Form P6208
Edition 4
November 2008
CCN: 03526464

MULTI–VANE® Air Motors

Series 17R and 34R (Reversible)

Operation and Maintenance Information

EN Operation and Maintenance Information
ZH 操作和维护信息

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

- Always operate, inspect and maintain this motor in accordance with American National Standards Institute Safety Code for Portable Air Tools (ANSI B186.1).
- For safety, top performance and maximum durability of parts, operate this motor at 90 psig (6.2 bar/620 Kpa) air pressure at the inlet with 5/8" air supply hose.
- Always turn off the air supply and disconnect the air supply hose before installing, removing or adjusting any accessory on this motor or before performing any maintenance on this motor.
- Do not use damaged, frayed or deteriorated air hoses and fittings.
- Keep hands, loose clothing and long hair away from rotating end of motor.
- Always wear eye protection when operating or performing maintenance on this motor.
- Always wear hearing protection when operating this motor.
- Anticipate and be alert for sudden changes in motion during start up and operation of any motor.
- Motor shaft may continue to rotate briefly after throttle is released.
- Do not lubricate motor with flammable or volatile liquids such as kerosene, diesel or jet fuel.
- Do not remove any labels. Replace any damaged label.
- Use accessories recommended by **Ingersoll Rand**.
- This motor is not designed for working in explosive atmospheres.
- This motor is not insulated against electric shock.

NOTICE

- 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 Servicenter.
- It is the responsibility of the employer to place the information in this manual into the hands of the operator.

Safety Symbol Identification

Wear Respiratory Protection

Wear Eye Protection

Wear Hearing Protection

Read Manuals Before Operating Product

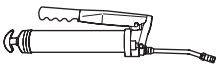
(Dwg. MHP2598)

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.

Placing Tool in Service

Lubrication



Ingersoll Rand No. 100
SAE 90 Gear Lubricant

Ingersoll Rand No. 50

We recommend using a Filter-Lubricator-Regulator Unit with these Motors. For Series 17R use No. C28241-800 (1/2" pipe tap inlet). For Series 34R use No. C31-08-G00 (3/4" tap inlet). Install the Unit as close to the Motor as practical. Keep the Lubricator filled with **Ingersoll Rand** No.50 Oil.

NOTICE

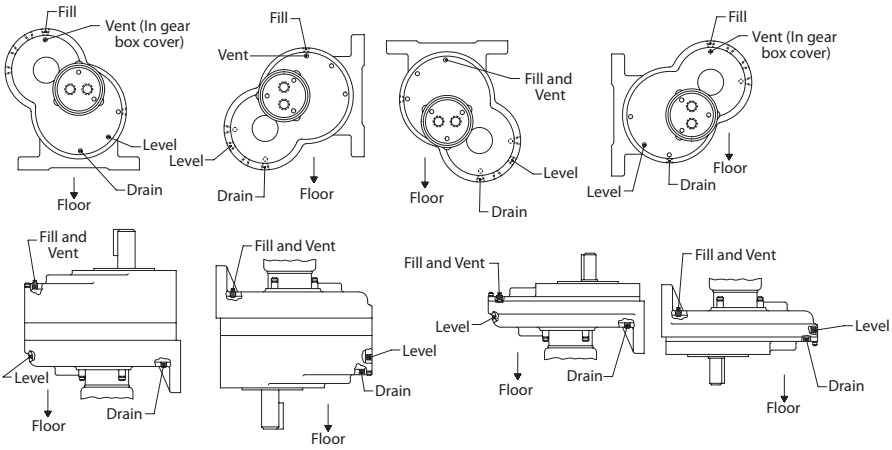
If a sight feed lubricator is used, adjust the lubricator to feed 60 drops per minute for continued duty operation. **Whenever the power unit is disassembled,** work some **Ingersoll Rand** No. 28 Grease into the Rear Rotor Shaft Bearing (2).

Use a good quality SAE 90 Gear Lubricant in the gear box. The amount of lubricant required is dependent upon the size of gear box and the mounting position of the Motor.

When lubricating the gear box, refer to the illustration showing the various mounting positions and the fill plugs, vent plug and drain plug. In each case, fill the gear chamber up to the "Level" plug. If the Vent Plug (40) is not located at the position indicated for a given mounting, relocate the Vent Plug by interchanging it with the pipe plug at that location. **Whenever a Series 17R or 34R Motor is mounted with the Motor Shaft (36) pointing toward the floor or ceiling,** you must install a gravity feed lubrication to make certain the gears in the upper portion of the gear box get adequate lubrication. To do this, remove one of the pipe plugs other than the Vent Plug from the upper side of the motor and connect an oil line from a gravity feed reservoir. Connect an overflow Line to the Level Plug opening and run it to a pump to return the lubricant to the gravity feed reservoir.

If the Motor is mounted in any position other than that illustrated, contact an **Ingersoll Rand** Representative for oil level and venting recommendations.

