Q: How can dirt cause a float valve to leak, and why doesn't dirt simply pass through as the floats raise and lower the needle against the seat?

A: The needle of the float valve is actually always being pressed up against the seat by the buoyancy of the floats. As the fuel level lowers, the pressure against the seat is somewhat less, and the pump is able to
force some more fuel into the float chamber. As the fuel level rises, the buoyancy once again is sufficient to close off the fuel flow, in opposition to the pressure from the pump.

The fact that the needle is always being pressed against the seat, explains why a piece of dirt will remain held between the needle and the seat once it works its way in.

The best safeguard against a leaky float valve is to install a good primary fuel filter with a water separator and then to service it regularly. We also recommend a small inline filter between the fuel pump and the carburetor. Primary fuel filters usually have a 10 micron mesh filter element, while the elements in small inline filters are usually 7 micron. These small inline filters serve a secondary or "polishing" function.

The dirt can of course be cleaned out by removing the carburetor and disassembling it. While the carburetor is disassembled, the seat of the float valve can be polished by taking a short length of 3/16" wooden dowel rod (bluntly pointed on the end) and pressing it against the seat while rotating it back and forth. This dressing action sometimes assures a better seating of the needle.

Depending on available access, it's sometimes possible to get rid of a piece of trapped dirt in the float valve, by draining all the fuel from the carburetor as follows, without actually removing the carburetor from the engine:

1) Remove the ½" hex-headed main passage plug and drain all of the fuel in the carburetor into a clean glass jar to check for any sign of turbidity in the fuel. The main passage plug lies horizontally in the bottom of the carburetor with the hex-head pointing directly away from the flywheel end of the engine. The main passageway is the lowest part of the carburetor so any crud that is trying to pass through the carburetor will wash out into your clean glass jar. CAUTION: The main passage plug has fine machine threads and seals with a hard black washer under the hex-head. Be careful not to drop the washer when removing the plug, and do not over-tighten the plug when reinstalling it or the washer will extrude out from under the hex-head.

2) While the main passage plug is still removed, it's a good idea to operate the fuel pump to move a couple pints of fuel through the carburetor and into your clean jar (or until the fuel is perfectly clear - which ever comes first). Mechanical pumps have a priming lever which makes this part of the job easy, but electric pumps will usually have an oil safety switch in their circuit making it necessary to connect a temporary jumper wire run between the positive terminal of the coil and the pump so that the pump will operate anytime that the ignition switch is turned on.

NOTE: A convenient way to run an electric fuel pump during troubleshooting or maintenance operations is to procure a hand held push-button starter switch at your local auto parts store, and connect it between the big battery cable on the starter solenoid and the terminal on the oil safety switch to which the fuel pump connects. You can then run the pump by simply pushing the handheld starter button

3) Reinstall the main passage plug and work the fuel pump again until the carburetor is charged with fuel.