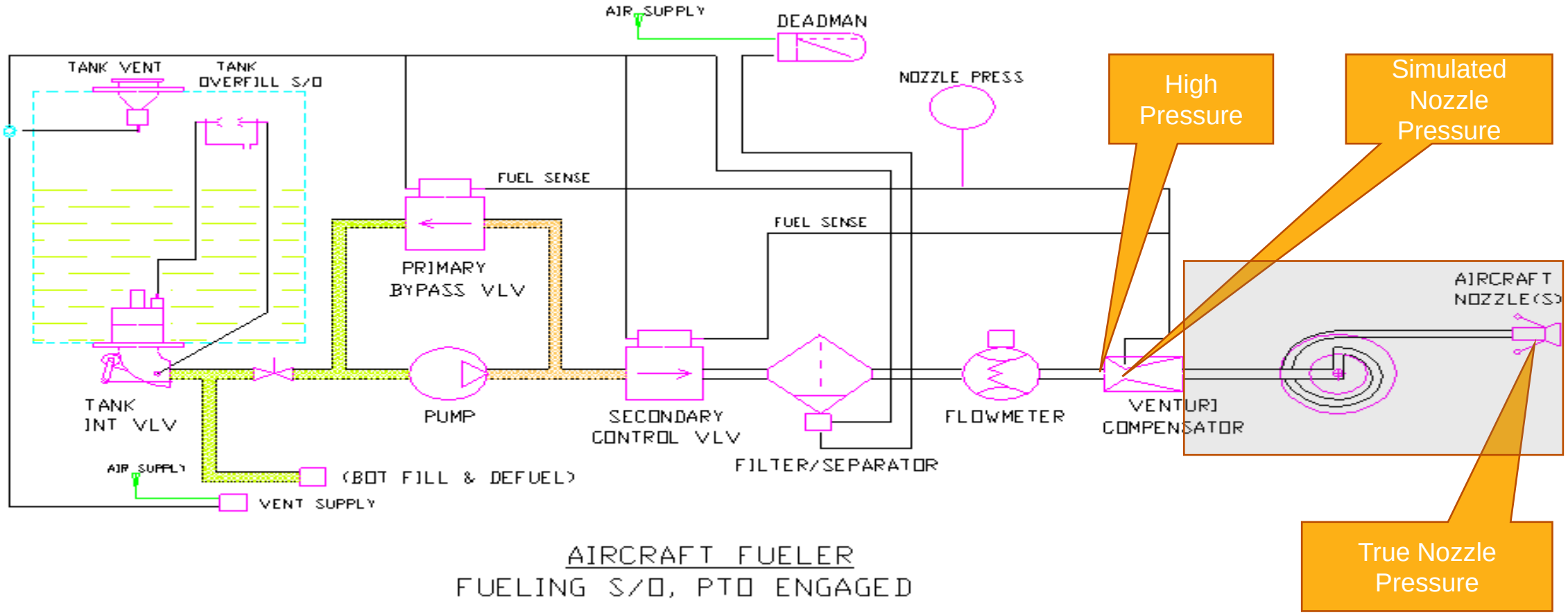
Ground Fueling Products

Steve Minier

Venturi

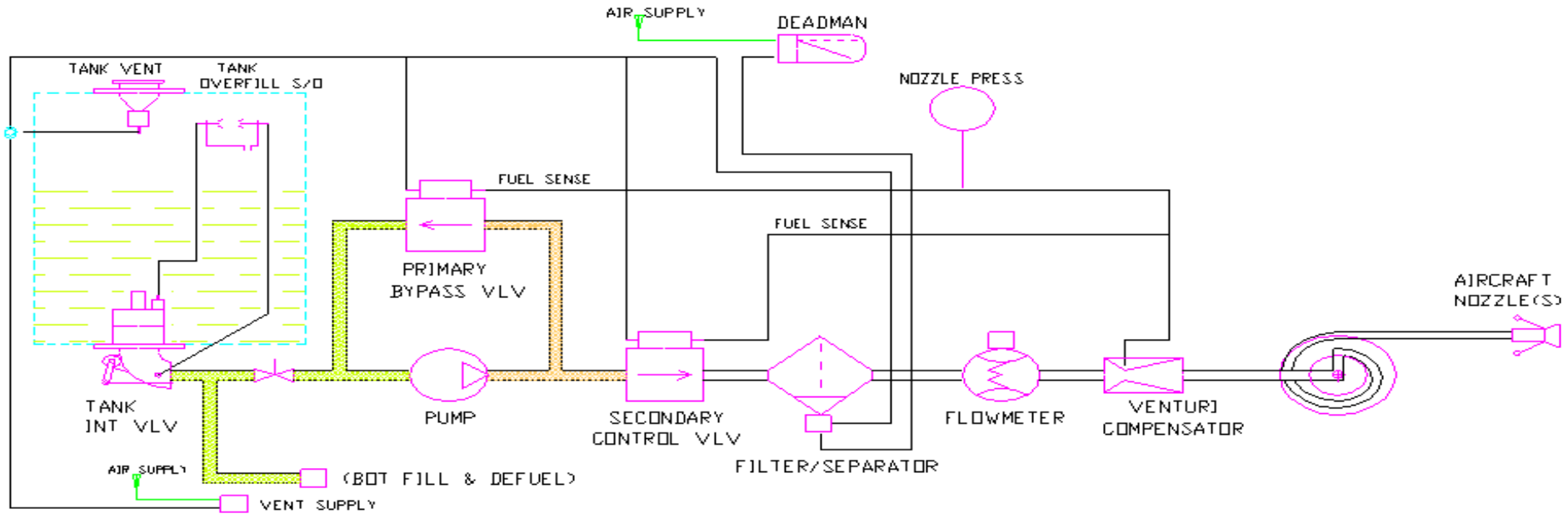
Venturi

The purpose of a Venturi is to compensate for the loss of pressure from the outlet of the venturi to the aircraft.



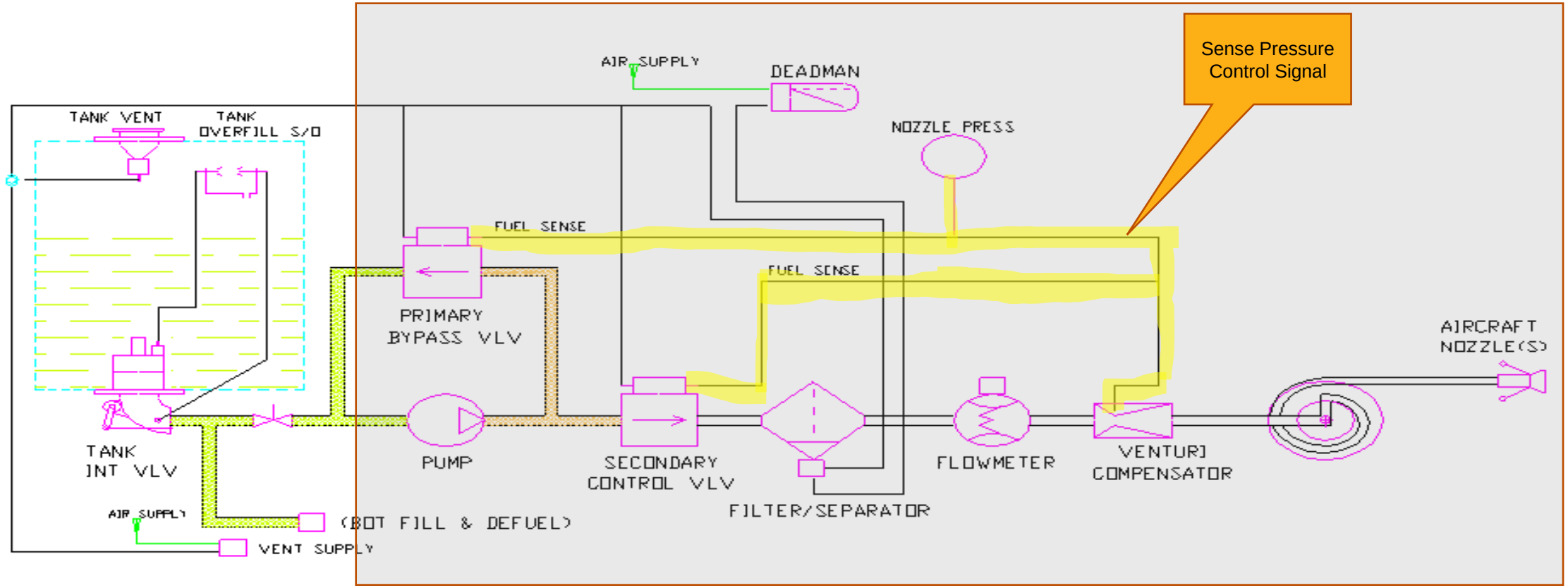
How The Venturi Works

- The venturi sends simulated nozzle pressure as a control signal to the pressure control valves and the panel mounted “nozzle pressure” gauge.
- To address the pressure loss the actual pump pressure is normally set at 80-90 psi to compensate for the loss.



