Preliminary I. L. 3661-GPR

RECEIVING • INSTALLATION • MAINTENANCE

INSTRUCTIONS

MODULINE*

GEARMOTORS

SPEED REDUCERS

PACKAGE MOTOR REDUCERS

*Trade-Mark

WESTINGHOUSE ELECTRIC CORPORATION

NUTTALL PLANT • **GEARING DIVISION** • **PITTSBURGH, PA.**

NEW INFORMATION

MAY, 1958

Printed in U.S.A.

GENERAL INSTRUCTIONS

INDUSTRIAL GEAR UNITS are designed for use with prime movers such as electric motors, gas, oil or diesel engines. They provide efficient transmission of power from high speed motors or engines to the slower speed requirements for driven machines. These units are rated in accordance with the AGMA standards for Helical and Herringbone parallel shaft speed reducers of the industrial type and carry the AGMA nameplate. They are sturdily constructed and directly applicable to all requirements except reversing service which must be pre-specified.

IMPORTANT

Each unit has been selected to suit the load conditions for the AGMA Service Rating specified on the nameplate. Proper performance is dependent on adherence to the operational ratings as stated on the nameplates and to the instructions contained in this booklet.

Receiving, Handling and Storing

Immediately upon receipt examine the crating carefully. If any evidence of damage due to rough handling is apparent, notify the carrier (transportation company) at once, **before unpacking the unit.**

Unpacking and Handling

The gear unit is usually bolted to a skid which forms the bottom of the crate in which it is shipped. Remove the sides of the crate carefully and then move the unit into a convenient position by attaching a tow rope to the skid.

Storing

When it is necessary to store the unit for any length of time before installation, the storage location should be dry, clean, and as nearly constant in temperature as possible. **Do not remove the crating or the skid.**

Internal parts are sprayed with a rust preventative at the factory. Lubricant need not be added until the unit is ready for operation.

Installation

The continuous efficient operation of a gear unit depends chiefly on four factors:

1. The proper type of foundation and correct mounting.

2. Proper alignment with the driven equipment.

3. Correct lubrication.

4. Full consideration of both preventive and operating maintenance.

The following instructions are suggested to provide a simple, basic plan for the installation and trouble-free operation of this equipment.

I. Foundation

A foundation or mounting, which provides rigidity and prevents weaving or flexing with resultant misalignment of the shafts, is essential to the successful operation of a gear unit.

A concrete foundation should be used whenever possible and should be carefully prepared to conform with data regarding bolt spacing and physical measurements contained in the Identified Dimension Leaflet, supplied prior to delivery of the equipment.

Gear units are designed with a tolerance of +0 and -1/32 in. between the shaft center and the base. Therefore, shimming may be required. Flat shims of various thicknesses, slotted to slide around the foundation bolts, should be used. After alignment has been secured through shimming, the equipment should be bolted down and alignment rechecked.

NOTE

When the units are installed on structural foundations, pads or a supporting base plate of steel should be provided to obtain proper rigidity. This plate or pads should be of a thickness not less than the diameter of the hold down bolts.

2. Alignment

Heat up couplings, sprockets or pinions and shrink them onto shaft extensions when required. To avoid severe damage to bearings and gears the above must not be hammered onto shaft extensions.

When the prime-mover is connected to the gear unit or the gear unit is connected to the driven equipment by means of a coupling, correct alignment cannot be overemphasized. This becomes of greater importance as speeds are increased or drive is subjected to variations in load conditions. Misalignment, either parallel or angular, is one of the most frequent causes of bearing or shaft failures, noisy operation, or excessive operating temperatures due to the extra load imposed.

A straightedge laid across the coupling member at the machined diameter provided for alignment purposes shows correct parallel alignment when the straightedge rests on both coupling members for their full length. Check this at four positions - 90 degrees apart.

The use of feeler gauges between coupling member faces is a common method of checking for correct angular alignment. Check at four positions 90 degrees apart.

A more accurate alignment check is obtained by the use of dial indicators. This is done by clamping the indicator on one coupling member with the indicator stem resting on the other coupling member, then rotating the member holding the clamped indicator. Parallel and angular alignment should be within .002.

Mounting

Units may be ordered by catalogue numbers for wall, ceiling, or vertical mounting (where applicable).

If a change in mounting is desired at any time after receipt of the equipment, certain minor changes in the assembly, breather, and oil level will be necessary. These changes may easily be made in the field. See specific instructions for unit type.

Units as furnished are intended to be mounted on level foundations or within the limits of angularity specified. Applications requiring angle mounting beyond the limits specified will require changes in the lubrication system. When such changes in mounting are necessary, Westinghouse should be contacted for mounting kits and detailed data before proceeding.

Electrical Connections

All electrical connections should be installed in accordance with the National Electric Code and local requirements.

3. Lubrication

Lubricating oils for use with gear units must be high-quality, straight mineral petroleum oils. They must be non-corrosive to gears or bearings, neutral in reaction, free from grit or abrasives, and have good defoaming and oxidation resisting properties.

For applications where loads, speeds or temperatures are abnormal, Westinghouse should be contacted for specific recommendations.

Lubricating oils should be within the viscosity recommended in the following table.

LUBRICATING RECOMMENDATIONS

Ambient Temperature, Deg. F.		
0-40 F	41-100 F	101-150 F
Lubricant #3	Lubricant #4	Lubricant #5
490-700 SUV	700-1000 SUV	1200-1500 SUV
at 100°F	at 100°F	at 100°F

Selection of Oil

A list of approved oils, identified by manufacturer's trade name, which meet the above general specifications will be furnished on request.

