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Service Manual for
Model **93808608-B** and **93808590-B**
Straight Spring Loaded Spindles

NOTICE

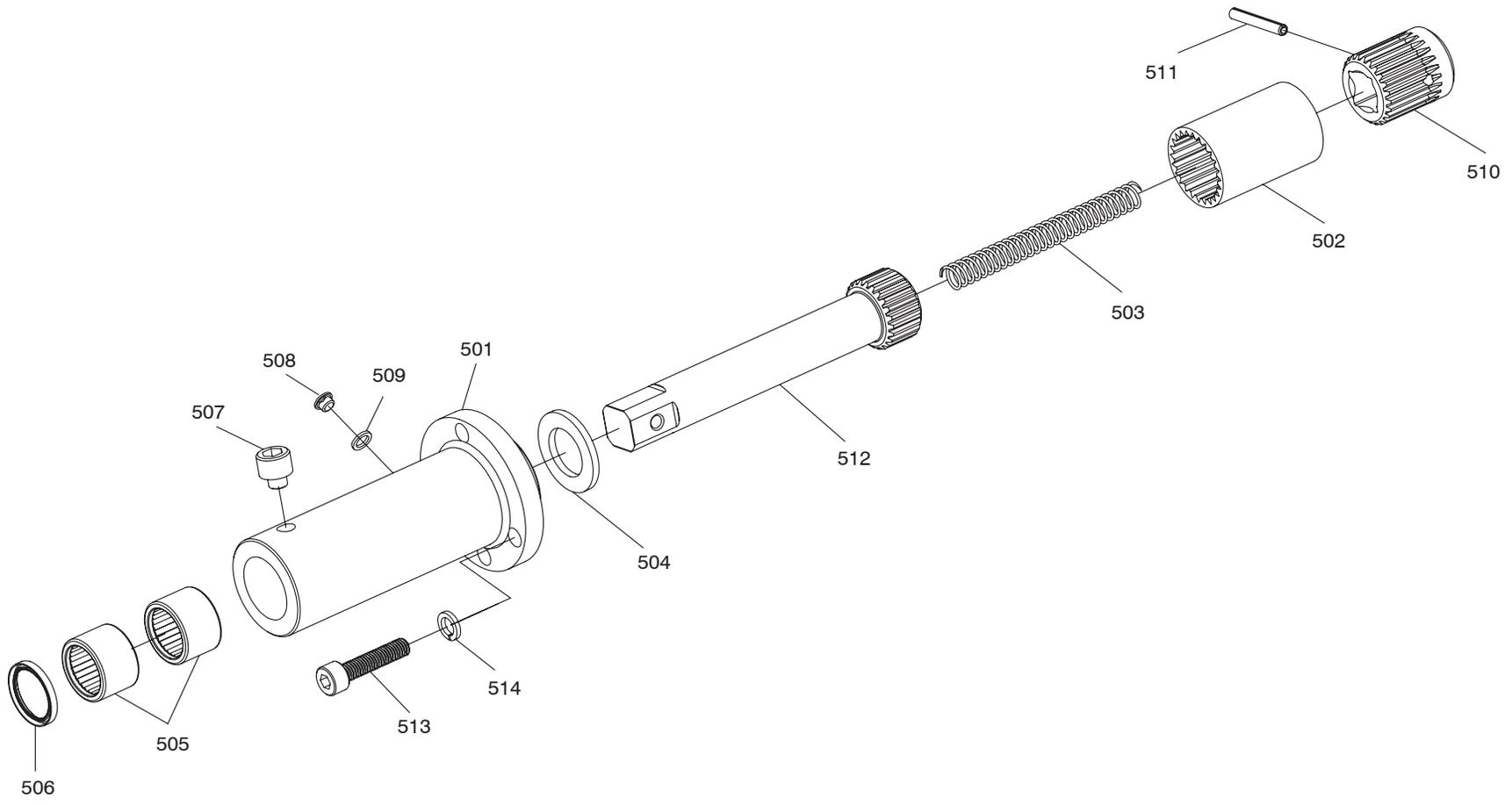
For routine Maintenance, Operation and Instruction information regarding this product, see Publication manual P7609, located at www.irttools.com/techdocuments, or contact the nearest Ingersoll-Rand Office or Distributor.

