Table 4-1. Sportster	Specifications
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	XLH 883		XLH 1200 / 1200S SPORT			
	49 State	Calif.	HDI, Swiss	49 State	Calif.	HDI, Swiss
Carburetor Jet Sizes Main jet	160	170	190	170/195	185/ 195	200
Carburetor Jet Sizes Slow jet	42	42	42	42	42	42
CARBURETOR ADJUSTMENTS						
Engine slow idle speed	1050 rpm					
Engine speed for setting ignition timing	1050-1500 rpm					
FUEL TANK CAPACITY						
Total	3.30 gallons (U.S.)					
	12.5 liters					
Reserve	0.50 gallon (U.S.) 1.9 liters					
Torque Values intake manifold flange bolts	6-10 ft-lbs					
	8-14 Nm					
Air cleaner backplate to cylinder bolts	10-20 ft-lbs					
	14-27 Nm					
Air cleaner backplate to carbure- tor bolts	3-5 ft-lbs					
Fuel tank mounting bolts	8-16 ft-lbs					
	11-22 Nm					
Air cleaner cover screws	3-5 ft-lbs					
	4-7 Nm					

# 

# GENERAL

See Figure 4-1. The carburetor is a constant-velocity, gravityfed type with a float-operated inlet valve, a variable venturi, a throttle stop screw (for idle speed adjustment) and a fuel enrichment system (for starting).

Idle and transfer ports provide a balanced fuel mixture during the transition period from stop to mid-range. A vacuum piston controls venturi opening.

The carburetor is specifically designed to control exhaust emissions. All jets are fixed. The idle mixture has been preset at the factory. The idle mixture screw is recessed in the carburetor casting. The opening is sealed with a plug because it is intended that the idle mixture be non-adjustable.

#### NOTE

#### Adjusting mixture setting by procedures other than specified in this section may be in violation of Federal or State regulations.

This system partially compensates for changes in the mixture that are normally caused by changes in altitude. Because atmospheric pressures drop as altitude increases, the pressure difference in the upper and lower chambers is reduced; this results in less fuel being delivered to the engine, thereby maintaining the correct air/fuel ratio for better engine performance and reduced exhaust emissions.

All models except the 1200S have a drain for emptying the float chamber during seasonal or extended periods of storage.

#### NOTE

# The XL1200S Sport model does NOT have a drain for emptying the float chamber.

The carburetor is equipped with an accelerator pump. The accelerator pump system uses sudden throttle openings (rapid accelerations) to quickly inject raw fuel into the carburetor venturi; this provides extra fuel for smooth acceleration.



4. Idle speed adjusting screw



OVERFLOW				
Check for:	Remedy:			
1. Restricted fuel tank vent system.	1. Correct restricted hose. Replace vapor valve.			
2. Loose float bowl screws.	2. Tighten screws.			
3. Damaged float bowl O-ring.	3. Replace O-ring.			
4. Damaged or leaking float assembly.	4. Replace float assembly.			
5. Particle contamination in fuel inlet fitting cavity.	5. Clean and clear cavity and fuel supply tract.			
6. Worn or dirty inlet valve or seat.	6. Clean or replace valve and clean seat.			
7. Improper fuel level in float bowl.	7. Adjust float tab for correct fuel level.			
POOR IDLING				
Check for:	Remedy:			
1. Idle speed improperly adjusted.	1. Adjust operating idle speed.			
2. Inlet system air leak (faster idling).	2. Correct as required.			
3. Loose low speed jet.	3. Tighten jet.			
4. Contaminated or plugged low speed system.	4. Clean contaminants and clear passages.			
5. Enrichener valve not seated or leaking.	5. Adjust, clean or replace.			
6. Leaking accelerator pump.	6. Repair.			
POOR FUE	LECONOMY			
Check for:	Remedy:			
1. Excessive use of enrichener system.	1. Limit system use.			
2. Enrichener valve not seated or leaking.	2. Adjust, clean or replace.			
3. Dirty air cleaner element.	3. Clean or replace as required.			
4. Restricted fuel tank vent system.	4. Correct restricted hose. Replace vapor valve.			
5. High speed riding style.	5. Modify riding habits.			
6. Idle speed improperly adjusted.	6. Adjust operating idle speed.			
7. Loose jets.	7. Tighten jets.			
8. Fuel level too high.	8. Adjust float level.			
9. Plugged or restricted bowl vent.	9. Clean and clear passages.			
10. Worn or damaged needle or needle jet.	10. Replace needle or needle jet.			
11. Vacuum piston assembly malfunction.	11. See Vacuum Piston Troubleshooting.			
12. Plugged air jets or passages.	12. Clean and clear passages.			
13. Excessive accelerator pump output.	13. Check and clean accelerator pump bypass orifice.			
POOR ACCELERATION				
Check for:	Remedy:			
1. Throttle cables misaligned.	1. Adjust throttle cables.			
2. Inlet system air leak.	2. Correct as required.			
3. Restricted fuel tank vent system.	3. Correct restricted hose. Replace vapor valve.			
4. Restricted fuel supply passages.	4. Correct and clear restriction.			
5. Plugged bowl vent or overflow.	5. Clean and clear passages.			
6. Enrichener valve not seated or leaking.	6. Adjust, clean or replace.			
7. Worn or damaged needle or needle jet.	7. Replace assembly.			
8. Vacuum piston malfunction.	8. See Vacuum Piston Troubleshooting.			
9. Plugged jets or passages.	9. Clean and clear as required.			
10. Fuel level (float chamber) too low.	10. Adjust float level.			
11. Accelerator pump leaking or no output.	11. Repair as necessary.			

