



**47135470**  
Edition 1  
January 2010

# **Air Screwdriver**

**41-EU Series**

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## **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).

### Lubrication

Each time a Series 41 Screwdriver is disassembled for maintenance and repair or replacement of parts, lubricate the tool as follows:

1. Lubricate the clutch with **Ingersoll Rand** No. 105 or No. 115 Grease.

2. Lubricate the gearing with **Ingersoll Rand** No. 105 Grease.
3. **Use Ingersoll Rand** No. 10 Oil for lubricating the motor. Inject approximately 1 to 2 cc of oil into the air inlet before attaching the air hose.

### Disassembly

#### General Instructions

1. Do not disassemble the tool any further than necessary to replace or repair damaged parts.
2. Whenever 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 a subassembly 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 replacement.

#### Disassembly of the Clutch

1. For Pistol grip models, clamp on handle. For Straight models, clamp on Inlet Adapter (7).
2. Remove Clutch Housing with strap type wrench.

**NOTICE**

**The Clutch Housing has left-hand threads.**

3. Remove Clutch Assembly from tool.

#### Cushion Clutch

1. Clamp 114" hex wrench in a vise, then place Bit Holder (89) and Clutch Assembly on it.
2. Remove Snap Ring (71).
3. Remove Adjustment Nut (72) using 718" wrench.
4. Remove Adjustment Washer (73) and Clutch Spring (74).
5. Remove Snap Ring (75).
6. Slide off Thrust Pad (76), two Thrust Washers (77) and Thrust Bearing (78).
7. Remove Ball Carrier (79) and ten Balls (82)
8. Remove Retaining Ring (86).
9. Slide Jaw back and remove Ball Race (85), sixteen Balls (84). Then remove Driven Jaw (83).
10. Remove O-ring (80) and Push Pin (88) out of Spindle (81).
11. Remove Spring (87).

#### Positive Jaw Clutch

1. Remove Pin Assembly (113) and Spring (87) from Jaw.
2. Remove Retaining Ring (112).

#### Auto Shut-Off Clutch

1. Clamp 114" hex wrench in a vise, then place Bit Holder (107) and Clutch Assembly on it.
2. Remove Snap Ring (71).
3. Remove Adjustment Nut (72) using 718" wrench.
4. Remove Adjustment Washer (94) and Clutch Spring (95).
5. Remove Retaining Rings (96).
6. Slide off Guide (97), Spring (98), Ball Sleeve (99) which will release six Balls (104), Thrust Race (100) and Thrust Bearing (78). Removal of Ball Sleeve releases six Balls (104).
7. Remove Thrust Race (101), Releasing Six Balls (106).
8. Remove Retaining Ring (log), then rotate Bit Holder to remove twelve Balls (105). Separate Bit Holder (107) and Spindle (103), releasing eleven Balls (105).

#### Disassembly of the Gearing

1. Remove clutch from tool (see Clutch Disassembly).
2. Remove Ring Gear (51) or (64) using wrench on flats.
3. For Direct Drive only, remove Retaining Ring (54) from spindle.
4. For Auto Shut-Off and Cushion Clutch models, remove Snap Ring (70) and Washer (69).
5. Remove spindle(s) and gears from Ring Gear (51) or (64).

**NOTICE**

**Keep gears grouped with mating spindle when disassembling 800, 1000 and 1700 rpm gearing. Do not remove Bearing (53) or Spacer (52) unless damage is evident.**

6. To remove Bearing and Spacer from Ring Gear, press on Spacer inside Ring Gear from splined end.

**NOTICE**

**Do not remove Sun Gears (43), (55) or (59) from Carrier Assembly unless damage is evident. Gears are press fit onto carrier assembly.**

#### Disassembly of the Motor

1. Remove clutch and gearing from tool.
2. Remove Spacer (41) and O-ring (40).
3. For Push to Start models, remove Throttle Rod (31) or (142).
4. Tap front edge of Housing to remove motor assembly. Locating pin should also come out.
5. Tap drive end of Rotor (36) with a soft face hammer; motor will come apart.

**NOTICE**

**Bearings are press fit on rotor.**

6. Remove End Plate (33) and Bearing (32) from Rotor.

#### Disassembly of the Motor Housing

##### Pistol Grip

1. Drive out Pin (19) from Housing.
2. Remove Trigger (26), Reverse Valve (25), Valve Bushing (24), Spring (23), Washer (22), Valve Assembly (21) and O-ring (20).
3. Remove O-ring (21-a), Valve (21-b), O-ring (21-c) and Retaining Ring (21-d). Remove Inlet Adapter (30) and Screen (8).
4. Remove Muffler (29) and Filler (28).

