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LUFKIN GEARS

HERRINGBONE GEAR SPEED REDUCERS AND INCREASERS



GEAR CATALOG G-20A

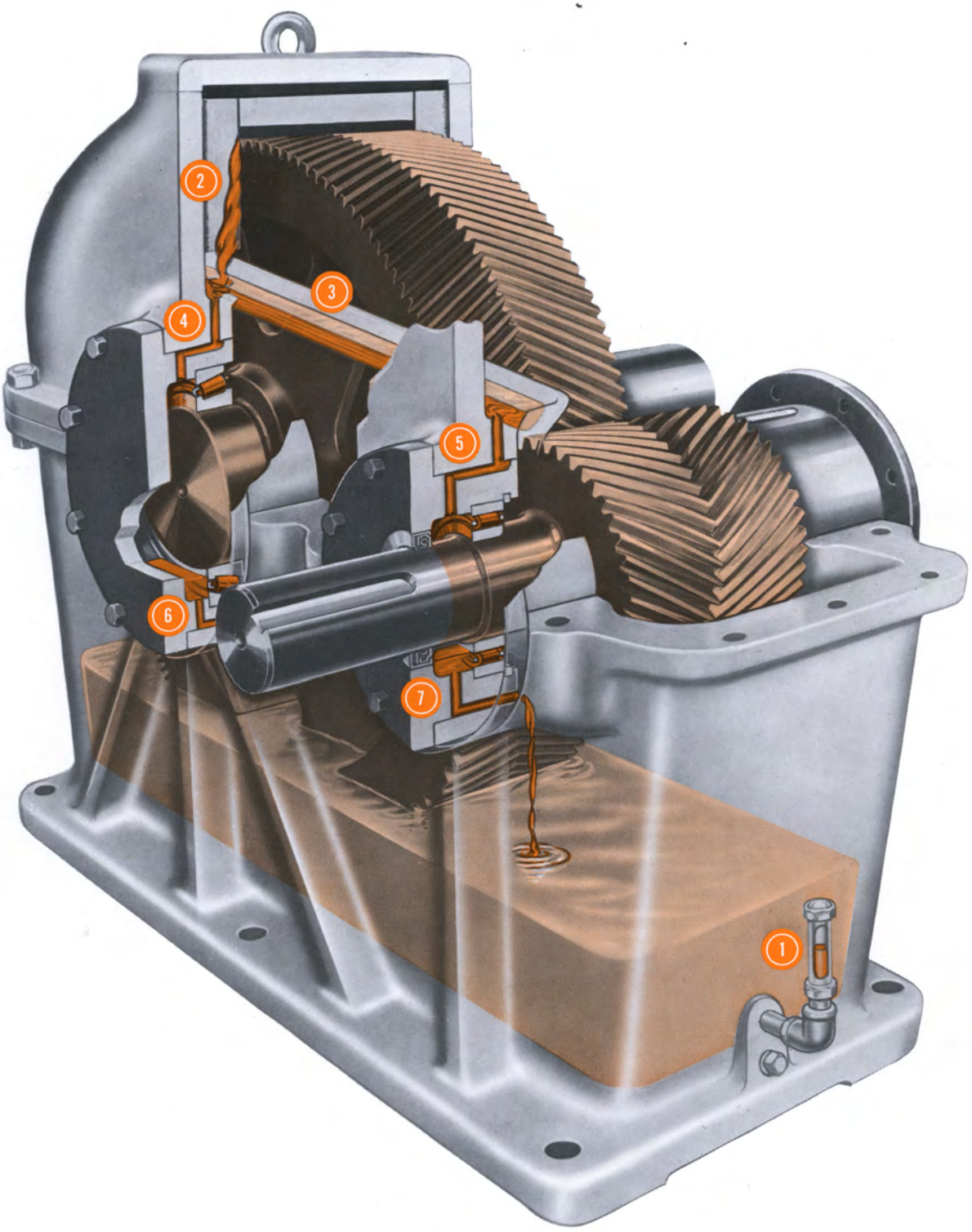
MEMBER OF AGMA

LUFKIN FOUNDRY & MACHINE COMPANY
LUFKIN, TEXAS

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TYPES S, D, M AND T REDUCERS

Lubrication System



The housing is filled with oil until the level is visible in glass gage 1. The gear dips in the bath of oil, lubricating the gear teeth. The film of oil which adheres to the side of the gear rim is deflected by wiper 2 into oil trough 3 which is cast integral with the cover. Oil flows by gravity from the trough through oil passages 4 and 5 into all bearings and returns to the sump by oil-return passages 6 and 7.

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2C627

COMMERCIAL *Gear Assemblies* *for* SPEED REDUCING *and* SPEED INCREASING SERVICE

I. SINGLE REDUCTION REDUCERS, TYPE S
Ratios 2:1 to 10:1
Pages 4-16

II. DOUBLE REDUCTION REDUCERS, TYPE D
Ratios 10:1 to 75:1
Pages 4-9, 17-20

III. TRIPLE REDUCTION REDUCERS, TYPE T
Ratios 75:1 to 300:1
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IV. MEDIUM-SPEED SINGLE REDUCTION REDUCERS AND INCREASERS, TYPE M
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V. HIGH SPEED REDUCERS AND SPEED INCREASERS, TYPE N AND NM
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VI. HI-Q SINGLE AND DOUBLE REDUCTION REDUCERS
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VII. SPECIAL LUFKIN UNITS
Pages 43-44

LUFKIN FOUNDRY & MACHINE CO.

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TRIPOLI, LIBYA
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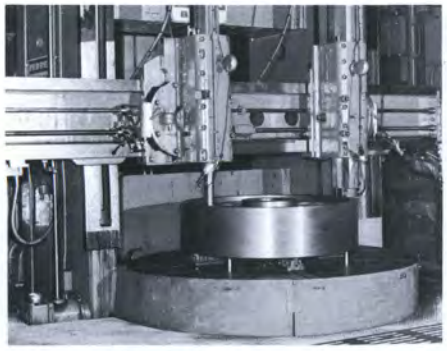
PLANT FACILITIES

From an humble beginning in 1902 as a small repair shop for sawmill and railroad machinery, LUFKIN Foundry & Machine Company today occupies a modern plant covering over 80 acres with approximately 18 acres under roof. This plant is equipped with every facility necessary for the manufacture of quality and precision gears. Pioneering the adaptation of the gear reducer to the oil well pumping unit in 1923, LUFKIN has placed over 90,000 of these units in service covering every oil producing country in the world. LUFKIN has gained over these years both the know-how and facilities for producing quality and dependable gears for any industry or application, and has specialized in the production of commercial gears since 1939.

MACHINE SHOP



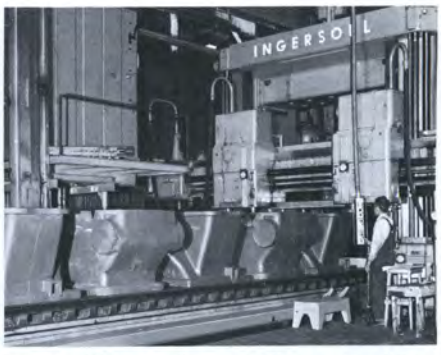
The main bay of the Machine Shop is 905 feet long and has over 200,000 square feet of floor space. Over 175 modern production machines are in use here. Among these are 21 Sykes herringbone gear generators and a hobbing machine with the capacity to cut a 16 foot pitch diameter, 48 inch face gear.



Vertical Boring Mill.
Capacity: 10′ - 6″ diameter.



10T Sykes Gear Generator. Capacity: 10 feet diameter x 24 inch face.



Large Planer Type Milling Machine. Capacity: 9 feet wide x 8 feet high x 26 feet travel.

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Schiess Hobbing Machine, Capacity: 16 Feet Diameter x 48 Inch Face.

MACHINE SHOP



Standard Stocked Gears in Finished Material Warehouse.



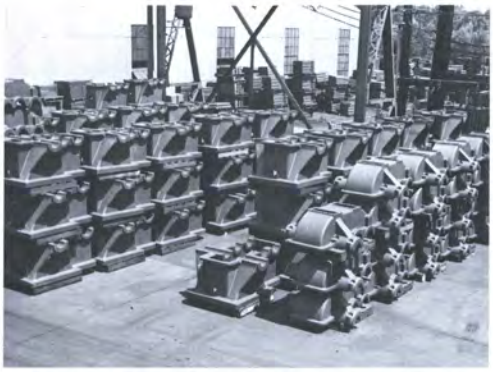
Inside View of Structural and Welding Shop.

STRUCTURAL SHOP

All cutting, welding and fabricating of structural parts is performed in the main structural building. This building has three acres under one roof. The structural shop is equipped with all modern equipment for the fabrication of large structural items.



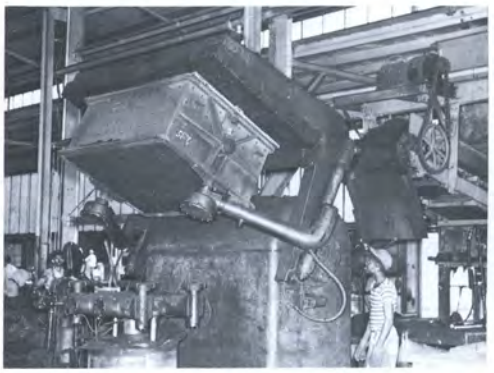
Torch Cut Gears for Slow Speed Application.



