80213671
Edition 3
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Air Impulse Wrenches

Q60P3, Q60PQ1, Q70P3, Q70PQ1, Q80P3, Q80PQ1, Q90P3, Q110P4, Q120P4, and Q140P4

Maintenance Information

Save These Instructions

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Product Safety Information

⚠ WARNING

- Failure to observe the following warnings, and to avoid these potentially hazardous situations, could result in death or serious injury.
- Read and understand this and all other supplied manuals before installing, operating, repairing, maintaining, changing accessories on, or working near this product.
- Always wear eye protection when operating or performing maintenance on this tool. The grade of protection required should be assessed for each use and may include impact-resistant glasses with side shields, goggles, or a full face shield over those glasses.
- Always turn off the air supply, bleed the air pressure and disconnect the air supply hose when not in use, before installing, removing or adjusting any accessory on this tool, or before performing any maintenance on this tool or any accessory.

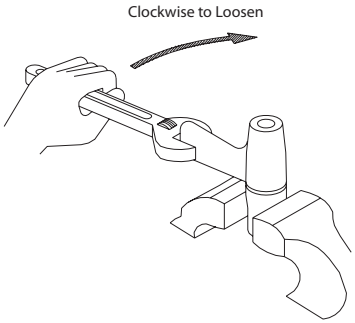
Note: *When reading the instructions, refer to exploded diagrams in Parts Information Manuals when applicable (see under Related Documentation for form numbers).*

Changing the Mechanism Fluid

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

1. **For Models Q60PQ1, Q70PQ1 and Q80PQ1**, use a pointed probe to push the Spring Seat (73) against the Retaining Sleeve Spring (72). While the Sleeve is compressed, use another pointed probe or thin blade screwdriver to remove the Retaining Ring (74). Lift the Spring Seat, the Spring and the Bit Retaining Sleeve (70) off the Drive Shaft (51) and remove the Bit Retaining Ball (71).
   - **Continue here for Models Q60PQ1, Q70PQ1 and Q80PQ1**
   - **Step 1 for Models Q60P3, Q70P3, Q80P3, Q90P3 and Q110P4**

   Using copper covered vise jaws, carefully grasp the Flats of the Hammer Case (65) with the output end of the Drive Shaft downward.
2. Using an adjustable wrench, unscrew the Motor Case Assembly (1) from the Hammer Case. This is a left handed thread, rotate the Motor Housing clockwise to remove it. (Refer to Dwg. TPD1264).

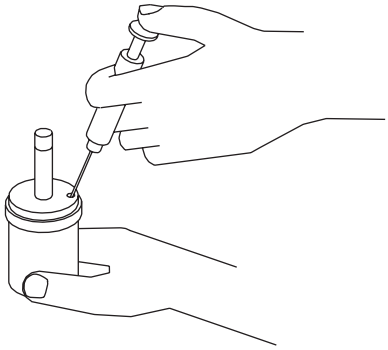


(Dwg. TPD1264)

3. Lift the assembled motor off the Hammer Case and pull the mechanism assembly out of the Cover.
4. With the assembled mechanism off of the Rotor, use the Oil Plug Wrench to unscrew and remove the two Oil Plugs (59) and two Oil Plug Seals (60) from the front end of the Mechanism.
5. Using the 1.5 mm hex wrench furnished with the tool, rotate the Adjust Bolt (56) counter-clockwise until it stops, then turn back clockwise 90°.
6. With the oil plug opening downward over a container, rotate the Drive Shaft to purge the fluid from the mechanism.
7. Using the syringe and fluid from the Fluid Replacement Kit (Part No. EQ106S-K400), fill the mechanism with the fluid furnished with the Kit until the fluid overflows the fill hole. (Refer to 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.

