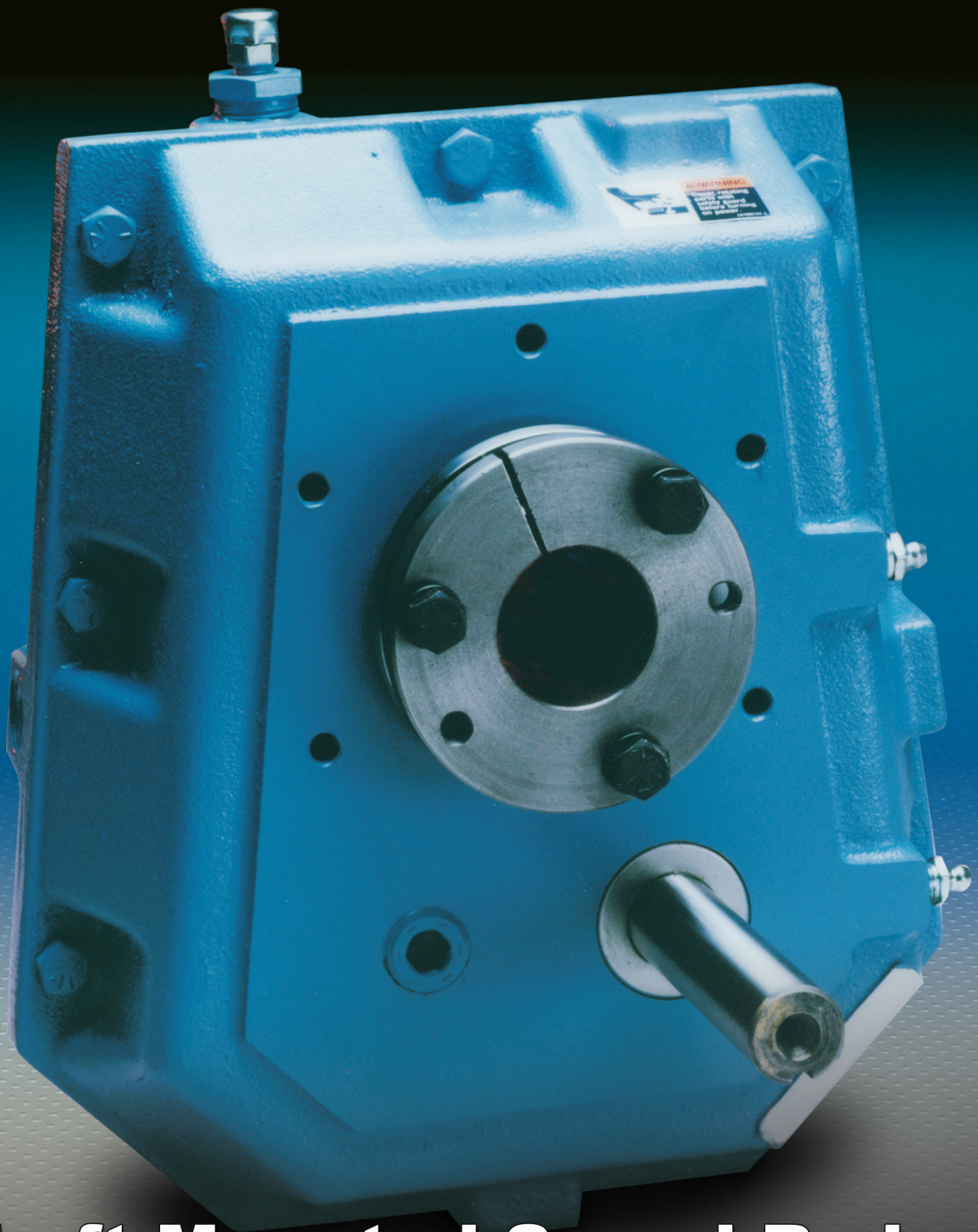
Link-Belt® Speed Reducers



Shaft Mounted Speed Reducers
F-Series

Rexnord

Link-Belt® Shaft Mounted Speed Reducers and Screw Conveyor Drives

Model F Shaft Mounted Speed Reducers and Screw Conveyor Drives have been designed with the features you requested:

- Easy installation and removal by using a unique front mounted tapered bushing.
- More power in a smaller package by incorporating the latest in carburized and ground, AGMA Class 12 gearing and tapered roller bearings.
- Taconite type oil seals are standard.
- Easy maintenance through extra large oil fill and drain holes and grease fittings located on the perimeter of the reducer housing.
- Rugged, dependable and quiet because of close grained, high strength cast iron housings.

Adaptability and Availability

Link-Belt Shaft Mounted Speed Reducers and Screw Conveyor Drives offer a full range of sizes and accessories for application versatility.

Ranges: Horsepower capacities to 200 HP
Output speeds to 400 RPM
Hollow Shaft bore capacities to 6-1/2" diameter

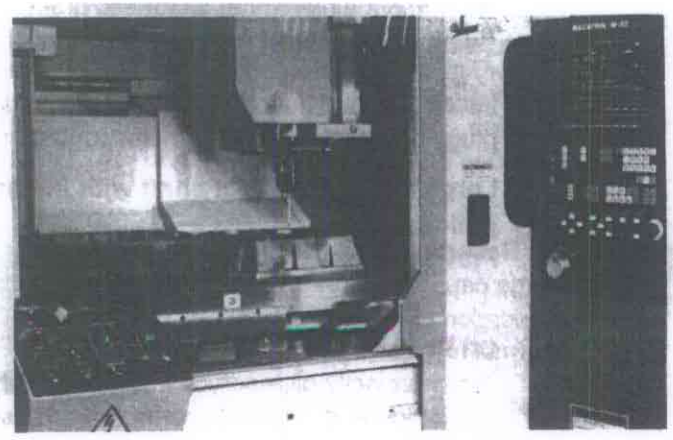
Accessories: Tie Rod
Screw Conveyor Adapter and CEMA Shaft Kit
Motor Bracket
OSHA required Belt Guard
Backstop
Shaft Bushing

Availability: Stocked off the shelf coast to coast

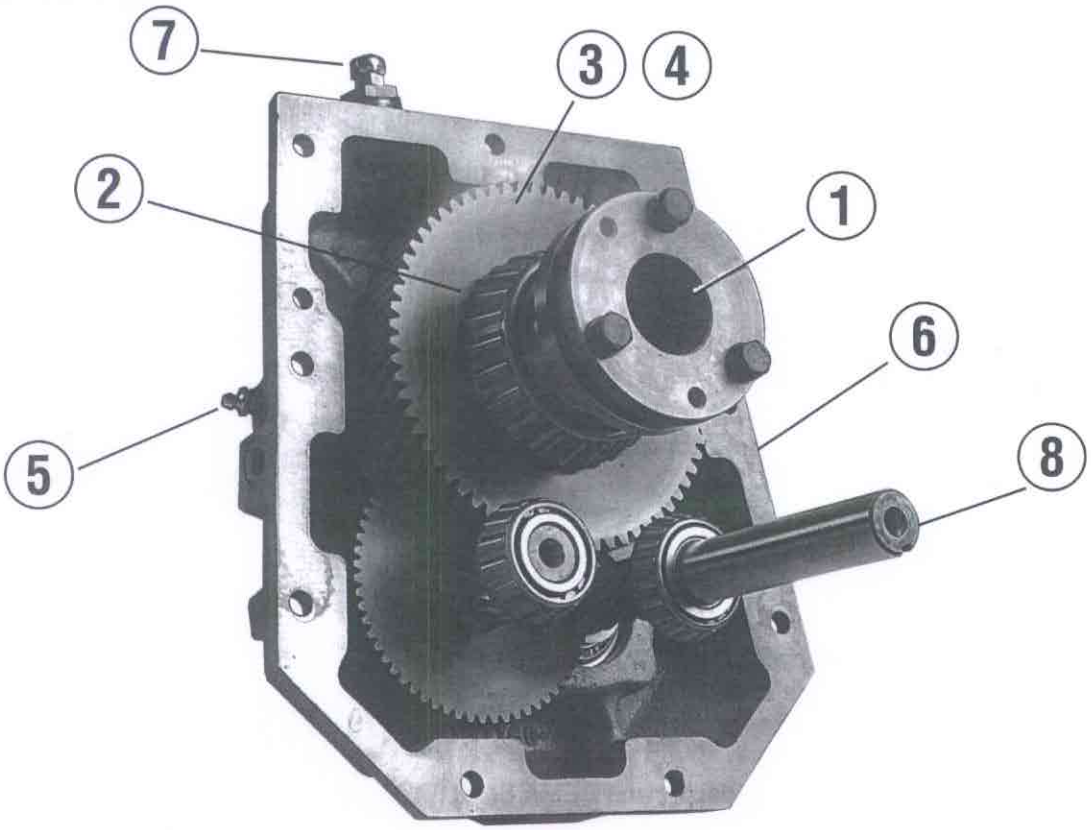
Quality

We are continually improving our methods and designs as part of our commitment to continuous quality improvements. All units were designed using the latest in computer aided technology and are manufactured with state of the art computer controlled machining centers and CNC grinding machines.

Contents



Model F Features and Benefits
Sizes 107 thru 415



Outboard mounted single tapered bushing
(Tie-Rod Units)
① Simplifies installation and removal. No special tools required. Full length key and anti-corrosive stabilizer sleeve minimizes wobble and reduces fretting corrosion and vibration.

100% Tapered roller bearings
② Longer bearing life, greater overhung load and thrust capacity and commercially available.

AGMA Class 12 case carburized and precision ground gears
③ Provides longer service life, higher ratings, compact design and quieter operation.

Higher ratings provide better value
④ Allows for smaller size reducer selections in most applications compared to reducers with conventional gearing.

Integral backstops
Quick installation in the field is possible by removing shaft cover and replacing with backstop kit.

Easily accessible, taconite type, grease purgeable sealing system
⑤ Standard spring loaded dual lip seal keeps oil in while the renewable grease barrier keeps contaminants out.

Rugged cast iron housings
⑥ Rigid, quiet, inherently sound dampening and corrosion resistant.

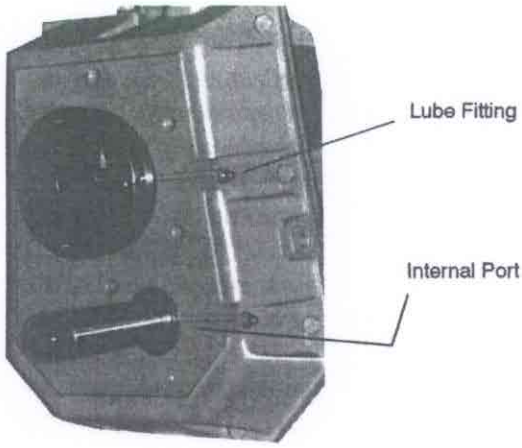
Conveniently located, generously sized, fill and drain holes
⑦ Eliminates waste and spillage. Allows faster installation and maintenance. Magnetic drain plugs help protect against metal contaminants.

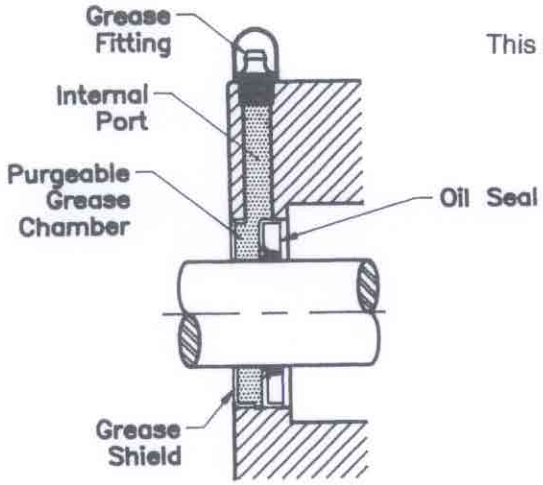
Large alloy steel input shaft with integral pinions
⑧ Provides rugged dependable service

Oil Reservoir
Large capacity oil reservoir assures splash lubrication to gears and bearings. Increased thermal ratings requiring no fans.

Grease Purgeable Sealing System

The Link-Belt® Model F Shaft Mounted Speed Reducers feature a superior, taconite type, sealing system. This system is standard with every speed reducer and is used on both the input and output shaft seals. The system consists of three lube fittings that are internally ported through the cast iron housing to the chamber between the grease shield and the dual lip, spring loaded oil seal.



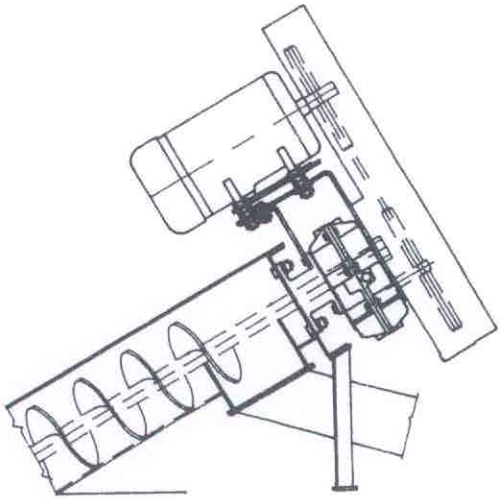


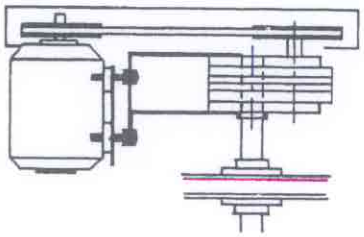
This exclusive sealing system results in the following benefits:

- Extends the life of the reducer by providing multiple barriers to external contaminants.
- Lubricates the seals maximizing both the life of the seal and lubricant retention.
- Protects the seals from external impacts.
- Allows for quick and easy purging of the grease chamber. The grease fittings are located near the outside flange of the housing away from rotating shafts which makes them easily accessible.

Mounting Flexibility

Standard shaft mounted speed reducers may be incline mounted with input shaft 20° upward or downward without modification for sizes 107-415. Greater angles of inclination are possible by minor external modifications such as relocation of oil level indicator, breather and drain plug to match shaft angle, shaft positions and assembly number. Consult Rexnord Geared Products Division.





Standard shaft mounted speed reducers with tie rod mounting can be supplied with modifications for vertical mounting in either input shaft up (as shown) or input shaft down. Consult Rexnord Geared Products Division.

Accessories

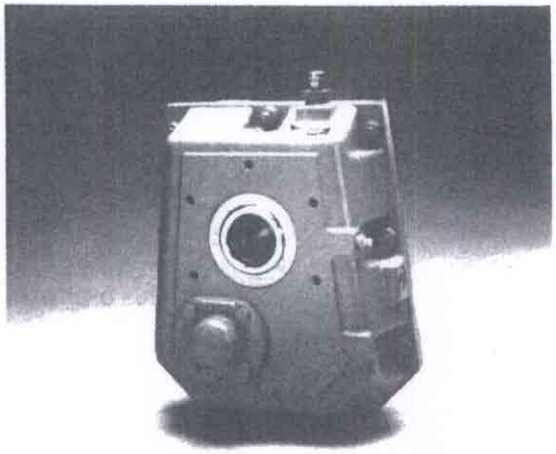
Backstop

An integral backstop is available for any speed reducer. It employs the overrunning clutch principle and automatically prevents reverse rotation of the output shaft during power shutdown or power failure. Holding action is assured through an infinite number of gripping positions. Typical uses for backstops include elevators, inclined conveyors and pumps. Backstop kits are available for field installation in sizes 107 through 507. Size 608 with backstop must be ordered from the factory.

NOTE: Do not use backstops as a substitute for a brake. Backstops are designed to prevent reverse rotation five times or less in eight hours, with one minute or more in the overrunning direction between backstopping load applications. If backstopping operations are more frequent, or the time between operations is less than one minute, the backstop is classified as a working or indexing device and the application must be referred to Rexnord Geared Products Division for engineering review.

WARNING: The use of backstops in the following positions may require a raised oil level. Consult Rexnord Geared Products Division.
Size 107 to 415 - Positions 1 and 4.

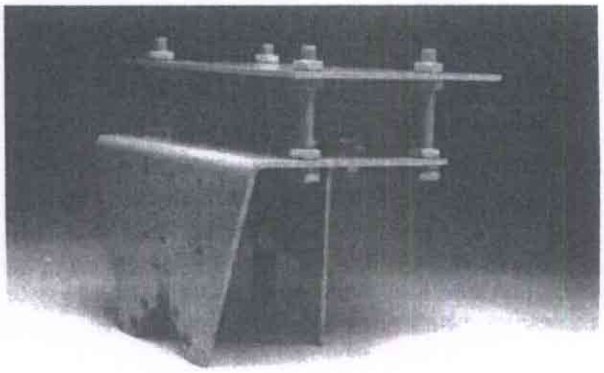
Do not use EP oils or oils with slippery additives in units with integral backstops.



MOTOR BRACKET

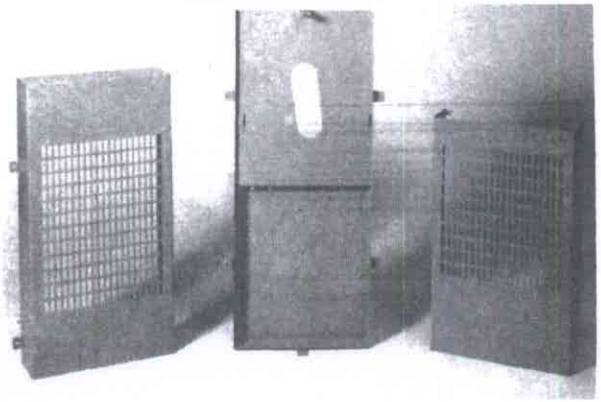
The two piece motor bracket is bolted to both the front and the back of the reducer. This exclusive wide stance arrangement provides the most rigid motor mount available. The adjustable motor plate simplifies belt tensioning.

For screw conveyor applications, the height of the standard motor bracket has been designed to allow ample clearance over the trough to permit easy removal of trough cover without disassembly of any part of the screw conveyor drive.



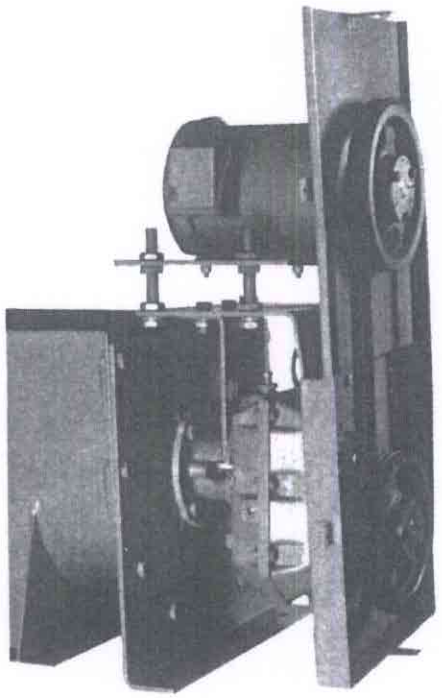
OPTIONAL BELT GUARD

Available as a standard accessory, the Link-Belt® Guard is designed to meet OSHA requirements. Sizes available to meet most V-belt size combinations. Standard guards are easily attached to our motor brackets (all hardware is included).



Screw Conveyor Drives

Exclusive design features begin with Model F Shaft Mounted Speed Reducer.



Model FC Screw Conveyor Drives consist of a standard Model F single or double reduction shaft mounted reducer, a removable drive shaft and a ductile iron screw conveyor adapter. Add our rugged steel motor bracket which bolts to the reducer and adapter, and our belt guard. The entire assembly mounts onto a CEMA screw conveyor trough end plate.

Screw conveyor drives are available in a range of sizes to suit your requirements.

Horsepower: 1/2 to 75HP*
Speeds: 5 RPM to 400 RPM
Drive Shaft Sizes: 1-1/2" to 3-7/16"
For Screw Diameters: 6" to 24"

*to 125HP for separately mounted motors

Adapter

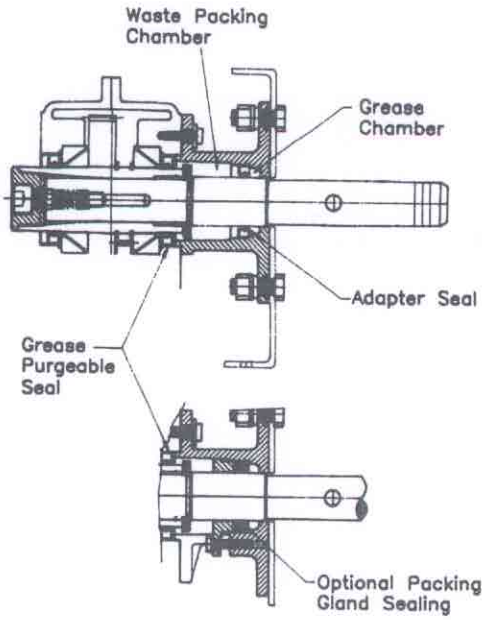
The adapter is used to mount the reducer on a CEMA standard screw conveyor trough end plate. In addition to rigid mounting of the drive, the adapter provides proper alignment of the reducer, drive shaft and trough end plate, along with a unique sealing system.

The Model FC Screw Conveyor Adapter provides several sealing methods.

- **Grease purgeable seal** - the grease fitting located on the perimeter of the reducer housing, allows convenient way to purge contaminants from the reducer oil seal.
- **Waste packing chamber** - for use when conveying abrasive material. (Waste pack material provided by customer).
- **Adapter seal** - dual lip, springloaded shaft seal, furnished with adapter
- **Grease chamber** - to be packed with heavy grease while adapter is being assembled. (Grease supplied by customer.)
- **Optional packing gland sealing** - braided seal with adjustable clamp ring for highly contaminating or high temperature materials. Replaces standard adapter seal.

Drive Shaft

Exclusive Link-Belt® Drive Shaft is crowned to help prevent damaging bearing loads resulting from misalignment of screw conveyor components. Drive shaft is easily installed and is available in standard screw conveyor shaft diameters.



Unit Identification Information

Tie-Rod Mounted Reducer: Model FX

Includes Basic unit, bushing and tie-rod.
The first three digits in the unit description designate the maximum hollow shaft bore in inches and sixteenths of an inch. **The FX indicates a Tie-Rod Mounted Reducer.** The next two numbers designate the nominal ratio (05:1, 15:1, 25:1). The letter designation TB indicates a tapered bushing is used. The last group of digits indicates the diameter of the bushing required. Note if no bushing is required then the bore of the hollow shaft should be used.

Examples: 107FX05TB1-1/4, 115FX25TB1-15/16

107	FX	05	TB	1-1/4
Drive Size	Model	Nominal Ratio	Tapered Bushing	Reduced Bushing Diameter

115	FX	25	TB	1-15/16
Drive Size	Model	Nominal Ratio	Tapered Bushing	Full Bore Bushing Diameter

Shaft Mounted Accessories

Most shaft mounted accessories are identified by the size and model followed by an accessory identifier.

Examples:

203	FX	BS
Size	Model	**Backstop**

215	FX	MB
Size	Model	**Motor Bracket**

307	BGV
Size	**Belt Guard**

Tie-rods and bushings are included with the reducer for Tie-Rod mounted installations, but if required separately, may be ordered as shown.

407	FX	TR
Size	Model	**Tie Rod**

415	X	3-7/16	TB
Size		Bushing Diameter	**Tapered Bushing**

Screw Conveyor Drive: Model FC

Includes Basic unit, an adapter and drive shaft.
The first three digits in the unit description designate the maximum hollow shaft bore in inches and sixteenths of an inch. **The FC indicates a screw conveyor model.** The next two numbers designate the nominal ratio (05:1, 15:1, 25:1). The last group of digits indicates the diameter of the drive shaft.

Examples: 207FC05X2, 315FC25X2-7/16

207	FC	05	X	2
Drive Size	Model	Nominal Ratio		Drive Shaft Diameter

315	FC	25	X	2-7/16
Drive Size	Model	Nominal Ratio		Drive Shaft Diameter

Screw Conveyor Accessories

The motor bracket and belt guard used on Tie-Rod mounted units can be used on screw conveyor assemblies.

215	FX	MB
Size	Model	**Motor Bracket**

307	BGV
Size	**Belt Guard**

Adapters and drive shafts are included with the reducer for screw conveyor applications, but if required separately, may be ordered as shown. Note: sizes 107 and 115 have two adapters each. Suffix AA denotes the adapter used for a 1-1/2" diameter drive shaft. The adapter for all other drive shafts is denoted by AB

FC	107	AA
Model	Size	**Adapter for 1-1/2" drive shaft**

FC	315	A
Model	Size	**Adapter**

FC	207	X	2-7/16
Model	Size		**Drive Shaft Diameter**

General Selection Information

INTRODUCTION

The same Link-Belt® Shaft Mounted Speed Reducer can be applied as either a screw conveyor drive, Tie-Rod mounted drive, or flange mounted drive. In all cases the procedure regarding drive selection will be the same; only the components making a specific drive arrangement will be different.

PRELIMINARY CONSIDERATIONS

Unusual Environmental Considerations

For conditions including but not limited to the following, consult Rexnord Geared Products Division.

- Temperatures below 15°F or above 125°F
- Excessively abrasive conditions.
- Unusual atmospheres such as explosive, corrosive, high altitude, etc.

Unusual Operating Conditions

For unusual applications including but not limited to the following, consult Rexnord Geared Products Division.

- Non-standard mounting positions such as inclined mounting of greater than 20°. Standard mounting positions are shown on page C-22.
- Applications where torsional vibrations exist or are suspected.
- Starts/Stops exceeding five per hour.

CAUTION

When applications involve the handling and safety of people, Rexnord Geared Products Division must be consulted for selection and approval.

Application Data Required

The following data is necessary for proper selection.

- Type of driven machine.
- Duty Cycle - hours per day of operation, starts per hour, reversals, etc.
- Demand (transmitted) horsepower or torque and peak power requirement.
- Motor speed (RPM).
- Speed (RPM) of driven machine (output speed of drive).
- Diameter of driven shaft , if applicable.
- Screw and shaft diameters on screw conveyor applications.
- Low speed shaft overhung and thrust load, if applicable.
- Environmental considerations other than standard.

SELECTION PROCEDURE

NOTE: Shaft mount selections are made on the basis of horsepower. The following formulas are used to convert between horsepower (HP) and pound inches of torque (T).

$$HP = \frac{T \times RPM}{63025} \qquad T = \frac{HP \times 63025}{RPM}$$

For additional PT formulas, see the General Engineering Information Section.

Step 1 Determine AGMA Service Class I, II, or III by referring to the AGMA Service Classes Table shown on page C-9. Find the type application and duty cycle which most closely matches your specific application.

Peak loads of the motor or driven machinery can also affect the selected service class for the application. Units selected for Service Class I duty can withstand momentary or starting loads of 200%. Service Class II and Service Class III units can withstand momentary or starting loads of 280% and 400% respectively. When momentary or starting loads exceed above stated conditions, use next higher service class or next larger speed reducer.

Step 2 Refer to the selection tables on pages C-10 to C-18 for Service Class determined in Step 1. Make selection by finding the Motor HP and desired output speed.

Compare hollow shaft bore with the size of the driven shaft. If the driven shaft is smaller than the bore, refer to page 19 for available bushings. If the driven shaft is larger than the bore of the selected reducer, the shaft must be machined to the proper size or select a larger reducer.

Step 3 Select Drive Arrangement. From the Sheave Ratios Table on page C-20, select required sheave ratio of the V-belt drive. Be careful to select the belt drive so that the sheave mounted on the reducer shaft is not smaller than the minimum sheave diameter shown in the Selection Table. Mount the sheave as close as possible to minimize the effect of overhung load on the speed reducer.

NOTE: Government regulations require that the V-belts be guarded to prevent personal injury.

General Selection Information

Step 4 Output overhung load check, if applicable. Calculate overhung load in pounds using the following formula:

$$O.H.L. = \frac{126{,}000 \times F \times HP}{\text{Pitch Dia.} \times \text{RPM}}$$

WHERE: HP = Demand (transmitted) or motor HP
Pitch Dia. = Pitch diameter of gear, sprocket or pulley
RPM = Revolutions Per Minute of the shaft
F = Factors for various drives
- 1.00 = Single or Multiple Chain
- 1.00 = Timing Belt
- 1.25 = Gear Drive
- 1.50 = Single or Multiple V-Belt
- 2.50 = Flat Belt
- 3.50 = Variable pitch pulley

Compare the calculated overhung load to the rating in the Overhung Load Table on page C-21. If the calculated load exceeds the rating, select a larger drive with sufficient rating or consult Rexnord Geared Products Division.

Step 5 Determine accessories required for your application: i.e. backstop, motor bracket, screw conveyor adapter, etc.

Step 6 The selection made from the Selection Table as well as the accessories are the base information for ordering your drive. Complete the ordering information for your drive by following the instructions on page C-6.

Selection Example - AGMA Service Class System

Required:

- Bucket elevator used in unloading raw sugar from a ship operating 24 hrs./day.
- 15 HP motor, 1750 RPM.
- Desired drive output speed approximately 44 RPM.
- Mounting position 2.
- Tie-Rod Mounted Arrangement.

Solution:

Step 1 Determine Service Class. In the AGMA Service Classes Table on page C-9 find bucket elevator. When the unit operates 24 hours per day the Service Class should be II.

Step 2 Select Basic Speed Reducer. Refer to Service Class II Table on pages C-13 to C-15. Find the selections for 15 HP and 44 RPM output speed. The unit selected is either 215F15 or 215F25. Since the driven shaft diameter is 2-7/16", and a 215 unit has a hollow bore of 2-15/16", a bushing is necessary. Refer to Bushing Table on page C-19 and confirm that a 2-7/16" diameter bushing is available for a 215 unit.

Step 3 Select Drive Arrangement. To decide whether a 215F15 ot 215F25 is preferred, check the V-belt drive requirements. From the Selection Table you can see the Minimum Sheave Diameter for 215F15 is 2.5 and 1.8 for 215F25. From the Sheave Ratios Table, sheave ratio for 44 RPM output speed is 2.65 for 215F15 and 1.59 for 215F25. From the dimension drawing on page 26 for 215 reducer and 254T frame motor, the belt centers should be between 28.38″ and 31.13″ Limit the sheave on the high speed shaft of speed reducer to 14″ diameter and use 215BGV.

Step 4 Overhung load check does not apply.

Step 5 Determine Accessories Required.
A backstop should be installed for this application to prevent the load from driving the elevator backwards during shutdown.

Step 6 Ordering Information Required.
"Since reducer is to be "Tie-Rod" mounted, add a X after the F."

Reducer:	215FX25TB2-7/16
Motor Bracket:	215FXMB
Belt Guard:	215BGV
Backstop:	215FXBS

AGMA Shaft Mount Service Classes

APPLICATION	3 - 10 hrs/day	24 hrs/day
AGITATORS		
Pure Liquids	I	II
Liquids and Solids	II	II
Liquids - Variable Density	II	II
BLOWERS		
Centrifugal	I	II
Lobe & Vane	II	II
BREWING & DISTILLING		
Bottling Machinery	I	II
Brew Kettles (continuous duty)	II	II
Cookers (continuous duty)	II	II
Mash Tubs (continuous duty)	II	II
Scale Hoppers (frequent starts)	II	II
CAN FILLING MACHINES	I	II
CAR DUMPERS	III	III
CAR PULLERS	II	II
CLARIFIERS	I	II
CLASSIFIERS	II	II
CLAY WORKING MACHINERY		
Brick Press, Briquette Machine	III	III
Pug Mill	II	II
COMPRESSORS		
Centrifugal	I	II
Lobe	II	II
Reciprocating		
Multi-Cylinder	II	III
Single-Cylinder	III	III
CONVEYORS		
Apron, Assembly, Belt, Bucket, Chain, Flight, Oven, Screw		
Uniformly loaded and fed	I	II
Heavy duty not uniformly loaded	II	II
CRANES *		
CRUSHERS		
Ore, Stone	III	III
DREDGES		
Cable Reels	II	II
Conveyors	II	II
Cutter Head Drives	III	III
Pumps	III	III
Screen Drives	III	III
Stackers & Winches	II	II
ELEVATORS		
Bucket	II	II
Centrifugal Discharge	I	II
Escalators	I	II
Freight	II	II
Gravity Discharge	I	II
EXTRUDERS		
General	II	II
Plastics and Rubber	III	III
FANS		
Centrifugal	I	II
Forced or Induced Draft	II	II
Industrial & Mine	II	II
FEEDERS		
Apron, Belt	II	II
Disc	I	II
Reciprocating	III	III
Screw	II	II
FOOD INDUSTRY		
Cereal Cookers	I	II
Dough Mixers	II	II
Meat Grinders	II	II
Slicers	II	II
GENERATORS (not welding)	II	II
HAMMER MILLS	III	III
HOISTS		
Main hoists		
Heavy duty	III	III
Medium duty	II	II
Skip Hoists	II	II

APPLICATION	3 - 10 hrs/day	24 hrs/day
LAUNDRY TUMBLERS	II	II
LAUNDRY WASHERS	II	III
LUMBER INDUSTRY		
Barkers		
Spindle Feed	II	II
Main Drive	III	III
Conveyors		
Burner	II	II
Main or Heavy Duty	II	II
Main Log	III	III
Re-saw, Merry-Go-Round	II	II
Slab	III	III
Transfer	II	II
Chains		
Floor	II	II
Green	II	III
Cut-Off Saws		
Chain & Drag	II	III
Debarking Drums	III	III
Feeds		
Edger	II	II
Gang	III	III
Trimmer	II	II
Log Deck	III	III
Log Hauls - Incline - Well Type	III	III
Log Turning Devices	III	III
Planer Feed	II	II
Planer Tilting Hoist	II	II
Rolls - Live-off brg - Roll Cases	III	III
Sorting Table	II	II
Tipple Hoist	II	II
Transfers		
Chain	II	III
Craneway	II	III
Tray Drives	II	II
Veneer Lathe Drives	II	II
METAL MILLS		
Draw Bench - Carriage and Main Drive	II	II
Runout Tables		
Non-reversing - Group	II	II
Non-reversing - Individual	III	III
Reversing	III	III
Wire Drawing	II	II
Wire Winding Machines	II	II
METAL STRIP PROCESSING MACHINERY		
Bridles	II	II
Coilers and Uncoilers	I	II
Edge Trimmers	II	II
Flatteners	II	II
Loopers (Accumulators)	I	I
Pinch Rollers	II	II
Scrap Choppers	II	II
Shears	III	III
Slitters	II	II
MILLS, ROTARY TYPE		
Cement Kilns	II	II
Dryers and Coolers	II	II
MIXERS - CEMENT	II	II
PAPER MILLS		
Agitator	II	II
Barking Drums	III	III
Beater	II	II
Breaker Stack	II	II
Chipper	III	III
Chip Feeder	II	II
Coating Rolls	II	II
Conveyors		
Chip, Bark, Chemical	II	II
Log	III	III
Couch Rolls	II	II
Cutter	III	III

APPLICATION	3 - 10 hrs/day	24 hrs/day
PAPER MILLS (Cont'd)		
Cylinder Molds	II	II
Dryers (Anti-Friction Bearings)		
Paper Machine	II	II
Conveyor Type	II	II
Embosser & Extruder	II	II
Fourdrinier Rolls	II	II
Jordan	II	II
Kiln Drive	II	II
Paper Rolls	II	II
Platter	II	II
Presses - Felt & Suction	II	II
Pulper	III	III
Pumps Vacuum	II	II
Reel	II	II
Screens		
Chip & Rotary	II	II
Vibrating	III	III
Size Press	II	II
Thickener	II	II
Washer & Winder	II	II
Wind and Unwind Stand	I	I
PULLERS		
Barge Haul	II	II
PUMPS		
Centrifugal	I	II
Proportioning	II	II
Reciprocating		
Single Acting, 3 or More Cylinders	II	II
Double Acting, 2 or More Cylinders	II	II
Rotary		
Gear Type	I	II
Lobe, Vane	I	II
RUBBER AND PLASTICS INDUSTRY		
Batch Mixers	III	III
Mixing Mills - 2 smooth rolls	II	II
1 or 2 corrugated rolls	III	III
Batch Drop Mill - 2 smooth rolls	II	II
Cracker Warmer - 2 roll, 1 corr. roll	III	III
Cracker - 2 corrugated rolls	III	III
Holding, Feed & Blend Mill - 2 rolls	II	II
Rubber Calenders	II	II
SAND MULLER	II	II
SCREENS		
Air Washing	I	II
Rotary (Stone or Gravel)	II	II
Traveling Water Intake	I	I
SCREW CONVEYORS		
Uniformly Loaded or Fed	I	II
Heavy Duty	II	II
SEWAGE DISPOSAL EQUIPMENT		
Bar Screens, Chemical Feeders	II	II
Sludge Collectors	II	II
Dewatering Screens	II	II
Scum Breakers	II	II
Slow or Rapid Mixers	II	II
Thickeners	II	II
Vacuum Filters	II	II
SUGAR INDUSTRY		
Beet Slicer	III	III
Cane Knives & Crushers	II	II
Mills (low speed end)	III	III
TEXTILE INDUSTRY		
Batchers	II	II
Calenders	II	II
Cards	II	II
Dyeing Machinery	II	II
Looms & Mangles	II	II
Nappers & Pads	II	II
Slashers & Spinners	II	II
Tenter Frames	II	II
Washers & Winders	II	II

*For information on Service Classes for Cranes, consult Rexnord Geared Products Division.