Grease Packed Bearings

Where fittings are provided for grease lubrication, a good grade of #2 ball bearing grease should be applied at regular lubrication change periods. Grease should be neutral in reaction and free from fillers and abrasives.

Double shielded grease packed bearings are sealed for life and do not require maintenance.

Filling the Unit

See specific instructions for unit type on page 12.

IMPORTANT

Never attempt to add or replace oil while the unit is running. Do not fill beyond the indicated oil level. Excess lubricant increases the "churning" effect and may result in overheating with consequent thinning of the oil and leakage.

The oil should be drained and filtered (or replaced) approximately one week after the unit is placed in service, and the unit refilled to the specified level. This practice removes any foreign material which may have collected in the lubricant during initial operation.

4. Maintenance

The care of gear units is an important operational function, which should be given every reasonable attention to assure long and efficient service life of the equipment. The following inspection and maintenance program, to cover both the gear unit and its drive is recommended.

A schedule based on the check chart given below should be regularly followed. Intervals between inspections should be determined by the existing atmospheric and operating conditions.

OPERATING MAINTENANCE CHECK CHART - GEARED DRIVE

Trouble	Probable Cause	Check
Noisy Operation of the unit.	1. Misalignment	1. Check alignment of unit with driven member. Check condition of couplings, if used.
	2. Faulty Lubrication	2. Check oil level. Determine if lubricant is of grade recommended.
	3. Excessive Tension, if power input or take off is by belt or chain drive.	3. Check tension and alignment of drive auxiliaries; relieve if necessary. (See that pulleys or sprockets are mounted as close to the unit as possible).
	4. Worn parts caused by normal length of service or possibly as a result of (1), (2), or (3) above.	4. Adjust or replace worn parts.

Trouble	Probable Cause	Check
Excessive operating temperature	1. Incorrect Lubricant 2. Incorrect amount of lubricant 3. Overloading.	1. Check oil against specification instructions. 2. If check shows low oil level fill to level indicated. Drain a portion if level is too high. See that breather is clean and functioning correctly.
Oil Leakage	1. Too much oil in unit. 2. Clogged Breather 3. Loose bolts or nuts.	1. Recheck oil level with unit shut down. 2. Remove and clean breather. 3. Tighten all joint and end cap bolts.
Loosened mounting bolts.	1. Vibration from fluctuating loads or misalignment.	1. Check and re-align system and periodically tighten all bolts.

Maintenance and Repair

If it is necessary to disassemble units for repair, the repair area must be clean and dry, and the open case and all parts protected from dust, dirt and moisture.

For disassembly procedure see repair section under specific unit type.

Bearing Replacement

NOTE

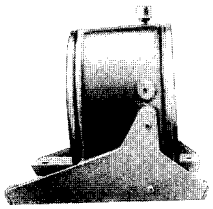
Never remove or mount a bearing by applying force against the outer race. Bearings should be removed with a commercial bearing puller or a small press. Mounting of bearings on a shaft should be made with a small press, or by heating the bearing to 100° F. above room temperature and shrinking it onto the shaft. Bearings must not be hammered onto the shaft.

COMMON PARTS FOR TYPES

HGCD, HGCT, HGCQ, VGCD, VGCT, VGCQ, HGZD, HGZT, HGZQ

PART (1) GEARCASE SUB-ASSEMBLY

The gearcase is pre-drilled for the following mounting positions:



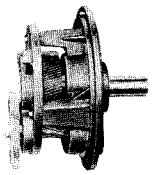
Horizontal Within the limits of angularity shown in the catalog.
Vertical - Left hand or right hand wall mounting.
Ceiling Mounting.

Dowel holes for locating the cages are drilled and reamed in four positions on each end of the case. The case is pre-drilled and tapped to permit locating of the breather and drain plug for the mounting positions indicated above.

The breather, all necessary pipe plugs, and standpipe (when required) are supplied in this sub-assembly.

PART (2) LOW SPEED CAGE SUB-ASSEMBLY

The low speed cage sub-assembly is double supported in the output end of the gearcase to minimize deflection and assure accurate alignment of the overhung change gears. The low speed gear set of a fixed ratio is supported by this assembly. The output shaft, endcap and seal, backstop (if required) and low speed pinion shaft with splined extension are also part of this assembly.



PART (3) HIGH SPEED CAGE SUB-ASSEMBLY TRIPLE RED. TYPE T ONLY

The high speed cage sub-assembly - triple reduction contains a spacer and a splined shaft to accept the change pinion, and the triple reduction gear.

The cage contains a dowel which must be located "up" with respect to the oil level regardless of the mounting position of the case. This assures proper lubrication of the change gearset and the triple reduction gearset.

PART (4) HIGH SPEED CAGE SUB-ASSEMBLY QUADRUPLE REDUCTION TYPE Q ONLY

The high speed cage sub-assembly quadruple reduction is similar in all respects to the triple reduction above except for a fixed ratio quadruple reduction gearset mounted between the cage plates.

PART (5) DOUBLE REDUCTION ADAPTER SUB-ASSEMBLY TYPE HGCD

The double reduction adapter sub-assembly bolts directly to the gearcase and is used to mount the standard flanged motors on double reduction gearmotors. This adapter is also used on double reduction speed reducers to mount the high speed right angle head.

PART (6) END COVER SUB-ASSEMBLY TYPES T AND Q

The end cover sub-assembly serves as an adapter which bolts through the high speed cage into the gearcase and is used to mount standard flanged type motors on triple and quadruple reduction gearmotors. The pipe plug is replaced with a breather when the unit operates vertically. This adapter is also used on triple and quadruple reduction speed reducers to mount the the high speed right angle head.

