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.

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 driven 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

RF700 (Coupling Input – 3-Jaw Type)


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)


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 with set screw.

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.
Oil Capacities

Single Reduction Models Only

Oil Levels for typical mounting positions

HORIZONTAL INPUT SHAFT

<table>
<thead>
<tr>
<th>Positions</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 &amp; 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit Size</td>
<td>710</td>
<td>713</td>
<td>715</td>
<td>718</td>
<td>721</td>
</tr>
<tr>
<td></td>
<td>2.2</td>
<td>5.5</td>
<td>10.0</td>
<td>12.0</td>
<td>15.0</td>
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</table>

VERTICAL INPUT SHAFT

<table>
<thead>
<tr>
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<th>2</th>
<th>3</th>
<th>4</th>
<th>5 &amp; 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit Size</td>
<td>710</td>
<td>713</td>
<td>715</td>
<td>718</td>
<td>721</td>
</tr>
<tr>
<td></td>
<td>3.3</td>
<td>7.0</td>
<td>15.0</td>
<td>18.0</td>
<td>20.5</td>
</tr>
</tbody>
</table>

Cast Iron Oil Capacity in Fluid Ounces

Stainless Steel Oil Capacity in Fluid Ounces

Double Reduction Models

The variety of mounting possibilities for double reduction drives makes it impractical to illustrate all mounting positions for these models. The common positions are found on page 6. In general, the vent filler is at the uppermost plug position, and the drain plug at the lowest possible position. The oil level must be at the approximate centerline of both gearboxes. In non stainless steel gearboxes, so if one gearbox is above the other, the lower gearbox must be 100% full. See pages 6 and 7 for more information on the proper lubrication level for each standard mounting position.

Recommended Lubricants

Enclosed Worm Gear Reducers

<table>
<thead>
<tr>
<th>Ambient (Room) Temperature 1.00 SF</th>
<th>Recommended Oil (or equivalent)</th>
<th>Viscosity Range SUS @ 100°F</th>
<th>Oil Type</th>
<th>ISO Viscosity Grade No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>-20° to 175°F* (-29° to 80°C)</td>
<td>Klubersynth* UH1 6-460 Synthetic</td>
<td>1950/2500</td>
<td>PAG</td>
<td>460</td>
</tr>
<tr>
<td>-30° to 175°F (-34° to 80°C)</td>
<td>Mobil SHC634 Synthetic</td>
<td>1950/2500</td>
<td>PAO</td>
<td>320/460</td>
</tr>
</tbody>
</table>

Worm Gear Lubricants Available from Boston Gear

<table>
<thead>
<tr>
<th>Type</th>
<th>Klubersynth</th>
<th>Mobil SHC634</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>QT.</td>
<td>QT.</td>
</tr>
<tr>
<td>Item Code</td>
<td>65159</td>
<td>51493</td>
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</table>

Order By Item Code

<table>
<thead>
<tr>
<th>Type</th>
<th>Klubersynth</th>
<th>Mobil SHC634</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>QT.</td>
<td>QT.</td>
</tr>
<tr>
<td>Item Code</td>
<td>65159</td>
<td>51493</td>
</tr>
</tbody>
</table>

**CAUTION** Relubricate more frequently if drive operated 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 Klubersynth UH1 6-460.

+Other lubricants corresponding to AGMA/ISO numbers are available from all major oil companies.

**The synthetic lubricant will perform at temperatures considerably higher than 175°F. However, the factory should always be consulted prior to operating at higher temperatures as damage may occur to oil seals and other components.
**Lubricant Interchange**

Lubricants are compounded for use in worm gears. Some contain non-corrosive, extreme pressure additives. DO NOT USE lubes that contain sulphur and/or chlorine which are corrosive to bronze gears. 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.

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Lubricant Name</th>
<th>AGMA Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Getty Refining Co.</td>
<td>Veedol Asreslube 98</td>
<td>8 EP</td>
</tr>
<tr>
<td>Getty Refining Co.</td>
<td>Veedol Asreslube 96</td>
<td>7 EP</td>
</tr>
<tr>
<td>Getty Refining Co.</td>
<td>Veedol Asreslube 90</td>
<td>6 EP</td>
</tr>
<tr>
<td>Lubrication Engr. Inc.</td>
<td>Almasol 609</td>
<td>8</td>
</tr>
<tr>
<td>Lubrication Engr. Inc.</td>
<td>Almasol 608</td>
<td>7</td>
</tr>
<tr>
<td>Mobil Oil Corp.</td>
<td>Mobilgear 634</td>
<td>8 EP</td>
</tr>
<tr>
<td>Mobil Oil Corp.</td>
<td>Mobil Extra Hecla Super</td>
<td>8</td>
</tr>
<tr>
<td>Mobil Oil Corp.</td>
<td>Mobil Cylinder 600W</td>
<td>7</td>
</tr>
<tr>
<td>Shell Oil Co.</td>
<td>Omala 460</td>
<td>7 EP</td>
</tr>
<tr>
<td>Shell Oil Co.</td>
<td>Valvala J460</td>
<td>7</td>
</tr>
<tr>
<td>Shell Oil Co.</td>
<td>Omala 680</td>
<td>8 EP</td>
</tr>
<tr>
<td>Shell Oil Co.</td>
<td>Valvala J680</td>
<td>8</td>
</tr>
<tr>
<td>Texaco Inc.</td>
<td>Meropa 680</td>
<td>8 EP</td>
</tr>
<tr>
<td>Texaco Inc.</td>
<td>Meropa 460</td>
<td>7 EP</td>
</tr>
</tbody>
</table>

**PosiVent® Option**

Units supplied with this option are sealed from the environment.

To ensure that the system operates properly, DO NOT REMOVE THE VENT PLUG FOR ANY REASON.

---

**Oil Level/ Mounting Positions**

**SFWA700 Series Oil Level/Mounting Position Chart**

- Indicates proper oil level.

**SFWC700 Series Oil Level/Mounting Position Chart**

- Indicates proper oil level.

**CAUTION**

When ordering speed reducers pre-lubricated, the Mounting Position must be indicated to ensure proper oil level.
Lubrication Ports

The gearbox lubrication level is critical for gearbox performance. Once the gearbox part number and mounting position have been identified the port guide below will help achieve the proper lubrication level.

### Single Reduction

<table>
<thead>
<tr>
<th>Port</th>
<th>Port Location</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port A</td>
<td>G-side</td>
<td>Fill/Vent</td>
<td>Fill/Vent</td>
<td>Oil Drain</td>
<td>Oil Drain</td>
<td>Oil Level</td>
<td>Oil Level</td>
</tr>
<tr>
<td>Port B</td>
<td>Motor-side</td>
<td>Oil Drain</td>
<td>-</td>
<td>Fill/Vent</td>
<td>Oil Level</td>
<td>Fill/Vent</td>
<td>Oil Drain</td>
</tr>
<tr>
<td>Port C</td>
<td>J-side</td>
<td>Fill/Vent</td>
<td>Oil Drain</td>
<td>Oil Drain</td>
<td>Fill/Vent</td>
<td>Oil Level</td>
<td>Oil Level</td>
</tr>
<tr>
<td>Port D</td>
<td>Nameplate-side</td>
<td>Oil Level</td>
<td>Oil Level</td>
<td>Oil Level</td>
<td>-</td>
<td>Oil Drain</td>
<td>Fill/Vent</td>
</tr>
</tbody>
</table>