# Table 4-2. Troubleshooting

# Table 4-2. Troubleshooting

HARD STARTING				
Check for:	Remedy:			
1. Enrichener system plugged, not properly functioning or improperly operated.	1. Clean, adjust, or replace; or read Owner's Manual.			
2. Inlet system air leak.	2. Correct as required.			
3. Restricted fuel supply	3. Correct fuel supply or passages			
4. Fuel overflow.	4. See Overflow Troubleshooting.			
5. Plugged slow jet or passages.	5. Clean and clear jet or passages.			
POOR PERFORMANCE ON ROAD				
Check for:	Remedy:			
1. Idle speed improperly adjusted.	1. Adjust operating idle speed.			
2. Inlet system air leak	2. Correct as required.			
3. Restricted fuel tank vent system	3. Correct restricted hose. Replace vapor valve			
4. Dirty or damaged air cleaner element.	4. Clean or replace.			
5. Enrichener valve not seated or leaking.	5. Adjust, clean or replace.			
6. Restricted fuel supply tract.	6. Correct and clear restriction.			
7. Plugged bowl vent or overflow.	7. Clean and clear passages			
8. Loose or plugged fuel and air jets or passages.	8. Clean, clear and correct as required.			
9. Worn or damaged needle or needle jet.	9. Replace assembly.			
10. Vacuum piston assembly malfunction.	10. See Vacuum Piston Troubleshooting			
11. Accelerator pump inoperative.	11. Repair as required			
POOR HIGH-SPEED PERFORMANCE				
Check for:	Remedy:			
1. Inlet system air leak.	1. Clean or replace			
2. Enrichener valve not seated or leaking.	2. Adjust, clean or replace.			
3. Restricted fuel tank vent system.	3. Correct restricted hose. Replace vapor valve.			
4. Restricted fuel supply tract.	4. Correct and clean restriction.			
5. Dirty or damaged air cleaner element.	5. Clean or replace.			
6. Plugged bowl, vent or overflow.	6. Clean and clear passages.			
7. Worn or damaged needle or needle jet.	7. Replace assembly			
8. Vacuum piston assembly malfunction.	8. See Vacuum Piston Troubleshooting			
9. Loose or plugged main jets or passages.	9. Tighten, clean, clear as required.			
10. Improper fuel level.	10. Adjust float level.			
11. Accelerator pump inoperative.	12. Repair as required.			

PISTON DOES NOT RISE PROPERLY			
Check for:	Remedy:		
1. Piston atmosphere vent blocked	1. Clear vent.		
2. Diaphragm cap loose, damaged or leaking.	2. Tighten or replace cap		
3. Spring binding.	3. Correct or replace spring.		
4. Diaphragm pinched at lip groove	4. Reposition diaphragm lip.		
5. Torn diaphragm.	5. Replace piston diaphragm assembly.		
6. Piston binding.	6. Clean piston slides and body or replace piston.		
7. Piston vacuum passage plugged.	7. Clean and clear passage		
PISTON DOES NOT CLOSE PROPERLY			
Check for:	Remedy:		
1. Spring damaged.	1. Replace spring.		
2. Piston binding.	2. Clean piston slides and body or replace piston.		
3. Piston diaphragm ring dirty or damaged.	3. Clean or replace piston.		