Lubrication Diagram

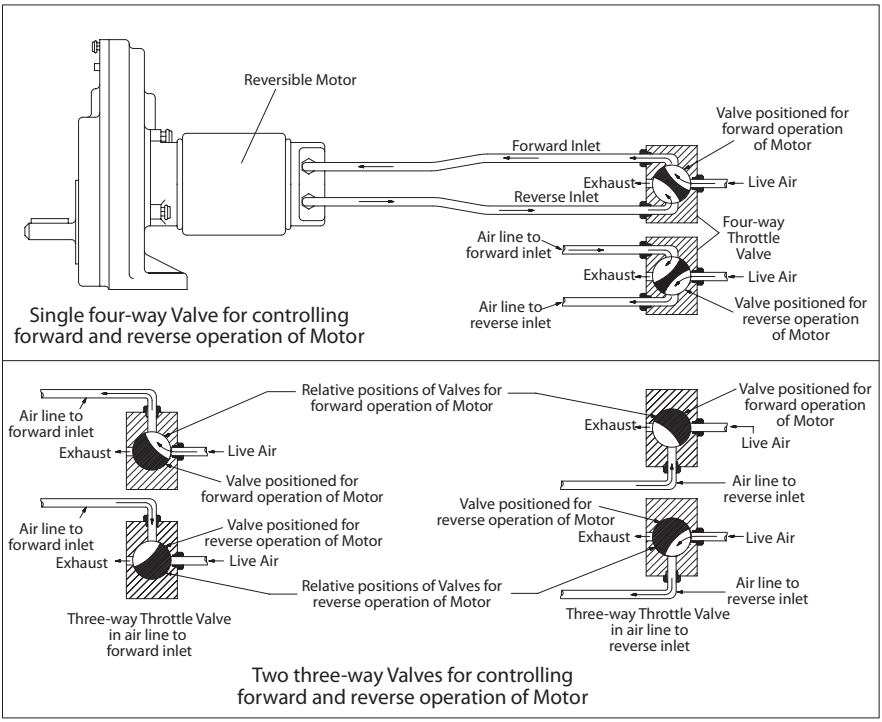


(Dwg. TPB490)

Valve and Piping

NOTICE

When these Motors are used on applications requiring a reversible motor, a 4-way Throttle Valve or two 3-way Throttle Valves must be used in the air supply line in accordance with the following schematic diagram. When the application requires a non-reversible motor, a 2-way inline Valve can be used in the air supply line. In either case, the inlet and outlet of the Valve must be equal in size, and preferably one size larger, than the inlet of the Motor.



(Dwg. TPB491)

Parts and Maintenance

When the life of the motor has expired, it is recommended that the motor be disassembled, degreased and parts be separated by material so that they can be recycled.

Manuals can be downloaded from www.irtools.com.

Refer all communications to the nearest **Ingersoll Rand** Office or Distributor.

⚠ 警　告

通用产品安全信息

- **操作本产品前请阅读并理解本手册。**
- **您有责任为其他操作该产品的人员提供本安全信息。**
- **不按照以下警告进行操作将可能导致人员受伤。**

⚠ 警　告

- 请始终按照美国国家标准学会便携式气动工具安全标准 (ANSI B186.1) 操作、检查和维护该马达。
- 为确保使用安全并达到最佳性能和零部件的最长使用寿命，在操作马达时，进口处的气压应为 90 psig (6.2bar/620kPa)，气源软管规格为 5/8”。
- 请务必在安装、拆卸或调节马达零件或进行任何维修之前，关闭气源并断开气源软管。
- 切勿使用损坏、磨损或老化的空气软管及其连接件。
- 保持手、宽松衣服、长发远离马达旋转端。
- 在操作或维修本马达的过程中，务必戴上防护眼镜。
- 在操作本马达的过程中，务必戴上听力保护装置。
- 请留心和注意马达在启动和操作过程中出现的异常运转变化。
- 节流阀松开后，马达轴仍会持续短暂旋转。
- 请勿使用易燃、易爆液体如煤油、柴油或喷气燃料润滑马达。
- 请勿撕掉任何标签。 请更换任何受损标签。
- 请使用 **Ingersoll Rand** 推荐配件。
- 该马达的设计不适用于爆炸性气体。
- 该马达没有防电击绝缘装置。

注　意

- 如果不使用原装 **Ingersoll Rand** 零配件，可导致安全危害，并会降低马达性能、增加维修次数，还会导致所有保证失效。
- 若用户未经咨询 **Ingersoll Rand** 而改变马达的应用，**Ingersoll Rand** 不承担任何责任。
- 维修须由授权并经过培训的专业人员进行。 请就近垂询 **Ingersoll Rand** 授权服务中心。
- 雇主有责任将本手册交到操作人员手中。

安全标识识别

配戴呼吸保护装置

配戴防护眼镜

配戴听力保护装置

操作产品前，请阅读手册

（图 MHP2598）

安全信息：安全信号文字说明

⚠ 危　险	即将发生的危险情况，若不避免，则将导致严重的伤害或死亡。
⚠ 警　告	潜在的危险情况，若不避免，则将导致严重的伤害或死亡。
⚠ 小　心	潜在的危险情况，若不避免，则将导致轻微或中度的伤害或财产损失。
注　意	与人身安全或财产安全有直接或间接关联的信息及公司政策。