Service Class I Selection Table

HP	OUT RPM	REDUCER SELECTION			
		SINGLE	MIN. SHEAVE DIA.	DOUBLE	MIN. SHEAVE DIA.
.50	400-121	107F05	1.5		
	120-90	107F05	1.5	107F15	1.5
	89-73			107F15	1.5
	72-30			107F15 107F25	1.5 1.5
	29-6			107F25	1.8
	5			115F25	1.5
.75	400-121	107F05	1.5		
	120-90	107F05	1.5	107F15	1.5
	89-73			107F15	1.5
	72-30			107F15 107F25	1.5 1.5
	29-9			107F25	1.8
	8-6			115F25	1.8
	5			203F25	1.5
1	400-121	107F05	1.5		
	120-90	107F05	1.5	107F15	1.5
	89-73			107F15	1.5
	72-30			107F15 107F25	1.5 1.5
	29-12			107F25	1.8
	11-8			115F25	1.8
	7-5			203F25	1.6
1.5	400-121	107F05	1.5		
	120-90	107F05	1.8	107F15	1.5
	89-73			107F15	1.5
	72-30			107F15 107F25	1.8 1.5
	29-17			107F25	1.9
	16-12			115F25	1.8
	11-7			203F25	1.8
	6-5			207F25	1.9
2	400-121	107F05	1.8		
	120-90	107F05	2.4	107F15	1.5
	89-73			107F15	1.5
	72-30			107F15 107F25	2.4 1.5
	29-24			107F25	1.8
	23-15			115F25	2.0
	14-10			203F25	1.7
	9-6			207F25	2.2
	5			215F25	1.5

HP	OUT RPM	REDUCER SELECTION			
		SINGLE	MIN. SHEAVE DIA.	DOUBLE	MIN. SHEAVE DIA.
3	400-121	107F05	2.7		
	120-90	107F05	3.6	107F15	1.5
	89-73			107F15	1.5
	72-35			107F15 107F25	3.1 1.9
	34-30			115F15 115F25	2.5 1.5
	29-23			115F25	1.9
	22-15			203F25	1.7
	14-9			207F25	2.2
	8-6			215F25	1.9
	5			307F25	1.7
5	400-121	107F05	7.7		
	120-114	107F05	9.4	107F15	1.6
	113-90	115F05	4.7	107F15	2.0
	89-74			107F15	2.4
	73			115F15	1.7
	72-39			115F15 115F25	3.2 2.3
	38-30			203F15 203F25	2.3 1.5
	29-24			203F25	1.7
	23-15			207F25	2.2
	14-10			215F25	1.9
	9-6			307F25	2.4
	5			315F25	2.5
7.5	400-200	107F05	9.9		
	199-121	115F05	7.1		
	120-90	115F05	12.0	115F15	2.1
	89-73			115F15	2.7
	72-64			115F15 115F25	3.3 2.7
	63-37			203F15 203F25	2.8 1.7
	36-30			207F15 207F25	2.7 1.6
	29-23			207F25	2.1
	22-15			215F25	1.9
	14-9			307F25	2.4
	8-7			315F25	2.6
	6-5			407F25	2.8

Service Class I Selection Table

HP	OUT RPM	REDUCER SELECTION			
		SINGLE	MIN. SHEAVE DIA.	DOUBLE	MIN. SHEAVE DIA.
10	400-295	107F05	10.9		
	294-121	115F05	17.4		
	120-95	203F05	4.3	115F15	3.4
	94-90	203F05	4.6	203F15	1.5
	89-73			203F15	1.9
	72-51			203F15 203F25	2.7 1.6
	50-30			207F15 207F25	3.6 2.2
	29-20			215F25	2.0
	19-12			307F25	2.4
	11-9			315F25	2.7
	8-6			407F25	3.1
	5			415F25	4.1
15	400-220	115F05	16.2		
	219-121	203F05	5.1		
	120-110	203F05	5.6	203F15	1.9
	109-90	207F05	5.7	203F15	2.3
	89-79			203F15	2.6
	78-73			207F15	2.2
	72-47			207F15 207F25	3.4 2.7
	46-30			215F15 215F25	3.3 2.6
	29-19			307F25	2.4
	18-13			315F25	3.2
	12-9			407F25	3.1
	8-7			415F25	4.4
	6-5			507F24	7.1
20	400-350	115F05	13.5		
	349-170	203F05	4.9		
	169-121	207F05	7.2		
	120-105	207F05	10.7	203F15	2.6
	104-95	207F05	14.2	207F15	2.3
	94-90	215F05	7.4	207F15	2.4
	89-73			207F15	3.0
	72-69			207F15 207F25	3.2 2.9
	68-38			215F15 215F25	3.9 3.4
	29-24			307F15 307F25	3.2 2.4

HP	OUT RPM	REDUCER SELECTION			
		SINGLE	MIN. SHEAVE DIA.	DOUBLE	MIN. SHEAVE DIA.
20 cont'd	23-17			315F25	4.0
	16-12			407F25	3.3
	11-9			415F25	4.5
	8-6			507F24	7.9
	5			608F24	9.2
25	400-275	203F05	4.0		
	274-133	207F05	14.2		
	132-121	215F05	7.8		
	120-90	215F05	15.0	207F15	3.5
	89-73			215F15	2.9
	72-50			215F15 215F25	4.2 3.7
	49-30			307F15 307F25	5.1 3.3
	29-22			315F25	4.4
	21-15			407F25	3.7
	14-11			415F25	4.6
	10-8			507F24	7.4
	7-6			608F24	9.5
30	400-380	203F05	3.7		
	379-170	207F05	14.8		
	169-121	215F05	17.0		
	120-100	215F05	20.0	215F15	2.8
	99-90	307F05	7.7	215F15	3.0
	89-73			215F15	3.6
	72-65			215F15 215F25	4.2 3.7
	64-37			307F15 307F25	5.6 6.5
	36-30			315F15 315F25	6.0 4.0
	29-26			315F25	5.2
	25-18			407F25	4.1
	17-13			415F25	4.7
	12-10			507F24	5.7
	9-7			608F24	9.8
40	400-300	207F05	8.8		
	299-160	215F05	20.0		
	159-121	307F05	9.9		
	120-90	307F05	18.6	215F15	4.7
	89-73			307F15	3.6
	72-52			307F15 307F25	6.3 4.0

Service Class I Selection Table

HP	OUT RPM	REDUCER SELECTION			
		SINGLE	MIN. SHEAVE DIA.	DOUBLE	MIN. SHEAVE DIA.
40 cont'd	51-34			315F15 315F25	10.7 7.1
	33-30			407F15 407F25	5.8 3.6
	29-24			407F25	5.0
	23-18			415F25	4.5
	17-13			507F24	7.3
	12-9			608F24	10.2
50	400-240	215F05	15.8		
	239-121	307F05	19.6		
	120-90	315F05	7.5	307F15	4.3
	89-73			307F15	6.0
	72-68			307F15 307F25	6.9 4.4
	67-48			315F15 315F25	10.1 6.7
	47-30			407F15 407F25	10.3 5.9
	29-23			415F25	4.6
	22-17			507F24	6.9
	16-11			608F24	10.4
60	400-160	307F05	19.0		
	159-121	315F05	16.4		
	120-90	315F05	10.9	307F15	6.6
	89-85			307F15	7.5
	84-73			315F15	7.1
	72-52			315F15 315F25	17.1 11.0
	51-37			407F15 407F25	11.6 6.5
	36-30			415F15 415F25	6.8 4.6
	29-27			415F25	5.6
	26-20			507F24	7.1
	19-13			608F24	10.6
75	400-215	307F05	19.9		
	214-121	315F05	11.5		
	120-117	315F05	12.5	307F15	7.5
	116-95	315F05	24.2	315F15	8.0
	94-73			315F15	16.2
	72-69			315F15 315F25	20.2 13.0

HP	OUT RPM	REDUCER SELECTION			
		SINGLE	MIN. SHEAVE DIA.	DOUBLE	MIN. SHEAVE DIA.
75 cont'd	68-48			407F15 407F25	13.4 7.3
	47-34			415F15 415F25	8.3 6.5
	33-30			507F15 507F24	9.4 5.9
	29-26			507F24	6.8
	25-17			608F24	10.1
100	400-150	315F05	20.2		
	149-121	Consult Rexnord Geared Products Division			
	120-100			315F15	24.2
	99-73			407F15	13.2
	72-70			407F15 407F25	14.9 7.9
	69-48			415F15 415F25	9.3 7.5
	47-35			507F15 507F24	11.0 6.7
	34-30			608F15 608F24	12.2 7.6
	29-24			608F24	9.5
125	400-275	315F05	9.7		
	274-121	Consult Rexnord Geared Products Division			
	120-98			407F15	14.1
	97-73			415F15	7.8
	72-62			415F15 415F25	10.6 8.9
	61-45			507F15 507F24	12.5 6.6
	44-30			608F15 608F24	15.3 9.5
150	400-121	Consult Rexnord Geared Products Division			
	120-77			415F15	11.7
	76-73			507F15	8.5
	72-55			507F15 507F24	14.4 7.1
	54-37			608F15 608F24	14.9 9.3
200	120-105			415F15	15.0
	104-75			507F15	21.0
	74-52			608F15 608F24	14.1 8.8

Service Class II Selection Table

HP	OUT RPM	REDUCER SELECTION			
		SINGLE	MIN. SHEAVE DIA.	DOUBLE	MIN. SHEAVE DIA.
.50	400-121	107F05	1.5		
	120-90	107F05	1.5	107F15	1.5
	89-73			107F15	1.5
	72-30			107F15 107F25	1.5 1.5
	29-9			107F25	1.5
	8-6			115F25	1.5
	5			203F25	1.5
.75	400-121	107F05	1.5		
	120-90	107F05	1.5	107F15	1.5
	89-73			107F15	1.5
	72-30			107F15 107F25	1.5 1.5
	29-12			107F25	1.5
	11-8			115F25	1.5
	7-5			203F25	1.5
1	400-121	107F05	1.5		
	120-90	107F05	1.5	107F15	1.5
	89-73			107F15	1.5
	72-30			107F15 107F25	1.5 1.5
	29-16			107F25	1.5
	15-11			115F25	1.5
	10-7			203F25	1.5
	6-5			207F25	1.5
1.5	400-121	107F05	1.5		
	120-90	107F05	1.8	107F15	1.5
	89-73			107F15	1.5
	72-30			107F15 107F25	1.8 1.5
	29-25			107F25	1.5
	24-16			115F25	1.5
	15-10			203F25	1.5
	9-6			207F25	1.6
	5			215F25	1.5
2	400-121	107F05	1.8		
	120-90	107F05	2.4	107F15	1.5
	89-73			107F15	1.5
	72-33			107F15 107F25	2.4 1.5
	32-30			115F15 115F25	1.5 1.5

HP	OUT RPM	REDUCER SELECTION			
		SINGLE	MIN. SHEAVE DIA.	DOUBLE	MIN. SHEAVE DIA.
2 cont'd	29-27			115F25	1.5
	26-13			203F25	1.5
	12-8			207F25	1.6
	7-6			215F25	1.5
	5			307F25	1.5
3	400-121	107F05	2.7		
	120-90	107F05	3.6	107F15	1.5
	89-73			107F15	1.5
	72-55			107F15 107F25	2.0 1.5
	54-32			115F15 115F25	2.3 1.5
	31-30			203F15 203F25	1.5 1.5
	29-20			203F25	1.5
	19-12			207F25	1.6
	11-8			215F25	1.5
	7-5			307F25	1.7
5	400-185	107F05	3.2		
	184-121	115F05	3.3		
	120-118	115F05	3.4	107F15	1.5
	117-90	115F05	4.7	115F15	1.5
	89-73			115F15	1.7
	72-59			115F15 115F25	2.1 1.5
	58-34			203F15 203F25	2.0 1.5
	33-30			207F15 207F25	1.8 1.5
	29-21			207F25	1.6
	20-14			215F25	1.5
	13-9			307F25	1.6
	8-6			315F25	2.0
	5			407F25	1.9
7.5	400-315	107F05	3.4		
	314-130	115F05	6.3		
	129-121	203F05	2.6		
	120-100	203F05	3.1	115F15	2.0
	99-90	203F05	3.4	203F15	1.5
	89-73			203F15	1.5
	72-48			203F15 203F25	2.1 1.5

Service Class II Selection Table

HP	OUT RPM	REDUCER SELECTION			
		SINGLE	MIN. SHEAVE DIA.	DOUBLE	MIN. SHEAVE DIA.
7.5 cont'd	47-30			207F15 207F25	2.7 1.6
	29-20			215F25	1.5
	19-13			307F25	1.7
	12-9			315F25	2.1
	8-7			407F25	2.8
	6-5			415F25	3.1
10	400-200	115F05	6.2		
	199-121	203F05	3.4		
	120-100	203F05	4.1	203F15	1.5
	99-90	207F05	3.6	203F15	1.5
	89-73			203F15	1.9
	72-43			207F15 207F25	2.5 1.5
	42-30			215F15 215F25	2.1 1.5
	29-27			215F25	1.5
	26-17			307F25	1.7
	16-12			315F25	2.1
	11-9			407F25	2.1
	8-6			415F25	3.4
	5			507F24	4.5
15	400-380	115F05	5.6		
	379-180	203F05	3.4		
	179-121	207F05	4.0		
	120-110	207F05	4.4	203F15	1.9
	109-103	207F05	4.7	207F15	1.6
	102-90	215F05	4.1	207F15	1.8
	89-73			207F15	2.2
	72-40			215F15 215F25	2.5 1.8
	39-30			307F15 307F25	2.4 1.6
	29-25			307F25	1.8
	24-18			315F25	2.1
	17-13			407F25	2.2
	12-9			415F25	3.4
	8-6			507F24	5.7
	5			608F24	6.6
20	400-325	203F05	2.5		
	324-155	207F05	4.5		
	154-121	215F05	4.6		
	120-110	215F05	5.2	207F15	2.0

HP	OUT RPM	REDUCER SELECTION			
		SINGLE	MIN. SHEAVE DIA.	DOUBLE	MIN. SHEAVE DIA.
20 cont'd	109-90	215F05	7.6	215F15	1.9
	89-73			215F15	2.2
	72-60			215F15 215F25	2.5 1.8
	59-34			307F15 307F25	2.9 2.0
	33-30			315F15 315F25	2.8 2.0
	29-24			315F25	2.5
	23-17			407F25	2.4
	16-13			415F25	3.1
	12-9			507F24	5.1
	8-6			608F24	7.3
25	400-220	207F05	4.3		
	219-130	215F05	6.6		
	129-121	307F05	4.1		
	120-90	307F05	5.7	215F15	2.4
	89-78			215F15	2.6
	77-73			307F15	2.0
	72-44			307F15 307F25	3.0 2.1
	43-30			315F15 315F25	4.0 2.7
	29-22			407F25	2.5
	21-16			415F25	3.2
	15-11			507F24	5.2
	10-8			608F24	6.9
30	400-375	207F05	3.3		
	374-175	215F05	6.3		
	174-121	307F05	5.4		
	120-98	307F05	7.0	215F15	2.7
	97-90	307F05	7.7	307F15	2.1
	89-73			307F15	2.5
	72-55			307F15 307F25	3.1 2.2
	54-35			315F15 315F25	4.7 3.2
	34-30			407F15 407F25	3.5 2.5
	29-25			407F25	2.8
	24-19			415F25	3.2
	18-14			507F24	4.9
	13-9			608F24	7.3

Service Class II Selection Table

HP	OUT RPM	REDUCER SELECTION			
		SINGLE	MIN. SHEAVE DIA.	DOUBLE	MIN. SHEAVE DIA.
40	400-380	215F05	3.9		
	379-140	307F05	7.4		
	139-121	315F05	3.5		
	120-90	315F05	5.4	307F15	2.9
	89-79			307F15	3.3
	78-73			315F15	3.2
	72-48			315F15 315F25	5.4 3.7
	47-33			407F15 407F25	5.0 3.3
	32-30			415F15 415F25	4.5 2.7
	29-26			415F25	3.1
	25-19			507F24	4.8
	18-13			608F24	6.8
50	400-200	307F05	7.1		
	199-121	315F05	5.3		
	120-108	315F05	6.0	307F15	3.3
	107-90	315F05	7.5	315F15	3.6
	89-73			315F15	4.6
	72-65			315F15 315F25	5.5 3.9
	64-43			407F15 407F25	5.4 3.4
	42-32			415F15 415F25	5.3 3.2
	31-30			507F15 507F24	6.3 3.8
	29-24			507F24	4.7
	23-16			608F24	6.9
60	400-390	307F05	4.5		
	389-121	315F05	7.2		
	120-113	315F05	7.9	315F15	3.7
	112-79			315F15	6.4
	78-73			407F15	3.8
	72-56			407F15 407F25	5.4 3.4

HP	OUT RPM	REDUCER SELECTION			
		SINGLE	MIN. SHEAVE DIA.	DOUBLE	MIN. SHEAVE DIA.
60 cont'd	55-39			415F15 415F25	5.2 3.2
	38-30			507F15 507F24	7.6 4.5
	29-19			608F24	6.9
75	400-165	315F05	7.3		
	164-121	Consult Rexnord Geared Products Division			
	120-106			315F15	6.5
	105-77			407F15	5.3
	76-73			415F15	3.9
	72-50			415F15 415F25	5.1 3.5
	49-37			507F15 507F24	7.7 4.6
	36-30			608F15 608F24	9.2 5.5
	29-25			608F24	6.6
100	400-121	Consult Rexnord Geared Products Division			
	120-114			407F15	5.5
	113-73			415F15	4.9
	72-70			415F15 415F25	5.1 3.9
	69-50			507F15 507F24	7.6 4.5
	49-34			608F15 608F24	10.8 6.5
125	400-121	Consult Rexnord Geared Products Division			
	120-90			415F15	5.6
	89-73			507F15	6.5
	72-65			507F15 507F24	7.3 4.4
	64-44			608F15 608F24	10.4 6.3
150	400-121	Consult Rexnord Geared Products Division			
	120-113			415F15	5.9
	112-78			507F15	7.6
	77-73			608F15	7.5
	72-54			608F15 608F24	10.2 6.1

Service Class III Selection Table

HP	OUT RPM	REDUCER SELECTION			
		SINGLE	MIN. SHEAVE DIA.	DOUBLE	MIN. SHEAVE DIA.
.50	400-121	107F05	1.5		
	120-90	107F05	1.5	107F15	1.5
	89-73			107F15	1.5
	72-50			107F15 107F25	1.5 1.5
	29-12			107F25	1.5
	11-8			115F25	1.5
	7-5			203F25	1.5
.75	400-121	107F05	1.5		
	120-90	107F05	1.5	107F15	1.5
	89-73			107F15	1.5
	72-30			107F15 107F25	1.5 1.5
	29-17			107F25	1.5
	16-12			115F25	1.5
	11-7			203F25	1.5
	6-5			207F25	1.5
1	400-121	107F05	1.5		
	120-90	107F05	1.5	107F15	1.5
	89-73			107F15	1.5
	72-30			107F15 107F25	1.5 1.5
	29-24			107F25	1.5
	23-15			115F25	1.5
	14-10			203F25	1.5
	9-6			207F25	1.5
	5			215F25	1.5
1.5	400-121	107F05	1.5		
	120-90	107F05	1.8	107F15	1.5
	89-73			107F15	1.5
	72-35			107F15 107F25	1.6 1.5
	34-30			115F15 115F25	1.5 1.5
	29-23			115F25	1.5
	22-15			203F25	1.5
	14-9			207F25	1.5
	8-6			215F25	1.5
	5			307F25	1.5
2	400-121	107F05	1.8		
	120-90	107F05	2.4	107F15	1.5
	89-73			107F15	1.5

HP	OUT RPM	REDUCER SELECTION			
		SINGLE	MIN. SHEAVE DIA.	DOUBLE	MIN. SHEAVE DIA.
2 cont'd	72-53			107F15 107F25	1.5 1.5
	52-30			115F15 115F25	1.7 1.5
	29-19			203F25	1.5
	18-12			207F25	1.5
	11-8			215F25	1.5
	7-5			307F25	1.5
3	400-145	107F05	2.3		
	144-121	115F05	1.8		
	120-90	115F05	2.5	107F15	1.5
	89-73			115F15	1.5
	72-48			115F15 115F25	1.6 1.5
	47-30			203F15 203F25	1.5 1.5
	29-18			207F25	1.5
	17-12			215F25	1.5
	11-8			307F25	1.5
	7-5			315F25	1.5
5	400-295	107F05	2.0		
	294-121	115F05	3.3		
	120-95	203F05	2.2	115F15	1.5
	94-90	203F05	2.3	203F15	1.5
	89-73			203F15	1.5
	72-51			203F15 203F25	1.5 1.5
	50-30			207F15 207F25	1.8 1.5
	29-20			215F25	1.5
	19-12			307F25	1.5
	11-9			315F25	1.5
	8-6			407F25	1.6
	5			415F25	2.1
7.5	400-220	115F05	3.3		
	219-121	203F05	2.6		
	120-110	203F05	2.8	203F15	1.5
	109-90	207F05	2.7	203F15	1.5
	89-79			203F15	1.5
	78-73			207F15	1.5
	72-47			207F15 207F25	1.7 1.5

Service Class III Selection Table

HP	OUT RPM	REDUCER SELECTION			
		SINGLE	MIN. SHEAVE DIA.	DOUBLE	MIN. SHEAVE DIA.
7.5 cont'd	46-30			215F15 215F25	1.6 1.5
	29-19			307F25	1.5
	18-13			315F25	1.5
	12-9			407F25	1.6
	8-7			415F25	2.2
	6-5			507F24	3.4
10	400-350	115F05	3.1		
	349-170	203F05	3.7		
	169-121	207F05	2.7		
	120-105	207F05	3.1	203F15	1.5
	104-95	207F05	3.4	207F15	1.5
	94-90	215F05	2.3	207F15	1.5
	89-73			207F15	1.5
	72-69			207F15 207F25	1.6 1.5
	68-38			215F15 215F25	1.7 1.5
	39-30			307F15 307F25	1.6 1.5
	29-24			307F25	1.5
	23-17			315F25	1.5
	16-12			407F25	1.6
	11-9			415F25	2.3
	8-6			507F24	3.8
	5			608F24	4.4
15	400-380	203F05	1.6		
	379-170	207F05	2.9		
	169-121	215F05	3.0		
	120-100	215F05	3.7	215F15	1.5
	99-90	307F05	2.7	215F15	1.5
	89-73			215F15	1.6
	72-65			215F15 215F25	1.7 1.5
	64-37			307F15 307F25	1.9 1.5
	36-30			315F15 315F25	2.1 1.5
	29-26			315F25	1.6
	25-18			407F25	1.7
	17-13			415F25	2.4
	12-10			507F24	3.4
	9-7			608F24	4.7

HP	OUT RPM	REDUCER SELECTION			
		SINGLE	MIN. SHEAVE DIA.	DOUBLE	MIN. SHEAVE DIA.
20	400-300	207F05	2.3		
	299-160	215F05	3.4		
	159-121	307F05	3.0		
	120-90	307F05	4.1	215F15	1.8
	89-73			307F15	1.6
	72-52			307F15 307F25	2.0 1.5
	51-34			315F15 315F25	2.5 1.8
	33-30			407F15 407F25	2.3 1.6
	29-24			407F25	1.8
	23-18			415F25	2.3
	17-13			507F24	3.5
	12-9			608F24	4.9
25	400-240	215F05	3.2		
	239-121	307F05	4.1		
	120-90	315F05	3.4	307F15	1.7
	89-73			307F15	2.1
	72-68			307F15 307F25	2.1 1.5
	67-48			315F15 315F25	2.5 1.8
	47-30			407F15 407F25	2.8 2.0
	29-23			415F25	2.2
	22-17			507F24	3.4
	16-11			608F24	5.0
30	400-160	307F05	4.1		
	159-121	315F05	3.0		
	120-90	315F05	4.1	307F15	2.1
	89-85			307F15	2.2
	84-73			315F15	2.2
	72-52			315F15 315F25	2.9 2.1
	51-37			407F15 407F25	3.0 2.1
	36-30			415F15 415F25	3.4 2.1
	29-27			415F25	2.3
	26-20			507F24	3.4
	19-13			608F24	5.1

Service Class III Selection Table

HP	OUT RPM	REDUCER SELECTION			
		SINGLE	MIN. SHEAVE DIA.	DOUBLE	MIN. SHEAVE DIA.
40	400-240	307F05	4.1		
	239-121	315F05	4.1		
	120-105	315F05	4.7	315F15	2.3
	104-73			315F15	3.1
	72-52			407F15 407F25	3.1 2.2
	51-37			415F15 415F25	3.7 2.2
	36-30			507F15 507F24	5.0 3.1
	29-28			507F24	3.3
	27-19			608F24	4.6
50	400-150	315F05	4.3		
	149-121	Consult Rexnord Geared Products Division			
	120-100			315F15	3.1
	99-73			407F15	3.1
	72-70			407F15 407F25	3.1 2.3
	69-48			415F15 415F25	3.5 2.2
	47-35			507F15 507F24	5.4 3.3
	34-30			608F15 608F24	6.1 3.7
	29-24			608F24	4.6

HP	OUT RPM	REDUCER SELECTION			
		SINGLE	MIN. SHEAVE DIA.	DOUBLE	MIN. SHEAVE DIA.
60	400-230	315F05	3.6		
	229-121	Consult Rexnord Geared Products Division			
	120-90			407F15	3.2
	89-73			415F15	2.8
	72-58			415F15 415F25	3.5 2.2
	57-43			507F15 507F24	5.3 3.2
	42-30			608F15 608F24	7.3 4.4
	29			608F24	4.5
75	400-121	Consult Rexnord Geared Products Division			
	120-77			415F15	3.3
	76-73			507F15	3.9
	72-55			507F15 507F24	5.2 3.1
	54-37			608F15 608F24	7.4 4.5
100	120-105			415F15	3.4
	104-75			507F15	5.1
	74-52			608F15 608F24	7.1 4.2
125	120-94			507F15	5.1
	93-73			608F15	6.3
	72-65			608F15 608F24	7.1 4.2

Bushings

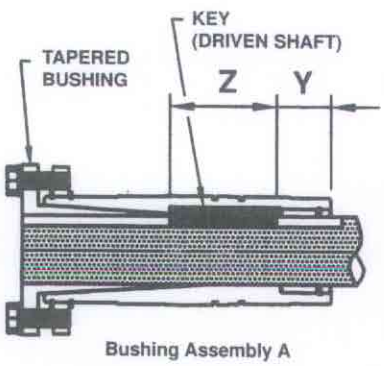
Model F Stock Bushings and Driven Shaft Keyseat

Drive Size	Hollow Shaft Bore	Warehouse Stock Bushing	Factory Stock Bushing	Driven Shaft		Z Length of Key	Weight	Bushing Assembly
		Bore Sizes, +.002" - .000"		Keyseat	Y			
107	1-7/16	1-7/16		3/8 x 3/16	1-1/16	2-3/32	1	A
		1		1/4 x 1/8	1-3/16	4-7/8	1	B
		1-1/8, 1-3/16, 1-1/4	1-1/16	1/4 x 1/8	1-1/8	4-1/8	1	C
			1-5/16	5/16 x 5/32	1-1/8	4-1/8	1	C
115	1-15/16	1-15/16		1/2 x 1/4	1-1/8	2-5/16	1	A
		1-1/4	1-3/16	1/4 x 1/8	1-1/8	5-1/4	1	B
		1-7/16		3/8 x 3/16	1-1/8	5-1/4	1	B
			1-5/16, 1-3/8	5/16 x 5/32	1-1/8	5-1/4	1	B
		1-1/2, 1-11/16	1-5/8, 1-3/4	3/8 x 3/16	1-1/8	4-3/16	1	C
203	2-3/16	2-3/16		1/2 x 1/4	1-3/16	2-15/16	1	A
			1-1/4	1/4 x 1/8	1-3/16	6-1/16	1	B
			1-5/16, 1-3/8	5/16 x 5/32	1-3/16	6-1/16	1	B
		1-7/16, 1-1/2, 1-11/16	1-5/8	3/8 x 3/16	1-3/16	6-1/16	1	B
			1-3/4	3/8 x 3/16	1-3/16	4-7/8	1	C
		1-15/16, 2	1-7/8	1/2 x 1/4	1-3/16	4-7/8	1	C
207	2-7/16	2-7/16		5/8 x 5/16	1-5/16	3-1/2	2	A
		1-1/2, 1-11/16	1-7/16, 1-5/8, 1-3/4	3/8 x 3/16	1-5/16	7	2	B
		1-15/16, 2, 2-3/16	1-7/8, 2-1/8, 2-1/4	1/2 x 1/4	1-5/16	6-1/16	2	C
215	2-15/16	2-15/16		3/4 x 3/8	1-5/16	4-7/16	2	A
		1-15/16, 2, 2-3/16	1-7/8	1/2 x 1/4	1-5/16	8-1/8	2	B
			2-1/4	1/2 x 1/4	1-5/16	7-1/8	2	C
		2-7/16, 2-1/2	2-11/16	5/8 x 5/16	1-5/16	7-1/8	2	C
307	3-7/16	3-7/16		7/8 x 7/16	1-5/16	5-1/8	3	A
		2-3/16	2-1/4	1/2 x 1/4	1-5/16	9	3	B
		2-7/16	2-1/2	5/8 x 5/16	1-5/16	9	3	B
			2-11/16	5/8 x 5/16	1-5/16	7-15/16	3	C
		2-15/16, 3	2-7/8	3/4 x 3/8	1-5/16	7-15/16	3	C
315	3-15/16	3-15/16		1 x 1/2	1-7/16	5-11/16	3	A
		2-7/16	2-1/2, 2-11/16	5/8 x 5/16	1-7/16	10-1/16	3	B
		2-15/16, 3	2-13/16, 2-7/8	3/4 x 3/8	1-7/16	10-1/16	3	B
			3-3/16	3/4 x 3/8	1-7/16	8-13/16	3	C
		3-7/16		7/8 x 7/16	1-7/16	8-13/16	3	C
407	4-7/16	4-7/16		1 x 1/2	1-1/2	6-5/8	4	A
		2-15/16		3/4 x 3/8	1-1/2	11-1/4	4	B
			3-1/16	3/4 x 3/8	1-1/2	10	4	C
		3-7/16		7/8 x 7/16	1-1/2	10	4	C
		3-15/16, 4-3/16		1 x 1/2	1-1/2	10	4	C
415	4-15/16	4-15/16		1 x 1/4 x 5/8	1-1/2	7-1/4	5	A
		3-7/16		7/8 x 7/16	1-1/2	12	5	B
		3-15/16, 4-7/16		1 x 1/2	1-1/2	10-5/8	5	C
507	5-7/16	5-7/16		1-1/4 x 5/8	2-1/8	10-11/16	12	A
		3-15/16, 4-7/16		1 x 1/2	2-1/8	15	12	B
		4-15/16		1-1/4 x 5/8	2-1/8	15	12	C
608	6-1/2	6-1/2		1-1/2 x 3/4	2-5/8	10-3/8	20	A
		5-15/16		1-1/2 x 3/4	2-5/8	16-3/16	20	B
		5-7/16		1-1/2 x 3/4	2-5/8	16-3/16	20	B

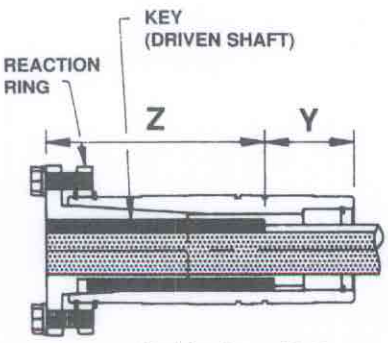
All dimensions are in inches.
Check driven shaft size for strength before using.

Weights shown are in pounds for bushing only.

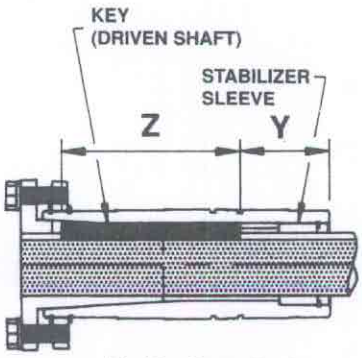
Link-Belt® Model FX Shaft Mounted Speed Reducers are furnished with a tapered bushing for easy removal. Reduction bushings are available to adapt the hollow shaft bore to the driven shaft size. Bushing kits include complete mounting hardware to mount reducer to shaft.



Bushing Assembly A



Bushing Assembly B



Bushing Assembly C

Sheave Ratios[Δ]

Output Speed RPM	Sheave Ratio 5:1
400	1.14†
395	1.13†
390	1.11†
385	1.10†
380	1.09†
375	1.07†
370	1.06†
365	1.04†
360	1.03†
355	1.01†
350	1.00
345	1.01
340	1.03
335	1.04
330	1.06
325	1.08
320	1.09
315	1.11
310	1.13
305	1.15
300	1.17
295	1.19
290	1.21
285	1.23
280	1.25
275	1.27
270	1.30
265	1.32
260	1.35
255	1.37

Output Speed RPM	Sheave Ratio 5:1	Sheave Ratio 15:1
250	1.40	
245	1.43	
240	1.46	
235	1.49	
230	1.52	
225	1.56	
220	1.59	
215	1.63	
210	1.67	
205	1.71	
200	1.75	
195	1.79	
190	1.84	
185	1.89	
180	1.94	
175	2.00	
170	2.06	
165	2.12	
160	2.19	
155	2.26	
150	2.33	
145	2.41	
140	2.50	
135	2.59	
130	2.69	
125	2.80	
120	2.92	1.03†
118	2.97	1.01†
116	3.02	1.01
114	3.07	1.02

Output Speed RPM	Sheave Ratio 5:1	Sheave Ratio 15:1	Sheave Ratio 25:1 •
112	3.13	1.04	
110	3.18	1.06	
108	3.24	1.08	
106	3.30	1.10	
104	3.37	1.12	
102	3.43	1.14	
100	3.50	1.17	
98	3.57	1.19	
96	3.65	1.22	
94	3.72	1.24	
92	3.80	1.27	
90	3.89	1.30	
88		1.33	
86		1.36	
84		1.39	
82		1.42	
80		1.46	
78		1.50	
76		1.54	
74		1.58	
72		1.62	1.03†
70		1.67	1.00
68		1.72	1.03
66		1.77	1.06
64		1.82	1.09
62		1.88	1.13
60		1.94	1.17
58		2.01	1.21
56		2.08	1.25
54		2.16	1.30

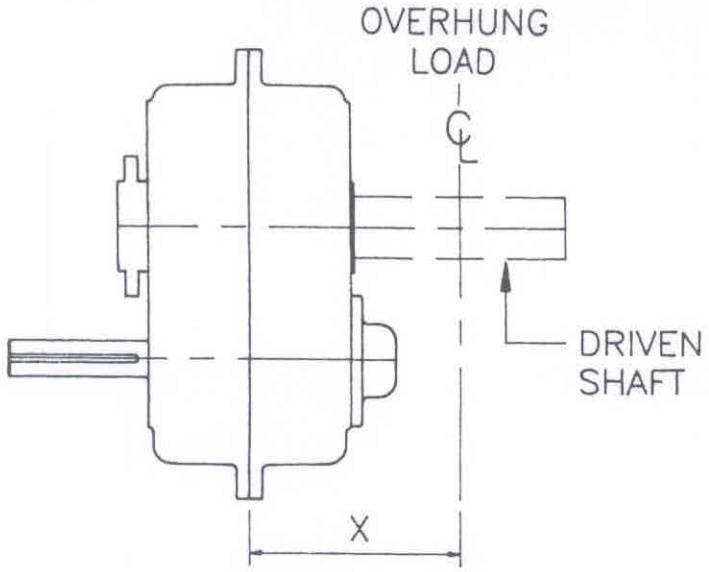
Output Speed RPM	Sheave Ratio 15:1	Sheave Ratio 25:1 •
52	2.24	1.35
50	2.33	1.40
48	2.43	1.46
46	2.54	1.52
44	2.65	1.59
42	2.78	1.67
40	2.92	1.75
38	3.07	1.84
36	3.24	1.94
34	3.43	2.06
32	3.66	2.19
30	3.89	2.33
28		2.50
26		2.69
24		2.92
22		3.18
20		3.50
19		3.68
18		3.89
17		4.12
16		4.38
15		4.67
14		5.00
13		5.38
12		5.83
11		6.36
10		7.00

Δ Based on nominal reducer ratio and 1750 RPM motor.

† Step-up ratio required.

• For size 507F and 608F, increase the belt drive ratio by a factor of 1.1.

