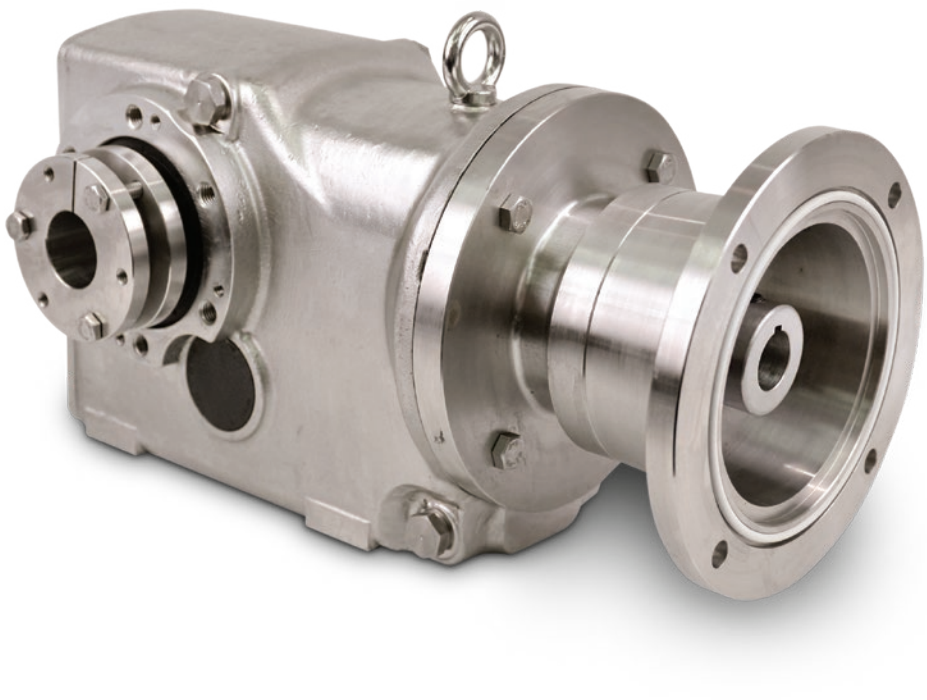
BOSTON GEAR™

SS2000R Series Helical Bevel Gear Drives & Gearmotors Maintenance and Service Manual

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FORM
MCM-P-3053-BG-EN-US
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SAFETY MESSAGE DEFINITIONS

⚠ DANGER Indicates a hazard which, if not avoided, will result in serious injury or death.

⚠ WARNING Indicates a hazard which, if not avoided, could result in serious injury or death.

⚠ CAUTION Indicates a hazard which, if not avoided, could result in minor or moderate personal injury.

NOTICE Indicates information considered important, but not hazard-related (e.g. messages relating to property damage).

GENERAL SAFETY INSTRUCTIONS

⚠ WARNING

- Read and follow all instructions carefully.
- Disconnect and lock out power before installation and maintenance. Working on or near energized equipment can result in severe injury.
- Do not operate equipment without guards in place. Exposed equipment can result in severe injury or death.
- Read and understand the information in this section and in this manual completely before installing, operating or maintaining this equipment. Failure to follow this instruction could result in severe injury or death.

⚠ CAUTION

- Rotating equipment is potentially dangerous and could cause injury or damage if not properly protected. Follow all applicable codes and regulations.
- Perform periodic inspections. Equipment may fail prematurely and could become unsafe if not properly inspected and maintained. Failure to follow this instruction could result in mild or moderate personal injury.

NOTICE

- In accordance with our established policy to constantly improve our products, the specifications contained herein are subject to change without notice.

WARNING!
These instructions must be read thoroughly before installing or operating Gear Drives or Gearmotors. File instructions for future reference and for ordering of replacement parts.

General Instructions

1. Align all shafts accurately. Improper alignment can result in failure. Mounting Registers can be used to assist in the alignment process. See Mounting Register section for more information.

2. When mounting, use maximum possible bolt size and secure reducer to a rigid foundation. Periodic inspection of all bolts is recommended.

3. Auxiliary drive components (such as sprockets, gears and pulleys) should be mounted on the shafts as close as possible to the housing to minimize effects of overhung loads. Avoid force fits that might damage bearings or gears.