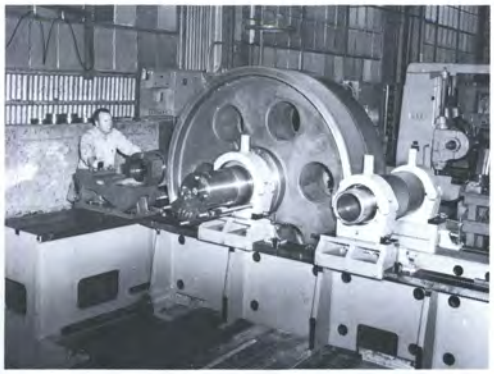
Reducer housing and cover castings on Foundry Yard.

FOUNDRY

The Foundry is equipped with the most modern equipment available for the production of gray and nodular iron castings, with a capacity of 175 tons per day.



Large Moulding Machine. Capacity: 12,000 Pounds.



Lapping two pinions with large propulsion gear on special variable center lapper.

GEAR FINISHING

Complete facilities are available for balancing, assembling and testing gear units; all components are thoroughly inspected and tested before shipment.



Dynamic Balancing Machine. Capacity: 10 feet diameter, 13,000 pounds.

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GENERAL SPECIFICATIONS

Types S, D, T and M

HOUSINGS

Housings are made of controlled specification high tensile gray iron castings in two sections, with accurately machined joint at split between base and cover. Interior surfaces are thoroughly sandblasted, cleaned, and painted to insure absolute freedom from core sand and foreign particles. Wall sections are of generous thickness and substantially ribbed for rigidity. Housings are bored in husky cast iron precision-built boring fixtures to assure accuracy and precise duplication of parts.

GEARS

Gears are continuous tooth herringbone type generated on Sykes Machines. The gear teeth are cut after the gear has been pressed on its shaft and finish-turned, to assure concentricity between pitch circle and shaft. Final cutting of teeth is done slowly with freshly-ground cutter for better finish. Final finish of teeth is done in lapping machine to insure perfect mating contact between the tooth surfaces. Finished gears are carefully balanced. Gears are made of heat treated high tensile alloy steel castings and forgings.

PINIONS

Except for very low ratios which result in large pinion diameters, pinions are made integral with their shafts. Material is heat treated alloy steel. Pinion shaft extensions are ground to nominal dimensions shown in rating tables with tolerance of plus or minus .0005".

SHAFTS

All slow speed shafts are made of heat treated alloy steel ground to nominal dimensions shown in table of dimensions with tolerance of plus or minus .0005".

BEARINGS

Tapered roller bearings are used on the slow speed shaft with the bearing adjusting shims on the side opposite the shaft extensions. On pinion shafts, solid-roll straight type anti-friction bearings are used which permit perfect alignment of the herringbone gears. All anti-friction bearings are mounted in individual bearing carriers. Bearings are designed for long, trouble-free life when properly lubricated.

LUBRICATION

The slow speed gear runs in a bath of oil in the bottom of the housing and provides constant lubrication to the gear-mesh. This splash also furnishes a generous amount of oil to the troughs on the inside of the cover and from these troughs all bearings are lubricated by gravity flow. Oil seals eliminate oil leakage and the entrance of dirt. A protected glass oil level gauge permits instantaneous determination of oil level by visual inspection. The lubrication system is simple, positive and fool-proof so long as the housing is filled with the correct lubricant to a level which is visible in the glass gauge. See Lubrication Instructions on page 42 for recommended lubricants.

MOTOR BASES

One-piece structural steel bases are available for mounting both the gear reducer and prime mover. These are fabricated by electric welding using heavy section steel plate and are stress-relieved after welding. All bases are custom-built to suit each individual job. In some cases common bases can be provided to accommodate the driven machine also.

EFFICIENCY

The mechanical efficiency of single reduction Type S reducers is 98% to 98.5%. Double reduction Type D reducers have an efficiency of 97% to 97.5%. Triple reduction Type T reducers have an efficiency of 96% to 96.5%.

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EXPLANATION OF HORSEPOWER RATING TABLES

Types S, D, T and M

The horsepower capacities of all Lufkin Gears are based on the latest Standard Practices of the American Gear Manufacturers Association of which Lufkin has been a member for several years. These ratings for Type S Single Reduction Units are shown on pages 10, 11 and 12, for Type D Double Reduction Units on pages 18 and 19, Type T Triple Reduction Units on pages 21 and 22, and Type M Single Reduction Units on pages 24, 25 and 26.

MECHANICAL RATINGS

The Mechanical Horsepower Ratings listed in the Rating Tables are for a Service Factor of 1 which would be the proper factor for a gear unit being driven by an electric motor up to 10 hours per day and driving a machine classed as a Uniform Load. For any other type of prime mover or driven machine or for any other duration of service the horsepower load would have to be modified by an appropriate Service Factor, as explained on the following pages, before the proper gear reducer could be selected.

The load carrying capacity of a set of gears for a given size housing varies with ratio and speed. Therefore, the Rating Tables show the horsepower ratings for each size reducer at the several standard ratios and motor speeds. The gears will stand 100% overload at starting or momentarily during operation.

THERMAL RATINGS

The table on page 13 shows the Thermal Horsepower Rating for each Type S and M reducers. These ratings vary with speed and ratio. The Thermal Horsepower Ratings for Type D reducers are shown in the left hand column of the Rating Tables on page 18 and 19 for each input speed shown. The Thermal Horsepower Rating is the average load the unit will deliver continuously without overheating. The actual horsepower transmitted by the gear unit may not be greater than the Thermal Horsepower Rating unless the unit is equipped with an oil pump and cooler. Type T reducers, when operated within the speeds and ratios listed, will never require oil pump and cooler.

SERVICE FACTORS

The selection of a gear unit for a certain job depends upon (1) the type of prime mover, (2) the character of the driven machine and (3) the number of hours per day the unit will operate. These variables enter into the selection of Reducers through the use of Service Factors.

A tabulation of the Character of Load for various types of machinery generally driven by gear units is shown in Table 1, page 9. Table 2, page 9, shows the Service Factors based on the three variables listed above.

In selecting a gear reducer the actual horsepower load to be transmitted is multiplied by the appropriate Service Factor to determine the Equivalent Horsepower. A reducer is then selected from the Rating Tables which has a tabulated rating equal to or greater than the Equivalent Horsepower. Conversely, the tabulated mechanical rating of a reducer divided by the Service Factor will give the Service Rating of that reducer. This Service Rating cannot be higher than the Thermal Horsepower unless means for artificially cooling the oil is provided.

RATIOS

The gear ratios listed in the Rating Tables are standard for each size reducer and these particular ratios are more readily available than any other ratio. The exact ratio required or a very close approximation can be furnished, however. The approximate horsepower rating for intermediate ratios not shown in the tables may be determined by interpolation.

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SELECTION OF GEAR REDUCERS

Types S, D, T and M

In order to accurately select the proper gear reducer it is necessary to know:

(1) Horsepower load to be transmitted;
(2) Speed of both input and output shafts, or the speed of one shaft and the gear ratio;
(3) Type of prime mover;
(4) Type of driven machine; and
(5) Hours per day continuous operation.

Knowing the type of driven machine, determine from Table 1, page 9, whether the character of the load is Uniform, Moderate Shock or Heavy Shock. With this information and knowing the type of prime mover and hours of operation, select the proper Service Factor from Table 2, page 9.

Multiply the actual horsepower load to be transmitted by the Service Factor just selected to arrive at the Equivalent Horsepower. This Equivalent Horsepower is the tabulated or catalog rating as listed in the Rating Tables, pages 10 through 26. If the starting load is high, it should also be used as a check to determine Equivalent Horsepower. To do this, divide starting load by two and if the result is higher than the Equivalent Horsepower just calculated, it should be used as the Equivalent Horsepower in making the selection.

Divide the motor speed by the output speed of the reducer to determine ratio. If the ratio is less than 10:1, use the Single Reduction Type S Rating Tables on pages 10, 11 and 12; if the ratio is between 10:1 and 75:1, use the Double Reduction Type D Rating Tables on pages 18 and 19. If the ratio required is higher than 75:1, use the Triple Reduction Type T Rating Tables on pages 21 and 22.

Refer to the proper Horsepower Rating Table as specified above. In the column showing a ratio nearest to that required and on a horizontal line with the proper input speed, find a listed horsepower which is equal to or greater than the Equivalent Horsepower required. The size of the reducer is shown at the top of the table in which this horsepower rating is found. For intermediate ratios and speeds between those listed, the approximate horsepower rating may be found by interpolation.

The Thermal Horsepower Ratings for Type S and M reducers are shown on page 13. The Thermal Horsepower Ratings for Type D reducers are shown in the left hand column of the Rating Tables on pages 18 and 19. On standard Type T reducers the Thermal Horsepower capacity will always be greater than the load transmitted. The reducer selected should have a Thermal Rating equal to or greater than the **actual horsepower load** to be transmitted in order to avoid overheating of the unit during operation. It is often necessary to go to a larger size reducer to obtain satisfactory thermal capacity. It is possible to equip a reducer with an oil cooling system and thus increase the Thermal Rating in some cases when because of space limitations it is desirable to use the smallest possible reducer.