安装在用工具,工具投入使用

润滑

Ingersoll Rand 100 号 SAE 90 齿轮润滑剂

Ingersoll Rand 50 号

我们推荐为这些马达使用过滤润滑调节器装置。 17R 系列使用 C28241-800 号（1/2”管活栓进口）。 34R 系列使用 C31-08-G00 号（3/4”活栓进口）。 请尽可能将三联件安装在靠近马达处。 润滑器内应装满 **Ingersoll Rand** 50 号润滑油。

注　意

若使用可视润滑器，为了连续使用，将润滑器设置为每分钟 60 滴。 **在拆卸动力部件时**，在后转子轴承 (2) 中加入 28 号 **Ingersoll Rand** 润滑脂。

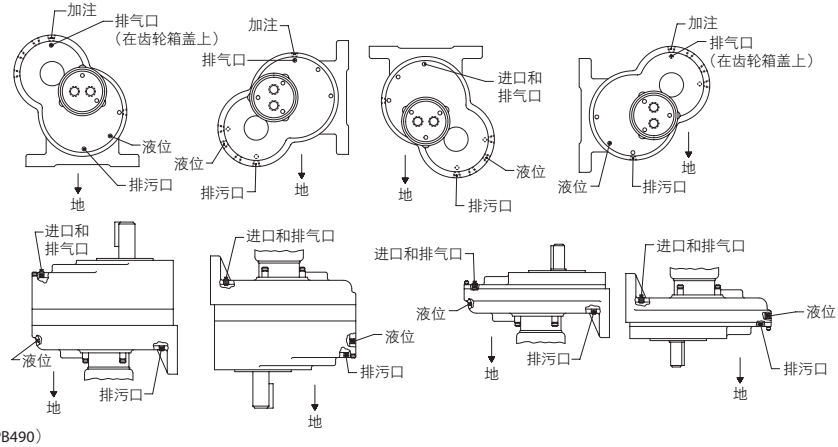
在齿轮箱中使用优质的 SAE90 齿轮润滑油。 润滑油的用量取决于齿轮箱的尺寸和马达的安装位置。

在润滑齿轮箱时，请参照示意图，该图显示了各种安装位置和进口塞、排气塞及排污塞。 在任何情况下，请将齿轮室添加至“液位”塞口位置。 若排气塞 (40) 不在指定的安装位置上，将其与在此位置上的管塞调换位置。 **在马达轴 (36) 上安装 17R 或 34R 系列马达**，马达轴摆放方向为与地板或天花板垂直时，为确保齿轮箱上部的齿轮得到充分润滑，必须安装重力给油润滑器。 为此必须拆下一个管塞，不要从马达上端拆下排气塞，并从重力给油箱连接一根油管。 将一根溢流管连接到液位塞口并引入油泵，使润滑油返回到重力给油箱。

若马达安装在图示位置以外的其它位置，请联系 **Ingersoll Rand** 代表，咨询推荐油位和排气位置。

ZH

润滑图

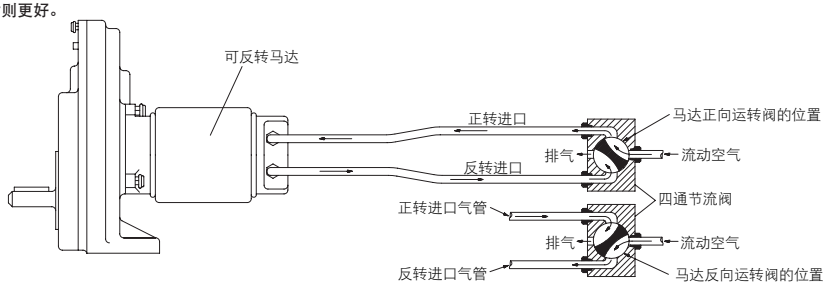


（图 TPB490）

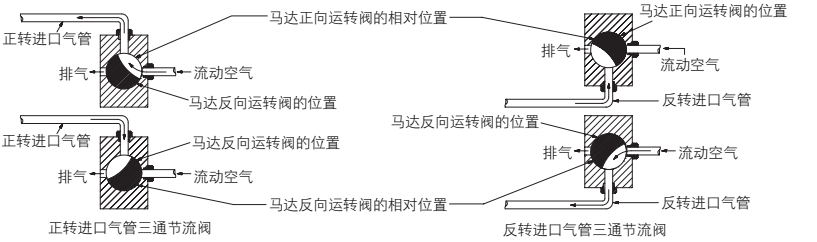
阀和管线敷设

注　意

当这些马达在使用时要求配备可逆转马达时，必须按照以下原理图所示，在气源管上使用一个4通节流阀或两个 3 通节流阀。 当应用时要求配备不可逆转马达时，可以在气源管上使用一个 2 通阀。 在任一情况下，阀出口和进口尺寸必须相等，若其中一个尺寸大于马达进口尺寸则更好。