PART (7) VERTICAL FLANGE ATTACHMENT

The vertical flange is used to convert the standard foot mounted units to flange mounting.

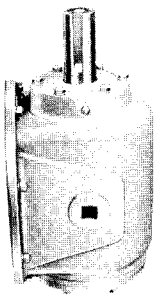
PART (8) CHANGE GEARING ALL TYPES

Change Gearing is available from 1:1 ratio through 5:1 ratio in 9 steps to meet AGMA ratio requirements.

Both gears and pinions are internally splined. Change gears always are mounted on the splined extension from the low speed cage. On double reduction units, (Type D), the change pinion is located on the splined motor shaft. On triple and quadruple reduction units (Types T & Q) the change pinion is mounted on the splined extension from the high speed cage.

PART (9) RIGHT ANGLE OUTPUT HEAD SUB-ASSEMBLY

The LSRA attachment contains a 3:2 ratio set of spiral bevel gears with the output shaft either single or double extended. The head can be located in eight different positions on unit sizes 1, 2, 3 and 4. Twelve different positions can be obtained on unit sizes 5, 6 and 7.



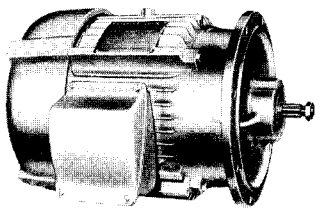
The heads are factory assembled, shimmed for correct contact and then doweled to the case. Both bearings are grease lubricated to permit operation in any position.

The output shaft of the basic low speed cage is modified to mount the bevel pinion when this attachment is used.

PART (10) GEARMOTOR MOTOR TYPES HGCD, HGCT, HGCQ

The gearmotor motor is supplied with a flange for mounting directly on the adapter for Type HGCD and on the endcover for types HGCT and HGCQ.

The motor is splined to accept the change pinion in Type D and the fixed ratio triple or quad. pinion for Types T or Q.

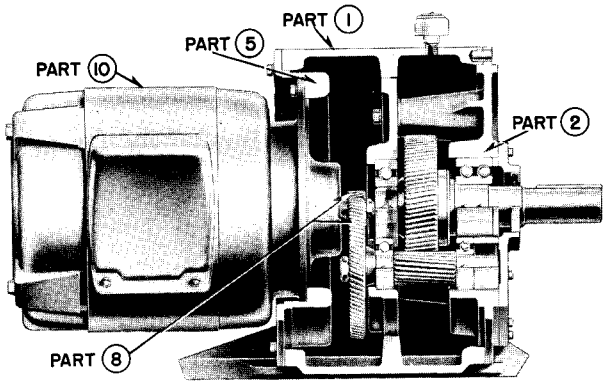


Slide Bases

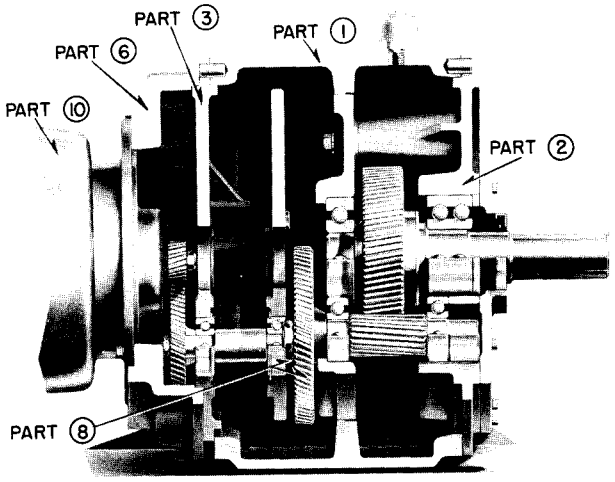
All steel slide bases can be supplied to permit adjustment of tension if the power take-off is by belt or chain.

