



**16609703**  
Edition 1  
March 2009

## **DC Electric Tool**

**QE2 Series**

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# **Maintenance Information**



**Save These Instructions**

 **Ingersoll Rand**

## General Instructions

- Refer to "Suggested Tools Parts List" 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.**

**Note:** When reading instructions refer to exploded diagrams in Parts Information manual when applicable (see under related documentation for form numbers).

## Disassembly

### WARNING

- 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 (1), always ensure that the Main Board Assembly (2), Transducer Assembly (9), Gear Pack Assembly, Spindle 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 an Angle Assembly Attachment with an In-Line Attachment.**
- When replacing a Transducer Assembly, Gear Pack Assembly, always use the Assembly designed for that model.**

## General Instructions for Disassembly

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

## Disassembly of Grips and Plastic Components

- For Models with Levers**, use the appropriate hex. key to loosen Socket Head Cap Screws (16) from Lever (14) and remove Lever and Spacer (19) from Motor Housing Assembly (1).
- For Models with Pistol Attachment**,
  - Use the appropriate hex. key to loosen Socket Head Screw (37).
  - Remove Housing Clip (33) and Hanger Suspension Clip (35) from the Pistol Handle Set (38).
  - Remove the Pistol Handle Set from the Motor Housing Assembly (1).
- For Models with Lever and Models with Pistol attachment**, remove the Lever Button Housing Assembly (18) from the Motor Housing Assembly (1) using designated tool.

## Lubrication

Whenever this product is disassembled, clean the parts and re-lubricate them as follows:

- Clean and degrease all parts except for the 1<sup>st</sup> stage Gear Assembly and 2<sup>nd</sup> stage Spindle Assembly (46).
- Wipe clean the 1<sup>st</sup> stage Gear Assembly and 2<sup>nd</sup> stage Spindle Assembly with a clean, dry and lint-free rag.
- Once cleaned, apply prescribed amounts of **Ingersoll Rand #67 Grease** as follows:
  - 2 to 3 cc to central area between gears of 1<sup>st</sup> stage Gear Assembly and 2<sup>nd</sup> stage Spindle Assembly.
  - 1 to 2 cc to faces of 1<sup>st</sup> stage Gear Assembly and 2<sup>nd</sup> stage Spindle Assembly.
  - Thin layer on Ring Gear teeth.
  - Thin layer on faces of Washers and O-Ring.
- For Models with an Angle Assembly Attachment:** Use **Ingersoll Rand #67 Grease** to lubricate Angle Head through Grease Fitting.
- For Models with an In-Line Attachment:** Use **Ingersoll Rand #67 Grease** to lubricate the Drive Spindle Bearings (117), the Drive Spindle (122), the Spring (124, 125) and the Needle Bearing (116).
- For Models with Pistol Attachment:** Use **Ingersoll Rand #67 Grease** to lubricate Pivot Pin (36). Use **Ingersoll Rand #160 O-Ring Lube** to lubricate sliding surface of Trigger Lever (32).

- For all Models**, use the appropriate hex. key to loosen low Head Cap Screw (15) from Suspension Nut. Slide the Suspension Nut (7) off of Motor Housing Assembly (1).
- Slide O-Ring (12), Lens cover (6) and Label (13) off of Motor Housing Assembly (1).
- For Push To Start Models and Models with Lever**, use appropriate hex. key to loosen Low Head Cap Screw (17) from the Main Cover (5).
  - Push down reverse button (8) and slide Main Cover (5) off of Motor Housing Assembly (1).
  - If applicable, slide Hand Flange (4) and O-Ring (11) off of Motor Housing Assembly (1).
- For Models with Pistol Attachment**, use appropriate hex. key to loosen the Socket Head Screw (37) from the Pistol Housing Key (34). Remove the Pistol Housing Key.

