

Lubrication

Series W Servo gearboxes are factory filled with synthetic lubricant. They require no lubrication service throughout the life of the unit. Series W Servo gearboxes are built for universal mounting; ready to mount in any position.

Installation

MOTOR ON GEARBOX:

1. Clean motor shaft and mating surfaces of the motor and gearbox to ensure they are dust free.
2. Slide the motor shaft into the coupling clamp ring until the gearbox and motor flanges are seated together. Install bolts to clamp the gearbox and motor flanges together.
3. Tighten the clamp ring screw through the access slot in the gearbox flange to the following torque settings:

	UNIT SIZE				
	W38	W51	W64	W76	W89
lb. in.	90	90	160	160	350
Nm.	10	10	18	18	40

4. Replace the urethane plug in the access slot.

HOLLOW SHAFT UNITS:

1. Place key in driven shaft.
2. Slide hollow shaft unit onto the driven shaft.
3. Secure unit to machine base using either a mounting base or torque arm.

SOLID SHAFT UNITS:

1. The gearbox must be securely mounted to a rigid flat foundation or base plate. If necessary, shim under the gearbox to provide a flat mounting surface.
2. Four mounting bolts are required to mount all gearboxes. If the gearbox will be subjected to heavy overhung load or thrust loading, heat treated mounting bolts must be used to prevent stretching and loosening of the bolts.
3. The output shaft of the gearbox should be coupled to the driven shaft with a flexible coupling and the gearbox aligned with the shaft, within $\pm .001$ ". Solid or rigid couplings should be avoided. Failure to properly align shafts and the use of solid couplings can result in excessive coupling and bearing wear, shaft deflection and eventual failure of one or more of the components.

ANCILLARY COMPONENTS:

1. Couplings, sheaves and sprockets should be mounted on the reducer shafts carefully. Do not pound or hammer them onto the shafts as this will damage bearings and oil seals.
2. Sprockets and sheaves should be mounted as close to the gearbox as possible and "V" belts and chains adjusted to the proper tension to keep bearing loading and shaft deflection to a minimum. Too much tension in belts and improper location of sheaves and sprockets will lead to excessive overhung load, bearing wear and shaft deflection. For specific information on overhung load capacity, shaft stress, and bearing life, please contact Cone Drive.

Start-Up

1. After the gearbox has been properly mounted and aligned, it is ready for start-up.
2. Make sure driven machine is clear of all obstructions and all safety guards and covers are in place. If possible, turn motor shaft by hand to confirm drive system is operating freely and in correct direction of rotation.
3. Jog motor to confirm proper rotation.
4. Operate gearbox with minimum load for approximately 15 minutes (in both directions if applicable) to seal gears, bearings, and oil seals.

Operation

1. All gearboxes require a "run-in" period under load to achieve optimum efficiency. During this initial run-in the gearbox will probably run warmer than normal and draw more current than after the run-in period. Gearboxes operating at a very low load or speed will take much longer to run-in and even if operated continuously at low load or speed may never achieve the efficiency that they would if operated at or near their catalog rating.
2. IMPORTANT: Normal gearbox operating temperature measured at the oil sump area of the housing should not exceed 100°F above ambient temperature or 210°F maximum. If the gearbox operating temperature exceeds these limits, shut down the unit and contact Cone Drive. Excessive oil sump temperature is indicative of overloading, misalignment, or improper or marginal lubrication. Continuous operation of the gearbox with the oil sump temperature above will result in failure of the gearbox.

Maintenance

1. If a gearbox has to be repaired, contact Cone Drive for detailed instruction, blueprints, parts lists, etc. If necessary, field service is available.
2. If a gearbox is to be returned, contact Cone Drive for instructions and a returned material authorization (RMA) number.
3. Please have model number information from the unit name plate recorded.

SAFETY PRECAUTIONS

IMPORTANT: In any applications of Cone Drive Products where breakage, damage, disconnection, any other malfunction of any drive train component, or excessive wear could result in personal injury or property damage, a fail-safe device capable of stopping and holding the load in the event of such an occurrence must be incorporated after the drive train.

THE FOLLOWING INFORMATION IS FOR YOUR PROTECTION. DO NOT ATTEMPT TO INSTALL OR OPERATE THIS GEARBOX UNTIL ALL OF THESE INSTRUCTIONS ARE READ AND THOROUGHLY UNDERSTOOD.

SELF-LOCKING

It is a common misconception that all worm gears are self-locking or non-overhauling. Actually, worm gear ratios up to 15:1 will overhaul quite freely. Ratios from 20:1 to 40:1 can generally be considered as overhauling with difficulty (particularly from rest). Ratios above 40:1 may or may not overhaul depending on loading, lubrication, and the amount of vibration present. Cone Drive cannot guarantee any worm gear ratio to be self-locking. There have been instances where single reduction ratios as high as 100:1 have overhauled. Therefore, it is not acceptable to rely on a worm gear to prevent movement in a system. Whenever a load must be stopped or held in place, a positive mechanical device must be incorporated into the system to prevent rotation of the gear set.

BACKDRIVING OR OVERHAULING

Applications such as wheel drives that require a brake on the motor or input shaft to decelerate a high inertial load require special attention to brake selection. Whenever possible, these applications should utilize freely overhauling ratios (15:1 or less). If self-locking ratios are used with a brake, the gear set can, under certain conditions, lock-up during decelerations and impose severe shock loading on the gearbox and driven equipment. Each reduction should be limited to 15:1 or less to allow the gearbox to overhaul. Contact Cone Drive for specific information on backdriving efficiency and brake selection.

RATINGS & SERVICE FACTORS

The horsepower or output torque capacity of this gearbox and the service factor (maximum allowable operating cycle) are documented in the product catalog. These values are not to be exceeded as overloading can result in gearbox failure. Exceeding the rating and duty cycle will void the warranty. Please contact Cone Drive with any questions regarding rating and service factors.

ALTERATION

Do not alter the gearbox without approval from Cone Drive.

OPERATION & REPAIR

This gearbox has moving mechanical components and may have connected electrical devices operating under high voltage. Operation and repair should only be done by qualified personnel.

PROTECTIVE GUARDING

Cone Drive products are furnished without guard covers. It is the responsibility of the purchase or user to provide guards for all exposed shafting, couplings, sprockets, sheaves, belts, chains, clutches, and any other moving parts in accordance with current local, state, and federal requirements.

LOCK-OUT/TAG-OUT

Before servicing a gearbox, the main electrical disconnect or other input power sources must be moved to and locked in the off-position. The person performing the work should post on that disconnect a warning to others not to turn on the power. Loads on the input and output shafts should be disconnected prior to working on the gearbox.

GEARBOX SURFACE IS HOT

It is normal for the gearbox to operate at temperatures up to and exceeding 200°F. To prevent burns, proper personal protective equipment, guards, or shields should be provided by the purchaser or user to prevent personnel from touching the gearbox.