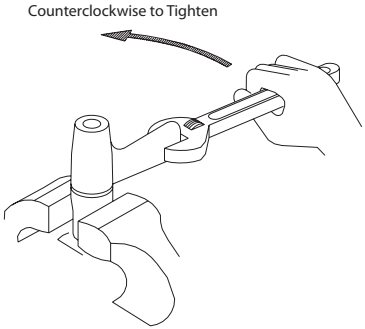


(Dwg. TPD1265)

8. Submerge the mechanism in a reservoir containing mechanism fluid, and using a wrench, rotate the Drive Shaft clockwise and counter-clockwise to purge any remaining air from the system.
9. Remove the mechanism from the fluid and rotate the Adjust Bolt clockwise until it stops, then turn back counter-clockwise 10°.
10. Thread the Oil Plugs with the Oil Plug Seals into the mechanism until snug.
11. Wipe the outside of the mechanism dry and clean and remove the Oil Plug. Using the syringe, withdraw:

Model	Withdraw Amount (cc)
Q60P3, Q60PQ1	0.33
Q70P3, Q70PQ1	0.35-0.38
Q80P3, Q80PQ1	0.38-0.41
Q90P3	0.75-0.80
Q110P4	1.15-1.20

12. Install the Oil Plugs and tighten between 20 and 25 in-lb (2.3 and 2.8 Nm) torque.
13. Insert the mechanism assembly (with output end leading) into the Mechanism Cover clamped in the vise jaws.
14. Insert the hex end of the rotor shaft into the hex recess at the rear of the Drive Shaft and thread the assembled Motor Housing onto the Mechanism. (Refer to Dwg. TPD1266). Tighten between 23 and 29 ft-lb (31 and 39 Nm) torque.



(Dwg. TPD1266)

15. **For Models Q60PQ1, Q70PQ1 and Q80PQ1**, insert Bit Retaining Ball into the hole in the Drive Shaft. Place Bit Retaining Sleeve Spring and Spring Seat onto the Drive Shaft. Compress the Spring Seat against the Spring and install the Retaining Ring onto the Drive Shaft.

    Now continue for all Models

16. Test the tool for torque at maximum, minimum and mid-range torque settings. If the tool does not perform satisfactorily, repeat the refill procedure and pay particular attention to removing unwanted air from the fluid system. Refer to the section **TORQUE ADJUSTMENT** in Product Information Manual for specific adjustment procedures.

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.
4. Do not disassemble the tool unless you have a complete set of new gaskets and O-rings for replacements.
5. Use Impulse Tool Rebuild Tools listed in Table 1 on page 7.

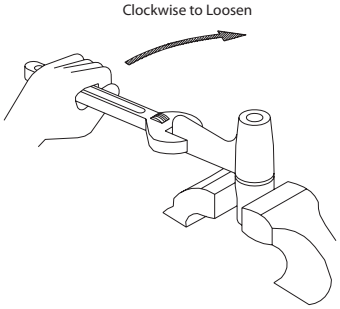
Disassembly of the Impulse Mechanism

1. **For Models Q60PQ1, Q70PQ1 and Q80PQ1** - use a pointed probe to push the Spring Seat (73) against the Retaining Sleeve Spring (72). While the Sleeve is compressed, use another pointed probe or thin blade screwdriver to remove the Retaining Ring (74). Lift the Spring Seat, the Spring and the Bit Retaining Sleeve (70) off the Drive Shaft (51) and remove the Bit Retaining Ball (71).

    - **Continue here for Models Q60PQ1, Q70PQ1 and Q80PQ1**
    - **Step 1 for Models Q60P3, Q70P3, Q80P3, Q90P3 and Q110P4**

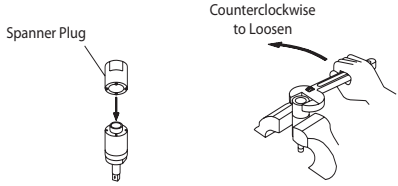
    Using copper-covered vise jaws, carefully grasp the Flats of the Hammer Case (65) with the output end of the Drive Shaft downward.

2. Using an adjustable wrench, unscrew the Motor Case Assembly (1) from the Hammer Case. This is a left-handed thread, rotate the Motor Housing clockwise to remove it. (Refer to Dwg. TPD1264.)



