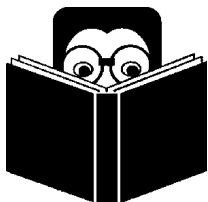




UG GRINDER

**Operation and
Maintenance
Manual**

This manual is a guide for the operation and routine maintenance of a NORDCO Railroad Maintenance Machine. It covers product technical information, basic operating and maintenance procedures, and safety information and is provided for use by the qualified personnel who will supervise, operate or service the equipment described herein.



Measurements in this manual are given in both metric and customary U.S. unit equivalents.

Personnel responsible for the operation and maintenance of this equipment should thoroughly study the manual before commencing operation or maintenance procedures.

This manual should be considered a permanent part of your machine and should remain with the machine at all times.

Additional copies of this manual are available either as a part (Operation Manual only) or a whole (operation and parts manual), at a nominal cost, through our Part Sales Department. Additional service information, parts, and application information is available through these Nordco product support resources:

NORDCO Sales:	Milwaukee, Wisconsin (414) 766-2180 sales@nordco.com
NORDCO Parts:	Milwaukee, Wisconsin 1-800-647-1724 parts@nordco.com
	Oshawa, Ontario, Canada (905) 579-4058, Ext. 224 oshsales@nordco.com
NORDCO Service:	1-800-445-9258 service@nordco.com

We ask that if you have any comments or suggestions about this manual, let us hear from you. We are here to be of service to you, our customers. Direct your comments and inquiries to:



Technical Documentation Department
NORDCO Inc.
245 W. Forest Hill Avenue
Oak Creek, WI 53154

HAZARDOUS MATERIAL DATA

In an effort to provide information necessary for your employee safety training program and to meet the requirements of OSHA Hazard Communication Standard 1910.1200, we have OSHA Form 20 Safety Data Sheets available that cover the material contained in this machine.

If you are interested in receiving this information, please refer to the Name, model, and Serial Number of your machine when calling or writing, and direct your inquiries to:



Vice-President of Operations
NORDCO Inc.
245 W. Forest Hill Avenue
Oak Creek, WI 53154

Fax: (414) 766-2299
Phone: (414) 766-2288

INSTRUCTIONS AND CARE OF THE MODEL UG NORDBERG UTILITY GRINDER

The Model UG Nordberg Utility Grinder is a portable power plant designed to run on either "land or rail". The very best grade of flexible shafting is used to transmit power to the various accessories offered for use with this machine. Its broad field of application reaches every rail grinding job in your territory.

A belt drive at the power take-off end of the engine crankshaft transmits necessary power to the end piece assembly. The drive belts are under constant tension during operation and may stretch slightly. For this reason, the belt tension should be checked once each day during the first week of operation and at least once each week thereafter. The belts are adjusted by shifting the engine. To adjust the belts loosen the mounting bolts and turn the diagonally opposed setscrews in or out until the correct adjustment is obtained as specified in the BELT ADJUSTMENT CHART. Be careful to maintain sheave alignment when making this adjustment.

NOTE

When new belts are installed, they should be set at twice the normal tension. After 48 hours of operation, belts should be set at between normal and 1-1/2 times normal tension.

TENSION	LBS. OF FORCE	BELT DEFLECTION
NORMAL	1-1/2	1/8
1-1/2 TIMES NORMAL	2-1/4	1/8
2 TIMES NORMAL	3	1/8

BELT ADJUSTMENT CHART

The engine is mounted on a full-revolving turntable to allow the flexible shaft to be worked in a straight line, thus avoiding unnecessary kinks. When using the grinder either on or off the rails, the revolving frame should be unlocked from the truck frame and allowed to turn in any direction. When wheeling the machine, it is much easier to handle if you lock the engine frame to prevent its turning. The handle that operates the lock is immediately below the engine on the power take-off side.

When wheeling the grinder, the stabilizer bar lock pin is pulled out to allow the stabilizer bar to be telescoped in under the engine. Reverse the procedure when using the grinder on the rails.

NOTE

See special instructions on Flexible Shaft Maintenance and Lubrication.

