47144084
Edition 2
December 2012

Air Pulse Tools

Models QS50P3, QS50PQ1, QS60P3, QS60PQ1, QS70P3, QS70PQ1 and QS80P3

Maintenance Information

Save These Instructions

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.

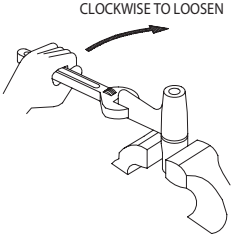
Note: *When reading the instructions, refer to exploded diagrams in parts Information Manuals when applicable (see under Related Documentation for form numbers).*

Changing the Pulse Mechanism Fluid

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

1. **For Models QS50PQ1, QS60PQ1, QS70PQ1,** use a pointed probe to push the Spring Washer (19d) against the Spring (19c). While the Spring is compressed, use another pointed probe or thin blade screwdriver to remove the Retaining Ring (19e). Lift the Spring Washer, the Spring and the Bit Chuck (19a) off the Main Shaft (14Aq) and remove the Ball (19b).
   - **Continue here for Models QS50PQ1, QS60PQ1, QS70PQ1**
   - **For Models QS50P3, QS60P3, QS70P3 and QS80P3, start from step a.**

   a. Use jig P to remove Hammer Case (18a) from motor case assembly.
2. Using an adjustable wrench, unscrew the Motor Case Assembly (1) from the Hammer Case (18a). This is a left-handed thread, rotate the Motor Case (1a) clockwise to remove it. (Refer to Dwg. TPD1264)

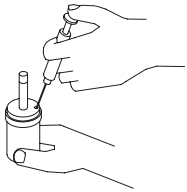


(Dwg. TPD1264)

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 Straight Slot Screwdriver to unscrew and remove one of the Oil Plug (14B1) and O-Ring (14C1) from the front end of the Mechanism.
5. Using the 1.5 mm hex wrench furnished with the tool, rotate the Torque Adjustment Screw counterclockwise until it stops. This screw adjusts the check valve.
6. With the oil plug opening downward over a container, rotate the Main Shaft (14q/14Aq) 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.)

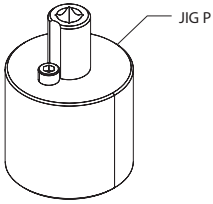
NOTICE

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 counterclockwise to purge any remaining air from the system.
9. Remove the mechanism from the fluid and rotate the Adjustment Screw clockwise until it stops.
10. Thread the Oil Plug (14B1) with the O-Ring (14C1) into the mechanism until it is snug.
11. Wipe the outside of the mechanism dry and clean and remove the Oil Plug (14B1).
12. Install the Oil Chamber Plug and tighten it 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. Use Jig P to assemble. Rotate counterclockwise to tighten.



15. **For Models QS50PQ1, QS60PQ1, QS70PQ1,** insert Bit Retaining Ball into the hole in the Drive Shaft. Place Spring and Spring Washer onto the Drive Shaft. While compressing the Spring Seat against the Spring, install the Retaining Ring onto the Drive Shaft.
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 Manual 47116942, for specific adjustment procedures.

Disassembly
General Instructions

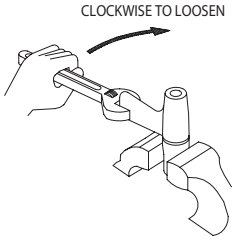
1. Do not disassemble the tool any further than necessary to replace or repair damaged parts.
2. When grasping a tool or part in a vise, always use leather-covered or copper-covered vise jaws to protect the surface of the part and help prevent distortion. This is particularly true of threaded members 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.

Disassembly of the Impulse Mechanism

1. **For Models QS50PQ1, QS60PQ1, QS70PQ1,** use a pointed probe to push the Spring Washer (19d) against the Spring (19c). While the Spring is compressed, use another pointed probe or thin blade screwdriver to remove the Retaining Ring (19e). Lift the Spring Washer, the Spring and the Bit Chuck (19a) off the Drive Shaft (14q) and remove the Ball (19b).
   - **Continue here for Models QS50PQ1, QS60PQ1, QS70PQ1**
   - **For Models QS50P3, QS60P3, QS70P3 and QS80P3, start from step a.**

a. Use jig P to remove Hammer Case (18a) from motor case assembly.

