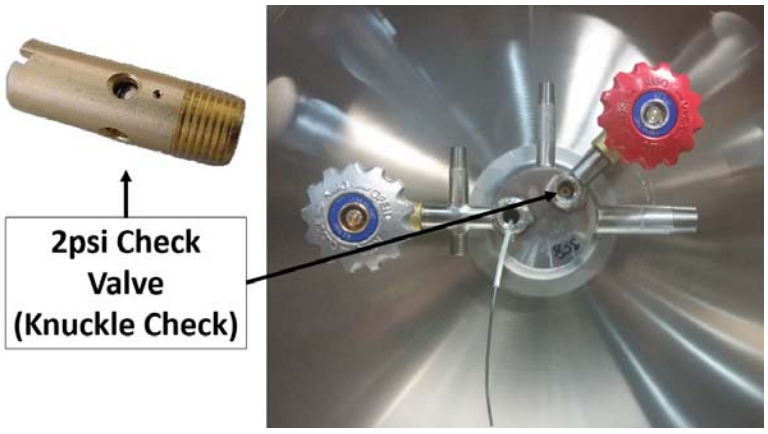
	VT-0059	001	09-19	CWH
CHART®	Removing a Damaged 2psi Knuckle Check Valve			

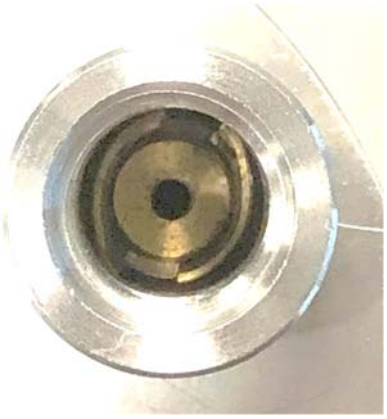
OVERVIEW

This document outlines the process for removing a damaged 2psi knuckle check valve (**KCV**). For removal and installation of a non-damaged KCV refer to VT-0053.

If a KCV becomes damaged during the removal/install process, the KCV tool will likely not be able to remove it. Damage to a KCV during removal/install can occur from using the wrong tool, attempting KCV removal with a cold knuckle, or improper tool alignment.

Removing a Damaged 2psi KnuckleCheck Valve





TOOLS REQUIRED

Extractors - #1 Spiral Screw & #4 Square with T-handle(s)
Internal wire brush and/or pick
Assorted Wrenches
Small hammer

SAFETY

Proper PPE – gloves, safety goggles, long sleeves, long pants, closed toe shoes, etc.

WARNING: LNG and LNG vapor is near or below -200°F/-129°C. Care must be taken as liquid, vapor, piping, components, and tools can reach cryogenic temperatures and burn exposed skin on contact. This procedure should only be performed on a defueled & depressurized tank.

This procedure is intended for use by trained technicians with experience on systems using LNG. Review all applicable safety documents before beginning this procedure.

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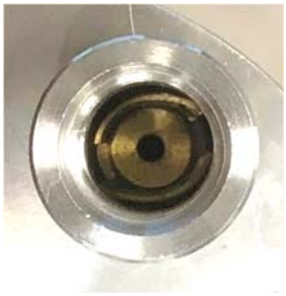
NOTE:
Attempting to remove the KCV while the tank knuckle is frozen will be difficult and will likely damage the KCV. To ease removal of the KCV it is recommended to warm, or to allow the knuckle to warm to above freezing prior to removal.

DAMAGED vs NON-DAMAGED 2PSI KNUCKLE CHECK VALVES (KCV)

Damaged



Old Style KCV

Old Style KCV

New Style KCV

Non-damaged

Old Style KCV New Style KCV

Parts of a KCV:

Body

Check Ball

Spring

Spring Retainer

NOTE: Old style and new style KCV's have the same parts and will be removed using the same process

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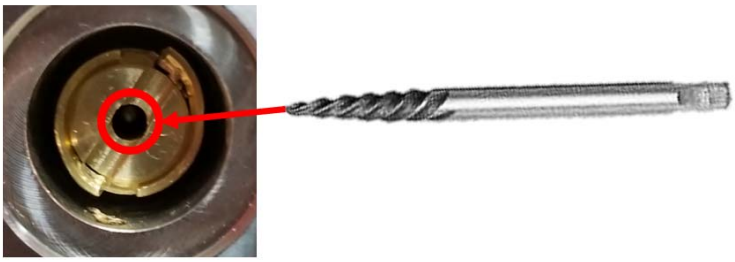
PROCEDURE

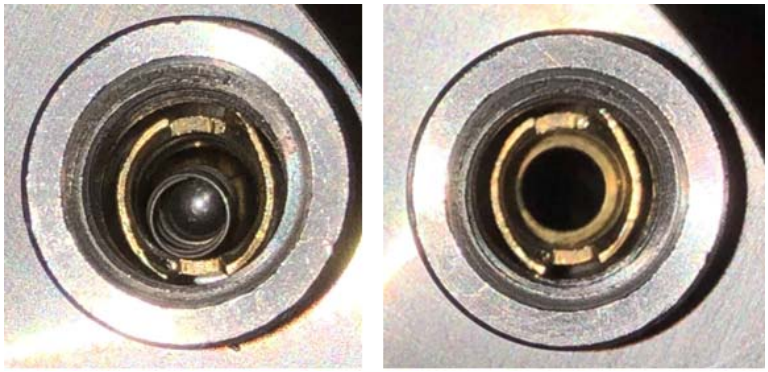
Insert the tip of the small extractor into the center hole of the spring retainer of the KCV and set in place with a few light taps from a small hammer



Install the T-handle onto the extractor

Using a counterclockwise rotating and slight pulling motion, remove the spring retainer portion of the KCV (the spring and check ball may fall out). If the spring and check ball remain inside of the KCV, use a magnet, pick, or an awl to remove them and discard.

Ensure that the check ball and spring are removed from the KCV body as seen below before attempting to extract the body of the KCV.



Insert the tip of the square extractor into the center of the KCV. Ensure that the extractor is seated into the KCV body and is set in place with a few light taps from a small hammer. Use caution to prevent damaging the tank stainless steel internal threads, including the threads the KCV is seated into. Excessive force can damage the knuckle port threads and permanently damage the tank.

Install the T-handle onto the extractor or use an appropriately sized wrench. Using a counterclockwise rotating motion, loosen and remove the body of the KCV. If the extractor slips inside of the KCV body, remove the T-handle/wrench, tap the extractor into place again, re-install T-handle/wrench, and repeat the removal process as needed.

Correct Extractor Seating

Extractor Forcing KCV Opening to Expand

If the extractor is forced too deep into the KCV body, the brass opening of the KCV may spread out and prevent removal from the knuckle opening. If so, remove the extractor and gently pry the brass KCV body back toward the center of the KCV to allow it to fit through the coupling. Use caution to prevent damaging the tank stainless steel internal threads, including the threads the KCV is seated into. Excessive force can damage the knuckle port threads and permanently damage the tank.

Clean any remaining debris from the threads with an internal wire brush and/or pick and purge the tank per VT-0004 to remove any remaining debris before attempting to replace the KCV. Refer to VT-0053 for re-installing the KCV.

NOTE: If the KCV body becomes lodged, contact Chart LNG Technical Service. Drilling of the KCV or the KCV body is not recommended as this can damage the knuckle port threads and permanently damage the tank.

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