4. For hollow-shaft Gear Drives, place Gear Drive as close as possible to supporting bearing on drive shaft.

5. Gear Drives are nameplated for 1750 input RPM and Class I Service (Service Factor 1.0), using PAG 460 H1 synthetic oil. For lower input speeds or for different service classes or lubricants, see catalog selection pages for rating information.

6. As shipped from factory, all lubrication access ports will be plugged. A 5 psi vent plug is shipped along with mounting hardware in shipping container. You may install vent plug as needed. See Plug chart for recommended locations.

Added Instructions - C-Face Models

1. Fix loose coupling half to motor shaft by tightening setscrew.

2. Align two coupling halves before mounting Motor to Flange.

Added Instructions - Gearmotors

1. Mechanically secure Gearmotor before initiating electrical connections.

2. Alter conduit box orientation by loosening motor-attaching bolts, rotating motor to desired orientation and then re-securing motor-attaching bolts.

3. Thoroughly review Motor Specifications section before initiating electrical installation.

Standard Output Shaft

1. Keys are used to transmit torque between Gear Drive and Driven Shaft. Key Staking can be used to fix key from moving inside keyway during installation.

2. Hollow shafts are supplied with a shaft retainer / retaining ring / bolt kit for axial retention to Driven Shaft. Driven Shaft must have mating coaxial threaded hole.

3. Optional Tapered Bushing feature provides secure mount that is keyless. See Tapered Bushing section for special installation instructions.

Key Staking Instructions

Lightly tap area of keyway adjacent to key. This will upset material and not allow key to move axially when installing Gear Drive.

Installation Aides

Mounting Registers

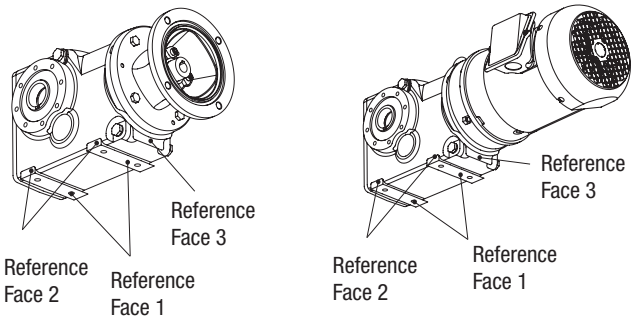
Mounting Registers on the SS2000R Series products enable a simpler installation for Base Mounted units. Use the following steps to assist in the alignment between the reducer output shaft and the shaft being driven (driven shaft).

1. Establish a reference edge that is parallel to the driven shaft using dimension M as the offset.

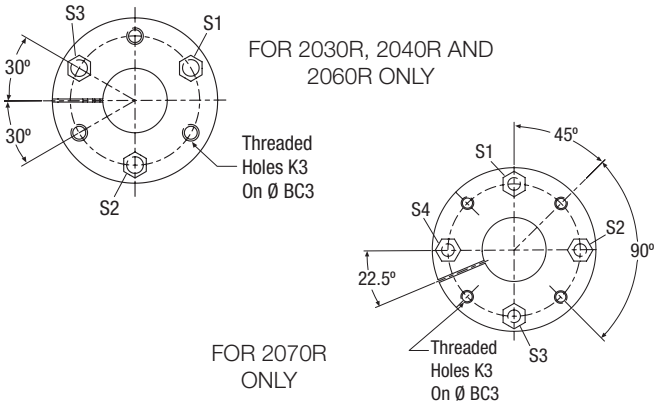
2. Bank Reference Face 3 of the reducer against your reference edge.

3. Use Reference Face 2 of the reducer for any fine angular (yaw) or lateral adjustments. Contacting thumbscrews against Reference Face 2 is a clever method.

Mounting Registers



DETAIL A



Scan to Watch
How to Install Tapered Bushing Option Series 2000R Units
https://regalrexnord.widen.net/s/vsr79kclcj/v-0117-bg

Tapered Adaptors

The Tapered Adaptor is a valuable option that ensures a simple and secure installation for Shaft Mounted units. Use the following steps to assist in the alignment between the reducer output shaft and the shaft being driven (driven shaft).