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



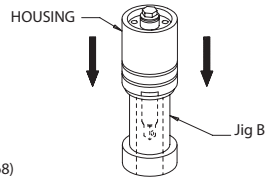
(Dwg. TPD1264)

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 Oil Plug Wrench to unscrew and remove the Oil Plug (14B1) and Oil Plug Seal (14C1) from the front end of the Mechanism.
5. Using the 1.5 mm hex wrench furnished with the tool, rotate the Torque Adjustment Screw counterclockwise until it stops.
6. With the oil plug opening downward over a container, rotate the Drive Shaft to purge the fluid from the mechanism.
7. Insert the Jig A into the Liner Cap (14c). Using a wrench on the Jig, unscrew and remove the Liner Cap from the Liner Case. (Refer to Dwg. TPD1267.)

NOTE: An adhesive agent is used on Model QS80P3.

(Dwg. TPD1267)

8. Stand the 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/press the Liner Case downward off the components. (Refer to Dwg. TPD1268.)

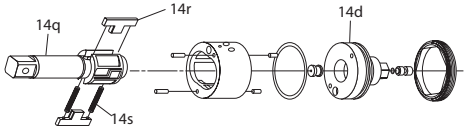


(Dwg. TPD1268)

9. Disassemble the components of the mechanism in the sequence shown in Manual 47144522.

Disassembly of Main Shaft and Blades

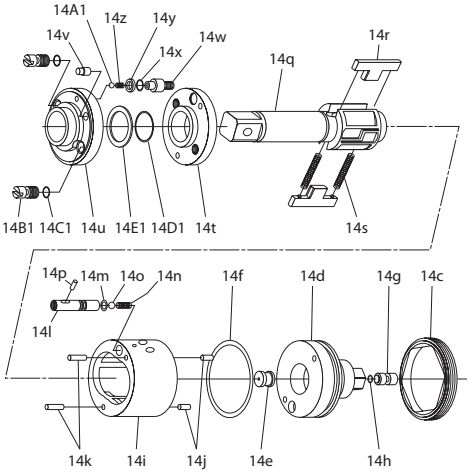
1. Remove the Liner Upper Plate (14d).
2. Match the positions of the Blades (14r) to the circle center part.
3. While holding the Blades at that position, Push the Main Shaft (14q) out.
4. Remove the main shaft (14q), Blades (14r) and Spring (14s).



(Dwg. 47148101)

Disassembly of Relief Valve

1. Rotate the adjust Bolt (14w) clock wise to maximum.
2. Remove the Liner Lower Plate (14u).
3. Remove the Relief Valve (14l) by pushing the Relief Valve to the Upper Plate side with a Pin.



(Dwg. 47148119)

NOTICE

In the following step do not push the relief valve to Lower Plate side, which can make O-ring get jammed.

Disassembly of Liner Lower Plate

1. Remove the adjust Bolt (14w).
2. Loosen Oil plug (14B1) 2 pcs with a slotted head screwdriver.
3. Remove the Oil Plug (14B1) from the underside by pushing it with a Pin.
4. Remove the Liner Lower Plate (A) (14t) and Lower Plate (B) (14u). Note: Can be easily removed by roatating the Liner Lower Plates.
5. Remove the Ball (14A1) and Spring (14z) with a Pin.

NOTICE

Ball and Spring should be retained carefully for future use.

6. Remove the O-ring (14C1) and Back Up Ring (14E1) from the adjust bolt hole with Pin.

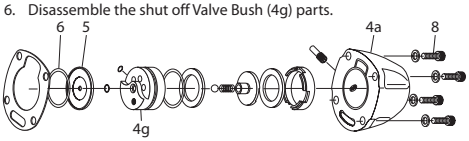
Disassembly of Sensor

1. Install the Gimlet with diameter less than 1 mm to the Gimlet hole of the Liner Upper Plate (14d).
2. Remove the Sensor (14g) by pushing it with the Gimlet.

