

Disassembly Instructions - 0.4 hp. Air Motor (Right Angle)

(Models: 46000, 46001, 46002, 47800, 47801, 47802, 47820, 47821, 47822, 48315, 48316, 48317, 48520, 48521, 48522, 48540, 48541, 48542, 48530, 48531, 48532, 49425)

Important: Use these instructions along with the tool, parts page or manual.

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.

Motor Disassembly:

All Non-Planetary Models

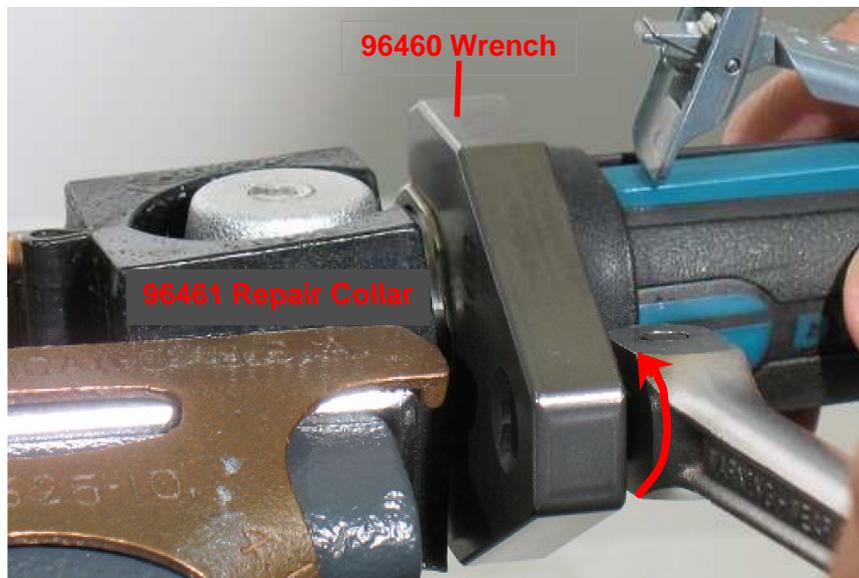
1. Use the **96461** Repair Collar to hold the **02031** or **02052** Housing in a vise, with the work spindle pointing down.

2. Use the **96460** Wrench to loosen and separate the **45305** or **45307** Housing Core.

Left Hand Thread

Turn clockwise.

Remove the motor from the housing core.



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Planetary Geared Model 49425

1. With the right angle housing pointing up, fasten the **01578** or **94523** Inlet Adapter in a vise with aluminum or bronze jaws.
2. Use an adjustable wrench to remove the **50024** Gear Case. Turn counterclockwise. Remove the motor from the housing core.

Notice: If the **01578** or **94523** Inlet Adapter loosens before the gear case, remove the inlet adapter, muffler and valve parts.

Fasten the **96399** Hex Key (12 mm) in the vise with the notched end pointing up.



Place the air inlet of the **45305** Housing Core onto the **96399** Hex Key. Line-up notch with the **97045** Pin.

Use an adjustable wrench to remove the gear case from the **45305** Housing Core.

To disassemble the muffler and valve components, refer to, and follow the exploded view instructions found in the parts page or tool manual.



Important: View & Follow, "Disassembly Instructions - 0.4 hp. Planetary Reduction Gears"

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Disassembly/Assembly Instructions

All Models: View and Follow, "**Disassembly Instructions - 0.4 hp. Air Motor (Straight)**"

3. Carefully hold the pinion gear in the vise with aluminum or bronze jaws so that the governor is pointing up.

4. Use a slot-blade screwdriver to remove 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 pinion gear 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.

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 spiral bevel pinion gear. Remove the **01478** Front Bearing Plate, **02649** Bearing, shims, and **01479** Spacer. Turn counterclockwise.

Notice: Planetary gear models, use the arbor press to remove the front bearing and plate.

Motor Disassembly Complete.

Important: Clean and inspect parts before assembling.

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All Models: View and Follow, "**Assembly Instructions - 0.4 hp. Air Motor (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: Planetary geared 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.