Overhung and End Thrust Loads – Model F



Single Reduction Ratio 5:1

Drive Size	Maximum end thrust, pounds † Output speed, RPM				Maximum overhung load, pounds Output speed, RPM				X Dim. in ♦ inches
	400	300	200	100	400	300	200	100	
107	2437	2671	3040	3743	1220	1330	1510	1855	5.00
115	3357	3596	4067	5005	1430	1540	1745	2150	6.00
203	3664	3921	4305	5268	1527	1650	1835	2250	6.87
207	4655	4855	5310	6501	2305	2455	2730	3355	7.75
215	9431	9971	11067	13307	4280	4610	5160	6260	9.12
307	7619	7864	8534	10404	3320	3515	3880	4750	10.50
315	4822	4948	4989	5695	3825	4070	4400	5055	13.00

Double Reduction Ratio 15:1 or 25:1

Drive Size	Maximum end thrust, pounds Output speed, RPM						Maximum overhung load, pounds ‡ Output speed, RPM						X Dim. in ♦ inches
	120	90	70	40	25	10	120	90	70	40	25	10	
107	3190	3477	3755	4431	5331	7607	1666	1815	1960	2315	2670	2670	5.00
115	4527	4933	5317	6344	7598	10617	1980	2155	2330	2760	3260	3432	6.00
203	4328	4869	5407	6668	8029	11354	1980	2190	2395	2890	3420	4197	6.87
207	5460	5898	6449	7667	9468	13829	2980	3250	3530	4175	4960	5774	7.75
215	11110	12276	13389	15985	19360	27492	5575	6100	6620	7700	7700	7700	9.12
307	7932	8647	9495	11562	14455	21396	4050	4400	4800	5760	6880	7745	10.50
315	4019	4402	4886	6472	8589	13638	3550	3880	4335	5740	7580	9819	13.00
407	5594	6082	6624	7836	10368	16419	3900	4240	4630	5500	7260	10550	15.12
415	5270	6284	7261	9434	12458	19021	3150	3770	4340	5650	7450	10640	18.12
507	Consult Rexnord Geared Products Division						10850	12050	12536	12536	12536	12536	20.25
608	Consult Rexnord Geared Products Division						—	8270	8300	8300	10200	15200	21.75

† Thrust values shown load bearings to capacity. Do not apply overhung load to reducer in addition to shown thrust loads.

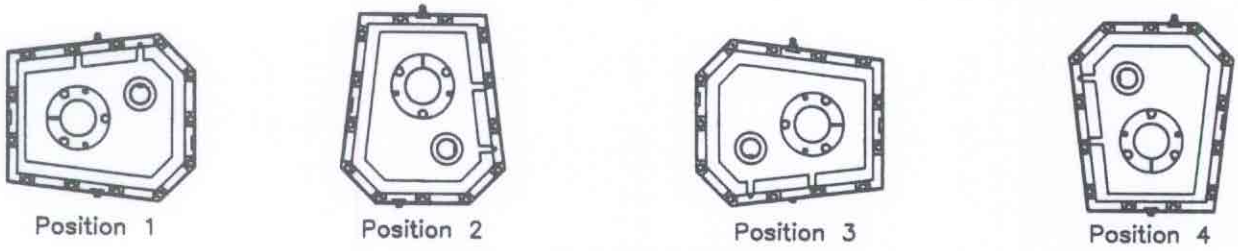
♦ Position of maximum overhung load when the driven shaft is supported entirely by the speed reducer bearings.

‡ Permissible maximum overhung load ratings are based on the most unfavorable position of the load. For actual operating conditions, the permissible overhung load might be higher. Consult Rexnord Geared Products Division with application details.

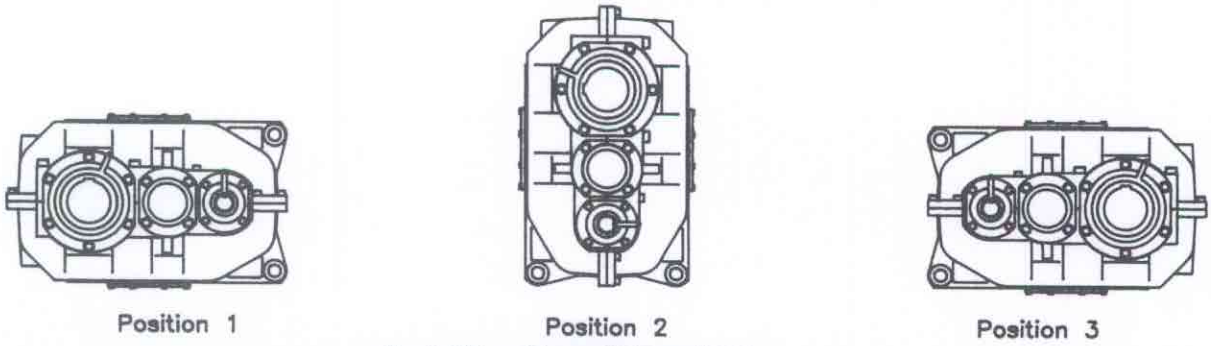
Mounting Positions

Units

The reducer may be mounted in any of the positions shown. Units are shipped arranged for installation in Position 1 for Model F (107 thru 415) and Position 3 for Model F (507 & 608). Any of the other positions may be used by simply relocating the breather and oil level plugs. Variations in basic mounting positions of ±15° are permissible. Sizes 507 and 608, can vary in basic mounting position by up to ± 8°. If more variation is required consult Rexnord Geared Products Division.



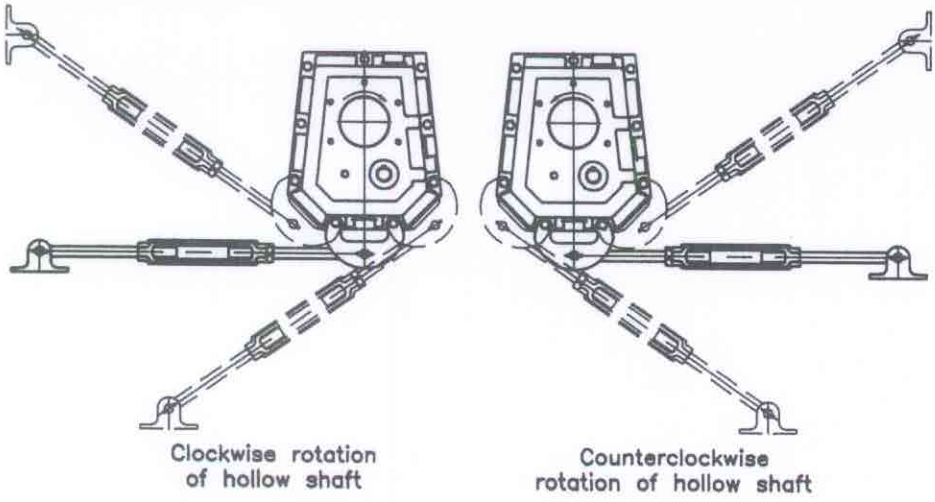
Model F — Sizes 107 through 415



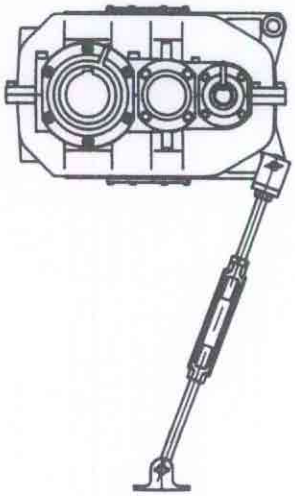
Model F — Sizes 507 and 608

Tie Rods

The tie rod may be attached to the reducer at any of several locations, and should be positioned at 90° to a line though the hollow shaft and the point of attachment. This position may vary between -15° and +30°. The preferred position of the tie rod relative to the hollow shaft rotation is one that puts the tie rod in tension.

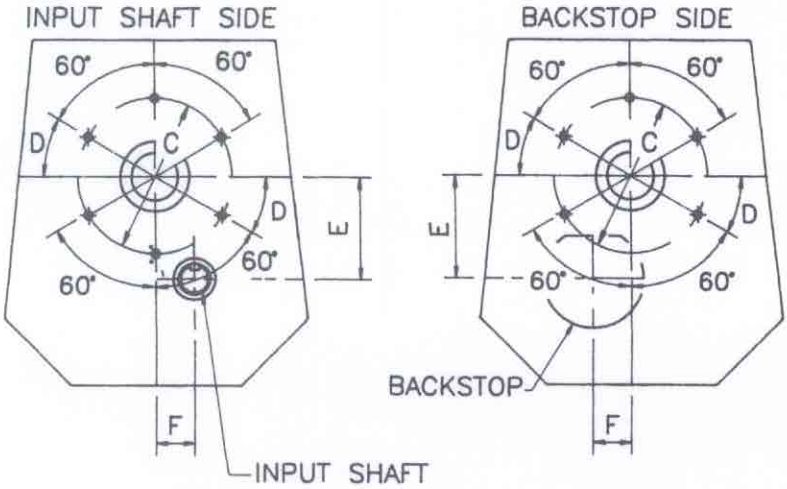


Sizes 107 through 415

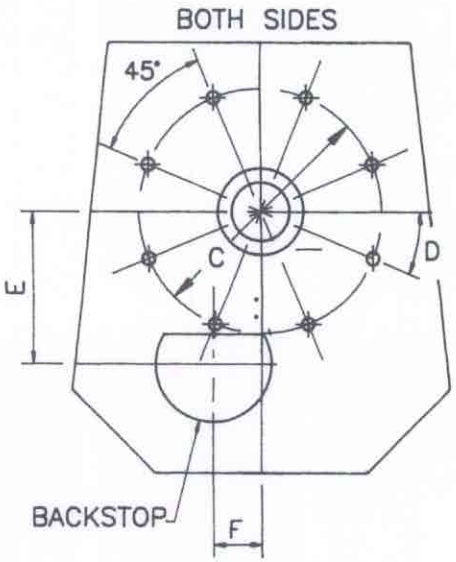


Sizes 507 and 608

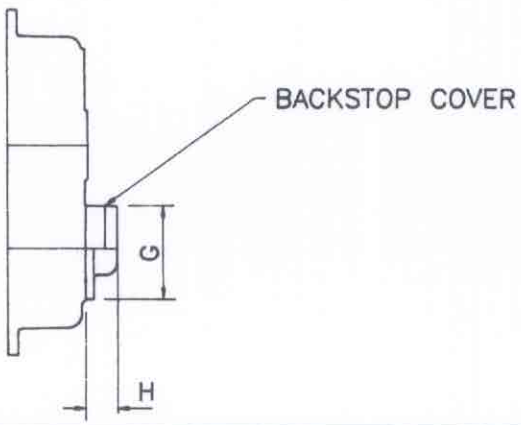
Mounting Hole Locations



SIZE 107–407
6 HOLES ON INPUT SHAFT SIDE
AND
5 HOLES ON BACKSTOP SIDE
'A' DIA. x 'B' DEEP

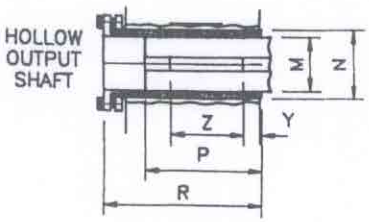


SIZE 415
8 HOLES
ON INPUT SHAFT SIDE
AND BACKSTOP SIDE
'A' DIA. x 'B' DEEP

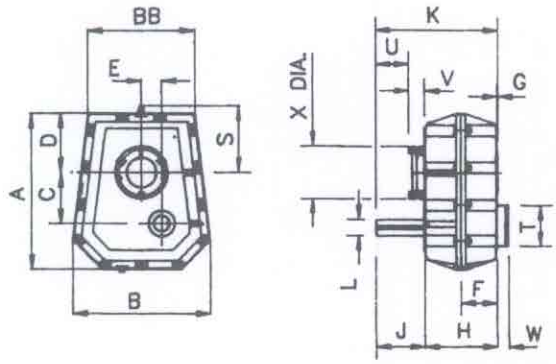


Drive Size	A Tapped Holes	B	C	D	E	F	G with Backstop	G without Backstop	H with Backstop	H without Backstop
107	.312 - 18UNC - 2B	.62	4.75	30°	3.16	1.19	3.12	3.12	1.00	1.00
115	.375 - 16UNC - 2B	.62	5.50	30°	3.40	1.25	3.62	3.62	1.19	1.19
203	.375 - 16UNC - 2B	.88	6.00	30°	3.98	1.50	3.62	3.75	1.19	1.19
207	.500 - 13UNC - 2B	.88	6.75	30°	4.71	1.69	4.25	4.25	1.25	1.38
215	.500 - 13UNC - 2B	1.00	7.75	30°	5.30	1.88	4.25	4.25	1.25	1.38
307	.625 - 11UNC - 2B	1.12	8.75	30°	6.05	2.38	5.50	5.50	1.62	1.62
315	.750 - 10UNC - 2B	1.25	10.00	30°	6.87	2.69	5.88	5.88	1.62	1.56
407	.750 - 10UNC - 2B	1.25	10.00	30°	7.42	3.00	6.59	6.59	1.69	1.69
415	.750 - 10UNC - 2B	1.25	11.25	22.5°	8.34	3.38	6.59	6.59	1.69	1.69

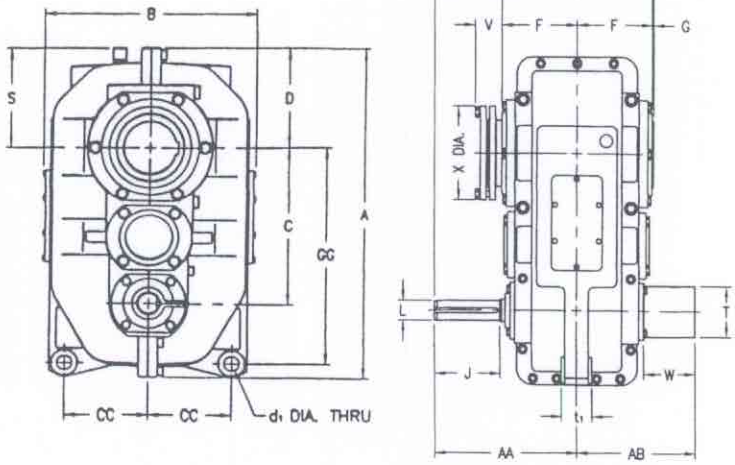
Dimensions
Shaft Mounted Reducers



MODEL F – (107 thru 415)



MODEL F – (507 & 608)



DRIVE SIZE	Exact Ratio 5:1	Wt.†	Exact Ratio 15:1	Exact Ratio 25:1	Wt.†	A	B	BB	C	CC	D	d_1 #	E	F	G	GG	H	J	K	L◆
107	5.000	50	14.722	25.417	55	10.62	9.38	7.50	3.16	--	4.15	--	1.19	2.40	.09	--	4.81	3.31	8.21	.875
115	4.933	55	14.553	24.287	60	11.12	9.62	7.75	3.40	--	4.35	--	1.25	2.56	.09	--	5.12	3.62	8.83	1.000
203	4.929	80	14.512	24.232	85	12.75	11.00	8.75	3.98	--	4.90	--	1.50	3.00	.09	--	6.00	4.00	10.09	1.250
207	5.077	135	15.485	25.775	143	14.81	12.62	10.38	4.71	--	5.72	--	1.69	3.44	.09	--	6.88	4.50	11.47	1.375
215	4.933	175	15.074	24.338	185	16.00	13.62	11.25	5.30	--	6.07	--	1.88	4.00	.12	--	8.00	5.25	13.37	1.750
307	5.077	270	14.964	24.994	290	19.00	16.75	13.50	6.05	--	7.20	--	2.38	4.44	.09	--	8.88	5.62	14.59	1.938
315	5.077	360	14.949	25.747	380	20.88	18.38	14.25	6.87	--	7.88	--	2.69	4.88	.12	--	9.75	6.50	16.37	2.188
407	N/A	N/A	15.485	25.022	400	22.62	20.75	15.00	7.42	--	8.38	--	3.00	5.50	.12	--	11.00	7.00	18.12	2.438
415	N/A	N/A	14.553	25.046	420	25.13	23.00	15.75	8.34	--	9.28	--	3.38	5.88	.12	--	11.75	7.50	19.37	2.438
507	N/A	N/A	15.680	22.010	1100	35.04	21.25	--	16.93	8.66	10.24	1.575	--	8.11	.12	23.23	16.22	7.06	23.56	2.125
608	N/A	N/A	14.070	21.540	1520	39.00	23.50	--	19.21	9.64	11.42	1.772	--	8.84	.19	25.79	17.68	8.73	26.82	2.313

DRIVE SIZE	Input Shaft Keyseat	M□	N	P△	R▽	S	T	t_1	U	V	W	X Dia.	Y	Driven Shaft Keyseat	Z⊕	AA	AB
107	.19 x .09 x 3.19	1.438	2.12	4.88	6.05	5.19	3.12	--	1.87	1.44	1.00	3.38	1.06	.38 x .19	2.09	--	--
115	.25 x .12 x 3.50	1.938	2.56	5.18	6.37	5.38	3.62	--	2.18	1.44	1.19	3.81	1.12	.50 x .25	2.31	--	--
203	.25 x .12 x 3.88	2.188	2.94	5.96	7.24	5.94	3.62	--	2.56	1.44	1.19	4.25	1.19	.50 x .25	2.94	--	--
207	.31 x .16 x 4.31	2.438	3.31	6.90	8.32	6.75	4.25	--	2.82	1.68	1.25	5.00	1.31	.62 x .31	3.50	--	--
215	.38 x .19 x 5.12	2.938	3.94	7.91	9.46	7.09	4.25	--	3.57	1.68	1.25	6.00	1.31	.75 x .38	4.44	--	--
307	.50 x .25 x 5.50	3.438	4.31	8.69	10.31	8.25	5.50	--	3.94	1.68	1.56	6.00	1.31	.88 x .44	5.12	--	--
315	.50 x .25 x 6.38	3.938	5.00	9.68	11.50	8.91	5.88	--	4.44	2.06	1.61	7.00	1.44	1.00 x .50	5.69	--	--
407	.62 x .31 x 6.88	4.438	5.62	10.80	12.74	9.41	6.59	--	4.94	2.06	1.69	7.63	1.50	1.00 x .50	6.62	--	--
415	.62 x .31 x 7.38	4.938	6.50	11.50	13.50	10.31	6.59	--	5.44	2.06	1.69	8.50	1.50	1.25 x .62	7.25	--	--
507	.50 x .25 x 6.75	5.439	7.09	15.00	18.66	10.78	5.50	2.95	7.22	2.89	5.56	10.00	2.12	1.25 x .62	10.69	15.33	12.72
608	.62 x .31 x 8.56	6.501	7.75	15.25	20.62	11.75	5.88	3.15	8.95	3.44	5.39	11.00	2.62	1.50 x .75	10.38	17.79	13.67

All dimensions are in inches. Have dimensions certified for installation purposes.

† Weights shown are in pounds for unit only.

□ Maximum bore - see bushing table on page 19. Tolerance: = + .002" - .000"

◆ Tolerance: 1.500 dia. or less = +.0000", - .0005"; over 1.500 dia. = + .000", - .001"

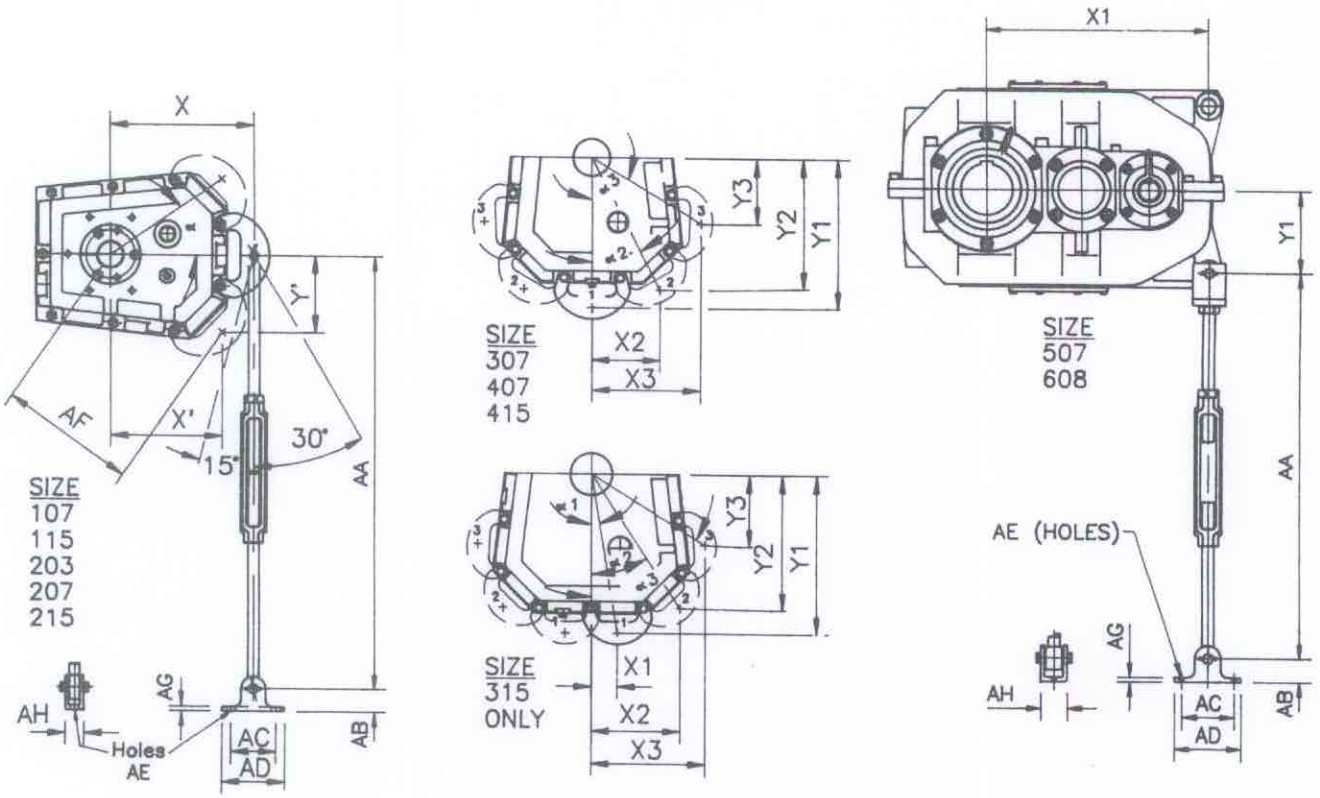
▽ Maximum recommended length of driven shaft.

△ Minimum recommended length of driven shaft.

Tolerance +.006", - .000"

⊕ Length of key furnished with reducer.

Dimensions
Tie Rod Dimensions and Positions



Drive Size	AA Max	AA Min	AB	AC	AD	AE	AF	AG	AH	Wt.[1]
107	30	24	1.25	2.50	3.50	.50	7.65	.25	1.31	5
115	30	24	1.25	2.50	3.50	.50	7.79	.25	1.31	6
203	33	27	1.50	3.50	5.00	.63	9.33	.38	1.69	9
207	33	27	1.50	3.50	5.00	.63	10.12	.38	1.69	10
215	36	30	1.75	4.00	5.75	.63	11.27	.44	1.94	14
307	36	30	1.75	4.00	5.75	.63	---	.44	1.94	14
315	36	30	2.00	4.75	6.50	.75	---	.50	2.13	19
407	36	30	2.00	4.75	6.50	.75	---	.50	2.13	25
415	36	30	3.12	7.00	9.00	.88	---	.75	3.00	25
507	36	30	2.75	6.00	8.50	1.06	---	.50	3.5	30
608	36	30	2.75	6.00	8.50	1.06	---	.50	3.5	35

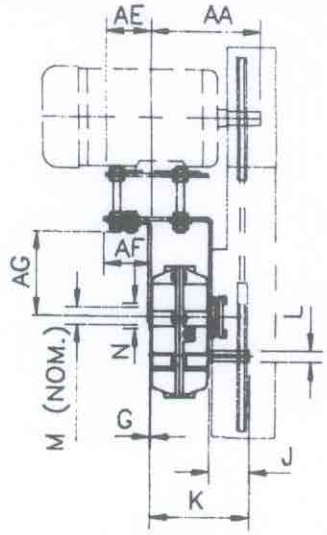
Drive Size	X	Angle α	X'	Y'	X1	Y1	α 1	X2	Y2	α 2	X3	Y3	α 3
107	7.97	34° - 55'	6.18	4.31	---	---	---	---	---	---	---	---	---
115	8.28	34° - 35'	6.41	4.42	---	---	---	---	---	---	---	---	---
203	9.98	35° - 24'	7.60	5.40	---	---	---	---	---	---	---	---	---
207	10.71	33° - 2'	8.48	5.52	---	---	---	---	---	---	---	---	---
215	11.56	29° - 14'	9.83	5.50	---	---	---	---	---	---	---	---	---
307	---	---	---	---	---	14.11	---	6.31	12.42	26° - 55'	10.08	6.16	58° - 35'
315	---	---	---	---	2.44	14.81	9° - 21'	8.24	12.49	33° - 24'	10.56	6.55	58° - 11'
407	---	---	---	---	---	17.05	---	6.14	15.92	21° - 4'	11.44	10.98	46° - 10'
415	---	---	---	---	---	18.22	---	5.53	17.66	17° - 22'	11.20	14.62	37° - 27'
507	---	---	---	---	23.23	8.66	---	---	---	---	---	---	---
608	---	---	---	---	25.79	9.64	---	---	---	---	---	---	---

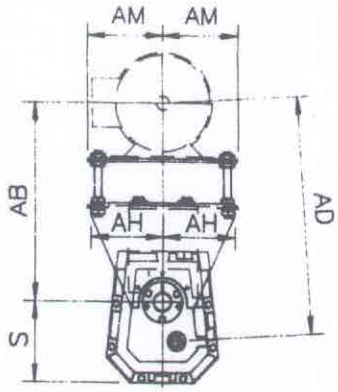
All dimensions are in inches. Have dimensions certified for installation purposes.

[1] Weights shown are in pounds for tie rod assembly only.

Dimensions

Motor Bracket - Unit Position 2





NOTE: Standard Motor Mounts can not be used on mounting positions 1 and 4.

Complete motor bracket and reducer assembly will operate satisfactorily at 90° or 180° from position shown by relocating the breather and oil level plugs.

Drive Size	NEMA Motor Frame	AA	AB [1]	AD [1]	AE	AF	AG	AH	AM	G	J	K	Input Shaft L [2]	Input Shaft Keyseat	M	N	S	Wt. [3]
107	56	8.18	12.69	15.94	3.71	3.94	6.88	6.00	6.25	.09	3.31	8.21	.8750	.19x.09x3.19	1.438	2.12	6.47	30
	143T-145T	8.56	12.69	15.94														
	182T-184T	9.06	13.69	16.94														
115	56	8.25	15.62	19.12	4.87	3.63	9.75	7.00	7.12	.09	3.62	8.83	1.0000	.25x.12x3.50	1.938	2.56	6.77	40
	143T-145T	8.63	15.62	19.12														
	182T-184T	9.13	16.62	20.12														
	213T-215T	9.75	17.38	20.88														
203	56	9.88	17.38	21.44	9.00	5.69	11.38	9.00	9.00	.09	4.00	10.09	1.2500	.25x.12x3.88	2.188	2.94	7.85	45
	143T-145T	9.88	17.38	21.44														
	182T-184T	10.35	18.38	22.44														
	213T-215T	10.90	19.12	23.19														
	254T-256T	11.06	20.12	24.19														
207	143T-145T	10.88	20.25	25.06	9.25	5.00	13.75	9.00	9.00	.09	4.50	11.47	1.3750	.31x.16x4.31	2.438	3.31	9.09	90
	182T-184T	11.38	21.25	26.06														
	213T-215T	12.00	22.00	26.81														
	254T-256T	12.38	23.00	27.81														
	284T	12.62	23.75	28.56														
215	143T-145T	12.00	20.25	25.62	8.12	4.13	13.75	9.00	9.00	.12	5.25	13.37	1.750	.38x.19x5.12	2.938	3.94	9.93	100
	182T-184T	12.50	21.25	26.62														
	213T-215T	13.12	22.00	27.38														
	254T-256T	13.50	23.00	28.38														
	284T-286T	13.75	23.75	29.12														
307	182T-184T	13.50	24.31	30.50	8.75	5.62	16.75	10.00	10.25	.09	5.62	14.59	1.938	.50x.25x5.50	3.438	4.31	11.80	125
	213T-215T	14.00	25.06	31.25														
	254T-256T	14.38	26.06	32.25														
	284T-286T	14.63	26.81	33.00														
	324T-326T	15.50	27.81	34.00														
315	182T-184T	14.62	24.44	31.44	9.01	5.50	16.75	11.00	11.25	.12	6.50	16.37	2.188	.50x.25x6.38	3.938	5.00	13.00	145
	213T-215T	15.25	25.19	32.19														
	254T-256T	15.62	26.19	33.19														
	284T-286T	16.25	26.94	33.94														
	324T-326T	16.88	27.94	34.94														
	364T-365T	16.88	28.94	35.94														
407	182T-184T	15.88	24.44	32.00	7.76	4.25	16.75	11.00	11.25	.12	7.00	18.12	2.438	.62x.31x6.88	4.438	5.62	14.24	175
	213T-215T	16.50	25.19	32.75														
	254T-256T	16.88	26.19	33.75														
	284T-286T	17.50	26.94	34.50														
	324T-326T	18.12	27.94	35.50														
	364T-365T	18.12	28.94	36.50														
415	213T-215T	17.25	25.19	33.70	7.01	5.00	16.75	11.00	11.25	.12	7.50	19.37	2.438	.62x.31x7.38	4.938	6.50	15.85	185
	254T-256T	17.62	26.19	34.70														
	284T-286T	18.25	26.94	35.44														
	324T-326T	18.88	27.94	36.44														
	364T-365T	18.88	28.94	37.44														

[1] Minimum dimension shown. Belt centers may be adjusted: +2.50" for 107 through 203, and +2.75" for 207 through 415.

[2] Tolerance: 1.500 dia. or less = +.0000 -.0005; over 1.500 dia. = + .000 -.001

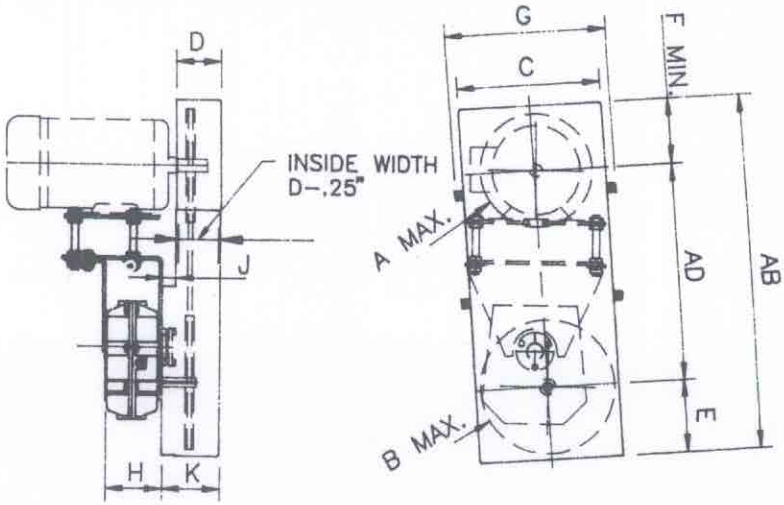
[3] Weight is in pounds for bracket assembly only.

Motor brackets are available for larger reducers, see page 39.

Dimensions are in inches.

Dimensions

Belt Guard - Unit Position 2



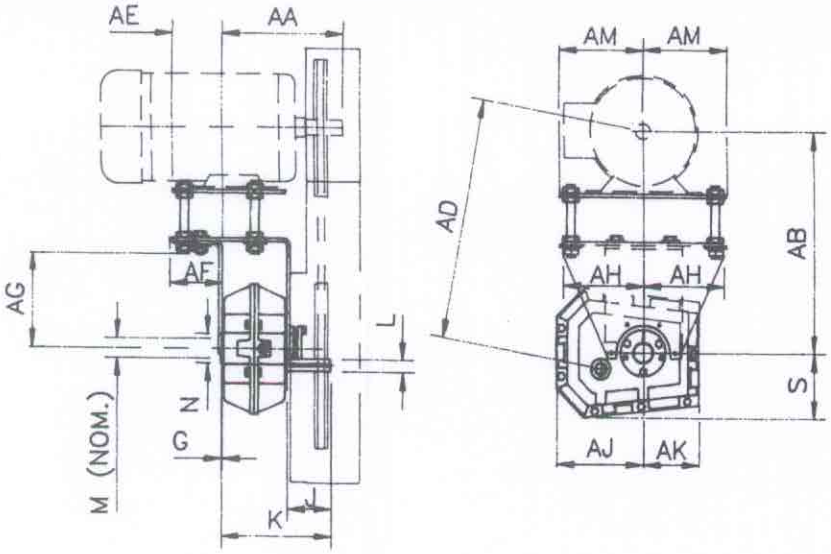
Drive Size	NEMA Motor Frame	AD Min	AD Max	Sheave Dia. A	Sheave Dia. B	C	D	E	F	G	H	J	K	AB	Wt. [1]
107	56	15.94	18.44	10.00	12.00	13.25	4.12	6.50	5.75	14.75	4.81	1.25	5.37	31.75	33
	143T-145T	15.94	18.44												
	182T-184T	16.94	19.44												
115	56	19.12	21.62	10.00	12.00	13.25	4.12	6.50	5.75	14.75	5.12	1.25	5.37	36.00	35
	143T-145T	19.12	21.62												
	182T-184T	20.12	22.62												
	213T-215T	20.88	23.38												
203	56	21.44	23.94	10.00	12.00	13.25	4.12	6.50	5.75	14.75	6.00	1.25	5.37	39.00	37
	143T-145T	21.44	23.94												
	182T-184T	22.44	24.94												
	213T-215T	23.19	25.69												
	254T-256T	24.19	26.69												
207	143T-145T	25.06	27.81	12.00	14.00	16.12	5.38	7.50	6.75	17.75	6.88	1.38	6.76	45.75	45
	182T-184T	26.06	28.81												
	213T-215T	26.81	29.56												
	254T-256T	27.81	30.56												
	284T	28.56	31.31												
215	143T-145T	25.62	28.37	12.00	14.00	18.31	5.38	7.50	6.75	19.75	8.00	1.38	6.76	46.38	50
	182T-184T	26.62	29.37												
	213T-215T	27.38	30.13												
	254T-256T	28.38	31.13												
	284T-286T	29.12	31.87												
307	182T-184T	30.50	33.25	12.00	14.00	18.31	5.38	7.50	6.75	19.75	8.88	1.38	6.76	51.00	55
	213T-215T	31.25	34.00												
	254T-256T	32.25	35.00												
	284T-286T	33.00	35.75												
	324T-326T	34.00	36.75												
315	182T-184T	31.44	34.19	12.00	14.00	18.31	5.38	7.50	6.75	19.75	9.75	1.62	7.00	53.50	60
	213T-215T	32.19	34.94												
	254T-256T	33.19	35.94												
	284T-286T	33.94	36.69												
	324T-326T	34.94	37.69												
	364T-365T	35.94	38.69												
407	182T-184T	32.00	34.75	12.00	14.00	20.56	5.38	7.50	6.75	22.25	11.00	1.62	7.00	54.00	75
	213T-215T	32.75	35.50												
	254T-256T	33.75	36.50												
	284T-286T	34.50	37.25												
	324T-326T	35.50	38.25												
	364T-365T	36.50	39.25												
415	213T-215T	33.70	36.45	12.00	14.00	20.56	5.38	7.50	6.75	22.25	11.75	1.62	7.50	54.75	80
	254T-256T	34.70	37.45												
	284T-286T	35.44	38.19												
	324T-326T	36.44	39.19												
	364T-365T	37.44	40.19												

[1] Weight is in pounds for belt guard only.
Dimensions are in inches.

Belt guards are available for larger reducers, consult Rexnord Geared Products Division.

Dimensions

Motor Bracket - Unit Position 3



NOTE: Standard Motor Mounts can not be used on mounting positions 1 and 4.

Complete motor bracket and reducer assembly will operate satisfactorily at 90° or 180° from position shown by relocating the breather and oil level plugs.