OVERHUNG LOAD

In the event the output shaft of the reducer drives through a pulley, sprocket or gear, the overhung load capacity of the slow speed shaft should be checked. Although standard reducers are designed primarily for straight line torque drive through a flexible coupling, they will stand moderate overhung loads without difficulty.

The following formula will give the actual overhung load imposed on the shaft:

$$OL = K \times \frac{126{,}000 \times HP}{D \times RPM}$$

Where OL = Overhung load, lbs.
K = Constant for type of external drive
= 1.0 for Sprocket
= 1.25 for pinion
= 1.5 for V-belts
= 2.5 for flat belt
HP = Actual horsepower load
D = Diameter of sprocket, pinion or pulley, inches
RPM = Revolutions per minute of shaft being checked.

If the result of the above calculation shows the overhung load to be higher than the standard reducer will permit as shown by the table of Moderate Overhung Load ratings on pages 12 and 20, the Heavy Overhung Load type reducer should be specified.

It might be that the actual load is also higher than the heavy overhung load capacity and in such an event it will be necessary to either increase the diameter of the pulley, sprocket or pinion, or go to the Outboard Bearing Type Assembly. The Heavy

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SELECTION OF GEAR REDUCERS (cont'd.)

Types S, D, T and M

Overhung Load capacities are not listed for Type S units, but are approximately double the ratings listed for Moderate Overhung Load Capacities on page 12.

OUTBOARD BEARING ASSEMBLY

In the event the external load is excessive, the reducer shaft may be extended to an outboard bearing. The outboard bearing is supported by a pedestal which is generally built integral with the motor and reducer base. The bases for these units are made of fabricated steel plate, electric welded; and are especially built for each application.

When the actual overhung load is more than double the capacities shown in the Moderate Load Table on page 12, the Outboard Bearing Assembly should be specified.

MOTOR BASES

If a Base for mounting the motor and reducer is desired, it is not necessary to make a selection of a Base. Bases are not made in specified sizes but are custom built for each application. This procedure is economical since the Bases are made of fabricated steel plate.

To obtain the proper Base on an order, it is only necessary that a certified setting plan for the motor be furnished.

EXAMPLES OF REDUCER SELECTION

Types S and D

Example 1

A gear reducer is required to drive a paper machine calender. Electric motor input speed 1150 RPM and reducer output speed 202 RPM. Actual load 250 HP.

Service Factor: Refer to Table 1, Page 9, for Character of Load and note that Calender is classified as Moderate Shock. Paper machines operate twenty-four hours per day; so, in Table 2, Page 9, the Service Factor for electric motor operating twenty-four hours per day with a Moderate Shock Load is found to be 1.5.

Equivalent Horsepower = Service Factor $\times$ Actual HP load $= 1.5 \times 250 = 375$ HP

$$\text{Gear Ratio} = \frac{\text{Input Speed, RPM}}{\text{Output Speed, RPM}} = \frac{1150}{202} = 5.69$$

Refer to the Rating Tables for Type S Reducers pages 10 and 11. Follow down the column showing a ratio nearest 5.69 and observe the horsepower ratings listed for 1150 RPM. Note that the reducer showing an Equivalent or Catalog Horsepower rating equal to or greater than the 375 horsepower required is the S189B which has a rating of 496 horsepower at a ratio of 5.67.

Check the Thermal Horsepower Capacity on page 13 and note that this reducer has a thermal rating higher than the mechanical rating of the reducer at this ratio and speed.

The S189B is, therefore, the proper selection.

Example 2

A gear reducer having a ratio of 3:1 is desired to drive a single cylinder reciprocating compressor. The prime mover is a 1400 RPM multi-cylinder engine and will deliver 150 horsepower twenty-four hours per day.

Service Factor: From Table 1 the Character of the Load is Heavy Shock and from Table 2 the Service Factor is found to be 2.25.

Equivalent Horsepower $= 2.25 \times 150 = 338$ HP.

Refer to the Rating Tables for Single Reduction units and observe that at a ratio of 3:1, the S126B is the smallest reducer with a Catalog Rating of at least 338 horsepower at the desired ratio and speed. It is obvious that the S105B is not large enough, because at 3.00:1 ratio and 1750 RPM the Catalog Rating is only 327 horsepower. Since the input speed of 1400 RPM is not listed for the S126B reducer, the approximate Catalog Rating can be found by direct interpolation as follows, observing that at 3.00:1 ratio it has a rating of 534 horsepower at 1750 RPM and at 1150 RPM it has a rating of 380 horsepower:

$$\frac{1400-1150}{1750-1150} \times (534-380) + 380 = 444 \text{ HP}$$

Check the Thermal Horsepower Rating on page 13. At 3.00:1 ratio the S126B reducer has a Thermal

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EXAMPLES (cont'd.)

Rating approximately half-way between 181 and 238 horsepower at 1400 RPM.

The S126B at 3.00:1 ratio is therefore, the proper selection.

Example 3

A gear reducer is required to drive a belt conveyor delivering foundry sand. It is probable that the belt will not be loaded at a uniform rate. The prime mover is a 5 horsepower electric motor running 1150 RPM, but the actual load on the drive will not exceed 4 horsepower. The output gear shaft is to operate at approximately 27 RPM and will be equipped with 7.63" pitch diameter sprocket. The conveyor will operate eight hours per day.

Service Factor: From Table 1 the Character of Load is Moderate Shock and from Table 2 the Service Factor is 1.25.

Equivalent Horsepower = $1.25 \times 4 = 5$ HP.

(Note that the actual load to be transmitted and not the motor rating is multiplied by the Service Factor to get Equivalent Horsepower. However, if there is a possibility that the prime mover can deliver and the driven machine can absorb more horsepower than the actual load as calculated, the possibility of overload should be taken into account in making a reducer selection.)

$$\text{Gear Ratio} = \frac{1150 \text{ RPM}}{27 \text{ RPM}} = 42.6$$

Refer to the Rating Tables for Type D Double Reduction Units on pages 18 and 19 for ratios between 10:1 and 75:1. Under a ratio of 42.1 and at a speed of 1150 RPM it is found that the D120B Reducer has a mechanical rating of 6.7 horsepower which is satisfactory.

Check the overhung load on the slow speed shaft due to the chain drive:

$$OL = K \times \frac{126{,}000 \times HP}{D \times RPM}$$

$$= 1 \times \frac{126{,}000 \times 4}{7.63 \times 27.3} = 2{,}420 \text{ lbs.}$$

Refer to the Overhung Load Table for Double Reduction Reducers on page 20 and note that the capacity of the slow speed shaft on the D120B Reducer is 4000 pounds which is greater than the actual load imposed.

The D120B is, therefore, the proper selection.

INFORMATION REQUIRED WITH ORDER OR INQUIRY

The following information should be furnished with a request for a quotation or with a purchase order for a gear reducer in order that we may furnish your exact requirement promptly without the delay of having to request additional information:

1. Actual horsepower load to be transmitted.
2. Speed of prime mover and driven machine, or speed of either shaft and gear ratio.
3. Type of prime mover (if engine, give number of cylinders).
4. Type of driven machine.
5. Number of hours per day reducer to be in continuous operation.
6. Direction of rotation (clockwise or counterclockwise, looking at extended end of high speed shaft).
7. Type of shaft connection (coupling, pulley, sprocket or gear).
8. If flexible couplings also purchased from us furnish diameter and key dimensions of connecting shafts.
9. If connection other than direct through coupling, furnish diameter of pulley, sprocket or gear, and give approximate direction of external load.
10. Shaft extensions right hand, left hand or special (see dimension drawings pages 14, 15 and 20 for illustration of hand).
11. If Motor Base required, furnish certified bolting layout for motor.
12. Report any unusual conditions of installation or operation.

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SERVICE FACTORS FOR SPEED REDUCER SELECTION

Types S, D, T, and M

Table 1 below is to be used as a guide for determining the Character of Load imposed on a gear reducer by a representative group of machines generally driven by Gear Reducers. It would be impractical, of course, to list here every machine that might conceivably be driven by a Gear Reducer. It is believed, however, that the list is sufficiently complete so that if a particular machine is not listed it can be determined, by comparison, the character of the load to be imposed on that drive.

For an explanation of the use of these tables in connection with the selection of a Gear Reducer, see pages 6 and 7.

