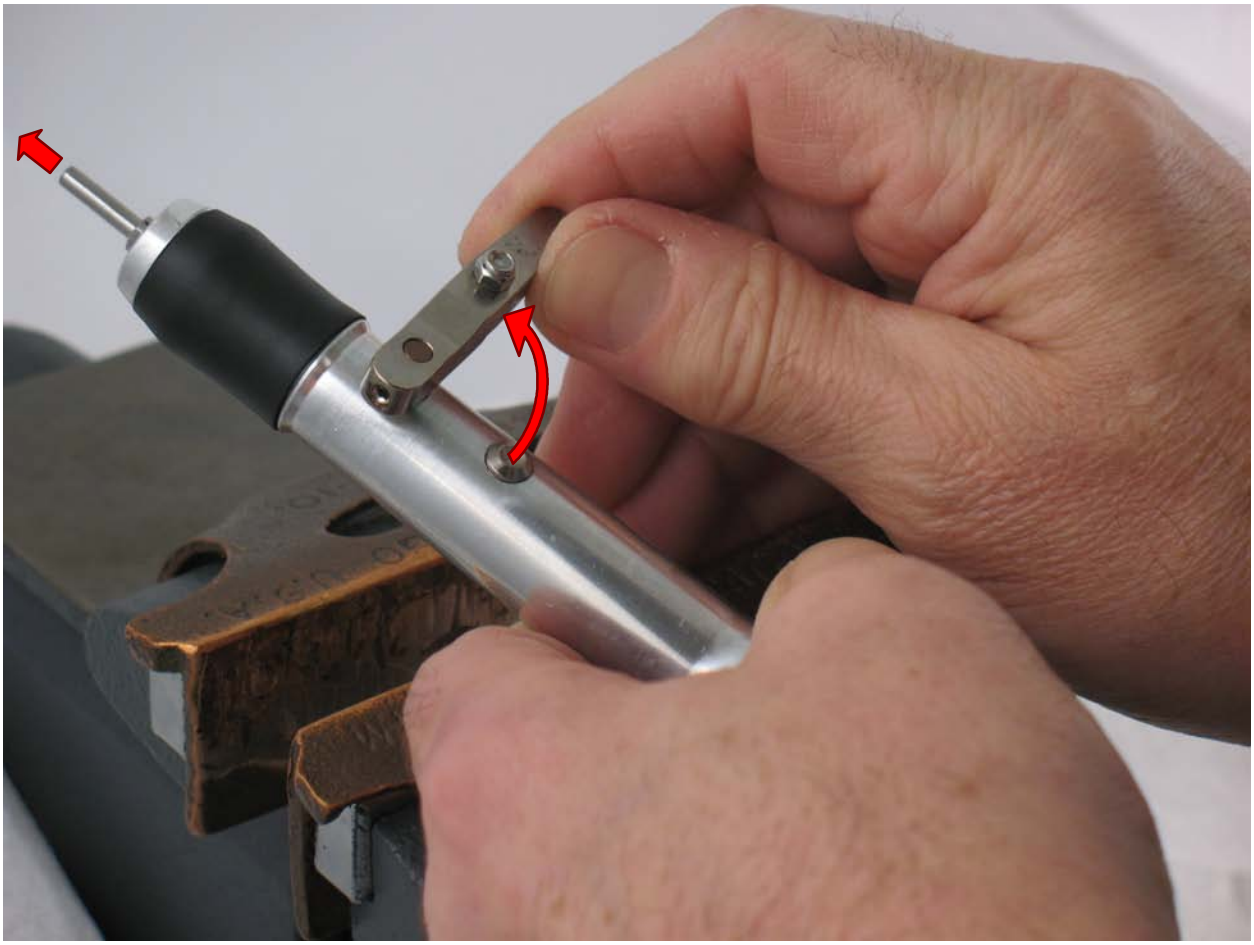
Disassembly/Assembly Instructions - Quick-Change Pencil Grinder, Drive & Motor
Models: 60051, 60052
Important: Use these instructions along with tool parts page or manual.
Notice: Shut off air supply. Open **51655** ON/OFF Valve to deplete air.

- Disconnect hose from air supply.

Drive/Motor Disassembly:



1. Rotate **60083** Lever 90° to open collet.
   - Remove insert tool from collet. **Notice:** If necessary, use **60116** wrench. Turn counterclockwise.

2. Remove collet insert from drive shaft. Turn conterclockwise.

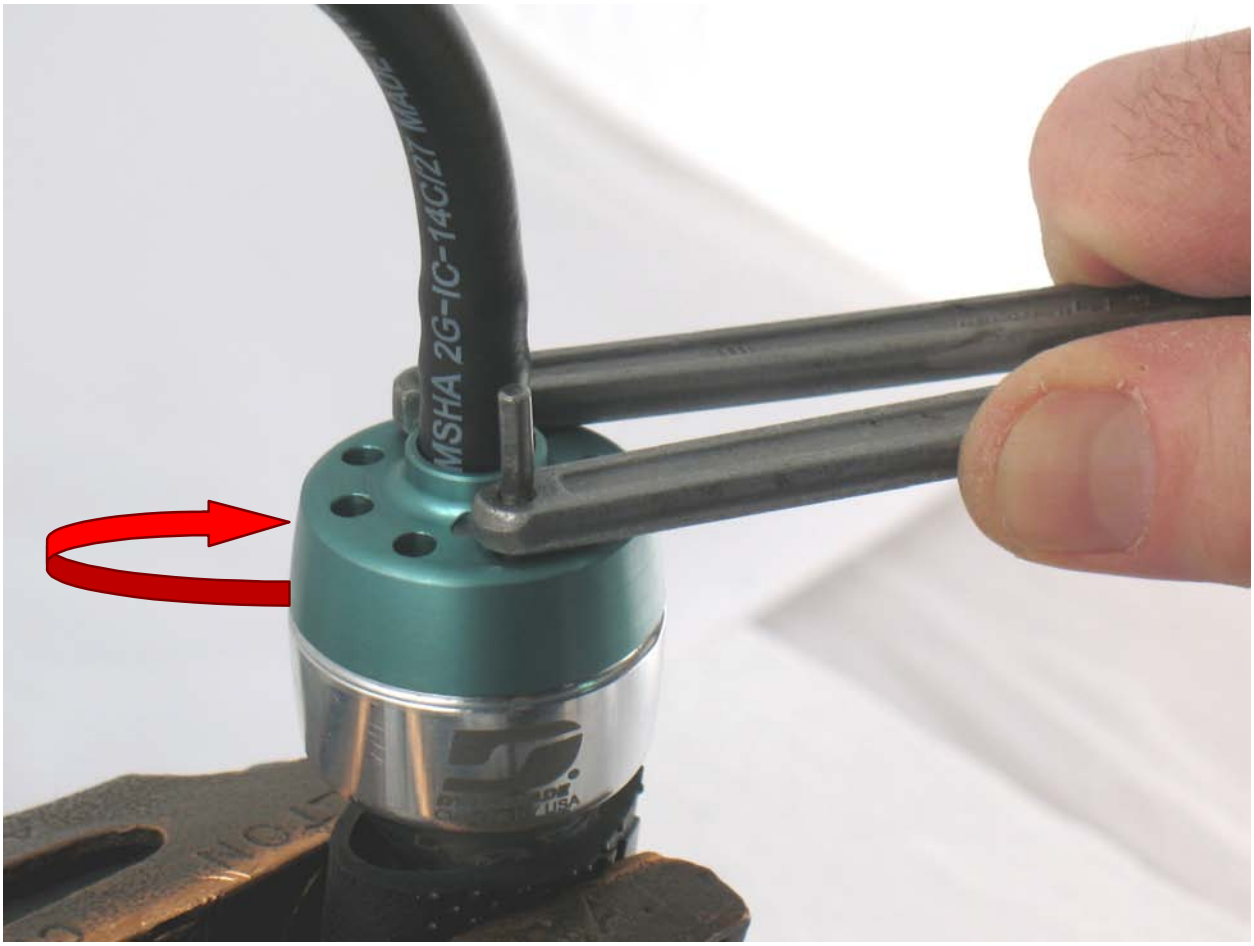
3. Use a piece of rubber to protect housing and fasten in vise with aluminum or bronze jaws.