### Double Reduction for WA/WB (Parallel Input and Output)

<table>
<thead>
<tr>
<th>Port</th>
<th>Port Location</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port A</td>
<td>G-side</td>
<td>Oil Drain</td>
<td>Oil Drain</td>
<td>Fill #2/Vent</td>
<td>Fill #2/Vent</td>
<td>-</td>
<td>Oil Level</td>
</tr>
<tr>
<td>Port B</td>
<td>Motor-side</td>
<td>Fill #2/Vent</td>
<td>Oil Level</td>
<td>Oil Drain</td>
<td>-</td>
<td>Fill #1</td>
<td>Oil Drain</td>
</tr>
<tr>
<td>Port C</td>
<td>J-side</td>
<td>Oil Drain</td>
<td>Fill #2/Vent</td>
<td>Oil Drain</td>
<td>Fill #2/Vent</td>
<td>Oil Level</td>
<td>-</td>
</tr>
<tr>
<td>Port D</td>
<td>Nameplate-side</td>
<td>Oil Level</td>
<td>-</td>
<td>-</td>
<td>Oil Level</td>
<td>Oil Drain</td>
<td>Fill #2/Vent</td>
</tr>
<tr>
<td>Port E</td>
<td>Top</td>
<td>Fill #1</td>
<td>Fill #1</td>
<td>Oil Drain</td>
<td>-</td>
<td>Oil Level</td>
<td>-</td>
</tr>
<tr>
<td>Port F</td>
<td>Cover side</td>
<td>-</td>
<td>-</td>
<td>Oil Level</td>
<td>-</td>
<td>Fill #2/Vent</td>
<td>Oil Drain</td>
</tr>
<tr>
<td>Port G</td>
<td>Bottom</td>
<td>Oil Drain</td>
<td>-</td>
<td>Fill #1/Vent</td>
<td>Fill #1</td>
<td>-</td>
<td>Fill #1</td>
</tr>
</tbody>
</table>

### Double Reduction for WC/WD (Perpendicular Input and Output)

<table>
<thead>
<tr>
<th>Port</th>
<th>Port Location</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port A</td>
<td>G-side</td>
<td>-</td>
<td>Oil Drain</td>
<td>Oil Drain</td>
<td>Fill #1/Vent</td>
<td>-</td>
<td>Oil Level</td>
</tr>
<tr>
<td>Port B</td>
<td>Motor-side</td>
<td>Fill #2/Vent</td>
<td>Fill #2/Vent</td>
<td>Oil Level</td>
<td>Oil Drain</td>
<td>Fill #1</td>
<td>Oil Drain</td>
</tr>
<tr>
<td>Port C</td>
<td>J-side</td>
<td>Oil Drain</td>
<td>Oil Drain</td>
<td>Fill #2/Vent</td>
<td>Fill #1/Vent</td>
<td>Oil Level</td>
<td>-</td>
</tr>
<tr>
<td>Port D</td>
<td>Nameplate-side</td>
<td>Oil Level</td>
<td>Oil Level</td>
<td>-</td>
<td>-</td>
<td>Oil Drain</td>
<td>Fill #2/Vent</td>
</tr>
<tr>
<td>Port A</td>
<td>Top</td>
<td>Fill #1/Vent</td>
<td>Fill #1</td>
<td>Oil Drain</td>
<td>Oil Drain</td>
<td>Level</td>
<td>-</td>
</tr>
<tr>
<td>Port B</td>
<td>Cover side</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Oil Level</td>
<td>Fill #2/Vent</td>
<td>Oil Drain</td>
</tr>
<tr>
<td>Port C</td>
<td>Bottom</td>
<td>Oil Drain</td>
<td>Oil Drain</td>
<td>Fill #1</td>
<td>Fill #2</td>
<td>-</td>
<td>Fill #1</td>
</tr>
</tbody>
</table>

### Notes:

- **Oil Drain**: Plugged from factory. Port used during regular maintenance intervals for draining used oil. Re-plug prior to oil-fill. There may be more than one Drain port.
- **Oil Level**: Plugged from factory. Port used during regular maintenance intervals. Defines recommended oil-level during operation for both gear housings.
- **Vent**: Plugged from factory except when Reducer is shipped Dry. Port used during regular maintenance intervals to fill Reducer with new oil after draining. Defines optional location for installation of a blue pressure vent, that is supplied uninstalled with each Reducer.
- **Fill #1**: Add lubrication via this port first
- **Fill #2**: Add lubrication via this port second

For stainless steel double reduction reducer, fill each reducer independently using the single reduction guidelines for each.
**Lubrication Instructions for Non-Standard Mounting Positions**

*Only the circled numbers indicate the mounting position used in the part number nomenclature.*

This is the #1 clock designation. Non circled numbers indicate clock designations.

For Single Reduction Cast Iron Units Only: Refer To Lubrication & Installation Instructions

Please note the clock designations (1 through 12) do not correlate with the part number nomenclature.

### Oil Capacity In Ounces

<table>
<thead>
<tr>
<th>Clock Designation</th>
<th>710</th>
<th>713</th>
<th>715</th>
<th>718</th>
<th>721</th>
<th>724</th>
<th>726</th>
<th>730</th>
<th>732</th>
<th>738</th>
<th>752</th>
<th>760</th>
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<tbody>
<tr>
<td>1</td>
<td>14.04</td>
<td>16.97</td>
<td>28.50</td>
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<td>56.80</td>
<td>71.60</td>
<td>162.0</td>
<td>255.7</td>
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<tr>
<td>2</td>
<td>19.93</td>
<td>22.85</td>
<td>35.80</td>
<td>52.80</td>
<td>67.80</td>
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<td></td>
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<tr>
<td>3</td>
<td>24.95</td>
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<td>84.80</td>
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<tr>
<td>4</td>
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<td>94.80</td>
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<td>6</td>
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</tbody>
</table>

* /F/L/O/O/R/*

Unit Size

For Single Reduction Cast Iron Units Only: Refer To Lubrication & Installation Instructions

Please note the clock designations (1 through 12) do not correlate with the part number nomenclature.
Parts List – Single Reduction Models, Cast Iron Units

Part No. Description
1 HOUSING
2* WORM GEAR
3* SINGLE PROJECTING OUTPUT SHAFT
4* DOUBLE PROJECTING OUTPUT SHAFT
5* GEAR SPACER
6* OUTPUT BEARING (CONE) – MODELS 713-760
7 OUTPUT BEARING (CUP) – MODELS 713-760
8 OUTPUT BEARING – MODEL 710 ONLY
9 BEARING CARRIER (OPEN)
10* BEARING CARRIER (CLOSED)
11* OUTPUT OIL SEAL
12* ADJUSTMENT SHIMS
13 INPUT WORM SHAFT
14 INPUT BEARING – MODELS 710-730
15 INPUT BEARING RETAINER
16 INPUT OIL SEAL – MODELS 710-760
17 RETAINING RING
18 ADJUSTMENT SHIMS
19 BORE PLUG – MODELS 710-730
20 INTERNAL BAFFLE – MODELS 713-732
21 INPUT “O” RING
23* OUTPUT “O” RING
24 HEX HEAD CAP SCREW
25 HEX HEAD CAP SCREW
26 VENT PLUG

Part No. Description
27 PIPE PLUG
28 PROTECTIVE CAP PLUG
29 INPUT KEY
30 OUTPUT KEY
31 NAMEPLATE
32 INPUT BEARING (CUP) – MODELS 732-760
33 INPUT BEARING (CONE) – MODELS 732-760
34 GREASE CUPS – MODELS 732-760
35 HEX HEAD CAP SCREW
36 OUTPUT SHAFT KEY – MODELS 730-760
37 RETAINING RING – MODELS 710-738
38 MOTOR SHAFT – MODELS 710-738
39 MOTOR FLANGE – MODELS 710-738
40 OIL SEAL – MODELS 710-738
41 HEX HEAD CAP SCREW
42 HORIZONTAL BASE
43 HEX HEAD CAP SCREW
44 LOCK WASHER
45 KEY (INTERNAL)
46 KEY (EXTERNAL)
47 RETAINING MOTOR FLANGE
48 RISER BLOCK
49 HEX HEAD CAP SCREW
50 VERTICAL BASE (HIGH OR LOW)
51 HEX HEAD CAP SCREW

Part No. Description
60 VERTICAL BASE (X & Y ASSEMBLY)
101 FAN
102 SPACER
103 HEX HEAD CAP SCREW
104 FAN GUARD
105 HEX HEAD CAP SCREW
106 WASHER
165 HOLLOW OUTPUT SHAFT (S VERSION ONLY)
166 HOLLOW OUTPUT SHAFT (H VERSION ONLY)
167 WORM GEAR
168 OUTPUT BEARING (CONE)
169 OUTPUT BEARING (CUP)
170 OIL SEAL
171 BEARING CARRIER
172 HOLLOW SHAFT MTG. BRACKET
173 HEX HEAD CAP SCREW
174 LOCK WASHER
175 KEY (INTERNAL)
176 KEY (EXTERNAL)
177 *V* TYPE BASE-MODEL (718, 721, 726, 732)
178 SOCKET SETSCREW

*For Models 710 to 726, these parts are available as complete assemblies. See Part Ordering Information, page 9.
Options & Accessories – Single Reduction Models, Cast Iron Units

Hollow Output Shaft Models S and SF718-732*

Models 732-760

Fan kit for models 732-760

HOLLOW OUTPUT Shaft Models H, HF, and HQC713-738

Models QC710-QC738, RF752-RF760

Models F710-F738

Part ordering information

1. Be sure to provide complete Boston Gear catalog number from speed reducer nameplate, along with part description and number. For example, “One output oil seal, Part No. 11, for RF718-30-B5-G”.

