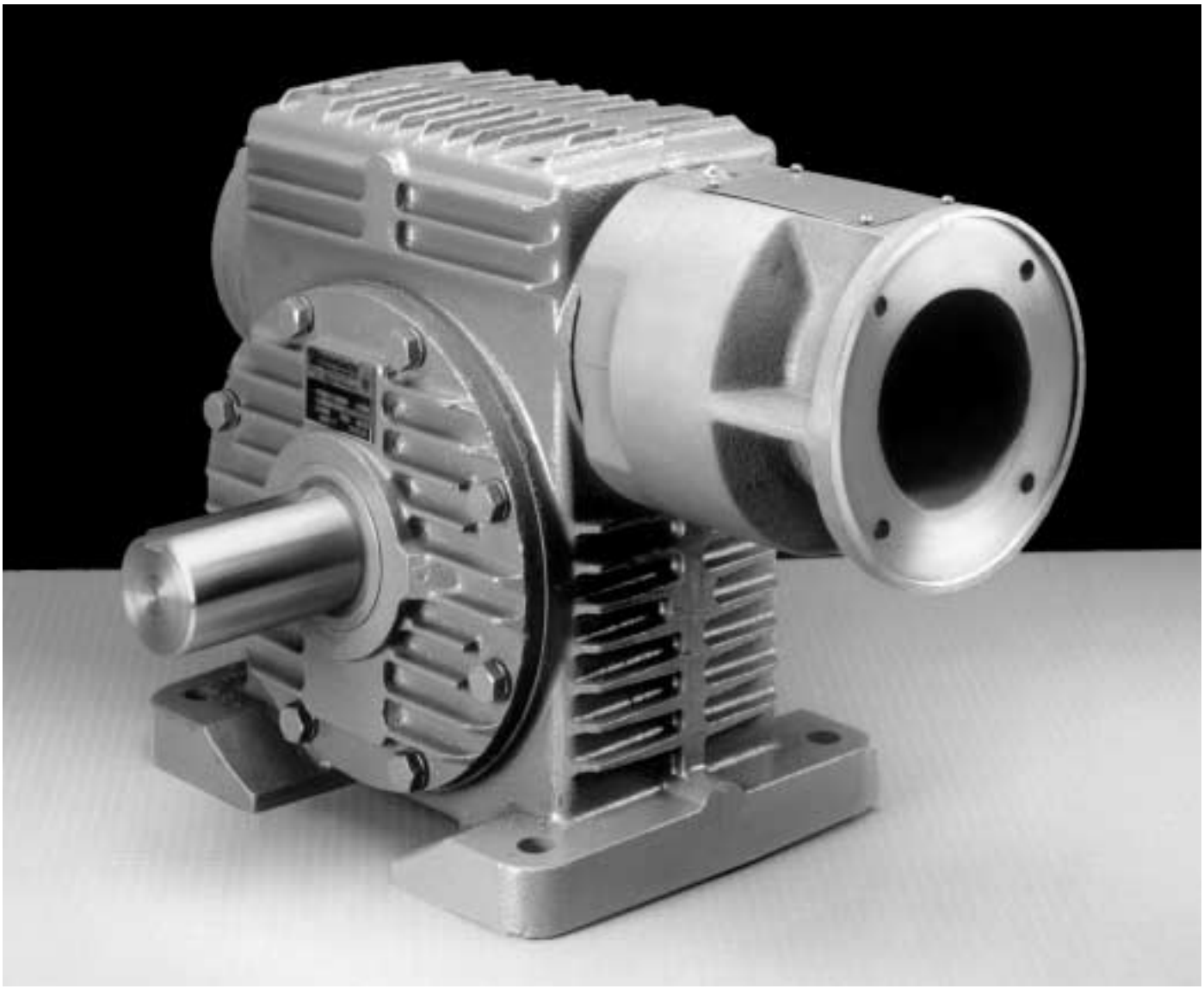
ENGINEERING
SERVICE BULLETIN

ILDE-00

WINSMITH
PEERLESS-WINSMITH, INC.

D-90® TYPE DE® SPEED REDUCERS



Installation, Operation, and Lubrication Instructions

This Engineering Service Bulletin is designed to enable users to obtain the best possible performance from their WINSMITH® Speed Reducers.

