

GaugeCalXP™ PRESSURE COMPARATOR

10000PSI–700bar

Service Instruction Sheet

Introduction

These instructions are intended for use with standard comparator rebuild kit (PN 4138) or the Skydrol rebuild kit (PN 4158). Both rebuild kits contain all of the parts and tools required to rebuild the **GaugeCalXP™** pressure comparator. Rebuilds should be performed only by qualified personnel.

Following service instructions are for the standard comparator rebuild kit (PN 4138). If rebuilding the Skydrol GaugeCalXP, cross reference the appropriate o-ring part numbers in the Parts List located on the last page.

Service Instructions

- 1 Remove all gauges and fittings from the **GaugeCalXP** pressure comparator (**figure 1**).
 - 2 Tip the comparator on its end to completely drain the water or oil from the system. Always dispose of fluids in a responsible manner.
 - 3 Use a 3mm Allen key to remove the two (2) cap screws securing the Reservoir to the Main Seal Block, then lift to remove the Reservoir and Reservoir o-ring (PN 2018) (**figure 2**).
 - 4 Remove the press-fit Reservoir Vessel, and replace the lower seal o-ring (PN 3303 or PN 3376) (**figure 2**).
- * Note:**The **GaugeCalXP** is assembled with a Reservoir o-ring in one of two sizes. Compare your o-ring to the illustrated parts list on page 6, to determine the appropriate replacement size for your unit.
- 5 Use a 4- or 5mm Allen key to remove the Handle Assembly bolt and washer(s), then pull to slide the Handle Assembly from the Piston Assembly (**figure 3**). Be sure to also remove the Key from the Piston Assembly Leadscrew (**figure 3**).

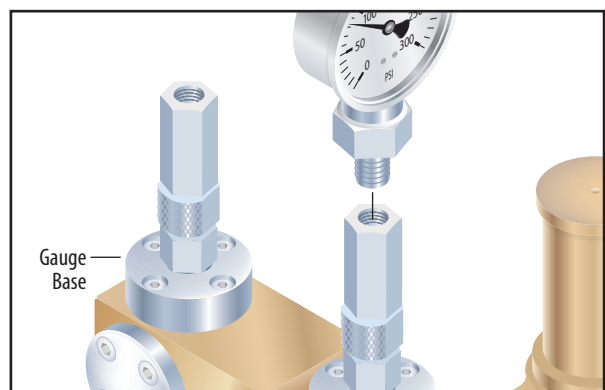


Figure 1

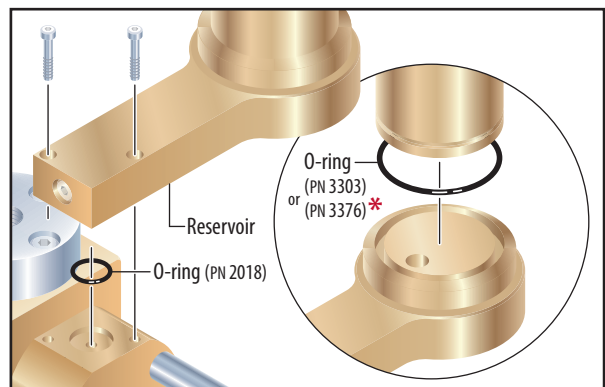


Figure 2

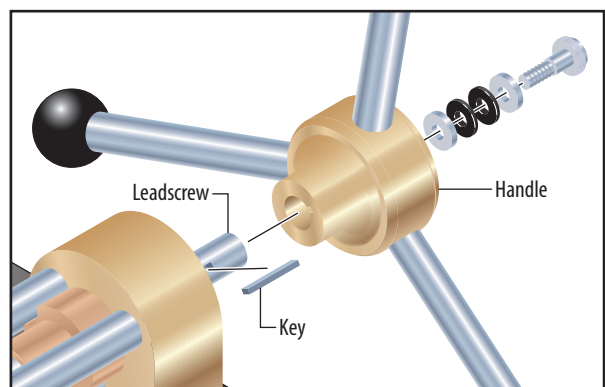


Figure 3

- 6 Turn the comparator over to gain access to the underside of the Baseplate.

Be aware that water or other test fluid may still be present in the system, and may drain out as the comparator is turned over.

