

# Worm Gear Speed Reducers

Installation and Operation

P-3009-BG  
Doc. No. 57746

700 Series  
Single and Double  
Reductions



** BOSTON GEAR™**  
A REGAL REXNORD BRAND



 **WARNING: Cancer and Reproductive Harm –**  
[www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

Inadequate lubrication is by far the largest contributor to premature failures of worm gear drives, applied within proper selection practice.

While lubricant selection is important to all gear reducers, it is critical for the worm gear type. Sliding action at the tooth mesh dictates use of a relatively high viscosity oil with special characteristics. A recent survey indicated improper lubricants were used in two-thirds of the applications. Although lightly loaded drives may survive, optimum performance is not obtained.

Boston Gear now offers Klubersynth UH1 6-460 Synthetic Lubricating Oil as a premium lubricant with many outstanding benefits for worm gear applications.

- Reduction in maintenance costs due to extended time between oil changes.
- Increased ratings providing for smaller drive selection or longer gear life.
- Lower energy consumption from improved efficiency.
- Broad ambient temperature range due to high viscosity temperature.
- Longer seal life, based on lower operating temperature.
- Multi-purpose application, including most other types of gear drives.
- Oil Type is PAG (polyalkylene Glycol)

**⚠ WARNING** Different oil types must not be mixed. For Example: PAG types such as Kluber UH1 6-460 must not be mixed with PAO types such as Mobil SHC products.

## Lubrication Instructions



Scan to Watch  
Adding or Replacing Lubrication in a  
Boston Gear 700 Series Right Angle  
Single Reduction Worm Gearbox  
<https://p.widencdn.net/uwrkij/V-0113-BG>

**⚠ WARNING** Boston Gear speed reducers are commonly shipped without lubricant. They must be filled to the proper level with the recommended lubricant for your application before operation. Please review the catalog number on the product nameplate (pages 26-29) to determine if the unit is prelubricated and verify the mounting position is correct. Different mounting positions require different oil levels and seal configurations.

The recommended lubricant table indicates the type and viscosity of lubricant suitable for reducers operating at various temperatures.

Lubrication and maintenance instructions are provided with each speed reducer. These instructions should be followed for best results. It is important that the proper type of oil be used since many oils are not suitable for the lubrication of worm gears. Various types of gearing require different types of lubricants.

The lubricant must remain free from oxidation and contamination by water or debris, since only a very thin film of oil stands between efficient operation and failure. To assure long service life, the reducer should be periodically drained (preferably while warm) and refilled to the proper level with a recommended lubricant. Under normal environmental conditions oil changes are suggested after the initial 250 hours or every 6 months.

Synthetic lubricants will allow extended lubrication intervals due to its increased resistance to thermal and oxidation degradation. It is suggested that the initial

oil change be made at 1500 hours and, thereafter, at 5000 hour intervals.

During the initial period of operation, higher than normal operating temperatures may be seen. This is due to the initial break-in of the worm gear set. The temperature of Double Reduction Worm Gear Reducers may reach 160°F and Single Reduction Worm Gear Reducers approximately 225°F.

These instructions must be read thoroughly before installing or operating speed reducers. File instructions for future reference and for ordering of replacement parts.

## General Instructions

1. Align all shafts accurately. Improper alignment can result in failure. Use of flexible couplings is recommended to compensate for slight misalignment.
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 speed reducers, place speed reducer as close as possible to supporting bearing on drive shaft. Spot-drill drive shaft for setscrews in severe applications. See kit instructions for reaction rod assembly.
5. Check and record gear backlash at installation and again at regular intervals. This should be done by measuring the rotary movement of the output shaft (rotating alternately clockwise and counterclockwise) at a suitable radius while holding the input shaft stationary. Gears should be replaced when the backlash exceeds four times the measurement taken at installation.
6. Gear drives are rated for 1750 input RPM and Class I Service (Service Factor 1.0), using Klubersynth UH1 6-460 synthetic lubricant. For lower input speeds or for different service classes or lubricants, see catalog selection pages for rating information.
7. Initial operating temperatures may be higher than normal during the break-in period of the gear set. FOR MAXIMUM LIFE, DO NOT ALLOW THE SPEED REDUCER TO OPERATE