- Use an adjustable wrench to remove **60066** Nose Cone. Turn counterclockwise.

4. Carefully, remove **60081** Washer, **60094** Spring and **60087** Washer Seal.

5. Invert tool in vise.

- Use a ***HEAT GUN*** to warm housing and soften thread sealant.



6. Use an adjustable pin spanner wrench to remove **60110** or **60111** Cover. Turn counterclockwise.

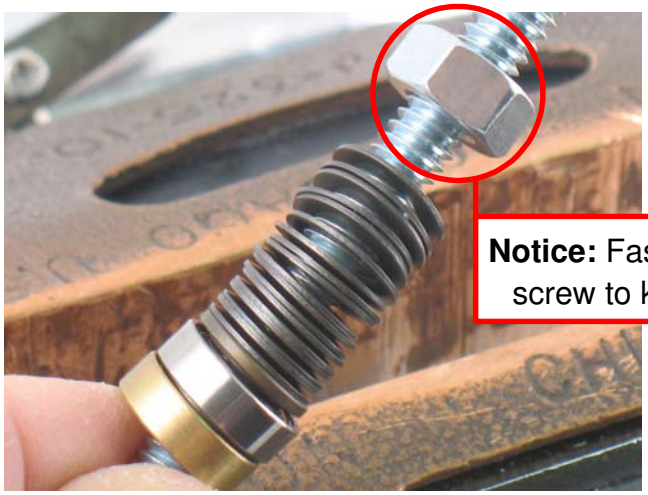
- Set cover, brake and hose assemblies aside.

See: Disassembly/Assembly Instructions - Quick-Change Pencil Grinder, Bushing & Brake, to replace air bushing and/or brake.

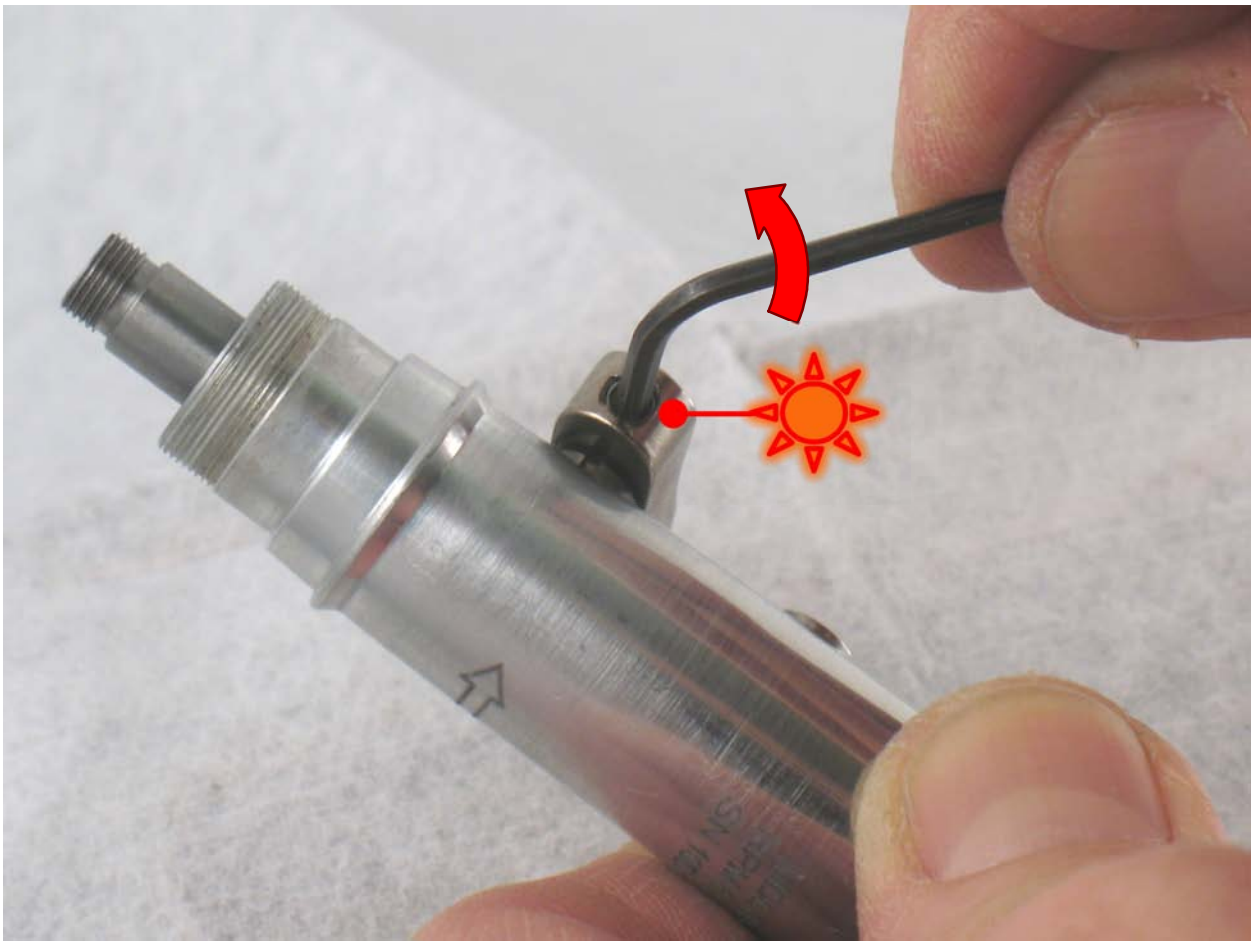
7. Remove from vise. **NOTICE: Quick-Change Chuck is SPRING LOADED! Use caution when removing 60077 Bumper.**
   - Use an adjustable wrench on **60077** Bumper, and insert 4 mm hex key into end of drive shaft. Carefully, turn bumper counterclockwise to remove from drive shaft.

8. Use a 1/4" (6 mm) Ø diameter by ~5" (~127 mm) long screw and carefully slide, **60088** Front Seal Washer, **60089** Outer Housing Seal, **60090** Inner Race Seal, **60092** Rear Seal Washer, **60093** Bearing, **60074** End Support and **60073** Springs (**19 to 20**) onto screw.

- **Notice:** Relaxed Measurement Range, 14.79 mm - 15.56 mm (~.582" - ~.613")

