COMPRESSED GAS ASSOCIATION, INC.

TECHNICAL BULLETIN

TB-31—2013

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RESIDUAL PRESSURE VALVE (RPV) FILL ADAPTERS

This technical bulletin describes the different types of residual pressure valve (RPV) fill adapters and addresses their correct use and routine maintenance. It applies to only those fill adapters equipped with a pin at the end of the fill nipple. The pin serves to open the check mechanism in the RPV. Figures 1 and 2 provide an illustration of how an RPV fill adapter connects to an outlet of an RPV.

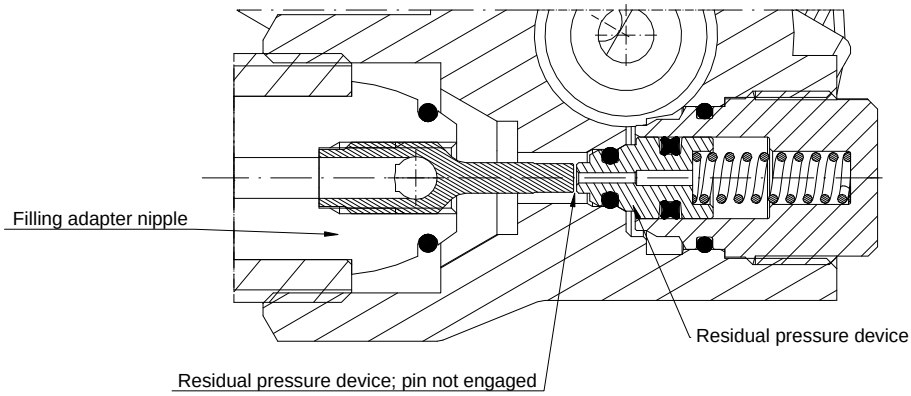


Figure 1—Example of a closed RPV

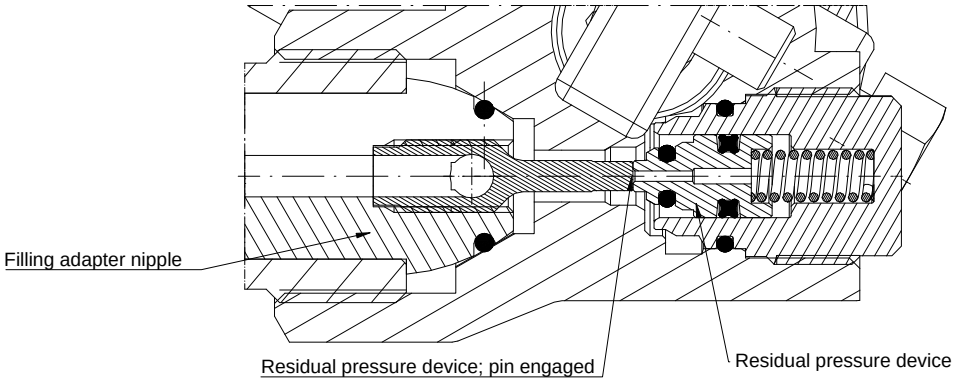


Figure 2—Example of an open RPV

RPVs have been in use for many years and have been supplied by a number of manufacturers around the world. An RPV uses a standard connection for service from the cylinder valve, but requires a special filling nipple with a pin to actuate the residual pressure device for both evacuation (i.e., vacuuming) and filling purposes. There has been no standardization of the residual pressure device dimensions, thus there is no standardization of the RPV fill adapters. Hence, the specifications for the RPV fill adapters vary, not only between manufacturers of RPVs but also, in some cases, from the same manufacturer.

A cylinder with an RPV shall be vented, evacuated, or filled using an RPV fill adapter that has been verified as being compatible with the RPV and the product.

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***WARNING**: Use of an improper RPV fill adapter could damage the RPV and/or fill adapter or fail to fully actuate the residual pressure device within the RPV. An improper adapter in oxygen (or other oxidizer) service could also elevate the risk of ignition that can result in property damage, personal injury, or death.*

There are two basic types of RPV fill adapters, fixed pin and retractable pin. The fixed pin adapter (see Figure 3) has a fixed actuation pin attached to the end of the filling nipple. The retractable pin design (see Figure 4) has a spring-loaded actuation pin incorporated in the filling nipple so that the pin can be retracted for filling standard valves.

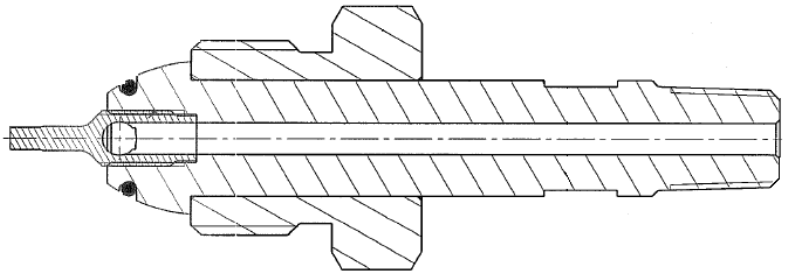


Figure 3—Example of a fixed pin adapter

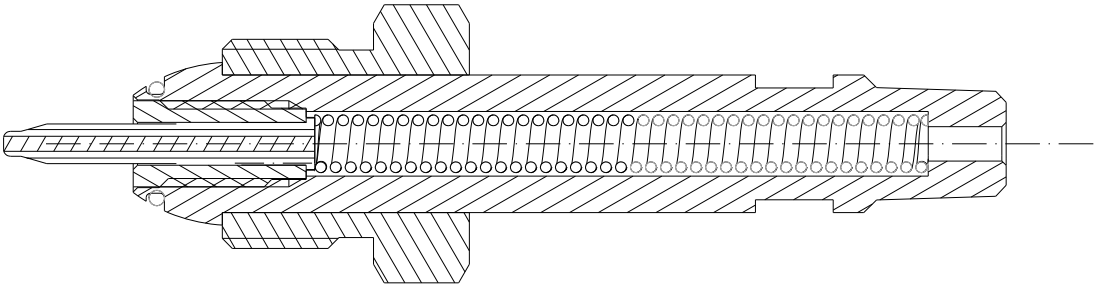


Figure 4—Example of a retractable pin design

In fixed pin adapters, the length of the pin required to actuate the residual pressure device is critical. In contrast, the spring force and the pin length of retractable pin adapters are both critical to ensure proper actuation of the residual pressure device. Regardless of the type of adapter, the pin length and/or spring force can both vary from manufacturer to manufacturer.

Since RPV fill adapters are mechanical devices, they require routine maintenance. Before using an RPV fill adapter, it should be inspected for significant wear of all components and, especially, for the condition of the actuation pin. Any adapters with a bent or broken actuation pin should be repaired or replaced before using the adapter. Due to fatigue, springs in retractable pin adapter designs should be replaced periodically based on RPV fill adapter manufacturer recommendations. When replacing any RPV fill adapter component, material selection is important, especially in oxidizing gas service.

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