



## QUICK FUEL TECHNOLOGY® Installation Instructions

### MARINE SERIES CARBURETORS

**M-650** 650 CFM, w/Electric Choke

**M-800** 800 CFM, w/Electric Choke

**M-750** 750 CFM, w/Electric Choke

**M-850** 850 CFM, w/Electric Choke

**M-4710** 1050 CFM, QFX, 2 Circuit



**Please Stop and Read these Instructions before proceeding. If you do not fully understand the installation and tuning instructions, you should seek professional help. Failure to follow the proper installation and tuning may result in damage or injury.**

**NOTICE:** For safety and protection of persons and property, all United States Coast Guard (U.S.C.G.) and other marine safety requirements and recommendations, as well as the following instructions, must be carefully studied and applied. Failure to follow the above WILL result in an improper installation, which may lead to personal injury, including death, and/or property damage. Improper installation and/or use will also void your warranty.

**WARNING:** For the safety and protection of yourself and others, ONLY a trained mechanic, having adequate marine fuel system experience, must perform the installation, adjustment, and repair. It is particularly important to remember one of the very basic principles of marine safety: fuel vapors are heavier than air and tend to collect in lower places. This means that ANY fuel spilled will vaporize and remain in the lowest extremes of the engine compartment of your vessel where an explosive fuel/air mixture may be ignited by any spark or flame. Great care must be exercised to prevent spillage and thus eliminate the formation of such fuel vapors. In all cases it is necessary to have and properly operate the bilge blower for a length of time sufficient to remove all vapors before starting your vessel's engine.

**NOTE:** Due to the large distance between the helm and the engine in most boats, it is STRONGLY recommended that the mechanic have an assistant to operate the appropriate helm controls during removal, installation, adjustment, or repair of the marine fuel system, and during the starting procedure.

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Quick Fuel Technology would like to congratulate and thank you for purchasing this carburetor. We feel you have purchased the finest marine performance carburetor currently on the market. If you need assistance please call the QFT Sales and Tech Support staff @ 270-781-9741, Monday through Friday 8AM – 5PM central time.

QFT™ carburetors are 100% tested to ensure all components are functional. The calibration should be very close for all adjustments. Different engine combinations could require adjustment of idle mixture, idle speed and main jets. The fuel level was set with 6 ½ lbs. of fuel pressure. The recommended fuel pressure for this carburetor is 6 ½ PSI.

**NOTE: This QFT™ carburetor has not been submitted for emission testing, therefore it is not C.A.R.B. (California Air Resources Board) legal in all 50 states - please check with local authorities regarding the use of this carburetor.**

#### **REMOVE OLD CARBURETOR:**

**WARNING!** The following steps MUST be carefully studied and applied when disconnecting ANY part of the fuel system.

1. Disconnect the battery (to prevent accidental arcing) and any other equipment, which may or can cause arcing. Extinguish ANY flame—NO SMOKING!
2. Label and remove all hoses going to the flame arrestor.
3. Remove the flame arrestor.
4. Remove the existing carburetor following the procedure outlined below:
  - A. Carefully disconnect the fuel line. Catch all fuel left in the fuel line in a suitable container and REMOVE the container from the vessel before proceeding further. Absorb any spilled fuel immediately with a shop towel or rag and remove from the vessel.
  - B. Label and disconnect all vacuum hoses attached to the carburetor. Hoses that exhibit surface cracks when bent to a 180° position should be replaced.
  - C. Disconnect any choke rods, heat tubes, and any electrical wires from the carburetor.
  - D. Disconnect and remove the throttle linkage. Save all retaining clips.
  - E. Unbolt the carburetor and remove.

**WARNING!** Be EXTREMELY careful not to tilt the carburetor, which may cause fuel to spill. REMOVE the carburetor from the vessel. If fuel spillage occurs, see instructions 4A above.

- F. Stuff shop rags or paper towels into the manifold opening and remove the original flange gasket. Clean the manifold face, taking precautions to prevent particles from falling into the manifold.