# OPERATION

### Outside Temperature Less Than 50°F (10°C))

## Enrichener

The enrichener knob, next to the ignition switch, controls the opening and closing of the enrichener valve at the carburetor.

# **Cool Engine**

BE SURE THROTTLE IS CLOSED. Pull enrichener knob fully out. Turn the ignition switch on and press starter switch to operate the electric starter.

### CAUTION

You must pay close attention to a C. V. carburetor equipped vehicle's warm-up time. Both excessive use and insufficient use of the enrichener may cause poor performance, erratic idle, poor fuel economy and spark plug fouling.

### Outside Temperature Less Than 50°F (10°C)

The vehicle should be allowed to warm up for only 15-30 seconds before being driven. Initial warm-up periods longer than 30 seconds are not recommended. For temperatures well below 50°F (10°C), you may need to twist the throttle once or twice immediately before attempting engine start-up. This will add extra fuel from the carburetor accelerator pump to assist the start-up.

- If the outside temperature is less than 50° F (10°C), ride for five minutes or three miles (5 km) with enrichener knob fully out.
- 2. Push the enrichener knob in to approximately 1/2 way. Ride another two minutes or two miles (3 km).

See Figure 4-2. Then push enrichener knob fully in. If engine will not idle at specified rpm, pull out enrichener knob enough to allow correct idle speed. Ride another two minutes or two miles (3 km); then push enrichener knob fully in.



Figure 4-2. Enrichener Knob Fully In

The vehicle should be allowed to warm up for only 15-30 seconds before being driven. Initial warm-up periods longer than 30 seconds are not recommended.

- 1. If the outside temperature is greater than 50°F (10°C), ride for three minutes or two miles (3 km) with enrichener knob fully out.
- 2. Push the enrichener knob in to approximately 1/2 way. Ride another two minutes or two miles (3 km).
- 3. Then push enrichener knob fully in. If engine will not idle at specified rpm, pull out enrichener knob enough to allow correct idle speed. Ride another two minutes or two miles (3 km); then push enrichener knob fully in.

### Warm or Hot Engine

See Figure 4-2. Open throttle 1/8-1/4 of full travel. Turn on ignition switch and operate electric starter. DO NOT USE ENRICHENER, unless engine will not idle at specified rpm. If engine will not idle at specified rpm, pull out enrichener knob enough to allow correct idle speed. Ride two minutes or two miles (3 km); then push enrichener knob fully in.

# ADJUSTMENT

## Slow Idle

NOTE

Make certain enrichener knob is pushed in all the way before adjusting engine idle. The CV carburetor enrichener circuit will cause engine idle speed to increase to approximately 2000 rpm with enrichener knob pulled out fully and engine running at normal operating temperature. With enrichener knob pulled out partially, and engine running at normal operating temperature, engine idle speed will also increase above normal idle speed. The increase in idle speed is intended to alert the rider that engine is warmed up, and that enrichener knob should be pushed in all the way. Continued use of enrichener, after engine is at normal operating temperature, may cause fouled spark plugs.

See Figure 4-1. With engine at normal operating temperature and enrichener pushed in all the way (enrichener valve closed), adjust idle speed adjusting screw (4) so engine idles at 950-1050 rpm.

#### NOTE

Use a test tachometer, connected to negative ignition coil terminal, to measure engine rpm on XLH 883 models.

## HOME Enrichener Control

See Figure 4-3. Check fuel enrichener operation. Fuel enrichener knob should open (and remain open) and close without binding. Plastic nut, next to the enrichener knob, controls the sliding resistance of the enrichener control cable within the cable conduit. If adjustment is needed, perform the following:



Figure 4-3. Fuel Enrichener Control

- 1. Loosen hex nut at backside of mounting bracket.
- 2. Move cable assembly free of slot in mounting bracket.
- 3. Hold cable assembly at flats with a wrench. Turn plastic nut by hand counterclockwise (reducing sliding resistance) until knob slides inward unaided.
- 4. Turn plastic nut clockwise (increasing sliding resistance) until knob remains fully open without holding, and closes with relative ease.
- 5. Position cable assembly into slot in mounting bracket. Tighten hex nut at backside of bracket.

