apeks

TECHNICAL MAINTENANCE MANUAL



XTX SECOND STAGE

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Apeks XTX Second Stage Technical Maintenance Manual

Introduction

Warnings, Cautions, & Notes

WARNINGS indicate a procedure or situation that may result in serious injury or death if instructions are not followed correctly.

CAUTIONS indicate any situation or technique that will result in potential damage to the product, or render the product unsafe if instructions are not followed correctly.

NOTES *are used to emphasize important points, tips and reminders.*

Scheduled Service

An Official Inspection consists of:

5. A visual inspection of the filter for debris or discoloration.

General Guidelines

specifically set up and equipped for the task. Adequate lighting,

an efficient repair facility.

or parts from other units. Delicate parts, including inlet fittings and

specification prescribed in this manual, using a calibrated torque

Procedure A: Cleaning and Lubrication

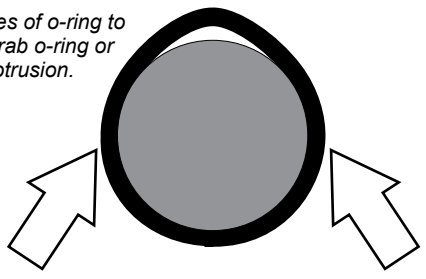
General Conventions

remove unscrew loosen

install screw in, tighten

remove

Pinch Method
Press upwards on sides of o-ring to create a protrusion. Grab o-ring or insert o-ring tool at protrusion.



MP

_ _ HP _ _ LP _ _

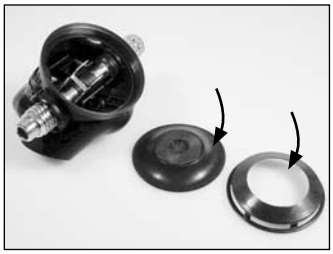
For example

DISASSEMBLY PROCEDURE

NOTE: *Before performing any disassembly, refer to the exploded parts drawing, which references all mandatory replacement parts. These parts should be replaced with new, and must not be reused under any circumstances – regardless of the age of the regulator or how much use it has received since it was last serviced.*

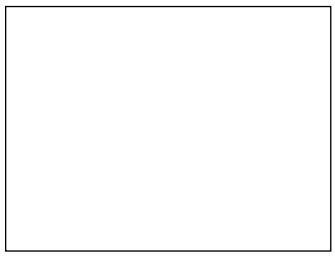
CAUTION: Use only a plastic or brass o-ring removal tool (pn 944022) when removing o-rings to prevent damage to the sealing surface. Even a small scratch across an o-ring sealing surface could result in leakage. Once an o-ring sealing surface has been damaged, the part must be replaced with new. DO NOT use a dental pick or any other steel instrument.

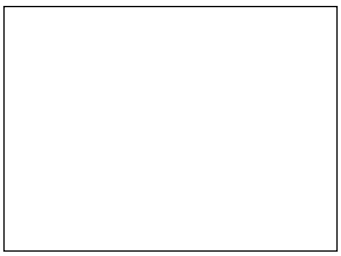
NOTE: *The Apeks cover tool should be firmly pressed against the case cover while loosening.*



