UBE

SAFETY BULLETIN

**********C A U T I O N**********

* *

* READ BEFORE OPERATING EQUIPMENT *

* *

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BEFORE STARTING EQUIPMENT.....

1. All guards must be in place.

2. All tools, non essential accessories or equipment, and foreign objects must be removed from the machinery before it is started.

3. All control areas,(i. e., start and stop push buttons, panic guarding, safety guarding) must be clear of all clutter and easily accessible by personnel. Un-obstructed aisles shall be provided on all sides of this equipment.

4. Prior to each start up of the machine, the operator must give a verbal warning and observe that all personnel are clear. Only then should the motor be started.

5. Only a trained operator should be allowed to start the machine.

6. Personnel should not participate in "horseplay" while operating equipment.

GENERAL SAFETY.....

1. Maintenance work must not be done while equipment is in operation. Repairs that may be necessary during production, should be accomplished with the machine out of service.

2. A locking electrical disconnect and locking air disconnects are provided. Any person making repairs must disconnect the electrical power by turning the disconnect handle to "off" and must place a lock on the handle locking it in the off position. This is done by pulling the center piece of the handle outward and placing a padlock through the hole. This person must also disconnect the air by sliding the lockout valve(s) to the closed position and placing a padlock through the hole. That person must be the only one to remove their lock. If electrical testing is necessary, then it should be done with at least two persons.

3. No safety device, safety guard, or safety switch shall be by-passed, artificially tripped, disabled or removed under penalty of prosecution by the manufacturer.

4. Management is responsible to train operating personnel in the safe and efficient operation of the machine. There should be a record of this training. Further, all persons not on the training record should be kept clear of the machine while electrical power or compressed air is connected.

5. The machinery should never be used for anything other than its intended function and not beyond its specified speeds.

6. All surfaces of the equipment should be thoroughly cleaned daily. Guarding should be wiped down. All crumbs and foreign material should be completely removed.

DANGER:

IT IS ESSENTIAL THAT THIS MACHINE BE CONNECTED TO A SUITABLE (10 AWG)

EARTH GROUND.

FAILURE TO DO SO COULD RESULT IN ELECTRICAL SHOCK, SEVERE PERSONAL INJURY OR DEATH.

IT WILL ALSO CAUSE ERRATIC OPERATION AND PREMATURE COMPONENT FAILURE.

SAFETY TIPS

GENERAL SAFETY RULES

Please review the following safety procedures and practice them during your daily operation of equipment. Observe these general safety guidelines to secure a safer working environment for yourself and your fellow employees.

1. Equipment should not be operated with safety devices by-passed or guards removed.
2. Only qualified personnel should operate the machine.
3. Machines should not be started until all personnel are clear.
4. Service or maintenance procedures should never be performed on a machine in motion.
5. Most equipment requires a high voltage electrical system. To avoid shock or serious injury, only qualified personnel should perform maintenance on the electrical system.
6. All air, hydraulic and electric power must be OFF before servicing the machine.

OPERATING ZONE

An operating zone should be established around all machines. A brightly painted guard rail or warning stripe should define the zone. Only the operator or other authorized personnel should be within the operating zone when machine control circuits are energized or the machine is running.

No tools or other equipment should be kept within the operating zone.

Bakery Equipment Manufacturers Association
111 East Wacker Drive
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312/644-6610

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SAFETY TIPS

ELECTRICAL SAFETY

Please review the following safety procedures and practice them during your daily operation of equipment. Observe these general safety guidelines to secure a safer working environment for yourself and your fellow employees.

1. All electrical/electronic maintenance and service should be perfomed only by trained and authorized electricians.
2. Assume at all times that power is "on." Treat all conditions as live. This practice assures a cautious approach which may prevent an accident or injury.
3. To remove load from circuit or equipment, open disconnect or breaker and lock in open position. For maximum protection, a locked out switch in open position using a lock for which only one person has the key prevents anyone from accidentally turning on the power.
4. Make certain that the circuit is open by using the proper test equipment. Note: Test equipment must be checked at regular intervals.
5. Give capacitors time to discharge, otherwise discharge manually with care.
6. There may be circumstances where "trouble-shooting" on live equipment may be required. Under such conditions, special precautions must be taken as follows:
   a) Make certain your tools and body are clear of the ground.
   b) Take extra safety measures in damp areas.
   c) Be alert and avoid any outside distractions.
7. Before applying power to any equipment, make certain that all personnel are clear of the machine.
8. Open control panel doors only to check out electrical equipment or wiring. After the panel door is closed, make certain that (on those panels, where applicable) the disconnect handle mechanism is operating properly.
9. Close all covers on junction panels before leaving any job.

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SAFETY TIPS

HYDRAULIC SYSTEM SAFETY

Please review the following safety procedures and practice them during your daily operation of equipment. Observe these general safety guidelines to secure a safer working environment for yourself and your fellow employees.

1. Never operate a hydraulic system unless covers, safety devices and indicators are operating and in place.
2. Never operate a hydraulic system above the pressure specified.
3. Never allow hydraulic fluid to collect on floors or equipment.
4. Avoid skin contact with hydraulic fluid. Always wear proper protective clothing when handling hydraulic fluid.
5. Never loosen any hydraulic connection when the system is under pressure.
6. Never operate a machine that has leaks in the hydraulic system.

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OPERATIONS MANUAL

MODEL: 92BS BAGEL SLICER FOR INDIVIDUAL ROLLS

Serial #_____

United Bakery Equipment Company
15815 West 110th Street
Lenexa, KS 66219

CONTENTS

SPECIFICATIONS

Electrical Service:

220/440 VAC, 50/60 Hertz, 3 Phase Power
Special voltage requirements are available.

Motors:	Options:
Slicer Blade Drive Motor with Brake. 2 required.	Slicer Elevation Motor actuator Rated 500 LB 2.6 AMPS @ 115VAC 1 Phase
2 H.P. 3450 RPM 2.3 AMPS @ 440 VAC 3 Phase TEFC	Base conveyor drive motor. 1/2 H.P. 1725 RPM 1.6 AMPS @ 440 VAC 3 Phase TEFC

Slicer Blade Drive Belt: BLT-W740-3/4X43
.75" WIDE x 43" LONG
2 required.

