



909-1600

909-1700

SERIES 909 RIGH ANGLE TUBE ROLLER



OPERATING INSTRUCTIONS & SERVICE MANUAL

Rev: A, 2/26/2007

**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.

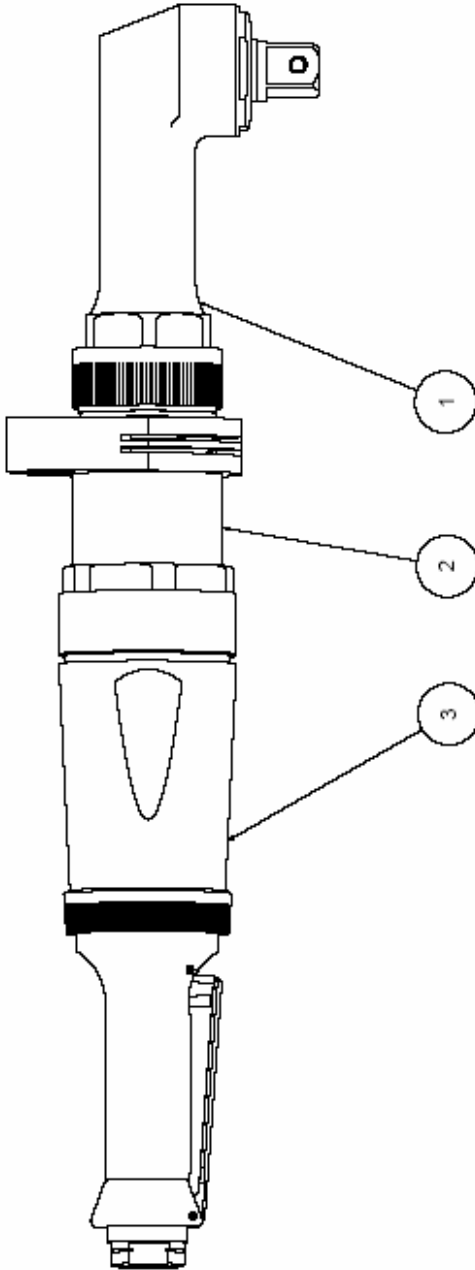
Disassembly should be done on a clean work bench with a clean cloth spread to prevent the loss of small parts. After disassembly is completed; all parts should be thoroughly washed in a clean solvent, blown dry with air and inspected for wear levels, abuse and contamination.

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 GENUINE REPLACEMENT PARTS.