##### Push to Start and Lever Throttle

1. Secure the Push Throttle Body (18) in a vise with leather-covered or copper-covered jaws and remove the Inlet Bushing (17).
2. Remove the Throttle Body Retainer (21) and pull the Push Throttle Body with throttle components from the Head Block.
3. Pull the Push Throttle Valve (19) from the Push Throttle Body. Remove the Throttle Valve Pin (22) and the Throttle Valve Face (20) if they need to be replaced.

**NOTICE**

**Do not remove or adjust rubber portion of Valve Rod as it is preset at the factory.**

- Remove two Balls (9), Valve Body (10) and Spring (11).
- Remove Screen (8) from Inlet Adapter.

- For Lever Throttle models, remove Throttle Pin (17) and Spring (16).

## Assembly

### NOTICE

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

### General Instructions

- Always press on the **inner** ring of a ball-type bearing when installing the bearing on a shaft.
- Always press on the **outer** ring of a ball-type bearing when pressing the bearing into a bearing recess.
- Whenever grasping a tool or part in a vise, always use leather-covered or copper-covered vice jaws. Take extra care with threaded parts and housings.
- Always clean every part and wipe every part with a thin film of oil before installation.
- Apply a film of O-ring lubricant to all O-rings before final assembly.
- Check every bearing for roughness. If an open bearing must be cleaned, wash it thoroughly in a clean, suitable, cleaning solution and dry with a clean cloth. **Sealed or shielded bearings should never be cleaned.** Work grease thoroughly into every open bearing before installation.

### Assembly of the Motor Housing

#### Pistol Grip

- Lubricate and install O-ring (20).
- Install Retaining Ring to Valve Stem (21-e).
- Lubricate and assemble O-ring to Valve.
- Assemble Valve to Valve Stem, with smallest diameter of Valve going on Valve stem first.
- Lubricate and assemble O-ring to Valve Stem.
- Assemble Washer (22) and Spring over Valve Stem.

### NOTICE

**Assemble Washer with "X" facing O-ring (20).**

- Assemble Reverse Valve (25) into Valve Bushing (24).

### NOTICE

**Position the .102 diameter hole through the bushing so that it aligns with slot thru side of Reverse Valve.**

- Assemble Valve Stem and components through Reverse Valve and Bushing.
- Install Valve Bushing with Valve components and Reverse Valve into Pistol Grip Housing (27), aligning 0.102 diameter holes in Housing and Bushing.
- Assemble Trigger (26) to Reverse Valve.
- Install Pin (19).
- Install Filler (28), Muffler (29) and Inlet Adapter (30).
- Clean and install Screen (8) in Inlet Adapter (30).

#### Push to start and Lever Throttle

- Install Spring (11) and Valve Body (10) in Housing.

### NOTICE

**Align ball slot in Valve Body with slot in Housing.**

- For Lever Throttle models, install Spring (16) and Throttle Pin (17), aligning slot in Throttle Pin with air inlet holes in Housing.
- Install Valve Rod Assembly (2) into Housing so it passes through open slot in Valve Body (10).

### NOTICE

**For Lever Throttle tools, the Throttle Pin (17) should not pull out when Valve Rod (2) is seated properly.**

- Assemble two Balls (9) into slots of housing and Valve Body (10).
- Install two Fillers (4) to Exhaust Cap (5) or (12).

- Install Exhaust cap to Housing, being certain Balls (9) remain properly positioned in Housing and Reverse Valve.
- Assemble Diffuser Washer (6), Spacer (18) where applicable and Inlet Adapter (7).
- Clean and install Screen (8) in Inlet Adapter.

### Assembly of the Motor

- Lubricate Bearing (32) with the recommended lubricant and assemble to End Plate (33), pressing on outer race of Bearing.
- Assemble End Plate to Rotor, pressing on inner race of Bearing.
- Coat five Rotor Blades (35) with **Ingersoll Rand** No. 10 Oil and assemble in Rotor Slots, straight side out.
- Coat inside diameter of Cylinder (37) with **Ingersoll Rand** No. 10 Oil and assemble over Rotor.

### NOTICE

**Air inlet slots in end of Cylinder must be aligned with two air inlet slots in End Plate (33).**

- Assemble Bearing (39) to End Plate (38), pressing outer race of Bearing.
- Assemble End Plate to Rotor, pressing on inner race of Bearing.

### NOTICE

**Be sure Rotor turns without binding.**

- Insert Locating Pin (42) into .096 blind hole at bottom of motor cavity in Housing.
- Align notches of End Plates and Cylinder and install motor into Housing, aligning notches with Pin (42).
- Lubricate and assemble O-ring (40) to End Plate.
- Assemble Spacer (41) to motor.
- For Push Start models, Coat Throttle Rod (31) or (142) with **Ingersoll Rand** No. 10 Oil and insert into Rotor.
- Assemble Gearing and Clutch to tool.

### Assembly of the Gearing

- Assemble Spacer (52) into Ring Gear.
- Press Bearing (53) into Ring Gear (51) or (64).

