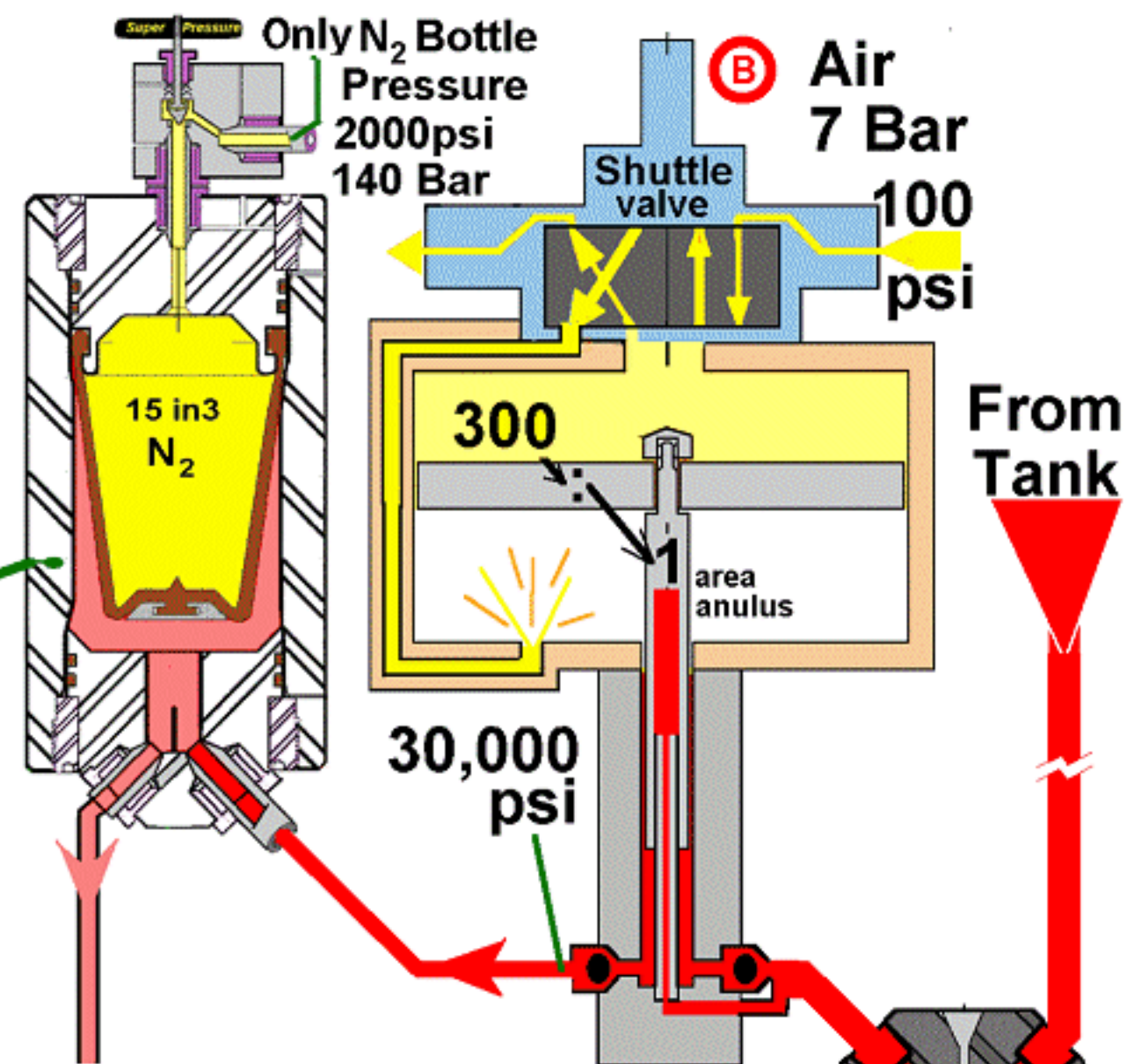


89. **Suction Problems with High Pressure Systems 10,000 to 30,000 psi**
Suction has to start with a jump **700 to 2,000 Bar**

PROBLEM 1, 2, & 3. Below

The National Oilwell ("O.W.E.CO") well head test rig (A) below, was re-deployed to 11,500 psi methanol and INHIBITOR pumping, to prove injection systems. The fast return / suction stroke of pump (B) prevented the suction from fully filling. The discharge stroke began with a huge acceleration until the plunger hit (F) the liquid and sent a shock into the system.