XTX 200/100/50

XTX 40/20





XTX 200/100/50

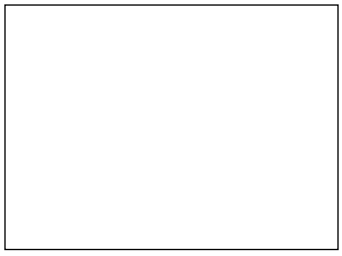
XTX 40/20

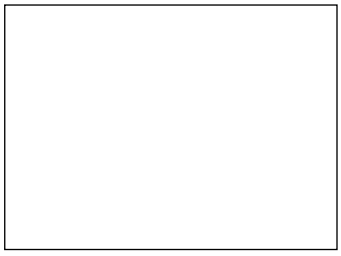




XTX 200/100/50

XTX 40/20





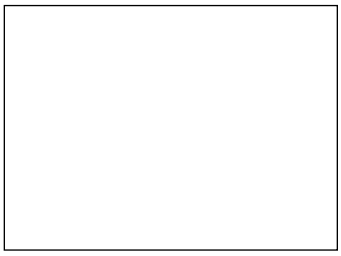
XTX 200/100/50

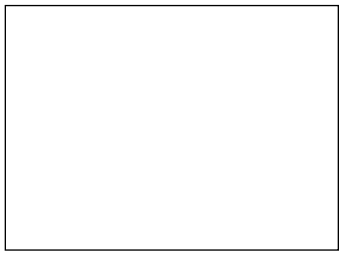
XTX 40/20

NOTE: *The venturi lever may have come out with the valve spindle in step 2 above. If this is occurs, depress the lever and slide the venturi lever off from right to left.*

NOTE: *It is NOT necessary to separate the venturi lever parts (15 & 16) unless the regulator is being converted to a different hand configuration.*

XTX 200/100/50:

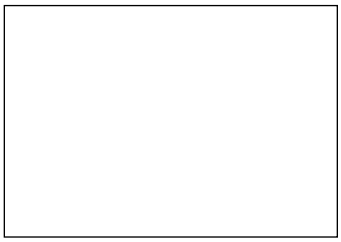




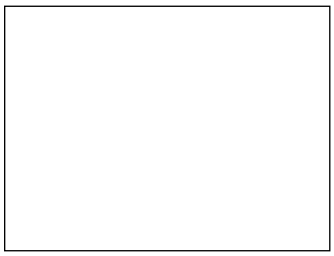


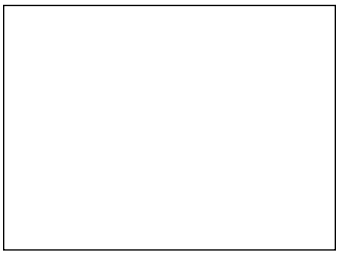




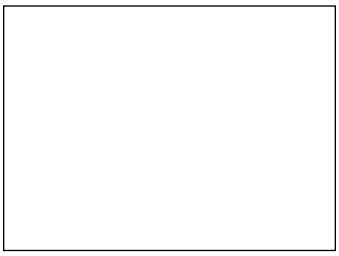




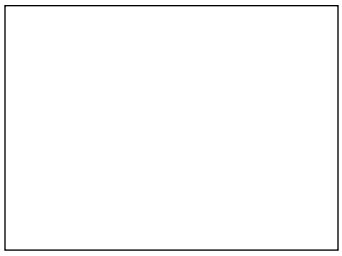


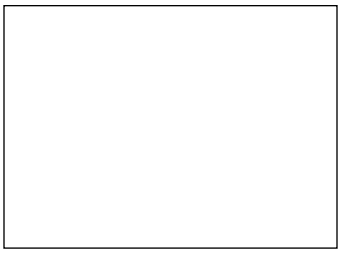


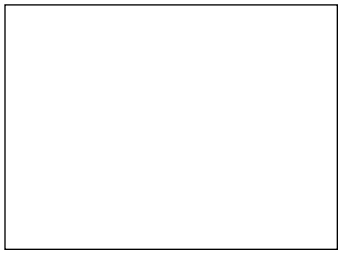


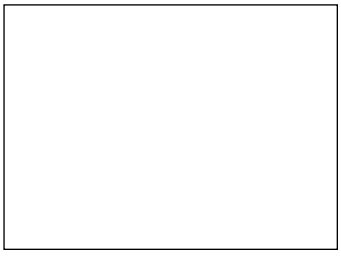


19. Using your fingernail, remove the rubber seat (26) and small

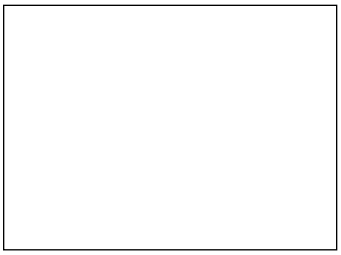


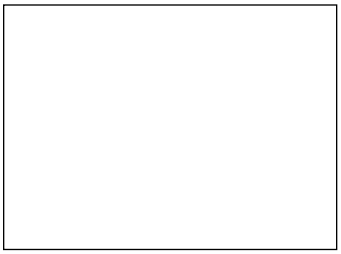






NOTE: *Lever does not need to be removed during service, unless following inspection it appears to be bent or mishapen.*



