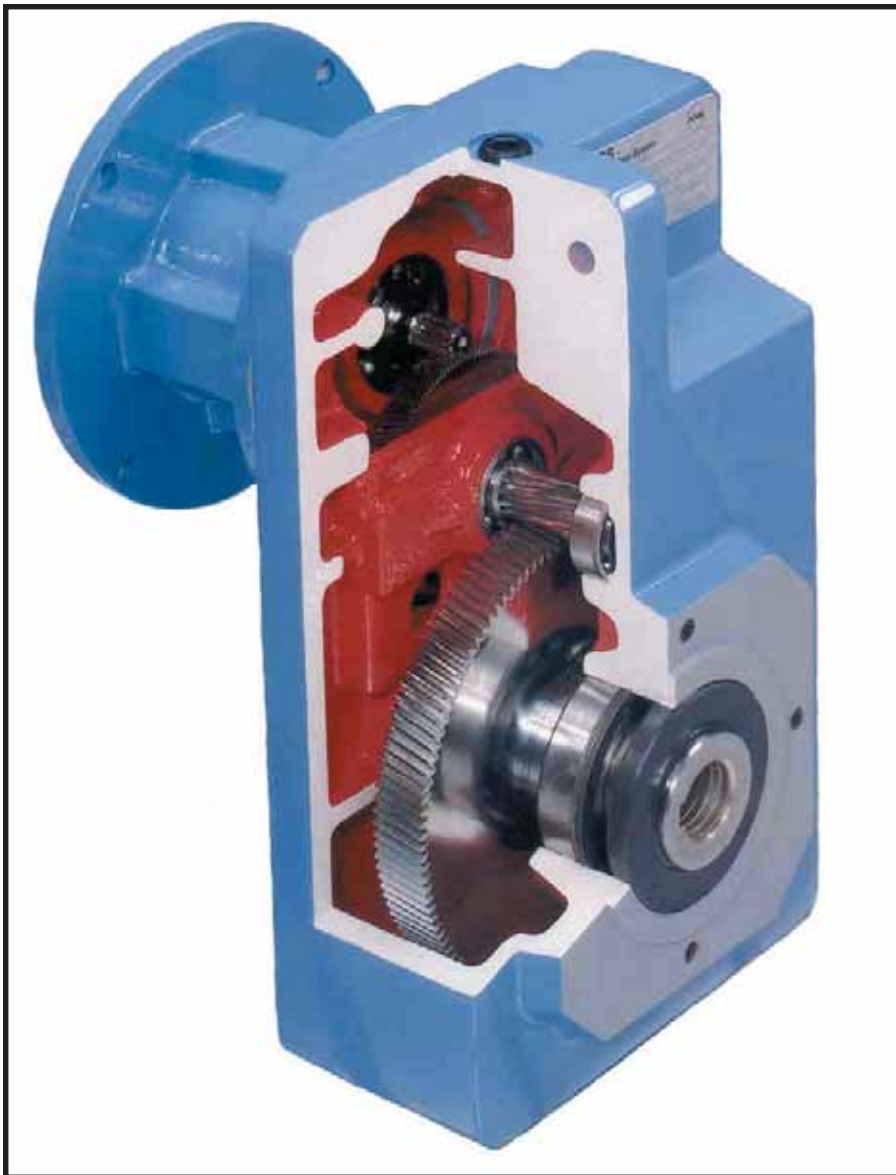


# MGS Speed Reducers



**"F" Series  
Maintenance  
Manual**







# "F" Series – Offset Helical MGS Reducer Installation Instructions

Thank you for purchasing a STOBER drive. In order to obtain long life and trouble-free operation from your MGS speed reducer, it is essential that the installation and operating procedures outlined in this manual be followed.

This manual includes directions for mounting and start-up of the MGS unit, as well as lubrication and maintenance instructions. Failure to follow these instructions will void the drive's warranty.

The torque required by the application must not exceed the reducer torque capacity shown on the nameplate. For safety purposes a safety coupling should be installed between the reducer and the driven load. Otherwise, overload may cause damage to the interior parts of the reducer which may result in breaking the reducer housing. As a result, persons could be injured by flying parts or splashing hot gear oil.

If you have questions about the installation, operation or maintenance of your MGS unit, please contact your local STOBER distributor for assistance.

## WARNING:



Safety is the most important consideration when operating any type of drive. Through proper application, safe handling methods, and wearing appropriate clothing, you can prevent accidents and injury to yourself and fellow workers.

The shafts of MGS speed reducers and gearmotors rotate at very high speeds and can cut off or severely injure hands, fingers, and arms. Use appropriate guards for shafts and other rotating parts at all times. Follow all directions in the service instruction manual. Obey all federal, state and local safety regulations when operating the drive.

- Always be sure electrical power is off while making electrical connections and during installation and maintenance of the unit.
- Keep clothing, hands, and tools away from ventilation openings on motors and from all rotating parts during operation.

- Lift drive with a double rope sling or other proper lifting equipment of adequate strength. Make sure load is secured and balanced to prevent shifting when unit is being moved. Lifting drives by hand may be dangerous and should be avoided.
- The intended use of lifting lugs is to handle the weight of the unit only. Never use a lifting lug to lift attached assemblies.
- Never operate drive at speeds higher than those shown on the nameplate, or personal injury may result. Contact STOBER Drives Inc., if there is any change of operating conditions from those for which the unit was originally sold (as stamped on the nameplate). Failure to comply could result in personal injury and or machinery damage.
- Always follow good safety practices at all times.

Each drive is tested before delivery. Before installation however, it is advisable to examine the unit for possible damage which might have occurred during transit. If damage is discovered, it should be immediately reported to the transport agent.

If installation is delayed after receipt of the MGS speed reducer, the drive should be stored in a clean, dry place until put into service. Long term storage requires special procedures. If not kept in a heated, dry area, consult STOBER Drives, Inc. for storage instructions.

**NOTE:** If it is necessary to clean drive shafts, take care to protect the oil seals.

**IMPORTANT:** Do not use any device to hammer the unit onto the output shaft during installation since the bearing races could be damaged.

# "F" Series – Offset Helical MGS Reducer

## Lubrication and Mounting Data

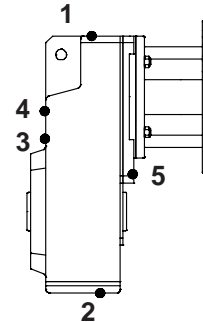


### Maintenance

With STÖBER reducers, very little maintenance is required under normal operating conditions.

In the event an oil change is needed, completely drain the reducer and replace with a compatible 5EP rated lubricant. Check your lubrication supplier for a compatible lubricant.

**CAUTION – KNOW YOUR APPLICATION:** If synthetic oil is required for high temperatures, replacing with mineral oil may prematurely fail the reducer.



**Table No. 2** F602 Plug Locations

| Mounting Position | Drain Plug and Vent Location |       |       |      |      |
|-------------------|------------------------------|-------|-------|------|------|
|                   | 1                            | 2     | 3     | 4    | 5    |
| EL1               | Vent                         | Drain |       |      |      |
| EL2               | Drain                        | Vent  |       |      |      |
| EL3               |                              | Drain |       | Vent |      |
| EL4               |                              | Drain | Vent  |      |      |
| EL5               |                              |       | Drain | Vent |      |
| EL6               |                              |       | Vent  |      | Vent |

### Lubrication and Mounting Position

All STÖBER units are shipped filled with the required amount of lubrication (Mobilgear 630).

The mounting positions and the required amount of lubricant for each position is shown on the following page.

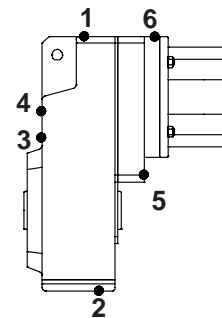
In order to provide the proper lubrication quantity the position required should be specified at the time of order.

**No unit will be shipped without the mounting position specified by the customer.**

**Positions, such as EL5 or EL6, may require different seals, bearings, etc. so it is very important to mount the unit in the position for which it was assembled.**

Breathers are provided on F602 and F603 units. See tables for location of drain and vent for each mounting position.

The following table shows recommended lubricant manufacturers and specifications.