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Disassembly/Assembly Instructions

4. Fasten the rotor in the vise with aluminum or bronze jaws so that the spindle is pointing up. Use a 14 mm Crowfoot and torque wrench to install the pinion gear.
(T 17 N•m/~150 in. lbs.)
5. Pull the front bearing plate forward to take play out of the bearing. 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:** Repeat steps 2-5 if clearance needs further adjustment. Install or remove shims as required.
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. This will establish a "snug-fit" between the bearing plates and the cylinder.
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 to 0.7 N•m/~6 in. lbs.)
12. Fasten the **96399** Hex Key (12 mm) in a vise with aluminum or bronze jaws so that it is pointing up. Place the **45305** Housing Core onto the 12 mm hex key so that the air inlet is pointing up.
13. Refer to the parts page or tool manual and follow the exploded view instructions to assemble the muffler and valve components.
14. Install the **01564** Air Control Ring onto the **01578** or **94523** Inlet Adapter and apply a small amount of Loctite #567 to the male threads of the inlet adapter.
15. Use a torque wrench to install the inlet adapter. (T to 28 N•m/~250 in. lbs.)
16. Line-up the **45320** Governor Chamber pin with the hole on the inside of the **45305** or **45307** Housing Core.
17. Install the **45320** Governor Chamber.

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18. Carefully line-up and install the motor assembly.
Motor Assembly Complete.

Important: View and Follow, "Assembly Instructions - 0.4 hp. Planetary Reduction Gears"

19. Fasten the **01578** or **94523** Inlet Adapter in the vise with aluminum or bronze jaws so that the motor pinion is pointing up.

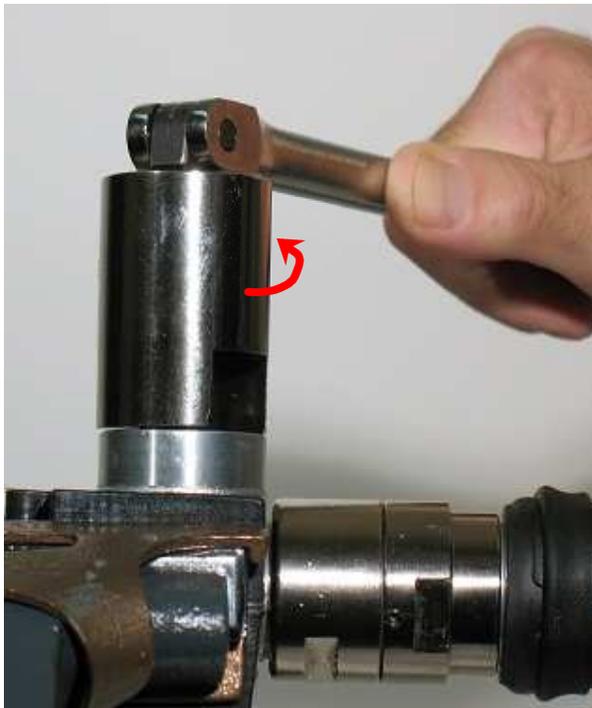
Apply a small amount of Loctite #567 to the threads of the **45305** Housing Core.

Install the planetary gear assembly onto the housing core (motor assembly). (T to 34 N•m/~300 in. Lbs.)



Right Angle Disassembly:

1. Use the **96461** Repair Collar to hold the **02031** or **02052** Housing in a vise, with the work spindle pointing up.



Use the **50971** Lock Ring Tool to remove the **02035** Lock Nut. Turn counterclockwise.

2. Pull the right angle work spindle, bearing and bevel gear out of the housing.



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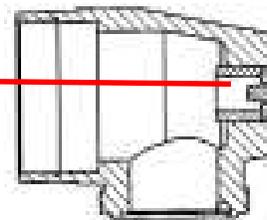
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3. Remove the lubricant wicks and any shims.



