

Overview: EVR Balance Total System

- The VST ECS membrane *Processor* does not interact directly with the other balance system hardware. It is in place to monitor and control the pressure in the UST to within limits specified by CARB.

Under conditions where the GDF is operational and the balance system hardware is functioning normally, the inherent ORVR compatibility of the balance system (when using VST's ENVIRO-LOC nozzle) will produce a predominately negative gauge pressure in the ullage space of the UST. Under these conditions the ECS membrane *Processor* will typically not need to operate.

During periods of less activity, the GDF being shut down overnight, winter fuels being present, or other conditions that promote the pressurization of the ullage space, the ECS membrane *Processor* will operate as needed to control the pressure in the ullage space to an accepted level. The ECS membrane *Processor* will turn on at an ullage pressure of +0.20 inches of water and turn it off at a pressure of -0.20 inches of water. Currently, the ECS membrane *Processor* unit is monitored and controlled through the PMC or ISD software.

- The ECS membrane *Processor* uses a type of membrane technology to enable it to selectively separate the components in the ullage vapor mixture.

Through a somewhat complex transport means, certain molecules will selectively travel in a stream from one side of the membrane to the other. This stream is referred to as the permeate stream.

In this case, predominate molecules transported across the membrane will be the primary constituents of air, which are oxygen, nitrogen, and water vapor. A small amount of the hydrocarbons present in the ullage mixture will also migrate across the membrane. Typically, permeate will contain less than 3.0% hydrocarbons. The result of this activity includes, fresh air vented to atmosphere, hydrocarbon vapors returned to the UST, and UST pressurization controlled to an acceptable level.

- The process of separation by the membrane is made possible by using two pumps, one low-pressure pump which circulates the ullage vapor mixture along one side of the membrane, and one high-vacuum pump, which creates the pressure differential needed to cause the permeate transport across the membrane. These are the only moving parts in the system.

Overview of How the Processor Operates

- The Processor is a technology created for Gasoline Dispensing Facilities (GDF) to assist them in reducing the number of harmful emissions released to the atmosphere through the natural occurrence of gasoline vaporization.
- The table below lists the steps that the Veeder-Root TLS 350 and the software takes to control the Processor.

1.	<ul style="list-style-type: none"> • When the UST system pressure rises above +0.2"WC, the <i>Processor</i> turns ON.
2.	<ul style="list-style-type: none"> • Through the vapor inlet pipe connection at the <i>Processor</i>, the VOC vapor is drawn into the suction side of the blower.
3.	<ul style="list-style-type: none"> • The blower discharges the VOC vapor into the membrane housing.
4.	<ul style="list-style-type: none"> • Inside the membrane housing, the VOC vapor is separated in to two air streams: VOC depleted air (referred to as "air") Gasoline VOC vapor • The membrane is designed specifically for separating air from gasoline VOC vapor.
5.	<ul style="list-style-type: none"> • A vacuum pump draws the air from the membrane housing through a check valve.
6.	<ul style="list-style-type: none"> • A sample of the air flows through a hydrocarbon sensor to check the percent hydrocarbons.
7.	<ul style="list-style-type: none"> • From the vacuum pump, the air is vented to atmosphere via the air return.
8.	<ul style="list-style-type: none"> • The gasoline VOC vapor returns to the UST system via the vapor return.
9.	<ul style="list-style-type: none"> • When the UST system pressure drops below -0.2"WC, the <i>Processor</i> turns OFF.