FLEXIBLE SHAFT
MAINTENANCE AND LUBRICATION INSTRUCTIONS

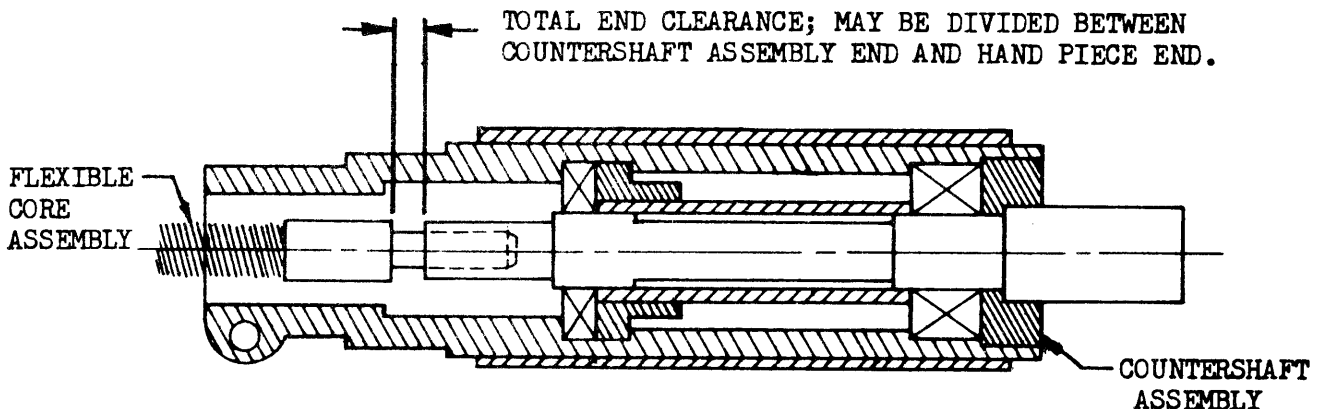
In order to develop a greater understanding of the flexible shaft operation and its various uses, the following general information has been provided.

A standard core assembly, 9606 0001, measures 114.375/114.250 overall and is .625 in diameter. A keyed tang fitting is swaged to each end of this core. This assembly has the necessary transverse flexibility and torsional stiffness to insure satisfactory, trouble-free service when operating under the maximum loads for which the grinder is recommended.

The flexible core assembly is for left hand operation and should be operated only for left hand rotation. To visually assure that the proper core assembly is being used, the core winding must have the appearance of a right hand screw thread. Left hand rotation can be verified by straddling the flexible shaft and viewing toward the grinding wheel end of the shaft; the rotation of the core must be counter clockwise.

The flexible shaft casing, 9606 0002, provides a continuous guide for the flexible core which enables it to run true and operate smoothly. The casing also prevents the core from looping when operating under grinding loads. With the core properly assembled in the casing, the core will be protected against damage from external sources and will remain properly lubricated. The overall length of the casing, 9606 0002, measures 107.500/107.375 inches.

The casing has one end fitting designed to allow sufficient adjustment in the event the casing stretches. These adjustments are provided by the two retaining rings on the casing end that assembles to the engine countershaft. These adjustments are necessary in maintaining the correct operating length of the casing, with reference to the core length. With the core and casing assembled to the countershaft and with a hand piece attached to the opposite end of the shaft a specific dimension is obtained. This dimension will provide, between the shoulders of the core fittings, end clearance or core float sufficient to prevent binding of the core within the casing.



Each time the core is removed from the casing for cleaning and renewing lubricant, a check should be made of the casing length with reference to the core length, as follows:

Insert the flexible shaft into the countershaft as described above, press the core all the way into the casing, so that the drive key in the countershaft spindle contacts the end of the keyway in the core fitting. Measure the amount the tip of the exposed core fitting extends beyond the hand piece end of the casing. If it is a new core and casing, both stop rings should be in place in the grooves provided in the countershaft end of the casing, when making this measurement, and the core end should extend beyond the casing approximately 3 to 3 1/8".

If the core and casing has been in service and the distance measured is LESS than 1 3/4", remove the first stop ring from the end of the casing and insert the casing into the countershaft adapter until the second stop ring is contacted.

