

Disassembly Instructions - 0.4 hp. Air Motor (2012 - Straight)

Notice: To avoid damage to the motor housing, use the Special Repair Tools designed for the disassembly and assembly of this motor.

Disconnect the tool from the air supply. Use the appropriate wrenches to hold the work spindle stationary and remove the accessory. (Check tool parts page or manual for correct wrenches.)

Motor Disassembly:

1. With the tool spindle pointing up, fasten the **01578** or **94523** Inlet Adapter in a vise with aluminum or bronze jaws.
2. Use the **50971** Lock Ring Tool to remove the rear exhaust cover or planetary housing. Turn counterclockwise.

Notice: For angle-head models use the **97782** Lock Ring Tool to remove the planetary adapter/gear case.



Notice: If the **01578** or **94523** Inlet Adapter loosens before the rear exhaust cover or planetary housing, remove the inlet adapter, muffler and valve parts. Fasten the **96399**, 12 mm Hex Key in the vise with the notched end pointing up.



Place the air inlet of the **45305** Housing onto the **96399** Hex Key. Line-up notch with the **97045** Pin. Use the **50971** Lock Ring Tool to remove the rear exhaust cover or planetary housing from the **45305** Housing.

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3. Remove the motor from the housing.

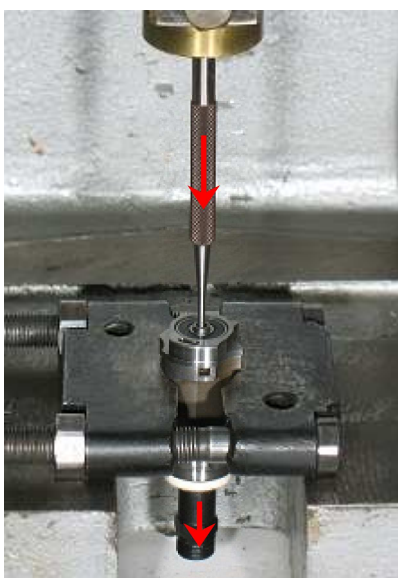


4. Carefully hold the tool spindle or pinion in the vise with aluminum or bronze jaws so that the governor is pointing up.

Use a slot-blade screwdriver to remove the governor. **LEFT HAND THREAD**
Turn clockwise.

Notice: The governor assembly is not serviceable. If the governor fails, it must be replaced as a complete assembly. (No governor on 35,000 RPM models.)

5. Fasten the **96346** Bearing Separator (2") around the **01476** Cylinder. Place the bearing separator and the motor in the **96232** Arbor Press (#2) with the tool spindle pointing down.



6. Use a 3/32" (2.38 mm) diameter flat-end drive punch as a press tool to push the rotor out of the **02696** Bearing.

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7. Remove the cylinder and vanes.
8. By hand, use the 3/32" (2.38 mm) diameter flat-end drive punch to push the **02696** Bearing (slip-fit) out of the **02676** Rear Bearing Plate.
9. Use a wrench to remove the **01435** Collet Body. Remove the **01478** Front Bearing Plate, **02649** Bearing, shims, and **01479** Spacer.



Motor Disassembly Complete.



Notice: For planetary gear tools, use the arbor press to remove the front bearing and plate.



Important: Clean and inspect parts before assembling.

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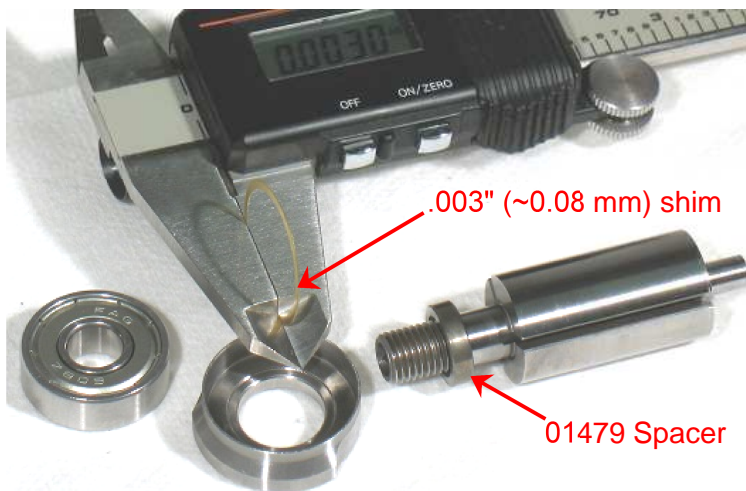
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Assembly Instructions - 0.4 hp. Air Motor (2012 - Straight)