1. Make a score mark on your Driven Shaft at a length equal to the Table 1 dimension from the mounting end.

2. Slide Support Bushing onto driven shaft, flange first, until the flange reaches the score mark & secure with clamp screw.

3. Mount Reducer onto Driven Shaft allowing it to slide through the Tapered Bushing on the opposite end. **Expect the Tapered Bushing to be pushed outward from the reducer as it expands inside the outer bore.**

4. Align the holes between the Tapered Bushing and the Anchor Plate.

5. Using a mallet, tap the Tapered Bushing inward until the bolts are able to engage the Anchor Plate threads.

6. Tighten bolts evenly in sequence indicated in Bolt Tightening Sequence Table below (Detail A).

7. Readjust Support Bushing as needed to ensure full engagement of taper and re-secure clamp screw.

Table 1

	Used Length of Driven Shaft	
	(in)	(mm)
2033R	7.47	190
2043R	8.48	216
2063R	10.24	260
2073R	12.04	306

Bolt Tighening Sequence Table

PART NO. IDENTIFIER	STEP 1 Apply Initial Torque - ft.lbs.				STEP 2 Apply Secondary Torque - ft.lbs.				STEP 3 Apply Final Torque - ft.lbs.			
	S1	S2	S3	S4	S1	S2	S3	S4	S1	S2	S3	S4
2033R	1.5	1.5	1.5	N/A	3.0	3.0	3.0	N/A	5.0	5.0	5.0	N/A
2043R	2.7	2.7	2.7	N/A	5.5	5.5	5.5	N/A	9.0	9.0	9.0	N/A
2063R	7.5	7.5	7.5	N/A	15	15	15	N/A	30	30	30	N/A
2073R	7.5	7.5	7.5	7.5	15	15	15	15	30	30	30	30

Motor Specification

Enclosure	TEFC
Voltage	208-230/460 VAC
Phase	3
Frequency	50/60 Hz
No. of Poles	4
Body	Rolled Steel
Encl. Rating	Class I, Div 2, Grps B/C/D/T3C IP55
Seal Features	V-ring seals (both endshields)
Insulation	Class F
Winding	Class B
RPM	1800
Duty	Continuous, 40C ambient
Service Factor	1.15
Supports	Ball bearings
Drive Usage	NEMA MGI Part 31 rated for use with VFD 2:1 CT and 10:1 VT
Compliance	EISA 2007, UR, CSA, CE

Handling

Lifting and lowering must be done gently without any shocks to avoid internal motor damage. Use proper equipment to handle the motor.

Storage

Boxed Gearmotors should be kept in an indoor storage location that is free of humidity, dust, radiation and corrosive gases. Temperature of storage area should be maintained to avoid extreme changes.

Installation

Gearmotors must be installed in accordance with all local codes, the National Electrical Code (NEC) and NEMA MG2 Safety Standards for Construction and Guide for Selection, Installation and Use of Electric Motors and Generators. Installation should be conducted by qualified personnel trained in safe installation and operation of electromechanical power transmission equipment. The following guidelines should be observed:

- Disconnect all power prior to installation
- Alleviate any stored energy in driven equipment
- Conduit port should be sealed and orientated to prevent water ingress
- Follow wiring diagrams provided for all electrical motor connections
- Ground motor according to safety regulations and local codes
- Install safety guards as needed to avoid incidental contact with rotating elements
- Ensure adequate ventilation around motor for heat dissipation
- Apply power based on and not exceeding rated conditions on motor label

Maintenance

Motor should be inspected periodically based on usage and duty cycle. Inspection must be conducted by qualified personnel with special attention to the following areas:

- Inspect seals for excessive wear
- Ensure bearings are properly lubricated
- Ensure wiring connections are secure
- Secure all fasteners and mounting hardware
- Clean all motor surfaces
- Ensure adequate ventilation around the motor

Motor should be shutdown and inspected if any of the following occurs:

- Excessive vibration or noise
- Motor temperature exceeds 100 degrees above ambient
- Excessive amperage draw

IMPORTANT Installation and Lubrication Notes

CAUTION!

