HOWELL

ENGINE DEVELOPMENTS, INC.
FUEL INJECTION APPLICATIONS

6201 Industrial Way • Marine City, Michigan 48039 • Phone (810) 765-5100 • Fax (810) 765-1503

INSTALLATION AND ADJUSTMENT INSTRUCTIONS FOR HOWELL 2 X 2 TBI FUEL INJECTION KITS:

These kits may be installed easily on any 2 x 4 barred intake manifold with 6 7/16" spacing between carb centers. Kits are normally supplied with 400 CFM TBI units modified by Howell. They are easily adapted to manifolds designed originally for Carter AFB bore centers and bolt pattern. The Carter design is currently manufactured by Edelbrock. Adaptors and gaskets are supplied with the kits to fit this bolt pattern.

KIT COMPONENTS:

1. 2 TBI units, remanufactured and guaranteed by Howell Engine Developments. Both are equipped with Idle Air Control motors, but only the rear unit has a Throttle Position Sensor. The front vacuum fittings on the rear unit, and the bypass fuel return from both front and rear have been blocked.
2. Adaptor plates and gaskets, with bolts, studs, and nuts.
3. A progressive throttle linkage assembly that attaches to the intake manifold, and connects to each TBI throttle lever with ball and socket links
4. A throttle cable bracket that attaches to the two rear adaptor hold down bolts. It will accept a standard GM throttle cable that will connect to the progressive link pivot plate.
5. Fuel lines and a modified bypass fuel pressure regulator with mounting hardware, that mounts on the right side of the TBI units off the two center intake manifold hold down bolts.
6. Wiring harness and computer (ECM) that will operate the EFI system based on coolant temp, manifold vacuum, throttle position, and engine speed. This is a specially calibrated GM ECM, tested and guaranteed for one year from installation. The system will operate in closed loop, using a heated oxygen sensor supplied with the kit. Operating this way, the system picks up

an ignition coil signal to determine that the engine is running, and at what speed.

7. On GM installations, you have the option of operating the ECM controlled Ignition, with preprogrammed spark curves, and knock sensor capability. IN ORDER TO DO THIS, YOU MUST HAVE SPECIFIED THIS WHEN PLACING YOUR ORDER.
8. No air cleaner is supplied. There are a number of Carb air filters that can be used, as most are designed for 6 7/16" carb centers, and will clear the injector pods.

INSTALLATION

1. Mount the adaptor plates using the supplied studs, nuts, and gaskets. The supplied 4 bbl gaskets, are Edelbrock, and you may want to mark and trim the amount overhanging the plates for appearance. Observing the 3 TBI hold down bolt holes, the adaptor plates mount with the near center bolt hole facing forward.
2. Mount the 2 TBI units. You may want to connect the fuel hoses as you mount these, as the fittings are easier to reach before the TBI's are completely in place.
3. Mount the fuel pressure regulator. Connect the fuel hoses as you do this while the unit is loose and can be moved around for things to line up. The fuel inlet in the regulator faces forward, and the bypass fuel exits out the bottom. You will need the necessary hardware to adapt your fuel lines to the regulator. THE REGULATOR FUEL PRESSURE IS PRESET TO 12 PSI.
4. On the drivers side of the engine, mount the fuel linkage pivot over the two left side adaptor plate studs, flush with the top of the adaptor plates (No washers between plate and adaptors).

5. CONNECTING THE LINKAGE: The most critical part of making the twin TBI system operate and drive smoothly is setting the length of the links connecting the throttle levers on both TBI units to the center pivot. When connected properly, the ball ends of the pivot plate should be slightly above and below a straight line from the front TBI pivot ball, to the rear TBI pivot ball. Their length should be adjusted so that both throttle levers move off idle at exactly the same time. Once this length is established, tighten the 10MM nuts against the linkage cups, and connect the throttle cable.
6. Connect PCV and any vacuum lines to the front TBI unit. Connect the MAP sensor to the back of the rear TBI with a tube no longer than 12"
7. Install the supplied coolant sensor in the inlet manifold water crossover, or 3/8 NPT hole in a cylinder head.
8. Install the wiring harness, ECM, and any other EFI sensors following the procedures outlined in our regular TBI instructions and service manual. All troubleshooting procedures and codes are the same as would apply to a 1990 Z-28 Camaro, as this is the ECM we have chosen to operate the system. The engine code to connect a scanner to the diagnostic connector is 8
9. FUEL PUMP: You should use an in-line or in-tank fuel pump suitable for a Tuned Port EFI to assure enough fuel flow. The regulator will regulate that fuel flow adequately.
10. FUEL PRESSURE: The supplied regulator is set to 12 PSI. You can measure your fuel pressure off the outlet tee from the regulator at the fitting supplied. This is a standard AC pressure fitting, and most pressure gauges will attach to it. If you check fuel pressure, be sure to use a low pressure gauge. A 100 PSI gauge doesn't read very accurately at 12 PSI.

OPERATION

The Twin TBI system should operate at all speeds and loads like any good EFI system. When you ordered the system, we attempted to match your requirements with the mem-cal calibration we supplied. When you are up and running, if there is a problem with anything, call Howell Engine Developments (810-765-5100), and someone will help you troubleshoot it, and if necessary change the calibration.

IDLE SPEED: Because you are now idling on 4 barrels slightly cracked open, you may need to adjust the throttle stops slightly to get a low enough idle speed. We have attempted to match both sets of throttle blades to the same opening at idle. If necessary to change them, the throttle stops are adjustable with a torx screwdriver. Adjust both of them an equal amount, if necessary to close them slightly for a slower idle.

Enjoy your EFI experience, our development prototype was a 1988 Corvette 350 engine, and it runs and drives like a top.

1/29/2009
B Howell