- 7 Use a 4mm Allen key to remove the two (2) cap screws holding the Bearing Block to the Baseplate (**figure 4**).

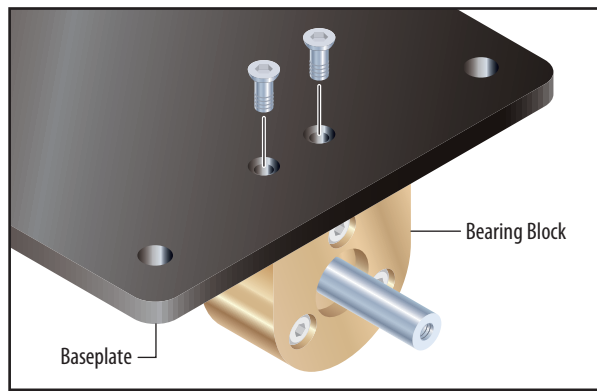


Figure 4

- 8 Turn the comparator back over, and then use a 5mm Allen key to remove the three (3) cap screws from the front of the Bearing Block (**figure 5**).

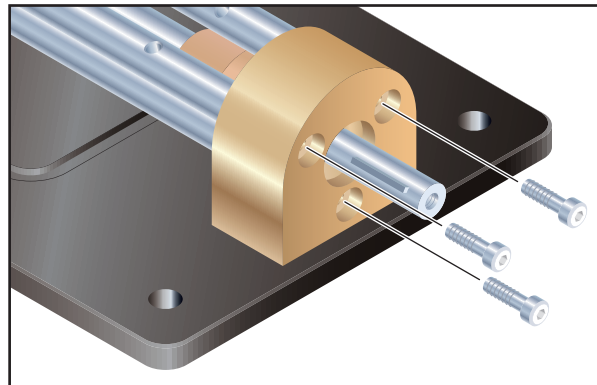


Figure 5

- 9 Carefully pull to slide the Bearing Block and Piston Assembly from the Manifold Block and Baseplate, taking care to avoid making contact with the three guide rods (**figure 6**).

- 10 Pull to slide the Piston Assembly from the rear of the Bearing Block, and then remove the Bearing Ring and Bearing Washer from the front of the Leadscrew (**figure 7**).

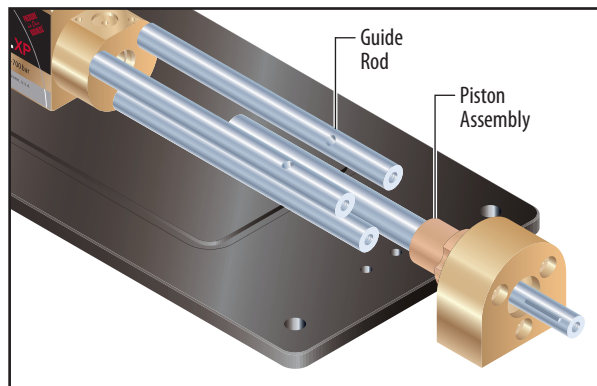


Figure 6

Note: A Bearing Ring may stay inside the Bearing Block. Please note the correct orientation of the Bearing Rings in relation to the Bearing itself. The correct orientation is the “open” side of the Bearing faces the Wide Channel Bearing Ring. The “closed” side faces the Narrow Channel Bearing Ring. This will center the Bearing between the two rings.

- 11 Unscrew the Piston Shaft from the Piston Assembly for cleaning, and then apply a light coat of multi-purpose lithium base grease before reassembling (**figure 8**).

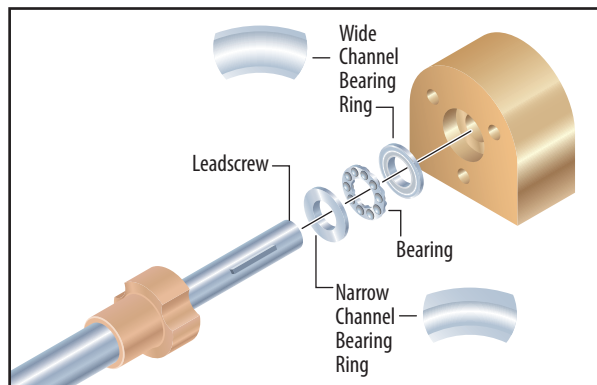


Figure 7

Note: The Piston Shaft has a left-hand thread, so you will turn it clockwise to remove it, and then counter-clockwise to replace it.

