



Technical User Manual
Accumulator Charging Valves
10-1/10-3/6-1

Published and maintained by: Poseidon Deepwater Solutions, LLC.

www.poseidondeepwatersolutions.com

All Rights Reserved. Copyright 2019.

Table of Contents

Revision History	3
Our Pledge.....	4
Your responsibility	4
About.....	4
Introduction	5
Specifications	6
Typical Dimensions	6
Components (SAE Seal).....	7
Theory of Operation.....	9
Installation and Removal Tools	11
Installing a charging valve	12
Charging and Gaging	16
Removing a charging valve	24
Disassembly.....	27
Inspection.....	31
Replacement Parts	32
Assembly	33
Support	38
Appendix A: PDS006-100 Drawing “10-1”	39
Appendix B: PDS006-R100 “10-1R”	41
Appendix C: PDS006-103 Drawing “6-1”	42
Appendix D: PDS006-R103 “6-1R”	44
Appendix E: PDS006-104 Drawing “10-3”	45
Appendix F: PDS006-R104 “10-3R”	47

Revision History

R00 – First Draft

R01 – Updates to Support and Assembly, Appendices, Replacement Parts

R02 – Moved “removing charging valve” section after installation and charging. 240 in-lbs installation torque was 120 in-lbs.

R03 – Added 6 series and face seal variants of valve [10-1, 10-3, 6-1]

To check for the latest revision scan the following code, or visit:

<http://poseidondeepwatersolutions.com/acs-user-guide.html>



Our Pledge

We pledge to provide you, the consumer, with the most accurate and up to date information. It is our goal to ensure our product provide the highest reliability and uptime possible. By educating the technician with detailed knowledge of our products, we shorten the troubleshooting cycle and short cut to the root cause. We strive to provide accurate and detailed information, in relevant views, not vague two dimensional cross sections. Our documentation is not a punishment to read, but a tool to enable anyone with common mechanical capabilities to accurately use and service our products. As always, we keep all of our documentation online and current.

Your responsibility

As a consumer of our product, it is your responsibility to follow these instructions when using or servicing our product. If you find an error, please report this and help improve the document. If you develop or forsee a better method of servicing one of our products, please share these learnings with our technical writers. Every suggestion will be evaluated and considered for the upcoming revision of the documentation. Only by providing feedback can this documentation be improved and maintained at its highest level. It is your responsibility to obtain the latest copy of this documentation before servicing our product.

About

This user manual is mostly graphical and depicts the product in familiar orientations. Much of the inspiration for this format comes from the popular children's toys LEGO™. These toys often come with instruction books which allow a child of very young age to accomplish an incredibly complex series of tasks with little assistance from adults. The attention to detail and highlighting of common mistakes prevents guides them through the process.

Introduction

The charging valve is a device used primarily for the adjustment of nitrogen in accumulator bottles. However, the valve may be applied with other gases, and on other mechanical devices. The valve is suitable for surface and subsea application. The 6 series version of the valve is better suited for topside application due to body material selection, however mechanically is the same as the 10 series. The valves have a method of adapting to subsea hydrostatic pressure. The valve uses ½-20UNF threads, which are compatible with the majority of accumulators using the military style charging valve. There are two sealing systems available which correspond to face seal and SAE oring boss style connections.

There are two tools which must be used when operating the valve. This manual describes the theory of operation for the valve, the proper use of the tools, and service information. It also covers where to get documentation on specific valves, if the serial number is known. This documentation may include the expiration date of elastomers contained within the valve, as well as material trace-ability.

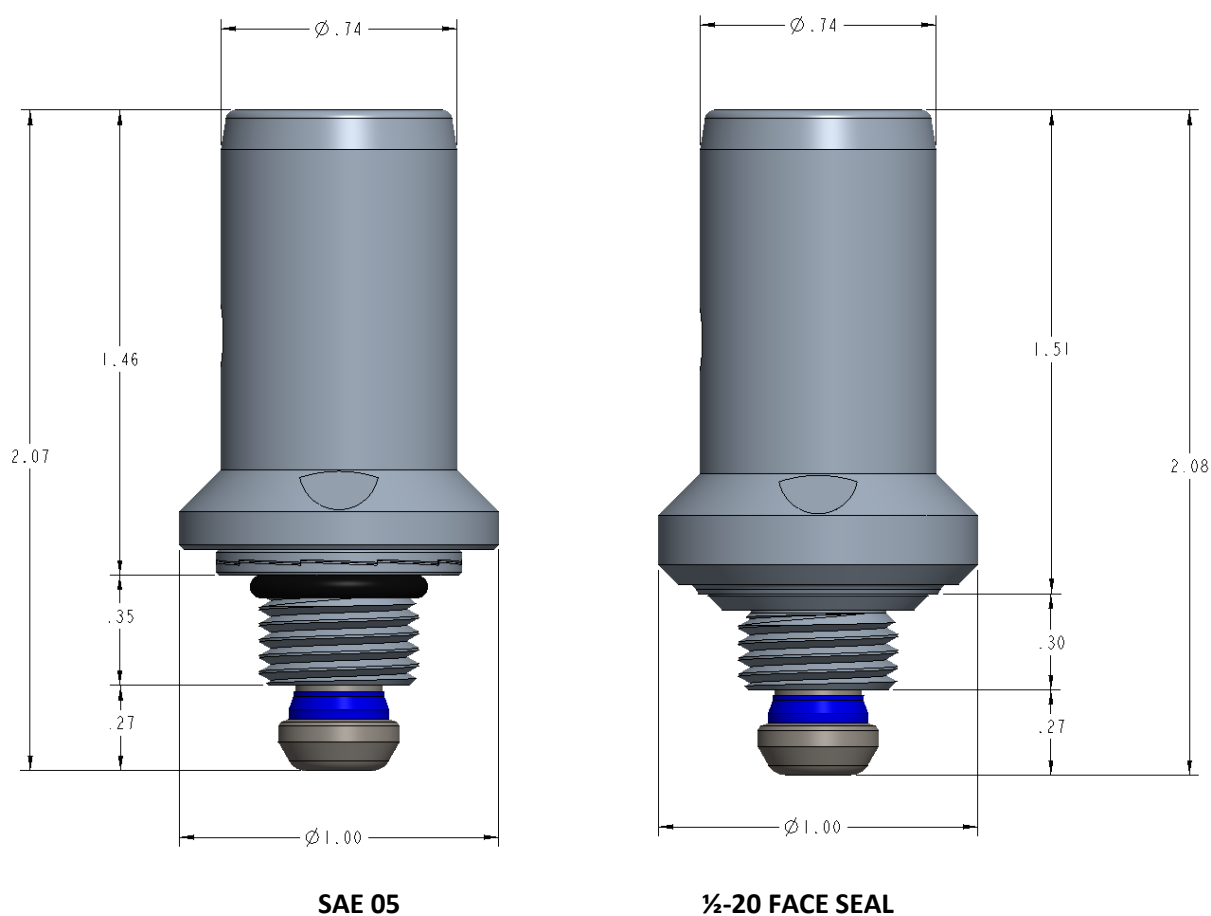


Typical Accumulator Bank

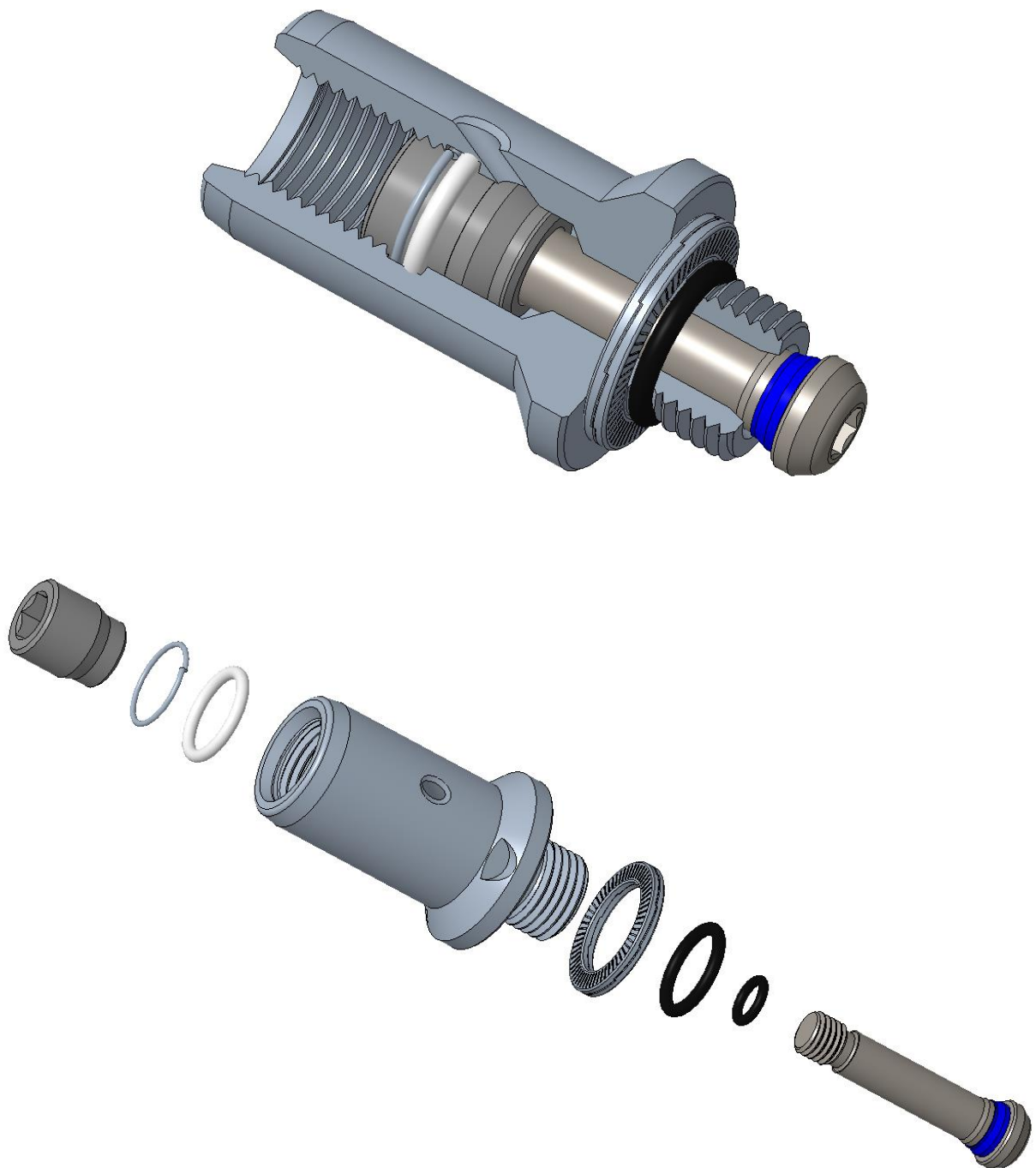
Specifications

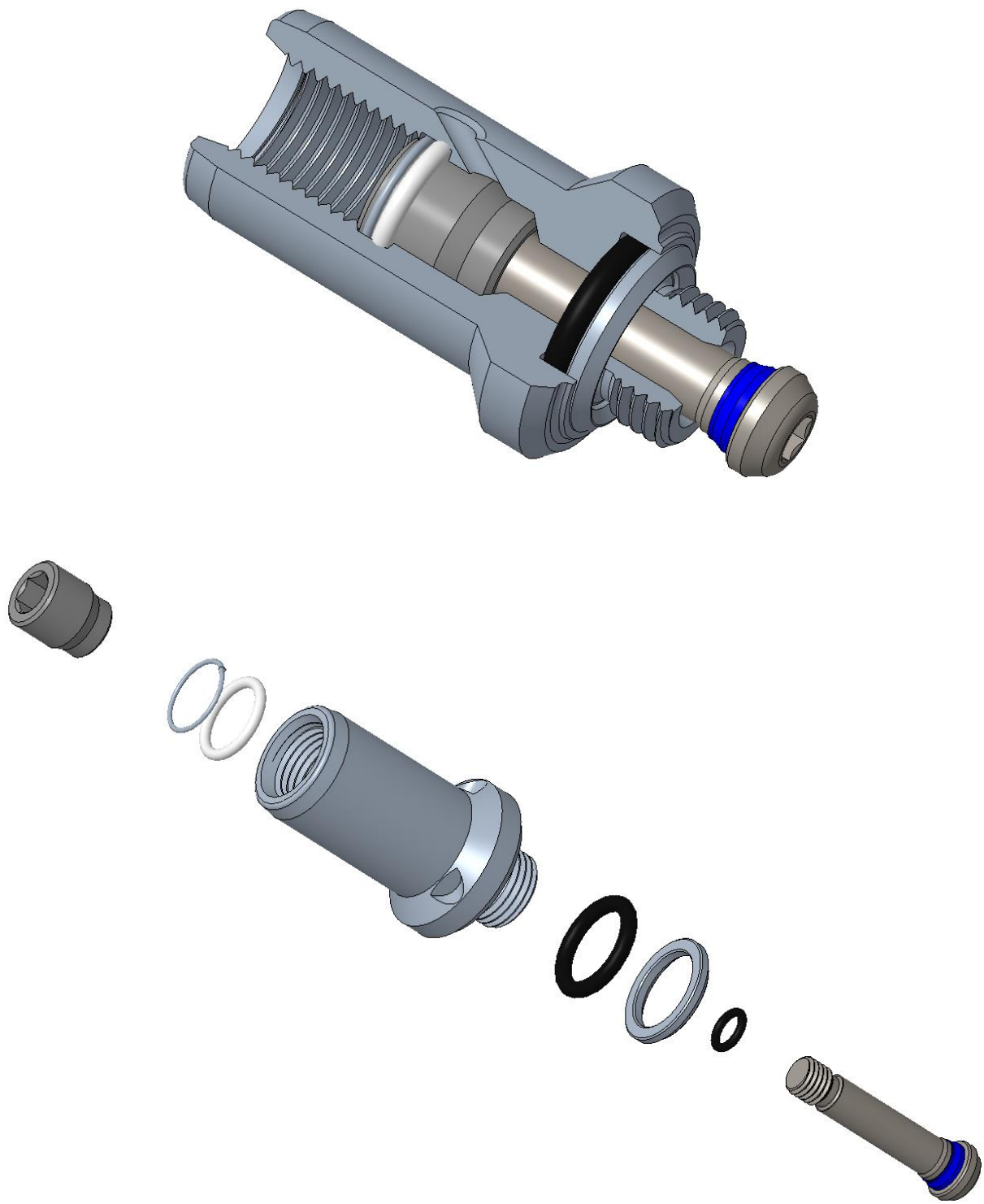
	10 SERIES		6 SERIES	
Rating	US Cust.	Metric	US Cust.	Metric
Working Pressure	10,000 psi	68.9 MPa	6,000 psi	42.3 MPa
Test Pressure	15,000 psi	103.4 MPa	12,000 psi	81.7 MPa
Low Temperature	-40 F	-40 C	-40 F	-40 C
High Temperature	220 F	104.4 C	220 F	104.4 C
Installation Torque	240 in-lb	27 N-m	240 in-lb	27 N-m
Maximum Depth	12,000 ft	3657.6 m	12,000 ft	3657.6 m

Typical Dimensions

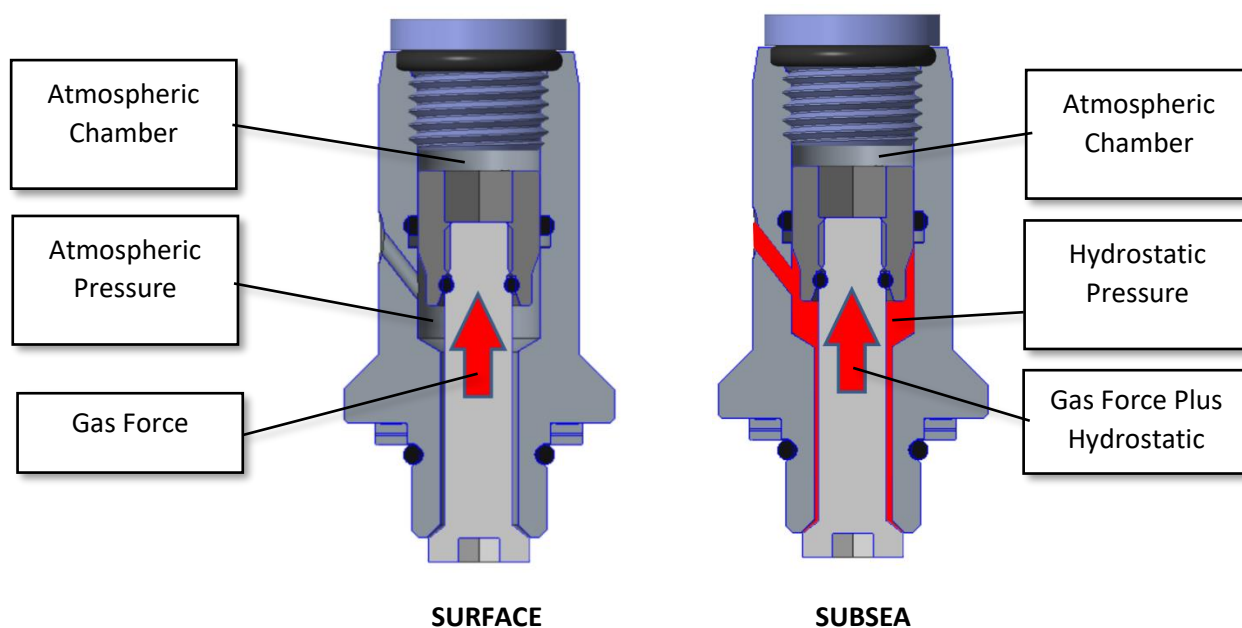
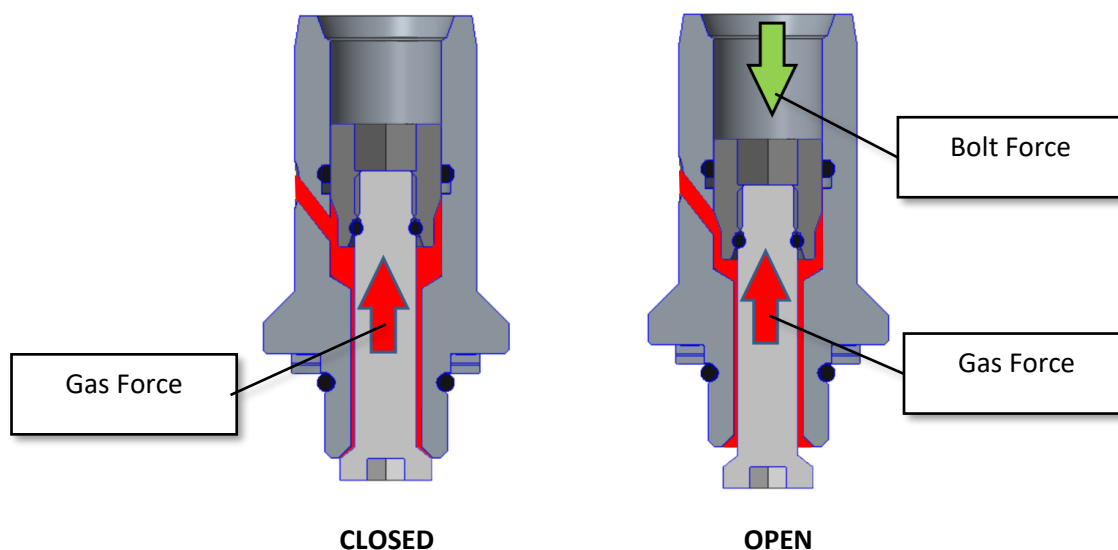