**WARNING!** In all cases where the fuel line has been cut, it is essential that it be clean to ensure that no metal particles enter the fuel bowl after new carburetor installation. This is performed by disconnecting the fuel line at the pump and blowing the line clean with compressed air. Holley DOES NOT recommend the procedure where the coil wire is disconnected, the engine cranked for a few revolutions, and the fuel collected in a container. This procedure is unsafe because sparking can occur either at the coil or at the distributor end of the coil wire, and then ignite any fuel spilled in the engine compartment.

- G. Perform the carburetor disassembly, service, and reassembly off the vessel.

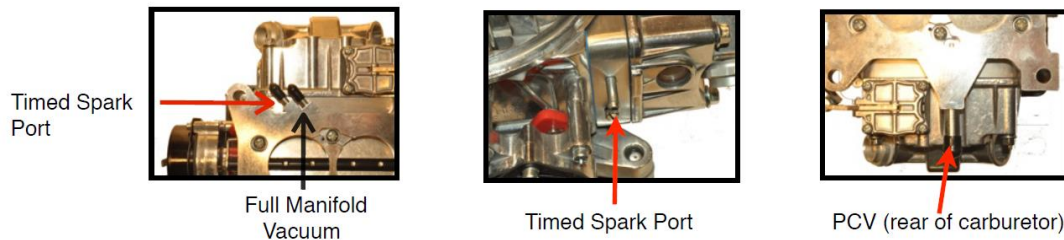
#### **INSTALLATION OF NEW CARBURETOR**

1. Set old carburetor and new carburetor side-by-side on work bench.
2. Examine linkage connection and transfer necessary components to new carburetor in same location if possible.
3. Install flange gasket over intake manifold studs on intake manifold, then install your new carburetor. Install throttle cable bracket on driver's side rear stud if applicable.
4. Install hold down nuts and washers (if used), tighten in a criss-cross pattern DO NOT TIGHTEN HOLD DOWN NUTS COMPLETELY.

- Reconnect the throttle and throttle return spring. With the engine off, check the throttle operation. Check for sticking by having an assistant at the help operate the controls while the experienced mechanic watches the operation of the carburetor(s) to detect any malfunctions. Be certain that there is no manner of bracket interference when the throttle lever is operated between the idle and wide-open positions.

**WARNING!** If any binding, sticking or malfunction is found... it **MUST** be corrected before proceeding further. Any interference could cause the throttle to stick during operation and could possibly result in the loss of carburetor throttle control (uncontrolled engine speed).

- If there is no interference or resistance in throttle operation then you can tighten the hold down nuts to their final torque value, 100 Inch Lbs. (8 Ft. Lbs.). Most intake manifold studs are a fine thread and therefore tightening the hold down nuts must be tightened in a criss cross pattern and in a number of steps before arriving at the final torque value. Rapidly tightening the hold down nuts to the final torque spec or over-tightening will cause performance problems as this process can warp or potentially break the throttle body.
- Install vacuum hoses. If the PCV was originally attached to the carburetor it should be installed the same way on your new carburetor. Vacuum connections to the new carburetor as shown below:

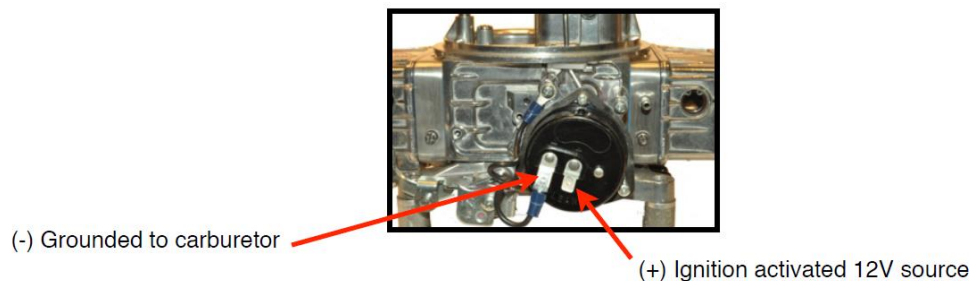


Distributor vacuum advance may also be connected to the tube in the primary metering block.