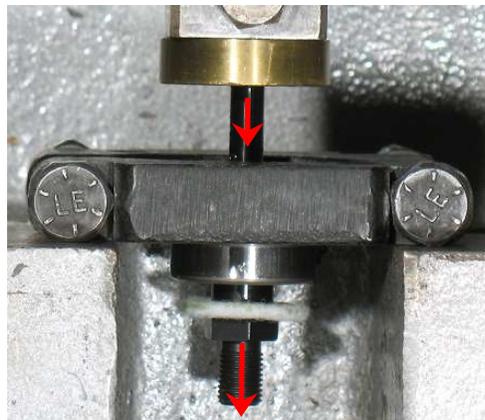
4. **Notice:** The **02033** Needle Bearing rarely requires replacement. Only remove the **02033** Bearing, and the **02041** Gear Oil Plate when the bearing needs to be replaced.



02031 or **02052** Housing
02033 Needle Bearing
02041 Gear Oil Plate
 - (Apply **2 Drops of Loctite**
 - **#680** to install **02041**
 Gear Oil Plate.)

01041 Lubricant Fitting

5. Fasten the **96346** Bearing Separator (2") between the bevel gear and the **54520** Bearing. Place the bearing separator with the work spindle, bearing and bevel gear in the **96232** Arbor Press (#2) with the working-end pointing down.



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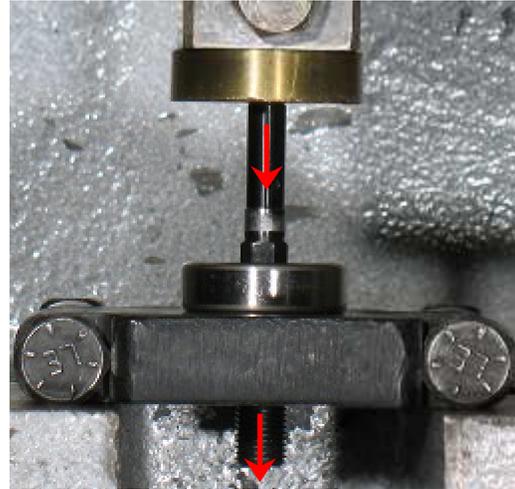
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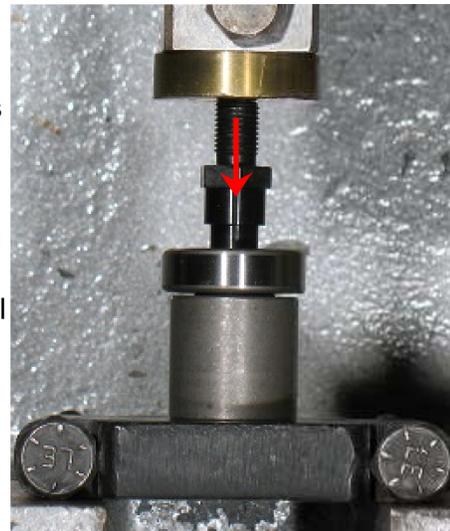
6. Use the bearing separator and the arbor press to remove the **54520** Bearing.

Right Angle Disassembly Complete.



Right Angle Assembly:

1. Refer to: #4. "Right Angle Disassembly". Replace parts as required.
2. Use the **RAISED CENTER** of the **96239** Bearing Press Tool and the arbor press to install the **54520** Bearing onto the work spindle.
3. Carefully line-up the hex shaped profile in the gear and on the work spindle. Use the **RAISED CENTER** of the **96419** Bearing Press Tool and the arbor press to install the bevel gear onto the work spindle.



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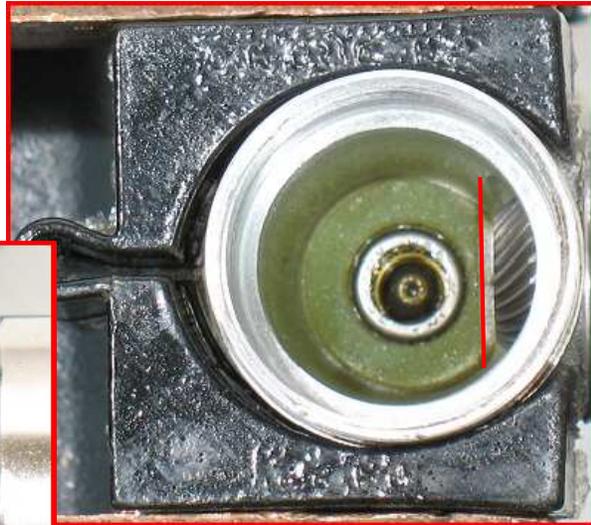
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- Saturate the lubricant wicks with the **95848** Gear Oil.

