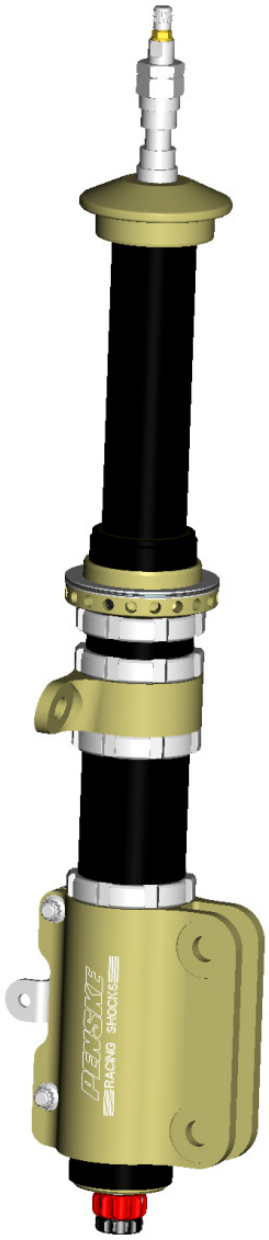
PENSKE
RACING SHOCKS®



PS-Mustang-Strut

Strut; In-line or Remote, Single, Double, or Triple Adjustable

TECHNICAL MANUAL

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Table of Contents:

Introduction:

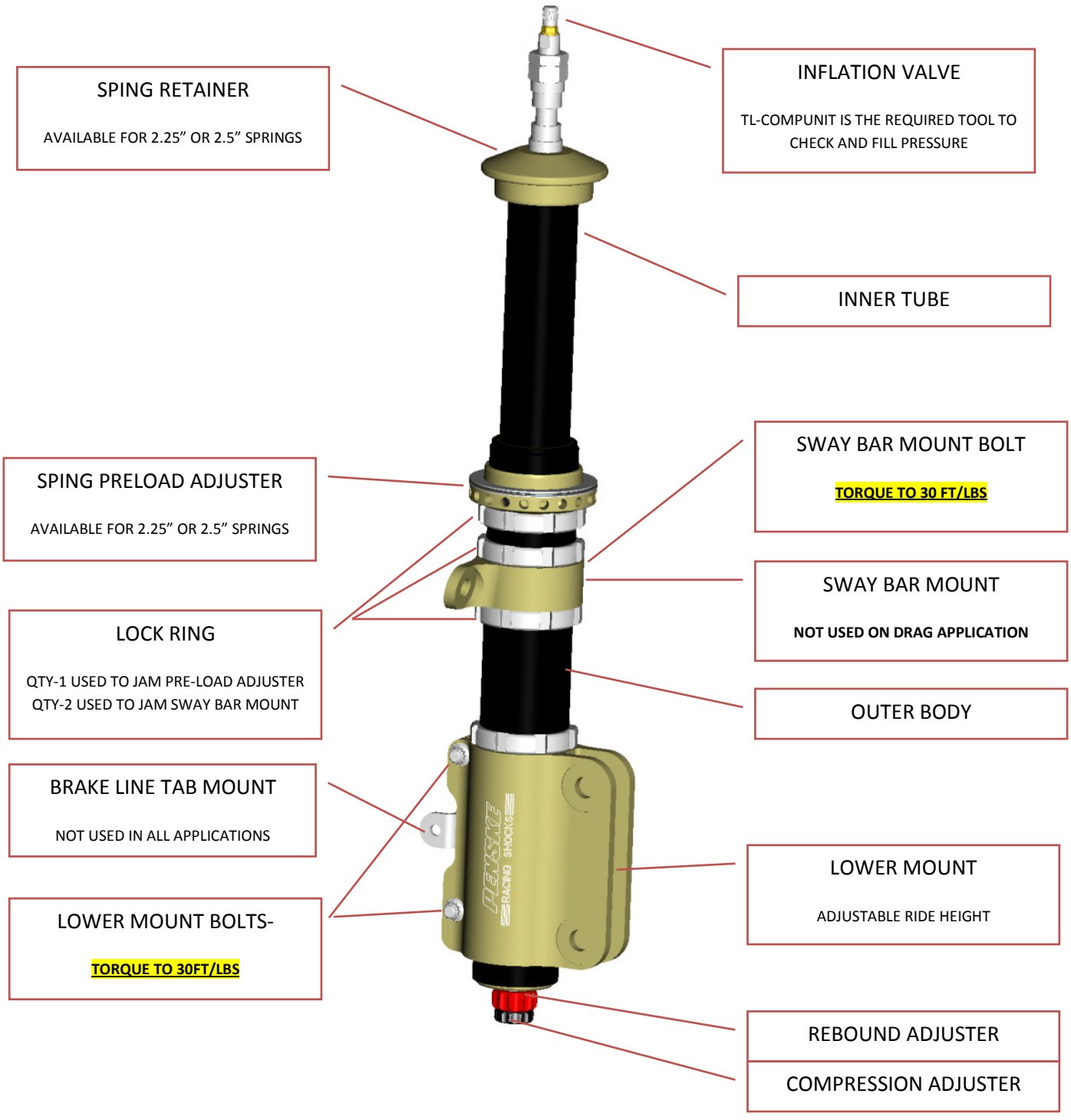
Thank you for your purchase of your new Penske Racing Shocks Mustang package!

The Mustang package can be used in all forms of racing. This manual will explain the details of the strut, give torque specifications, and give all part #'s.

All of the fundamental attributes found in any Penske Racing Shock have been incorporated into the Mustang Strut including:

- *Standard Penske 45mm bore size which allows use of wide array of piston types*
- *Low-friction shaft and piston seals*
- *Hard-chromed 4130 main shaft for strength, durability, and low breakaway friction*
- *Durable ACME thread body that allows quick adjustment of spring preload (.100" per turn)*
- *Simple, in-line design*
- *All Penske user friendly adjusters can be utilized in the strut. Single adjustable, Double adjustable, our industry leading Dual Bleed Adjuster, Triple, and even Four Way adjustable configurations can be used.*
- *Winning heritage – Penske Racing Shocks continue to help our customers win races and championships in all forms of Motorsport.*
- *Made in U.S.A. – The Mustang Strut has been 100% designed, machined, assembled, and tested for quality in the United States.*

Terminology:



Getting Started:

The Mustang Struts are set from the factory at recommended starting settings for your application. They are pressurized and ready to go. The starting pressure for the Mustang Strut is will range from 75-225 psi, depending on application.