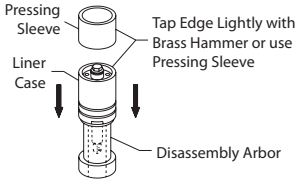
(Dwg. TPD1264)

3. Lift the assembled motor off the Hammer Case and pull the mechanism assembly out of the Cover.
4. With the assembled mechanism off of the Rotor, use the Oil Plug Wrench to unscrew and remove the two Oil Plugs (59) and two Oil Plug Seals (60) from the front end of the Mechanism.
5. Using the 1.5 mm hex wrench furnished with the tool, rotate the Adjust Bolt counter-clockwise until it stops, then turn back clockwise 90°.
6. With the oil plug opening downward over a container, rotate the Drive Shaft to purge the fluid from the mechanism.
7. Insert mechanism into Holder - Jig H and then clamp the flats on the Holder in a vise. Insert the Spanner-Jig A into the Liner Cap (44). Using a wrench on the spanner, unscrew and remove the Liner Cap from the Liner Case. (Refer to Dwg. TPD1267.)



(Dwg. TPD1267)

8. Stand the Disassembly Arbor-Jig B, with large end downward, on a workbench or on the table of an arbor press. Insert the output end of the Drive Shaft into the central opening and either tap the Liner Case downward off the components or use the Pressing Sleeve-Jig C to press the Liner Case downward off the components. (Refer to Dwg. TPD1268.)

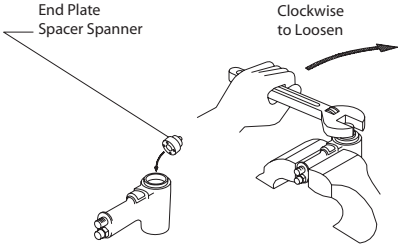


(Dwg. TPD1268)

9. Tap the Liner on a soft surface to remove the dowel pin. Be careful not to lose the pin when attempting to remove it.
10. Disassemble the components of the mechanism in the sequence shown in Drawings, refer to Parts List to locate specific Model drawings.

Disassembly of the Motor

1. Grasp the Motor Case (1) in vise jaws with the shaft of the Rotor (34) upward.
2. Insert the pins of the End Plate Spacer Spanner-Jig F into the holes in the Lower Plate Spacer (40). Using a wrench, unscrew and remove the Spacer. This is a **left-handed thread**; rotate the wrench **clockwise** to remove the Spacer. (Refer to Dwg. TPD1269.)

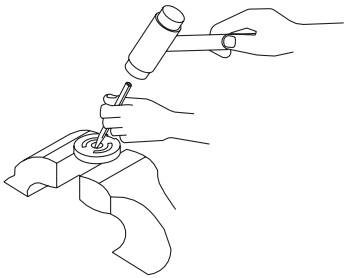


(Dwg. TPD1269)

3. Thread an M6 or M8 bolt into the hole in the rotor. Pull motor out of housing using the bolt. Remove the bolt from the motor.
4. Remove the two O-Rings (29) from inside the Motor Housing.
5. Remove the Lower Plate (36), Lower Plate Bearing (37), Cylinder Assembly (32) and Vanes (35) from the Rotor.
6. On the table of an arbor press, support the Upper Plate (30) with blocks as close to the Rotor as possible and press the Rotor out of the Upper Plate and Bearing (31).
7. To remove the Bearing from the Upper Plate, use a small drift or pin punch through the central opening of the Upper Plate to tap the Bearing out of the End Plate. (Refer to Dwg. TPD 1271).

NOTICE

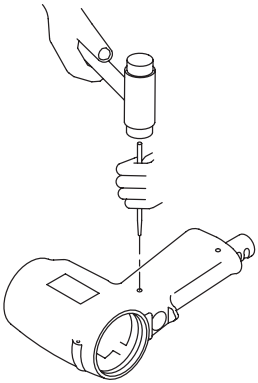
Do not enlarge or damage the shaft hole in the End Plate.