2. Output shaft components for Boston Gear models 710 through 726 are available only as complete assemblies that include Parts 2, 3, 5, 6, 11, 12 and 23 for single projecting shafts; and Parts 2, 4, 5, 6, 11, 12 and 23 for double projecting shafts. When ordering, specify “output shaft assembly” and full Boston Gear catalog number from nameplate.

* * Not available in the 730 or 724 Center distance, See H series.
## Parts List – Double Reduction Models, Cast Iron Units

### Part No. Description

1. HOUSING
2. WORM GEAR
3. SINGLE PROJECTING OUTPUT SHAFT
4. DOUBLE PROJECTING OUTPUT SHAFT
5. GEAR SPACER
6. OUTPUT BEARING (CONE)
7. OUTPUT BEARING (CUP)
8. BEARING CARRIER (OPEN)
9. BEARING CARRIER (CLOSED)
10. OUTPUT OIL SEAL
11. ADJUSTMENT SHIMS
12. INTERMEDIATE WORM SHAFT
13. INTERMEDIATE BEARING – MODELS W713-W730
14. INTER. BEARING RETAINER – MODELS W732-W760
15. INTER. BEARING – MODELS W732-W760
16. INTER. OIL SEAL – MODELS W732-W760
17. RETAINING RING – MODELS W713-W730
18. ADJUSTMENT SHIMS
19. BORE PLUG – MODELS W713-W730
20. INTERMEDIATE BEARING
21. INTERMEDIATE “O” RING
22. OUTPUT “O” RING
23. HEX HEAD CAP SCREW
24. HEX HEAD CAP SCREW
25. HEX HEAD CAP SCREW
26. VENT PLUG – 2 PIECE
27. PIPE PLUG
28. PROTECTIVE CAP PLUG
29. INTERMEDIATE KEY
30. OUTPUT KEY
31. NAMEPLATE
32. INTER. BEARING (CUP) – MODELS 732-W760
33. INTER. BEARING (CONE) – MODELS 732-W760
34. GREASE CUPS – MODELS W732-W760
35. HEX HEAD CAP SCREW
36. OUTPUT SHAFT KEY – MODELS W730-W760
37. HORIZONTAL BASE
38. HEX HEAD CAP SCREW
39. LOCK WASHER
40. RISER BLOCK
41. HEX HEAD CAP SCREW
42. VERTICAL BASE (HIGH OR LOW)
43. HEX HEAD CAP SCREW
44. VERTICAL BASE (ASSEMBLY X & Y)
45. ATTACHMENT HOUSING
46. INPUT WORM SHAFT
47. INPUT BEARING
48. ADJUSTMENT SHIMS
49. RETAINING RING
50. “O” RING
51. BEARING RETAINER
52. OIL SEAL
53. HEX HEAD CAP SCREW
54. BORE PLUG – MODELS W713-W738
55. INPUT WORM SHAFT KEY
56. GEAR SPACER
57. ADJUSTMENT SHIMS
58. HEX HEAD CAP SCREW
59. INTERMEDIATE WORM GEAR
60. WASHER
61. LOCK WASHER
62. HEX HEAD CAP SCREW
63. ATTACHMENT COVER GASKET
64. ATTACHMENT COVER
65. HEX HEAD CAP SCREW
66. INPUT BEARING (CONE) – MODELS W760 ONLY
67. INPUT BEARING (CUP) – MODELS W760 ONLY
68. TWO PIECE FC COUPLING WITH INSERT
69. MOTOR FLANGE
70. HEX HEAD CAP SCREW
71. INPUT WORM SHAFT
72. EXTERNAL RETAINING RING
73. INTERMEDIATE WORM GEAR
74. WASHER
75. OUTPUT SHAFT KEY – MODELS W730-W760
76. OIL SEAL – MODELS FW713-FW738
77. WASHER
78. HOLLOW OUTPUT SHAFT (S VERSION ONLY)
79. HOLLOW OUTPUT SHAFT (H VERSION ONLY)
80. WORM GEAR
81. OUTPUT BEARING (CONE)
82. OUTPUT BEARING (CUP)
83. OIL SEAL
84. BEARING CARRIER
85. HOLLOW SHAFT MTG. BRACKET
86. HEX HEAD CAP SCREW
87. LOCK WASHER
88. KEY (INTERNAL)
89. KEY (EXTERNAL)
90. “V” TYPE BASE MODEL (718, 721, 726, 732)
91. SOCKET SET SCREWS

*For Models 710 to 730, these parts are available as complete assemblies. See Part Ordering Information, Page 11.*
Options & Accessories – Double Reduction Models, Cast Iron Units

Hollow Output Shaft Models
SW, SFW, and SRFW718-732*

Models W732-W760
Parts added to W732-W760

Hollow Output Shaft Models
HW, HFW, and HQCW713-738

Models FW713-FW752
Parts added to W713-W752.

Models QCW713-QCW760
Parts added to W713-W726 or W732-W760.
These parts available in kit form.

Part ordering information

1. Be sure to provide complete Boston Gear catalog number from speed reducer nameplate, along with part description and number. For example, “One output oil seal, Part No. 11, for W713-150-G”.

2. Output shaft components for Boston Gear models 710 through 726 are available only as complete assemblies that include Parts 2, 3, 5, 6, 11, 12 and 23 for single projecting shafts; and Parts 2, 4, 5, 6, 11, 12 and 23 for double projecting shafts. When ordering, specify “output shaft assembly” and full Boston Gear catalog number from nameplate.

* Not available in 730 center distance, see H series.
Output Shaft Disassembly

1. Remove vented filler (Item 26), and the most convenient pipe plug (Item 27) and completely drain oil.

2. Remove bearing carrier screws (Item 24) from projecting shaft bearing carrier (Item 9). Remove carrier by CAREFULLY sliding it over the projecting shaft diameter. Carrier removal is improved by rotating it 30 to 45 degrees and prying on the exposed edges.

3. Output shaft assembly (Items 2, 3, 5 & 6) can now be removed from the unit. Exercise care not to nick or scratch worm gear or shaft diameters.

4. Visually examine the output shaft assembly. Check tapered roller bearings (Item 6) for signs of pitting or metallic contamination or discoloration. Rollers should have continuously smooth action and should not bind or exhibit “flat-spots”.

5. Note that replacement parts for output gear (Item 2) will include an output shaft assembly (Items 3 OR 4) for sizes F710 through F726. Also included are items 5, 6, 11, 12 and 23.

Input Shaft Disassembly

Models F710 through F730

1. With a screwdriver or suitable tool, pierce the bore plug (Item 19) and remove from the housing bore.

Models F732 and F738 only

2. Remove fan guard (Item 104). Remove fan retaining screw (Item 103), fan (Item 101) and spacer. With a screw-driver or suitable tool, pierce fan end oil seal or end cap (item 16 or 19) and remove from the housing bore.