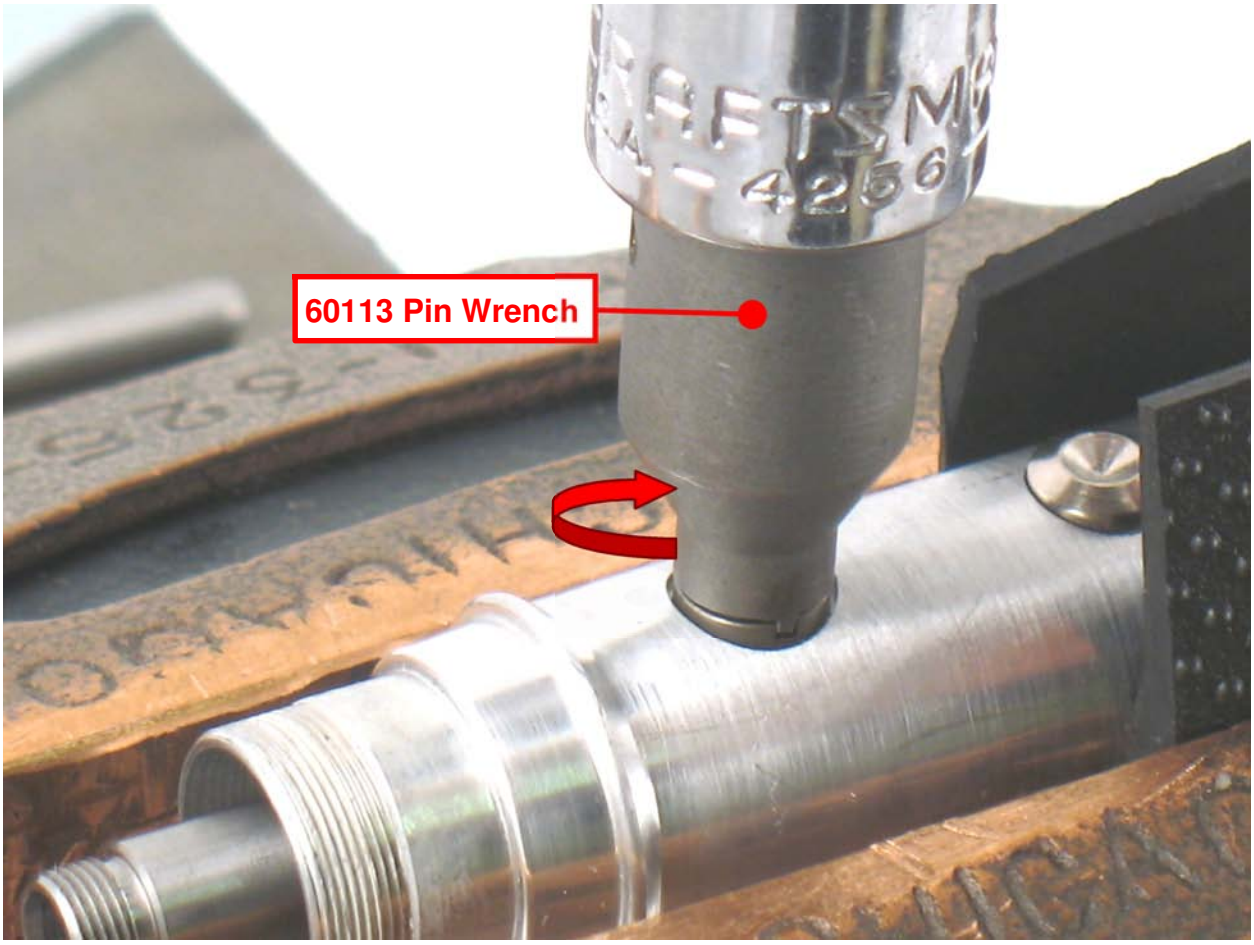


Notice: Fasten nut on end of screw to keep parts fixed.



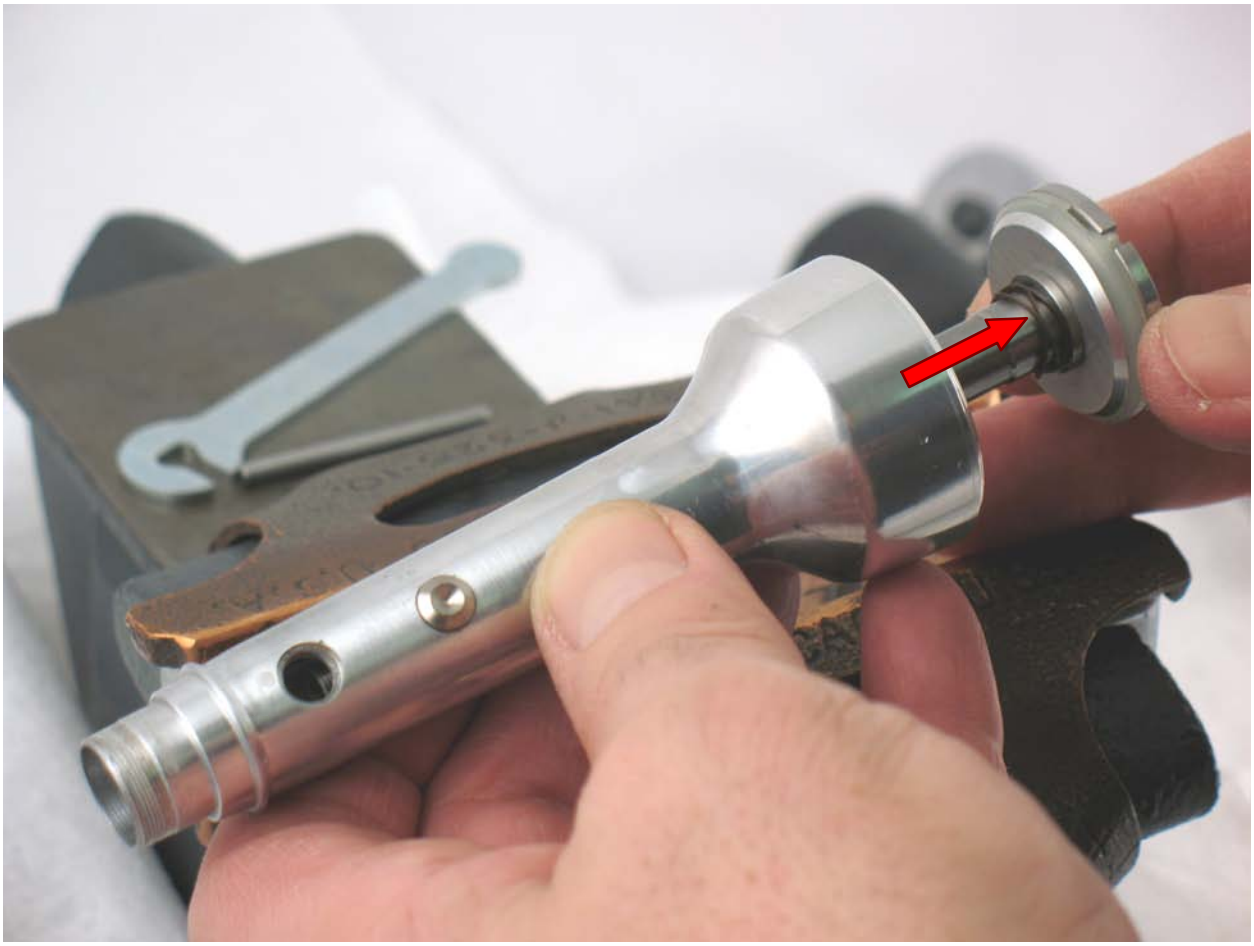
9. Use a ***HEAT GUN*** to warm lever and soften Loctite #271.

- Use 2 mm hex key to remove **60112** Set Screw. Turn counterclockwise.