Drive Size	NEMA Motor Frame	AA	AB [1]	AD [1]	AE	AF	AG	AH	AJ	AK	AM	G	J	K	Input Shaft L [2]	Input Shaft Keyseat	M	N	S	Wt. [3]
107	56	8.18	12.69	14.25	3.71	3.94	6.88	6.00	6.47	4.15	6.25	.09	3.31	8.21	.8750	.19x.09x3.19	1.438	2.12	4.69	30
	143T-145T	8.56	12.69	14.25																
	182T-184T	9.06	13.69	15.25																
115	56	8.25	15.62	17.25	4.87	3.63	9.75	7.00	6.77	4.35	7.12	.09	3.62	8.83	1.0000	.25x.12x3.50	1.938	2.56	4.81	40
	143T-145T	8.63	15.62	17.25																
	182T-184T	9.13	16.62	18.20																
	213T-215T	9.75	17.38	18.94																
203	56	9.88	17.38	19.31	9.00	5.69	11.38	9.00	7.85	4.90	9.00	.09	4.00	10.09	1.2500	.25x.12x3.88	2.188	2.94	5.50	45
	143T-145T	9.88	17.38	19.31																
	182T-184T	10.35	18.38	20.31																
	213T-215T	10.90	19.12	21.00																
	254T-256T	11.06	20.12	22.00																
207	143T-145T	10.88	20.25	22.44	9.25	5.00	13.75	9.00	9.09	5.72	9.00	.09	4.50	11.47	1.3750	.31x.16x4.31	2.438	3.31	6.31	90
	182T-184T	11.38	21.25	23.44																
	213T-215T	12.00	22.00	24.15																
	254T-256T	12.38	23.00	25.15																
	284T	12.62	23.75	25.88																
215	143T-145T	12.00	20.25	22.75	8.12	4.13	13.75	9.00	9.93	6.07	9.00	.12	5.25	13.37	1.750	.38x.19x5.12	2.938	3.94	6.81	100
	182T-184T	12.50	21.25	23.75																
	213T-215T	13.12	22.00	24.50																
	254T-256T	13.50	23.00	25.50																
	284T-286T	13.75	23.75	26.18																
307	182T-184T	13.50	24.31	27.38	8.75	5.62	16.75	10.00	11.80	7.20	10.25	.09	5.62	14.59	1.938	.50x.25x5.50	3.438	4.31	8.38	125
	213T-215T	14.00	25.06	28.12																
	254T-256T	14.38	26.06	29.09																
	284T-286T	14.63	26.81	29.81																
	324T-326T	15.50	27.81	30.81																
315	182T-184T	14.62	24.44	28.00	9.01	5.50	16.75	11.00	13.00	7.88	11.25	.12	6.50	16.37	2.188	.50x.25x6.38	3.938	5.00	9.19	145
	213T-215T	15.25	25.19	28.75																
	254T-256T	15.62	26.19	29.69																
	284T-286T	16.25	26.94	30.44																
	324T-326T	16.88	27.94	31.38																
	364T-365T	16.88	28.94	32.38																
407	182T-184T	15.88	24.44	28.44	7.76	4.25	16.75	11.00	14.24	8.38	11.25	.12	7.00	18.12	2.438	.62x.31x6.88	4.438	5.62	10.38	175
	213T-215T	16.50	25.19	29.16																
	254T-256T	16.88	26.19	30.12																
	284T-286T	17.50	26.94	30.85																
	324T-326T	18.12	27.94	31.81																
	364T-365T	18.12	28.94	32.81																
415	213T-215T	17.25	25.19	29.75	7.01	5.00	16.75	11.00	15.85	9.28	11.25	.12	7.50	19.37	2.438	.62x.31x7.38	4.938	6.50	11.50	185
	254T-256T	17.62	26.19	30.72																
	284T-286T	18.25	26.94	31.44																
	324T-326T	18.88	27.94	32.44																
	364T-365T	18.88	28.94	33.38																

[1] Minimum dimension shown. Belt centers may be adjusted: +2.50" for 107 through 203, and +2.75" for 207 through 415.

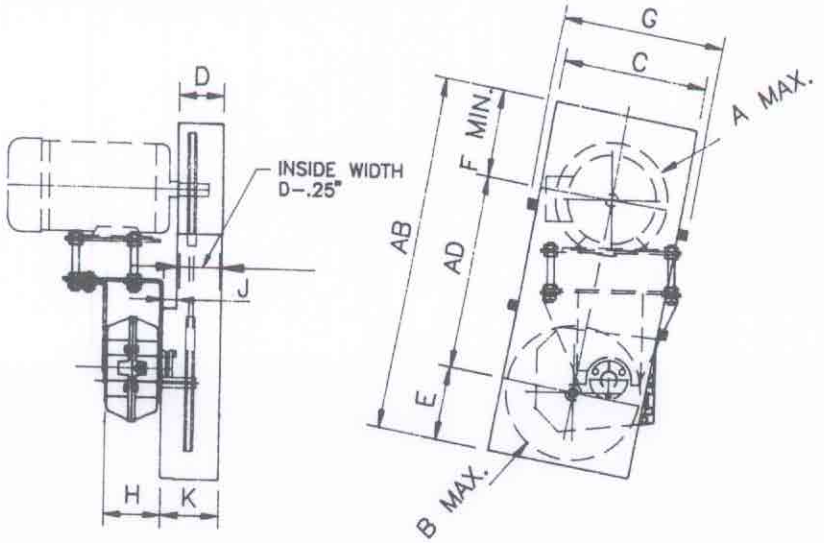
[2] Tolerance: 1.500 dia. or less = +.0000 -.0005; over 1.500 dia. = + .000 -.001

[3] Weight is in pounds for bracket assembly only.

Dimensions are in inches. Motor brackets are available for larger reducers, see page 39.

Dimensions

Belt Guard - Unit Position 3



Drive Size	NEMA Motor Frame	AD Min	AD Max	Sheave Dia. A	Sheave Dia. B	C	D	E	F	G	H	J	K	AB	Wt. [1]
107	56	14.25	16.75	10.00	12.00	13.25	4.12	6.50	5.75	14.75	4.81	1.25	5.37	31.75	33
	143T-145T	14.25	16.75												
	182T-184T	15.25	17.75												
115	56	17.25	19.75	10.00	12.00	13.25	4.12	6.50	5.75	14.75	5.12	1.25	5.37	36.00	35
	143T-145T	17.25	19.75												
	182T-184T	18.20	20.70												
	213T-215T	18.94	21.44												
203	56	19.31	21.81	10.00	12.00	13.25	4.12	6.50	5.75	14.75	6.00	1.25	5.37	39.00	37
	143T-145T	19.31	21.81												
	182T-184T	20.31	22.81												
	213T-215T	21.00	23.50												
	254T-256T	22.00	24.50												
207	143T-145T	22.44	25.19	12.00	14.00	16.12	5.38	7.50	6.75	17.75	6.88	1.38	6.76	45.75	45
	182T-184T	23.44	26.19												
	213T-215T	24.15	26.90												
	254T-256T	25.15	27.90												
	284T	25.88	28.63												
215	143T-145T	22.75	25.50	12.00	14.00	18.31	5.38	7.50	6.75	19.75	8.00	1.38	6.76	46.38	50
	182T-184T	23.75	26.50												
	213T-215T	24.50	27.25												
	254T-256T	25.50	28.25												
	284T-286T	26.18	28.93												
307	182T-184T	27.38	30.13	12.00	14.00	18.31	5.38	7.50	6.75	19.75	8.88	1.38	6.76	51.00	55
	213T-215T	28.12	30.87												
	254T-256T	29.09	31.84												
	284T-286T	29.81	32.56												
	324T-326T	30.81	33.56												
315	182T-184T	28.00	30.75	12.00	14.00	18.31	5.38	7.50	6.75	19.75	9.75	1.62	7.00	53.50	60
	213T-215T	28.75	31.50												
	254T-256T	29.69	32.44												
	284T-286T	30.44	33.19												
	324T-326T	31.38	34.13												
	364T-365T	32.38	35.13												
407	182T-184T	28.44	31.19	12.00	14.00	20.56	5.38	7.50	6.75	22.25	11.00	1.62	7.00	54.00	75
	213T-215T	29.16	31.91												
	254T-256T	30.12	32.87												
	284T-286T	30.85	33.60												
	324T-326T	31.81	34.56												
	364T-365T	32.81	35.56												
415	213T-215T	29.75	32.50	12.00	14.00	20.56	5.38	7.50	6.75	22.25	11.75	1.62	7.50	54.75	80
	254T-256T	30.72	33.47												
	284T-286T	31.44	34.19												
	324T-326T	32.44	35.19												
	364T-365T	33.38	36.13												

[1] Weight is in pounds for belt guard only.
Dimensions are in inches.

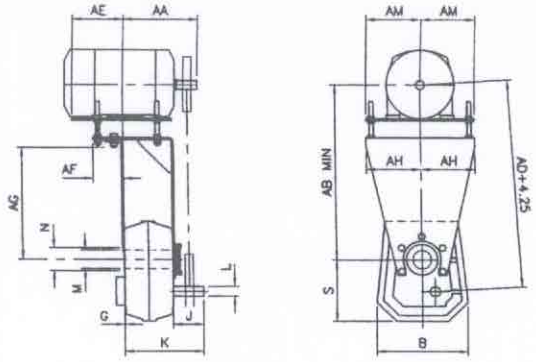
Belt guards are available for larger reducers, consult Rexnord Geared Products Division.

Dimensions

Tall Motor Bracket – Reducer Position 2

Link-Belt® Drives

Model F sizes 107 thru 415



DRIVE SIZE	NEMA FRAME	AA	AB	AD	AE	AF	AG	AH	AM	B	G	J	K	Input Shaft L	Input Shaft Keyseat	M	N	S	Weight Bkt Assy only
107	56	8.18	20.81	24.00	3.71	3.94	14.88	6.00	6.25	9.38	.09	3.31	8.21	.8750 -.0005	.19x.09x3.19	1.438	2.12	4.69	45
	143T — 145T	8.56	20.81	24.00															
	182T — 184T	9.06	21.81	25.00															
	213T — 215T	9.06	22.56	25.75	5.00	4.94			7.12										55 ●
115	56	8.25	22.25	25.69	4.87	3.63	16.38	7.00	7.12	9.62	.09	3.62	8.83	1.0000 -.0005	.25x.12x3.50	1.938	2.56	4.81	55
	143T — 145T	8.63	22.25	25.69															
	182T — 184T	9.13	23.25	26.69															
	213T — 215T	9.75	24.00	27.44															
203	56	9.88	23.50	27.56	5.62	3.94	17.62	7.12	7.12	11.00	.09	4.00	10.09	1.2500 -.0005	.25x.12x3.88	2.188	2.94	5.50	60
	143T — 145T	9.88	23.50	27.56															
	182T — 184T	10.35	24.50	28.56															
	213T — 215T	10.90	25.25	29.31															
	254T — 256T	11.06	26.25	30.31	9.00	5.69		9.00	9.00										70 ●
207	143T — 145T	10.88	25.50	30.25	9.25	5.00	18.88	9.00	9.00	12.62	.09	4.50	11.47	1.3750 -.0005	.31x.16x4.31	2.438	3.31	6.31	105
	182T — 184T	11.38	26.50	31.25															
	213T — 215T	12.00	27.25	32.00															
	254T — 256T	12.38	28.25	33.00															
	284T — 286T	12.62	29.00	33.75															
215	143T — 145T	12.00	25.50	30.88	8.12	4.13	18.88	9.00	9.00	13.62	.12	5.25	13.37	1.750 -.001	.38x.19x5.12	2.938	3.94	6.81	115
	182T — 184T	12.50	26.50	31.88															
	213T — 215T	13.12	27.25	32.62															
	254T — 256T	13.50	28.25	32.62															
	284T — 286T	13.75	29.00	34.38															
	324T — 326T	14.62	30.00	35.38	10.00	6.00		10.25	10.25										130 ●
307	182T — 184T	13.50	28.38	34.50	8.75	5.62	20.75	10.00	10.25	16.75	.09	5.62	14.59	1.938 -.001	.50x.25x5.50	3.438	4.31	8.38	140
	213T — 215T	14.00	29.12	35.25															
	254T — 256T	14.38	30.12	36.25															
	284T — 286T	14.63	30.88	37.00															
	324T — 326T	15.50	31.88	38.00															
315	182T — 184T	14.62	28.75	35.50	9.01	5.50	20.75	11.00	11.25	18.38	.12	6.50	16.37	2.188 -.001	.50x.25x6.38	3.938	5.00	9.19	160
	213T — 215T	15.25	29.50	36.25															
	254T — 256T	15.62	30.50	37.25															
	284T — 286T	16.25	31.25	38.00															
	324T — 326T	16.88	32.25	39.00															
	364T — 365T	16.88	33.25	40.00															
407	182T — 184T	15.88	28.75	36.25	7.76	4.25	20.75	11.00	11.25	20.75	.12	7.00	18.12	2.438 -.001	.62x.31x6.88	4.438	5.62	10.38	190
	213T — 215T	16.50	29.50	37.00															
	254T — 256T	16.88	30.50	38.00															
	284T — 286T	17.50	31.25	38.75															
	324T — 326T	18.12	32.25	39.75															
	364T — 365T	18.12	33.25	40.75															
415	213T — 215T	17.25	29.50	38.00	7.01	5.00	20.75	11.00	11.25	23.00	.12	7.50	19.37	2.438 -.001	.62x.31x7.38	4.938	6.50	11.50	200
	254T — 256T	17.62	30.50	39.00															
	284T — 286T	18.25	31.25	39.75															
	324T — 326T	18.88	32.25	40.75															
	364T — 365T	18.88	33.25	41.75															

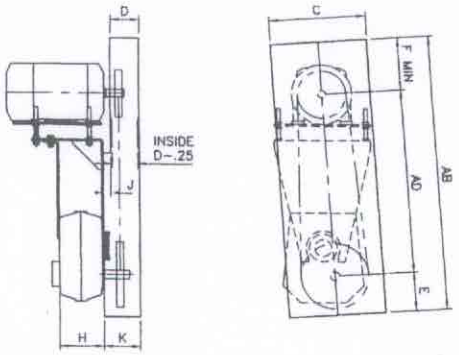
● SPECIAL MOTOR MOUNT MADE TO ORDER.

Dimensions

Long Belt Guard – Reducer Position 2

Link-Belt® Drives

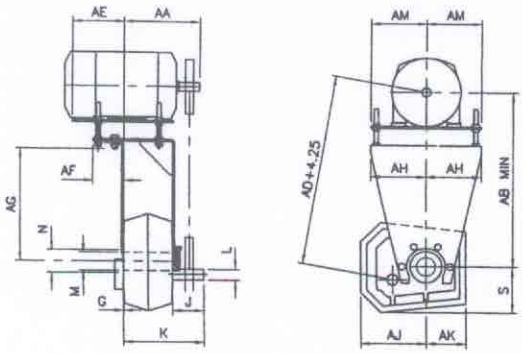
Model F sizes 107 thru 415



DRIVE SIZE	NEMA FRAME	BELT GUARD	AD MIN	AD MAX	SHEAVE DIA A MAX	SHEAVE DIA B MAX	C	D	E	F MIN	H	J	K	AB	Weight Guard only
107	56 143T-145T 182T-184T 213T-215T	1012L	24.00 24.00 25.00 25.75	28.25 28.25 29.25 30.00	10.00	12.00	13.25	4.12	6.50	5.75	5.12	1.25	5.38	42.25	42
115	56 143T-145T 182T-184T 213T-215T	1012L	25.69 25.69 26.69 27.44	29.94 29.94 30.94 31.69	10.00	12.00	13.25	4.12	6.50	5.75	5.44	1.25	5.38	44.00	43
203	56 143T-145T 182T-184T 213T-215T 254T-256T	1012L	27.56 27.56 28.56 29.31 30.31	31.81 31.81 32.81 33.56 34.56	10.00	12.00	13.25	4.12	6.50	5.75	6.31	1.25	5.38	46.88	44
207	143T-145T 182T-184T 213T-215T 254T-256T 284T-286T	1214L	30.25 31.25 32.00 33.00 33.75	34.50 35.50 36.25 37.25 38.00	12.00	14.00	16.12	5.38	7.50	6.75	7.19	1.38	6.75	52.25	51
215	143T-145T 182T-184T 213T-215T 254T-256T 284T-286T 324T-326T	1517L	30.88 31.88 32.62 33.62 34.38 35.38	35.12 36.12 36.88 37.88 38.62 39.62	12.00	14.00	18.31	5.38	7.50	6.75	8.38	1.38	6.75	53.88	58
307	182T-184T 213T-215T 254T-256T 284T-286T 324T-326T	1517L	34.50 35.25 36.25 37.00 38.00	38.75 39.50 40.50 41.25 42.25	12.00	14.00	18.31	5.38	7.50	6.75	9.25	1.38	6.75	56.50	61
315	182T-184T 213T-215T 254T-256T 284T-286T 324T-326T 364T-365T	1517L	35.50 36.25 37.25 38.00 39.00 40.00	39.75 40.50 41.50 42.25 43.25 44.25	12.00	14.00	18.31	5.38	7.50	6.75	10.25	1.62	7.00	58.50	68
407	182T-184T 213T-215T 254T-256T 284T-286T 324T-326T 364T-365T	1820L	36.25 37.00 38.00 38.75 39.75 40.75	40.50 41.25 42.25 43.00 44.00 45.00	12.00	14.00	20.56	5.38	7.50	6.75	11.50	1.62	7.00	59.25	78
415	213T-215T 254T-256T 284T-286T 324T-326T 364T-365T	1820L	38.00 39.00 39.75 40.75 41.75	42.25 43.25 44.00 45.00 46.00	12.00	14.00	20.56	5.38	7.50	6.75	12.25	1.62	7.00	60.25	80

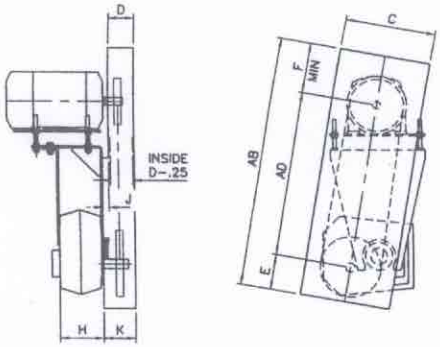
Dimensions

Tall Motor Bracket – Reducer Position 3



DRIVE SIZE	NEMA FRAME	AA	AB	AD	AE	AF	AG	AH	AJ	AK	AM	G	J	K	Input Shaft L	Input Shaft Keyseat	M	N	S	Weight Bkt Assy only
	56	8.18	20.81	22.25																
107	143T — 145T	8.56	20.81	22.25	3.71	3.94	14.88	6.00	6.47	4.15	6.25	.09	3.31	8.21	.8750 -.0005	.19x.09x3.19	1.438	2.12	4.69	45
	182T — 184T	9.06	21.81	23.25																
	213T — 215T	9.06	22.56	24.00	5.00	4.94		7.00			7.12									55●
	56	8.25	22.25	23.75																
115	143T — 145T	8.63	22.25	23.75	4.87	3.63	16.38	7.00	6.77	4.35	7.12	.09	3.62	8.83	1.0000 -.0005	.25x.12x3.50	1.938	2.56	4.81	55
	182T — 184T	9.13	23.25	24.75																
	213T — 215T	9.75	24.00	25.50																
	56	9.88	23.50	25.31																
	143T — 145T	9.88	23.50	25.31	5.62	3.94	17.62	7.00	7.85	4.90	7.12	.09	4.00	10.09	1.2500 -.0005	.25x.12x3.88	2.188	2.94	5.50	60
203	182T — 184T	10.35	24.50	26.31																
	213T — 215T	10.90	25.25	27.06																
	254T — 256T	11.06	26.25	28.06	9.00	5.69		9.00			9.00									70●
	143T — 145T	10.88	25.50	27.62																
	182T — 184T	11.38	26.50	28.62																
207	213T — 215T	12.00	27.25	29.31	9.25	5.00	18.88	9.00	9.09	5.72	9.00	.09	4.50	11.47	1.3750 -.0005	.31x.16x4.31	2.438	3.31	6.31	105
	254T — 256T	12.38	28.25	30.31																
	284T — 286T	12.62	29.00	31.06																
	143T — 145T	12.00	25.50	27.88																
	182T — 184T	12.50	26.50	28.88																
215	213T — 215T	13.12	27.25	29.62	8.12	4.13	18.88	9.00	9.93	6.07	9.00	.12	5.25	13.37	1.750 -.001	.38x.lgx5.12	2.938	3.94	6.81	115
	254T — 256T	13.50	28.25	30.62																
	284T — 286T	13.75	29.00	31.38																
	324T — 326T	14.62	30.00	32.38	10.00	6.00		10.25			10.25									130●
	182T — 184T	13.50	28.38	31.35																
	213T — 215T	14.00	29.12	32.08																
307	254T — 256T	14.38	30.12	33.06	8.75	5.62	20.75	10.25	11.80	7.20	10.25	.09	5.62	14.59	1.938 -.001	.50x.25x5.50	3.438	4.31	8.38	140
	284T — 286T	14.63	30.88	33.81																
	324T — 326T	15.50	31.88	34.81																
	182T — 184T	14.62	28.75	32.25																
	213T — 215T	15.25	29.50	33.00																
315	254T — 256T	15.62	30.50	34.00																
	284T — 286T	16.25	31.25	34.75	9.01	5.50	20.75	11.00	13.00	7.88	11.25	.12	6.50	16.37	2.188 -.001	.50x.25x6.38	3.938	5.00	9.19	160
	324T — 326T	16.88	32.25	35.75																
	364T — 365T	16.88	33.25	36.75																
	182T — 184T	15.88	28.75	32.62																
	213T — 215T	16.50	29.50	33.38																
407	254T — 256T	16.88	30.50	34.38	7.76	4.25	20.75	11.00	14.24	8.38	11.25	.12	7.00	18.12	2.438 -.001	.62x.3lx6.88	4.438	5.62	10.38	190
	284T — 286T	17.50	31.25	35.25																
	324T — 326T	18.12	32.25	36.25																
	364T — 365T	18.12	33.25	37.25																
	213T — 215T	17.25	29.50	34.00																
	254T — 256T	17.62	30.50	35.00																
415	284T — 286T	18.25	31.38	35.75	7.01	5.00	20.75	11.00	15.85	9.28	11.25	.12	7.50	19.37	2.438 -.001	.62x.3lx7.38	4.938	6.50	11.50	200
	324T — 326T	18.88	32.38	36.75																
	364T — 365T	18.88	33.38	37.75																

● SPECIAL MOTOR MOUNT MADE TO ORDER

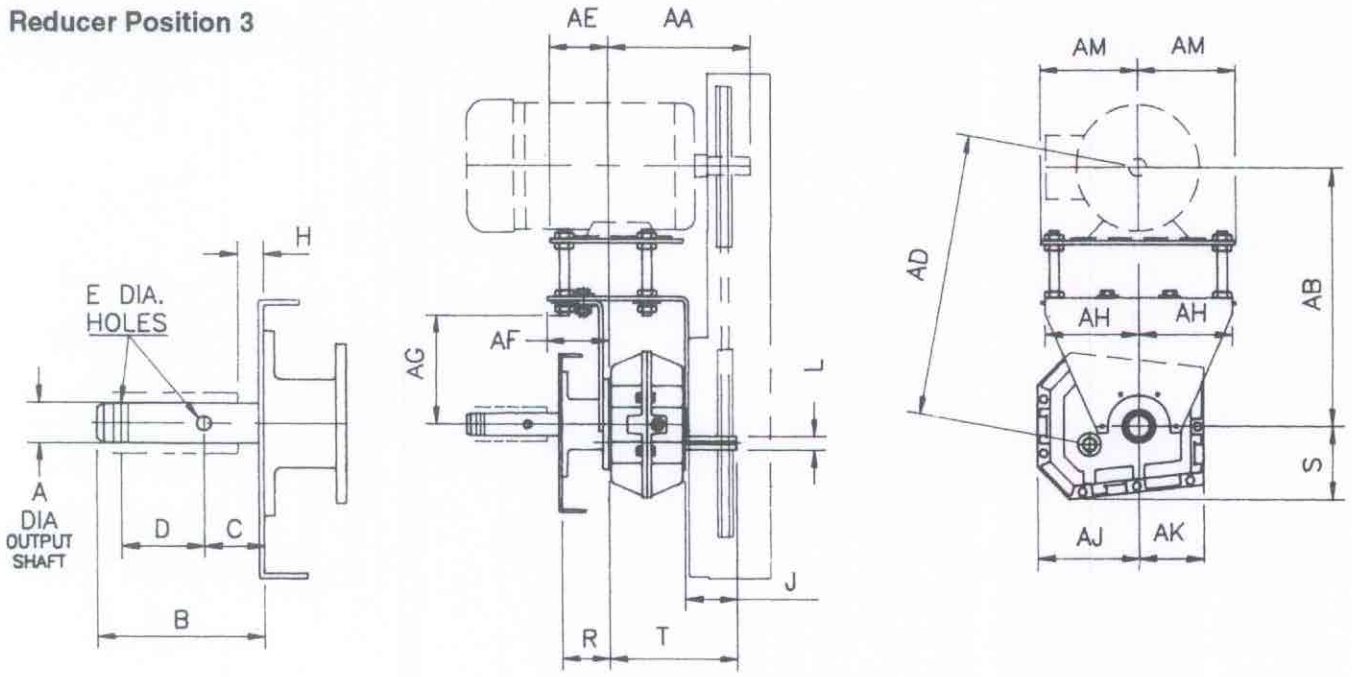


DRIVE SIZE	NEMA FRAME	BELT GUARD	AD		SHEAVE DIA		C	D	E	F MIN	H	J	K	AB	WEIGHT GUARD ONLY
			MIN	MAX	A MAX	B MAX									
	56		22.25	26.50											
	143T — 145T		22.25	26.50	10.00	12.00	13.25	4.12	6.50	5.75	5.12	1.25	5.38	42.25	42
107	182T — 184T	1012L	23.25	27.50											
	213T — 215T		24.00	28.25											
	56		23.75	28.00											
	143T — 145T	1012L	23.75	28.00	10.00	12.00	13.25	4.12	6.50	5.75	5.44	1.25	5.38	44.00	43
115	182T — 184T		24.75	29.00											
	213T — 215T		25.50	29.75											
	56		25.31	29.56											
	143T — 145T		25.31	29.56											
203	182T — 184T	1012L	26.31	30.56	10.00	12.00	13.25	4.12	6.50	5.75	6.31	1.25	5.38	46.88	44
	213T — 215T		27.06	31.31											
	254T — 256T		28.06	32.31											
	143T — 145T		27.62	31.88											
	182T — 184T		28.62	32.88											
207	213T — 215T	1214L	29.31	33.56	12.00	14.00	16.12	5.38	7.50	6.75	7.19	1.38	6.75	52.25	51
	254T — 256T		30.31	34.56											
	284T — 286T		31.06	35.31											
	143T — 145T		27.88	32.12											
	182T — 184T		28.88	33.12											
215	213T — 215T	1517L	29.62	33.88	12.00	14.00	18.31	5.38	7.50	6.75	8.38	1.38	6.75	53.88	58
	254T — 256T		30.62	34.88											
	284T — 286T		31.38	35.62											
	324T — 326T		32.38	36.62											
	182T — 184T		31.35	35.60											
	213T — 215T		32.08	36.33											
307	254T — 256T	1517L	33.06	37.31	12.00	14.00	18.31	5.38	7.50	6.75	9.25	1.38	6.75	56.50	61
	284T — 286T		33.81	38.06											
	324T — 326T		34.81	39.06											
	182T — 184T		32.25	36.50											
	213T — 215T		33.00	37.25											
315	254T — 256T	1517L	34.00	38.25	12.00	14.00	18.31	5.38	7.50	6.75	10.25	1.62	7.00	58.50	68
	284T — 286T		34.75	39.00											
	324T — 326T		35.75	40.00											
	364T — 365T		36.75	41.00											
	182T — 184T		32.62	36.88											
	213T — 215T		33.38	37.62											
407	254T — 256T	1820L	34.38	38.62	12.00	14.00	20.56	5.38	7.50	6.75	11.50	1.62	7.00	59.25	78
	284T — 286T		35.25	39.50											
	324T — 326T		36.25	40.50											
	364T — 365T		37.25	41.50											
	213T — 215T		34.00	38.25											
	254T — 256T		35.00	39.25											
415	284T — 286T	1820L	35.75	40.00	12.00	14.00	20.56	5.38	7.50	6.75	12.25	1.62	7.00	60.25	80
	324T — 326T		36.75	41.00											
	364T — 365T		37.75	42.00											

Screw Conveyor Drive

Standard Motor Bracket – Reducer Position 3

Reducer Position 3



Drive Size	AE	AF	AG	AH	AJ	AK	AM	J	Input Shaft		R	S	T
									L ♦	Keyseat			
107	3.71	3.94	6.88	6.00	6.47	4.15	6.25	3.31	.8750	.19x.09x3.19	3.00	4.69	8.12
115	4.87	3.63	9.75	7.00	6.77	4.35	7.12	3.62	1.0000	.25x.12x3.50	3.25	4.81	8.74
203	9.00	5.69	11.38	9.00	7.85	4.90	9.00	4.00	1.2500	.25x.12x3.88	3.38	5.50	10.00
207	9.25	5.00	13.75	9.00	9.09	5.72	9.00	4.50	1.3750	.31x.16x4.31	3.75	6.31	11.38
215	8.12	4.13	13.75	9.00	9.93	6.07	9.00	5.25	1.750	.38x.19x5.12	4.00	6.81	13.25
307	8.75	5.62	16.75	10.00	11.80	7.20	10.25	5.62	1.938	.50x.25x5.50	4.25	8.38	14.50
315	9.01	5.50	16.75	11.00	13.00	7.88	11.25	6.50	2.188	.50x.25x6.38	4.62	9.19	16.25
407	7.76	4.25	16.75	11.00	14.24	8.38	11.25	7.00	2.438	.62x.31x6.88	4.62	10.38	18.00

♦ Tolerance: 1.500 dia. or less = +.0000 -.0005; over 1.500 dia. = + .000 -.001
Dimensions are in inches.

Dimensions

Link-Belt® Drives

Screw Conveyor Drive

Standard Motor Bracket – Reducer Position 3

Drive Size	Screw Dia. ▽	Shaft Dia. A	B	C	D	E	H	NEMA Motor Frame	AA	AB [1]	AD [1]	Wt. [2]
	6 or 9	1-1/2	6.00	2.12	3.00	0.53	1.25	56	8.18	12.69	14.25	
107	9	2	6.00	2.12	3.00	0.66	1.25	143T-145T	8.56	12.69	14.25	75
	9	2-7/16	6.69	2.75	3.00	0.66	1.81	182T-184T	9.06	13.69	15.25	
	6 or 9	1-1/2	6.00	2.12	3.00	0.53	1.25	56	8.25	15.62	17.25	
115	9 or 12	2	6.00	2.12	3.00	0.66	1.25	143T-145T	8.63	15.62	17.25	91
	12 or 14	2-7/16	6.69	2.75	3.00	0.66	1.81	182T-184T	9.13	16.62	18.20	
	12 or 14	3	6.88	2.88	3.00	0.78	1.88	213T-215T	9.75	17.38	18.94	
	9	1-1/2	6.00	2.12	3.00	0.53	1.25	56	9.88	17.38	19.31	
	9 or 12	2	6.00	2.12	3.00	0.66	1.25	143T-145T	9.88	17.38	19.31	
203	12 or 14	2-7/16	6.69	2.75	3.00	0.66	1.81	182T-184T	10.35	18.38	20.31	121
	12 to 16	3	6.88	2.88	3.00	0.78	1.88	213T-215T	10.90	19.12	21.00	
								254T-256T	11.06	20.12	22.00	
								143T-145T	10.88	20.25	22.44	
	9	1-1/2	6.00	2.12	3.00	0.53	1.25	182T-184T	11.38	21.25	23.44	
207	9 or 12	2	6.00	2.12	3.00	0.66	1.25	213T-215T	12.00	22.00	24.15	189
	12 or 14	2-7/16	6.69	2.75	3.00	0.66	1.81	254T-256T	12.38	23.00	25.15	
	12 to 16	3	6.88	2.88	3.00	0.78	1.88	284T	12.62	23.75	25.88	
								143T-145T	12.00	20.25	22.75	
	9 or 12	2	6.00	2.12	3.00	0.66	1.25	182T-184T	12.50	21.25	23.75	
215	12 or 14	2-7/16	6.69	2.75	3.00	0.66	1.81	213T-215T	13.12	22.00	24.50	251
	12 to 20	3	6.88	2.88	3.00	0.78	1.88	254T-256T	13.50	23.00	25.50	
	18 or 20	3-7/16	9.12	3.88	4.00	0.91	2.38	284T-286T	13.75	23.75	26.18	
								182T-184T	13.50	24.31	27.38	
	12 or 14	2-7/16	6.69	2.75	3.00	0.66	1.81	213T-215T	14.00	25.06	28.12	
307	12 to 20	3	6.88	2.88	3.00	0.78	1.88	254T-256T	14.38	26.06	29.09	366
	18 to 24	3-7/16	9.12	3.88	4.00	0.91	2.38	284T-286T	14.63	26.81	29.81	
								324T-326T	15.50	27.81	30.81	
								182T-184T	14.62	24.44	28.00	
								213T-215T	15.25	25.19	28.75	
315	12 or 14	2-7/16	6.69	2.75	3.00	0.66	1.81	254T-256T	15.62	26.19	29.69	491
	12 to 20	3	6.88	2.88	3.00	0.78	1.88	284T-286T	16.25	26.94	30.44	
	18 to 24	3-7/16	9.12	3.88	4.00	0.91	2.38	324T-326T	16.88	27.94	31.38	
								364T-365T	16.88	28.94	32.38	
								182T-184T	15.88	24.44	28.44	
	12 or 14	2-7/16	6.69	2.75	3.00	0.66	1.81	213T-215T	16.50	25.19	29.16	
407	12 to 20	3	6.88	2.88	3.00	0.78	1.88	254T-256T	16.88	26.19	30.12	538
	18 to 24	3-7/16	9.12	3.88	4.00	0.91	2.38	284T-286T	17.50	26.94	30.85	
		⊗						324T-326T	18.12	27.94	31.81	
								364T-365T	18.12	28.94	32.81	

[1] Minimum dimension shown. Belt centers may be adjusted: +2.50" for 107 through 203, and +2.75" for 207 through 407.

[2] Weight is in pounds and includes unit, screw conveyor adapter and drive shaft.

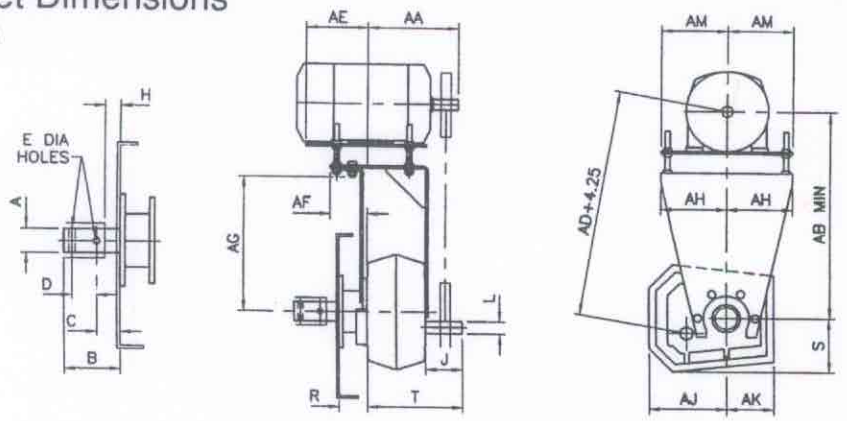
⊗ Larger shafts available.

Dimensions are in inches.

▽ For U-trough conveyors. Drives using Tall Brackets for flared troughs, see pages C-36 and C-37.