Install the **02043** or **02045** Top Wick into the right angle housing. Place the flat side toward the pinion gear.

Install the **02042** or **02044** Bottom Wick.



- Install the work spindle, gear and bearing.
- Check the rotation of the work spindle.
 - Rotate work spindle a full 360°.
 - Turn spindle clockwise and counterclockwise.



Notice: Rotation should be smooth. The backlash (clearance) between the gear teeth should be close, without being too tight.

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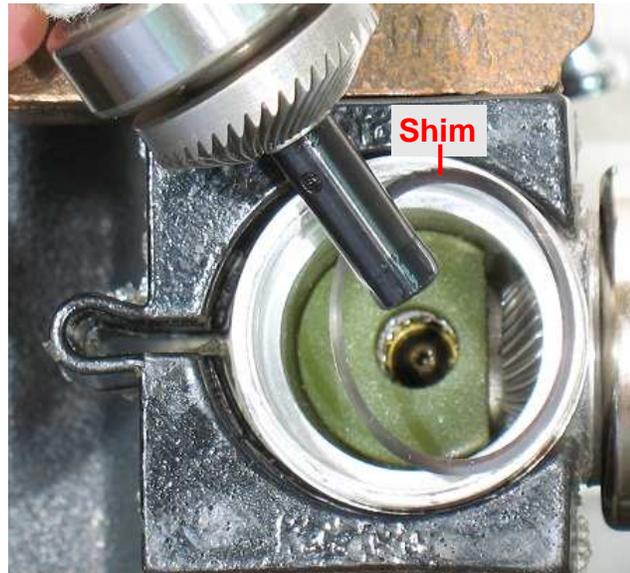
7. By hand, install the **02035** Lock Nut, and check the fit of the gears.

If too tight, remove the work spindle, bearing and bevel gear.

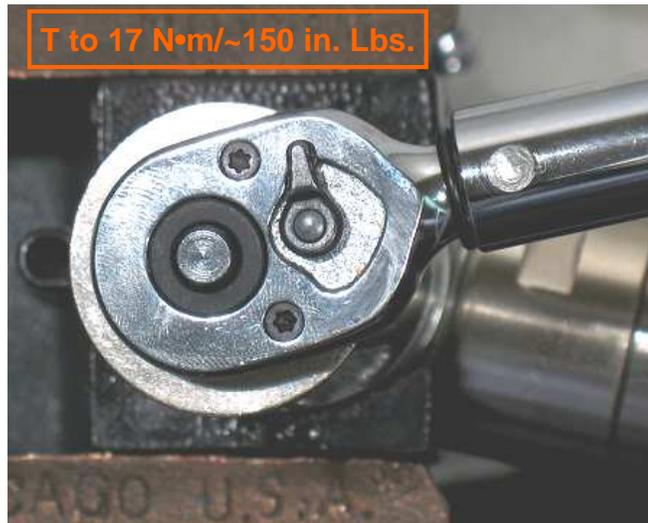
As required, add or remove shim(s) to establish the correct gear fit.

Install the **01486** Fabric Washer.