1. The pressure set valve (C) was blasted off its seat.
2. The chart recorder (D) was ruptured.
3. The certified gauge (E) immediately lost calibration.

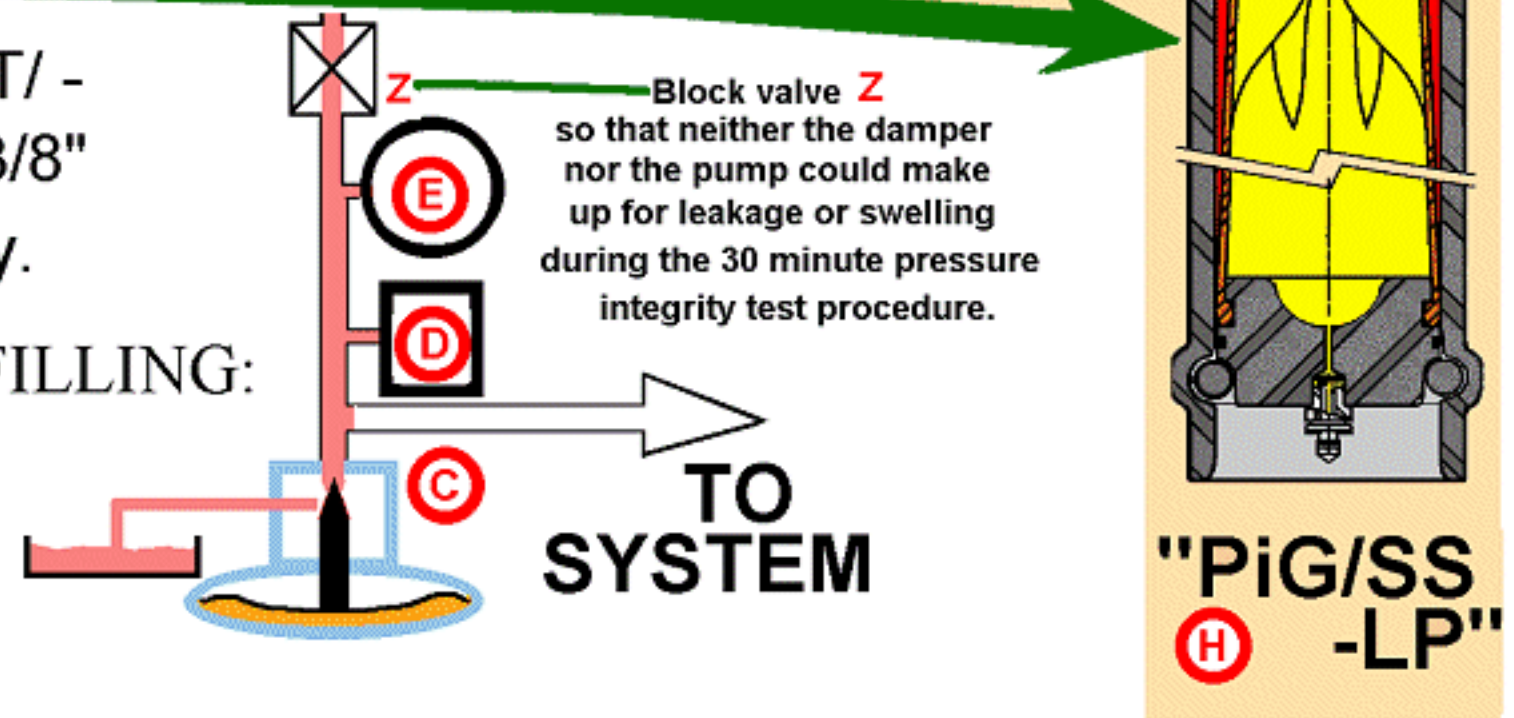


ANSWER (H) "PiG" PIPEGUARD - LP see PHOTO. on Page 88

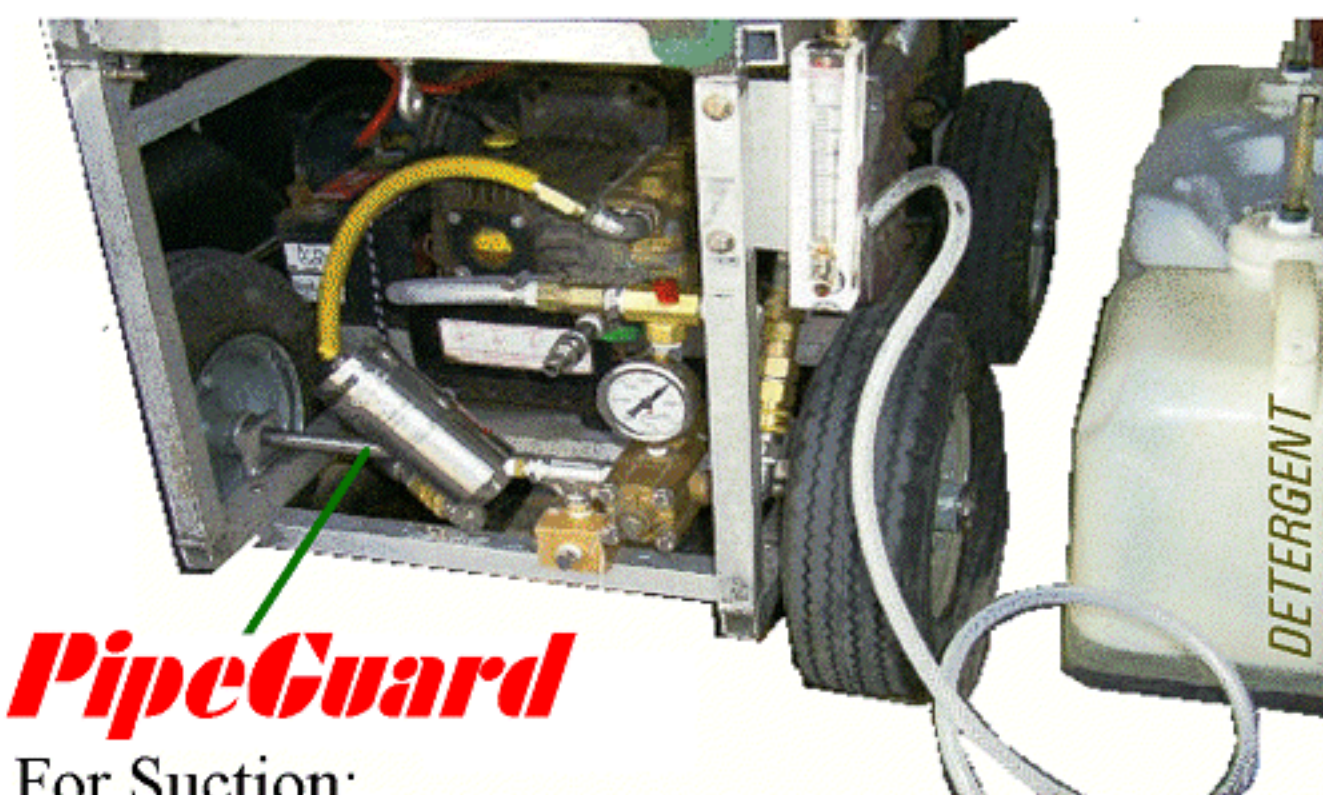
US Pt. No. PigLP/ 15 i / 600p / 1/2" x 3/8" NPT/ -
 Metric Pt.# - PigLp / 0.25 Lt. / 40 Br. / 1/2" x 3/8"
 Just one of 1000 items "off the shelf" Inventory.

RESULTS FROM PROPER SUCTION FILLING:

1. 70% Reduction in pressure pulsation
2. 225% increase in pumpable rate.
3. A year before recalibration required.



High speed pumping systems, create the same suction problems, as high pressure. An example is a direct motor driven three plunger 2500 psi wash pump - below.



PipeGuard

For Suction:
 Pig/ss/LP/15i/600p/ 0.375" in x 0.50" to pmp.
 For Discharge:
 Pig/ss/HP/6i/3000p/0.375" to pmp. x 0.25" out
 (Please also see PipeGuard HP price and dimension Literature.)

WHITE FINGER

Vibration of the high pressure cleaning lance from pressure pulsation, made it impossible for the operator to clean for more than 2 hours.

After fitting the FLOW-THROUGH **PipeGuard** Pressure Pulsation Interceptor, the two hours waiting time per day, for circulation to return to the hands, was saved.

The **PipeGuard** damper paid for itself in two and one half days.

AND : Pump life between service was tripled.

Dampers that do. Flow goes through. BUT Pressure Pulsation does not.

PULSE GUARD Inc. In USA Toll Free, 1-888-DAMPERS (326-7377)

Guard against Pulsation For the Americas --01(1)910-270-2737

BW & Color Fax, --01(1)910-270-0320

Color fax is 10 times faster than email attach, and there are no viruses.