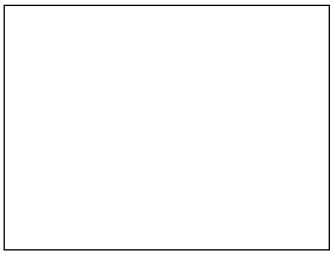


have well defined edges. If there is any sign of deterioration,



NOTE: *If the exhaust valve needs to be replaced, pinch the edges and pull the tail through hole in the case (25).*



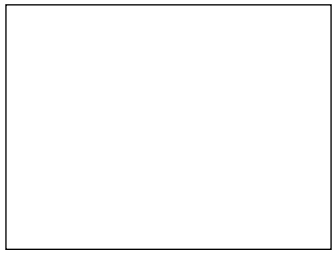


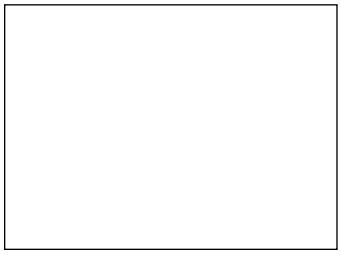
THIS ENDS DISASSEMBLY

Before starting reassembly, perform parts cleaning and lubrication in accordance with *Procedure A: Cleaning and Lubricating* (p. 19).

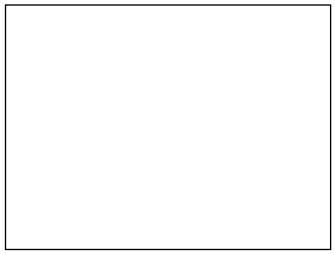
REASSEMBLY PROCEDURE

WARNING: Flooding may occur if the tail of the valve is not fully pulled through. Ensure that the barb has engaged on inside of case.





Ensure that the exhaust rib (34) is placed firmly in the left



NOTE: *There is no exhaust rib (34) when using the small exhaust tee (25).*

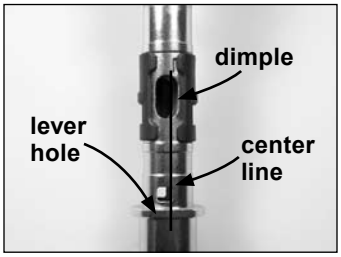








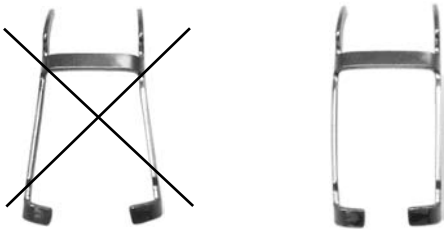






NOTE: *Ensure that the rubber seat fits flush with the shuttle valve.*

CAUTION: **The lever legs should not be twisted. If necessary, gently squeeze legs together to straighten.**



required hose configuration.