Motor Assembly:

1. Install the **01479** Spacer onto the rotor.
2. Select **.003"** (~0.08 mm) shim thickness from the **54529** Shim Pack. Install shims in the **01478** Front Bearing Plate.
3. Install the **02649** Bearing into the front bearing plate and onto the rotor.
Notice: For the planetary-gear models use the **RAISED CENTER** of the **96240** Bearing Press Tool and the arbor press to install the **02649** Bearing with the bearing plate onto the rotor.
4. Fasten the rotor in the vise with aluminum or bronze jaws so that the spindle is pointing up. Use a 12 mm socket and torque wrench to install the **01435** Collet Body. (**T 17 N•m/~150 in. lbs.**)
5. Use a **.001"** (~0.03 mm) thick feeler gauge to check the clearance between the bearing plate and rotor.
6. Clearance should be **.001"- .0015"** (~0.03-0.04 mm).
Notice: If the clearance needs adjustment, repeat steps 2-5. Install or remove shims as required.



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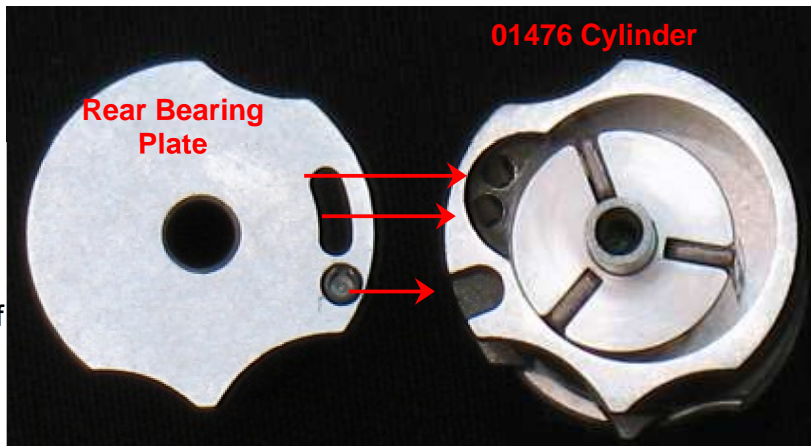
7. Use Dynabrade Air Lube **95842** 10W/NR (or equivalent) to lubricate the **01480** Vanes. Install the vanes in the rotor.

8. Install the **01476** Cylinder and the **02676** Rear Bearing Plate so that the air inlet openings line-up.

9. Position the **02696** Bearing onto the bearing journal of the rotor.

10. Use the **RAISED CENTER** of the **96242** Bearing Press Tool and the arbor press to install the **02696** Bearing onto the rotor, and into the **02676** Rear Bearing Plate.

IMPORTANT: Carefully press the bearing until the plate just touches the cylinder. Establish a "snug-fit" between the bearing plates and the cylinder.



Complete Motor Assembly

Notice: The rear bearing should sit below the outside surface of the rear bearing plate.

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11. Apply a small amount of Loctite #243 (or equivalent) to the threads of the governor assembly and carefully install the governor onto the rotor. **LEFT HAND THREAD**
Turn counterclockwise. (T 0.7 N•m/~6 in. lbs.)



LEFT HAND THREAD:
Turn counterclockwise.
(T 0.7 N•m/~6 in. lbs.)



12. Install the **45320** Governor Chamber into the **45305** Housing.

13. Line-up and carefully install the motor assembly.
Motor Assembly Complete.

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Disassembly Instructions - 0.4 hp. Planetary Reduction Gears**Planetary Disassembly:**

1. **Important:** To separate the planetary adapter/gear case from the **45305** Housing, view and follow the "**Disassembly Instructions - 0.4 hp. Air Motor (2012 - Straight)**".