I. SELECTION

The selection of the appropriate speed reducer for a given application requires that all factors affecting the operation of the unit be given careful consideration. Service factors must be applied to catalog ratings depending on the type of prime mover used, severity of the application and duration of daily service. If you have any questions relative to the suitability of your WINSMITH® speed reducer for your particular application, refer to the selection section of the appropriate WINSMITH catalog, contact your WINSMITH representative or distributor.

II. INSTALLATION

1. Shaft Alignment

A. The various drive members (motor, speed reducer, couplings, sprockets, sheaves, gears, etc.) should be aligned as accurately as possible to guard against unusual stresses and overloads imposed by misalignment.

B. If a prime mover shaft is to be directly connected to the high speed (input) shaft or if the slow speed (output) shaft is to be directly connected to the driven shaft, flexible couplings should be used. It should be remembered that even flexible couplings have limited ability to accommodate misalignment. Care must be taken at installation to insure that shaft alignments are within the limits recommended by the coupling manufacturer. Use of a rigid coupling to connect speed reducer shafts to other drive components is not recommended as it is almost impossible to obtain exact alignment between two shafts.

C. A common base plate supporting the motor and reducer will help preserve the original alignment between reducer and motor shafts. If a structural steel base is used, the plate should be at least equal in thickness to the diameter of the bolts used to fasten the speed reducer to the base plate. Also, for sufficient rigidity, the design in general including angle or channel members should be substantial enough to prevent flexing under vibration. After the first week or two of operation all of the bolts and nuts used to fasten the reducer and motor, pedestal, etc., to the base plate should be retightened. Vibration tends to loosen the nuts even if tight initially. Dowelling the motor and speed reducer to the base plate will help insure that alignment is maintained.

2. Mounting Positions

Units are built to accommodate one mounting position as specified during order entry. Utility plug locations for standard mounting positions, furnished unless otherwise specified, are shown in Figures 1 and 2. Other mounting positions are considered special and must be specified at the time of order entry. In such cases, outline drawings specific to that mounting provide the utility plug locations. These drawings can be made available on request.

Double reduction models, Figure 2, have an oil level common to both housings and do not use an intermediate oil seal. The vent plug is located in the main housing where the slower worm speed creates less splash.

Grease fittings, as shown in Figures 1 and 2, are used to lubricate bearings when oil splash or reservoir does not serve this purpose.

3. Venting

During operation, the heat generated by the gearbox will cause the air and lubricant inside the unit to expand. A vent plug is used to equalize the resulting pressure, the location of which is dependent on the model and mounting position. Before putting the unit into service, make certain the vent plug is correctly positioned. Figures 1 and 2 are applicable to standard units mounted as shown. Otherwise, special outline drawings will identify the correct vent plug location for non-standard mountings as discussed in item 2 above.

To prevent loss of oil during shipment, the vent plug includes a brass pin which must be removed prior to operation. If a speed reducer is installed in an atmosphere containing exceptional amounts of moisture or dust, a shielded or hooded vent plug should be used. For intermittent duty applications, where the operating temperature does not rise more than about 20 degrees F, internal pressure build-up is minimal and venting is not necessary.

4. C-Flange Motor Mounting Procedures

A. Mounting Motor to C-Flange Reducer With Hollow Input Shaft

Check motor and reducer mounting registers for nicks that would interfere with assembly. Remove if necessary.

Remove protective plastic plug from reducer input shaft. The bore has been coated with an anti-seize compound.

Align the motor shaft and key with keyway in bore and slide motor up to flange.

Position the motor conduit box as desired.

Using the fasteners supplied, secure the motor to the reducer. Draw down evenly so as not to bend the motor shaft. Tighten fasteners to 200 inch pounds.

B. Mounting Motor to C-Flange Reducer With Coupling Adaptor

Check motor and reducer mounting registers for nicks that would interfere with assembly. Remove if necessary.

When assembling the motor and coupling, the coupling halves should be equally spaced on each shaft to insure adequate engagement. The following describes a method for doing this.