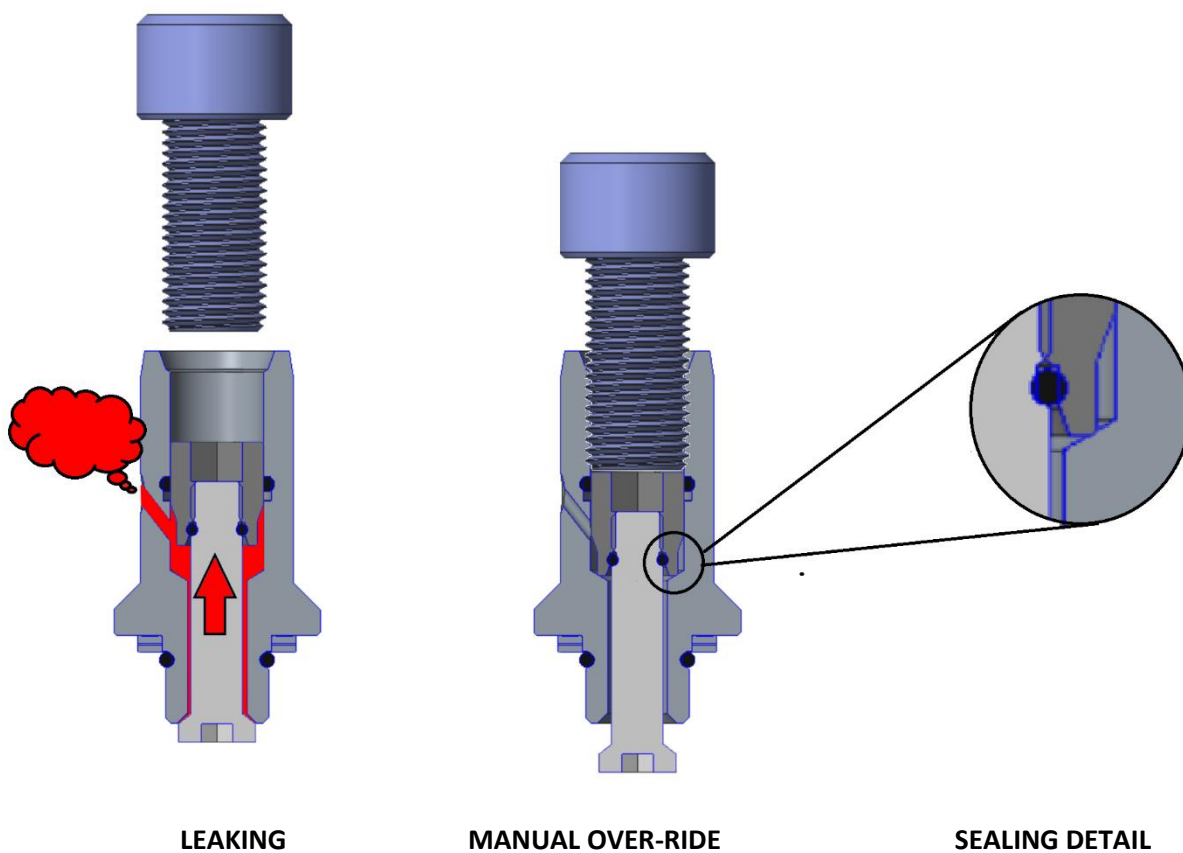
Components (SAE Seal)





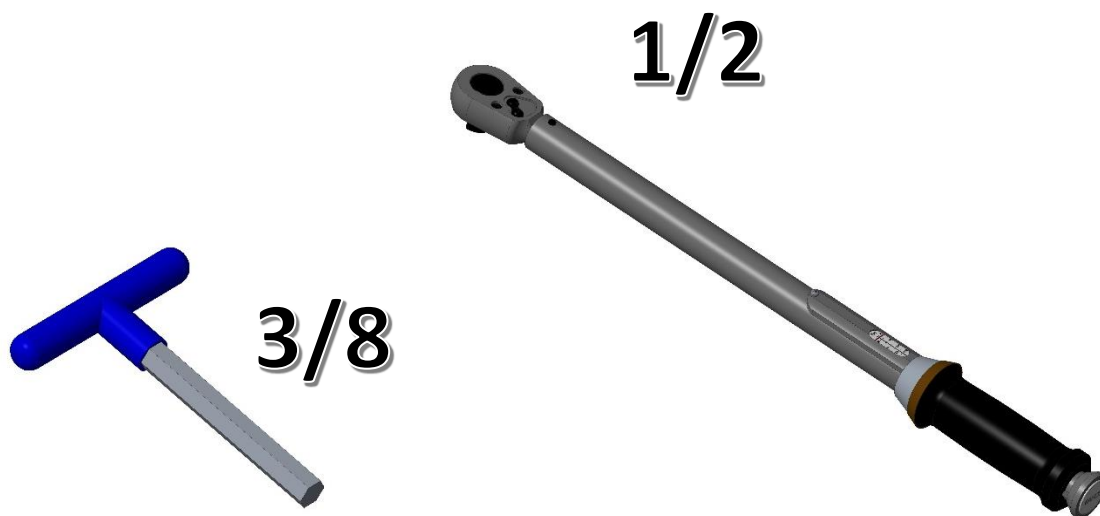
Theory of Operation





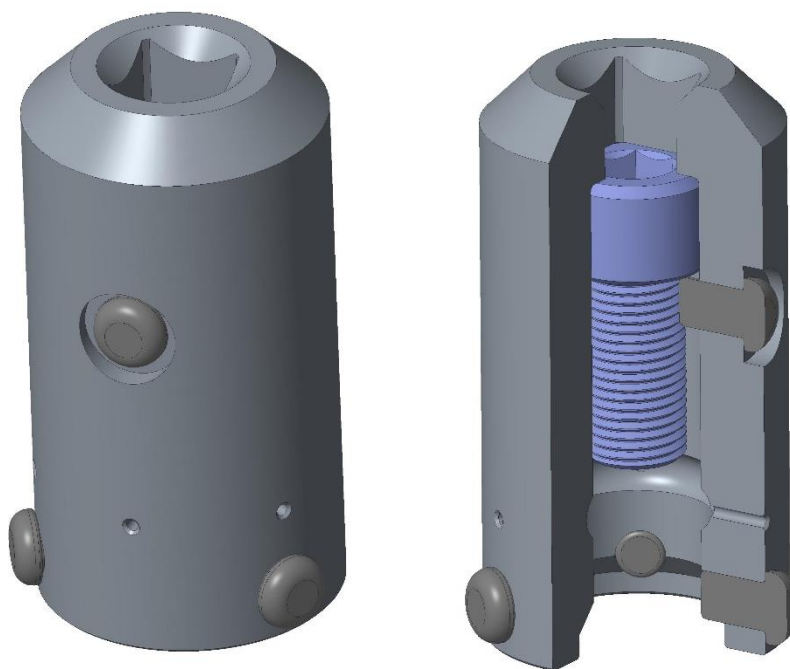
NOTE: THIS IS A TEMPORARY SOLUTION TO RETAIN GAS UNTIL A REPAIR KIT CAN BE SOURCED AND THE VALVE REBUILT. THERE IS NO WARRANTY PERIOD FOR A VALVE IN THIS CONDITION.

Installation and Removal Tools



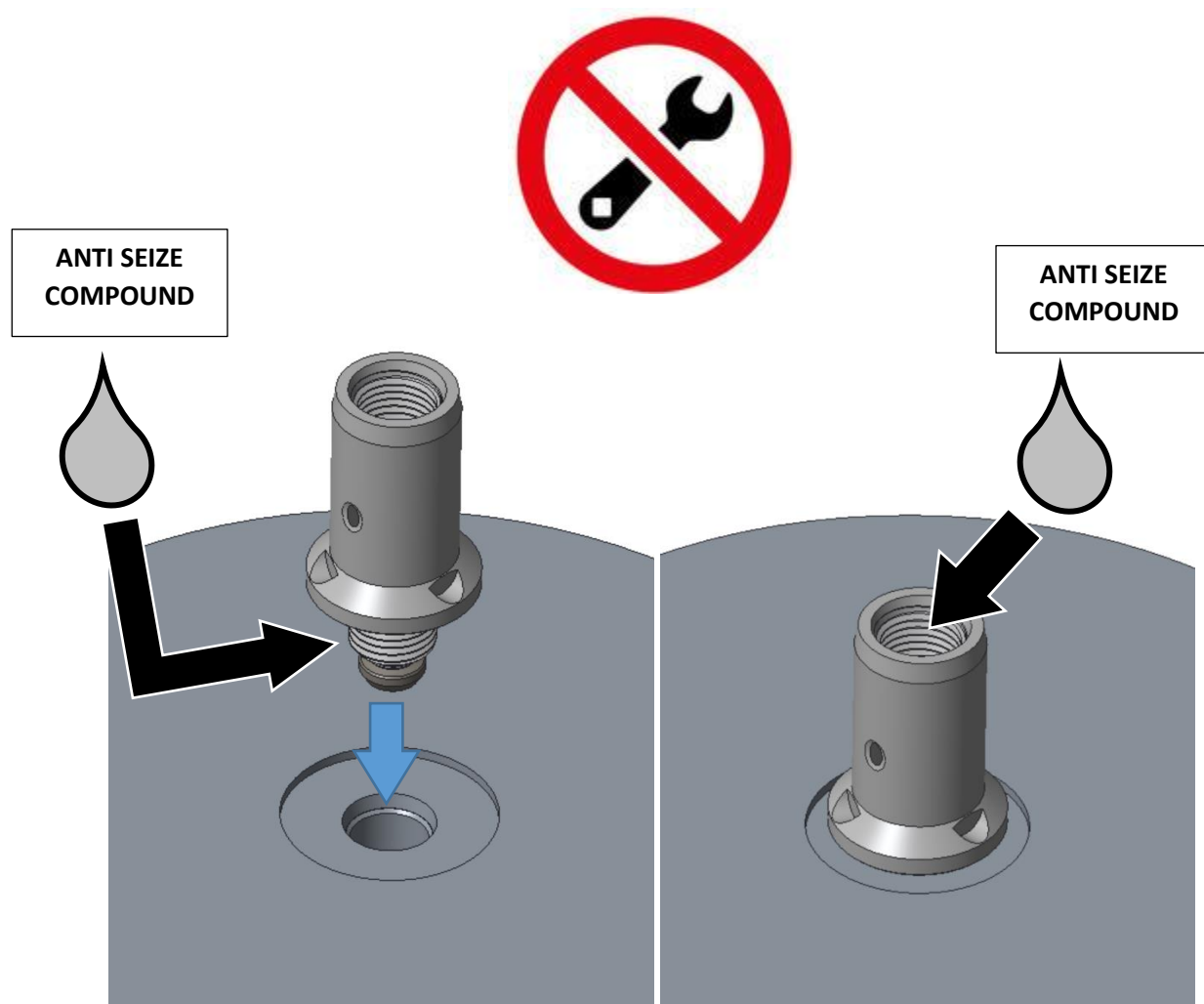
3/8" T-Handle Allen Key

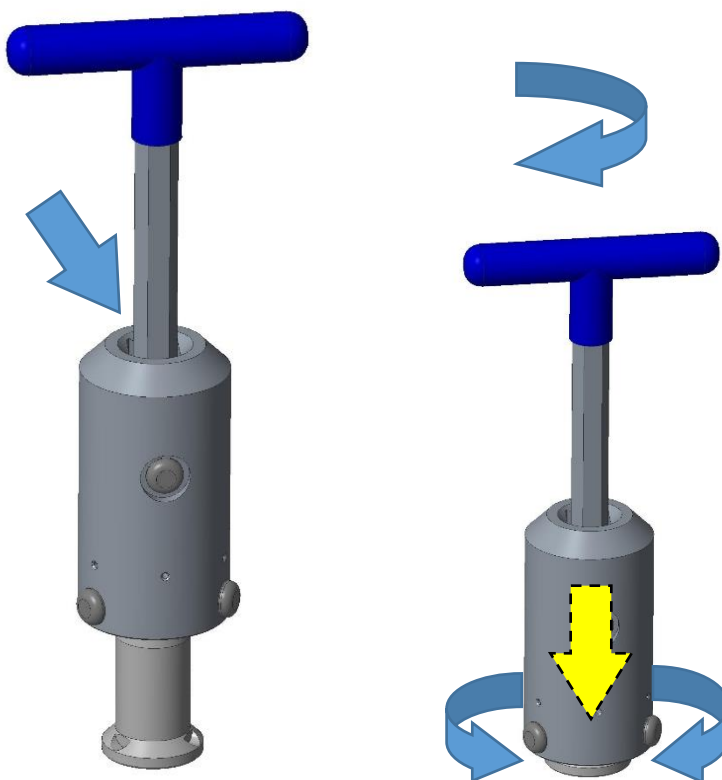
1/2" Drive Torque Wrench (240 in-lb / 27 N-m)



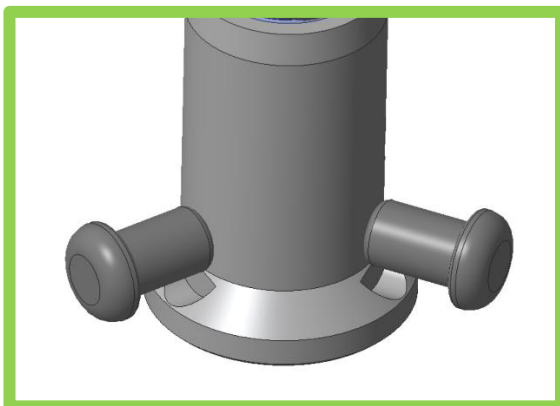
PDS006-200 Torque Tool

Installing a charging valve

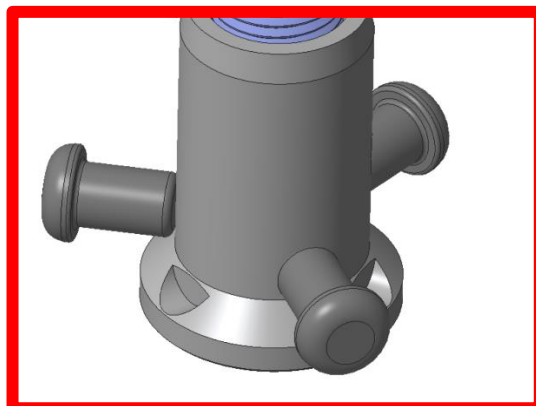




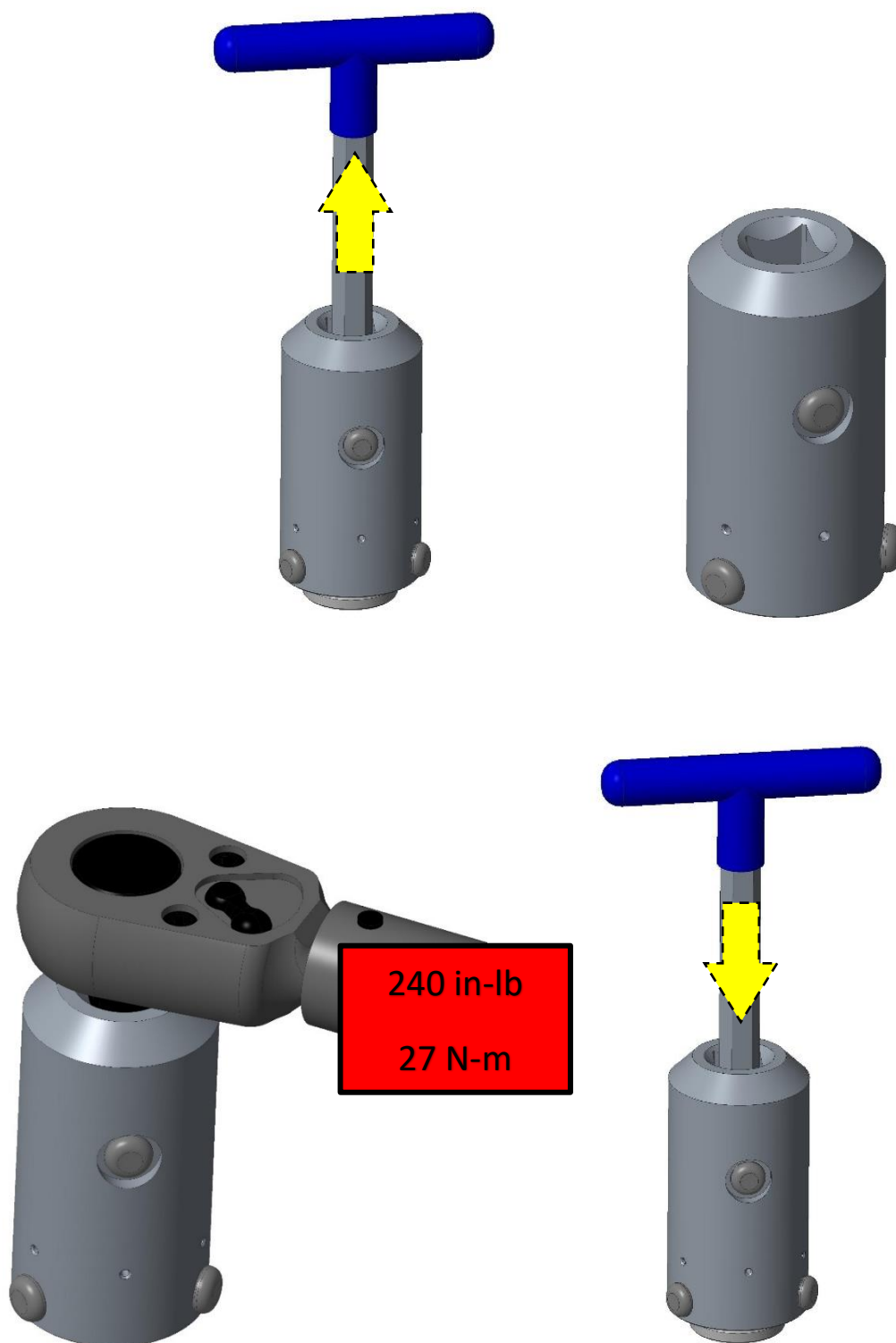
CAUTION: *Ensure the drive pins are fully engaged*