Disassembly of the Motor Case Cover

Disassembly of Motor Case Cover Assembly

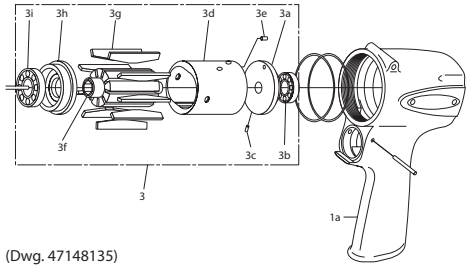
1. Loosen the Bolt (8) 4 pcs to remove the Motor Case Cover (4a).
2. Remove the Upper Plate Spacer (5) and O-ring (6).
3. Remove the Valve Plug (4k) after Warming up the Valve Plug with a Dryer.
4. Install the Bolt to the female thread of the shut off Valve Bush (4g).
5. Remove the shut off Valve Bush (4g) by pulling shut off Valve Bush out.
6. Disassemble the shut off Valve Bush (4g) parts.



(Dwg. 47148127)

Disassembly of the Motor

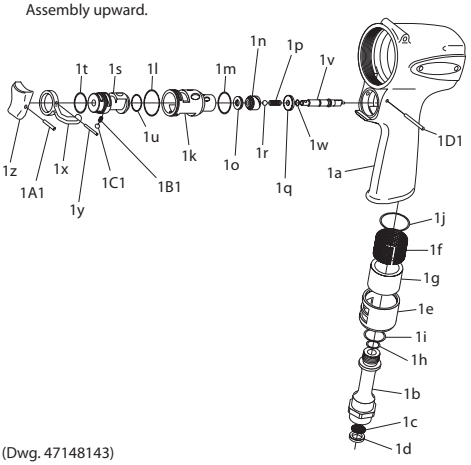
1. Use Jig W to disassemble the motor Assembly (3). Place the Motor Case (1a) and female hexagon part of the Rotor (3f) to projecting part of the Jig W.
2. Remove the motor Assembly (3) by pushing the motor case (1a) vertically downward.
3. Remove vanes (3g) from Rotor (3f).
4. Remove the Rotor (3f) by hitting Jig placed on the Rotor by hammer.
5. Remove the Upper Plate Assembly from Rotor (3f).



(Dwg. 47148135)

Disassembly of Trigger and Throttle Assembly

1. Using a Pin Punch, tap the Pin (1D1) out of the Handle (1a). The ends of the pin are covered with cement.
2. Grasp the Throttle Knob (1z) and pull the assembled throttle and reverse valve out of the Motor Case. Take care not to loosen Spring (1p).
3. Using a pin punch and without damaging the Throttle Knob, remove the Pin (1A1).
4. Grasp the Reverse Lever (1x) and pull the Reverse Valve (1s) from the front of the Throttle Bushing Assembly. The Reverse Lever Detent Ball (1C1) and Reverse Lever Detent Spring (1B1) will fall out of the Reverse Valve. Take care not to lose them.
5. Remove the Throttle Rod Assembly from the rear of the Throttle Bushing (1k).
6. Remove the Throttle Rod Seal (1w) from the Throttle Rod (1v).
7. If it is necessary to replace the Reverse Lever or Reverse Valve, use a pin punch to tap out the Pin (1y) out of the Reverse Lever. Separate the Reverse Lever from the Reverse Valve.
8. Using an adjustable wrench, unscrew and remove the Hose Joint Assembly (1b) and Exhaust Cover (1e).
9. To disassemble the shut-off mechanism, grasp the Cover Assembly in copper-covered vise jaws with the Control Shaft Assembly upward.



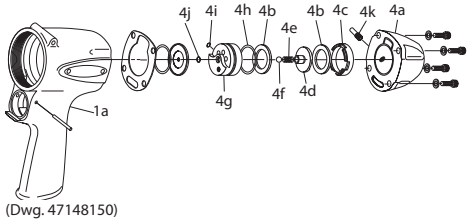
(Dwg. 47148143)

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. Remove burrs if any on Motor Case Cover, Blades slot parts with Scrappers.