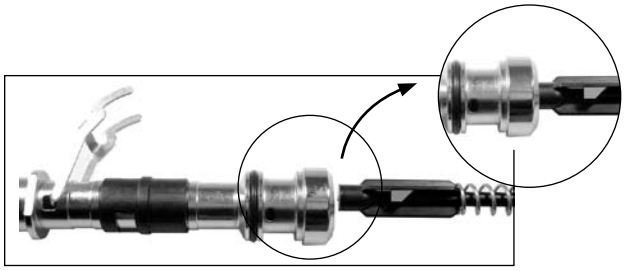




CAUTION: **Ensure that the spindle collar clicks frmly into position and that the entire valve spindle hole is visible.**

WARNING: **Failure to place the spindle collar in the correct position will result in a substantial loss of breathing performance.**

the valve spindle. Use your finger to press the shuttle valve



NOTE: *The lever should move freely and not catch on the valve spindle. The spring (29) should be visible through the valve spindle hole.*

For XTX 200/100/50

XTX 200/100/50

XTX 40/20

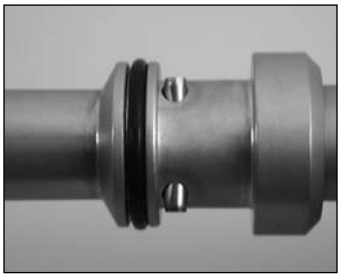
For XTX200/100/50,
spring adjuster (37) into the adjustment knob until it is flush with the end of the adjustment knob (32). From flush, turn

XTX 200/100/50



XTX 40/20



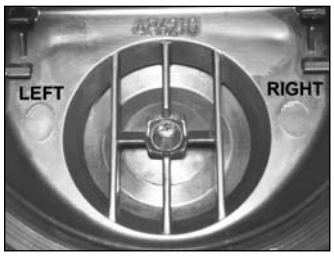


RIGHT". Press the venturi ring firmly

NOTE: *The arrow on the venturi ring and line on the venturi lever body must be correctly aligned in order for them to fasten together. If the regulator is to be configured as right handed, the arrow must be aligned to the line with the word "**RIGHT**" underneath. See the section titled **Converting the XTX Regulator to Left Handed Configuration, p. 13** for further information.*

CAUTION: The components of the venturi lever must be firmly pressed together (see example below). You will hear a click if connected correctly.

"RIGHT". Press firmly to secure the o-ring.



firmly to secure the o-ring.

the venturi lever and into the case. The two flats and two lever

CAUTION: Do not allow the lever to forcefully spring up after passing through the case.

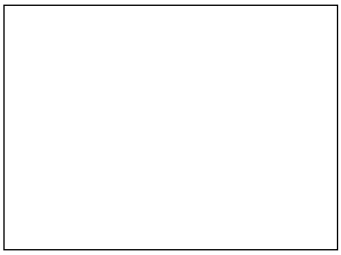
onto the valve spindle until finger tight. Using a 11/16" crow-

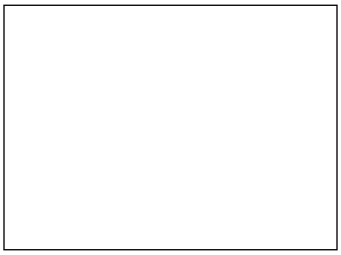
CAUTION: Lever must be vertical after tightening.

CAUTION: Excessive tightening of the heat exchanger will cause damage to the blanking piece and case.

threaded end first, into the valve spindle. Then use a

of the diaphragm into place with your finger so it sits evenly



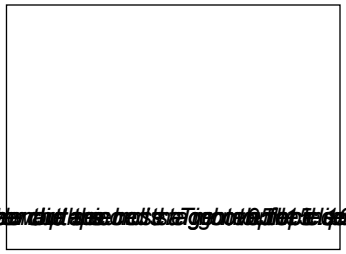




CAUTION: Ensure diaphragm is seated correctly and not creased.

NOTE: *It is recommended that the bench tests be performed prior to installing the mouthpiece. Refer to "Final Testing Procedure," on p. 12.*





*Hip(Hip)ii(ii)ii(ii)ii(ii

FINAL TESTING PROCEDURE

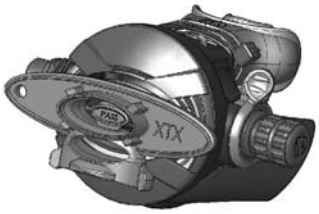
WARNING: Compressed air can be highly explosive and is dangerous if misused. Ensure cylinder valve is opened slowly. Use Eye and Ear Personal Protective Equipment when performing any tests involving compressed air .

