04558243
Edition 3
October 2007

"44" Series Power Motors and Milling Motors

Models: 82( )( )-A and 82( )( )-4A

Installation and Maintenance Information

EN Installation and Maintenance Information

Save These Instructions

Ingersoll Rand

WARNING

General Product Safety Information

- **Read and understand this manual before operating this product.**
- **It is your responsibility to make this safety information available to others that will operate this product.**
- **Failure to observe the following warnings could result in injury.**

WARNING

Product Safety Information - When Placing the Tool in Service

- Always install, operate, inspect and maintain this product in accordance with all applicable standards and regulations (local, state, country, federal, etc.).
- Always use clean, dry air at 90 p.s.i.g. (6.2 bar/620 kPa) maximum air pressure at the inlet. Higher pressure may result in hazardous situations including excessive speed, rupture, or incorrect output torque or force.
- Be sure all hoses and fittings are the correct size and are tightly secured.
- Ensure an accessible emergency shut off valve has been installed in the air supply line, and make others aware of its location.
- Install a properly sized Safety Air Fuse upstream of hose and use an anti-whip device across any hose coupling without internal shut-off, to prevent hose whipping if a hose fails or coupling disconnects.
- Do not use damaged, frayed or deteriorated air hoses and fittings.
- Keep clear of whipping air hoses. Shut off the compressed air before approaching a whipping hose.
- Always turn off the air supply, bleed the air pressure and disconnect the air supply hose before installing, removing or adjusting any accessory on this tool, or before performing any maintenance on this tool or any accessory.
- Do not lubricate tools with flammable or volatile liquids such as kerosene, diesel or jet fuel. Use only recommended lubricants.
- Use only proper cleaning solvents to clean parts. Use only cleaning solvents which meet current safety and health standards. Use cleaning solvents in a well ventilated area.
- Keep work area clean, uncluttered, ventilated and illuminated.
- Do not remove any labels. Replace any damaged label.

WARNING

Product Safety Information - When Using the Tool

- Always wear eye protection when operating or performing maintenance on this tool.
- Always wear hearing protection when operating this tool.
- Always use Personal Protective Equipment appropriate to the tool used and material worked. This may include dust mask or other breathing apparatus, safety glasses, ear plugs, gloves, apron, safety shoes, hard hat and other equipment.
- When wearing gloves always be sure that the gloves will not prevent the throttle mechanism from being released.
- Prevent exposure and breathing of harmful dust and particles created by power tool use.
  - Some dust created by power sanding, sawing, grinding, drilling, and other construction activities contains chemicals known to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:
    - lead from lead based paints,
    - crystalline silica from bricks and cement and other masonry products, and
    - arsenic and chromium from chemically treated lumber.
  - Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.
- Keep others a safe distance from your work area, or ensure they use appropriate Personal Protective Equipment.
- This tool is not designed for working in explosive environments, including those caused by fumes and dust, or near flammable materials.
- This tool is not insulated against electric shock.
- Be aware of buried, hidden or other hazards in your work environment. Do not contact or damage cords, conduits, pipes or hoses that may contain electrical wires, explosive gases or harmful liquids.
- Keep hands, loose clothing, long hair and jewelry away from working end of tool.
- Power 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.
- Keep body stance balanced and firm. Do not overreach when operating this tool. Anticipate and be alert for sudden changes in motion, reaction torques, or forces during start up and operation.
- Tool and/or accessories may briefly continue their motion after throttle is released.
- To avoid accidental starting - ensure tool is in "off" position before applying air pressure, avoid throttle when carrying, and release throttle with loss of air.
- Ensure work pieces are secure. Use clamps or vises to hold work piece whenever possible.
- Do not carry or drag the tool by the hose.
- Do not use power tools when tired, or under the influence of medication, drugs, or alcohol.
- Never use a damaged or malfunctioning tool or accessory.
- Do not modify the tool, safety devices, or accessories.
- Do not use this tool for purposes other than those recommended.
- Use accessories recommended by **Ingersoll Rand**.
- Never exceed rated r.p.m. of tool.

Safety Symbol Identification

Wear Respiratory Protection

Wear Eye Protection

Wear Hearing Protection

Read Manuals Before Operating Product

(Dwg. MHP2598)

Safety Information - Explanation of Safety Signal Words

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.

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).

Every 40 hours of tool operation - Flush tool with a solution of three parts cleaning solvent and one part light oil. After flushing, apply a small amount of spindle oil in air inlet and run free for one minute to insure proper lubrication.