Assembly of Motor Case Cover



(Dwg. 47148150)

1. Place O-Ring (4h), Back up Ring (4b), Ball (4f), Spring (4e), Shut off Valve (4d)and Buffer Plate (4c) in the Shut Off Valve Bush (4g).

NOTICE

Apply a little amount of grease before installing the Back Up Ring to prevent misalignment.

2. Install O-Ring (4i) to the side hole in the Shut Off Valve Bush (4g).
3. Slightly Apply grease to O-ring. Install the Shut Off Valve housing (4g) to Motor Case (1a) adjusting the positions of the side holes.

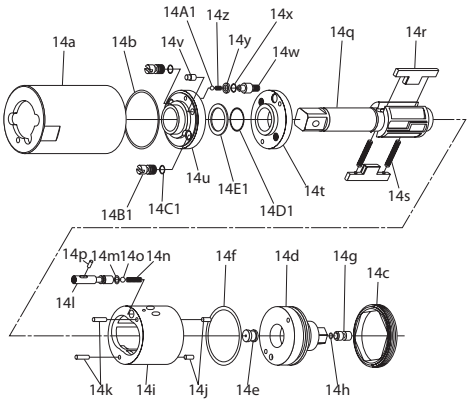
NOTICE

Install M4 bolt to the thread hole and pull the part out if there is misalignment of the position.

4. Place the O-ring (4j) in the Shut Off Valve housing (4g).
5. Tighten the Valve Pulg (4k) to the side hole of the Motor Case (1a).

Assembly of Impulse Unit

1. Check whether the relief valve move smoothly and install the O-ring (14m) to the Relief Valve (14l).
2. Install the greased O-ring (14h) to the Sensor (14g) using Jig E.
3. Apply grease to the Sensor inserting hole of the Liner Upper Plate (14d) and then install the Sensor (14g) by pushing it all the way to Bottom.
4. Install the Spring (14z) and the Ball (14A1) to the Liner Lower Plate (A) (14t) in the order.
5. Install the Back Up Ring (14y) and O-ring (14x) to the Liner Lower Plate (B) (14u) in the order.
6. Apply impulse unit oil to the O-ring.
7. Install the Adjust Bolt (14w) to the Relief Valve (14l) and insert it by pushing while roatating it counter-clock wise direction.
8. Remove the Relief Valve (14l). If Relief Valve doesnot comes off, Use adjustment bolt with hexagon wrench to remove the Relief Valve by roatating it in Clock wise direction.



(Dwg. 47148168)

9. Apply impulse unit oil and assemble Backup Ring (14E1) and O-ring (14D1) in order in the Liner Lower Plate (B) (14u) As shown in the figure above.
10. Assemble Liner lower Plate (A) (14t) and (B) (14u).
11. Apply Impulse unit oil to the Main Shaft (14q) and install the Main Shaft (14q) to Liner Lower Plate Assembly by rotating the shaft.

NOTICE

Be Careful not to damage the O-Ring in the Liner Lower Plate.

12. Assemble Blades (14r) and Spring (14s) to Main Shaft (14q) and keep them intact in their position.
13. Insert the Main Shaft (14q) aligning the Blades (14r) with the circle center of the liner (14i).
14. Align the Adjustment Bolt (14w) with the Relief Valve (14l) inserting part by rotating the Liner Lower Plate.
15. Apply impulse unit oil to the O-ring (14m) and insert the Relief Valve (14l) by rotating it.

NOTICE

Be Careful not to damage the O-Ring

16. Tighten the Adjust Bolt (14w) while holding the Relief Valve (14l). to the Liner.
17. Align the Slotted hole of the Relief Valve (14l) with the Pin hole of the Liner and insert the pin (14p). Loosen the adjustment bolt 180° to 360° from the minimum postion.
18. Insert the Ball (14o) and Spring (14n) to the Relief Valve (14l) in Order.
19. Align the hole of the Liner Upper Plate (14d) with hole of the Liner (14i) and assemble the Liner Upper Plate (14d).
20. Install O-ring (14b) to the Liner Case (14a), Apply impulse unit oil to O-ring (14b) and assemble the Unit with the Liner Upper Plate (14d).
21. Insert the above assembled parts to the Liner Case (14a). Lightly hold the unit with hands when the parts inside goes over the O-ring.
22. Apply impulse unit oil to the end section of the Liner Upper Plate (14d).
23. Use Jig H to fix Liner Case (14a) and tighten Liner Case Cap (14c) to specifed torque using Jig A.