Compressed Air: 1 SCFM @ 90 PSIG (dry filtered air for clutch)

Blade Style: Horizontal blade with mounted shaft
5/16" diameter x 4 1/8" long
Retaining slot at top of blade with locking ring at center of shaft

Blade sizes are specified for each product.

GENERAL DESCRIPTION

The UBE Bagel Slicer has been designed to provide very flexible and efficient slicing for individual rolls.

Rapid adjustments of blade slicing locations are easily accomplished through screw shafts and locks, on the operator side of the slicing head. Blade elevation and product holding adjustments are also easily made with simple crank handle devices.

The unit is constructed with several safety features such as guard safety shut off's and out of cutting position disconnects. These, as well as the fixed position guards, make the Hinge slicer one of the safest machines available.

However, strong precautions are advised:

1. **NEVER** PLACE HANDS OR LIMBS IN ANY PORTION OF THE SLICER WHILE ELECTRICAL POWER IS ON.

2. **BLADES ARE EXTREMELY SHARP**. THEY SHOULD BE HANDLED WITH GREAT CARE. PROTECTIVE MESH GLOVES ARE RECOMMENDED WHEN HANDLING BLADES.

OPERATORS GUIDE

The first step in operational set up is to install the correct blades for the product to be run. A blade configuration guide is provided in this manual. After the blades have been selected, they need to be installed in the correct spindles of the slicer. The following steps should be followed:

1. Turn off power to slicer.

2. Open the slicer top guard. (Two latches)

3. Tilt the slicer head so that the slicing area is visible.
   (Use handle or power lift depending on the option furnished)

4. Careful handling of each blade will prevent injury. Grasp each blade by the spindle shaft and insert this spindle shaft into the correct spindle receiver. Lift the blade release lever with one hand while sliding the blade into position with the other hand. Be certain to rotate the blade until it snaps into position and the blade release cap retaining ring returns to its normal position, and is FULLY LOCKED. Check the blade and lock mechanism thoroughly to insure it is locked.

5. After all slicing blades have been installed, and checked, lower the slicing head.

6. Next, to adjust the blade location with respect to the conveyor belt, release the blade position locks. (Located at the base of each blade position handle)

7. The blade adjusting handles should now be used to align the blades to their set up position. If blades require relocating more than an inch from the existing location, it will be helpful to roll the pressure table belts enough to move them into new positions. Be certain to retighten blade position locks.

8. If this unit is provided as part of our Automatic Bagel system, align the blades to center on the fixed bagel feeder guides. (See set-up diagram) If the slicer is a “stand alone” unit, then guides on the infeed and outfeed will require adjustment for efficient production.

9. Start slicer motor at operator’s station. If this unit is provided as part of an automatic system, the one start button will start the feeder, the conveyor and the slicer (if it is down in the cutting position).

10. Start machine conveyor to release product at the feeder (as part of an automatic system), or place product on the infeed and verify blade position for slicing.

OPERATORS GUIDE –Continued.

11. Readjust blades and guides as necessary.

12. Adjust blade cutting height. This adjustment is located on the slicer frame.

13. Adjust pressure table belt height. This is an important set up step. Too much pressure belt pressure causes product damage and poor slicing. Use only enough pressure to hold product from moving more than one or two inches while being sliced. (Pressure table handle) The pressure table is constructed to provide progressively more control on the product as it travels through the slicer. There is a point where the blade cutting forces may overcome the control of the pressure table and sling the product forward a small distance. This is necessary for two reasons:

    a) The least amount of pressure while slicing the bagel will produce the least amount of heat and prolong the production time before the blades must be cleaned or changed.
    b) More pressure on the product produces a distortion in the slice.

14. Start production.

It is useful to periodically check the slice of the production run to insure that quality is consistent.

Dull blades will have a tendency to provide substantial crumbing as well as tearing product. Gluten build up on the blades will also cause a decrease in slice quality. Keep blades clean.

If the indexer lane guides are changed by the operation, then the slice will also change.

Be aware that product fed into the slicer will be sliced at the angle of the lane guides; therefore it is important that the guides are parallel with the conveyor belt travel.

SANITATION

The bagel slicer is made to be cleaned by brushing off the surfaces that collect crumbs. It must be cleaned thoroughly after every shift. Bagel fines will harden and become very difficult to remove.

The base conveyor can be removed by pushing out a connecting rod and rolling up the conveyor to take it to a wash basin. The plastic should be cleaned with a mild detergent like DAWN. (See belt manufacturer installation sheets.)

The bagel blades can accumulate a fruit or gluten buildup. These conditions are best remedied by using a bucket of mild soap and a rinse bucket. Two sets of blades allow one to be in production and the other soaking. Wipe them off when out of the rinse bucket. This condition is minimal when product varieties are not with fruit, chocolate & nuts.

WARNING

STOP THIS MACHINERY BEFORE OILING, WIPING OR REPAIRING

DO NOT OPERATE WITHOUT GUARDS

SAFETY TIPS

SERVICE & MAINTENANCE SAFETY

Please review the following safety procedures and practice them during your daily operation of equipment. Observe these general safety guidelines to secure a safer working environment for yourself and your fellow employees.

1. Do not service a machine until you are thoroughly qualified, trained and familiar with the tasks to be performed. Only trained personnel should be operating machines.
2. Never operate any controls while other persons are performing maintenance on the machine.
3. Do not by-pass a safety device.
4. Always use the proper tool for the job.
5. Never open covers with power on.
6. All air and hydraulic pressure must be relieved before performing maintenance or loosening connections on any pressurized system.
7. Air, hydraulic and electrical power are to be turned off unless absolutely required for the specific service being performed. Note: For maximum protection, the power source should be locked out using a lock for which only one person has the key. This prevents anyone from accidentally turning on the power to the machine while it is being serviced.
8. Replace fuses only when electrical power is off (locked out).