**Table No. 3** F603 Plug Locations

| Mounting Position | Drain Plug and Vent Location |       |       |      |   |      |
|-------------------|------------------------------|-------|-------|------|---|------|
|                   | 1                            | 2     | 3     | 4    | 5 | 6    |
| EL1               | Vent                         | Drain |       |      |   |      |
| EL2               | Drain                        | Vent  |       |      |   |      |
| EL3               |                              | Drain |       | Vent |   |      |
| EL4               |                              | Drain | Vent  |      |   |      |
| EL5               |                              |       | Drain | Vent |   |      |
| EL6               |                              |       | Vent  |      |   | Vent |



# "F" Series – Offset Helical MGS Reducer

## Lubrication and Mounting Data

Position EL1

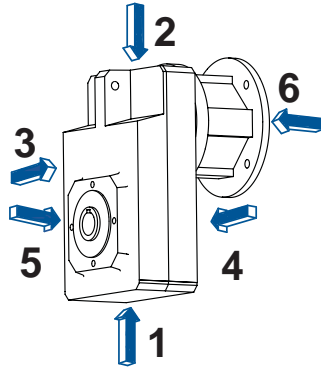


Table No. 1

Quantity of Lubricant

| Module | Quantity |        |
|--------|----------|--------|
|        | ozs.     | liters |
| F102   | 24       | .7     |
| F202   | 47       | 1.4    |
| F203   | 68       | 2.0    |
| F302   | 74       | 2.2    |
| F303   | 95       | 2.8    |
| F402   | 101      | 3.0    |
| F403   | 139      | 4.1    |
| F602   | 179      | 5.3    |
| F603   | 250      | 7.4    |

Position EL2

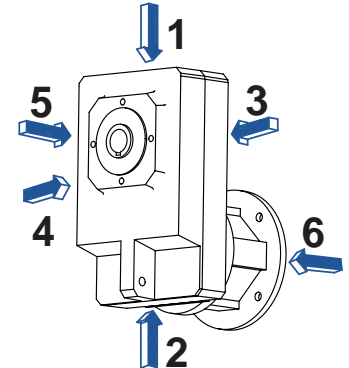


Table No. 2

Quantity of Lubricant

| Module | Quantity |        |
|--------|----------|--------|
|        | ozs.     | liters |
| F102   | 27       | .8     |
| F202   | 61       | 1.8    |
| F203   | 74       | 2.2    |
| F302   | 84       | 2.5    |
| F303   | 105      | 3.1    |
| F402   | 122      | 3.6    |
| F403   | 132      | 3.9    |
| F602   | 203      | 6.0    |
| F603   | 237      | 7.0    |

Position EL3

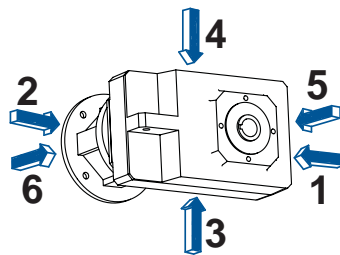


Table No. 3

Quantity of Lubricant

| Module | Quantity |        | Module | Quantity |        |
|--------|----------|--------|--------|----------|--------|
|        | ozs.     | liters |        | ozs.     | liters |
| F102   | 24       | .7     | F402   | 95       | 2.8    |
| F202   | 41       | 1.2    | F403   | 101      | 3.0    |
| F203   | 47       | 1.4    | F602   | 162      | 4.8    |
| F302   | 68       | 2.0    | F603   | 182      | 5.4    |
| F303   | 78       | 2.3    |        |          |        |

Position EL4

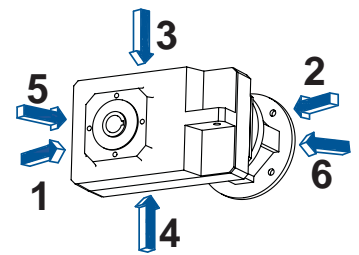


Table No. 4

Quantity of Lubricant

| Module | Quantity |        | Module | Quantity |        |
|--------|----------|--------|--------|----------|--------|
|        | ozs.     | liters |        | ozs.     | liters |
| F102   | 24       | .7     | F402   | 95       | 2.8    |
| F202   | 41       | 1.2    | F403   | 101      | 3.0    |
| F203   | 47       | 1.4    | F602   | 162      | 4.8    |
| F302   | 68       | 2.0    | F603   | 182      | 5.4    |
| F303   | 78       | 2.3    |        |          |        |

Position EL5

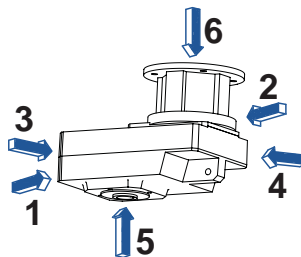


Table No. 5

Quantity of Lubricant

| "A" Module Quantity |      |        | "V" Module Quantity |      |        |
|---------------------|------|--------|---------------------|------|--------|
| Module              | ozs. | liters | Module              | ozs. | liters |
| F102                | 30   | .90    | F102                | 30   | .90    |
| F202                | 71   | 2.10   | F202                | 73   | 2.15   |
| F203                | 76   | 2.25   | F203                | 81   | 2.40   |
| F302                | 101  | 3.00   | F302                | 113  | 3.35   |
| F303                | 117  | 3.45   | F303                | 122  | 3.50   |
| F402                | 155  | 4.60   | F402                | 155  | 4.70   |
| F403                | 167  | 4.95   | F403                | 179  | 5.30   |
| F602                | 257  | 7.60   | F602                | 257  | 7.70   |
| F603                | 274  | 8.10   | F603                | 291  | 8.20   |

Position EL6

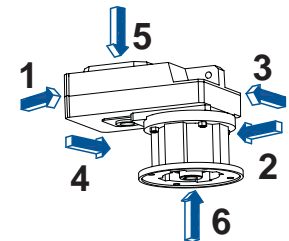


Table No. 6

Quantity of Lubricant

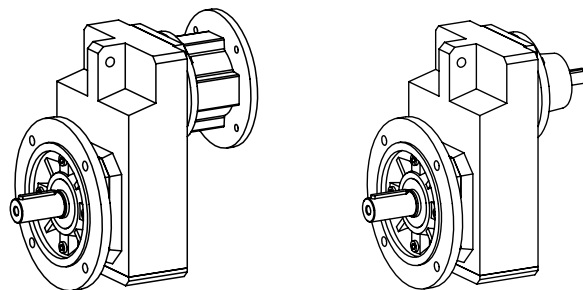
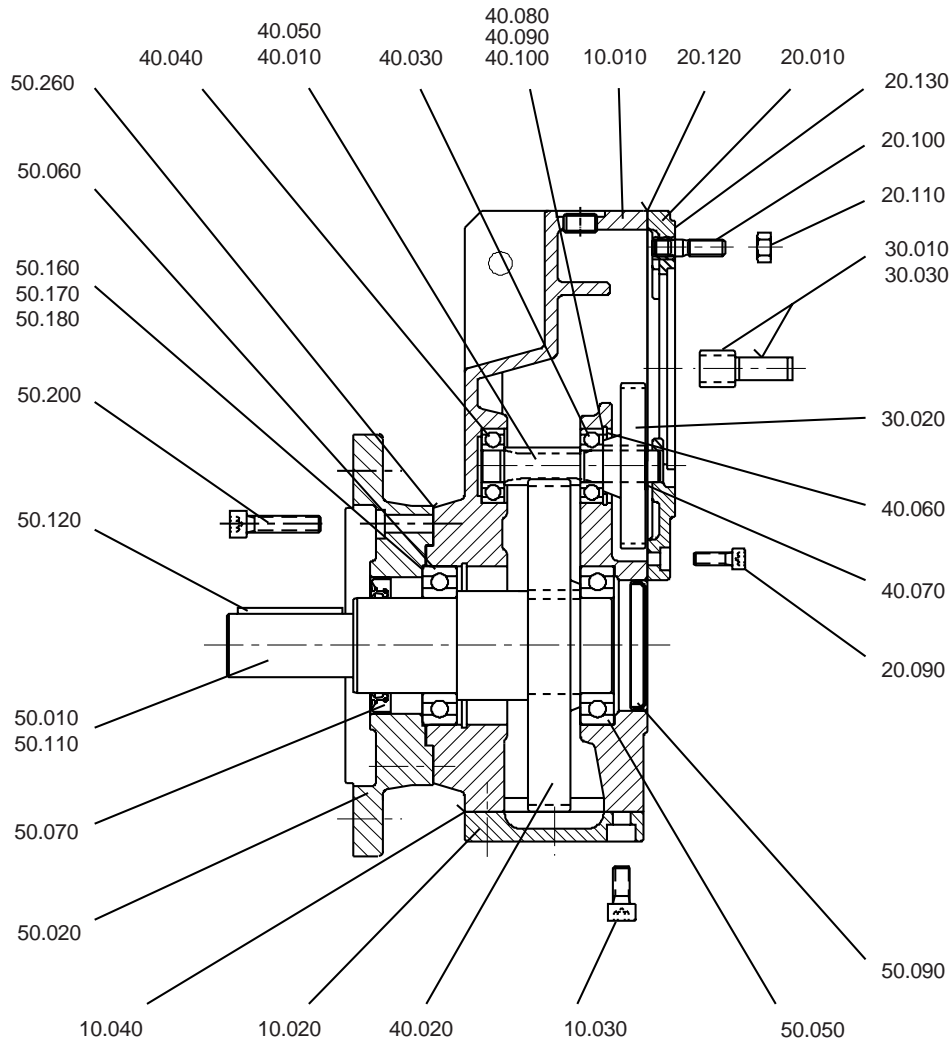
| Module | Quantity |        |
|--------|----------|--------|
|        | ozs.     | liters |
| F102   | 24       | .7     |
| F202   | 54       | 1.6    |
| F203   | 64       | 1.9    |
| F302   | 68       | 2.0    |
| F303   | 78       | 2.3    |
| F402   | 101      | 3.0    |
| F403   | 118      | 3.5    |
| F602   | 186      | 5.5    |
| F603   | 220      | 6.5    |

# "F" Series – Offset Helical MGS Reducer

## "F" Housing Style — Round Flange



F102VF to F602VF



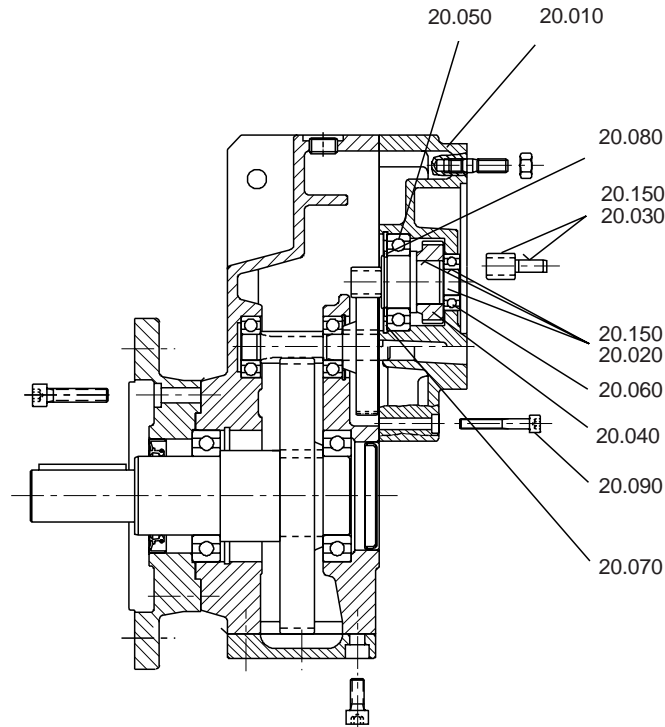
See Pages 8 for MR Motor Adapter or Page 9 for an AW Input to fit these units.