### NOTICE

**Press on outer race of Bearing and press to shoulder of ring gear**

- Coat shafts of spindle with the recommended lubricant.
- Assemble Gears to shafts of mating spindle.
- Assemble Carrier Assembly to spindle assembly of 800, 1000 and 1700 rpm gearing.
- Assemble spindle(s) and gearing into Ring Gear. Rotate spindle and gears to align gear teeth with splines of Ring Gear.
- Thread Ring Gear to tool and tighten with wrench on flats.
- Assemble clutch to tool

### Assembly of the Clutch

#### Cushion Clutch

- Lubricate ball groove of Clutch Spindle (81) with the recommended lubricant.
- Install sixteen Balls (84) in groove.
- Slide Driven Jaw (83) on Spindle (81) from threaded end until it seats over Balls (84).
- Assemble Ball Race (85), beveled i.d. towards Balls.
- Assemble Retaining Ring (86).
- Lubricate ball pockets of Driven Jaw and install Ball Carrier (79) and ten Balls (82).
- Lubricate and assemble one Thrust Washer (77), Thrust Bearing (78), other Thrust Washer (77) and Thrust Pad (76).
- Install Snap Ring (75).
- Install Clutch Spring (74), Adjustment Washer (73) and Adjustment Nut (72).

10. Install Snap Ring (71).
11. Coat Pin (88) with the recommended lubricant then slide Spring (87) over Pin. Install Pin (88) and Spring (87) into Spindle.
12. Assemble O-ring (80) to Pin.
13. Lubricate Spindle, jaw face and Ball (48) of Bit Holder (89), then install on clutch assembly and assemble both to tool.

**NOTICE**

**The Clutch Housing (126) has left-hand threads.**

14. Assemble Clutch Housing (91) onto tool.
15. Refer to section on Clutch Adjustment.

**Positive Jaw**

1. Assemble Jaw (111) to gearing spindle and secure with Retaining Ring (112).
2. Coat Pin Assembly (113) with the recommended Oil and slide Spring (87) over Pin Assembly.
3. Install Pin Assembly and Spring (87) into spindle. Use the recommended lubricant to lubricate spindle, jaw face and Ball (48) of Bit Holder (89) and assemble to tool.

**NOTICE**

**The Clutch Housing (126) has left-hand thread.**

4. Assemble Clutch Housing onto tool.
5. Refer to section on Clutch Adjustment.

**Auto Shut-Off**

1. Lubricate ball grooves of Clutch Spindle (103) with the recommended lubricant.
2. Install eleven Balls (105) into groove.
3. Slide spindle into Bit Holder, securing Balls.
4. Assemble twelve Balls (105) into Bit Holder. Then with Retaining Ring (108).

**Clutch Adjustment**

**External**

1. Rotate Sleeve until opening in Housing is visible.
2. Depress bit to engage clutch, then rotate until notch in Adjustment Washer or is visible.
3. Insert No. 1 Phillips screwdriver in notch to turn gear teeth on Nut.
4. Turning **clockwise** will decrease torque.
5. Turning **counterclockwise** will increase torque.

**Internal**

1. Remove Clutch Housing, Bit Holder and Clutch Assembly from tool.

**Related Documentation**

For additional information refer to:  
 Product Safety Information Manual 04585006.  
 Product Information Manual 47135462.  
 Parts Information Manual 03539780.

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

5. Use the recommended lubricant to lubricate ball pockets of Bit Holder and install six Balls (106) into pockets, securing with Thrust Race (101).
6. Use the recommended lubricant to lubricate Thrust Bearing (78). Assemble Thrust Bearing and Thrust Race (100) to spindle.
7. Coat Plunger (102) with the recommended lubricant and assemble to spindle, securing with Balls (104).

**NOTICE**

**Assemble two Balls per hole.**

8. Secure Balls with Ball Sleeve (99).
9. Assemble Spring (98) and Guide (97) to spindle, securing with Retaining Rings (96).
10. Install Clutch Spring (95).
11. Lubricate face of Adjustment Washer (94) with the recommended lubricant and install on spindle. Thread Adjustment Nut (72) onto spindle, securing with Snap Ring (71).
12. Lubricate Ball (48) of Bit Holder with the recommended lubricant.
13. Assemble Springs (109) and (110) into spindle.

**NOTICE**

**Assemble Spring (109) with large diameter into spindle first.**

14. Assemble clutch assembly to tool.

**NOTICE**

**The Clutch Housing (91) has left-hand threads.**

15. Assemble Clutch Housing to tool.
16. Refer to section on Clutch Adjustment.

**NOTICE**

**Clutch housing has left-hand threads.**

2. With bit in Bit Holder, clamp bit in vise.
3. Place Clutch Assembly on Bit Holder.
4. Engage jaws, hold Clutch Assembly from turning. Then rotate Adjustment Nut with 7/8" wrench.

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