Dimensions

Screw Conveyor Drive
Tall Motor Bracket Dimensions
Reducer Position 3



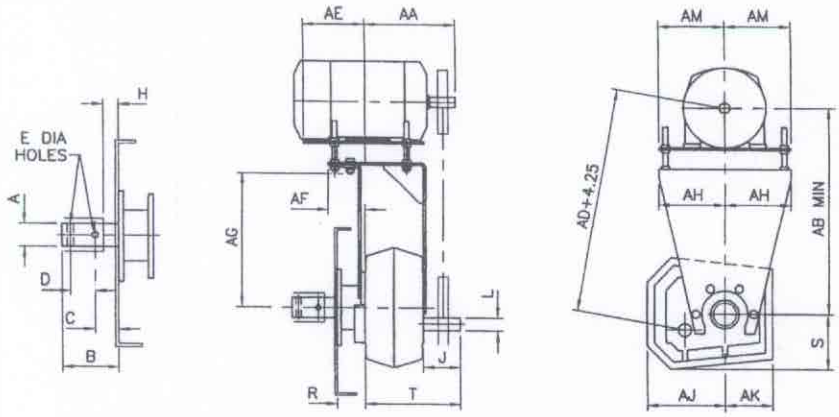
DRIVE SIZE	SCREW DIA▼	SFT A DIA	B	C	D	E	H	J	Input Shaft		R	S	T
									L	Keyseat			
107	6 — 9	1.50	6.00	2.12	3.00	.53	1.25	3.31	.8750 -.0005	.19 x .09x3.19	3.00	4.69	8.12
	9 — 12	2.00	6.00	2.12	3.00	.66	1.25						
	12 — 14	2.44	6.69	2.75	3.00	.66	1.81						
	12 — 20	3.00	6.88	2.88	3.00	.78	1.88						
115	6 — 9	1.50	6.00	2.12	3.00	.53	1.25	3.62	1.0000 -.0005	.25 x .12x3.50	3.25	4.81	8.74
	9 — 12	2.00	6.00	2.12	3.00	.66	1.25						
	12 — 14	2.44	6.69	2.75	3.00	.66	1.81						
	12 — 20	3.00	6.88	2.88	3.00	.78	1.88						
203	9	1.50	6.00	2.12	3.00	.53	1.25	4.00	1.2500 -.0005	.25 x .12x3.88	3.38	5.50	10.00
	9 — 12	2.00	6.00	2.12	3.00	.66	1.25						
	12 — 14	2.44	6.69	2.75	3.00	.66	1.81						
	12 — 20	3.00	6.88	2.88	3.00	.78	1.88						
207	9	1.50	6.00	2.12	3.00	.53	1.25	4.50	1.3750 -.0005	.31 x .16x4.31	3.75	6.31	11.38
	9 — 12	2.00	6.00	2.12	3.00	.66	1.25						
	12 — 14	2.44	6.69	2.75	3.00	.66	1.81						
	12 — 20	3.00	6.88	2.88	3.00	.78	1.88						
	18 — 24	3.44	9.12	3.88	4.00	.91	2.38						

DRIVE SIZE	NEMA FRAME	AA	AB	AD	AE	AF	AG	AH	AJ	AK	AM	WEIGHT ✻
107	56	8.18	20.81	22.25	3.71	3.94	14.88	6.00	6.47	4.15	6.25	75
	143T — 145T	8.56	20.81	22.25								
	182T — 184T	9.06	21.81	23.25								
●	213T — 215T	9.06	22.56	24.00	5.00	4.94		7.00			7.12	
115	56	8.25	22.25	23.75	4.87	3.63	16.38	7.00	6.77	4.35	7.12	91
	143T — 145T	8.63	22.25	23.75								
	182T — 184T	9.13	23.25	24.75								
	213T — 215T	9.75	24.00	25.50								
203	56	9.88	23.50	25.31	5.62	3.94	17.62	7.12	7.85	4.90	7.12	121
	143T — 145T	9.88	23.50	25.31								
	182T — 184T	10.35	24.50	26.31								
	213T — 215T	10.90	25.25	27.06								
●	254T — 256T	11.06	26.25	28.06	9.00	5.69		9.00			9.00	
207	143T — 145T	10.88	25.50	27.62	9.25	5.00	18.88	9.00	9.09	5.72	9.00	189
	182T — 184T	11.38	26.50	28.62								
	213T — 215T	12.00	27.25	29.31								
	254T — 256T	12.38	28.25	30.31								
	284T — 286T	12.62	29.00	31.06								

● SPECIAL MOTOR MOUNT MADE TO ORDER.
✻ WEIGHT INCLUDES UNIT, SCREW CONVEYOR ADAPTER & DRIVE SHAFT.
▼ FOR U TROUGH CONVEYOR. DRIVES FOR FLARED TROUGH AVAILABLE.

Dimensions

Screw Conveyor Drive
Tall Motor Bracket Dimensions
Reducer Position 3

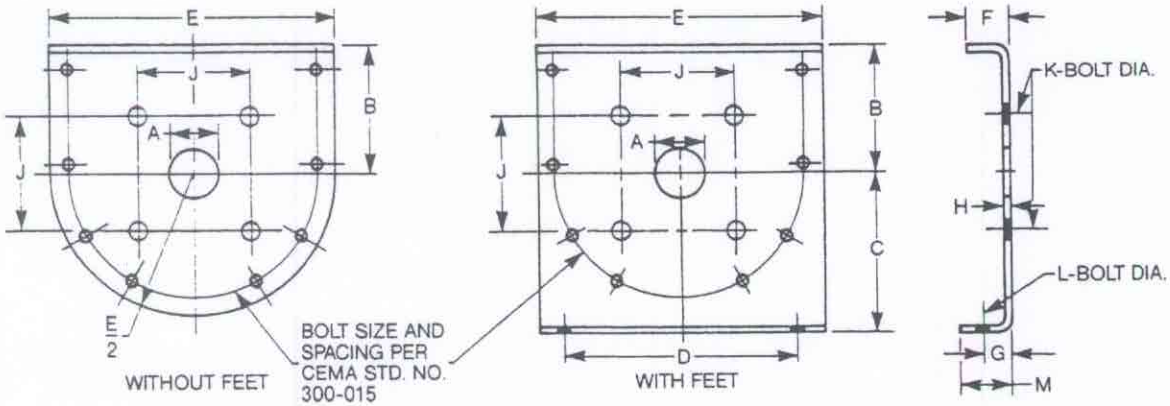


DRIVE SIZE	SCREW DIA ▼	SFT A DIA	B	C	D	E	H	H	Input Shaft L	Input Shaft Keyseat	R	S	T
215	9 - 12	2.00	6.00	2.12	3.00	.66	1.25	5.25	1.750 -.001	.38 x .19 x 5.12	4.00	6.81	13.25
	12 - 14	2.44	6.69	2.75	3.00	.66	1.81						
	12 - 20	3.00	6.88	2.88	3.00	.78	1.88						
	18 - 24	3.44	9.12	3.88	4.00	.91	2.38						
307	12 - 14	2.44	6.69	2.75	3.00	.66	1.81	5.62	1.938 -.001	.50 x .25 x 5.50	4.25	8.38	14.50
	12 - 20	3.00	6.88	2.88	3.00	.78	1.88						
	18 - 24	3.44	9.12	3.88	4.00	.91	2.38						
315	12 - 14	2.44	6.69	2.75	3.00	.66	1.81	6.50	2.188 -.001	.50 x .25 x 6.38	4.62	9.19	16.25
	12 - 20	3.00	6.88	2.88	3.00	.78	1.88						
	18 - 24	3.44	9.12	3.88	4.00	.91	2.38						
407	12 - 14	2.44	6.69	2.75	3.00	.66	1.81	7.00	2.438 - .001	.62 x .31 x 6.88	4.62	10.38	18.00
⊗	12 - 20	3.00	6.88	2.88	3.00	.78	1.88						
	18 - 24	3.44	9.12	3.88	4.00	.91	2.38						

DRIVE SIZE	NEMA FRAME	AA	AB	AD	AE	AF	AG	AH	AJ	AK	AM	WEIGHT ❊
215	143T — 145T	12.00	25.50	27.88	8.12	4.13	18.88	9.00	9.93	6.07	9.00	251
	182T — 184T	12.50	26.50	28.88								
	213T — 215T	13.12	27.25	29.62								
	254T — 256T	13.50	28.25	30.62								
	284T — 286T	13.75	29.00	31.38								
●	324T — 326T	11.06	30.00	32.38	10.00	6.00		10.25			10.25	
307	182T — 184T	13.50	28.38	31.35	8.75	5.62	20.75	10.25	11.80	7.20	10.25	366
	213T — 215T	14.00	29.12	32.08								
	254T — 256T	14.38	30.12	33.06								
	284T — 286T	14.63	30.88	33.81								
	324T — 326T	15.50	31.88	34.81								
315	182T — 184T	14.62	28.75	32.25	9.01	5.50	20.75	11.00	13.00	7.88	11.25	491
	213T — 215T	15.25	29.50	33.00								
	254T — 256T	15.62	30.50	34.00								
	284T — 286T	16.25	31.25	34.75								
	324T — 326T	16.88	32.25	35.75								
	364T — 365T	16.88	33.25	36.75								
407	182T — 184T	15.88	28.75	32.62	7.76	4.25	20.75	11.00	14.24	8.38	11.25	538
	213T — 215T	16.50	29.50	33.38								
	254T — 256T	16.88	30.50	34.38								
	284T — 286T	17.50	31.25	35.25								
	324T — 326T	18.12	32.25	36.25								
	364T — 365T	18.12	33.25	37.25								

● SPECIAL MOTOR MOUNT MADE TO ORDER.
❊ WEIGHT INCLUDES UNIT, SCREW CONVEYOR ADAPTER & DRIVE SHAFT.
▼ FOR U TROUGH CONVEYOR. DRIVES FOR FLARED TROUGH AVAILABLE.
⊗ LARGER SHAFTS AVAILABLE.

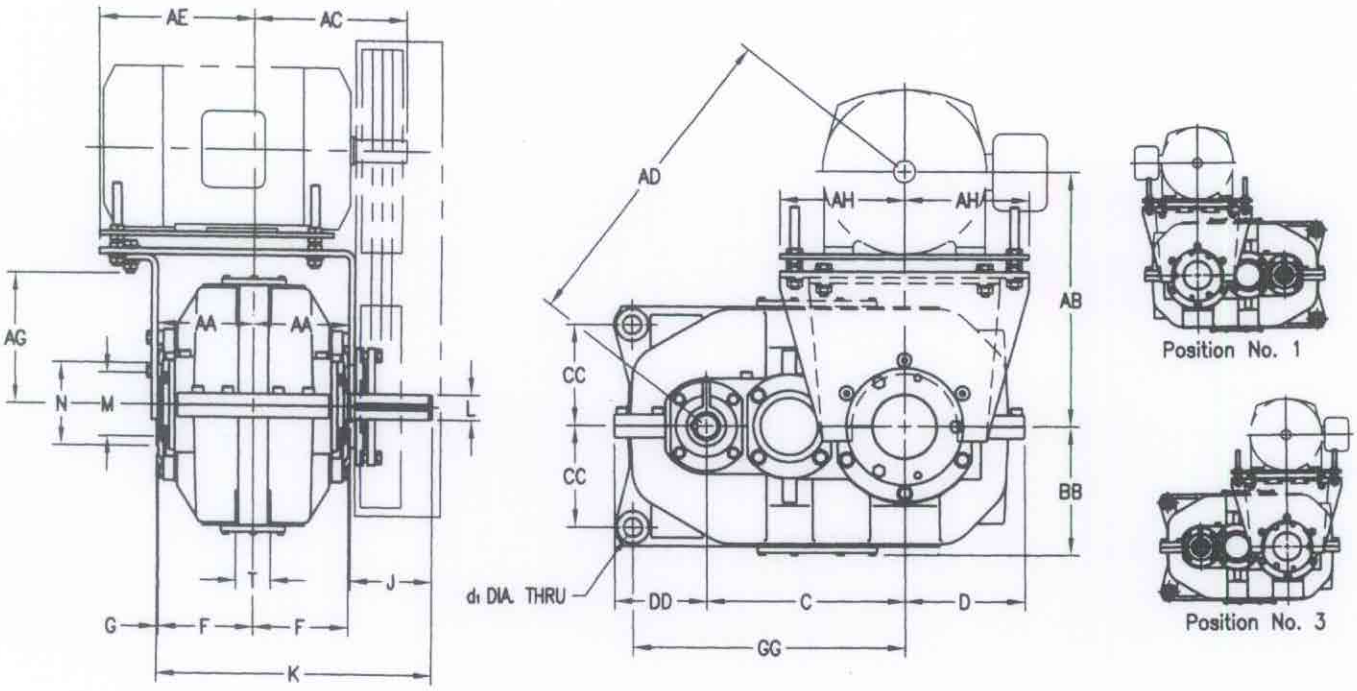
Trough End Plates* Dimensions



Drive Size	Screw Dia	Shaft Dia.	A Min.	B	C	D	E Min.	F Min.	G	H	J	K	L	M
107 or 115	6	1-1/2	1.62	4.50	5.62	8.12	9.75	1.50	1.00	.19	4.00	.50	.38	1.75
107 to 215	9	1-1/2 2	1.62 2.12	6.12	7.88	9.38	13.50	1.62	1.50	.25	4.00 5.12	.50 .62	.50	2.62
115 to 407	12	2 2-7/16 3	2.12 2.56 3.12	7.75	9.62	12.25	17.25	2.00	1.62	.25	5.12 5.62 6.00	.62 .62 .75	.62	2.75
115 to 407	14	2-7/16 3	2.56 3.12	9.25	10.88	13.50	19.25	2.00	1.62	.31	5.62 6.00	.62 .75	.62	2.88
203 to 407	16	3	3.12	10.62	12.00	14.88	21.25	2.50	2.00	.31	6.00	.75	.62	3.25
207 to 407	18	3 3-7/16	3.12 3.56	12.12	13.38	16.00	24.25	2.50	2.00	.38	6.00 6.75	.75	.62	3.25
207 to 407	20	3 3-7/16	3.12 3.56	13.50	15.00	19.25	26.25	2.50	2.25	.38	6.00 6.75	.75	.75	3.75
407	24	3-7/16	3.56	16.50	18.12	20.00	30.25	2.50	2.50	.38	6.75	.75	.75	4.12

*Trough endplates shown are for U-Trough style only. Trough endplates to be supplied by others.

Motor Bracket - Unit Position 1 and 3
Sizes 507F and 608F



SIZE	MTR FRAME	WT	AA	AB	AC	AD△	AE	AG	AH	BB	C	CC	D
507	213T-215T	140*	8.23	20.00	14.50	26.20	13.21	11.00	10.62	10.62	16.93	8.66	10.24
	254T-256T			21.00	14.88	26.97							
	284T-286T			21.75	15.50	27.56							
	324T-326T			22.75	15.73	28.36							
	364T-365T			23.75	16.03	29.17							
	404T-405T	270*		27.88	15.81	32.62	18.00	13.14	14.75				
	444T-445T			28.88	16.81	33.62							
608	284T-286T	163*	8.94	22.75	17.02	29.78	13.92	12.00	11.75	11.75	19.21	9.64	1.42
	324T-326T			23.75	17.65	30.55							
	364T-365T			24.75	18.28	31.33							
	404T-405T			25.75	18.28	32.13							
	444T-445T	290*		29.88	17.00	35.50	18.38	14.14	14.75				

SIZE	DD	d1+.006	F	G	GG	J	K	L -.001	KEYSEAT	M +.002	N	T
507	7.87	1.575	8.11	.12	23.23	7.06	23.56	2.125	.50x.25x6.75	5.438	7.09	2.95
608	8.37	1.772	8.84	.19	25.79	8.73	26.82	2.313	.62x.31x8.56	6.500	7.75	3.15

△ BELT CENTERS MAY BE ADJUSTED +2.50 THRU MOTOR FRAME 365T
BELT CENTERS MAY BE ADJUSTED +4.75 FOR MOTOR FRAMES 400T & 440T

* WEIGHT IS FOR MOTOR BRACKET ASSEMBLY ONLY

Link-Belt® Model HF Hydraulically Driven Shaft Mounted Reducers

Take all the outstanding features of the Model F Shaft Mounted Reducers and screw conveyor drives, add hydraulic input adaptability and you now have Model HFX and HFC.

Hydraulically adaptable drives are available from size 207 thru 315 only. Other sizes on application. These units are designed to accommodate standard SAE spline and flanged adapters as shown on pages C-41 and C-42.

Hydraulic motors and auxiliary control equipment are supplied by others. In many cases hydraulic motors can be transferred from existing installations and mounted to the model HF Reducers - see interchange table below.

Hydraulically driven reducers can satisfy applications where V-belt drives, chain drives are impractical and electric motors are not available. By varying fluid pressure and volume to hydraulic motors, a high degree of control flexibility can be obtained. Both speed and torque can be adjusted to meet application requirements. Reducers are reversible when integral backstops are not used.

Use general selection instructions shown on pages C-7 and C-8 where applicable, along with the AGMA shaft mounted service class table shown on page C-9. Use selection tables on pages C-10 thru C-15 for basic drive selection.

Important: Use the designation HFX or HFC instead of FX or FC when ordering the Link-Belt Hydraulic Drives.

INTERCHANGE TABLE — HYDRAULIC MOTORS:

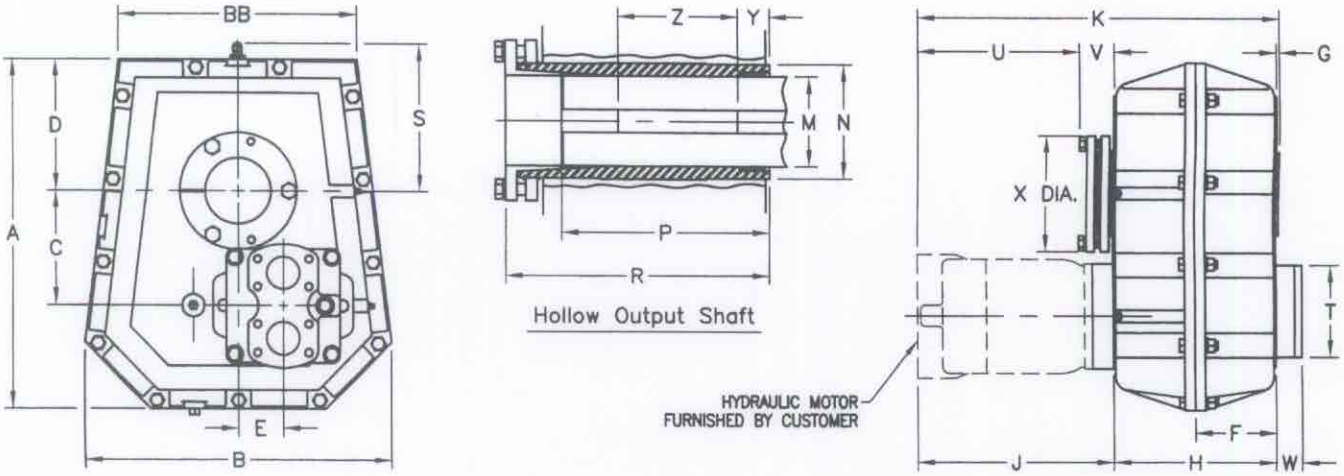
DENISON MODEL	DODGE HYDROIL™ MOTOR
M4C-043 M4C-075	B-30
M4D-138 ■	B-40
M4E-214 ■	B-50

Splined shaft per SAE J498b Class I, 30° Pressure angle flat root side fit.
Standard design is for four hole mounting flange.
■ Two hole mounting could be provided on special request.

Dimensions

Link-Belt® Drives

Model HF(X) Shaft Mounted Reducers for use with Hydraulic Motors



DRIVE SIZE	Exact Ratio	Hydraulic Motor ● MOTOR SIZE	SHAFT SPLINE ⌖	HOLE DIAMETER	BOLT CIRCLE	PILOT DIAMETER	Weight In Pounds	A	B	BB	C	D	E	F	G
								DIMENSIONS IN INCHES							
207	25.775	M4C–043	13 TEETH 16/32 D.P. SAE B	.56	5.750 2 HOLES	4.000	182	14.81	12.62	10.38	4.71	5.72	1.69	3.44	.09
	15.485	M4C–075													
	5.077	M4D–138■	14 TEETH 12/24 D.P. SAE C		6.375 4 HOLES	5.000	215								
215	24.338	M4C–075	13 TEETH 16/32 D.P. SAE B		5.750 2 HOLES	4.000	224	16.00	13.62	11.25	5.30	6.07	1.88	4.00	.12
	15.074	M4D–138■	14 TEETH 12/24 D.P. SAE C		6.375 4 HOLES	5.000	265								
	4.933	M4E–214■					295								
307	24.994	M4D–138■					360	19.00	16.75	13.50	6.05	7.20	2.38	4.44	.09
	14.964														
315	25.747	M4D–138■					450	21.25	18.76	14.58	6.87	8.07	2.69	4.88	.12
	14.949	M4E–214■					489								

DRIVE SIZE	Hydraulic Motor	H	J	K	M◇	N	P△	R	S	T	U	V	W	X	Driven Shaft Keyseat	Z*
		DIMENSIONS IN INCHES														
207	M4C–043	6.88	8.19	15.16	2.438	3.31	6.90	8.32	6.75	4.25	6.51	1.68	1.25	5.00	.62x.31	4.88
	M4C–075															
	M4D–138		11.00	17.97							9.32					
215	M4C–075	8.00	8.12	16.25	2.938	3.94	7.91	9.46	7.09	4.25	6.44	1.68	1.25	6.00	.75x.38	5.81
	M4D–138		11.00	19.12							9.32					
	M4E–214		13.68	21.81							12.00					
307	M4D–138	8.88	9.06	18.03	3.438	4.31	8.69	10.31	8.25	5.50	7.38	1.68	1.56	6.00	.88x.44	6.50
315	M4D–138	9.75	9.06	18.93	3.938	5.00	9.68	11.50	9.10	5.88	7.00	2.06	1.61	7.00	1.00x.50	7.19
	M4E–214		11.75	21.62							9.69					

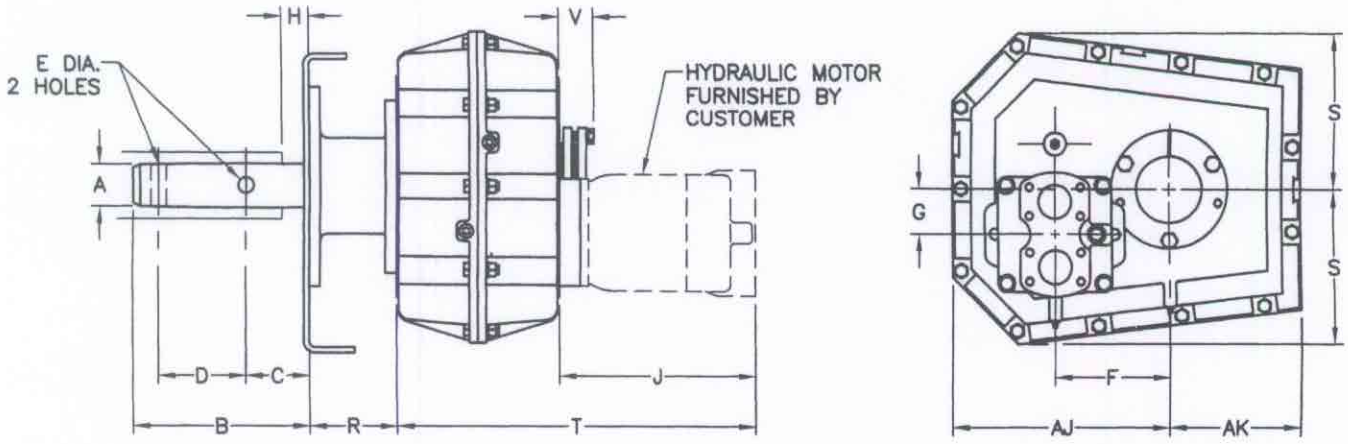
◇ WEIGHT OF DRIVE INCLUDING HYDRAULIC MOTOR ADAPTER, AND HYDRAULIC MOTOR.
◇ MAXIMUM BORE SEE BUSHING TABLE
* LENGTH OF KEY FURNISHED WITH REDUCER
△ MINIMUM RECOMMENDED LENGTH OF DRIVEN SHAFT
⌖ SPLINED SHAFT PER SAE J498b CLASS I
30° PRESSURE ANGLE FLAT ROOT SIDE FIT

● DENISON HYDRAULIC MOTOR MODEL NUMBERS, AND DIMENSIONS SHOWN. SEE INTERCHANGE LIST WITH DODGE HYDROIL MOTORS.
■ FOUR (4) HOLE MOUNTING IS STANDARD, TWO (2) HOLE MOUNTING CAN BE FURNISHED ON REQUEST.

Dimensions

Link-Belt® Drives

Model HF(C) Screw Conveyor Drives for use with Hydraulic Motors



DRIVE SIZE	Exact Ratio	Hydraulic Motor ● MOTOR SIZE	SHAFT SPLINE ⊕	HOLE DIAMETER	BOLT CIRCLE	PILOT DIAMETER	SCREW DIAMETER ▼	A SHAFT DIAMETER	B	C	D	E
									DIMENSIONS IN INCHES			
207	25.775	M4C-043	13 TEETH 16/32 D.P. SAE B	.56	5.750 2 HOLES	4.000	9	1.50	6.00	2.12	3.00	0.53
	15.485	M4C-075					9-12	2.00	6.00	2.12	3.00	0.66
	5.077	M4D-138■	14 TEETH 12/24 D.P. SAE C		6.375 4 HOLES	5.000	12-14	2.44	6.69	2.75	3.00	0.66
							12-16	3.00	6.88	2.88	3.00	0.78
215	24.338	M4C-075	13 TEETH 16/32 D.P. SAE B		5.750 2 HOLES	4.000	9-12	2.00	6.00	2.12	3.00	0.66
							12-14	2.44	6.69	2.75	3.00	0.66
	15.074	M4D-138■	14 TEETH 12/24 D.P. SAE C		6.375 4 HOLES	5.000	12-20	3.00	6.88	2.88	3.00	0.78
	4.933	M4E-214■					18-20	3.44	9.12	3.88	4.00	0.91
307	24.994	M4D-138■					12-14	2.44	6.69	2.75	3.00	0.66
	14.964						12-20	3.00	6.88	2.88	3.00	0.78
							18-24	3.44	9.12	3.88	4.00	0.91
315	25.747	M4D-138■					12-14	2.44	6.69	2.75	3.00	0.66
	14.949	M4E-214■					12-20	3.00	6.88	2.88	3.00	0.78
							18-24	3.44	9.12	3.88	4.00	0.91

DRIVE SIZE	Hydraulic Motor	F	G	H	J	R	S	T	V	AJ	AK	Weight ✳
		DIMENSIONS IN INCHES										
207	M4C-043	4.71	1.69	1.25	8.19	3.75	6.31	15.07	1.68	9.09	5.72	228
	M4C-075			1.25								
	M4D-138			1.81 1.88	11.00			17.88				269
215	M4C-075	5.30	1.88	1.25	8.12	4.00	6.81	16.12	1.68	9.93	6.07	290
	M4D-138			1.81 1.88	11.00			19.00				331
	M4E-214			2.38	13.68			21.68				371
307	M4D-138	6.05	2.38	1.81 1.88 2.38	9.06	4.25	8.38	17.94	1.68	11.80	7.20	436
315	M4D-138	6.87	2.69	1.81 1.88	9.06	4.62	9.19	18.81	2.06	13.00	7.88	561
	M4E-214			2.38	11.75			21.50				600

✳ Weight is in pounds and includes unit, screw conveyor adapter, drive shaft, hydraulic motor and hydraulic motor adapter.

⊕ Splined shaft per SAE J498b Class I 30° PRESSURE ANGLE FLAT ROOT SIDE FIT

■ FOUR (4) hole mounting is standard TWO (2) hole mounting can be furnished on request

● DENISON HYDRAULIC MOTOR MODEL NUMBERS, AND DIMENSIONS SHOWN. SEE INTERCHANGE LIST WITH DODGE HYDROIL MOTORS.

Unit Size and Ratio: Reducer Only	Tie Rod	Warehouse Stock Bushings* Nomenclature	Backstop	Motor Bracket** Assembly	NEMA Motor Frame Range	*Optional* Belt Guard
107F05 107F15 107F25	107FXTR	107X1-7/16TB 107X1TB 107X1-1/8TB 107X1-3/16TB 107X1-1/4TB	107FXBS	107FXMB	56 thru 184T	107BGV
				107FXTMB	56 thru 215T	107LBGV
115F05 115F15 115F25	115FXTR	115X1-15/16TB 115X1-1/4TB 115X1-7/16TB 115X1-1/2TB 115X1-1/16TB	115FXBS	115FXMB	56 thru 215T	115BGV
				115FXTMB	56 thru 215T	115LBGV
203F05 203F15 203F25	203FXTR	203X2-3/16TB 203X1-7/16TB 203X1-1/2TB 203X1-11/16TB 203X1-15/16TB 203X2TB	203FXBS	203FXMB	56 thru 256T	203BGV
				203FXTMB	56 thru 256T	203LBGV
207F05 207F15 207F25	207FXTR	207X2-7/16TB 207X1-1/2TB 207X1-11/16TB 207X1-15/16TB 207X2TB 207X2-3/16TB	207/215FXBS	207FXMB	143T thru 284T	207BGV
				207FXTMB	143T thru 286T	207LBGV
215F05 215F15 215F25	215FXTR	215X2-15/16TB 215X1-15/16TB 215X2TB 215X2-3/16TB 215X2-7/16TB 215X2-1/2TB	207/215FXBS	215FXMB	143T thru 286T	215BGV
				215FXTMB	143T thru 326T	215LBGV
307F05 307F15 307F25	307FXTR	307X3-7/16TB 307X2-3/16TB 307X2-7/16TB 307X2-15/16TB 307X3TB	307FXBS	307FXMB	182T thru 326T	307BGV
				307FXTMB	182T thru 365T	307LBGV
315F05 315F15 315F25	315FXTR	315X3-15/16TB 315X2-7/16TB 315X2-15/16TB 315X3TB 315X3-7/16TB	315FXBS	315FXMB	182T thru 365T	315BGV
				315FXTMB	182T thru 365T	315LBGV
407F15 407F25	407FXTR	407X4-7/16TB 407X2-15/16TB 407X3-7/16TB 407X3-15/16TB 407X4-3/16TB	407/415FXBS	407FXMB	182T thru 365T	407BGV
				407FXTMB	213T thru 365T	407LBGV
415F15 415F25	415FXTR	415X4-15/16TB 415X3-7/16TB 415X3-15/16TB 415X4-7/16TB	407/415FXBS	415FXMB	213T thru 365T	415BGV
				415FXTMB	213T thru 365T	415LBGV
507F15 507F24	507TR	507X5-7/16TB 507X4-15/16TB 507X4-7/16TB 507X3-15/16TB	507BS	507MB210/250 507MB280/360	213 thru 256T 284T thru 365T	2025BGV
				507MBH	404T thru 445T	507LBGV
608F15 608F24	608TR	608X6-1/2TB 608X5-15/16TB 608X5-7/16TB	608BS	608MB	284T thru 405T	2025BGV
				608MBH	444T thru 445T	608LBGV

*Bushings shown are in warehouse stock (except for size 608, which is factory stock only), additional bores are available from the factory.

**Motor Bracket Assemblies for size 507 Consist of two pieces, a bracket and separate motor plate. The bracket and plates are stocked separately at the warehouse and are packaged together on the order. When entering an order for these brackets, please be sure to use the complete nomenclature as shown in bold print.

Shaft Mounted Screw Conveyor Drives

Unit Size and Ratio: Reducer Only	Conveyor Size (Screw Dia.)	Adapter Assembly	Drive Shaft Diameter	Drive Shaft Assembly	Standard Motor Bracket Assembly	Tall Motor Bracket Assembly	NEMA Motor Frame Range	*Optional* Belt Guard
107F05	6"- 9"	FC107AA	1-1/2"	FC107x1-1/2	107FXMB (6" to 9" Screw)	107FXTMB (12" to 20" Screw)	56 thru 184T (213T/215T-M.T.O.)	107BGV or 107LBGV
107F15	9" - 12"	FC107AB	2"	FC107x2				
107F25	12"- 14"		2-7/16"	FC107x2-7/16				
115F05	6"- 9"	FC115AA	1-1/2"	FC115x1-1/2	115FXMB (6" to 14" Screw)	115FXTMB (16" to 20" Screw)	56 thru 215T	115BGV or 115LBGV
115F15	9" - 12"	FC115AB	2"	FC115x2				
115F25	12"- 14"		2-7/16"	FC115x2-7/16				
	12"- 20"		3"	FC115x3				
203F05	9"	FC203A	1-1/2"	FC203x1-1/2	203FXMB (6" to 16" Screw)	203FXTMB (18"to 20" Screw)	56 thru 215T (254T/256T M.T.O.)	203BGV or 203LBGV
203F15	9"- 12"		2"	FC203x2				
203F25	12"- 14"		2-7/16"	FC203x2-7/16				
	12"- 20"		3"	FC203x3				
207F05	9"	FC207A	1-1/2"	FC207x1-1/2	207FXMB (9" to 18" Screw)	207FXTMB (20"to 24" Screw)	143T thru 286T	207BGV or 207LBGV
207F15	9"- 12"		2"	FC207x2				
207F25	12"- 14"		2-7/16"	FC207x2-7/16				
	12"- 20"		3"	FC207x3				
215F05	9"- 12"	FC215A	2"	FC215x2	215FXMB (9" to 18" Screw)	215FXTMB (20"to 24" Screw)	143T thru 286T 286T (324T/326T M.T.O.)	215BGV or 215LBGV
215F15	12"- 14"		2-7/16"	FC215x2-7/16				
215F25	12"- 20"		3"	FC215x3				
	18"- 24"		3-7/16"	FC215x3-7/16				
307F05	12"- 14"	FC307A	2-7/16"	FC307x2-7/16	307FXMB (9" to 20" Screw)	307FXTMB (24" Screw)	182T thru 326T	307BGV or 307LBGV
307F15	12"- 20"		3"	FC307x3				
307F25	18"- 24"		3-7/16"	FC307x3-7/16				
315F05	12"- 14"	FC315A	2-7/16"	FC315x2-7/16	315FXMB (12" to 20" Screw)	315FXTMB (24" Screw)	182T thru 365T	315BGV or 315LBGV
315F15	12"- 20"		3"	FC315x3				
315F25	18"- 24"		3-7/16"	FC315x3-7/16				
407F15	12"- 14"	FC407A	2-7/16"	FC407x2-7/16	407FXMB 12" to 20" Screw	407FXTMB (24" Screw)	182T thru 365T	407BGV or 407LBGV
407F25	12"- 20"		3"	FC407x4				
	18"- 24"		3-7/16"	FC407x3-7/16				

C-Face and hydraulic inputs are available for Model F Shaft Mounted Reducers, consult Rexnord Geared Products Division.

