



Winsmith RD Installation, Operation, and Lubrication Instructions

SECTION I: INSTALLATION

1. C Face Motor Mounting Procedures

A. Fret-Free Coupling Mounting

1. Check the motor and speed reducer mounting registers for damage or raised material that could interfere with assembly; remove any raised material.
2. Verify that the key supplied with the coupling hub fits properly in both the motor shaft keyway and the coupling hub keyway.
3. Verify that the inner diameter of the supplied coupling hub matches and fits smoothly (slip fit) over the motor shaft.
4. Install the supplied key into the motor shaft keyway.
5. Align the keyway and loosely install the coupling hub onto the motor shaft with the drive lugs facing away from the motor.
6. Identify the edge of the coupling hub installation guide (Winsmith PN: 14642) that matches the NEMA frame size of the motor (56C, 140TC, or 180TC).
7. Place the appropriate edge of the coupling hub installation guide against the mounting face of the motor and using the guide, locate the coupling hub axially on the motor shaft as shown in Figure 1 and 2.

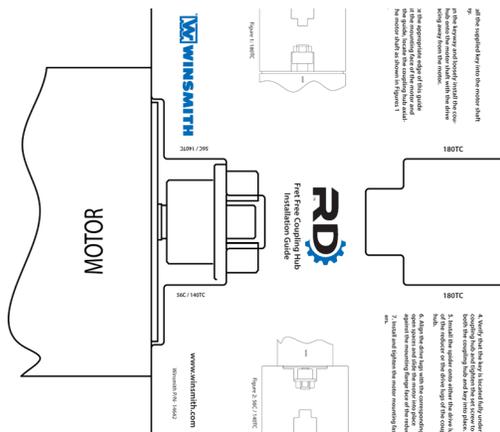


Figure 1

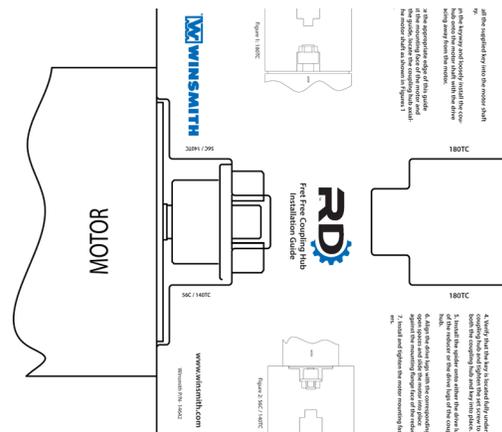


Figure 2



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8. Verify that the key is located fully under the coupling hub and tighten the set screw to lock both the coupling hub and key into place.
9. Install the spider onto either the drive lugs of the speed reducer or the drive lugs of the coupling hub.
10. Align the drive lugs of the motor coupling hub with the open spaces of the speed reducer coupling hub and slide the motor into place against the mounting flange face of the speed reducer.
11. While still supporting the motor, install the four motor mounting fasteners and tighten them to the torque appropriate for the fastener material and size.

B. C Face / Quill Motor Mounting

1. Check the motor and reducer mounting registers for damage or raised material that could interfere with assembly; remove any raised material.
2. Remove protective plastic plug from the speed reducer input shaft. The bore has been coated with an anti-seize compound.
3. Install the key and align the motor shaft and key with keyway in bore and slide motor up to input adaptor.
4. Position the motor conduit box as desired.
5. Secure the motor to the speed reducer using the supplied fasteners. Ensure proper motor seating before tightening the fasteners. Tighten the fasteners to the appropriate torque per the size and material of the fastener.

2. Shaft Alignment and Loading Considerations

- A. The various drive components (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. Winsmith RD speed reducers are supplied with various input and output shaft configurations as listed below:

Available Input Shaft Configurations	Available Output Shaft Configurations
Fret-Free Coupling	Solid Output Shaft
Quill	Hollow Output Shaft
Solid Shaft	

Each configuration has its own specific set of features and requirements for shaft alignment. Reference sections 1A and 1B of this document for additional mounting considerations. Contact Winsmith with any questions regarding proper shaft alignment and loading.