1个控制马达正反向运转的四通阀



2个控制马达正反向运转的三通阀

（图 TPB491）

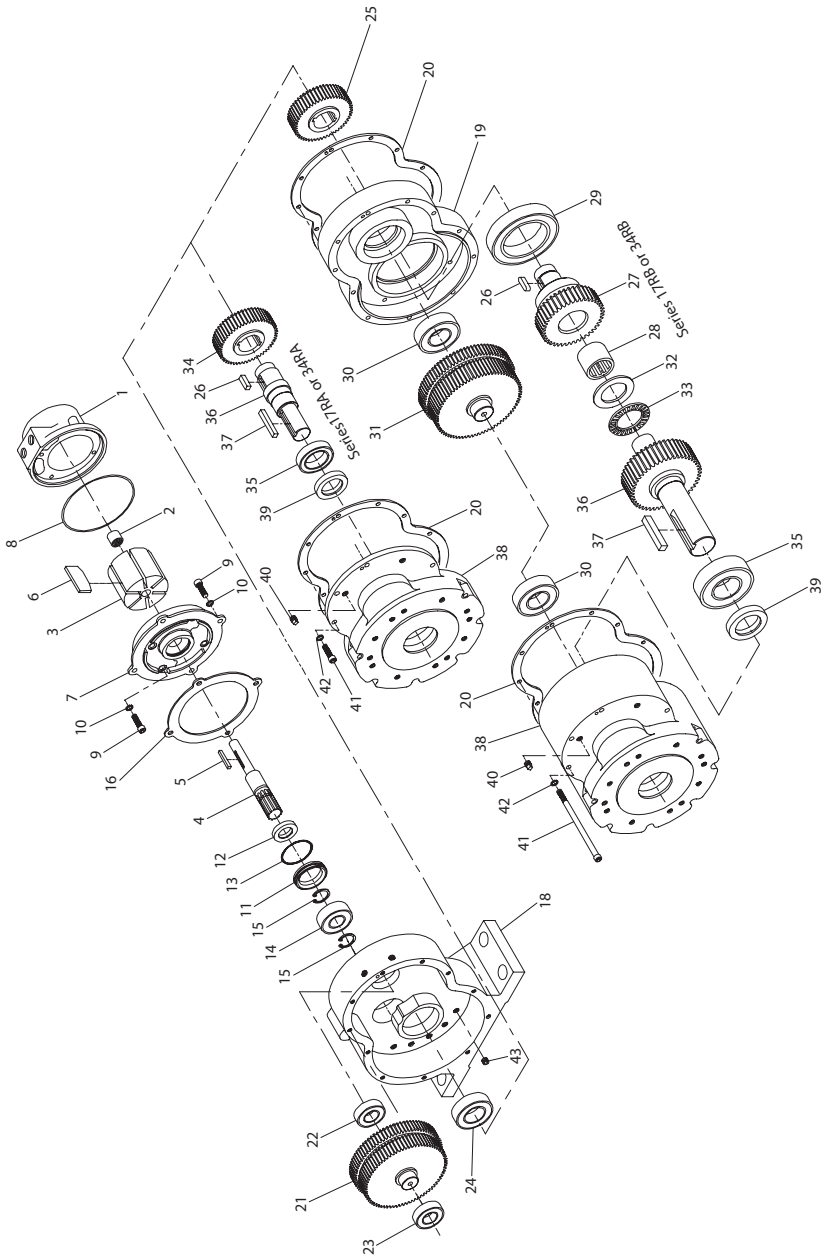
零件和维护

当马达到达使用寿命后，建议您将其拆开、去油，并将零件按材料分类，以便回收利用。

手册可从 www.irtools.com 下载。

如有任何事宜，请就近垂询 **Ingersoll Rand** 办事处或经销商。

Air Motor Exploded Diagram



(Dwg. TPA553)

