



Form 04584363  
Edition 1  
December 2004

## Air Impact Wrench

2161 and 2171

---

# Maintenance Information



**Save These Instructions**

***IR*** Ingersoll-Rand®

## WARNING

Always wear eye protection when operating or performing maintenance on this tool.  
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.

### Lubrication

Each time a Series 2161P or 2171P Impact Wrench is disassembled for maintenance and repair or replacement of parts, lubricate the tool as follows:

1. Work approximately 12 to 15 cc of **Ingersoll-Rand** No. 100 Grease into the impact mechanism. Coat the Anvil (38) lightly with grease

around the Hammer Case Bushing (36). Inject approximately 2 to 4 cc of grease into the Grease Fitting (15).

2. Use **Ingersoll-Rand** No. 50 Oil for lubricating the motor. Inject approximately 1 to 2 cc of oil into the air inlet before attaching the air hose.

### Disassembly

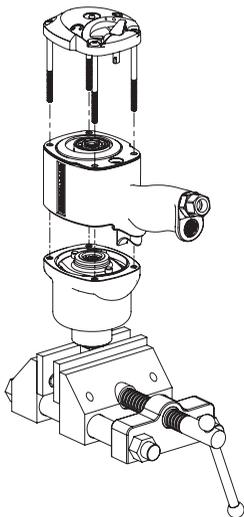
#### General Instructions

1. Do not disassemble the tool any further than necessary to replace or repair damaged parts.
2. Whenever grasping a tool or a part in a vise, always use leather-covered or copper-covered vise jaws to protect the surface of the part and help prevent distortion. This is particularly true of threaded members and housings.
3. Do not remove any part which is a press fit in or on a subassembly unless the removal of that part is necessary for repair or replacement.
4. Do not disassemble the Impact Wrench unless you have a complete set of new gaskets and O-Rings for replacement.

#### Disassembly of the Hammer Case and Anvil Assembly

### NOTICE

Before disassembling this tool, clamp the anvil drive in leather-covered or copper-covered vise jaws with the Backcap (14) pointing upward. See Drawing TPD1922.



(Dwg. TPD1922)

1. Using a Torx® Number 27 drive wrench or bit, unscrew and remove the four Backcap Bolts (12).
2. Lift the assembled Motor Housing (1) off of the Hammer Case (35). Make sure that you hold the Backcap in position on the Housing and that the motor does not come out of the Housing.
3. Remove the Hammer Case Gasket (34) and replace with a new one when assembling the Hammer Case to the Housing.

4. Remove the Hammer Case and impact mechanism assembly from the vise. Remove the Hammer Frame Washer (30) from the rear of the Hammer Frame and set it aside on a clean bench.

\* Registered trademark of Textron.

5. Place the impact mechanism on a bench with the Anvil (pointing upward). Make sure that the Hammer Pins (33) do not drop out of the Hammer.
6. Lift the Hammer Case off of the Anvil (38). If it is unnecessary to disassemble the impact mechanism, set it aside intact.

#### Disassembly of the Impact Mechanism

Disassemble the impact mechanism as follows:

1. Set the mechanism, driver end up, on the workbench. Using a felt tipped pen, mark one end of the Hammer \* ↑ with the arrow pointing upward.
2. With the mechanism sitting upright on the workbench, slowly rotate the Anvil in a clockwise direction until it comes up solid.

### NOTICE

If you continue to rotate the Anvil, it will cam the Hammer out of engagement. Don't do this; merely rotate the Anvil until it comes up solid.

3. Hold the Hammer Frame firmly and, without disturbing the Hammer, gently lift the Anvil from the Hammer Frame.
4. With the Anvil removed, lift out the two Hammer Pins.

### CAUTION

The Hammer is now free to slide from the Hammer Frame. Be careful not to drop it.

#### Disassembly of the Reverse Valve

1. Using a Torx® No. 27 drive wrench or bit, remove the four Backcap Bolts (12).
2. Lift the Backcap off of the rear of the Housing.
3. Discard the Backcap Gasket (13) and replace it with a new one when assembling the tool.
4. Use a hooked tool to remove the Reverse Valve (29) from the reverse valve bushing. Set the Reverse Valve aside on a clean bench.
5. Remove and discard the Reverse Valve O-Ring (28). Replace it with a new one when assembling the Reverse Valve.
6. Use a flat, thin blade screwdriver to remove the Reverse Lever Retaining Ring (17) and Reverse Lever Spring (18) from the Reverse Lever (16).
7. Remove the Reverse Lever from the Backcap.

