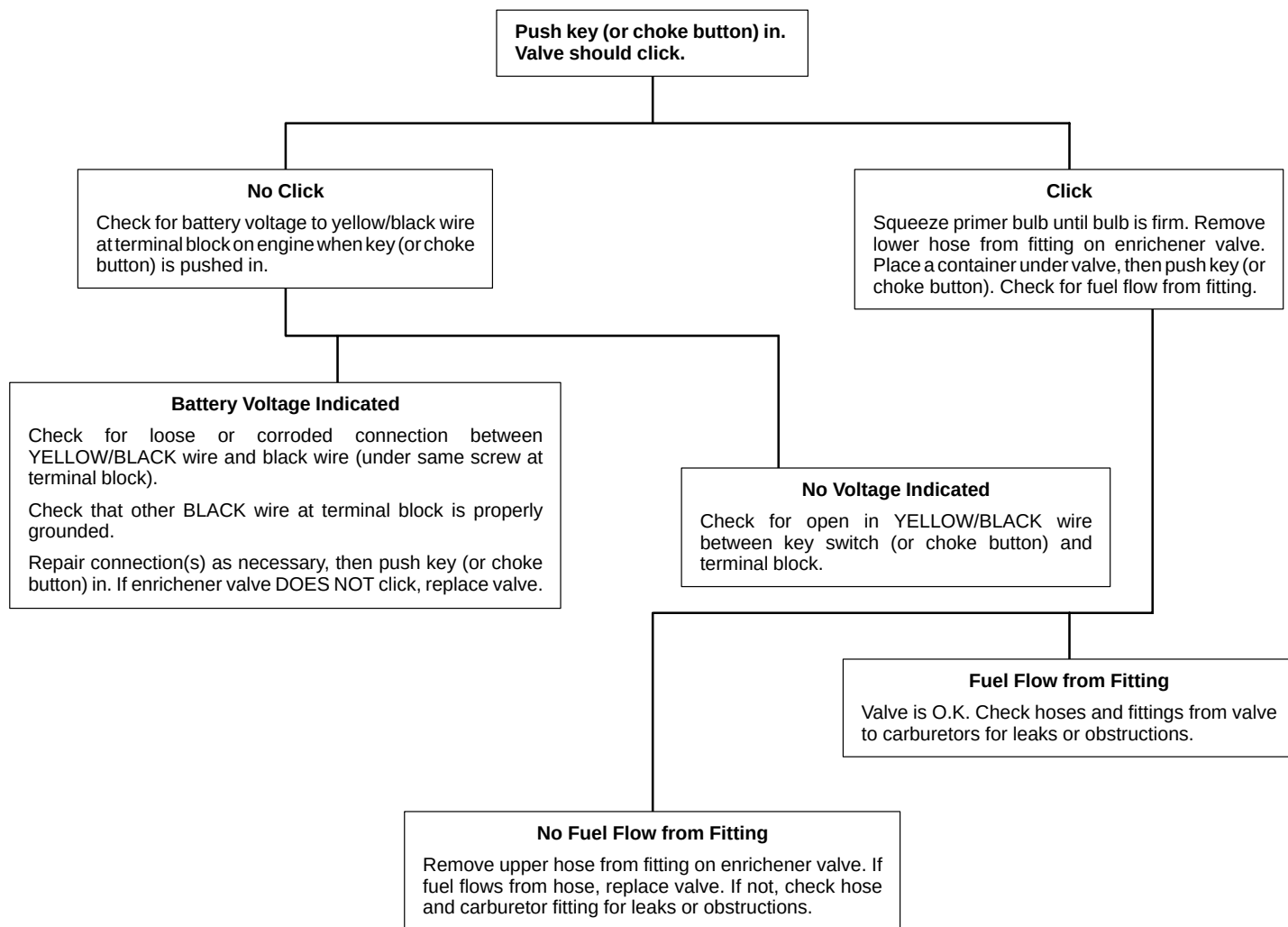


23121



IMPORTANT: Use of enricher if engine is warm could result in engine flooding.

