



**Form P7781**  
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Service Manual for  
Model **D3860-A237** and **D3870-A237**  
**Geared Offset Heads**

**NOTICE**

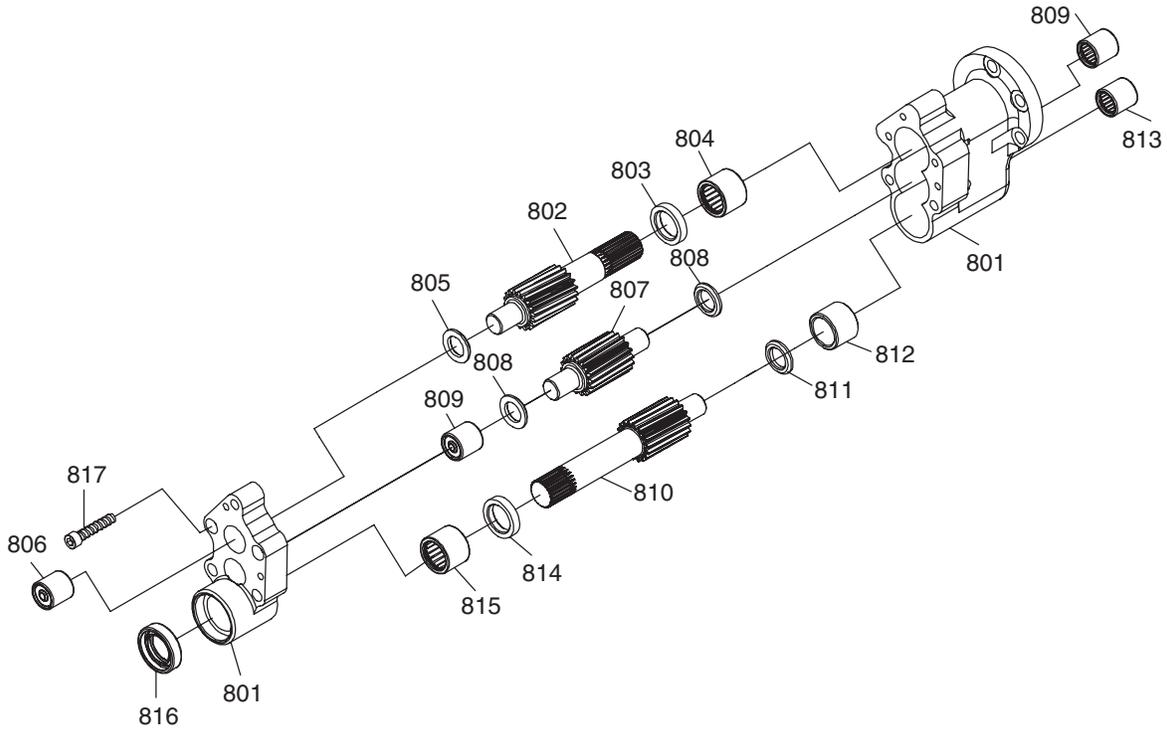
For routine Maintenance, Operation and Instruction information regarding this product, see Publication manual P7609, located at [www.irtools.com/techdocuments](http://www.irtools.com/techdocuments), or contact the nearest Ingersoll-Rand Office or Distributor.

(Dwg. TP2410)

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 **Assembly Solutions**

## GEARED OFFSET HEADS EXPLODED VIEW



(Dwg. TPC686)



*When Ordering, use applicable Part Number*

Geared Offset Heads Parts List		
Item	Product Identification Code	Part Number
	Geared Offset Head . . . . .	D3850-A237
801	Gear Housing (sold only as a matched set) . . . . .	99401168-D
802	Drive Gear . . . . .	D3850-756
	Drive Gear (for D3850-A237) . . . . .	D3850-756
	Drive Gear (for D3860-A237) . . . . .	D3860-756
	Drive Gear (for D3870-A237) . . . . .	D3870-756
803	Drive Gear Rear Thrust Washer . . . . .	93975092-B
804	Drive Gear Rear Bearing . . . . .	D01-363A
805	Drive Gear Front Thrust Washer . . . . .	93974921-B
806	Drive Gear Front Bearing . . . . .	D3850-143
807	Intermediate Gear . . . . .	93974855-D
808	Intermediate Gear Thrust Washer (2) . . . . .	93974921-B
809	Intermediate Gear Bearing (2) . . . . .	D3850-143
810	Socket Driver. . . . .	93974871-D
811	Socket Driver Rear Thrust Washer . . . . .	93974921-B
812	Socket Driver Rear Bushing . . . . .	D3850-676
813	Socket Driver Rear Bearing . . . . .	D3850-143
814	Socket Driver Front Thrust Washer. . . . .	93975092-B
815	Socket Driver Front Bearing . . . . .	D01-363A
816	Socket Driver Front Bearing Seal . . . . .	D3850-271
817	Housing Screw (1/4 -20 x 1" Socket Head Cap Screw) (2) . . . . .	R3F-7
*	Top Mounting Plate Screw (M8 x 1.25 x 45 Socket Head Cap Screw) . . . . .	D3850-104
*	Lower Mounting Plate Screw (M8 x 1.25 x 65 Socket Head Cap Screw) (2) . . . . .	D3850-665
*	Multiplier Mounting Screw (M8 x 1.25 x 25 Socket Head Cap Screw) (4) . . . . .	D3850-354
*	Mounting Screw Lock Washer (7) . . . . .	DEF150-58

