Pistol DC Electric Nutrunner
QE4 Series

Maintenance Information

Save These Instructions
General Instructions:
• Refer to "Suggested Tools" in the Parts Information Manual Form 80151632 for quick reference to the tools recommended for the following disassembly/assembly instructions.

WARNING
• Repairs should be made only by authorized trained personnel. Consult your nearest Ingersoll-Rand Authorized Service Center.
• Disconnect the power cord from the receptacle before performing any maintenance on this or any other tool.
• Always use protective eyewear when performing maintenance on a tool or while operating a tool.
• Use of non-Ingersoll-Rand parts or failure to follow Maintenance Instructions may create a risk of electric shock or injury.

Lubrication
Whenever this product is disassembled, clean the parts and re-lubricate them as follows:
1. Clean and degrease all parts except for the 1st and 2nd Stage Spindle Assemblies (75 and 77).
2. Wipe clean the 1st and 2nd Stage Spindle Assemblies with a clean, dry and lint-free rag
3. Once cleaned, apply prescribed amounts of Ingersoll-Rand #67 Grease as follows:
   • 2 to 3 cc to central area between gears of Spindle Assemblies
   • 1 to 2 cc to faces of Spindle Assemblies
4. Apply light coat of grease to Trigger Magnet Post. Use Ingersoll-Rand #67 Grease.
5. For Trigger Start, Push-To-Start, and Trigger Permit Models: Use Ingersoll-Rand #67 Grease to lubricate Bearing (43) located inside Spindle Housing Assembly and the gear teeth drive spindle assembly (20).
6. For Extended Spindle Models: Use Ingersoll-Rand #67 Grease to lubricate the Drive Spindle Bearings, the Drive Spindle (68) and the Disengaging Spring (67).

Disassembly
• This procedure is to be performed by an authorized, trained repair person. To ensure proper functioning of the tool.
• When replacing the Motor Housing Assembly (34), always ensure that the Memory Chip (32), Communication Board (38), Transducer Gear Pack Assembly, and Attachment are all assembled as a set with the new Motor Housing Assembly.

CAUTION
• When replacing an Attachment, always use the Assembly Attachment designed for that model. Never replace a Push-To-Start Assembly Attachment with a Trigger Start or Extended Spindle Attachment.
• When replacing a Transducer Gear Pack Assembly, always use the Assembly designed for that model.

General Instructions for Disassembly:
1. Do not disassemble the tool any further than necessary to replace or repair damaged parts.
2. To protect part surfaces and to prevent distortion of housings and threaded joints, use care when grasping the tool.
3. Avoid clamping non-metal surfaces unless directed otherwise.
4. Do not remove any press fit part or any part of an assembly unless its removal is necessary for repair or replacement.

WARNING
• When grasping tool in vise, support both handle and barrel simultaneously. Do not clamp down excessively or crush housing. Use only enough force to arrest rotation.

Disassembly of External Components
1. Unscrew and remove handle cover screw (39) with appropriate hex key and pull out bottom of handle cover (33). Lower out of pistol handle opening.
2. Unscrew and remove back cap screws (9) with appropriate hex key and pull back cap assembly (8) straight back out of housing.
3. Slide Switch Reverse Ring (31) away from the housing, being cautious not to lose the Ball (45) and Springs (29 and 30).
4. Dislodge O-rings (15).
5. Remove Chip Holder Assembly (32) from Motor Housing Assembly.

Disassembly of Internal Components
1. Remove Retainer (28) used to hold Main Board (38) located in the handle of the housing.
2. Through the Handle Cover opening, disconnect all connectors.
3. If necessary, remove the Main Board from the pistol housing assembly. The Main Board must be carefully lifted/bent over the trigger post. Use a pick or hook tool to aid in this operation.
4. Slide board partially out of housing assembly until trigger screw is visible through hole in board. Unscrew trigger screw (12), relieving tension on the board and continue to remove the main board.