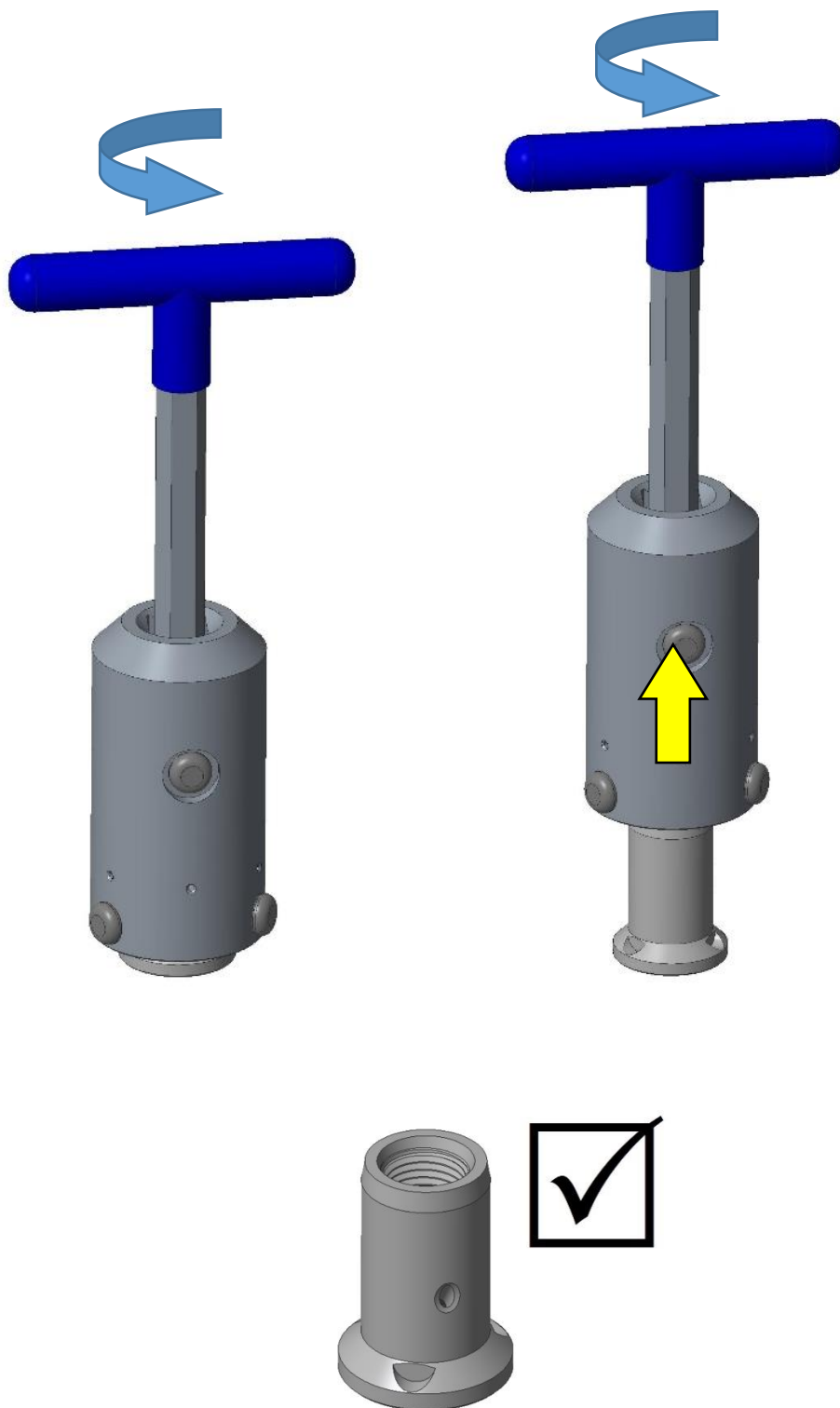


GOOD

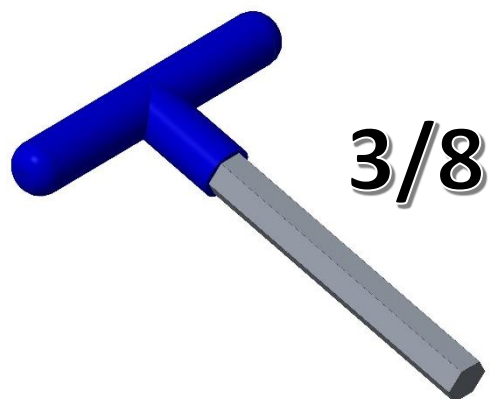


BAD





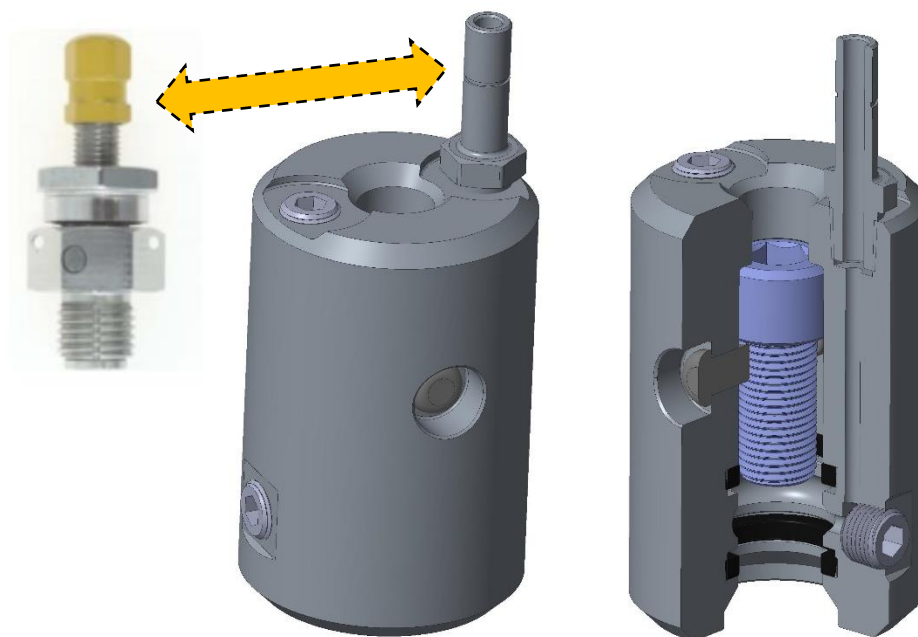
Charging and Gaging



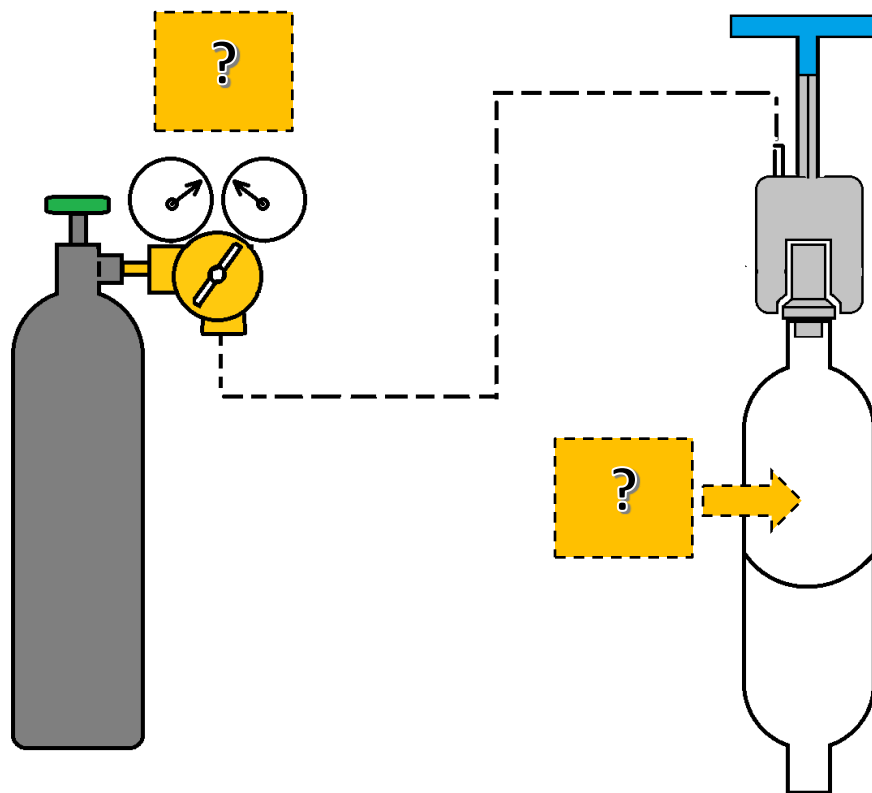
3/8" T-Handle Allen Key

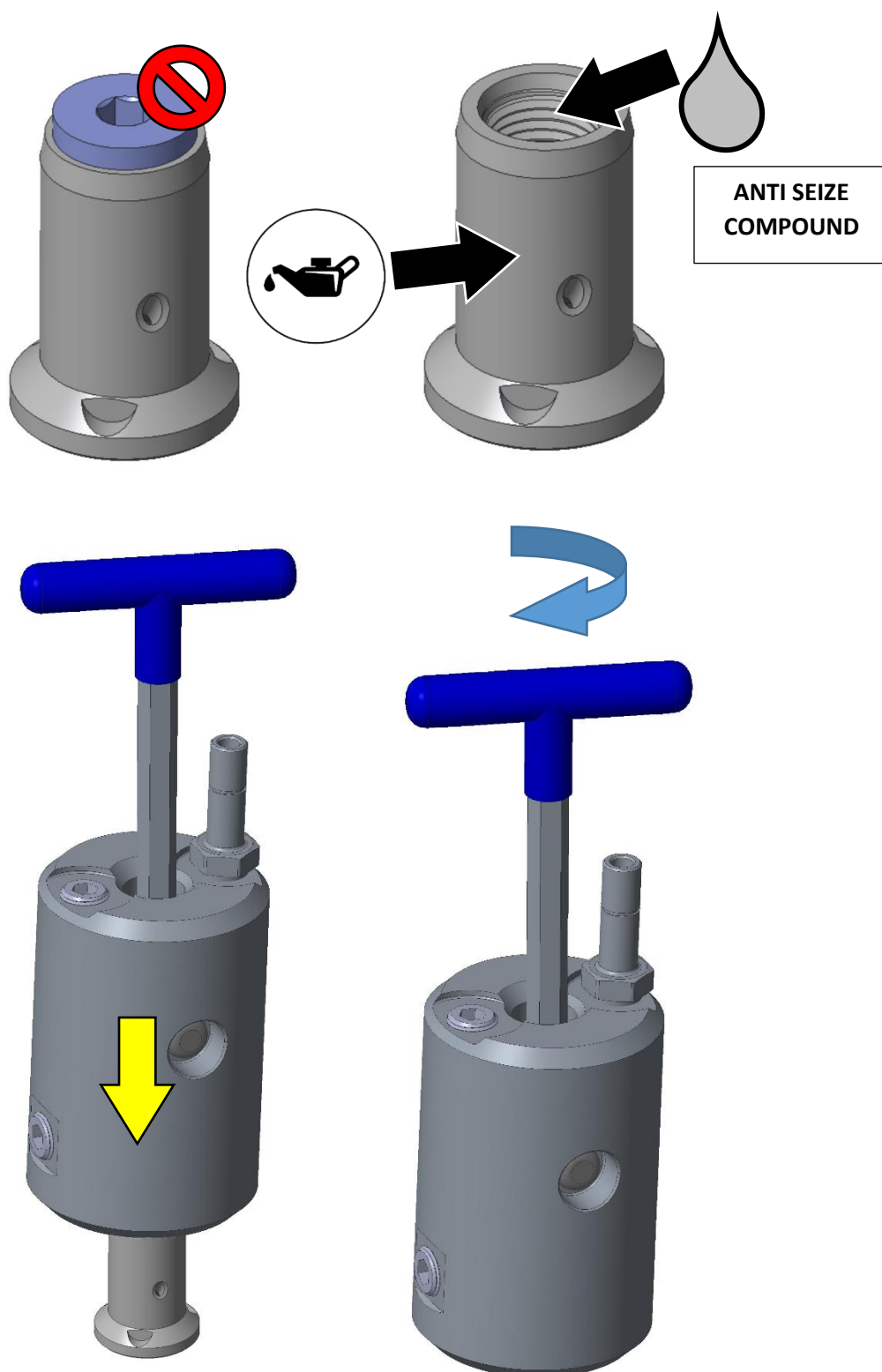


Charging Kit

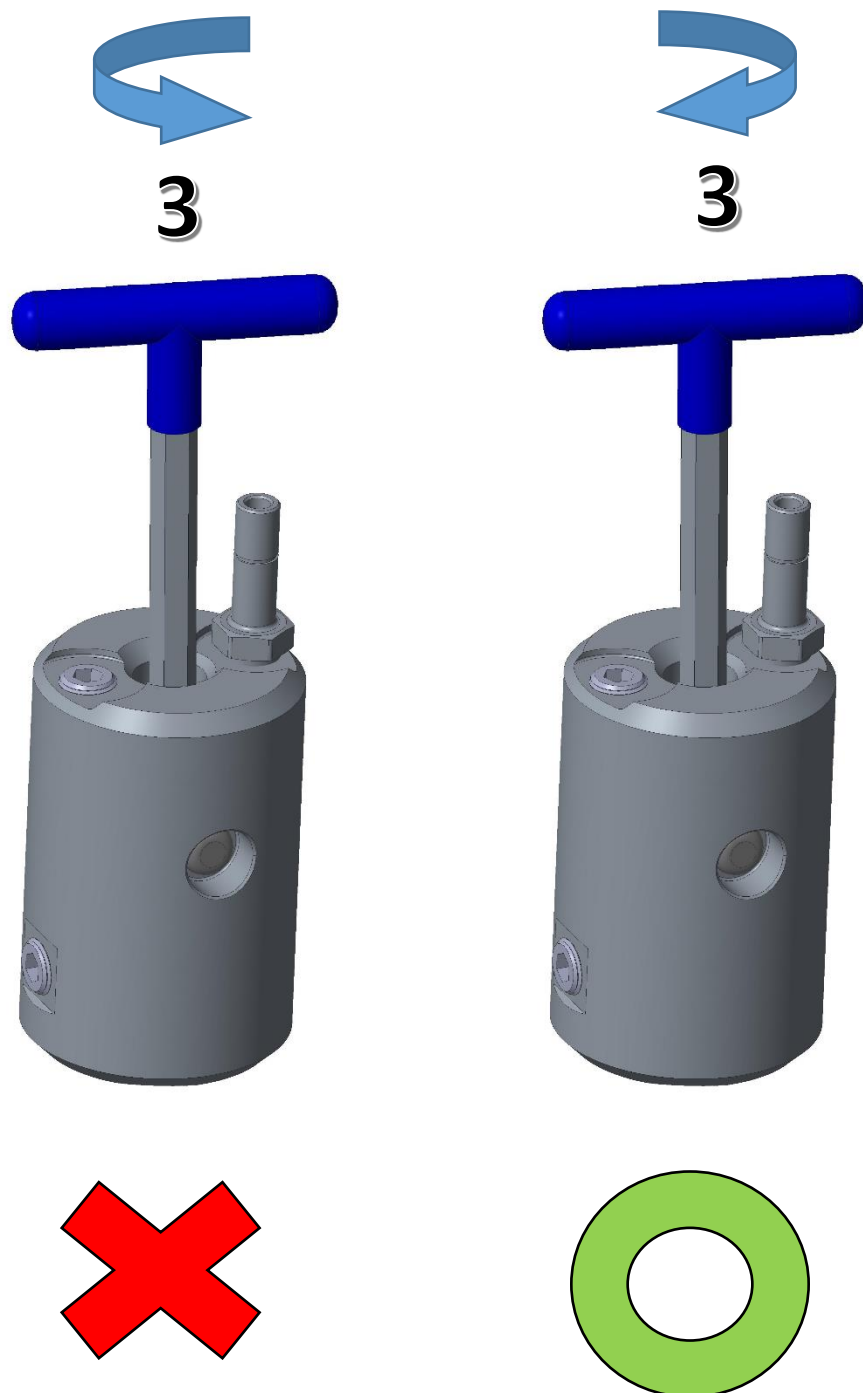


PDS006-300 Charging Head

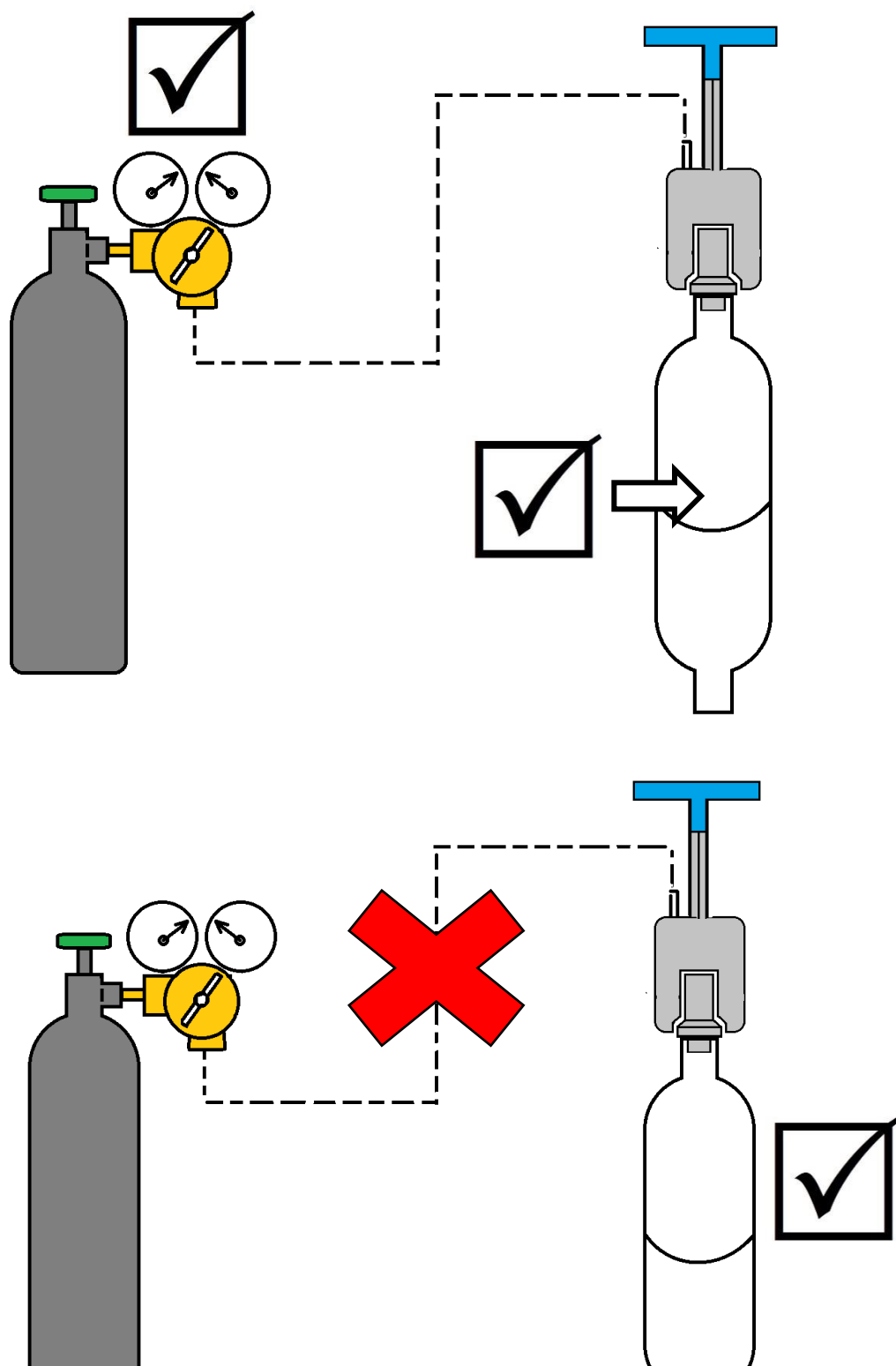




ENSURE THE CHARGING HEAD IS COMPLETELY THREADED ONTO THE VALVE BODY AND BOTTOMED OUT. DO NOT OVER TORQUE. THE HEAD SHOULD ROTATE BY HAND.

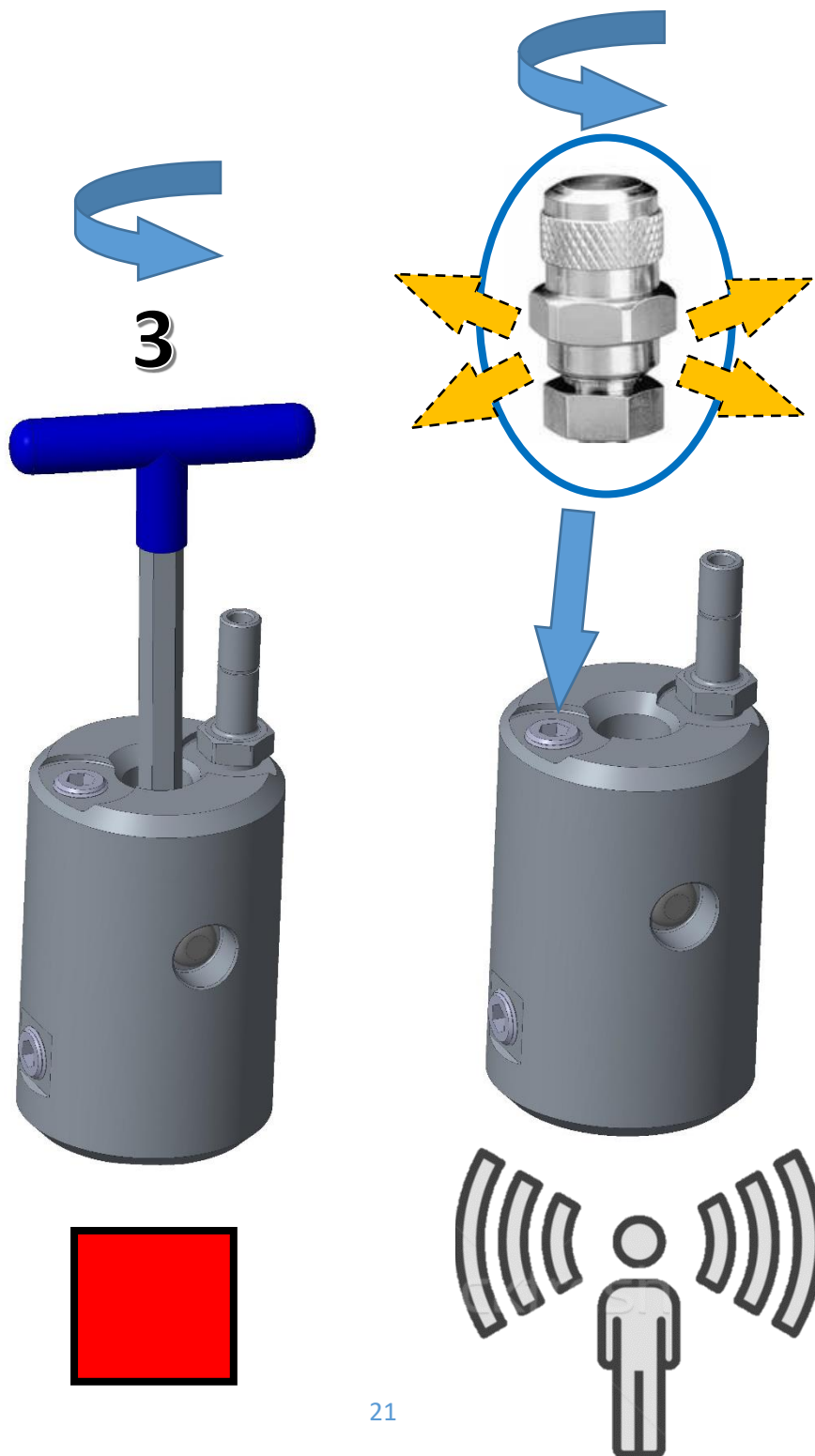


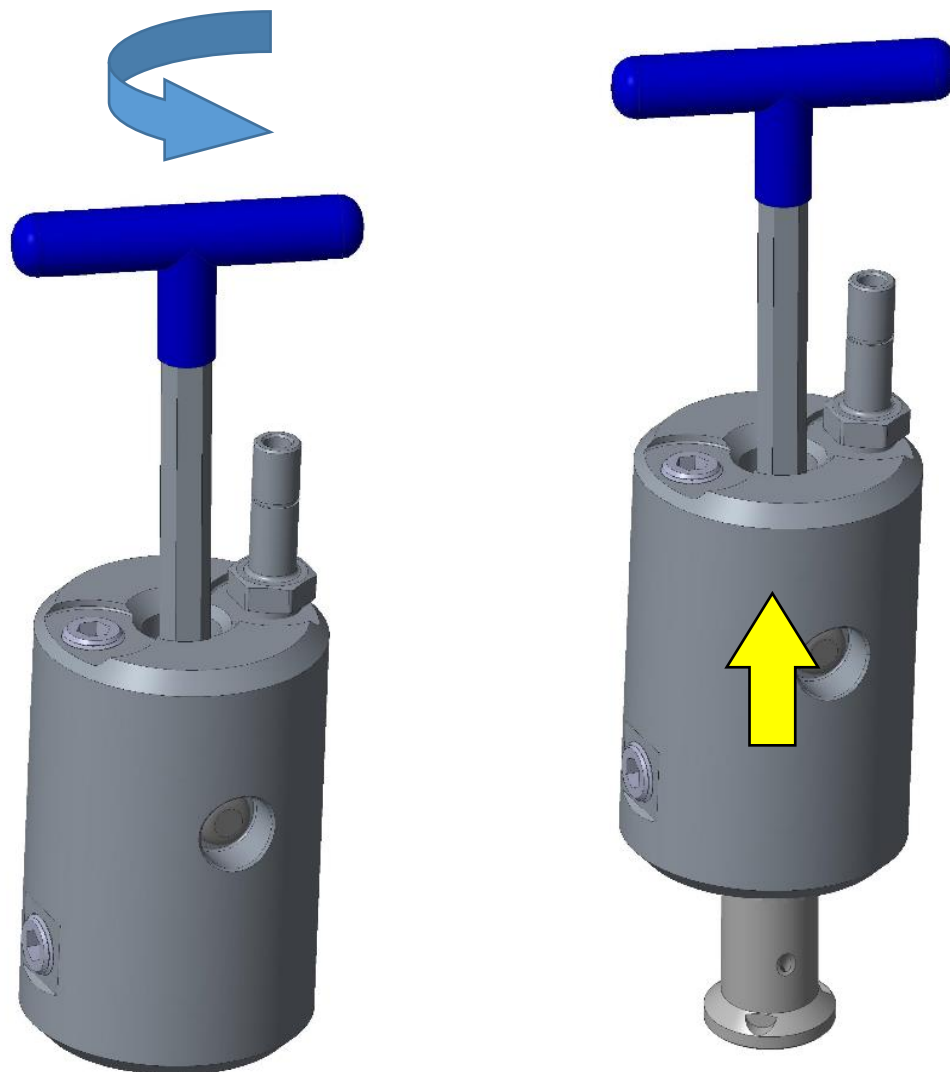
NEVER CLOSE THE VALVE WITH SUPPLY PRESSURE. ISOLATE THE SUPPLY PRESSURE BEFORE ATTEMPTING TO CLOSE OR OPEN THE VALVE. FAILURE TO DO SO CAN DAMAGE THE ELASTOMERIC SEAL ON THE VALVE STEM.