- 12** To remove the three (3) stainless steel Guide Rods, insert the 4mm Allen key into the hole in the side of each rod, and then pull to the left (counter-clockwise) to loosen and unscrew each one (**figure 9**).

When the final Guide Rod has been removed, the Main Seal Block will fall away from the Manifold Block.

- 13** From the front of the Main Seal Block, remove the o-ring (PN 3131) and the back-up ring (PN 3151) (**figure 10**).
- 14** From the rear of the Main Seal Block, remove the Rod Seal (PN 3152) and Rod Seal Backup (PN 3434) (**figure 10**).

Note: When rebuilding the Main Seal Block assembly, Dow Corning[®] 111, or a similar silicone-based lubricant, must be applied to the grooved surface of the Rod Seal (PN 3152).

When the Rod Seal is installed, its flat surface should face toward the Main Seal Block, while its grooved surface faces out to mate with the Manifold Block (**figure 10**).

- 15** From the front of the Manifold Block, remove the Main Seal Block o-ring (PN 3418) (**figure 11**).

Note: When re-attaching the Main Seal Block and Guide Rods to the Manifold Block, you may find it easier to first remove the Manifold Block from the Baseplate. From the underside of the Baseplate, use a 4mm Allen key to remove the four (4) cap screws holding the Manifold Block in place. Use the three (3) Guide Rods to attach the Main Seal Block to the Manifold Block, then re-attach the Manifold Block to the Baseplate before attaching the Piston Assembly and Bearing Block.