## Attachments

### WARNING

- NEVER grasp the tool in a vise, as this will likely result in damage to the tool causing wire leads to malfunction, which increases risk of electric shock.**

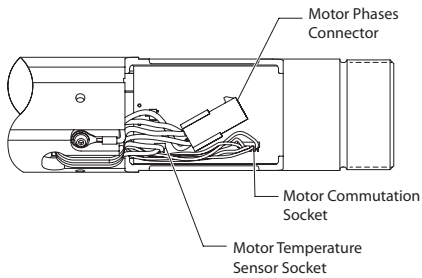
### CAUTION

- When installing or removing a Coupling Nut, use the designated tool, a Hook Spanner Wrench or similar wrench to hold the tool, and use a Spanner Wrench to tighten or loosen the Coupling Nut.**

## Disassembly of Internal Components

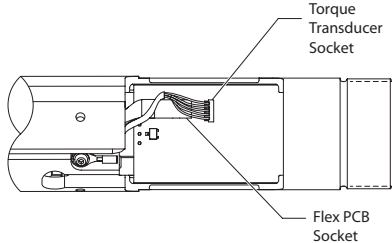
(Common to all Models)

- Remove the access cover (3).
- If required, remove the Reverse Button Housing Assembly (8) from the Access Cover (3) using Button Housing Socket, CPS2-38-2T.
- Through the access hole in housing, disconnect the Motor Phase connector.
- Disconnect the Motor temperature-sensor connector from the Main Board Assembly (2).



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5. Disconnect the Torque Transducer connector from the Main Board Assembly (2).
6. Disconnect the Flex PCB (64) from the Main Board Assembly (2).



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7. Disconnect the Motor commutation connector from the Main Board Assembly (2).
8. Remove Retainer (20).
9. If necessary, remove the Main Board Assembly (2) from Motor Housing Assembly (1).

### Output Spindle End - Disassembly

1. Disassemble the grips and plastic components.
2. **For In-line and Pistol Models,**
  - Using CPS2-25F-70 Fixture Plug, a Hook Spanner Wrench or similar wrench to hold the tool, and using Spanner Wrench CPS2-478 (or other appropriate wrench), unscrew Coupling Nut (81).
  - Use caution while removing coupling nut. If spindle assembly becomes disengaged from main housing keys spindle assembly can rotate causing damage to the flex circuit. Spindle housing must be held engaged with motor housing keys during nut disassembly.
  - Remove the Spring (83).
3. **For Angle and Fixture Models,**
  - Using CPS2-25F-70 Fixture Plug, a Hook Spanner Wrench or similar wrench to hold the tool, and using Spanner Wrench CPS2-478 (or appropriate wrench), unscrew Coupling Nut (92).

**Note:** Left hand thread.

  - Remove the Angle Head (91) or In-line Attachment.
  - Remove the Lock Washer (104) off of Spindle Coupling (103).
  - Using a CPS2-25F-70 Fixture Plug, a Hook Spanner Wrench or similar wrench to hold the tool, and using Spanner Wrench CPS2-478 (or appropriate wrench), unscrew Spindle Coupling (103) off Spindle Housing (102).

**Note:** Left hand thread

  - Remove Light Ring Lens (106) off of Spindle Housing (102).
  - Using CPS2-25F-70 Fixture Plug, a Hook Spanner Wrench or similar wrench to hold the tool, and using Spanner Wrench CPS2-478 (or appropriate wrench), unscrew Coupling Nut (107) off Motor Housing Assembly (1). Use caution while removing coupling nut. If spindle assembly becomes disengaged from the main housing keys the spindle assembly can rotate causing damage to the flex circuit.

- Remove Spindle Housing (102).
- If required, remove Flex PCB (105) from the Spindle Housing (102).
- If required, Remove Retainer (99) off of Bit Holder Plug Assembly (98).
- If required, Remove Bit Holder (76).
- Remove Hall Housing (72) from Spindle Housing (102).