WARNING
• Tool board components may be damaged during disassembly if care is not taken. Board must be bent to clear Trigger Post prior to dislodging board from Housing.

Trigger Start, Trigger Permit and Push-to-Start Attachments
1. While holding tool carefully using a vise, use a spanner wrench to unscrew nose cap (41).
2. While holding tool carefully using a vise, use a spanner wrench #GEA40-478 (or other appropriate wrench) to unscrew coupling nut (40).
3. Verify that the transducer gear pack assembly connector has been removed from its terminal on the main board (38). (See Disassembly of Internal Components section)
   For Push-to-Start models: Slide the spindle housing assembly (1) and transducer gear pack assembly (24, 25, 26 or 27) simultaneously out of the motor housing assembly (34) while ensuring clearance for wire assemblies between the spline teeth of the transducer and the relief notch in the motor housing assembly.
4. Slide the spindle housing (2) out of the motor housing assembly (34).
5. If necessary, remove coupling nut retainer (42) from spindle housing (1 or 2).
6. If necessary, press bearing (43) out of spindle housing (2).
7. Remove spring (44).
8. Slide the drive spindle assembly (20) out of the transducer gear case assembly inside the motor housing assembly.
9. Slide the transducer gear case assembly (24, 25, 26 or 27) out of the motor housing assembly (34) while ensuring clearance for wire assemblies between the spline teeth of the transducer and the relief notch in the motor housing assembly.
For 3/8” and 1/4” Square Drive Spindles,
  a. Locate Retaining Pin (59 or 61) and Retaining Spring (60 or 62) of Spindle's square socket.
  b. If necessary, use a pointed metal probe to pull Retaining Spring out of Spindle cavity.
  c. Also, if necessary, remove Pin from Square Drive Spindle.

For Quick Change Spindles,
  a. Remove Retaining Ring (58), using Snap Ring Pliers.
  b. Slide Spring (57), Sleeve (56) and Ball (55) off the Spindle (52).

For Extended Spindle Model Attachment
  1. Using an adjustable Pin Wrench, unscrew Bearing Cap (72).

Assembly

Assembly-Motor Housing

General Instructions
1. To protect the part's surfaces and to prevent distortion of Houings and threaded joints, use care when grasping the tool.
2. Always press on the inner ring of a ball-type bearing when installing the bearing onto a shaft.
3. Always press on the outer ring of a ball-type bearing when pressing the bearing into a bearing recess.
4. Refer to the “Lubrication” section of this manual for instructions on how to properly grease this tool.

**WARNING**
- The following procedures are to be performed by an authorized, trained repair person. To ensure proper functioning of the tool.
- When replacing the Motor Housing Assembly (34), always ensure that the Memory Chip (32), Communication Board (38), Transducer Gear Pack Assembly, and Attachment are all assembled as a set with the new Motor Housing Assembly.

**CAUTION**
- When replacing a Transducer Gear Pack Assembly, always use the Assembly designed for that model.

Assembly-Transducer Gear Pack

1. Apply Grease (Ingersoll-Rand #67) to ring gear of Transducer Assembly (73).
2. Place one Spacer (74) into Transducer Assembly against bottom face.
3. Grease the planet gear teeth of the 2nd Stage Spindle Assembly (75), and slide into Transducer Assembly.
4. Place second Spacer (76) into Transducer Housing against face of 2nd Stage Spindle Assembly.
5. Grease the planet gear teeth of the 1st Stage Spindle Assembly (77), and slide into Transducer Assembly, taking care to align gear teeth of the 1st Stage Spindle Assembly with the planet gears of the 2nd Stage Spindle Assembly.
6. Place third Spacer (78) against 1st Stage Spindle Assembly.
7. Finally, install Retaining Ring (79) taking care to properly align into groove of Transducer Assembly.
8. To assure free rotation of assembly, hold Transducer Gear Pack Assembly steady, and manually rotate the 1st Stage Spindle Assembly.

