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20 Series Power Unit

DLO21B-10-P

Installation and Maintenance Information

Save These Instructions

Ingersoll Rand

⚠ WARNING

General Product Safety Information

- **Important Safety Information enclosed.**
- **Read and understand this manual before operating this motor.**
- **It is your responsibility to make this safety information available to others that will operate this motor.**

Safety Information - Explanation of Safety Signal

⚠ DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or property damage.
NOTICE	Indicates information or a company policy that relates directly or indirectly to the safety of personnel or protection of property.

⚠ WARNING

Failure to observe the following warnings could result in injury.

- **Operate this tool at 90 p.s.i.g. (6.2bar/620 KpA) maximum air pressure at the air inlet of the motor.**
- **Keep hands, clothing and long hair away from rotating end of the motor.**
- **Anticipate and be alert for sudden changes in motion during start up and operation of any power tool.**
- **Never exceed rated r.p.m. of motor.**
- **Wear suitable eye and hearing protection while operating motor.**
- **Tool shaft can continue to rotate briefly after throttle is released.**
- **Do not lubricate tools with flammable or volatile liquids such as kerosene, diesel or jet fuel.**
- **Do not carry the tool by the Hose.**
- **Do not use damaged, frayed or deteriorated air hoses and fittings.**
- **Do not overreach when operating this tool. Keep body stance balanced and firm.**
- **Do not remove any labels. Replace any damaged label.**
- **Use only accessories recommended by Ingersoll Rand.**
- **Repeated prolonged operator exposure to vibrations which may be generated in use of certain hand-held tools may produce Raynaud's phenomenon, commonly referred to as Whitefinger disease. The phenomenon produces numbness and burning sensations in the hand and may cause circulation and nerve damage as well as tissue necrosis. Repetitive users of hand held tools who experience vibrations should closely monitor duration of use and their physical condition.**
- **Air powered tools can vibrate in use. Vibration, repetitive motions or uncomfortable positions may be harmful to your hands and arms. Stop using any tool if discomfort, tingling feeling or pain occurs. Seek medical advice before resuming use.**

Safety Symbol Identification

Wear Respiratory Protection

Wear Eye Protection

Wear Hearing Protection

Read Manuals Before Operating Product

(Dwg. MHP2598)

Routine Lubrication Requirements

Lack of or an excessive amount of lubrication will affect the performance and life of this tool. Use only recommended lubricants at below time intervals:

Every 8 Hours of Tool Operation:-

Fill lubricator reservoir of recommended F.R.L. with spindle oil (29665). If an in line or air line lubricator is not used, apply several drops of spindle oil (29665) in air inlet.

Every 160 Hours of Tool Operation:-

Lubricate gearing. Pack bearings, coat shafts and lubricate gears with **NLGI #1 "EP"** grease (33153). Gearing should contain approximately 3/64 oz. (1.3 g) of grease.

Air Supply Requirements

For maximum operating efficiency, the following air supply specifications should be maintained to this air tool:

- Air Pressure - 90 p.s.i.g. (6.2 bar)
- Air Filtration - 50 micron
- Lubricated Air Supply
- Hose Size - 5/16" (8mm) I.D.

An **Ingersoll Rand** model C28231-810 air line FILTER/ REGULATOR/LUBRICATOR (F.R.L.) is recommended to maintain the above air supply specifications.

Recommended Lubricants

After disassembly is complete, all parts, except sealed or shielded bearings, should be washed with solvent. To relubricate parts, or for routine lubrication, use the following recommended lubricants:

Where Used	Ingersoll Rand Part #	Description
Air Motor	29665	1 qt Spindle Oil
'O" Rings & Lip Seals	36460	4 oz. Stringy Lubricant
Gears and Bearings	33153	5 lb. "EP" - NLGI # 1 Grease

Inspection, Maintenance and Installation

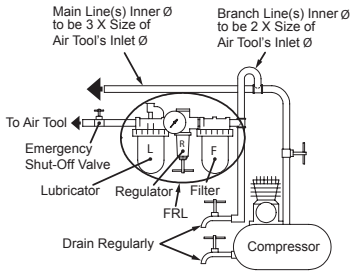
Disconnect air supply from the tool or shut off air supply and exhaust (drain) line of compressed air before performing maintenance or service to the tool.
It is important that the tools be serviced and inspected at regular intervals for maintaining safe, trouble-free operation of the tool.
Be sure the tool is receiving adequate lubrication, as failure to lubricate can create hazardous operating conditions resulting from excessive wear.
Be sure that the air supply lines and connectors are of proper size to provide a sufficient quantity of air to the tool.