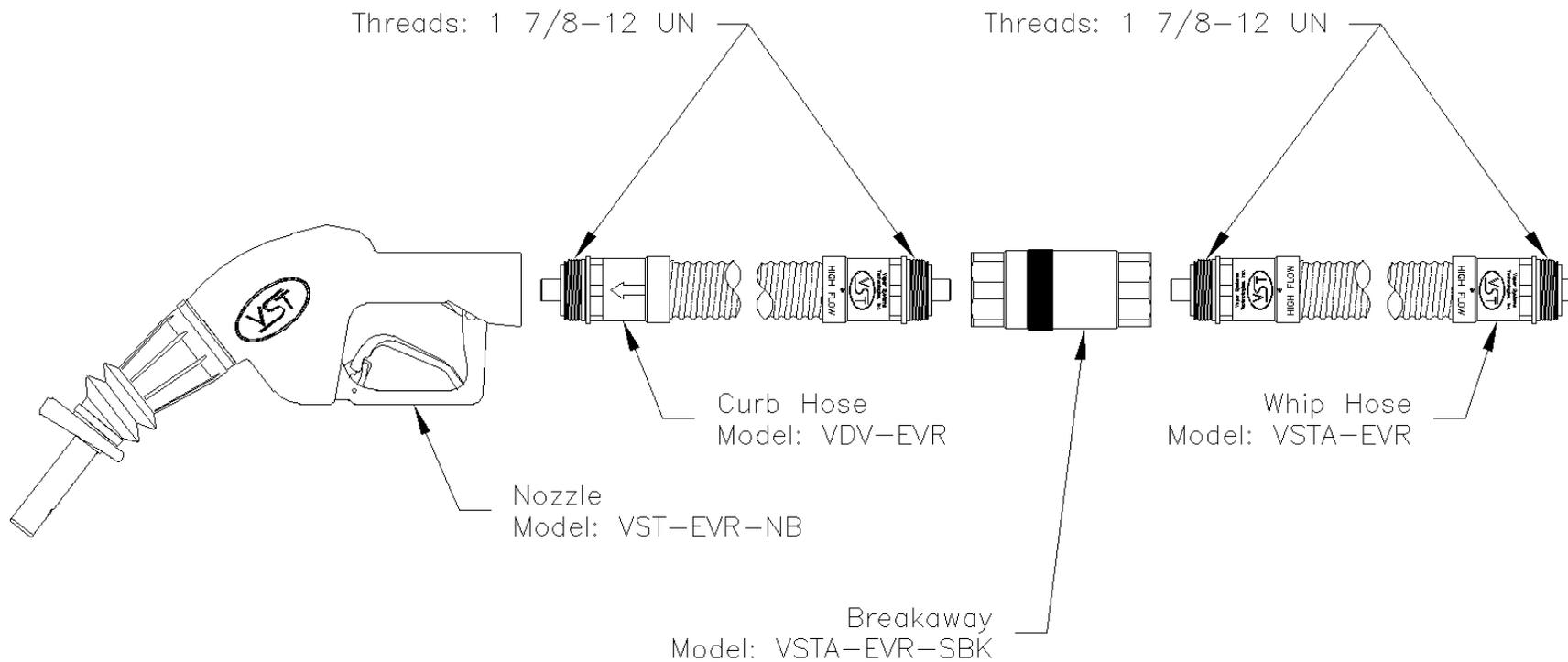


Figure 1: VST Hanging Hardware
(Nozzle, Coaxial Curb Hose, Breakaway, and Coaxial Whip Hose)