Air Motor Parts List

Item	Part Description	Part Number
1	Cylinder Assembly	
	for Series 17R	MVA017-A3
	for Series 34R	MVA034-A3
• 2	Rear Rotor Shaft Bearing	MVA008-22
3	Rotor	
	for Series 17R	MVA017-53
	for Series 34R	MVA034-53
4	Rotor Shaft	
	for Series 17R	17R-52
	for Series 34R	34R-52
5	Rotor Key	
	for Series 17R	J5-754
	for Series 34R	MVA034-610
• 6	Vane Packet (set of 6 Vanes)	
	for Series 17R	MVA017-42-6
	for Series 34R	MVA034-42-6
7	Front head Assembly	8R-A240
• 8	Front head Seal	MVA008-103
9	Front head Cap Screw (8)	510-638
10	1/4" Lock Washer (8)	8U-58
11	Rotor Bearing Spacer Assembly	92N-A65
• 12	Front Rotor Shaft Seal	48N-758
• 13	Bearing Spacer Seal	AF160-294
• 14	Front Rotor Bearing	T02-33
15	Rotor Shaft Retainer (2)	R380Q-6
• 16	Gear Case Gasket	8R-284
18	Gear Box	92NA-750
19	Gear Box Frame (for Series 17RB or 34RB)	48NB -763
• 20	Gear Box Gasket (2 for Series 17RB or 34RB; 1 for other)	48NA-752
21	First Stage Intermediate Gear	
	for Model 17RA005 or 34RA005	48NA-755-005
	for Model 17RA008 or 34RA008	48NA-755-008
	for Model 17RA011 or 34RA011	48NA-755-011
	for Model 17RA014 or 34RA014	48NA-755-014
	for Model 17RA017 or 34RA017	48NA-755-017
	for Model 17RA022 or 34RA022	48NA-755-022
	for Series 17RB or 34RB	48NA-755-022
• 22	First Stage Intermediate Gear Rear Bearing	R1AP-97
• 23	First Stage Intermediate Gear Front Bearing	R38P-97
• 24	Motor Shaft Rear Bearing or Intermediate Gear Pinion Rear Bearing	48NA-510
25	Second Stage Intermediate Gear (for Series 17RB or 34RB)	48NA-756-022
26	Second Stage Intermediate Gear Key or Motor Shaft Gear Key (2)	R4H-410
27	Intermediate Gear Pinion	
	for Model 17RB029 or 34RB029	48NB-760-029
	for Model 17RB036 or 34RB036	48NB-760-036
	for Model 17RB045 or 34RB045	48NB-760-045
	for Model 17RB078 or 34RB078	48NB-760-078

Item	Part Description	Part Number
• 28	Intermediate Gear Pinion Roller Bearing (for Series 17RB or 34RB)	48NB-765
• 29	Intermediate Gear Pinion Front Bearing (for Series 17RB or 34RB)	48NB-764
• 30	Third Stage Intermediate Gear Bearing (2) (for Series 17RB or 34RB)	C6H20A-518
31	Third Stage Intermediate Gear	
	for Model 17RB029 or 34RB029	48NB-761-029
	for Model 17RB036 or 34RB036	48NB-761-036
	for Model 17RB045 or 34RB045	48NB-761-045
	for Model 17RB078 or 34RB078	48NB-761-078
• 32	Motor Shaft Thrust Bearing Race (for Series 17RB or 34RB)	48NB-767
• 33	Motor Shaft Thrust Bearing (for Series 17RB or 34RB)	48NB-769
34	Motor Shaft Gear	
	for Model 17RA005 or 34RA005	48NA-756-005
	for Model 17RA008 or 34RA008	48NA-756-008
	for Model 17RA011 or 34RA011	48NA-756-011
	for Model 17RA014 or 34RA014	48NA-756-014
	for Model 17RA017 or 34RA017	48NA-756-017
	for Model 17RA022 or 34RA022	48NA-756-022
• 35	Motor Shaft Front Bearing	
	for Series 17RA or 34RA	C6H20A-518
	for Series 17RB or 34RB	48NB-766
36	Motor Shaft	
	for Series 17RA or 34RA	48NA-757-4
	for Model 17RB029, 34RB029, 17RB036 34RB036, 17RB045 or 34RB045	48NB-762-029
	for Model 17RB078 or 34RB078	48NB-762-078
37	Motor Shaft Key	
	for Series 17RA or 34RA	107-54
	for Series 17RB or 34RB	R5H51-768
38	Gear Box Cover Assembly	
	for Series 17RA or 34RA	48NA-A751
	for Series 17RB or 34RB	48NB-A751
• 39	Motor Shaft Seal	
	for Series 17RA or 34RA	48NA-759
	for Series 17RB or 34RB	48NB-759
40	Vent Plug	48NA-368
41	Gear Box Cover Cap Screw (11)	
	for Series 17RA or 34RA	R0H-354
	for Series 17RB or 34RB	48NB-354
42	1/4" Lock Washer (11)	8U-58
43	Oil Plug (10 for Series 17RB or 34RB; 9 for others)	R2-227

• To keep downtime to a minimum, it is desirable to have on hand certain repair parts. We recommend that you stock one (pair on set) of each part indicated by a bullet (•) for every four tools in service.

Maintenance Section

⚠ WARNING

Always use protective eyewear when performing maintenance on a motor or operating a motor. Always turn off the air supply and disconnect the air supply line before installing, removing or adjusting any accessory on this motor, or before performing maintenance on this motor. Failure to do so could result in injury.

Disassembly

General Instructions

1. Do not disassemble the motor any further than necessary to replace or repair damaged parts.
2. Do not remove any part which is a press fit in or on a subassembly unless the removal of that part is necessary for repairs or replacement.
3. Whenever grasping a motor or part in a vise, always use leather-covered or copper-covered vise jaws to protect the surface of the part or motor and help prevent distortion. This is particularly true of threaded members and housings.
4. Do not press any needle bearing from a part unless you have a new needle bearing on hand for installation. Needle bearings are always damaged during the removal process.
5. If it is necessary to remove a needle bearing, make certain you have a new bearing on hand for replacement. These bearings are always damaged during the removal process.

