



SERVICE GUIDE

HAYES

PERFORMANCE SYSTEMS



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INTRODUCTION

This manual is intended to guide the user through basic service of Manitou Dorado Pro and Expert front forks. We highly suggest the service on these forks be performed by an experienced suspension mechanic. Service is supported by the identification of common parts and assemblies that have been assembled into Service Kits. The purpose of this manual will be to describe conditions that may drive the need for service and to provide installation instructions for the kits.

Due to the time-consuming nature of suspension fork service, at this time our primary focus is to offer service kits that minimize the amount of downtime and labor involved. Please read through the manual carefully before beginning the service of your fork. The Dorado fork service is considerably more involved than a standard fork service and having a basic understanding of the tasks you are about to perform will assist you greatly in the disassembly and re-assembly of your fork.

Please read through the required tools page and be sure you have all of the items you will need for the service of your fork. The guide is designed to be used with the Dorado Service kit which includes all O-rings and seals to overhaul the fork. The part number for the kit is 141-25995.

For any assistance with the service of your Dorado please contact our Technical Service Department at 888-686-3472 and email them at techsupport@hayesbicycle.com

 **WARNING** We highly recommend that service to this fork be performed by a certified bicycle mechanic. Failure to follow instructions presented in this manual could lead to serious injury or death. Any questions about the servicing of this fork or the manual itself should be directed to Manitou Customer Support at:

Phone: 888-686-3472

Email: techsupport@hayesbicycle.com


 **WARNING** Suspension forks by design can contain preloaded springs, gases and fluids under extreme pressures. Warnings contained in this manual must be observed to avoid damage to fork, serious injury or even death.

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REQUIRED TOOLS

Below is a list of tools that will be used in the complete service of a Dorado Pro/Expert fork.

Dorado Clamp Blocks – Manitou Part Number 172-25077

Dorado Seal Press – Manitou Part Number 172-29862

Dorado Service Kit – Includes all O-rings and seals for service. Part number 141-25995

5wt Maxima Fork oil - Manitou part number 85-0023

Slickoleum™ Grease

Torque Wrench

36mm Wrench or Socket (an adjustable wrench can be used instead but care must be taken to not damage the top caps.)

12mm Combination Wrench

13mm Combination Wrench

20mm Combination Wrench

20mm Crow's Foot

2mm Allen Wrench

2.5mm Allen Wrench

5mm Allen Wrench

6mm Allen Wrench

26mm Socket with ratchet

Small Flat Blade Screwdriver

Needle Nose Pliers

Pick or similar tool for removing O-rings

Blue Loctite

Safety Glasses

Isopropyl Alcohol

DAMPING LEG DISASSEMBLY

1. First step is to loosen the damping leg top cap using a 36mm wrench. It helps if the leg is still clamped in the lower crown assembly while breaking the top cap loose (be sure the upper crown is loosened, you only want the lower tightened when breaking loose the top cap). Only loosen the top cap at this point. Do not remove it. **(FIG. 1)**



FIG. 1

2. Loosen the pinch bolts on the lower crown and remove the damping leg from the fork. You will need to remove the frame bumpers to do so. Put them in a safe place so you do not misplace them.

3. Clamp the upper sleeve of the fork in bike stand.

4. Remove the top cap from the fork leg using a 36mm wrench. The top cap is still attached to the rebound shaft at this point.

5. You will now remove the top cap from the rebound shaft. Place a 12mm wrench on the flats of the rebound shaft and use a 36mm wrench to unthread the top cap from the shaft. **(FIG. 2)** Once the top cap is unthreaded, remove the rebound knob from the top cap.



FIG. 2

6. Remove the fork leg from the bike stand and pour the oil out of the leg. **(FIG. 3)** Slide the inner leg out of the outer leg and leave the outer leg to drain in a drainage pan.

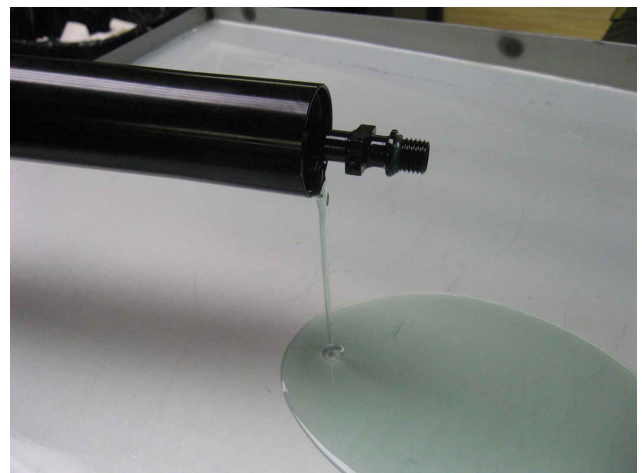


FIG. 3

7. Holding the inner leg over a drainage pan, stroke the rebound shaft several times to drain the rest of the oil from the inner leg.

DAMPING LEG DISASSEMBLY

8. Wrap the inner leg in a rag and lightly clamp it into a bike stand with the rebound shaft pointing down towards the floor.

9. Using a 2mm Allen wrench, remove the TPC+ adjuster knob. Remove O-ring and be sure you capture the 2 detent balls and springs under the knob. **(FIG. 4, 5 & 6)**

10. Next you will remove the High Speed adjuster knob. Remove the c-clip that holds the knob on using a small flat blade screwdriver or similar tool. **(FIG. 7)** Once the c-clip is removed pull the knob up. Be sure to capture the O-ring, 2 detent balls and springs under the knob. **(FIG. 8)**



FIG. 6

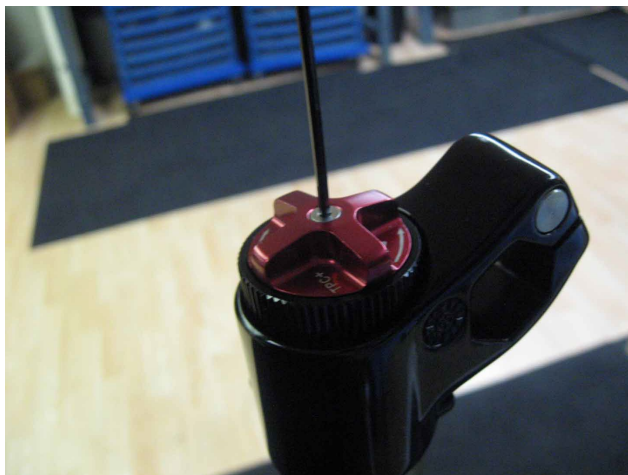


FIG. 4



FIG. 7



FIG. 5



FIG. 8

DAMPING LEG DISASSEMBLY

11. Remove the damping cartridge from the inner leg using a 26mm socket. Pull the damping cartridge completely out of the inner leg. **(FIG. 9 &10)**

12. You will notice the damping cartridge has two larger diameter sections at the ends. These are called the Outer Cartridge Adapters. Using the Dorado Clamp Blocks (Part # 172-25077), clamp the outer cartridge adapter on the rebound end in a vise.