### Angle Attachment Disassembly

1. **For 3/8" and 1/4" Square Drive Spindles,**
  - Looking down hole of the Spindle's square socket, locate Retaining Pin (95) and Retaining Spring (94).
  - If necessary, use a pointed metal probe to pull retaining Spring out of Spindle cavity.
  - If necessary, remove Pin from Spindle.
2. **For Quick Change Spindles,** remove Bit Retaining Spring (97) and Bit Retaining Ball (96).
3. Using CPS2-25F-70 Fixture Plug, a Hook Spanner Wrench or similar wrench to hold the tool, and using Spanner Wrench CPS2-478 (or other appropriate wrench), unscrew Coupling Nut (92) and pull the Angle Assembly Attachment (91) out of Motor Housing Assembly (1).
4. If necessary, remove Coupling Nut Retainer (93) using an appropriate tool.

### In-Line Attachment Disassembly

1. Using CPS2-25F-70 Fixture Plug, a Hook Spanner Wrench or similar wrench to hold the tool, and using Spanner Wrench CPS2-478 (or other appropriate wrench), unscrew Coupling Nut (92) and pull the In-Line Attachment out of Motor Housing Assembly (1).
2. If desired, remove Coupling Nut Retainer (93) using the appropriate tool.

**Note:** In the following step, the Bearing Cap (119) has a lefthand thread.

3. Using CPS3-532T Hex Socket or an adjustable Pin Wrench, unscrew Bearing Cap (139).
4. Pull the Drive Spindle Assembly (142) out of Housing (141).
5. Remove the Retaining Ring (138). If necessary, using a bearing puller tool, press the Rear Spindle Bearing (137) off the Drive Spindle Assembly.
6. Tilt Spindle Housing, causing the Spring (144, 145), Square Drive Spindle (140), and Washer (143) to slide out.
7. Note that the No-Float Models have an extra Spacer (146) inside the Spindle (140).

### Spindle Assembly - Disassembly

#### (Common for Push to start, Trigger and Pistol Model)

1. Remove the Hall Holder (72) from the Spindle Sub Assembly (74).
2. Remove Retainer (69) from the Bit Holder (76, 80).
3. Slide the Push to Start Assembly (73) and Thrust Washer (71) off of Bit Holder (76, 80).
4. Note that the No-Float Models have an additional Spacer (81).
5. Slide the Bit Holder (76, 80) out of the Spindle Assembly from the front end.
6. Use appropriate hex. Key to loosen the Cap Screws (70) from the Front Spindle Housing (65).
7. Remove the Front Spindle Housing (65).
8. Remove the Light Ring Lens (67).
9. If necessary, disassemble the Flex PCB (64) from the Spindle Sub Assembly (74).
10. **For Quick change type Bit Holder -** Remove the Retainer (63) from the Bit Holder (76). Remove the Spacer (68) and Spring (62). Remove the Collar (66) from the Bit Holder (76). Remove the ball (61) from the Bit Holder (76).
11. **For Square type Bit Holder -** Remove the Rubber Insert (77) from the Bit Holder (76) using a pick or other appropriate tool. Remove the retaining pin (78) from the Bit Holder (76).

## Gear Assembly Removal

### (Common for all models)

1. Once the Spindle Assembly has been disassembled, slide the Gear Assembly out of the Motor Housing Assembly (1).

## Transducer Assembly Removal

### (Common for all models)

1. Make sure that the Transducer Assembly (9) connector is disconnected from the Main Board (2).
2. Pull Transducer Assembly (9) out of the Motor Housing Assembly (1), feeding the transducer wire through the hole in the Motor Housing Assembly.

## Assembly

### Motor Housing Assembly

#### General Instructions

1. To protect the part's surfaces and to prevent distortion of Housings 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

- This 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 (1), always ensure that Main Board Assembly (2), Transducer Assembly (9), 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 an Angle Assembly Attachment with an In-Line Attachment.
- When replacing a Transducer Assembly (9), always use the Assembly designed for that model.