COMMON PARTS FOR TYPES
HGCD, HGCT, HECQ, HGZD, HGZT, HGZQ, VGCD, VGCT, VGCQ

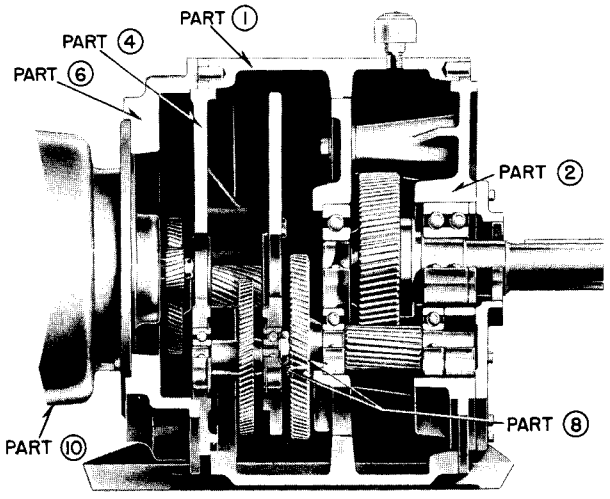
HORIZONTAL GEARMOTORS
Type HGCD



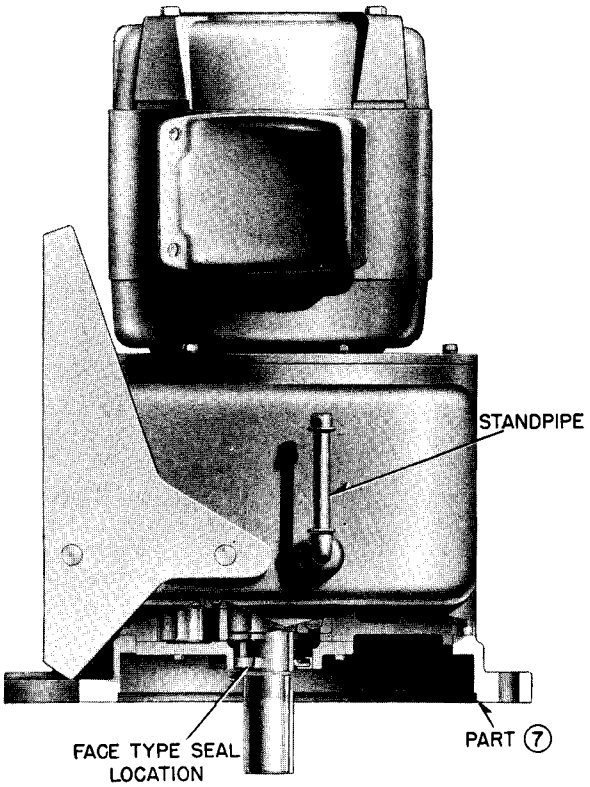
Type HGCT



Type HGCQ

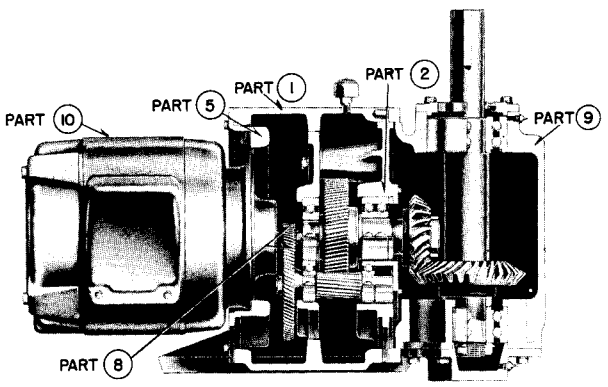


VERTICAL GEARMOTORS
Types VGCD, VGCT and VGCQ



The horizontal gearmotors shown at left can be supplied or converted in the field for use as vertical flange mounted gearmotors with the addition of a vertical flange attachment, face type seal and standpipe for indicating oil level.

RIGHT ANGLE GEARMOTORS
Type HGZD



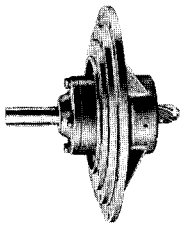
TYPES HGZT AND HGZQ have the same low speed cage and right angle attachment as Type HGZD and the high speed cage, endcover and motor assembly shown above for Types HGCT and HGCQ.

TYPES HRCD, HRCT, HRCQ, VRCD, VRCT, VRCQ, HRZD, HRZT, HRZQ, HRXD, HRXT, HRXQ

SUB-ASSEMBLIES DESCRIBED UNDER GEARMOTORS

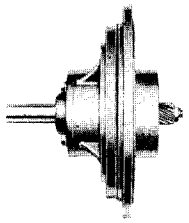
Part (1) Gearcase Sub-Assembly
(2) Low Speed Cage Sub-Assembly
(3) High Speed Cage Sub-Assembly-Triple
(4) High Speed Cage Sub-Assembly-Quadruple
(5) Double Reduction Adapter Sub-Assembly
Part (6) End Cover Sub-Assembly
(7) Vertical Flange Attachment
(8) Change Gearing All Types
(9) Right Angle Output Head Sub-Assembly

PART (11) DOUBLE REDUCTION SPEED REDUCER BRACKET SUB ASSEMBLY



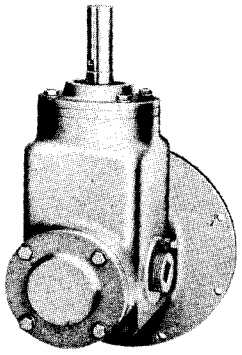
This sub assembly contains the splined input shaft for the change pinion on double reduction units and bolts directly to the gearcase. The bearing nearer the input shaft extension is grease packed and sealed for life.

PART (12) TRIPLE & QUADRUPLE REDUCTION SPEED REDUCER BRACKET SUB ASSEMBLY



This sub assembly contains the input shaft and triple or quadruple pinion and bolts to the endcover. The bearing nearer the input shaft extension is grease packed and sealed for life.

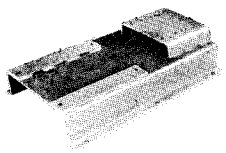
PART (13) RIGHT ANGLE INPUT HEAD



The high speed right angle attachment contains a 1:1 set of spiral bevel gears. The head may be located in three positions - input shaft horizontal to the left or right or vertically down. The heads are factory assembled and shimmed for correct contact.

When applied with a right angle head, the unit must be filled to the oil level indicated on the head.