First determine the assembled shaft clearance by measuring the distance from the C-Flange face to the reducer shaft end and subtracting the motor shaft length. Mount and secure the motor shaft coupling half hub section, extending one half the clearance distance beyond the motor shaft. Mount the reducer coupling half and coupling spider on reducer shaft in its approximate position but do not secure.

Locate the motor conduit box in the desired position and secure the motor to the reducer flange using the fasteners provided. Tighten to about 200 inch pounds.

Using the access hole in the flange, slide the coupling together and tighten the set screw.

III. LUBRICATION & MAINTENANCE

1. Factory Filling

WINSMITH® double enveloping wormgear speed reducers are filled with synthetic lubricant to the proper level prior to shipment as determined by the mounting position specified on the order. **The oil level should be checked and adjusted (if necessary) prior to operation, using the oil level plug provided and while the unit is oriented in its operating position.** Unless otherwise specified at order entry, the grade of oil is taken from Table I based on a 16-165 degree F. ambient temperature. If the ambient temperature requires a different grade, then refer to Table I and refill the unit with the correct lubricant based on the actual operating conditions.

2. Oil Changing and Bearing Lubrication

A. Oil Type

Performance ratings for this product have been established based on using a synthetic hydrocarbon (SHC) lubricant which optimizes both torque transmission and efficiency. Synthetic lubricants can be advantageous over mineral oils in that they generally are more stable, have longer life, and operate over a wider temperature range. These oils are appropriate for any application, but are especially useful when units are subjected to low start-up temperatures or high operating temperatures. When adding or changing oil, the replacement should be of this type. Mixing mineral oil with the synthetic may have a serious detrimental effect on performance and could result in damage to the internal components. See Table I for recommended oils.

TABLE I—RECOMMENDED LUBRICANT

Ambient Temperature	-30 to 15°F	16 to 165°F
Max. Operating Temperature	185°F	200°F
Recommended Lubricant	Mobil SHC 629 or Equivalent	Mobil SHC 634 or Equivalent

B. Initial Oil Change

The oil in a new speed reducer should be changed or filtered after the first 1500 hours of operation to remove metal particles that accumulate during break-in.

C. Subsequent Oil Changes

Under normal conditions, after the initial oil change, the oil should be changed after every 5000 hours of operation or once per year, whichever occurs first. Under severe conditions (rapid temperature changes, moist, dirty or corrosive environment) it may be necessary to change oil at more frequent intervals. Periodic examination of oil samples taken from the unit will help establish the appropriate interval.

D. Grease Fittings

Some units are equipped with grease fittings to lubricate bearings not adequately lubricated by the oil splash. Because the gearing is lubricated with synthetic oil, the bearings should be lubricated with a synthetic bearing grease such as Mobil Synthetic Universal Grease, Mobilith SHC 100 or a suitable equivalent.

E. General Comments

After any oil change, the oil level of each stage should be rechecked after a short period of operation and adjusted if necessary. When changing oil in double reduction models, each housing stage should be drained and filled independently, even though there may be a common oil level.

3. Long Term Storage or Infrequent Operation

If a speed reducer is to stand idle for an extended period of time, either prior to installation or during use, it is recommended that the unit be filled completely with oil to protect interior parts from rust and corrosion due to internal condensation. Be sure to drain the oil to the proper level before placing the speed reducer in service. A long term storage option is available on new units. Contact the factory for details.