## Gear Pack - Assembly

### (Common to all models)

1. Apply Grease (**Ingersoll Rand** #67) to Ring Gear Teeth (48).
2. Grease the planet gear teeth of the 1<sup>st</sup> stage Spindle Assembly, and slide it into Ring Gear (48) from the front end.
3. Grease and place the Washer (47) into Ring Gear (48) against the face of the 1<sup>st</sup> stage Spindle Assembly.
4. Grease the planet gear teeth of the 2<sup>nd</sup> stage gear assembly (46) and slide into the gear pack assembly, taking care to align gear teeth of the 1<sup>st</sup> stage gear assembly with the planet gears of the 2<sup>nd</sup> stage Spindle Assembly.
5. Apply grease to O-Ring (52) and install into the groove of Ring Gear (48).
6. Place Washer (54) into O-Ring (52) and against the shoulder in the Ring Gear (48).
7. Apply grease to O-Ring (53) and install into the groove of Ring Gear (48).
8. To assure free rotation of assembly, hold Gear Pack Assembly steady, and manually rotate the 2<sup>nd</sup> Stage Gear Assembly.

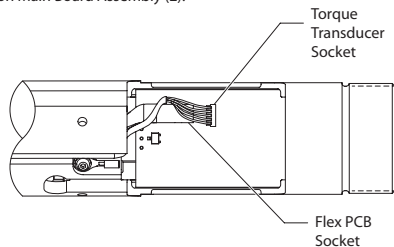
## Push-to-Start, Lever-to-Start and Pistol Model Assembly Installation

1. Slide the Main Board Assembly (2) into the Motor Housing Assembly (1).

## Gear Pack - Disassembly

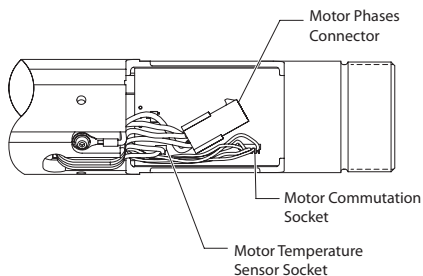
### (Common to all models)

1. Remove the 2<sup>nd</sup> stage Spindle Assembly (46) from the front end of the Ring Gear (48).
2. Slide the 1<sup>st</sup> stage Gear Assembly and the Washer (47) from the Ring Gear (48).
3. If required remove the O-Rings (52, 53) from their respective grooves in the Ring Gear (48).
2. Install Retaining Ring (20) into Motor Housing Assembly (1).
3. Feed transducer cable and connector through hole in motor housing and slide the Transducer Assembly (9) into the Motor Housing Assembly. Align gear teeth of transducer assembly with matching teeth of Motor Housing Assembly.
4. Guide the transducer cable through the long outer slot in motor housing assembly and connect it to its perspective terminal, marked "TORQUE" on the Main Board Assembly (2).
5. Apply grease (**Ingersoll Rand** #67) on outer diameter of Ring Gear (48) and slide it into the Motor Housing Assembly (1) while ensuring that the ring gear tabs line up with the slots in the transducer and the tabs of 2<sup>nd</sup> Stage Spindle Assembly (46) lines up with the slots on the Motor Housing Assembly (1).
6. Push Spring (83) against Gear Pack Assembly.
7. Assemble the spindle assembly ensuring engagement of Bit Holder (76, 80) with the 2<sup>nd</sup> stage Spindle Assembly (46) of planetary gear system and also ensuring that the Flex PCB (64) of the spindle assembly aligns with the slot in the Motor Housing Assembly (1).
8. Using CP52-25F-70 Fixture Plug, a hook spanner wrench or similar wrench to hold the tool, and using Spanner wrench CP52-478 (or appropriate wrench), Screw Coupling Nut (81) onto the Motor Housing Assembly (1). Use caution while tightening coupling nut. If spindle assembly becomes disengaged from main housing keys spindle assembly can rotate causing damage to the flex circuit. Spindle housing must be held engaged with motor housing keys during nut assembly.
9. Guide the Flex PCB (64) through the long outer slot in Motor Housing Assembly (1) and connect it to its perspective terminal on Main Board Assembly (2).