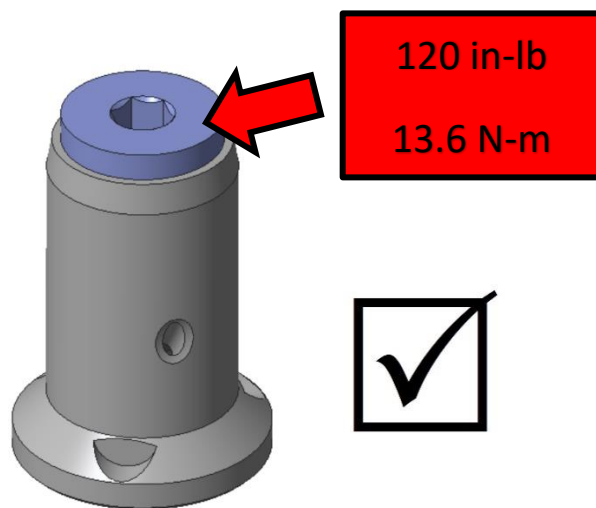
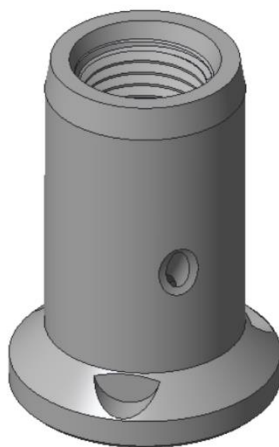


WHEN THE BOTTLE IS CHARGED, ISOLATE THE SUPPLY FROM THE NITROGEN SOURCE TO THE CHARGING HEAD. FAILURE TO DO SO COULD DAMAGE THE SEAL ON THE VALVE STEM.

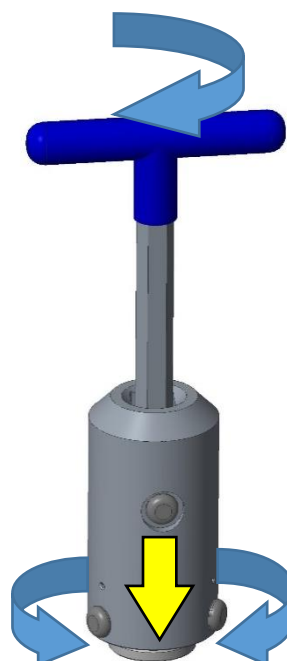
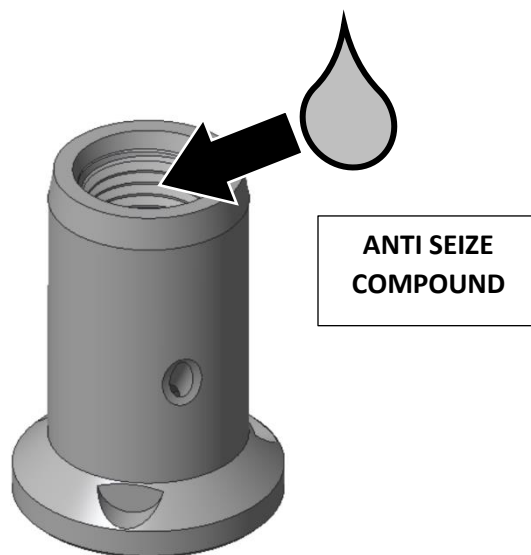
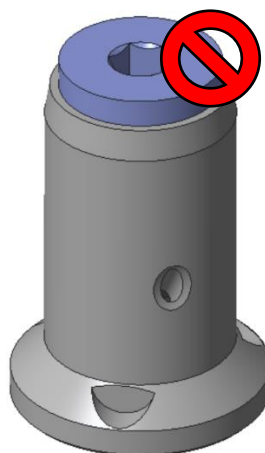
WITH THE SUPPLY ISOLATED, REVERSE THE CHARGING HEAD BOLT 3 TURNS. DO NOT EXCEED 3.5 TURNS! VENT THE PRESSURE TRAPPED BETWEEN THE ISOLATION VALVE AND THE CHARGING TOOL.



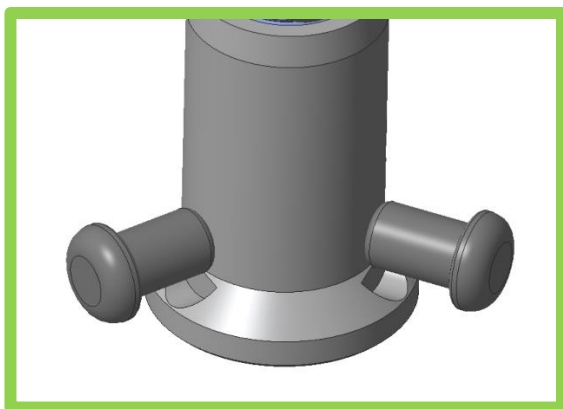




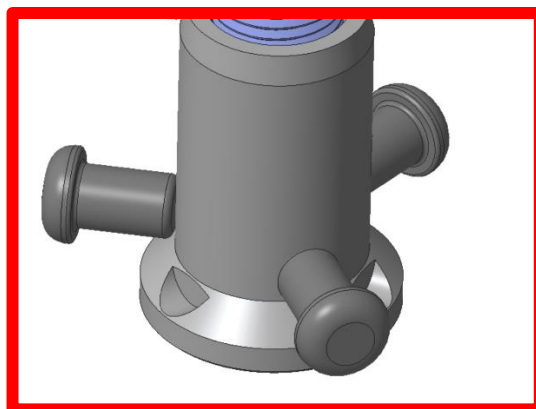
Removing a charging valve



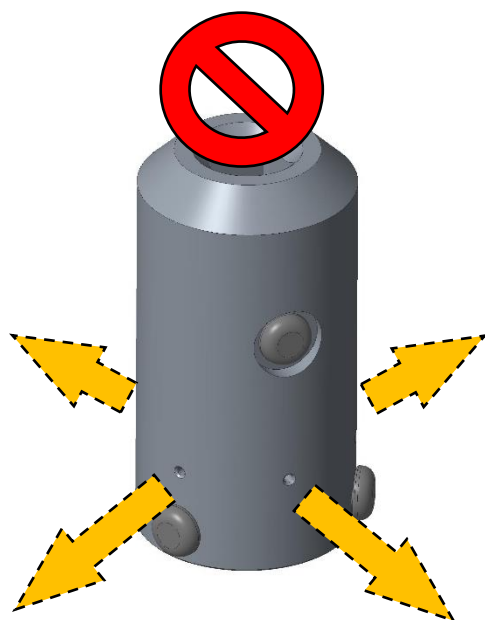
CAUTION: *Ensure the drive pins are fully engaged*