After the flexible shaft has been in service for some time following the first adjustment, the casing may stretch to the point where a second adjustment is necessary. When the casing has stretched so that the core end extends only 1 3/4" beyond the casing, it is necessary to remove both stop rings and insert the casing end all the way into the countershaft adapter.

The two adjustments above compensate for 2 1/8" casing stretch. It is doubtful if a casing will ever stretch beyond this amount. Proper adjustment for casing stretch is important because if it is not made, the core fittings will not have sufficient contact and damage to them will result.

It is also very important that the adjustment is not made too soon, because this will make the casing too short with respect to the core length and will obviously crimp the core and cause damage to both core and casing.

The flexible shaft used on this grinder has been selected to meet or exceed the requirements of both engine and grinding operations. Care has been taken to select speeds of both grinding wheels and engine based on specific engineering information covering these operations. These speeds are recorded on a permanent plate and attached to the machine in a location visible to the operator and observers.

WARNING

DO NOT EXCEED RECOMMENDED SPEED.
EXCEEDING RECOMMENDED SPEEDS CAN RESULT IN PERSONAL INJURY
AND PROPERTY DAMAGE.

The flexible shaft is designed and made to give lasting performance with proper care. By following a few simple instructions, the utmost service will be attained.

1. The flexible shaft assembly should always be operated in as large a radius as is possible. Operation of the shaft in an arc smaller than 10" radius will shorten the life of the core and casing.
2. Care must be taken to prevent dirt, moisture, abrasive dust and other foreign substances from contacting the core surfaces.
3. When not in use the flexible shaft should be stored straight and away from possible damage and contamination.
4. Do not subject the shaft to unnecessary overloads and shocks. This is liable to cause helixing of the core, resulting in a shaft failure.
5. When it is necessary to move the grinder, do not use the flexible shaft as a tow rope. Pulling will produce longitudinal strains and cause stretching of the casing. Carry the flexible shaft whenever possible.
6. Never force the fittings or attachments on the shaft assembly. Turn fitting slowly until the key drops into keyway. If this does not occur smoothly and readily, disassemble and investigate.
7. Care must be taken not to over lubricate. Observe the lubrication instructions to assure proper operation and long shaft life.

LUBRICATION

The flexible shaft selected for this grinder requires only a minimum of maintenance. But to assure trouble-free operation the following lubrication items should be understood and observed.

1. The core assembly should be greased approximately every month. This is only a guide, if the grinder is being used 8-10 hours per day on continuous service, the core should be inspected at regular weekly intervals. Where the shaft operates for longer periods, or where it is being constantly flexed for operation it must be inspected more often. Never allow the core to become dry; on the other hand, do not over lubricate.
2. Proper lubrication of the shaft assembly is essential for maximum life of both core and casing. We recommend using Houghton FA nonfluid oil or a high quality grade of medium weight cup grease. The use of poorer quality lubricant will only reduce shaft life.
3. To lubricate core assembly, remove flexible shaft assembly from countershaft end of engine. Withdraw core from the hand piece end of casing. Apply grease by holding some in hand and pulling

the core through the grease while it is being fed back into the casing. Care must be taken to prevent dirt, lint or abrasive material from contaminating the grease.

4. Take care not to apply an excessive amount of lubricant to the core. As long as the core has a slight film of lubricant throughout its entire length, you will have satisfactory, frictionless operation. Excess lubricant will cause the grease to churn, resulting in heating and this heating will be detrimental to both core and casing.
5. The flexible shaft core should be removed from the casing after about 160 hours of service. Clean the old grease off the core with kerosene, and with a draw wire fitted with a section of lintless cloth, clean the old grease out of the casing. Allow core to dry thoroughly before relubricating. Be careful that no dust, moisture, lint or abrasive material collects on the core.

When replacing the core in the casing after each 160-hour cleaning operation, reverse the position of the core. The end that was formerly at the countershaft or power take-off should be switched to the hand piece end of the casing. These cores are reversible; both core fittings are identical. This procedure will assist in improving the life of the core, since the hand piece end of the shaft is usually given the most severe service.