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10. Connect the motor phase connector to its perspective terminal on the Main Board Assembly (2).
11. Connect the motor temperature sensor connector to its perspective terminal on the Main Board Assembly (2).
12. Connect the motor commutation socket to its perspective terminal, marked "RESOLVER" on the Main Board Assembly (2).



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13. Assemble the Reverse Button Housing Assembly (8) onto the Access Cover (3) using Button Housing Socket, CP52-38-2T.
14. Assemble the Access Cover (3) onto the Motor Housing Assembly (1).
15. For straight models, install the O-Ring (11) onto the Coupling Nut (81).
16. **For Push to Start Model and Models with a Lever,**
  - Slide the Hand Flange (4) on the Motor Housing Assembly (1) aligning the slots with the tabs of the Coupling Nut (81).
  - Assemble the Main Cover (5) onto the Motor Housing Assembly (1) and install Cap Screw (17).
  - Install the label (13) into the Lens Cover (6) aligning the cutout in the label with the tabs on the Lens Cover (6)
  - Assemble the lens cover (6) onto the Motor Housing Assembly (1).
  - Install the O-Ring (12) onto the Motor Housing Assembly (1) and against the Lens Cover (6).
  - Assemble the Suspension Nut (7) onto Motor Housing Assembly (1) and install Low Head Cap Screw (15).
17. **For Models with a Lever,**
  - Assemble the Lever Button Housing Assembly (18) onto the Motor Housing Assembly (1) using Button Housing Socket, CP52-38-2T.
  - Use appropriate hex. Key, fasten the Screws (16) onto the Motor Housing Assembly (1) with the Spacers (19) and the Lever (14) installed.
18. **For Pistol Model,**
  - Assemble the Lever Button Housing Assembly (18) onto the Motor Housing Assembly (1) using Button Housing Socket, CP52-38-2T.
  - Assemble the Pistol Housing Key (34) onto the Motor Housing Assembly (1) using the Socket Head Screw (37).
  - Install the Pivot Pins (36) into the respective holes in one half of the Pistol Handle Set (38).
  - Assemble Trigger (31) and Trigger Lever (32) onto the Pivot Pins (36).
  - Place Motor Housing Assembly (1) into half of the Pistol Handle Set (38).
  - Assemble other half of Pistol Handle Set (38) onto Motor Housing Assembly (1) and secure the 2 halves together using Socket Head Screws (37).
  - Install the Housing Clips (33) to clamp the Pistol Handle Set (38).
  - Install the Label (13) into the Lens Cover (6) aligning the cutout with the tabs in the Lens Cover (6).
  - Slide the Lens Cover (6) onto the Motor Housing Assembly (1).
  - Install the O-Ring (12) against the Lens Cover (6).
  - Assemble the Suspension Nut (7) onto the Motor Housing Assembly (1) and install Low Head Cap Screw (15).

## Spindle Assembly - Assembly

(Common for Push To start, Lever Start and Pistol Model)

### Quick Change Assembly

1. Grease the Ball (61) and place it into the Bit Holder Plug Assembly (76).
2. Slide the Quick Change Collar (66) over the Bit Holder Plug Assembly (76).
3. Assemble the Spring (62).
4. Install the Quick Change Spacer (68) over the Spring (62).
5. By pushing the Spacer (68) and Spring (62), install the Spiral Retaining Ring (63) into the groove of the Bit Holder Plug Assembly (76).