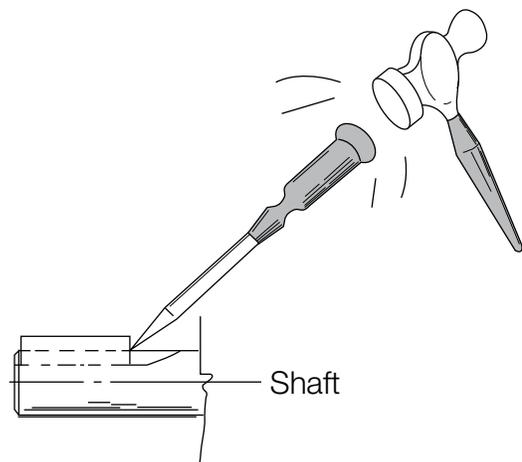
CONTINUOUSLY ABOVE 225°F AT THE GEAR CASE. In the event of overheating, check for overloads or high ambient temperatures.

8. Keep shafts and vent plugs clean to prevent foreign particles from entering seals or gear housing.
9. All reducers should be checked to see if they have been lubricated. Prelubed 700 Series reducers will have a solid plug in the vent hole which must be replaced by the vent plug at time of installation unless the unit has a Posivent.

**▲CAUTION** If the motor does not readily seat itself, check to determine if key has moved axially along motor shaft, causing interference. Staking of the keyway adjacent to the motor key will facilitate this procedure.

## Key Staking Instructions

Lightly tap area of keyway adjacent to key. This will upset material and not allow key to move axially when assembling to speed reducer.



### ▲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 speed reducer to raise or lower a load, such as in hoisting applications, provision must be made for external braking. Under no conditions should a speed reducer be considered self-locking.
- Mounting of speed reducers in overhead positions may be hazardous. Use of external guides or supports is strongly recommended for overhead mounting.

## Instructions for Flanged Models

### F700 (Quill Type Input)

1. Coat input bore with anti-seize compound. Do not apply anti-seize compound to the motor shaft or the reducer shaft. Some anti-seize compounds are very abrasive and can accelerate seal wear.
2. Assemble the key to the motor shaft. Insert the motor shaft into the reducer bore. Do not move the motor side-to-side during assembly.
3. Verify the motor is seated completely against the gearbox flange. If the motor is not completely seated remove the motor and identify the obstruction. Do not force the motor into the gearbox.
4. Rotate the motor to proper position and firmly secure to flange with four hex-head cap screws



Scan to view  
Proper Motor Installation Video  
<https://p.widencdn.net/rqaygh>

### RF700 (Coupling Input – 3-Jaw Type)

1. Coat both coupling bores with anti-seize compound. Remove excess anti-seize compound.
2. Position coupling half on input shaft with shaft flush to end of coupling bore.
3. Locate remaining half on motor shaft, with 1/32" clearance between jaw surfaces.
4. Tighten setscrews securely. For reversing applications, a thread-locking compound is recommended.
5. Install coupling insert and position motor. Rotate the motor to the correct clock position and confirm the motor mounting face contacts the gearbox flange face completely. Secure motor to the flange with the supplied motor bolts.

### QC700 (Coupling Input-3-Jaw Quick Connect Type)

1. Coat both coupling bores with anti-seize compound. Remove excess anti-seize compound.
2. Install motor coupling half onto motor shaft. Use a straight edge to align coupling jaw top end flush with motor shaft except QC738 units with B9 bore codes - or - QC738 units with NEMA 180TC/210C motor frames which will be flush with bottom of jaw. Secure set screw and torque per table below:

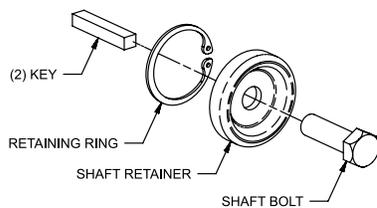
#### QC/BF COUPLING HUB SET SCREW TORQUE VALUES

COUPLING	SET SCREW	DRY SEATING TORQUE (IN-LBS)
BF7	#10-32	36
BF10	5/16-18	165
BF13	5/16-18	165
BF18	3/8-16	290

3. Install urethane spider insert on motor coupling half.
4. Insert D-Bore coupling half into urethane spider element.
5. Rotate reducer input shaft so "milled flats" are either vertical or parallel. Rotate motor coupling D-Bore to match the reducer milled flats.
6. Insert motor assembly into reducer flange assembly. Minor rotating of the motor may be necessary to facilitate D-Bore alignment.
7. Once aligned, push motor towards reducer until properly seated against the face of the reducer flange.
8. Confirm the motor face is completely seated against the gearbox flange. If it does not seat completely adjust the position of the motor coupling half.
9. Insert (4) hex head cap screws into the designated locations and securely tighten.