13. Using a 20mm wrench, remove the rebound damper from the cartridge. (The inner cartridge tube will come out with either the rebound assembly or compression assembly. If it comes out with the rebound, pull the tube off of the assembly.) **(FIG. 11 & 12)**



FIG. 10



FIG. 11



FIG. 9



FIG. 12

DAMPING LEG DISASSEMBLY

14. Replace the following O-rings on the rebound damper assembly. You can also refer to the Rebound Assembly Diagram on Page 23 to see the placement of the O-rings on the assembly.

A. O-ring #064962 - This is the O-ring above the threads on the end of the damper assembly.

(FIG. 13)

B. O-ring #100-121 - This is the larger O-ring on the bottom out end cap. **(FIG. 14)**

C. O-ring #100-014 - This is the smaller O-ring on the bottom out end cap. **(FIG. 15)**



FIG. 13



FIG. 14



FIG. 15

DAMPING LEG DISASSEMBLY

15. Clamp the outer cartridge adapter on the compression damper side using the Dorado Clamp Blocks. **(FIG. 16)**

16. Remove the TPC+ Compression assembly from the cartridge using a 26mm socket. (The inner cartridge tube will come out with either the rebound assembly or the compression assembly. Pull the tube off of the assembly.) **(FIG. 17 & 18)**

17. Remove the top cap and nylon washer from the assembly. This is required to replace the O-rings included in the service kit for the compression assembly. **(FIG. 19)**



FIG. 16



FIG. 17



FIG. 18



FIG. 19

DAMPING LEG DISASSEMBLY

18. Replace the following O-rings on the compression assembly top cap.

A. O-ring # 08-29433-L026 - This is the O-ring that is around the outside of the compression assembly top cap. **(FIG. 20)**

B. O-ring # 100-023 - This O-ring is located in an inside groove in the top cap. It is directly behind the two pins. **(FIG. 21)**

C. O-ring # 101-1250-200 - This O-ring is located just below the top opening on the top cap where the adjuster slides through. **(FIG. 22)**

19. Press the top cap back onto the compression assembly. **(FIG. 23)**



FIG. 20



FIG. 21



FIG. 22



FIG. 23

DAMPING LEG ASSEMBLY

1. Inspect the inner and outer damper tubes and be sure they are free from debris and contaminants.
2. Press the inner damper tube onto the rebound assembly.
3. Clean the threads on the outer cartridge adapter with isopropyl alcohol and apply Blue Loctite to the threads. Install the rebound damper assembly into the outer cartridge. Only tighten to hand tight at this point.
4. Clean the threads on the second outer cartridge adapter and apply blue Loctite to them. Install the TPC+ compression assembly into the cartridge.
5. Using a 26mm socket and 20mm wrench, tighten both the compression assembly and rebound assembly to 6.8 N m (60 in lb). **(FIG. 1 & 2)**
6. Put a small amount of Slickoleum Grease on the O-ring on the rebound end of the damper cartridge assembly. Install the assembly in the inner leg by sliding it into the bottom of the leg. Use a 26mm socket to tighten it into the leg. Tighten to 6.8 N m (60 in lb). **(FIG. 3)**



FIG. 1



FIG. 2



FIG. 3

DAMPING LEG SERVICE ASSEMBLY

7. Insert the detent springs into opposite holes in the end cap and place the detent balls on top of the springs. To hold the detent balls in place on the spring use a small dab of grease. **(FIG. 4)**

8. Install the high speed adjuster onto the end cap. Be sure that O-ring # 100-025 below the adjuster is in place and greased. **(FIG. 5)** Secure the adjuster with the c-clip.

9. Insert the springs into opposite holes on the TPC+ adjuster knob and then place the detent balls in the corresponding holes of the high speed adjuster knob. **(FIG. 6)** Place O-ring # 100-024 around the TPC+ knob and apply a small amount of grease to it. **(FIG. 7)**

10. Install the TPC+ adjuster knob onto the end cap and secure with the 2mm screw. **(FIG. 8)**



FIG. 6



FIG. 4



FIG. 7



FIG. 5



FIG. 8

DAMPING LEG SERVICE ASSEMBLY

11. Replace the oil and dust seals on the outer leg following the directions on pages 22-23. Inspect the inside of the outer leg and the outside of the inner leg and be sure they are free from debris and contaminants. Lube the oil seal and dust wiper on the outer leg with a small amount of Slickoleum grease. Slide the inner leg into the outer leg and clamp into the bike stand.

12. Replace O-ring # 100-027 on the top cap **(FIG. 9)**

13. Install the top cap onto the end of the rebound shaft. Use a 36mm wrench and a 12mm wrench to tighten to the proper torque of 6.8-9.0 N m (60-80 in lb).

14. Install the rebound knob into the top cap by snapping it into place. Fully close the rebound by turning the knob clockwise.

15. Fully extend the rebound shaft, pulling the inner leg up into the outer leg.

16. Pour damper oil (5wt fork oil) into the leg. Stroke the rebound shaft to bleed the system and release the air. You want to stroke the rebound shaft a few times with the rebound fully closed, then turn the rebound knob open two clicks counterclockwise. Stroke the rebound shaft another 15-20 times and the system will be bled. **(FIG. 10)**

17. Once the system is bled you need to set the oil height in the leg. The oil height is 110mm. You measure this by measuring down from the top of the outer leg to the top of the oil. You want the inner leg fully compressed into the outer leg when measuring. **(FIG. 11)**

18. After you have properly set the oil height fully extend the inner leg and tighten down the top cap using a 36mm wrench to the proper torque of 6.8-9.0 N m (60-80 in lb).

19. Reinstall the damping leg into the fork crowns on the bike.



FIG. 9



FIG. 10



FIG. 11

AIR SPRING LEG DISASSEMBLY

1. First, the air pressure needs to be released from the system. Remove the air cap from the top of the fork leg, and release the air pressure using a shock pump. **(FIG. 1)**

2. The air spring leg top cap needs to be loosened. Loosen the pinch bolt on the top crown, and crack the top cap loose with a 36mm wrench. **(FIG. 2)**

3. Loosen the pinch bolts on the lower crown, and remove the leg from the fork. Be sure not to misplace the frame bumper that will need to come off the fork leg. **(FIG. 3)**

4. Lightly clamp the fork leg in a bike stand. Remove the top cap from the leg with a 36mm wrench. Remove the top cap from the compression rod with a 13mm wrench on the top of the compression rod and a 36mm wrench. **(FIG. 4)**



FIG. 2



FIG. 3



FIG. 1



FIG. 4

AIR SPRING LEG DISASSEMBLY

5. Pour the fluid out of the leg, and slide the inner leg out of the outer leg. Remove the outer leg from the stand and let it sit above a drainage pan. **(FIG. 5)**

6. Wrap the inner in a rag and clamp it lightly in the bike stand with the compression rod pointing towards the ceiling.

7. Loosen the Compression Rod Assembly from the inner leg with a 20mm wrench. **(FIG. 6)**

8. Remove Compression Rod Assembly from the inner leg. Note: there may be a small amount of Semi-bath oil on top of the piston. Remove Semi-bath, this will be replaced with Slickoleum™ grease **(FIG. 7)**



FIG. 5



FIG. 6



FIG. 7

COMPRESSION ROD SERVICE

This section covers the complete tear down and rebuild of the air spring compression rod in the air leg of the fork.