2. Fasten the flats of the planetary adapter/gear case in a vise with aluminum or bronze jaws.

Use a **HEAT GUN** to warm the rear exhaust cover or planetary housing to soften the thread adhesive.

Use the **50971** Lock Ring Tool to separate the rear exhaust cover or planetary housing from the adapter.



3. Use a 2 mm or 5/64" hex key to remove the setscrew(s).



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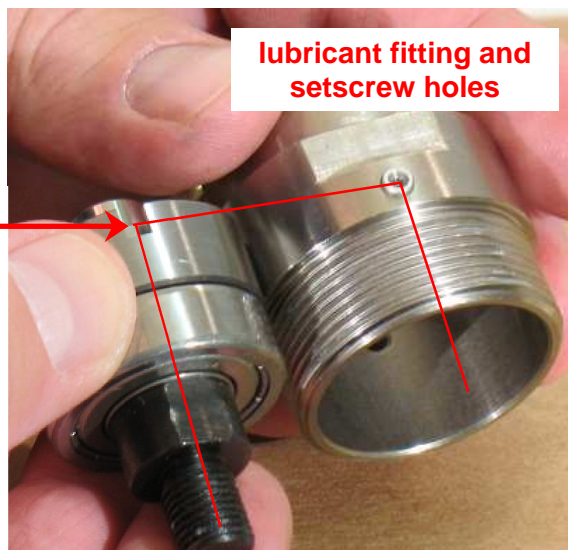
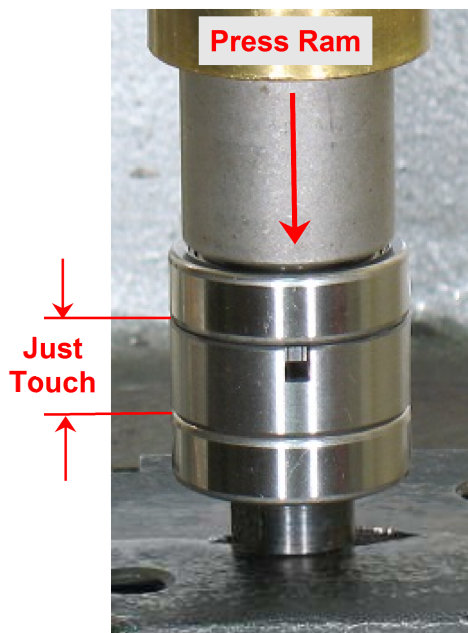
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Install the **54468** Ring Gear so that the notches will line-up with the lubricant and setscrew holes in the **53152** Adapter or **53153** Planetary Housing.

4. Use the **RAISED CENTER** of the **96239** Bearing Press Tool and the arbor press to install the **54520** Bearing onto the planetary carrier. **IMPORTANT:** Carefully press the bearing to just touch the ring gear. This will establish a snug-fit between the bearings and the ring gear.



5. Install the planetary reduction into the adapter and/or planetary housing. Apply Loctite #567 (or equivalent) to the **50784** Setscrew(s) and install.



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6. Apply Loctite #7649 Primer, and a small amount of Loctite #567 (or equivalent) to the threads of the adapter.



7. Fasten the wrench flats of the **53152** Adapter in the vise, and install the rear exhaust cover or planetary housing onto the adapter.
(T to 28 N•m/~250 in. lbs.)

8. Use the **95541** Lubricant Gun to supply 2 plunges of **95542** Grease (or equivalent) through the lubricant fitting(s). It is recommended to supply 2 plunges of grease after every 50-hours of use.



Planetary Assembly Complete.

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7. Use a **HEAT GUN** to warm the **50782** Adapter or **53150** Pinion to soften the thread adhesive.