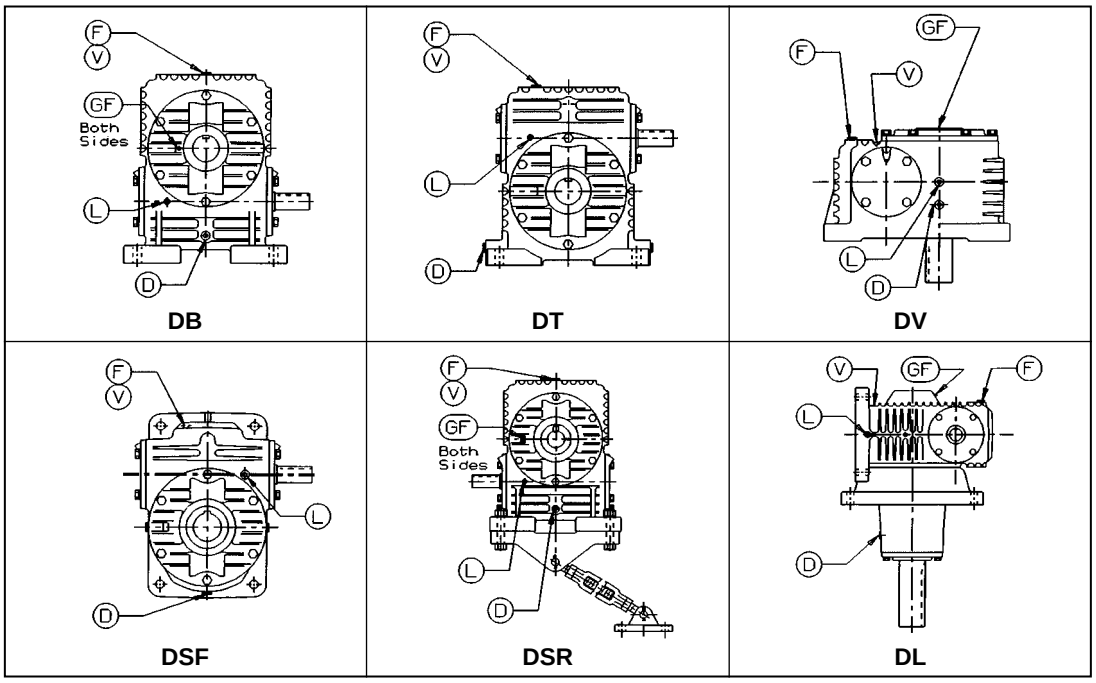
4. Low Input Speeds (Under 1160 RPM)

In double reduction models, when the input speed to the attachment housing is less than 1160 RPM, grease fittings will be required to lubricate any bearing not partially covered by the normal oil level. Such units are considered non-standard and necessitate factory modification. If this condition exists and units are without the appropriate grease fittings, please contact the factory.

5. Oil Temperature

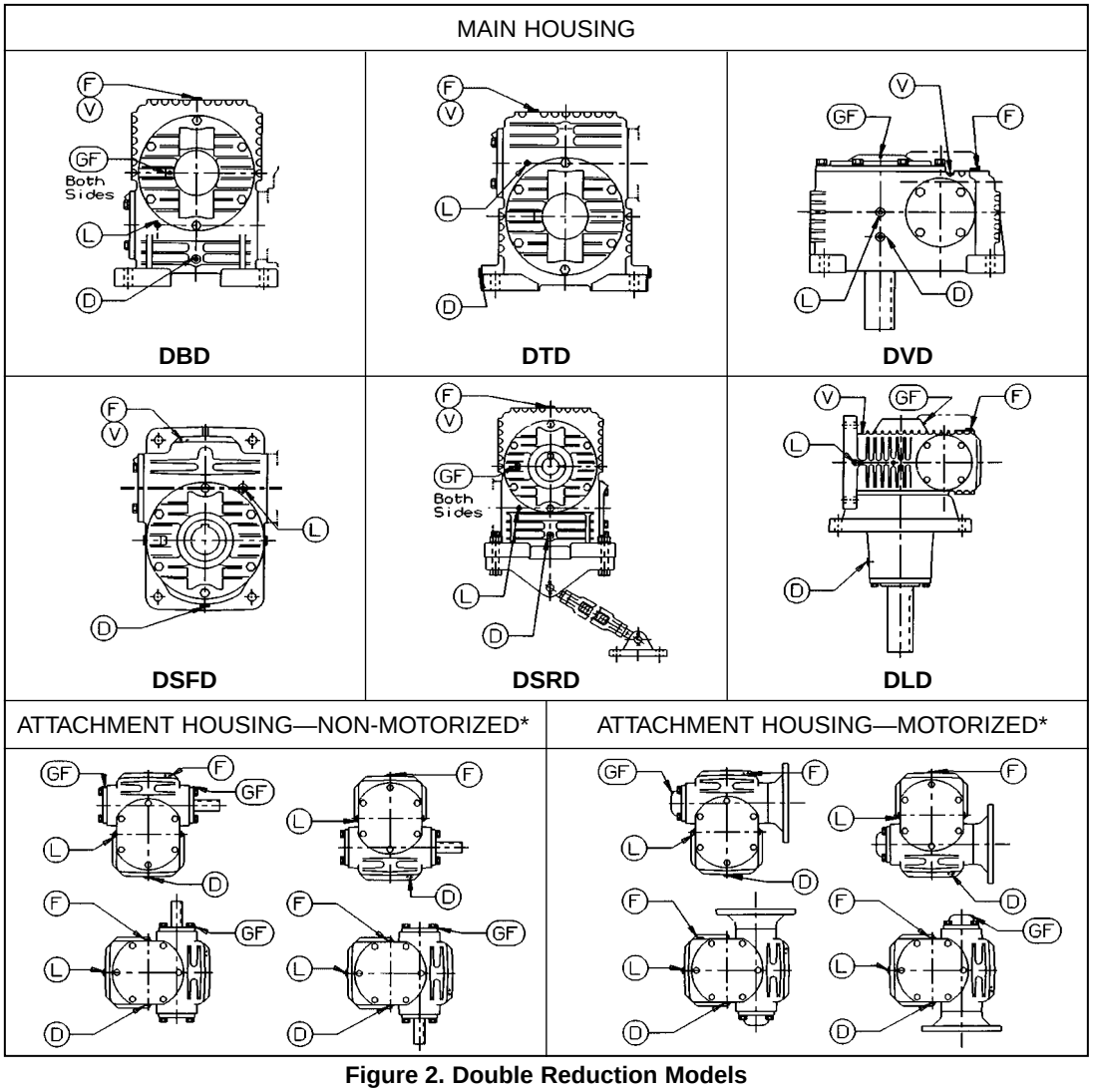
Speed reducers in normal operation can generate temperatures up to 200°F depending on the type of reducer and the severity of the application (loading, duration of service, ambient temperatures). However, continuous operation above 225°F may cause damage to the seals or other components. Excessive oil temperatures may be the result of one or more of the following factors: (See back page.)