Adjusters:

The most popular and common adjuster are the dual-bleed adjusters, these are nested within the same mechanism. This means that when making a compression adjustment, the rebound adjuster will NOT turn. When making a rebound adjustment, the compression knob will rotate. This is normal. If the rebound adjuster turns when you are making a compression adjustment, you may be side loading the knob or you may have "locked" them together. Check for debris in the threads and or check the straightness of the screws.

The Dual-Bleed adjuster mechanism provides the following ranges:

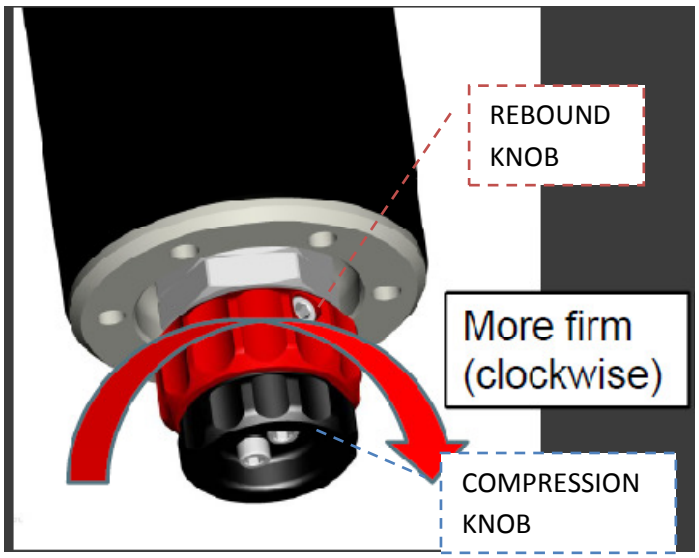
- Compression Adjuster (**Black** Hand Knob): 40 clicks

  (stiffer = clockwise; 0 = full hard, -40 = full soft)

- Rebound Adjuster (**Red** Hand Knob): 40 clicks

  (stiffer = clockwise; 0 = full hard, -40 = full soft)

  you will get more clicks than 20, depending on your valving, -20 clicks is typically full soft.



Do not over-tighten the adjusters. When making adjustments, they will have a positive stop. In order to close off the bleed, you do not need to continue to turn the knob for it to seal.

To adjust, follow the procedure as follows (if this procedure is not followed in the recommended sequence, the intended settings may not be achieved in practice):

To Set Adjusters:

1.) Turn **REBOUND** full clockwise until it stops.

2.) Turn **COMPRESSION** full clockwise until it stops.

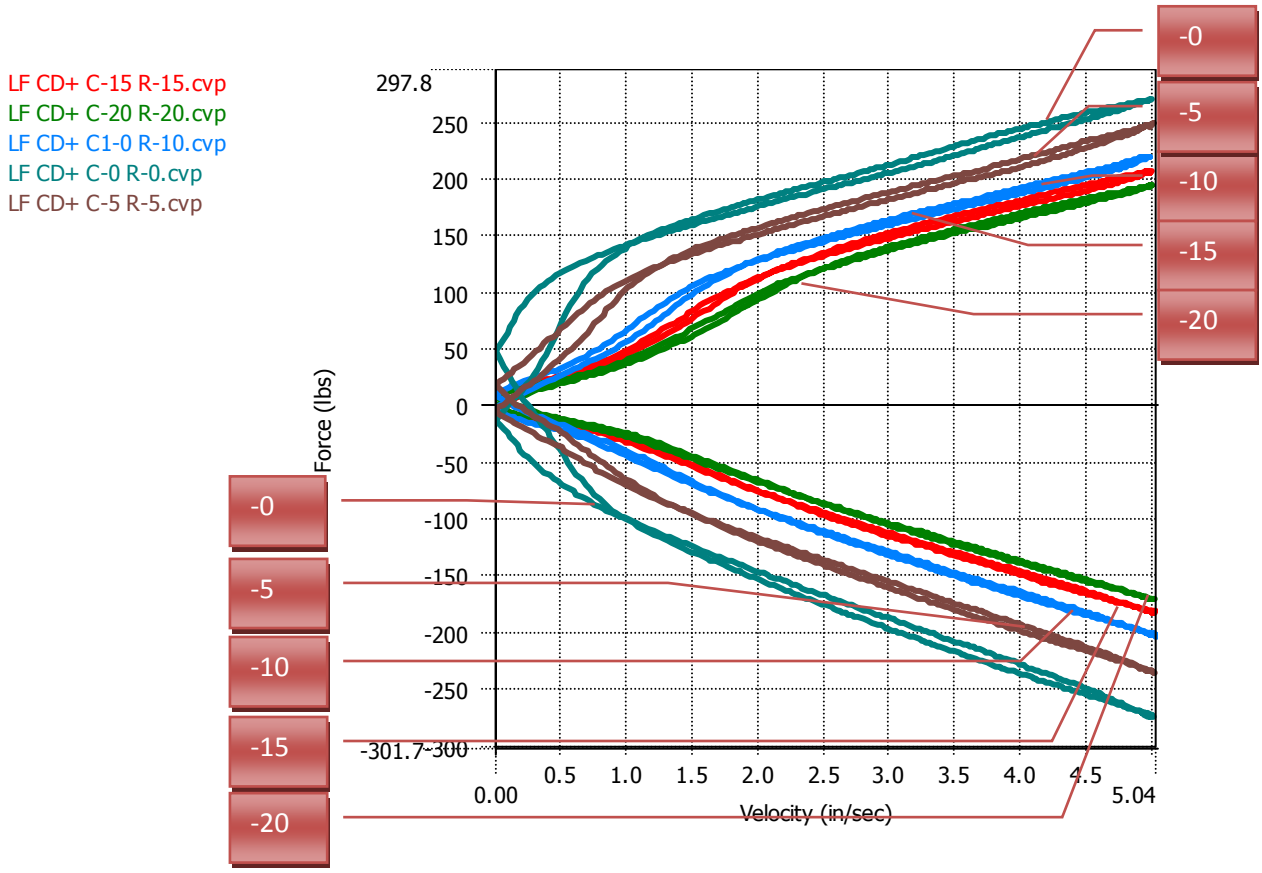
3.) Turn the **COMPRESSION** counterclockwise to desired setting.

4.) Turn the **REBOUND** counterclockwise to desired setting.

5.) During track tuning, simply turn adjusters as needed until the adjuster stops which would signify you are at the end of the adjustment range.