Every 160 hours of tool operation - Lubricate gearing. Inject 2 or 3 strokes of grease thru grease fitting in housing. Pack bearings, coat shafts and lubricate gears with NLGI #1 "EP" grease (33153). Gearing should contain approximately 1/2 oz. (14 g) of grease per reduction.

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 - 1/2" (12.7 mm) 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 or abuse of the tool and worn parts. Corrective action should be taken before returning the tool for use.

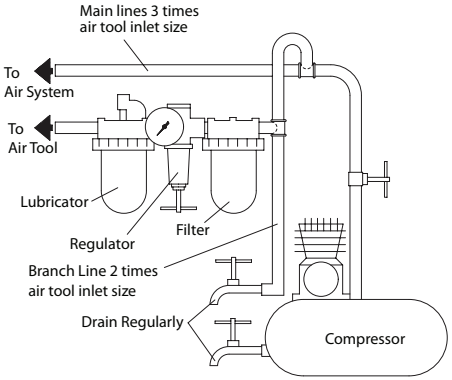
Disassembly should be done on a clean work bench with a clean cloth spread to prevent the loss of small parts. After disassembly is completed, all parts should be thoroughly washed in a clean solvent, blown dry with air and inspected for wear levels, abuse and contamination. Double sealed or shielded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

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 exercised 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.



Model Identification

Power Motors

Model Number	Rotation	R.P.M	Gearing Section		Motor Assembly	Head Section	Gearing Red.
			Auxiliary	Drive			
8200-A	Forward	275	36164	36163	36188-1	36175	49:1
8201-A	Forward	500	36164	36162	36188-1	36175	28:1
8202-A	Forward	900	36165	36162	36188-1	36175	16:1
8203-A	Forward	2,000		36163	36188-1	36175	7:1
8204-A	Forward	3500		36162	36188-1	36175	4:1
8205-A	Forward	14,000		36161	36188-1	36175	1:1
8206-A	Reversible	275	36164	36163	36184	36174	49:1
8207-A	Reversible	500	36164	36162	36184	36174	28:1
8208-A	Reversible	900	36165	36162	36184	36174	16:1
8209-A	Reversible	2,000		36163	36184	36174	7:1
8210-A	Reversible	3,500		36162	36184	36174	4:1
8211-A	Reversible	14,000		36161	36184	36174	1:1

Milling Motors

Model Number	Rotation	R.P.M	Gearing Section		Motor Assembly	Head Section	Gearing Red.
			Auxiliary	Drive			
8200-4A-( )	Forward	275	36164	39884	36188-1	36175	49:1
8201-4A-( )	Forward	500	36164	39883	36188-1	36175	28:1
8202-4A-( )	Forward	900	36165	39883	36188-1	36175	16:1
8203-4A-( )	Forward	2,000		39884	36188-1	36175	7:1
8204-4A-( )	Forward	3,500		39883	36188-1	36175	4:1
8205-4A-( )	Forward	14,000		39882	36188-1	36175	1:1

Collets

Collet Option	Collet Number	Size	Capacity	
			Minimum	Maximum
820( )-4A-A	35264-1	1/4″	.2178 (5.556 mm)	.2500 (6.350 mm)
820( )-4A-B	35264-2	9/32″	.2500 (6.350 mm)	.2812 (7.144 mm)
820( )-4A-C	35264-3	5/16″	.2812 (7.144 mm)	.3125 (7.938 mm)
820( )-4A-D	35264-4	11/32″	.3125 (7.938 mm)	.3437 (8.731 mm)
820( )-4A-E	35264-5	3/8″	.3437 (8.731 mm)	.3750 (9.525 mm)
820( )-4A-F	35264-6	13/32″	.3750 (9.525 mm)	.4062 (10.319 mm)
820( )-4A-G	35264-7	7/16″	.4062 (10.319 mm)	.4375 (11.112 mm)
820( )-4A-H	35264-8	15/32″	.4375 (11.112 mm)	.4687 (11.906 mm)
820( )-4A-J	35264-9	1/2″	.4687 (11.906 mm)	.5000 (12.700 mm)
820( )-4A-K	35264-10	17/32″	.5000 (12.700 mm)	.5312 (13.494 mm)
820( )-4A-L	35264-11	9/16″	.5312 (13.494 mm)	.5625 (14.288 mm)
820( )-4A-M	35264-12	19/32″	.5625 (14.288 mm)	.5937 (15.081 mm)
820( )-4A-N	35264-13	5/8″	.5937 (15.081 mm)	.6250 (15.875 mm)
820( )-4A-P	35264-14	21/32″	.6250 (15.875 mm)	.6562 (16.669 mm)
820( )-4A-Q	35264-15	11/16″	.6562 (16.669 mm)	.6875 (17.462 mm)
820( )-4A-R	35264-16	23/32″	.6875 (17.462 mm)	.7187 (18.256 mm)
820( )-4A-S	35264-17	3/4″	.7187 (18.256 mm)	.7500 (19.050 mm)