#### Disassembly of the Motor

1. Using a Torx® No. 27 drive wrench or bit, remove the four Backcap Bolts.
2. Remove the Backcap, Motor Clamp Washer (19) and Backcap Gasket from the Housing and set them aside on a clean bench. Discard the Backcap Gasket and replace it with a new one when assembling the tool.
3. Lift the Housing from the Hammer Case. Place one hand over the rear of the Housing and turn the Housing over so that the assembled motor can slide and be guide out of the Housing.
4. Place the assembled motor on a clean bench with the rotor spline facing upward.
5. Remove the Front End Plate (26) and Cylinder (25).

6. Remove the Rotor (22) from the Rear End Plate (21).
7. Remove the Vanes from the Rotor.
8. Inspect all motor parts including the Front Rotor Bearing (27) and Rear Rotor Bearing (20) and replace all worn or damaged parts.

### Disassembly of the Throttle Mechanism

1. Unscrew and remove the Air Inlet Bushing (7).

2. Remove the Screen (6), Throttle Valve Spring (5) and Throttle Valve (4).
3. If the Throttle Valve Seat (2) requires replacement, insert a hooked tool through the center of the Valve Seat. Catching the backside of the Seat with the hook, pull the Seat from the Housing.
4. Withdraw the Trigger Assembly (3) from the Housing.
5. Remove the Retaining Ring (10), Exhaust Deflector (11) and Muffler

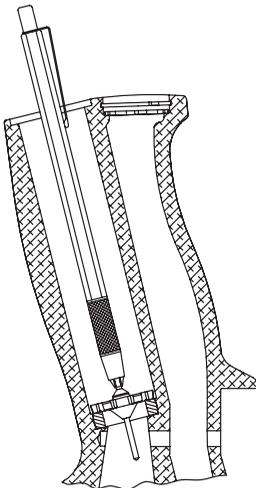
## ASSEMBLY

### 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 with threaded parts or housings.
4. Always clean every part and wipe every part with a thin film of oil before installation.
5. Apply a film of O-Ring lubricant to all O-Rings before final assembly.
6. Check every bearing for roughness. **Sealed or shielded bearings should never be cleaned.** Work grease thoroughly into every open bearing before installation.

### Assembly of the Throttle Mechanism

1. Install a new Throttle Valve Seat (2) by pushing it into position in the Housing (1) with a 13/16" dowel.
2. Insert the short end of the stem of the Throttle Valve (4) into the jaws of an expanding-type mechanical pencil. Allow the jaws to retract around the stem to secure it.
3. Install the Throttle Valve on the Valve Seat. See Dwg. TPD1919.



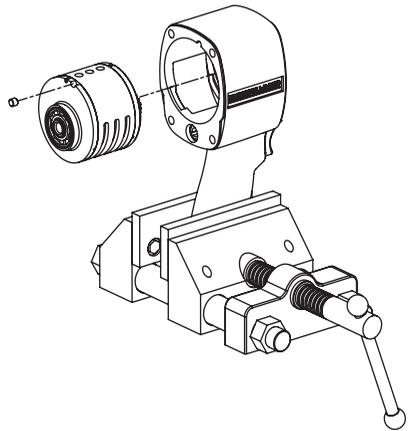
(Dwg. TPD1919)

4. As an alternate assembly procedure, drop the Throttle Valve, long stem first, into the inlet passage. If the throttle Valve does not sit squarely on the Throttle valve Seat, shake the Handle until it seats.
5. Install the Throttle Valve Spring (5), small end first, with the inside diameter of the small first coil around the hub of the Throttle Valve.
6. Coat the Inlet Bushing O-Ring (8) with O-Ring lubricant and install it on the Inlet Bushing (7).
7. Screw the Inlet bushing into the Housing until snug and tighten to 55-60 ft. lbs. (75-81 Nm) torque.
8. Wipe the stem of the Trigger Assembly (3) with light grease and insert the stem of the Trigger into the trigger bore in the Housing until it snaps into place on the Throttle Valve.

