**47109483**
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# Air Impulse Wrench (Twin Blade)

## Models 1100P, 1410P and 1900P

# Maintenance Information

Save These Instructions

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**⚠ WARNING**

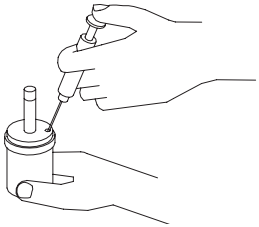
**Always wear eye protection when operating or performing maintenance on this tool.**
**Always turn off the air supply and disconnect the air supply hose before installing, removing or adjusting any accessory on this tool or before performing any maintenance on this tool.**

**Note:** When reading the instructions, refer to exploded diagrams in Parts Information Manual when applicable (see under Related Documentation for form numbers).

## Changing The Mechanism Fluid

**To change the Mechanism Fluid in the Impulse Mechanism, proceed as follows:**

1. Remove the Rubber Housing Boot (45).
2. Using a hex wrench, remove the three Hammer Case Cap Screws (43) and Lock Washers (44). Lift the Hammer Case (39) off the Motor Housing (1) over the Drive Shaft. Remove the Hammer Case Gasket (42).
3. Lift the assembled mechanism off the Rotor (28).
4. Using a 2 mm hex wrench, rotate the Torque Adjustment Screw (53) clockwise until the Screw stops. Rotate the Screw counterclockwise until it stops or makes six complete revolutions.
5. Using a 2.5 mm hex wrench, unscrew and remove the Oil Plug (56). Remove the Oil Plug Seal (57) and Oil Plug Seal Support (58).
6. With the oil plug opening downward over a container, rotate the Drive Shaft to purge the fluid from the mechanism.
7. Thread the Tee Wrench included with the Tool Kit (Part No. 700A–99 or 1900P–99) into the Piston Stop Assembly (71) that is 180 degrees from the Torque Adjustment Screw and pull the Stop Assembly toward the output end of the mechanism until it stops.
8. Using the syringe and fluid from the Fluid Replacement Kit (Part No. EQ106S–K400), fill the mechanism with the fluid furnished in the Kit until the fluid overflows the fill hole. Model 1100P will require 17 cc of fluid; Model 1410P, 23 cc and Model 1900P, 30 cc. (Refer to Dwg. TPD1265)



(Dwg. TPD1265)

***NOTICE***

**Do Not Substitute Any Other Fluid.**
**Failure to use the impulse mechanism fluid provided could damage the tool, increase maintenance and decrease performance. Use only clean fluid in these tools.**

9. Submerge the fill opening in the remainder of the fluid, and using a wrench, rotate the Drive Shaft to purge any remaining air from the system.
10. Remove the mechanism from from the fluid and use the Tee Wrench to push the Piston Stop Assembly slowly downward until fluid flows from the fill opening.
11. Thread the Oil Plug with the Oil Plug Seal and Seal Support into the mechanism until it is snug.
12. Using a 2 mm hex wrench, turn the Torque Adjustment Screw clockwise until it stops. This is the maximum torque position.
13. Wipe the outside of the mechanism dry and clean and remove the Oil Chamber Plug. Using the syringe, withdraw 0.85 cc of fluid from 1100P models, 0.85 cc of fluid from 1410P models and 1.2 cc from 1900P models.
14. Install the Oil Chamber Plug and tighten it between 20 and 25 in–lb (2.3 and 2.8 Nm) torque.
15. Position a new Hammer Case Gasket on the Motor Housing and install the assembled mechanism on the rotor shaft.
16. Place the Hammer Case Cover over the Drive Shaft against the Housing and Gasket. Install the three Hammer Case Cap Screws and Lock Washers. Tighten each Screw between 45 an 50 in–lb (5.1 and 5.6 Nm) torque.
17. Install the Rubber Housing Boot on the tool.

## Disassembly

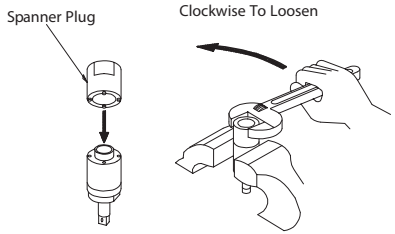
### General Instructions

1. Do not disassemble the tool any further than necessary to replace or repair damaged parts.
2. When grasping a tool or 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 an assembly unless the removal of that part is necessary for repairs or replacement.