Disassembly of the Motor

1. Remove the Vent Plug (40) and position the motor so that the oil will drain into a container. Remove the Drain Plug (43) and drain the oil from the Gear Box (18).
2. Unscrew and remove the four Fronthead Cap Screws (9) and Lock Washers (10) that hold the Cylinder Assembly (1) against the Gear Box. Pull the assembled motor away from the Gear Box.
3. Remove the Gear Case Gasket (16).
4. Remove the four Fronthead Cap Screws and Lock Washers that secure the Fronthead Assembly (7) to the Cylinder Assembly and pull the Cylinder Assembly away from the Fronthead.
5. Remove the Fronthead Seal (8).
6. If the Rear Rotor Shaft Bearing (2) must be replaced, pull it from the Cylinder.
7. Remove the Vanes (6) from the Rotor (3) and slide the Rotor off the Rotor Shaft (4). Remove the Rotor Key (5) from the Shaft.
8. Grasp the Front Rotor Bearing (14) and the front of the Rotor Shaft and pull the assembled Rotor Shaft out of the Fronthead.
9. Using snap ring pliers, remove the gear end Rotor Shaft Retainer (15) and slide the Front Rotor Bearing off the Rotor Shaft. Use the same snap ring pliers to remove the remaining Retainer.
10. Pull the Rotor Bearing Spacer Assembly (11), and Front Rotor Shaft Seal (12) off the Shaft.

Disassembly of Series 17RA and 34RA Gearing

1. Unscrew and remove the eleven Gear Box Cover Cap Screws (41) and Lock Washers (42).
2. Remove the Motor Shaft Key (37) and lay the assembled Gear Box on a workbench with the Motor Shaft (36) upward.
3. Carefully separate the Gear Box Cover Assembly (38) from the Gear Box (18) and set it aside. If the intermediate Gear (21) remains with the Gear Box Cover, make certain it does not drop onto any hard surfaces or other gearing.
4. Remove the Gear Box Gasket (20).
5. Lift the intermediate Gear out of the Gear Box. Pull the First Stage Intermediate Gear Rear Bearing (22) and First Stage Intermediate Gear Front Bearing (23) off the hubs of the Intermediate Gear. If the Bearings are frozen on the hubs, use a bearing puller to remove them.
6. Push the assembled Motor Shaft out of the Gear Box Cover Assembly.
7. Pull the Motor Shaft Rear Bearing (24) off the rear hub of the Motor Shaft.
8. Pull the Motor Shaft Front Bearing (35) off the front hub of the Motor Shaft.
9. Using a gear puller, pull the Motor Shaft Gear (34) off the rear of the Motor Shaft. Remove the two Shaft Keys (26).
10. Using a hooked tool, pull the Motor Shaft Seal (39) out of the Gear Box Cover.

Disassembly of Series 17RB and 34RB Gearing

1. Unscrew and remove the eleven Gear Box Cover Cap Screws (41) and Lock Washers (42).
2. Remove the Motor Shaft Key (37) and lay the assembled Gear Box on a workbench with the Motor Shaft (36) upward.
3. Grasp the Gear Box Frame (19) and carefully separate the assembled Frame and Gear Box Cover Assembly (38) from the Gear Box (18) and set it aside. If the First Stage intermediate Gear (21) remains with the Gear Box Frame, make certain it does not drop onto any hard surfaces or other gearing.
4. Remove the Gear Box Gasket (20).
5. Lift the First Stage Intermediate Gear out of the Gear Box. Pull the First Stage Intermediate Gear Rear Bearing (22) and First Stage Intermediate Gear Front Bearing (23) off the hubs of the Intermediate Gear. If the Bearings are frozen on the hubs, use a bearing puller to remove them.
6. Carefully separate the Gear Box Cover Assembly from the Gear Box Frame and remove the Gear Case Gasket. Be careful not to allow the Motor Shaft Thrust Bearing Race (32) or the Motor Shaft Thrust Bearing (33) to slide off the Motor Shaft and become damaged.
7. Remove the Third Stage Intermediate Gear (31) and the two Third Stage Intermediate Gear Bearings (30) from either the Gear Box Frame or the Gear Box Cover Assembly. Pull the two Bearings from the shafts of the Gear. If the Bearings are frozen on the shafts, use a bearing puller to remove them.
8. Pull the Intermediate Gear Pinion Rear Bearing (24) off the rear hub of the intermediate Gear Pinion (27).
9. Using a gear puller, pull the Second Stage Intermediate Gear (25) from the rear hub of the Intermediate Gear Pinion. Remove the two Shaft Keys (26).
10. Push the Intermediate Gear Pinion out the motor shaft end of the Gear Box Frame.
11. Pull the Intermediate Gear Pinion Front Bearing (29) off the Pinion and if the Intermediate Gear Pinion Roller Bearing (28) must be replaced, pull it from the Pinion.
12. If the Motor Shaft Thrust Bearing and Bearing Race have not been removed, remove them from the Shaft.
13. Push the assembled Motor Shaft out of the Gear Box Cover Assembly.
14. Pull the Motor Shaft Front Bearing (35) off the front hub of the Motor Shaft.
15. Using a hooked tool, pull the Motor Shaft Seal (39) out of the Gear Box Cover.