(Dwg. TP2402)

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 **Assembly Solutions**

STRAIGHT SPRING LOADED SPINDLES EXPLODED VIEW



(Dwg. TPC687)

STRAIGHT SPRING LOADED SPINDLES



When Ordering, use applicable Part Number

Straight Spring Loaded Spindles Parts List

Item	Part Description	Part Number	Item	Part Description	Part Number
501	Spindle Housing Assembly (does not include the Spindle for models with short stroke (5/8" stroke)	93808608-B	512	Spindle 1/2" square drive x 4" long (for models with short stroke only)	99377350-D
	for models with long stroke (2" stroke)	93808590-B			
	Spindle Housing for models with short stroke	93804474-C			
	for models with long stroke	93804417-C			
502	Spindle Sleeve for models with short stroke	93804524-B	513	1/2" square drive x 6" long	99377368-D
	for models with long stroke	93804201-B		1/2" square drive x 8" long	99377376-D
503	Spindle Thrust Spring for models with short stroke	93801454		1/2" square drive x 10" long	99377384-D
	for models with long stroke	93804300-A		1/2" square drive x 12" long	99377392-D
	Spindle Stop Washer	93913226		5/8" square drive x 4" long (for models with short stroke only)	99377400-D
504	Spindle Bearing (2)	93804284		5/8" square drive x 6" long	99377418-D
506	Spindle Seal	93929487		5/8" square drive x 8" long	99377426-D
507	Socket Head Cap Screw	93807923-A		5/8" square drive x 10" long	99377434-D
508	Oil Chamber Plug	R00A-95		5/8" square drive x 12" long	99377442-D
509	Oil Chamber Plug Seal	R3-92A		3/4" square drive x 6" long	99377558-D
510	Driver	93804227-B		3/4" square drive x 8" long	99377566-D
511	Driver Retainer	93934537		3/4" square drive x 10" long	99377574-D
			514	3/4" square drive x 12" long	99377582-D
				Mounting Screw (6 for long stroke; 4 for short stroke)	DEF150-638
				Mounting Screw Lock Washer (6 for long stroke; 4 for short stroke)	DEF150-58

INSTALLATION

CAUTION

- **Do not use power units and gear trains that exceed the capability of the output device.**

These Spindles must be attached to a customer's mounting plate that complies with specific bolt pattern and pilot alignment requirements. Contact **Ingersoll-Rand** for specific mounting dimensions.

During installation, tighten the mounting bolts between 18.5 and 25.5 ft-lb. (*25.0 and 34.5 Nm*) torque.

DISASSEMBLY AND ASSEMBLY

NOTICE

Do not attempt to replace the Spindle Bearings (505) unless you have a new set of Bearings available for installation. Needle Bearings are always damaged during the removal process.

1. Disconnect any electronic readout devices that might be attached to the Spindle Housing Assembly.

⚠ CAUTION

In the following step, removing the Spring Loaded Spindle from the Tool creates two conditions for which precautions must be taken to prevent injury to the person disassembling the Tool. The Tool or Spindle Housing will be free to fall when the mounting bolts are removed from the assembly and the Spindle Thrust Spring (503) is free to eject from the Spindle (512) when the Tool and Spindle Housing are separated. Take all precautions necessary to avoid injury.