### Assembly of the Motor

1. Pack the Front Rotor Bearing (27) and Rear Rotor Bearing (20) with the recommended grease. Install the Front Rotor Bearing in the Front End Plate (26) and the Rear Rotor Bearing in the Rear End Plate (21).

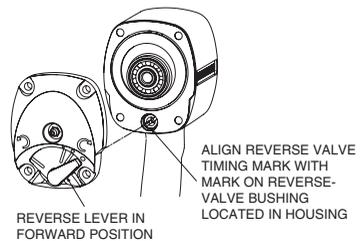
2. Slide the assembled Rear End Plate and Rear Rotor Bearing on the hub of the Rotor (22).
3. Set the assembled Rear End Plate and Rotor on a clean surface with the spline of the Rotor pointing upward.
4. Insert the Vanes (23) in the vane slots on the Rotor.
5. Install the Front and Rear Cylinder Dowels (24) in the Cylinder (25).
6. Slide the Cylinder over the Rotor and Vanes making sure that the Rear Cylinder Dowel enters the notch in the outside diameter of the Rear End Plate.
7. Install the assembled Front End Plate and Bearing over the front, splined end of the Rotor making sure that the front Cylinder Dowel fits into the notch in the outside diameter of the Front End Plate.
8. Grasp the Housing with one hand and set it upside down on its top. With the other hand, carefully guide the motor assembly into the Housing, making sure that the side of the motor assembly containing the Cylinder Dowels is oriented to the top of the Housing. Install Locating Pin (21A) into Housing and Rear End Plate. See Dwg. TPD1923-1.



(Dwg. TPD1923-1)

### Assembly of the Reverse Valve

1. Coat a new Reverse Valve O-Ring (28) with O-Ring lubricant and install it in the groove on the Reverse Valve (29).
2. Install the Reverse Valve in the reverse valve bushing with the slotted end trailing, making sure that the index mark on the Reverse Valve is aligned with the index mark on the Bushing. See Dwg. TPD1912-1.



(Dwg. TPD1912-1)

operation. See Dwg. TPD1912-

## NOTICE

The Reverse Valve must be installed and indexed with the bushing as directed in Step 2 and Dwg. TPD1912-1. Failure to do so will cause improper operation of the Reverse Valve.

3. Insert the Reverse Lever (16) through the rear of the Backcap (14).
4. Slide the Reverse Lever Spring (18) over the shaft of the Reverse Lever and secure the Spring and Reverse Lever by installing the Reverse Lever Snap Ring (17) in the groove in the shaft of the Reverse Lever. Rotate the Reverse Lever so that it is pointing to the symbol for FORWARD (clockwise).

### Assembly of the Impact Mechanism

1. Coat the Hammer (38) with a light film of **Ingersoll-Rand** No. 170 Grease.
2. Slide the Hammer into the Hammer Frame (36) exactly as it was when you marked it prior to disassembly.

## NOTICE

In order to utilize both impacting surfaces on the Hammer and thus equalize the wear on each hammer jaw, the Hammer can be flipped over so that the arrow is pointing downward.

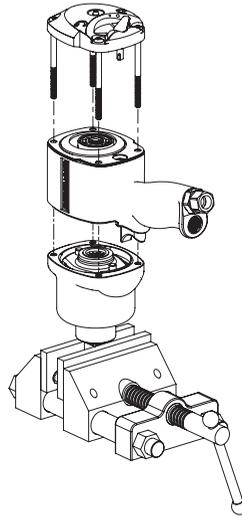
3. Replace the Hammer Pins (37).
4. Examine the base of the Anvil (39) and note its contour. While looking down through the Hammer Frame, swing the Hammer to its full extreme one way or another until you can match the contour of the Anvil. Enter the Anvil into the Hammer Frame and through the Hammer.

### Assembly of the Anvil

1. Place the Hammer Frame Washer (30), hub side first, over the hub of the Rotor and against the Front Rotor Bearing.
2. Set the assembled impact mechanism down over the splined hub of the Rotor. If the impact mechanism was disassembled, refer to **Assembly of the Impact Mechanism**.
3. Position the new Hammer Case Gasket (34) on the Housing.
4. Work approximately 12 to 15 cc of **Ingersoll-Rand** No. 170 Grease into the impact mechanism.
5. Smear a thin film of **Ingersoll-Rand** No. 170 Grease on the inside surface of the Hammer Case Bushing (36) and place the Hammer Case (35) down over the Anvil and against the Motor Retainer.
6. Install the Backcap Bolts and using a No. 27 Torx® drive wrench or bit, tighten them to 10 to 12 ft-lb (13 to 16 Nm) torque.
7. Remove the Impact Wrench from the vise and inject 2 to 4 cc of **Ingersoll-Rand** No. 170 Grease into the Grease Fitting (15).