# "F" Series – Offset Helical MGS Reducer

## "F" Housing Style — Round Flange

F203VF to F603VF



### Parts List for Double and Triple Reduction — "F" Housing Style

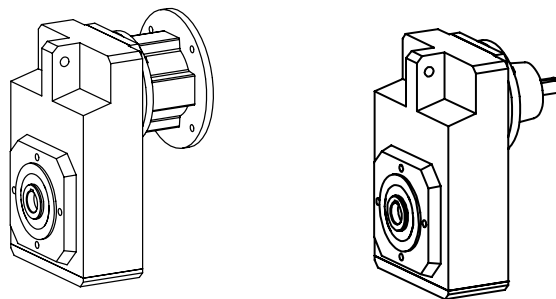
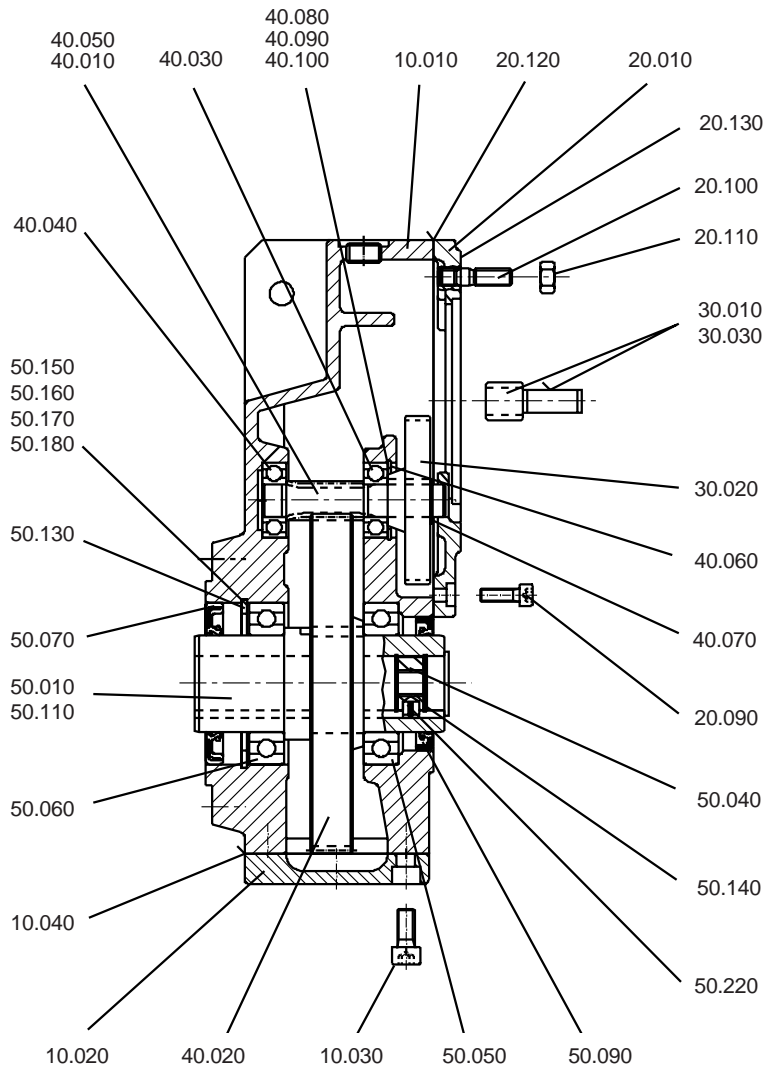
| Location No. | Description              | Location No. | Description              | Location No. | Description              |
|--------------|--------------------------|--------------|--------------------------|--------------|--------------------------|
| 10.010       | Housing                  | 20.120       | Joint Compound           | 40.100       | Shim                     |
| 10.020       | Bottom Cover             | 20.130       | Gasket                   | 50.010       | Output Shaft             |
| 10.030       | Hollow Head Screw        | 20.150       | Adhesive                 | 50.020       | Output Flange            |
| 10.040       | Joint Compound           | 30.010       | Stem Pinion              | 50.050       | Deep Groove Ball Bearing |
| 20.010       | Cover                    | 30.020       | Gear                     | 50.060       | Deep Groove Ball Bearing |
| 20.020       | Shaft                    | 30.030       | Adhesive                 | 50.070       | Oil Seal                 |
| 20.030       | Stem Pinion              | 40.010       | Pinion Shaft             | 50.090       | Cap                      |
| 20.040       | Gear                     | 40.020       | Gear                     | 50.110       | Key                      |
| 20.050       | Deep Groove Ball Bearing | 40.030       | Deep Groove Ball Bearing | 50.120       | Key                      |
| 20.060       | Deep Groove Ball Bearing | 40.040       | Deep Groove Ball Bearing | 50.160       | Shim                     |
| 20.070       | Snap Ring                | 40.050       | Key                      | 50.170       | Shim                     |
| 20.080       | Snap Ring                | 40.060       | Snap Ring                | 50.180       | Shim                     |
| 20.090       | Hollow Head Capscrew     | 40.070       | Snap Ring                | 50.200       | Hollow Head Capscrew     |
| 20.100       | Stud                     | 40.080       | Shim                     | 50.260       | Joint Compound           |
| 20.110       | Nut                      | 40.090       | Shim                     |              |                          |

When ordering replacement parts, specify the Part No. and Serial No. from the nameplate and the Location No. shown on the drawing.

# "F" Series – Offset Helical MGS Reducer "G" Housing Style — Tapped Holes



F102AG to F602AG



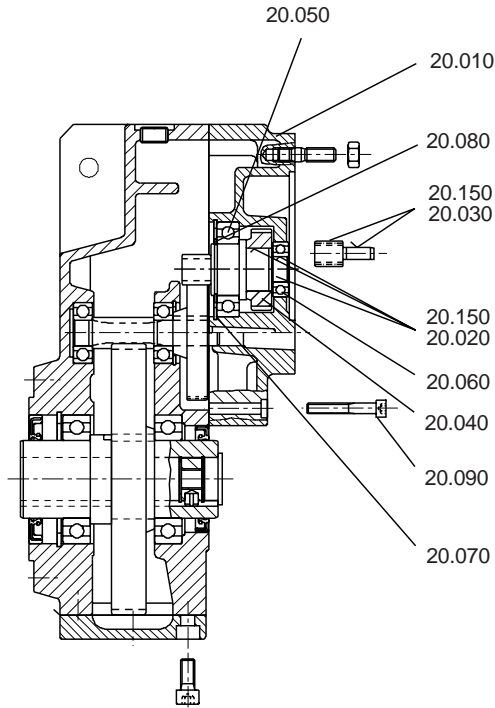
See Pages 8 for MR Motor Adapter or Page 9 for an AW Input to fit these units.  
See Pages 14 for hollow output installation instructions.





# "F" Series – Offset Helical MGS Reducer "G" Housing Style — Tapped Holes

F203AG to F603AG



## Parts List for Double and Triple Reduction — "G" Housing Style

| Location No. | Description              | Location No. | Description              | Location No. | Description              |
|--------------|--------------------------|--------------|--------------------------|--------------|--------------------------|
| 10.010       | Housing                  | 20.120       | Joint Compound           | 40.100       | Shim                     |
| 10.020       | Bottom Cover             | 20.130       | Gasket                   | 50.010       | Hollow Shaft             |
| 10.030       | Hollow Head Screw        | 20.150       | Adhesive                 | 50.040       | Keeper Plate             |
| 10.040       | Joint Compound           | 30.010       | Stem Pinion              | 50.050       | Deep Groove Ball Bearing |
| 20.010       | Cover                    | 30.020       | Gear                     | 50.060       | Deep Groove Ball Bearing |
| 20.020       | Shaft                    | 30.030       | Adhesive                 | 50.070       | Oil Seal                 |
| 20.030       | Stem Pinion              | 40.010       | Pinion Shaft             | 50.090       | Oil Seal                 |
| 20.040       | Gear                     | 40.020       | Gear                     | 50.110       | Key                      |
| 20.050       | Deep Groove Ball Bearing | 40.030       | Deep Groove Ball Bearing | 50.130       | Snap Ring                |
| 20.060       | Deep Groove Ball Bearing | 40.040       | Deep Groove Ball Bearing | 50.140       | Snap Ring                |
| 20.070       | Snap Ring                | 40.050       | Key                      | 50.150       | Shim                     |
| 20.080       | Snap Ring                | 40.060       | Snap Ring                | 50.160       | Shim                     |
| 20.090       | Hollow Head Capscrew     | 40.070       | Snap Ring                | 50.170       | Shim                     |
| 20.100       | Stud                     | 40.080       | Shim                     | 50.180       | Shim                     |
| 20.110       | Nut                      | 40.090       | Shim                     | 50.220       | Roll Pin                 |

When ordering replacement parts, specify the Part No. and Serial No. from the nameplate and the Location No. shown on the drawing.