- For safe operation of any Gear Drive, all rotating shafts and auxiliary components must be shielded to conform with applicable safety standards. You must consider overall operational system safety at all times.
- When using a Gear Drive to raise or lower a load, such as in hoisting applications, provision must be made for external braking. Under no conditions should a Gear Drive be considered self-locking.
- Mounting of Gear Drives in overhead positions may be hazardous. Use of external guides or supports is strongly recommended for overhead mounting.

CAUTION!

Eyebolt is designed to handle weight of Gear Drive or Gearmotor, as supplied. DO NOT use Eyebolt to lift any additional loads.

CAUTION!

Avoiding those positions where the high speed oil seal is immersed in oil will provide greater security against high speed input seal wear.

CAUTION!

Relubricate more frequently if drive operates in high ambient temperatures or unusually contaminated atmosphere. High loads and operating temperatures will also require more frequent lubrication.

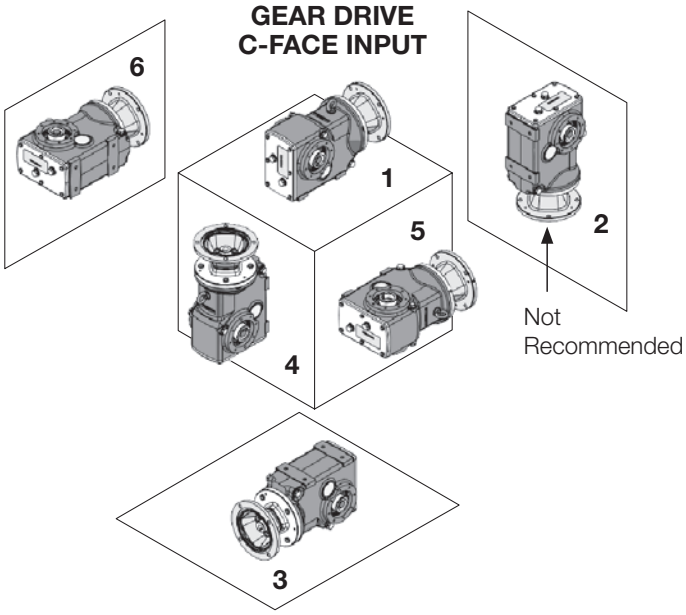
- Food Grade Synthetic recommendation is exclusively for PAG 460 H1 synthetic oil.
- Other lubricants corresponding to AGMA/ISO numbers are available from all major oil companies.
- The synthetic lubricant will perform at temperatures considerably higher than 225° F. However, the factory should always be consulted prior to operating at higher temperatures as damage may occur to oil seals and other components.

CAUTION!

Unauthorized Lubricants

Some lubricants contain non-corrosive, extreme pressure additives. DO NOT USE lubes that contain sulphur and/or chlorine which are corrosive. Extreme pressure lubes, in some cases contain materials that are toxic. Avoid use of these lubes where they can result in harmful effects. If in doubt, consult your lube supplier.

Oil Mounting Positions & Lubrication



Lubrication

PAG 460 H1 synthetic oil is recommended for the SS2000 Series gear drives for optimum performance. Normal full-load operating temperatures range between 130 F - 150 F. During initial break-in of the gear drive, higher than normal operating temperatures may result. All gear drives are supplied with PAG 460 H1 synthetic oil (unless specified otherwise) with quantity listed below for standard mounting position 1 or to mounting specified at time of order. These gear drives are designed with internal features to reduce the impact of metallic wear debris, which should increase maintenance intervals. Relubrication is recommended for 15,000 hours or more frequently when operating in highly contaminated environments. Satisfactory performance may be obtained in some applications with non-synthetic oils, but will require more frequent oil changes.

RECOMMENDED LUBRICANT	Reducer Designation	ISO Viscosity Grade No.	Viscosity Range SUS @ 100F	Part Number (Quart)	Comments
PAG 460 H1 Synthetic Oil	K	460	1950/2500	65159	Food-Grade

Ambient temperature range of -20 F to +125 F is suitable for standard configured products. Contact technical support for operating conditions beyond this range.