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SAFETY TIPS

CLEANING SAFETY

Please review the following safety procedures and practice them during your daily operation of equipment. Observe these general safety guidelines to secure a safer working environment for yourself and your fellow employees.

Manual Cleaning Procedures:

1. Do not use toxic and/or flammable solvents to clean a machine.
2. Turn off air, hydraulic and electrical power (lock out) prior to cleaning machine.
3. Keep electrical panel covers closed and power off when washing a machine.
4. Always clean up spills around machine as soon as possible.
5. Never attempt cleaning a machine while it is operating.

Cleaning-In-Place Procedures:

1. Make certain that all connections in cleaning circuit are tight to avoid contact with hot water or cleaning solutions.
2. When cleaning cycle is controlled from a remote or automated control center, establish fail-safe procedures to avoid automatic start-up while servicing equipment in circuit.

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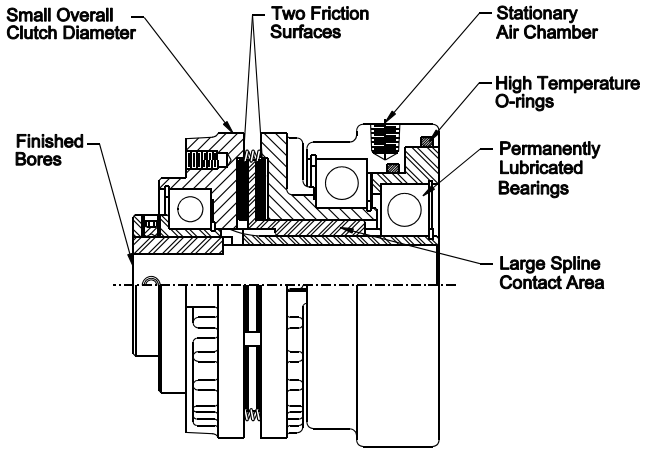
TROUBLE SHOOTING

PROBLEM	CAUSE	CORRECTION
Bagels depart from slicer at high rate of speed	Improper pressure table setting.	Using pressure table adjustment knob and visual observation lower the pressure table to the setting that allows each product to move through the blades and then be restricted lightly.
	Change in product size.	
Bagels appear to be cut completely around the circumference.	Improper pressure table setting.	Apply more restriction by using the pressure table.
	Change in product size.	Examine the lane guides. To produce a consistent butterfly slice the guides need to allow minimal side-to-side movement (compensating for the product size range). If the guide allows a bagel to slice off center - adjust to correct it.
	Improper lane guide to blade setting.	
Bagels are jammed in slicer.	Improper alignment of discharge guides.	Realign discharge guides.
	Product has wedged itself on some machine component and causing others to not flow freely.	Stop slicer with illuminated emergency stop pushbutton. Pivot slicer head to out of cutting position. Clear out product. Examine for any damage. Lower slicer head. Pull out the emergency stop pushbutton, and restart the machine.
Bagel slice appears rough.	Build up on blades.	Clean blades
	Dull blades.	Re-sharpen as required
Slice appears angled from the horizontal.	Pressure table belts do not have adequate tension to drive at the same rate as the base conveyor.	Tighten spring-loaded belts on pressure table idler roller.

PARTS & DRAWINGS

Through Shaft Air Clutches and Clutch/Brake Combinations



USED ON:

- **Feed Conveyors**
- **Accumulating Conveyors**
- **Label Machinery**
- **Slitters**
- **Casers and Uncasers**
- **Wrapping Machinery**
- **Packaging Machinery**
- **Converting Machinery**
- **Bakery Machinery**

POWER FLO TSC PNEUMATIC CLUTCH designed for MID SHAFT OR END SHAFT APPLICATIONS requiring a bearing mounted sprocket or sheave. The TSC unit is offered in a PM MODEL for bolt on attachment of a sheave or sprocket. An IM MODEL is also available which has V grooves machined into the backplate, These units are BORED TO SIZE so no bushing is required for mounting to the shaft. The models feature a SMALL COMPACT DESIGN with two friction surfaces that transmit HIGH TORQUE.

POWER FLO TSCB SHAFT MOUNTED CLUTCH BRAKE COMBINATION designed with all the outstanding concepts of the TSC clutch plus the added feature of using one STATIONARY PISTON that engages either the clutch or brake. This design makes it IMPOSSIBLE TO OVERLAP THE CLUTCH AND THE BRAKE and allows the unit to run cooler for longer service life.

Power Flo Model	Description	Torque Rating @80PSI	Max RPM	Bore Range
TSC 60 PM	Pilot Mount	60 in/lbs	1800	.625"
TSC 60 IM	Integral Sheave	60 in/lbs	1800	.625"
TSC 150 PM	Pilot Mount	150 in/lbs	1800	.750" - .875"
TSC 150 IM	Integral Sheave	150 in/lbs	1800	.750" - .875"
TSC 350 PM	Pilot Mount	350 in/lbs	1800	.875" - 1.000"
TSC 350 IM	Integral Sheave	350 in/lbs	1800	.875 - 1.000"
TSC 850 PM	Pilot Mount	850 in/lbs	1800	1.125" - 1.625"
TSC 850 IM	Integral Sheave	850 in/lbs	1800	1.125" - 1.625"

Power Flo Model	Description	Clutch Torque @ 80PSI	Brake Torque @ 80PSI	Bore
TSCB 150 PM	Clutch/Brake	150 in/lbs	200 in/lbs	.875"
TSCB 350 PM	Clutch/Brake	350 in/lbs	400 in/lbs	1.000"
TSCB 850 PM	Clutch/Brake	850 in/lbs	900 in/lbs	1.625"

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BALDOR®
MOTORS AND DRIVES

Integral Horsepower
AC Induction Motors
ODP, WPI, WPII Enclosure
TEFC Enclosure
Explosion Proof