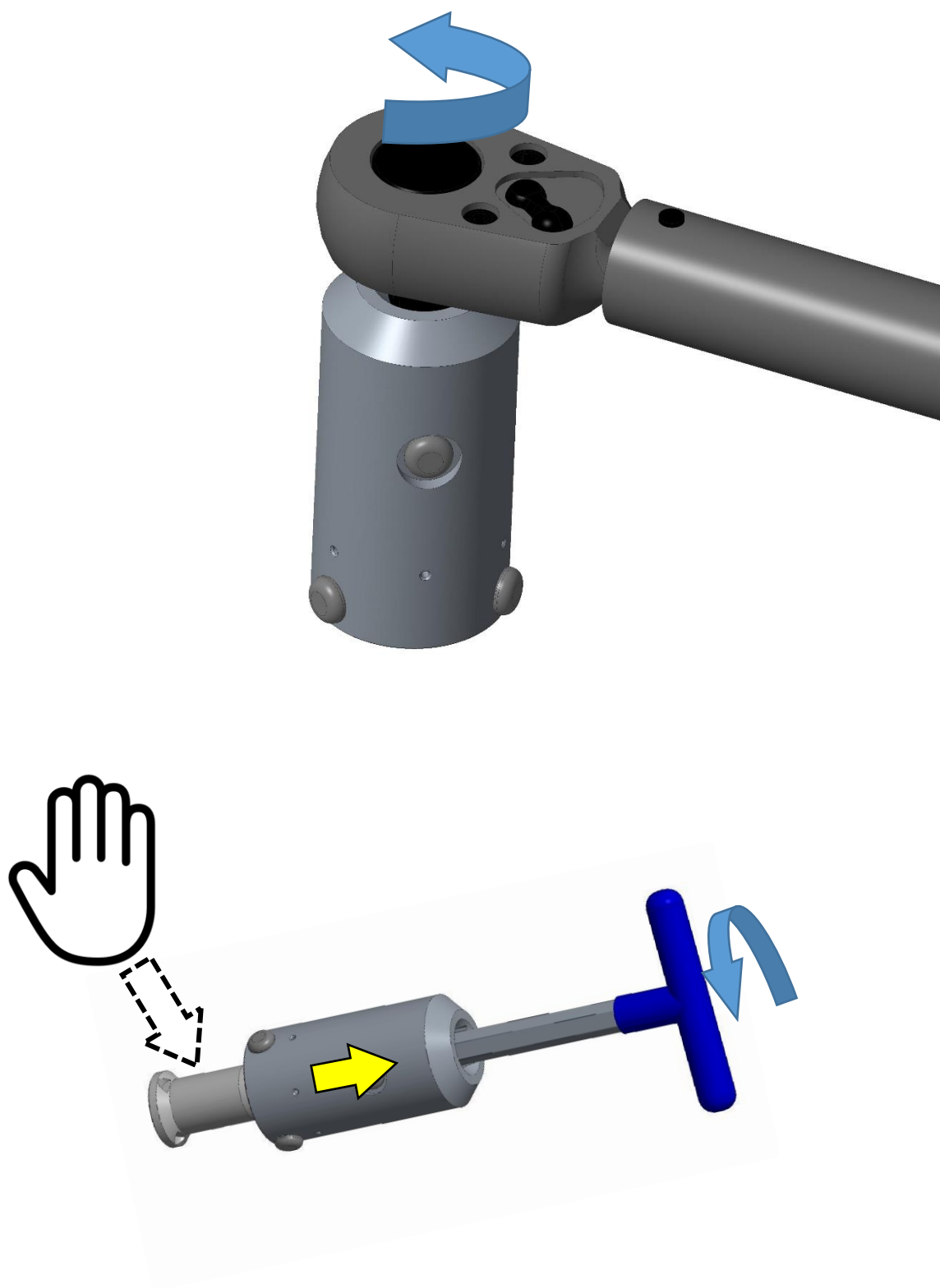
GOOD



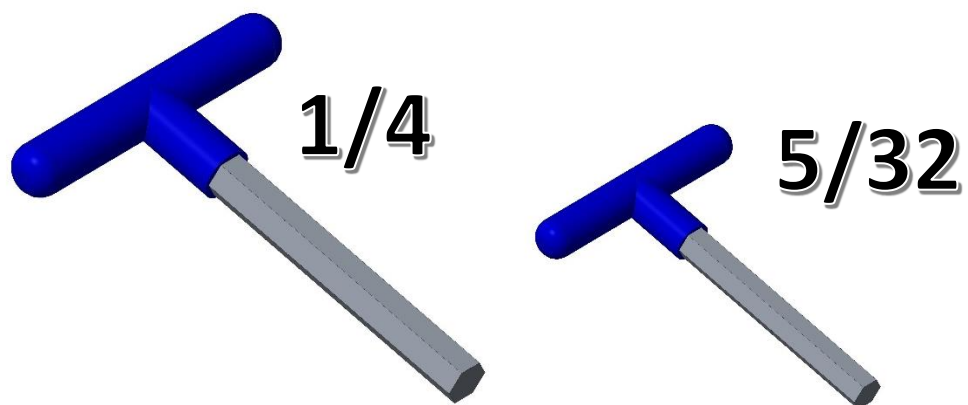
BAD

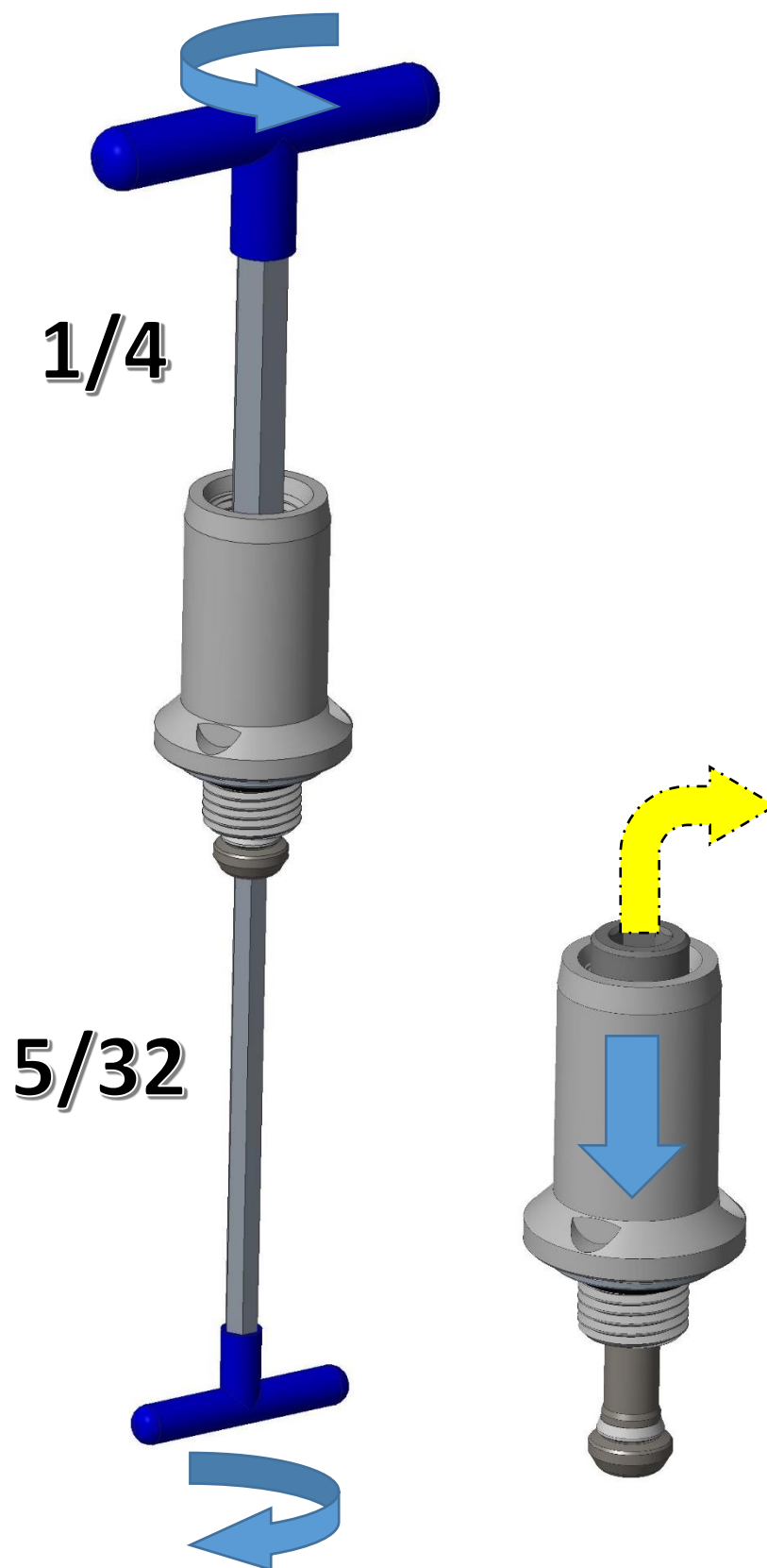


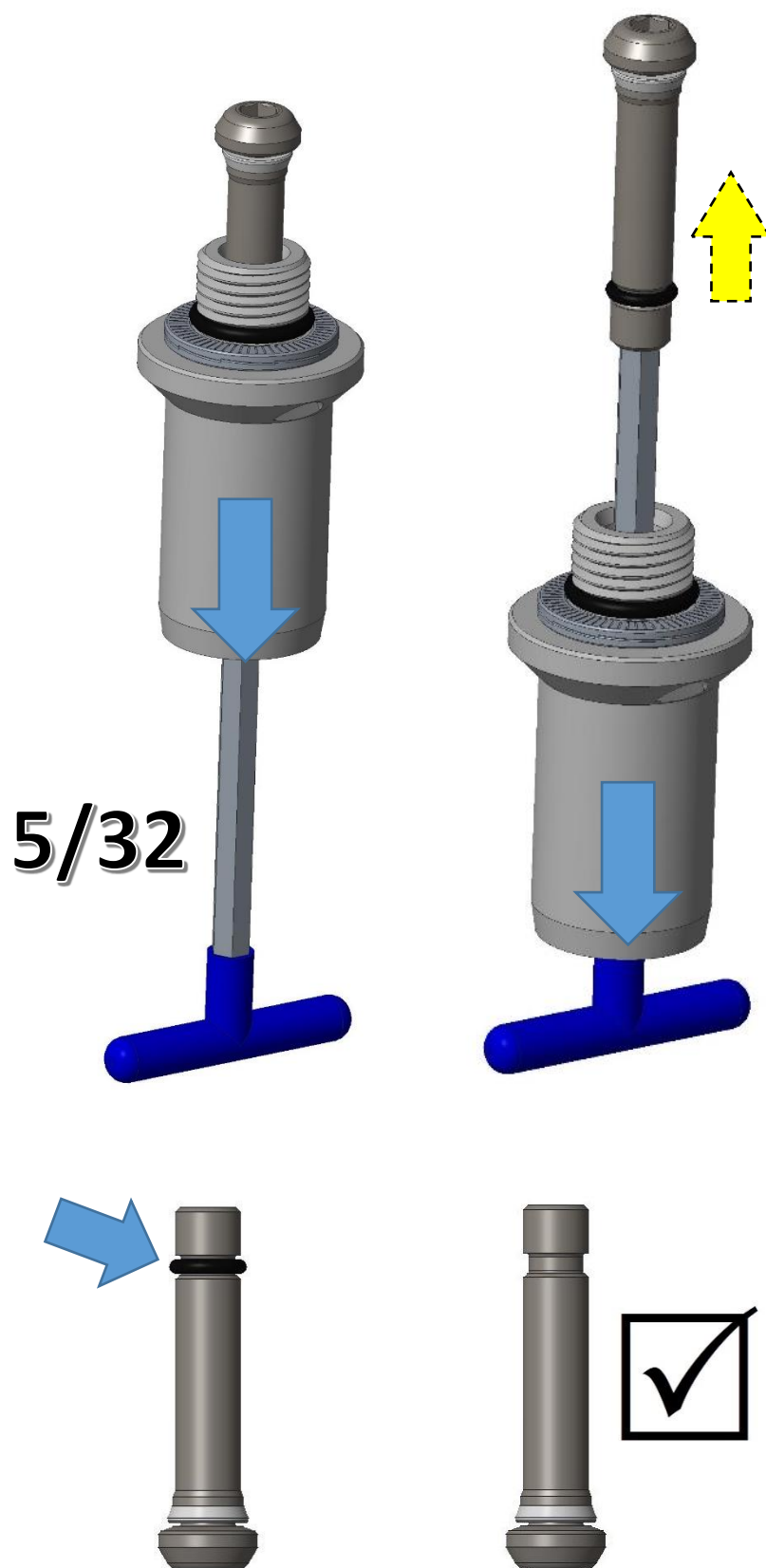
WARNING:
FAILURE TO BLEED OFF SYSTEM PRESSURE PRIOR TO WORKING ON VALVE CAN CAUSE SERIOUS INJURY. ALWAYS CHECK FOR PRESSURE PRIOR TO DISASSEMBLY OR REMOVAL FROM SYSTEM.

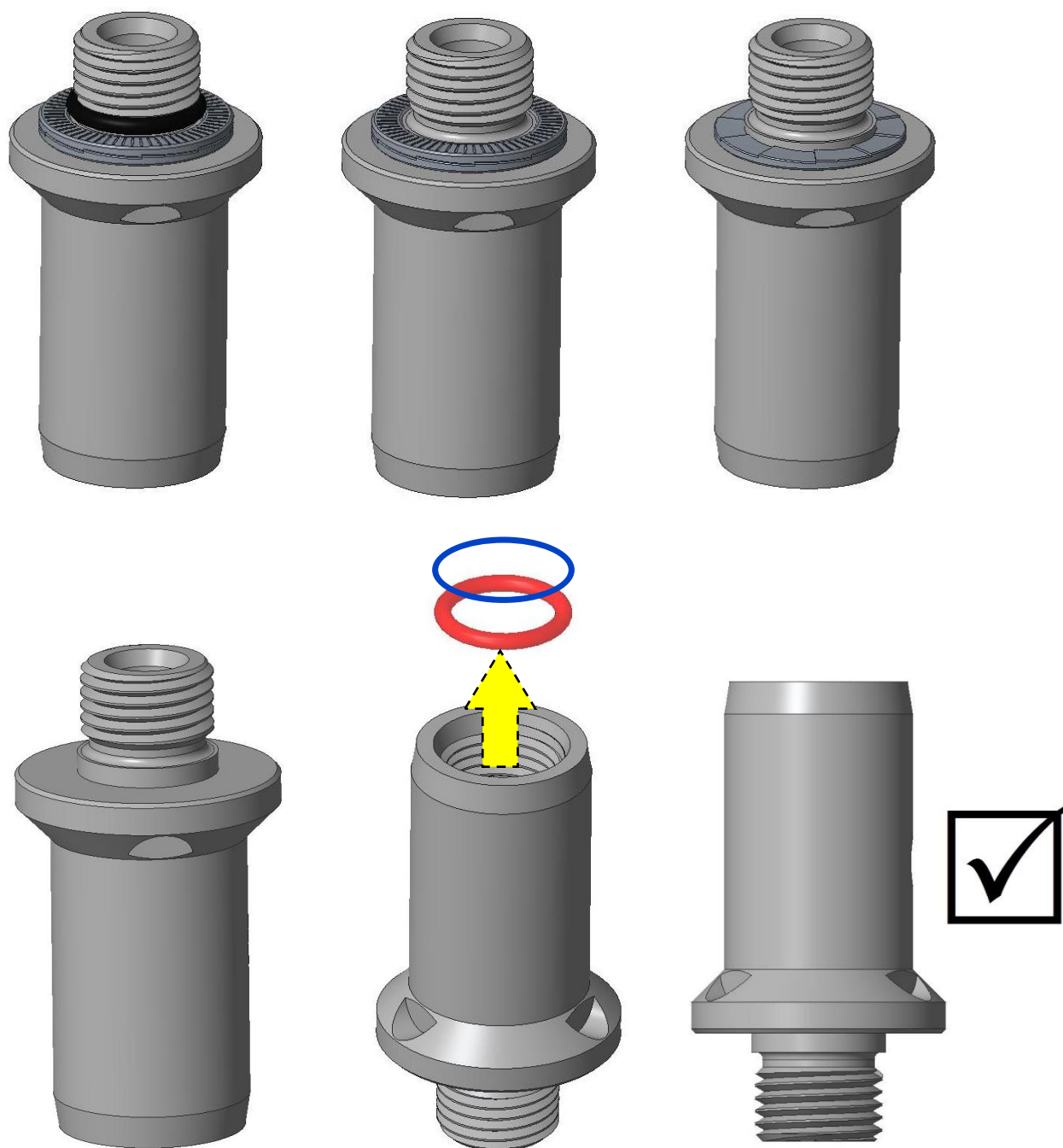


Disassembly



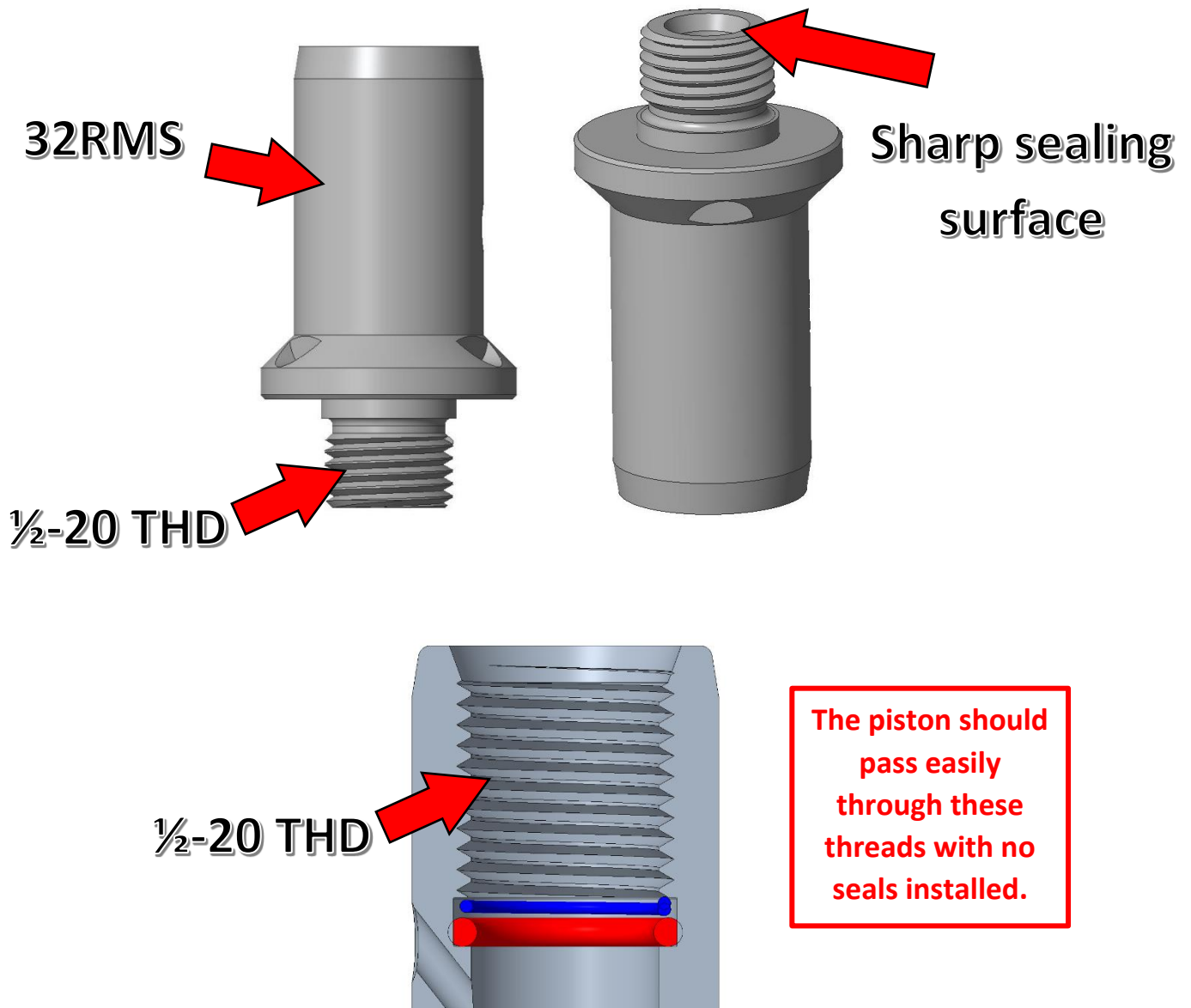






Inspection

The valve body is re-usable when repairing a Triton Charging Valve. Care should be used when inspecting the body. Ensure the noted areas are in perfect condition. Any damage or flaws should be addressed and determined if they are re-usable. If needed, send inquiries to Poseidon Deepwater Solutions to determine if the valve is field repairable, scrap, or can be sent in for repair. Refer to the “support” section. If good parts are installed into a damaged or worn valve body, there is a high likelihood it will not work and provide the intended service life.