1. Using the Dorado Clamp Blocks (Part # 172-25077), clamp the compression rod in a vise. Be sure to clamp the compression rod near the end or below the air piston. Do not clamp in the middle of the shaft. **(FIG. 1)** Do not clamp the rod in a vise without the clamp blocks. Doing so will damage the rod rendering it unusable.

2. Next you need to unthread the poppet from the valve shaft. Insert a 2.5mm Allen wrench into the center hole of the air piston. **(FIG. 2 & 3)** You may have to turn and push lightly on the wrench until you feel it engage the Allen head inside the shaft. Turn the wrench counter-clockwise. You will notice as you are turning the wrench the valve shaft is moving out of the valve housing on the other end of the compression rod. **(FIG. 4)** Keep turning the wrench until the valve shaft stops moving out of the housing.



FIG. 2



FIG. 3

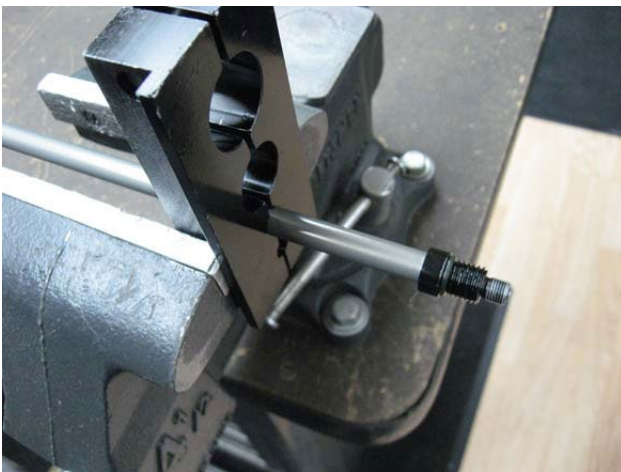


FIG. 1



FIG. 4

AIR SPRING LEG DISASSEMBLY

3. Using a 13mm wrench unthread the valve assembly off of the compression shaft and remove the air valve shaft from the compression rod shaft. **(FIG. 5 & 6)**

4. Slide the travel spacer, bottom-out bumper and end cap off of the compression shaft. **(FIG. 7)**

5. Using a 6mm Allen wrench unthread the air piston off of the compression shaft. **(FIG. 8)** Be careful when removing the piston as there is a small spring in the shaft under the piston. **(FIG. 9)**



FIG. 7



FIG. 5

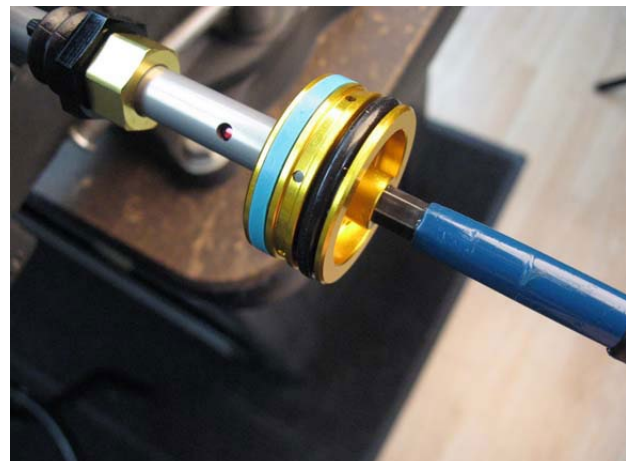


FIG. 8



FIG. 6

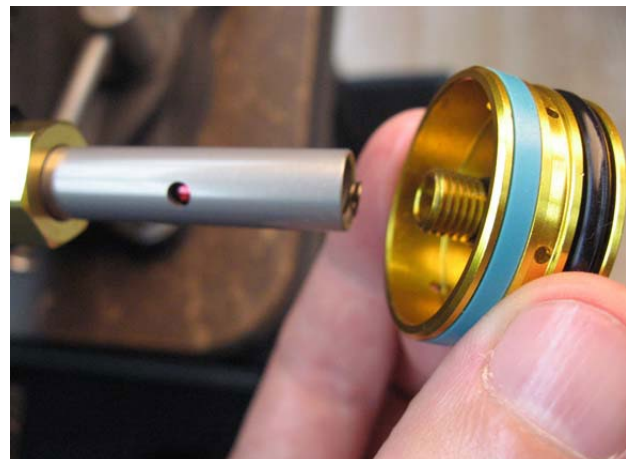


FIG. 9

AIR SPRINGLEG DISASSEMBLY

6. Insert the valve shaft back into the compression rod shaft and use it to push the poppet out of the other end of the compression rod shaft.

(FIG. 10 & 11)

7. Replace O-rings #101-350-150 on the poppet.

(FIG. 12)

8. Replace O-ring #100-214 on the air piston.

(FIG. 13A) Forks produced in 2017 and after will have the updated piston. **(FIG. 13B)** Replace Quad Seal #110-214 on the air piston.



FIG. 12

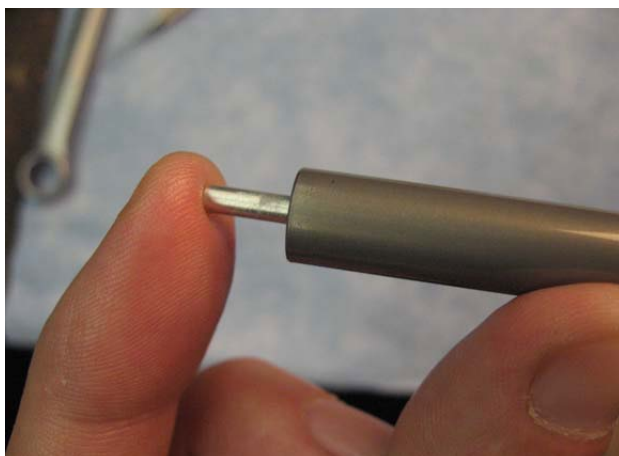


FIG. 10



FIG. 13A

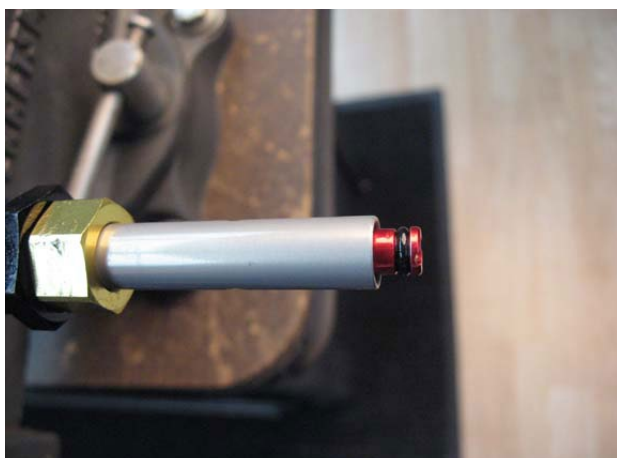


FIG. 11



FIG. 13B

AIR SPRINGLEG DISASSEMBLY

9. Replace O-rings 100-026 and 100-110 on the end cap. **(See Page 26, FIG A)** Install the end cap, bottom-out bumper and the travel spacer back onto the compression rod shaft. **(FIG. 14 & 15)**