STANDARD MOUNTING POSITIONS D-90® TYPE DE®



F Filler
V Vent
L Level
D Drain
GF Grease Fitting

Figure 1. Single Reduction Models



*Contact the factory when input speeds are less than 1160 RPM.

Figure 2. Double Reduction Models

A. Overloads

Overloads may be due to the original unit selection being too small for the application, or increased loads on the speed reducer to a point where its rating is exceeded after it has been in service for a period of time. Always check the speed reducer rating when increasing driven loads or increasing the horsepower rating of the motor or other prime mover.

B. Overfilling or Underfilling

If a speed reducer is overfilled with oil, the energy used in churning the excessive oil can result in overheating. If this occurs, shut down the drive, remove the oil level plug and allow oil to drain until oil ceases to drain from the level hole, reinstall the oil level plug, and restart the drive. If the speed reducer is underfilled, the resultant friction can cause overheating and possible damage. If this occurs, fill the speed reducer to the oil level plug hole and check the gearing for excessive wear.

C. Inadequate Cooling

In order to dissipate internally generated heat, the speed reducer must be installed in such a way that air can circulate freely. Tightly confined areas (inside cabinets, etc.) should be avoided. If this is not possible, forced air cooling by means of a separate blower should be used.

6. Oil Seals

Although WINSMITH® uses high quality oil seals and precision ground shafts to provide a superior seal contact surface, it is possible that circumstances beyond WINSMITH's control can cause oil seal leakage (damage during shipment or installation, etc.) When replacing a shaft oil seal, using the following suggestions will help to insure leak-free operation and long seal life.

A. When installing a new seal, cover the keyway and any other surface discontinuity with smooth tape to protect the seal lip from being damaged.

B. A sealant should be used between the O.D. of the seal and the I.D. of the bore into which the seal is installed. The seal bore should also be free of any burrs, nicks, or scratches.

C. Be sure that the seal is not cocked in the seal bore. The outer face of the seal should be flush with the surface into which it is mounted.

PEERLESS-WINSMITH, INC. MOTORS and GEARING

PEERLESS-WINSMITH, INC. ISO 9001 CERTIFIED

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