Guide for Selecting Character of Load—Table 1

UNIFORM LOAD

Agitators
- Pure Liquids

Blowers
- Centrifugal
- Vane

Clarifiers

Compressors
- Centrifugal

Conveyors
- (Uniformly Loaded or Fed)
- Apron
- Assembly
- Belt
- Bucket
- Chain
- Flight
- Oven
- Screw

Cranes
- Main Hoists

Elevators
- Bucket—Uniform Load
- Bucket—Continuous
- Centrifugal Discharge
- Escalators
- Gravity Discharge

Extruder
- Light Duty

Fans
- Centrifugal
- Light

Feeders
- Disc

Generators

Line Shafts
- Light

Machine Tools
- Auxiliary Drives

Mixers
- Constant Density

Paper Mills
- Bleacher
- Conveyors
- Presses
- Suction Roll
- Winders

Pumps
- Centrifugal
- Rotary

Rubber and Plastics Industries
- Rubber Mill (3 on line)

Sewage Disposal Equipment
- Bar Screens
- Chemical Feeders
- Collectors

Screens
- Air Washing
- Traveling Water Intake

Stokers

MODERATE SHOCK LOAD

Agitators
- Liquids and Solids
- Liquids—Variable Density

Blowers
- Lobe

Cane Knives

Classifiers

Compressors
- Lobe
- Reciprocating, Multi-Cylinder

Conveyors—(Heavy Duty Not Uniformly Fed)
- Apron
- Assembly
- Belt
- Bucket
- Chain
- Flight
- Oven
- Screw

Crusher
- Sugar

Dredges
- Cable Reels
- Conveyors
- Maneuvering Winches
- Pumps
- Stackers
- Utility Winches

Elevators
- Bucket—Heavy Load Freight

Extruder
- Constant Duty

Fans
- Cooling Tower
- Induced Draft
- Large

Feeders
- Apron
- Belt
- Screw

Hoists
- Medium Duty
- Skip

Line Shafts
- Processing Equipment

Lumber Industry
- Barkers—Spindle Feed
- Conveyors—Burner
- Merry-go-Round
- Transfer
- Chains—Green
- Cut-Off Saws
- Feeds-Edger, Trimmer
- Planer Feed
- Sorting Table
- Tipple Hoist
- Transfers, Chain, Craneway
- Tray Drives

Machine Tools
- Bending Roll
- Main Drives

Metal Mills
- Draw Bench, Carriage and Main Drive
- Slitters
- Wire Drawing and Flattening Machine
- Wire Winding Machine

Mills, Rotary Type
- Ball
- Cement Kilns
- Dryers and Coolers
- Kilns
- Pebble
- Rod, Plain and Wedge Bar
- Rubber

Mixers
- Concrete
- Variable Density

Paper Mills
- Agitators
- Barker

Paper Mills (Cont'd)
- Beater and Pulper
- Calenders
- Converting Machine except Cutters, Platers
- Couch
- Cylinders
- Dryers
- Felt Stretchers
- Pulp Machine Reel
- Stock Chests
- Washers and Thickeners

Pumps
- Proportioning
- Reciprocating (3 or more cylinders)

Rubber & Plastics Industries
- Laboratory Equipment
- Refiners
- Rubber Calenders
- Rubber Mill (2 on line)
- Sheeter
- Tubers and Strainers
- Warming Mills

Sand Muller

Sewage Disposal Equipment
- Dewatering Screws
- Scum Breakers
- Slow or Rapid Mixers
- Thickeners
- Vacuum Filters

Screens
- Rotary-Stone or Gravel

Slab Pushers

Sugar Industry
- Cane Knives
- Crushers
- Mills

Textile Machinery

HEAVY SHOCK LOAD

Compressors
- Reciprocating, Single-Cylinder

Conveyors—Heavy Duty
- Shaker

Crushers
- Ore
- Stone

Dredges
- Cutter Head Drives
- Jig Drives
- Screen Drives

Feeders
- Reciprocating

Hammer Mills

Hoists
- Heavy Duty

Lumber Industry
- Barkers—Main Drive
- Conveyors—Main Log
- Conveyors—Slab
- Debarking Drums
- Feeds—Gang
- Log Deck
- Log Hauls—Incline-Well Type
- Log Turning Devices
- Rolls-Live-Off Brg.-Roll Cases

Machine Tools
- Punch Press
- Plate Planers
- Tapping Machine

Metal Mills
- Table Conveyors non-reversing, Individual drives

Mills, Rotary Type
- Tumbling Barrels

Paper Mills
- Barking Drum
- Calenders—Super
- Cutters—Platers
- Felt Whippers
- Jordans
- Log Hauls

Pullers
- Barge Haul

Rubber and Plastics Industries
- Crackers
- Mixing Mills

Service Factors—Table 2

Prime Mover	DURATION OF SERVICE	Character of Load on Driven Machine		
		Uniform	Moderate Shock	Heavy Shock
Electric Motor or Turbine	*Occasional ½ Hour per Day	0.50	0.80	1.25
	*Intermittent 3 Hours per Day	0.80	1.00	1.50
	Up to 10 Hours per Day	1.00	1.25	1.75
	24 Hours per Day	1.25	1.50	2.00
Multi-Cylinder Internal Combustion Engine	*Occasional ½ Hour per Day	0.80	1.00	1.50
	*Intermittent 3 Hours per Day	1.00	1.25	1.75
	Up to 10 Hours per Day	1.25	1.50	2.00
	24 Hours per Day	1.50	1.75	2.25
Single Cylinder Internal Combustion Engine	*Occasional ½ Hour per Day	1.00	1.25	1.75
	*Intermittent 3 Hours per Day	1.25	1.50	2.00
	Up to 10 Hours per Day	1.50	1.75	2.25
	24 Hours per Day	1.75	2.00	2.50

* Maximum momentary or starting load must not exceed 200 percent of gear reducer rating (rating meaning Service Factor of 1).

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HORSEPOWER RATING TABLES

TYPE S—SINGLE REDUCTION UNITS

The Horsepower Ratings listed in the tables below are Mechanical ratings calculated by the A.G.M.A. formula using a Service Factor of 1. See pages 6, 7 and 8 for information on selecting reducers. See page 13 for Thermal Horsepower Ratings.

Size No. S63B

Motor R.P.M.	STANDARD RATIOS															
	1.22	1.50	1.84	2.24	2.72	3.00	3.36	4.14	5.00	5.67	6.20	7.00	7.73	8.60	9.29	10.29
1750	171	150	129	108	88.7	79.6	69.8	53.8	41.8	35.0	30.7	25.6	22.0	18.6	16.5	14.0
1150	111	106	90.8	75.9	62.2	55.7	48.8	37.5	29.0	24.2	21.3	17.7	15.2	12.8	11.3	9.6
870	84.0	84.0	71.6	59.8	48.8	43.7	38.2	29.3	22.6	18.9	16.6	13.8	11.8	10.0	8.8	7.4
720	69.5	69.5	60.8	50.7	41.4	37.0	32.3	24.8	19.1	15.9	14.0	11.6	9.9	8.4	7.4	6.2
580	56.0	56.0	50.4	41.9	34.2	30.6	26.7	20.4	15.7	13.1	11.5	9.5	8.1	6.9	6.1	5.1
High Speed Shaft Diameter	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1	1	⅞	⅞	⅞	⅞

Size No. S84B

Motor R.P.M.	STANDARD RATIOS															
	1.22	1.50	1.84	2.27	2.73	3.00	3.36	4.16	5.00	5.67	6.27	7.00	7.73	8.60	9.24	10.29
1750	270	270	270	237	197	178	156	120	93.7	78.6	68.0	57.8	49.7	42.1	37.6	31.6
1150	180	180	180	168	139	125	110	83.8	65.4	54.8	47.3	40.1	34.4	29.1	26.0	21.8
870	135	135	135	133	110	98.5	86.2	65.8	51.3	42.9	37.0	31.3	26.8	22.7	20.2	16.9
720	112	112	112	112	93.0	83.7	73.2	55.8	43.4	36.2	31.2	26.4	22.6	19.1	17.0	14.3
580	90.0	90.0	90.0	90.0	77.0	69.2	60.5	46.0	35.8	29.8	25.7	21.7	18.6	15.7	14.0	11.7
High Speed Shaft Diameter	1¾	1¾	1¾	1¾	1¾	1¾	1¾	1¾	1¾	1¾	1½	1½	1½	1¼	1	1

Size No. S105B

Motor R.P.M.	STANDARD RATIOS															
	1.22	1.50	1.86	2.24	2.72	3.00	3.38	4.16	5.00	5.67	6.27	7.00	7.57	8.47	9.00	10.43
1750	...	400	400	400	363	327	286	221	174	146	126	107	95	80	73	58
1150	265	265	265	265	258	232	202	156	122	102	88	75	66	56	51	40
870	200	200	200	200	200	183	159	123	96	80	69	59	52	44	40	31
720	166	166	166	166	166	156	135	104	81	68	59	50	44	37	33	26
580	134	134	134	134	134	129	112	86	67	56	48	41	36	30	28	22
High Speed Shaft Diameter	2	2	2	2	2	2	2	2	2	2	2	1¾	1½	1½	1½	1½

Size No. S126B

Motor R.P.M.	STANDARD RATIOS															
	1.22	1.50	1.85	2.24	2.73	3.00	3.36	4.14	5.00	5.55	6.27	7.00	7.57	8.33	9.29	10.43
1750	...	...	848	718	591	534	470	365	285	247	208	177	157	136	115	95
1150	600	600	600	514	421	380	334	258	201	173	146	124	110	95	80	66
870	450	450	450	409	334	301	264	204	158	137	114	97	86	74	62	52
720	370	370	370	349	285	257	225	173	134	116	97	82	73	63	53	44
580	300	300	300	291	237	213	187	144	111	96	80	68	60	52	43	36
High Speed Shaft Diameter	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2	2	1¾	1¾	1½