3. Remove the outboard retaining ring (Item 17) from the housing bore. Remove the metal shims (Item 18), located between the retaining ring and the ball bearing (Item 14).

4. Remove four (4) screws (Item 42) from the motor flange (Item 40) and remove the flange from the housing.

5. Remove the input worm assembly (Items 14, 38 and 39) through the bore opposite the flange side. Remove the oil seal (Item 41) from the housing.

6. Check the condition of the ball bearing (Item 14). The bearing should roll smoothly and not bind. If the bearing needs replacement, remove the snap ring (Item 38) and press the shaft through the bearing. Install new bearing onto the shaft and re-assemble the snap ring. If the bearing is not pre-packed with grease, pack at least 50% full with Mobilux EP #2 All Purpose Grease or equivalent.

Input Shaft Reassembly

Models F710 through F738

1. Insert input worm assembly in the housing. Seat the ball bearing against the inner retaining ring (Item 17).

2. Install the metal shims (Item 18) and assemble outboard snap ring (Item 17).

3. Clean the housing bore(s) in the area where oil seals will be installed.

4. Install the oil seals as follows:
   Oil Seals - Apply ALL-PURPOSE grease (NLGI #2 consistency) to the seal lip area.

5. Insert the new oil seal (Item 41) over the shaft until it contacts the housing. CARE MUST BE TAKEN NOT TO DAMAGE THE OIL SEAL LIP. For best performance, cover the shaft with a seal leader or greased paper to prevent seal lip damage.

6. With a small hammer, tap around the face of the oil seal casing - near the outside diameter. Locate the seal as shown in Figure 2 Page 22. Use a suitable driving tool that contacts the full seal face. Once the seal is fully seated, verify the seal is not cocked in the bore. For best seal performance they should be installed perpendicular within .010” of the machined surface.
Model F710 through F730

7. Install a new bore plug (Item 19). Using a small hammer, lightly tap around the plug face near the outside diameter. CAUTION should be exercised not to distort or cock the bore plug.

Model F732 and F738

8. Install new oil seal on the fan end (Item 16). With a small hammer, tap around the face of the oil seal casing - near the outside diameter. Use a suitable tool to assure squareness of the seal to the bore. Drive the seal flush to 1/16th inch projection. Reinstall fan spacer, fan, washer, lockwasher, and bolt. Verify the seal is not cocked in the bore. Tighten the bolt per the chart in Figure 5, Page 23. Reinstall the fan guard and tighten the screws per chart in Figure 5.

Worm Gear Replacement

Model F710 through F726

1. Replace the entire output assembly.

Model F730 through F760

2. Place the output gear assembly into a pressing fixture and remove the worm gear from the shaft.

3. With the gear key assembled in the shaft key, press the new gear onto the shaft to the dimension shown in Figure 1, Page 22.

4. Install the shaft spacer (Item 5) and grease cups (Item 34).

5. Press the bearing cones (Item 6) onto the shaft making sure that the assembly is tight (no space between items).

6. Remeasure from the end of the shaft to the gear face as shown in Figure 1, Page 22. Readjust, if necessary, by pressing on the bearing cone until desired dimension is achieved.

7. Where grease cups are used, pack with Mobilux EP #2 All Purpose Grease or equivalent.

Output Shaft Reassembly into Housing

1. Remove the existing oil seal (Item 11) from the bearing carrier (Item 9).

2. Coat the gear teeth with blue or red Dykme mixture or similar coating and install the output assembly into the housing.

3. Slide the bearing carrier over the projecting shaft and bolt the carrier to the housing, making sure the metal shims (Item 12) are between the carrier and the housing. Rotate the input shaft to properly seat the tapered bearings.

4. Shim adjustment must be made at this time. If the output shaft is excessively loose, measure the endplay of the output shaft and remove shims evenly from BOTH carriers until the endplay is within the limits shown in Figure 3, Page 23.

If the carrier does NOT meet the housing face, measure the gap and add shims evenly to BOTH carrier locations until the endplay is within the limits specified.

5. ASSEMBLE THE MOTOR TO THE UNIT. Check the worm gear centrality. Apply a slight load on the output shaft then rotate the input shaft for one to two minutes. Remove the bearing carrier and remove the gear shaft assembly. Check the gear teeth for correct contact pattern as shown in Figure 6, Page 24.

6. If adjustment is required, all adjustments MUST be made to the carrier which is located on the side OPPOSITE the GEAR HUB. All adjustment for centrality must be made from the TOTAL shim pack which has already been determined.

Example: If a shim is REMOVED from the centralized side, it must be ADDED to the opposite side.

7. When a good contact pattern has been established, assemble carrier(s) to the unit. Replace all O-rings (Item 23) where required. (Install all shims on the carriers BEFORE installing O-rings.)

8. Install a new oil seal (Item 11) into the carrier bore. Use procedures as described above. Install the carrier over the projecting shaft (recommend placing masking tape over the sharp edges of the shaft keyseat to prevent cutting the oil seal lip).

9. Tighten all screws as shown in Figure 5, Page 23.

10. Fill the unit to the proper oil level with the recommended lubricant.

11. Install the vent plug (Item 26) and the drain pipe plug (Item 27).
Output Shaft Disassembly

1. Remove vented filler (Item 26) and the most convenient pipe plug (Item 27) and completely drain oil.

2. Remove bearing carrier screws (Item 24) from projecting shaft bearing carrier (Item 9). Remove carrier by CAREFULLY sliding it over the projecting shaft diameter.

3. Output shaft assembly (Items 2, 3, 5 & 6) can now be removed from the unit. Exercise care not to nick or scratch worm gear or shaft diameters.

4. Visually examine the output shaft assembly. Check tapered roller bearings (Item 6) for signs of metallic contamination or discoloration. Rollers should have continuously smooth action and should not bind or exhibit “flat-spots”.

5. Note that replacement parts for output gear (Item 2) will include an output shaft (Items 3 OR 4) for sizes RF/710 through RF/726.

End Cap Instructions

Model RF/732 through RF/760

5. Remove the fan guard (Item 104). Remove the fan retaining screw (Item 103), fan (Item 101), and spacer. Remove the retainer(s) (Item 15) at both ends, if applicable or remove the motor flange (Item 47) and shims (Item 18) and O-ring (Item 22).

6. With a soft mallet, tap lightly on the projecting shaft, removing the bearing cup and input shaft through the fan end.

7. Remove the bearing cup from the projecting shaft end.

8. Check the conditions of the bearing cones and cups (Items 32 and 33). The rollers should not exhibit pitting. The cage should show no wear or distortion. The bearings, when supported in the cups, should run smoothly with no binding.

9. If the bearings need replacement, press the shaft through the bearing. Hand-pack the new cones with grease and install onto the shafts.

Input Shaft Disassembly

Model RF/710 through RF/730

1. With a screwdriver or suitable tool, pierce the bore plug (Item 19) and remove from the housing.

2. Remove the snap ring (Item 17) from the housing. Remove the retainer at the projecting shaft (Item 15) and the shims (Item 18).

3. With a soft mallet, tap lightly on the projecting shaft, removing the shaft assembly from the bore plug end.

4. Check the condition of the ball bearings (Item 14). The bearing should roll smoothly and not bind. If the bearing needs replacement, press the shaft through the bearing. Install new bearings on the shaft. Install bearings so that the shields face inward. If the bearing is not prepacked with grease, pack at least 50% full with Mobilux EP #2 All Purpose Grease or equivalent.

Input Shaft Reassembly

Model RF/710 through RF/730

1. Install the retaining ring (Item 17) in the outboard housing groove. Install the input shaft assembly through the projecting shaft end of the housing. Tap lightly to seat the bearing against the snap ring retainer.

2. Remove the old oil seal (Item 16) from the bearing retainer (Item 15). Using a small hammer, install a new oil seal by tapping around the face of the seal casing - near the outside diameter. The seal should be flush to 1/16th inch projection above the retainer surface. Verify the seal is not cocked in the bore.