\* Not illustrated.

## MAINTENANCE

### DISASSEMBLY

#### NOTICE

**Do not remove any bearing from the Housings unless you have a new Bearing on hand to replace it. Needle bearings are always damaged during the removal process.**

1. Loosen and remove the three Mounting Plate Screws holding the spindle extension housing to the mounting plate and the Gear Housing (801). Remove the spindle extension housing and mounting plate.
2. Loosen and remove the four Mounting Screws and the Lock Washers holding the Gear Housing against the gear case and separate the Gear Housing from the gear case.
3. Unscrew and remove the two Housing Screws (817).

#### CAUTION

**In the following step, some components will be free to fall from the assembly. Place a cardboard box under and near the assembly to catch and protect any parts which might fall.**

4. Lightly grasp the large section of the Gear Housing in leather-covered or copper-covered vise jaws and while lightly tapping the Housing with a plastic hammer, carefully separate the two Housing sections.

#### NOTICE

**The gearing in this gear head has a helical spline. It may be necessary to rotate the shafts an amount that matches the helix when inserting the shafts into or withdrawing the shafts from the Gear Housing.**

5. Grasp the shaft of the Drive Gear (802) and pull it, along with the two Drive Gear Thrust Washers (803 and 805), out of the Gear Housing.
6. Grasp the shaft of the Intermediate Gear (807) and pull it, along with the two Intermediate Gear Thrust Washers (808), out of the Gear Housing.
7. Pushing on the spline end of the Socket Driver (810), remove the Driver and two Socket Driver Thrust Washers (811 and 814) from the Gear Housing.
8. Pull the Socket Driver Front Bearing Seal (816) out of the Housing, if the Seal or the Socket Driver Front Bearing (815) must be replaced.
9. To remove the Socket Driver Front Bearing, stand the Gear Housing, socket driver hub upward, on the table of an arbor press and press the Bearing out of the Housing.
10. To remove the Intermediate Gear Bearing (809) from the output end of the Gear Housing, use a flat punch

and hammer to remove the Bearing by tapping on the closed end of the Bearing.

11. To remove the Drive Gear Front Bearing (806) in that Gear Housing, invert the Housing on the table of the arbor press. While supporting the bearing face of the Housing and providing clearance for the socket driver hub, press the Bearing out of the Housing.
12. To remove the Socket Driver Rear Bearing (813) and the Intermediate Gear Bearing (809) in that Gear Housing, support the Housing on the arbor press table with the closed ends of the Bearings downward. Press the Bearings from the Housing.
13. Invert the Housing and while supporting it, press the Drive Gear Rear Bearing (804) from the Housing.
14. If the Socket Driver Rear Bushing (812) must be replaced, press it from the Housing.

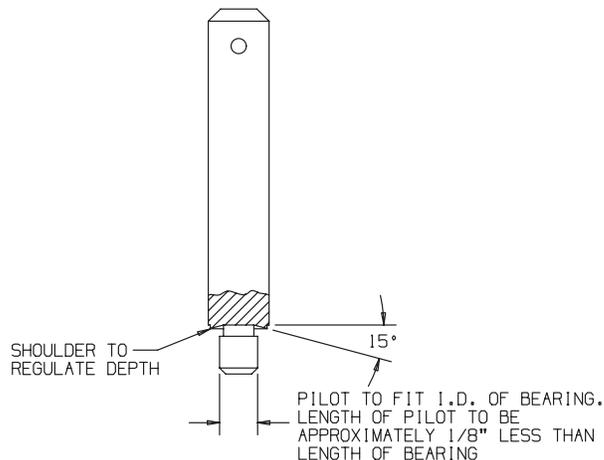
### ASSEMBLY

#### NOTICE

**Whenever the Geared Offset Head is disassembled for overhaul or replacement of parts, remove all the old grease and pack the Gear Case with Ingersoll-Rand No. 67 Grease.**

1. Place the thicker section of the Gear Housing (801) on the table of an arbor press with the hub for the Drive Gear (802) downward.
2. Using a bearing inserting tool as shown in Drawing TPD786, press the Drive Gear Rear Bearing (804) into the Housing until it is flush with the inner face of the Housing.
3. If the Socket Driver Rear Bushing (812) was removed, press it into the Housing until it is flush with the inner face of the Housing.