Installation & Operating Manual

7/02 **MN400**

Section 3
Maintenance & Troubleshooting

WARNING: **UL rated motors must only be serviced by authorized Baldor Service Centers if these motors are to be returned to a flammable and/or explosive atmosphere.**

General Inspection

Inspect the motor at regular intervals, approximately every 500 hours of operation or every 3 months, whichever occurs first. Keep the motor clean and the ventilation openings clear. The following steps should be performed at each inspection:

WARNING: **Do not touch electrical connections before you first ensure that power has been disconnected. Electrical shock can cause serious or fatal injury. Only qualified personnel should attempt the installation, operation and maintenance of this equipment.**

1. Check that the motor is clean. Check that the interior and exterior of the motor is free of dirt, oil, grease, water, etc. Oily vapor, paper pulp, textile lint, etc. can accumulate and block motor ventilation. If the motor is not properly ventilated, overheating can occur and cause early motor failure.
2. Use a “Megger” periodically to ensure that the integrity of the winding insulation has been maintained. Record the Megger readings. Immediately investigate any significant drop in insulation resistance.
3. Check all electrical connectors to be sure that they are tight.

Lubrication & Bearings

Bearing grease will lose its lubricating ability over time, not suddenly. The lubricating ability of a grease (over time) depends primarily on the type of grease, the size of the bearing, the speed at which the bearing operates and the severity of the operating conditions. Good results can be obtained if the following recommendations are used in your maintenance program.

Type of Grease

A high grade ball or roller bearing grease should be used. Recommended grease for standard service conditions is Polyrex EM (Exxon Mobil).

Equivalent and compatible greases include:
Texaco Polystar, Rykon Premium #2, Pennzoil Pen 2 Lube and Chevron SRI.

– Maximum operating temperature for standard motors = 110° C.
– Shut–down temperature in case of a malfunction = 115° C.

Lubrication Intervals

Recommended lubrication intervals are shown in Table 3-1. It is important to realize that the recommended intervals of Table 3-1 are based on average use.

Refer to additional information contained in Tables 3-2 and 3-3.

Table 3-1 Lubrication Intervals *

NEMA / (IEC) Frame Size	Rated Speed - RPM					
	10000	6000	3600	1800	1200	900
Up to 210 incl. (132)	**	2700 Hrs.	5500 Hrs.	12000 Hrs.	18000 Hrs.	22000 Hrs.
Over 210 to 280 incl. (180)			3600 Hrs.	9500 Hrs.	15000 Hrs.	18000 Hrs.
Over 280 to 360 incl. (225)			* 2200 Hrs.	7400 Hrs.	12000 Hrs.	15000 Hrs.
Over 360 to 5800 incl. (300)			*2200 Hrs.	3500 Hrs.	7400 Hrs.	10500 Hrs.

* Lubrication intervals are for ball bearings. For roller bearings, divide the listed lubrication interval by 2.

** For 6205 and 6806 bearings. For 6807 bearings, consult oil mist lubrication (MN401).
Relubrication interval for 6205 bearing bearing is 1550Hrs. (using grease lubrication).
Relubrication interval for 6806 bearing bearing is 720Hrs. (using grease lubrication).

Table 3-2 Service Conditions

Severity of Service	Ambient Temperature Maximum	Atmospheric Contamination	Type of Bearing
Standard	40° C	Clean, Little Corrosion	Deep Groove Ball Bearing
Severe	50° C	Moderate dirt, Corrosion	Ball Thrust, Roller
Extreme	>50° C* or Class H Insulation	Severe dirt, Abrasive dust, Corrosion	All Bearings
Low Temperature	<–30° C **		

* Special high temperature grease is recommended (Dow Corning DC44). Note that Dow Corning DC44 grease does not mix with other grease types. Thoroughly clean bearing & cavity before adding grease.

** Special low temperature grease is recommended (Aeroshell 7).

Table 3-3 Lubrication Interval Multiplier

Severity of Service	Multiplier
Standard	1.0
Severe	0.5
Extreme	0.1
Low Temperature	1.0

Table 3-4 Bearings Sizes and Types

Frame Size NEMA (IEC)	Bearing Description (These are the "Large" bearings (Shaft End) in each frame size)					
	Bearing	OD D mm	Width B mm	Weight of Grease to add * oz (Grams)	Volume of grease to be added	
					in^3	tea-spoon
Up to 210 incl. (132)	6307	80	21	0.30 (8.4)	0.6	2.0
Over 210 to 280 incl. (180)	6311	120	29	0.61 (17)	1.2	3.9
Over 280 to 360 incl. (225)	6313	140	33	0.81 (23)	1.5	5.2
Over 360 to 449 incl. (280)	6319	200	45	2.12 (60)	4.1	13.4
Over 5000 to 5800 incl. (355)	6328	300	62	4.70 (130)	9.2	30.0
Over 360 to 449 incl. (280)	NU319	200	45	2.12 (60)	4.1	13.4
Over 5000 to 5800 incl. (355)	NU328	300	62	4.70 (130)	9.2	30.0
Spindle Motors						
76 Frame	6207	72	17	0.22 (6.1)	0.44	1.4
77 Frame	6210	90	20	0.32 (9.0)	0.64	2.1
80 Frame	6213	120	23	0.49 (14.0)	0.99	3.3

* Weight in grams = .005 DB

Note: Not all bearing sizes are listed. For intermediate bearing sizes, use the grease volume for the next larger size bearing.

Lubrication Procedure

Be sure that the grease you are adding to the motor is compatible with the grease already in the motor. Consult your Baldor distributor or an authorized service center if a grease other than the recommended type is to be used.

Caution: To avoid damage to motor bearings, grease must be kept free of dirt. For an extremely dirty environment, contact your Baldor distributor or an authorized Baldor Service Center for additional information.

With Grease Outlet Plug

1. Clean all grease fittings.
2. Remove grease outlet plug.
3. If motor is stopped, add the recommended amount of grease.

   If motor is to be greased while running, a slightly greater quantity of grease will have to be added. Add grease slowly until new grease appears at shaft hole in the endplate or purge outlet plug.
4. Re-install grease outlet plug.