Size No. S147B

Motor R.P.M.	STANDARD RATIOS															
	1.33	1.50	1.84	2.23	2.73	3.00	3.36	4.16	5.00	5.67	6.26	7.00	7.62	8.33	9.18	10.20
1750	...	...	...	1082	887	803	707	546	430	361	314	267	235	205	177	150
1150	890	890	890	777	635	573	503	387	304	255	221	188	165	144	124	104
870	675	675	675	619	505	456	400	307	240	201	174	148	130	113	97	82
720	555	555	555	530	432	389	341	261	204	171	148	125	110	96	82	69
580	450	450	450	442	360	324	284	217	169	141	122	103	91	79	68	57
High Speed Shaft Diameter	3	3	3	3	3	3	3	3	3	3	3	2⅝	2½	2	2	2

Size No. S168B

Motor R.P.M.	STANDARD RATIOS															
	1.29	1.50	1.84	2.25	2.73	3.00	3.36	4.16	5.00	5.67	6.27	7.00	7.62	8.33	9.24	10.20
1750	...	...	...	...	1256	1136	1001	774	610	514	446	380	335	293	250	214
1150	...	1160	1160	1092	901	814	716	551	433	364	315	268	236	206	175	149
870	870	870	870	860	719	648	569	437	343	287	248	211	186	162	137	117
720	710	710	710	710	615	554	486	373	292	244	211	179	157	137	116	99
580	570	570	570	570	513	462	405	310	242	203	175	148	130	113	96	82
High Speed Shaft Diameter	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	2¾	2¾	2	2

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HORSEPOWER RATING TABLES (cont'd.)

TYPE S—SINGLE REDUCTION UNITS

Size No. S189B

	STANDARD RATIOS															
Motor R.P.M.	1.50	1.84	2.22	2.72	3.00	3.36	4.14	5.00	5.67	6.20	7.00	7.57	8.42	9.29	9.80	10.45
1750	....	....	....	....	....	1357	1058	829	699	617	518	461	393	337	310	281
1150	....	1750	1501	1229	1106	973	755	590	496	437	366	325	276	237	218	197
870	1320	1320	1202	982	883	776	600	468	393	345	289	256	218	186	171	154
720	1090	1090	1031	841	756	663	513	399	334	294	245	218	185	158	145	131
580	880	880	864	703	631	554	427	331	278	244	203	180	153	131	120	108
High Speed Shaft Diameter	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¼	2⅝	2⅝	2⅝	2½

Size No. S2010B

	STANDARD RATIOS															
Motor R.P.M.	1.50	1.86	2.24	2.72	3.00	3.36	4.16	5.00	5.67	6.27	7.00	7.57	8.60	9.37	10.43	.....
1750	....	....	....	....	....	....	1380	1090	919	798	681	607	501	439	371	....
1150	....	....	1750	1615	1454	1280	988	777	654	567	483	429	353	309	261	....
870	1320	1320	1320	1293	1163	1022	787	617	518	449	382	339	279	244	205	....
720	1090	1090	1090	1090	996	875	672	527	442	382	325	288	237	207	174	....
580	880	880	880	880	833	731	561	438	367	317	269	239	196	171	144	....
High Speed Shaft Diameter	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¼	2⅝	2⅝	....

Size No. S2211B

	STANDARD RATIOS															
Motor R.P.M.	1.50	1.84	2.24	2.73	3.00	3.40	4.18	5.00	5.67	6.33	7.00	7.80	8.43	9.27	10.0	.....
1150	....	....	....	2059	1863	1618	1260	998	840	718	621	528	469	405	359	....
870	....	2280	2008	1651	1492	1294	1005	794	667	570	491	417	370	319	283	....
720	1885	1885	1727	1418	1280	1109	859	678	569	486	419	355	315	271	240	....
580	1520	1520	1450	1188	1071	927	717	565	474	404	348	295	261	225	199	....
High Speed Shaft Diameter	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	3¾	3¾	3¾	3¾	....

Size No. S2411B

	STANDARD RATIOS															
Motor R.P.M.	1.50	1.85	2.24	2.73	3.00	3.36	4.19	5.00	5.67	6.27	7.00	7.62	8.60	9.29	10.08	11.00
1150	....	....	....	2404	2176	1917	1469	1168	984	853	727	641	534	473	416	362
870	....	2280	2280	1931	1745	1535	1173	930	782	678	577	508	422	374	329	285
720	1885	1885	1885	1659	1498	1317	1005	795	668	578	492	433	359	318	279	242
580	1520	1520	1520	1392	1256	1103	839	663	556	481	409	359	298	264	231	201
High Speed Shaft Diameter	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	3¾	3¾	3¼	3¼

Size No. S2712B

	STANDARD RATIOS															
Motor R.P.M.	1.50	1.84	2.24	2.72	3.00	3.36	4.19	5.00	5.75	6.20	7.00	7.53	8.53	9.22	10.25	11.27
1150	....	....	....	....	....	2540	1950	1551	1298	1153	968	869	720	639	541	465
870	....	....	3110	2571	2316	2038	1560	1238	1034	918	769	690	570	505	427	367
720	....	2580	2580	2212	1991	1751	1337	1060	884	784	656	588	486	430	364	312
580	2080	2080	2080	1859	1671	1468	1119	885	737	653	546	489	404	357	301	258
High Speed Shaft Diameter	5	5	5	5	5	5	5	5	5	5	5	5	5	4½	4	3¾

Size No. S3014B

	STANDARD RATIOS															
Motor R.P.M.	1.83	2.24	2.75	3.00	3.36	4.17	5.00	5.67	6.27	7.00	7.57	8.38	9.29	10.54	.....	.....
1150	....	....	....	....	....	2510	2085	1735	1500	1285	1155	990	840	693	....	....
870	....	....	3120	3070	2725	2030	1660	1400	1200	1040	925	790	675	543	....	....
720	2580	2580	2580	2580	2330	1730	1410	1225	1060	895	800	685	580	470	....	....
580	2080	2080	2080	2080	1935	1430	1195	985	850	735	665	565	478	389	....	....
High Speed Shaft Diameter	5	5	5	5	5	5	5	5	5	5	5	5	5	4½	....	....

Ratios listed are standard but intermediate ratios are available.

Ratings for intermediate ratios and speeds may be found by direct interpolation. When selection falls in the blank space above the ratings listed, see page 23 for Medium Speed Type M Reducers.

All units may be operated at speeds lower than the minimum shown. The selection of a reducer for a lower speed may be accomplished by multiplying the desired horsepower by 580 and dividing by the desired RPM. The result will be the equivalent horsepower at 580 RPM which can be found in the above tables.

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HORSEPOWER RATING TABLES (cont'd.)

TYPE S—SINGLE REDUCTION UNITS

Size No. S3318B

Motor R.P.M.	STANDARD RATIOS												
	1.84	2.26	2.75	3.00	3.34	4.15	5.00	5.60	6.17	7.00	7.61	8.44	9.31
1150	....	....	....	....	....	3710	2910	2590	2190	1860	1640	1440	1200
870	....	....	....	4150	3830	2985	2350	2060	1800	1490	1325	1145	955
720	....	3430	3430	3430	3300	2560	2020	1775	1540	1290	1160	990	825
580	2800	2800	2800	2800	2740	2130	1665	1485	1265	1055	945	820	670
High Speed Shaft Diameter	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½

Size No. S3824B

Motor R.P.M.	STANDARD RATIOS												
	2.25	2.75	3.00	3.37	4.14	5.03	5.61	6.17	7.00	7.65	8.50	.....	.....
1150	....	....	....	....	....	4710	4070	3575	3020	2685	2280	.....	.....
870	....	....	....	5400	4380	3610	3240	2865	2450	2175	1855	.....	.....
720	....	5470	5000	4470	3630	3000	2680	2440	2110	1885	1595	.....	.....
580	4575	4575	4380	3580	2920	2400	2155	1960	1725	1535	1315	.....	.....
High Speed Shaft Diameter	6½	6½	6½	6½	6	6	6	6	6	6	6	.....	.....

Ratios listed are standard but intermediate ratios are available.

Ratings for intermediate ratios and speeds may be found by direct interpolation. When selection falls in the blank space above the ratings listed, see page 23 for Medium Speed Type M Reducers.

All units may be operated at speeds lower than the minimum shown. The selection of a reducer for a lower speed may be accomplished by multiplying the desired horsepower by 580 and dividing by the desired RPM. The result will be the equivalent horsepower at 580 RPM which can be found in the above tables.

MODERATE OVERHUNG LOAD CAPACITIES

SLOW SPEED SHAFTS

The table below shows Moderate Overhung Load Capacities for Standard Type S Reducers. It is assumed that the external load is acting one shaft diameter in from the end of the shaft. Special Heavy Overhung Load Capacity Reducers are available with twice the capacity shown below.

The table below does not apply for double extended slow speed shafts. Present your application to us for recommendations.

The actual load imposed on a shaft for a given condition of service may be determined by the formula on the bottom of page 6. For unusual conditions or in case of doubt present your problem to us for recommendations.