#### NEEDLE BEARING INSERTING TOOL



(Dwg. TPD786)

## MAINTENANCE (CONTINUED)

4. Invert that section of the Housing on the table and support the center opening on a round, metal bar that is larger than the hole with ends that are flat, square and perpendicular.
5. Press the one of the Intermediate Gear Bearings (809), closed end trailing, into the center opening until it bottoms on the bar and is flush with the inner bottom face of the Housing.
6. Use a similar rod and the same procedure to install the Drive Gear Rear Bearing (813) in the remaining hole in the Housing. Make certain the leading edge of the Bearing's open end is flush with the internal housing face.
7. Place the thin section of the Gear Housing on the table of an arbor press with the hub for the Socket Driver (810) downward.
8. Using a bearing inserting tool as shown in Drawing TPD786, press the Socket Driver Front Bearing (815) into the hole in the Housing with the hub until it is flush with the face of the Housing.
9. Support the flat face of the Gear Housing on the arbor press table. Using a bearing inserting tool as shown in Drawing TPD786, press the remaining Intermediate Gear Bearing (809), closed bearing end leading, into the central opening of the Housing until it is flush with the face of the Housing.
10. Invert that section of the Housing on the arbor press table and press the Drive Gear Front Bearing (806), closed end trailing, into the remaining hole in the Housing until it bottoms on the table.
11. Install the Socket Driver Front Thrust Washer (814) onto the long, spline shaft of the Socket Driver.
12. Install the Socket Driver Rear Thrust Washer (811), beveled outer edge leading, onto the short hub of the Socket Driver.
13. Install the assembled Socket Driver in the thick section of the Gear Housing with the spline shaft end trailing.
14. The Intermediate Gear Thrust Washers (808) have a bevel on the outer on one side. Install a Washer on each hub of the Intermediate Gear (807) with the bevel side nearest to the gear spline.
15. Align the teeth of the Intermediate Gear with the teeth of the Socket Driver and insert the hub of the assembled Intermediate Gear into the Intermediate Gear Bearing in the Gear Housing.
16. Install the Drive Gear Front Thrust Washer (805) on the short hub of the Drive Gear (802).
17. Install a Drive Gear Rear Thrust Washer (803), beveled outer edge leading, onto the spline hub of the Drive Gear.
18. Align the teeth of the Drive Gear with the teeth of the Intermediate Gear and insert the spline hub of the assembled Drive Gear into the Drive Gear Rear Bearing in the Gear Housing.
19. There are two pins that align the two sections of the Gear Case. Both may be found in one section of the Gear Case or one in each section. Regardless of their location, bring the sections of the Gear Case together by installing the thin section of the Gear Case over the shaft of the Socket Driver while aligning the pins with the holes and the shafts with the Bearings.
20. Prevent the assembled Gear Case from separating by installing the two Housing Screws (817).
21. Being careful not to nick or cut the Seal, install the Socket Driver Front Bearing Seal (816), lip end leading, over the spline shaft of the Socket Driver and into the Gear Case against the Bearing.
22. Rotate the shafts to make sure there is no binding of the gearing and then reinstall the gearing in the application.

### NOTICE

**The gearing in this gear head has a helical spline. It may be necessary to rotate the shafts an amount that matches the helix when inserting the shafts into or withdrawing the shafts from the Gear Housing.**

### NOTICE

**SAVE THESE INSTRUCTIONS. DO NOT DESTROY.**

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

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### **Ingersoll-Rand**

1872 Enterprise Drive  
Rochester, MI 48309  
Phone: (248) 293-5700  
Fax: (248) 293-5800

### **UK**

Ingersoll-Rand & Co. Ltd.  
Swan Lane (Gate 3)  
Hindley Green  
Wigan WN2 4EZ UK  
Phone: +44 (0) 1942 257 171  
Fax: +44 (0) 1942 503 450

### **India**

Ingersoll Rand Wadco  
Tools Pvt. Limited  
37-A, Site-4, Sahibabad  
Industrial Area  
Ghaziabad-201 010 India  
Tel : +91-120-2895116-126  
Fax: +91-120-2895127

## OFFICE LOCATIONS

### **Asia Pacific Operations**

Ingersoll-Rand Ltd.  
42 Benoi Road  
Jurong, Singapore 629903  
Phone: 65-861-1555  
Fax: 65-861-0317