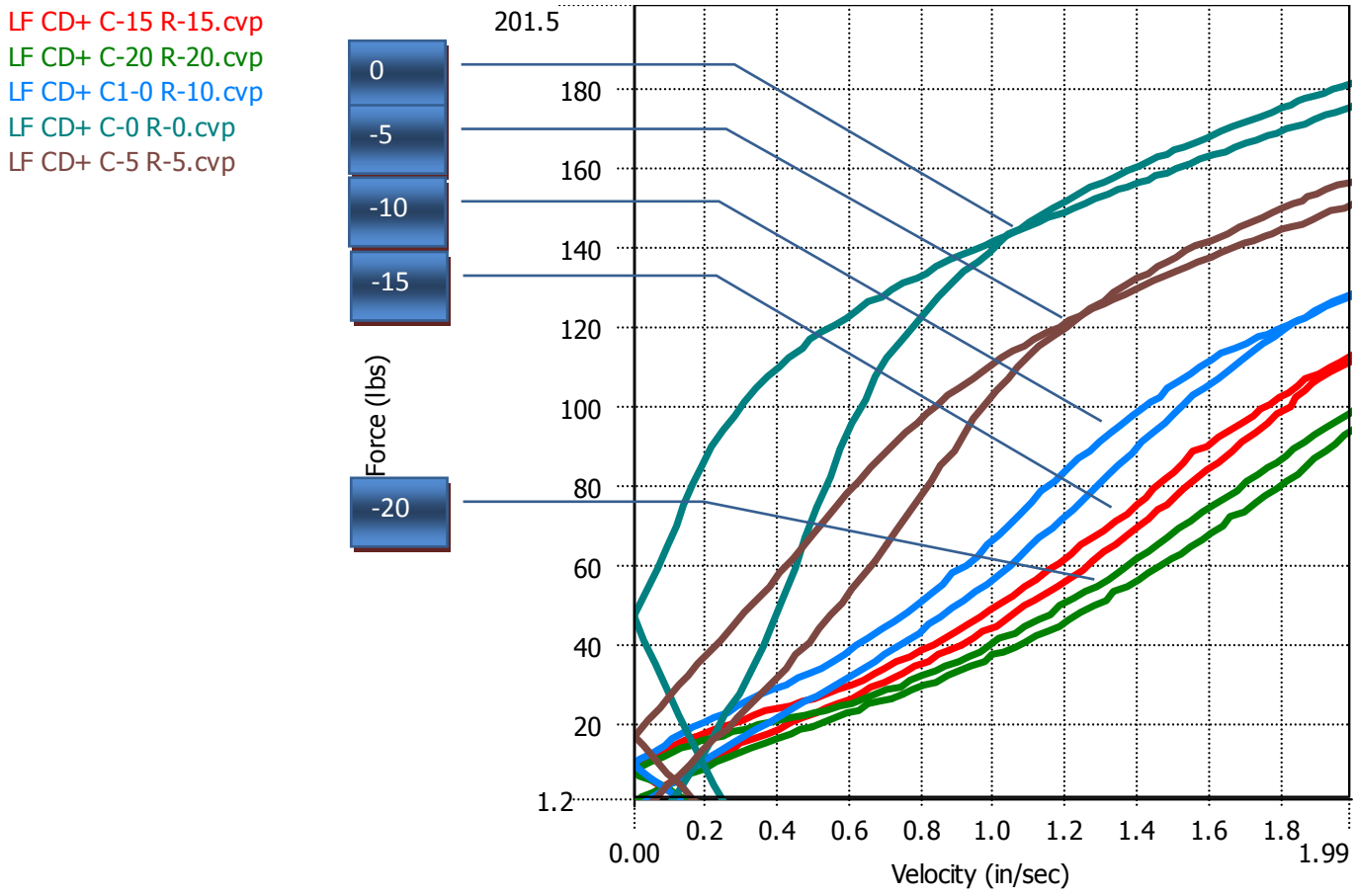
Adjustment Range: REBOUND (40 Clicks)

The rebound adjustment range is extensive but within the typical tuning window for all chassis and track conditions. The adjuster has most effect in the 0-5 in/sec velocity range of the strut.



Adjustment Range: COMPRESSION (20 Clicks)

The adjustment range of the compression adjuster works primarily in the low-speed area of the velocity spectrum. This is from 0-2 in/sec in strut velocity. Testing has shown that this is the area where transients to the chassis can be tuned depending on driver preference and down-track aero performance. These adjusters are very driver sensitive, so 2 clicks, sometimes 1 click driver will feel.



Remember the adjustment range is completely dependent on what forces your main piston and shim stacks are producing. For instance, the build above is:

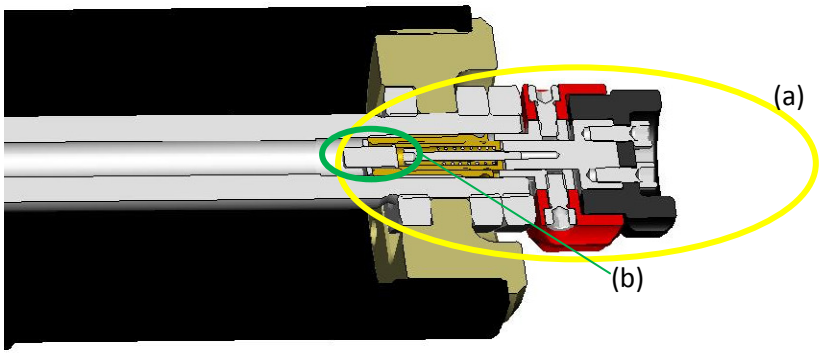
- Piston- 1°2° High Flow
- Compression Stack- C
- Rebound Stack – D

If you valve your strut with a stiffer shim stack, your will have a greater adjustment range.