Overhung load capacities are figured at the highest speed shown in horsepower rating tables for each size reducer.

Reducer No.	REDUCTION RATIOS								
	2	3	4	5	6	7	8	9	10
S63B	1,500	1,650	1,800	1,950	2,100	2,250	2,400	2,550	2,750
S84B	2,000	2,450	2,650	2,975	3,200	3,400	3,550	3,800	3,950
S105B	2,170	2,410	2,900	3,400	3,750	4,040	4,250	4,520	4,780
S126B	2,750	3,600	4,350	4,780	5,250	5,650	6,050	6,370	6,725
S147B	3,550	4,020	4,800	5,480	6,000	6,570	6,950	7,350	7,700
S168B	6,800	7,500	7,900	8,350	9,100	9,800	10,500	11,450	13,000
S189B	8,300	9,160	9,750	10,000	11,000	12,000	13,000	14,000	15,000
S2010B	8,950	10,300	11,600	13,150	14,400	15,500	16,500	17,300	18,200
S2211B	9,000	9,800	11,400	13,200	14,500	15,600	16,650	17,600	18,500
S2411B	8,900	9,500	11,100	12,900	14,200	15,400	16,350	17,300	18,250
S2712B	9,450	10,700	11,800	13,100	14,300	15,450	16,400	17,400	18,300
S3014B	12,300	12,450	13,900	15,400	17,000	18,800	20,100	21,650	25,400
S3318B	13,500	13,300	15,000	16,600	18,800	20,700	22,300	24,000	.....
S3824B	26,000	30,000	31,000	34,000	37,500	41,250	44,200	47,700	.....

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THERMAL HORSEPOWER RATINGS

TYPE S AND M

The Thermal Horsepower Rating listed here for a particular unit at a given ratio and speed must be equal to or higher than the ACTUAL HORSEPOWER DELIVERED.

The Table below must be used to check the selection of a gear unit after the selection has been made on the basis of mechanical rating.

Type S and Type M Single Reduction Units

Size No.	High Speed Shaft R.P.M.	RATIOS 1.22	1.50	1.84	2.24	2.72	3.00	3.36	4.16	5.00	5.67	6.27	7.00	7.57	8.60	9.29	10.29	11.00	11.50
63	3600	....	PC	PC	PC	PC	PC	PC	PC	PC	PC	PC	PC	PC	PC	PC	PC	....	....
	3000	17	18	19	20	21	22	24	29	32	33	34	35	....	....	....	....	....	....
	2400	38	39	40	41	43	44	47	54	....	....	....	....	....	....	....	....	....	....
	2000	54	55	56	58	59	60	62	....	....	....	....	....	....	....	....	....	....	....
	1750	63	64	66	67	68	69	....	....	....	....	....	....	....	....	....	....	....	....
	1150	79	80	82	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
84	3600	....	....	....	PC	PC	PC	PC	PC	PC	PC	PC	PC	PC	PC	PC	PC	....	....
	3000	....	....	24	26	28	29	32	38	42	44	45	46	47	49	51	53	....	....
	2400	54	55	56	59	62	63	66	78	83	88	91	....	....	....	....	....	....	....
	2000	78	79	81	83	85	87	91	99	....	....	....	....	....	....	....	....	....	....
	1750	89	92	94	96	97	98	101	112	....	....	....	....	....	....	....	....	....	....
	1150	116	118	120	122	123	124	....	....	....	....	....	....	....	....	....	....	....	....
	870	127	128	131	132	....	....	....	....	....	....	....	....	....	....	....	....	....	....
105	3600	....	....	....	....	....	PC	PC	PC	PC	PC	PC	PC	PC	PC	PC	PC	....	....
	3000	....	....	....	28	31	32	36	42	47	50	52	53	55	57	60	63	....	....
	2400	....	....	72	76	80	82	89	102	111	117	120	123	125	....	....	....	....	....
	2000	103	105	107	111	114	115	122	136	143	150	....	....	....	....	....	....	....	....
	1750	120	123	128	131	133	134	139	152	....	....	....	....	....	....	....	....	....	....
	1150	160	163	166	168	170	172	179	....	....	....	....	....	....	....	....	....	....	....
	870	176	180	182	187	189	....	....	....	....	....	....	....	....	....	....	....	....	....
126	3600	....	....	....	....	....	....	....	PC	PC	PC	PC	PC	PC	PC	PC	PC	....	....
	3000	....	....	....	....	....	35	40	47	52	55	58	59	61	64	66	69	....	....
	2400	....	....	....	96	102	104	112	131	143	151	156	159	162	....	....	....	....	....
	2000	....	....	135	140	144	146	155	174	183	192	198	....	....	....	....	....	....	....
	1750	169	171	172	175	179	181	189	207	218	227	....	....	....	....	....	....	....	....
	1150	222	227	231	233	235	238	246	....	....	....	....	....	....	....	....	....	....	....
	870	247	250	254	260	262	265	....	....	....	....	....	....	....	....	....	....	....	....
	720	258	261	265	272	274	....	....	....	....	....	....	....	....	....	....	....	....	....
	580	265	266	267	277	....	....	....	....	....	....	....	....	....	....	....	....	....	....
147	3600	....	....	....	....	....	....	....	....	PC	PC	PC	PC	PC	PC	PC	PC	....	....
	3000	....	....	....	....	....	....	....	41	46	49	51	53	54	57	59	61	....	....
	2400	....	....	....	....	110	114	124	146	160	168	174	178	181	189	196	206	....	....
	2000	....	....	....	173	175	178	189	214	228	240	247	252	255	....	....	....	....	....
	1750	....	....	202	208	211	215	226	248	263	270	281	....	....	....	....	....	....	....
	1150	275	280	285	288	291	294	305	323	....	....	....	....	....	....	....	....	....	....
	870	307	310	317	323	326	329	335	....	....	....	....	....	....	....	....	....	....	....
	720	323	327	333	339	343	346	....	....	....	....	....	....	....	....	....	....	....	....
	580	333	338	345	351	355	....	....	....	....	....	....	....	....	....	....	....	....	....
168	3600	....	....	....	....	....	....	....	....	....	PC	PC	PC	PC	PC	PC	PC	....	....
	3000	....	....	....	....	....	....	....	31	35	37	38	39	40	41	44	46	....	....
	2400	....	....	....	....	....	....	130	153	168	177	185	189	192	200	207	219	....	....
	2000	....	....	....	....	187	191	203	233	250	263	271	277	280	291	....	....	....	....
	1750	....	....	....	225	233	236	251	278	294	306	315	319	323	....	....	....	....	....
	1150	310	316	322	329	332	334	340	368	380	....	....	....	....	....	....	....	....	....
	870	354	357	364	367	371	374	381	388	....	....	....	....	....	....	....	....	....	....
	720	372	376	383	387	390	394	402	....	....	....	....	....	....	....	....	....	....	....
	580	380	385	393	400	404	408	....	....	....	....	....	....	....	....	....	....	....	....
189	3600	....	....	....	....	....	....	....	....	....	....	PC	PC	PC	PC	PC	PC	....	....
	3000	....	....	....	....	....	....	....	....	PC	PC	PC	PC	PC	PC	PC	PC	....	....
	2400	....	....	....	....	....	....	124	148	165	173	182	185	188	196	205	214	....	....
	2000	....	....	....	....	....	204	221	254	275	290	299	305	310	323	335	....	....	....
	1750	....	....	....	....	263	265	278	314	335	352	359	366	370	383	....	....	....	....
	1150	....	370	378	385	388	392	400	435	448	467	....	....	....	....	....	....	....	....
	870	....	423	430	438	443	447	455	483	....	....	....	....	....	....	....	....	....	....
	720	....	447	455	463	467	468	477	507	....	....	....	....	....	....	....	....	....	....
	580	....	460	468	478	480	483	497	....	....	....	....	....	....	....	....	....	....	....
2010	3600	....	....	....	....	....	....	....	....	....	....	....	PC	PC	PC	PC	PC	....	....
	3000	....	....	....	....	....	....	....	....	....	PC	PC	PC	PC	PC	PC	PC	....	....
	2400	....	....	....	....	....	....	....	....	154	163	168	173	176	185	192	202	....	....
	2000	....	....	....	....	....	....	238	270	294	311	322	328	333	349	360	379	....	....
	1750	....	....	....	....	282	287	304	344	371	387	400	406	411	....	....	....	....	....
	1150	....	406	423	439	444	447	455	500	516	536	550	....	....	....	....	....	....	....
	870	....	484	494	503	507	511	521	560	573	....	....	....	....	....	....	....	....	....
	720	....	515	526	535	539	541	550	586	....	....	....	....	....	....	....	....	....	....
	580	....	534	544	555	557	560	573	....	....	....	....	....	....	....	....	....	....	....
2211	3600	....	....	....	....	....	....	....	....	....	....	....	....	PC	PC	PC	PC	PC	....
	3000	....	....	....	....	....	....	....	....	....	....	PC	PC	PC	PC	PC	PC	PC	....
	2400	....	....	....	....	....	....	....	....	132	139	145	149	153	161	166	174	180	....
	2000	....	....	....	....	....	....	....	266	292	308	317	326	330	346	358	378	390	....
	1750	....	....	....	....	....	....	309	357	383	402	415	424	429	445	457	480	....	....
	1150	....	....	451	465	473	477	486	539	560	577	585	600	....	....	....	....	....	....
	870	....	523	536	546	551	556	566	607	624	644	....	....	....	....	....	....	....	....
	720	....	566	578	589	591	595	605	644	663	....	....	....	....	....	....	....	....	....
	580	....	585	596	608	611	614	631	665	....	....	....	....	....	....	....	....	....	....
2411	3600	....	....	....	....	....	....	....	....	....	....	....	....	....	PC	PC	PC	PC	....
	3000	....	....	....	....	....	....	....	....	....	....	....	PC	PC	PC	PC	PC	PC	....
	2400	....	....	....	....	....	....	....	....	....	96	100	102	105	110	114	120	123	....
	2000	....	....	....	....	....	....	....	245	267	282	292	301	305	318	329	345	358	....
	1750	....	....	....	....	....	....	....	350	379	399	410	420	425	444	457	478	498	....
	1150	....	....	....	489	498	502	520	570	588	610	624	628	636	....	....	....	....	....
	870	....	540	566	578	583	589	605	647	670	685	....	....	....	....	....	....	....	....
	720	....	603	615	625	632	638	650	690	708	....	....	....	....	....	....	....	....	....
	580	....	635	646	659	661	665	677	720	....	....	....	....	....	....	....	....	....	....
2712	3000	....	....	....	....	....	....	....	....	....	....	....	....	PC	PC	PC	PC	PC	....
	2400	....	....	....	....	....	....	....	....	....	....	PC	PC	PC	PC	PC	PC	PC	....
	2000	....	....	....	....	....	....	....	....	243	255	260	265	270	282	293	308	318	....
	1750	....	....	....	....	....	....	....	351	381	402	415	425	431	453	467	495	510	....
	1150	....	....	....	....	555	560	585	634	665	694	704	715	719	....	....	....	....	....
	870	....	620	645	665	671	678	690	745	770	856	870	....	....	....	....	....	....	....
	720	....	685	709	715	721	729	750	796	824	844	....	....	....	....	....	....	....	....
	580	....	741	756	764	766	771	793	844	865	....	....	....	....	....	....	....	....	....
3014	3000	....	....	....	....	....	....	....	....	....	....	....	....	....	PC	PC	PC	PC	PC
	2400	....	....	....	....	....	....	....	....	....	....	....	PC	PC	PC	PC	PC	PC	PC
	2000	....	....	....	....	....	....	....	....	....	175	182	187	191	202	208	218	225	230
	1750	....	....	....	....	....	....	....	....	350	368	382	394	398	415	430	450	466	480
	1150	....	....	....	....	588	594	620	680	720	746	766	776	781	797	....	....	....	....
	870	....	....	704	730	738	745	757	831	860	893	906	914	....	....	....	....	....	....
	720	....	....	792	800	807	815	837	890	920	950	973	....	....	....	....	....	....	....
	580	....	....	851	860	867	876	893	949	974	....	....	....	....	....	....	....	....	....
3318	3000	....	....	....	....	....	....	....	....	....	....	....	....	....	....	PC	PC	....	....
	2400	....	....	....	....	....	....	....	....	....	....	....	....	....	PC	PC	PC	....	....
	2000	....	....	....	....	....	....	....	....	....	272	PC	PC	PC	PC	PC	PC	....	....
	1750	....	....	....	....	....	619	650	735	776	814	284	292	297	314	324	341	....	....
	1150	....	....	....	818	825	841	871	938	975	1012	840	850	866	891	914	....	....	....
	870	....	....	908	925	934	941	960	1036	1070	1103	1042	1050	1059	1072	....	....	....	....
	720	....	....	991	1000	1010	1020	1049	1114	1141	1180	1120	1140	....	....	....	....	....	....
	580	....	....	....	....	....	....	....	....	....	....	1200	....	....	....	....	....	....	....
3824	2000	....	....	....	....	....	....	....	....	....	....	....	PC	PC	PC	....	....	....	....
	1750	....	....	....	....	....	....	....	....	....	....	PC	PC	PC	PC	....	....	....	....
	1150	....	....	....	....	....	....	....	685	747	786	816	835	846	876	....	....	....	....
	870	....	....	....	....	885	895	945	1030	1085	1130	1162	1178	1193	1225	....	....	....	....
	720	....	....	....	....	1057	1068	1204	1290	1239	1285	1314	1332	1342	1370	....	....	....	....
	580	....	....	....	1190	1200	1212	1257	1335	1300	1425	1458	1470	1480	....	....	....	....	....