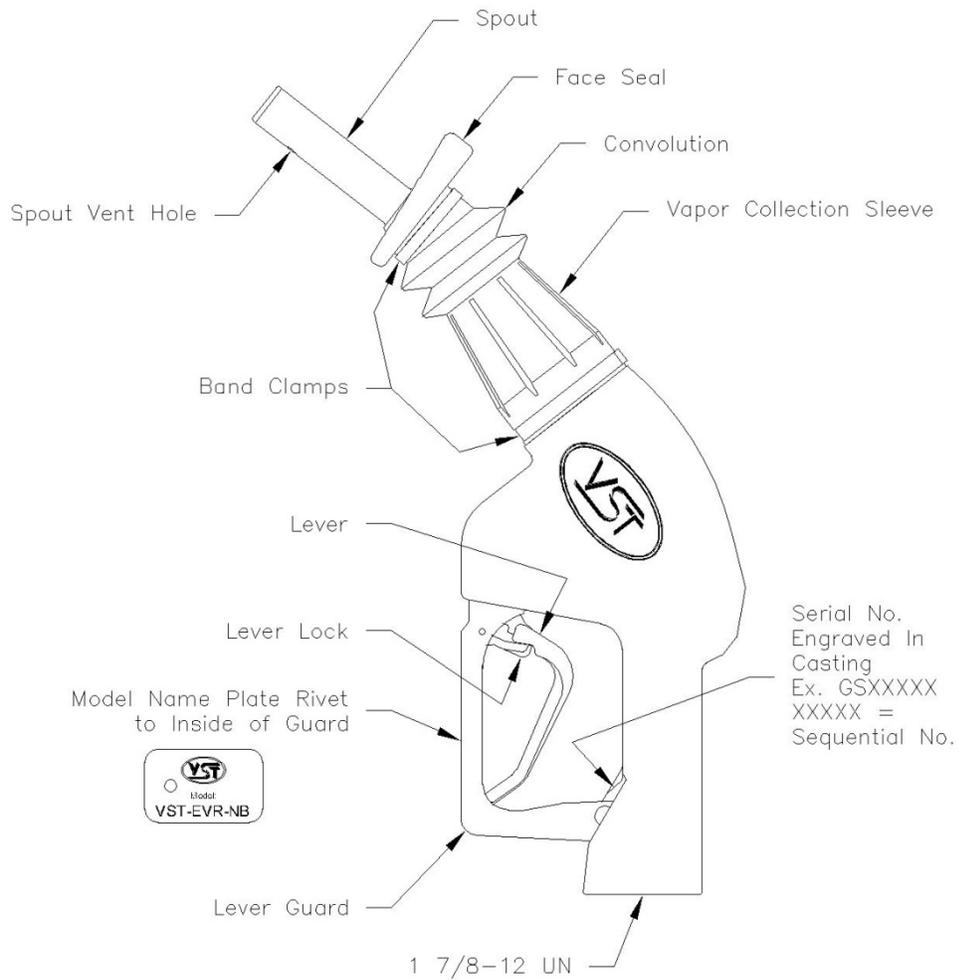
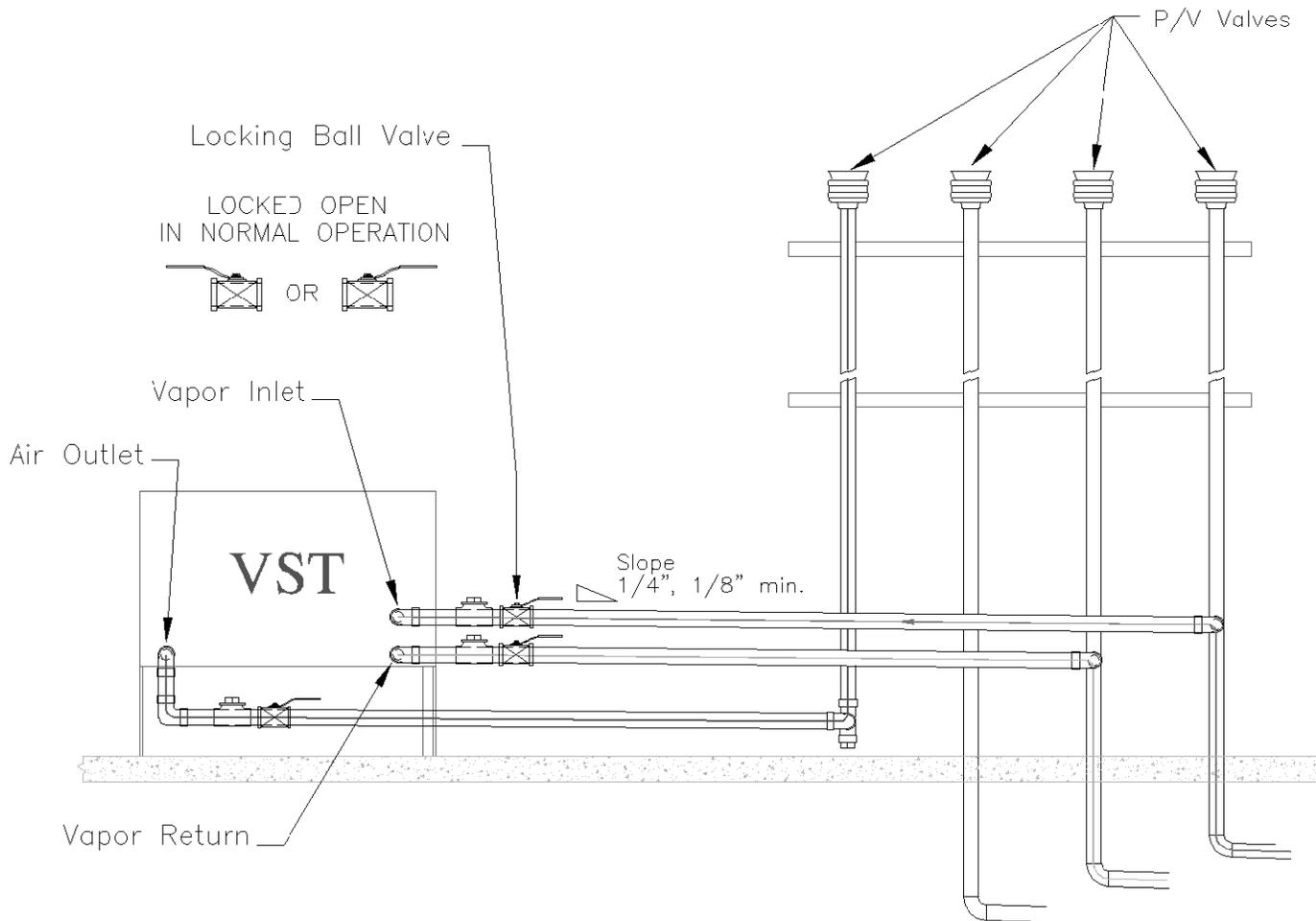


Figure 2: Model VST-EVR-NB Nozzle



CAUTION: THE HANDLES ON THE LOCKING BALL VALVES MUST NOT BE REMOVED.

Figure 3: Model VST-ECS-CS3 Membrane Processor