CAIRE®
A Chart Industries Company

SERVICE BULLETIN

#20583567

DATE: June 1, 2012

MODELS: All Companion Reservoirs
All HELiOS Reservoirs
All Liberator Reservoirs

ISSUE: QDV & Vent Valve Standardization

NOTES: Effective as early as July 1st, 2012 all models of CAIRE reservoirs will utilize the same top fill Quick Disconnect Valve (QDV) and vent valve. This change will help to standardize parts between the CAIRE product lines. This will benefit service technicians as the same replacement parts can be used on all new reservoirs going forward and multiple parts will not have to be kept in stock.

The standardization of these parts will not affect the performance or specifications of any CAIRE reservoir.

QDV Standardization Across All Models

All QDVs will now contain a 5/8 inch male threaded compression fitting connection to the manifold. To accommodate this change, all manifolds will now contain a nut and ferrule connection. This connection on both the QDV and manifold is shown below.

Figure 1 - - Standard QDV 5/8" Compression Fitting

With the nut and ferrule design, there may be an occasional observation of foam that develops over several seconds. This is normal and does not affect operation of the unit. It is not a "leak" which would be defined as forming and breaking bubbles when checked with SNOOP®. This minimal amount of foam appearance has no negative impact on the performance.

This minimal amount of foam appearance has been measured and documented to be well under 1 SCCM. To put this into perspective this would be .053 Liters of LOX in a month, or less than 0.2% of the contents. As cryogenic liquids are stored as a boiling liquid, all cryogenic containers are continually venting excess gas to maintain the proper internal pressure . During periods of nonuse, the pressure will rise to the primary relief valve setting and gaseous oxygen will vent to the atmosphere. This Normal Evaporation Rate of up to 1.5 lb/day (0.68 kg/day) is equivalent to .595 liters of LOX per day, which is over 300 times the loss due to this insignificant leakage.

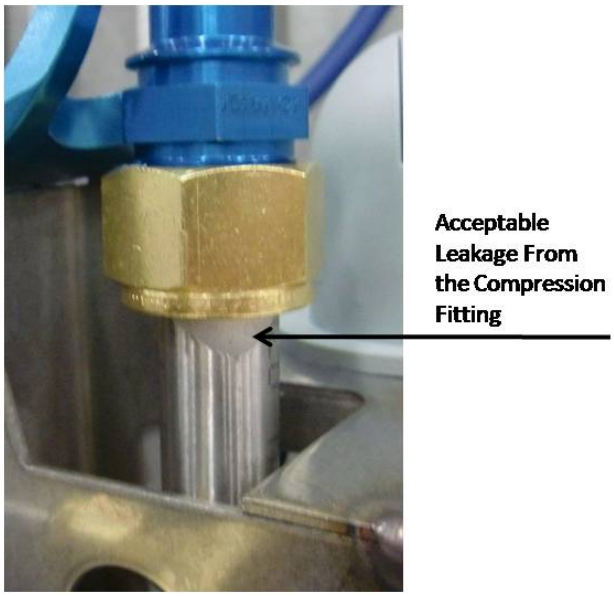

Figure 2 - - Acceptable Leak Detector Foaming

The poppet design of the standard CAIRE top-fill QDV is also changing. All QDVs of this style will now contain a stainless steel poppet that will be standardized across all models. The stainless steel poppet is shown below in Figure 3. The tip of the poppet which engages for filling will be 0.14 inches (3.56 mm) in diameter and will be raised 0.24 inches (6.10 mm).

Figure 3 - - Standard QDV Metal Poppet

The poppet or fill connection design of all other style QDVs will not be changing. The only change to these styles will be their connection to the manifold as described above.

Vent Valve Standardization Across All Models

A standard vent valve will now be used in production on all CAIRE reservoirs. The standard vent valve is shown below in Figure 4. The connection of the standard vent valve to the manifold will be made with a NPT connection.