Assembly-Trigger Start, Push-to-Start, and Trigger Permit Attachments

1. Visually check Housing for loose material fragments.
2. For 3/8” and 1/4” Square Drive Spindles, install Socket Retaining Pin (59 or 61) into small hole on one of the flat sides of square Spindle.
   a. With Socket Retaining Pin (59 or 61) in place, locate the pin's groove inside end-hole of square Spindle.
   b. Position Socket Retaining Spring (62 or 60) inside large hole of square Spindle such that the free ends of the Socket Retaining Spring are faced away from the hole and the closed side of the spring will straddle the Socket Retaining Pin (59 or 61).
   c. Holding the Socket Retaining Pin steady, push Spring down hole of square Spindle until the Socket Retaining Spring's wire engages Socket Retaining Pin.
   d. Socket Retaining Pin is properly installed when Socket Retaining Spring snaps into place.

**NOTICE**
- Bearing Cap (72) has a left handed thread.

3. For Quick Change Spindles,
   a. Place Ball (55) into hole in Spindle.
   b. Slide Sleeve (56) onto Spindle so that it retains the Ball, and slide Spring (57) onto Spindle underneath the Sleeve.
4. Place Retaining Ring (58) into groove of Spindle to retain Spring and Sleeve.
5. Slide Coupling Nut (64) over Attachment.
6. Using an appropriate tool, install Retainer (70) on Assembly. Take care to seat Retainer Ring in groove.
7. Slide Coupling Nut over Retainer (70), and spin by hand to check freedom of movement.
8. Engage Attachment's Pinion into spline of Spindle Assembly (68), then engage the spline on the Attachment with the internal spline of the Motor Housing Assembly.
9. Thread Coupling Nut (64) onto Motor Housing Assembly.
10. While holding the tool using a Hook Spanner or similar wrench, use a Spanner Wrench to torque Coupling Nut to 15 - 20 lbs. ft. (20 - 27 Nm).

Assembly-Extended Spindle Attachment

1. Visually check Housing for loose material fragments.
2. For 3/8” and 1/4” Square Drive Spindles, install Socket Retaining Pin (59 or 61) into small hole on one of the flat sides of square Spindle.
   a. With Socket Retaining Pin (59 or 61) in place, locate the pin's groove inside end-hole of square Spindle.
   b. Position Socket Retaining Spring (62 or 60) inside large hole of square Spindle such that the free ends of the Socket Retaining Spring are faced away from the hole and the closed side of the spring will straddle the Socket Retaining Pin (59 or 61).
   c. Holding the Socket Retaining Pin steady, push Spring down hole of square Spindle until the Socket Retaining Spring's wire engages Socket Retaining Pin.
   d. Socket Retaining Pin is properly installed when Socket Retaining Spring snaps into place.
3. For Quick Change Spindles,
   a. Place Ball (55) into hole in Spindle.
   b. Slide Sleeve (56) onto Spindle so that it retains the Ball, and slide Spring (57) onto Spindle underneath the Sleeve.
4. Place Retaining Ring (58) into groove of Spindle to retain Spring and Sleeve.
5. Slide Coupling Nut (64) over Attachment.
6. Using an appropriate tool, install Retainer (70) on Assembly. Take care to seat Retainer Ring in groove.
7. Slide Coupling Nut over Retainer (70), and spin by hand to check freedom of movement.
8. Engage Attachment's Pinion into spline of Spindle Assembly (68), then engage the spline on the Attachment with the internal spline of the Motor Housing Assembly.
9. Thread Coupling Nut (64) onto Motor Housing Assembly.
10. While holding the tool using a Hook Spanner or similar wrench, use a Spanner Wrench to torque Coupling Nut to 15 - 20 lbs. ft. (20 - 27 Nm).