(Dwg. TPD1271)

Disassembly of Throttle and Exhaust Element

1. Remove Rubber Grip (41).
2. Using a pin punch, tap the Throttle Retaining Pin (28) out of the Handle. The Throttle Retaining Pin is protected by an embossed circular pad of metal. Insert the pin punch into the middle of the pad to locate the Pin. (Refer to Dwg. TPD1272-1).



(Dwg. TPD1272-1)

3. Grasp the Trigger (26) and pull the assembled throttle out of the Motor Housing.
4. Using a pin punch and without damaging the Trigger, remove the Trigger Pin (27).
5. Grasp the Reverse Lever (24) and pull the Reverse Valve (19) from the front of the Throttle Bushing Assembly. The Reverse Lever Detent Ball (23) and Reverse Lever Detent Spring (22) will fall out of the Reverse Valve. Take care not to lose them.
6. Remove the Throttle Rod Assembly (16) from the rear of the Reverse Valve.
7. If it is necessary to replace the Reverse Lever or Reverse Valve, use a pin punch to tap out the Reverse Lever Pin (25) out of the Reverse Lever. Separate the Reverse Lever from the Reverse Valve.
8. **For Models Q60P3, Q70P3, Q70PQ1, Q80P3, Q80PQ1, and Q90P3**, using a punch, tap the Rubber Pad (15) of the Throttle Valve Assembly in order to push the Throttle Bushing Cap (18a) out of the back of the Throttle Bushing. The Spring (17a) and Ball (18b) will fall out of the Throttle Valve (14). Take care not to lose them.
9. **For Model Q110P4**, remove the Snap Ring (18) from the Throttle Rod. Push the Throttle Rod out of the Throttle Rod Bushing (14a).
10. Unscrew and remove the Hose Joint (2).
11. Remove the Washer (4) and Strainer (3).
12. Remove the Exhaust Cover (5) and Silencer Sheets (6 and 7) from Hose Joint.
13. Remove the O-ring (10) from the Motor Housing.

Assembly

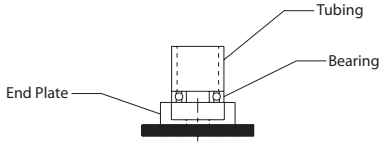
General Instructions

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.
7. Use Impulse Tool Rebuild Tools listed in Table 1 on page 7.

Assembly of the Motor, Throttle and Exhaust Components

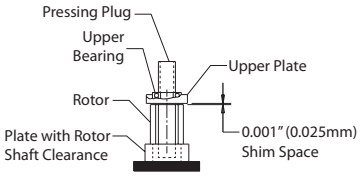
1. Install the Silencer Sheet (6) over the Silencer Sheet (7) and insert both inside the Exhaust Cover (5). Install the Exhaust Cover containing both Silencers on the Hose Joint until it seats.
2. Install the O-ring (10) in the Motor Housing (1).
3. Thread the Hose Joint with the Exhaust components into the Motor Housing and tighten to 18-23 ft-lb (25-31 Nm) torque.
4. Put the Reverse Lever (24) on the Reverse Valve (19) and secure it with the Reverse Lever Pin (25).

5. **For Models Q60P3, Q70P3, Q70PQ1, Q80P3, Q80PQ1 and Q90P3**, place the Ball (18b) and Spring (17a) in the back of the Throttle Valve (14). Place the Rubber Pad (15) on the front of the Throttle Valve. Insert the Throttle Valve Assembly into the back of the Throttle Bushing (11). Replace the Throttle Bushing Cap (18a) on the back of the Throttle Bushing to hold the Throttle Valve Assembly in the Bushing.
6. Insert Throttle Rod (16) into the back of the Reverse Valve, rounded end first.
7. **For Model Q110P4**, push the Throttle Rod (16) into the back of the Throttle Rod Bushing (14a). Install the Snap Ring (18) to the Throttle Rod. Insert Throttle Rod Bushing assembly into the back of the Throttle Bushing.
8. Start the Reverse Valve into the Throttle Bushing. Install the Reverse Lever Detent Spring (22) in the hole in the Reverse Valve. Set the Reverse Lever Detent Ball (23) on the Spring and while holding it in place, align the Ball with the detent hole in the Bushing. Push the Valve into the Bushing until the Reverse Lever Detent Ball seats in the detent hole.
9. Install the Trigger (26) on the Throttle Rod and secure it with the Trigger Pin (27).
10. Slide the assembled unit into the Motor Housing (1).
11. Install the Throttle Retaining Pin (28) in the Housing, making sure that it captures the Throttle Bushing Assembly.
12. Using an arbor press and a piece of tubing that contacts the outer ring of the bearings, press the Lower Plate Bearing (37) into the Lower Plate (36) and the Upper Plate Bearing (31) into the Upper Plate (30). (Refer to Dwg. TPD1274).