PART (14) BEDPLATE

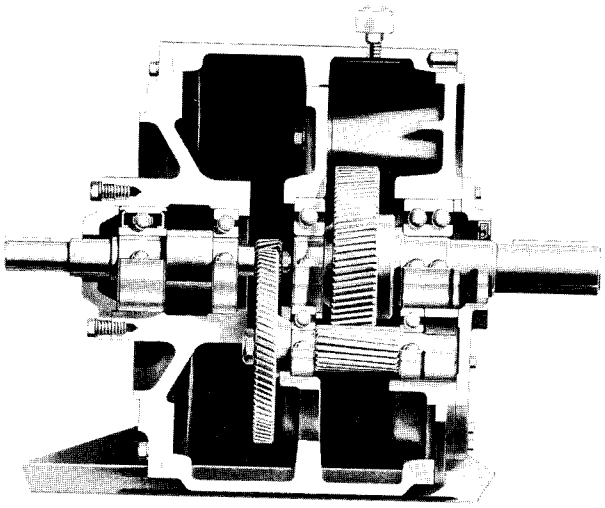


A line of fabricated steel bedplates is available for Moduline speed reducers and coupled standard frame motors. The unit and motor are preshimmed to provide proper coupling alignment. However, due to flexing during shipment and installation the coupling alignment should be checked after the bedplate is bolted down, and adjusted if necessary.

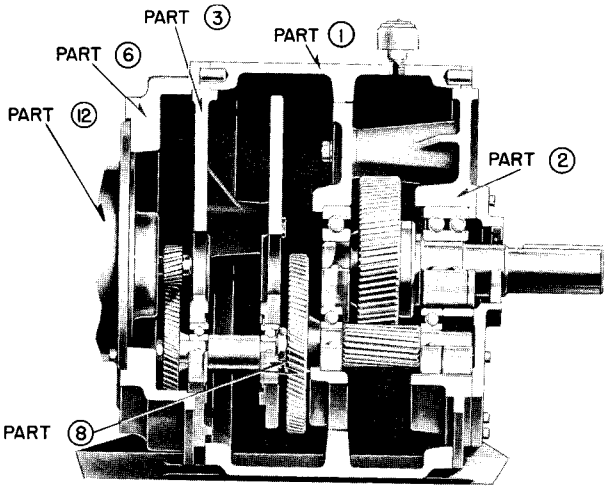
TYPES HRCD, HRCT, HRCQ, VRCD, VRCT, VRCQ, HRZD, HRZT, HRZQ, HRXD, HRXT, HRXQ

HORIZONTAL REDUCERS

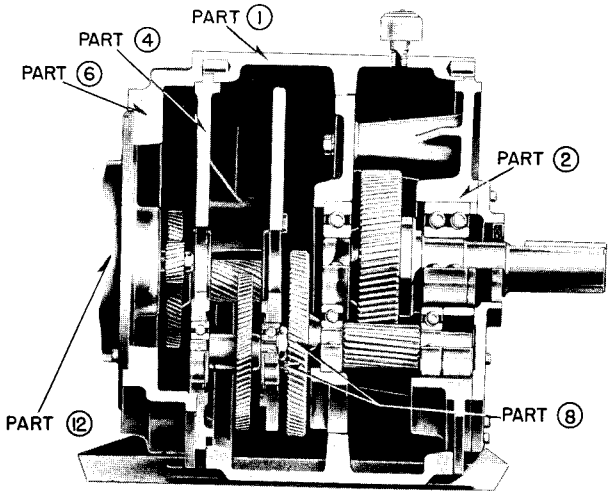
Type HRCD



Type HRCT

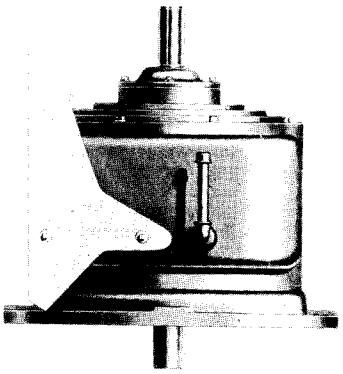


Type HRCQ



VERTICAL REDUCERS

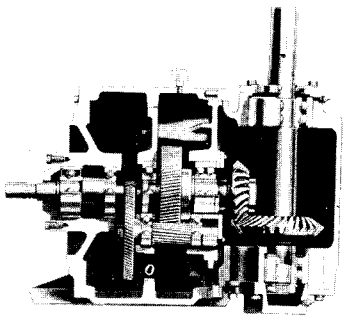
Types VRCD, VRCT, VRCQ



The horizontal reducers shown at left can be supplied or converted in the field for use as vertical flange mounted reducers with the addition of a vertical flange attachment, face type seal and standpipe for indicating oil level.

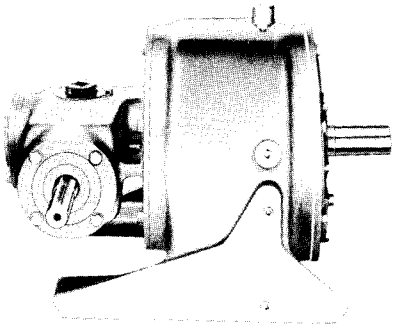
RIGHT ANGLE REDUCERS

Type HRZD



Types HRZT and HRZQ have the same low speed cage and right angle attachment as Type HRZD and the high speed cage, endcover and bracket assembly shown above for Types HRCT and HRCQ.

Types HRXD, HRXT, HRXQ



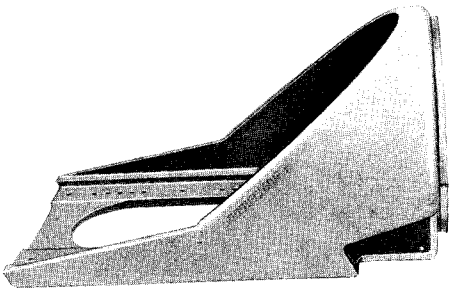
Types HRXD, HRXT, and HRXQ have the same basic construction as Types HRCD, HRCT, and HRCQ except that the bracket is replaced by a right angle input head.