3. Install the bearing cup (Item 32) and shims (Item 18), the bearing retainer (Item 15) and the O-ring (Item 22). It is recommended to protect the oil seal lip by using masking tape on the keyseat edges.
Model RF/732 through RF/760

4. Install a new oil seal in the far retainer (Item 16). With a small hammer, tap around the face of the oil seal casing - near the outside diameter. Use a suitable tool to assure squareness of the seal to the bore. Drive the seal flush to 1/16th inch projection. Verify the seal is not cocked in the bore.

5. Repack the roller bearings (Items 32 and 33) or replace if required.

6. Reinsert the input shaft assembly, assuring that the far bearing cup (Item 32) is in place. Lightly tap the end of the projecting shaft to seat the bearing.

7. Insert the front bearing cup (Item 32) and the shim pack. Replace the front oil seal in the retainer as per step #4 above.

8. Reinstall the front retainer using the O-ring. Tighten all bolts per table Figure 5, Page 23.

9. Rotate the shaft several times to seat the bearings and check for shaft endplay per Figure 4, Page 23. Adjust if required.

10. Replace fan and fan guard. Tighten bolts per Figure 5, Page 23.

Worm Gear Replacement

Model RF/710 through RF/726

1. Replace the entire output assembly.

Model RF/730 through RF/760

2. Place the output gear assembly into a pressing fixture and remove the worm gear from the shaft.

3. With the gear key assembled in the shaft key seat, press the new gear onto the shaft to the dimension shown in Figure 1, Page 22.

4. Install the shaft spacer (Item 5) and grease cups (Item 34).

5. Press the bearing cones (Item 6) onto the shaft making sure that the assembly is tight (no space between items).

6. Remeasure from the end of the shaft to the gear face as shown in Figure 1, Page 22. Readjust, if necessary, by pressing on the bearing cone until desired dimension is achieved.

7. Where grease cups are used, pack with Mobilux EP #2 All Purpose Grease or equivalent.

Output Shaft Reassembly into Housing

1. Remove the existing oil seal (Item 11) from the bearing carrier (Item 9).

2. Coat the gear teeth with blue or red Dykme mixture or similar coating and install the output assembly into the housing.

3. Slide the bearing carrier over the projecting shaft and bolt the carrier to the housing, making sure the metal shims (Item 12) are between the carrier and the housing. Rotate the input shaft to properly seat the tapered bearings.

4. Shim adjustment must be made at this time. If the output shaft is excessively loose, measure the endplay of the output shaft and remove shims evenly from BOTH carriers until the endplay is within the limits shown in Figure 4. If the carrier does NOT meet the housing face, measure the gap and add shims evenly to BOTH carrier locations until the endplay is within the limits specified.

5. Check the worm gear centrality. Apply a slight load on the output shaft and rotate the input shaft for one to two minutes. Remove the bearing carrier and remove the gear shaft assembly. Check the gear teeth for correct contact pattern as shown in Figure 6, Page 24.

6. If adjustment is required, all adjustments MUST be made to the carrier which is located on the side OPPOSITE the GEAR HUB. All adjustment for centrality must be made from the TOTAL shim pack which has already been determined.

Example: If a shim is REMOVED from the centralized side, it must be ADDED to the opposite side.

7. When a good contact pattern has been established, assemble carrier(s) to the unit. Replace all O-rings (Item 23) where required. (Install all shims on the carriers BEFORE installing O-rings).

8. Install a new oil seal (Item 11) into the carrier bore. Use procedures as described above. Press the seal flush to 1/16th inch projecting. Install the carrier over the projecting shaft.

Scan to Watch
Replacing the Radial Lip Seal on a Boston Gear Speed Reducer.
https://p.widencdn.net/bbgndd/V-0116-BG
(recommend placing masking tape over the sharp edges of the shaft keyseat to prevent cutting the oil seal lip). Verify the seal is not cocked in the bore.

9. Tighten all screws as shown in Figure 5, Page 23.

10. Fill the unit to the proper oil level with the recommended lubricant.

11. Install the vent plug (Item 26) and the drain pipe plug (Item 27).
W700, RFW 700 and QCW700 Series

Disassembly and Reassembly Procedures
(For item identification, refer to exploded view)

FW713 - FW752 Series

Output Shaft Disassembly

1. Remove vented filler (Item 26), and the most convenient pipe plug (Item 27) and completely drain oil.

2. Remove bearing carrier screws (Item 24) from both bearing carriers (Items 9 & 10). Remove both carriers.

Note: Carefully slide open carrier (Item 9) over projecting shaft diameter.

3. Output shaft assembly (Items 2, 3, 5 & 6) can now be removed from unit. Exercise care not to nick or scratch worm gear or shaft diameters.

4. Output shaft assembly can now be visually examined. Check tapered roller bearings (Item 6) for signs of any metallic contamination or discoloration. Rollers should have continuously smooth action and should not bind or exhibit “flat-spots”.

Intermediate Worm Shaft Disassembly

Models FW713 - FW730

1. With a screwdriver or other similar tool, pierce input bore plug (Item 19) and remove from housing bore.

Models FW732 - FW752

Remove bearing retainer screws (Item 25) and remove bearing retainer (Item 15).

Models FW713 - FW752

2. Remove outboard retaining ring (Item 17) from housing bore.

Models FW713 - FW738

3. Remove four (4) screws (Item 83) from attachment cover (Item 82) and remove from housing.

4. Remove screw (Item 80), lock washer (Item 79) and washer (Item 78).

5. Remove intermediate worm assembly (Item 13) through bore opposite attachment housing.

Models FW713 - FW730

6. Check condition of ball bearings (Items 14 & 21). Bearings should roll smoothly and not bind. If bearings need replacement, press shaft through bearings. Install new bearings onto shaft. If not already packed with grease, bearings should be packed at least 50% full with Mobilux EP #2 All Purpose Grease or equivalent.

Models FW732 - FW752

Check tapered roller bearings (Items 32 & 33) for signs of any metallic contamination or discoloration. Rollers should have continuously smooth action and should not bind or exhibit “flat-spots”. Repack bearings with Mobilux EP #2 All Purpose or equivalent.

Intermediate Worm Gear

Now that intermediate shaft has been removed, intermediate gear (Item 77) may be removed from attachment housing. Shims (Item 75) and gear spacer (Item 74) should be set aside for reassembly.

Note: Do not attempt to remove intermediate worm gear (Item 77) prior to removal of intermediate shaft as gear teeth will be damaged from being pried out from under the engaged worm threads.

Input Shaft Disassembly

1. With a screwdriver or other similar tool, pierce input bore plug (Item 72) and remove from housing bore.

2. Remove outboard retaining ring (Item 67) from housing bore. Remove metal shims (Item 66) located between snap ring and ball bearing (Item 65).

3. Remove four (4) screws (Item 88) from motor flange (Item 89) and remove flange from housing.

4. Remove input worm assembly (Item 90) through bore opposite flange side. Remove oil seal (Item 92) from housing bore. Inboard retaining ring (Item 67) will remain in housing.
5. Check condition of ball bearing (Item 65). Bearing should roll smoothly and not bind. If bearings need replacement, remove snap ring (Item 91) and press shaft through bearing.

Install new bearing onto shaft and reassemble snap ring (Item 91). If not already packed with grease, bearing should be packed at least 50% full with Mobilux EP #2 All Purpose Grease or equivalent.

**Input Shaft Reassembly**

1. Insert input worm shaft assembly (Item 90) into housing with retaining ring (Item 67) used to seat ball bearing.

2. Install metal shims (Item 66) and assemble outboard snap ring (Item 67).

3. Clean housing bore(s) in area where oil seal is to be inserted.

4. Oil Seal Assembly:
   - Oil Seal - Apply All Purpose Grease (NLGI #2 consistency) to seal lip area.

5. Insert new oil seal (Item 92) over the shaft (care must be taken not to damage oil seal lip) until it contacts the housing.

6. With small hammer, tap around the face of seal casing near the outside diameter. Oil seal location as follows:
   - Flange end oil seal - Refer to Figure (2) Page 22 (use suitable driving tool to recess seal).