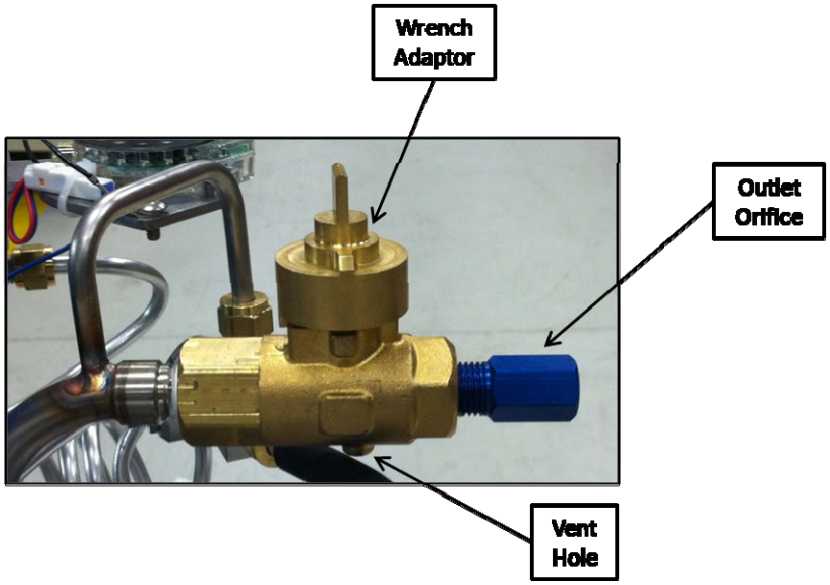

Figure 4 - - Standard Vent Valve

The standard vent valve will contain a newly designed wrench adaptor. The wrench adaptor (Figure 5) has been designed with two different diameter tiers. This will allow the vent valve to be opened using either style of vent wrench that is currently sold by CAIRE.

Figure 5 - - Standard Vent Wrench Adaptor (Part Number #15102229)

The top tier with the singular rectangular tab will allow the smaller diameter Companion and HELiOS wrench (#B-775182-00) to be used. The lower tier and the two short tabs on the bottom of the adaptor will allow the larger diameter Liberator wrench (#97202005) to be used.

Figure 6 - - CAIRE Vent Wrench Options

The vent outlet will be an orifice. This orifice will differ depending on the model of reservoir. The Companion & Liberator will have a blue orifice (B-775329-00), and the HELiOS reservoirs will use a black orifice (#B-701699-00). The vent valve will also contain a vent hole on the bottom of the valve to serve as a bleed port to vent liquid oxygen that can be trapped in the ball valve after the valve is closed.

Changes to HELiOS and Companion Reservoirs

All HELiOS and Companion reservoirs contain the standard CAIRE top-fill QDV. The stainless steel poppet of the standard design will replace the plastic poppet that was previously used on Companion & HELiOS reservoirs. The metal poppet will be more robust and durable than the plastic version shown below.

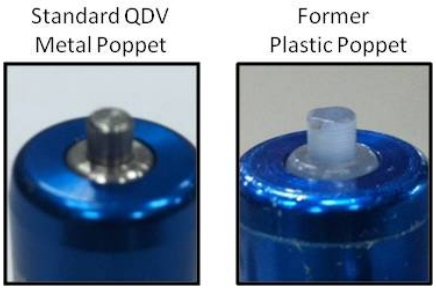

Figure 7 - - HELiOS & Companion Poppet Comparison

A 5/8 inch nut and ferrule compression fitting connection is already being used on Companion & HELiOS reservoirs. Because of this, the design of the manifold on these reservoirs will not be changing, and the standard QDV will be a direct

replacement for the previous QDV on all Companion & HELiOS models. It will be ordered as a replacement part going forward. Previous part numbers used for these reservoirs will no longer be available. Table 1 below can be used as a guideline to order replacement QDV assemblies for the Companion & HELiOS reservoirs.

Table 1 - - HELiOS & Companion QDV Part Numbers

Reservoir Model	QDV Assembly Part Number
HELiOS	15101621
Companion	15101621

The body of the standard vent valve will be the same one that is currently used on Companion & HELiOS Reservoirs. In addition, these reservoirs already contain the NPT connection for the vent valve to the manifold. Therefore, the standard vent valve will be a direct replacement for the previous vent valve on all HELiOS and Companion reservoirs. The only noticeable change on these tanks will be the new vent wrench adaptor. Use Table 2 below as a guideline for ordering replacement vent valve assemblies for HELiOS and Companion reservoirs.

Table 2 - - HELiOS & Companion Vent Valve Part Numbers

Reservoir Model	Vent Valve Assy. Part Number
HELiOS	20580960
Companion	20580870

Changes to Liberator Reservoirs

A stainless steel poppet is currently being used on Liberator reservoirs. The poppet on the standard QDV will be 0.03 in (0.76 mm) longer than these previously used in production. This raised poppet length will provide for better connectivity between the QDVs when filling the reservoir or filling a portable.

The 5/8-inch compression fitting on the standard QDVs will replace the Posi-Lock connection that was previously used on Liberator reservoirs. A comparison between the two connections is shown in Figure 8.

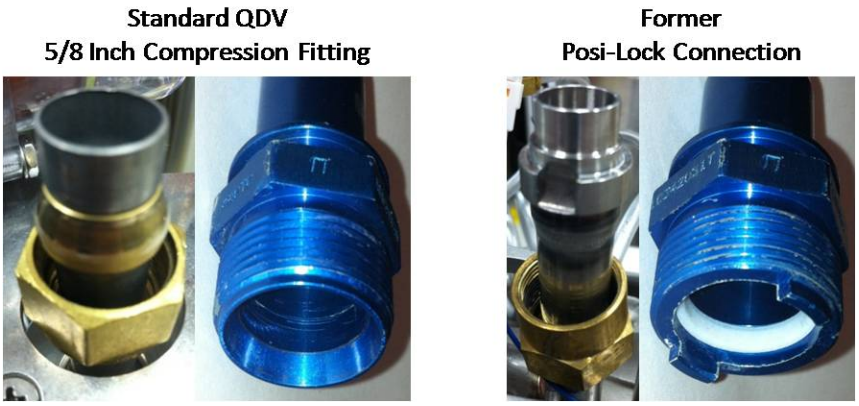

Figure 8 - - Former Posi-Lock Connection on Liberator Reservoirs

The threaded connection on the standard vent valve will also replace the previous Posi-Lock connection. Figure 9 below is a comparison between the two connections.