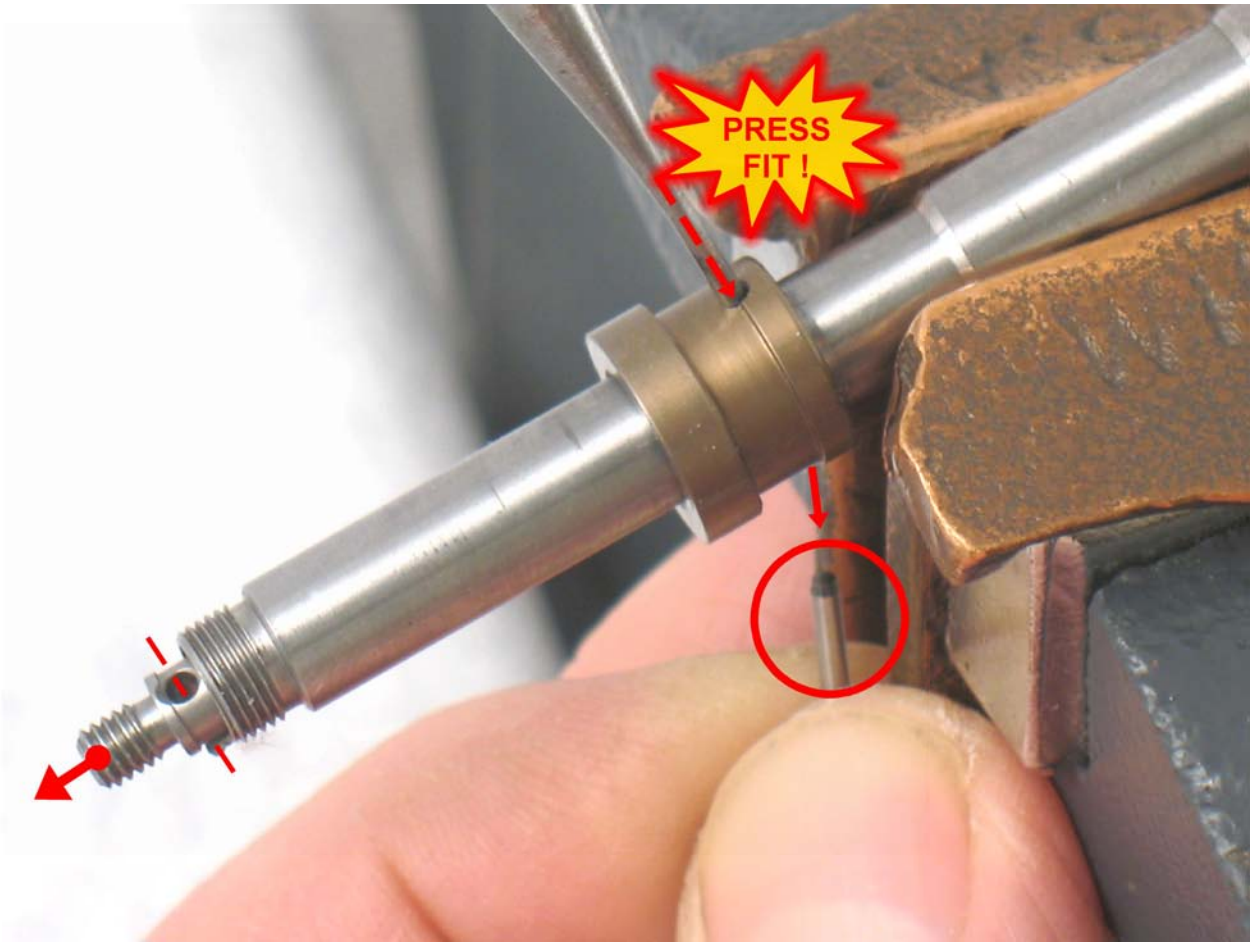


10. Fasten in vise and use **60113** Pin Wrench to remove **60080** Cam Support. Turn counterclockwise.

11. Remove **60080** Cam Support and **60082** Cam.

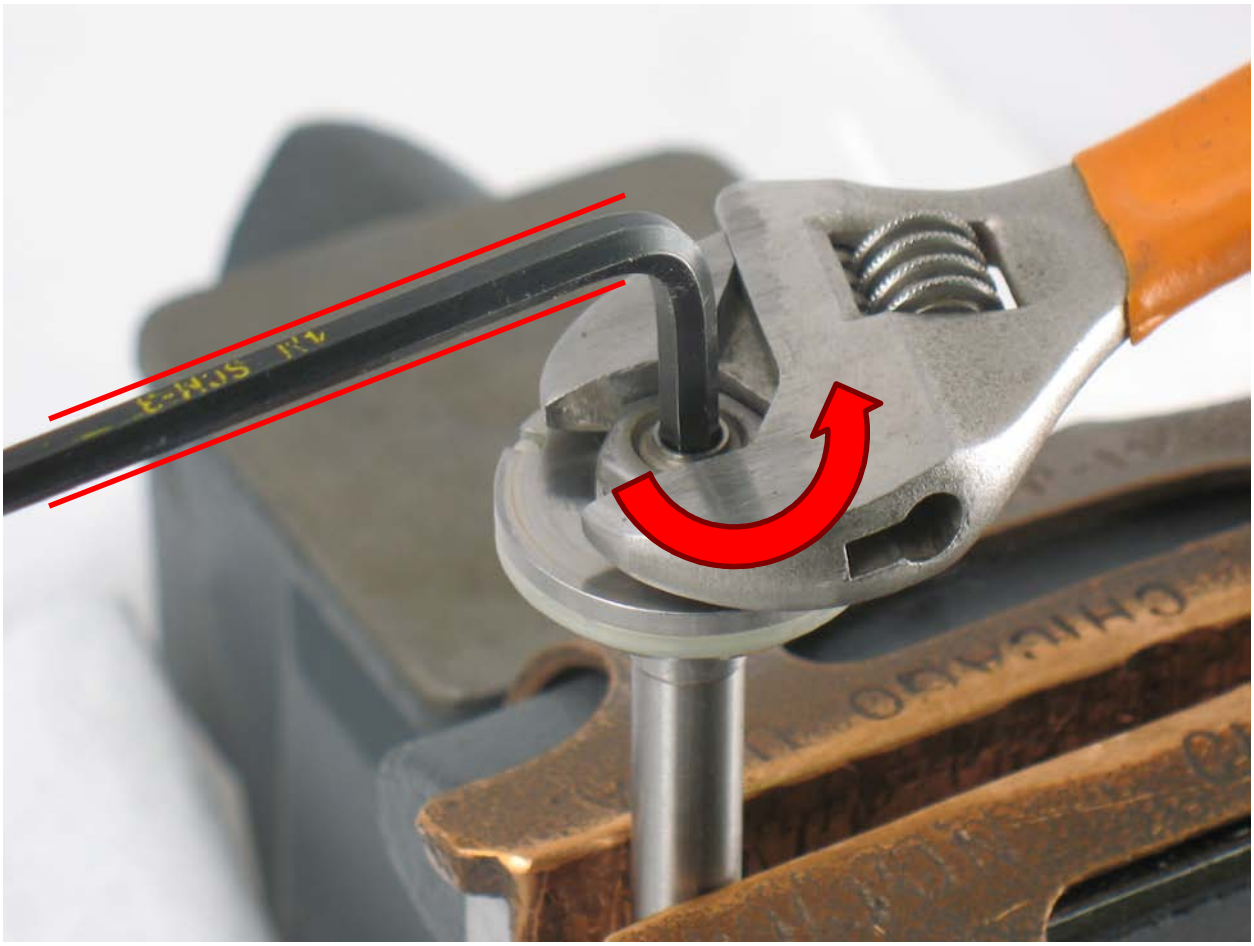


12. Remove drive shaft, turbine motor, **51651** Bearing and **60102** Spring from housing.



13. Fasten drive shaft in vise.

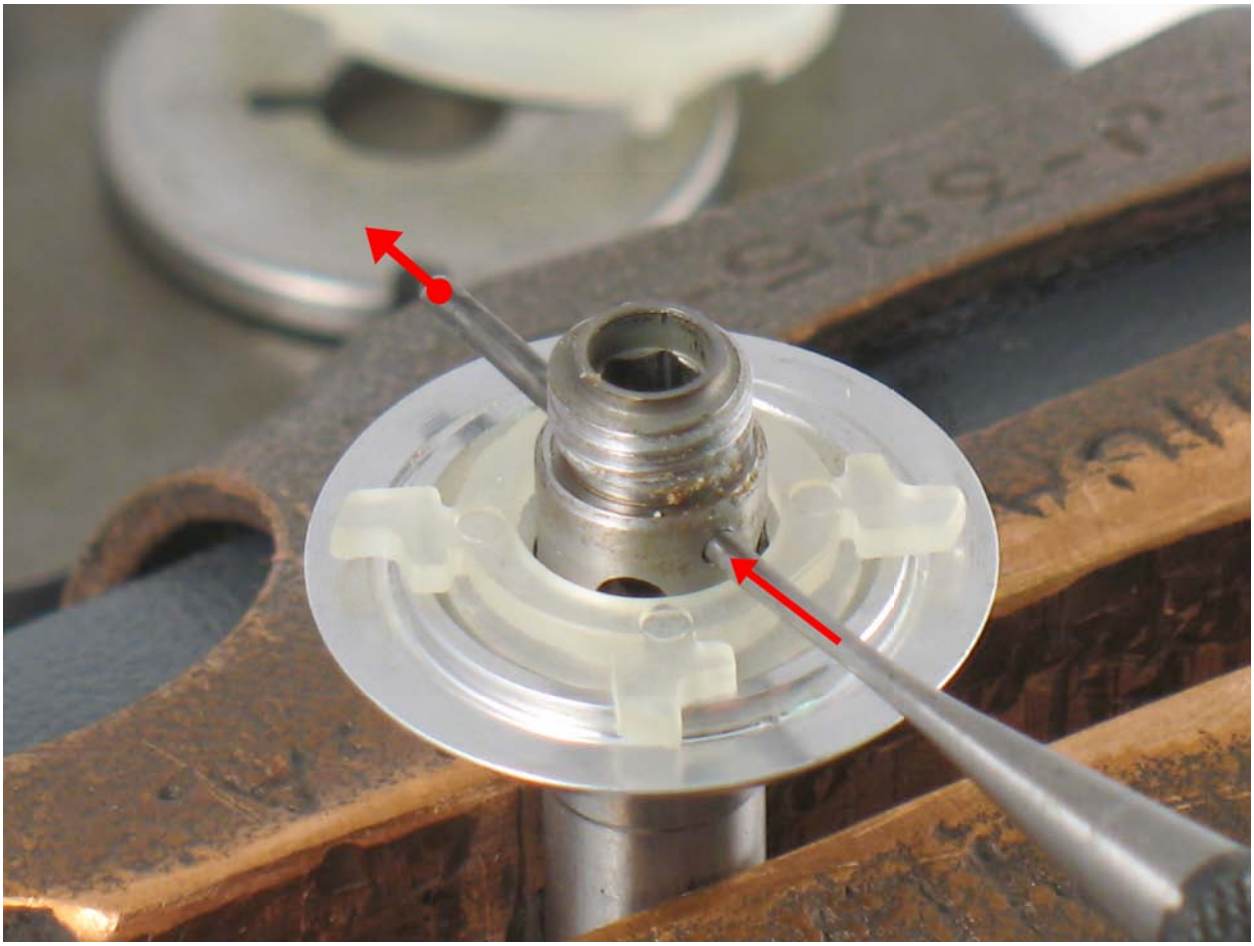
- Identify ***PRESS-FIT*** hole in **60078** Spring Washer. (**NO CHAMFER**)
- Use ~1/16" or ~1.5 mm Ø drive punch to remove the **60091** Pin.
- Remove **60078** Spring Washer and **60079** Screw.