7. Install new bore plug (Item 72). If rubber clad O.D. no sealant is required. Using small hammer, lightly tap around plug face near the outside diameter. Caution should be exercised not to distort or cock plug during installation.

8. Assemble motor flange (Item 89).

**Intermediate Worm Reassembly**

1. Insert intermediate worm assembly (Item 13) through bore opposite attachment housing.

**Note:** Spacer (Item 74) and shims (Item 75) should be put on shaft and worm gear (Item 77) held in mesh with input worm (Item 90) while sliding intermediate worm assembly into position.

2. Assemble attachment cover (Item 82).

**Models FW713 - FW730**

3. Install new bore plug (Item 19). Using small hammer, lightly tap around plug face near the outside diameter. Caution should be exercised not to distort or cock plug during installation.

**Models FW732 - FW752**

Assemble intermediate bearing retainer (Item 15).

**Worm Gear Replacement**

**Models FW713 - FW726**

1. Replace entire output assembly.

**Models FW730 - FW752**

1. Place output gear assembly (Item 2) into a pressing fixture and remove worm gear from shaft.

2. With gear key assembled in shaft keyseat, press new gear onto shaft to dimension shown in Figure 1, Page 22.

3. Install shaft spacer (Item 5) and grease cups (Item 34) when applicable.

4. Press bearing cones (Item 6) onto shaft making sure the assembly is tight.

5. Remeasure from end of shaft to worm gear face as shown in Figure 1, Page 22. If adjustment is necessary, press bearing cone (Item 6) until required dimension is achieved.

6. Where grease cups are used, pack with Mobilus EP #2 All Purpose Grease or equivalent.
Output Shaft Reassembly into Housing

1. Remove existing oil seal (Item 11) from bearing carrier (Item 9).

2. Coat gear teeth (Item 3) with red-lead mixture or similar coating and install output gear assembly into housing.

3. Slide bearing carrier (Item 9) over projecting shaft (Item 4) diameter and bolt carrier to housing. Make sure metal shims (Item 12) are between carrier and housing face. Rotate input shaft to properly seat tapered roller bearings.

4. Adjustments of shims (Item 12) must be made at this time. If output shaft is excessively loose, measure endplay of output shaft and remove shims (Item 12) evenly from both carriers (Items 9 and 10) until endplay is within limits specified on Figures 3 or 4, Page 23.

   If bearing carrier (Item 9) does not meet housing face, measure gap and add shims (Item 12) evenly to each side (Items 9 and 10).

5. Assemble motor to unit. Check worm gear centrality. Apply slight load to output shaft and rotate input shaft for 1 or 2 minutes. Remove output bearing carrier (Item 9) and remove output gear assembly. Check gear teeth for contact pattern. Optimum bearing pattern is shown in Figure 3, Page 23.

   If gear requires adjustment for centrality, all adjustments must be made from side opposite gear hub.

**Note:** All adjustment for gear centrality to be made from the already established total shim pack (Ref. - Step 4). For example - If a shim is removed from centralized side, it must be added to the opposite side.

6. When good contact pattern or gear teeth is established, assemble carriers(s) to unit. Install new oil seal (Item 12) into bearing carrier bore. Seal assembly same as shown in “Input Shaft Reassembly” - Steps 4, 5 and 6. (Recommend masking tape over sharp keyseat edges so seal lip is not cut or damaged.) Oil seal to be flush with carrier face. Verify the seal is not cocked in the bore.

7. Fill unit to proper level with recommended gear lubrication. (Ref. Pages 5-8.)

8. Install vent (Item 26) and pipe plug (Item 27).

**Important:** All screw tightening torques listed in Figure 5, Page 23.

**Note:** For RFW and W700 Series Ref. to Single Reduction Instructions for 700/RF Series Input Disassembly and reassembly Page 16.
Note: “C” Dimensions shown are original oil seal locations. When seal is replaced add or subtract 1/16th of an inch to dimension shown. This will allow seal to wear on a new surface for extended life.
## ENDPLAY - FLANGED REDUCTOR

<table>
<thead>
<tr>
<th>UNIT SIZE</th>
<th>INPUT SHAFT ENDPLAY</th>
<th>OUTPUT SHAFT ENDPLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>F710, F713</td>
<td>.0005 to .0075 Max.</td>
<td>.0005 to .003 Max.</td>
</tr>
<tr>
<td>F715 Through F730</td>
<td>.0005 to .009 Max.</td>
<td>.0005 to .003 Max.</td>
</tr>
<tr>
<td>F715 Through F730</td>
<td>.0005 to .003 Max.</td>
<td>.0005 to .003 Max.</td>
</tr>
</tbody>
</table>

Note: Endplays adjusted by:
1. Input Shaft - Adding or subtracting metal shims (Item 18)
2. Output Shaft - Adding or subtracting metal shims (Item 12)

## ENDPLAY - REDUCTOR & RF & QC TYPE

<table>
<thead>
<tr>
<th>UNIT SIZE</th>
<th>INPUT SHAFT ENDPLAY</th>
<th>OUTPUT SHAFT ENDPLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>710, 713</td>
<td>.0005 to .002 Max.</td>
<td>.0005 to .003 Max.</td>
</tr>
<tr>
<td>715 Through 730</td>
<td>.0005 to .003 Max.</td>
<td>.0005 to .003 Max.</td>
</tr>
<tr>
<td>732 Through 738</td>
<td>.0005 to .005 Max.</td>
<td>.0005 to .003 Max.</td>
</tr>
</tbody>
</table>

Note: Does not apply to SSF or SSHF reducers

## SCREW TIGHTENING TORQUES* (IN-LBS.)

<table>
<thead>
<tr>
<th>UNIT SIZE</th>
<th>CARRIER SCREW</th>
<th>FLANGE SCREW</th>
<th>FAN GUARD SCREW</th>
<th>FAN ATTACH. SCREW</th>
<th>PIPE PLUG</th>
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<tbody>
<tr>
<td>F710</td>
<td>40-65</td>
<td>45-65</td>
<td></td>
<td></td>
<td>90</td>
</tr>
<tr>
<td>F713</td>
<td>132-156</td>
<td>132-156</td>
<td></td>
<td></td>
<td>132</td>
</tr>
<tr>
<td>F715</td>
<td>264-312</td>
<td>264-312</td>
<td></td>
<td></td>
<td>132</td>
</tr>
<tr>
<td>F718</td>
<td>264-312</td>
<td>264-312</td>
<td></td>
<td></td>
<td>132</td>
</tr>
<tr>
<td>F721</td>
<td>264-312</td>
<td>264-312</td>
<td></td>
<td></td>
<td>132</td>
</tr>
<tr>
<td>F724</td>
<td>264-312</td>
<td>264-312</td>
<td></td>
<td></td>
<td>132</td>
</tr>
<tr>
<td>F726</td>
<td>264-312</td>
<td>264-312</td>
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<td></td>
<td>132</td>
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<tr>
<td>F730</td>
<td>264-312</td>
<td>264-312</td>
<td></td>
<td></td>
<td>132</td>
</tr>
<tr>
<td>F732</td>
<td>264-312</td>
<td>264-312</td>
<td>85-105</td>
<td>140-160</td>
<td>240</td>
</tr>
<tr>
<td>F738</td>
<td>480-552</td>
<td>264-312</td>
<td>85-105</td>
<td>140-160</td>
<td>240</td>
</tr>
<tr>
<td>F752</td>
<td>840-948</td>
<td>840-948</td>
<td>132-156</td>
<td>140-160</td>
<td>240</td>
</tr>
<tr>
<td>F760</td>
<td>1200-1368</td>
<td>840-948</td>
<td>132-156</td>
<td>140-160</td>
<td>240</td>
</tr>
</tbody>
</table>

Note: Does not apply to SSF or SSHF reducers
IDEAL POSITIONING OF WORM GEAR CONTACT

Figure No. 6

- Worm rotation
- Entering side
- Leaving side
- Contact area

A B

- Driving face for worm rotation 'B'
- Driving face for worm rotation 'A'