Disassembly and Reassembly of Tools

Before starting to disassemble or reassemble this tool (any part or completely), be sure to read "Inspection, Maintenance and Installation". To minimize the possibility of parts damage and for convenience, the steps for disassembly or reassembly listed on the following pages are recommended.

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

With the tool disconnected from air service -

Gearing Section

To remove drive gearing, remove nuts (Y109-428) and cap screws (Y157-42-C) or cap screws (Y157-42-C) and washers (Y14-416). Pull gearing from tool. On models with both drive and auxiliary gearing, remove drive gearing as outlined and remove nuts (Y109-428) and cap screws (Y157-43-C). Pull auxiliary gearing from motor.

Motor Section

To remove motor assembly, remove gearing and grasp splined end of rotor and pull motor from housing.

Head Section

To remove motor housing from head, place head of tool in a suitable holding device and, using a strap wrench, unthread and remove motor housing.

Typical Cross Section of Tool

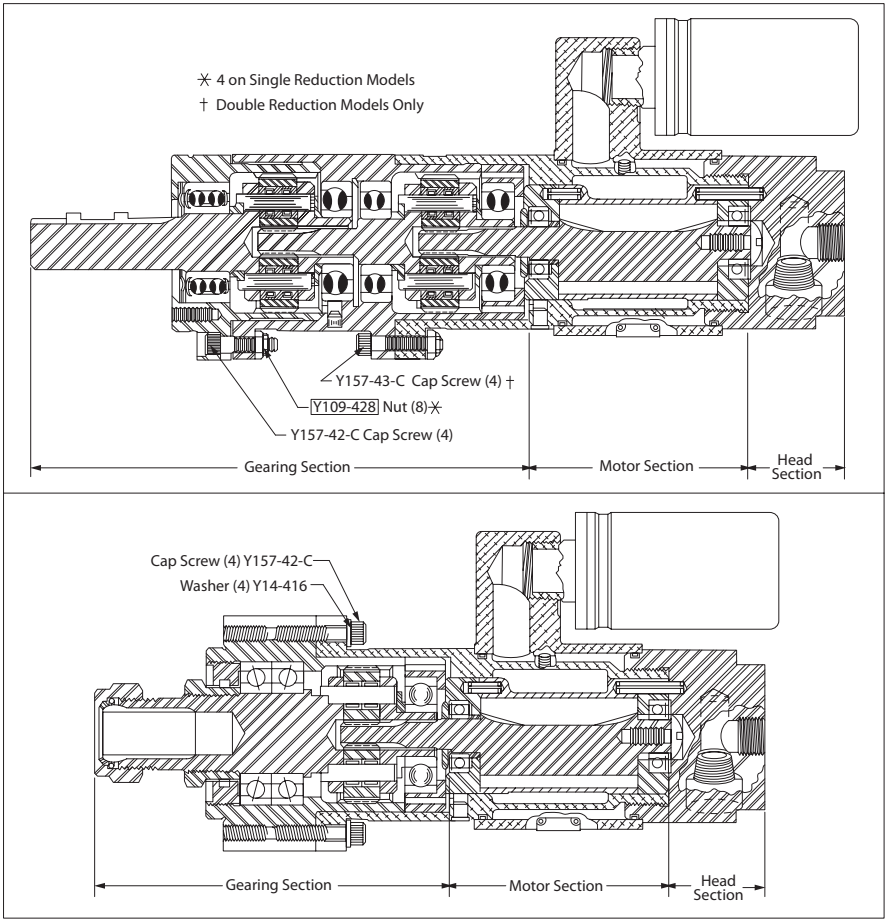


Figure 1

Disassembly/Assembly Instructions

Drive Gearing Forward

Disassembly

- Grasp housing (ring gear) in one hand and tap drive end of spindle with a soft face hammer: spindle and components will loosen from housing.
- Gearing should not be disassembled further unless it is necessary to replace a part, as Brinelling of the bearing races may occur, making replacement necessary.
- To disassemble further, remove bearing and spacer from drive end of spindle.
- Remove shafts, releasing gears.
- To remove bearing from opposite end of spindle, insert shafts in spindle and alternately tap ends of shafts, loosening bearing.