Connect the first stage regulator to a calibrated test bench and

lator to freeflow. Stop the freeflow after a couple of seconds

NOTE: *The spindle collar (20) must be positioned correctly with the valve spindle (19) hole facing the top of the case (24), otherwise the regulator will not freeflow. If not, disassemble and remedy the problem.*

not flow from the second stage, proceed to step 5. If air flows



step 1 Disassembly Procedures, p. 4

against the front cover. If air flows from the second stage the lever height has been set correctly. If air does not flow from

Disassembly Procedures, step 1, p. 4.

Second Stage Opening Effort Test

1. Connect the first stage regulator to a calibrated test bench

the flowmeter control knob (start vacuum) while watching both

ing is less than or greater than these specifications, adjust

Table 1: Troubleshooting Guide, p. 16
specific procedures.

External Leak Test

After disconnecting the regulator from the flow bench, connect it to a scuba cylinder filled to approximately 3,000 psi

NOTE: *Extremely small leaks may be better detected by applying a soap solution or Snoop™ to the leak area. Bubble streams will indicate the source of the leak. Before disassembling to correct any leaks, rinse the entire regulator thoroughly with fresh water and blow out all residual moisture with filtered, low-pressure (50 psi) air. Disassemble and remedy the problem, referring to* ***Table 1: Troubleshooting, p. 16.***

Subjective Breathing Test

volume of airflow is adequate to clear the second stage.

airflow upon deep inhalation; without excessive effort, hesitation, or freeflow. If any abnormalities or problems occur,
Table 1: Troubleshooting Guide, p. 16.

regulator. Remove the first stage from the valve and secure the

This concludes the service procedures for the XTX Second Stage Regulator.

CONVERTING THE XTX REGULATOR TO A LEFT HANDED CONFIGURATION



Right Handed Configuration



Left Handed Configuration



NOTE: *The cover tool must be firmly pressed against the case cover while loosening.*



NOTE: *The venturi lever may have come out with the valve spindle in step 4. If so, depress the lever and slide the venturi lever off from right to left.*

until finger tight. Using

CAUTION: Lever must be vertical after tightening.

CAUTION: Excessive tightening of the heat exchanger will cause damage to the blanking piece and case.

of the diaphragm into place with your finger so it sits evenly

CAUTION: Ensure diaphragm is seated correctly and not creased.

NOTE: *Perform the following suction test prior to fitting the hose: hold your thumb over the valve spindle (19) to seal, then breathe through the mouthpiece outlet port. You should not be able to draw air in.*



This concludes the Conversion Procedures.

NOTE: *It is recommended that the bench tests be performed. Remove the mouthpiece and refer to "Final Testing," p. 12.*

Table 1: Troubleshooting Guide

SYMPTOM	POSSIBLE CAUSE	TREATMENT
Second Stage Air Leak or Free Flow	1. Extremely high MP from first stage.	
Low Purge or Labored Breathing on full cylinder	1. The first stage has low MP.	
Water Entering Second Stage	1. The mouthpiece (15) is incorrectly fitted	1. Refit or replace mouthpiece

NOTE: *This is a partial list of possible problems and recommended treatments. For more information, refer to the second-stage troubleshooting guide, or contact Apeks Technical Service Department for assistance with problems not described here.*

CAUTION: Recommended treatments which require disassembly of the regulator must be performed during a complete overhaul, according to the prescribed procedures for scheduled, annual service. Do not attempt to perform partial service.