### Disassembly of the Impulse Mechanism

1. Use a hooked wire to pull the Retaining Pin Spring (65) out of the end of the Drive Shaft (63) and remove the Socket Retaining Pin (64).
2. Remove the Rubber Housing Boot (45).
3. Using a hex wrench, remove the three Hammer Case Cap Screws (43) and Lock Washers (44). Lift the Hammer Case (39) off the Motor Housing (1) over the Drive Shaft. Remove the Hammer Case Gasket (42).
4. Lift the assembled mechanism off the Rotor (28).
5. Grasp the flats of the Housing (51) in vise jaws with the output end of the Drive Shaft downward.
6. Insert the pins of the Spanner Plug from the No. 700A–99 or No. 1900P–99 Tool Kit into two holes in the Housing Cap (76). Using a wrench on the plug, unscrew and remove the Housing Cap from the Housing.

(Refer to Dwg. TPD1267)

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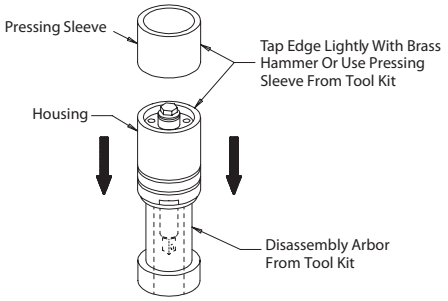
7. Stand the Disassembly Arbor from the Tool Kit, large end downward, on a workbench or the table of an arbor press. Insert the output end of the Drive Shaft into the central opening and either tap the Housing downward off the components or use the Pressing Sleeve in the Kit to press the Housing downward off the components.
   (Refer to Dwg. TPD1268).

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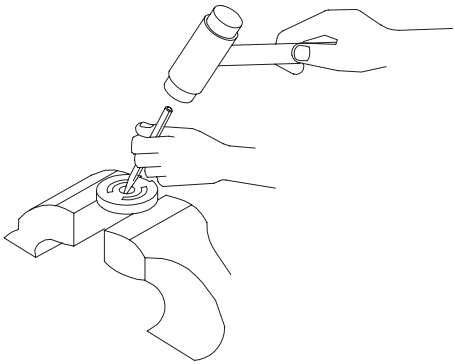
### Disassembly of the Motor

1. Grasp the Motor Housing (1) in vise jaws with the Motor Case Cover Assembly (33) upward.
2. Using a hex wrench, remove the three Motor Case Cover Screws (37) and Lock Washers (38).
3. Remove the Cover and Motor Case Cover Gasket (35) from the Motor Housing and also the Rear End Plate Gasket (36) on 1100P models.
4. Remove the Housing from the vise jaws and insert a rod into the central opening in the output end of the rotor shaft.
5. While holding the motor end of the Housing above a piece of cardboard on the workbench, lightly tap the rod to remove the Rear End Plate Assembly (23), Rotor (28) and Vanes (29).
6. On the table of an arbor press, support the Rear End Plate with blocks as close to the Rotor as possible and press the Rotor out of the Rear End Plate and Rear Rotor Bearing (25).
7. To remove the Rear Rotor Bearing from the Rear End Plate, use a small drift or pin punch through the central opening of the Rear End Plate to tap the Bearing out of the End Plate.
   (Refer to Dwg. TPD1271).

**NOTICE**

**In the following two steps, do not enlarge or damage the shaft hole in the End Plate.**

8. Using a longer drift punch through the Cylinder (26), tap the Front Rotor Bearing (32) out of the Front End Plate Assembly (30) in the same manner.