14. Reposition drive shaft in vise and use 4 mm hex key to hold it stationary.

- Use an adjustable wrench to remove **60099** Nut. Turn counterclockwise.

15. Remove **60069** Top Brake Plate and **51378** Turbine.



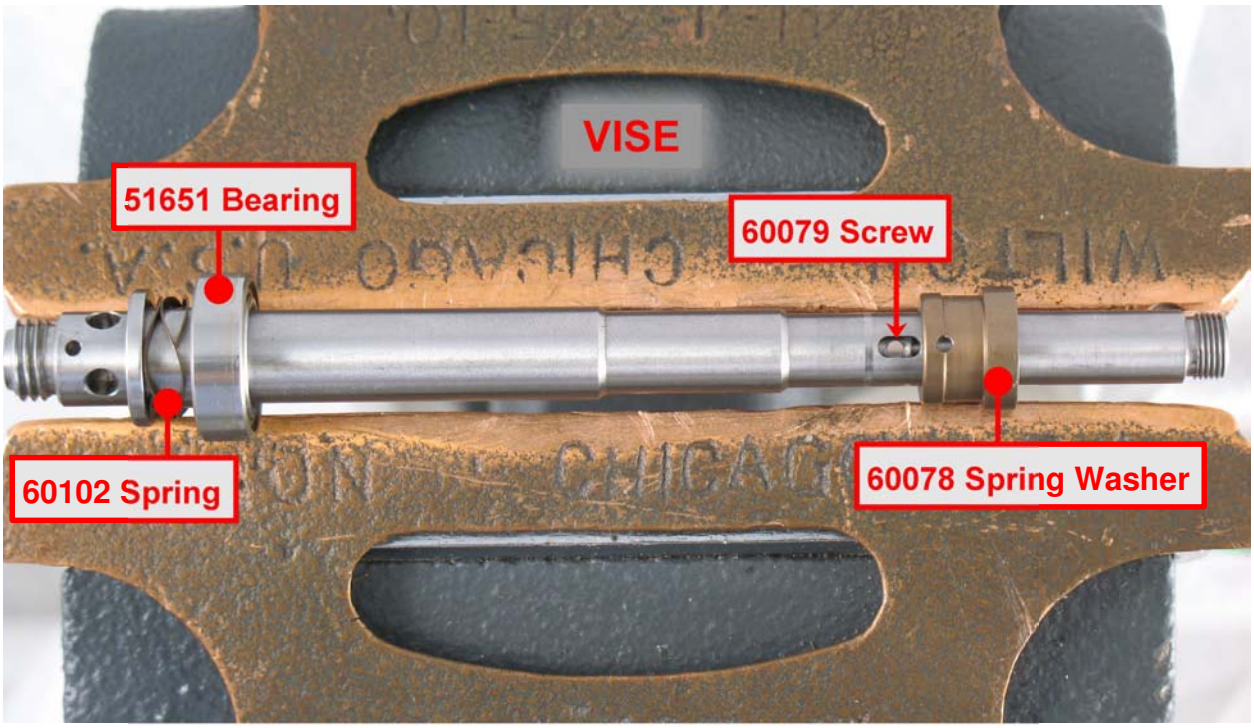
16. Use ~1/16" or ~1.5 mm Ø drive punch to remove the **60098** Pin.

- Remove **51675** or **51691** Governor and **51656** Turbine Base.

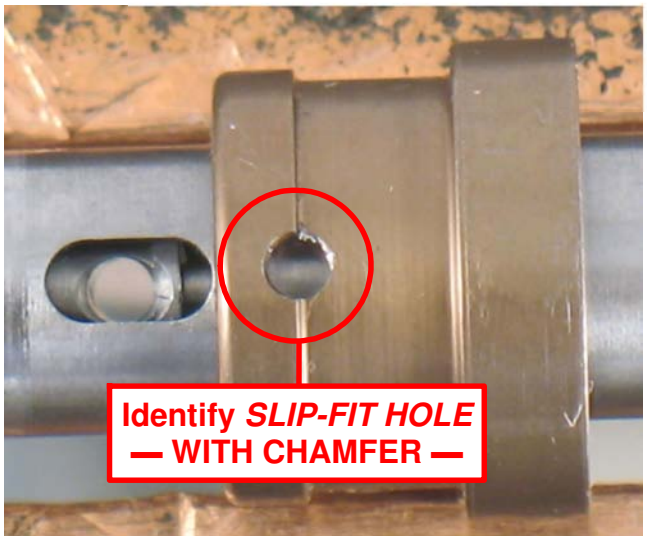
Drive/Motor Disassembly Completed.

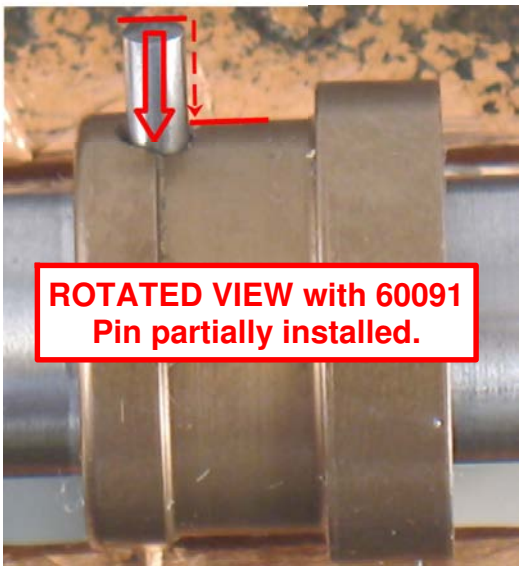
Clean and inspect parts for wear or damage before assembling.