10. Apply a small amount (too much Loctite will clog the air shaft assembly) of red Loctite to the threads of the valve assembly. **(FIG. 16)** Lightly grease valve shaft and insert both the valve shaft and valve assembly into compression rod. Tighten to 5.1 - 6.2 N m (45 -55 in lb) **(FIG. 17 & 18)**



FIG. 16



FIG. 14



FIG. 17



FIG. 15



FIG. 18

AIR SPRINGLEG DISASSEMBLY

11. Replace O-ring #064962 on the threaded end of the compression rod shaft. **(FIG. 19)**

12. Insert poppet into compression rod shaft. **(FIG. 20)**

13. Insert poppet spring into air piston and thread into compression rod shaft. **(FIG. 21)**
Tighten air piston to 45-55 in lb (5.1 - 6.2 N m)

14. Insert a 2.5mm Allen wrench into the center of the air piston and push lightly until you feel it engage on the poppet. **(FIG. 22)** Turn the poppet clockwise, threading it onto the valve shaft. Tighten it until the valve shaft protrudes from the valve housing 1mm. **(FIG. 23)**



FIG. 21



FIG. 19

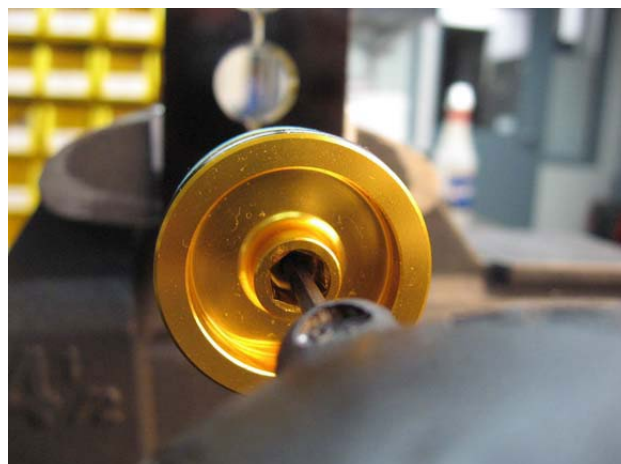


FIG. 22

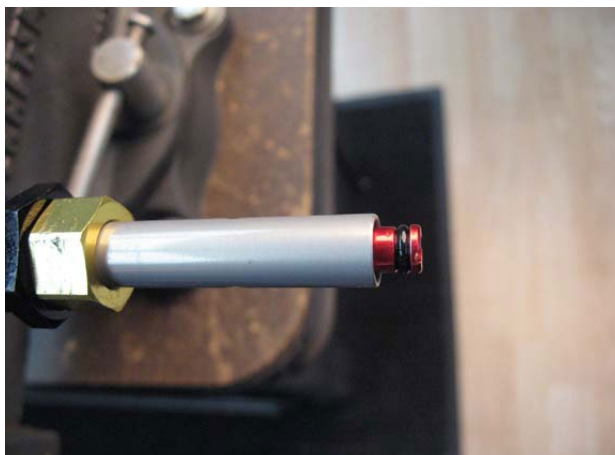


FIG. 20



FIG. 23

AIR SPRING LEG ASSEMBLY

1. Inspect the inner leg, inside and out, and be sure it is free from debris and contaminants.
2. Lube the outer diameter, and fill the piston cup halfway with Slickoleum grease.
3. Insert the compression rod, piston first, into the top of the inner leg using rotational motion.
4. Use a 20mm crows foot to tighten the air spring end cap to the proper torque of 6.8-9.0 N m (60-80 in lb). **(FIG. 1)**
5. Replace the oil and dust seals on the outer leg following the directions on pages 22-23. Inspect the inside of the outer leg, and be sure it is free from debris and contaminants. Lube the oil seal and dust wiper on the end of the outer leg with Slickoleum Grease. **(FIG. 2)** Slide the inner leg into the outer leg, and clamp the top of the outer leg in the bike stand.
6. Replace O-ring #100-027 on the top cap. **(FIG. 3)**



FIG. 1



FIG. 2



FIG. 4

AIR SPRINGLEG ASSEMBLY

7. Install the top cap onto the end of the compression rod. Use a 36mm wrench and a 13mm wrench to tighten to the proper torque of 6.8-9.0 N m (60-80 in lb) (**FIG. 5**)

8. Inject 30cc of Semi Bath oil (5/40wt. Synthetic oil, P/N: 85-0023) into the outer leg on top of the inner leg. (**FIG. 6**)

9. Fully extend the inner leg and tighten down the top cap to the proper torque of 6.8-9.0 N m (60-80 in lb). (**FIG. 7**)

10. Fill the fork to the desired air pressure. (50-90psi)



FIG. 5



FIG. 6



FIG. 7

DUST & OIL SEAL REPLACEMENT

1. Using a pick or small blade screwdriver remove the wear ring from the outer leg. **(FIG. 1)**

2. Gently pry out the old dust seal from the outer leg. A tool we have found that works well is a downhill tire lever. If using a flat blade screwdriver to remove the seal be careful the tip of the blade does not catch on the lip inside the outer leg. **(FIG. 2)**

3. Using a pick or small flat blade screwdriver remove the retaining ring on top of the oil seal. **(FIG. 3)**

4. Gently pry out the old oil seal from the outer leg. **(FIG. 4)**

5. Place the new oil seal into the outer leg. Be sure the side with the lip and garter spring is facing upwards. Use the smooth side of the Dorado Seal Press to press in the new oil seal until it stops. **(FIG. 5 & 6)**

6. Place the retaining ring on top of the oil seal. Ensure that it snaps completely into the groove on the inside of the leg. **(FIG. 7)**

7. Place the new dust seal into the leg and use the knurled end of the Dorado Seal Press to press it complete into the leg. **(FIG. 8)**