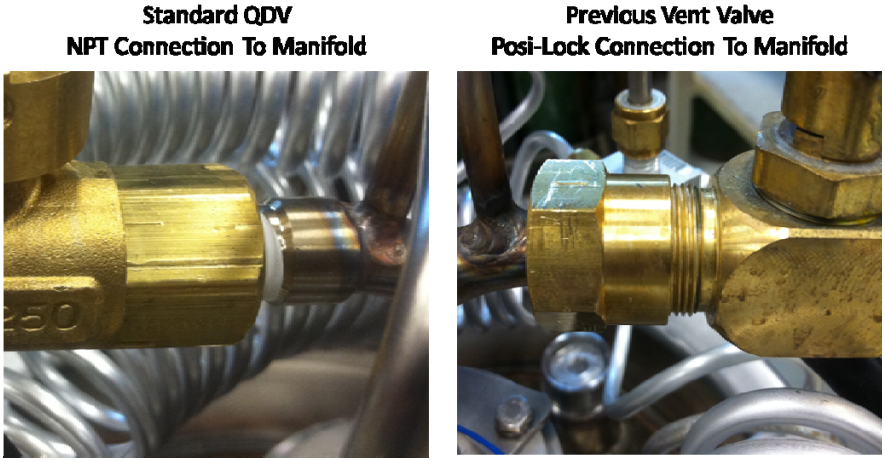

Figure 9 - - Vent Valve Connection to Manifold

All new Liberator tanks will now contain the compression fitting connection for the QDV and the threaded connection fitting for the vent valve on their manifolds. All manifolds ordered as replacement parts will also now contain these connections. Manifolds with Posi-Lock connections will no longer be available after July 1st. When ordering a replacement manifold for an Liberator that previously contained the Posi-Lock connection, a QDV and Vent Valve upgrade will also be required. Use Table 3 below as a guideline for ordering replacement manifolds for Liberator reservoirs.

Table 3 - - Liberator Manifold Part Numbers

Liberator Model	Manifold Part Number
Lib 10 - Top Fill	11648013
Lib 20 - Top Fill	20583553
Lib 20 - Side Fill	20583550
Lib 20 - Dual Fill	20583547
Lib 30 - Top Fill	20583554
Lib 30 - Side Fill	20583548
Lib 30 - Dual Fill	20583578
Lib 37 - Top Fill	20583555
Lib 37 - Side Fill	20583551
Lib 37 - Dual Fill	20583577
Lib 45 - Top Fill	20583558
Lib 45 - Side Fill	20583552
Lib 45 - Dual Fill	20583576
Lib 60 - Top Fill	20583558
Lib 60 -Side Fill	20583552
Lib 60 - Dual Fill	20583576
Low Loss 32 - Top Fill	20583560
Low Loss 32 - Side Fill	20535888
Low Loss 32 - Dual Fill	20583559
Low Loss 41 - Top Fill	20583560
Low Loss 41 - Side Fill	20535888
Low Loss 41 - Dual Fill	20583559

The previous QDV assemblies with the Posi-Lock connection will still be available for the Liberator for a period of 5 years. During this period, a new manifold will not need to be ordered if only a QDV replacement is required. The style of manifold must be identified before ordering a replacement QDV. Use Table 4 below as a guideline for ordering replacement QDV assemblies for Liberator reservoirs.

Table 4 - - Liberator QDV Part Numbers

Liberator QDV Style	**Compression Fitting (New) QDV Assy. Part Number**	**Posi-Lock Fitting (Previous) QDV Assy. Part Number**
CAIRE Top Fill	15101621	10542031T
Cryo2	15095786	10754084T
CryoPal	15095807	14447612T
Life-Ox	20538335	CA003778T
Penox	15095760	10754105T
Series J (Japan Only)	20535308	10712159
Taema	15095794	13708067T

A service part will also be available for standard vent valve to allow it to connect to a Liberator manifold with the Posi-Lock connections. A new manifold will not need to be ordered if only a vent valve replacement is required. They style of manifold must be identified before ordering a replacement vent valve. Use Table 5 below as a guideline for ordering replacement vent valve assemblies on all Liberator reservoirs.

Table 5 - - Liberator Vent Valve Part Numbers

Liberator Manifold Connection	Vent Valve Assy. Part Number
NPT Thread (New Standard)	20580870
Posi-Lock (Previous)	20561451
Japanese Units Only	20578757SJ

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