Drive/Motor Assembly:



1. Install **60102** Spring and **51651** Bearing onto **60117** Drive Shaft.
   - Install **60079** Screw in alignment with slot in drive shaft.
   - **Notice:** Identify ***SLIP-FIT HOLE*** in **60078** Spring Washer. With larger diameter toward collet body end of drive shaft install spring washer with ***SLIP-FIT HOLE*** up. (*It is helpful to rest assembly on bronze or aluminum jaws, with vise partially open.*)

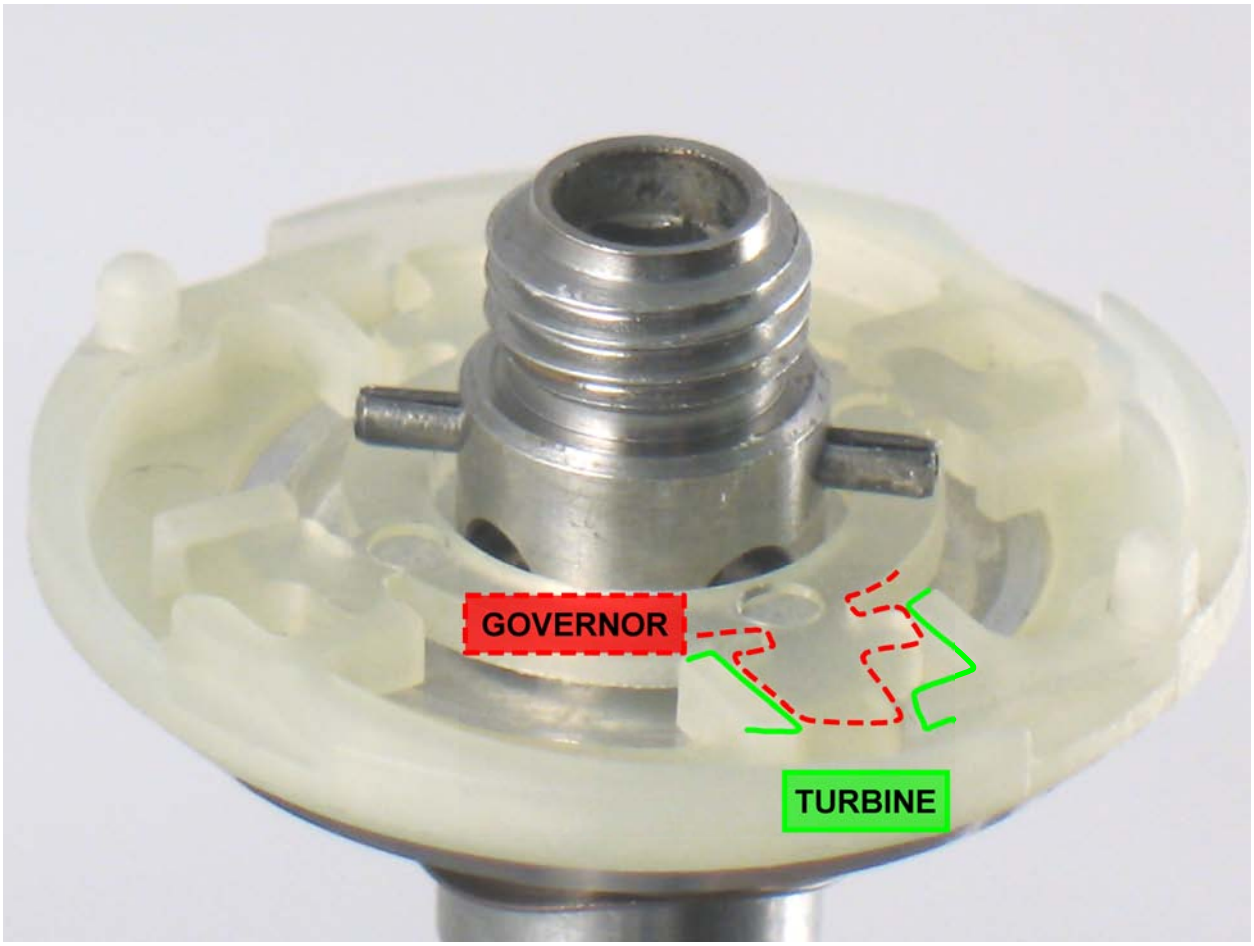




   - Install **60091** Pin. Make ends of pin even with **O.D.** of **60078** Spring Washer.

2. Fasten drive shaft in vise with ‘Motor End’ pointing up.

- Install **51656** Turbine Base onto drive shaft.
- Install **60098** Pin through ‘Cross-Hole’ so that it is ‘Centered’ in drive shaft.



3. Install **51678** Turbine and **51675** or **51691** Governor (stretch governor around pin).

4. Install **60069** Brake Plate.

- Align, ‘slot & notch’ brake plate features, with **60089** Pin, and **51678** Turbine.
- Apply a small amount of Loctite #222 or equivalent to threads on drive shaft.

5. Use 1/2" hex socket and torque wrench to install **60099** Nut.
- Torque to 4.5 N•m/~40 lbs. in.

6. Carefully transfer **60073** Springs, and **60074** End Support onto drive shaft.

7. Use **60077** Bumper to temporarily retain parts.

8. Apply a small amount of Loctite #609 to outside diameter of **51651** Bearing.

9. Install assembly.

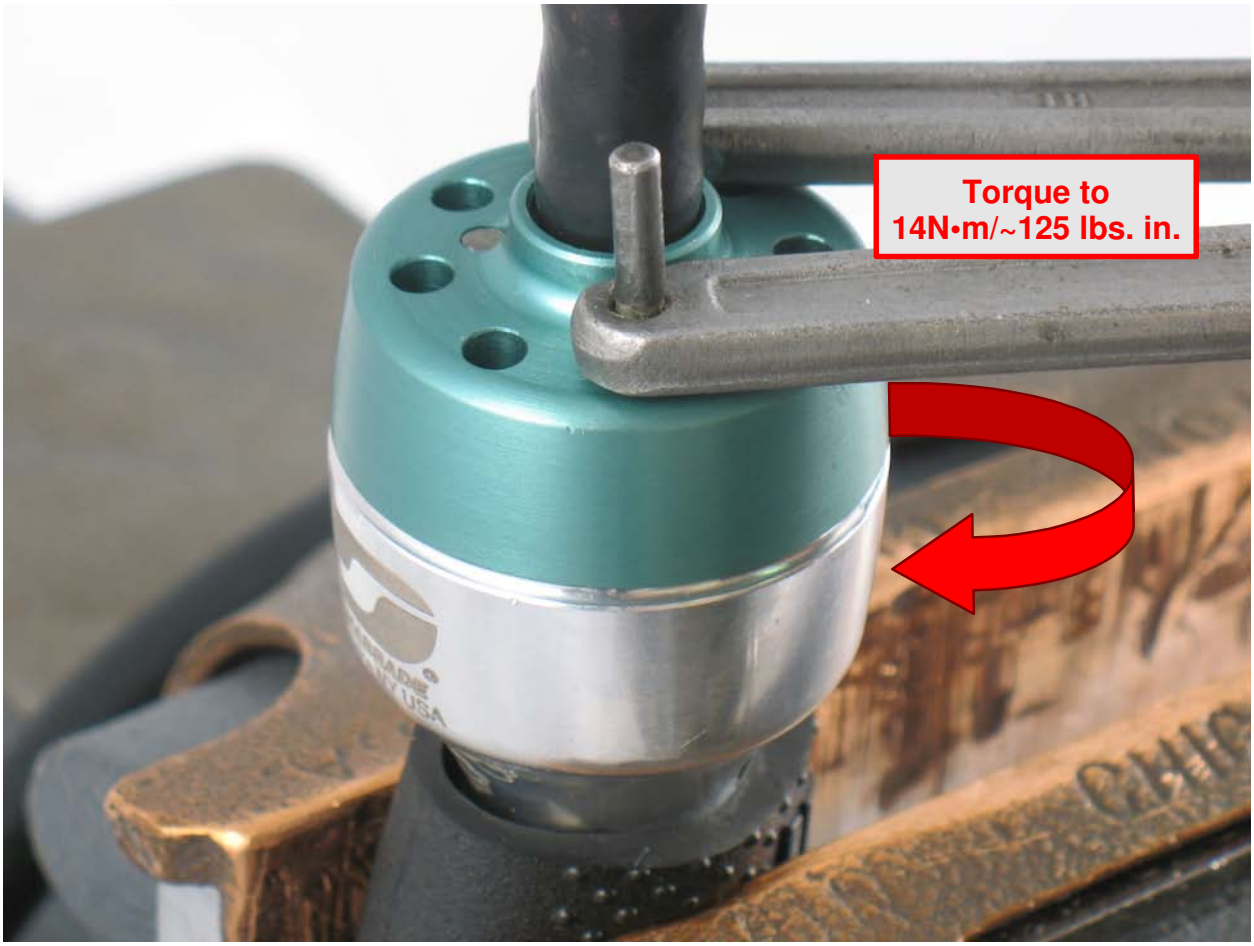
10. Remove **60077** Bumper. Back-Up **60099** Nut with **96418** Bearing Press Tool.