#### NOTE

Do not lubricate the cable or inside of conduit; the cable must have sliding resistance to work properly.

# **Float Level**

1. See Figure 4-4. Place carburetor on a flat, clean surface on engine manifold side. This is the "base." Tilt carburetor counterclockwise 15° to 20° from base until float comes to rest.

### NOTE

If carburetor is tilted less than 15° or more than 20°, your measurements will be inaccurate.

- Use a vernier or dial caliper depth gauge to measure from the carburetor flange face to the perimeter of the float. Be careful not to push on float while measuring. The measurement must be 0.413-0.453 in. (10.49-11.51 mm). If measurement is not within given dimension, remove float and carefully bend tab in order to reposition float at proper level.
- 3. Install float, and recheck setting.
- 4. Install float bowl. Install carburetor as described in CAR-BURETOR, INSTALLATION.

# OPERATION CHECK – VACUUM PISTON

# **Opening Malfunction**

## WARNING

While observing piston slide movement, be sure to maintain a safe distance from the carburetor and to wear suitable eye protection. An unexpected engine backfire could cause death or serious injury.

- 1. See Figure 4-5. With air cleaner cover off and engine running, twist throttle control partially open and closed several times while observing whether or not vacuum piston (6) has upward movement. If piston does not rise, see VACUUM PISTON.
- 2. With engine not running, lift vacuum piston (6) with finger. Feel whether piston lifts fully and smoothly or whether there is a binding condition.

# **Closing Malfunction**

- 1. With engine not running, lift vacuum piston (6) to full open position, then release. Observe whether piston slides downward smoothly and fully to stop.
- Observe position of piston slide at its lowest downward point. Lower edge of slide should rest at horizontal groove at lower end of slide track. See VACUUM PIS-TON TROUBLESHOOTING if problems are noted.

#### <u>HOME</u>



Figure 4-4. Carburetor Float Adjustment

## AWARNING

Gasoline can be extremely flammable and highly explosive. Do not smoke or allow open flame or sparks when refueling or servicing the fuel system. Inadequate safety precautions may result in death or serious injury.

- 1. Turn the fuel supply valve to OFF.
- 2. Remove the air cleaner and backplate. See AIR CLEANER, REMOVAL in this section.

## **A**WARNING

A small amount of gasoline may drain from the fuel hose when disconnected from the carburetor. Thoroughly wipe up any spilled fuel immediately and dispose of rags in a suitable manner. Gasoline can be extremely flammable and highly explosive. Inadequate safety precautions may result in death or serious injury.

- 3. See Figure 4-6. Disconnect fuel hose and throttle cables from carburetor.
- See Figure 4-5. Disconnect fuel overflow/drain hose (19) from fuel overflow fitting (except XL-Sport). Disconnect vacuum hose from V.O.E.S. fitting. Disconnect enrichener valve assembly.

On California models only, disconnect canister purge hose from fitting on carburetor body. See EVAPORATIVE EMISSIONS CONTROL – CALIFORNIA MODELS in this section.

- 5. Remove the fuel tank. See FUEL TANK, REMOVAL in this section.
- 6. See Figure 4-7. Pull carburetor free of intake manifold. If removing intake manifold, remove four manifold mounting screws. Remove intake manifold, seal ring, mounting flanges (1 and 2) and two intake manifold seals.

# DISASSEMBLY

# Vacuum Piston Chamber

- 1. Remove screws and bracket.
- 2. Remove three screws and washers. Remove cover and spring.
- 3. Lift out vacuum piston with needle and spring seat. Remove loose parts from vacuum piston.

# **Carburetor Body**

- 1. See Figure 4-5. Remove four screws and washers (28). Remove float bowl assembly.
- 2. Remove pin, float and fuel inlet valve.
- 3. Back out main jet and needle jet holder. Needle jet is free to be removed from bottom end of passage.
- 4. Insert thin-bladed screwdriver into slow jet passage to remove slow jet.