Table 2: List of Tools and Service Kits

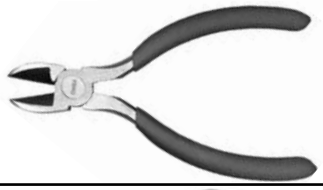
PART #	DESCRIPTION	APPLICATION
100190		
111605		
109437		
944022		
AT20		
N/A		
N/A		
111100		
N/A		
N/A		Torque Specifications, p. 19
N/A		
N/A		Apply torque to parts listed in Table 3: Torque Specifications, p. 19
N/A	Magnifier with Illumination	
N/A		
AP0219/AA		

Table 3: Torque Specifications

PART #	DESCRIPTION / KEY ITEM #	TORQUE

Table 4: Test Bench Specifications

TEST	CONDITION	SPECIFICATION

Table 5: Recommended Cleaners and Lubricants

LUBRICANT/CLEANER	APPLICATION	SOURCE
Christo-Lube MCG 111		
CAUTION: Silicone rubber requires no lubrication or preservative treatment. DO NOT apply grease or spray to silicone rubber parts. Doing so may cause a chemical breakdown and premature deterioration of the material.		
Oakite #31		
CAUTION: Do not use muriatic acid for the cleaning of any parts. Even if strongly diluted, muriatic acid can harm chrome plating and may leave a residue that is harmful to o-ring seals and other parts.		
White distilled vinegar		
Liquid dishwashing detergent (diluted with warm water)		

Procedure A: Cleaning and Lubricating

Aqua Lung and Apeks First Stages and Nitrox

When it comes to issues of nitrox safety and compatibility, the concerns lie primarily with the first stage as it is subjected to high inlet

condensed hydrocarbons (compressor oils) from the inside passageways of the first stage. For the first stage to remain EAN40 compatible, only use hyper filtered compressed gas (hydrocarbons < 0.1 mg/m3). Ordinary compressed breathing air (Grade E) usually does not meet this criterion. Once ordinary breathing air is used, the first stage is no longer EAN40 compatible until it is cleaned and

Cleaning Brass and Stainless Steel Parts

2. Thoroughly clean parts in an ultrasonic cleaner filled with soapy water. If there are stubborn deposits, household white distilled

with low pressure (25 psi) filtered air, and inspect closely to ensure proper cleaning and like-new condition.

Cleaning Anodized Aluminum, Plastic & Rubber Parts

fresh water and thoroughly blow dry, using low pressure filtered air.

CAUTION: Do not place plastic and rubber parts in acid solutions. Doing so may alter the physical properties of the component, causing it to prematurely degrade and/or break.