Assembly

- Assemble spacer and bearing to drive end of spindle.
- Lubricate gears liberally with **Ingersoll Rand** 33153 grease and assemble to spindle, securing with shafts. Align notch in shafts with spacer.
- Assemble spacer and bearing to opposite end of spindle and assemble, with washer (33563), to housing. See "Routine Lubrication Requirements", page 3.

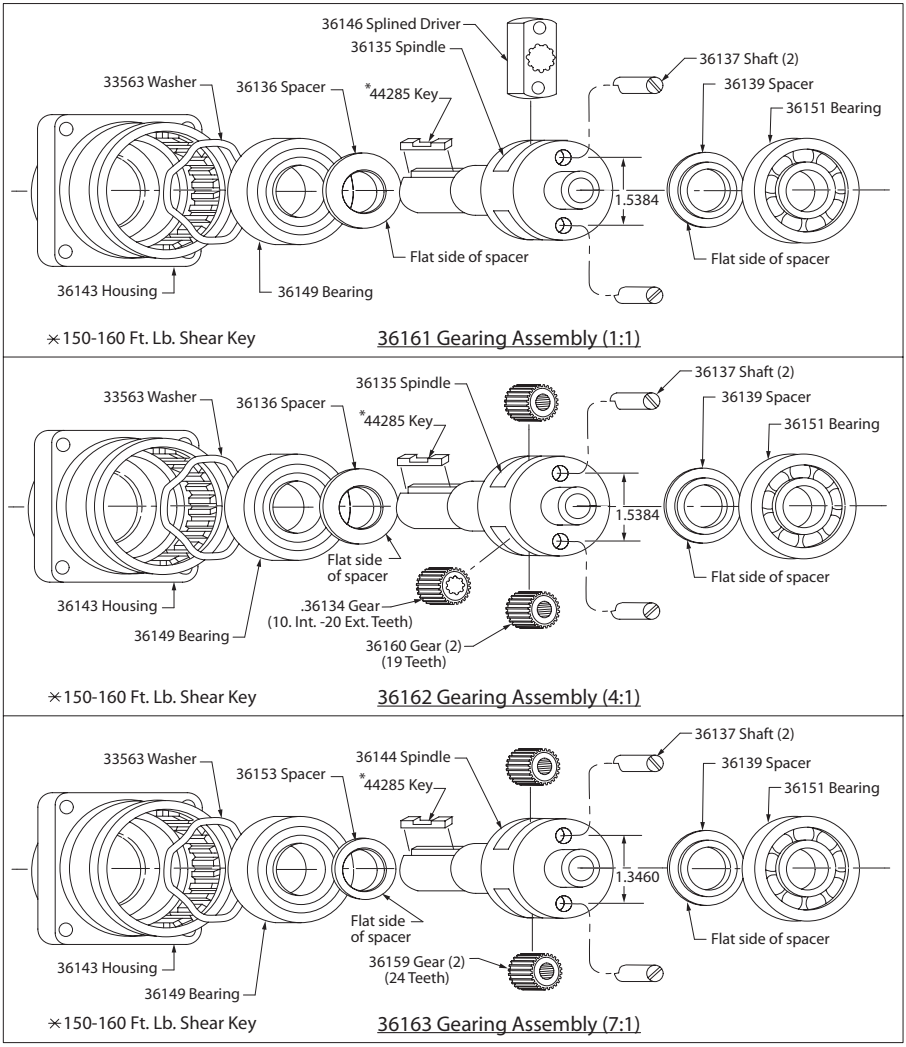


Figure 2

Drive Gearing Reverse

Disassembly

- Remove collet nut (39877) and lock nut (39878).
- Tap drive end of spindle with a soft face hammer to remove from housing.
- Remove bearing (36151), spacer (36139) and shafts (36137) to remove gears or driver from spindle.

Assembly

- Lubricate gears or driver liberally with **Ingersoll Rand** 33153 grease and assemble to spindle, securing with shafts (36137).
- Assemble spacer (36139) and bearing (36151) to spindle and assemble to housing.