Manifold vacuum is typically used for transmission modular or any accessory that requires a full manifold vacuum signal, i.e. heat and/or A/C control, vacuum actuated fresh air induction, etc. . The Ported or timed vacuum is typically used for the vacuum advance canister on the distributor if applicable. NOTE: some distributor vacuum advance canisters require full manifold vacuum, not ported or timed vacuum.

**Check the specifications for your distributor.**

- Install fuel inlet fittings **DO NOT USE PTFE TAPE ON INVERTED FLARE FUEL INLET FITTINGS.** Clean threads and flare of any dirt and debris before installation. Check to be certain the fuel inlet fittings in the fuel bowl are tight, then install the fuel line nuts. Tighten sufficiently to prevent fuel leakage.
- Connect positive (+) wire for electric choke to an key on 12 volt voltage source. **DO NOT CONNECT TO THE BATTERY SIDE OF THE IGNITION COIL.** Preferably check voltage with a volt meter to determine the correct voltage. NOTE: battery voltage will be 12 volts or greater. You need to recheck the voltage reading when the engine is running to be certain the voltage does not drop below 12.6 volts. (Some engines use a field wire from the alternator that only produces 9.5 volts which does not allow the choke to operate properly.)



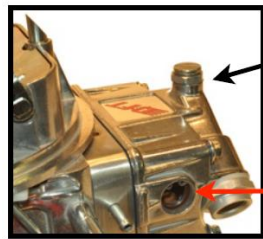
- Reinstall flame arrestor and open all hatches allowing bilge to ventilate naturally until no vapors are present.

## STARTING THE ENGINE

1. Reattach the negative battery cable and operate bilge blower for a minimum of 10 minutes.

**WARNING!** After starting the engine, check the fuel lines and inlet fittings for possible leaks. If ANY fuel leakage or weeping is detected, shut off the engine immediately. The presence of liquid fuel demands the tightening of fittings, hose replacement and re-torque of fuel system component flange nuts (where applicable). Wipe any leaked fuel up and remove the rag or towel from the vessel. Operate the bilge blower as directed above before proceeding to correct the cause of the leakage. Be sure to operate the blower again before attempting to restart the engine.

2. You are now ready to start the engine.
3. Before attempting to start; the fuel bowls need to be filled with fuel. Whether you have an electric fuel pump or a mechanical pump, it is necessary to operate the fuel pump for 15 seconds or so, a couple of 10 second cranks for mechanical pumps, to enable the bowls to fill with fuel.
4. Before starting the engine make an initial check of the float level. If fuel is not visible in the sight glass. This carburetor was pre-set at the factory to be in the middle of the sight glass at 6.5 P.S.I. Fuel pressure greater than 6.5 P.S.I. will cause the float level to be too high. Conversely, if the fuel pressure is significantly below 6.5 P.S.I. the float level will be too low. For the carburetor to operate correctly the float levels must be in the middle of the sight glass. The most accurate way to establish the correct float level is to check it while the engine is running. If the initial float level is not visible in the sight glass then it might be necessary to re-adjust the float level before starting the engine.



Raise or Lower Float with a 5/8" wrench

Set fuel level in middle of window with engine running at idle speed with proper fuel pressure (note the arrows in the casting)

**DO NOT ADJUST WITH ENGINE RUNNING**

5. With the float level verified and correct, rotate the throttle to wide open twice. If the temperature is below 72 degrees, the choke will close and the accelerator pump nozzles should discharge fuel. You can now start the engine.
6. It should not be necessary to continue operating the throttle while attempting to start the engine. If it does not start on the first attempt, rotate the throttle a couple of additional times, and then try starting the engine again.
7. If the engine still will not start, try holding the throttle open slightly while starting in the event too much fuel entered the engine while operating the throttle or the idle speed might be too low for your application.
8. Let it idle for approximately 5 minutes. The choke should open on its own during this time and be fully open (vertical position) after approximately 3 minutes (will vary with outside temperature).

