



909-1600

909-1700

SERIES 909 RIGHT ANGLE TUBE ROLLER



OPERATING INSTRUCTIONS & SERVICE MANUAL

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TO REDUCE THE RISK OF INJURY AND EQUIPMENT DAMAGE
USER MUST READ AND UNDERSTAND OPERATOR'S MANUAL.

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SAFETY INSTRUCTIONS



WARNING!

READ AND UNDERSTAND ALL INSTRUCTIONS

Failure to follow all instructions listed below, may result in accident, fire and/or personal injury.

SAVE THESE INSTRUCTIONS

1. Do not allow corrosive gases or foreign material to enter the unit. Moisture, oil-based contaminants, or other liquids must be filtered out.
2. Eye protection is always required when running motor.
3. Hearing protection is recommended when in close proximity to all operating air motors.
4. Dust mask, non-skid safety shoes, hard hat, gloves and other personal safety equipment must be used.
5. Stay alert, watch what you are doing, and use common sense when operating a power tool.
6. Dress properly. Do not wear loose clothing or jewelry.
7. Keep your work area clean and well lit.
8. Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust.
9. Disconnect the tool from the air supply before installing, making any adjustment, changing accessories, servicing or storing tool.

OPERATION

Always operate, inspect and maintain this tool in accordance with American National Standards Institute Safety Code for Portable Air Tools (ANSI B186.1) and any other applicable safety codes and regulations.

FOR TOP PERFORMANCE AND MAXIMUM DURABILITY OF PARTS, OPERATE THIS TOOL AT 90 psig (6.2bar/620kPa) AIR PRESSURE WITH ½” (13mm) DIAMETER HOSE.

WARNING: Always turn off the air supply and disconnect the air supply hose before installing, removing or adjusting any accessory on this tool, or before performing any maintenance on this tool. Failure to do could result in injury.

Air powered tools can vibrate in use. Repetitive motions, uncomfortable positions, vibrations can cause injury to hands, fingers, wrists of some persons. Stop using any tool if discomfort, tingling felling or pain occurs. Seek medical advice before resuming use.

HOSE AND HOSE CONNECTIONS

Use ½” (13mm) hose or hose fitting with a Male Hose Nipple (1/2” hose to ½” male pipe) for attaching it to the tube Roller. A smaller hose or hose fitting will reduce the power and efficiency of the Tube Roller.

LUBRICATION

After each two or three hours of operation, unless an Air Line Lubricator is used, disconnect the air hose and pour into the inlet about 3cc of SAE No. 10 or ‘Wilsolub’ Pneumatic motor oil Cat. No. 9047.

The use of an Air Line Lubricator is recommended with any air-operated tool. Install an Wilson automatic lubricator Cat. No. 8597 as close to the tool as possible.

Gearing and Right-Angle Assembly should be grease lubricated approximately every 160 hours of operation. Inject bearing type grease, 1 to 2 strokes through grease fitting in housing. Grease Gun Nozzle Cat No. 53553-0001 is supplied with the tool.

OPERATION INSTRUCTIONS

Never operate this tool unless its dead handle/reaction bar is held firmly against a solid mass.

Do not use a heavy oil or gum-forming oil. The use of either will cause sluggish, inefficient performance.

Use only clean oil. Dirty oil will cause cutting and scoring of internal parts.

Weekly, or before storing the Tool for a long time, put a liberal amount of oil into the Air Inlet. Also keep operating air moisture to a minimum. Compressor after coolers, air line traps, water separators, and rust inhibiting oil can help.

Clean or replace rusted parts during service check.

MAINTENANCE

WARNING

Always turn off the air supply and disconnect the air supply hose before installing, removing or adjusting any accessory on this tool, or before performing any maintenance on this tool. Failure to do could result in injury.

Air tools are made of precision parts and should be handled with reasonable care when servicing.

Excessive pressure exerted by a holding device may cause distortion of a part. Apply pressure evenly when disassembling (or assembling) parts which have a press fit.

When removing or installing bearing, apply pressure to the bearing race that will be the press fit to mating part; if this is not practiced, Brinelling of the bearing race may occur making replacement necessary.

It is important that the correct tools and fixtures are used when servicing this tool.