PARTS LIST

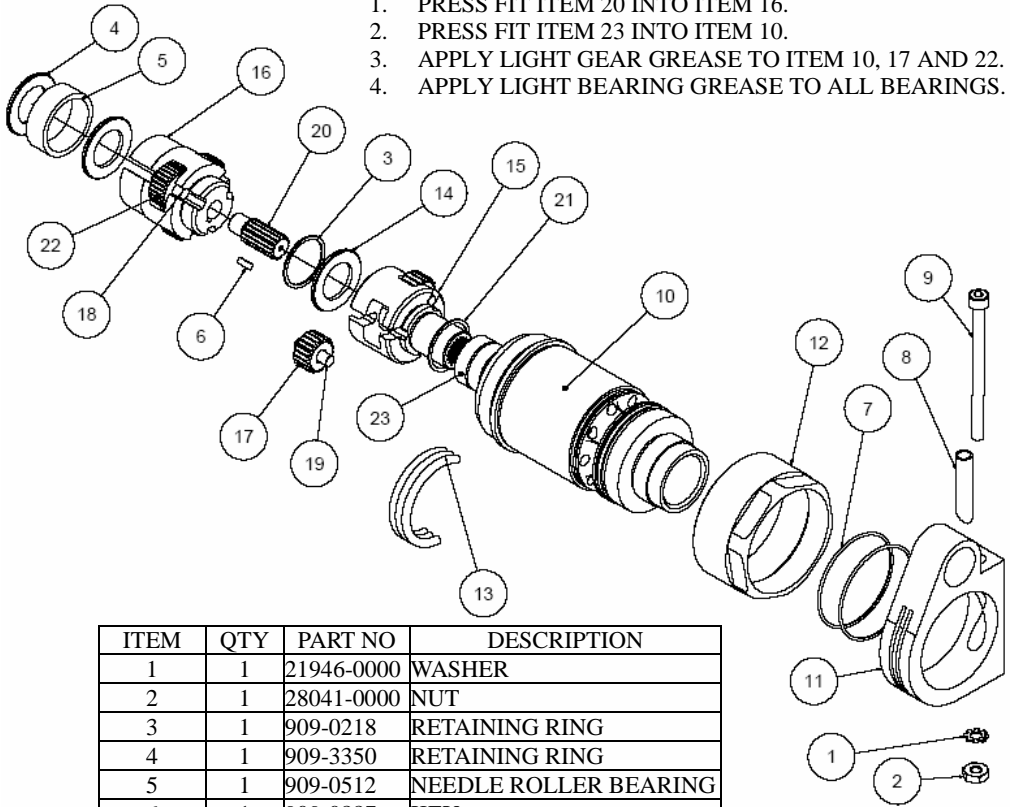


KEY	PART NO. 909-1600	PART NO. 909-1700	QTY	DESCRIPTION
1	909-3939	909-3939	1	RIGHT ANGLE HEAD ASSY
2	909-4940	909-4939	1	GEAR TRAIN ASSEMBLY
3	909-5940	909-5939	1	THROTTLE & AIR MOTOR ASSEMBLY

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.

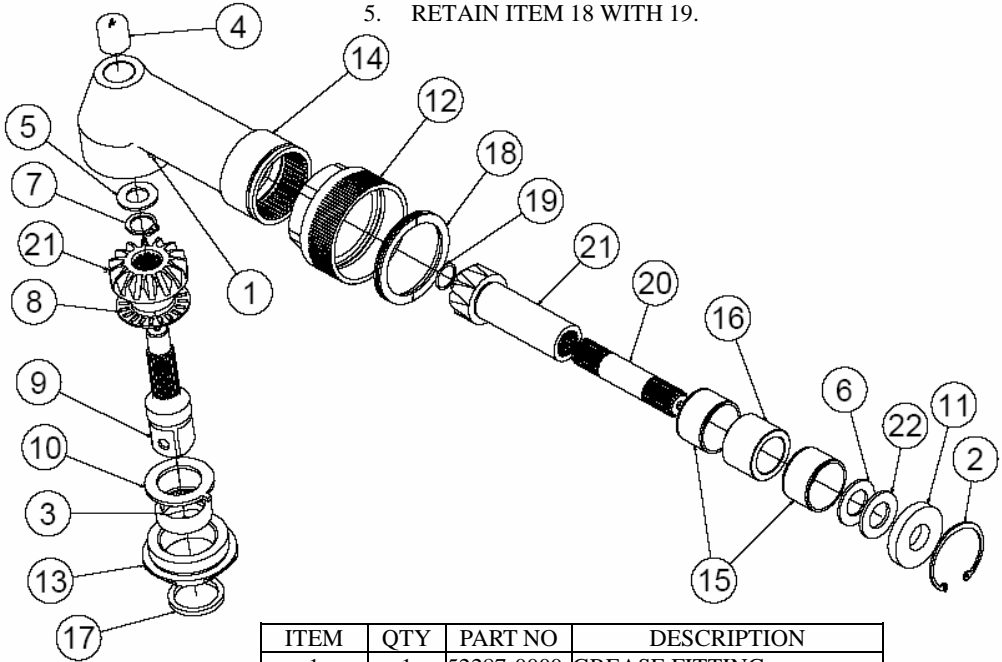


ITEM	QTY	PART NO	DESCRIPTION
1	1	21946-0000	WASHER
2	1	28041-0000	NUT
3	1	909-0218	RETAINING RING
4	1	909-3350	RETAINING RING
5	1	909-0512	NEEDLE ROLLER BEARING
6	1	909-0887	KEY
7	2	909-0923	'O' RING
8	2	909-1281	LOCK SLEEVE
9	1	909-151P	SOCKET HEAD SCREW
10	1	909-2950	GEAR CASE
11	1	909-2953	REACTION BAR COLLAR
12	1	909-2957	LOCK NUT
13	3	909-2973	MUFFER
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