NOTICE
- Bearing Cap (72) has a left-handed thread.
3. While holding the tool carefully using a vise, use a Spanner wrench to engage the spline on the drive spindle of the Attachment with the internal spline teeth of Motor Housing Assembly. Continue sliding Transducer Gear Pack Assembly into the Motor Housing while guiding the wire through the hole.
4. Insert spring (44) into hole in end of drive spindle assembly (20).
5. Align and engage the 1st Stage Spindle planet gears with gear teeth on rotor of the Motor Housing Assembly. Be Certain that the Transducer wire exits the Transducer directly over the access hole through with the wire was fed.
6. While holding the tool carefully in a vise, use a spanner wrench to torque coupling nut to 20-27 Nm.

Installation-Transducer Gear Pack Assembly
1. Orient the Spacer located in the Motor Housing Assembly groove at the bottom of the spline, so that the opening in the spacer lines up with the hole in the housing.
2. After guiding Transducer's connector into the hole found at end of Motor Housing Assembly's inner groove, insert Transducer Gear Pack Assembly into Motor Housing Assembly.
3. Carefully pull Transducer's connector and wiring through opposite end of Motor Housing Assembly.
4. Engage external spline teeth of Transducer Gear Pack Assembly into the internal spline teeth of Motor Housing Assembly. Continue sliding Transducer Gear Pack Assembly into the Motor Housing while guiding the wire through the hole.
5. Align gear teeth of output spindle assembly with matching teeth of drive spindle assembly (20).
6. While holding the tool carefully in a vise, use a spanner wrench to torque coupling nut to 20-27 Nm.

Installation-Trigger Start, Attachment
1. Install O-Rings (15) around the LED Assembly in housing in Motor Assembly (34).
2. Install LED Board Assembly (35) in the rear of the Motor Assembly. Gently guide the LED Board Assembly by the cable assembly.
3. Connect the LED assembly connector to the Main Board. If not using the Push-to-Start assembly, connect jumper connector to the Main board.
4. Connect transducer connector to Main Board.
5. Pull the LED Assembly (37) wires first through the small opening at the top of the front of the Motor Assembly Handle.
6. Slide Coupling Nut (64) over Housing Assembly (49).
7. Press coupling nut retainer (42) onto groove in OD of spindle housing (2).
8. Insert coupling nut retainer (42) onto groove in OD of spindle housing (2).
9. Insert output spindle assembly into spindle housing (2).
10. Align gear teeth of output spindle assembly with matching teeth of drive spindle assembly (20).
11. While holding the tool carefully in a vise, use a spanner wrench to torque coupling nut to 20-27 Nm.

Installation-Internal Components
1. Pull the LED Assembly (37) wires first through the small opening at the top of the front of the Motor Assembly Handle.
2. Install O-Rings (15) around the LED Assembly in housing in Motor Assembly (34).
3. Place Trigger Spring (11) around the long metal post on the reverse side of the Trigger Assembly (16) and rotate the Trigger Spring clockwise and counterclockwise until it is secure.
4. Press coupling nut retainer (42) onto groove in OD of spindle housing (2).
5. Insert Trigger Washer (10) around Trigger Screw (12) and screw Trigger Screw into reverse side of Trigger Assembly to secure the One Finger Trigger in Motor Assembly housing.
6. Connect transducer connector to Main Board.
7. Insert the LED Board Assembly (35) in the rear of the Motor Assembly. Gently guide the LED Board Assembly by the cable assembly.
8. Insert the Main Board (38) into the Motor Assembly by sliding it up through the bottom opening of the handle of the Motor Assembly, lifting it gently over the Trigger Post.
10. While holding the tool carefully in a vise, use a spanner wrench to torque coupling nut to 20-27 Nm.
11. Connect green Resolver connector to Main Board.
12. If necessary, connect the Push-to-Start connector to the Main Board.
13. If using the Push-to-Start assembly, connect jumper connector to the Main board.
14. If necessary, connect the LED assembly connector to the Main board.
15. If necessary, connect the LED assembly connector to the Main board.

For Push-to-Start models: Install trigger spacer (7) onto metal post of trigger assembly.