Centralizing side

Gear hub side
### PARTS LIST - STAINLESS STEEL MODELS SSF AND SSHF

The original Domed Crown™ Design

#### SSF726, 732 and SS713, 715, 724, 726, 732 ONLY

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>HOUSING</td>
</tr>
<tr>
<td>2</td>
<td>WORM GEAR</td>
</tr>
<tr>
<td>3</td>
<td>SINGLE PROJECTING OUTPUT SHAFT</td>
</tr>
<tr>
<td>4</td>
<td>DOUBLE PROJECTING OUTPUT SHAFT</td>
</tr>
<tr>
<td>5</td>
<td>GEAR SPACER</td>
</tr>
<tr>
<td>6</td>
<td>OUTPUT BEARING (CONE)</td>
</tr>
<tr>
<td>7</td>
<td>OUTPUT BEARING (CUP)</td>
</tr>
<tr>
<td>8</td>
<td>BEARING CARRIER (OPEN)</td>
</tr>
<tr>
<td>9</td>
<td>OUTPUT OIL SEAL</td>
</tr>
<tr>
<td>10</td>
<td>ADJUSTMENT SHIMS</td>
</tr>
<tr>
<td>11</td>
<td>INPUT WORM SHAFT</td>
</tr>
<tr>
<td>12</td>
<td>INPUT BEARING</td>
</tr>
<tr>
<td>13</td>
<td>INPUT OIL SEAL</td>
</tr>
<tr>
<td>14</td>
<td>RETAINING RING (EXTERNAL)</td>
</tr>
<tr>
<td>15</td>
<td>RETAINING RING (INTERNAL)</td>
</tr>
<tr>
<td>16</td>
<td>BORE PLUG</td>
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<tr>
<td>17</td>
<td>INPUT &quot;O&quot; RING</td>
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<tr>
<td>18</td>
<td>OUTPUT &quot;O&quot; RING</td>
</tr>
<tr>
<td>19</td>
<td>PIPE PLUG</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>28</td>
<td>PROTECTIVE CAP PLUG</td>
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<tr>
<td>30</td>
<td>OUTPUT KEY</td>
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<tr>
<td>40</td>
<td>MOTOR FLANGE</td>
</tr>
<tr>
<td>43</td>
<td>HORIZONTAL BASE</td>
</tr>
<tr>
<td>68</td>
<td>MOTOR FLANGE &quot;O&quot; RING</td>
</tr>
<tr>
<td>120</td>
<td>KEY (EXTERNAL)</td>
</tr>
<tr>
<td>121</td>
<td>KEY (INTERNAL)</td>
</tr>
<tr>
<td>123</td>
<td>SOCKET SETSCREW</td>
</tr>
<tr>
<td>166</td>
<td>HOLLOW OUTPUT SHAFT (H) VERSION ONLY</td>
</tr>
<tr>
<td>167</td>
<td>WORM GEAR</td>
</tr>
<tr>
<td>168</td>
<td>OUTPUT BEARING (CONE)</td>
</tr>
<tr>
<td>169</td>
<td>OUTPUT BEARING (CUP)</td>
</tr>
<tr>
<td>182</td>
<td>REDUCER BUSHING</td>
</tr>
<tr>
<td>183</td>
<td>MODELS 718 &amp; 721 SOLID SHAFT ONLY</td>
</tr>
<tr>
<td>184</td>
<td>HSBHCS</td>
</tr>
<tr>
<td>184</td>
<td>SHCS</td>
</tr>
</tbody>
</table>
### 700 Series Right Angle Worm Gearbox - Single Reduction

#### Input Shaft Style
- **Blank**: Solid Projecting Input Shaft
- **F**: Quill Style Motor Flange
- **RF**: Coupling Style Motor Flange
- **QC**: Quick Connect Motor Flange (close coupled)

#### Output Shaft Style
- **Blank**: Solid Output Shaft
- **H**: BostMount Hollow Output (setscrews both sides, bore size selectable)
- **S**: Hollow Output (setscrews one side, bore size fixed)

#### Reducer Material/Paint
- **Blank**: Cast Iron, Std. Gray paint
- **BKC**: Cast Iron, White BostKleen paint
- **SBKC**: Cast Iron, Stainless BostKleen paint
- **SS**: Stainless Steel material – no paint

#### Center Distance (inches)
- **10**: 1.00
- **13**: 1.33
- **15**: 1.54
- **18**: 1.75
- **21**: 2.06
- **24**: 2.38
- **26**: 2.62
- **30**: 3.00
- **32**: 3.25
- **38**: 3.75
- **52**: 5.13
- **60**: 6.00

#### Lubrication
- **Blank**: No lubrication
- **K**: Klubersynth UH1 6-460
- **S**: Mobil SHC 634
- **X**: Mobil 600W

#### Oil Seal
- **Blank**: Standard Seal
- **T**: High pressure washdown output seals and double input seals (stainless products only)

#### NEMA Motor Mounting
- **Blank**: Solid Input Shaft (No Flange)

#### Vent
- **Blank**: Standard Vent
- **P**: Pressure Vent (5 psi)
- **Z**: Posivent (sealed)

#### Endcap or Fan
- **Blank**: Standard Vent
- **E**: Endcap (standard)
- **F**: Fan

#### Basic/ Mounting Attachment*
- **Blank**: No Base
- **A**: Horizontal base – Top Mount
- **B**: Horizontal base – Bottom Mount
- **BRB**: Riser Block – Top Mount
- **C**: Vertical High base – Right Mount
- **D**: Vertical Low base – Right Mount
- **E**: Vertical High base – Left Mount
- **F**: Vertical Low base – Left Mount
- **R**: BostMount Bracket – Right Mount
- **L**: BostMount Bracket – Left Mount
- **M**: Conveyor Flange Adptr – Right Mount
- **N**: Conveyor Flange Adptr – Left Mount
- **V**: Hollow Output Flange – Right Mount
- **W**: Hollow Output Flange – Left Mount
- **X**: Vertical Base – Rear Mount
- **Y**: Vertical Base – Front Mount

*Projection of Base/Flange/Bracket assumes one is always looking into the input shaft in the #1 mounting position

*Note: Or Consult Factory for Availability*
### Clutch/Brake

The Clutch/Brake section provides details on the various models and mounting positions available. It includes the Boston Gear 700 Series Common C-Face Brakes, which are installed in specific bore codes and AC voltage ratings. The section also includes details on the Motor Conduit Box Orientation and Output Shaft positions.

#### BostMount Output Bore Code

For H Series Only Specified in 1/16" increments.

Example: 1 1/4" = P20

<table>
<thead>
<tr>
<th>Size</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/8</td>
<td>P10</td>
</tr>
<tr>
<td>3/4</td>
<td>P12</td>
</tr>
<tr>
<td>7/8</td>
<td>P14</td>
</tr>
<tr>
<td>1-1/16</td>
<td>P17</td>
</tr>
<tr>
<td>1-1/8</td>
<td>P18</td>
</tr>
<tr>
<td>1-3/16</td>
<td>P19</td>
</tr>
<tr>
<td>1-1/4</td>
<td>P20</td>
</tr>
<tr>
<td>1-5/16</td>
<td>P21</td>
</tr>
<tr>
<td>1-3/8</td>
<td>P22</td>
</tr>
<tr>
<td>1-7/16</td>
<td>P23</td>
</tr>
</tbody>
</table>

See catalog for availability by center distance. Consult Factory for Metric Bores.