AIRCRAFT FUELER
FUELING S/O, PTO ENGAGED

Venturi



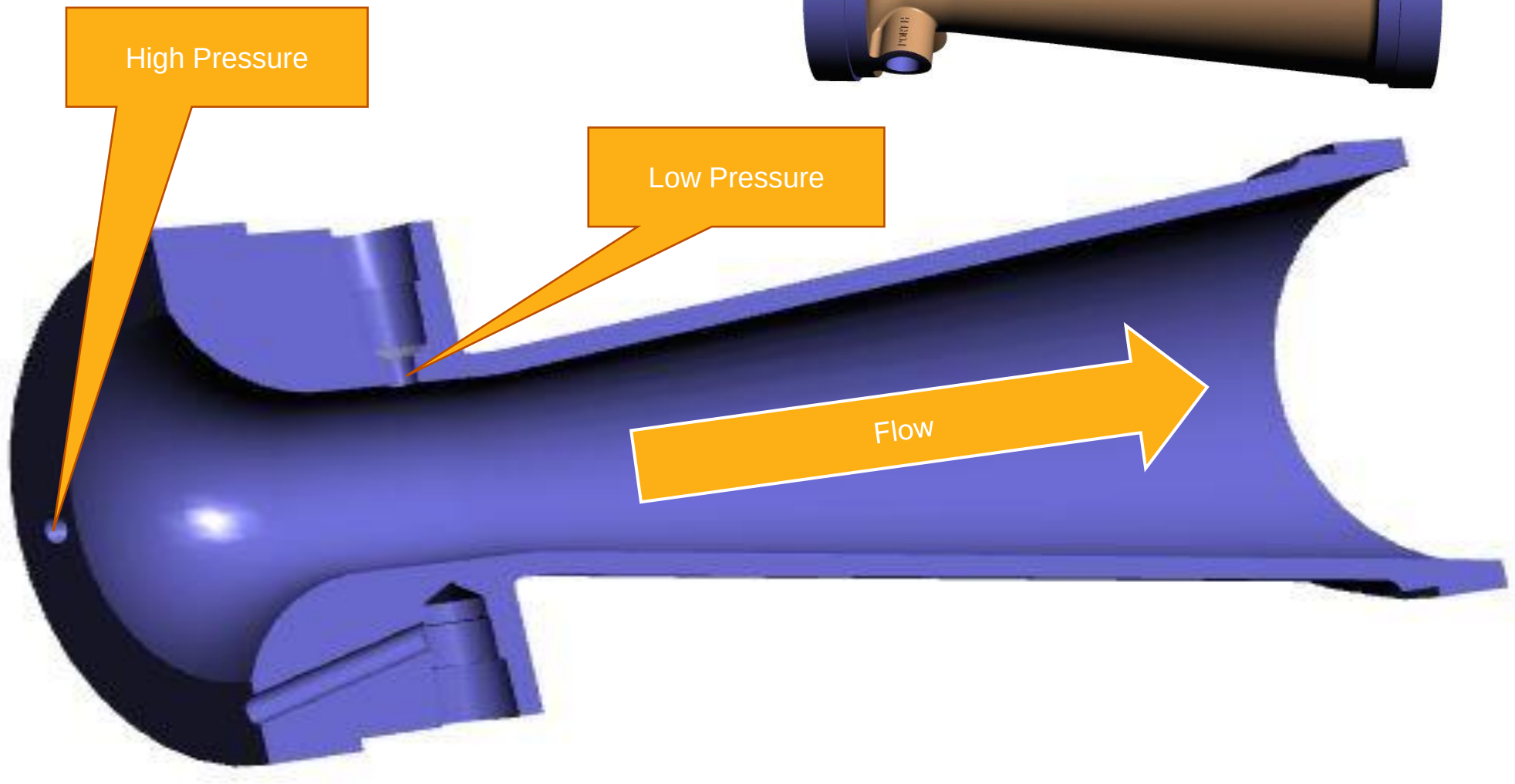
AIRCRAFT FUELER
FUELING S/O, PTO ENGAGED