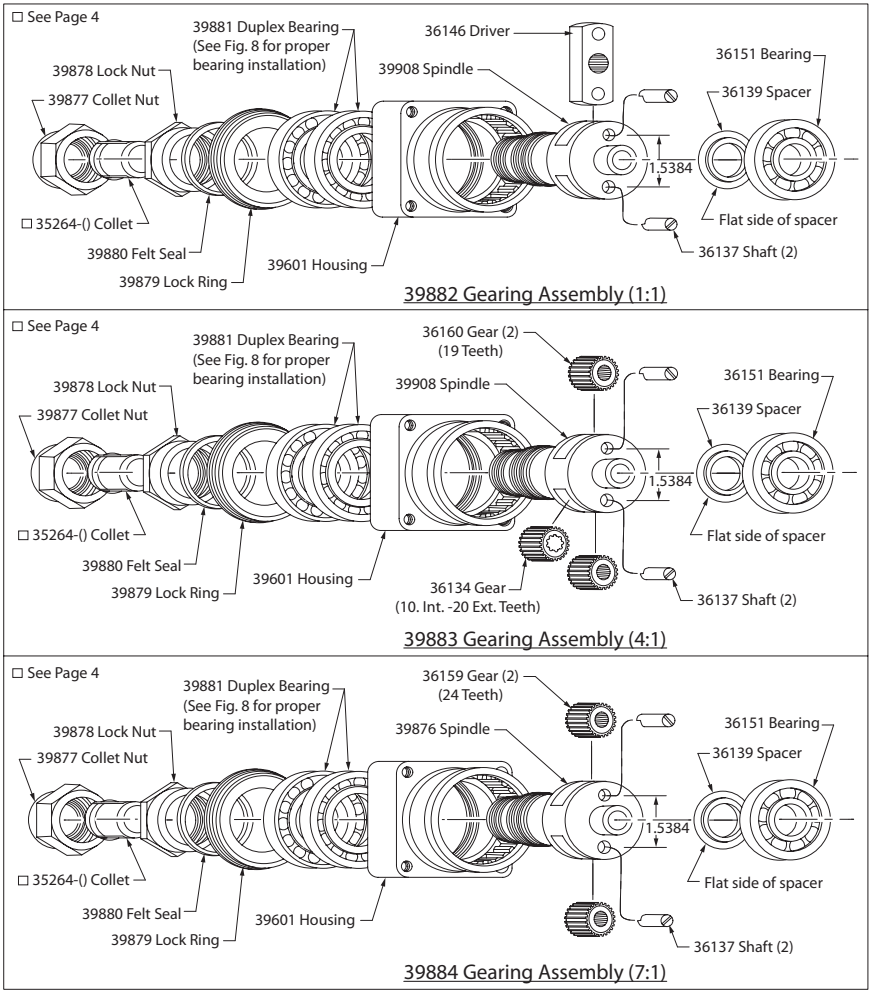


Figure 3

Auxiliary Gearing

Disassembly

- Grasp housing (ring gear) in one hand and tap drive end of spindle with a soft face hammer; spindle and components will loosen from housing.
- Gearing should not be disassembled further unless it is necessary to replace a part, as Brinelling of the bearing races may occur, making replacement necessary.
- To disassemble further, remove bearing and spacer from drive end of spindle.
- Remove shafts, releasing gears.
- To remove bearing from opposite end of spindle, insert shafts into spindle and alternately tap ends of shafts, loosening bearing.

Assembly

- Assemble spacer and bearing to drive end of spindle.
- Lubricate gears liberally with **Ingersoll Rand** 33153 grease and assemble to spindle, securing with shafts (36137). Align notch in shaft with spacer.
- Assemble spacer (36139) and bearing (36151) to opposite end of spindle.
- Assemble retaining ring (36152-1) and spindle and components into housing.