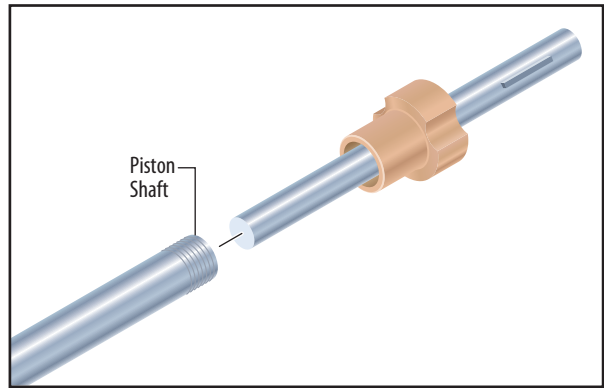


Figure 8

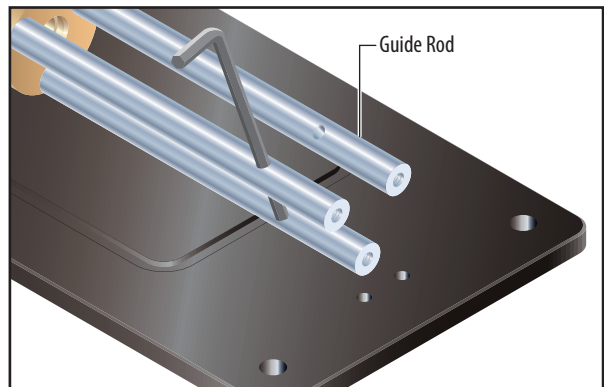


Figure 9

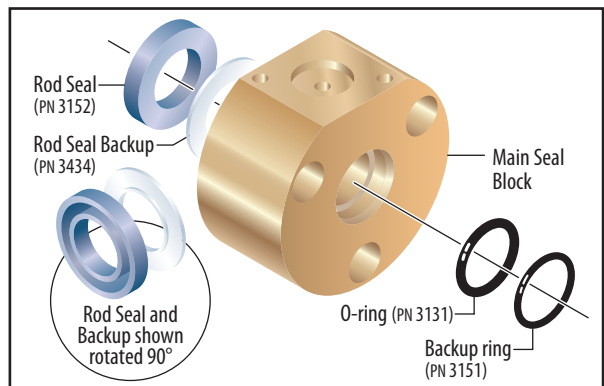


Figure 10

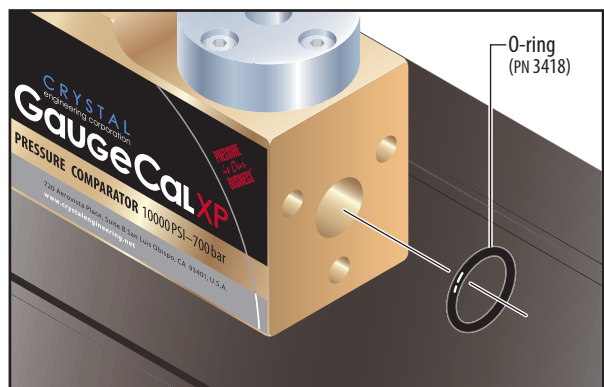


Figure 11

16 Remove the MPF-1/4FPT and MPM-MPM fittings from the Rear Gauge Base. Use a 5mm Allen key to remove the four (4) cap screws holding the Rear Gauge Base and its o-ring (PN 4114 or 3130) from the top of the Manifold Block. Remove the o-rings (PN 3981) from the MPF fitting on both the Gauge Base and the MPF-1/4FPT. Repeat for Front Gauge Base.

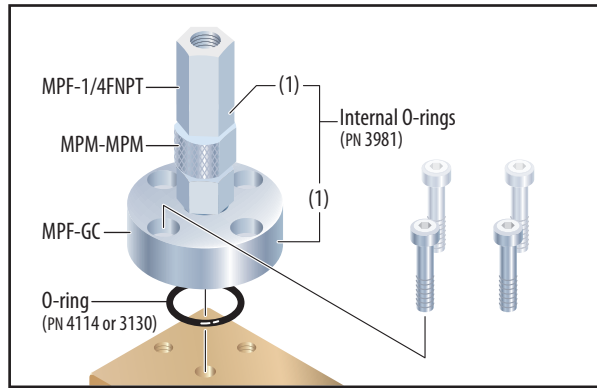


Figure 12

17 If the comparator is fitted with an optional Fine Adjust Kit, continue to step 18. If not, you may skip ahead to step 24.

Note: A comparator without the Fine Adjust option is instead fitted with an Accessory Cap, plus an o-ring that should be replaced. The screws for the plate will require a 4mm Allen key to remove. Screws included with older Fine Adjust Kits will require a 5mm key, while those included with recent, redesigned kits will require a 4mm key.

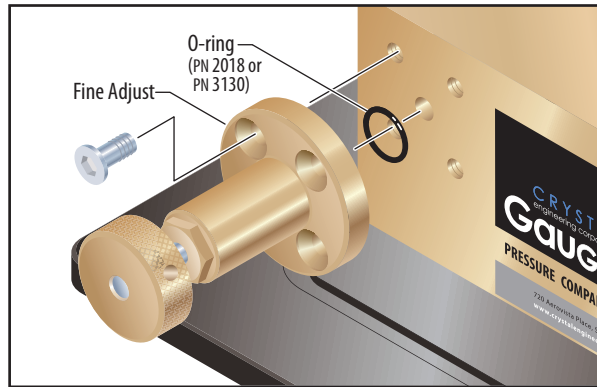


Figure 13

18 Use either a 4- or 5mm Allen key to remove the four (4) cap screws holding the Fine Adjust to the side of the Manifold Block, then pull the Fine Adjust and its o-ring (PN 2018 or PN 3130) away from the Manifold Block (figure 13).

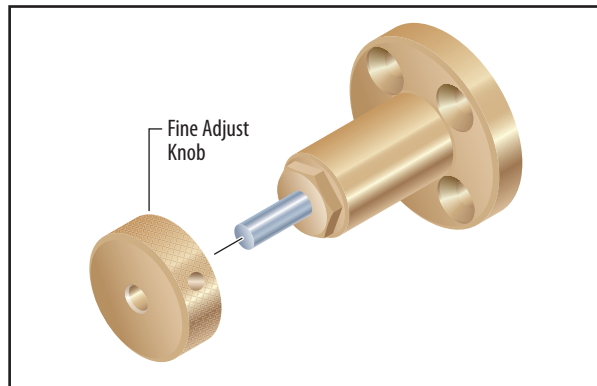


Figure 14

19 Use a 3mm Allen key to loosen the set screw inside the Fine Adjust knob, then slide the knob off of the piston (figure 14).