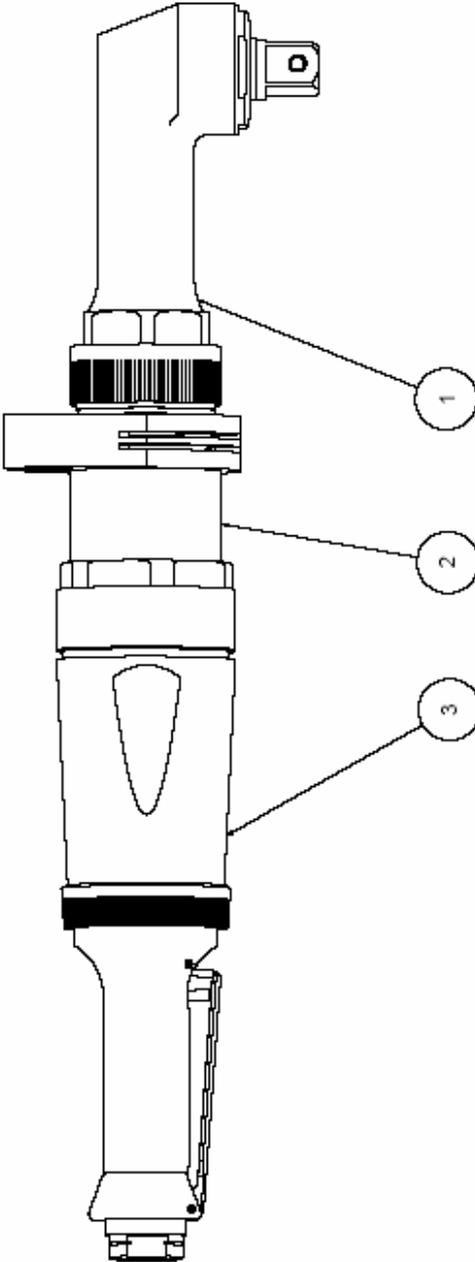
Disassembly should be done on a clean work bench with a clean cloth spread to prevent the loss of small parts. After disassembly is completed; all parts should be thoroughly washed in a clean solvent, blown dry with air and inspected for wear levels, abuse and contamination.

Double sealed or shielded bearings should never be placed in solvent unless a good method of re-lubricating the bearing is available. Open bearings may be washed but should not be allowed to spin while being blown dry. When replacement parts are necessary, consult drawing containing the parts for identification.

Before reassembling, lubricate parts where required. Use bearing grade grease in bearings. When assembling 'O' ring, care must be exercised to prevent damage to the rubber sealing surfaces. A small amount of grease will usually hold steel balls and small parts in place while assembling.

When ordering parts, be sure to list PART NUMBER, PART NAME, MODEL NUMBER AND SERIAL NUMBER OF TOOL. USE ONLY GENIUE REPLACEMENT PARTS.