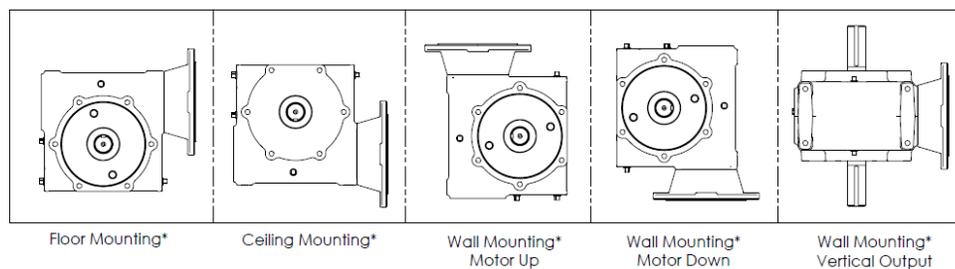
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- C. A common base plate supporting the motor and speed reducer will help preserve the original alignment between the speed reducer and the motor shaft. If a structural steel base is used, the plate should be at least equal in thickness to the diameter of the base plated fastening bolts. In addition, the structure supporting the base plate must be sufficiently rigid that it prevents excessive flexing during normal operation.
- D. Vibration tends to loosen fasteners even if they are initially tight. After the first week of operation, all mounting hardware should be checked and retightened if necessary.
- E. Excessive thrust or overhung loads on the input or output shafts of a speed reducer may cause premature failures of the bearings and/or shafts. Mount gears, pulleys and sprockets as close to the housing as possible to minimize such loads. Do not exceed catalog ratings.

3. Mounting Positions

- A. Universal Oil Level: All Winsmith RD single reduction speed reducers are filled with lubricant by Winsmith and can be mounted in any of the positions identified in Figure 3 without adjusting the initial oil volume. Please contact Winsmith when the input speed is below 1160 RPM. Please reference Section II of this document "Lubrication & Maintenance," for details related to proper lubrication levels.

Figure 3:



4. Mounting Considerations

- A. The recommended mounting configuration for a hollow shaft speed reducer incorporates a torque arm. Proper torque arm arrangement is very important in order to minimize loads on the speed reducer. Contact Winsmith with any questions regarding torque arm arrangement.



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- B. Hollow output shaft speed reducers may be mounted without the use of a torque arm however careful attention to output shaft alignment is required to avoid excessive bearing loads. In this case, a three-bearing arrangement is often used (Two bearings in the speed reducer and one at the far end of the driven shaft). In these cases, shimming is required when locating the speed reducer and/or the driven shaft to ensure acceptable shaft alignment.
- C. Solid output shaft speed reducers are typically hard mounted and then connected to the driven shaft. When the driven shaft is supported by two bearings the use of a flexible coupling allows for slight shaft misalignment.

5. Winsmith Easy Open / Closed Vent Operation

Venting is a standard feature on the RD speed reducers. Each speed reducer is supplied with an optional "open-closed vent" that can be installed by the equipment builder or the equipment user. A bright yellow plastic tag is provided with the vent that reads: "IMPORTANT – VENT REQUIRES ACTIVATION. THIS SPEED REDUCER HAS BEEN SHIPPED WITH THE VENT IN THE CLOSED POSITION – IT IS IMPORTANT TO OPEN THE VENT BY MAKING A ONE QUARTER TURN COUNTER CLOCKWISE.

The Winsmith two (2) year warranty on defects in parts and workmanship remains unaffected whether an RD speed reducer operates with or without a vent.

SECTION II: LUBRICATION & MAINTENANCE

Winsmith RD speed reducers are filled with Mobil Glygoyle 460 lubricant. This oil is specifically designed for use in worm gear speed reducers and is not necessarily compatible with other worm gear lubricants. Other lubricants should never be mixed with this oil due to the possible loss of lubricating properties. If other lubricants are used, a thorough flushing is required. Reference Winsmith website for a recommended flushing procedure.

NOTE: THE USE OF OTHER LUBRICANTS MAY RESULT IN SUBSTANTIALLY LOWER TORQUE CAPACITY AND IS NOT RECOMMENDED.

1. Filling and Universal Mounting

The oil volume is appropriate for all mounting orientations shown in Figure 3 when input speed is between 1160-1800 RPM. If the input speed is less than 1160, contact Winsmith.

2. Ambient Temperature

If the ambient temperature during operation is outside of -18°F to 130°F, please contact Winsmith as application specific lubricants may be required.