	Mounting Position					
	1	2‡	3	4	5	6
Plug A	Oil-Fill	Opt. Vent	—	Oil Drain	Oil-Fill	—
Plug B	—	Opt. Vent	Oil-Fill	Oil Drain	—	Oil-Fill
Plug C	Opt. Vent	Oil-Fill	Oil Drain	—	Oil Drain	Opt. Vent
Plug D	Oil Drain	Oil Drain	Opt. Vent	Oil-Fill	Oil Drain	Opt. Vent
Plug E	Oil Drain	Oil Drain	Opt. Vent	Oil-Fill	Opt. Vent	Oil Drain
Plug F	Opt. Vent	Oil-Fill	Oil Drain	—	Opt. Vent	Oil Drain

Notes:

Oil-Fill Plugged from factory. Port used during regular maintenance intervals for Oil-Fill. Defines appropriate oil-level during operation.

Opt. Vent Plugged from factory. A 5 psi pressure vent plug is supplied uninstalled with each product. Defines optional location for installation of that pressure vent.

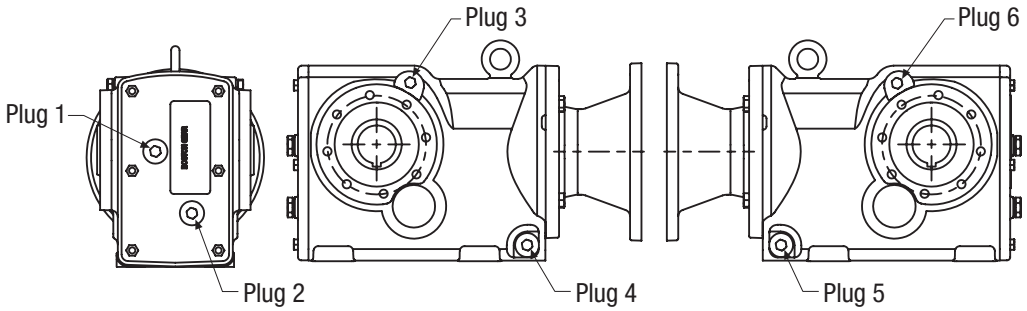
Oil Drain Plugged from factory. Port used during regular maintenance intervals for draining used oil. Re-plug prior to oil-fill.

‡ Position 2 - Not preferred and not recommended as a Mounting Position.
All products supplied from factory lubed for Position 1 unless specified otherwise.