Pressure Loss

Typical pressure loss at 450 GPM

- Nozzle, 100 mesh screen and standard disconnect 14 psi.
- 2 1/2 “ X 50’ refueling hose 18 psi.
- Total compensation 32 psi.
  - Not including the piping and hose reel…

Venturi



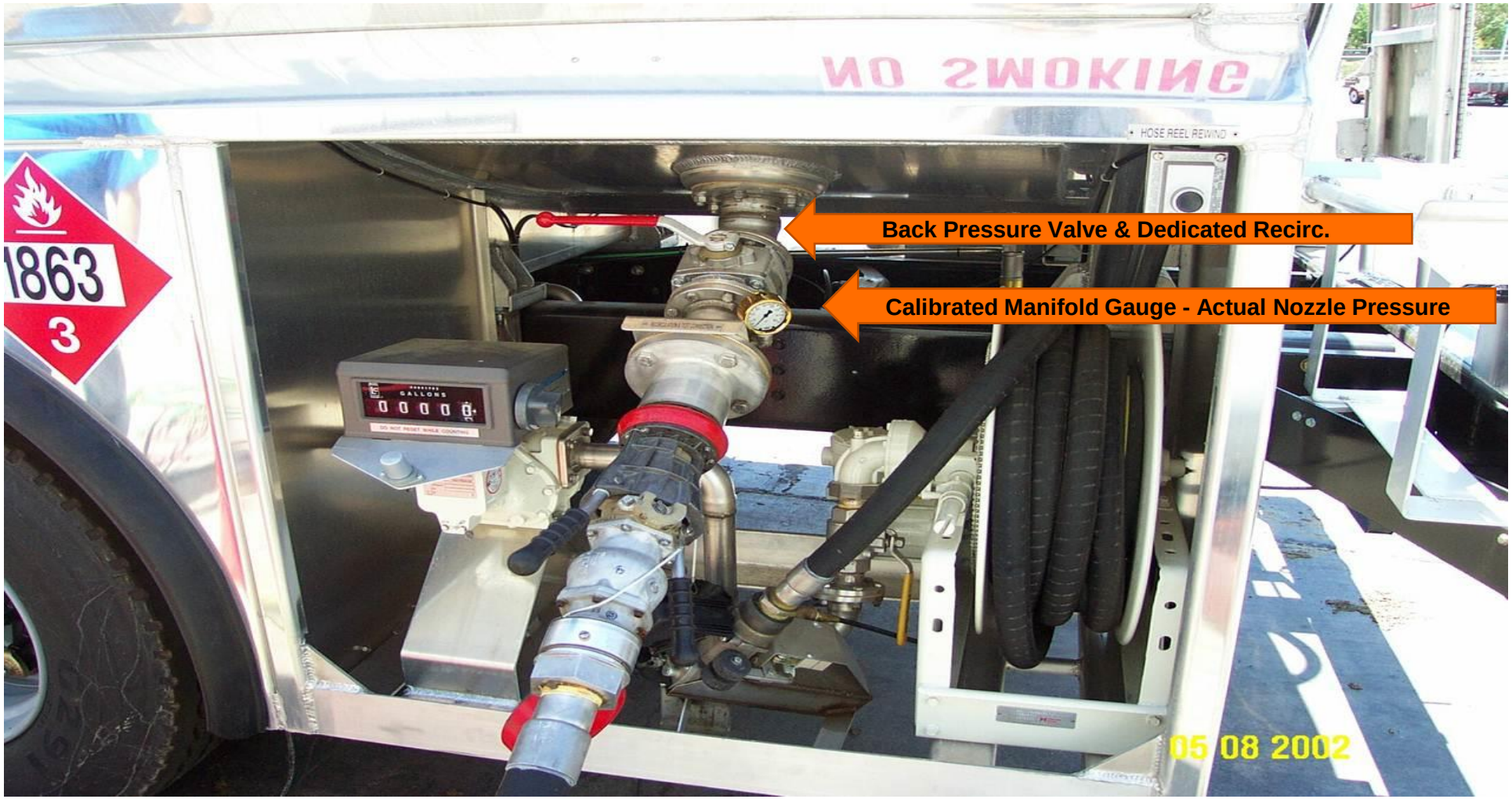
Venturi
Selection

- There isn’t one venturi that fits all applications, picking the correct venturi is determined by a few factors: Flow rate, pressure compensation and pipe diameter.
- Always choose a venturi that has more compensation than the system requires. By doing this you can bleed off high signal pressure when adjusting the venturi.
- To properly achieve compensation the venturi should be installed with a minimum of straight pipe 4 times the pipe diameter both upstream and downstream. Less than this may reduce the available compensation.
- All sense lines must be 3/8” ID to allow the venturi to properly send a signal to the control valves.