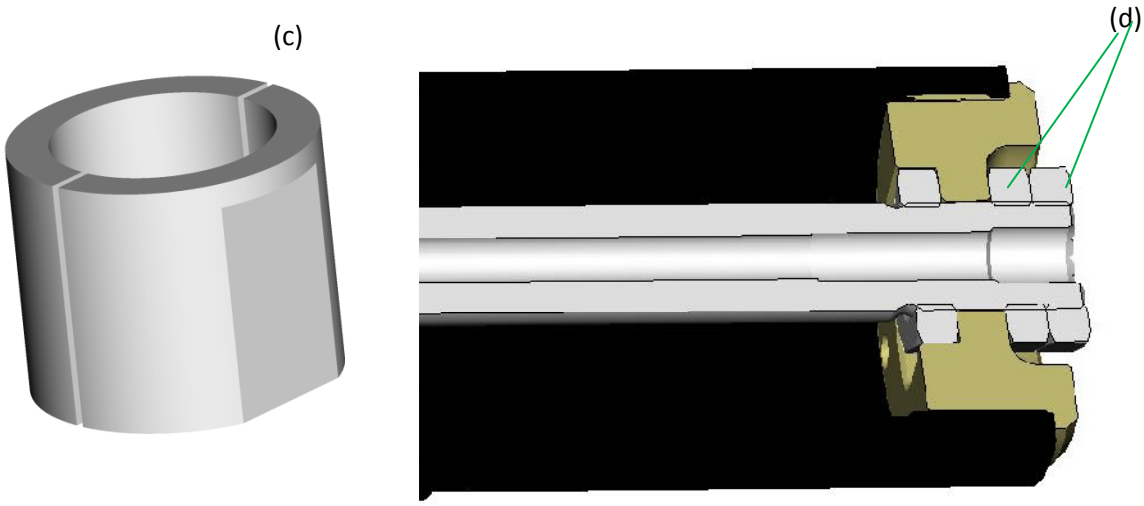
Disassembly Procedure:

This is a brief explanation of how to disassemble your strut unit so you can service and or re-valve you strut.

1. Remove lower mount.
2. Remove Dual Bleed Adjuster Knob assembly.
    a. Do this by turning rebound knob **counter clockwise** unit entire assembly **(a)** is unthreaded.
    b. **a small steel washer and aluminum plug **(b)** should be with adjuster assembly**



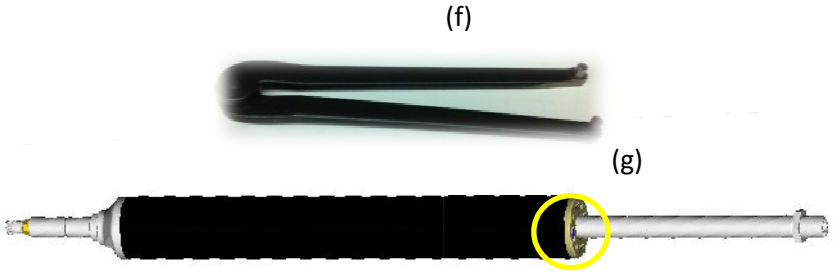
3. Clamp outer tube into **TL-BDCL-MUSTANG-OUTER (**c**)**. Then using a 7/8 socket, remove both jam nuts **(d).**



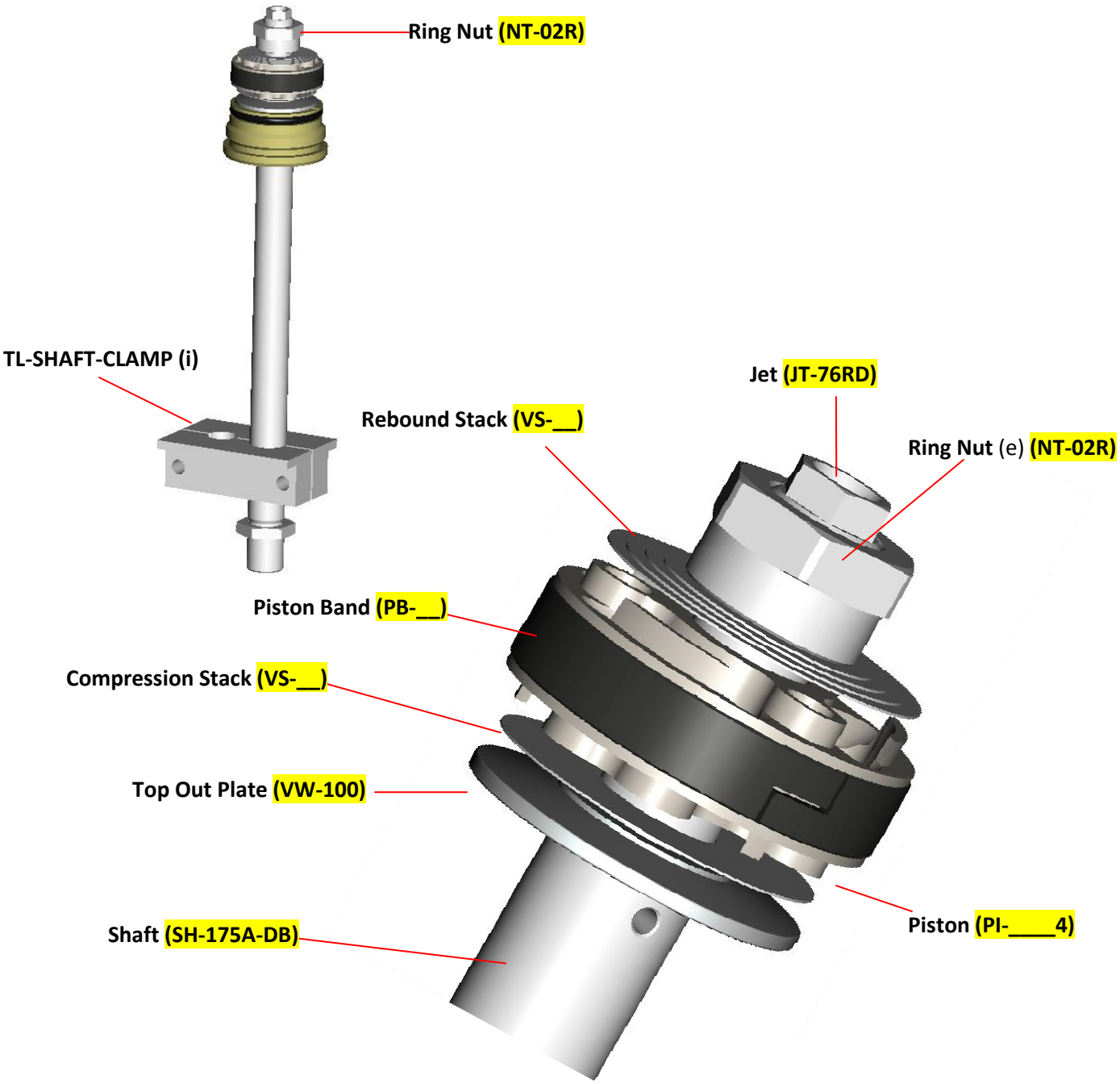
4. Remove inner tube assembly from outer tube by pulling inner tube out.

5. Depressurize tube assembly at this point. Remove valve cap from inflation unit **(e)** and depress valve core.

6. Hold inner tube assembly in vise using flats on body cap or using inner body clamp. Then using the proper spanner wrench **(f),** unthread the shaft bearing **(g)** from the inner body. Before removing shaft assembly from body, install **TL-45RNG (h)** to capture any oil overflow.



