

**GROVE GEAR**

***TorqueLine***<sup>TM</sup>  
*Helical Inline Drives*



**Installation,  
Lubrication and  
Maintenance  
Instructions**

**CONGRATULATIONS!**



Your decision to purchase a world class reducer from Grove Gear will provide you with many years of trouble-free service if you adhere to the following installation and maintenance instructions.

## IMPORTANT INFORMATION



Please Read Carefully



The following  and  information is supplied to you for your protection and to provide you with many years of trouble free and safe operation of your Grove Gear product.

Read **ALL** instructions prior to operating reducer. Injury to personnel or reducer failure may be caused by improper installation, maintenance or operation.



- Written authorization from Grove Gear is required to operate or use reducers in man lift or people moving devices.
- Check to make certain application does not exceed the allowable load capacities published in the current catalog.
- Buyer shall be solely responsible for determining the adequacy of the product for any and all uses to which Buyer shall apply the product. The application by Buyer shall not be subject to any implied warranty of fitness for a particular purpose.
- For safety, Buyer or User should provide protective guards over all shaft extensions and any moving apparatus mounted thereon. The User is responsible for checking all applicable safety codes in his area and providing suitable guards. Failure to do so may result in bodily injury and/or damage to equipment.
- Hot oil and reducers can cause severe burns. Use extreme care when removing lubrication plugs and vents.
- Make certain that the power supply is disconnected before attempting to service or remove any components. Lock out the power supply and tag it to prevent unexpected application of power.
- Reducers are not to be considered fail safe or self-locking devices. If these features are required, a properly sized, independent holding device should be utilized. Reducers should not be used as a brake.
- Any brakes that are used in conjunction with a reducer must be sized or positioned in such a way so as to not subject the reducer to loads beyond the catalog rating.
- Lifting supports including eyebolts are to be used for vertically lifting the gearbox only and no other associated attachments or motors.
- Use of an oil with an EP additive on units with backstops may prevent proper operation of the backstop. Injury to personnel, damage to the reducer or other equipment may result.
- Overhung loads subject shaft bearings and shafts to stress which may cause premature bearing failure and/or shaft breakage from bending fatigue, if not sized properly.



- Test run unit to verify operation. If the unit tested is a prototype, that unit must be of current production.
- If the speed reducer cannot be located in a clear and dry area with access to adequate cooling air supply, then precautions must be taken to avoid the ingestion of contaminants such as water and the reduction in cooling ability due to exterior contaminants.
- Mounting bolts should be routinely checked to ensure that the unit is firmly anchored for proper operation.

In the event of the resale of any of the goods, in whatever form, Resellers/Buyers will include the following language in a conspicuous place and in a conspicuous manner in a written agreement covering such sale:

The manufacturer makes no warranties or representations, express or implied, by operation of law or otherwise, as to the merchantability or fitness for a particular purpose of the goods sold hereunder. Buyer acknowledges that it alone has determined that the goods purchased hereunder will suitably meet the requirements of their intended use. In no event will the manufacturer be liable for consequential, incidental or other damages. Even if the repair or replacement remedy shall be deemed to have failed of its essential purpose under Section 2-719 of the Uniform Commercial Code, the manufacturer shall have no liability to Buyer for consequential damages.

Reseller/Buyers agree to also include this entire document including the warnings and cautions above in a conspicuous place and in a conspicuous manner in writing to instruct users on the safe usage of the product.

This information should be read together with all other printed information supplied by Grove Gear.

# General Operation / Installation

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## General Operation

1. Run the motor which drives the reducer and check the direction of reducer output rotation. Consult motor nameplate for instructions to reverse the direction of rotation.
2. Attaching the load: On direct coupled installations, check shaft and coupling alignment between speed reducer and loading mechanism. On chain/sprocket and belt/pulley installation, locate the sprocket or pulley as close to the reducer as possible to minimize overhung load. Check to verify that the overhung load does not exceed specifications published in the catalog.

**⚠ WARNING** Overhung loads subject shaft bearings and shafts to stress which may cause premature bearing failure and/or shaft breakage from bending fatigue, if not sized properly.

3. **⚠ WARNING** High momentum loads: If coasting to a stop is undesirable, a braking mechanism should be provided to the speed reducer output or the driven mechanism. **The reducer should not be used as a brake.**

**⚠ CAUTION** The system of connected rotating parts must be free from critical speed, torsional or other type vibration, no matter how induced. The responsibility for this system analysis lies with the purchaser of the speed reducer.