- Install **60093** Bearing, **60092** Rear Seal, **60090** Inner Race Seal, **60089** Outer Housing Seal and **60088** Front Seal.
- Reinstall **60077** Bumper. **Notice:** Push against bumper to compress spring washers while turning bumper to catch threads and retain parts.

11. Use a 4 mm hex key and, an adjustable wrench to fasten **60077** bumper.

12. Apply Loctite Primer #7649 or equivalent to threads of **60110** or **60111** Cover.

13. Wait five minutes, and then apply a small amount of Loctite #567 or equivalent.



14. Fasten turbine cover on housing.

- Torque to 14N•m/~125 lbs. in.

15. Install **60081** Washer, **60094** Spring, and **60087** Washer Seal into **60060** Nose Cone.

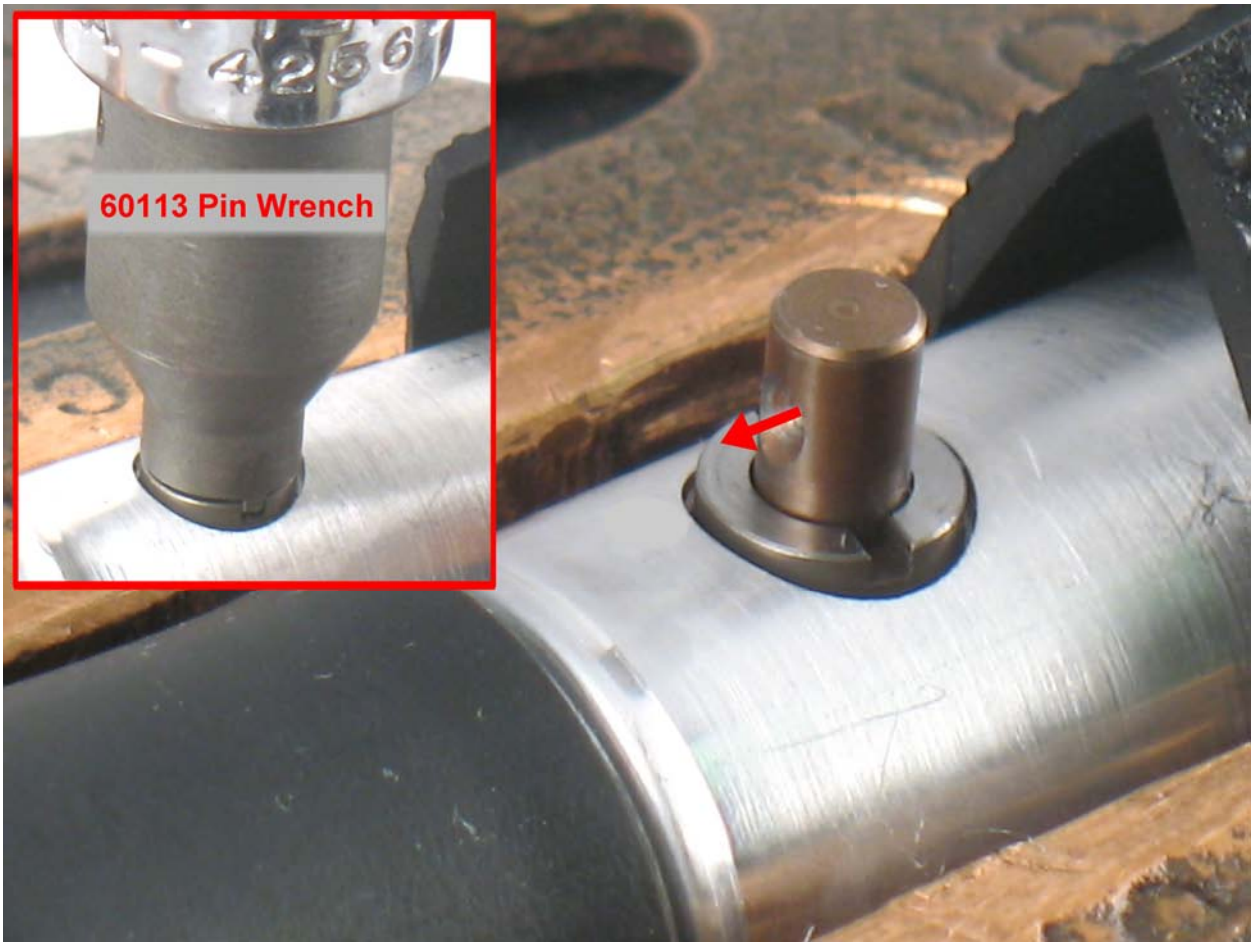
- Apply a small amount of Loctite #567 or equivalent to threads on housing.

16. Install **60066** Nose Cone. Use a 14 mm crowfoot and torque wrench to fasten.

- Torque to 4.5 N•m/~40 lbs. in.