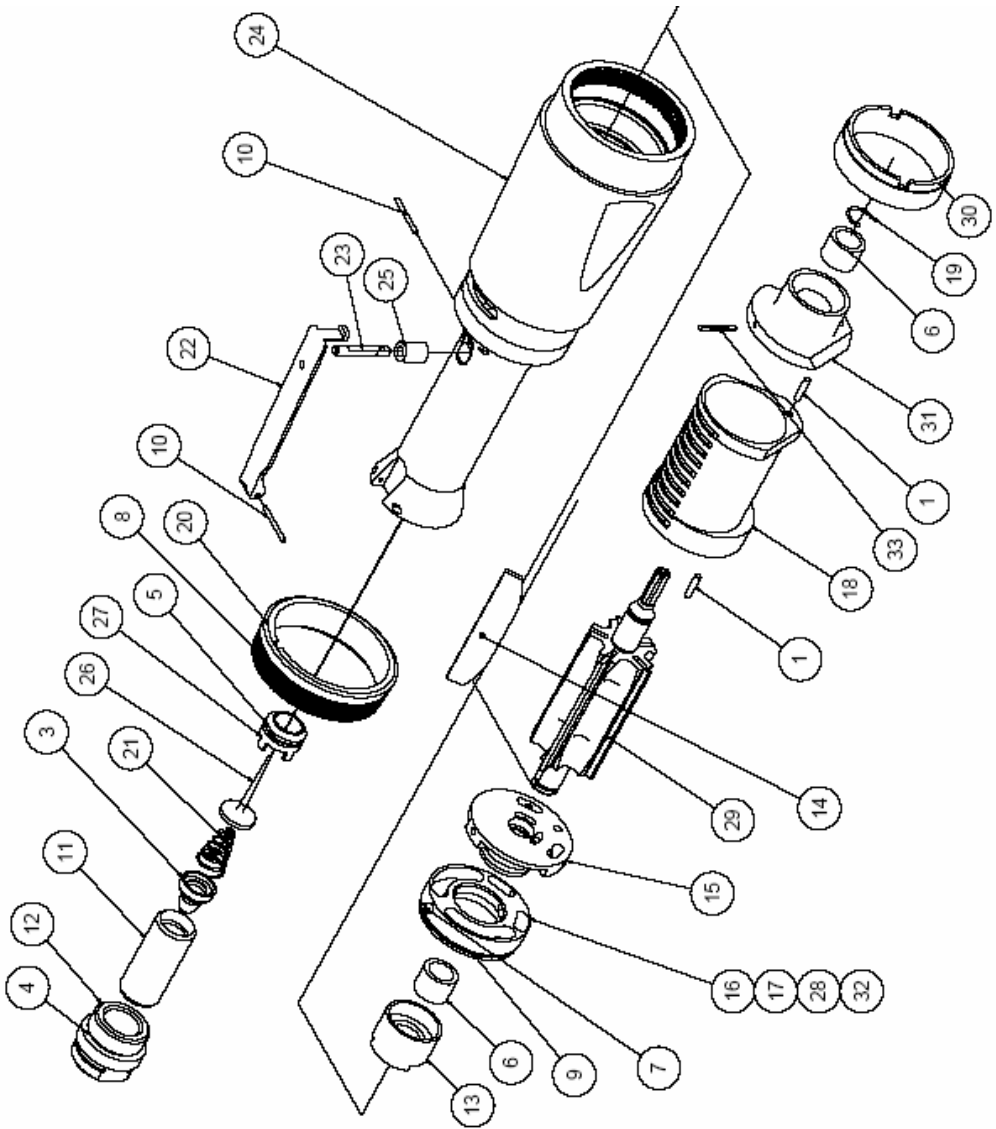
NOTES:

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

PARTS LIST, 909-5939 & 909-5940



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. LOCTITE 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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