### Assembly of the Tool

1. Wipe a thin film of the recommended grease on the inside of the Hammer Case Bushing (36) and insert the assembled impact mechanism into the Hammer Case (35).
2. Secure the Hammer Case and impact mechanism by the anvil (square drive) end in leather-covered or copper-covered vise jaws. See Dwg. TPD1922.



(Dwg. TPD1922)

3. Install a new Hammer Case Gasket (34) on the Hammer Case making sure that the holes in the gasket align with the holes in the Hammer Case.

## NOTICE

When installing optional Hanger Kit, place Gasket (34) on the Housing.

4. Wipe a small amount of the recommended grease on the flat side of the Hammer Frame Washer (30) and place it on the splined face of the Hammer Frame (31) with the hub end of the washer pointing up.

## NOTICE

When installing optional Hanger Kit, place additional washer provided between the Hammer Frame and Hammer Frame Washer.

5. Set the fully assembled Motor Housing over the opening in the Hammer Case. Insert the spline drive of the Rotor into the splined hole of the impact mechanism. Make sure of the wide section of the Hammer Case is just above the Trigger.
6. Place a new Backcap Gasket (13) over the rear of the Housing making sure that the holes in the Gasket align with the holes in the Housing and that the profile of the Gaskets matches the profile of the Housing.
7. Place a Motor Clamp Washer (19) over the rear of the motor with the convex side up and matching the large outside diameter of the Rear End Plate.
8. Place the Backcap (14) over the back of the Housing making sure that the Reverse Valve Lever (16) is in the full-forward (clockwise) position with the lugs in the Lever engaging the slots in the Reverse Valve. Make sure that the index mark on the Reverse Valve lines up with the index mark on the reverse valve bushing.
9. Install the four Backcap Bolts and using a No. 27 Torx® drive wrench or bit, tighten to 10–12 ft-lbs (13–16 Nm) torque.

## Troubleshooting Guide

Troubleshooting Guide		
Trouble	Probable Cause	Solution
Low power	Dirty Inlet Bushing or Air Strainer Screen and/or Exhaust Silencer	Using a clean, suitable, cleaning solution, in a well ventilated area, clean Air Strainer Screen, Inlet Bushing and Exhaust Silencer.
	Worn or broken Vanes	Replace the <b>complete</b> set of Vanes.
	Worn or broken Cylinder and/or scored End Plates	Examine the Cylinder and replace it if it is worn or broken or if the bore is scored or wavy. Replace the End Plates if they are scored.
	Dirty motor parts	Disassemble tool and clean all parts with a suitable cleaning solution, in a well-ventilated area. Reassemble tool as instructed in this manual.
Motor will not run	Improper positioning of the Reverse Valve Lever or Reverse Valve	Make certain that the Reverse Valve Lever is in the reverse position or one of the three forward positions. If the tool has been disassembled, refer to Dwg. TPD1912-1 for proper Reverse Valve and Reverse Lever orientation.
	Incorrect assembly of the motor	Disassemble the motor, replace worn or broken parts and reassemble as instructed.
Tool will not impact	Insufficient lubricant in the impact mechanism	Remove the Hammer Case Assembly and lubricate the impact mechanism.
	Broken or worn impact mechanism parts	Remove the Hammer Case and examine the impact mechanism parts. Replace any worn or broken parts.
	Impact Mechanism not assembled correctly	Refer to <b>Assembly of the Impact Mechanism</b> .

## Related Documentation

For additional information refer to:  
 Air Impact Wrench Product Safety Information Manual 04580916,  
 Air Impact Wrench Product Information Manual 04584926,  
 Air Impact Wrench Parts List Manual 04584637.

Manuals can be downloaded from [www.irttools.com](http://www.irttools.com).

---

**Notes**





[www.irttools.com](http://www.irttools.com)

© 2004 Ingersoll-Rand Company