Without Grease Outlet Plug

1. Disassemble motor.
2. Add recommended amount of grease to bearing and bearing cavity. (Bearing should be about 1/3 full of grease and outboard bearing cavity should be about 1/2 full of grease.)

Note: Bearing is 1/3 full when only one side of bearing is completely full of grease.

3. Assemble motor.

Sample Lubrication Determination

Assume - NEMA 286T (IEC 180), 1750 RPM motor driving an exhaust fan in an ambient temperature of 43° C and the atmosphere is moderately corrosive.

1. Table 3-1 list 9500 hours for standard conditions.
2. Table 3-2 classifies severity of service as “Severe”.
3. Table 3-3 lists a multiplier value of 0.5 for Severe conditions.
4. Table 3-4 shows that 1.2 in^3 or 3.9 teaspoon of grease is to be added.

Note: Smaller bearings in size category may require reduced amounts of grease.

Table 3-5 Troubleshooting Chart

Symptom	Possible Causes	Possible Solutions
Motor will not start	Usually caused by line trouble, such as, single phasing at the starter.	Check source of power. Check overloads, fuses, controls, etc.
Excessive humming	High Voltage.	Check input line connections.
	Eccentric air gap.	Have motor serviced at local Baldor service center.
Motor Over Heating	Overload. Compare actual amps (measured) with nameplate rating.	Locate and remove source of excessive friction in motor or load. Reduce load or replace with motor of greater capacity.
	Single Phasing.	Check current at all phases (should be approximately equal) to isolate and correct the problem.
	Improper ventilation.	Check external cooling fan to be sure air is moving properly across cooling fins. Excessive dirt build-up on motor. Clean motor.
	Unbalanced voltage.	Check voltage at all phases (should be approximately equal) to isolate and correct the problem.
	Rotor rubbing on stator.	Check air gap clearance and bearings.
		Tighten “Thru Bolts”.
	Over voltage or under voltage.	Check input voltage at each phase to motor.
	Open stator winding.	Check stator resistance at all three phases for balance.
	Grounded winding.	Perform dielectric test and repair as required.
	Improper connections.	Inspect all electrical connections for proper termination, clearance, mechanical strength and electrical continuity. Refer to motor lead connection diagram.
Bearing Over Heating	Misalignment.	Check and align motor and driven equipment.
	Excessive belt tension.	Reduce belt tension to proper point for load.
	Excessive end thrust.	Reduce the end thrust from driven machine.
	Excessive grease in bearing.	Remove grease until cavity is approximately $^3/_4$ filled.
	Insufficient grease in bearing.	Add grease until cavity is approximately $^3/_4$ filled.
	Dirt in bearing.	Clean bearing cavity and bearing. Repack with correct grease until cavity is approximately $^3/_4$ filled.
Vibration	Misalignment.	Check and align motor and driven equipment.
	Rubbing between rotating parts and stationary parts.	Isolate and eliminate cause of rubbing.
	Rotor out of balance.	Have rotor balance checked are repaired at your Baldor Service Center.
	Resonance.	Tune system or contact your Baldor Service Center for assistance.
Noise	Foreign material in air gap or ventilation openings.	Remove rotor and foreign material. Reinstall rotor. Check insulation integrity. Clean ventilation openings.
Growling or whining	Bad bearing.	Replace bearing. Clean all grease from cavity and new bearing. Repack with correct grease until cavity is approximately $^3/_4$ filled.

Suggested bearing and winding RTD setting guidelines

Most large frame AC Baldor motors with a 1.15 service factor are designed to operate below a Class B (80°C) temperature rise at rated load and are built with a Class H winding insulation system. Based on this low temperature rise, RTD (Resistance Temperature Detectors) settings for Class B rise should be used as a starting point. Some motors with 1.0 service factor have Class F temperature rise.

The following tables show the suggested alarm and trip settings for RTDs. Proper bearing and winding RTD alarm and trip settings should be selected based on these tables unless otherwise specified for specific applications.

If the driven load is found to operate well below the initial temperature settings under normal conditions, the alarm and trip settings may be reduced so that an abnormal machine load will be identified.

The temperature limits are based on the installation of the winding RTDs imbedded in the winding as specified by NEMA. Bearing RTDs should be installed so they are in contact with the outer race on ball or roller bearings or in direct contact with the sleeve bearing shell.

Winding RTDs – Temperature Limit In °C (40°C Maximum Ambient)

Motor Load	Class B Temp Rise ≤ 80°C (Typical Design)		Class F Temp Rise ≤ 105°C		Class H Temp Rise ≤ 125°C	
	Alarm	Trip	Alarm	Trip	Alarm	Trip
≤ Rated Load	130	140	155	165	175	185
Rated Load to 1.15 S.F.	140	150	160	165	180	185

Note: • Winding RTDs are factory production installed, not from Mod–Express.
• When Class H temperatures are used, consider bearing temperatures and lubrication requirements.

Bearing RTDs – Temperature Limit In OC with 40°C Max Ambient

Bearing Type Oil or Grease	Anti–Friction		Sleeve	
	Alarm	Trip	Alarm	Trip
Standard*	95	100	85	95
High Temperature**	110	115	105	110

Note: * Bearing temperature limits are for standard design motors operating at Class B temperature rise.
** High temperature lubricants include some special synthetic oils and greases.