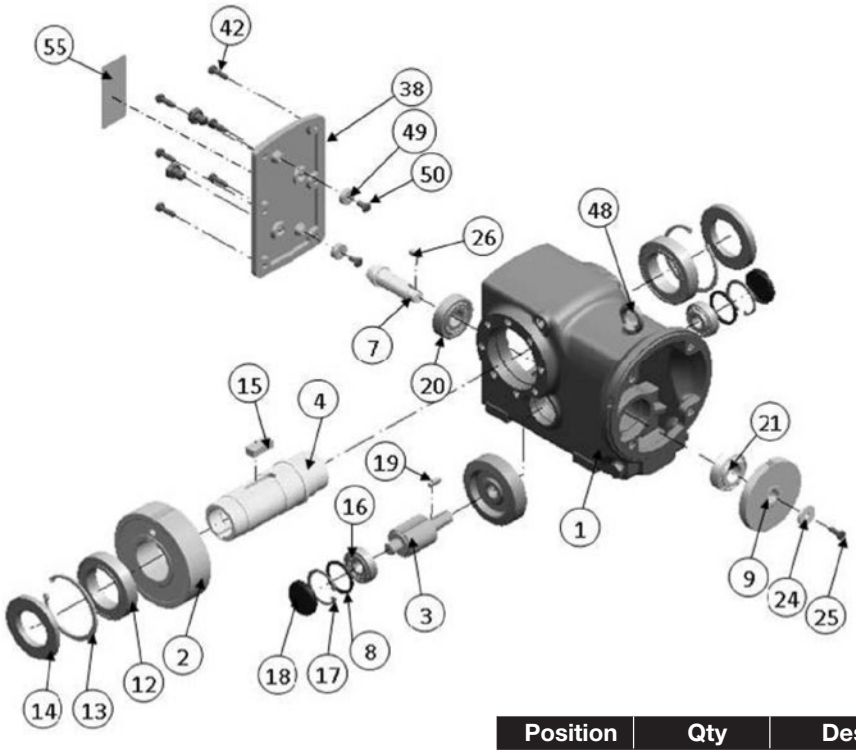
Lube Capacity in Quarts

	Mounting Position					
	1	2	3	4	5	6
2033R	0.43	0.95	1.40	1.58	1.25	1.38
2043R	0.70	1.77	2.23	2.47	2.00	2.00
2063R	1.25	2.32	3.30	4.08	2.82	3.02
2073R	1.60	3.58	5.46	6.27	4.86	5.16

Oil Plug and Vent Plug Location Details



Exploded View



Position	Qty	Description
17	2	Retainer Ring
8	2	Spacer
15	1	Key
4	1	Shaft
12	2	Bearings
2	1	Gear
14	2	Oil Seal
13	2	Retainer Ring
38	1	End Cover
50	2	End Cover Bolts (inside)
42	6	End Cover Bolts
44	6	Pipe Plugs
55	1	Label

Position	Qty	Description
48	1	Eye Bolt
1	1	Housing
44	6	Pipe Plugs
26	1	2P b Pinion Key
7	1	2P b Pinion
20	1	Bearing
21	1	Bearing
9	1	1st Stage Gear
24	1	Washer
25	1	Bolt
19	1	Key
3	1	Pinion
16	1	Bearing
6	2	Gear
18	2	Bore Plug

Replacing Output Seals

Scan to Watch
Replacing the Radial Lip Seal on a Boston Gear Speed Reducer.
https://rrx.link/RadialLipSealReplacement

1. Remove existing seal by punching a hole through the seal case and then prying it out. Make sure the shaft is not scratched or damaged during this process. Be careful not to drive through the seal too far and damage the internal bearing.
2. Clean the shaft and inspect for small scratches or rust damage. The shaft surface **must** be smooth and rust/debris free. If the shaft is damaged it should be replaced.
3. Inspect the output shaft for any radial movement. If the radial movement exceeds .005" the bearings may be worn and need replacing.
4. Clean the housing bore and wipe clean from **any** oil residue.
5. Grease new seal cavity (fill seal spring area). See picture #1.
6. Grease new seal lip. See picture #2.
7. Install new seal slowly. The seal lip must be protected from any sharp edges so it is recommended the shaft be covered with grease coated wax paper or something similar. Once the seal is past any sharp edges the wax paper can be removed and discarded.
8. Inspect the seal garter spring. This spring should be facing inside the gearbox and should be attached to the seal.
9. The seal(s) should be tapped into the housing slowly. A pipe or tube that is just smaller than the seal outside diameter is recommended to minimize any seal installation damage.
10. The seal(s) must be installed perpendicular to the housing/carrier face. There should be a visual reference to the chamfer in 4 places 12:00, 3:00, 6:00, 9:00 and all measurements should be within .005".
11. The seal must be installed flush with the housing/carrier face.
12. Visually check to make sure the seal looks undamaged.
13. Check oil level before operation.



Picture #1
Grease and fill seal cavity by the garter spring



Picture #2
Grease Seal lip before installation.

Warranty Policy

Boston Gear warrants that products manufactured or sold by it shall be free from defects in material and workmanship. Any products which shall within one (1) year of delivery, be proved to the Company's satisfaction to have been defective at the time of delivery in these respects will be replaced or repaired by the Company at its option. Freight is the responsibility of the customer. The Company's liability under this limited warranty is limited to such replacement or repair and it shall not be held liable in any form of action for direct or consequential damages to property or person.THE FOREGOING LIMITED WARRANTY IS EXPRESSLY MADE IN LIEU OF ALL OTHER WARRANTIES WHATSOEVER, EXPRESS, IMPLIED AND STATUTORY AND INCLUDING WITHOUT LIMITATION THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS.

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To view our Standard Terms and Conditions of Sale, please visit https://www.regalrexnord.com/Terms-and-Conditions-of-Sale.

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