

The COST \$\$ of GEAR PUMPS with Various PULSEGUARD Dampers



**25% saving by a 2 connection damper - even if you do not flow through it.
but 50% saving by a 2 connection damper - when you do flow through it.**

A gear pump test rig, 29 teeth at 1740 rpm - 87 Hz. Pressure wave passes a 1" T in 0.0000175 of a second. Someone specifies a 5 Liter (300 In3) single connection accumulator, for this 75Lt./Min. (20 USGPM), 25 Bar (350 psi) application. A 300in3 off line Acc. does nothing other than increase softness, therefore - lower wave speed

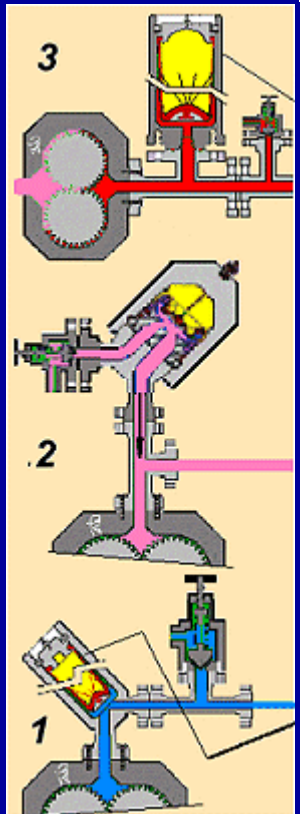
2 pcs. 316 1"=T Sch 80 @ \$53 \$106
6 pcs. 316 1" 300# Flgs @ \$15 \$90
6 hrs. welding @ 62.50/hr. \$375
3+hrs. NDE & Hydro. \$200
Flgd. 40 Bar SS Acc. @ \$1,156
3. Total \$1,927

Next the "T" for the Relief Valve was saved and the three flanges and welding time, so there was a 25% installed cost reduction, and a 30% reduction in pulsation because of the direct line from pump to large diameter bottle.

1 pcs. "T" as above \$53
3 pcs. Flgs. as above \$45
Weld, NDE & Hydro. \$310
Twin flange 316 Damper \$997
2. Total \$1,405

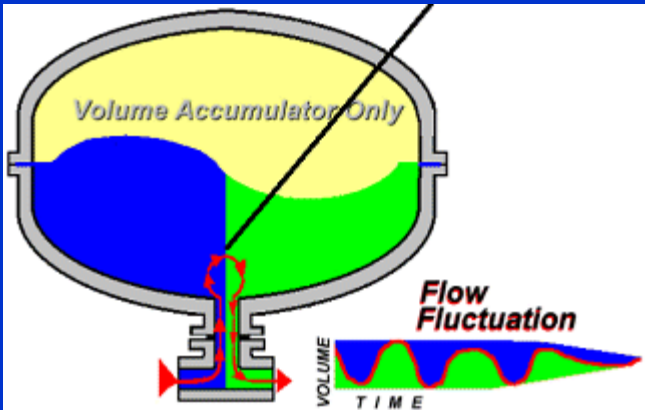
Finally, "third time lucky", the pressure ripple went into the pressure pulsation damper and completely disappeared. This time it was only a 120 in3 at less half the cost of the 300 in3 accumulator, which had proved useless.

1 pcs. "T" as above \$53
3 pcs. Flgs. as above \$45
Weld, NDE & Hydro. \$310
Small flo-thru Damper & flanges, 293+238 = \$531
1. Total \$939



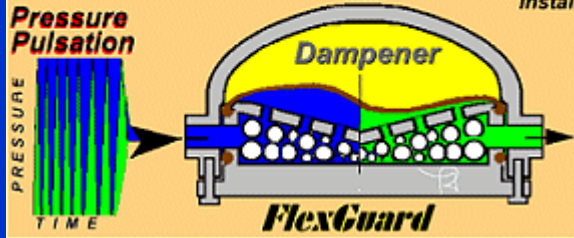
**Pressure travels 300 times faster than flow
So pulsation - flies straight past a "T"!**

Because flow is so slow, there is time to flow up, come to a stop, and flow back down a "T" on the other hand, whatever the residual pressure pulsation level is, it will fly straight past a "T".



Mass of liquid in a pipe is transferred at not above 180 inches/sec or say 460 cm/sec

A Pulsation Dampener intercepts pressure pulsation and smooths flow fluctuations; *is smaller & costs less to instal.*



Pressure in a fluid travels at, Mach 1 (in Air)
In harder substances (liquid) is transferred at up to 4000 MPH, or say 140,000 cm/sec.

CONCLUSION:- With 300% greater efficiency, because flow fluctuations & pressure pulsation are forced to see the inside of PULSEGUARD PULSE DAMPERS, are more compact vessels and DO MORE WORK FOR A LOWER COST. Hence the saying:-

Dampers that do, flow goes through, BUT pressure pulsation is caught