## Installation

1. Mount the unit to a rigid flat surface using grade 5 or higher fasteners. The mounting fasteners should be the largest standard size that will fit in the base mounting hole. Shim as required under flange or base feet which do not lie flat against the mounting surface.
2. For shipment, pipe plugs are installed in the unit and a vent plug is packed separately. After mounting the unit in position, remove the appropriate pipe plug and install the vent plug in the location shown on page 5. On quad reduction units both the primary and the secondary housings must be vented. Failure to vent the unit can cause premature seal wear or loss of seal and oil. These conditions are not covered by warranty. Check for correct oil level. Contact the factory for level and vent recommendations on non-standard mounting positions.
3. Connect motor to speed reducer. Check to ensure that the voltage range specified on the motor corresponds to the supply voltage. Wiring instructions are normally given on the motors, but if in doubt, reference should be made to the particular manufacturer's handbook.

**⚠ CAUTION** If the mounting position is changed, the oil quantity must be adjusted to obtain the proper oil level per these Lubrication Instructions. Mounting position must be one shown on page 5. Consult the factory if you are not certain of the correct oil level or quantity. Consult the factory for mounting positions not shown.

**⚠ CAUTION** Do not operate the reducer without making sure it contains the correct amount of oil. Do not overfill or underfill with oil, or injury to personnel, reducer or other equipment may result.

**⚠ CAUTION** A unit cannot be used as an integral part of a machine superstructure which would impose additional loads on the unit other than those imposed by the torque being transmitted either through a shaft-mounted arrangement, or any shaft mounted power transmitting device. (*e.g. sprockets, pulleys, couplings*)

**⚠ CAUTION** For safe operation and to maintain the unit warranty, when changing a factory installed fastener for any reason, it becomes the responsibility of the person making the change to properly account for fastener grade, thread engagement, load, tightening torque and the means of torque retention.

**⚠ CAUTION** When the gear units are used in conjunction with any auxiliary equipment, care must be taken to ensure proper alignment is achieved.

**⚠ CAUTION** Use a flexible coupling with this gear unit. Do not use a solid coupling. Any coupling, pulley, gear wheel or sprocket fitted to the shaft of this unit must be fitted by utilizing the tapped hole provided in the final shaft. It must **NOT** be driven on as this may cause internal damage to gears and bearings.

# Lubrication

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## Lubrication

All standard reducers ordered from the factory are filled with lubricant to the correct level for the mounting position specified to operate within a 30° to 125° F ambient temperature range. Quad reduction units have separate oil sumps and must be filled/checked independently. Prior to startup, verify that the oil is at the level shown on the drawings on pages 6 and 7. If the ambient temperature will be outside the range for the lubricant installed at the factory, drain and refill the reducer with the proper viscosity lubricant prior to use.

**CAUTION** If the mounting position is changed, the oil quantity must be adjusted to obtain the proper oil level per these Lubrication Instructions. Mounting position must be one shown on pages 6 and 7. Consult the factory if you are not certain of the correct oil level or quantity. Consult the factory for mounting positions not shown.

**CAUTION** In the Food and Drug Industry (including animal food), consult the lubrication supplier for recommendation of lubricants which are acceptable to the Food and Drug Administration and/or other authoritative bodies having jurisdiction. Factory supplied oil is not suitable for these applications or this industry.

**CAUTION** Do not mix different oils in the reducer. Oil should be compatible with Nitrile seal material.

**WARNING** Use of an oil with an EP additive on units with backstops may prevent proper operation of the backstop. Injury to personnel, damage to the reducer or other equipment may result.

**Change Intervals:** After the first 500 hours or one month in service, whichever comes first, drain the oil from the reducer. Flush and refill with new oil. TorqueLine units utilize extreme pressure lubricants which protect the teeth in the event of the oil thinning out due to local temperature rise, or high pressure due to accidental overloads. These oils are liable to form sludge after continuous service. The oil should be changed after every 1500 hours of operation, or more often as conditions may dictate. The grades of oil shown below are for normal conditions of duty and ambient temperature. High ambient temperatures cause the oil to thin out and reduce its protective qualities. In such cases it will be necessary to utilize heavier grades than shown. Conversely, low temperatures will necessitate a thinner grade, otherwise trouble may be experienced with burning out of motors at starting. In this connection, the pour point of the oil must be less than the lowest ambient temperature to be encountered.

The precision-made gears and bearings in Grove Gear Speed Reducers require high-grade lubricants of the proper viscosity to maintain trouble-free performance. For best results, use lubricants on the following chart for TorqueLine gear reducers for ambient temperatures of 30° to 125° F.