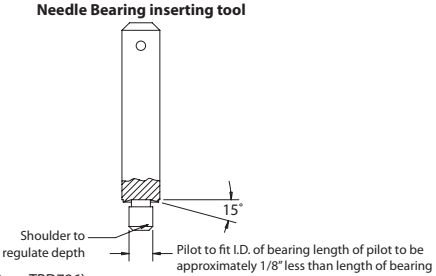
Assembly

General Instructions

1. Always press on the **Inner** ring of a ball-type bearing when installing the bearing on a shaft.
2. Always press on the **Outer** ring of a ball-type bearing when pressing the bearing into a bearing recess.
3. Whenever grasping a tool or part in a vise, always use leather-covered or copper-covered vise jaws. Take extra care not to damage threads or distort housings.
4. Clean every part and wipe every part with a thin film of oil before installation.
5. Check every bearing for roughness. If an open bearing must be cleaned, wash it thoroughly with a clean suitable solution and dry with a clean cloth. **Sealed or shielded bearings should not be cleaned.** Work grease into every bearings before installation.
6. Apply a film of O-ring lubricant to every O-ring before installation.

7. Unless otherwise noted, always press on the stamped end of a needle bearing when installing a needle bearing into a recess. Use a bearing inserting tool similar to the one shown in drawing below :

Needle Bearing inserting tool



(Dwg. TPD786)

Assembly of Series 17RB and 34RB Gearing

1. Using a bearing inserting tool, press the Intermediate Gear Pinion Roller Bearing (28) into the Intermediate Gear Pinion (27).
2. Using a piece of tubing that contacts the outer ring of the Intermediate Gear Pinion Bearing (29). Press the Bearing into the large Bearing recess in the spindle side of the Gear Box Frame (19).
3. Insert the shaft of the Intermediate Gear Pinion through the Bearing and Frame, and rest the assembly on the table of an arbor press with the pinion shaft upward and the gear end face of the Pinion supported.
4. Insert the two Second Stage Intermediate Gear Keys (26) into the slots in the shaft and press the Second Stage Intermediate Gear (25) onto the Pinion shaft capturing the Gear Box Frame within the assembly.
5. Using a piece of tubing that contacts the inner ring of the Third Stage Intermediate Gear Bearing (30), press a Bearing onto each shaft of the Third Stage intermediate Gear (31).
6. Place the assembled Gear Box Frame on a workbench with the roller bearing end of the Pinion upward.
7. Position the Bearing nearest the large spline on the shaft of Third Stage Intermediate Gear above the bearing recess in the Gear Box Frame. Engage the large spline of the Gear with the spline of the Pinion while pushing the Bearing into the recess.
8. Using a piece of tubing that contacts the inner ring of the Motor Shaft Front Bearing (35), press the Bearing onto the output end of the Motor Shaft (36).
9. Install the Motor Shaft Thrust Bearing (33) followed by the Motor Shaft Thrust Bearing Race (32) onto the opposite end of the Motor Shaft and insert the assembled Shaft, Bearing Race leading into the Pinion Roller Bearing.
10. Place one of the. Gear Box Gaskets (20) onto the Gear Box Frame making certain the Gasket fits over the alignment pin in the Frame and fits well around the large, raised alignment hub.
11. Using a dowel, push the Motor Shaft Seal (39), small opening leading, into the recess in the Gear Box Cover Assembly (38).
12. Position the Cover over the Box Frame and install the Seal on the Motor Shaft by bringing the Cover down against the Gasket. Make certain the alignment pin and hub on the Frame enter the hole and recess in the Cover.
13. Turn the assembly over so that the output end of the Motor Shaft is downward.
14. Using a piece of tubing that contacts the inner ring of the First Stage Intermediate Gear Front Bearing (23), press the Bearing onto the shaft adjacent to the small spline of the First Stage Intermediate Gear (21).
15. Using a piece of tubing that contacts the inner ring of the First Stage Intermediate Gear Rear Bearing (22), press the Bearing onto the shaft adjacent to the large spline of the First Stage Intermediate Gear (21).
16. Position the Bearing nearest the smaller spline on the shaft of the First Stage Intermediate Gear above the bearing recess in the Gear Box Frame. Engage the smaller spline of the Gear with the spline of the Second Stage Intermediate Gear while pushing the Bearing into the recess.
17. Using a piece of tubing that contacts the inner ring of the intermediate Gear Pinion Rear Bearing (24), press a Bearing onto the shaft of the Intermediate Gear Pinion.
18. Place the remaining Gear Box Gasket onto the Gear Box Frame making certain the Gasket fits over the alignment pin in the Frame and fits well around the large, raised alignment hub.
19. Position the Gear Box (18) over the assembly and bring the Gear Box down against the Gasket while making sure the Bearings enter the bearing recesses in the Gear Box. Make certain the alignment pin and hub on the Frame enter the hole and recess in the Gear Box.
20. While keeping the assembly together, turn it over and insert the eleven Gear Box Cover Cap Screws (41) with their Lock Washers (42) through the holes of the Cover and Frame and into the Gear Box. Tighten the Screws evenly, a little at a time, using an alternating pattern. Use the Screws to draw the assembly together without distortion and without binding.