***USE THREAD GAGES TO INSPECT THREADS**

Replacement Parts

Repair Kits are offered for Triton ACVs. The repair kit is the same number and revision level as the valve it is going into. The kit is numbered in two different ways:

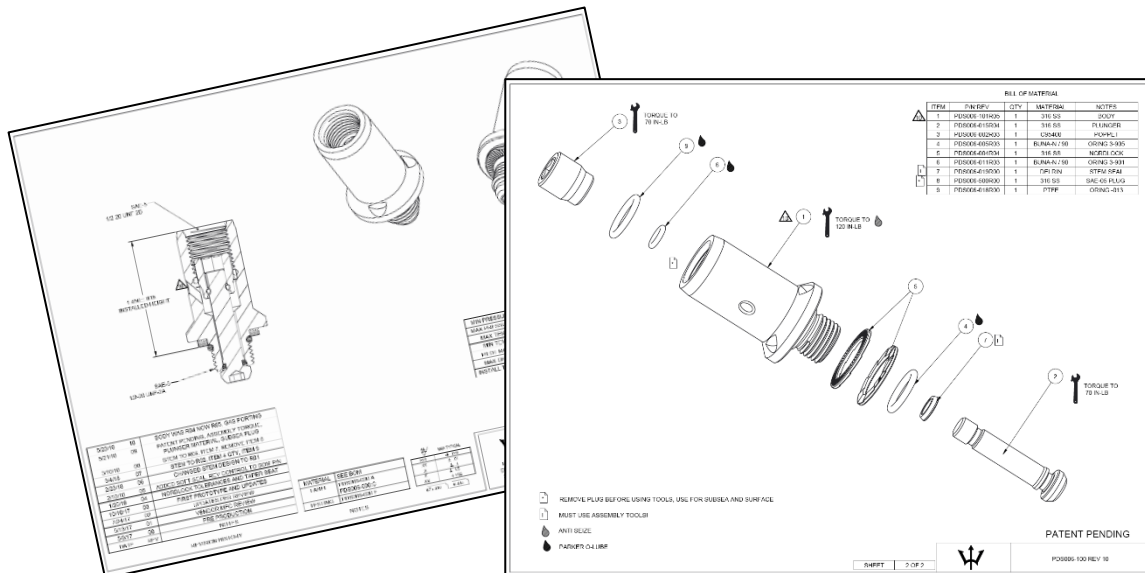
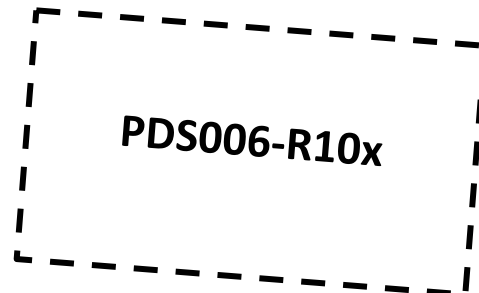
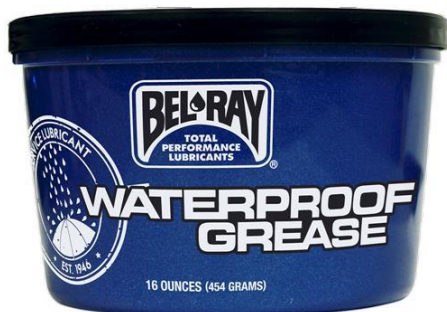
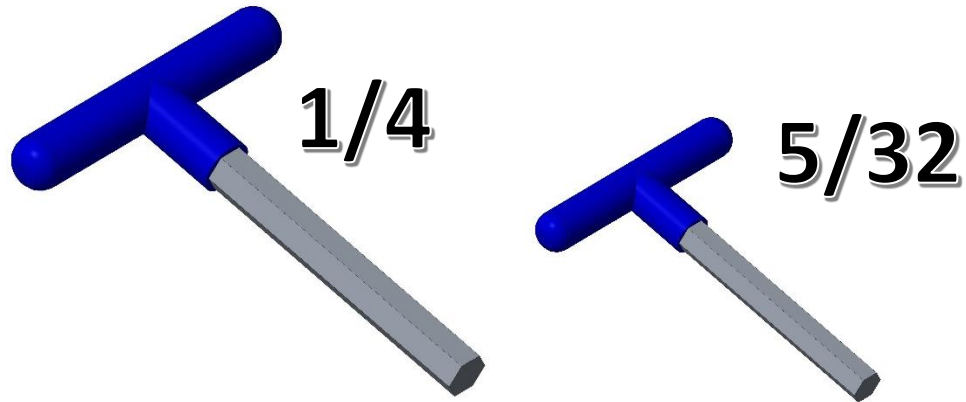
- 10-1 valve uses a 10-1R repair kit
- PDS006-100R14 uses a PDS006-R100R14 repair kit

Refer to the assembly drawings to identify components and where they go. The assembly drawing of the valve has a column of the Bill of Materials (BOM) which is labelled “RK”. This column helps identify which items are replaceable.

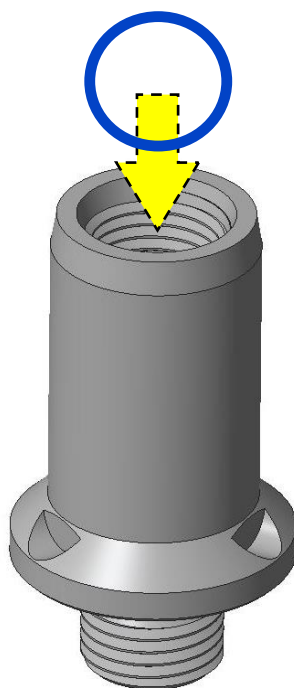
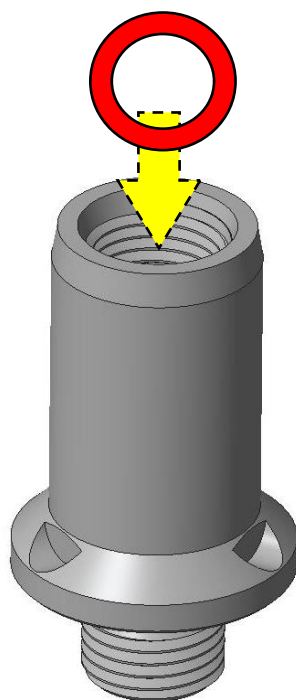
Follow the instructions in this manual to disassemble, inspect, and rebuild the valve. Take care to note what serial number repair kit was placed into the body serial number so that traceability information can be accurate.

Assembly

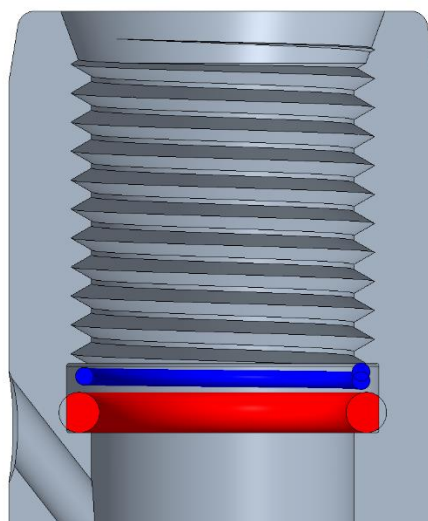
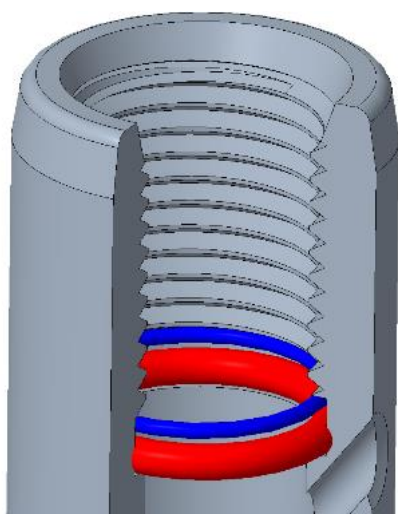
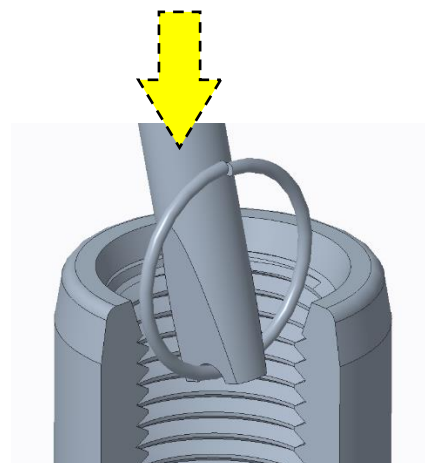
Use the assembly drawing of the valve along with the recommended tools to repair the ACV.