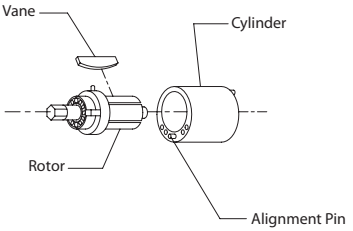
(Dwg. TPD1274)

13. Stand the Rotor (34) on the table of an arbor press. It should be upright on a flat metal plate having a clearance hole for the shaft. The side with the internal hex must be down.
14. 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 Upper Bearing and Upper Plate, Upper Plate leading, onto the shaft of the Rotor until the Upper Plate contacts the shim. Remove the shim. (Refer to Dwg.TPD1275).



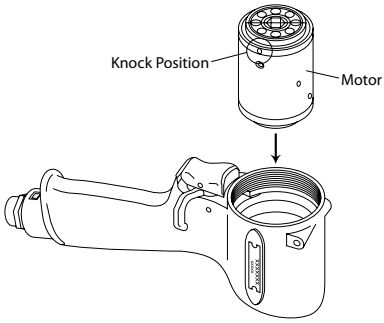
(Dwg. TPD1275)

15. Coat each Vane (35) 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.
16. Install the Cylinder (32) over the Vanes and Rotor with the end of the Cylinder having the two holes diagonal from each other toward the Upper Plate. Make certain the Pin enters the hole in the face of the Upper Plate. (Refer to Dwg TPD1276).



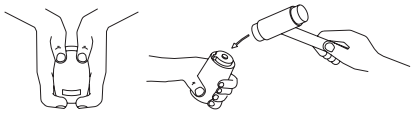
(Dwg. TPD1276)

17. Press the Lower Plate and Bearing against the face of the Cylinder, Bearing end trailing.
18. Insert the two O-Rings (29) into the back of the Motor Housing.
19. Insert the Motor Assembly into the Motor Housing, confirming knock position. (Refer to Dwg. 16595993).



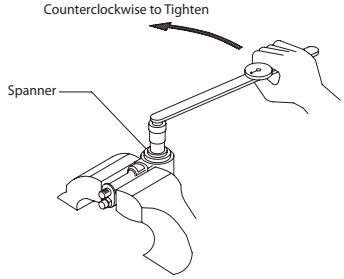
(Dwg. 16595993)

It may be necessary to tap the assembly into position with a brass or plastic hammer. (Refer to Dwg. TPD1279).



(Dwg. TPD1279)

Grasp the handle of the Motor Housing in vise jaws with the rotor shaft upward. Install the gasket (39). Thread the Lower Plate Spacer (40) into the Housing and using the End Plate Spacer Spanner-Jig F, tighten the Spacer to 23-29 ft-lb (31-39 Nm) torque. This is a left-handed thread; rotate the wrench counter-clockwise to tighten. (Refer to Dwg. TPD1280).



(Dwg. TPD1280)

20. After installing the Lower Plate Spacer, grasp the shaft of the Rotor and rotate it by hand. If the Rotor does not turn easily, disassemble the motor unit and determine where the assembly is binding. The motor must rotate freely before proceeding further with the assembly.
21. Install the Rubber Grip (41).