#### Motor Conduit Box Orientation

(When looking at fan end of motor and gearbox is in mounting position #1)

<table>
<thead>
<tr>
<th>Position</th>
<th>Orientation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>12 O'clock</td>
</tr>
<tr>
<td>3</td>
<td>3 O'clock(standard for G &amp; H shaft assemblies)</td>
</tr>
<tr>
<td>6</td>
<td>6 O'clock</td>
</tr>
<tr>
<td>9</td>
<td>9 O'clock (standard for J shaft assemblies)</td>
</tr>
</tbody>
</table>

#### Common C-Face Motors Installed

<table>
<thead>
<tr>
<th>HP Rating</th>
<th>Bore Code</th>
<th>AC Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4 HP</td>
<td>B5</td>
<td>115/208-230-1-60</td>
</tr>
<tr>
<td>1/3 HP</td>
<td>B5</td>
<td>115/208-230-1-60</td>
</tr>
<tr>
<td>1/2 HP</td>
<td>B5</td>
<td>208-230/460-3-60</td>
</tr>
<tr>
<td>3/4 HP</td>
<td>B5</td>
<td>208-230/460-3-60</td>
</tr>
<tr>
<td>1 HP</td>
<td>B7</td>
<td>208-230/460-3-60</td>
</tr>
<tr>
<td>1.5 HP</td>
<td>B7</td>
<td>208-230/460-3-60</td>
</tr>
<tr>
<td>2 HP</td>
<td>B7</td>
<td>208-230/460-3-60</td>
</tr>
<tr>
<td>3 HP</td>
<td>B9</td>
<td>208-230/460-3-60</td>
</tr>
<tr>
<td>5 HP</td>
<td>B9</td>
<td>208-230/460-3-60</td>
</tr>
</tbody>
</table>

For other motors available, please see catalog P-1485-BG.
## 700 Series Right Angle Worm Gearbox - Double Reduction

### Input Shaft Style
- Blank: Solid Projecting Input Shaft
- F: Quill Style Motor Flange
- QC: Quick Connect Motor Flange (close coupled)

### Output Shaft Style
- Blank: Solid Output Shaft
- H: BostMount Hollow Output (setscrews both sides, bore size selectable)
- S: Hollow Output (setscrews one side, bore size fixed)

### Reduction Type
- WA: Double Reduction Parallel Shafts
- WB: Double Reduction Parallel Shafts
- WC: Double Reduction Right Angle Shafts
- WD: Double Reduction Right Angle Shafts
- HMA: Helical Multiplier 12 O’clock
- HMB: Helical Multiplier 6 O’clock
- HMC: Helical Multiplier 3 O’clock
- HMD: Helical Multiplier 9 O’clock
- WP: Planetary Torque Multiplier

### Center Distance (inches)

<table>
<thead>
<tr>
<th>7 – 700 Series</th>
<th>38</th>
<th>B – 300</th>
<th>K</th>
<th>E</th>
<th>Z</th>
<th>T – B5 –</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 – 1.33</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>18 – 1.75</td>
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</tr>
<tr>
<td>21 – 2.06</td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>26 – 2.62</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>30 – 3.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32 – 3.25</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>38 – 3.75</td>
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<tr>
<td>52 – 5.13</td>
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</tr>
<tr>
<td>60 – 6.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Base/Mounting Attachment*
- Blank: No base kit required
- A & B: Horizontal bases
- C & E: Vertical High bases
- D & F: Vertical Low bases
- R/L: BostMount Output Bracket
- X: Input Vertical Up
- Y: Input Vertical Down
- V/W: Hollow O/P with base
- M/N: Hollow O/P with CFA

*See catalog for mounting configurations

### Gear Ratio

<table>
<thead>
<tr>
<th>700 Series</th>
<th>Exact Gear Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>38</td>
<td>100 1200 150 1800 200 2400 300 3500 600 3600 900 1800 2000 2400 3000 3600 4800 6000 7200 8000 9600</td>
</tr>
</tbody>
</table>

### Lubrication
- Blank: No lubrication
- K: Klubermirth UH1 6-460
- S: Mobil SHC 634
- X: Mobil 600W

### Reducer Material/Paint
- Blank: Cast Iron, Std. Gray paint
- BK: Cast Iron, White BostKleen paint
- SBKC: Cast Iron, Stainless BostKleen paint
- SS: Stainless Steel material – no paint

### Oil Seal
- Blank: Standard Seal
- T: Two Standard Input Seals
- Z: High pressure washdown output seals and double input seals (stainless products only)

### NEMA Motor Mounting

<table>
<thead>
<tr>
<th>BORE</th>
<th>NEMA</th>
<th>INPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>42CZ</td>
<td>500&quot;</td>
<td>1/8 x 1/16</td>
</tr>
<tr>
<td>56C</td>
<td>.625</td>
<td>3/16 x 3/32</td>
</tr>
<tr>
<td>140TC/180C</td>
<td>.875</td>
<td>3/16 x 3/32</td>
</tr>
<tr>
<td>180TC/210C</td>
<td>1.125</td>
<td>1/4 x 1/8</td>
</tr>
<tr>
<td>210TC/250UC</td>
<td>1.375</td>
<td>5/16 x 5/32</td>
</tr>
<tr>
<td>250TC</td>
<td>1.625</td>
<td>3/8 x 3/16</td>
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</tbody>
</table>

### Other Features
- SBKC: Reducer Material/Paint
- H: BostMount Hollow Output (setscrews both sides, bore size selectable)
- QC: Quick Connect Motor Flange (close coupled)
- B: Oil Seal
- E: Endcap (732-760 only)
- Z: Posivent (sealed)
- T: Bore
- B5: Bore
- SBKC: Bore
- H: Bore
- QC: Bore
- B: Bore
- E: Bore
- Z: Bore
- T: Bore
- B5: Bore

---

**Note:** IP69K certification indicates the highest level of protection against dust and water ingress.
**Boston Gear 700 Series**

**Clutch/Brake**

<table>
<thead>
<tr>
<th>Bore Code</th>
<th>FT-Lb</th>
<th>AC Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMBA56R-3</td>
<td>3</td>
<td>115/230 VAC 60Hz</td>
</tr>
<tr>
<td>CMBA56R-6</td>
<td>6</td>
<td>208-230/460 VAC 60Hz</td>
</tr>
<tr>
<td>CMBA140TR-6</td>
<td>6</td>
<td>208-230/460 VAC 60Hz</td>
</tr>
</tbody>
</table>

**Motor**

**Motor Conduit box Orientation**

(When looking at fan end of motor and gearbox is in mounting position #1)

- 0 – 12 O’clock
- 3 – 3 O’clock (standard for G & H shaft assemblies)
- 6 – 6 O’clock
- 9 – 9 O’clock (standard for J shaft assemblies)

**Common C-Face Motors Installed**

<table>
<thead>
<tr>
<th>HP Rating</th>
<th>Bore Code</th>
<th>AC Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4 HP</td>
<td>B5</td>
<td>115/208-230/1-60</td>
</tr>
<tr>
<td>1/3 HP</td>
<td>B5</td>
<td>208-230/460/3-60</td>
</tr>
<tr>
<td>1/2 HP</td>
<td>B5</td>
<td>115/230 VAC 60Hz</td>
</tr>
<tr>
<td>3/4 HP</td>
<td>B5</td>
<td>208-230/460 VAC 60Hz</td>
</tr>
<tr>
<td>1 HP</td>
<td>B5</td>
<td>208-230/460 VAC 60Hz</td>
</tr>
<tr>
<td>1.5 HP</td>
<td>B7</td>
<td>208-230/460 VAC 60Hz</td>
</tr>
<tr>
<td>2 HP</td>
<td>B7</td>
<td>208-230/460 VAC 60Hz</td>
</tr>
<tr>
<td>3 HP</td>
<td>B9</td>
<td>208-230/460 VAC 60Hz</td>
</tr>
<tr>
<td>5 HP</td>
<td>B9</td>
<td>208-230/460 VAC 60Hz</td>
</tr>
</tbody>
</table>

Other motors available, please see catalog P-1485-BG.
Warranty

The Company warrants that all 700 Series speed reducers will be free from defects in material and workmanship over the lifetime of the product.

Oil seals are considered to be replaceable maintenance items.

Any products which shall 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 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 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. No employee, agent, distributor, or other person is authorized to give additional warranties on behalf of Boston Gear, nor to assume for Boston Gear any other liability in connection with any of its products, except an officer of Boston Gear by a signed writing.