TYPES HUCD, HUCT, HUCD, VUCD, VUCT, VUCQ, HUZD, HUZT, HUZQ

SUB-ASSEMBLIES DESCRIBED UNDER GEARMOTORS OR SPEED REDUCERS

Part (1) Gearcase Sub-Assembly
(2) Low Speed Cage Sub-Assembly
(3) High Speed Cage - Sub-Assembly-Triple
(4) High Speed Cage - Sub-Assembly, Quadruple
(6) Endcover Sub-Assembly, Types T and Q
(7) Vertical Flange Attachment
(8) Change Gearing, All Types
(9) Right Angle Output Head, Sub-Assembly
(11) Double Reduction Speed Reducer Bracket Sub-Assembly
(12) Triple & Quadruple Reduction Speed Reducer Bracket Sub-Assembly

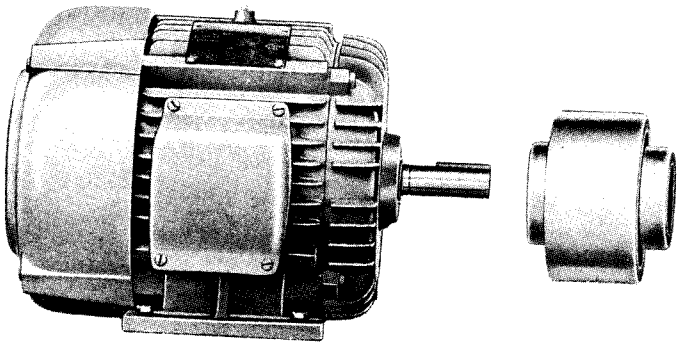
PART (15) MOTOR SUPPORT BRACKET SUB ASSEMBLY

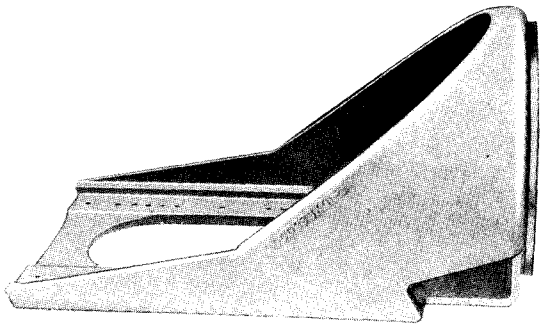


The motor support bracket sub-assembly bolts to the speed reducer bracket and is pre-drilled for correct coupling gap when the motor is bolted to it. The motor is pre-shimmed to provide proper coupling alignment, and pre-alignment should not be required at installation.

TYPES HUCD, HUCT, HUCQ, VUCD, VUCT, VUCQ, HUZD, HUZT, HUZQ

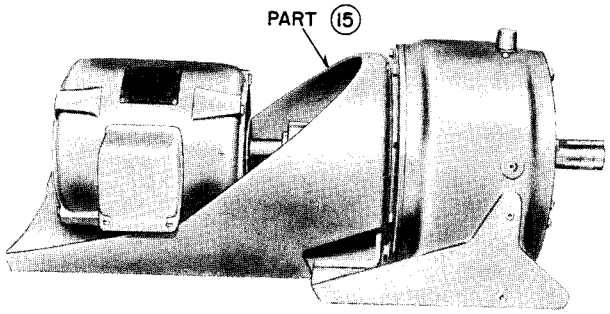
DESCRIPTION



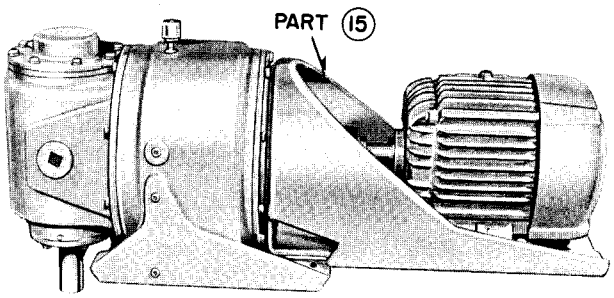


The addition of a motor support bracket, standard foot mounted motor, and coupling to a Type HRC, VRC, or HRZ unit converts that unit into the corresponding HUC, VUC or HUZ unit. (See description of Types HRC, VRC, HRZ)

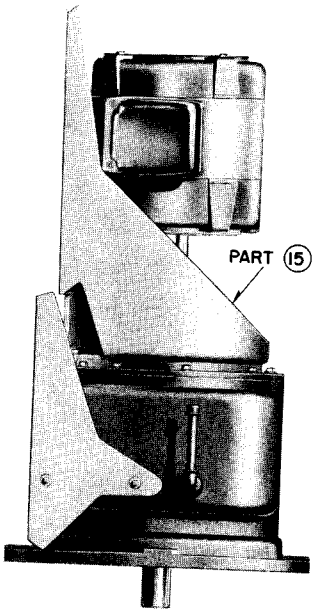
TYPES HUCD, HUCT, HUCQ



TYPES HUZD, HUZT, HUZQ



TYPES VUCD, VUCT, VUCQ



FIELD MODIFICATION OF UNITS

Changes in Mounting - Horizontal Units Only

If units are to be floor, ceiling or wall mounted in a position other than specified when ordered, the following procedure should be followed:

1. Remove low speed cage (and high speed cage on Types T and Q) and rotate so that dowel locations will be "up" with respect to the oil level when the unit is in operating position.

2. If end cover or speed reducer bracket on Types T and Q is stamped "top", they should be rotated so that the word "top" is in line with the dowel in the H.S. cage.