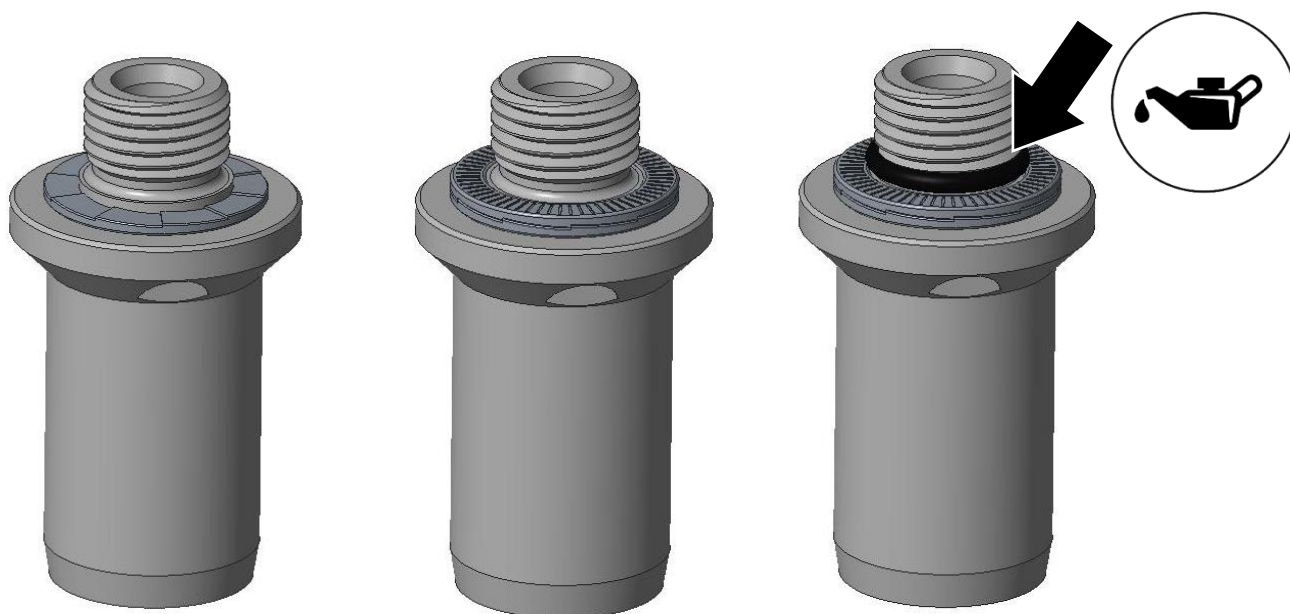
Bias Piston Seal and Backup Ring



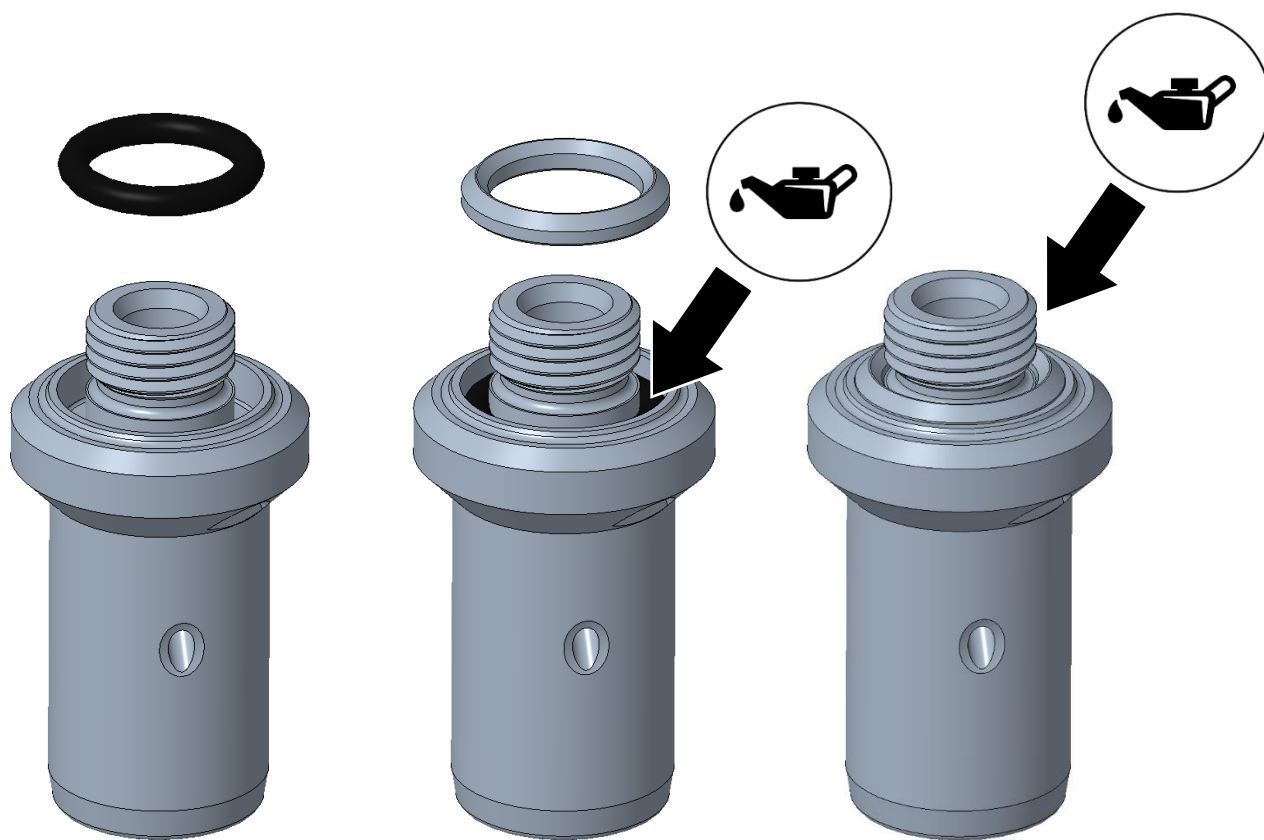
Use tool PDS006-0118

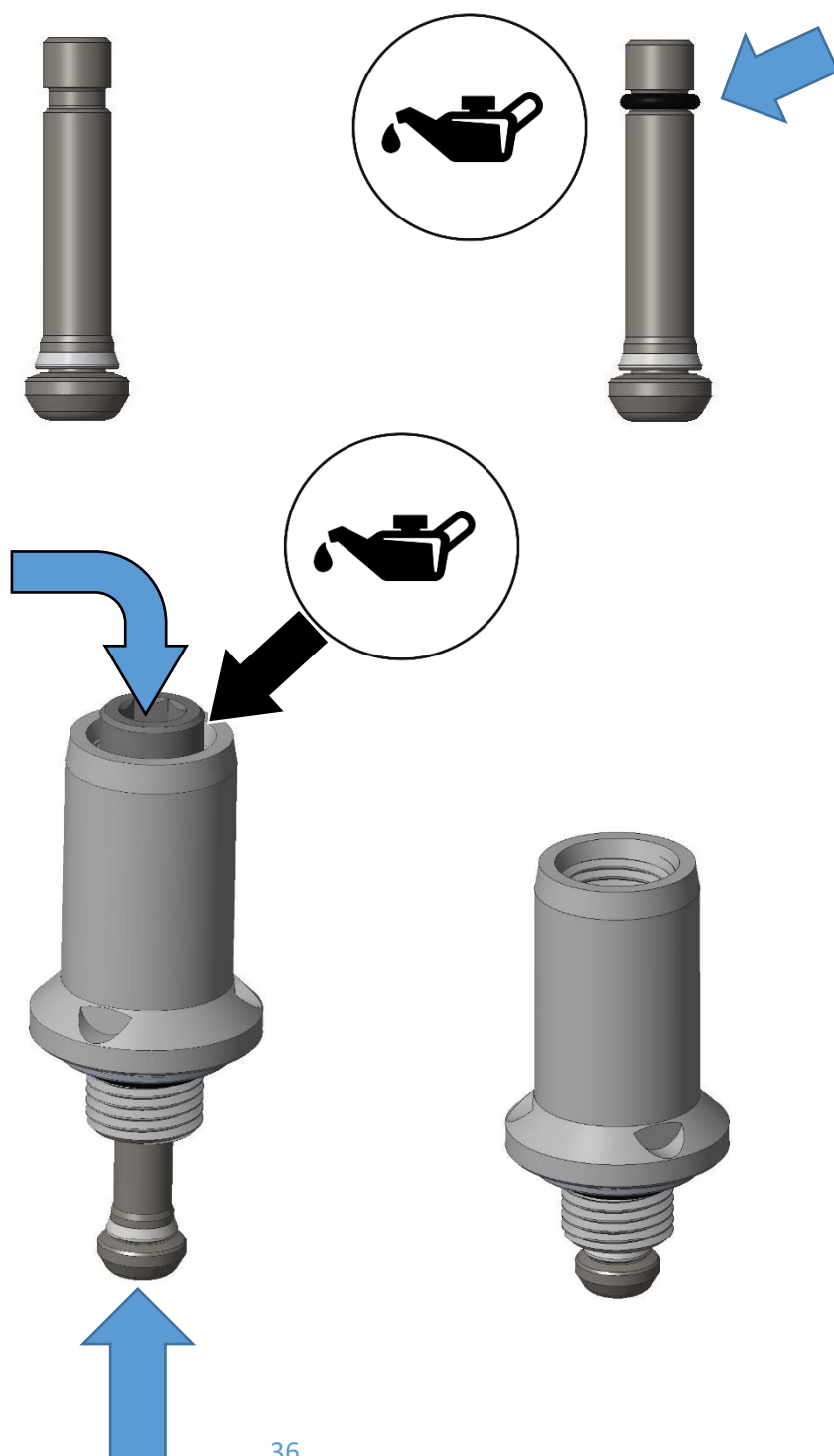


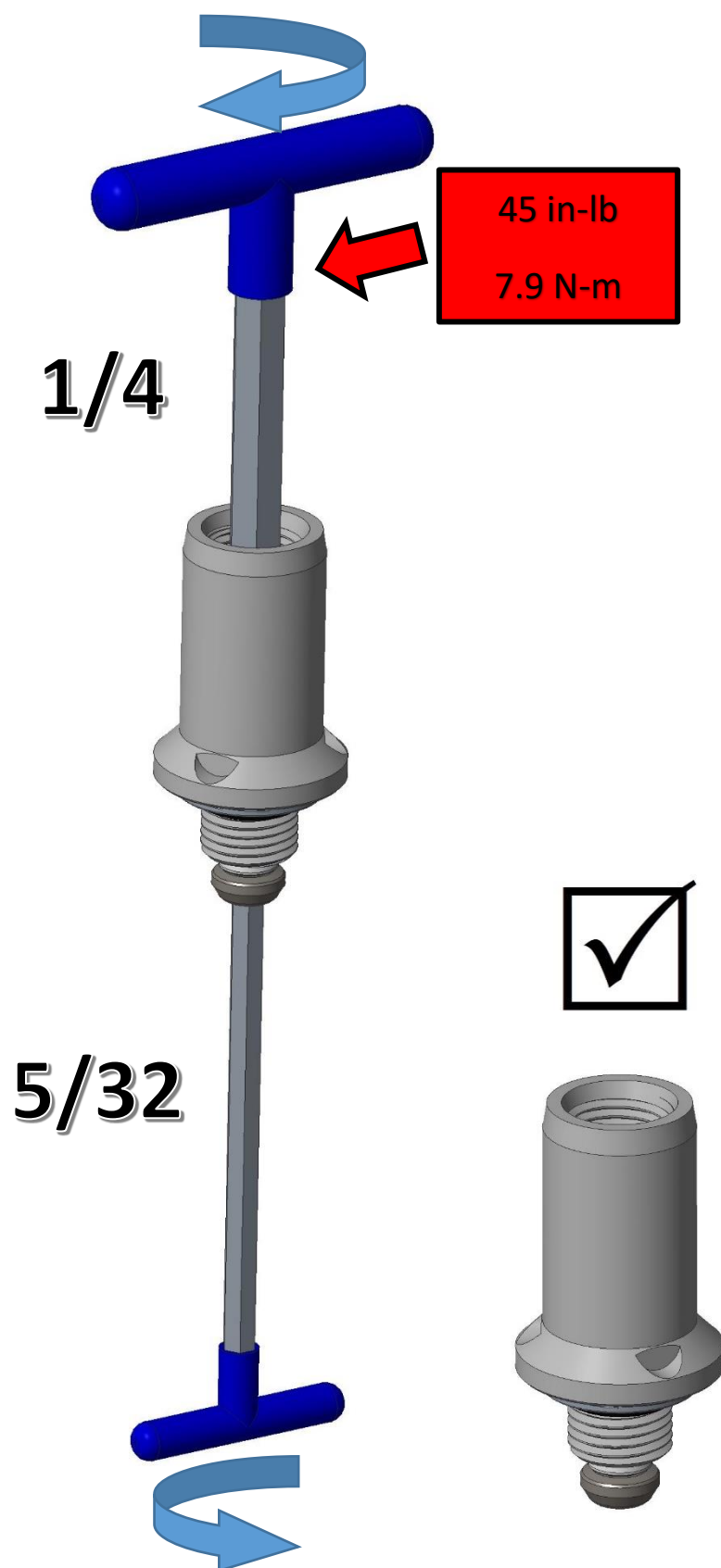
SAE Connection



Face Seal Connection

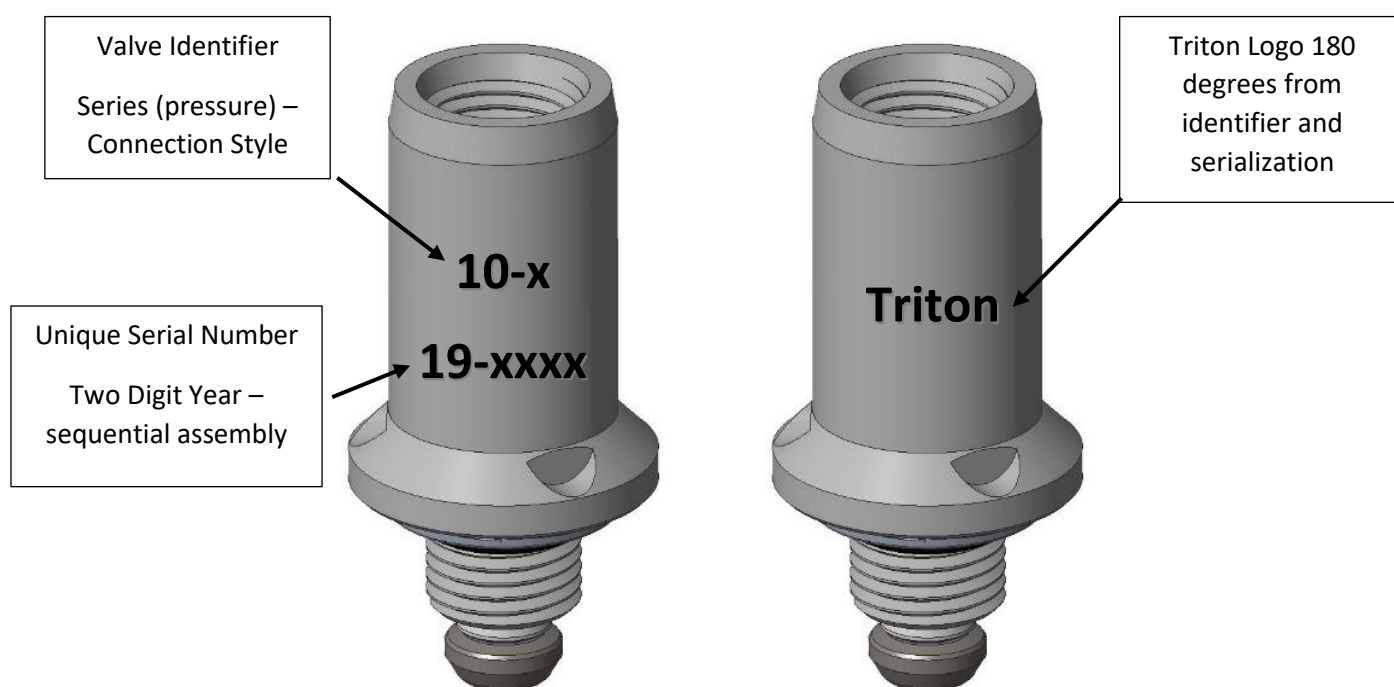




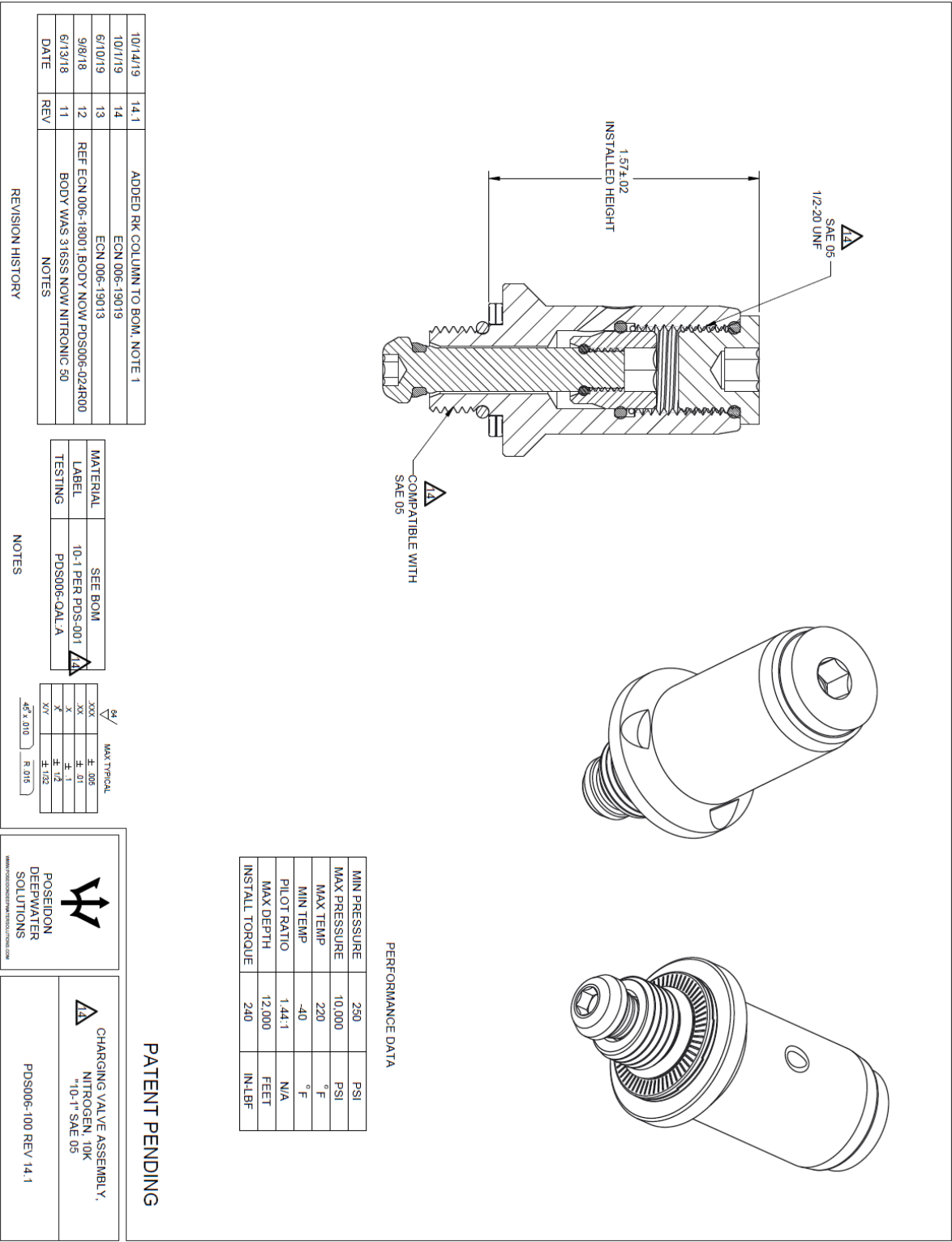


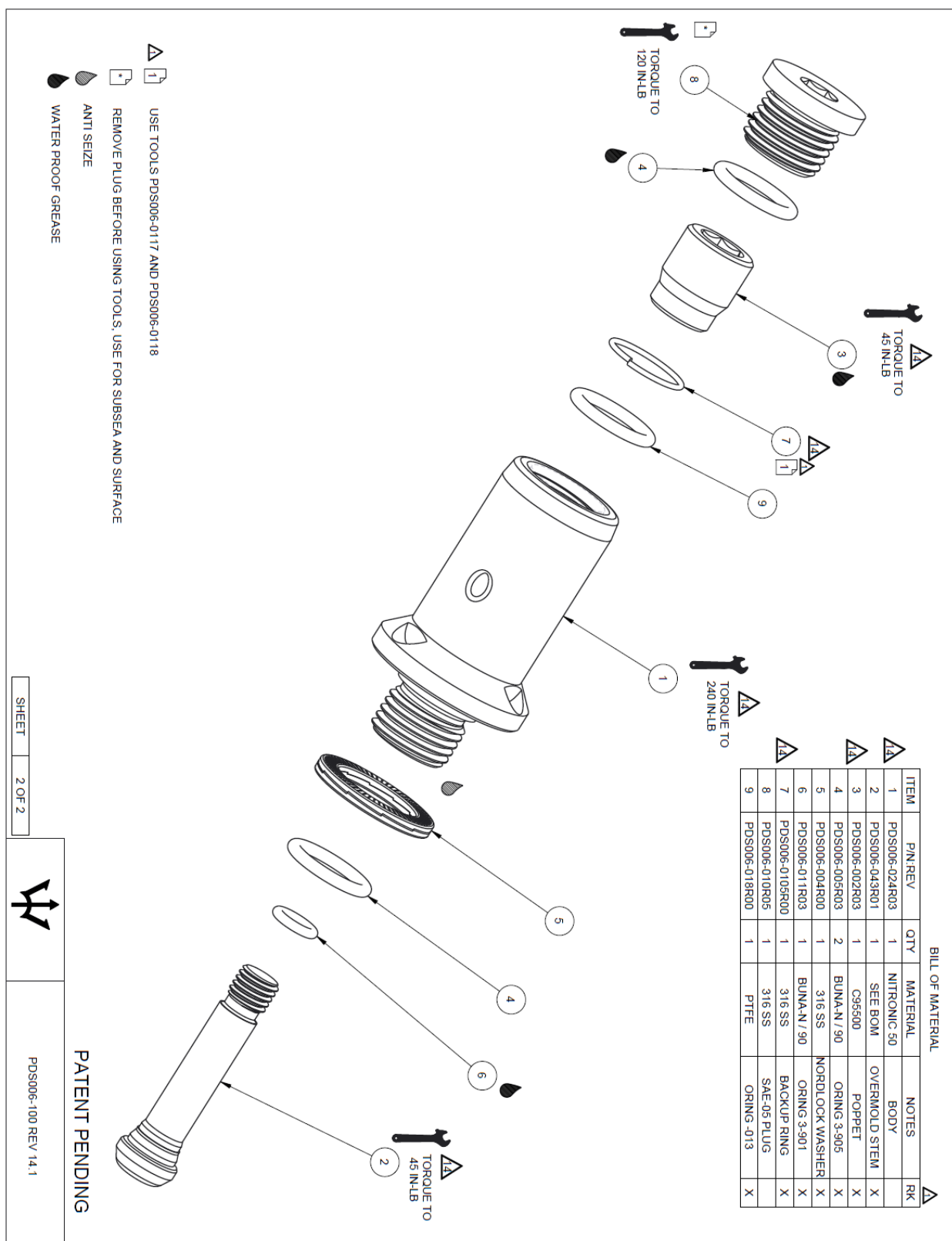
Support

For information on your valve, send an email request to tech-support@poseidonds.com. Include the number or a photo of the code and logo located on the side of the valve body.