The hand piece end connection on the casing is designed for "quick change" from straight hand piece to right angle hand piece. The quick change coupling also acts as a ball bearing swivel. To uncouple either hand piece from the casing, press casing release lock sleeve away from the casing, permitting the steel balls to drop into the groove machined on the inside of the sleeve. Withdraw the hand piece. Release the casing release lock sleeve which will be returned to its normal position due to the pressure of the tension spring.

To re-connect the hand piece, press the release lock sleeve forward and insert casing end (the end that has the 5/16" wide machined groove approximately 5/8" from the end) into the coupling. Release the sleeve which will return to its normal position.

REXNORD
Railway Equipment Division

October 2, 1978

LUBRICATION of the Nordberg 9606 0023 Hand Piece
and 9606 0005 End Piece Assembly

Due to the type of ball bearings used in the hand pieces and countershafts, it is not necessary, nor is it possible to relubricate these bearings. The two-seal bearings used in the above assemblies have sufficient grease lubricant to last the life of the bearings when operated under normal conditions. These sealed bearings are primarily employed to keep dirt and emery grit out of the bearings and also to serve to retain an adequate supply of lubricant.

Sealed ball bearings in conjunction with the labyrinth seals exclude any possibility of dirt or emery grit entering the bearings.

Since bearings with seals on both sides should not be washed or cannot be relubricated, there is no reason to disassemble these units until excessive end or radial play develops and the bearings have to be replaced.

LUBRICATION of the Nordberg 9606 0024 Right Angle Hand Piece

The bearings used in the 9606 0024 right angle head are all of the single-seal type. A labyrinth seal is incorporated with the main spindle to further eliminate dirt and emery grit from entering the gear housing and bearings. These bearings are furnished lubricated with the proper amount of grease for correct operation and normally require no further attention.

It is advisable and necessary at intervals of six months to check the lubricant in the gear chamber. While it is almost impossible for the gear grease to work its way past the bearings and labyrinth seal on the main spindle, this grease can become contaminated with grains of metal and pulverized scale due to the normal wear on the hardened spiral bevel gears. There is also a possibility of the grease lubricant becoming hard and carbonized due to excessive heat resulting from overload. Therefore, it is desirable to inspect this gear grease at six-month intervals; and if the grease is badly discolored or hardened, the head should be disassembled and all old grease carefully cleaned off of the gears, bearing surfaces, and the inside of the housing. Before reassembling the right angle head, fill the gear chamber of the housing one-third full with high quality gear grease.

A good way to determine whether or not there is sufficient good grease in the gear chamber is to remove the grease plug in the right angle casting and observe the movement of the grease when the head is in operation. If you notice that the quantity of grease is sufficient to cover the gear mounted onto the main spindle, it will not be necessary to add more lubricant.

REXNORD
Railway Equipment Division

ACCESSORIES FOR FLEXIBLE SHAFT GRINDERS

9606 0007 Cup wheel guard includes flange, 3235 4776
9606 0011 Slotting guide assembly
9606 0014 Cup wheel surfacing appliance includes flange,
3235 6576, flange nut, 5163 5441 and wrench,
8780 7705
9606 0022 Free hand surfacing guard
9606 0023 Straight hand piece
9606 0024 Right angle hand piece includes adjustable
spanner wrench, #482
9606 0033 Guard for 8" double cup wheel
9606 0087 Safety guard includes two flanges, 3235 3201

ACCESSORIES TO BE USED WITH STRAIGHT HAND PIECE 9606 0023

9606 0007 Cup wheel guard
9606 0011 Slotting guide assembly
9606 0033 Guard for 8" double cup wheel
9606 0087 Safety guard

ACCESSORIES TO BE USED WITH RIGHT ANGLE HAND PIECE 9606 0024

9606 0014 Cup wheel surfacing appliance
9606 0022 Free hand surfacing guard

NOTE: When Accessories are ordered at the time of purchase of a Grinder, the necessary flanges, flange nuts, special wrenches, etc., are furnished at no additional charge. However, when Accessories are purchased separately, there will be a charge for these parts.