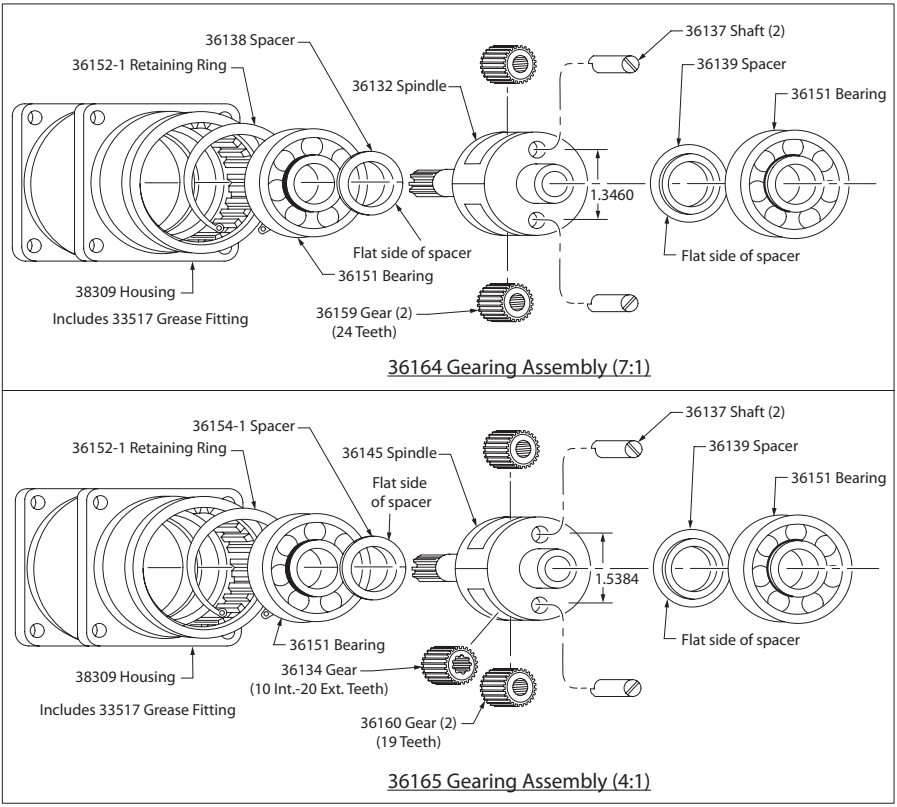


Figure 4

Motor Section

Disassembly

- Remove motor assembly from housing and remove sems fastener (36171).
- Remove nut (36140) and washer (Y1-916) from rotor.
- Grasp cylinder in one hand and tap splined end of rotor with a soft face hammer; motor will come apart.
- Remove bearing (36191), spacer (36189) and rear end plate from rotor.

Assembly

- Pack bearings with **IR** 33153 grease and assemble into end plates, pressing on outer race of bearings.
  Note: Bearings are paired bearings and must be assembled into end plates with the identification markings facing out.
- Assemble spacer (36189) and rear end plate to rotor, pressing on inner race of bearing. Secure with sems fastener prior to installing 36171 screw in the rotor a requirement for 242 or 243 loctite is applied to threads of 36171 screw and fixture cured for 20 minutes (minimum) (36171) torque to 100-120 in. lbs.
- Coat five rotor blades (36190) with **IR** 29665 spindle oil and assemble to rotor slots - straight side out.
- Coat i.d. of cylinder with ARC 29665 spindle oil and assemble over rotor to end plate, aligning roll pin with hole in end plate.
- Assemble spacer (36189) and front end plate to rotor, pressing on inner race of bearing. Secure with washer (Y1-916) and nut (36140).

Note: When assembling motor to tool, remove head from motor housing. Place head of tool in a suitable holding device with the "motor end" in an upright position. Place motor assembly on head, with roll pin (Y178-78) protruding from end plate aligned with hole in head (largest hole). Slip motor housing, with manifold, over motor and secure to head. Assemble spacer (36141) and gearing to tool.