QS50, QS60, QS70	**QS80**
80±8Nm	90±9Nm

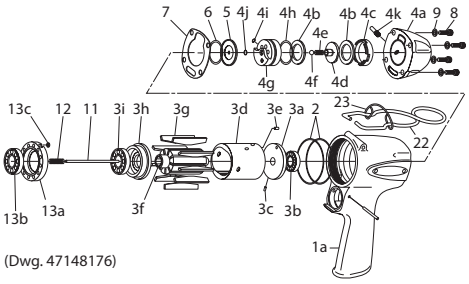
NOTICE

Check Main Shaft and Adjust Bolt rotates smoothly. Loosen the Adjust Bolt.

Assembly of Motor

Rotor Adjustment

1. Assemble the Upper Plate assembly to the Rotor (3f) by hitting the Upper Plate (3a) by about 2 mm. Make sure Rotor (3f) rotates smoothly. Hit the Upper Plate (3a) until there is no clearance between the Upper Plate (3a) and the Rotor (3f). Adjust the clearance.



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Motor Assembly

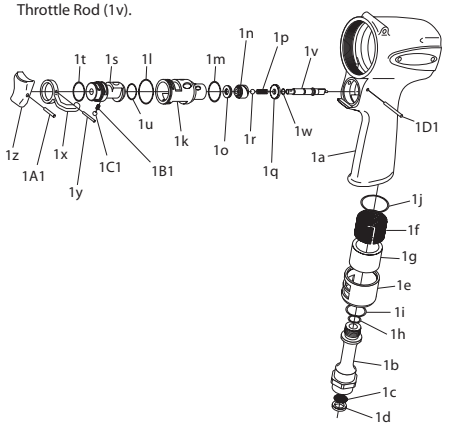
1. Install Vanes (9) (3g) into the Rotor (3f).
2. Apply grease on the Cylinder pin (3e) hole and install pin (3e) in the Cylinder (3d).
3. Align Cylinder pin (3e) with pin hole of the Upper plate and assemble the Cylinder (3d).
4. Assemble the Lower Plate assembly.
5. Apply grease on the pin hole of Upper Plate (3a) and install the Pin (3c).
6. Install the o-ring (2 pcs) (2) into the Motor Case (1a) and slightly apply grease on the O-ring (2).
7. Aligning the Upper Plate Pin (3c) insert the Motor assembly into the Motor Case (1a).

Motor Case Cover Assembly

1. Apply grease on the Bearing (3b) of the Rotor (3f) and mount the O-ring (6) and upper plate spacer (5) in order.
2. Install the S-Packing (7)and install Motor Case Cover assembly (4).
3. Tighten the Bolt (4 pcs) (8), pre-tighten the Bolts in several batches and check for smooth rotation of motor. Tighten the Bolts to the specified torque. (Torque 2.0±0.5Nm).
4. Degrease or wash the female thread part of the Motor Case Cover and thread part of Valve Plug using Degreasing washing agent.
5. Apply Anaerobic strong sealing agent to whole thread part of Valve Plug at 2-3 turns.
6. Tighten the Valve Plug to specified torque and wipe out the overflowed agent from the side of the Motor Case Cover. (Torque 1.5Nm).

Assembly of Trigger and Throttle Assembly

1. Install O-ring (1j) onto the Hose Joint Assembly, followed by the Exhaust Cover Assembly.
2. Coat the Hose Joint Assembly thread with thread lock and secure it to the Housing.
3. Install the Throttle Rod Seal in the groove on the large hub of the Throttle Rod (1v).



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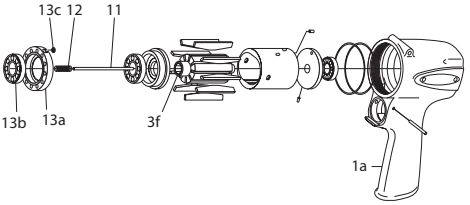
4. Install the Throttle Valve Seal in the groove on the large hub of the Throttle Valve (1n).