Greases that may be substituted that are compatible with Polyrex EM (but considered as “standard” lubricants) include the following:
– Texaco Polystar
– Rykon Premium #2
– Chevron SRI #2

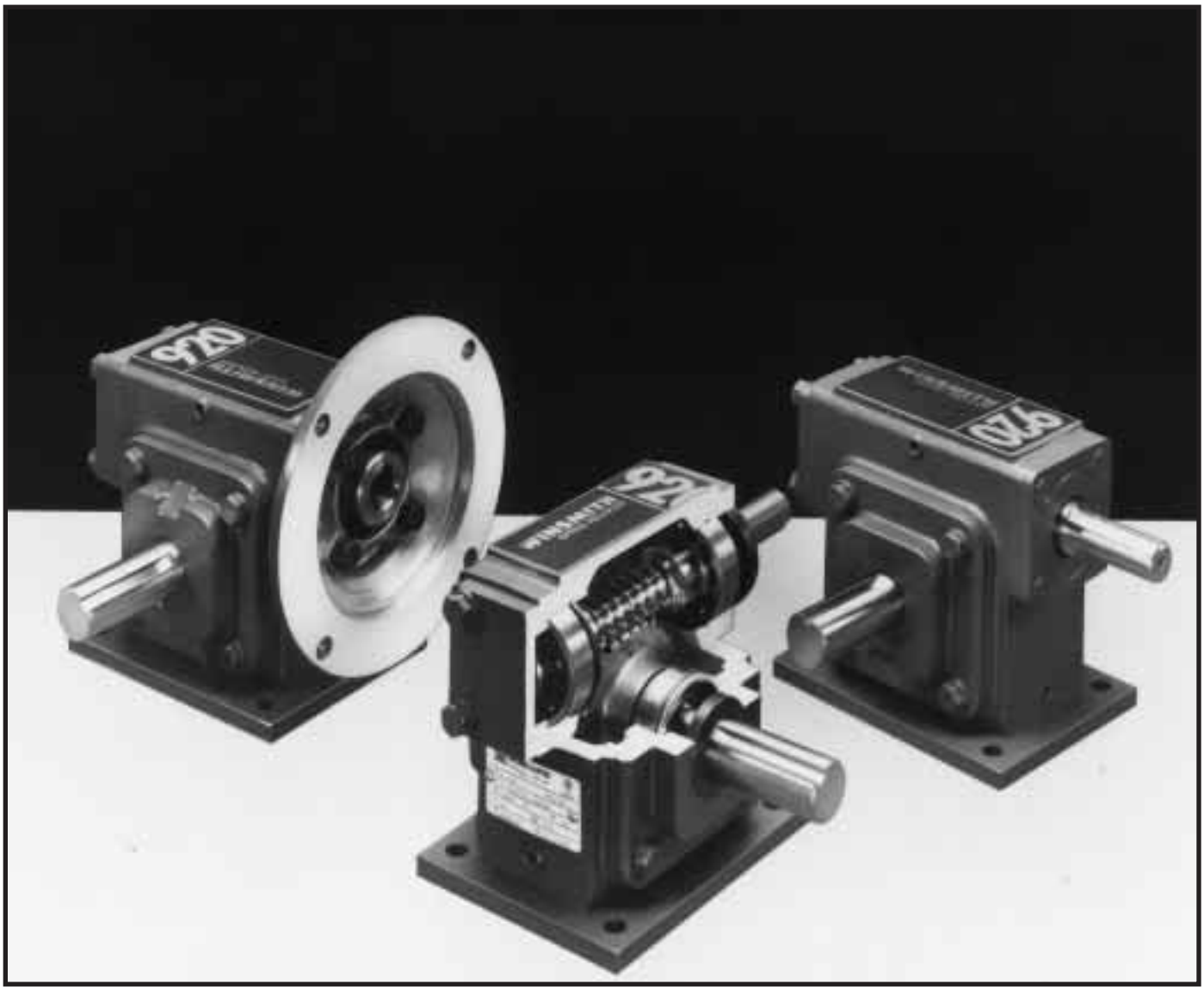
See the motor nameplate for replacement grease or oil recomendation. Contact Baldor application engineering for special lubricants or further clarifications.

ENGINEERING
SERVICE BULLETIN

ILD-99

WINSMITH
PEERLESS-WINSMITH, INC.

D-90® TYPE SE® 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, or 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

A. Single reduction units are designed to accommodate most standard mounting positions. Figure 1 illustrates the utility plug locations for each based on model. All standard single reduction models are equipped with an internal splash shield located near the worm. This shield deflects the oil from the vent, preventing leakage when the vent plug is adjacent to the worm (as on the DT or DV standard mounting). When this location is used as a drain (as on the DV sidewall, worm under), drainage will be better facilitated if done at or near the operating temperature. Filling from this location is not recommended, as the shield will impede the oil flow rate. Bearings are splash lubricated provided the input speed is 1160 RPM or greater. Contact the factory when input speeds fall below this.

B. Double reduction models are built to accommodate one mounting position as specified during order entry. Standard mounting positions, furnished unless otherwise specified, are shown in Figure 2 which also illustrates the utility plug locations. Note that the mounting position relates to the main housing orientation. Standard units 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 eliminates the need for a vent shield. Grease fittings (not shown in Figure 2) are used to lubricate bearings when oil splash does not serve this purpose (as with the DV or DL upper slow speed bearing).

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, review Figures 1 and 2 and relocate the vent plug (if necessary) as shown for the appropriate model and mounting position. Double reduction models (Figure 2) are vented in the main housing only. 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. Some models are available with an optional internal expansion chamber allowing units to be totally sealed. Contact us for more details.

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 with the spider end 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.

5. Unit Assembly/Disassembly Instructions

Contact the factory for an instruction manual.

III. LUBRICATION & MAINTENANCE

1. Factory Filling

WINSMITH speed reducers are oil filled at the factory to the proper level for the standard mounting position as shown in Figures 1 or 2. **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.**

2. Ambient Temperature

If the operating ambient temperature is other than 51-95°F, then refer to lubrication chart and refill the unit with the correct grade based on actual ambient temperatures and operating speed. See item 3 for additional information regarding oil changes.

3. Oil Changing

When changing oil for any reason, it should be remembered that oils of various types may no be compatible. Therefore, when changing to a different oil, it is recommended that the housing be completely drained and thoroughly flushed with a light flushing oil prior to refilling with the appropriate lubricant. The oil level should be rechecked after a short period of operation and adjusted, if necessary. When changing double reduction models, each housing should be drained and filled independently, even though there may be a common level.

A. Initial Oil Change

The oil in a new speed reducer should be changed at the end of 250 hours of operation. (30 days for 8 hour per day service, 15 days for 16 hour service, 10 days for 24 hour service).