PARTS LIST

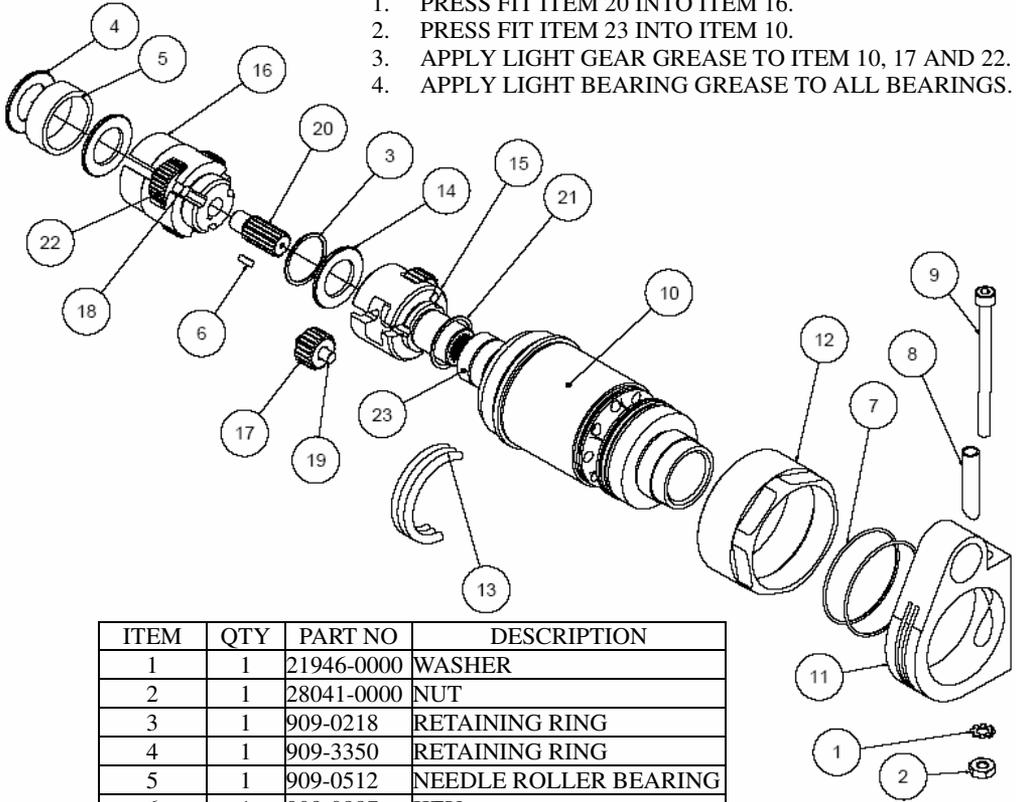


| KEY | PART NO. 909-1600 | PART NO. 909-1700 | QTY | DESCRIPTION |
|-----|----------------------|----------------------|-----|-------------------------------|
| 1 | 909-3939 | 909-3939 | 1 | RIGHT ANGLE HEAD ASSY |
| 2 | 909-4940 | 909-4939 | 1 | GEAR TRAIN ASSEMBLY |
| 3 | 909-5940 | 909-5939 | 1 | THROTTLE & AIR MOTOR ASSEMBLY |

PARTS LIST,

NOTES:

1. PRESS FIT ITEM 20 INTO ITEM 16.
2. PRESS FIT ITEM 23 INTO ITEM 10.
3. APPLY LIGHT GEAR GREASE TO ITEM 10, 17 AND 22.
4. APPLY LIGHT BEARING GREASE TO ALL BEARINGS.