USE NUMBER IN BOLD PRINT FOR ORDER ENTRY

To enter an order for a complete screw conveyor drive use the following unit nomenclature:

315	**FC**	**25**	**X**	**2-7/16**
Drive Size	Model	Nominal Ratio		Drive Shaft Diameter

To enter an order for a complete shaft mounted reducer with tie-rod, use the following unit nomenclature:

107	**FX**	**05**	**TB**	**1-1/4**
Drive Size	Model	Nominal Ratio	Tapered Bushing	Bushing Diameter

Table of Contents

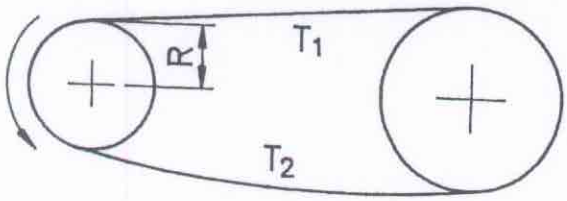
General Engineering Information

POWER TRANSMISSION FORMULAS

TO FIND	GIVEN	FORMULA	
1. BASIC GEOMETRY			
Circumference of a circle	Diameter	Circumference =	3.1416 x diameter
Diameter of a Circle	Circumference	Dia. =	Circumference / 3.1416
2. MOTION			
Ratio	High Speed and Low Speed RPM	Ratio =	$\frac{\text{RPM high}}{\text{RPM low}}$
RPM	Feet per Minute of Belt and Pulley Diameter	RPM =	$\frac{\text{FPM}}{.262 \times \text{diameter in inches}}$
Belt Speed Feet Per Minute	RPM and Pulley Diameter	FPM =	.262 x RPM x diameter in inches
Ratio	Teeth of Pinion and Teeth of Gear	Ratio =	$\frac{\text{Teeth of Gear}}{\text{Teeth of Pinion}}$
Ratio	Two Sprockets or Pulley Diameters	Ratio =	$\frac{\text{Diameter driven}}{\text{Diameter driver}}$
3. FORCE - WORK - TORQUE			
Force (F)	Torque and Diameter	F =	$\frac{\text{Torque x 2}}{\text{Diameter}}$
Torque (T)	Force and Diameter	T =	[F x Diameter] / 2
Diameter (Dia.)	Torque and Force	Dia. =	[2 x T] / F
Work	Force and Distance	Work =	Force x Distance
Chain Pull	Torque and Diameter	Pull =	[T x 2] / Diameter
4. POWER			
Chain Pull	Horsepower and Speed (FPM)	Pull =	[33000 x HP] / Speed
Horsepower	Force and Speed (FPM)	HP =	[Force x Speed] / 33000
Horsepower	RPM and Torque (#in.)	HP =	[Torque x RPM] / 63025
Horsepower	RPM and Torque (#ft.)	HP =	[Torque x RPM] / 5250
Torque	HP and RPM	T #in.=	[63025 x HP] / RPM
Torque	HP and RPM	T #ft.=	[5250 x HP] / RPM
5. INERTIA			
Accelerating Torque (#ft.)	WK^2, RPM, time	T =	$\frac{WK^2 \times RPM}{308 \times time}$
Accelerating Time (Sec)	Torque, WK^2, RPM	t =	$\frac{WK^2 \times RPM}{308 \times Torque}$
WK^2 at motor	WK^2 at load, ratio	WK^2 motor =	$\frac{WK^2}{Ratio^2}$
6. GEARING			
Gearset Centers	Pd Gear and Pd Pinion	Centers =	$[Pd_G + Pd_P] / 2$
Pitch Diameter	Number of Teeth and Diametral Pitch	Pd =	Teeth / DP
Pitch Diameter	Number of Teeth and Module	Pd =	$\frac{\text{Teeth x Module}}{25.4}$
Diametral Pitch	Pd and Number of Teeth	DP =	Teeth / Pd
Module	Pd and Number of Teeth	Module =	$\frac{\text{Pd x 25.4}}{\text{Teeth}}$
Circular Pitch	Pd and Number of Teeth	CP =	$\frac{\text{3.1416 x Pd}}{\text{Teeth}}$
Circular Pitch	Diametral Pitch	CP =	3.1416 / DP
Number of Teeth	Pd and DP	Teeth =	Pd x DP
Number of Teeth	Pd and Module	Teeth =	[Pd x 25.4] / Module
Tooth Depth	Diametral Pitch	TD =	2.35 / DP
Tooth Depth	Module	TD =	[2.35 x Module] / 25.4

General Engineering Information

POWER TRANSMISSION FORMULAS

TO FIND	GIVEN	FORMULA	
7. BELTING			
			
Effective Tension	T_1 and T_2	Te =	$T_1 - T_2$
Effective Tension	HP, RPM, Pulley Radius	Te =	$\frac{63025 \times HP}{RPM \times R}$
Effective Tension	Torque, Pulley Radius	Te =	Torque / R
Effective Tension	Horsepower, Belt Velocity (FPM)	Te =	[HP x 33000] / FPM
Total Load	T_1 and T_2	TL =	$T_1 + T_2$
8. OVERHUNG LOAD			
Overhung Load	Torque, diameter	OHL =	[T x 2] / Diameter
Overhung Load ($T_1 + T_2$)	Effective Tension, Belt Factor f = 1.5 V-Belts f = 2.5 Flat Belts	OHL =	$T_t \times f$
Overhung Load	Horsepower, Speed (RPM), Diameter, factor f = 1.0 chain f = 1.25 gear drives f = 1.50 V-belts f = 2.50 flat belt	OHL =	$\frac{126000 \times f \times HP}{Diameter \times RPM}$
Overhung Load	Weight	OHL =	Weight
9. ELECTRICITY			
Motor Speed (RPM)	Number of poles	RPM =	$\frac{120 \times HZ}{No.\ of\ Poles}$
Horsepower Single Phase Or Direct Current Motor	Volts, Amps, Power factor, efficiency	HP =	$\frac{Volts \times Amps \times Pf \times Eff.}{746}$
Horsepower 3 Phase Motor	Volts, Amps, Power factor, efficiency	HP =	$\frac{Volts \times Amps \times 1.73 \times Pf \times Eff.}{746}$
Horsepower	Watts	HP =	Watts / 746
Horsepower	Kilowatts	HP =	KW / .746
Motor Power (Watts), Single Phase	Volts, Amps, PF, Eff.	Watts =	V x Amps x Pf x Eff
Motor Power (Watts), 3 Phase	Volts, Amps, PF, Eff.	Watts =	1.73 x V x Amp x Pf x Eff.
10. TEMPERATURE			
Degrees Fahrenheit	Degrees Centigrade	°F =	(1.8 x °C) + 32
Degrees Centigrade	Degrees Fahrenheit	°C =	5/9 (°F - 32)

11. METRIC CONVERSION FACTORS

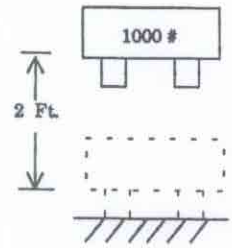
Inches x 25.4 = Millimeters
Pounds x .455 = Kilograms
U.S. Gallons x 3.785 = liters
Pounds (Force) x 4.448 = Newtons
Pounds inches x .113 = Newton Meters
Horsepower x .746 = Kilowatts
Pounds/in^2 (psi) x .0069 = Newtons/mm^2
BTU x .00029 = Kilowatt Hours

Millimeters x .0394 = inches
Kilograms x 2.2 = pounds
Liter x .264 = U.S. Gallon
Newtons x .2248 = Pounds (force)
Newton Meters x 8.85 = Pound-inches
Kilowatts x 1.34 = Horsepower
Newtons/mm^2 x 145 = Pounds/in^2 (PSI)
Kilowatt Hours x 3415 = BTUs

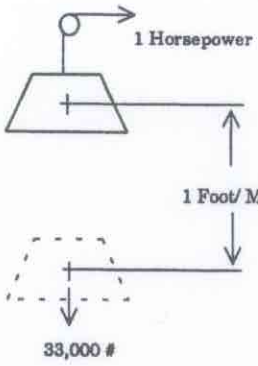
HORSEPOWER AND TORQUE

FORCE is a measure of push, pull or weight, and is expressed in pounds in English Units or Newtons in Metric Units.

A 1000 pound block exerts a force of 1000 pounds onto the floor. A force moved over a distance is called WORK. To obtain work, multiply force by distance. Thus, if a forklift truck raises a 1000 pound weight two feet it does 1000# x 2 Ft. or 2000 foot-pounds of work. If the forklift could not lift the weight, the machine exerted a lot of effort but, according to this definition, NO WORK WAS DONE. Motion must occur in order for work to be done. POWER is the rate of doing work per unit time. A unit of HORSEPOWER was established by Scottish Inventor James Watt around the year 1782 while developing a steam engine. He concluded that a horse could lift 33,000 pounds a distance of one foot in one minute.



Thus horsepower is equal to:

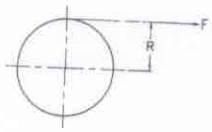


1 Horsepower HP = PV / 33,000 WHERE

P = Pull or Force in Pounds

V = Velocity in Feet Per Minute (FPM)

TORQUE is work of a rotating body, and is defined as a force multiplied by a perpendicular distance (radius) to the center of rotation:



Torque = F X R WHERE

F = Force in Pounds

R = Perpendicular Distance to Center of Rotation

Converting linear velocity to rotational velocity, the formula for horsepower becomes:

$$HP = \frac{T \times RPM}{63025}$$ WHERE

T = Torque in Pound Inches

RPM = Rotational Speed in Revolutions Per Minute

When torque is expressed in units of pound-feet the formula for horsepower becomes

$$HP = \frac{T \times RPM}{5252}$$

OVERHUNG LOAD

Overhung load is an external radial force acting on either input or output shafts of the speed reducer. It is the resultant force of all external forces acting on a given shaft.

Normally, the overhung load (OHL) is due to a reaction to torque transmitted through a chain, gear or belt drive. Weights of items mounted on the shaft could also create a significant OHL. Weights of items such as heavy drums, large sprockets and gears should be added vectorially to OHL due to transmitted torque. The resultant is the total OHL. This calculated OHL should not exceed the allowable OHL published by the speed reducer manufacturer.

Based on transmitted horsepower the formula for OHL is

$$OHL = \frac{\text{Torque x Factor}}{\text{Pitch Radius}}$$ OR

$$OHL = \frac{126{,}000 \times HP \times Factor}{\text{Pitch Dia.} \times RPM}$$ WHERE

HP = Transmitted Horsepower

Factor = Overhung Load Factor from Table 1

Pitch Radius or Dia. = Pitch Radius or Dia. of Gear, Sprocket or Pulley

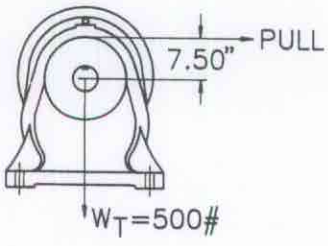
RPM = Revolutions Per Minute of the Shaft

Table 1 - Overhung Load Factors

Drive Type	Factor
Single or multiple chain	1.00
Timing belt	1.00
Gear Drive	1.25
Single or multiple V-belt	1.50
Flat belt	2.50
Variable pitch pulley	3.50
Other types	Consult drive manufacturer

Overhung Load Example:

A sprocket weighing 500 lbs. is mounted on the output shaft of a speed reducer. Its pitch diameter is 15". The reducer transmits 10 HP and the output speed is 75 RPM. Find the output OHL when the chain pull is horizontal.



Solution:

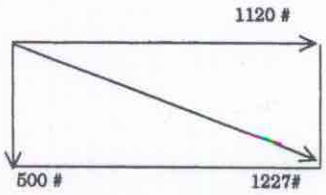
For chain drive the factor = 1
Therefore, OHL due to transmitted load is

$$OHL = \frac{126{,}000 \times HP \times 1}{\text{Pitch Dia.} \times RPM}$$

$$OHL = \frac{126{,}000 \times 10}{15 \times 75} = 1120 \text{ lbs.}$$

OHL due to the weight of the sprocket = 500 lbs.
Resultant OHL =

$$\sqrt{1120^2 + 500^2} = 1227 \text{ lbs.}$$



MOMENT OF INERTIA

A moving object possesses energy called Kinetic Energy. The amount of this energy is a function of weight and speed. In a rotating object this energy is also a function of the radial distance of the center of the mass to the center of rotation. This distance is called Radius of Gyration, K.

To accelerate or to decelerate an object, energy must be added or removed. For example, a motor adds energy to a system while a brake takes away energy. The formula that calculates the amount of torque required to accelerate or decelerate the equipment is

$$T = \frac{WK^2 \times \Delta RPM}{308 \times \Delta t}$$

WHERE

T = Torque in Pound-Feet

WK^2 = Moment of Inertia of equipment in Pound-Feet

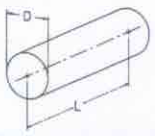
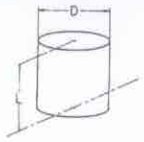
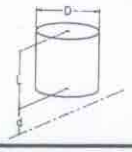
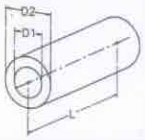
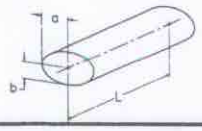
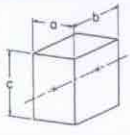
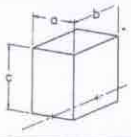
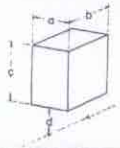
Δ RPM = Change in RPM

Δ t = Time in seconds required to make change in RPM

All driven equipment must have its WK^2 referred to the shaft where torque is applied (i.e., at the motor or brake). Thus,

$$WK^2 \text{ at Motor} = WK^2 \text{ at Object} \times \left[\frac{\text{(RPM Object)}}{\text{(RPM Motor)}}\right]^2$$

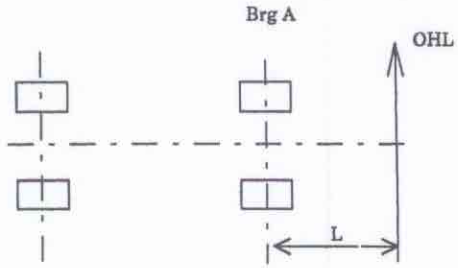
Following are some useful formulas for calculating WK^2 of various shapes. Distances are in ft. and weights (w) are in weight per cubic inch of material.

Part All Dimensions in Feet	Radius of Gyration, K Feet	Weight, W w = weight per cu. in. of material, lb	WK^2 lb-ft^2
Circular cylinder - about its own axis 	$.354D$	$1{,}360\ wLD^2$	$170.4\ wLD^4$
Circular cylinder - about axis at one end 	$.144\sqrt{3D^2 + 16L^2}$	$1{,}360\ wLD^2$	$196\ wLD^2[3D^2 + 16L^2]$
Circular cylinder - about outside axis 	$.144\sqrt{3D^2 + 16L^2 + 48dL + 48d^2}$	$1{,}360\ wLD^2$	$196\ wLD^2[3D^2 + 16L^2 + 48dL + 48d^2]$
Hollow circular cylinder - about its own axis 	$.354\sqrt{D_2^2 + D_1^2}$	$1{,}360\ wL\left[D_2^2 - D_1^2\right]$	$170.4wL\left[D_2^4 - D_1^4\right]$
Right elliptical cylinder - about its own axis 	$\sqrt{\frac{a^2 + b^2}{2}}$	$5{,}426\ abwL$	$5{,}426\ abwL\left[\frac{a^2 + b^2}{4}\right]$
Rectangle - about its own axis 	$0.289\sqrt{a^2 + c^2}$	$1{,}728\ abcw$	$144.5\ abcw\left[a^2 + c^2\right]$
Rectangle - about axis at one end 	$0.289\sqrt{a^2 + 4c^2}$	$1{,}728\ abcw$	$144.5\ abcw\left[a^2 + 4c^2\right]$
Rectangle - about outside axis 	$.289\sqrt{a^2 + 4c^2 + 12cd + 12d^2}$	$1{,}728\ abcw$	$144.5\ abcw\left[a^2 + 4c^2 + 12cd + 12d^2\right]$

General Engineering Information

SHAFTING

Shafts are subjected to bending and torsional stresses. Bending stresses are the result of radial loads imposed on the shaft, such as overhung loads. These stresses are also called tensile or compressive stresses. Moment is defined as force x distance, and has units of pound inches or pound feet.



In this example the moment at BRG A = OHL x L
Torsional stresses are the result of torque being transmitted through the shaft. They are also called shear stresses since they act perpendicular to the axis of the shaft, and tend to shear the shaft.

Bending stresses can be calculated as follows:

$$\text{Solid Shaft } S_b = \frac{32 \times M}{\pi \times d_o^3} \qquad \text{Hollow Shaft } S_b = \frac{32 \times M \times d_o}{\pi\,[d_o^4 - d_1^4]}$$

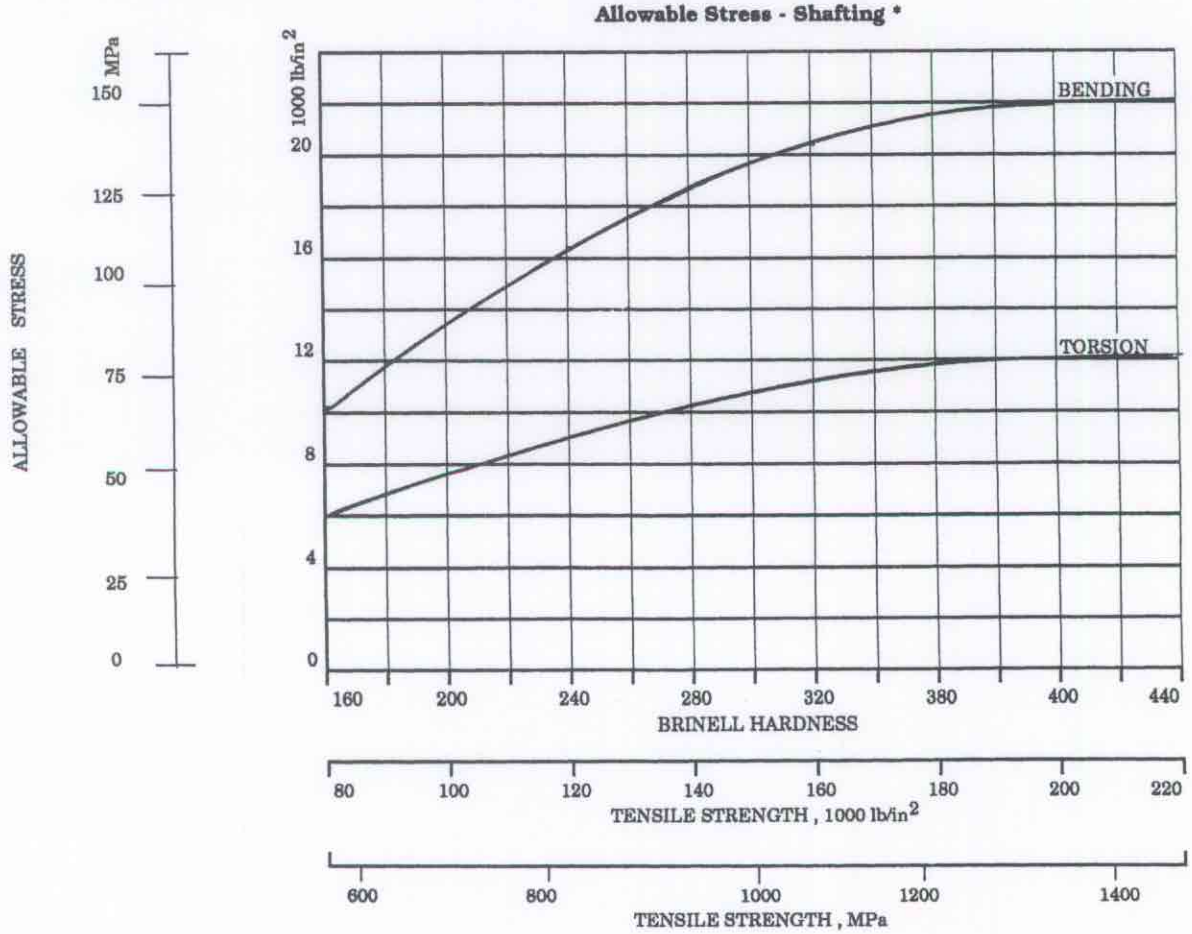
Torsional stresses can be calculated as follows:

$$\text{Solid Shaft } S_t = \frac{16 \times T}{\pi \times d_o^3} \qquad \text{Hollow Shaft } S_t = \frac{16 \times T \times d_o}{\pi\,[d_o^4 - d_1^4]}$$

Where
S_b = Bending Stress in Lb/in^2 (PSI)
S_t = Torsional Stress in Lb/in^2 (PSI)
M = Bending Moment in Lb-in
T = Torque in Lb-in
d_o = Shaft Outside Diameter, in
d_1 = Hollow Shaft Inside Diameter, in

The stresses calculated by the above method should not exceed allowable stresses shown in the graph below.

Allowable Stress - Shafting *



* Extracted from AGMA 6010-E88, "Standard for Spur, Helical, Herringbone & Bevel Enclosed Drives", with permission of the publisher, The American Gear Manufacturers Association.

For more detailed shaft stress analysis refer to ANSI/AGMA 6001-D97.

General Engineering Information

WEIGHTS OF STEEL SHAFTING

Table 2 - Weight of Round Steel Shafting

Shaft Size	Weight of Shafting for Various Lengths in Feet																	Weight per Inch
	1	2	3	4	5	6	7	8	9	10	12	14	16	18	20	22	24	
3/4	1.5	3.0	4.5	6.0	7.5	9.0	10.5	12.0	13.5	15	18	21	24	27	30	33	36	.125
7/8	2.0	4.0	6.1	8.1	10.2	12.2	14.3	16.3	18.4	20	25	29	33	37	41	45	49	.170
* 15/16	2.3	4.7	7.0	9.4	11.7	14.1	16.5	18.8	21.2	23	28	33	38	42	47	52	56	.195
1	2.7	5.3	8.0	10.6	13.3	16.0	18.6	21.3	24.0	27	32	37	43	48	53	59	64	.223
1-1/8	3.4	6.8	10.0	13.4	16.7	20.1	23.4	26.7	30.1	34	41	47	54	61	68	74	81	.281
*1-3/16	3.8	7.6	11.3	15.1	18.9	22.6	26.4	30.1	34.0	38	45	53	60	68	75	83	90	.314
1-1/4	4.2	8.3	12.5	16.7	20.8	25.0	29.2	33.3	37.5	42	50	58	67	75	83	92	100	.348
1-3/8	5.0	10.1	15.3	20.2	25.3	30.3	35.4	40.4	45.4	50	60	71	81	91	101	111	121	.420
*1-7/16	5.5	11	17	22	28	33	39	44	50	55	66	77	88	99	110	121	133	.460
1-1/2	6.0	12	18	24	30	36	42	48	54	60	72	84	96	108	120	132	144	.500
*1-11/16	7.6	15	23	30	38	46	53	61	68	76	91	107	122	137	152	167	183	.634
*1-15/16	10.0	20	30	40	50	60	70	80	90	100	120	140	161	181	201	221	241	.835
2	10.7	21	32	43	53	64	75	85	96	107	128	150	171	192	214	235	256	.890
*2-3/16	12.8	26	38	51	64	77	90	102	115	128	153	179	205	230	256	281	307	1.06
*2-7/16	15.9	32	48	63	79	95	111	127	143	159	190	222	254	286	317	349	381	1.32
2-1/2	16.7	34	50	67	83	100	117	134	150	167	200	234	267	301	334	367	401	1.39
*2-11/16	19.3	39	58	77	97	116	135	154	174	193	232	270	309	348	386	425	463	1.61
*2-15/16	23.0	46	69	92	115	138	161	184	208	231	277	323	369	415	461	507	553	1.92
*3-7/16	31.6	63	95	126	158	189	221	253	284	316	379	442	505	568	631	695	758	2.63
*3-15/16	41.4	83	124	166	207	248	290	331	373	414	497	580	662	745	828	911	994	3.45
*4-7/16	52.6	105	158	210	263	315	368	421	473	526	631	736	841	946	1052	1157	1262	4.38
*4-15/16	65.1	130	195	260	326	391	456	521	586	651	781	911	1041	1172	1302	1432	1562	5.42
*5-7/16	79.0	158	237	316	395	474	553	632	711	790	947	1105	1263	1421	1579	1737	1894	6.58
*6	96	192	288	384	481	577	673	769	865	961	1154	1346	1538	1730	1923	2115	2307	8.01

* Recommended Diameters - These shaft diameters are recommended for use whenever possible as power transmission components are normally stocked in these sizes

SHAFT KEYSEATS

The shafts of most Link-Belt products will be furnished with keyseats and keys per Table 3 below. Keyseat sizes for specific products appear on the dimension drawings in this catalog. Shaft keyways are always straight (i.e., non-tapered), and they may be furnished plain or round ended.

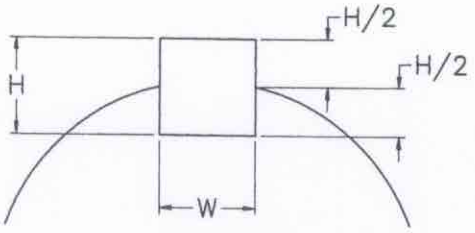


Table 3 - Key Size Versus Shaft Diameter

Nominal Shaft Diameter		Nominal Key Size			Nominal Keyseat Depth	
			Height, H		H / 2	
Over	To (Incl.)	Width, W	Square	Rectangular	Square	Rectangular
5/16	7/16	3/32	3/32		3/64	
7/16	9/16	1/8	1/8	3/32	1/16	3/64
9/16	7/8	3/16	3/16	1/8	3/32	1/16
7/8	1-1/4	1/4	1/4	3/16	1/8	3/32
1-1/4	1-3/8	5/16	5/16	1/4	5/32	1/8
1-3/8	1-3/4	3/8	3/8	1/4	3/16	1/8
1-3/4	2-1/4	1/2	1/2	3/8	1/4	3/16
2-1/4	2-3/4	5/8	5/8	7/16	5/16	7/32
2-3/4	3-1/4	3/4	3/4	1/2	3/8	1/4
3-1/4	3-3/4	7/8	7/8	5/8	7/16	5/16
3-3/4	4-1/2	1	1	3/4	1/2	3/8
4-1/2	5-1/2	1-1/4	1-1/4	7/8	5/8	7/16
5-1/2	6-1/2	1-1/2	1-1/2	1	3/4	1/2
6-1/2	7-1/2	1-3/4	1-3/4	1-1/2*	7/8	3/4
7-1/2	9	2	2	1-1/2	1	3/4
9	11	2-1/2	2-1/2	1-3/4	1-1/4	7/8
11	13	3	3	2	1-1/2	1
13	15	3-1/2	3-1/2	2-1/2	1-3/4	1-1/4
15	18	4		3		1-1/2
18	22	5		3-1/2		1-3/4
22	26	6		4		2
26	30	7		5		2-1/2

* Some key standards show 1-1/4 in. Preferred size is 1-1/2 in. All dimensions given in inches.

General Engineering Information

ELECTRICAL

Table 4 - Electrical Formulas

To Find	Alternating Current		To Find	Alternating or Direct Current
	Single-Phase	Three-Phase		
Amperes when horsepower is known	$\frac{HP \times 746}{E \times Eff \times pf}$	$\frac{HP \times 746}{1.73 \times E \times Eff \times pf}$	Amperes when voltage and resistance are known Voltage when resistance and current are known Resistance when voltage and current are known	E / R IR E / I
Amperes when kilowatts are known	$\frac{KW \times 1000}{E \times pf}$	$\frac{KW \times 1000}{1.73 \times E \times pf}$	I = Amperes KW = Kilowatts E = Volts R = Ohms Eff = Efficiency Kva = Kilovolt Amperes pf = Power Factor	
Amperes when Kva are known	$\frac{Kva \times 1000}{E}$	$\frac{Kva \times 1000}{1.73 \times E}$		
Kilowatts	$\frac{I \times E \times pf}{1000}$	$\frac{1.73 \times I \times E \times pf}{1000}$		
Kva	$\frac{I \times E}{1000}$	$\frac{1.73 \times I \times E}{1000}$		
Horsepower = (Output)	$\frac{I \times E \times Eff \times pf}{746}$	$\frac{1.73 \times I \times E \times Eff \times pf}{746}$		

General Information (Approximation)
All Voltages at 100% Load
At 1800 rpm, a motor develops a 36 lb.-in. per HP
At 1200 rpm, a motor develops 54 lb.-in. per HP
At 575 volts, a 3-phase motor draws 1 amp per HP
At 460 volts, a 3-phase motor draws 1.25 amp per HP
At 230 volts, a 3-phase motor draws 2.5 amp per HP
At 230 volts, a single phase motor draws 5 amp per HP
At 115 volts, a single phase motor draws 10 amp per HP

Table 5 - Motor Amps at Full Load

	Alternating Current				Alternating Current				Alternating Current				Alternating Current		
HP	Single Phase	3-Phase	DC	HP	Single Phase	3-Phase	DC	HP	Single Phase	3-Phase	DC	HP	Single Phase	3-Phase	DC
1/2	4.9	2.0	2.7	5	28	14.4	20	25	.....	60	92	75	.....	180	268
1	8.0	3.4	4.8	7-1/2	40	21.0	29	30	.....	75	110	100	.....	240	355
1-1/2	10.0	4.8	6.6	10	50	26.0	38	40	.....	100	146	125	.....	300	443
2	12.0	6.2	8.5	15	.....	38.0	56	50	.....	120	180	150	.....	360	534
3	17.0	8.6	12.5	20	.....	50.0	74	60	.....	150	215	200	.....	480	712

Values are for all speeds and frequencies at 230 volts.
Amperage for other than 230 volts can be calculated as follows:

$$I = \frac{230 \times \text{Amps from Table}}{\text{New Voltage}}$$

Example:
For 40 HP 3-phase at 550 volts: $I = (230 \times 100) / 550 = 42$ amps.
Power Factor estimated at 80% for most motors. Efficiency is usually 80-90%.

Table 6 - NEMA Electrical Enclosure Types

Type	Description	Type	Description
NEMA Type 1 (General Purposes)	For indoor use wherever oil, dust or water is not a problem.	NEMA Type 5 Dust Tight (Non-Hazardous)	Used for excluding dust (All NEMA 12 enclosures are usually suitable for NEMA 5 use.)
NEMA Type 2 (drip tight)	Used indoors to exclude falling moisture and dirt.		
NEMA Type 3 (Weatherproof)	Provides protection against rain, sleet and snow.	NEMA Type 9 Dust Tight (Hazardous)**	For locations where combustible dusts are present
NEMA - Type 4 (Watertight)*	Needed when subject to great amounts of water from any angle - such as areas which are repeatedly hosed down.	NEMA Type 12 (Industrial Use)	Used for excluding oil, coolant, flying dust, lint, etc.

* Not designed to be submerged.
** Class II Groups E, F and G.

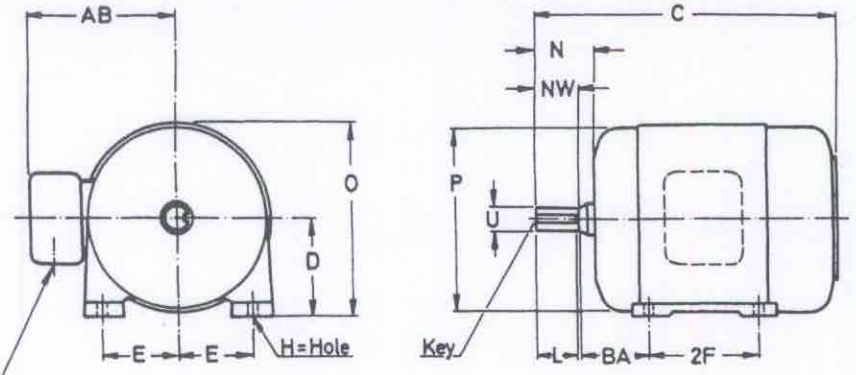
A-C MOTOR INFORMATION (NEMA Frame Designation)

Table 7 - Frame Assignments

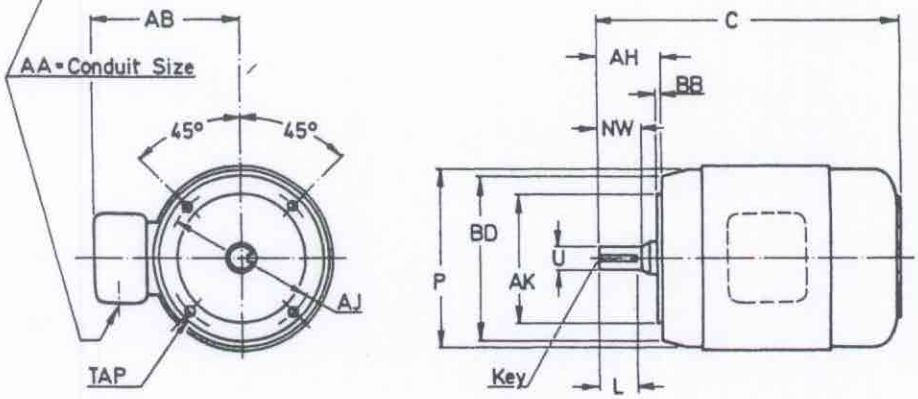
	Motor Speed, rpm					Motor Speed, rpm			
HP	3600	1800	1200	900	HP	3600	1800	1200	900
1/8-1/3	.....	48	.....	.....	15	215T,256U	254T,284U	284T,324U	286T,326U
1/8-1/2	48	.....	56	.....	20	254T,284U	256T,286U	286T,326U	324T,364U
1/6	.....	.....	48	.....	25	256T,286U	284T,324U	324T,364U	326T,365U
1/3-1	.....	56	.....	.....	30	284TS,324S	286T,326U	326T,365U	364T,404U
3/4-1	56	.....	.....	.....	40	286TS.326S	324T,364U	364T,404U	365T,405U
1/2	.....	.....	.....	143T	50	324TS,364US	326T,365U,365US	365T,405U	404T,444U
3/4	.....	.....	143T	145T	60	326TS,365US	364TS, 404U,404US	404T,444U	405T,445U
1	.....	143T	145T	182T	75	364TS,404US	365TS, 405U,405US	405T,445U	444T
1-1/2	143T	145T	182T	184T	100	365TS,405US	404TS, 444US	444T	445T
2	145T	145T	184T	213T	125	404TS,444US	405TS, 445US	445T	.....
3	145T	182T	213T	215T,254U	150	405TS,445US	444TS	.....	.....
5	182T	184T	215T,254U	254T,256U	200	444TS	445TS	.....	.....
7-1/2	184T	213T,254U	254T,256U	256T,284U	250	445TS	.....	.....	.....
10	213T,254U	215T,256U	256T,284U	284T,286U	.....	.....	.....	.....	.....

NEMA Motor Frame Assignments

Foot Mounted



C-Face Flange Mounted



HP at 1750 RPM	NEMA Frame	D	E	2F	*H	*N	*O	*P	U	NW	*AA	*AB	AH	AJ	AK	BA	BB	BD	TAP	*C	Key - *L
.50 + .75	56	3.50	2.44	3.00	.34	2.25	6.88	6.63	.63	1.88	.50	5.00	2.06	5.88	4.50	2.75	.13	6.50	.375 - 16	12.25	.19 - 1.00
1 1.5 + 2	143T 145T	3.50	2.75	4.00 5.00	.34	2.50	6.88	6.63	.88	2.25	.75	5.25	2.13	5.88	4.50	2.25	.13	6.50	.375 - 16	12.25 13.50	.19 - 1.38
3 5	182T 184T	4.50	3.75	4.50 5.50	.41	3.56	8.69	7.88	1.13	2.75	.75	5.88	2.63	7.25	8.50	2.75	.25	9.00	.50 - 13	14.75 15.75	.25 - 1.75
7.5 10	213T 215T	5.25	4.25	5.50 7.00	.41	3.88	10.25	9.56	1.38	3.38	.75	7.38	3.13	7.25	8.50	3.50	.25	9.00	.50 - 13	17.75 19.25	.31 - 2.38
15 20	254T 256T	6.25	5.00	8.25 10.00	.53	4.31	13.00	13.50	1.63	4.00	1.00	9.63	3.75	7.25	8.50	4.25	.25	9.13	.50 - 13	22.75 24.50	.38 - 2.88
25 30	284T 286T	7.00	5.50	9.50 11.00	.53	4.88	14.56	15.50	1.88	4.63	1.25	10.88	4.38	9.00	10.50	4.75	.25	11.25	.50 - 13	26.00 27.50	.50 - 3.25
40 50	324T 326T	8.00	6.25	10.50 12.00	.66	5.50	16.63	17.25	2.13	5.25	1.50	11.88	5.00	11.00	12.50	5.25	.25	13.38	.63 - 11	29.00 30.50	.50 - 3.88
60 75	364T 365T	9.00	7.00	11.25 12.25	.66	6.25	18.75	19.50	2.38	5.88	2.50	14.31	5.63	11.00	12.50	5.88	.25	14.00	*.63 - 11	33.50 33.50	.63 - 4.25
100 125	404T 405T	10.00	8.00	12.25 13.75	.81	7.31	23.00	20.50	2.88	7.25	3.00	14.75	4.00	11.00	12.50	6.63	.25	15.50	*.63 - 11	36.75 38.50	.75 - 5.63
150 200	444T 445T	11.00	9.00	14.50 16.50	.81	8.50	26.25	23.00	3.38	8.25	3.00	16.50	4.50	14.00	12.50	7.50	.25	18.00	*.63 - 11	42.50 44.50	.88 - 6.88

Tolerances: D = +.0000, -.0313 U = +.0000, -.0005 AK = +.0000, -.0030

*These dimensions are not NEMA-Standard; for exact dimensions a certified drawing should be requested from the Motor Manufacturer.

*NEMA C-face of these frames has eight mounting holes.

General Engineering Information

ENGLISH STANDARD MEASURES

Long Measure
1 mile = 1760 yards = 5280 feet
1 yard = 3 feet= 36 inches
1 foot = 12 inches

Square Measure
1 square mile = 640 acres = 6400 square chains
1 acre = 10 square chains = 4840 square yards = 43,560 square feet
1 square chain = 16 square rods = 484 square yards = 4356 square feet
1 square rod = 30.25 square yards = 272.25 square feet = 625 square links
1 square yard = 9 square feet
1 square foot = 144 square inches
An acre is equal to a square, the side of which is 208.7 feet

Dry Measure
1 bushel (U.S. or Winchester struck bushel) = 1.2445 cubic foot = 2150.42 cubic inches
1 bushel = 4 pecks = 32 quarts = 64 pints
1 peck = 8 quarts = 16 pints
1 quart = 2 pints
1 heaped bushel = 1-1/4 struck bushel
1 cubic foot = 0.8036 struck bushel
1 British Imperial bushel = 8 Imperial gallons = 1.2837 cubic foot = 2218.19 cubic inches

Liquid Measure
1 U.S. gallon = 0.1337 cubic foot = 231 cubic inches = 4 quarts = 8 pints
1 quart = 2 pints = 8 gills
1 pint = 4 gills
1 British Imperial gallon = 1.2003 U.S. gallon = 277.27 cubic inches
1 cubic foot = 7.48 U.S. gallons
1 barrel = 31.5 U. S. gallons

Circular and Angular Measure
60 seconds (") = 1 minute (')
60 minutes = 1 degree (o)
360 degrees = 1 circumference (C)
57.3 degrees = 1 radian
2 π radians = 1 circumference (C)

Temperature
The following equations are useful for converting temperature from one system to another:
Let F = degrees Farenheit; C = degrees Centigrade:
Deg.C = (Deg.F-32) x 5/9
Deg.F = (Deg.C x 9/5) +32

Avoirdupois or Commercial Weight
1 gross or long ton = 2240 pounds
1 net or short ton = 2000 pounds
1 pound = 16 ounches = 7000 grains
1 ounce = 16 drams = 437.5 grains

Cubic Measure
1 cubic yard = 27 cubic feet
1 cubic foot = 1728 cubic inches
The following measures are also used for wood and masonry:
1 cord of wood = 4 x 4 x 8 feet = 128 cubic feet
1 perch of masonry = 16-1/2 x 1-1/2 x 1 foot = 24-3/4 cubic feet

Shipping Measure
For measuring entire internal capacity of a vessel:
1 register ton = 100 cubic feet

For measurement of cargo
1 U.S. shipping ton = 40 cubic feet = 32.143 U. S. bushels = 31.16 Imperial bushels

British shipping ton = 42 cubic feet = 33.75 U. S. bushels = 32.72 Imperial bushels

METRIC SYSTEM OF MEASUREMENTS
The principal units are the meter for length, the liter for capacity and the gram for weight. The following prefixes are used for sub-divisions and multiples: milli = 1/1000; centi = 1/100; deci = 1/10; deca = 10; hecto = 100; kilo = 1000

Measure of Length
10 millimeters(mm)=1 centimeter(cm)
10 centimeters = 1 decimeter (dm)
10 decimeters = 1 meter (m)
1000 meters = 1 kilometer (km)

Measures of Weight
10 milligrams(mg)=1 centigram (cg)
10 centigrams = 1 decigram (dg)
10 decigrams = 1 gram (g)
10 grams = 1 decagram (Dg)
10 decagrams = 1 hectogram (Hg)
10 hectograms = 1 Kilogram (Kg)
1000 kilograms = 1 (metric) ton (T)

Square Measure
100 sq. millimeters (mm^2) = 1 sq. centimeter (cm^2)
100 sq. centimeters = 1 sq. decimeter (dm^2)
100 sq. decimeters = 1 sq. meter (m^2)

Cubic Measure
1000 cu. millimeters(mm^3) = 1 cu. centimeter (cm^3)
1000 cu. centimeters = 1 cu. decimeter (dm^3)
1000 cu. decimeters = 1 cu. meter(m^3)

Dry and Liquid Measure
10 milliliters(ml)=1 centiliter(cl)
10 centiliters = 1 deciliter (dl)
10 deciliters = 1 liter (l)
100 liters = 1 hectoliter (Hl)
1 liter = 1 cubic decimeter = the volume of 1 Kg of pure water at a temperature of 39.2 deg. F.