Mobil Corporation	Chevron Corporation	Texaco Inc.	Citgo Petroleum Corporation	Shell Group of Companies	Castrol Limited
Mobilgear 630	Gear Compound EP ISO220	Meropa 220	EP Compound 220	Omala 220	Alpha SP220

## Approximate Oil Capacities Double Reduction (Pints)

Model Type	Mounting Position	7172	8272	8372	8472	UNIT SIZE					
						8572	8672	8772	8872	8972	81072
C-Frame or Gearmotor Style	B3 & B5 Floor	Permanently Grease Lubed	1.0	1.0	1.6	1.6	3.3	4.3	6.8	16.9	22.5
	B8 Ceiling		1.8	1.8	3.0	3.0	5.2	7.4	11.4	20.1	28.4
	B6 & B7 Wall		1.5	1.5	2.3	2.3	4.2	6.1	10.1	19.6	25.5
	V5 & V1 Vertical		1.4	1.4	2.5	2.5	4.0	5.5	10.0	13.6	19.4
Shaft Input Style	B3, B5 Floor		1.0	1.0	1.6	1.6	3.3	4.3	6.8	16.9	22.5
	B8 Ceiling		2.2	2.2	3.1	3.1	5.4	7.8	13.2	23.3	33.3
	B6 & B7 Wall		1.6	1.6	2.4	2.4	4.2	6.1	11.0	21.6	30.0
	V5 & V1 Vertical		1.4	1.4	2.5	2.5	4.0	5.5	10.0	13.6	19.4

# Lubrication & Mounting Positions

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## Approximate Oil Capacities Triple Reduction (Pints)

Model Type	Mounting Position	7173	8273	8373	UNIT SIZE						
					8473	8573	8673	8773	8873	8973	81073
C-Frame or Gearmotor Style	B3 & B5 Floor	Permanently Grease Lubed	2.0	2.0	4.1	4.1	6.1	8.1	11.6	29.6	39.4
	B8 Ceiling		2.0	2.0	4.2	4.2	5.9	7.6	11.8	20.3	29.0
	B6 & B7 Wall		1.7	1.7	3.0	3.0	4.3	5.5	10.1	19.6	25.5
	V5 & V1 Vertical		2.8	2.8	4.7	4.7	7.1	9.5	15.8	21.7	30.0
Shaft Input Style	B3, B5 Floor		2.0	2.0	4.1	4.1	6.1	8.1	11.6	29.6	39.4
	B8 Ceiling		2.2	2.2	4.3	4.3	6.4	8.6	12.9	22.3	31.0
	B6 & B7 Wall		1.9	1.9	3.1	3.1	5.1	7.1	10.8	20.6	26.5
	V5 & V1 Vertical		2.8	2.8	4.7	4.7	7.1	9.5	15.8	21.7	30.0

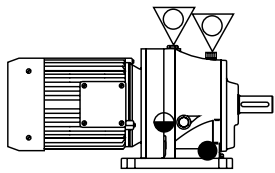
## Approximate Oil Capacities Quad Reduction (Pints)

Quad reduction units are compound units, and the primary and secondary units are filled separately. Refer to the model table below and use the oil capacities in the table above.

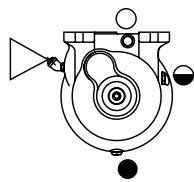
Unit Size	8474	8574	8674	8774	8874	8974	81074	
Primary Unit Size	8372	8372	8372	8572	8772	8872	8872	(use primary oil capacities for desired Input type)
Secondary Unit Size	8472	8572	8672	8772	8872	8972	81072	(use secondary oil capacities for C-Frame Input)

## Mounting Positions

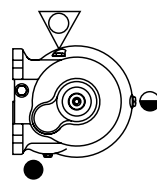
### Foot Mounted Reducers and Gearmotors



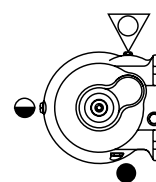
B3 - Standard Floor



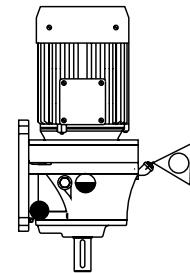
B8 - Ceiling



B6 - LH Wall

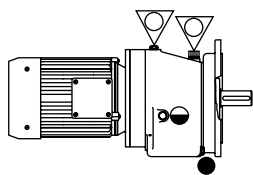


B7 - RH Wall

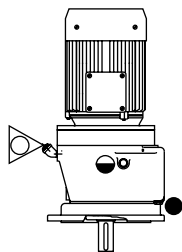


V5 - Vertical Down

### Flange Mounted Reducers and Gearmotors



B5 - Horizontal



V1 - Vertical Down

16 oz. = 1 pint  
 2 pints = 1 quart  
 4 quarts = 1 gallon  
 1 gallon = 128 oz. = 231 cu. in.

**CAUTION** Always check for proper oil level after filling. Capacities vary somewhat with model and mounting position. Oil should rise to the center of the sight gage. Do not overfill.

