

SETTING THE LEAKAGE OF A BARREL VALVE SPOOL

LEAKAGE SETTING BARREL VALVE

A leakage test is done to determine how far the idle passage ramp is open in the spool. The setting that works best for one engine combination may not work for another because variables such as fuel pressure, throttle size, idle speed, and ignition timing all affect the proper barrel valve "idle" opening. The idle setting, or spool indexing, affects the part throttle fuel delivery. See sections on KINSLER BARREL VALVE SPOOLS, Pg. 98 and SETTING THE "IDLE" FUEL RATE FOR BEST THROTTLE RESPONSE, Pg. 106

DIFFERENT STYLES OF LEAKAGE METERS

- 1) **Direct Percent Readout Style** - displays the percent of leakage on the gauge. Sun leak testers were like this.... no longer made.
- 2) **Pressure Differential Style** - usually has two pressure gauges, pressure in and pressure out. The leakage is a function of the differential value between the gauge readings.

Examples: 100-PSI in and 70-PSI out, results in a leakage of 30-PSI, 30-PSI is 30% of 100-PSI.
80-PSI in and 70-PSI out, results in a leakage of 10-PSI, 10-PSI is 12.5% of the 80-PSI inlet pressure.

REMEMBER YOU WANT A PERCENTAGE !

To calculate this: $\frac{\text{Inlet PSI} - \text{Outlet PSI}}{\text{Inlet PSI}} = \% \text{ Leakdown}$

TESTING PROCEDURE

- NOTES:**
- A) PLEASE read the instructions for the leakage tester before using it.
 - B) Be consistent in the test method. Perform the test the same every time, this will help avoid errors.
 - C) The secondary bypass fitting **MUST** be capped off, see upper photo.
 - D) Always use the same inlet pressure for repeatability.
- 1) Attach the leakage meter outlet hose to the barrel valve inlet fitting.
 - 2) Open the barrel valve to wide open throttle, turn the air pressure to the meter on and off to make sure that the gauges zero.
- Note:** The manufacturer of the leakage meter you are using may specify a different zeroing method. Use that one.
- 3) With the air pressure on, close the throttles to the idle position and observe the gauge reading(s).
 - 4) Most Leakage Meters Do Not Read the Same; but all Kinsler meters are calibrated to a master so each of them reads the same. Test your barrel valve leakage after receiving your unit from our calibration department. Record the reading before making ANY adjustments. Your leakage tester may show a value different than the unit we used. Leakage testers that are working properly read within about 2% of one another.

CONDITIONS THAT INFLUENCE THE REQUIRED LEAKAGE

Fuel system pressure, engine idle speed, and the load against the engine all affect the required leakage setting of the barrel valve spool.

- 1) Fuel Pressure at Idle ; Given two identical engines: if engine 'A's fuel pressure is higher than engine 'B's, because of a heavier spring behind the poppet in the main bypass, the barrel valve spool on Engine 'A' will need to be closed further to maintain the same fuel idle flow.
- 2) Engine Idle Speed ; Is proportional to the idle air flow, which will affect the amount of fuel required. The more air, the more fuel needed to maintain the same air/fuel ratio.
- 3) Engine Load ; A Sprint Car which is push started "in gear" will have a significant load against the engine right from the start. A drag car engine will start and idle "out of gear" with very little load, mainly the reciprocating friction of the engine and accessories. The Sprint Car engine will require more fuel due to the heavier load (increased load means additional horsepower requirement) to maintain a given RPM.

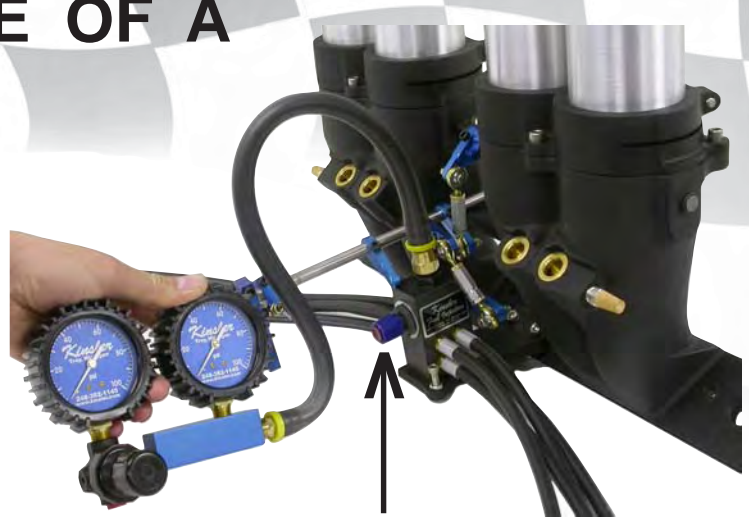


Fig. 1 cap off secondary outlet fitting



5980 Dual gauge leakdown metering; 0-100 PSI / 0-100 PSI gauges with 6 AN female swivel hose assembly