Length Conversion Constants for Metric and U.S. Units
Millimeters x .039370 = inches
Meters x 39.370 = inches
Meters x 3.2808 = feet
Meters x 1.09361 = yards
Kilometers x 3,280.8 = feet
Kilometers x .62137=Statute Miles
Kilometers x .53959 = Nautical Miles
Inches x 25.4001 = millimeters
Inches x .0254 = meters
Feet x .30480 = meters
Yards x .91440 - meters
Feet x .0003048 = kilometers
Statute Miles x 1.60935 = kilometers
Nautical Miles x 1.85325 = kilometers

Weight Conversion Constants for Metric and U.S. Units
Grams x 981 = dynes
Grams x 15.432 = grains
Grams x .03527 = ounces (Avd.)
Grams x .033818=fluid ounces(water)
Kilograms x 35.27 = ounces (Avd.)
Kilograms x 2.20462 = pounds (Avd.)
Metric Tons (1000 Kg) x 1.10231 = Net Ton (2000 lbs.)
Metric Tons (1000 Kg) x .98421 = Gross Ton (2240 lbs)
Dynes x .0010193 = grams
Grains x .0648 = grams
Ounces (Avd.) x 28.35 = grams
Fluid Ounces (Water) x 29.57 = grams
Ounces (Avd.) x .02835 = kilograms
Pounds (Avd.) x .45359 = kilograms
Net Ton (2000 lbs.) x .90719 = Metric Tons (1000 Kg)
Gross Ton (2240 lbs) x 1.01605 = Metric Tons (1000 Kg)

Area Conversion Constants for Metric and U.S. Units
Square Millimetersx .00155=sq. inches
Square Centimeters x .155=sq. inches
Square Meters x 10.76387=sq. feet
Square Meters x 1.19599=sq. yards
Hectares x 2.47104 = acres
Square Kilometers x 247.104 = acres
Square Kilometers x .3861=sq. miles
Square inches x 645.163 = square millimeters
Square inches x 6.45163 = square centimeters
Square feet x .0929= square meters
Square Yards x .83613 = square meters
Acres x .40469 = hectares
Acres x .0040469 = square kilometers
Square Miles x 2.5899 = square kilometers

Volume Conversion Constants for Metric and U.S. Units
Cubic Centimeters x.033818=fl. oz.
Cubic Centimeters x .061023 = cubic inches
Cubic Centimeters x .271=fluid drams
Liters x 61.023 = cubic inches
Liters x 1.05668 = quarts
Liters x .26417 = gallons
Liters x .035317 = cubic feet
Hectoliters x 26.417 = gallons
Hectoliters x 3.5317 = cubic feet
Hectoliters x 2.83794 = bushel
Hectoliters x .1308 = cubic yards
Cubic Meters x 264.17 = gallons
Cubic Meters x 35.317 = cubic feet
Cubic Meters x 1.308 = cubic yards
Fluid ounces x 29.57 = cubic centimeters
Cubic Inches x 16.387 = cubic centimeters
Fluid Drams x 3.69 = cubic centimeters
Cubic Inches x .016387 = liters
Quarts x .94636 = liters
Gallons x 3.78543 = liters
Cubic Feet x 28.316 = liters
Gallons x .0378543 = hectoliters
Cubic Feet x .28316 = hectoliters
Bushels x .352379 = hectoliters
Cubic Yards x 7.645 = hectoliters
Gallons x .00378543 = cubic meters
Cubic Feet x .028316 = cubic meters
Cubic Yards x .7645 = cubic meters

Power and Heat Conversion Constants for Metric and U.S. Units
Calorie x 0.003968 = B.T.U.
Joules x .7373 = footpounds
Kilogrammeters x 7.233 = foot pounds
Kilowatts x 1.34 = Horsepower
Kilowatt Hours x 3415 = B.T.U.
B.T.U. x 252 = calories
Foot Pounds x 1.3563 = joules
Foot Pounds x .13825 = kilogrammeters
Horsepower x .746 = kilowatt
B.T.U. x .00029282 - kilowatt hours

General Engineering Information

TRIGONOMETRIC FORMULAS

Table 8 - Formulas for Finding Functions of Angles

Side Opposite / Hypotenuse	= SINE
Side Adjacent / Hypotenuse	= COSINE
Side Opposite / Side Adjacent	= TANGENT
Side Adjacent / Side Opposite	= COTANGENT
Hypotenuse / Side Adjacent	= SECANT
Hypotenuse / Side Opposite	= COSECANT

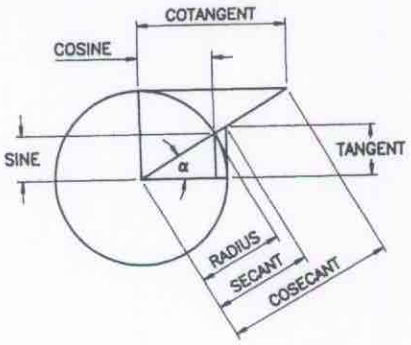
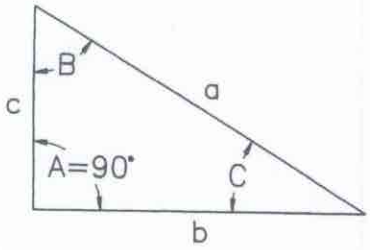


Table 9 - Formulas for Finding Sides of Right Angle Triangles With an Angle and Side Known

To Find: Length of Side Opposite	Hypotenuse x Sine Hypotenuse / Cosecant Side Adjacent x Tangent Side Adjacent / Cotangent
To Find: Length of Side Adjacent	Hypotenuse x Cosine Hypotenuse / Secant Side Opposite x Cotangent Side Opposite / Tangent
To Find: Length of Hypotenuse	Side Opposite x Cosecant Side Opposite / Sine Side Adjacent x Secant Side Adjacent / Cosine

Right Triangle



Oblique Triangle

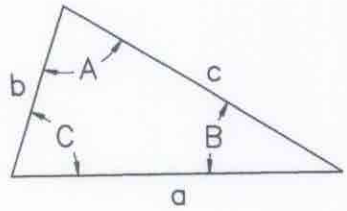


Table 10 - To Find Angles and Sides of Right Angle Triangles

To Find Angles			To Find Sides		
To Find:	**Formulas**		**To Find:**	**Formulas**	
C	c / a	= Sine C	a	$\sqrt{b^2+c^2}$	.....
C	b / a	= Cosine C	a	c x Cosec.C	c / Sine C
C	c / b	= Tan.C	a	c x Secant B	c / Cosine B
C	b / c	= Cotan.C	a	b x Cosec B	b / Sine B
C	a / b	= Secant C	a	b x Secant C	b / Cosine C
C	a / c	= Cosec.C	b	$\sqrt{a^2-c^2}$	.....
B	b / a	= Sine B	b	a x Sine B	a / Cosecant B
B	c / a	= Cosine B	b	a x Cos.C	a / Secant C
B	b / c	= Tan.B	b	c x Tan.B	c / Cotangent B
B	c / b	= Cotan.B	b	c x Cot.C	c / Tangent C
B	a / c	= Secant B	c	$\sqrt{a^2-b^2}$	.....
B	a / b	= Cosec.B	c	a x Cos.B	a / Secant B
			c	a x Sine C	a / Cosecant C
			c	b x Cot. B	b / Tangent B
			c	b x Tan.C	b / Cotangent C

Table 11 - To Find Angles and Sides of Oblique Angle Triangles

To Find:	Known:	Formulas	To Find:	Known	Formulas
C	A,B	180 deg. - (A + B)	A	B,C	180 deg - (B + C)
b	a,B,A	$\frac{a \times \text{Sin.B}}{\text{Sin.A}}$	Cos.A	a,b,c,	$\frac{b^2+c^2-a^2}{2bc}$
c	a,A,C	(a x Sin.C.) / Sin. A	Sin.C.	c,A,a	(c x Sin.A) / a
Tan.A	a,C,b	$\frac{a \times \text{Sin. C}}{b - (a \times \text{Cos.C})}$	Cot.B	a,C,b	$\frac{a \times \text{Cosec.C}}{b}$ - Cot.C
B	A,C	180 deg - (A + C)	c	b,C,B	b x Sin.C x Cosec.B
Sin.B	b,A,a	(b x Sin.A) / a	.....	.....	.....

ENGINEERING FORMULAS AND CONSTANTS

1 HP = 33,000 Foot-pounds of work per minute.
1 HP = 2547 B.T.U. per hour
1 B.T.U. = Heat required to raise 1 lb. water 1 deg. F.
1 B.T.U. = 777.6 Foot-pounds work.
Heat Value of Carbon = 14,600 B.T.U. per pound.
Latent Heat of Fusion of Ice = 143.15 B.T.U. per pound.
Latent Heat of Evaporation of Water at 212 deg. F = 970.4 B.T.U. per pound.
Total Heat of Saturated Steam at atmospheric pressure = 1,150.4 B.T.U. per pound
1 Ton of Refrigeration = 288,000 B.T.U. per 24 hours.
g = Acceleration of Gravity (commonly taken as 32.16 feet per second per second).
Atmospheric Pressure = 14.7 pounds per sq. in. = 29.92 inches mercury at 32 deg. F.
1 Lb. per Sq. In. Pressure = 2.3095 ft fresh water at 62 deg. F = 2.0355 inches mercury at 32 deg. F. = 2.0416 inches mercury at 62 deg. F.
Water Pressure (pounds per sq. in.) = .433 x height of water in feet (Fresh water at 62 deg. F.)
Weight of 1 cu. ft. fresh water = 62.355 lbs. at 62 deg. F. = 59.76 lbs. at 212 deg. F.
Weight of 1 cu. ft. Air at 14.7 lbs. per sq. in. Pressure = .07608 lbs. at 62 deg. F = .08073 lbs. at 32 deg. F.
1 cubic inch steel = .2833 lbs.
Weight of steel bar in lbs. per inch = diameter2 x .2225

MATHEMATICAL EQUATIONS

To find circumference of a circle, multiple diameter by 3.1416
To find diameter of a circle, multiply circumference by .31831
To find area of a circle, multiply square of diameter by .7854
To find area of a rectangle, multiply length by width
To find area of a triangle, multiply base by 1/2 perpendicular height
To find area of elipse, multiply product of both diameters by .7854
To find area of parallelogram, multiply base by altitude
To find side of an inscribed square, multiply diameter by .7071 or multiply circumference by .2251 or divide circumference by 4.4428
To find side of inscribed cube, multiply radius of sphere by 1.1547
To find side of an equal square, multiply diameter by .8862
To find the surface of a sphere, square the diameter and multiply by 3.1416
To find the volume of a sphere, cube the diameter and multiply by .5236
A side of a square multiplied by 1.4142 = diameter of its circumscribing circle
A side of a square multiplied by 4.443 = circumference of its circumscribing circle
A side of a square multiplied by 1.128 = diameter of an equal circle
A side of a square multiplied by 3.547 = circumference of an equal circle
To find gallon capacity of tanks (given dimensions of a cylinder in inches): square the diameter of the cylinder, multiply by the length and by .0034

General Engineering Information

BASIC STRENGTH OF MATERIALS

Robert Hooke, an English Scientist, performed research that became the basis for the study of strength of materials. Hooke's law, as it is known, states that "the relationship between stress and strain may be said to be linear for all materials". Symbolically this law may be expressed by the equation:

$E = \frac{\text{Stress}}{\text{Strain}}$ Where E is known as Modulus of Elasticity or Young's Modulus.

Stress Is defined as force per unit of area, and is normally expressed in pounds/in^2, or PSI. Stress can be tensile, compressive, or shear.

Stress for Tension and Compression	S = P/A
Stress for Shear	S = V/A
Stress in Bending	S = M x C/I
Stress in Torsion	S = T x C/J

Where
- S = Stress in PSI
- A = Area of a cross section in square inches
- P = Tensive or compressive load-pounds
- V = Shear load-pounds.
- M = Bending moment in pound inches
- T = Torque in pound inches
- C = Distance from centroid of shape to the point where stress is calculated- inches
- I = Moment of inertia of the shape- inches^4
- J = Polar moment of inertia of the shape-inches

Combined Stresses
Stresses can be combined. A beam may be subjected to both tensive and bending loads, thus the stress would be

$$S_T = (P/A) + (MC/I)$$

A shaft can be loaded both in torsion and in bending, thus the stress would be:

$$S_T = \sqrt{(MC/I)^2 + (TC/J)^2}$$

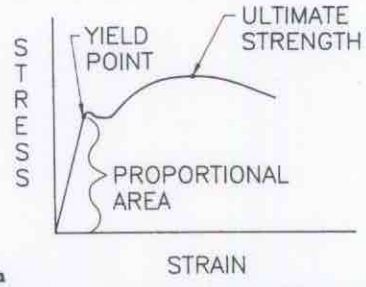
Strain The amount of deformation of a body from its original shape due to the load. The basic unit of strain is inches/inch.

Elongation of Rod $\Delta = (P \times L)/(A \times E)$

Twisting of a Shaft $\theta = (T \times L)/(J \times G)$

WHERE
- Δ = Elongation in Inches
- θ = Twisting in Radians
- L = Length of Rod or Shaft - inches
- A = Area of a cross section in square inches
- E = Modulus of Elasticity
- G = Modulus of Elasticity in Shear
- P = Tensive or compressive load-pounds
- T = Torque in pound inches
- J = Polar moment of inertia of the shape - inches

Hookes Law applies only in a proportional area of the material. As the load increases the material will tend to yield, and eventually rupture.



Yield Strength
The maximum stress that can be applied to a material without permanent deformation of the material.

Tensile or Ultimate Strength
The stress at which the material subjected to the load will rupture.

Table 12 - AVERAGE PROPERTIES OF STANDARD STEELS

The values shown below have been determined from tests and are offered as a general guide to probable physical properties of steels in common use in 1" rounds. Lower tensile properties are to be expected in large sections; the values of strength decrease as the size of the section increases. These values are not guaranteed, and should not be used to specify the raw materials or as a basis for acceptance or rejection of material.

It must not be assumed that these properties will be obtained in all cases as they vary widely with permissible variations in analysis, size of section, rolling conditions, grain size and methods of heat treatment. Dependable physical properties can only be obtained through carefully controlled heat treatment.

AISI No.	SAE No.	Condition of Steel	Strength in 1000 PSI		% Elong. in 2"	% Red. of Area	Hardness		Machinability % of B1112CD	Quenching	
			Tensile	Yield			Brineli	Rockwell		Temp. Deg. Fahr.	Medium
.....	.....	Natural Hot Rolled Mild Steel	50-60	30-40	30-40	55-65	115 Avg.	.....	50-55	.....	.....
B1112	1112	Cold Drawn Bessemer	75-90	60-70	12-16	40-50	170-185	80-95B	100	.....	.....
B1113	1113	Cold Drawn Bessemer	80-95	70-80	12-16	40-50	175-190	85-95B	120-140	.....	.....
C1213	1113	Cold Drawn	70-85	65-75	12-20	40-50	160-180	80-90B	120-140	.....	.....
C1015	1015	Natural Hot Rolled	50-65	32-45	30-40	55-65	110 Avg.	.....	50	.....	.....
C1018	1018	Natural Hot Rolled	55-70	40-50	25-35	50-65	120-140	.....	55	.....	.....
		Cold Drawn	70-85	50-70	18-25	45-55	160-180	80-90B	65	.....	.....
		1" Rd. Carburized at 1700 deg. F. Cooled in Box, Reheated, Quench - Core Porperties	90-100	60-80	10-22	35-50	200-230	93-98B	.....	1625	Water
C1020	1020	Natural Hot Rolled	60-80	40-50	25-35	50-65	120-145	60-98B	50	.....	.....
		Cold Drawn	70-80	45-70	15-25	45-60	120-160	70-85B	60	.....	.....
C1117	1117	Natural Hot Rolled	60-70	37-47	20-30	45-60	135-150	.....	80	.....	.....
		Cold Drawn	80-90	60-75	15-20	40-50	160-190	80-90B	90	.....	.....
		1" Rd. Carburized at 1700 deg. F. Cooled in Box, Reheated, Quench - Core Porperties	95-110	60-85	10-25	35-50	210-240	15-22C	.....	1625	Water
C1035	1035	Natural Hot Rolled	75-85	40-55	18-25	40-55	155-175	.....	60	.....	.....
		Cold Drawn	85-95	65-80	15-25	40-50	170-200	85-95B	65	.....	.....
		1" Rd. Quenched Tempered 1000 deg. F	95-105	70-80	20-25	55-60	195-220	93-98B	55	1550	Water
C1040	1040	Natural Hot Rolled	80-90	45-55	18-25	35-50	165-185	.....	60	.....	.....
		Cold Drawn	90-100	70-85	14-20	35-50	190-215	91-98B	62	.....	.....
		1" Rd. Quenched Tempered 1000 deg. F	100-110	75-85	15-25	45-60	210-240	17-23C	52	1550	Water
C1042	1042	Natural Hot Rolled	85-95	50-60	15-25	35-50	175-205	.....	58	.....	.....
		Cold Drawn	90-105	75-90	12-20	30-45	185-215	.....	60	.....	.....
		1" Rd. Quenched Tempered 1000 deg. F	105-120	80-90	15-25	40-60	215-250	.....	.....	1525	Water

Table 12 - Average Properties of Standard Steels (continued)

AISI No.	SAE No.	Condition of Steel	Strength in 1000 PSI		% Elong. in 2"	% Red. of Area	Hardness		Machinability % of B1112CD	Quenching	
			Tensile	Yield			Brinell	Rockwell		Temp. Deg. Fahr.	Medium
C1045	1045	Natural Hot Rolled	85-105	50-65	15-25	35-45	175-215	.....	55	.....	.....
		Cold Drawn	90-110	75-90	12-20	30-45	195-230	95-99B	58	.....	.....
		1" Rd. Quenched Tempered 1000 deg. F	110-130	80-95	12-25	40-55	235-260	22-26C	47	1500	Water
C1137	1137	Natural Hot Rolled	90-105	57-70	15-25	35-50	180-220	.....	65	.....	.....
		Cold Drawn	90-110	75-90	9-19	25-45	190-225	91-98B	70	.....	.....
		1" Rd. Quenched Tempered 1000 deg. F	115-130	90-105	15-22	40-55	250-280	24-28C	55	1550	Water
C1141	1141	Natural Hot Rolled	90-110	60-80	15-25	25-45	180-220	.....	65	.....	.....
		Cold Drawn	100-120	85-105	8-18	20-50	195-230	.....	70	.....	.....
		1" Rd. Quenched Tempered 1000 deg. F	120-145	100-130	10-20	35-50	270-310	.....	.....	1550	Water
C1144	1144	Natural Hot Rolled	95-110	60-85	15-25	30-45	200-240	.....	75	.....	.....
		Cold Drawn	100-120	90-115	7-17	20-45	210-245	17-23C	85	.....	.....
		1" Rd. Quenched Tempered 1000 deg. F	130-150	110-130	15	45	286-302	29-31C	.....	1550	Water
C1050	1050	Natural Hot Rolled	95-110	55-70	15-20	25-40	210-235	.....	50	.....	.....
		1" Rd. Quenched Tempered 1000 deg. F	115-135	85-100	10-22	35-50	240-265	23-27C	.....	1500	Water
C1095	1095	Hot Rolled, Annealed	90-110	55-65	15-25	40-50	190-220	.....	45	.....	.....
		1" Rd. Quenched Tempered 1000 deg. F	170-180	120-130	10-13	30-40	360-380	38-40C	.....	1450	Water
1340	1340	Natural Hot Rolled	90-110	60-75	15-25	35-50	190-235	12-22C	60	.....	.....
		1" Rd. Quenched Tempered 1000 deg. F	125-140	100-120	15-20	45-50	270-300	27-31C	.....	1550	Oil
2317	2317	Natural Hot Rolled	70-85	50-65	25-35	58-65	140-170	77-87B	50	.....	.....
		1" Rd. Carburized at 1700 deg. F. Cooled in Box, Reheated, Quench - Core Porperties	140-160	110-120	12-18	35-45	310-350	32-37C	.....	1525	Oil
3140	3140	Hot Rolled, Annealed	95-105	60-70	20-30	50-60	195-215	92-95B	55	.....	.....
		1" Rd. Quenched Tempered 1000 deg. F	140-150	120-130	15-20	50-60	300-325	31-35C	30	1550	Oil
		3" Rd. Quenched Tempered 1000 deg. F	115-125	80-90	17-22	50-60	240-265	23-27C	.....	1550	Oil
4140	4140	Hot Rolled, Annealed	90-100	60-70	20-30	50-60	185-210	91-95B	55	.....	.....
		Cold Drawn, Annealed	110-120	85-95	15-25	45-55	230-250	20-25C	65	.....	.....
		Heat Treated, Cold Drawn	140-155	125-140	12-20	45-55	270-300	26-30C	45	.....	.....
		1" Rd. Quenched Tempered 1000 deg. F	150-160	130-140	15-20	50-60	320-350	34-37C	.....	1550	Oil
		2" Rd. Quenched Tempered 1000 deg. F	145-155	125-135	15-20	50-60	320-345	33-36C	.....	1550	Oil
		3" Rd. Quenched Tempered 1000 deg. F	130-145	115-125	15-20	55-65	280-310	28-32C	.....	1550	Oil
4147-4150	4150	Hot Rolled, Annealed	90-105	65-75	20-30	50-60	185-215	92-96B	52	.....	.....
		1" Rd. Quenched Tempered 1000 deg. F	170-180	145-155	15-20	50-60	350-375	37-39C	.....	1525	Oil
		3" Rd. Quenched Tempered 1000 deg. F	150-160	130-140	15-20	50-60	325-350	34-37C	.....	1525	Oil
		4" Rd. Quenched Tempered 1000 deg. F	140-150	120-130	15-20	50-60	300-330	31-35C	.....	1525	Oil
		5" Rd. Quenched Tempered 1000 deg. F	135-150	115-125	15-22	52-62	295-320	30-34C	.....	1525	Oil
4340	4340	Hot Rolled, Annealed	100-120	70-90	15-25	40-50	220-250	20-25C	45	.....	.....
		2" Rd. Quenched Tempered 1000 deg. F	175-190	155-170	12-18	48-55	370-400	38-42C	.....	1550	Oil
		3" Rd. Quenched Tempered 1000 deg. F	170-180	140-155	12-20	45-50	350-375	36-39C	.....	1550	Oil
		4" Rd. Quenched Tempered 1000 deg. F	160-170	135-145	12-20	40-50	330-360	35-38C	.....	1550	Oil
		5" Rd. Quenched Tempered 1000 deg. F	145-160	125-135	10-15	40-50	300-330	31-36C	.....	1550	Oil
		6" Rd. Quenched Tempered 1000 deg. F	140-150	120-130	10-15	40-50	240-320	30-35C	.....	1550	Oil
4615	4615	Natural Hot Rolled	75-85	53-63	25-35	58-68	145-180	80-87B	50	.....	.....
		Cold Drawn	90-100	75-85	15-22	50-60	190-215	91-96B	55	.....	.....
		1" Rd. Carburized at 1700 deg. F. Cooled in Box, Reheated, Quench - Core Porperties	110-125	80-100	18-23	50-60	220-250	20-24C	.....	1525	Oil
4620	4620	Natural Hot Rolled	80-110	60-75	20-30	50-60	180-220	.....	50	.....	.....
		1" Rd. Carburized at 1700 deg. F. Cooled in Box, Reheated, Quench - Core Porperties	115-130	80-100	15-25	45-50	240-270	24-30C	.....	1525	Oil
4815	4815	Natural Hot Rolled	100-110	65-75	20-30	50-60	210-230	95-99B	50	.....	.....
		1" Rd. Carburized at 1700 deg. F. Cooled in Box, Reheated, Quench - Core Porperties	140-160	120-140	14-18	45-55	300-340	33-38C	.....	1525	Oil
E52100	52100	Hot Rolled, Annealed	100-110	75-85	20-25	50-60	210-235		45	.....	.....
		1" Rd. Quenched Tempered 1000 deg. F	180-195	65-80	10-15	35-45	375-415	40-43C	.....	1500	Oil
6150	6150	Hot Rolled, Annealed	95-110	75-85	20-30	50-60	200-230	14-21C	50	.....	.....
		1" Rd. Quenched Tempered 1000 deg. F	170-185	150-160	12-17	45-55	360-390	38-41C	.....	1575	Oil
8620	8620	Natural Hot Rolled	90-95	55-65	18-25	45-60	160-200	85-95B	55	.....	.....
		Cold Drawn	90-105	65-80	15-25	40-50	185-215	90-96B	60-70	.....	.....
		1" Rd. Carburized at 1700 deg. F. Cooled in Box, Reheated, Quench - Core Porperties	120-135	90-100	15-20	40-50	285-350	28-40C	.....	1550	Oil
8642	8642	Natural Hot Rolled	90-120	50-70	15-25	35-50	210-260	17-27C	50-55	.....	.....
		Hot Rolled, Heat Treated	125 Min.	105 Min.	16 Min.	50 Min.	260-320	26-33C	45-50	.....	.....
		Cold Drawn, Annealed	100-110	90-100	13-20	40-50	195-220	93-98B	65	.....	.....
		1" Rd. Quenched Tempered 1000 deg. F	150-160	130-140	15-20	50-55	325-345	34-37C	.....	1550	Oil
		2" Rd. Quenched Tempered 1000 deg. F	130-145	105-115	15-20	50-60	285-310	29-32C	.....	1550	Oil
8645	8645	Natural Hot Rolled	105-125	55-75	15-25	35-50	220-270	20-28C	48-55	.....	.....
		Hot Rolled, Annealed	100-110	50-60	20-25	40-55	210-230	17-21C	54	.....	.....
		2" Rd. Quenched Tempered 1000 deg. F	140-150	110-125	15-20	45-55	300-320	30-34C	.....	1550	Oil
		3" Rd. Quenched Tempered 1000 deg. F	130-140	105-115	15-20	50-60	285-310	29-32C	.....	1550	Oil
8742	8742	Natural Hot Rolled	110-125	50-70	15-25	35-50	230-270	22-28C	45-50	.....	.....
		Cold Drawn, Annealed	105-120	95-105	10-18	35-45	210-235	95-99B	60	.....	.....
		1" Rd. Quenched Tempered 1000 deg. F	155-165	135-145	15-20	45-52	330-355	35-38C	.....	1550	Oil
		2" Rd. Quenched Tempered 1000 deg. F	135-145	110-120	15-20	50-60	290-320	30-33C	.....	1550	Oil

Table 13 Approximate Equivalent Hardness Numbers for Rockwell C Hardness Numbers for Steel*

Rockwell C-scale hardness No.	Vickers Diamond Pyramid Hardness No.	Brinell Hardness No. 10 mm ball, 3000-kg load: Standard ball	Brinell Hardness No. 10 mm ball, 3000-kg load: Hultgren ball	Brinell Hardness No. 10 mm ball, 3000-kg load: Tungsten Carbide Ball	Rockwell Hardness No. A-scale 60-kg Load Brale Penetrator	Rockwell Hardness No. B-scale 100-kg Load,1/16 In-diam. Ball	Rockwell Hardness No. D-scale 100-kg Load, Brale Penetrator	Rockwell Superficial Hardness No. Superficial Brale Penetrator 15-N Scale 15-kg Load	30-N Scale 30-kg Load	45-N Scale 45-kg Load	Shore Scleroscope Hardness No.	Tensile Strength (Approx.) 1000 psi	Rockwell Hardness C-scale No.
68	940	.....	.....	.....	85.6	.....	76.9	93.2	84.4	75.4	97	.....	68
67	900	.....	.....	.....	85.0	.....	76.1	92.9	83.6	74.2	95	.....	67
66	865	.....	.....	.....	84.5	.....	75.4	92.5	82.8	73.3	92	.....	66
65	832	.....	.....	739	83.9	.....	74.5	92.2	81.9	72.0	91	.....	65
64	800	.....	.....	722	83.4	.....	73.8	91.8	81.1	71.0	88	.....	64
63	772	.....	.....	705	82.8	.....	73.0	91.4	80.1	69.9	87	.....	63
62	746	.....	.....	688	82.3	.....	72.2	91.1	79.3	68.8	85	.....	62
61	720	.....	.....	670	81.8	.....	71.5	90.7	78.4	67.7	83	.....	61
60	697	.....	613	654	81.2	.....	70.7	90.2	77.5	66.6	81	.....	60
59	674	.....	599	634	80.7	.....	69.9	89.8	76.6	65.5	80	326	59
58	653	.....	587	615	80.1	.....	69.2	89.3	75.7	64.3	78	315	58
57	633	.....	575	595	79.6	.....	68.5	88.9	74.8	63.2	76	305	57
56	613	.....	561	577	79.0	.....	67.7	88.3	73.9	62.0	75	295	56
55	595	.....	546	560	78.5	.....	66.9	87.9	73.0	60.9	74	287	55
54	577	.....	534	543	78.0	.....	66.1	87.4	72.0	59.8	72	278	54
53	560	.....	519	525	77.4	.....	65.4	86.9	71.2	58.6	71	269	53
52	544	500	508	512	76.8	.....	64.6	86.4	70.2	57.4	69	262	52
51	528	487	494	496	76.3	.....	63.8	85.9	69.4	56.1	68	253	51
50	513	475	481	481	75.9	.....	63.1	85.5	68.5	55.0	67	245	50
49	498	464	469	469	75.2	.....	62.1	85.0	67.6	53.8	66	239	49
48	484	451	455	455	74.7	.....	61.4	84.5	66.7	52.5	64	232	48
47	471	442	443	443	74.1	.....	60.8	83.9	65.8	51.4	63	225	47
46	**458**	**432**	**432**	**432**	**73.6**	.....	**60.0**	**83.5**	**64.8**	**50.3**	**62**	**219**	**46**
45	446	421	421	421	73.1	.....	59.2	83.0	64.0	49.0	60	212	45
44	434	409	409	409	72.5	.....	58.5	82.5	63.1	47.8	58	206	44
43	423	400	400	400	72.0	.....	57.7	82.0	62.2	46.7	57	201	43
42	412	390	390	390	71.5	.....	56.9	81.5	61.3	45.5	56	196	42
41	402	381	381	381	70.9	.....	56.2	80.9	60.4	44.3	55	191	41
40	392	371	371	371	70.4	.....	55.4	80.4	59.5	43.1	54	186	40
39	382	362	362	362	69.9	.....	54.6	79.9	58.6	41.9	52	181	39
38	372	353	353	353	69.4	.....	53.8	79.4	57.7	40.8	51	176	38
37	363	344	344	344	68.9	.....	53.1	78.8	56.8	39.6	50	172	37
36	354	336	336	336	68.4	(109.0)	52.3	78.3	55.9	38.4	49	168	36
35	345	327	327	327	67.9	(108.5)	51.5	77.7	55.0	37.2	48	163	35
34	336	319	319	319	67.4	(108.0)	50.8	77.2	54.2	36.1	47	159	34
33	327	311	311	311	66.8	(107.5)	50.0	76.6	53.3	34.9	46	154	33
32	318	301	301	301	66.3	(107.0)	49.2	76.1	52.1	33.7	44	150	32
31	310	294	294	294	65.8	(106.0)	48.4	75.6	51.3	32.5	43	146	31
30	302	286	286	286	65.3	(105.5)	47.7	75.0	50.4	31.3	42	142	30
29	294	279	279	279	64.7	(104.5)	47.0	74.5	49.5	30.1	41	138	29
28	286	271	271	271	64.3	(104.0)	46.1	73.9	48.6	28.9	41	134	28
27	279	264	264	264	63.8	(103.0)	45.2	73.3	47.7	27.8	40	131	27
26	272	258	258	258	63.3	(102.5)	44.6	72.8	46.8	26.7	38	127	26
25	266	253	253	253	62.8	(101.5)	43.8	72.2	45.9	25.5	38	124	25
24	260	247	247	247	62.4	(101.0)	43.1	71.6	45.0	24.3	37	121	24
23	254	243	243	243	62.0	100.0	42.1	71.0	44.0	23.1	36	118	23
22	248	237	237	237	61.5	99.0	41.6	70.5	43.2	22.0	35	115	22
21	243	231	231	231	61.0	98.5	40.9	69.9	42.3	20.7	35	113	21
20	238	226	226	226	60.5	97.8	40.1	69.4	41.5	19.6	34	110	20
(18)	230	219	219	219	.....	96.7	.....	.....	.....	.....	33	106	(18)
(16)	222	212	212	212	.....	95.5	.....	.....	.....	.....	32	102	(16)
(14)	213	203	203	203	.....	93.9	.....	.....	.....	.....	31	98	(14)
(12)	204	194	194	194	.....	92.3	.....	.....	.....	.....	29	94	(12)
(10)	196	187	187	187	.....	90.7	.....	.....	.....	.....	28	90	(10)
(8)	188	179	179	179	...	89.5	.....	.....	.....	.....	27	87	(8)
(6)	180	171	171	171	.....	87.1	.....	.....	.....	.....	26	84	(6)
(4)	173	165	165	165	.....	85.5	.....	.....	.....	.....	25	80	(4)
(2)	166	158	158	158	.....	83.5	.....	.....	.....	.....	24	77	(2)
(0)	160	152	152	152	.....	81.7	.....	.....	.....	.....	24	75	(0)

* Values for Rockwell hardness in parentheses are beyond normal range and are given for information only.

LUBRICATION

Introduction
Lubricants used in industrial speed reducers are normally oils rather than greases. While certain design criteria and operating conditions can dictate the use of greases in bearings and/or gear meshes, oils are the lubricant of choice from the standpoint of simplicity and ease of maintenance.

The oils thus serve two purposes:
1) To provide a protective film that reduces friction on the working surfaces of gears, seals and bearings; and
2) To provide a medium to absorb heat from the working surfaces and transfer it to the heat removal system.
Research has shown that only minute amounts of lubricant are actually required to reduce friction. The relatively large volume of oil used in lubricating systems serves the purpose of removing heat.

Types of Systems
The simplest and most popular reducer lubricating system is to partially fill the gearbox with the appropriate lubricant and to allow the rotating gears to splash oil into the required areas. Unless special sealing provisions have been made, the best practice is to keep the oil level below the lip of the lowest seal. Furthermore, the oil level should be kept as low as possible to prevent heating of the oil by churning. Strategic placement of wipers can help. The oil level is lowered and the wiper skims oil from the rotating gear face and directs it into critical bearing locations and gear mesh points. When it becomes impractical to maintain an oil level (due to gearbox speed or orientation, for example), a circulating oil pump can be introduced. Driven by one of the gearbox shafts, or by an electric motor, the pump draws oil out of a small sump and directs it to the critical bearing and mesh points. Heaters, coolers, filters and other conditioning devices can be incorporated into this pumping circuit.
Other lubrication methods, such as oil injection and oil mist injection are available, but add considerable cost to the system. Prudent designers try to stay with the two methods outlined in the above paragraphs.

Thermal Limitations
In a general sense, reducers whose highly loaded gear meshes operate at higher speeds, produce more heat. Gear tooth grinding can improve efficiency and minimize this heat because of the inherent smooth finish and high accuracy. But under certain conditions the gearbox surface area becomes inadequate to dissipate the heat being transferred into the lubricating oil. Thus a thermal horsepower limit is established for the reducer.