Assembly of Impulse Mechanism

1. Install O-Ring (57) and then the Back-Up Ring (58) on Adjust Bolt (56). Use the Assembly Arbor - Jig J to slide the Adjust Bolt in the hole of the Assembly Arbor - Jig I until the Back-Up Ring sticks out of the bottom. Then use Jig I to press the Adjust Bolt into the Liner Lower Plate (54). Be careful not to cut the O-ring during installation. (Refer to Dwg. 16595985).

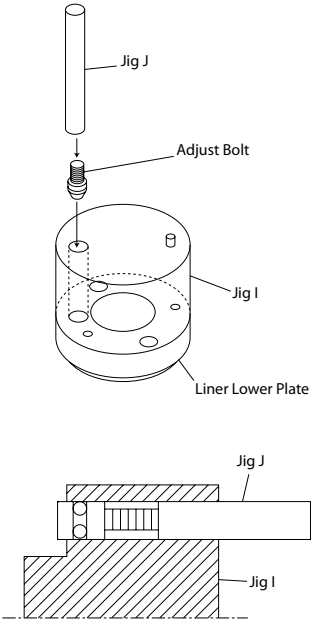
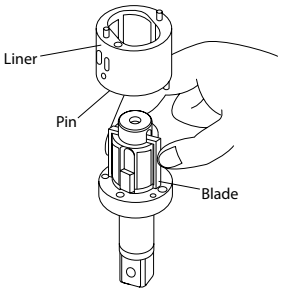


FIGURE A

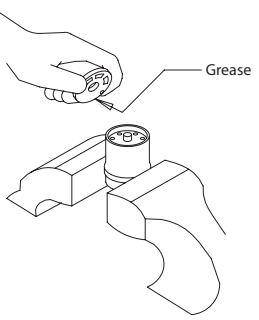
(Dwg. 16595985)

2. Install O-Ring (61) and the Back-Up Ring (62) to the Main Shaft (51). Pay attention to the direction of the Back-Up Ring on Q110P4. The chamfered edge should be towards the front of the shaft.
3. Install the Relief Valve (49) in the Liner (47), aligning the long hole in the relief valve with the hole in the outside of the liner. Ensure the Relief Valve slides in smoothly and then install the Pin (50) in the Liner.
4. Place a Blade (52) into one of the slots of the Main Shaft (51) with the blade assembly pins inward.
5. From the opposite side of the Shaft, encircle each Pin with a Blade Spring (53).
6. Install the Assembly Pins of the remaining Blade in the open ends of the Springs.
7. Compress the Springs with the Blades until both Blades are flush with the Drive Shaft. Install the Liner over the assembly, lining up the two Pins (48) with the holes in the Liner Lower Plate. The side with the relief valve goes towards the output end of the main shaft. The hole for the Relief Valve should line up with the Adjust Bolt on the Liner Lower Plate. Make certain the ends of the Blades are flush with the ends of the Liner. (Refer to Dwg. 16595977).



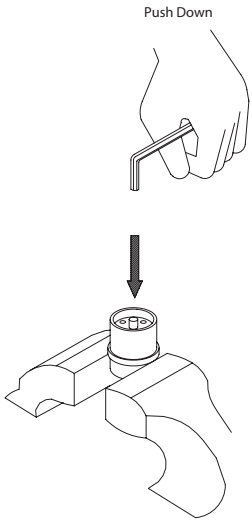
(Dwg. 16595977)

8. Install the O-Ring (46) in the groove in the Liner Upper Plate (45). Align the pin holes in the face of the Liner Upper Plate with the two Liner Pins (48) at the rear of the Liner and place the Plate against the Liner.
9. Ensure the Adjust Bolt is lined up with the Relief Valve and using a 1.5 mm hex wrench, supplied with tool, turn the adjust bolt counter clockwise until it stops. Then turn it back clockwise 90 degrees.
10. Lubricate the Front Liner O-Ring (43) and install it in the forward bore of the Liner Case (42).
11. Install the Dowel Pin (55) into the Liner Lower Plate.
12. Assemble the Liner Case over the mechanism assembly and line it up with the Dowel Pin in the Liner Lower Plate.
13. Insert mechanism into Holder - Jig H and then clamp the flats on the Holder in a vise with the output spindle downward. Remove the Liner Upper Plate and put grease in the central opening of the Cover. (Refer to Dwg. TPD1289).