Tool maintenance and repair shall be performed by authorized, trained, competent personnel. Tools, hose and fittings shall be replaced if unsuitable for safe operation and responsibility should be assigned to be sure that all tools requiring guards or other safety devices shall be kept in legible condition. Maintenance and repair records should be maintained on all tools. Frequency of repair and the nature of the repairs can reveal unsafe application. Scheduled maintenance by competent authorized personnel should detect any mistreatment of abuse of the tool and worn parts. Corrective action should be taken before returning the tool for use.

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 throughly 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.

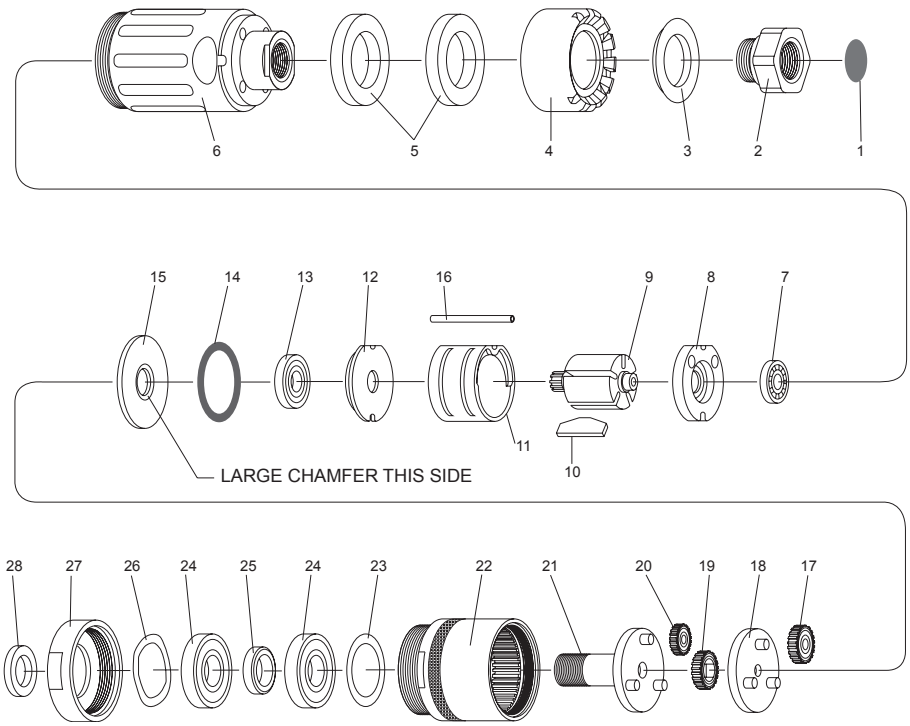
Upon reassembling, lubricate parts where required. Use 33153 grease, or equivalent, in bearings. Use 36460 lubricant for "O" ring assembly. When assembling "O" rings or parts adjacent "O" rings, care must be excercised to prevent damage to the rubber sealing surfaces. A small amount of grease will usually hold steel balls and other small parts in place while assembling.

When replacement parts are necessary, consult drawing containing the part for identification.
Always use clean, dry air. Dust, corrosive fumes and/or excessive moisture can damage the motor of an air tool. An air line filter can greatly increase the life of an air tool. The filter removes rust, scale, moisture and other debris from the air lines. Low air pressure (less than 90 p.s.i.g.) reduces the speed of the air tool. High air pressure (more than 90 p.s.i.g.) raises performance beyond the rated capacity of the tool and could cause injury. Shown below is a typical piping arrangement.



Dwg. (TPD905-2)

20 Series Power Unit Exploded View



Dwg. (16598492)

20 Series Power Unit Parts List

Item	Part Description	Part Number	Item	Part Description	Part Number
1	Screen	33911	16	Locating Pin	47719-2
2	Inlet Adapter	46377	17	Planet Gear (3 req'd) 21 teeth	46875
3	Diffuser Washer	46371	18	Carrier Assembly	46336
4	Exhaust Cap	46352	19	Sun Gear, 21 teeth	46560
5	Filler (2 req'd)	48199-1	20	Planet Gear (3 req'd) 15 teeth	46904
6	Housing Assembly	04562500	21	Spindle Assembly	47804-2
	Motor Assembly	48225-1S	22	Ring Gear	46703
7	Bearing	41643	23	Spacer	46496
8	Rear End Plate	46245	24	Bearing (2 req'd)	Y65-13
9	Rotor	46338-2	25	Spacer	46706
10	Blade (5 req'd)	46301	26	Wave Washer	47682
11	Cylinder	48200-1S	27	Lock Nut	46704
12	Front End Plate	47718	28	Spacer	46705
13	Bearing	Y65-10	*	Warning Label	48176-1
14	"O" Ring	Y325-116	*	Bail	46328
15	Spacer	46305			

