

DESCRIPTION:

The Return Flow Splitter was designed to eliminate the crossover line between the fuel tanks in over-the-road vehicles. The splitter is intended to equally divide the returned fuel from the engine into two streams, one of which would be routed to each fuel tank. The object of dividing the returning fuel is to aid in maintaining equal fuel levels in both fuel tanks. This guide outlines the proper installation of a dual draw/dual return fuel system.

DRAW (SUCTION) LINES:

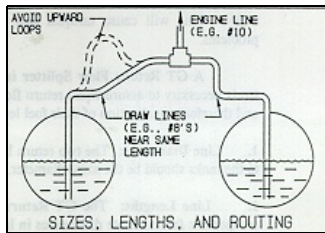


Figure 1: Line Routing

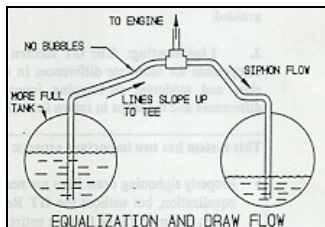


Figure 2: Draw Flow

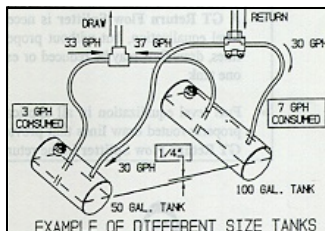
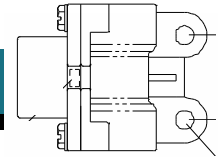


Figure 3: Different Sized Tanks

1. **Line Diameters:** Both fuel tank draw lines must be the same diameter. The line to the engine may be any size within engine guidelines.
2. **Line Lengths:** Both fuel tank lines should be equal in length. (A slight difference is acceptable.) In a typical installation, a one-foot length difference may result in an inch of fuel height difference while the vehicle is running.
3. **Line Routing:** The two tank draw lines should rise steadily (or at least be level). Avoid forming upward loops that could trap an air bubble, or downward loops that could trap water (the line from the tee to the engine may be routed in any convenient way). (See Figure 1.)
4. **Tank Connection:** It makes no difference whether the draw tube exits the bottom of the tank and rises to the tee (bottom draw), rises within the tank (top draw), or exits the tank from the side. The lines are better protected by top draw, but more care must be taken to keep the lines sloping up to the tee from the top of the tank.
5. **Equalization:** If full of fuel (bubble free), the lines will act as a siphon to level the fuel in the two tanks, just like a crossover line. An air bubble can break the siphon if trapped in an upward loop, and stop flow from one tank.
6. **Draw Flow:** If fuel levels are equal, and the lines are full, the engine will draw equally from each tank. If levels are different, more fuel will flow from the full tank, tending to equalize the tanks. (See Figure 2.)
7. **Different Sized Tanks:** This system adequately handles different sized tanks. The larger tank will develop a slightly higher fuel level, causing more fuel to flow from that tank to the engine. Only a 1/4 inch fuel level difference typically results, even from substantially different sized tanks. (See Figure 3.)
8. **High Flow Engines:** High fuel flow to the engine may flush bubbles out if they are trapped, but will create higher pressure drops. Large lines are indicated to minimize the chance of pressure drop differences becoming fuel level differences.



RETURN LINES:

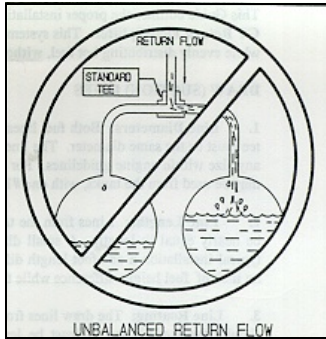


Figure 4: Unbalanced Return Flow

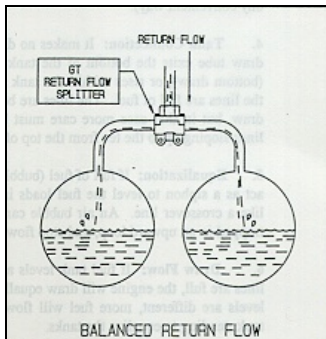


Figure 5: Balanced Return Flow

Although the draw lines may serve as the crossover line by siphoning, equal return of the unused fuel to the two tanks is also necessary for equalization. Flow through a standard tee can be very unpredictable. Even a slight difference in line routing, or a little air in one line, can cause all the flow to go to one of the tanks. This will cause unequal fuel levels and hot fuel problems. A GT Return Flow Splitter in place of the return tee is necessary to assure equal return flows from all engines to the two tanks, and therefore, equalization of their fuel levels.

1. **Line Diameter:** The two return lines from the splitter to the tanks should be the same diameter.
2. **Line Lengths:** The GT Return Flow Splitter will compensate for moderate differences in line lengths from side to side; however extreme differences should be avoided.
3. **Routing:** The GT Return Flow Splitter will compensate for moderate differences in routing from side to side, and moderate air-trapping loops. However, large differences and big loops in return lines should be avoided. (See Figure 5.)

This system has two important aspects:

Properly siphoning draw lines are necessary for fuel level equalization, but without the GT Return Flow Splitter return fuel may still be flowing entirely to one tank.

A GT Return Flow Splitter is necessary to assure fuel level equalization, but without properly siphoning draw lines, draw flow may be reduced or entirely stopped from one tank.

SUMMARY: Fuel level equalization in all applications requires both properly routed draw lines that provide siphoning, and a GT Return Flow Splitter in the return line.