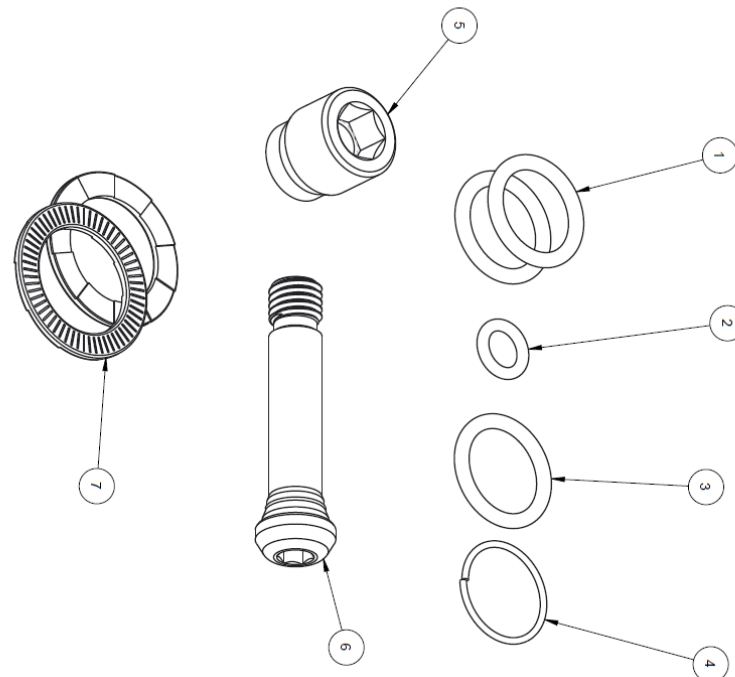


Appendix A: PDS006-100 Drawing “10-1”







Appendix B: PDS006-R100 “10-1R”



ITEM	PART NUMBER	QTY	DESCRIPTION
1	PDS006-005R04	2	ORING 3-905
2	PDS006-011R04	1	PTFE ORING-013
3	PDS006-018R00	1	BACKUP RING
4	PDS006-105R00	1	PISTON
5	PDS006-002R03	1	STEM
6	PDS006-043R01	1	NORDLOCK WASHER
7	PDS006-004R04	1	

BILL OF MATERIALS

 REMOVAL TOOL: PDS006-0117R00
 INSTALLATION TOOL: PDS006-0118R00


DATE	REV	DESCRIPTION
10/14/19	00	FIRST ISSUE

REVISION HISTORY

MATERIAL	SEE BOM
COATING	
LABEL	PIN AND SN

NOTES

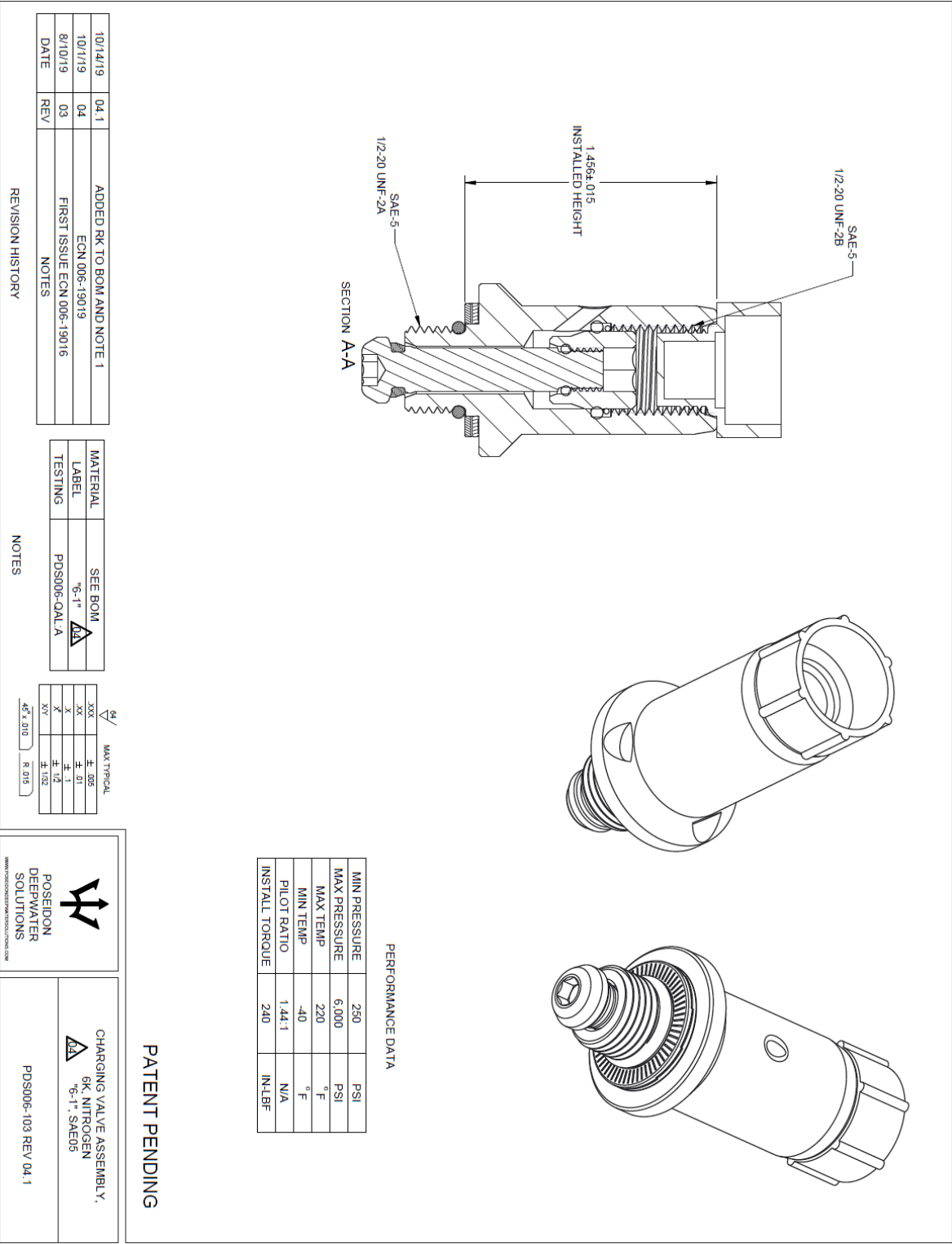
MAX TYPICAL
±.005
±.01
±.1
±.12
±.125
±.015

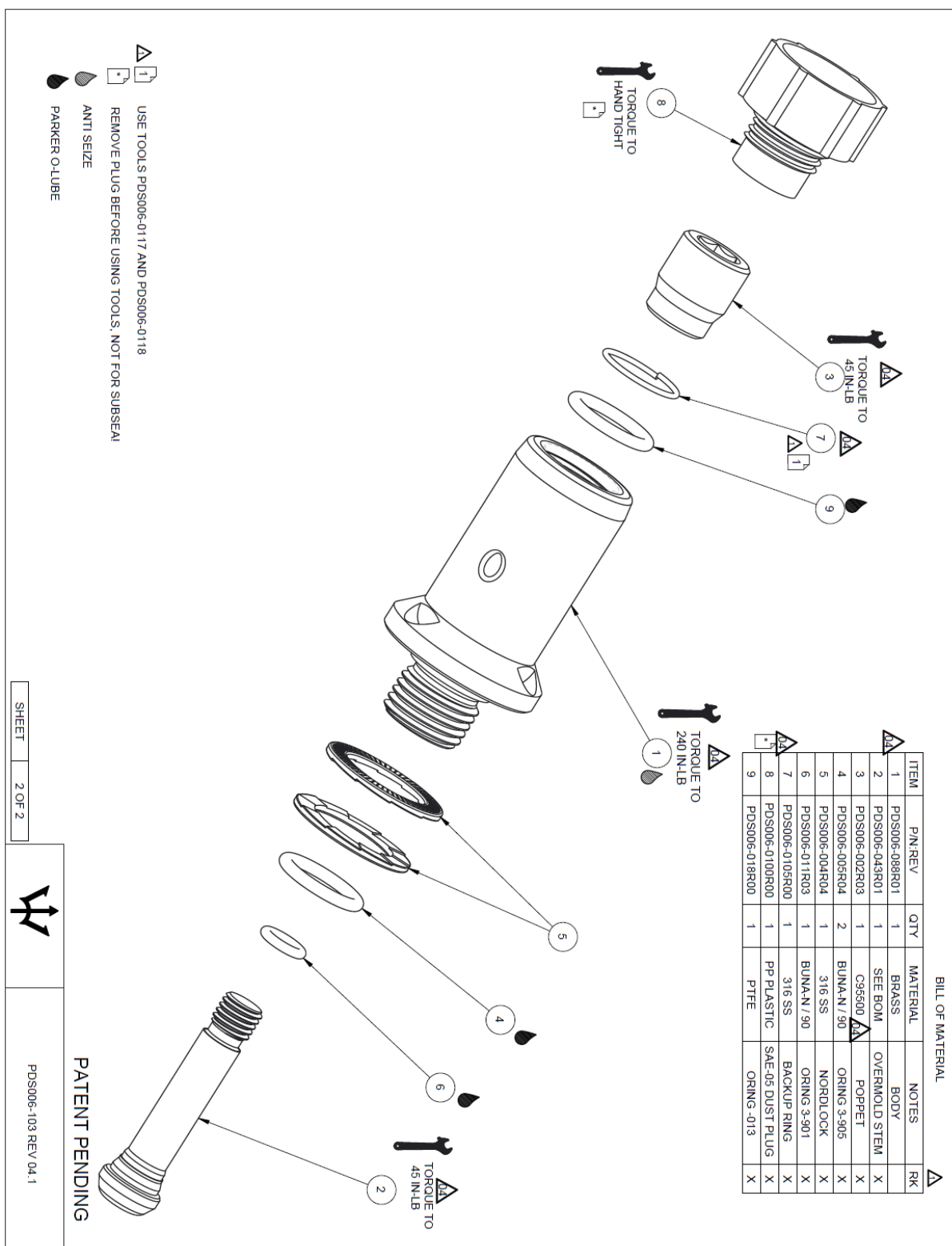

POSEIDON
DEEPWATER
SOLUTIONS
www.poseidondeepwatersolutions.com

REPAIR KIT
NITROGEN CHARGING VALVE 10-1 ACV

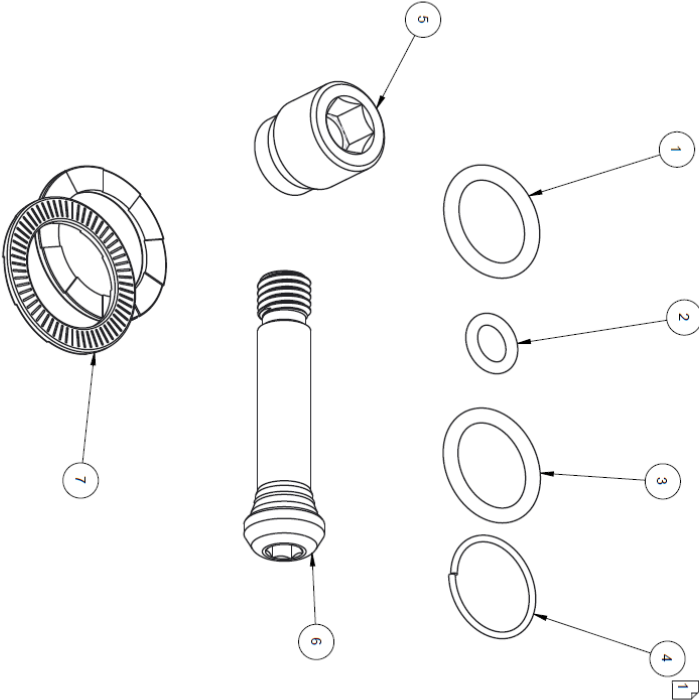
PDS006-R100 R14

Appendix C: PDS006-103 Drawing “6-1”





Appendix D: PDS006-R103 “6-1R”



ITEM	PART NUMBER	QTY	DESCRIPTION
1	PDS006-005R04	1	ORING 3-905
2	PDS006-011R04	1	ORING 3-901
3	PDS006-018R00	1	PTFE ORING -013
4	PDS006-105R00	1	BACKUP RING
5	PDS006-002R03	1	PISTON
6	PDS006-043R01	1	STEM
7	PDS006-004R04	1	NORDLOCK WASHER

1

REMOVAL TOOL: PDS006-0117R00

INSTALLATION TOOL: PDS006-0118R00

64 / MAX TYPICAL

XXX

XX

X

XV

± .005


± .01

± .1

± .125

45° x .010

R .015



POSEIDON
DEEPWATER
SOLUTIONS

WWW.POSEIDONDEEPWATER.COM

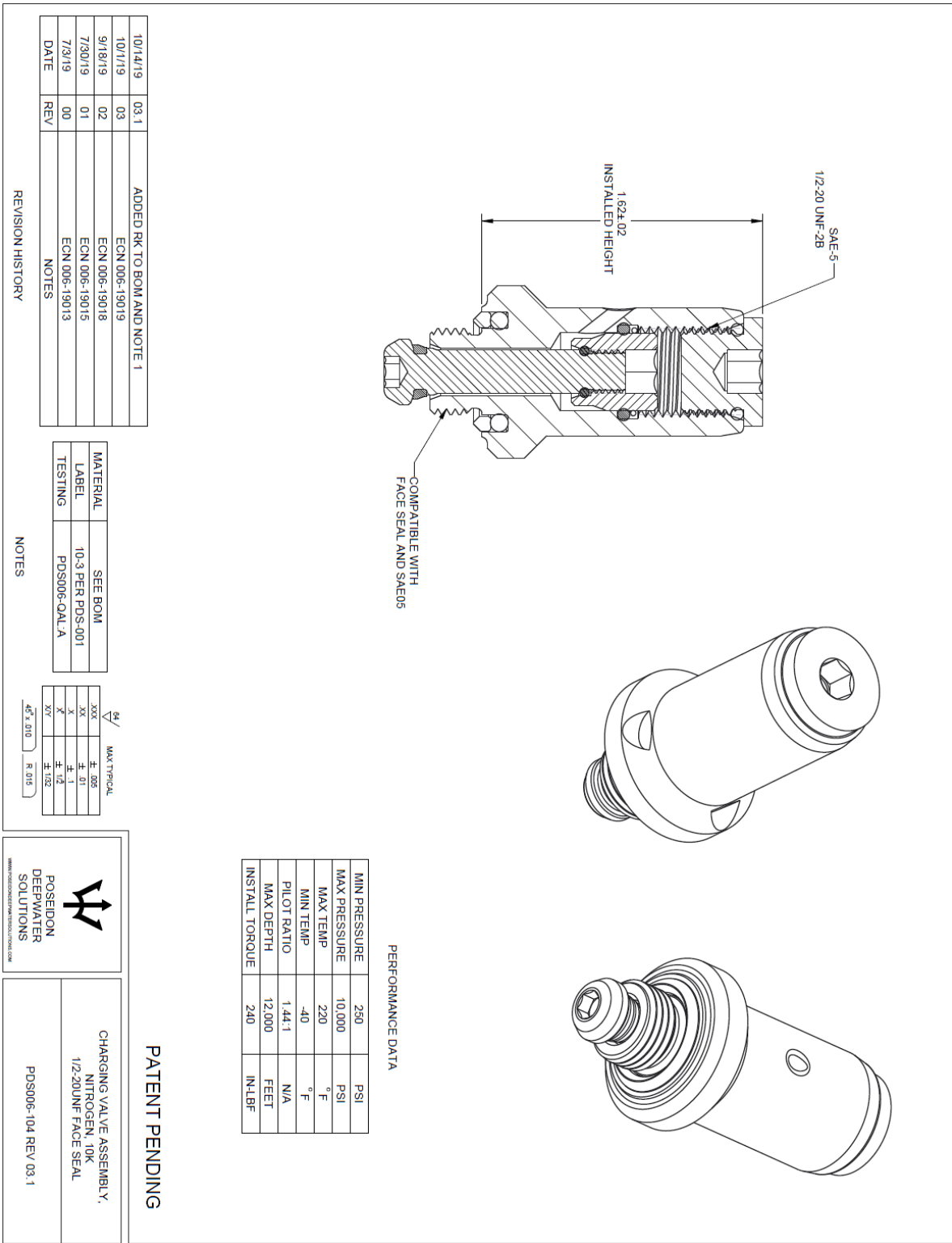
REPAIR KIT

NITROGEN CHARGING VALVE

6-1 ACV

PDS006-R103 R04

Appendix E: PDS006-104 Drawing “10-3”



Appendix F: PDS006-R104 “10-3R”

10/14/19

00

FIRST ISSUE

DATE

REV

DESCRIPTION

REVISION HISTORY

MATERIAL

SEE BOM

COATING

LABEL

P/N AND S/N

NOTES

XX

± .005

XX

± .01

X

± .1

X


± .12

XX

± .032

45° ± .010

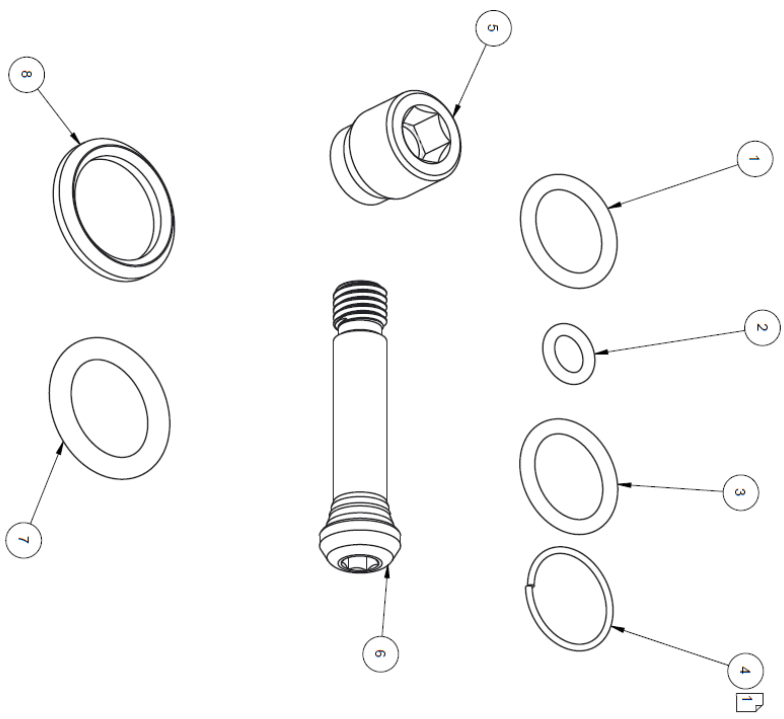
R .015




POSEIDON
DEEPWATER
SOLUTIONS


REPAIR KIT
NITROGEN CHARGING VALVE
10-3 ACV

PDS006-R104 R03



ITEM	PART NUMBER	QTY	DESCRIPTION
1	PDS006-005R04	1	ORING 3-905
2	PDS006-011R04	1	ORING 3-901
3	PDS006-018R00	1	PTFE ORING .013
4	PDS006-105R00	1	BACKUP RING
5	PDS006-002R03	1	PISTON
6	PDS006-043R01	1	STEM
7	PDS006-0113R00	1	ORING -112
8	PDS006-0103R00	1	BOOST RING

 REMOVAL TOOL: PDS006-0117R00

 INSTALLATION TOOL: PDS006-0118R00