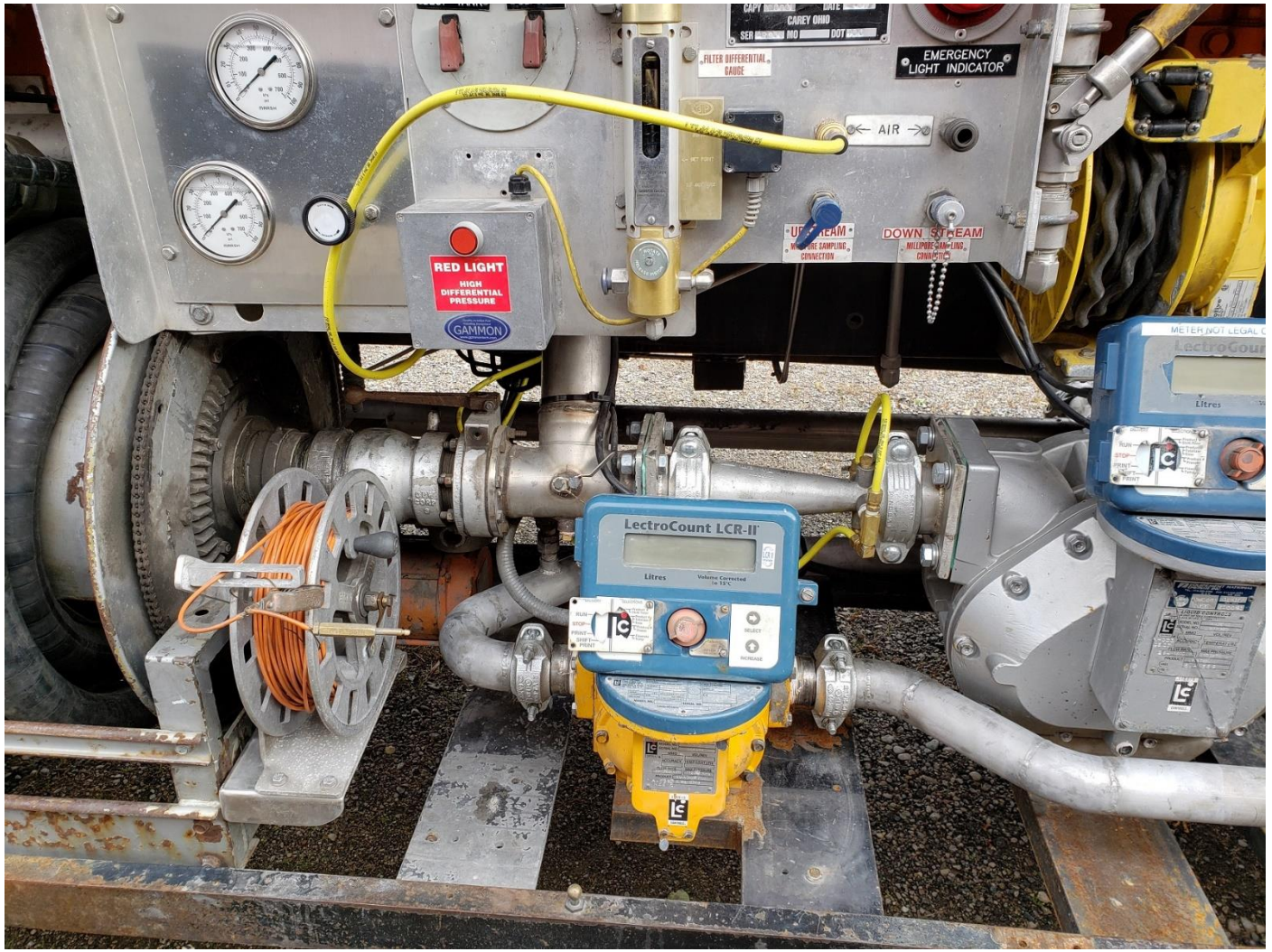
Venturi
Selection

- The pressure at the nozzle is true nozzle pressure. Once the venturi is properly selected and adjusted both your test manifold and unit panel gauges will read the same.
- With the venturi properly adjusted the system will deliver the maximum flow rate at the proper pressure to protect the aircraft.
- If the length or diameter of the product hose is changed you will need to re-adjust the venturi.
- If a HECV is mounted to the nozzle it must be blocked out during set-up of the venturi.
- Always verify the sense lines are:
  - Air Free
  - Kink free
  - Leak Free
  - Properly Routed

Test Set-up



Venturi
Installation…



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Single Point Nozzle

NOZZLE REPAIR

- ✓ **Recommended tools of the trade**

- ✓ **Manufactures tools for teardown, rebuilding and testing**

12

NOZZLE REPAIR

- ✓ **Ample spare parts and a complete rebuild kit from the manufacturer**

- ✓ **Maintenance manual for the specific nozzle model number**

Maintenance Manual

UNDERWING REFUELLING NOZZLE

F117 Series

MMF117

Revision 2.0
27 September 2013

Meggitt Control Systems

MEGGiTT
smart engineering for
extreme environments

13

NOZZLE TESTING

EXAMINATION OF PRODUCT

- The nozzle shall be inspected for compliance to the requirements of materials, workmanship, dimensions, configuration, markings, etc.
- The nozzle shall be free of dirt, grease, chips and other foreign matter as evidenced by visual examination.

Teardown & Inspection:

- Inspect for defects or damage that needs to be addressed prior to teardown

General:

- Complete all tests using Stoddard solvent or equivalent as the test fluid, supplied by 0 to 120 psi

NOZZLE TESTING

Testing after the nozzle has been completely rebuilt

TEST PROCEDURES

Mechanical Test

- ✓ Install a test fixtures on both the nozzle inlet and 3-lug test fixture.