### Square Drive Assembly

1. Install Socket Retaining Plunger (78) into the Bit Holder.
- Note:** For Trigger start models there is an additional Spacer (82) which has to be installed before Spacer (71).
2. Insert Socket Retaining Rubber Insert (77) into Bit Holder so that Socket Retaining Plunger (78) protrudes through hole in Bit Holder.
  3. Insert applicable Bit Holder Assembly into Spindle Sub Assembly (74).
  4. Place the Spacer (71) onto the Bit Holder (76, 80) to the shoulder.
  5. Install the PTS Assembly (73) against the Spacer (71).
  6. Assemble the Retaining Ring (69) onto the Bit Holder (76, 80).
  7. Guide the Flex PCB through the slot in the Spindle Sub Assembly (74).
  8. Glue the Flex PCB (64) onto the Spindle Sub Assembly (74) ensuring that the LED's of the Flex PCB (64) line up with the cutout's in the Spindle Sub Assembly (74).
  9. Assemble the Hall Housing (72) aligning the slot in the hall housing with the stiffener in the Flex PCB (64).
  10. Assemble the Light Ring Lens (67) onto the Spindle Sub Assembly (74).
  11. Assemble the Front Spindle Housing (65) onto the Spindle Sub Assembly (74) using the Socket Head Cap Screw (70).
  12. Using CP52-25F-70 Fixture Plug, a Hook spanner wrench or similar wrench to hold the tool, and using spanner wrench CP52-478 (or appropriate wrench), screw the Coupling Nut (81) onto the Motor Housing Assembly (1). Use caution while tightening coupling nut. If spindle assembly becomes disengaged from main housing keys spindle assembly can rotate causing damage to the flex circuit. Spindle housing must be held engaged with motor housing keys during nut assembly.

### In-Line and Angle Wrench - Assembly

1. Guide the Flex PCB (105) through the slot in the Spindle Housing (102).
2. Glue the Flex PCB (105) onto the Spindle Housing (102).
3. Install Hall Housing (100) into the Spindle Housing (102) aligning the slot in the hall housing with the stiffener in the Flex PCB (105).
4. Slide the Bit Holder Plug Assembly (98) into the Spindle Housing (102).
5. Assemble Retainer (99) onto Bit Holder Plug Assembly (98).
6. Using CP52-25F-70 Fixture Plug, a hook spanner wrench or similar wrench to hold the tool, and using Spanner wrench CP52-478 (or appropriate wrench), screw Coupling Nut (107) onto the Motor Housing Assembly (1). Use caution while tightening coupling nut. If spindle assembly becomes disengaged from main housing keys spindle assembly can rotate causing damage to the flex circuit. Spindle housing must be held engaged with motor housing keys during nut assembly.
7. Assemble Light Ring Lens (106) against Coupling Nut (107).
8. Using CP52-25F-70 Fixture Plug, a hook spanner wrench or similar wrench to hold the tool, and using Spanner wrench CP52-478 (or appropriate wrench), screw Spindle Coupling (103) onto Spindle Housing (102).

9. Place Lock Spacer (104) onto Spindle Coupling (103) aligning the tab of the lock spacer with appropriate slot in the Spindle Coupling (103).

**10. For Angle Head Models,**

- Visually check Housing for loose material fragments.
- **For 3/8" and 1/4" Square Drive Spindles,** install Socket Retaining Pin (95) into small hole on one of the flat sides of square Spindle.
- With Socket Retaining Pin (95) in place, locate the Pin's groove inside large end-hole of square Spindle.
- Position Socket Retaining Spring (94) 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 (95).
- Holding the Socket Retaining Pin (95) steady, push Spring down hole of square Spindle until the Socket Retaining Spring's wire engages Socket Retaining Pin.
- Socket Retaining Pin (95) is properly installed when Socket Retaining Spring (94) snaps into place.
- **For Quick Change Spindles,** install Socket Retaining Ball (96) into small hole, and then place Ball Retaining Spring (97) in groove of spindle such that the hole in the Ball Retaining Spring lines up with the Socket Retaining Ball.
- Spin output Spindle by hand to check freedom of movement.
- Slide Coupling Nut (92) over Angle Assembly Attachment.
- Using an appropriate tool, install Retainer (93) into groove on assembly.
- Slide Coupling Nut over Retainer (93), and spin by hand to check freedom of movement.
- Position the Angle Assembly Attachment to desired orientation.
- Engage Angle Assembly Attachment's Pinion into hex. of Bit Holder Plug Assembly (98).
- Using CPS2-25F-70 Fixture Plug, a hook spanner wrench or similar wrench to hold the tool, and using Spanner Wrench CPS2-478 (or appropriate wrench), screw Coupling Nut (92) onto Spindle Coupling (103).