## Accelerator Pump-

1. Remove three screws, lock washers, accelerator pump housing, spring and diaphragm. Remove O-ring from housing.

# CLEANING, INSPECTION AND REPAIR

## **Vacuum Piston Components**

- 1. See Figure 4-5. Hold vacuum piston (6) up to strong light. Examine diaphragm at top of vacuum piston for evidence of pinching, holes or tears. Replace if damaged.
- 2. Examine vacuum passage through bottom of piston. Clean passage if restricted.
- 3. Examine spring for stretching, crimping, distortion or damage. Replace if necessary.
- 4. Examine slide on sides of piston to be sure surface is smooth and clean. Clean or buff out any rough surfaces.

Examine needle for evidence of bending or damage. Needle should be straight; surface of taper should be smooth and even.

# **Carburetor Body Components**

- 1. See Figure 4-5. Check float bowl O-ring for any distortion or damage. Replace if seating surfaces are damaged.
- Examine fuel inlet valve and inlet valve seat. Clean with carburetor cleaner. Replace if seating surfaces are damaged.
- 3. Clean slow jet with carburetor cleaner. Check to be sure all orifices are open.
- 4. Check enrichener valve. Be sure needle guide is clean, straight and undamaged. Check composition seating surface for wear or damage. Replace if damaged.
- 5. Check enrichener valve chamber. Clean with carburetor cleaner. Check that all passages are open and free of obstruction.
- 6. Clean needle jet. Replace if damaged.
- 7. Clean all internal fuel/air passages and jets. Check that all passages and jets are open and free of obstruction.
- 8. Check needle jet holder. Clean bleed tube orifices. Replace holder if damaged.
- 9. Check float for cracks or other leaks. Replace if damaged.
- 10. Clean main jet with carburetor cleaner and inspect for damage. Replace if damaged.

## **Accelerator Pump-**

- 1. See Figure 4-5. Inspect the accelerator pump diaphragm for holes, cracks or deformation. Replace as necessary.
- 2. Replace the pump rod if it is bent; replace the boot if it is cracked.

#### <u>HOME</u>



Figure 4-5. Constant-Velocity (CV) Carburetor



Figure 4-6. Throttle Cables



Figure 4-7. Intake Manifold

# ASSEMBLY

# **Vacuum Piston Chamber**

- 1. See Figure 4-5. Place needle through center hole in vacuum piston. Place spring seat over top of needle.
- 2. Insert vacuum piston into carburetor body. The slides on the piston are off-center and the piston will fit into the slide track grooves one way only. If piston does not fit, rotate 180 degrees.
- 3. Check to be sure diaphragm is seated evenly into groove at top of carburetor body. Place spring over spring seat, and carefully lower top cover. Keep spring straight while lowering top cover.
- After top cover is seated, hold top cover while lifting vacuum piston upward. Piston should raise to top smoothly. If piston movement is restricted, spring is cocked; lift up top cover, then lower carefully, keeping spring coils straight.
- 5. Once top cover is installed correctly, install screws and washers. Place bracket in position with idle screw, resting on top of throttle cam stop. Install body screw and washer first, then top screw to prevent bending bracket or throttle cam.

# Carburetor Body

### CAUTION

Slow jets from fixed-venturi carburetors look the same as the slow jet of the CV carburetor. However, the air bleed hole sizes are different on fixed-venturi carburetors, and they must not be installed on CV carburetors.

- 1. See Figure 4-5. Thread slow jet into slow jet passage with narrow-bladed screwdriver.
- 2. Turn carburetor upside down. Place needle jet in main jet passage with needle passing through center hole. Be sure end of jet with larger opening and chamfered surface enters passage first.
- 3. Insert needle jet holder into main jet passage with needle inserted into center of holder. Thread holder into passage and tighten. Thread and tighten main jet in tapped hole in holder.
- Place float assembly into position with fuel inlet valve inserted into valve seat and with pivot arm aligned with holes in mounting posts (at bottom of carburetor body). Insert pin through float pivot arm and float mounting posts.
- 5. Check float level setting and adjust if necessary. See CARBURETOR, ADJUSTMENT, FLOAT LEVEL in this section.
- 6. Place float bowl over float and onto carburetor body flange. Bowl will only fit in one position. Install and tighten screws and washers.

# **Accelerator Pump**

See Figure 4-5. Install diaphragm, spring, O-ring and pump housing. Secure with three screws and lock washers.