- ✓ Install a test plug in the inlet side to allow the bleeding air out through the test port.
- ✓ The nozzle shall freely engage and disengage with the 3-lug flange, there shall be no binding of the nozzle operating handle.
- ✓ With the nozzle connected to the 3-lug test fixture, actuate the flow control handle 5 times. The nozzle must operate freely with no mechanical interference or binding.

NOZZLE TESTING

Leakage Test (Closed Position)

- ✓ With the flow control handle in the closed position apply 5 psi fluid pressure while bleeding the air out through the test plug on the nozzle.
- ✓ Apply pressure to the nozzle at 10, 60 then 120 psi. Each test should be held for 3 minutes per test.
- ➢ *Note; Look for evidence of external leakage through the nozzle body, shaft seals, swivel or nose seal area.*
- ✓ Decrease pressure to 0 psi.

NOZZLE TESTING

Leakage Test (Open Position)

- ✓ Engage and lock the nozzle to the 3-lug test fixture.
- ✓ Rotate the flow control handle to the open position and apply 5 psi fluid pressure bleeding out the air through the test plug in the nozzle.
- ✓ Apply pressure to the nozzle at 10, 60 then 120 psi. Each test should be held for 3 minutes per test.
- ➢ *Note; Open and close the flow control handle 3 times during each test pressure and check for leaks at the shaft seals and nose seal area.*
- ✓ Decrease test pressure to 0 psi.
- ✓ Close the flow control handle

NOZZLE TESTING

Final Test:

Leakage Test (Closed Position Disconnected)

- ✓ Remove nozzle from 3-lug test fixture and wipe down the poppet face.
- ✓ Apply pressure to the nozzle at 10, 60 then 120 psi. Each test should be held for 3 minutes per test.
- ➢ *Note; Look for leaks between the poppet and the nose seal.*
- ✓ Decrease test pressure to 0 psi.
- ✓ Remove nozzle from test fixture.

Thank You

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