NOTE: Where Thermal Horsepower Ratings are not shown at the right hand side of the above tables, the Thermal Horsepower Rating is higher than the Mechanical Rating of the Reducer shown on pages 10, 11 and 12 for that ratio and speed.

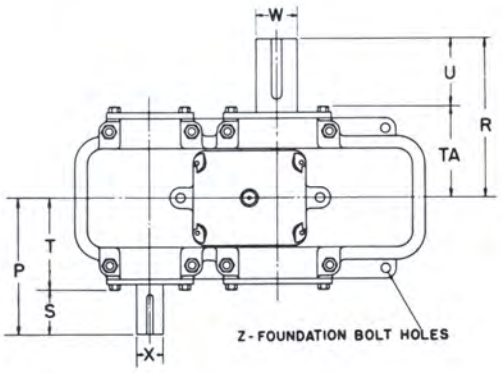
PC in above Table means that an oil pump and cooler must be added to the assembly to prevent over-heating, regardless of the horsepower to be delivered.

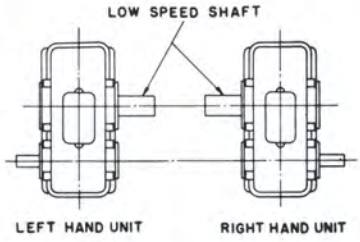
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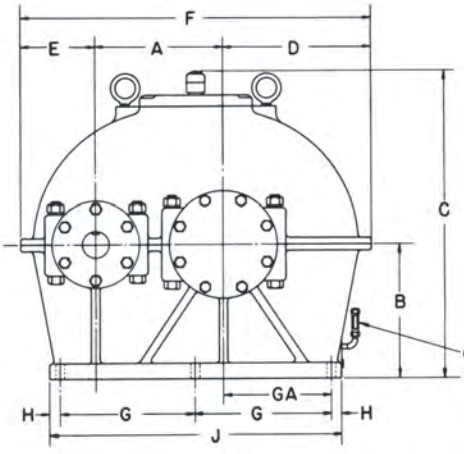
GENERAL DIMENSIONS

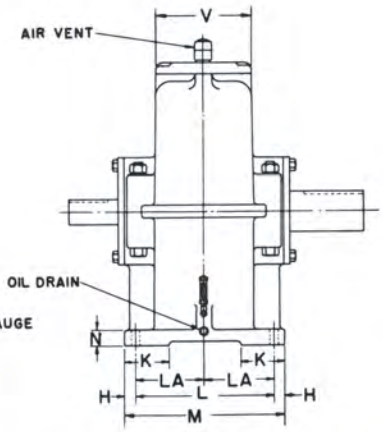
Type S

SINGLE REDUCTION HERRINGBONE GEAR REDUCERS









Size No.	A	B	C	D	E	F	G	GA	H	J	K	L	LA	M	N	P	R	S	T	TA	U	V	W	X**	Slow Speed Shaft Keyway	Z Bolt Holes	Weight
S63B	6	8	16 15/16	7 1/2	4 1/2	18	13 1/2	5 1/4	3/4	15	3	8 1/2	4 1/4	10	7/8	8 5/8	9 3/4	3 1/16	5 9/16	5 9/16	4 3/16	6	2	For High Speed Shaft Dia. See Table of H.P. Ratings Pages 10 and 11	1/2 x 1/4 x 3 7/8	4–1 1/16	280
S84B	8	10 1/2	22 1/2	10	5 1/2	23 1/2	17 1/2	7	1	19 1/2	3 1/4	9 1/2	4 3/4	11 1/2	1	9 1/2	10 1/4	3 3/8	6 1/8	6 1/8	4 1/8	6 3/4	2 1/2		5/8 x 5/16 x 3 7/8	4–1 3/16	500
S105B	10	12 1/2	27 3/8	12 1/2	7	29 1/2	11	8 3/4	1	24	4	11 1/2	5 3/4	13 1/2	1 1/2	12 1/2	13 3/4	4 3/4	7 3/4	7 7/8	5 7/8	8 1/2	3		3/4 x 3/8 x 5	6–1 3/16	875
S126B	12	15	32 1/4	15	8	35	14	11 1/2	1	30	4	13	6 1/2	15	1 1/2	14 1/2	16 1/4	5 9/16	8 15/16	8 15/16	7 5/16	9 3/4	3 1/2		7/8 x 7/16 x 5 1/2	6–1 3/16	1,380
S147B	14	17	37	16 1/2	8 1/2	39	15 1/2	12 1/2	1 1/4	33 1/2	4 1/2	15 1/2	7 3/4	18	2	16 1/2	18	6 1/2	10	10	8	11 1/2	4		1 x 1/2 x 7 1/2	6–1 1/16	1,950
S168B	16	19	40 3/8	18 1/2	9 1/2	44	17	13 1/2	1 1/2	36 1/2	5	16	8	18 1/2	1 3/4	16 1/2	20	5 1/4	11 1/4	11 1/2	8 1/2	12	5		1 1/4 x 7/16 x 7 1/2	6–1 1/16	2,600
S189B	18	21	45 1/8	20	10	48	19	15	1 1/2	41	5 1/2	17 1/2	8 3/4	20 1/2	2	18	22	6 1/2	11 1/2	11 1/2	10 1/2	13	5 1/2		1 1/4 x 7/16 x 9	6–1 5/16	2,975
S2010B	20	23	50 1/8	22 1/2	11	53 1/2	22	17 3/4	1 1/2	47	5	19	9 1/2	22	2	19	24	6 1/2	12 1/2	12 1/2	11 1/2	14	6		1 1/2 x 1/2 x 9	6–1 5/16	4,300
S2211B	22	25	52 1/2	24 1/2	12 1/2	59	23	18	2	50	7	21	10 1/2	25	3	21	26	8 1/4	12 3/4	13 1/4	12 3/4	15	7		1 3/4 x 5/8 x 10	6–1 9/16	5,600
S2411B	24	27	58 15/16	26 1/2	13 1/2	64	25 1/2	20	1 3/4	54 1/2	6	21	10 1/2	24 1/2	2 3/4	21	26	8	13	13 1/2	12 1/2	15	7		1 3/4 x 5/8 x 10	6–1 9/16	6,200
S2712B	27	28	59 1/8	29	14	70	*	22	2	60	8	26	13	30	3	22 1/2	29 1/2	8 1/2	14	14 1/2	15	17	8		2 x 3/4 x 12 1/2	8–1 9/16	8,800