Assembly-Internal Components
1. Null
2. Null
3. Null
4. Null
5. Null
6. Null
7. Null
8. Null
9. Null
10. Null
11. Null
12. Null
13. Null
14. Null
15. Null
16. Null
17. Null
18. Null
19. Null
20. Null

Installation-Internal Components
1. Null
2. Null
3. Null
4. Null
5. Null
6. Null
7. Null
8. Null
9. Null
10. Null
11. Null
12. Null
13. Null
14. Null
15. Null
16. Null
17. Null
18. Null
19. Null
20. Null

Installation-Extended Spindle Attachment
1. Position the Attachment appropriately.
2. Engage the spline on the drive spindle of the Attachment with the matching internal spline of the Transducer Gear pack Assembly, engage the spline on the Housing Assembly with the internal spline of the Motor Housing Assembly and thread the Coupling Nut onto the Motor Housing.
3. While holding the tool carefully using a vise, use a Spanner wrench to torque the Coupling Nut to 15 - 20 lb. ft. (20 - 27 Nm).
Assembly-External Components

1. Rotate tool so that Handle End faces upwards and insert Spring (29) into spring track in Switch Reverse Ring (31).
2. Insert Spring (30) followed by Ball (45) into rear of Motor Assembly and be careful to hold them compressed and in place while slowly sliding the Switch Reverse Ring over rear of Motor Assembly.

**NOTICE**
- In Step 2 above, three triangular grooves are cut in the Switch Reverse Ring. The Spring and Ball will fit inside one of them, line one of the holes up with the location of the Spring and Ball when sliding the Switch Reverse Ring over the Motor Assembly.

3. Position the Back Cap Assembly (8) into place, mating it with the Switch Reverse Ring on the rear of the Motor Assembly.
4. Using the appropriate Allen Wrench, screw the Back Cap Screws (9) into a secure position through the Back Cap Assembly.
5. Insert Chip Holder Assembly (32) into hole in side of bottom of the Motor Assembly handle.
6. Using two cable ties (48), dress wires so that they are out of the trigger post path.
7. Put Handle Cover (33) on back of the Motor Assembly handle by putting top in first and swinging bottom into position.

**NOTICE**
- In Step 7 above make sure all wiring is securely inside Motor Assembly handle and be careful not to crush wiring against the Main Board.

8. Using appropriate Allen Wrench secure Handle Cover onto Motor Assembly handle by screwing Handle Cover Screw (39) into position on the bottom of the Motor Assembly handle.

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### Tool Board Configuration Chart.
For TRIGGER START (TS), PUSH-TO-START (PTS) and TRIGGER PERMIT (TP) Models.

<table>
<thead>
<tr>
<th>Connector</th>
<th>Description</th>
<th>Model Configuration</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jumper Connector</td>
<td>3 Pin</td>
<td>TS</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PTS</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TP</td>
<td>not used</td>
</tr>
<tr>
<td>Led Board Assembly</td>
<td>8 Pin, White</td>
<td>TS, PTS, TP</td>
<td>2</td>
</tr>
<tr>
<td>White Led Assembly</td>
<td>2 Pin, Black</td>
<td>TS, PTS, TP</td>
<td>3</td>
</tr>
<tr>
<td>Motor Commutation Connector</td>
<td>5 Pin, Green</td>
<td>TS, PTS, TP</td>
<td>4</td>
</tr>
<tr>
<td>Transducer Connector</td>
<td>5 Pin, White</td>
<td>TS, PTS, TP</td>
<td>5</td>
</tr>
<tr>
<td>Push-to-start Connector</td>
<td>3 Pin, White</td>
<td>TS</td>
<td>not used</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PTS</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TP</td>
<td>1</td>
</tr>
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<td>Temperature Sensor Connector</td>
<td>2 Pin, Grey Wires</td>
<td>TS, PTS, TP</td>
<td>7</td>
</tr>
<tr>
<td>Motor Phases Connector</td>
<td>4 Pin, Black</td>
<td>TS, PTS, TP</td>
<td>8</td>
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