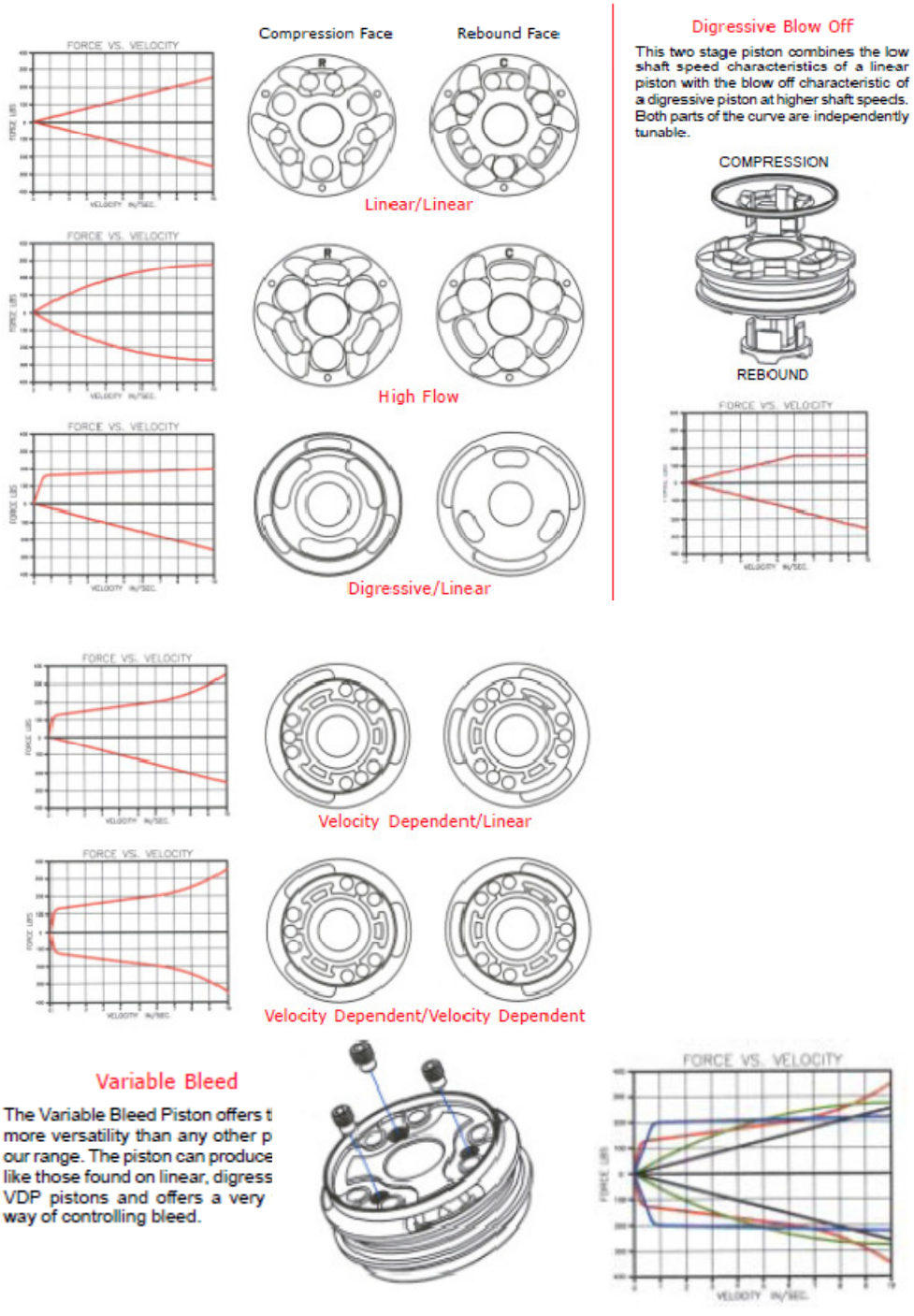
7. You are then ready to remove the Ring Nut from the shaft. Hold the shaft in the **TL-SH-CLAMP (i)**, and with a ¾" socket, remove the nut. You can then make changes to the shim stack and change pistons if desired. See below for our piston tuning guide. After desired vavling is installed, tighten ring nut and torque to 25 ft/lbs.



Piston Selections:

Piston selection is critical to achieve your desired damping curve. For recommendations, please contact a Penske Racing Shocks representative.

Pistons

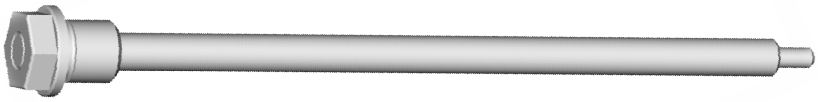


Reassemble:

Once you have your desired piston and shim stack on the shaft assembly and the ring nut is torque, you are now ready to reassemble the inner tube.

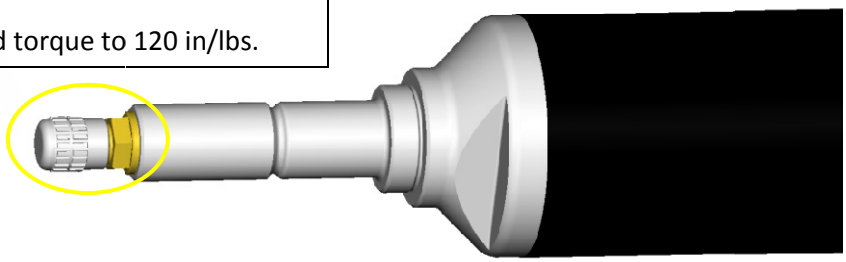
1. Install Floating Piston tool **TL-FP-MUSTANG (j)** into body. Do this by removing the inflation valve, then thread the tool into the floating piston, then into the body. This will hold the floating piston in place so you can properly bleed the shaft assembly and will.

(j)

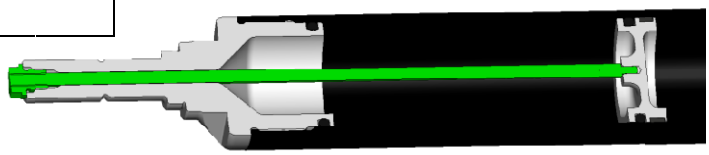


Remove with 7/16 socket.