(Dwg. TPD1271)

9. The Cylinder and Front End Plate are a shrink fit in the Motor Housing and parts that can be damaged during the heating process must be removed before heating the Housing.
10. Press the Reverse Lever Pin (4) out of the Reverse Lever (2) and pull the lever off the shaft of the Reverse Valve (6).
11. Using snap ring pliers, remove the Reverse Valve Retainer (9).
12. Grasp the shaft of the Reverse Valve with pliers, and pull the Reverse Valve, Reverse Valve Detent Ball (7) and Detent Spring (8) out of the Reverse Valve Bushing (5). Be careful not to lose the Ball and Spring.
13. Using a pin punch, tap the Throttle Retaining Pin (20) out of the Handle.
14. Grasp the Trigger (18) and pull the assembled throttle out of the Motor Housing.
15. Using a pin punch and without damaging the Trigger, remove the Trigger Pin (19).
16. Slide the Throttle Bushing Assembly (11) off the shaft of the Throttle Rod Assembly (16).
17. Using a thin blade screwdriver, remove the Valve Retaining Ring (15) and slide the Throttle Valve Assembly (13) off the shaft of the Throttle Valve Rod.
18. Using an adjustable wrench, unscrew and remove the Inlet Bushing (21) and Exhaust Deflector Assembly (22).
19. Insert a threaded rod through the Cylinder and Front End Plate and install a nut and washer on the end plate end of the rod. Position the Rear End Plate on the threaded rod against the Cylinder and clamp the End Plates and Cylinder snug with another nut and washer. Do not tighten the assembly excessively.
20. Using a heat induction coil or an oven, heat the assembly and Housing until it is warm enough to pull the assembly out the rear of the Motor Housing. Do not apply enough heat to distort the Housing.

**⚠ CAUTION**

**In the following step, take all precautions necessary to prevent being burned by handling warm or hot parts.**

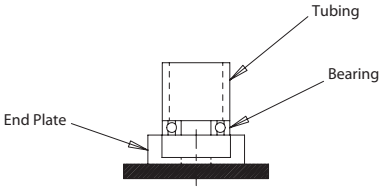
## Assembly

### General Instructions

1. When grasping a tool or 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.
2. Always press on the inner ring of a ball–type bearing when installing the bearing on a shaft.
3. Always press on the outer ring of a ball–type bearing when pressing the bearing into a bearing recess.
4. Except for bearings and mechanism parts, always clean every part and wipe every part with a thin film of oil before installation.
5. Wipe a thin film of mechanism fluid on all internal mechanism components before installing them in the mechanism.
6. Apply a film of O–ring lubricant to every O–ring before installation.

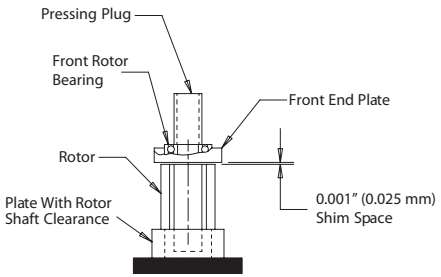
### Assembly of the Motor

1. Using an arbor press and a piece of tubing that contacts the outer ring of the bearings, press the Front Rotor Bearing (32) into the Front End Plate (30) and the Rear Rotor Bearing (25) into the Rear End Plate (23).
   (Refer to Dwg. TPD1274).




(Dwg. TPD1274)

2. Stand the Rotor (28) on the table of an arbor press. It should be upright on a flat metal plate having a clearance hole for the shaft. The shaft with the hex must be upward.
3. Place a 0.001" (0.025 mm) shim on the upward surface of the large portion of the rotor body. Using a piece of tubing that contacts the inner ring of the bearing, press the Front Rotor Bearing and Front End Plate, End Plate leading, onto the shaft of the Rotor until the End Plate contacts the shim. Remove the shim.
   (Refer to Dwg. TPD1276)
4. Coat each Vane (29) with a thin film of oil and insert a Vane into each of the rotor vane slots with the straight edge of the Vane outward.
5. For Model 1100P or 1410P, install the Cylinder (26) over the Vanes and Rotor making certain the End Plate Alignment Dowel (31) enters the notch in the end face of the Cylinder.
   For Model 1900P, install the Cylinder Assembly (26) over the Vanes and Rotor making certain the Cylinder Alignment Pin (27) enters the hole in the face of the Front End Plate.




(Dwg. TPD1275)

6. Stand the assembly on an arbor press table so that the rotor shaft on the front end plate end contacts the table. Press the Rear End Plate Assembly, bearing end trailing, onto the rotor shaft against the Cylinder.
   For Model 1100P or 1410P, make certain the End Plate Alignment Dowel (24) enters the notch in the end face of the Cylinder.
   For Model 1900P, make certain the Cylinder Alignment Pin (27) enters the hole in the end face of the Cylinder.
7. Stand the assembly on a table with the Front End Plate Assembly upward.
8. Using an induction coil or oven, heat the Motor Housing until the motor opening is large enough to be placed over the Cylinder. At that time, install the Housing over the Cylinder and Front End Plate making sure the radial End Plate Alignment Pin (24) in the Rear End Plate enters the notch in the Motor Housing.