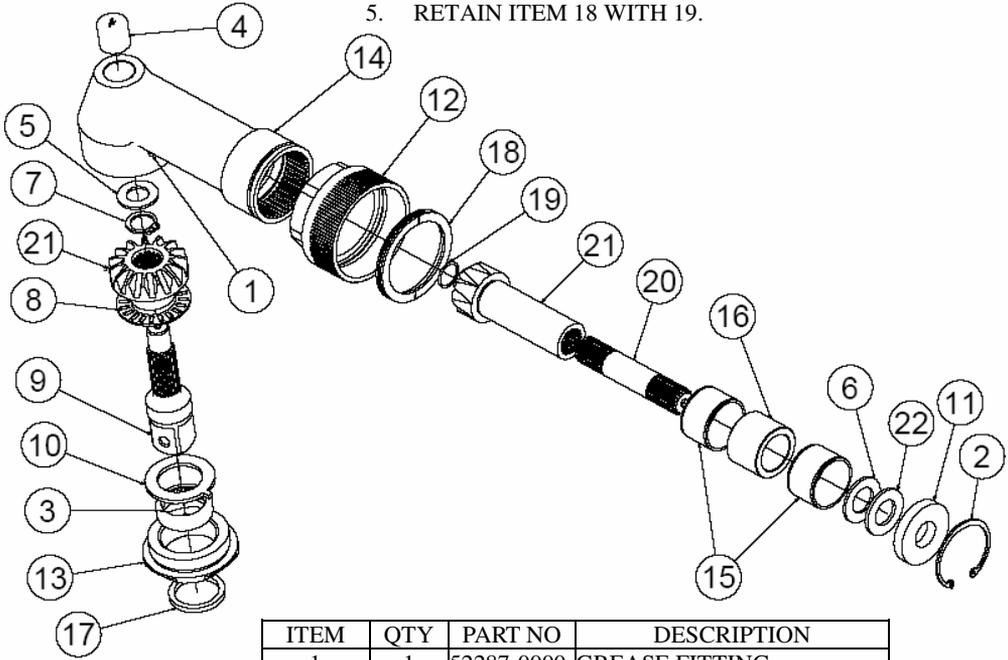


| ITEM | QTY | PART NO | DESCRIPTION |
|----------|-----|------------|-----------------------|
| 1 | 1 | 21946-0000 | WASHER |
| 2 | 1 | 28041-0000 | NUT |
| 3 | 1 | 909-0218 | RETAINING RING |
| 4 | 1 | 909-3350 | RETAINING RING |
| 5 | 1 | 909-0512 | NEEDLE ROLLER BEARING |
| 6 | 1 | 909-0887 | KEY |
| 7 | 2 | 909-0923 | 'O' RING |
| 8 | 2 | 909-1281 | LOCK SLEEVE |
| 9 | 1 | 909-151P | SOCKET HEAD SCREW |
| 10 | 1 | 909-2950 | GEAR CASE |
| 11 | 1 | 909-2953 | REACTION BAR COLLAR |
| 12 | 1 | 909-2957 | LOCK NUT |
| 13 | 3 | 909-2973 | MUFFLER |
| 14 | 3 | 909-2985 | THRUST WASHER |
| 15 | 1 | 909-3217 | LOWER GEAR CASE |
| 16 | 1 | 909-3218 | UPPER GEAR CASE |
| 17 | 3 | 909-3227 | LOWER IDLER GEAR |
| 909-1600 | 1 | 909-3228 | LOWER IDLER GEAR |
| 18 | 3 | 909-3233 | IDLER PIN |
| 19 | 3 | 909-3236 | IDLER PIN |
| 20 | 1 | 909-3239 | SHORT SPINDLE GEAR |
| 909-1600 | 1 | 909-3238 | SHORT SPINDLE GEAR |
| 21 | 1 | 909-0201 | RETAINING RING |
| 22 | 3 | 909-3533 | UPPER IDLER GEAR |
| 909-1600 | 3 | 909-3534 | UPPER IDLER GEAR |
| 23 | 1 | 909-3943 | BEARING |

PARTS LIST, 909-3939

NOTES:

1. PRESS FIT ITEM 3 INTO ITEM 13.
2. PRESS FIT ITEM 4 INTO ITEM 14.
3. APPLY LIGHT GEAR GREASE TO ITEM 20 AND 21.
4. APPLY LIGHT BEARING GREASE TO ALL BEARINGS.
5. RETAIN ITEM 18 WITH 19.



| ITEM | QTY | PART NO | DESCRIPTION |
|------|-----|------------|---------------------|
| 1 | 1 | 52287-0000 | GREASE FITTING |
| 2 | 1 | 71685-0009 | RETAINING RING |
| 3 | 1 | 909-0507 | BEARING |
| 4 | 1 | 909-0510 | BEARING |
| 5 | 1 | 909-2553 | THRUST WASHER |
| 6 | 1 | 909-2983 | THRUST WASHER |
| 7 | 1 | 909-3002 | RETAINING RING |
| 8 | 1 | 909-3154 | THRUST BEARING |
| 9 | 1 | 909-3219 | SINGLE END SPINDLE |
| 10 | 1 | 909-3230 | THRUST WASHER |
| 11 | 1 | 909-3235 | THRUST BEARING RACE |
| 12 | 1 | 909-3242 | LOCK NUT |
| 13 | 1 | 909-3245 | RETAINING NUT |
| 14 | 1 | 909-3253 | ANGLE DRIVE HOUSING |
| 15 | 2 | 909-3945 | BEARING ASSEMBLY |
| 16 | 1 | 909-3946 | BEARING SPACER |
| 17 | 1 | 909-4883 | GREASE SEAL |
| 18 | 2 | 909-5539 | SPLIT RING |
| 19 | 1 | 909-6483 | ELASTIC RING |
| 20 | 1 | 909-6730 | SPLINED ADAPTER |
| 21 | 1 | 909-6744 | GEAR SET |
| 22 | 1 | 909-9141 | THRUST BEARING |

| ITEM | QTY | PART NO | DESCRIPTION |
|------|-----|------------|-----------------|
| 1 | 2 | 25171-0000 | ROLL PIN |
| 2 | 1 | 50915-0000 | 'O' RING |
| 3 | 1 | 51179-0000 | AIR SCREEN |
| 4 | 1 | 8653-0000 | 'O' RING |
| 5 | 1 | 8659-0000 | 'O' RING |
| 6 | 2 | 909-0511 | BEARING |
| 7 | 1 | 909-0716 | THREADED PIN |
| 8 | 1 | 909-0828 | 'O' RING |
| 9 | 1 | 909-0973 | 'O' RING |
| 10 | 3 | 909-103P | ROLL PIN |
| 11 | 1 | 909-1091 | SLEEVE |
| 12 | 1 | 909-1092 | INLET FITTING |
| 13 | 1 | 909-1273 | CAP |
| 14 | 5 | 909-2584X | ROTOR BLADE |
| 15 | 1 | 909-3291 | UPPER END PLATE |
| 16 | 1 | 909-3292 | REVERSING VALVE |
| 17 | 1 | 909-3293 | BUTTON |