Most thermal horsepower charts are based on splash lubricated reducers operating in relatively still air. Degrees of improvement in the thermal rating can be effected by using external fans, shaft mounted fans, oil heat exchangers, or centralized lubrication coolers. Rating improvements due to fans can usually be determined from catalog data. More exotic solutions should be referred to the factory.

Lubricant Types
A myriad of products are marketed as gear lubricants. As mentioned previously, grease might be selected for a reducer operating very slowly in a benign environment. Some reducers combine grease and oil, using oil splash for the gears and sealed cavities fed with grease for the bearings. The most popular approach, however, is to splash oil.

Straight mineral oils are acceptable lubricants for many types of lightly loaded gearing. These should contain rust and oxidation inhibitors, and are therefore known as R & O oils.

Where a stronger lubrication film is required, as in worm gears, fatty acids, or vegetable or animal fats are added to the mineral oils, and these blends are known as compounded oils.

For heavy duty service, where a lubricant film must be assured under conditions of high contact pressure and relatively low pitching velocity, a class of additives known as EP (extreme pressure) is used. These additives normally consist of Chlorine, Sulphur or Phosphorus in solution with the oil. (Note that certain of the EP oils are not suitable for use in worm gear drives because their additives react chemically with the bronze worm wheel. Compatibility with bronze at elevated temperature and pressure must be checked with lubricant manufacturer. Also note that EP oils are not recommended for lubrication of backstops on units so equipped.)

A variety of synthetic lubricants has come on the market, many of which have proven to be adequate in gearbox service. Their improved stability, resistance to oxidation, extended viscosity range, and extended life have been found to offset their higher price. Before switching to synthetics, the user must assure himself that the synthetic product is compatible with shaft seals, gears, and any residual mineral oils left in the gearcase.

Lubricant Grades
For reducers exposed to temperature extremes, it has been customary to specify different viscosity grades, dependent upon the season. Winter months require lighter oils with low pour points to endure cold start ups. Summer months require heavier oils that can maintain their viscosity (and thus maintain a lube film) at higher summer operating temperatures. See lubrication tables in catalog and service manual for further information.

Circulating oil systems with heaters and coolers can circumvent the seasonal oil change, since they can condition the oil to maintain ideal operating temperatures. The synthetics can also help eliminate the seasonal change because a single oil can often be supplied with a reduced pour point and increased high temperature viscosity. However, in no case should the oil change interval be extended beyond Rexnord Geared Products Division's recommendations. See Lubricant Tables in catalog and service manual for further information.

Rexnord Geared Products Division specifies lubricants per American Gear Manufacturers Association oil grades. See the most recent revision of ANSI/AGMA 9005-D94 Industrial Gear Lubrication for full information. Rexnord Geared Products Division does not endorse any lubricant manufacturer's products. However, for the sake of convenience, products that several manufacturers claim meet AGMA specifications are listed in the Typical Oils tables of the catalog and service manual.

Table 14 - Viscosity ranges for AGMA* lubricants

Rust and oxidation inhibited gear oils AGMA Lubricant No.	Viscosity range[1] mm^2/s (cSt) at 40°C	Equivalent ISO grade [1]	Extreme pressure gear lubricants [2] AGMA Lubricant No.	Synthetic gear oils [3] AGMA Lubricant No.
0	28.8 to 35.2	32		0 S
1	41.4 to 50.6	46		1 S
2	61.2 to 74.8	68	2EP	2 S
3	90 to 110	100	3 EP	3 S
4	135 to 165	150	4 EP	4 S
5	198 to 242	220	5 EP	5 S
6	288 to 352	320	6 EP	6 S
7, 7 Comp [4]	414 to 506	460	7 EP	7 S
8, 8 Comp [4]	612 to 748	680	8 EP	8 S
8A Comp [4]	900 to 1100	1000	8A EP	-
9	1350 to 1650	1500	9 EP	9 S
10	2880 to 3520	-	10EP	10 S
11	4140 to 5060	-	11EP	11 S
12	6120 to 7480	-	12EP	12 S
13	190 to 220 cSt at 100°C (212°F) [5]	-	13EP	13 S
Residual compounds [6] AGMA Lubricant No.	**Viscosity ranges [5] cSt at 100°C (212°F)**			
14R	428.5 to 857.0			
15R	857.0 to 1714.0			

NOTES
1) per ISO 3448, *Industrial Liquid Lubricants - ISO Viscosity Classification*, Also ASTM D 2422 and British Standards Institution B.S. 4231.
2) Extreme pressure lubricants should be used only when recommended by the gear manufacturer.
3) Synthetic gear oils 9S - 13S are available but not yet in wide use.
4) Oils marked Comp are compounded with 3% to 10% fatty or synthetic fatty oils.
5) Viscosities of AGMA Lubricant Number 13 and above are specified at 100°C (210°F) as measurement of viscosities of these heavy lubricants at 40°C (100°F) would not be practical.
6) Residual compounds-diluent type, commonly known as solvent cutbacks, are heavy oils containing a volatile, non-flammable diluent for ease of application. The diluent evaporates leaving a thick film of lubricant on the gear teeth. Viscosities listed are for the base compound without diluent.
CAUTION: These lubricants may require special handling and storage procedures. Diluent can be toxic or irritating to the skin. Do not use these lubricants without proper ventilation. Consult lubricant supplier's instructions.

*Extracted from ANSI/AGMA 9005-D94 "Industrial Gear Lubrication", with permission of the publisher, The American Gear Manufacturers Association.

Table 15 - AGMA* Lubricant number guidelines for enclosed helical, herringbone, straight bevel, spiral bevel and spur gear drives [1]

Pitch line velocity [2),3)] of final reduction stage	AGMA lubricant numbers,[1),4),5)] ambient temperature °C (°F) [6),7)]			
	-40 to -10 (-40 to +14)	-10 to +10 (14 to 50)	10 to 35 (50 to 95)	35 to 55 (95 to 131)
Less than 5 m/s (1000 ft/min)[8)]	3 S	4	6	8
5-15 m/s (1000 - 3000 ft/min)	3 S	3	5	7
15-25 m/s (3000 - 5000 ft/min)	2 S	2	4	6
Above 25 m/s (5000 ft/min) [8)]	0 S	0	2	3

NOTES

1) AGMA lubricant numbers listed above refer to R & O and synthetic gear oil shown in table 4. Physical and performance specifications are shown in tables 1 and 3. EP or synthetic gear lubricants in the corresponding viscosity grades may be substituted where deemed acceptable by the gear drive manufacturer.
2) Special considerations may be necessary at speeds above 40 meters per second (8000 feet per minute). Consult gear drive manufacturer for specific recommendations.
3) Pitch line velocity replaces center distance as the gear drive parameter for lubricant selection. The corresponding table from the previous standard is included as annex B for reference.
4) Variations in operating conditions such as surface roughness, temperature rise, loading, speed, etc., may necessitate use of a lubricant of one grade higher or lower. Contact gear drive manufacturer for specific recommendations.
5) Drives incorporating wet clutches or over running clutches as backstopping devices should be referred to the gear manufacturer as certain types of lubricants may adversely affect clutch performance.
6) For ambient temperatures outside the ranges shown, consult the gear manufacturer.
7) Pour point of lubricant selected should be at least 5°C (9°F) lower than the expected minimum ambient starting temperature. If the ambient starting temperature approaches lubricant pour point, oil sump heaters may be required to facilitate starting and ensure proper lubrication (see 5.1.6).
8) At the extreme upper and lower pitch line velocity ranges, special consideration should be given to all drive components, including bearing and seals, to ensure their proper performance.

Table 16- AGMA* Lubricant number guidelines for enclosed cylindrical wormgear drives [1]

Pitch line velocity [2)] of final reduction stage	AGMA lubricant numbers, [1)] ambient temperature °C (°F) [3),4)]			
	-40 to -10 (-40 to +14)	-10 to +10 (14 to 50)	10 to 35 (50 to 95)	35 to 55 (95 to 131)
Less than 2.25 m/s (450 ft/min)	5 S	7 Comp	8 Comp	8 S
Above 2.25 m/s (450 ft/min)	5 S	7 Comp	7 Comp	7 S

NOTES

1) AGMA lubricant numbers listed above refer to compounded R&O oils and synthetic oils shown in table 4. Physical and performance specifications are shown in tables 1 and 3. Wormgear drives may also operate satisfactorily using other types of oils. Such oils should be used, however, only with approval of the gear manufacturer.
2) Pitch line velocity replaces center distance as the gear drive parameter for lubricant selection. The corresponding table from the previous standard is included as annex B for reference.
3) Pour point of the oil used should be at least 5°C (9°F) lower than the minimum ambient temperature expected.
4) Wormgear applications involving temperatures outside the limits shown above, or speeds exceeding 2400 rpm or 10 m/s (2000 ft/min) sliding velocity, should be referred to the manufacturer. In general, for higher speeds a pressurized lubrication system is required along with adjustments in recommended viscosity grade.

*Extracted from ANSI/AGMA 9005-D94 "Industrial Gear Lubrication", with permission of the publisher, The American Gear Manufacturers Association.

Glossary

ACCELERATION TORQUE
The torque available from a prime mover after overcoming friction to accelerate a load from one speed to a higher speed, most usually from zero rpm to full load rpm.

ADDENDUM
Height of a gear tooth above the pitch diameter.

ADDITIVE
Materials added to a lubricating oil or grease to improve its suitability for service. Typical examples; rust and oxidation inhibitors and extreme pressure agents.

AFBMA
Anti-friction Bearing Manufacturers Association. An association of bearing manufacturers producing and publishing standards for anti-friction ball and roller bearings and associated bearing parts.

AGMA
American Gear Manufacturers Association. A standards producing trade association of members who manufacture open gears, speed reducers, flexible couplings and gear machinery and equipment.

AGMA LUBRICANT NUMBERS
A system assigning integer numbers to various lubricant viscosity ranges. Numbers increase with increasing viscosity ranges. Higher numbers indicate heavier or thicker lubricants.

AGMA RATIOS
A geometrical progression of ideal gear ratios with a ratio between terms of 1.5. Enclosed gear drives with spur, helical, herringbone or spiral bevel gears generally adhere to these ratios within the tolerances specified by AGMA.

ALLOWABLE STRESS
The maximum unit stress (psi) that is considered safe for a member in service under load. Also known as working stress.

ALLOY STEEL
Combination of iron, carbon with some other element, such as nickel, chromium, tungsten, vanadium, manganese, and molybdenum. All of these metals give certain distinct properties to steel. Primarily increase in hardness and toughness.

ANSI
American National Standards Institute. A federation of trade associations, technical societies, professional groups and consumer organizations providing for the creation of voluntary standards under the designation "American National Standards".

ASTM
American Society for Testing and Materials. A scientific and technical organization devoted to the development of voluntary standards on the characteristics and perfor- mance of materials, products, systems and services.

AVERAGE LIFE
As applied to bearings is the life in hours that 50% of bearings will exceed. It is equal to five times B-10 life.

B-10 - (L-10) LIFE
The statistical fatigue life that may be expected from 90% of a given group of approximately identical bearings operating under equal conditions of load and speed.

BACKLASH
The amount by which the width of a tooth space exceeds the thickness of the mating tooth at the operating pitch circles.

BACKSTOP
An overrunning clutch that rotates freely in one direction of rotation but locks mechanically in the opposite direction to prevent rotation.

BASE CIRCLE
The circle from which the involute portion of a tooth profile is developed.

BENDING MOMENT
Force which tends to rotate a beam or a shaft along its axis creating a bending moment in that object. Units of bending moment are pound-in. or pound-ft.

BENDING STRESS
Tensile or compressive stresses in a beam or shaft as a result of bending moment.

BEVEL GEARS
Gears of conical form designed to operate on intersecting axis.

BREAKDOWN TORQUE
The maximum torque developed during the starting cycle of an electric motor without an abrupt drop in speed.

CATALOG RATIO
The nominal gear ratio listed in speed reducer catalogs. Normally, the same as AGMA ratio.

CENTER DISTANCE
Perpendicular distance between the axes of mating gears.

CENTISTOKE (CST)
An international measure of a fluid's kinematic viscosity.

CIRCULAR PITCH
Distance along pitch circle between corresponding profiles of adjacent teeth.

COMBINED STRESS
A stress induced in a loaded member by a combination of normal stresses (perpendicular to the surface of contact) and shearing stresses (tangential to the surface of contact).

COMPOUNDED OIL
A mineral oil compounded with 3% to 10% of fatty or synthetic fatty oils.

COMPRESSIVE STRESS
Stress which causes a decrease in the length of the body in the direction of the force, or one of the stresses created by a bending moment.

CROSSED HELICAL GEARS
Gears that operate on non-intersecting axes.

CROWNED TEETH
Teeth having their surfaces crowned along their length to prevent contact at their ends.

CYLINDRICAL WORM
A gear having one or more teeth in the form of screw threads located on a cylinder.

DECIBEL (dB)
Unit of measure for sound pressure level.

DEDENDUM
Depth of tooth below pitch diameter.

DEMAND LOAD
Actual horsepower required at the driven machine input shaft to perform the required work.

DESIGN "B" MOTOR
General purpose AC electric motor with normal starting torque and current and low slip.

DESIGN "C" MOTOR
High starting torque AC electric motor with normal starting current and low slip. Normally used where breakaway loads are high.

DESIGN "D" MOTOR
Very high starting torque AC electric motor with high slip and low starting current. Normally available in two designs, 5% to 8% slip and 8% to 13% slip.

DIAMETRAL PITCH
Number designating the size of a gear tooth and is the ratio of the number of teeth to the standard pitch diameter in inches.

DOUBLE ENVELOPING WORMGEARING
Wormgearing in which the worm and gear wrap around each other, or double envelop, to produce a drive with an hour glass shaped worm and a throated gear.

DOUBLE HELICAL GEAR
A single gear having both right and left hand teeth. The teeth are separated by a gap between the helices.

DUCTILE (NODULAR) CAST IRON
Gray iron treated with special alloy while in the liquid state so that the graphite is spherulitic rather than flake. This results in greater strength and ductility.

EFFECTIVE FACE WIDTH
The part of the total face width which actually comes in contact with mating teeth.

EFFICIENCY
The ratio of useful power output to total power input.

ELASTIC LIMIT
The maximum stress which a material may be subjected to without the occurrence of plastic deformation.

ENDPLAY
The amount of lateral (axial) movement in a shaft or bearing assembly.

ENDURANCE LIMIT
The highest stress under a great number of repetitive loadings which will not produce evidence of failure.

EXTREME PRESSURE (EP) LUBRICANT
An oil or grease containing chemical additives which form a protective film to withstand high pressures.

EQUIVALENT HORSEPOWER
The demand or transmitted horsepower multiplied by the service factor for the applicable conditions of prime mover, load and hours of operation.

EXTERNAL GEAR
A gear with teeth formed on its outer surface.

FACE GEARS
A gear set in which the teeth of the gear are formed on the face of a disc and the pinion axis is usually at right angles.

FACE WIDTH
The length of the teeth on a gear in the axial plane.

FATIGUE LIMIT
Also known as an endurance limit. Maximum value of completely reversed bending stress which the object can sustain for an infinite number of load cycles.

FLASH POINT
Temperature at which the material will ignite without being subjected to actual fire.

FULL DEPTH TEETH
Teeth in which the working depth equals 2.000 divided by the normal diametral pitch.

GEAR
Of two gears that run together, the one with the larger number of teeth.

GEAR RATIO
The ratio of the larger number to the smaller number of teeth in a pair of gears.

GRAY CAST IRON
An alloy of iron and carbon (1.7% to 4.5%), and silicon (1% to 3%), traces of manganese, phosphorus and sulphur. Carbon in form of flakes. Standard material for most reducer housings, bearing retainers, etc.

HELICAL GEAR
A spur gear whose tooth profiles are not parallel to the axis of rotation.

HELIX ANGLE
The angle between any helix and an axial reference perpendicular to the face of a gear.

HERRINGBONE GEAR
(Sykes Cut) Continuous tooth double helical gears (left and right hand) cut without a groove separating the two rows of teeth.

HORSEPOWER
Unit of power equal to 33,000 ft.-lbs. per minute.

HOURGLASS WORM
A worm that increases in diameter from its middle portion toward both ends.

HYPOID GEARS
Gears similar in form to bevel gears but designed to operate on non-intersecting axes.

INERTIA
A property of material by which it will remain at rest or in uniform motion unless acted upon by some external force.

INERTIAL LOAD
The amount of work necessary to change the steady state of an object. Or, the power required to accelerate or decelerate an object.

INDUCTION MOTOR
The most generally used AC motor, the induction motor is one in which the magnetic field in the rotor is induced by currents flowing in the stator. The rotor speed is always less than the motor theoretical synchronous speed.

INTERNAL GEAR
A gear with teeth formed on its inner cylindrical surface.

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INVOLUTE TEETH
Gear teeth which have the profile of the involute of a circle.

ISO
International Standards Organization - A group which correlates the standards of participating countries and establishes international standards.

KILOWATT
A unit of electrical power equal to 1000 watts. One kilowatt equals 1.34 horsepower.

KILOWATT HOUR (KwH)
The work performed by one kilowatt acting over one hour.

LEAD
Axial advance of a point moving on a helix through one revolution.

LEAD ANGLE
Angle between a helix and a line of reference perpendicular to the axis of rotation of a worm gear.

LEFT HAND HELICAL GEAR
One in which the teeth twist counter clockwise or to the left as they recede from the observer.

LOAD CLASS
An expected load or type of service classification determined by the operation of a particular type of driven machine. Load classifications are normally uniform, moderate shock or heavy shock.

LOCKED ROTOR TORQUE
The minimum torque developed at rest by an electric motor with rated voltage applied at rated frequency.

LONG AND SHORT ADDENDUM TEETH
Teeth of engaging gears, one having a long addendum, the other a short addendum.

MITER GEARS
Mating bevel gears with equal numbers of teeth and with axes at right angles.

MODULE (INCH)
Ratio of pitch diameter in inches to the number of teeth. Also, the reciprocal of the diametral pitch.

MODULE (MILLIMETER)
Ratio of pitch diameter in millimeters to the number of teeth.

MOMENT OF INERTIA (WK^2 OR WR^2)
Property of an object which relates its weight and the location of the weight K, called radius of gyration. WK^2 is used in calculating the flywheel affects of an object.

NEMA
National Electrical Manufacturers Association - A trade association of manufacturers of electrical apparatus and supplies engaged in setting standards for electric motors and generators.

NLGI
National Lubricating Grease Institute - A trade association engaged in setting standards for the lubricating grease industry.

NLGI NUMBER
A numerical scale for classifying the consistency range of lubricating greases. As numbers increase grease consistency thickens.

NORMAL CIRCULAR PITCH
The distance in a plane at right angles (normal) to the helix between corresponding profiles of adjacent equally spaced teeth.

NORMAL DIAMETRAL PITCH
The diametral pitch in a normal plane of a helical gear or worm.

OPERATING PITCH DIAMETERS
Pitch diameters determined from the numbers of teeth and the center distance at which gears operate.

OUTSIDE DIAMETER
Cylindrical gear or worm; the maximum diameter of the toothed portion. Bevel gear; the diameter of the crown circle. Throated wormgear; the maximum diameter of the blank.

OVERRUNNING LOAD
Loads characterized by the load reaction acting in the same direction as the powered motion of the prime mover. E.g. a crane lowering a weighty load.

OVERHUNG LOAD
A load resulting in a bending moment applied to the shaft of a speed reducer by connecting belts, chains or gears.

PINION
Of two gears that run together, the one with the smaller number of teeth.

PITCH
Distance between corresponding points on equally spaced teeth.

PLANE OF ROTATION
A plane perpendicular to a gear axis.

PLUGGING
The instantaneous reversal of electric motor shaft rotation accomplished by across the line reversal of electrical current.

POWER FACTOR
The ratio of the actual power used by an electrical device to do useful work to the apparent power furnished by the utility company.

PRESSURE ANGLE
An angle formed by a normal line to a tooth profile and a line of intersection with the corresponding pitch plane.

PULL UP TORQUE
The minimum torque developed during acceleration of an electric motor from rest to the breakdown torque speed.

RACK
Gear with teeth spaced along a straight line and suitable for straight line motion.

RESISTIVE LOAD
One in which the load reaction opposes the motion of the prime mover. E.g. moving palletized bricks along tracks in a wheeled car.

RIGHT HAND HELICAL GEAR
One in which the teeth twist clockwise or to the right as they recede from the observer looking along the axis.

ROOT CIRCLE
The circle tangent to the roots of the tooth spaces in a cross section.

ROOT DIAMETER
Diameter of the root circle.

SAFETY FACTOR
The ratio of the ultimate strength (or yield strength or fatigue strength, depending on the designer) of a material to the allowable or working stress for that material.

SERVICE FACTOR
A multiplying factor applied to the load demand horsepower or the speed reducer catalog horsepower rating which ensures adequate service life of the reducer. Service factor considers load class, type of prime mover and hours of operation.

SHEARING STRESS
The stress resulting from parallel internal forces in a body which tend to slide one part over the other part in opposite directions.

SINGLE HELICAL GEARS
Those having teeth of only one hand on each gear.

SPEED INCREASER
A device which increases speed and for a given input horsepower decreases output torque.

SPEED REDUCER
A device which decreases speed and for a given input horsepower increases output torque.

SPIRAL BEVEL GEAR
Bevel gears having teeth which are curved and oblique.

SPUR GEARS
Cylindrical gears with teeth that are straight and parallel and that operate on parallel axes.

SSU
Saybolt Universal Viscosity, a measure of the viscosity of fluids.

STARTING TORQUE
The total torque available from a prime mover to overcome friction, accelerate its own parts and the load from rest to load speed.

STRAIGHT BEVEL GEARS
Bevel gears with straight tooth elements which, if extended, would pass through the point of intersection of their axes.

STUB TEETH
Those in which the working depth is less than 2.00 divided by the normal diametral pitch.

SYNCHRONOUS MOTOR
Constant speed AC motor which operates in absolute synchronism with frequency. Speed is determined by the number of pole pairs and by the frequency.

SYNTHETIC LUBRICANT
A lubricant which does not contain mineral oil, but which may be made from man-made hydrocarbons, diesters or polyglycols.

TENSILE STRESS
The internal stress developed in a body when it resists the action of external forces which are tending to increase its length.

THERMAL HORSEPOWER
The heat limited horsepower rating of a speed reducer. It is based on the heat dissipatation ability of the housing to limit the temperature rise to 100 deg. F over ambient, or the total sump temperature to a maximum of 200 deg. F.

TOOTH PROFILE
The outline of a tooth between the addendum or outside diameter circle and the root circle.

TORQUE
Unit of work created by a twisting effort resulting in shear stress in an object.

TORSION
The twisting of a body by forces tending to turn one end of a part about a longitudinal axis, while the other is held fast or turned in the opposite direction.

ULTIMATE STRENGTH
The highest unit stress a material can withstand before rupturing.

VISCOSITY
That property of a fluid which enables it to offer resistance to shear stress.

VISCOSITY INDEX
A dimensionless number indicating the effect of change in temperature on the viscosity of an oil. A low viscosity index signifies a relatively large change in viscosity with temperature.

WHOLE DEPTH
The total depth of a tooth space, equal to the sum of the addendum plus dedendum. Also, the working depth plus clearance.

WORK
The result of a force or twisting effort producing motion. Motion must result if work is done.

WORKING DEPTH
The depth of engagement of two gears, that is, the sum of their addendums.

WORM
Gear with one or more teeth in the form of screw threads.

WORM GEAR
Gear mating with a worm.

YIELD POINT
The unit stress at which deformation of a material first increases markedly without an increase in the applied load.

YIELD STRENGTH
The stress at which a material takes a limited specified permanent set. It is a measure of the useful limit of materials.

General Installation, Operating & Maintenance of Speed Reducers

To provide the ultimate in speed reducer operation Link-Belt® speed reducers have been engineered and built using the latest in gearing technology. They are industry's choice for efficient, economical transmission of power from prime mover to machine. We take extreme care in designing and manufacturing our products, and are proud of their performance.

This section is to familiarize you with the general procedures for installation, operation and maintenance of speed reducers. Should questions arise that are not answered here, refer to the service manual written for the specific speed reducer in question. These manuals are supplied with each unit shipped from our factories. Additional manuals are available by contacting the nearest Rexnord Service Center.

NOTE: Always refer to the appropriate service manual supplied with the speed reducer for warnings, cautions, and notes pertaining to the safe installation and operation of that specific unit.

1. **MOUNTING**
   Foot mounted units must be positioned horizontally unless specifically ordered for another mounting position. Avoid overloading shafts, bearings and housings by using a rigid flat support foundation such as a Link-Belt supplied baseplate, and providing accurate initial alignment. All housing feet must rest firmly on supports before being bolted down. Use the proper size mounting bolts with a flat washer under the head of each bolt. Mounting bolts must be tightened only after the unit, motor and/or other auxiliary equipment has been carefully aligned. Care should be taken to ensure that the drive rests properly on the foundation, and that the input and output shafts are aligned in accordance with the coupling manufacturer's specifications with the corresponding shafts of the driving and driven equipment.

   Alignment and leveling of the unit is accomplished by careful shimming between the mounting feet and the foundation. Dowel pins or shear blocks should be provided on the mounting feet, to maintain proper alignment.

   If the reducer and other drive components are mounted on a Link-Belt Steel Baseplate, recheck the factory alignment of all components' shafts to insure nothing has been misaligned during shipment and installation.

   Care must be taken to ensure that the unit is readily accessible, particularly the oil filter and drain plugs, the oil sight glass or dipstick, and the inspection cover. If the speed reducer is supplied with a cooling fan, there must be an unrestricted air flow over the reducer housing. Reducers with a built in cooler or separate oil to water cooler require water connections. For dimensions of connections and special operating instructions refer to Link-Belt Drive Division.

2. **MOUNTING OF COUPLINGS, GEARS, SPROCKETS OR SHEAVES**
   To prevent possible damage to reducer internal parts, avoid hammer blows on the shaft projections when mounting couplings, gears, sprockets, sheaves, etc. These components should be mounted onto the shafts using proper shop practices. To facilitate this, the shafts can be greased and the tapered holes in the shaft ends used for pulling components on. When a tight fit occurs, the component will slide on easily after pre-heating it in oil or an oven to 150°F to 200°F to expand its bore.

   Flexible Coupling Connection—Flexible couplings should be utilized for all direct connections between components. Although these couplings will compensate for minor parallel and angular misalignment, initial alignment of the connected shafts should be as accurate as possible to enable the coupling to accommodate any variations that may later develop during normal operation of the drive, such as settling or conditions caused by temperature variations.

   Parallel alignment can be checked by laying a straightedge on the coupling diameter, parallel to the shaft, at two positions 90° apart. The straightedge should rest on the full length of both of the coupling members.

   Angular alignment can be checked with feeler gauges between the coupling halves at four positions, 90° apart on the faces, to check for uniform spacing between the coupling halves.

   Spur gear connection—When spur gears are the connection, the gear drive shaft and the connecting shaft must be parallel and accurately spaced on centers. Alignment can be roughly checked by placing a straightedge across the faces of the two gears, as shown in the illustration.

   For greater accuracy, a feeler gauge may be used to check alignment by determining that teeth are making equal contact across the tooth face. The gauge is used at the point where teeth are just starting to mesh. A final check may be made by coating the pinion teeth with Prussian blue and manually turning the drive. The contact should extend straight across the tooth face.

   Chain or belt connection—The two shafts being connected should be parallel and sprockets or sheaves should be in line. Align the shafts horizontally by means of a machinists level and adjust parallel alignment with a vernier caliper or feeler bar. For sprocket or sheave alignment, lay a straightedge across the machined faces; it must contact at all points. Use manufacturers recommendations for chain or belt slack.

Outboard bearing support—When an outboard bearing is used, it must be accurately located. The position of the bearing after being firmly fastened should be the same as if it were hanging freely on the extended shaft of the drive. Otherwise, the extended shaft will be deflected.

Always check the shaft for free turning after the drive and bearing have been bolted down.

3. **PRE START CHECK LIST**
The following is a list of general checks to be made prior to start up of a speed reducer.
   a. Are mounting bolts tight? Have you checked all external bolts, screws, etc., to make sure they are tight and have not loosened during shipment and handling.
   b. Are couplings, sprockets, pinions, etc. mounted on shaft projections correctly with keys in place?
   c. Have couplings been greased?
   d. Have coupling connections been aligned and tightened properly?
   e. Has reducer been filled to the proper oil level indicated on dip stick or sight glass with type and grade of oil recommended.
   f. Have all inspection covers and pipe plugs on unit been closed and properly tightened?
   g. Have electrical connections been made?
   h. Does the motor shaft rotate in the proper direction?

4. **ON SITE STORAGE**
When speed reducers are to be stored, full protection will best be obtained indoors in a clean, dry place, under relatively even, moderate temperatures. When outdoor storage is unavoidable, provide adequate protection from the elements.

   Housing interiors and operating parts of the speed reducer are protected by a rust inhibitor, such as Texaco Engine Preservative Oil 10W, before leaving the factory. This oil meets Military Specs MIL-L-21260 for preservative engine oils.

   Proper storage of drives will permit protection for approximately one year against corrosion from condensation. For longer periods follow the Long Term Storage instructions or consult Rexnord Geared Products Division.

5. **OUTDOOR AND LONG TERM STORAGE OF SPEED REDUCERS**
It is always preferable to store speed reducers indoors. When this is not possible, or when storage is for a period longer than one year, follow these instructions.
   a. Reducers should never be exposed to the elements. They must be protected from the elements in some manner. If stored outdoors, cover with a tarp that can be secured to the base of the reducer housing.
   b. Remove plug from breather hole and attach a sufficient length of pipe to extend above the highest part of the speed reducer.
   c. Cap the pipe (pipe cap should be drilled and tapped for alemite fitting) and install alemite #317400 fitting to relieve potential internal pressure.
   d. Fill reducer completely with a heavy rust inhibitor such as Gulf No-Rust Engine Oil, Grade 3, which conforms to Military Specification MIL-L-21260.
   e. At least every three months rotate input shaft. Be sure the output shaft rotates more than one revolution. This is done to insure all internal parts are coated with fresh oil and that the shaft seals are free and the seal journals are coated with oil.
   f. At least every three months check the speed reducer for water condensation by removing lowest drain plug and allowing small amount of oil to drain from the oil sump. All water that may have accumulated will be at bottom of reducer housing and will drain out first.
   g. Check all exposed fittings and shaft projections every three months for integrity of the protective coating. Reapply coating if required, to prevent possible corrosion of shafts. Use Cosmoline 1102 MIL-C-16173 Grade 2 or equivalent.

   Before starting the reducer be sure to drain all preservative oil and refill to proper level with the appropriate oil listed in the lubrication instructions.

SPARE AND REPLACEMENT PARTS
When spare or replacement parts are required for a speed reducer, the following information is required to insure correct parts are supplied.

1. Unit serial number
2. Unit model number
3. Unit ratio
4. Description of part and/or locator number from parts drawing. (Parts drawings are found in the service manual supplied with each Link Belt speed reducer)
5. Quantity required

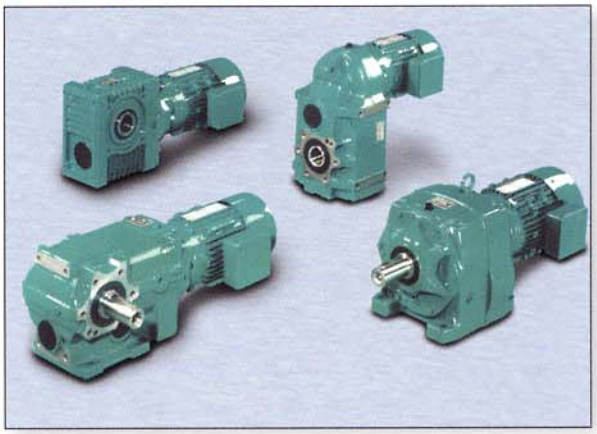
In general, installations having 1 to 5 identical speed reducers need only inventory a minimum of spare parts. We recommend one set of high speed bearings, one set of input and output seals and one high speed gear set. For critical applications, or where more than 5 identical units are involved, we recommend one complete speed reducer be carried as a spare along with the above mentioned parts.

Refer to the individual service manual supplied with the speed reducer for locator numbers of parts.

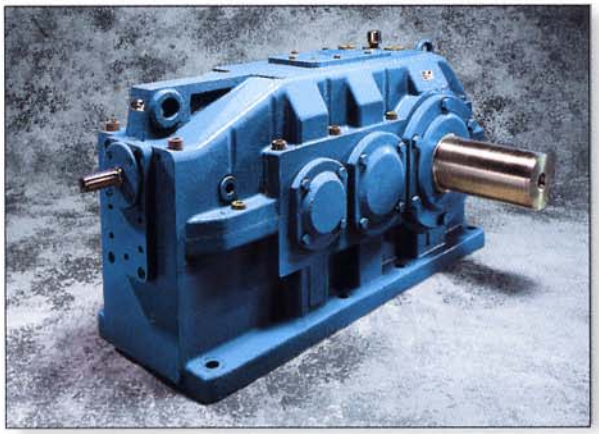
REPAIR SERVICE
Rexnord Geared Products Division maintains an authorized service shop network and a factory repair shop to service and repair our products. Refer to the back cover of the service manual supplied with your reducer or contact your local representative for the name of the service shop in your area.

Other Products Available

Rex® Planetgear™ Speed Reducers

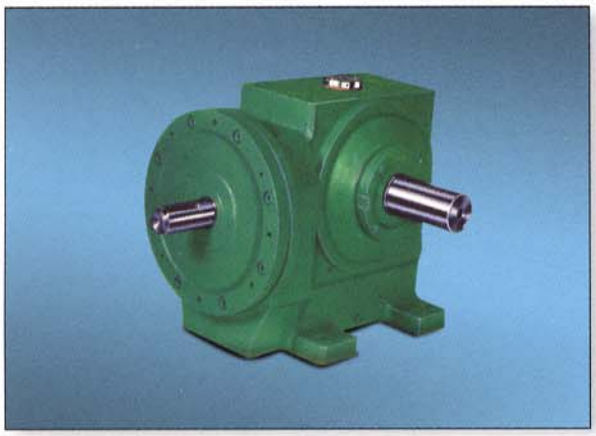


Rex® S3 Gearmotors and Reducers

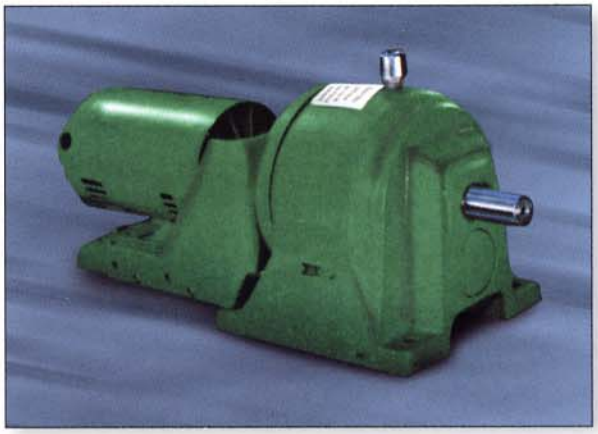


Link-Belt® Model R Reducers

Link-Belt® P.I.V. Mechanical Variable Speed Reducers



Link-Belt® Worm Reducers



Link-Belt® Inline Reducers

Complete Packages Available

Motor Couplings, Sleeves, Belts, Sprockets and Guards

(Assorted Couplings Shown)

World Class Customer Service

For over 100 years the dedicated people of Rexnord have delivered excellence in quality and service to our customers around the globe. Rexnord is a trusted name when it comes to providing skillfully engineered products that improve productivity and efficiency for industrial applications worldwide. We are committed to exceeding customer expectations in every area of our business: product design, application engineering, operations and customer service.

Because of our customer focus, we are able to more thoroughly understand the needs of your business and have the resources available to work closely with you to reduce maintenance costs, eliminate redundant inventories and prevent equipment down time.

Rexnord represents the most comprehensive portfolio of power transmission and conveying components in the world with the brands you know and trust.

The Power of Rexnord™

WORLDWIDE CUSTOMER SERVICE

AUSTRALIA
Rexnord Australia Pty. Ltd.
Picton, New South Wales
Phone: 61.2.4677.3811
Fax: 61.2.4677.3812

BRAZIL
Rexnord Correntes Ltda.
Sao Leopoldo - RS
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CHINA
Rexnord China
Shanghai, China
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Fax: 86.21.62701943

EUROPE
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Vilvoorde, Belgium
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Fax: 32.2.720.1023

Rexnord Kette GmbH
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Phone: 49.2741.2840
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Queretaro, Qro.
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Fax: 52.442.218.1090

SINGAPORE
Rexnord International, Inc.
Singapore City, Singapore
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Fax: 65.6338.5422

UNITED STATES
Eastern Service Center
Smyrna, Georgia
Phone: 1.770.431.7200
Fax: 1.770.431.7299

Central Service Center
Grove City, Ohio
Phone: 1.614.675.1800
Fax: 1.614.675.1898

Southern Service Center
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