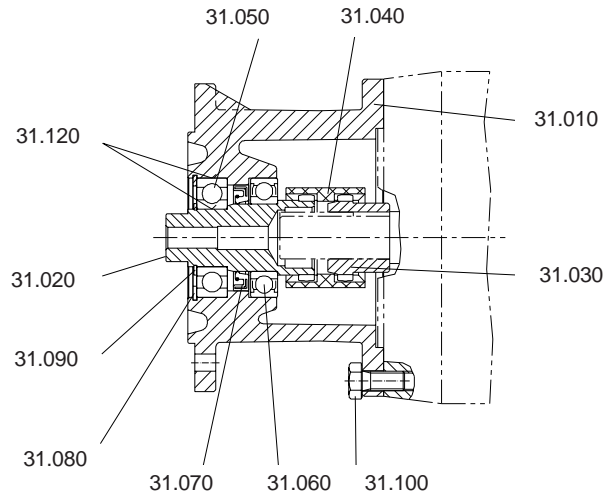
# "F" Series – Offset Helical MGS Reducer

MR – Motor Adapter

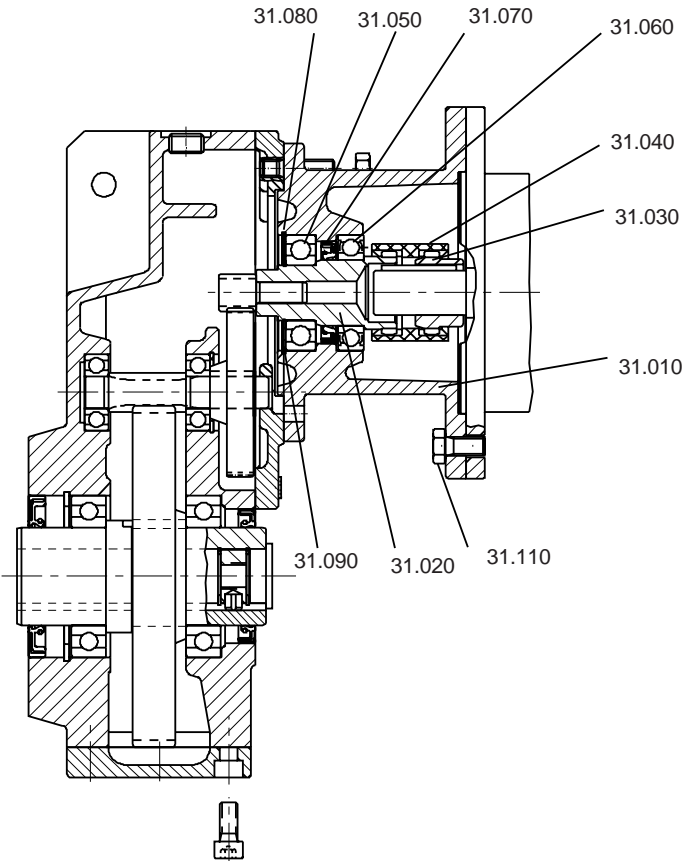
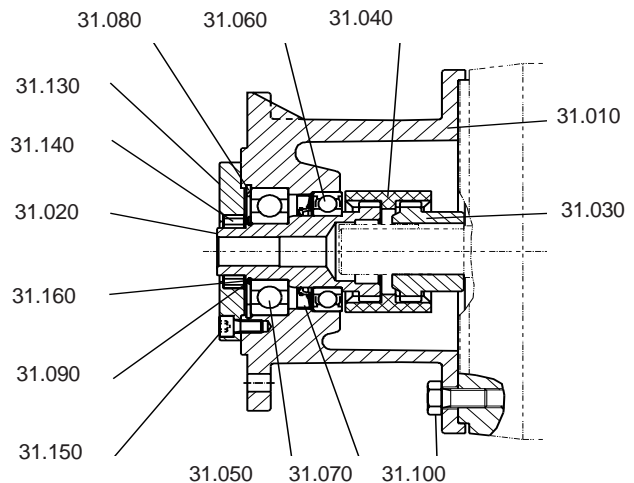
MRB – Motor Adapter with Backstop



## MRB for flange diameter 140-160



## MRB for flange diameter 200 -250 (Double Reduction Only)



### Parts List for MR and MRB Motor Adapters

| Loc. No. | Description              | Loc. No. | Description  | Loc. No. | Description    |
|----------|--------------------------|----------|--------------|----------|----------------|
| 31.010   | MR Motor Adapter Housing | 31.060   | Ball Bearing | 31.120   | Adhesive       |
| 31.020   | Coupling Hub/Shaft       | 31.070   | Seal         | 31.130   | Backstop Cover |
| 31.030   | Motor Coupling Hub       | 31.080   | Snap Ring    | 31.140   | Backstop       |
| 31.040   | Coupling Sleeve          | 31.090   | Snap Ring    | 31.150   | Capscrew       |
| 31.050   | Ball Bearing *           | 31.100   | Capscrew     | 31.160   | Shim           |

\* This is a combination Bearing/Backstop in the MRB for flange diameters 140 to 160.

The direction of rotation of the backstop **MUST** be specified when ordered.

**Do Not Use Backstops on Man Lifts.**

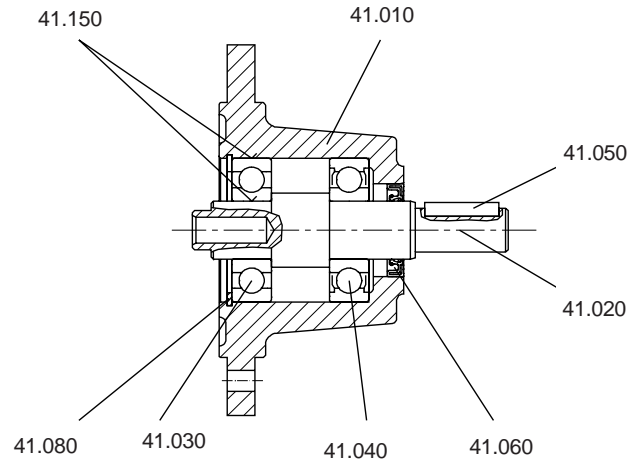
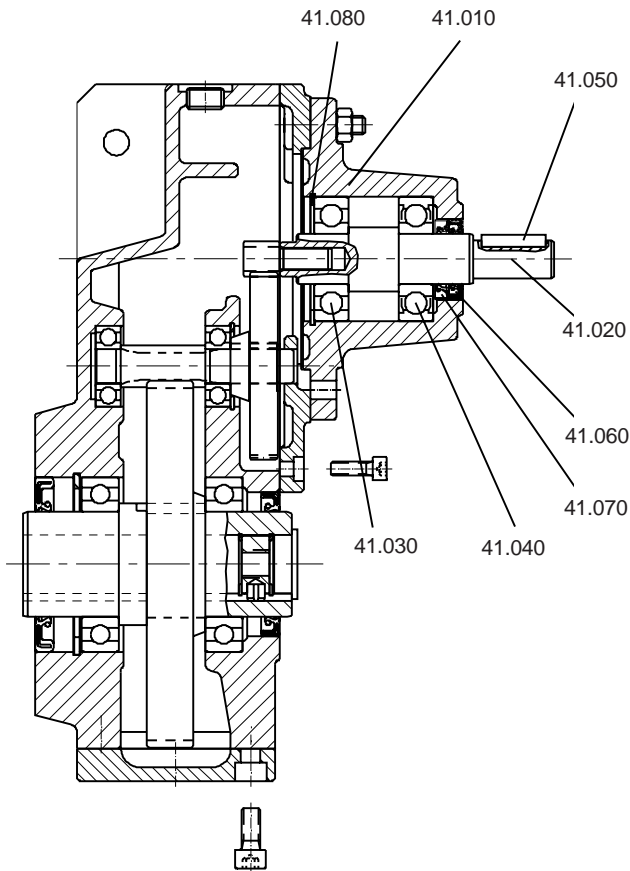
When ordering replacement parts, specify the Part No. and Serial No. from the nameplate and the Location No. shown on the drawing.



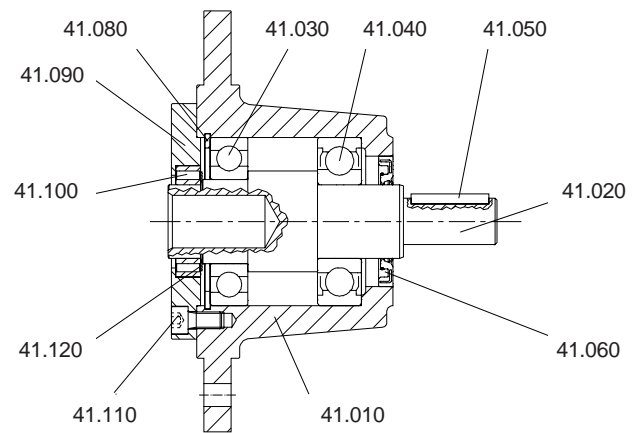
# "F" Series – Offset Helical MGS Reducer

AW — Input Shaft

AWB — Input Shaft with Backstop



**AWB for flange diameter 140-160**



**AWB for flange diameter 200 to 250  
(Double Reduction Only)**

## Parts List for AW and AWB Input Shaft

| Loc. No. | Description    | Loc. No. | Description    | Loc. No. | Description |
|----------|----------------|----------|----------------|----------|-------------|
| 41.010   | Input Housing  | 41.060   | Seal           | 41.110   | Capscrew    |
| 41.020   | Shaft          | 41.070   | Seal           | 41.120   | Shim        |
| 41.030   | Ball Bearing * | 41.080   | Snap Ring      | 41.150   | Adhesive    |
| 41.040   | Ball Bearing   | 41.090   | Backstop Cover |          |             |
| 41.050   | Key            | 41.100   | Backstop       |          |             |

\* This is a combination Bearing/Backstop in the MRB for flange diameters 140 to 160.