ENRICHENER VALVE TEST





Acceleration Pump Circuit Operation - Four Cylinder Engines

ACCELERATOR PUMP - Receives pressurized fuel from T-fitting in fuel line between #1 and #2 carburetors. Pump is actuated by throttle cam. Pumps to two check valve/injector nozzles in #3 and #4 cylinder boost passages.

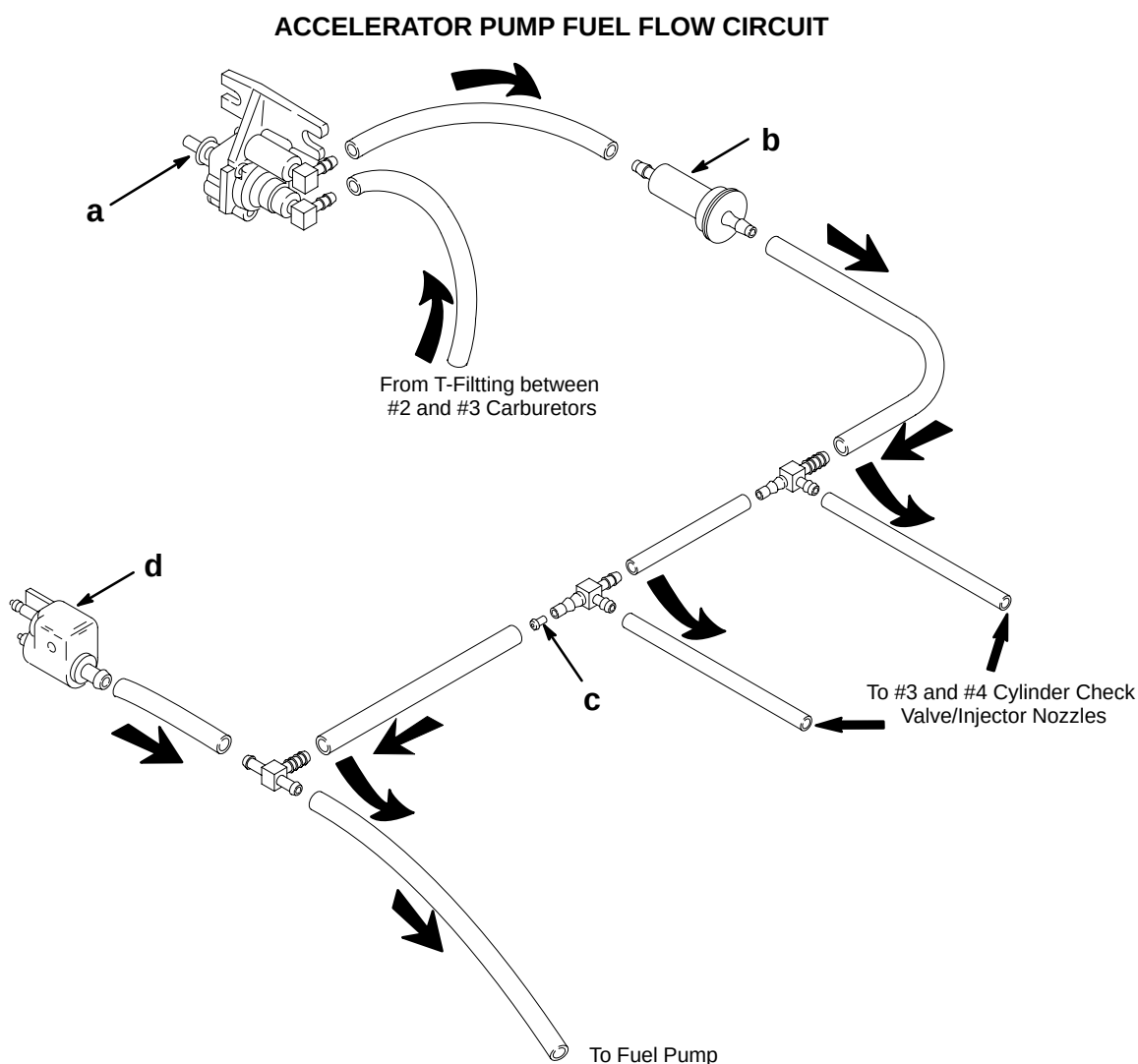
FUEL FILTER - 74 micron filter. Prevents debris from plugging check valve/injector nozzles.