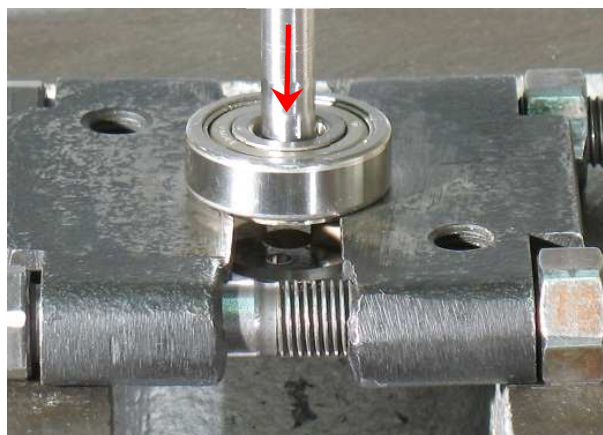
With the planetary carrier pointing up, carefully fasten the adapter or pinion in the vise with aluminum or bronze jaws. **Notice:** To prevent the pinion from turning in the vise, insert a 3 mm diameter pin through the cross-hole in the pinion.



Insert a screwdriver through the carrier and turn counterclockwise to remove the adapter or pinion.

8. Use the arbor press, and a 5/16" flat-end drive punch as a press tool to push the planetary carrier out of the remaining **54520** Bearing.

Planetary Disassembly Complete.



Clean and inspect parts before assembling.

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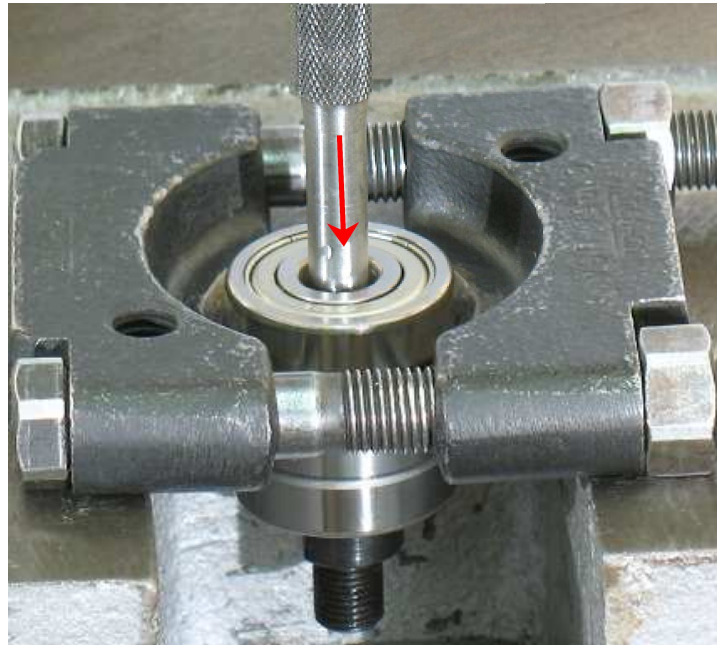
4. Remove the planetary reduction.

Important: Fasten the **96346** Bearing Separator (2") with the **FLAT SIDE** facing the RING GEAR and the **BEVELED SIDE** facing the "REAR" **54520** Bearing. Place the bearing separator and the planetary reduction in the **96232** Arbor Press (#2) with the **50782** Adapter or **53150** Pinion pointing down.



5. Use a 5/16" flat-end drive punch as a press tool to push the planetary carrier out of the "REAR" **54520** Bearing.

6. Remove the ring gear, shafts, and planet gears.



Notice: Gently tap the carrier on a hard surface. The shafts and gears will fall out of the carrier.

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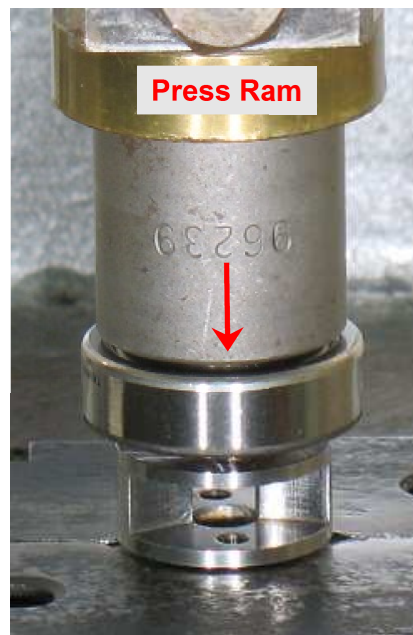
Assembly Instructions - 0.4 hp. Planetary Reduction Gears

Planetary Assembly:

1. Use the **RAISED CENTER** of the **96239** Bearing Press Tool and the arbor press to install the **54520** Bearing onto the front of the planetary carrier.