20 Use a 15mm box wrench to remove the Fine Adjust bushing from the body, then slide the bushing and its o-ring (PN 2018) off of the piston (figure 15).

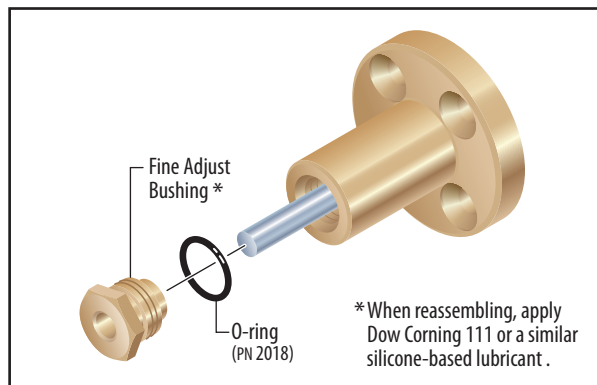


Figure 15

21 With the front of the Fine Adjust body facing toward you, turn the piston clockwise until the piston threads are clear of the hole in the back of the Fine Adjust body (figure 16).

22 From the back of the Fine Adjust body, slide out the piston (figure 17).

- 23** From the front of the Fine Adjust body, remove the o-ring (PN 3129) and the backup ring (PN 3150) (**figure 18**).

Note: The o-ring and backup ring may be firmly seated in the Fine Adjust body. If so, they can be extracted with a pair of tweezers or other appropriate tool.

- 24** Use a 4mm Allen key to remove the four (4) screws holding the Accessory Cap to the side of the Manifold Block, then pull the cap and its o-ring (PN 2018) away from the Manifold Block (**figure 19**).

- 25** If the comparator **is not** fitted with an optional Fine Adjust, remove the second Accessory Cap located on the other side of the Manifold Block. Follow the procedure outlined in step 24.

- 26** Clean all of the parts. Crystal recommends you use an ultrasonic bath and a cleaning solution that is compatible with the media used in the unit.

In addition, we recommend that you use a round brush to clean the piston hole in the Manifold Block.

- 27** Reassemble the **GaugeCal^{xp}** pressure comparator and optional Fine Adjust by following the preceding steps in reverse order.

Replace all o-rings, backup rings, and main seal with those supplied in the rebuild kit. Refer to the illustrated parts list on page 6. Dow Corning[®] 111, or similar silicone-based lubricants, are recommended for use on new o-rings to ensure proper sealing.

When installing the gauge bases, accessory caps, and fine adjust; tighten the screws in the order shown at right: first to a snug fit, and then fully-torqued to 85 in-lbs / 9.6 N-m.

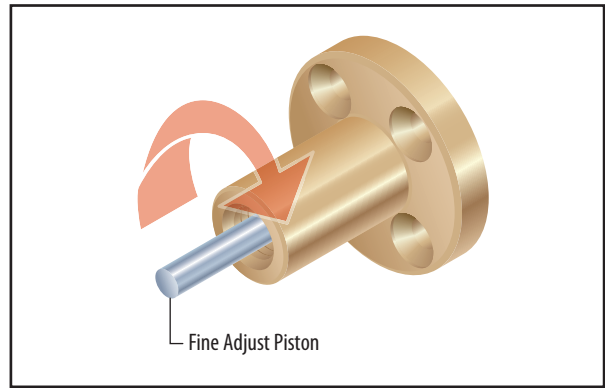
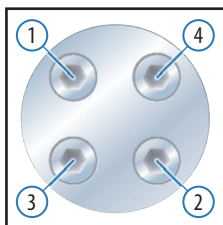