CHECK VALVE/INJECTOR NOZZLE - 2 assemblies, one each for #3 and #4 cylinders. Fuel passes from check valve thru .026 inch orifice (injector nozzle) and into respective cylinder boost passage.

FLOW RESTRICTOR - Helps equalize pressure within the accelerator pump circuit while allowing air or any vapor which has formed to pass through and be vented at the carburetors.

FUEL CONNECTOR - Spring loaded shut off valve which connects boat fuel tank with outboard fuel system.

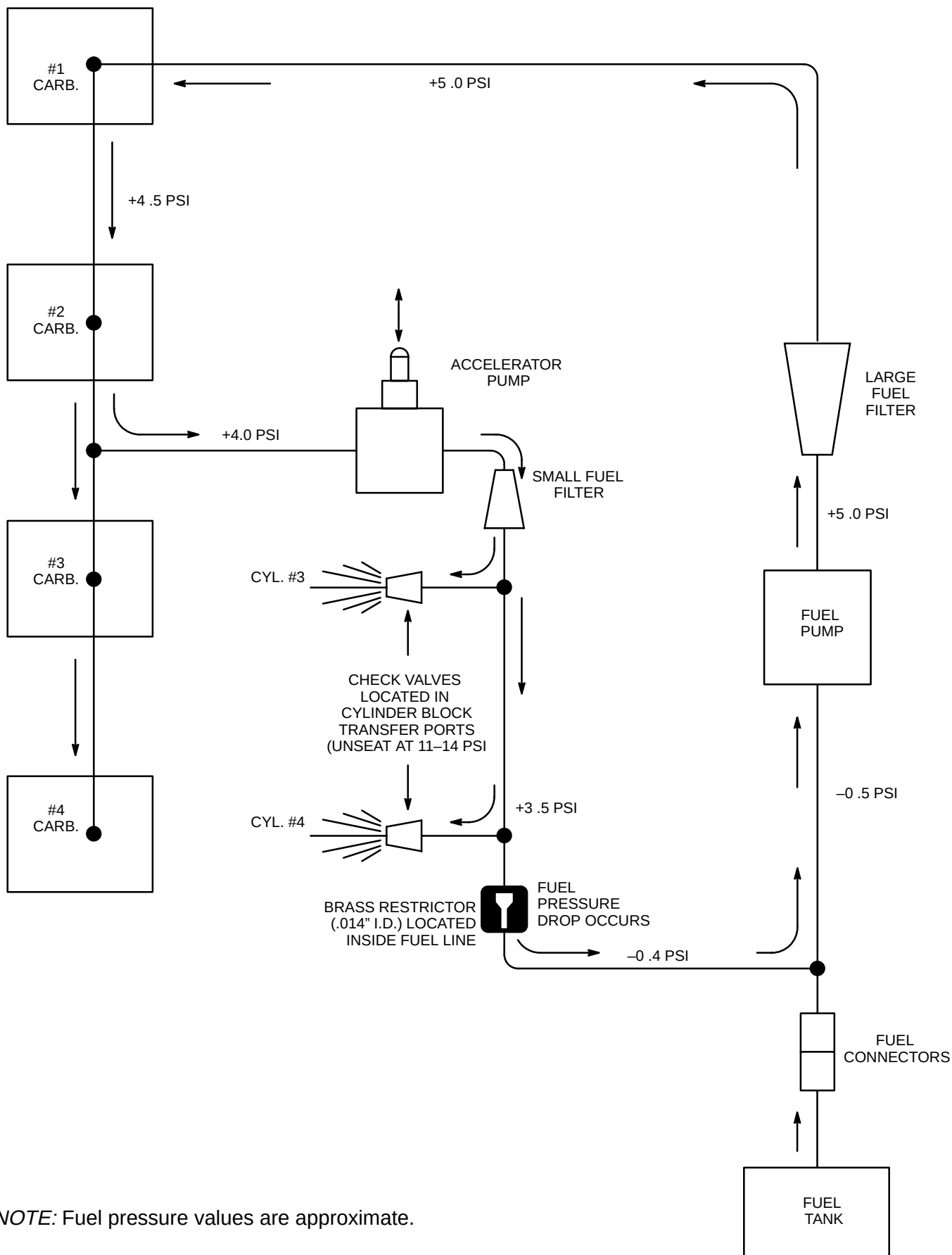
IMPORTANT: The distance between the accelerator pump and the throttle cam determines the amount of fuel the accelerator pump will discharge. If accelerator pump is moved or replaced, refer to SECTION 2C for correct positioning of accelerator pump.