← Thread at front of carrier.



Press Ram

2. Apply a small amount of Loctite #271 (or equivalent) to the adapter or pinion thread.



Carefully hold the planetary carrier in the vise with aluminum or bronze jaws and install the adapter or pinion onto the planetary carrier. (T to 17 N•m/~150 in. lbs.)

3. Apply the **95542** Grease (or equivalent) to the needle bearings in the planet gears.



(T to 17 N•m/~150 in. lbs.)

Install the planet gears and the **54472** Pins into the carrier.

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Disassembly Instructions - 0.4 hp., Angle-Head

Disconnect the tool from the air supply. Use the **95987**, 5/16" Wrench to hold the work spindle stationary, and remove the accessory.

Angle-Head Disassembly:

1. Fasten the wrench flats of the **54547** Angle Housing in a vise with aluminum or bronze jaws.

2. Use an adjustable wrench to loosen the **54527** Lock Ring.
LEFT HAND THREAD
Turn clockwise.

Separate the **53451** or **53454** Adapter from the **54547** Angle Housing.

3. Use a 5/8" or 16 mm hex key to remove the **54540** Retaining Nut.
LEFT HAND THREAD
Turn clockwise.



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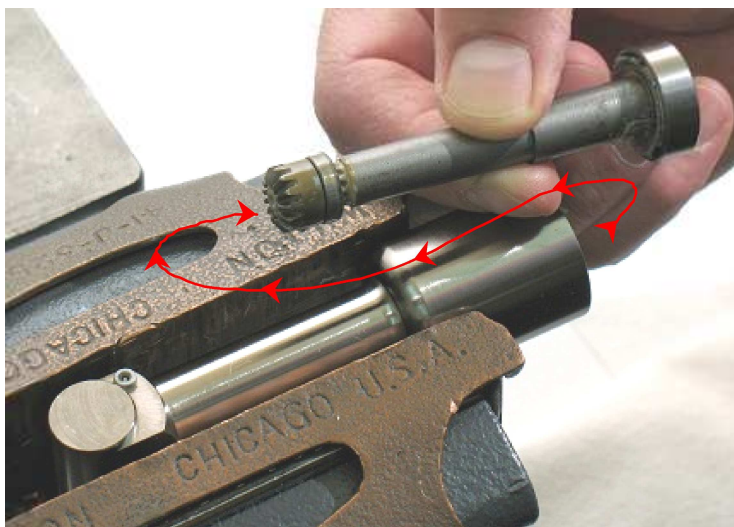
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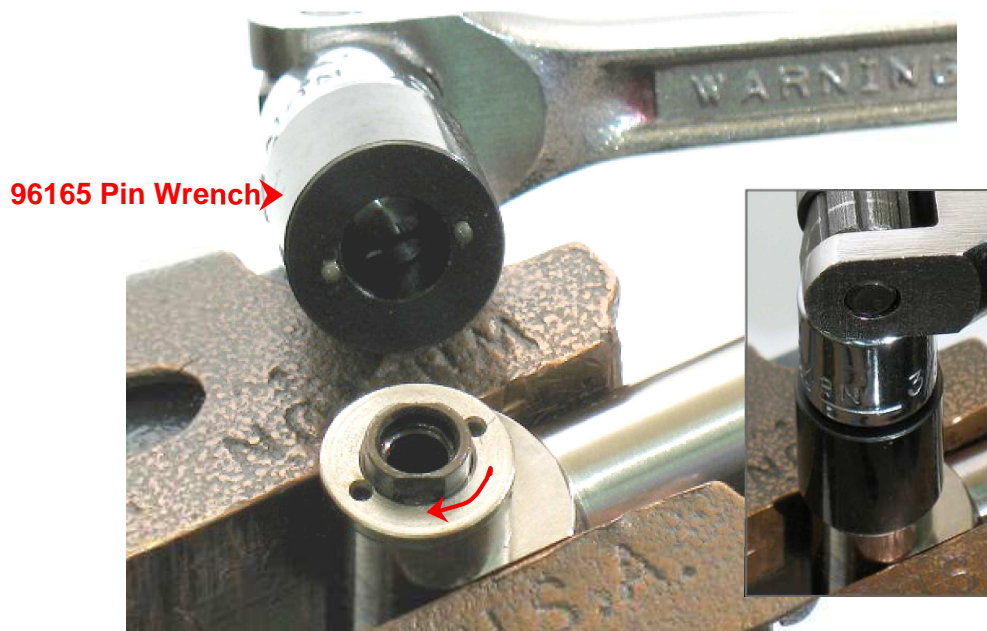
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4. Remove the **54541** Spindle and connected parts, from the **54547** Angle Housing.