## Hollow bore mounting of AP shaft for 7180, 7210, 7240 sizes

1. Install internal snap ring into the outboard side of the hollowbore.
2. Verify the solid head shaft chamfer is less than .025" for proper contact with the snap ring and thread hole accepts 1/2-13 bolt 1.50" deep minimum.
3. Slide gearbox onto the shaft and thread bolt and washer/retainer into the end of the solid shaft as shown.
4. Torque 1/2-13 bolt to 46 lb-ft.
5. Complete gearbox installation.



"AP" Hollow Output Shaft Kit Mounting Arrangement from Either End of Output Shaft

## Installation of TP Tapered Bushings for 7180, 7210, 7240 sizes

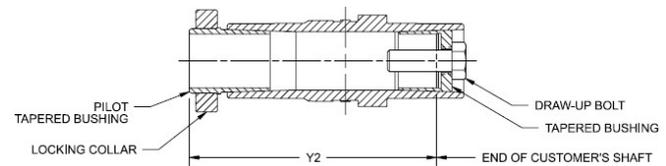
Note the head shaft must be free to float axially during the mounting of this gearbox.

1. Mark the Y2 dimension on the solid head shaft based on the unit size and chart below.
2. Align tapered pilot bushing and lock collar with the Y2 location and torque per chart below.
3. Verify Y2 dimension is accurate within +/- .015"
4. Verify the solid headshaft freely accepts the 1/2-13 bolt a minimum of 1.5" deep
5. Slide gearbox assembly onto the head shaft and securely engage the pilot tapered bushing.
6. Insert the tapered bushing and torque the shaft bolt per chart below.

Unit Size	Distance Y2 +/- .015"	Pilot Bushing Cap Screw Torque (-0 / +1 lbs-ft)	Draw -Up Bolt Size	Draw-Up Bolt Torque (-0 / +1 lbs-ft)
7180	5 – 11/16"	14.2 lbs-ft	½ -13	46 lbs-ft
7210	6 – 3/8"	28.4 lbs-ft	½ -13	54.2 lbs-ft
7240	6 – 3/8"	28.4 lbs-ft	½ -13	54.2 lbs-ft

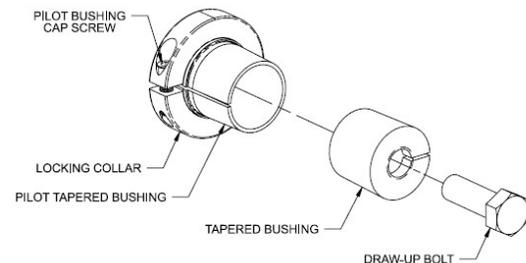
Note: Components to be clean and dry. Position

Y2 is critical to prevent the tapered bushing from bottoming out on machine shaft. The customer's shaft must be allowed to float axially during the gearbox mounting procedure.



## Removal of TP Tapered Bushings

1. Remove draw up bolt.
2. Thread 5/8 bolt into tapered bushing and tighten until the bushing is forced from the bore.
3. Move gearbox side to side until it is free from the pilot bushing.
4. Remove pilot bushing by loosening the clamp collar bolt.



## Closed Cover Installation for 7180, 7210, 7240

1. Remove the outer seal by puncturing with a sharp tool. Once the outer seal is penetrated, increase the angle and be careful not to damage the inner seal.
2. Clean the outer seal cavity and verify the inner seal is perpendicular to the machined face within .010 inches. Adjust the inner seal if needed.
3. Slide O-ring onto cover pilot.
4. Install closed cover with a mallet. Insure cover is fully seated 360 degrees by checking contact with housing face.
5. Remove cover via the pry slot if needed.

## Shaft Covers for SS700 Series

(Sold separately. Field installable and removable.)

Size	Catalog Number
7180	XHSS7180-33-KIT
7210	XHSS7210-33-KIT
7240	XHSS7240-33-KIT