**⚠ CAUTION**

**In the following step, take all precautions necessary to prevent being burned by handling warm or hot parts.**

9. Allow the assembly to cool and install the Rear End Plate Gasket (36) (for 1100P or 1100P–EU models), the Motor Case Cover Gasket (35) and Motor Case Cover (33).
10. Secure the Cover to the Housing by installing the three Motor Case Cover Screws (37) and Lock Washers (38). Tighten each Screw between 45 and 50 in–lb (5.1 and 5.6 Nm) torque.
11. Install the Exhaust Deflector (22) in the bottom of the handle of the Motor Housing and tighten it between 20 and 25 ft–lb (27 and 34 Nm) torque.
12. Thread the Inlet Bushing (21) into the bottom of the handle of the Motor Housing (1) and tighten it between 30 and 35 ft–lb (40 and 47 Nm) torque.
13. Install the Throttle Rod Seal (17) in the groove on the large hub of the Throttle Rod (16).
14. Install the Throttle Valve Seal (14) in the groove on the large hub of the Throttle Valve (13).
15. Slide the Throttle Valve, Valve Seal end first, onto the Throttle Valve Rod.
16. Secure the Throttle Valve Assembly by installing the Valve Retaining Ring (15) in the small groove on the Throttle Valve Rod.
17. Install the three Throttle Bushing Seals (12) in the grooves on the Throttle Bushing (11).
18. Slide the Throttle Bushing Assembly onto the shaft of the Throttle Valve Rod and position the Trigger (18) on the same shaft. Install the Trigger Pin (19).
19. Insert the assembled Trigger into the Housing. Make certain the widest end of the Trigger is nearest the motor bore and the narrowest portion of the Throttle Valve aligns with the hole for the Throttle Retaining Pin (20). Install the Pin making certain it captures the Throttle Valve and secures the assembled Trigger.
20. Align the detent hole in the Reverse Valve (6) with the hole inside the Reverse Valve Bushing (5) and slide the Valve into the Bushing until almost reaching the detent hole. Insert the Reverse Valve Detent Spring (8) and Reverse Valve Detent Ball (7) into the hole and while compressing the Spring with the Ball, slide the Valve completely into the Bushing.
21. Using snap ring pliers, install the Reverse Valve Retainer (9).
22. Slide the Reverse Lever (2) onto the Reverse Valve, making certain the Reverse Lever Alignment Pin (3) or cast lug on 1900P models enters the notch on the face of the Reverse Valve Bushing. Secure the Lever to the Valve by inserting the Reverse Lever Retaining Pin (4).

### Assembly of the Impulse Mechanism

1. Insert the long shaft of the Piston Stop (71) into the central opening of the O–ring Installer furnished with the Tool Kit (Part No. 700A–99 or Part No. 1900P–99). Place the Piston Stop Seal (72) on the tapered end of the Installer and roll the Seal up the taper and into the groove on the large body of the Piston Stop. Repeat the procedure with the other Piston Stop and Seal.
2. When looking inside the central opening of the Liner Assembly (68), the internal wall has three holes on one side which do not extend through the wall. The opening on the end face of that wall is for the Torque Valve Piston (70). Install the Torque Valve Piston, large end trailing, into that opening.
3. Insert the Piston Stop Assist Spring (73) into hole in the end face of the opposite wall.
4. Thread the Threaded Tee Wrench furnished with the Tool Kit into one of the Piston Stop Assemblies and using the Wrench to hold the Assembly, insert the Assembly into the opening against Piston. Mark this opening with a felt marker to indicate that it contains the Torque Valve Piston.
5. Unscrew the Wrench and in the same manner, install the other Piston Stop Assembly in the hole with the Spring.
6. Install the Rear Liner Cover Seal (74) in the annular groove on the face of the Rear Liner Cover (75).
7. Install the two Front Liner Cover Piston Seals (61) in the openings on the face of the Front Liner Cover.
8. Install the Seal Back–Up Ring (60) followed by the Drive Shaft O–ring (59) in the central opening in the face of the Front Liner Cover.
9. Insert the short round hub of the Drive Shaft (63) into the central opening of the Rear Liner Cover.
10. Insert a Blade (66) into one slot in the Drive Shaft. Install the Blade Springs (67) through the Drive Shaft and into the holes in the Blade. Place the remaining Blade on the Springs making certain the Springs enter the holes in that Blade.
11. Using finger pressure, compress the Springs with the Blades until the outer edges of the Blades are flush with the drive shaft surface. Capture the Blades in this position by installing the Liner Assembly, piston stop end trailing, over the Drive Shaft and against the Rear Liner Cover.