| ITEM | QTY | PART NO | DESCRIPTION |
|----------|-----|----------|-----------------|
| 18 | 1 | 909-3294 | CYLINDER |
| 19 | 2 | 909-3521 | RETAINING RING |
| 20 | 1 | 909-3589 | ACTUATING RING |
| 21 | 1 | 909-3590 | SPRING |
| 22 | 1 | 909-5112 | LEVER |
| 23 | 1 | 909-5113 | VALVE STEM |
| 24 | 1 | 909-5135 | MOTOR HOUSING |
| 25 | 1 | 909-5136 | BUSHING |
| 26 | 1 | 909-5355 | THROTTLE VALVE |
| 27 | 1 | 909-5356 | VALVE SEAT |
| 28 | 1 | 909-6481 | SPRING |
| 29 | 1 | 909-6537 | ROTOR |
| 909-1600 | 1 | 909-6536 | ROTOR |
| 30 | 1 | 909-6703 | STACK-UP NUT |
| 31 | 1 | 909-6710 | LOWER END PLATE |
| 32 | 1 | 909-6989 | PLUG |
| 33 | 1 | 909-S106 | PIN |

NOTES:

1. LOCITE ITEM 7 IN PLACE.
2. PRESS FIT ITEM 25 INTO ITEM 24.
3. PRESS FIT ITEM 1 INTO ITEM 18.
4. PRESS FIT ITEM 6 AND 33 INTO ITEM 31.
5. PRESS FIT ITEM 32 INTO ITEM 16.
6. APPLY LIGHT GEAR GREASE TO ITEM 29.
7. APPLY LIGHT OIL TO ITEM 14.
8. INSERT POINTED END OF ITEM 26 INTO HOLE IN ITEM 23.

DISASSEMBLY

Before starting to disassemble or reassemble this tool (any part or completely) be sure to read MAINTENANCE Section.

The basic sections and instructions for removing them from are as follows:

RIGHT-ANGLE SECTION

Using wrenches on flats of Lock Ring (Key #12), loosen Ring completely and pull Right-Angle Section from gearing.

GEARING SECTION

Hold motor housing on flats in a vise, and remove gearing section using a wrench on flats of Lock Ring (Key #12). Separate Drive Gearing from Auxiliary Gearing.

MOTOR AND THROTTLE SECTION

The remaining section becomes the Motor and Throttle Section.

Unscrew Stack-Up Nut (Key #30) and lift out Rotor Assembly. Remove Retaining Ring (Key #19) to disassembly Rotor and Rotor Blades.

TROUBLE-SHOOTING

| PROBLEM | CAUSE & REMEDY |
|------------------------------------|--|
| Motor will not run. | <ol style="list-style-type: none"> 1. Inefficient air supply —Check 90 psi and 72 CFM air supply. 2. Clogged air inlet screen —Replace. 3. Broken or severely worn rotor blades —Replace. 4. Rust due to improper storage of tool —Disassemble and clean— Refer to Disassembly procedure. 5. Broken throttle valve pin or lever |
| Motor will not reach RPM. | <ol style="list-style-type: none"> 1. Insufficient air volume —Check 72 CFM supply. 2. Dirty air inlet screen —Clean. 3. Worn rotor blades —Replace. 4. Air supply hose chocked or too small —See Operating Procedure recommended hose. |
| Motor stalls at high torque | <ol style="list-style-type: none"> 1. Insufficient air pressure —Check 90 psi supply 2. Dirty air inlet screen —Clean. 3. Rotor blades worn, chipped or broken —Replace. |
| Motor fails to stop | <ol style="list-style-type: none"> 1. Broken throttle valve spring —Replace. 2. Valve ball does not seal —Replace or rework valve seat. |

SPECIFICATIONS

| Model no. | 909-1600 | 909-1700 |
|---------------------------------|------------------------------|------------------------------|
| Type | Lever Throttle Stall Type | Lever Throttle Stall Type |
| Free Speed (RPM) | 160 | 95 |
| Min. Torque Ft-Lb | 10 | 10 |
| Max. Torque Ft-Lb | 165 | 240 |
| Air Pressure psi | 90 | 90 |
| Air Inlet | 1/2" NPT | 1/2" NPT |
| Hose | 1/2" I.D. | 1/2" I.D. |
| Air Flow @Free Speed | 72 CFM | 72 CFM |
| Spindle | 3/4" square | 3/4" square |
| Weight | 13.3 Lb (6.0kg) | 13.3 Lb (6.0kg) |

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