Figure 16

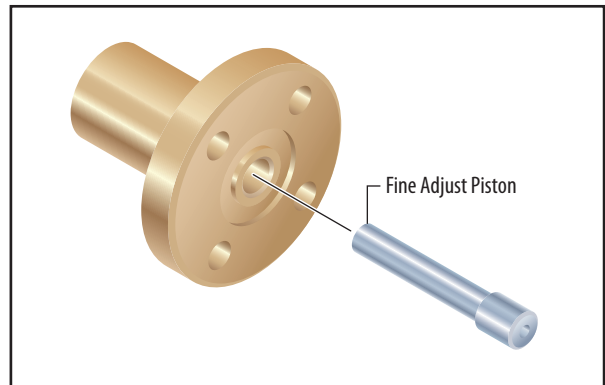


Figure 17

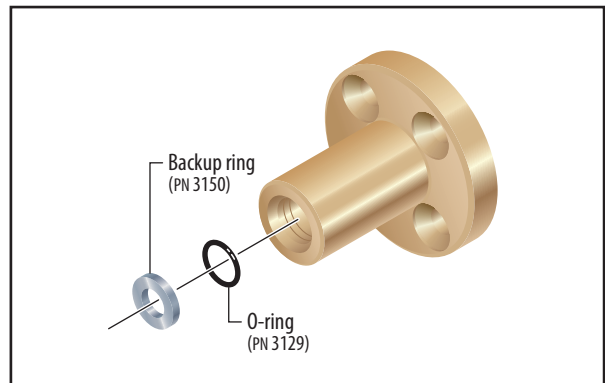


Figure 18

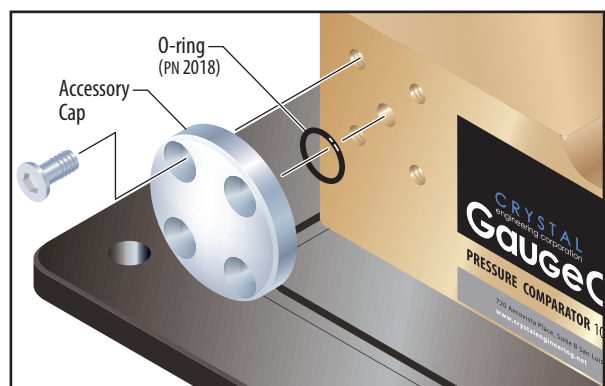
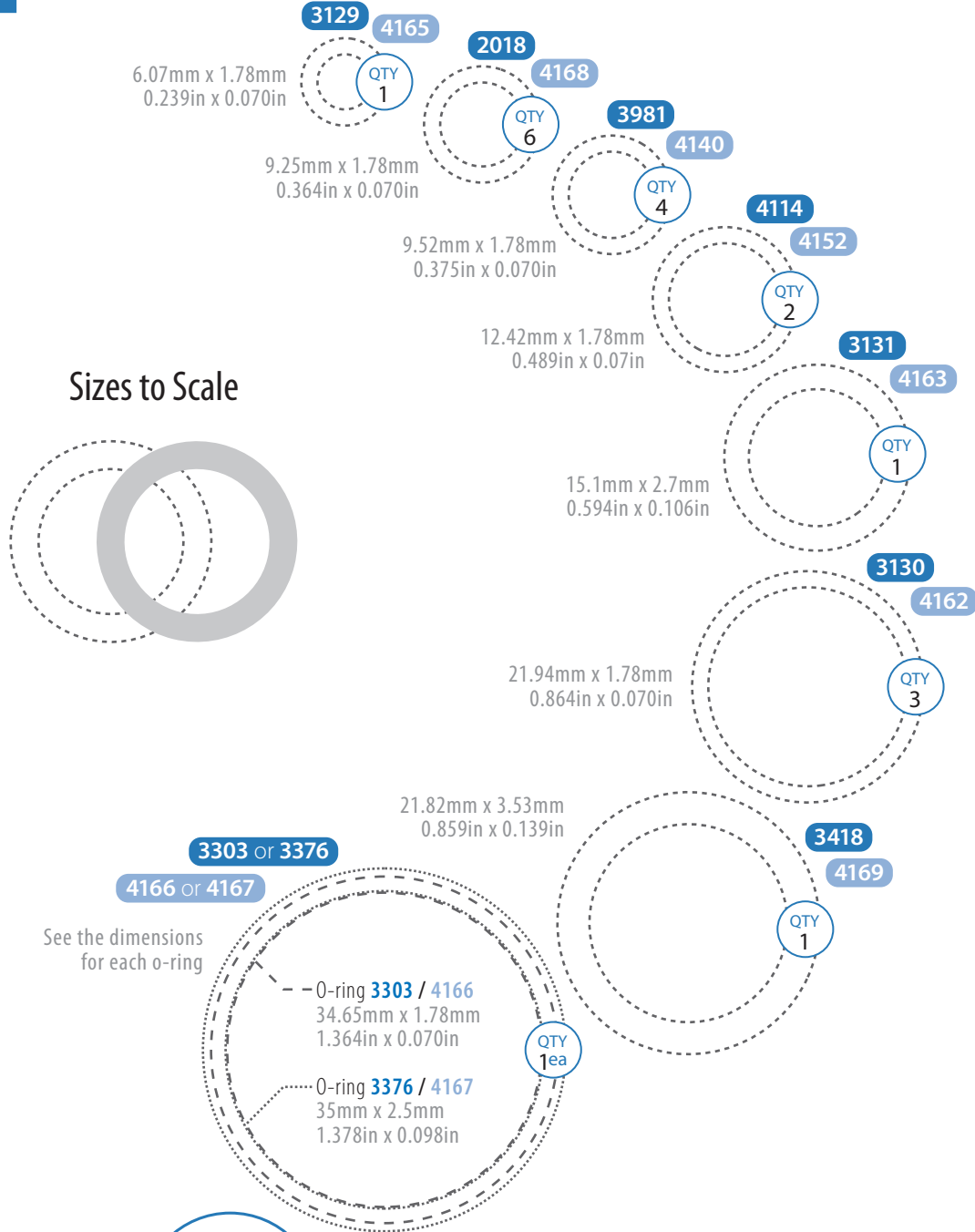