- a - Accelerator Pump
- b - Fuel Filter
- c - Flow Restrictor
- d - Fuel Connector



Acceleration Pump Fuel Flow Circuit for Four Cylinder Engines



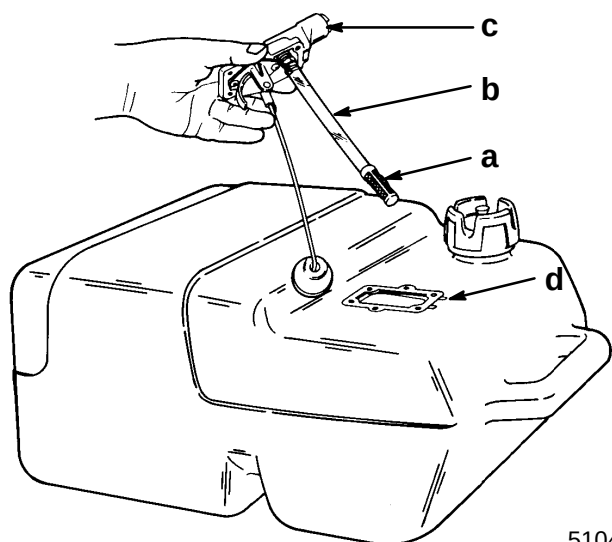


Fuel Tank

MAINTENANCE

The inside of the fuel tank should be cleaned once each season. Dirt or water may have entered the fuel tank during refilling. Clean the tank by flushing with clean, lead-free gasoline or kerosene.

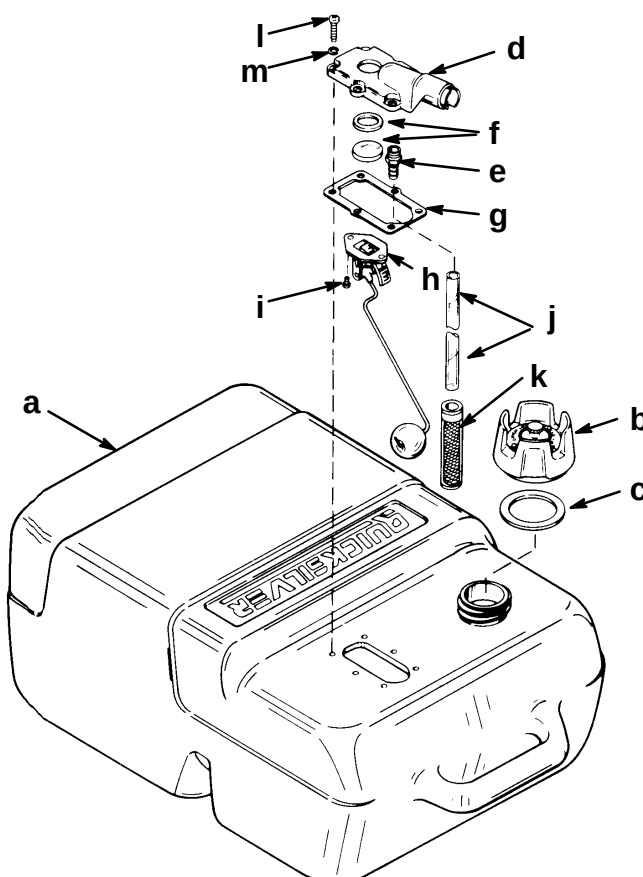
If a fuel restriction problem is encountered, the fuel filter on end of outlet tube may be obstructed. Remove cover and inspect filter for varnish, dirt or deposits. Clean filter by rinsing in clean, lead-free gasoline or kerosene.