Breather ○ Filler ▽ Filler/Breather ▽ Level ● Drain ●

# Mounting Positions, Fill, Level & Drain

# GROVE GEAR

FOOT MOUNT DOUBLE REDUCTION	
GEARMOTOR & MOTORIZED REDUCER	SHAFT INPUT
<p>4042-4072 4082-4102</p> <p>B3 - Standard Floor</p>	<p>4042-4072 4082-4102</p> <p>4092 4102 (OPPOSITE SIDE)</p> <p>B3 - Standard Floor</p>
<p>4082 (OPPOSITE SIDE)</p> <p>V5 - Vertical Down</p>	<p>4092 4102 (OPPOSITE SIDE)</p> <p>4082 (OPPOSITE SIDE)</p> <p>V5 - Vertical Down</p>
<p>B6 - LH Wall</p>	
<p>B7 - RH Wall</p>	
<p>B8 - Ceiling</p>	

FOOT MOUNT TRIPLE REDUCTION	
GEARMOTOR & MOTORIZED REDUCER	SHAFT INPUT
<p>4083-4103 4043-4073</p> <p>B3 - Standard Floor</p>	<p>4083-4103 4043-4073</p> <p>B3 - Standard Floor</p>
<p>V5 - Vertical Down</p>	<p>V5 - Vertical Down</p>
<p>B6 - LH Wall</p>	
<p>B7 - RH Wall</p>	
<p>B8 - Ceiling</p>	

BREATHER ○ FILLER ▽ FILLER/BREATHER ▽ LEVEL ● DRAIN ● GREASE ZERK □ (4092-4102 SHAFT INPUT)

# Mounting Positions, Fill, Level & Drain

# GROVE GEAR

FLANGE MOUNT DOUBLE REDUCTION	
GEARMOTOR & MOTORIZED REDUCER	SHAFT INPUT
<p>4082-4102      4042-4072</p> <p>B5 - Horizontal</p>	<p>4082-4102      4042-4072</p> <p>4092 4102</p> <p>B5 - Horizontal</p>
<p>V1 - Vertical Down</p>	<p>4092 4102</p> <p>V1 - Vertical Down</p>
FLANGE MOUNT TRIPLE REDUCTION	
GEARMOTOR & MOTORIZED REDUCER	SHAFT INPUT
<p>4083-4103      4043-4073</p> <p>B5 - Horizontal</p>	<p>4083-4103      4043-4073</p> <p>B5 - Horizontal</p>
<p>V1 - Vertical Down</p>	<p>V1 - Vertical Down</p>

BREATHER ○    FILLER ▽    FILLER/BREATHER ▽    LEVEL ●    DRAIN ●    GREASE ZERK □  
 (4092-4102 SHAFT INPUT)

# Maintenance

# GROVE GEAR

## Maintenance

Your Grove Gear reducer has been tested and adjusted at the factory. Dismantling or replacement of components must be done by Grove Gear to maintain the warranty.

Frequently check the oil level of the reducer. If oil level is low, (refer to reducer vent and level position chart) add proper lubrication through the filler plug until it comes to the center of the sight gage.

Inspect vent plug often to insure it is clean and operating.

**CAUTION** Mounting bolts should be routinely checked to ensure that the unit is firmly anchored for proper operation.

**Seals:** The Grove Gear line of speed reducers utilize premium quality seals which are the state-of-the-art in sealing technology. Seals are, however, a wear item and eventually need to be replaced. Replacement can be easily accomplished by following the steps below:

1. **WARNING** Lock out and tag out the reducer's power source.
2. **CAUTION** Remove any load from the input and/or output shafts of the reducer prior to disconnecting any drive components.
3. Remove appropriate drive components to gain access to seal to be replaced.
4. Drain oil if seal is below oil level.
5. Remove the worn seal without damaging the shaft surface or the seal bore. This can be done by puncturing an approximate .062 diameter hole in the seal casing using an awl (being careful not to strike the bearing behind the seal). Screw a #10 sheet metal screw into the hole and pry out the seal.
6. Clean the seal bore of sealant.
7. Before installing the new seal, use electrical tape to cover any keyways on the shaft to prevent seal lip damage.
8. Grease the seal lips with bearing grease and apply a sealant to the seal bore in housing or cover.
9. Slide the seal onto the shaft being careful not to fold the inner lip over on any shaft steps.
10. Press the seal into its bore with a sleeve that presses on the seal casing, being careful to keep the seal square in its bore.
11. Refill reducer to proper level with appropriate lubricant.
12. Reconnect any drive components disconnected in Step 3. Make sure components are properly aligned.

## Class of Service

All capacity ratings are based on proper application of American Gear Manufacturers Association (AGMA) service factors as given on pages A6 and E2 of the TorqueLine Catalog. Load conditions must be within cataloged ratings published in the current Grove Gear Catalog (available upon request).

**Warranty From Grove Gear** - See catalog page E13 for warranty terms and conditions.

For more information contact:

# GROVE GEAR

5970G/1K/8-07/BH/BP