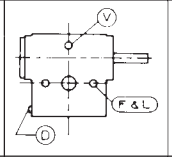
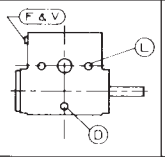
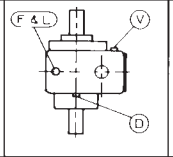
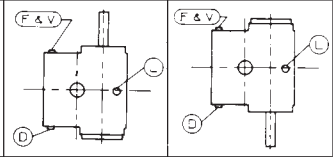
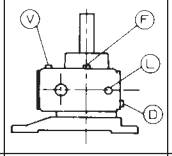
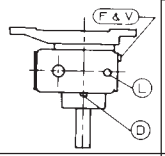
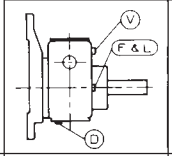
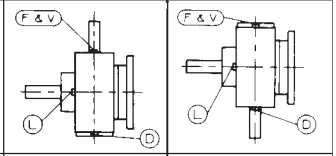
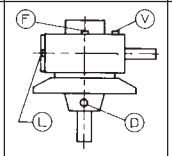
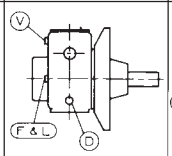
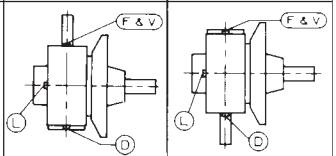
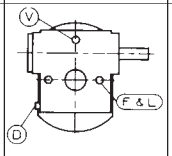
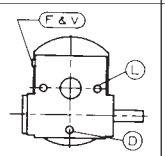
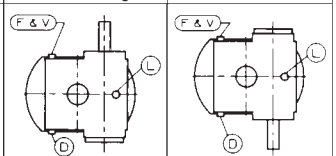
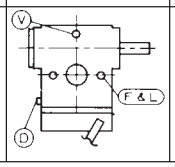
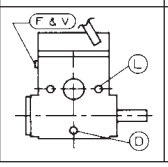
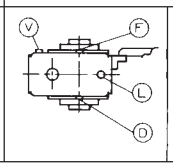
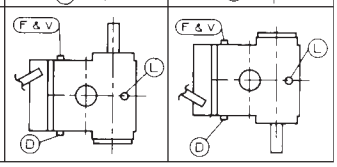
B. Subsequent Oil Changes

Under normal conditions, after the initial oil change, the oil should be changed after every 2500 hours of operation, or every six months, whichever occurs first. Under severe conditions (rapid temperature changes, moist, dirty or corrosive environment) it may be necessary to change oil at intervals of one to three months. Periodic examination of oil samples taken from the unit will help establish the appropriate interval.

C. Synthetic Oils

Synthetic lubricants can be advantageous over mineral oils in that they generally are more stable, have a 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. However, continuous operation above 225°F may cause damage to seals or other components. It is recommended that the initial oil be changed or filtered after the first 1500 hours of operation to remove metal particles that accumulate during break-in. Subsequent oil

STANDARD MOUNTING POSITIONS D-90® TYPE SE®

BASIC MODEL	TRADITIONAL MOUNTING	INVERTED MOUNTING	ADDITIONAL MOUNTING POSITIONS	
			INPUT SHAFT HORIZONTAL	INPUT SHAFT VERTICAL
DB DD DJ DN DT DU WB WT WU				
DV				
DL		**SPECIAL** Contact the Factory		
DSF			**SPECIAL** Contact the Factory	
DSN DSR DSU				

Note: Single Reduction 935 and 943 standard models are supplied with grease fittings on the input shaft to insure bearing lubrication for all mounting positions.

F = Fill Plug

V = Vent Plug

L = Level Plug

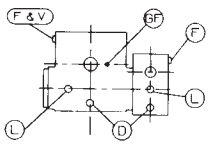
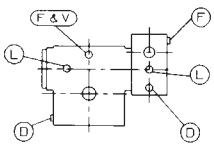
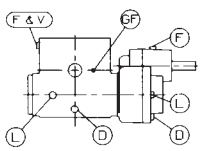
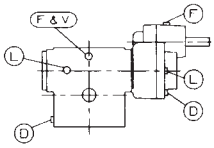
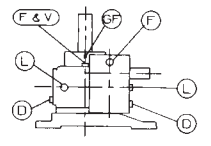
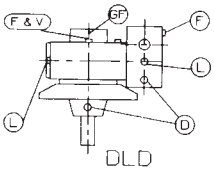
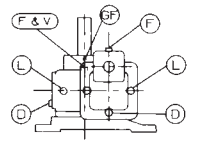
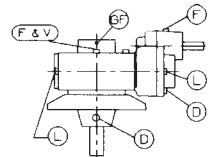
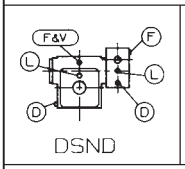
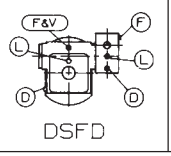
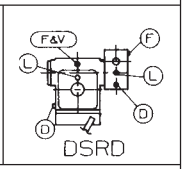
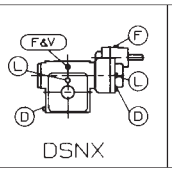
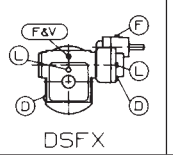
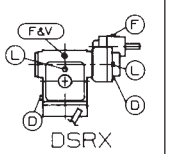
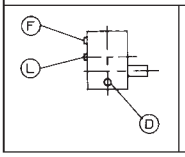
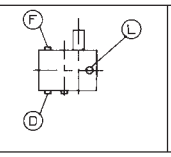
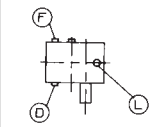
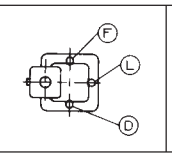
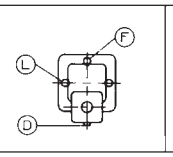
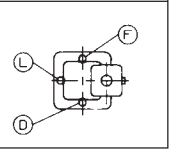
D = Drain Plug

GF = Grease Fitting

Figure 1. Single Reduction Models

Plug locations apply to motorized units also.