Assembly of Series 17RA and 34RA Gearing

1. Insert the two Motor Shaft Gear Keys (26) into the slots in the Motor Shaft (36) and press the Motor Shaft Gear (34) onto the Motor Shaft.
2. Using a dowel, push the Motor Shaft Seal (39), small opening leading, into the recess in the Gear Box Cover Assembly (38).
3. Using a piece of tubing that contacts the inner ring of the Motor Shaft Front Bearing (35), press the Bearing onto the output end of the Motor Shaft.
4. Using a piece of tubing that contacts the inner ring of the Motor Shaft Rear Bearing (24), press a Bearing onto the motor end of the Motor Shaft.
5. Insert the output end of the Motor Shaft through the Motor Shaft Seal and push it into the gear Box Cover Assembly until the Motor Shaft Front Bearing seats in the bearing recess.
6. Using a piece of tubing that contacts the inner ring of the First Stage Intermediate Gear Front Bearing (23), press the Bearing onto the shaft adjacent to the small spline of the First Stage Intermediate Gear (21).
7. Using a piece of tubing that contacts the inner ring of the First Stage Intermediate Gear Rear Bearing (22), press the Bearing onto the shaft adjacent to the large spline of the First Stage Intermediate Gear (21).
8. Place the Gear Box Cover Assembly on a workbench with the output end of the Motor Shaft downward.
9. Position the Bearing nearest the smaller spline on the shaft of the First Stage Intermediate Gear above the bearing recess in the Gear Box Cover. Engage the smaller spline of the Gear with the spline of the Motor Shaft Gear while pushing the Bearing into the recess.
10. Place the Gear Box Gasket (20) onto the Gear Box Cover making certain the Gasket fits over the alignment pin in the Cover and fits well around the large, raised alignment hub.
11. Position the Gear Box (18) over the assembly and bring the Gear Box down against the Gasket while making sure the Bearings enter the bearing recesses in the Gear Box. Make certain the alignment pin and hub on the Frame enter the hole and recess in the Gear Box.
12. While keeping the assembly together, turn it over and insert the eleven Gear Box Cover Cap Screws (41) with their Lock Washers (42) through the holes of the Cover into the Gear Box. Tighten the Screws evenly, a little at a time, using an alternating pattern. Use the Screws to draw the assembly together without distortion and without binding.

Assembly of the Motor

1. If the Rear Rotor Shaft Bearing (2) was removed, use a bearing inserting tool to press it into the central opening of the Cylinder Assembly (1).

2. Slide the Front Rotor Shaft Seal, large opening leading, onto the spline end of the Rotor Shaft (4) and move it to a position beyond the two snap ring grooves.
3. Using snap ring pliers, install one of the Rotor Shaft Retainers (15) on the Rotor Shaft. Install it in the groove nearest the small shaft with the key slot.
4. Slide the Front Rotor Bearing (14) onto the spline end of the Rotor Shaft until it contacts the Retainer. Install the remaining Retainer behind it to capture it in position on the Shaft.
5. Slide the installed Front Rotor Shaft Seal toward the Bearing until it contacts the Retainer.
6. Install the Bearing Spacer Seal (13) in the groove around the outside of the Rotor Bearing Spacer Assembly (11).
7. From the small end of the Rotor Shaft and with the large bevelled end leading, install the Spacer on the Shaft. Make certain the central opening of the Spacer fits onto the Front Rotor Shaft Seal and the Spacer makes contact with the face of the Rotor Bearing.
8. Insert the small end of the Rotor Shaft through the hole in the Fronthead Assembly (7) from the side having the large central hub.
9. Install the Rotor Shaft Key (5) in the key slot on the Rotor Shaft to keep the assembled Shaft in the Fronthead.
10. Slide the Rotor (3) onto the Rotor Shaft and install a Vane (6) into each of the vane slots in the Rotor.
11. Install the Fronthead Seal (8) on the large hub of the Fronthead.
12. Slide the Cylinder over the Rotor and bring it into contact with the Fronthead. Make certain the Rotor Shaft enter the Rear Rotor Shaft Bearing and the tapped holes in the face of the Cylinder align with the bolt holes in the face of the Fronthead.
13. Thread four of the Fronthead Cap Screws (9) and Lock Washers (10) into the Cylinder through the face of the Fronthead. Tighten the Screws evenly, a little at a time, using an alternating pattern. Use the Screws to draw the assembly together without binding or without damaging the Seals.
14. Position the Gear Case Gasket (16) over the large hub on the face of the Fronthead and insert the remaining four Screws and Lock Washers through the Fronthead and Gasket from the Cylinder end of the assembly.
15. Insert the spline of the Rotor Shaft through the face of the Gear Box (15) making sure the spline engages the gearing in the Gear Box. Bring the face of the Fronthead with the Gasket against the face of the Gear box and thread the Screws into the Gear box. Tighten the Screws evenly, a little a time, using an alternating pattern.

www.irtools.com

Ingersoll Rand