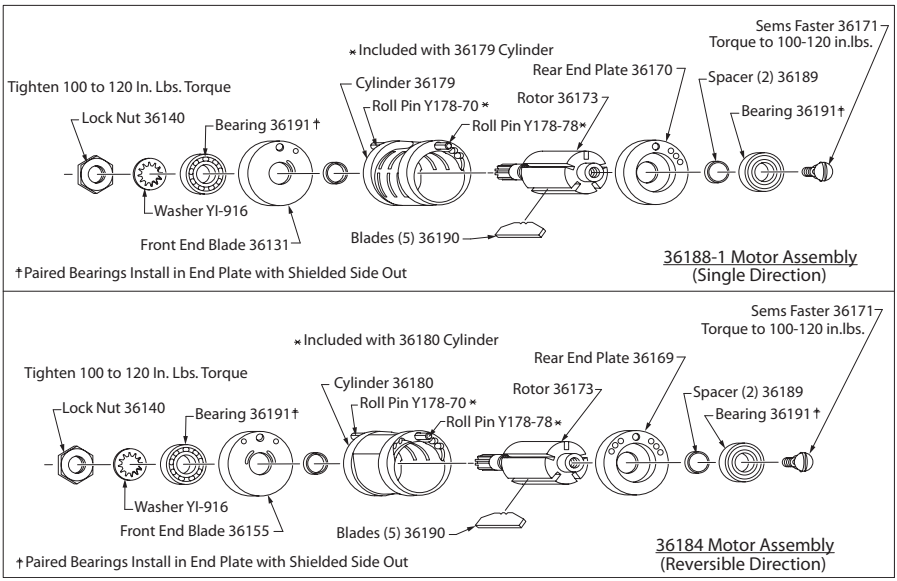


Figure 5

Motor Housing and Exhaust Manifold

Disassembly

- To remove manifold from motor housing, remove head, loosen set screw and slip manifold off housing.

Assembly

- Assemble "O" ring (Y325-147) to housing. Slide manifold over housing and tighten set screw (Y29-44).

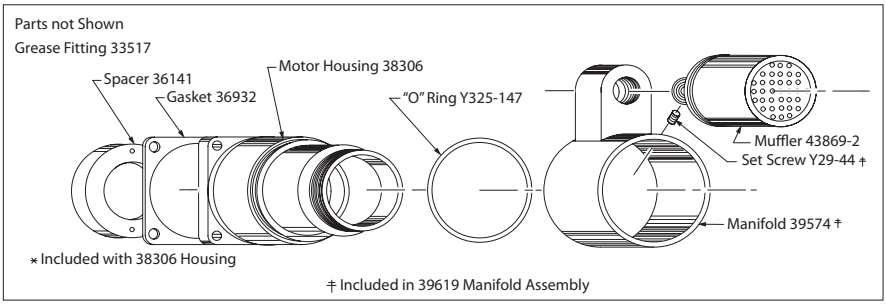


Figure 6

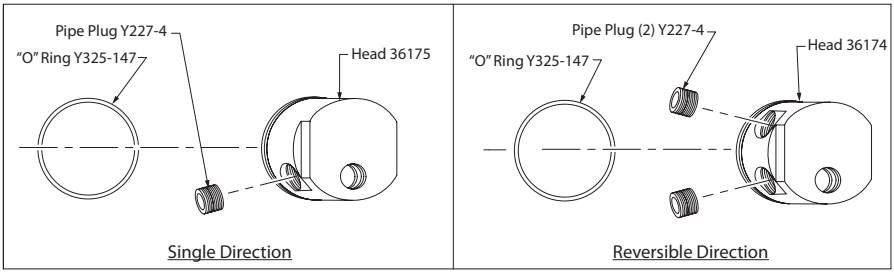


Figure 7

Note: When assembling head to tool, place head in a suitable holding device with the "motor end" in an upright position. Assemble "O" ring (Y325-147) to head. Place motor assembly on head, with roll pin (Y178-78) protruding from end plate aligned with hole in head (largest hole). Slip motor housing, with manifold, over motor and secure to head. Assemble spacer (36141) and gearing to tool.

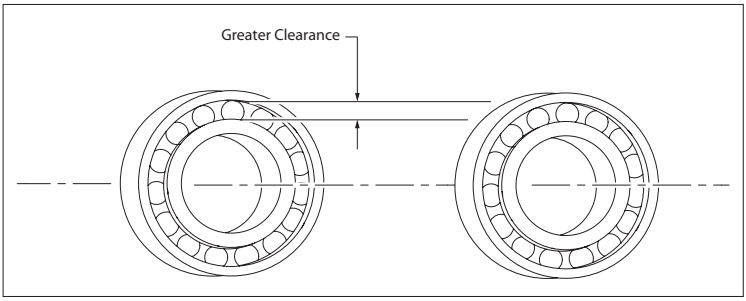
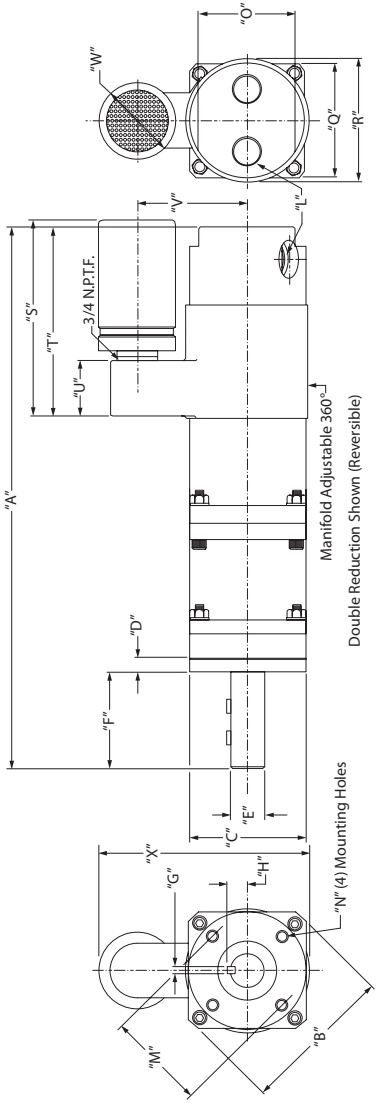