8. Install the wear ring back onto the outer leg.



FIG. 1



FIG. 2



FIG. 3

AIR SPRING LEG ASSEMBLY



FIG. 4



FIG. 7



FIG. 5

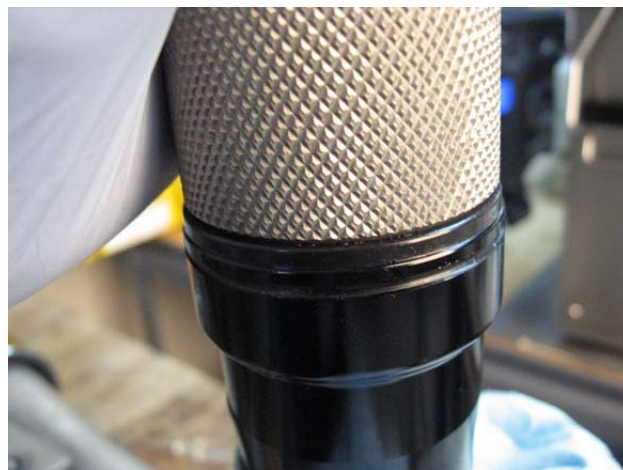


FIG. 8



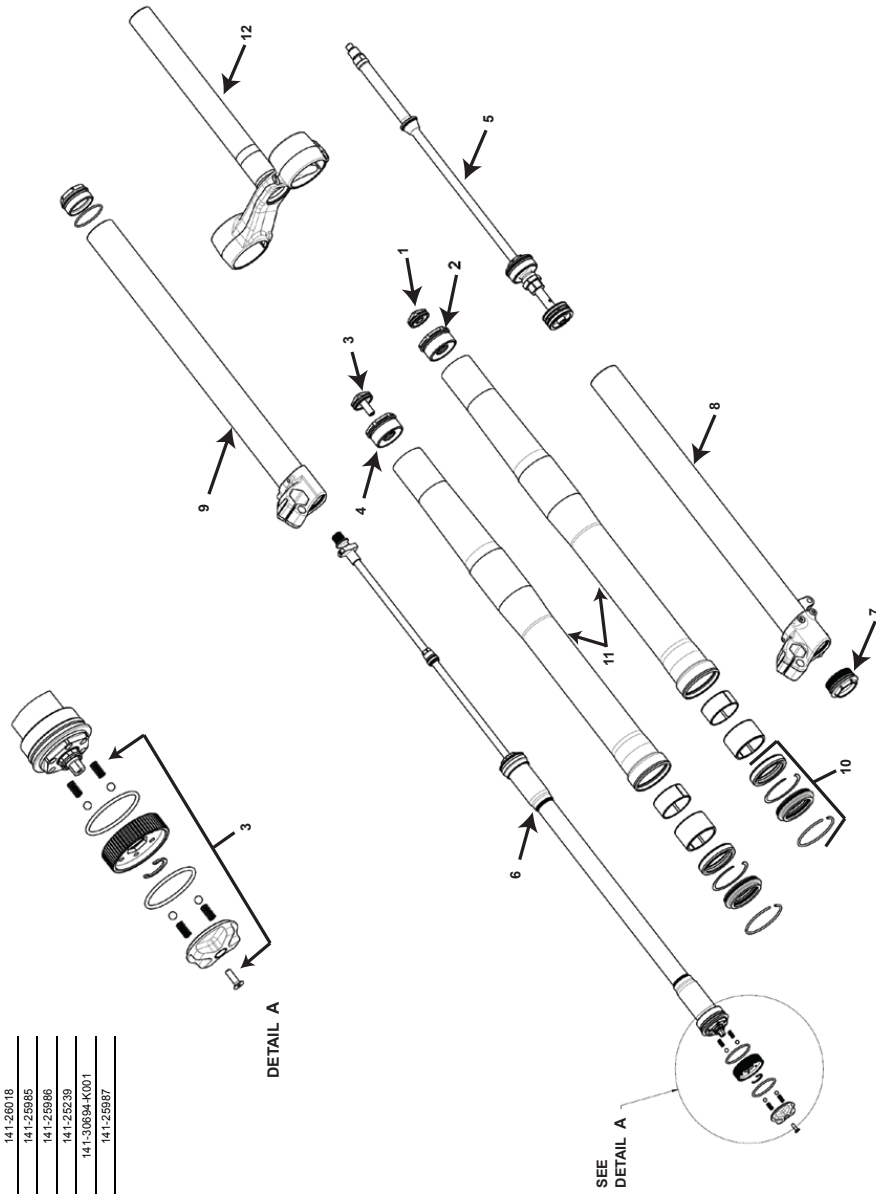
FIG. 6

DORADO PRO EXPLODED VIEW

PART DESCRIPTION	26"	27.5"
	1. Schrader Cap	141-25993
2. Top Air Cap	141-24111	141-24111
3. Knob Kit	141-24109	141-24109
4. Rebound Top Cap	141-24801	141-24801
5. Compression Rod	141-25983	141-25983
6. Complete Cartridge (contains parts a, b and c assembled)	141-24104	141-24104
a. Compression Damper Assembly	141-24103	141-24103
b. Rebound Damper Assembly	141-24102	141-24102
c. Cartridge Tube	141-24122	141-24122
7. Bottom Air Leg Cap	141-26018	141-26018
8. Left Inner Leg	141-25985	141-25985
9. Right Inner Leg	141-25986	141-25986
10. Dust/Oil Seal Kit (only includes seals)	141-25239	141-25239
11. Outer Leg	141-25982	141-30694-K001
12. Lower Crown/Steer	141-25987	141-25987