The direction of rotation of the backstop **MUST** be specified when ordered.

**Do Not Use Backstops on Man Lifts.**

When ordering replacement parts, specify the Part No. and Serial No. from the nameplate and the Location No. shown on the drawing.



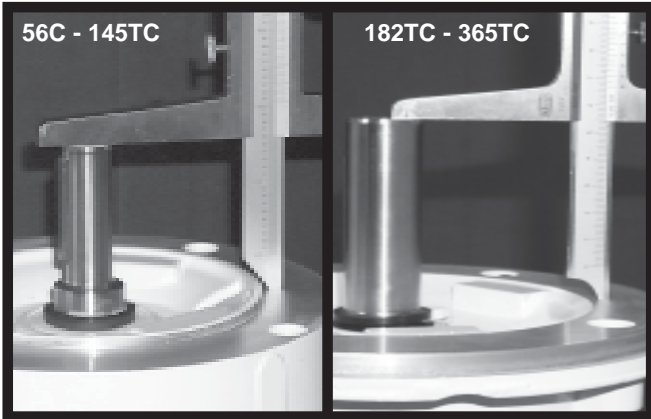
**INDUSTRIAL MAGZA**  
DIST. AUTORIZADO

MEX (55) 53 63 23 31 MTY (81) 83 54 10 18  
QRO (442) 1 95 72 60 ventas@industrialmagza.com

# MGS Reducer Motor Adapter Installation



## Step 1. Measure the Motor Shaft

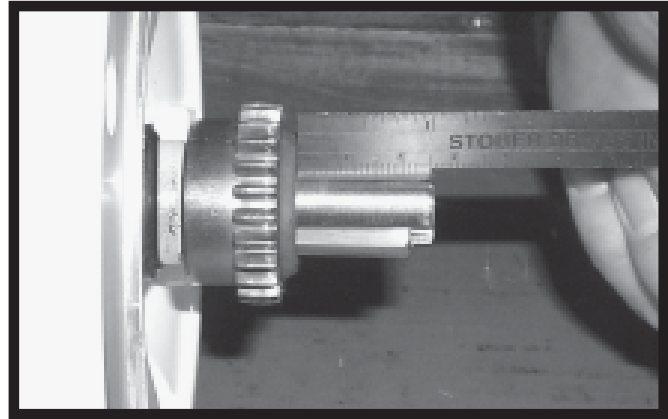


Accurate measurement of the motor shaft is vital to mounting the motor coupling correctly. The measurement must be taken from the face of the motor or pilot surface (see above) to the end of the motor shaft. If this dimension is the same as the NEMA standard "AH" dimension shown in Table No. 1, proceed with the motor mounting in Step 2.

**Table No. 1 NEMA Motor Shaft Dimensions**

| Motor Frame      | "AH"                           | Shaft Dia.                    | Motor Frame      | "AH"                          | Shaft Dia.                    |
|------------------|--------------------------------|-------------------------------|------------------|-------------------------------|-------------------------------|
| <b>56C</b>       | 2 <sup>1</sup> / <sub>16</sub> | 5/8                           | <b>254/256TC</b> | 3 <sup>3</sup> / <sub>4</sub> | 1 <sup>5</sup> / <sub>8</sub> |
| <b>143/145TC</b> | 2 <sup>1</sup> / <sub>8</sub>  | 7/8                           | <b>284/286TC</b> | 4 <sup>3</sup> / <sub>8</sub> | 1 <sup>7</sup> / <sub>8</sub> |
| <b>182/184TC</b> | 2 <sup>5</sup> / <sub>8</sub>  | 1 <sup>1</sup> / <sub>8</sub> | <b>324/326TC</b> | 5                             | 2 <sup>1</sup> / <sub>8</sub> |
| <b>213/215TC</b> | 3 <sup>1</sup> / <sub>8</sub>  | 1 <sup>3</sup> / <sub>8</sub> | <b>364/365TC</b> | 5 <sup>5</sup> / <sub>8</sub> | 2 <sup>3</sup> / <sub>8</sub> |

## Step 2. Locate the Motor Coupling on the Motor Shaft



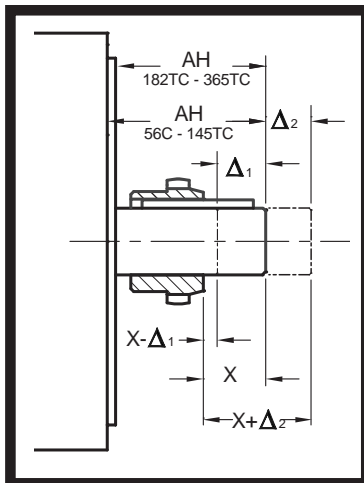
Mount the coupling with the hub projection toward the step or shoulder of the motor. The motor shaft should project through the coupling by the "X" dimension (or the value determined using the previous measurement).

**Table No. 2 Location of Motor Coupling**

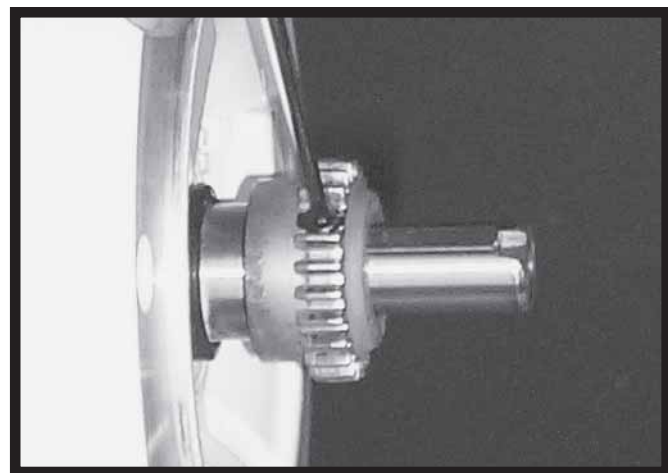
| Adapter Part No. | "X" mm | "X" inches | Adapter Part No. | "X" mm | "X" inches |
|------------------|--------|------------|------------------|--------|------------|
| <b>MR140/050</b> | 28     | 1.1        | <b>MR250/210</b> | 46     | 1.8        |
| <b>MR160/050</b> | 22     | .9         | <b>MR300/180</b> | 10     | .4         |
| <b>MR160/140</b> | 25     | 1.0        | <b>MR300/210</b> | 26     | 1.0        |
| <b>MR200/050</b> | 12     | .5         | <b>MR300/250</b> | 42     | 1.7        |
| <b>MR200/140</b> | 12     | .5         | <b>MR300/280</b> | 58     | 2.3        |
| <b>MR200/180</b> | 30     | 1.2        | <b>MR350/320</b> | 64     | 2.5        |
| <b>MR250/180</b> | 30     | 1.2        | <b>MR350/360</b> | 80     | 3.1        |

"X" Tolerance – +1mm / -0mm (+0.040 / -0.000 inches)

If the motor shaft length measurement is less than "AH", **subtract** the difference ( $\Delta_1$ ) from the "X" dimension shown in Table No. 2. If the motor shaft length measurement is greater than "AH", **add** the difference ( $\Delta_2$ ) to the "X" dimension shown in Table No. 2.



## Step 3. Tighten the Setscrew

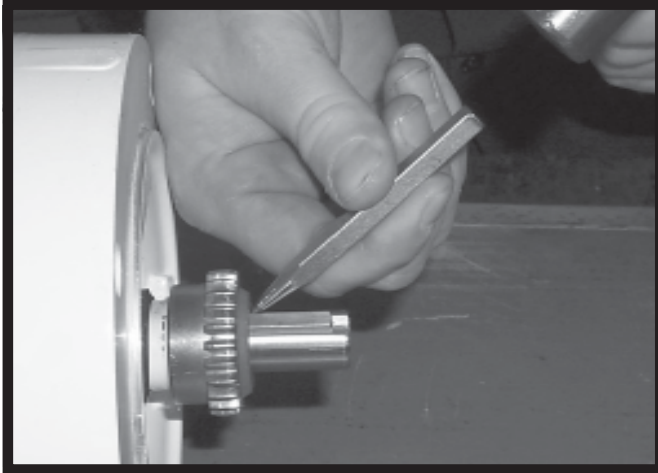


With the coupling hub located at the correct distance, tighten the setscrew in the coupling.