Figure 8

Note: Duplex bearings must be assembled to spindle with the face of the bearing having the greater clearance between the inner and outer races facing each other ("DF" mounting).

Dimensional Data

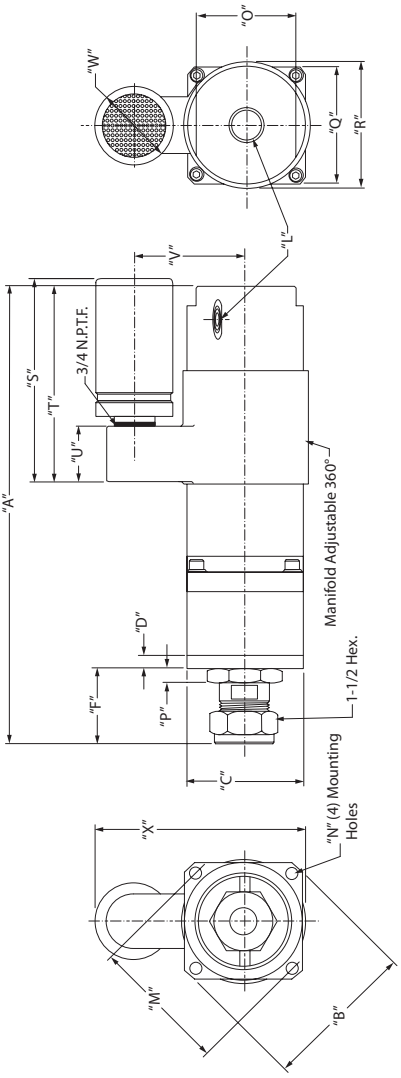


Models	Gear Reduction	A
8203-A, 8204-A, 8205-A	Single	11-17/64
8209-A, 8210-A, 8211-A		286 mm
8200-A, 8201-A, 8202-A	Double	14-1/16
8206-A, 8207-A, 8208-A		373 mm

	B	C	D	E	F	G	H	L	M	N	O	Q	R	S	T	U	V	W	X
Inches	4.090	2.996	.369	.8743	2.483	.1872	.528	3/8 Air Inlet N.P.T.F.	2.495	5/16-24 UNF-2B Thread	2-1/2	3	3-3/16	5-3/16	5	1-7/16	2-27/32	2	5-7/16
	4.110	2.998	.374	.8748	2.559	.1875	.531		2.505										
mm	103.886	76.098	9.372	22.207	63.068	4.7548	13.411		63.373		63	76	81	132	127	36	72	51	138
	104.394	76.149	9.499	22.219	64.998	4.7625	13.487		63.627										

Figure 9

Dimension Data - Continued



Single Reduction Shown

Models	Gear Reduction	A
8203-4A, 8204-4A, 8205-4A	Single	11-1/16 297 mm
8200-4A, 8201-4A, 8202-4A	Double	14-1/2 368 mm

	B	C	D	F	L	M	N	O	P	Q	R	S	T	U	V	W	X
Inches	4.090 4.110	2.996 2.998	.302 .322	1-15/16 (Approx.)	3/8 Air Inlet N.P.T.F.	3.498 3.502	5/16-24 UNF-2B Thread	2-1/2	.335 .364	3	3-3/16	5-3/16	5	1-7/16	2-27/32	2	5-7/16
mm	103.886 104.394	76.098 76.149	7.670 8.178	49 (Approx.)		86.563 88.950		63	8.509 9.245	76	81	132	127	36	72	51	138

Figure 10

Notes:

Notes:

www.irtools.com

Ingersoll Rand