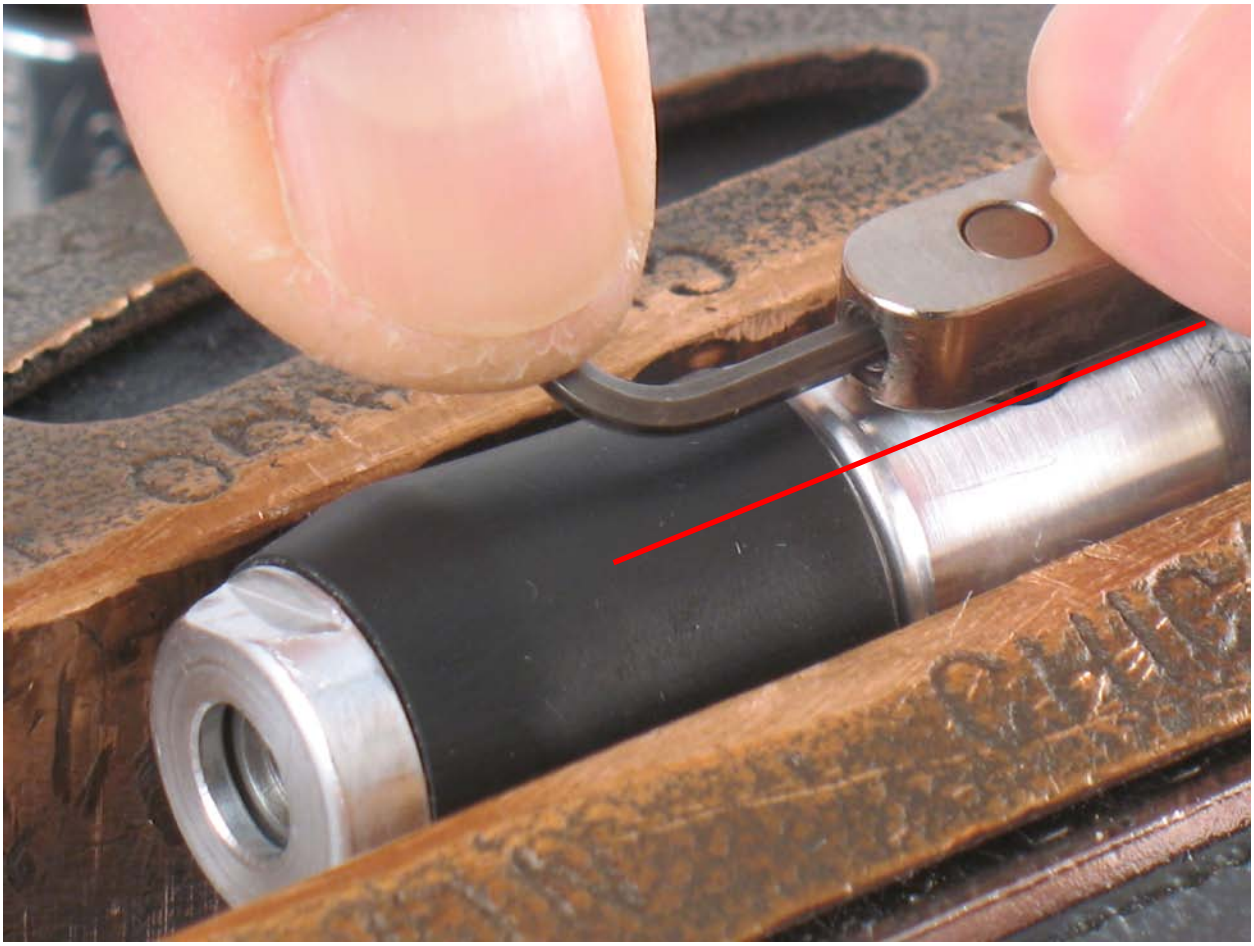
17. Insert **60082** Cam through **60080** Cam Support.

- **Notice:** Point *'SET SCREW POCKET'* forward**.**
- Apply a small amount of Loctite #271 to threads of cam support.



18. Use **60113** Pin Wrench to fasten **60080** Cam Support.

19. Apply a small amount of Loctite #271 to **60112** Set Screw



20. Use 2 mm hex key to tighten **60112** Set Screw. Fasten **60083** Lever in line with housing.

21. Rotate **60083** Lever 90° to compress spring washers and open collet.

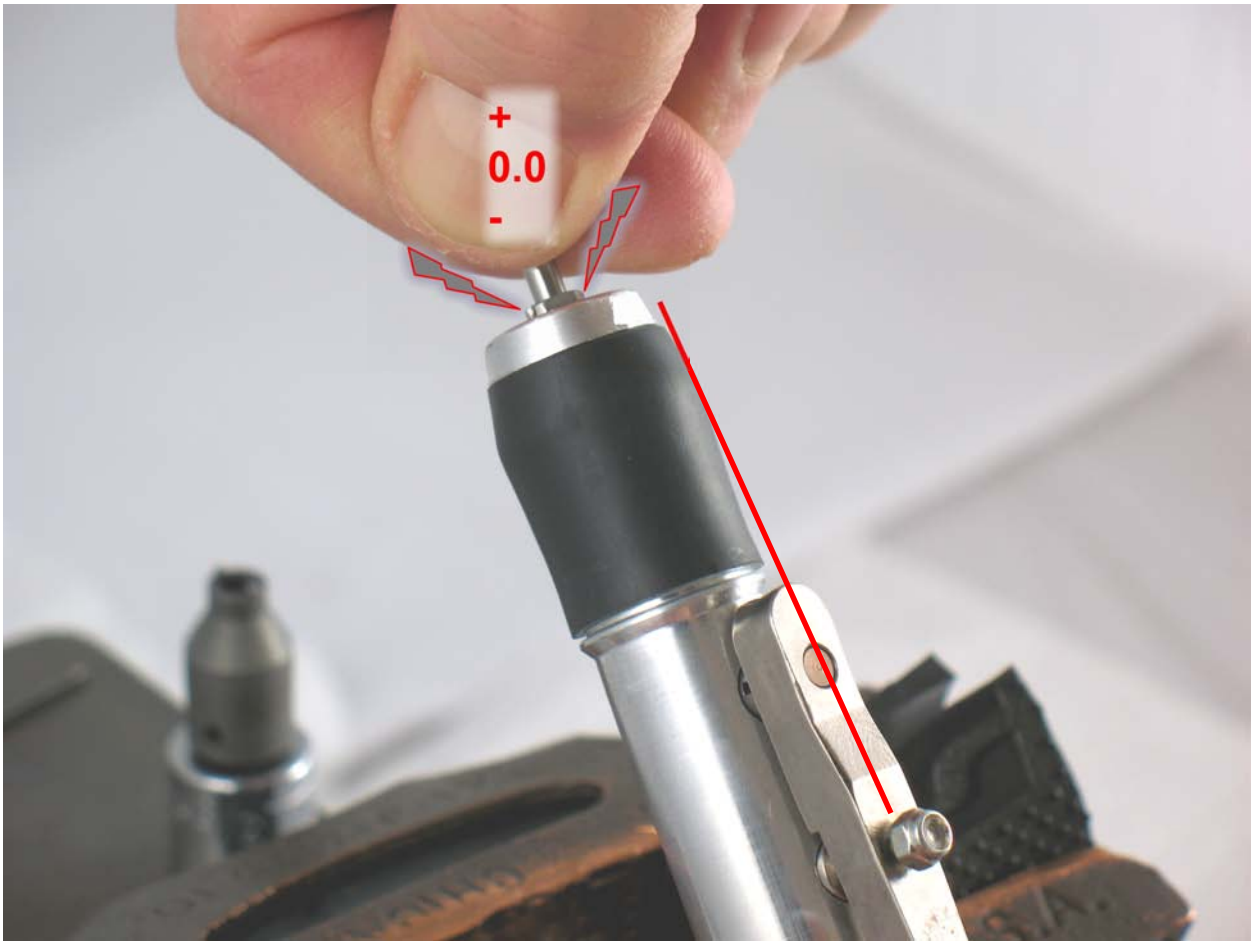
- Install **60118** or **60119** Collet Insert in drive shaft collet body.

22. Use **94600** (1/8") or **94601** (3/32") Ø Pin to guage correct adjustment and fit of collet inserts

- With **60083** Lever turned 90° to housing, insert guage pin. Check fit by inserting and removing pin. The pin should slide in and out of collet without resistance while still having a close fit.

  a. If too tight, loosen collet insert slightly.

  b. If too loose, tighten collet insert slightly.



23. With collet fit adjusted.
- Rotate **60083** Lever into alignment with housing.
- Collet will close tight on guage pin.

Drive/Motor Assembly Completed.

Use tool parts page or manual to identify valve, brake and exhaust components and the order of assembly.

Important: Allow Loctite Threadlockers and Retaining Compounds to cure/fixture for 30 minutes before checking RPM.
- Fasten **94600** (1/8") or **94601** (3/32") Ø Guage Pin into collet.
- Supply **90 psig.** (**6.2 Bar**) maximum operating air pressure at air hose of tool.
- Use tachometer to check maximum speed.