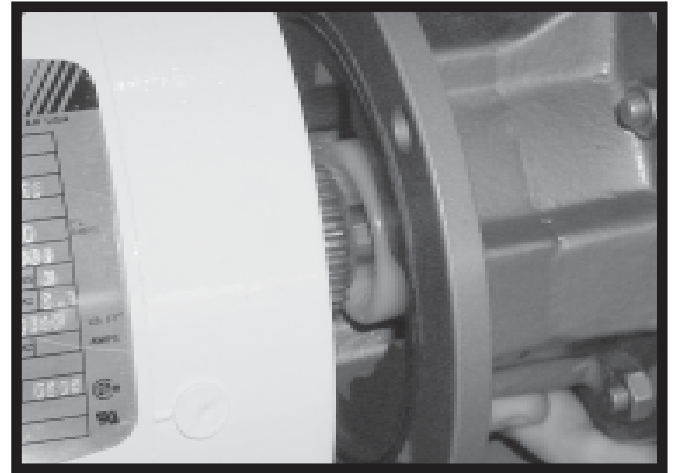
# MGS Reducer Motor Adapter Installation

## Step 4. Secure the Motor Shaft Key



For ease of installation, secure the motor shaft key. Staking near the end of the keyway, on the sides of the key, or a temporary adhesive works well.

## Step 5. Mount the Motor



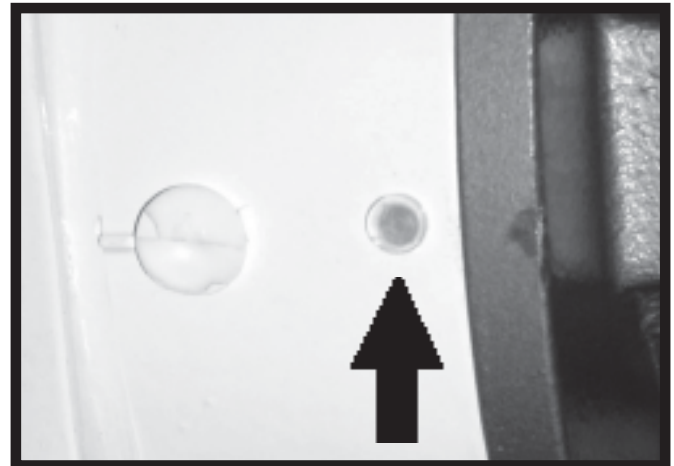
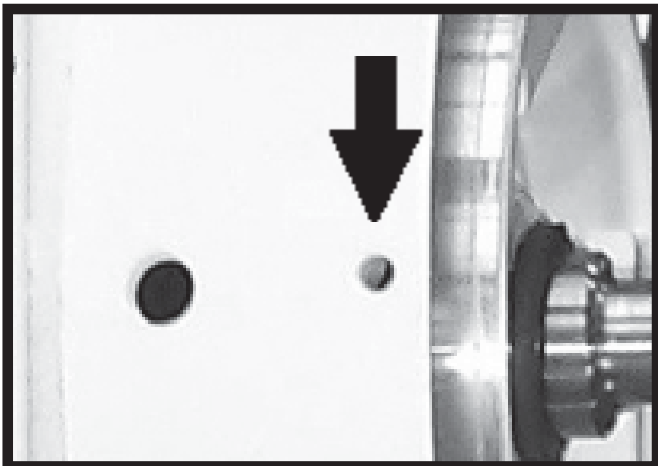
With the coupling secure, insert the motor shaft into the motor adapter. The coupling sleeve is already installed on the mating reducer coupling hub inside the motor adapter. **The sleeve should move freely in an axial direction.** (Axial displacement  $\pm 0.040$  inches.)

With the motor in place, tighten the motor bolts.

**Caution: If the motor coupling is not installed correctly, the input bearing may fail due to pre-load. This will void the warranty of the reducer and possibly fail the motor.**

Some motor manufacturers provide a drain hole in the mounting face of washdown motors. In some mounting positions, water or other material can enter the motor adapter and fail the bearing.

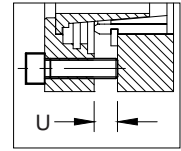
Be sure this hole is covered during washing or when the unit is in a wet environment. The illustration shows the method that Stober assembly personnel use to plug the hole.



# "WF" Bushing with "F" Series MGS Reducer Single Sided Bushing Installation Instructions



ATTENTION: The gap from the Pressure Ring to the Clamp Ring is determined by two (2) hollow head "spacer bolts". This gap should remain the "U" dimension as shown in Table No. 1 until the unit is mounted onto the shaft. Be sure the inside and outside diameters of the Tapered Cone and Flanged Cone Assembly are free of grease and oil. The Flanged Cone Assembly is the Flanged Cone, the Support Spacer, and the Expansion Ring.



## Assembly of Single Sided "WF" Bushing

The bushing will be installed into the housing on the side of the reducer that was specified at the time the order was placed.

1. Clean the machine shaft.

**WARNING: Shaft must be free of grease for bushing to clamp properly.**

Mount the reducer onto the clean shaft.

2. Remove the two (2) hollow head "spacer bolts". Tighten the capscrews to the torque shown in Table No 1. The tightening should be done gradually in a rotating sequence and will require more than one (1) rotation to tighten properly.

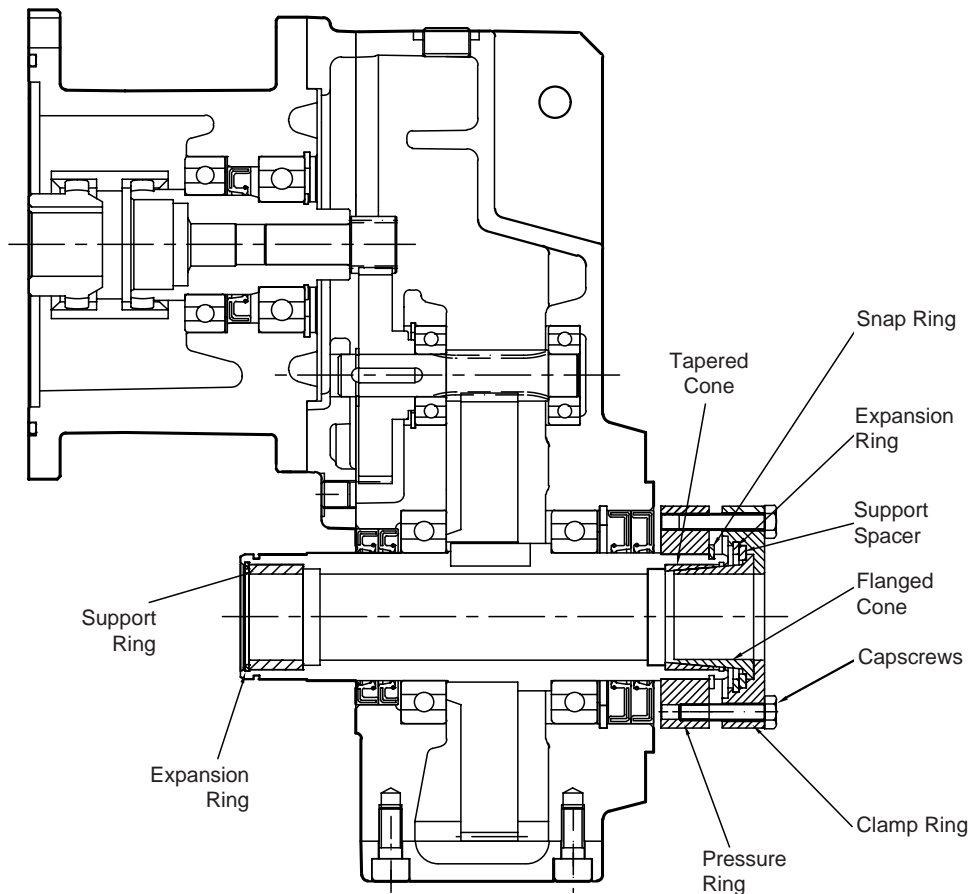
**After two (2) hours (minimum) running time, check capscrews and retighten to the specified torque, if necessary.**

Table No. 1

| Base<br>Module | Capscrews |               | Tightening Torque |          | U  |        |
|----------------|-----------|---------------|-------------------|----------|----|--------|
|                | Qty.      | Size x Length | Nm.               | in. lbs. | mm | inches |
| F102           | 6         | M6 x 20 mm    | 10                | 89       | 5  | .20    |
| F202/F203      | 8         | M6 x 30 mm    | 10                | 89       | 5  | .20    |
| F302/F303      | 8         | M6 x 30 mm    | 10                | 89       | 6  | .24    |
| F402/F403      | 8         | M8 x 30 mm    | 25                | 221      | 6  | .24    |
| F602/F603      | 8         | M10 x 35 mm   | 49                | 434      | 6  | .24    |

## Removal of Reducer with a "WF" Bushing

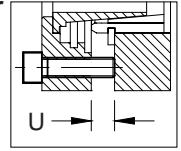
1. Remove all capscrews.
2. Mount two (2) capscrews into the two tapped holes of the Flanged Cone Assembly to push against the Pressure Ring and release pressure between the Flanged Cone and the Tapered Cone.
3. Remove the reducer from the machine shaft using a crane or hoist.





# "WF" Bushing with "F" Series MGS Reducer Double Sided Bushing Installation Instructions

ATTENTION: The gap from the Pressure Ring to the Flanged Cone Assemblies is determined by 2 hollow head "spacer bolts". This gap should remain the "U" dimension as shown until the unit is mounted onto the shaft.



## Assembly of Double Sided "WF" Bushing

The double bushing is shipped as a kit. There is a Support Flanged Cone Assembly and a Clamp Flanged Cone Assembly. The Support Flanged Cone Assembly is the bushing with the coating on the cone. DO NOT use cleaner on the coated cone.

1. Clean the Tapered Cone and the quill counterbore. Press the Tapered Cone into the quill. Be sure to install the cone with the smaller diameter toward the inside.
2. **The Support Flanged Cone Assembly must be installed on the machine side of the reducer.**

Install the Support Flanged Cone Assembly with its slot opposite (180°) the slot of the Tapered Cone already installed. Insert the capscrews and tighten **ONLY** hand tight.