3. Initial Start-Up

During the initial start-up operation, a break-in period is necessary before the speed reducer reaches maximum operating efficiency. Winsmith recommends a gradual application of load during the first several hours after start-up. The speed reducer may run hot during this initial break-in period. This is normal. A few drops of oil may weep from



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the lip seals during the break-in stage. After a short period of operation, clean off any excess oil around the shaft seals and recheck the oil level; adjust if necessary.

4. Oil Change Instructions

When changing the oil for any reason, use only Mobil Glygoyle 460 or other compatible PAG (Polyalkylene glycol) synthetic lubricant. If another oil type is used (PAO, Mineral Oil, etc.), the speed reducer must be drained and thoroughly flushed. Reference the Winsmith website for a recommended flushing procedure. Do not mix different lubricants in the speed reducer. Lubricant incompatibility may result in premature failure. Note: When changing the oil, carefully inspect used oil to be sure there are no metal shavings, fragments and other signs of excessive wear.

In many light duty, relatively clean ambient conditions, the life of Mobil Glygoyle 460 is extended to the point where a speed reducer can operate for the AGMA and ISO specified "Normal" reducer life of 25,000 hours without ever changing the lubricant.

Under severe conditions (rapid temperature changes, moist, dirty, or corrosive environments) it may be necessary to change the lubricant at intervals of 1-3 months. Periodic examination of lubricant samples taken from the speed reducer will help establish the appropriate interval.

The oil change procedure for all RD speed reducers is similar. After draining the old lubricant, Mobil Glygoyle 460 or other compatible PAG synthetic lubricants should be added to the appropriate level plug shown. Reference the oil volume chart below.

Size (Center Distance)	Oil volume (oz.) Solid Output Shaft	Oil volume (oz.) Hollow Output Shaft
1.33"	5	NA
1.75"	12	10
2.00"	15	12
2.38"	20	16
2.63"	33	23
3.00"	44	36

5. Long Term Storage or Infrequent Operation

If a speed reducer is to stand idle for an extended period, either prior to installation or during use, the housing should be completely filled with oil. This will protect the interior components from corrosion due to internal condensation. Be sure to drain the oil to the proper level prior to placing the speed reducer into service. Contact Winsmith with questions on long term storage.

6. Grease Fittings

Non-standard speed reducer models are equipped with grease fittings to lubricate bearings that are not adequately lubricated by the oil splash. These fittings must be lubricated every 3-6 months depending on the operating conditions. Winsmith uses Mobilith SHC 220 or equivalent (NLGI #2). Caution should be used when greasing



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because excessive grease may reduce the performance of the lubricant inside the speed reducer.

7. Oil Temperature

Speed reducers in normal operation can generate temperatures of up to 212° 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:

A. Overloads

Overloads may be due to the original model being too small for the application. Overloads can also occur if the speed reducer is properly sized for the application and higher than anticipated loads are experienced. Always check the speed reducer rating when increasing driven loads or when increasing the horsepower 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 the speed reducer is under filled, the resultant friction can cause overheating and possible damage. If this occurs please contact Winsmith for assistance.

C. Inadequate Cooling

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, use a separate blower to provide forced air cooling.



Warnings

Winsmith products, and associated equipment and machinery, are intended for selection and use by trained and skilled persons capable of determining their suitability for the specific application or use. Proper selection, installation, operation and maintenance, including implementation of adequate safety precautions, are the responsibility of the purchaser or user. The following safety precautions, as well as additional safety precautions that may be required for the specific application or use, are the responsibility of the purchaser or user. FAILURE TO OBSERVE REQUIRED SAFETY PRECAUTIONS COULD RESULT IN SERIOUS INJURY TO PERSONS OR PROPERTY OR OTHER LOSS.

Lock-out/Tag-out

It is EXTREMELY IMPORTANT that equipment or machinery does not unexpectedly start. To prevent this possibility, all electrical or other input power sources must be turned off, and properly locked out. Tag out procedures must be followed before working on or near the reducer or any associated equipment. Loads on the input and output shafts should be disconnected prior to working on any reducer. Failure to observe these precautions may result in serious bodily injury and/or property damage.

Grounding

Be sure the reducer and associated equipment are properly grounded and otherwise installed in accordance with all electrical code requirements.

Protective Guarding / Loose Clothing, etc.