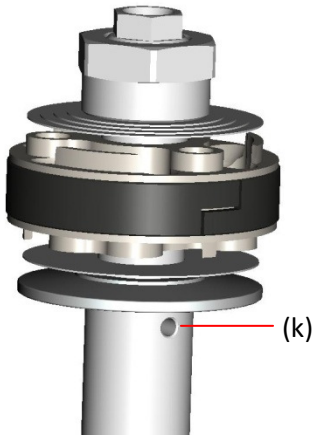
Reinstall with Blue Loctite and torque to 120 in/lbs.

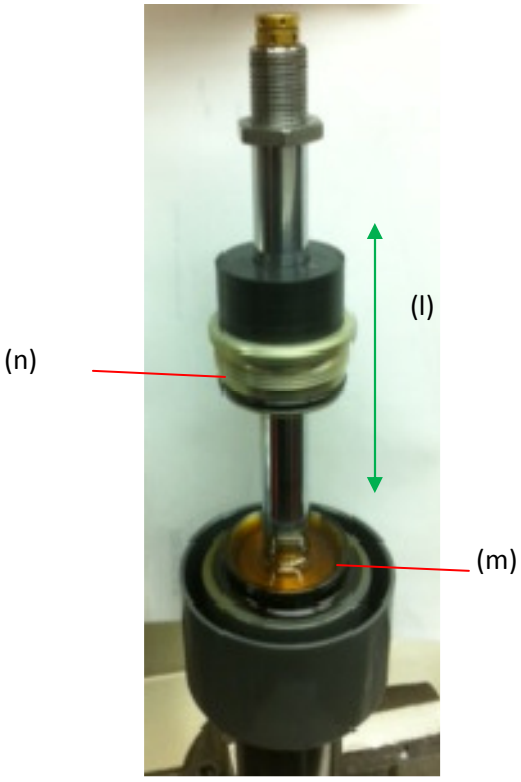


Thread tool into floating piston first, then thread into the body, you are then ready to fill the body assembly with oil.



Fill body with oil to the first set of threads.





Next take the shaft assembly and submerge it into the oil, make sure the cross holes**,(k),** on the shaft are submerged in the oil, from this point on, don't allow the cross holes to come out of the oil.

Manually displace the shaft up and down **(l).** You will get air out of it initially; continue to displace the shaft up and down until you get a smooth, solid feel.

You then want to pull the shaft assembly up so that the top out plate is in the middle of the threads **(m);** you may have to add a bit of oil to ensure the cross holes stay submerged.

Finally slide the shaft bearing **(n)** down and start to thread into the body, once it starts to get tight, remove the floating piston tool, and finishing tightening the bearing.

There is no torque spec on this, make sure you get it good and tight, more than snug.

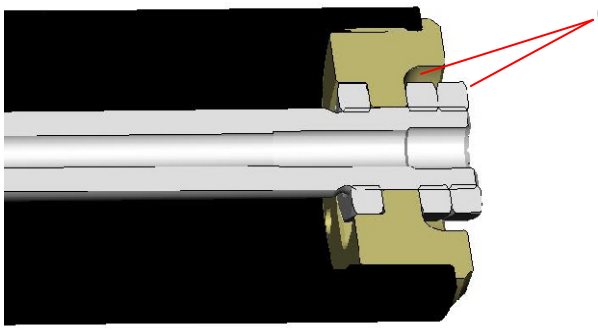
The inner tube assembly is then ready to be reinserted into the outer tube. Make sure there is 1 jam nut bottomed on the shaft prior to inserting into outer body. **(o,p)**

Thread on first jam nut, torque to 60 ft/lbs with Red Loctite, then the second, torque to 60 ft/lbs with Red Loctite. **(q)**

Reinstall adjuster assembly, and internal metering rod and tube. Make sure small extension and washer are installed as well. **(r)**

(o)

(p)