**For In-line Models,**

- Position the In-line Assembly Attachment to desired orientation.
- Engage In-line Assembly Attachment's Pinion into hex. of Bit Holder Plug Assembly (98).
- Using CPS2-25F-70 Fixture Plug, a hook spanner wrench or similar wrench to hold the tool, and using Spanner wrench CPS2-478 (or appropriate wrench), screw Coupling Nut (92) onto Spindle Coupling (103).

**In-Line Attachment - Assembly**

1. Lubricate the bearings (136) of the Housing Assembly (141) with **Ingersoll Rand # 67 Grease**.
2. Apply grease **Ingersoll Rand # 67** to the Spindle (140).
3. Slide Washer (143) onto Spindle (140). Insert the Spindle (140) into the Spindle Housing (141).
4. **For No-Float Models,** insert Lockout Spacer (146) into the Spindle (140).
5. Press Front Rotor Bearing (137) onto the Drive Spindle (142).
6. Using an appropriate tool, install Retainer (138) onto Drive Spindle (142) until seated into groove.
7. Place Disengaging Spring (144, 145) over Drive Spindle Assembly.
8. Align the Drive Spindle Assembly with spline of Spindle (140) and insert Drive Spindle assembly into Housing Assembly (141).
9. Apply one drop of Perma-Lok MM-115 to threads of Bearing Cap (139).
10. Carefully grasp the Housing Assembly.

**Note:** In the following step, the Bearing Cap (119) has a lefthand thread.

11. Using the CPS2-532T, Hex. Socket, tighten Bearing Cap (139).
12. Slide Coupling Nut (92) over Housing Assembly (141).
13. Install the Coupling Nut Retainer (93) until seated into groove.
14. Slide Coupling Nut (92) over Retainer (93), and spin by hand to check freedom of movement.

**QE2 Series Wiring (Cable) Chart**

| Connector Pin | Wire Color (Cable) | Logic         | Connector Pin |
|---------------|--------------------|---------------|---------------|
| A             | Red                | VCC           | 13            |
| B             | Black              | COM           | 14            |
| F             | Yellow             | Sine          | 21            |
| G             | Orange             | Cosine        | 28            |
| J             | Green              | Ground Sense  | 20            |
| K             | Blue               | RX+           | 5             |
| L             | Blue/White         | RX-           | 6             |
| M             | White              | TX-           | 8             |
| N             | White/Blue         | TX+           | 9             |
| U             | Red                | Motor Phase B | 23            |
| V             | Black              | Motor Phase C | 34            |
| W             | White              | Motor Phase A | 36            |
| X             | Green/Yellow       | Ground        | 25            |
| ---           | ---                | TX Shield     | 1             |
| ---           | ---                | RX Shield     | 4             |
| ---           | ---                | Hall Shield   | 22            |
| ---           | ---                | Motor Shield  | 16            |

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## Parts and Maintenance

**The use of other than genuine Ingersoll Rand replacement parts may result in safety hazards, decreased motor performance, and increased maintenance, and may invalidate all warranties.**

**Ingersoll Rand is not responsible for customer modification of motors for applications on which Ingersoll Rand was not consulted. Repairs should be made only by authorized trained personnel. Consult your nearest Ingersoll Rand Authorized Service center.**

When the life of the motor has expired, it is recommended that the motor be disassembled, degreased and parts be separated by material so that they can be recycled.

Refer all communications to the nearest **Ingersoll Rand** Office or Distributor.

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## Related Documentation

For additional information refer to:

Safety Information manual form 16573685.

Product Information manual form 16576951.

Parts Information Manual 45609799.

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

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

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