51046

- a - Fuel Tank Filter
- b - Pick-Up Tube
- c - Cover
- d - Gasket

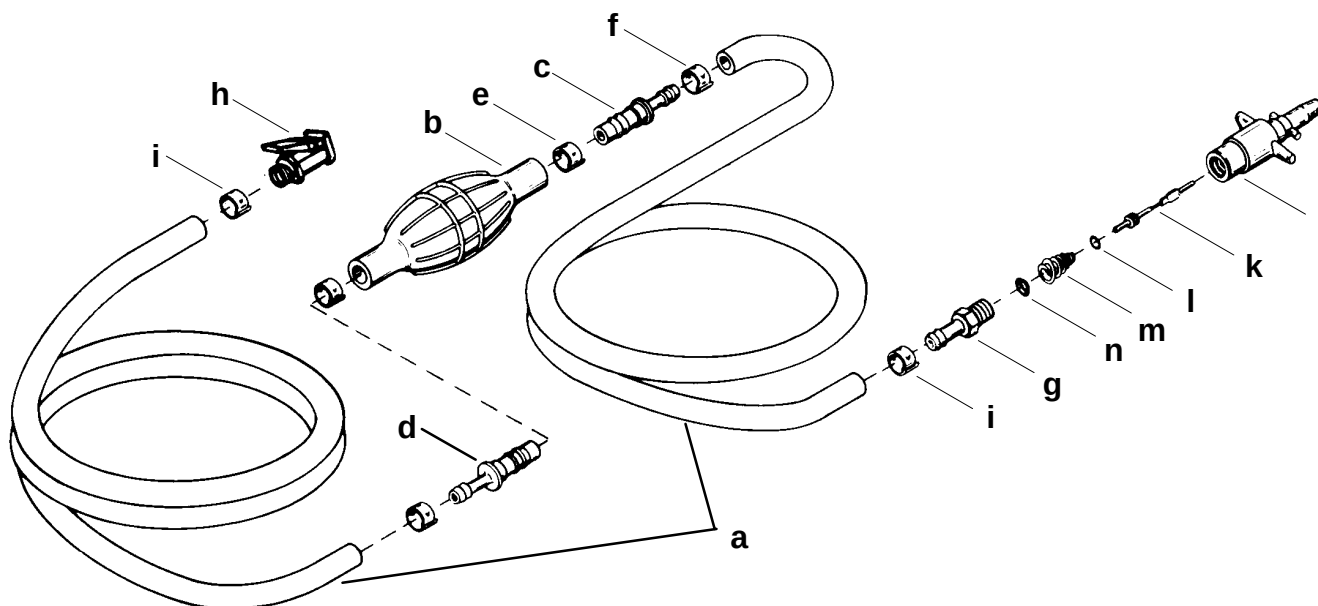
Fuel Tank Components



- a - Fuel Tank Assembly (Plastic - 6.6 Gal.)
- b - Filler Cap
- c - Gasket, Filler Cap
- d - Pick-Up Body Assembly
- e - Adaptor
- f - Window Assembly
- g - Gasket, Pick-Up Body
- h - Fuel Gauge Assembly
- i - Screw, Fuel Gauge (2)
- j - Hose
- k - Filter
- l - Screw, Pick-Up Body (6)
- m - Washer, Pick-Up Body Screw (6)