### DO NOT REMOVE THE SPACER BOLTS.

3. Repeat the above procedure for mounting the Clamp Flanged Cone Assembly on the other side.

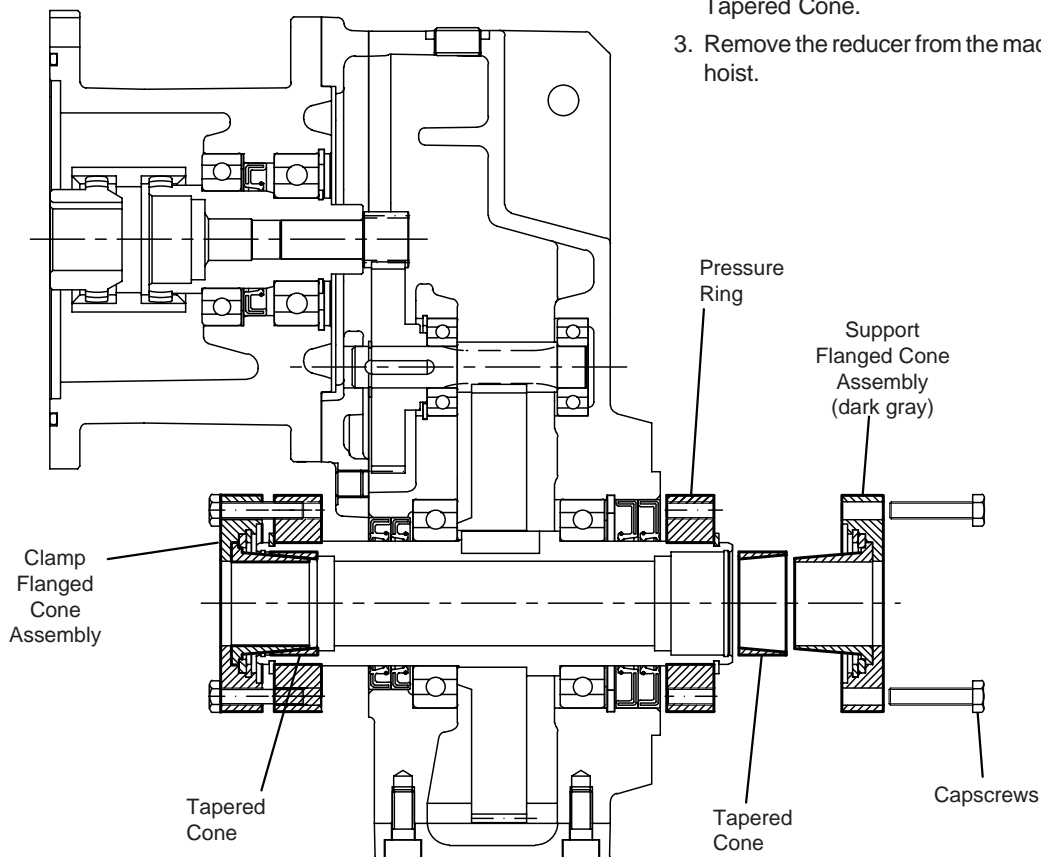
## Installation of Reducer onto a Shaft

1. Clean the machine shaft. **WARNING: Shaft must be free of grease for bushing to clamp properly.**
2. Guide the shaft through the bore of the quill until it reaches but does not protrude through the end of the clamp ring on the clamp side.
3. Remove the spacer bolts.
4. **TIGHTEN CLAMP SIDE FIRST.** Tighten all capscrews to the torque shown in Table No. 1. Use a torque wrench. The tightening should be done gradually in a rotating sequence and will require more than one (1) rotation to tighten properly.
5. Tighten all Capscrews on the Support Side.

**After two (2) hours (minimum) running time, check capscrews and retighten to the specified torque, if necessary.**

## Removal of Reducer with a "WF" Bushing

1. Remove all clamp and support side bushing capscrews.
2. Mount two (2) capscrews into the two tapped holes of the Flanged Cone Assemblies to push against the Pressure Ring and release pressure between the Flanged Cone and the Tapered Cone.
3. Remove the reducer from the machine shaft using a crane or hoist.



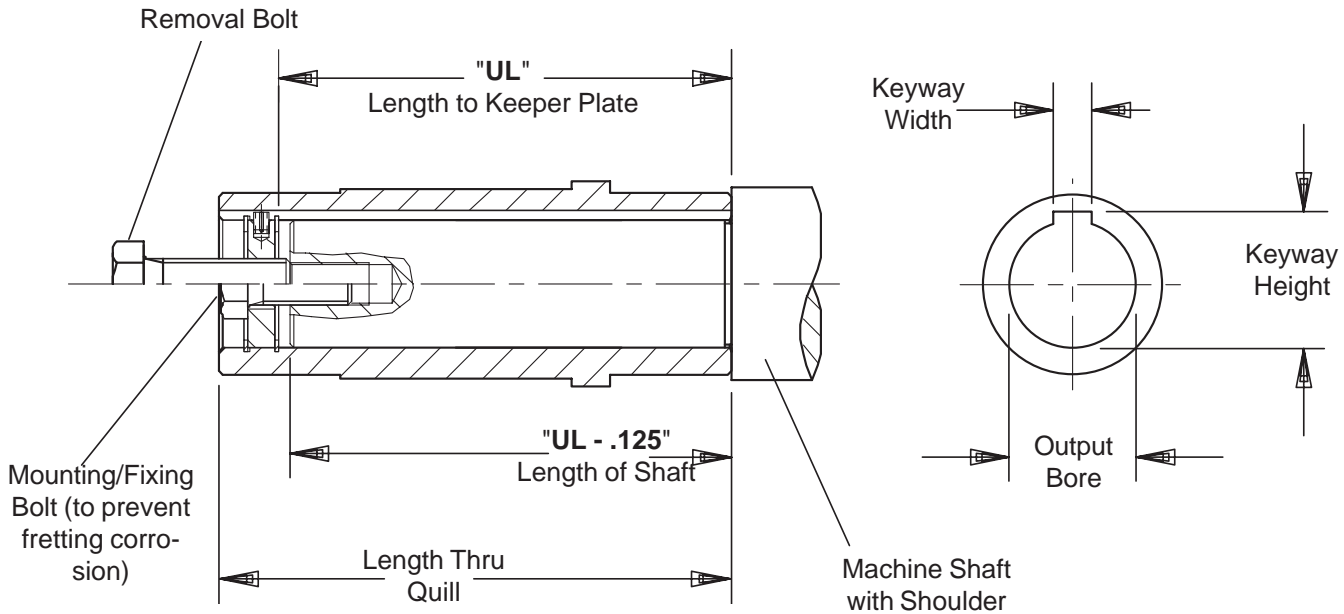
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# "F" Series – Offset Helical MGS Reducer Installation of Hollow Output



## Mounting Hollow Output Reducers

A STÖBER hollow output reducer can be mounted from either side. The tolerance for the hollow bore is shown in the table below and the shaft should be toleranced to fit this bore accordingly.

A keeper plate inside the quill is provided with each unit to prevent axial movement. This keeper plate is held in place with snap rings and can be easily removed for location on either end. A spring pin in the keeper plate mounts into the keyway of the quill and prevents rotation. The keeper plate center hole is tapped to fit the removal bolt.

Before installation, brush the inside of the quill with rust inhibiting grease. When mounting the unit onto the shaft, avoid hammering as this may damage the bearings. Do not mount the reducer dry as removal may be impossible.

The drawing above shows a mounting or fixing bolt and a removal bolt. The mounting/fixing bolt should be smaller in size than the removal bolt. See Table No. 2.

To use the keeper plate with a mounting/fixing bolt, drill and tap the end of the shaft that will be mounted into the reducer. Insert the mounting/fixing bolt through the keeper plate and thread into the shaft end. The machine shaft length should not be longer than the "UL" dimension. A shaft length of "UL minus .125" will allow the shaft shoulder to pull against the face of the quill of the reducer.

## Removal of Hollow Output Reducers

To dismantle the unit from the shaft, remove the mounting bolt. Thread the removal bolt into the keeper plate to press against the shaft and loosen the shaft from the unit. Removal of the reducer will be easier if the quill is greased before installation.

**Table No. 1** Hollow Output Bore Tolerance

| Bore Range  | Tolerance       |
|-------------|-----------------|
| .39 — .71   | +0.0007/-0.0000 |
| .71 — 1.18  | +0.0008/-0.0000 |
| 1.18 — 1.97 | +0.0010/-0.0000 |
| 1.97 — 3.15 | +0.0012/-0.0000 |

**Table No. 2**

| Base Module | Output Bore | UL   | Removal Bolt |
|-------------|-------------|------|--------------|
| F102        | .7500       | 2.87 | 3/8-16 NC    |
| F202/F203   | 1.0000      | 3.62 | 1/2-13 NC    |
| F302/F303   | 1.2500      | 4.06 | 1/2-13 NC    |
| F402/F403   | 1.5000      | 4.49 | 3/4-10 NC    |
| F602/F603   | 2.0000      | 5.63 | 3/4-10 NC    |





# Terms and Conditions of Sale

1. **GENERAL.** All orders for products supplied by STOBER DRIVES INC. ("STOBER") shall be subject to these terms and conditions of sales. All transactions shall be governed by the laws of the Commonwealth of Kentucky. No modifications hereto will be binding unless agreed to in writing by STOBER.