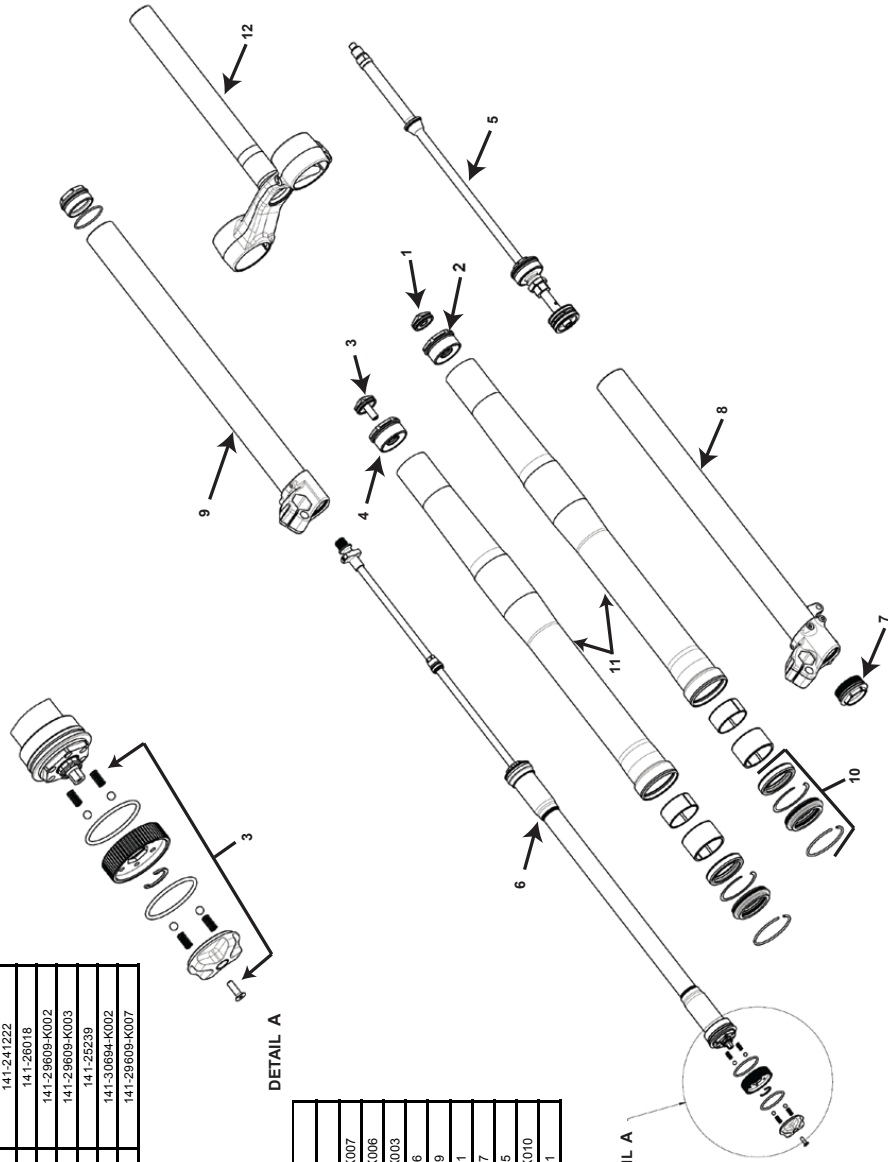
PARTS NOT SHOWN ON DRAWING

PART DESCRIPTION	26"	27.5"
	Top Crown (Small, included with fork)	141-25990
Top Crown (Large)	141-25988	141-25988
Leg Guards	141-28073-K003	141-28073-K003
Frame Bumpers	141-24116	141-24116
20mm Thru Axle (includes end bolt and washer)	141-24119	141-24119
Thru Axle Hardware	141-25991	141-25991
ISPost Mount Brake Mount Set	141-23817	141-23817
Rebuild Kit (Contains all o-rings and seals)	141-25995	141-25995
Decal Kit	141-28073-K001	141-30616-K009
Cable Guide	141-24121	141-24121



DORADO EXPERT EXPLODED VIEW

PART DESCRIPTION	PART NUMBER	
	26"	27.5"
1. Schrader Cap	141-25993	141-25993
2. Top Air Cap	141-24111	141-24111
3. Knob Kit	141-24109	141-24109
4. Rebound Top Cap	141-24801	141-24801
5. Compression Rod	141-25983	141-25983
6. Complete Cartridge (contains parts a, b and c assembled)	141-24104	141-24104
a. Compression Damper Assembly	141-24103	141-24103
b. Rebound Damper Assembly	141-24102	141-24102
c. Cartridge Tube	141-24122	141-24122
7. Bottom Air Leg Cap	141-26018	141-26018
8. Left Inner Leg	141-29609-K002	141-29609-K002
9. Right Inner Leg	141-29609-K003	141-29609-K003
10. Dust/Coil Seal Kit (kit only/ includes seals)	141-25239	141-25239
11. Outer Leg	141-29609-K004	141-30694-K002
12. Lower Crown/Sleeve	141-29609-K007	141-29609-K007