5. Slide the Throttle Valve, Valve Seal end first, onto the Throttle Valve Rod (1v).
6. Secure the Throttle Valve Assembly by installing the O-Ring (1w) in the small groove on the Throttle Valve Rod (1v).
7. Insert the Reverse Valve (1s) part way into the Throttle Bushing (1k). Install the Spring (1C1) and Ball (1B1), then carefully push the Reverse Valve the rest of the way into the Throttle Bushing (1K).
8. Insure that the Ball (1B1) is aligned with one of the holes in the side of the Throttle Bushing.
9. Install the O-ring (1l) in the groove on the Throttle Bushing (1k).
10. Assemble the Reverse Lever (1x) onto the Reverse Valve (1s) and secure with a Roll Pin (1y).
11. Insert the Throttle Valve Assembly through the Reverse Valve (1s), then secure with the Throttle Knob (1z) and a Roll Pin (1A1).
12. Insert the Trigger and Reverse Valve Assembly into the Motor Housing, taking care to align the slots in the Reverse Valve and Throttle Bushing with the pin hole in the Motor Housing.
13. Secure Trigger and Reverse Valve Assembly with pin, which should be centered from side to side.
14. To prevent air leakage, after pin assembly seal each end of the pin with cement.

Assembly of hammer Case Assembly



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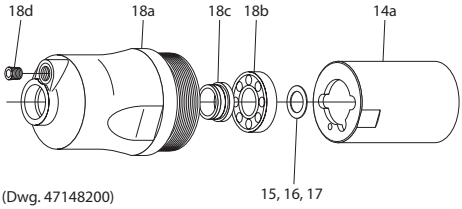
1. Insert Rod (11), Spring (12) into Rotor (3f). Apply grease to the bearing (13b).



(Dwg. 47148200)

2. Assemble bearing (18b) and main shaft bushing (18c) to Hammer Case (18a).
3. Apply grease to Bearing of Hammer Case, Bearing Part and to the hexagon part.
4. Assemble greased Lower Plate Spacer (13a) with its Bearing (13b) and washer (13c) facing the impulse unit.
5. Aligning the Position of the Washer (13c) to the groove of the Hammer Case (18a), Install the Linear Case Assembly to the Hammer case.
6. Install ST Packing (15, 16, 17).
7. Tighten the Hammer Case (18a) to the Motor case (1a).

NOTICE

Match the Position of impulse unit and hexagon position of motor part by rotating the main shaft with fingers In Case there is a mismatch in the position of impulse unit and hexagon position of motor part.

7. Fully tighten the hammer case with use of Jig P. Install Jig P on the Hammer Case by aligning the Socket Plug position with the bolt on the Hammer Case. (Torque 50±5Nm).

Troubleshooting

Trouble	Probable Cause	Solution
The tool rotates under no load.		
When under load 0.		
The tool does not work (no pulsing).	Damaged knock pin of the liner	Immediately stop using the tool. Tool repair and maintenance should only be carried out by an authorized Service Center.
	Damaged spring for blades	
	Pulse unit seizure	
The oil pulse unit Silps.	Oil leaks	
	Damaged spring for blades	
The tool doesnot stop even after a throttle lever is released.	Malfunction of a throttle	
The tool does not rotates under no load.		
Main shaft rotates if it is turned by fingers.	Faulty assembled motor	Immediately stop using the tool. Tool repair and maintenance should only be carried out by an authorized Service Center.
	Too low air pressure	
	Motor part seizure	
	Dust contamination	
Main shaft does not rotates even if it is turned by fingers.	Motor part seizure	
	Damaged vane	
	Damaged ball bearing	
	Seized main shaft bushing	
	Dust contamination	

Related Documentation

For additional information refer to:
Product Safety Information Manual 04584983.
Product Information Manual 47116942.
Parts Information Manual 47144522.

Manuals can be downloaded from www.ingersollrandproducts.com.

Notes:

www.ingersollrandproducts.com