2. **CUSTOMER.** The term "Customer," as used herein, means the distributor, resale dealer, original equipment manufacturer or first end-user customer that purchases the STOBER products.

3. **WARRANTY.** STOBER products shall be free from defects in material and workmanship for a maximum of 5-years (single shift operation or 30 months multiple shift operation) for ServoFit products; 3-years (single shift operation or 18 months multiple shift operation) for MGS products; 2-years (single shift operation or 12 months multiple shift operation) for TD products, from the date of shipment to the Customer. For ServoFit products, all normal wear items, including oil seals and bearings, shall be covered for a period of 2-years (single shift operation or 12 months multiple shift operation). In the event that a product proves to be defective, STOBER's sole obligation shall be, at its option, to repair or replace the product. The repaired or replacement product will be shipped F.O.B. STOBER's facilities, freight prepaid by STOBER.

No employee, agent or representative of STOBER has the authority to waive, alter, vary or add to the terms hereof without the prior written approval of an officer of STOBER. It is expressly agreed that (a) this section constitutes the final expression of the parties' understanding with respect to the warranty and (b) this section is a complete and exclusive statement of the terms of the warranty.

STOBER shall have no obligation under the warranty set forth above in the event that:

- (a) The Customer fails, within the warranty period to notify STOBER in writing and provide STOBER with evidence satisfactory to STOBER of the alleged defect within five (5) days after it becomes known to the customer;
- (b) After inspection of a product, STOBER determines, in its sole discretion, that it is not defective in material or workmanship;
- (c) Repair or replacement of a product is required through normal wear and tear;
- (d) Any part in a product or any ingredient contained in a product requires replacement or repair through routine usage or normal wear and tear;
- (e) A product is not maintained or used in accordance with STOBER's applicable operating and/or maintenance manuals, whether by the Customer or any third party;
- (f) A product has been subject to misuse, misapplication, negligence, neglect (including, but not limited to, improper maintenance or storage), accident, catastrophe, improper installation, modification, adjustment, repair or lubrication, whether by the Customer or any third party, without the prior written consent of STOBER. Misuse shall include, but not be limited to, deterioration in a product due to chemical action and wear caused by the presence of abrasive materials;
- (g) The system of connected rotating parts into which the product becomes incorporated is not compatible with the product, or it is not free from critical speed or torsional or other type of vibration within the specified operating range, no matter how induced; or
- (h) The transmitted load and imposed torsional thrust and overhung loads are not within the published capacity limits for the unit sold.

Items manufactured by other parties but installed in or affixed to STOBER's products are not warranted by STOBER and bear only those warranties, express or implied, which are given by the manufacturer of such items, if any.

THE WARRANTY SET FORTH ABOVE IS INTENDED SOLELY FOR THE BENEFIT OF THE Customer AND DOES NOT APPLY TO ANY THIRD PARTY. ALL CLAIMS MUST BE MADE BY THE Customer AND MAY NOT BE MADE BY ANY THIRD PARTY. THIS WARRANTY MAY NOT BE TRANSFERRED OR ASSIGNED, IN WHOLE OR IN PART, BY THE Customer FOR ANY REASON WHATSOEVER. ANY SUCH ATTEMPTED TRANSFER OR ASSIGNMENT SHALL BE NULL AND VOID.

THIS WARRANTY TAKES THE PLACE OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, WHICH ARE HEREBY DISCLAIMED AND EXCLUDED BY STOBER, INCLUDING WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF USE AND ALL OBLIGATIONS OR LIABILITIES ON THE PART OF STOBER FOR DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE USE, REPAIR OR PERFORMANCE OF THE PRODUCTS.

4. **MODIFICATIONS.** STOBER reserves the right, without notice to the Customer, to (a) change the specifications of any product, (b) improve a product in any manner that STOBER deems necessary or appropriate and (c) discontinue the manufacture of any product.

5. **PURCHASE ORDERS.** The Customer will submit purchase orders for the products to STOBER in writing, whether by mail or telefax, which shall set forth, at a minimum: (a) an identification of the products ordered, (b) prices for such products, (c) quantities, (d) requested delivery dates and (e) shipping instructions and shipping addresses.

6. **ACCEPTANCE OF ORDERS.** All purchase orders received from the Customer are subject to acceptance by STOBER in writing.

7. **MODIFICATION OF ORDERS.** No accepted purchase order shall be modified or canceled except upon the written agreement of STOBER and the Customer. Mutually agreed cancellations shall be subject to reasonable charges based upon expenses already incurred by STOBER and commitments made by STOBER. Mutually agreed change orders shall be subject to all provisions of these Terms and Conditions of Sale.

8. **PRICE INCREASES.** STOBER may increase its prices for the products by providing the original purchaser of the products with at least thirty (30) days' prior written notice. Increased prices for products shall not apply to purchase orders accepted prior to the effective date of the price increase unless such orders provide for delivery more than thirty (30) days after the date of acceptance of the order.

9. **PRICING AND DELIVERY TERMS.** In accordance with KRS 355.2-319(1)(b), all products are delivered F.O.B. STOBER's warehouse facility in Maysville, Kentucky, or such other facility as STOBER may designate. Orders are then shipped per Customer's shipping instructions as set forth in Customer's purchase order. **CATALOG PRICING DOES NOT INCLUDE SHIPPING, HANDLING AND TAXES.** Once delivered to a common carrier of the Customer's choosing [or of STOBER's choosing if Customer has failed to specify a common carrier on or before five (5) days prior to the requested delivery date] STOBER shall have no further responsibility for the products and all risk of damage, loss or delay shall pass to the Customer. A handling fee is added to freight costs by STOBER to cover the cost of having to pay the carrier within seven (7) days with the terms with the Customer are net 30. The Customer has the option of shipping collect with our carrier or the carrier of choice.

10. **PAYMENT TERMS.** Net 30 days. All orders will be shipped either prepaid by the Customer or C.O.D., at STOBER's option, unless the Customer has established a previously approved credit line. If STOBER approves a credit line for the Customer, all payments shall be due within thirty (30) days of the date of the invoice. If any invoice is not paid in full within such thirty (30) day

period, then finance charges shall be assessed at the rate of one and one-half percent (1½%) per month (eighteen percent (18%) per year). If such rate is deemed to be usurious at any time, it shall be reduced to the maximum rate permitted by applicable law. STOBER may stop or withhold shipment of products if the Customer does not fulfill its payment obligations. If STOBER is insecure about payment for any reason, STOBER may require full or partial payment in advance and as a condition to the continuation of its delivery of products.

11. **SECURITY INTEREST.** Unless and until the products are paid for in full, STOBER reserves a security interest in them to secure the unpaid balance of the purchase price. The Customer hereby grants to STOBER a power of attorney, coupled with an interest, to execute and file on behalf of the Customer all necessary financing statements and other documents required or appropriate to protect the security interest granted herein.

12. **ACCEPTANCE OF PRODUCTS.** The Customer will conduct any incoming inspection tests as soon as possible upon arrival of the products, but in no event later than ten (10) days after the date of receipt. Any products not rejected by written notice to STOBER within such period shall be deemed accepted by the Customer. STOBER shall not be liable for any additional costs, expenses or damages incurred by the Customer, directly or indirectly, as a result of any shortage, damage or discrepancy in a shipment.

13. **LIMITATION OF REMEDIES.**

- (a) STOBER SHALL NOT BE LIABLE FOR ANY LOSS OR DAMAGE CAUSED BY DELAY IN FURNISHING THE CUSTOMER WITH PRODUCTS.
- (b) IN NO EVENT SHALL STOBER'S LIABILITY INCLUDE ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL LOSSES OR DAMAGES, EVEN IF STOBER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH POTENTIAL LOSS OR DAMAGE.

14. **MADE-TO-ORDER PRODUCTS.** STOBER reserves the right to revoke and amend any price quotations offered to the Customer for made-to-order products, provided that such price quotations have not been accepted by the Customer prior to the date of revocation or amendment.

15. **DIES, TOOLS AND EQUIPMENT.** Charges incurred by the Customer for dies, tools and other equipment shall not confer ownership or the right to possession therein by the Customer. All such dies, tools and equipment shall remain the property of STOBER, and STOBER shall have the exclusive right to possession thereof. STOBER shall maintain such tools and equipment in good working order.

16. **REGULATORY LAWS AND STANDARDS.** STOBER makes no representation that its products conform to state or local laws, ordinances, regulations, codes or standards except as may be otherwise agreed to in writing by STOBER.

17. **SIZES AND WEIGHTS.** STOBER's products are made only in the sizes and to the specifications set forth in its catalogs and other literature. If any alteration is requested, such altered product will be treated as a made-to-order item. STOBER assumes no responsibility for typographical errors which may appear in its catalogs or literature, and cannot accept alteration charges caused by such errors. Since weights shown in STOBER's catalogs are approximate, they cannot be used in determining freight allowances set forth in its catalogs and other literature. Freight allowances will be determined at the time of shipment and shall be based on actual shipping weight.

18. **SYSTEM DESIGN.** Responsibility for system design to ensure proper use and application of STOBER's products within their published specifications and ratings rests solely with the Customer. This includes, but is not limited to, an analysis of loads created by torsional vibrations within the entire system, regardless of how induced.




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|   |                        |            |
|---|------------------------|------------|
| Part No.  |                        |            |
| Serial No.  | Date Code              |            |
| Oil Capacity in Ozs./Liters   | Output Torque in ./lb. |            |
| Input HP/kW   | Input RPM              | Output RPM |
| Customer Information  | Ratio : 1              |            |
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