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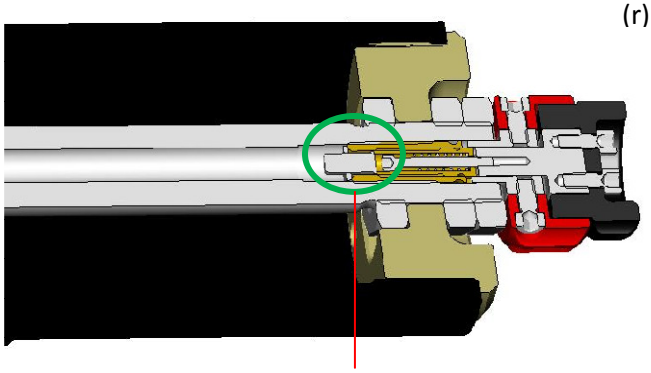
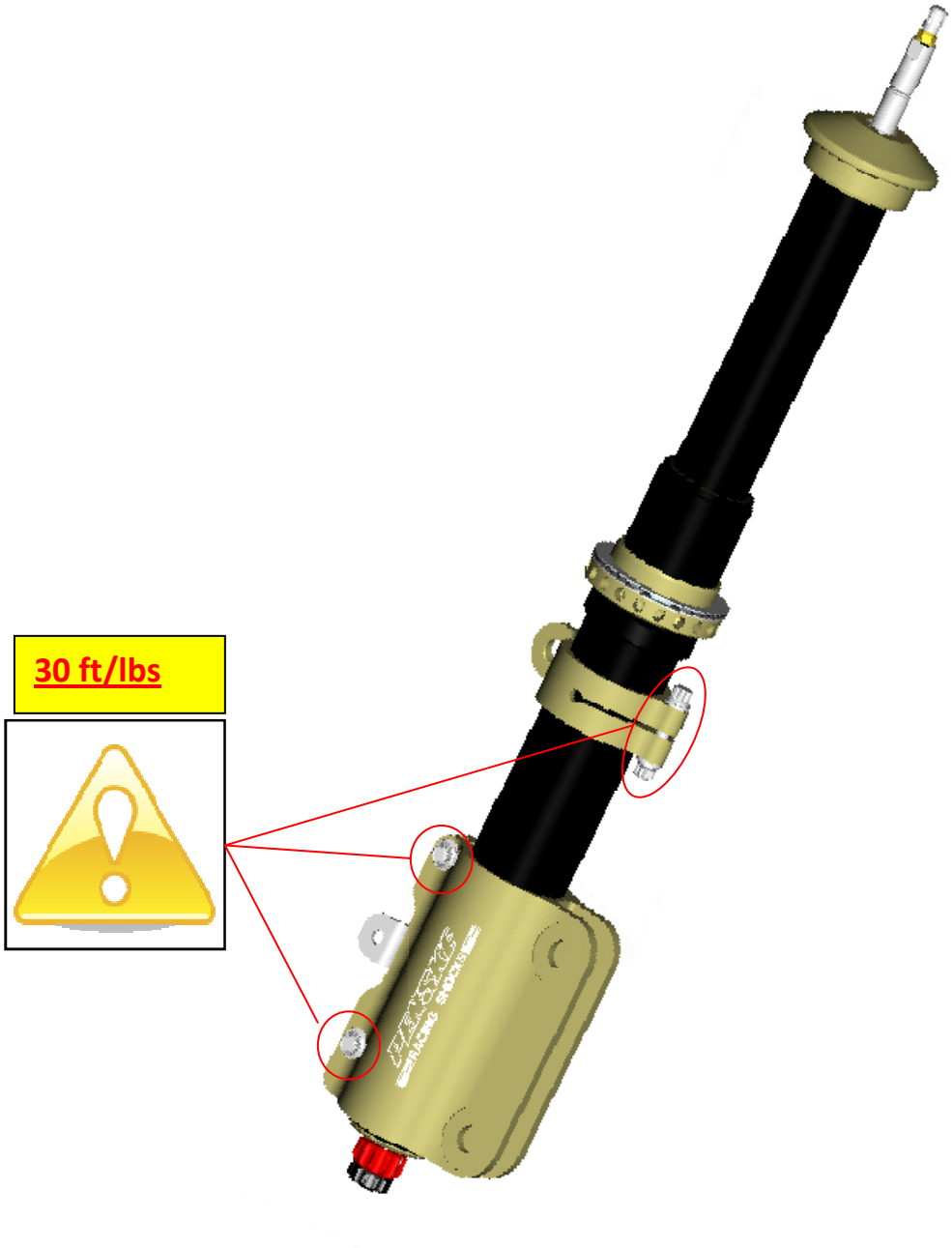
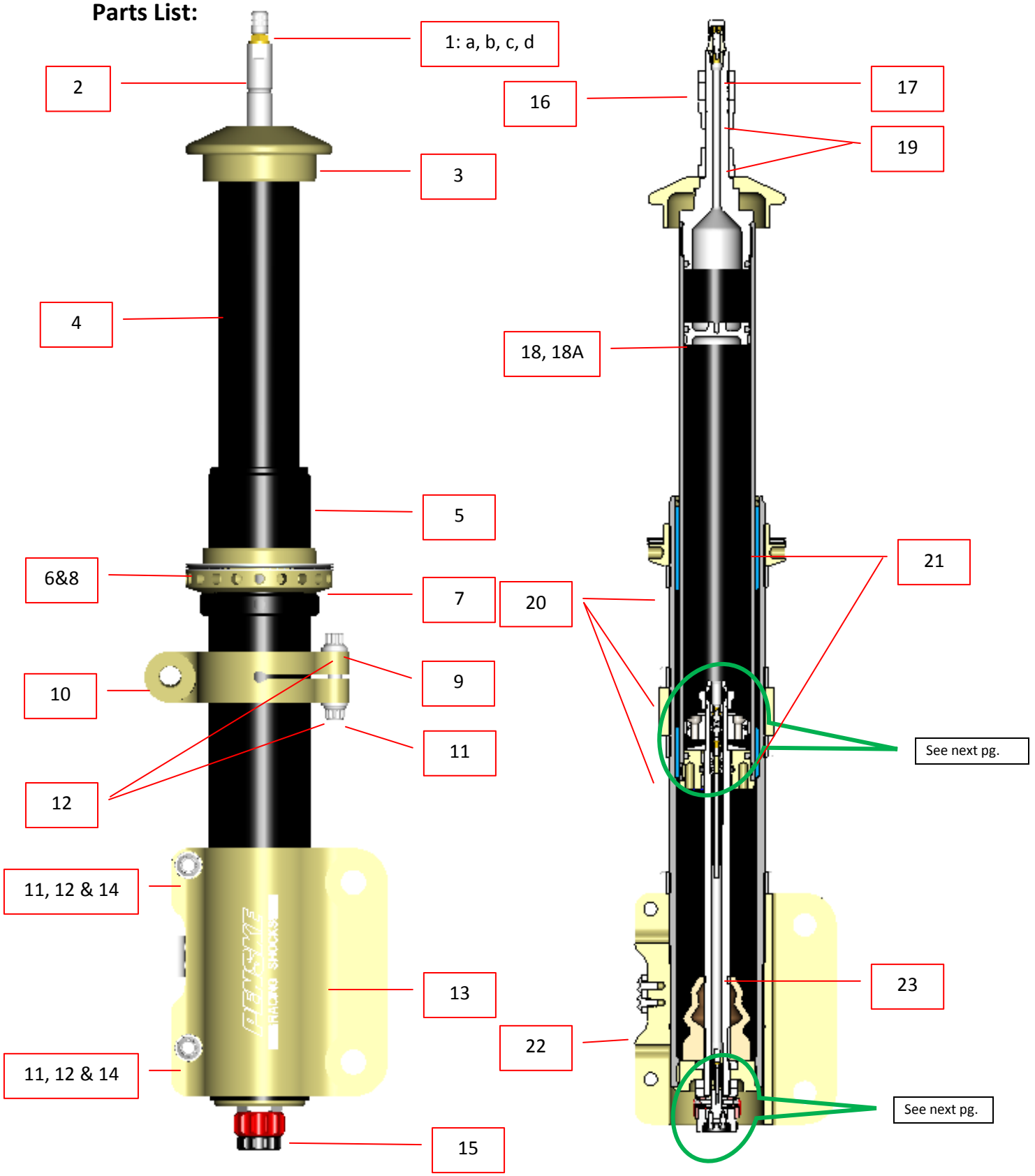


Metering rod extension and washer.

Warnings: Make sure the circled bolts torque to the appropriate spec before running vehicle. By not having proper torque, strut could become loose and cause damage.