**NOTICE**

**This installation can be accomplished more easily by aligning the compressed Blades with the webs at the narrowest portion of the opening. Keeping the Blades on the web allows them to slide the length of the Liner without interference.**

12. Insert the hex end of the Rear Liner Cover into the Disassembly Arbor from the Tool Kit and stand it on a workbench with the Drive Shaft upward.
13. Install the Front Liner Cover Assembly over the Drive Shaft and against the Liner. Make certain the Torque Adjustment Screw (53) aligns with the proper piston stop opening that was marked during assembly.
14. Install the two Liner Cover Seals (62) in the grooves inside the Liner Housing (51) near the end with the external wrench flats.
15. Place the Liner Housing, Seal end trailing, over the assembled Liner. Make certain the notch in the trailing end face of the Housing aligns with the Oil Plug (56) in the Front Liner Cover. Use the Pressing Sleeve from the Tool Kit to press the Housing over the Seals and into position. Do not Damage the Seals during installation.
16. Grasp the flats of the Liner Housing in vise jaws and using the Spanner Plug furnished with the Tool Kit and a torque wrench, install the Housing Cap, castellated end leading. This is a left–hand thread; rotate the wrench counterclockwise to tighten the Cap. Tighten the Cap on model 1100P or 1410P between 137 and 152 ft–lb (186 and 206 Nm) torque and on model 1900P between 173 and 188 ft–lb (235 and 255 Nm) torque.
17. Make certain the Drive Shaft rotates freely and then fill the mechanism with fluid and reassemble the tool as instructed in the section, CHANGING THE MECHANISM FLUID.
18. After assembling the tool, check the torque output with a torque tester or pulse counter. If the output is not acceptable, adjust the torque output as instructed in the section TORQUE ADJUSTMENT in Product Information Manual.
    If the output is acceptable, proceed as follows:
    a. Using a hex wrench, remove the three Hammer Case Cap Screws (43) and Lock Washers (44). Lift the Hammer Case (39) off the Motor Housing (1) over the Drive Shaft. Remove the Hammer Case Gasket (42).
    b. Lift the assembled mechanism off the Rotor (28).
    c. Grasp the flats of the Housing (51) in vise jaws with the output end of the Drive Shaft downward.
    d. Insert the pins of the Spanner Plug from the No. 700A–99 or No. 1900P–99 Tool Kit into two holes in the Housing Cap (76). Using a wrench on the plug, unscrew and remove the Housing Cap from the Housing. This is a left–hand thread, rotate the plug counterclockwise to loosen the Cap.
    e. Apply thread sealant to the threads of the Cap and using the Spanner Plug furnished with the Tool Kit and a torque wrench, install the Housing Cap, castellated end leading. This is a left–hand thread; rotate the wrench counterclockwise to tighten the Cap. Tighten the Cap on model 1100P or 1410P between 137 and 152 ft–lb (186 and 206 Nm) torque and on model 1900P between 173 and 188 ft–lb (235 and 255 Nm) torque.
    f. Position a new Hammer Case Gasket (42) on the Motor Housing and install the assembled mechanism on the rotor shaft.
    g. Place the Hammer Case Cover over the Drive Shaft against the Housing and Gasket. Install the three Hammer Case Cap Screws and Lock Washers. Tighten each Screw between 45 and 50 in–lb (5.1 and 5.6 Nm) torque.
    h. Install the Rubber Housing Boot on the tool.

## Related Documentation

For additional information refer to:
Product Safety Information Manual 04584983.
Product Information Manual 47133053.
Parts Information Manual 47135645.

Manuals can be downloaded from www.ingersollrandproducts.com

**Notes:**

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