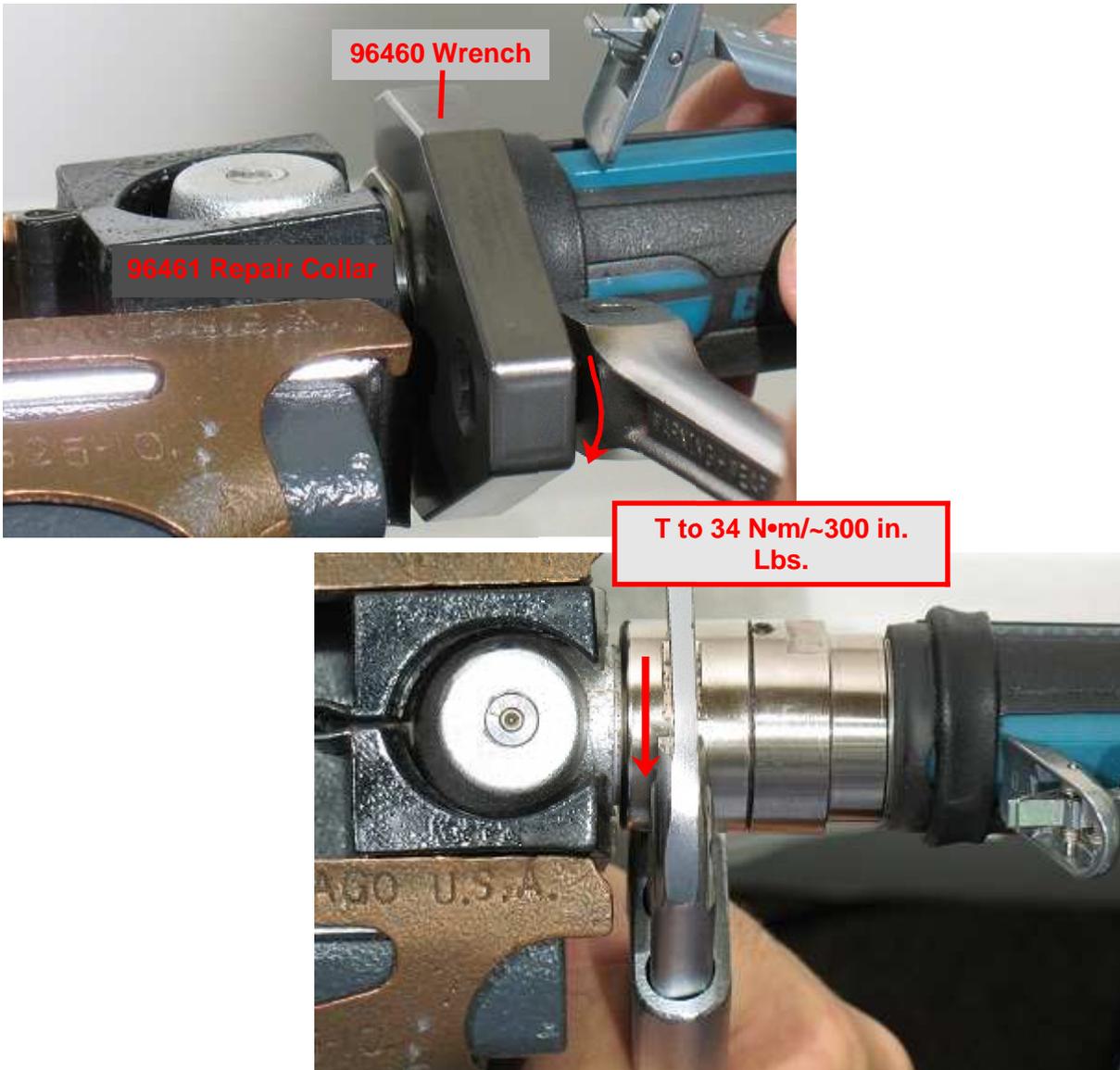
8. Once the gear adjustment is made, apply a small amount of the Loctite #567 to the threads of the **02035** Lock Nut.



Install the lock nut and tighten. (T to 17 N•m/~150 in. Lbs.)



9. Tighten the **45305** or **45307** Housing Core, or the **50019** Lock Nut onto the **02031** or **02052** Right Angle Housing. **Notice:** Work the left hand thread and right hand thread against each other while holding the throttle lever in the desire position. (T to 34 N•m/~300 in. Lbs.)



10. Move **01547** Insulating Collar back into the proper position.

Right Angle Assembly Complete.

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