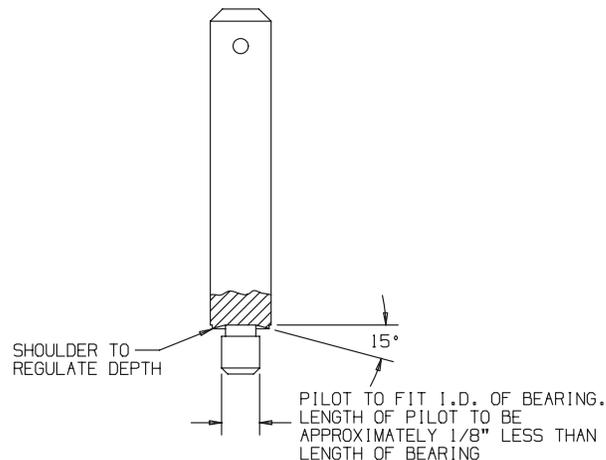
2. Carefully remove the four or six Mounting Screws (513) at the spindle end of the mounting plate. These Screws pass through the Spindle Housing (501) and mounting plate and are threaded into the housing of the gear head. Do not allow the Tool or Spindle Housing Assembly to fall or the Spindle Thrust Spring (503) will be ejected when removing the Screws and separating the components.
3. Remove the Spindle Thrust Spring from the rear of the Spindle (512).
4. The Driver (510) will remain captured on the spindle of the gear head by the Driver Retainer (511).
5. Push on the output end of the Spindle to move the Spindle Sleeve (502) and Spindle out the rear of the Spindle Housing (501).
6. If the Spindle Stop Washer (504) remained in the Spindle Housing, sharply rap the rear of the Housing on a block of wood to dislodge it. If it remained on the Spindle when the Spindle was removed, slide it off the Spindle.
7. Using a hooked tool, pull the Spindle Seal (506) out of the front end of the Spindle Housing.

NOTICE

In the next step, do not remove the Spindle Bearings (505) unless you have a new set of Bearings available for installation. Needle Bearings are always damaged during the removal process.

8. Using a bearing puller, pull the two Spindle Bearings (505) out of the Spindle Housing.
9. Stand the Spindle Housing on the table of an arbor press with the smaller central opening downward.
10. Using a bearing inserting tool as shown in Drawing TPD786, press a new Spindle Bearing into the smaller central opening until the trailing end of the Bearing is flush with the face of the opening..

NEEDLE BEARING INSERTING TOOL



(Dwg. TPD786)

11. Invert the Housing on the table of the arbor press so that the large central opening is downward.
12. Install a stop collar on the bearing inserting tool that will allow the Bearing to be pressed to a depth that is 3/16" below the end face of the Housing and press the Bearing into the Housing until it is 3/16" below the Housing face.
13. Lubricate the Bearings with a light coat of **Ingersoll-Rand No. 67 Grease**.
14. Slide the Spindle Stop Washer onto the output shaft of the Spindle until it stops against the shaft shoulder. Lubricate the shaft and spline with a light coat of **Ingersoll-Rand No. 67 Grease**.
15. Lubricate the spline of the Spindle Sleeve with a light coat of **Ingersoll-Rand No. 67 Grease** and install the Spindle Sleeve on the Spindle by engaging the spline of the Sleeve with the spline of the Spindle.
16. Install the Spindle, Washer and Sleeve, spindle output end leading, in the large end of the Spindle Housing and through the Bearings.
17. Being careful not to damage the Seal, install the Spindle Seal over the Spindle, closed end trailing, into the central opening against the Bearing that is pressed below the end face of the Housing. Make certain the closed end of the Seal is flush with the end face of the Housing.
18. Install the Spindle Thrust Spring into the central opening in the Spindle.

MAINTENANCE (CONTINUED)

19. Using the rear hub of the Spindle Housing as a pilot, place the assembled Spindle housing against the mounting plate and align the bolt holes in the housing flange with the holes in the mounting plate.
20. Insert the Driver attached to the gear head through the opening in the mounting plate to engage the internal spline of the Spindle Sleeve and align the bolt holes in the face of the gear head with the holes in the mounting plate.
21. Install the Mounting Screw Lock Washers (514) on the Mounting Screws (513) and insert the Screws through the Spindle Housing and mounting plate and thread them into the gear head. Tighten the Screws between 18.5 and 25.5 ft-lb. (*25.0 and 34.5 Nm*) torque.

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.

SERVICE CENTERS

**Centres d'entretien • Ingersoll-Rand Niederlassungen • Centri di Assistenza •
Centros de Servicio • Service Centra • Servicentre • Servicecenter • Servicesenter •
Huoltokeskus • Centros de Assistência Técnica • Κέντρα Εξυπηρέτησης**

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