Fuel Line and Primer Bulb Assembly



- a - Fuel Line Assembly
- b - Primer Bulb Assembly
- c - Check Valve, Inlet
- d - Fitting, Outlet
- e - Clamp, Primer Bulb to Check Valve (Large)
- f - Clamp, Fuel Line to Check Valve (Small)
- g - Connector, Fuel Tank (Outlet)
- h - Connector, Engine (Inlet)
- i - Clamp, Fuel Line to Connector
- j - Bayonet Body Assembly (Fuel Tank End)
- k - Stem, Bayonet Body
- l - O-ring, Bayonet Body Stem
- m - Spring, Bayonet Body Stem
- n - Washer, Cupped - Body Spring



Maintenance

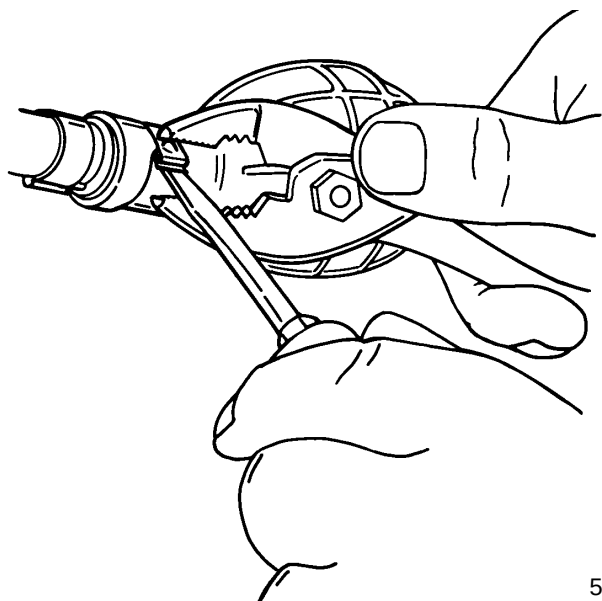
Periodically check fuel line and primer bulb for cracks, breaks, restrictions or chafing. Check all fuel line connections for tightness. All fuel line connections must be clamped securely.

Primer bulb assembly has 2 check valves: Fuel inlet (toward tank) and a fuel outlet (toward engine).

The fuel inlet valve allows fuel to fill primer bulb but closes to prevent fuel from returning to tank when bulb is squeezed. The fuel outlet valve opens when primer bulb is squeezed to allow fuel flow to carburetor, but closes as bulb is released to prevent fuel from returning to primer bulb.

FUEL LINE CLAMP REMOVAL AND INSTALLATION

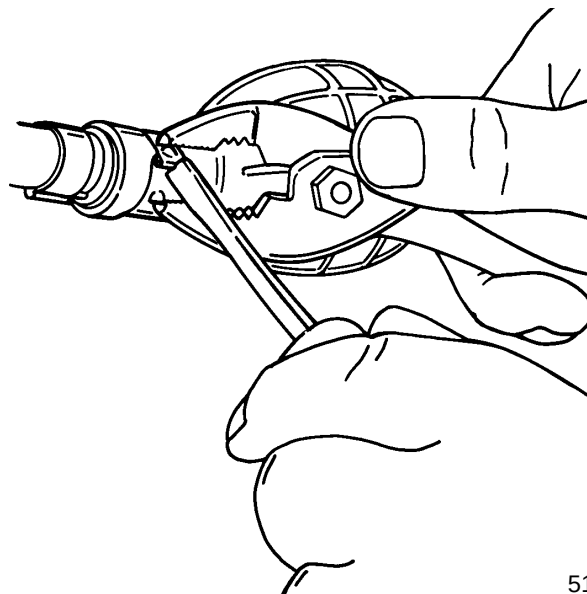
1. To remove fuel line clamps, grip clamp with pliers and bend overlapping hook backwards.



51115

Removing Fuel Line Clamps

2. To install fuel line clamps, grip hose clamp with pliers and push down on hook with screwdriver until hooks interlock.



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Installing Fuel Line Clamps