Cleaning Hoses

1. Hose fittings: Ultrasonically clean with soapy water

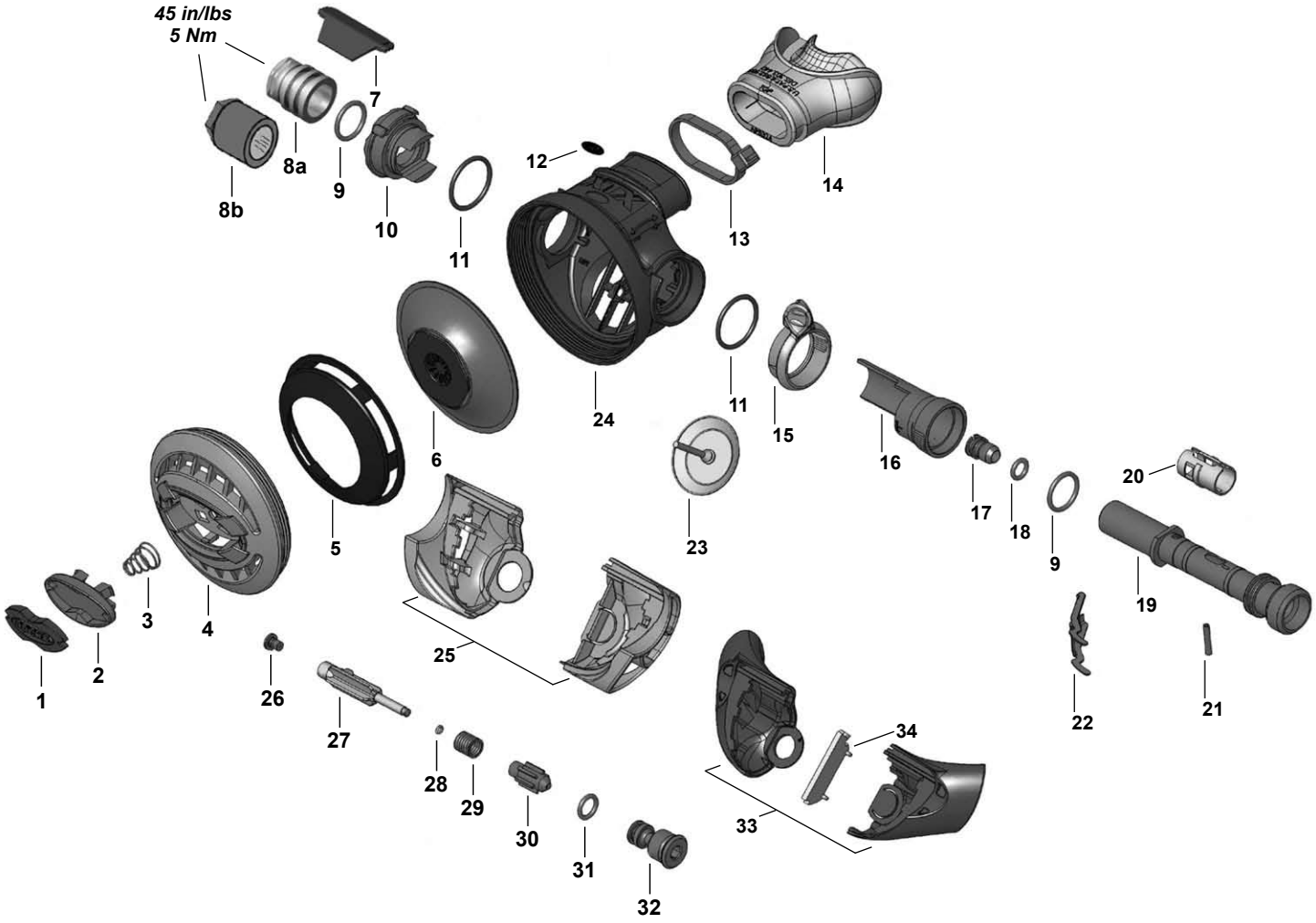
Lubrication and Dressing

is important when running enriched air nitrox through a first stage. All o-rings should be lubricated with Christo-Lube
the o-rings with a very light film of grease, and remove any visible excess by running the o-ring between thumb and forefinger. Avoid

*Soapy water is defined as “household” grade liquid dishwashing detergent diluted in warm water.