Parts List: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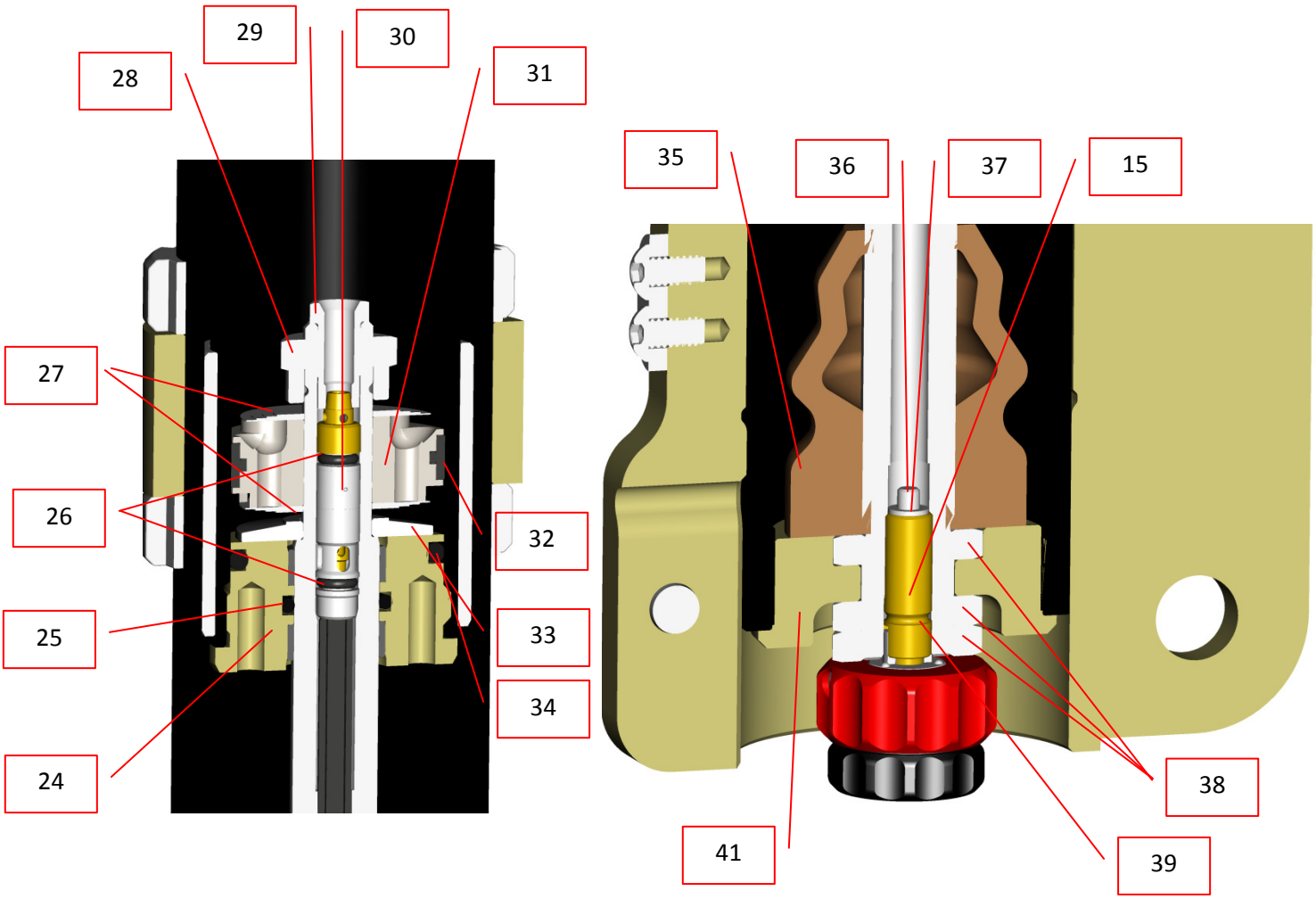
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Item #	PART#	DESCRIPTION
1	INFLATION ASSEMBLY	
a	IU-04	HIGH PSI VALVE CORE
b	IU-06	HIGH PSI VALVE CAP
c	IU-20A	AIR VALVE, PORT O-RING, ALUM.
d	OR-2010-B	SEALING O-RING
2	BC-MUSTANG-TP	BODY CAP, MUSTANG TOP PIN
3	SR-____	SPRING RETAINER, STRUT(2.25"2.5"60MM)
4	BD-MUSTANG-INNER	BODY, MUSTANG INNER STRUT
5	BD-MUSTANG-OUTER	BODY, MUSTANG OUTER STRUT
6	VW-__	THRUST BEARING PLATE (x2)(2.25"2.5"60MM)
7	RH-___	RIDE HEIGHT, STRUT (2.25"2.5"60MM)
8	VW-__	THRUST BEARNIG (2.25"2.5"60MM)
9	SC-MG-LONG	SCREW, SWAY BAR MOUNT, STRUT
10	TM-MUSTANG-__	MUSTANG SWAY BAR MOUNT (LH,RH)
11	NT-MG-BC	LOCK NUT, STRUT
12	VW-MG-BC	WASHER, STRUT (2 PER BOLT ASSEMBLY)
13	CL-MUSTANG	LOWER CLEVIS, MUSTANG
14	SC-MG-SHORT	SCREW, LOWER CLEVIS MOUNT (x2)
15	AS-DBKNOBS	DUAL BLEED KNOB ASSEMBLY
16	NT-MX5	MOUNTING NUT, UPPER PIN (M14x1.5)
17	NT-MX5-JN	JAM NUT, UPPER PIN (M14x1.5)
18	PI-PC997	FLOATING PISTON
a	OR-4219-B	O-RING, FLOATING PISTON
19	BU-MX5-F	BUSHING, UPPER PIN MOUNT
20	RH-JN-STRUT	JAM NUT, STRUT BODY (x3)
21	BU-MB4550DU	BUSHING, OUTER TUBE (x2)
22	TM-MG-BRAKE	TAB MOUNT, BRAKE LINE
23	SH-175A-DB	SHAFT, ADJ 9.375DUAL BLEED
24	SB-PO-STRUT	SHAFT BEARING, STRUT
25	OR-2114-V	O-RING, SHAFT BEARING
26	OR-2007-B	O-RING, DUAL BLEED NEEDLE
27	VS-__	SHIM STACK, COMPRESSION AND REBOUND
28	NT-02R	RING NUT
29	JT-DBRD	JET, DUAL BLEED
30	JT-DBCOMP	DUAL BLEED NEEDLE ASSEMBLY
31	PI-_____	PISTON, (SEE AVAILABLE PISTONS)
32	PB-__	PISTON BAND (CORRECT BAND DEPENDS ON PISTON TYPE)
33	VW-100	TOP OUT PLATE
34	OR-2219-B	O-RING, SHAFT BEARING TO BODY
35	BR-___	BUMP RUBBER , DIFFERENT DUROMETERS AVAILABLE
36	MR-DBCD	METERING ROD EXTENSION, DUAL BLEED
37	VW-26130-156	METERING ROD VALVE WASHER, DUAL BLEED
38	NT-04J	JAM NUT, STRUT (x3)
39	OR-5MMX1MM-V	O-RING, DUAL BLEED KNOB ASSEMBLY

Technical Support:

8:30 AM – 5:00 PM (EST)

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