5. Reposition the **54547** Angle Housing and fasten the flat sides of the housing in the vise with the **54550** Bearing Cap facing up.



6. Use the **96165** Pin Wrench to remove the bearing cap. **LEFT HAND THREAD**
Turn clockwise.

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7. Remove the **54549** Work Spindle, bearings and shims.
8. Use the **96345** Bearing Separator (15/16"), a 3/16" flat-end drive punch, and the **96232** Arbor Press (#2) to remove the bearings from the **54549** Work Spindle, and the **54541** Spindle.



Angle-Head Disassembly Complete.

Clean and inspect parts before assembling.

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Assembly Instructions - 0.4 hp., Angle-Head

Angle-Head Assembly:

1. Use the **RAISED CENTER** of the **96243** Bearing Press Tool and the arbor press to install the **54542** Bearings (2) onto the **54549** Work Spindle and the **54541** Spindle.



2. Use the **RAISED CENTER** of the **96418** Bearing Press Tool and the arbor press to install the **54537** Bearing onto the **54549** Work Spindle.



3. Use the **54536** Shim Pack. **Notice:** Shim pack contains .002" (0.05 mm) and .005" (~0.13 mm) thick shims. To start, install a .002" (0.05 mm) thick shim into the **54547** Angle Housing.

Install **54549** Work Spindle with bearings into the angle housing.

4. Use the **96165** Pin Wrench to install the **54550** Bearing Cap hand-tight.
LEFT HAND THREAD
Turn counterclockwise.



5. Rotate the work spindle to check the fit in the angle housing. The spindle should turn smoothly. Also, check axial movement of the spindle.
 - a) If spindle rotation is rough, remove the shim and check rotation again.
 - b) If there is axial movement, add shims as required.



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6. When the adjustment is correct, apply Loctite #7649 Primer to the threads of the **54550** Bearing Cap. Apply a small amount of Loctite #567 (or equivalent) to the threads of the bearing cap. Use the **96165** Pin Wrench to tighten the bearing cap.
(T to 1.2 N•m/~11 in. lbs.)
7. Install the **95398** Bearing onto the **54541** Spindle. **Notice:** If necessary, use the **RAISED CENTER** of the **96243** Bearing Press Tool and the arbor press.
8. Install the **54541** Spindle with bearings into the housing.



Install the **54540** Retaining Nut. (T to 34 N•m/~300 in. Lbs.)

9. With the **54541** Spindle secured in the angle housing, shake the angle housing assembly to check movement of the spindle assembly. **Notice:** Minimal movement is desired to reduce gear backlash.



If there is movement, use the **54536** Shim Pack and add shims as required.

Notice: Shim pack contains .002" (0.05 mm) and .005" (~0.13 mm) thick shims.

10. Fasten the wrench flats of the **54547** Angle Housing in a vise with aluminum or bronze jaws.
 11. Join the **53451** or **53454** Adapter to the **54547** Angle Housing. Use an adjustable wrench to tighten the **54527** Lock Ring. **LEFT HAND THREAD** Turn counterclockwise.
 12. Use an adjustable wrench to tighten the **54527** Lock Ring. **LEFT HAND THREAD** Turn counterclockwise. (T to 34 N•m/~300 in. lbs.)
- Angle-Head Assembly Complete.**

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