On Type U units the motor support should be rotated so that the motor feet are parallel to the floor. (Motor may be inverted on support if desired).

4. On Type X or Z units the right angle attachment may be rotated to the desired position.

Type X units are not suitable for mounting with input shaft vertically up.

If input shaft is to be relocated to vertically down and unit has not been ordered for this position contact Westinghouse for face type seal kit.

If type Z unit is to be located with the shaft extension below the horizontal centerline and has not been ordered for this position, consult Westinghouse for face type seal kit.

After re-bolting, type Z units should be drilled and reamed using the 2 dowel holes as pilot holes so that the dowels may be re-positioned. Consult Westinghouse for detailed instructions.

5. The breather should be re-located for the new operating position as shown at right.

Changes in Mounting-Vertical Units Only

Standard Types X and Z are not suitable for vertical mounting.

No standard types are suitable for mounting with the output shaft vertically upward.

If units ordered for horizontal mounting are to be mounted vertically, the following procedure should be followed:

1. Contact Westinghouse for face type seal kit, standpipe kit, and vertical flange (if required).

2. Mount per instructions received in Kits.

FILLING UNITS

Fill all units to the bottom of the pipe plug hole adjacent to the oil level decal.

Horizontal Units

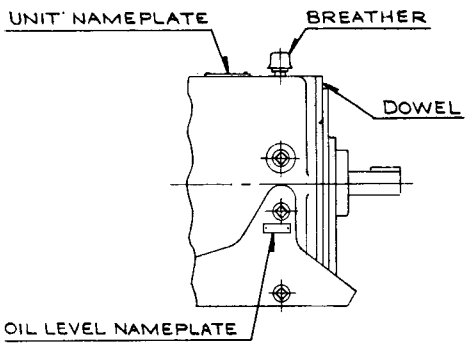
Fill through pipe plug hole adjacent to breather. If force filling is used, remove breather and fill through pipe plug hole adjacent to breather.

Vertical Units

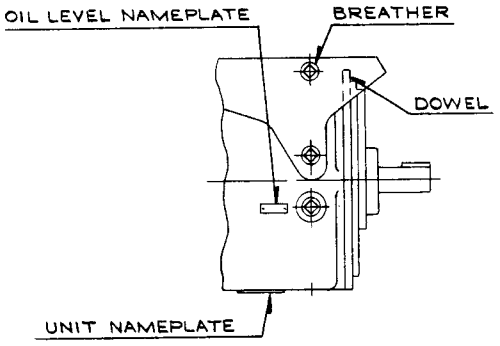
Remove breather and fill through standpipe. Replace breather after filling.

Type HRX

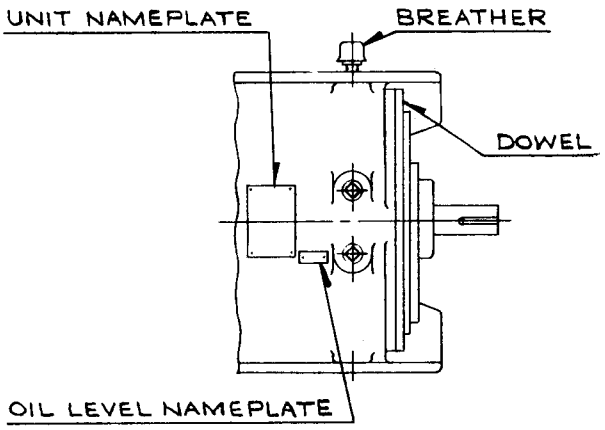
Fill to oil level indicated on high speed right angle attachment.



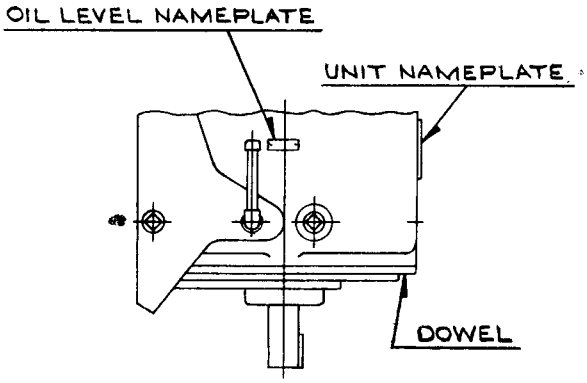
HGCD	HGCT	HGCQ
HRCD	HRCT	HRCQ
HUCD	HUCT	HUCQ
HGZD	HGZT	HGZQ
HRZD	HRZT	HRZQ
HUZD	HUZT	HUZQ



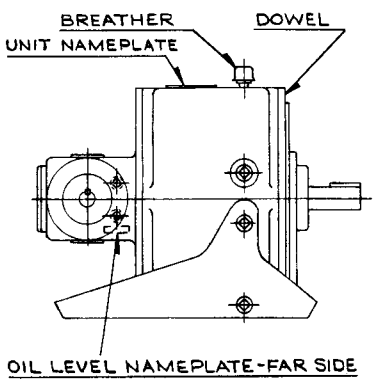
HGCD	HGCT	HGCQ
HRCD	HRCT	HRCQ
HUCD	HUCT	HUCQ
HGZD	HGZT	HGZQ
HRZD	HRZT	HRZQ
HUZD	HUZT	HUZQ