### **Australia**

Ingersoll-Rand Ltd.  
Landmark Corporate Center  
Level 2  
454-472 Nepean Highway  
Frankston, Vic 3199  
Australia  
Phone: 61 3 8781 1600  
Fax: 61 3 8781 1611

### **Canada**

National Sales Office  
Regional Warehouse  
Toronto, Ontario  
51 Worcester Road  
Rexdale, Ontario M9W 4K2  
Phone: (416) 213-4500  
Fax: (416) 213-4510

### **Order Desk**

Fax: (416) 213-4506

### **China**

Ingersoll-Rand Productivity Solutions  
Room 1616, South Tower,  
Guangzhou World Trade Center Complex,  
371 Huanshi East Road  
Guangzhou, 510095  
China  
[86] 20 8776 4754 or 86 20 8776 4755

### **Czech Republic**

Ingersoll-Rand Productivity Solutions  
Ostrovskeho 34 151 28 Prague  
Czech Republic  
Phone: +420 2 57 109 756/7  
Fax: +420 2 57 109 758

### **France**

Ingersoll-Rand Productivity Solutions  
A.S. Division  
Zone du Chêne Sorcier  
B.P. 62  
Les Clayes sous Bois Cedex 78346  
Phone: +33 (0) 1 30 07 69 00  
Fax: +33 (0) 1 30 07 69 82

### **Germany**

Ingersoll-Rand European Sales Ltd.  
c/o Intersoll-Rand GmbH  
Postfach 10 09 54  
45409 Mülheim / Ruhr Germany  
Phone: +49 (0) 208 9994 0  
Fax: +49 (0) 208 9994 444  
e-mail: Assembly\_Solutions@eu.irco.com

### **India**

Ingersoll Rand Wadco Tools Pvt. Limited  
37-A, Site-4, Sahibabad Industrial Area  
Ghaziabad-201 010 India  
Tel : +91-120-2895116-126  
Fax: +91-120-2895127

### **Italy**

Productivity Solutions  
Ingersoll-Rand Italia S.r.l.  
Strada Provinciale Cassanese 108  
20060 Vignate (Milano), Italy  
Phone: +39 02-95056-261  
Fax: +39 02-95360-159

## OFFICE LOCATIONS (CONTINUED)

### Japan

IR Japan, Ltd.  
LS Bldg. 2F, 1-1-17 Kami-Ohsaki, Shinagawa-ku  
Tokyo, 141-0021  
Japan  
[81] 3-5420-3397

### Latin America Operations

Ingersoll-Rand  
730 N.W. 107 Avenue  
Suite 300, Miami, FL, USA  
33172-3107  
Phone: (305) 559-0500  
Fax: (305) 222-0864

### Europe, Middle East and Africa

Ingersoll-Rand  
Douai Operations  
111, Avenue Roger Salengro  
59450 Sin Le Noble, France  
Phone: (33) 3-27-93-08-08  
Fax: (33) 3-27-93-08-00

### Poland

Nowiniarska 1 ap. 1  
00-235 Warsaw Poland  
Phone: +48 (0) 22 635 7245  
Fax: +48 (0) 22 635 7332

### Russia

Ingersoll-Rand Company  
Mjasnitskaya Street, 32, bld. 1  
101990 Moscow  
Russia  
Phone: +7 (8) 095 933 03 24  
Fax: +7 (8) 095 785 21 26

### Scandinavia

Ingersoll-Rand  
Drammensveien 126 A  
0277 Oslo Norway  
Phone: +47 (0) 22 55 15 26  
Fax: +47 (0) 22 43 65 81

### Spain

Ingersoll-Rand Productivity Solutions  
Tierra de Barros, 2  
28820 - Coslada  
Madrid (Spain)  
Phone: +34 (0) 91 6277405 / 6277400  
Fax: +34 (0) 91 6277406

### South Africa

Ingersoll-Rand Company SA (PTY) Ltd.  
Productivity Solutions  
P.O. Box 123720  
Alrode 1451  
South Africa  
Phone: +27 (0) 11-617-3828  
Fax: +27 (0) 11-864-5609

### UK

Ingersoll-Rand & Co. Ltd.  
Swan Lane (Gate 3)  
Hindley Green  
Wigan WN2 4EZ UK  
Phone: +44 (0) 1942 257 171  
Fax: +44 (0) 1942 503 450

### USA

Ingersoll-Rand Productivity Solutions  
P.O. Box 970  
1467 Route 31 South  
Annandale, NJ 08801  
Phone: (908) 238-7000  
Fax: (908) 238-7048