Contact the factory when input speeds are less than 1160 RPM to insure proper lubrication.

DOUBLE REDUCTION* WORM/WORM		DOUBLE REDUCTION* HELICAL/WORM	
 DBD	 DTD	 DBX	 DTX
 DVD	 DLD	 DVX	 DLX
 DSND	 DSFD	 DSRD	 DSNX	 DSFX	 DSRX
OTHER ATTACHMENT HOUSING POSITIONS		OTHER ATTACHMENT HOUSING POSITIONS	
					

*Double Reduction units are not universal mounting. Mountings other than standard require a special outline.

Figure 2. Double Reduction Models

changes should be made after 5000 hours operation if units are operating in a clean environment. This can be extended to 10,000 hours if using new reformulated Mobil SHC lubricants (orange in color) and the lubricant remains free of contamination over this period. See comments under 3B for more severe ambient conditions.

4. 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 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 us for details.

5. Grease Fittings

Some units are equipped with grease fittings to lubricate bearings not adequately lubricated by the oil splash. These fittings must be lubricated every 3-6 months depending on operating conditions. Bearing greases must be compatible with the type of gear lubricant being used (ie. mineral, synthetic, food grade, etc.) For mineral oils, use a high quality lithium base NLGI #2 bearing grease. For synthetic oils, use a synthetic bearing grease such as Mobil Synthetic Universal grease, Mobilith SHC 100 or a suitable equivalent. For food grade lubricants, use Chevron FM grease, NLGI 2, or equivalent.

6. Low Input Speeds (Under 1160 RPM)

When input speeds are less than 1160 RPM, grease fittings will be required to lubricate any bearings not partially covered by the normal oil level. Such units are considered non-standard and necessitate factory modification. If this low speed operating condition exists and units are without the appropriate grease fittings, please contact the factory.

7. 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). Excessive oil temperatures may be the result of one or more of the following factors:

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.

8. 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.

Lubricants

Worm Gear Reducers

For special applications that involve severe ambient temperature extremes or a seasonal oil requirement, WINSMITH, based on extensive testing and field experience, recommends the use of Mobil SHC synthetic lubricants.

Ambient Temperature	-30 to 15°F	16 to 50°F	51 to 95°F	51 to 95°F	96 to 131°F	96 to 131°F
Final Stage Worm Speed*	up to 2000 FPM	up to 2000 FPM	up to 450 FPM	above 450 FPM	up to 450 FPM	above 450 FPM
ISO Viscosity Grade	220	460	680	460	680	460*
AGMA Lubricant No.	5S**	#7 Compounded***	#8 Compounded***	#7 Compounded***	8 S**	7S**

Mobil	SHC 630	600W Super Cylinder	Extra Hecla Super	600W Super Cylinder	SHC 636	SHC 634
American Lubricants	SHC-90W	AGMA #7 Gear Oil	AGMA #8 Gear Oil	AGMA #7 Gear Oil	N/A	N/A
Castrol	Tribol 800/220	Tribol 1105-7C	Tribol 1105-8C	Tribol 1105-7C	Tribol 800/680	Tribol 800/460
Chevron	Tegra 220	Cylinder Oil W460	Cylinder Oil W680	Cylinder Oil W460	Tregra 680	Tegra 460
Conoco	Syncon R & O 220	Inca Oil 460	Inca Oil 680	Inca Oil 460	N/A	Syncon R & O 460
Exxon (Esso)	Teresstic SHP 220	Spartan EP 460	Spartan EP 680	Spartan EP 460	Teresstic SHP 680	Teresstic SHP 460
Fiske Brothers	SPO-MG	SPO-277	SPO-288	SPO-277	N/A	N/A
Shell	Omala RL 220	Valvata J 460	Valvata J 680	Valvata J 460	Omala RL 680	Omala RL 460
Texaco	Pinnacle 220	Vanguard 460	Vanguard 680	Vanguard 460	Pinnacle 680	Pinnacle 460

**synthetic oil
***3% to 10% fatty or synthetic oils or mild EP additives

Lubricant selections are provided by the lubricant manufacturer based on AGMA recommended viscosity grades.
Viscosity grades are based on Lubrication Standard ANSI/AGMA 9005-D94.

*The sliding velocity in feet per minute (FPM) for standard ratios is determined by multiplying the speed of the worm in RPM by the factor from the following table. For selecting the proper lubricant, use the speed of the worm in the final stage (input RPM divided by the first stage ratio).

	Nominal Ratio											
SIZE	**5**	**7.5**	**10**	**15**	**20**	**25**	**30**	**40**	**50**	**60**	**80**	**100**
910	0.153	—	0.137	0.133	0.122	0.116	0.132	0.121	0.115	—	—	—
913	0.231	0.189	0.183	0.179	0.171	0.165	0.178	0.169	0.164	0.161	—	—
917	0.303	0.229	0.201	0.193	0.180	0.172	0.189	0.176	0.170	0.166	0.161	0.133
920	0.347	0.263	0.225	0.216	0.202	0.191	0.215	0.200	0.188	0.182	0.164	0.161
924	0.412	0.312	0.261	0.256	0.236	0.223	0.249	0.231	0.216	0.210	0.201	0.196
926	0.455	0.345	0.283	0.276	0.254	0.238	0.269	0.249	0.234	0.225	0.215	0.210
930	0.520	0.395	0.327	0.317	0.291	0.273	0.307	0.285	0.269	0.258	0.246	0.241
935	0.607	0.461	0.427	0.412	0.373	0.349	0.403	0.367	0.345	0.330	0.311	0.299
943	0.633	0.588	0.568	0.553	0.507	0.558	0.544	0.501	0.475	0.457	0.435	0.422

WINSMITH®

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PWS-18560 August 1999 10M
Printed in U.S.A.