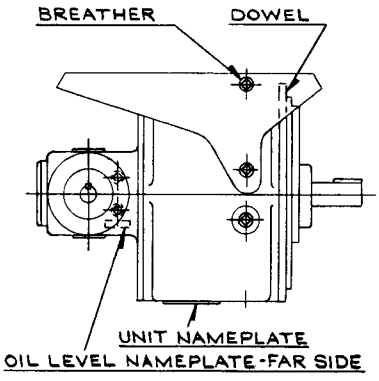
HGCD	HGCT	HGCQ
HRCD	HRCT	HRCQ
HUCD	HUCT	HUCQ
HGZD	HGZT	HGZQ
HRZD	HRZT	HRZQ
HUZD	HUZT	HUZQ



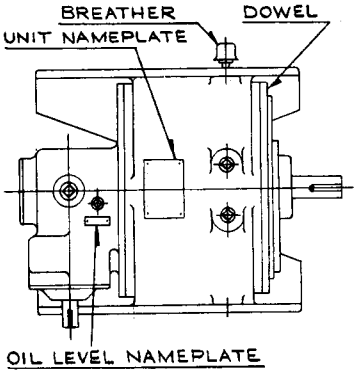
VGCD	VGCT	VGCQ
VRCD	VRCT	VRCQ
VUCD	VUCT	VUCQ
VGZD	VGZT	VGZQ
VRZD	VRZT	VRZQ
VUZD	VUZT	VUZQ



HRXD HRXT HRXQ



HRXD HRXT HRXQ



HRXD HRXT HRXQ

CHANGE OF RATIO

Ratio changes may be made without disconnecting the unit from the driven equipment.

NOTE

Increasing the Ratio in the change set raises the output torque and lowers the output RPM. Westinghouse should be contacted to determine whether the unit has sufficient torque capacity at the new ratio.

Decreasing the Ratio in the change set lowers the output torque and raises the output RPM. The prime mover and application should be checked since higher horsepower may be required at the higher output RPM. Westinghouse should be contacted if prime mover horsepower is to be increased.

The following procedure should be followed in changing ratios. Ratios are changed in only one set of gears. Change ratio only in "change gearset". See "description" for location of "change gearset" in various types of units.

1. Remove motor adapter assembly, bracket or RA input head. (In addition, triple and quad. reduction units require removal of high speed cage).

2. Replace gear on splined extension of low speed pinion shaft and the mating pinion with the gear and pinion of the ratio required.

NOTE

When removing or tightening elastic stop nut holding gear onto splined shaft, the output shaft should be locked to prevent rotation. Protect the shaft to avoid scratching. When removing the pinion from a cage, bracket or RA input head, the shaft should be held. When removing pinions from motors, a leather strap should be wrapped around the pinion to prevent rotation. Do not jam the mesh or clamp on gear teeth to prevent rotation.

3. Reassemble unit and rotate by hand to be positive that all parts are rotating freely.

OVERHAUL AND REPAIR

If it becomes necessary to replace a wearing part in a sub-assembly an exchange replacement of the sub-assembly is advocated by Westinghouse. Factory assembled cages, brackets and high speed and low speed right angle attachments are stocked in stragetically located warehouses assuring rapid replacement parts service throughout the country. Contact the nearest Westinghouse sales and service office for details of the exchange program.

If repairs must be made to the unit the following procedure should be followed:

1. Remove the unit to a clean dry area for disassembly.

2. Drain oil, and remove sub-assembly to be repaired. (L S. cage has jacking holes to facilitate removal).

3. Protect case from entry of dust or dirt.

Low Speed Cage Sub-Assembly

1. Remove change gear from splined shaft.

2. Unbolt end cover and remove.
Shaft must be smooth and free from nicks or burrs so that seal lip is not damaged. Cover keyway with plastic tape to prevent cutting of seal when removing end cover.

3. Remove the three bolts holding the cage plates together. Tap on the smaller plate to slide it off the three hollow dowels serving as locaters. Remove the smaller plate.

4. Remove low speed gear and shaft as an assembly and low speed pinion shaft. See instructions on Page 5 for bearing replacement.

High Speed Cage Sub-Assembly

1. Remove gear and pinion held onto splined shaft extensions.

2. Remove the three bolts holding the cage plates together. Tap on the smaller plate to slide it off the three hollow dowels serving as locaters. Remove the smaller plate.

3. The shaft or shafts may then be removed.

See instructions on Page 5 for bearing replacement.

Bracket Sub-Assembly

1. Remove pinion held onto splined shaft extension.

2. Remove endcap.

3. The shaft may now be removed.

See instructions on Page 5 for bearing replacement.

Input and Output Right Angle Attachment Sub-Assemblies Types X and Z

These sub-assemblies are factory shimmed and adjusted for correct bevel gear and pinion contact. If bearing replacement or other repair must be made on these sub-assemblies, extreme caution must be used to avoid improper mating at re-assembly with subsequent noise and rapid wear.

1. Remove attachment from unit.

2. Remove endcaps.

3. When internal friction seal is used (type Z only, sizes 5, 6 & 7) remove bolts holding seal bracket.

4. Slide shaft assemblies out through the larger bore in the housing.

5. The shafts may now be removed.

See instructions on Page 5 for bearing replacement.

Motor Sub-Assembly

When motors must be removed from the unit for repair:

1. Remove pinion from motor shaft.

2. Unbolt rear bracket (next to shaft extension) and unscrew bearing support plate.

3. Remove any attachments on the front end of the motor.

4. Slide stator and front bracket off the rotor shaft.

See instructions on Page 5 for bearing replacement.

Field Modification Kits

Units may be modified in the field for backstops, vertical mounting positions, or mounting beyond the limits of angularity specified in the catalog.

Contact Westinghouse for information.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