* Not Shown

Disassembly/Assembly Instructions

NOTICE

- Never apply excessive pressure by holding device which may cause distortion of a part.
- Apply pressure evenly to parts which have a press fit.
- Apply even pressure to the bearing race that will be press fitted to the mating part.
- Use correct tools and fixtures when servicing this tool.
- Don't damage "O" rings when servicing this tool.
- Use only genuine **Ingersoll Rand** replacement parts for this tool. When ordering, specify part number, description, tool model number and serial number.

Gearing Disassembly

- Clamp tool in a smooth face vise, clamping on inlet adapter (2).
- Unthread and remove ring gear (22) and components from tool using a wrench on flats of ring gear.
- Remove spindles and gears from ring gear.
- Remove lock nut (27), releasing washer (26), bearings (24) and spacers (25 and 23).
- Do not remove gear (19) from carrier assembly unless damage is evident. Gear is press fit onto carrier assembly.

Gearing Assembly

- Assemble spacer (23) and one bearing (24) into ring gear (22), pressing on outer race of bearing.
- Coat shafts of spindle(s) with **Ingersoll Rand** 33153 grease.
- Assemble gears to shafts of spindle(s).
- Assemble carrier assembly (18) to spindle assembly (21).
- Lubricate sets of gears liberally with **Ingersoll Rand** 33153 grease (approximately 1/32 oz. per reduction).
- Assemble spindle(s) and gearing into ring gear. Rotate spindle and gears to align gear teeth with splines of ring gear.
- Assemble spacer (25) and bearing (24) into ring gear, pressing an outer race of bearing.
- Assemble wave washer (26) to ring gear.
- Assemble lock nut (27) to spindle, securing components.
- Assemble ring gear and components to tool and tighten, using a wrench on flats of ring gear.
- Assemble spacer (28) to tool.

Motor Disassembly

- Remove gearing from tool.
- Remove spacer (15) and "O" ring (14).
- Tap front edge of housing to remove motor assembly. Locating pin (16) should also come out.
- Grasp cylinder in one hand and tap splined end of rotor (9) with a soft face hammer; motor will come apart.
- Remove end plate (8) and bearing (7) from rotor.

Motor Assembly

- Pack bearing (7) with **Ingersoll Rand** 33153 grease and assemble to end plate (8), pressing on outer race of bearing.
- Assemble end plate (8) to rotor, pressing on inner race of bearing.
- Coat five rotor blades (10) with **Ingersoll Rand** 29665 spindle oil and assemble to rotor slots - straight side out.
- Coat i.d. of cylinder (11) with **Ingersoll Rand** 29665 spindle oil and assemble over rotor.
  NOTE: Air inlet slots in end of cylinder must be aligned with two air inlet holes in end plate (8).
- Assemble bearing (13) to end plate (12), pressing on outer race of bearing.
- Assemble end plate (12) to rotor, pressing on inner race of bearing. Be sure rotor turns without binding.
- Insert locating pin (16) into 0.081" diameter blind hole at bottom of motor cavity in housing.
- Align notches of end plates and cylinder and install motor into housing, aligning notches with locating pin (16).
- Grease and assemble "O" ring (14) to end plate (12).
- Assemble spacer (15) to motor, with counterbore facing motor.
- Assemble gearing to tool.

Housing and Disassembly

- Clamp air inlet adapter (2) in a smooth face vise.
- Unthread housing (6) with a strap type wrench.
- Remove diffuser washer (3), exhaust cap (4) and two fillers (5).

Throttle Assembly

- Install two fillers (5) to exhaust cap (4).
- Assemble exhaust cap (4), diffuser washer (3) and inlet adapter (2) to housing.
- Clean and replace screen (1) in inlet adapter.

Product Parts Information

CAUTION

The use of other than genuine Ingersoll Rand replacement parts may result in safety hazards, decreased motor performance, and increased maintenance, and may invalidate all warranties.
Ingersoll Rand is not responsible for customer modification of motors for applications on which Ingersoll Rand was not consulted.
Repairs should be made only by authorized trained personnel. Consult your nearest Ingersoll Rand Authorized Service center.

Manuals can be downloaded from www.irtools.com
Refer all communications to the nearest **Ingersoll Rand** Office or Distributor.

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