Maintenance Notes

XTX40 · XTX40 Octopus · XTX20 · XTX20 Octopus



AP0219/AA Universal Second Stage Repair Kit

AP2037 Deflector

9 .....AP1267 O-ring

11 .....AP1438 O-ring

13 .....104913 Mouthpiece Clamp

18 .....AP1154 O-ring

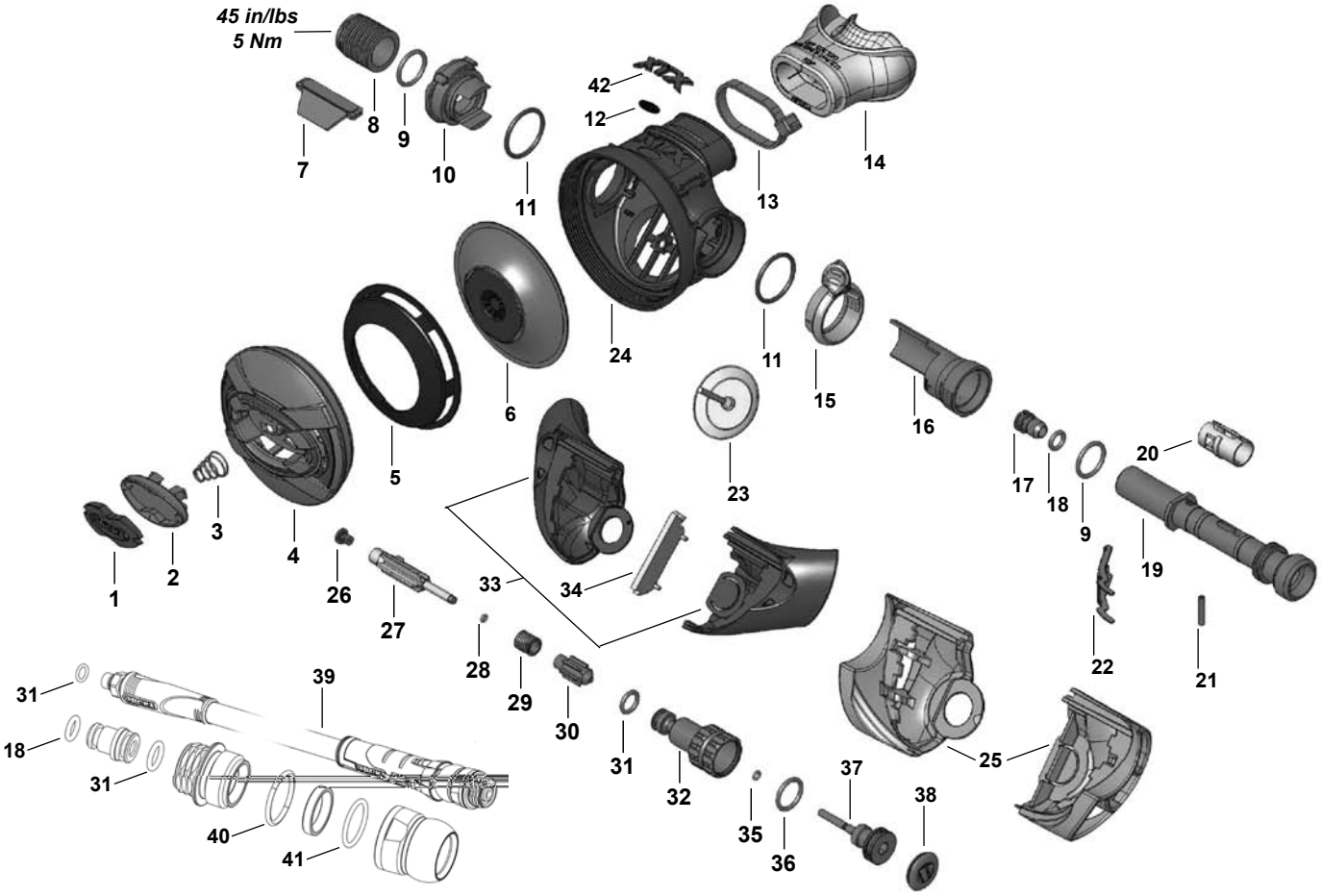
26 .....AP2034 Rubber Seat

28 .....AP2041 O-ring

31 .....AP1409 O-ring

BOLD ITALICS

XTX200 | XTX100 | XTX50 | XTX50 Octopus



AP0219/AA Universal Second Stage Repair Kit
.....AP0249 Service Kit, Swivel Hose

AP2037 Deflector

9 .....AP1267 **O-ring**

11 .....AP1438 **O-ring**

13 .....104913 **Mouthpiece Clamp**

18 .....AP1154 **O-ring**

26 .....AP2034 **Rubber Seat**

28 .....AP2041 **O-ring**

31 .....AP1409 **O-ring**

35 .....AP5711 **O-ring**
36 .....AP1159 **O-ring**

40 .....AP1298 ***O-ring***
41 .....AP1360 ***O-ring***

BOLD ITALICS



Authorized Technician

TECHNICAL MAINTENANCE MANUAL

XTX SECOND STAGE REGULATOR