# Carburetor

- 1. See Figure 4-7. Place flanges onto aluminum manifold.
- 2. Place intake manifold seals onto each spigot of manifold with chamfered edge against flanges.
- 3. Place channel of seal ring over inlet end of manifold.
- Position manifold against intake ports of cylinder head, with slotted and round holes in flanges aligned with holes in cylinder head. Insert screws through manifold flanges and loosely thread into tapped holes in cylinder head.

#### NOTE

The fit between the carburetor and the seal ring is tight. For ease of installation, lubricate the mating surfaces, carburetor body and seal ring with liquid dish soap or tire mounting lube prior to assembly.

- 5. Lubricate only the inside surface of seal ring that will be in contact with the carburetor. Also apply a light coat of lubricant to the spigot of the carburetor body. Push carburetor body into seal ring.
- 6. Install air cleaner backplate and air cleaner. See AIR CLEANER, INSTALLATION in this section.
- 7. See Figure 4-7. Final tighten intake manifold screws to 6-10 ft-lbs (8-14 Nm) torque.
- 8. Install fuel tank. See FUEL TANK, INSTALLATION in this section.
- On California models only, connect canister purge hose onto fitting on carburetor body. See EVAPORATIVE EMISSIONS CONTROL – CALIFORNIA MODELS in this section.
- See Figure 4-5. Connect fuel overflow/drain hose to fuel overflow fitting. Connect vacuum hose to V.O.E.S. fitting. Connect enrichener valve assembly to carburetor body.
- 11. See Figure 4-6. Install throttle cables and fuel hose onto carburetor.

# Carburetor Fuel Overflow / Drain Hose Routing

See Figure 4-5. On non-California models, route fuel overflow/drain hose from the carburetor fuel overflow fitting downward and forward through the space between the engine front cylinder and the front cylinder push rod covers (intake and exhaust), and then downward through the space between the engine crankcase and the oil filter.

On all California models, route the fuel overflow/drain (vent) hose from the carburetor fuel overflow fitting forward, along the inboard side of the carburetor float bowl, to a plastic fitting on the inboard side of the air cleaner backplate. Refer to EVAPORATIVE EMISSIONS CONTROL –CALIFORNIA MODELS and AIR CLEANER, INSTALLATION in this section.

# FUEL SUPPLY VALVE

# GENERAL

See Figure 4-9. The fuel supply valve is located on the left side, below the fuel tank. The gasoline supply to the carburetor is shut off when the handle is in the horizontal position. For gasoline main supply, turn the handle clockwise until it stops in the vertical position. For gasoline reserve supply, turn the handle counterclockwise until it stops in the vertical position. Valve should always be in the OFF position when engine is not running.



3. Gasket

Figure 4-9. Fuel Supply Valve

# REMOVAL

## WARNING

Gasoline can be extremely flammable and highly explosive. Do not smoke or allow open flame or sparks when refueling or servicing the fuel system. Inadequate safety precautions may result in death or serious injury.

1. See Figure 4-9. Turn the fuel supply valve to OFF.

# 

A small amount of gasoline may drain from the fuel hose when disconnected from the carburetor. Thoroughly wipe up any spilled fuel immediately and dispose of rags in a suitable manner. Gasoline can be extremely flammable and highly explosive. Inadequate safety precautions may result in personal injury and/or property damage.

- 2. Remove fuel hose from carburetor.
- 3. Place end of fuel hose into a proper, clean container of adequate size.
- 4. Turn supply valve to reserve (RES). Drain gasoline from tank into container.

# 

Even with the fuel tank completely drained, a small amount of gasoline may leak from the bore when the fuel supply valve is loosened or removed. Thoroughly wipe up any spilled fuel immediately and dispose of rags in a suitable manner. Gasoline can be extremely flammable and highly explosive. Inadequate safety precautions may result in death or serious injury.

5. Turn fitting and remove fuel supply valve assembly.

# CLEANING, INSPECTION, AND REPAIR

- 1. See Figure 4-9. Clean or replace filter strainer (located inside fuel tank above fuel supply valve).
- 2. Flush fuel tank to remove all dirt.

# INSTALLATION

- 1. See Figure 4-9. Coat supply valve threads with Loctite Pipe Sealant with Teflon and securely install fitting onto fuel tank.
- 2. Connect fuel hose to carburetor.