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9. If possible using a manifold vacuum gage, set the idle mixture screws to attain the highest manifold vacuum reading at idle. It is not necessary to keep all four mixture screws at exactly the same number of turns from seated, but they should be close to the same number of turns. Make adjustments in small increments of ¼ turn per adjustment. See how the engine responds then adjust the mixture screws to smooth out the idle. Turning in one mixture screw could not have any noticeable effect, if the other three mixture screws are out too far. The mixture screws should be adjusted in conjunction with each other to achieve the proper mixture. When engine's RPM increases during the adjustment process, adjust it back down to the desired rpm and continue mixture screw adjustment until the engine RPM or vacuum drops. When the engine RPM or vacuum drop, the idle mixture is too lean and the mixture screws will need to be backed out to the highest vacuum or RPM.
10. Turning the mixture screws in (clockwise) leans the mixture, turning the mixture screws out (counter-clockwise) richens the mixture.
11. After you have attained the highest manifold vacuum (or best idle quality), shift the transmission into gear. This will create a load on the engine and may change the idle characteristics. With performance camshafts with longer duration it is often

necessary to add a little more fuel because the engine is not as efficient and therefore must be over fueled slightly to keep the engine from laboring when a load is placed on the engine such as shifting the transmission into gear.

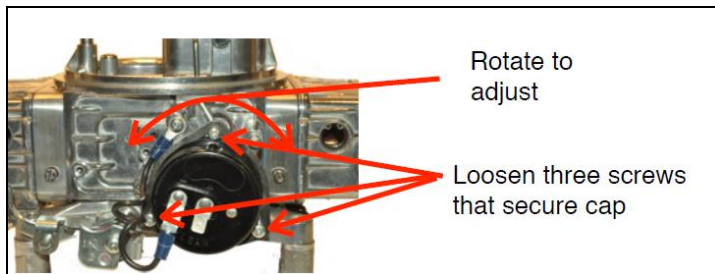
12. You are now ready to drive the vessel. It may require some minor adjustments with the mixture screws and idle speed but the engine should drive smoothly and have good throttle response.
13. Once you are satisfied with the general drivability, determine how well the engine runs while holding a steady RPM. Generally any RPM above 2,000 RPM the carburetor is operating off the main metering system. The air fuel ratio in this system is usually controlled by the main metering jets. If the engine surges while driving at a steady RPM on flat ground then the mixture is probably too lean and the main jets need to be increased in size. If the engine labors and has difficulty holding a steady speed without opening the throttle more, then the mixture is probably too rich. Ultimately, you should look at the spark plug color after one (1) hour of runtime to help determine the general air/fuel mixture the carburetor is delivering and the engine is operating. White plug color indicates a lean mixture, dark gray or black indicates a rich mixture.

## Adjustments & Tuning

### Choke Adjustments - Choke Indexing

The electric choke cap is adjustable for varying conditions and personal preference should you desire. The normal choke setting is for the choke plate to just barely close at 72 degrees Fahrenheit. Loosening the three screws securing electric choke spring will allow the choke cap to rotate. Rotating the choke cap clockwise reduces the choke effect (lean) whereas rotating the choke cap counter-clockwise increases the choke effect (rich).

#### **Clockwise Rotation Leans Choke (closes higher temperature, opens faster)**



Clockwise rotation reduces temperature for choke to close and shortens the time for the choke plate to completely open. Full clockwise rotation the choke will never close. Counter-clockwise rotation raises the temperature for the choke to close and lengthen the time the choke plate is closed, so it will take longer for the choke plate to open to full vertical position.

## FUEL SYSTEM STORAGE INSTRUCTIONS

During extended periods of vessel storage (60 days or more), gasoline may deteriorate due to oxidation. This can damage rubber and other polymers in the fuel system. It may also clog small orifices such as main jets, idle feed restrictions, and power valve channel restrictions. A commercially available fuel stabilizer such as STA-BIL or an equivalent should be added to the vessel's fuel tank whenever actual or expected storage periods exceed 60 days.

Follow the product instructions for the amount of additive to use. The engine should be operated at idle for a minimum of ten minutes after the addition of the stabilizer to assure that it reaches the carburetor.

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