Always insure there is proper protective guarding over all rotating or moving parts. Never allow loose clothing, hair, jewelry and the like to be worn in the vicinity of rotating or moving parts or machinery. The purchaser or user is responsible for complying with all applicable safety codes. Failure to do so may result in serious bodily injury and/or damage to property or other loss.

Selection & Installation

This speed reducer and associated equipment must be selected, installed, adjusted and maintained by qualified personnel who are knowledgeable regarding all equipment in the system and the potential hazards involved.

Consult Catalog Ratings

Load, torque and other requirements must not exceed the published ratings in the current catalog and/or on the speed reducer nameplate. The reducer selected must be consistent with all service factors for the application. See Winsmith catalogs and www.winsmith.com.

Brake Torque Loads

Whenever a brake or any other stopping force is involved in an application, braking torque loads imposed on the speed reducer must not exceed the allowable load ratings.

Not a Brake

Speed reducers should never be used to provide the function of a fail safe brake or an assured self locking device. Speed reducers must never be used to replace a brake or a critical braking application function.

Excess Overhung Loads

Excessive overhung loads on the input or output shafts of a speed reducer may cause premature fatigue failures of the bearings and/or shafts. Mount gears, pulleys and sprockets as close to the housing as possible to minimize such loads. Do not exceed catalog ratings.

Excess Thrust Loads

Excessive thrust loads on the input or output shafts of a gear reducer may cause premature failure of bearings. Do not exceed catalog ratings.

Alignment

Properly align any input and output power transfer elements connected to the speed reducer. Even slight misalignments in a rigid mounting system may cause binding, large vibration forces or excessive overhung loads, leading to premature bearing, shaft, or speed reducer failure. Use of flexible couplings that allow the reducer and connected transfer

elements to self-align during operation will compensate for minor misalignments.

Not a Support Structure

A speed reducer must never be used as an integral component of a machine superstructure or support frame that would subject it to additional loads other than properly rated loads transmitted through the shafts.

Mounting Position

The speed reducer should be mounted in one of the mounting positions shown in the catalog. Different mounting positions should not be used without contacting Winsmith as this may result in improper lubrication.

Overhead Mounting

Mounting of a speed reducer in overhead positions may be hazardous. Use of external support rails or structure is strongly recommended for any over-head mounting.

Lifting Eyebolts

Any lifting supports or eyebolts provided on the speed reducer are supplied with the purpose of vertically lifting only the speed reducer, without any other attachments or motors. Inspect such supports and bolts before each use.

Properly Secure Mounting Bolts

Proper mounting bolts and proper torques must be applied and maintained to insure the speed reducer is securely mounted to the desired machinery. Inspect regularly as machine vibration may loosen fasteners.

Thread Locking Compound

Proper thread locking compound should be appropriately applied to the cleaned threads of all mounting bolts connecting or securing the speed reducer to equipment and any drive, accessories, or brake components attached to the speed reducer. If, at any time after installation a factory supplied assembly or construction bolt is removed, care must be taken to thoroughly clean off the old thread locking compound and a new appropriate thread locking compound must be applied. Failure to properly apply new thread locking compound on all mounting or reducer construction bolts may result in serious injury or death from falling mechanical components.

Reducer Surface Is Hot

Operating speed reducers generate heat. Surface temperatures may become hot enough to cause severe burns. Proper personal protective equipment should be used.

Noise

Operating speed reducers may generate high noise levels. Use appropriate hearing protection and avoid extended exposure to high noise levels.

Lubricants Hot and Under Pressure

The temperature of lubricants inside a speed reducer may be very high. The reducer should be allowed to cool to ambient temperature before removal of any vent, drain, level, or fill plugs, and before removing seals or bearing covers. Speed reducers without a pressure vent may also be under great internal pressure. Slowly loosen the lubricant fill plug above the lubricant level to vent any internal pressure before further disassembling.

Lubricant Contact

Contact with lubricants can present safety concerns. Proper personal protective equipment should be used whenever handling speed reducer lubricants. Consult the lubricant MSDS sheet which is often available on the lubrication manufacturer's website.

FDA, USDA, and NSF Applications

Factory supplied lubricants may not be suitable or safe for applications involving food, drugs and similar products. This includes applications subject to FDA, USDA, NSF or other regulatory jurisdiction. Consult the lubricant supplier or Winsmith for acceptable lubricants.

Inspection and Lubrication

Ensure proper operation by regularly inspecting the speed reducer and following all maintenance, operation and lubrication guidelines.

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