(Dwg. TPD1289)

14. Reinstall the Cover Assembly and use a hex wrench to push it below the threads at the rear of the Housing. (Refer to Dwg. TPD1290).

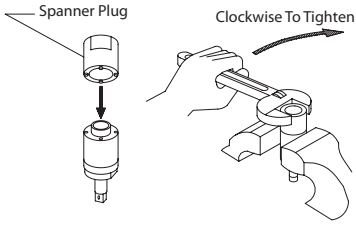


(Dwg. TPD1290)

15. Install the Liner Cap (44) and using the Spanner Plug-Jig A tighten the Cap to the specs below:

Model	Tightening Torque
Q60P3, Q60PQ1, Q70P3, Q70PQ1, Q80P3, Q80PQ1	60 - 72 ft-lb (82 - 98 Nm)
Q90P3	66 - 81 ft-lb (90 - 110 Nm)
Q110P4	103 - 118 ft-lb (140 - 160 Nm)

(Refer to Dwg. TPD1291).



(Dwg. TPD1291)

16. 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**.

Table 1 - Impulse Tool Rebuild Tools		
Tool Name	**Part Number**	**Models Used On**
Spanner - Jig A	Y-0181-0990-0001	Q60P3, Q60PQ1, Q70P3, Q70PQ1, Q80P3, Q80PQ1, Q90P3
Spanner - Jig A	Y-0187-0990-0001	Q110P4
Disassembly Arbor - Jig B	180PQ-B-HA	Q60P3, Q60PQ1, Q70P3, Q70PQ1, Q80P3, Q80PQ1, Q90P3
Disassembly Arbor - Jig B	Y-0175-0990-0002	Q110P4
Pressing Sleeve - Jig C	180PQ-C-HA	Q60P3, Q60PQ1, Q70P3, Q70PQ1, Q80P3, Q80PQ1
Pressing Sleeve - Jig C	Y-0181-0990-0003	Q90P3
Pressing Sleeve - Jig C	Y-0187-0990-0003	Q110P4
O-Ring Installer - Jig E	45P-E-PSS	Q60P3, Q60PQ1, Q70P3, Q70PQ1, Q80P3, Q80PQ1, Q90P3, Q110P4
Spanner - Jig F	Y-0189-0990-0006	Q60P3, Q60PQ1, Q70P3, Q70PQ1, Q80P3, Q80PQ1
Spanner - Jig F	Y-0188-0990-0006	Q90P3
Spanner - Jig F	Y-0187-0990-0006	Q110P4
Holder - Jig H	Y-0189-0990-0008	Q60P3, Q60PQ1, Q70P3, Q70PQ1, Q80P3, Q80PQ1
Holder - Jig H	Y-0188-0990-0008	Q90P3
Holder - Jig H	Y-0190-0990-0008	Q110P4
Assembly Arbor - Jig I	Y-0189-0990-0009	Q60P3, Q60PQ1, Q70P3, Q70PQ1, Q80P3, Q80PQ1
Assembly Arbor - Jig I	Y-0188-0990-0009	Q90P3
Assembly Arbor - Jig I	Y-0190-0990-0009	Q110P4
Assembly Arbor - Jig J	Y-0188-0990-0010	Q60P3, Q60PQ1, Q70P3, Q70PQ1, Q80P3, Q80PQ1, Q90P3, Q110P4
Slotted Driver	Y-8690-2001-0000	Q60P3, Q60PQ1, Q70P3, Q70PQ1, Q80P3, Q80PQ1, Q90P3, Q110P4

Related Documentation

For additional information refer to:
Product Safety Information Manual 04584983.
Product Information Manuals 80206667.
Parts List Manuals 80206618.

Manuals can be downloaded from ingersollrandproducts.com.

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