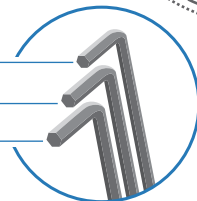
Figure 19

Parts List



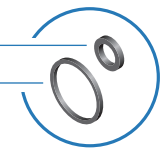
Allen Keys

- 3176** - 3mm
- 3177** - 4mm
- 3178** - 5mm



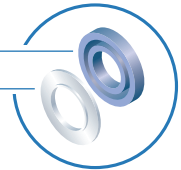
Backup Rings

- 3150**
- 3151**



Rod Seal

- 3152** - Primary
- 3434** - Backup



Part Number: Standard

Part Number: Skydrol compatible

Note:

1. The full-size o-ring diagrams may not reproduce to scale when printed from the pdf download.
2. All o-ring dimensions provide first the inside diameter, then the thickness.

Routine Flushing

If a complete rebuild is not required, flushing the **GaugeCal^{XP}** can serve as a quick and simple way to remove small amounts of dirt or sediment from the system. Flushing can also be used to ensure that any air is removed from the system prior to performing a calibration test. Flushing the unit should never serve as a substitute for a rebuild; and remember that ***any service beyond a routine flush should always be performed by a qualified technician.***

Flushing Instructions

- 1 Remove all gauges from the **GaugeCal^{XP}** pressure comparator.
- 2 To completely open the reservoir, wind the handle counter-clockwise until you feel it stop.
- 3 Securely grip the front of the Baseplate (near the bearing block) and lift to tip the **GaugeCal^{XP}** on its end. Any fluid in the system will run out through the rear Gauge Base port.
- 4 Set the unit back down, flat on the Baseplate, and begin to pour warm soapy water or clean hydraulic oil into the reservoir. Continue to fill the unit until the fluid begins to run out of the Gauge Base ports. Always dispose of fluids in a responsible manner.
- 5 Once again, tip the **GaugeCal^{XP}** on its end until all of the fluid in the system has drained out.
- 6 Set the unit back down, then wind the handle clockwise at least 10 turns, then fill the reservoir with test fluid to within 6mm (1/4") from the top.
- 7 Follow the operator instructions supplied with your **GaugeCal^{XP}** to fill the system and begin calibration testing.

CAUTION: Solvents can damage o-rings and should never be used when flushing or otherwise cleaning the **GaugeCal^{XP}**.

How to Contact Us:

Phone (805) 595-5477

Toll-Free (800) 444-1850

Fax (805) 595-5466

Email service@crystalengineering.net

Web www.crystalengineering.net

Send your comments to: feedback@crystalengineering.net

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engineering corporation