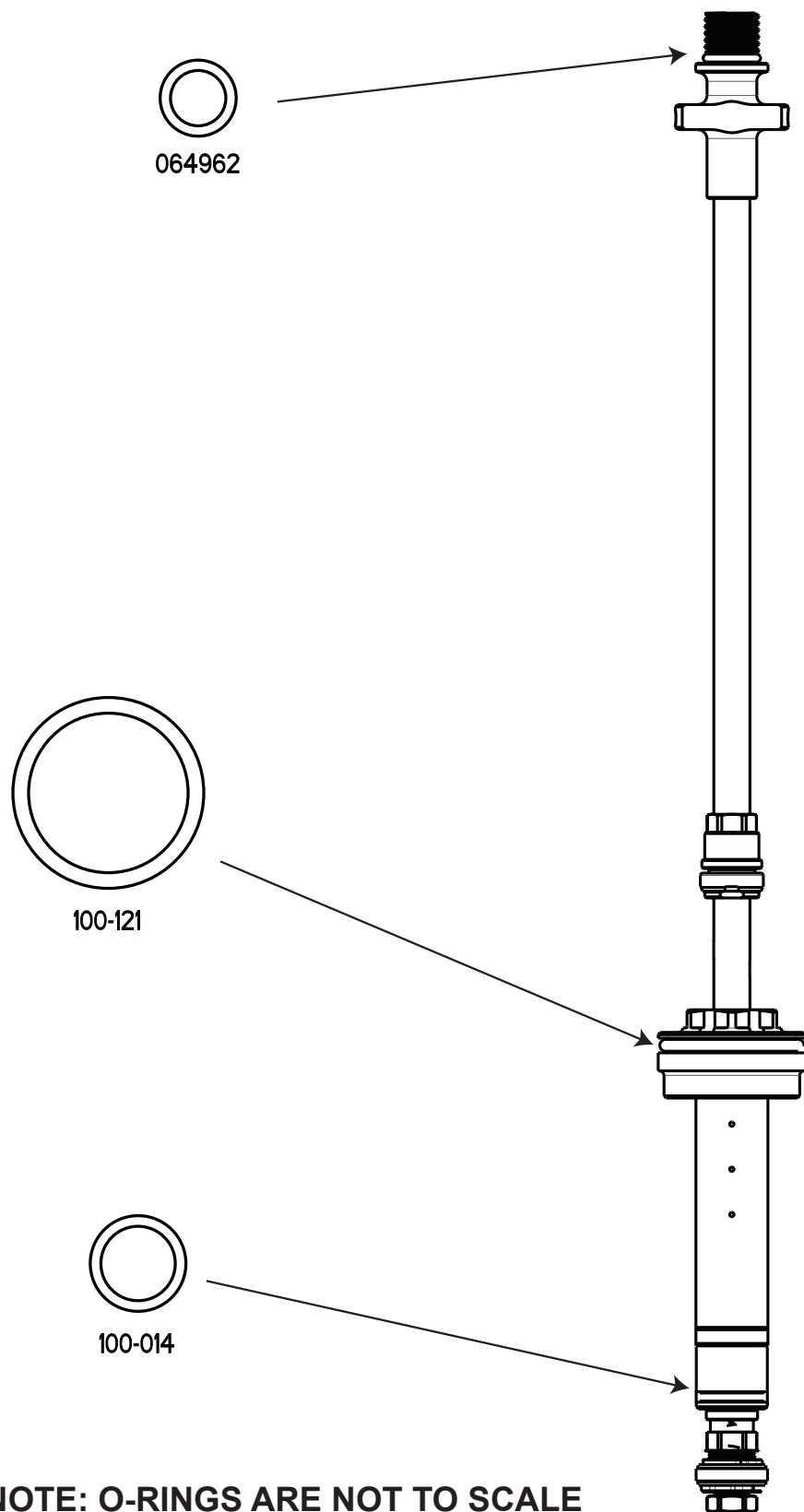


PARTS NOT SHOWN ON DRAWING

PART DESCRIPTION	PART NUMBER	
	26"	27.5"
Top Crown (Small, included with fork)	141-29609-K007	141-29609-K007
Top Crown (Large)	141-29609-K006	141-29609-K006
Leg Guards	141-28073-K003	141-28073-K003
Frame Bumpers	141-24116	141-24116
20mm Thru Axle (includes end bolt and washers)	141-24119	141-24119
Thru Axle Hardware	141-25991	141-25991
IS/Post Mount Brake Mount Set	141-23817	141-23817
Rebuild Kit (Contains all o-rings and seals)	141-25995	141-25995
Decal Kit	141-29609-K001	141-30616-K010
Cable Guide	141-24121	141-24121

SEE
DETAIL A

REBOUND DAMPER ASSEMBLY



NOTE: O-RINGS ARE NOT TO SCALE

COMPRESSION ROD ASSEMBLY

FIGURE A

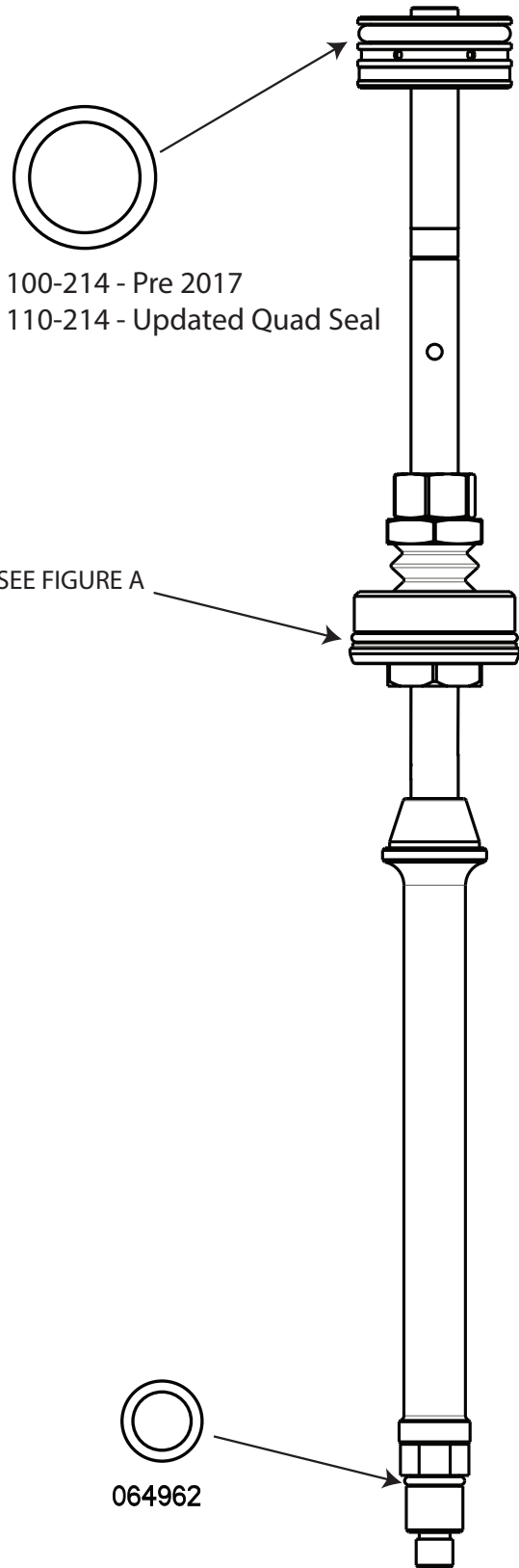
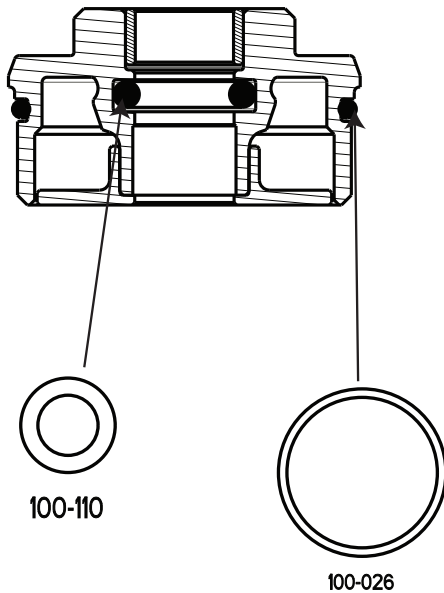
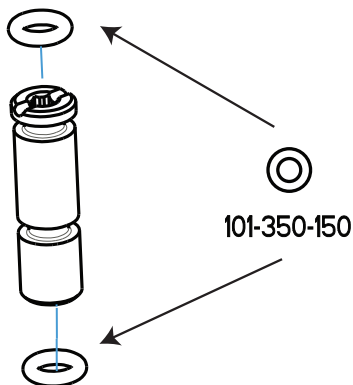


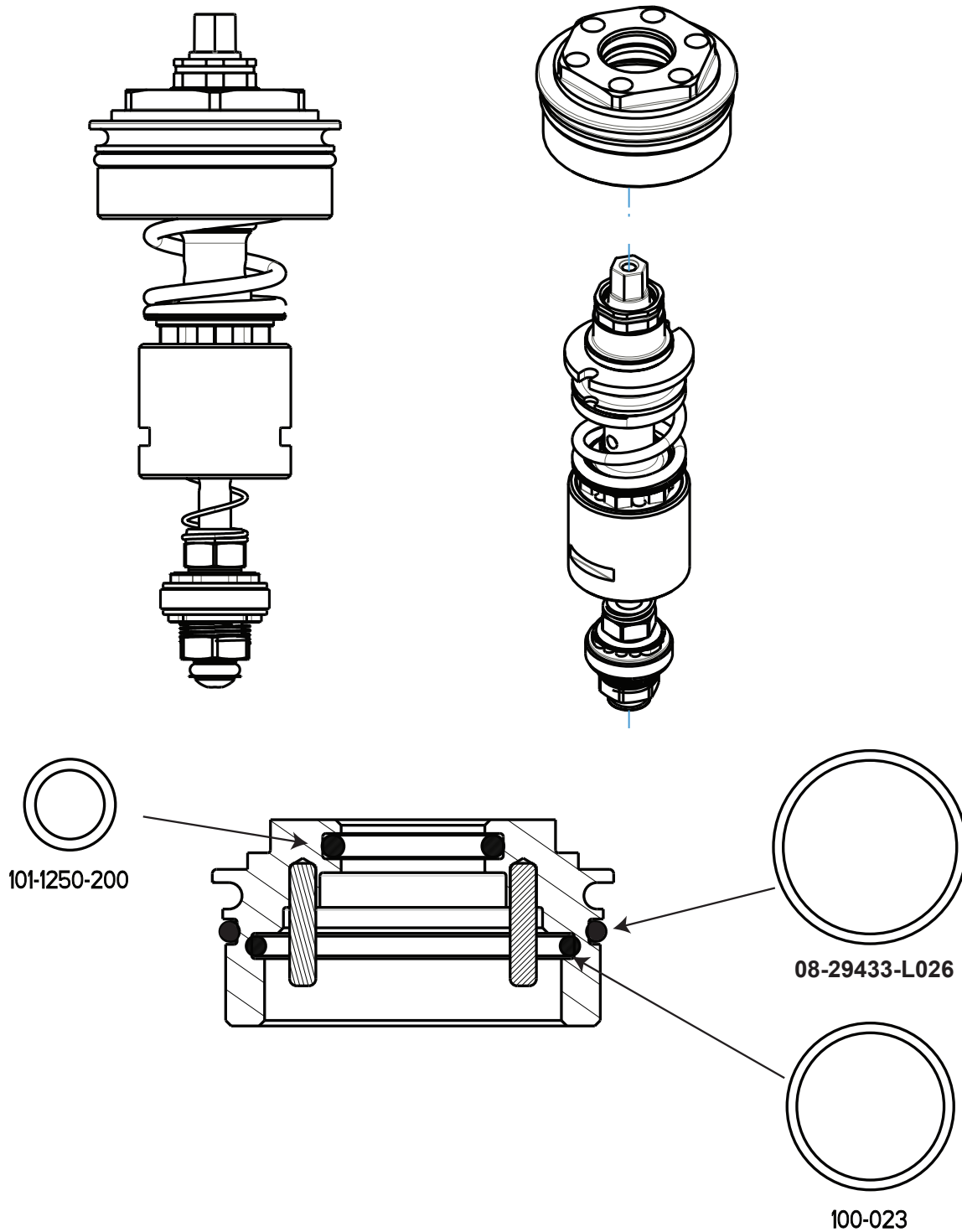
FIGURE B

This is the poppet that is located inside the compression damper shaft. Please see the service manual section that shows the disassembly of the compression rod..



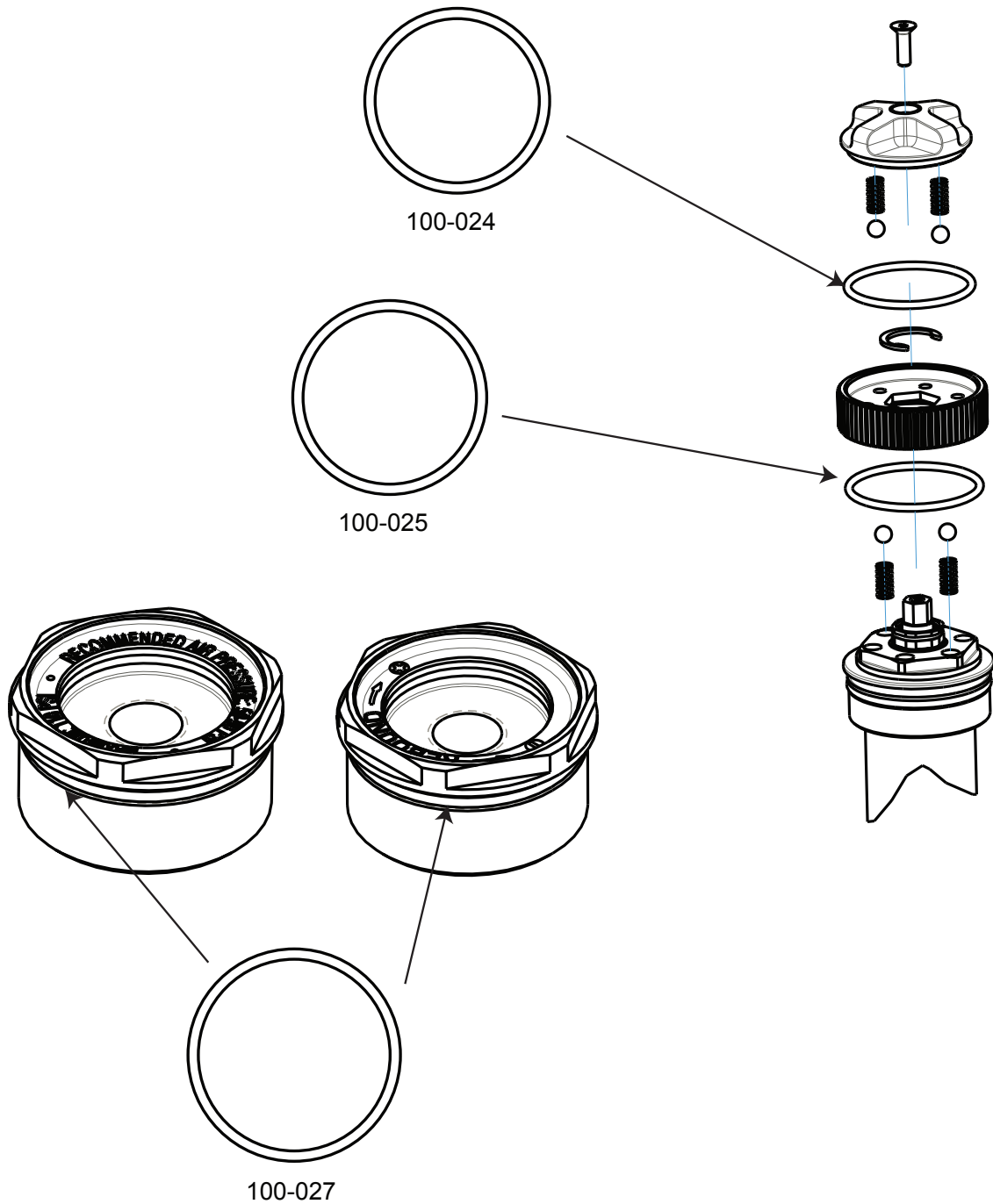
NOTE: O-RINGS ARE NOT TO SCALE

COMPRESSION DAMPER ASSEMBLY



NOTE: O-RINGS ARE NOT TO SCALE

TOP CAP & COMPRESSION DAMPER ASSEMBLY



NOTE: O-RINGS ARE NOT TO SCALE



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