All dimensions are in inches.
* The S2712B Has 8 Foundation Holes Spaced 16-24-16.
** For High Speed Shaft Keyways, see Table of Standard Keyways Page 42.
For units having four foundation bolts the dimension under G is the distance between bolts.

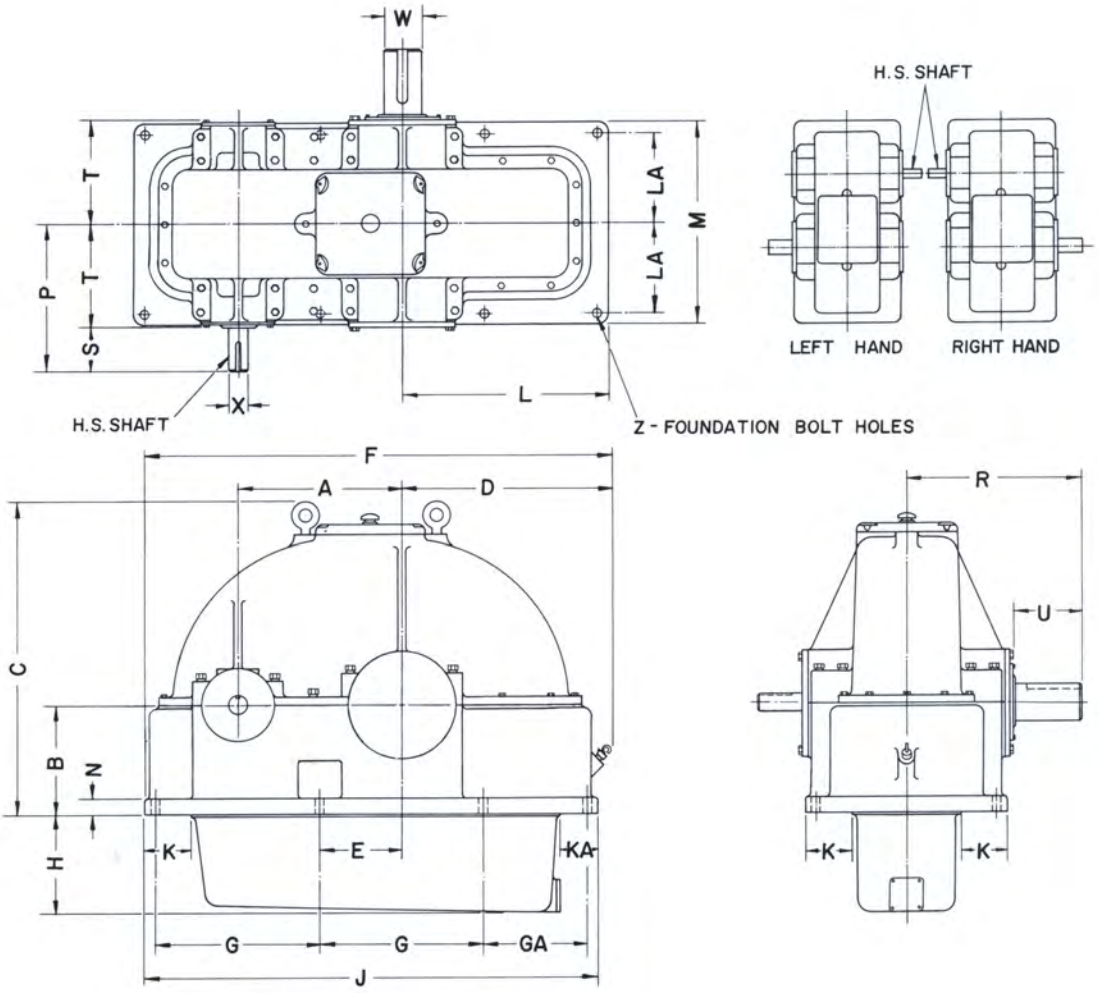
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GENERAL DIMENSIONS

Large Type S

SINGLE REDUCTION HERRINGBONE GEAR REDUCERS



Size No.	A	B	C	D	E	F	G	GA	H	J	K	KA	L	LA	M	N	P	R	S	T	U	W	** X	S.S. Shaft Keyway	Z	Weight
S3014 B.....	30	20	57½	38	15	86	30	19	18	83	8½	7	36	16½	27	3	27	34	7⅞	19⅛	14¼	8	*	2 x ¾ x 13	8–1⅝	14,750
S3318 B.....	33	20	60¼	39½	17	91	32	20	19	88	8½	7	37	18¼	40½	3	30	38	9	21	16	9	*	2 x ⅞ x 15	8–1⅝	20,000
S3824 B.....	38	24	66	44	20	104	37¼	22	20	101	8½	7	41½	22¼	49	3¼	36	42	10⅞	25⅛	15⅞	9	*	2 x ⅞ x 15	8–1⅝	24,000

All dimensions are in inches.
* For H. S. Shaft Dia, see table of H. P. Ratings Pages 11 and 12.
** For High Speed Shaft Keyways, see table of Standard Keyways Page 42.

Above dimensions are not to be used for installation.
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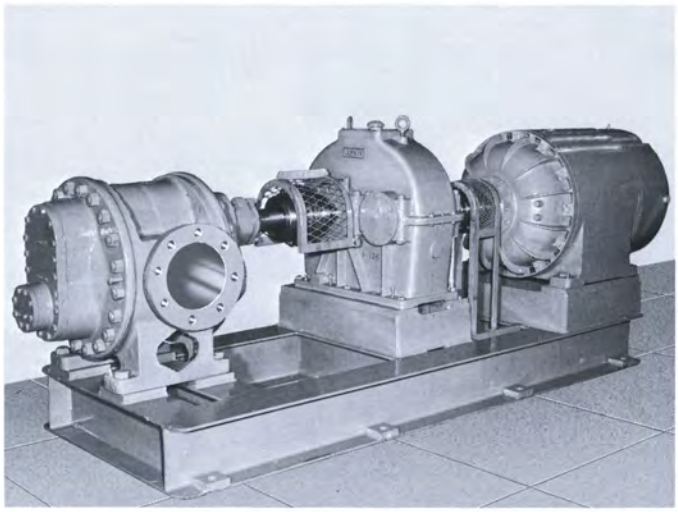
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Type S

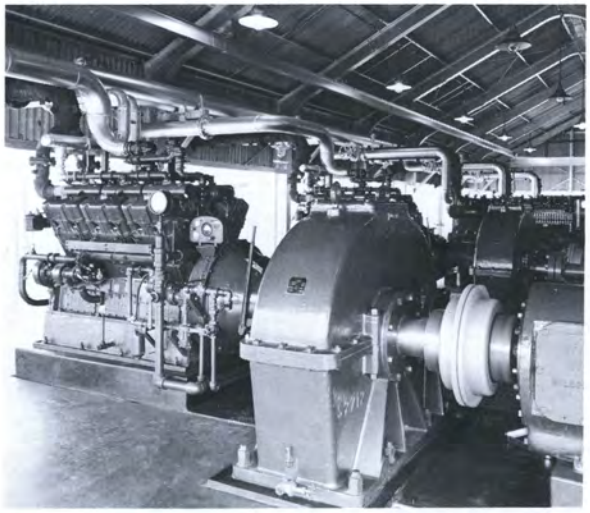
SINGLE REDUCTION HERRINGBONE GEAR REDUCERS







Lufkin S126B Reducer mounted on fabricated base with electric motor and rotary gear pump.

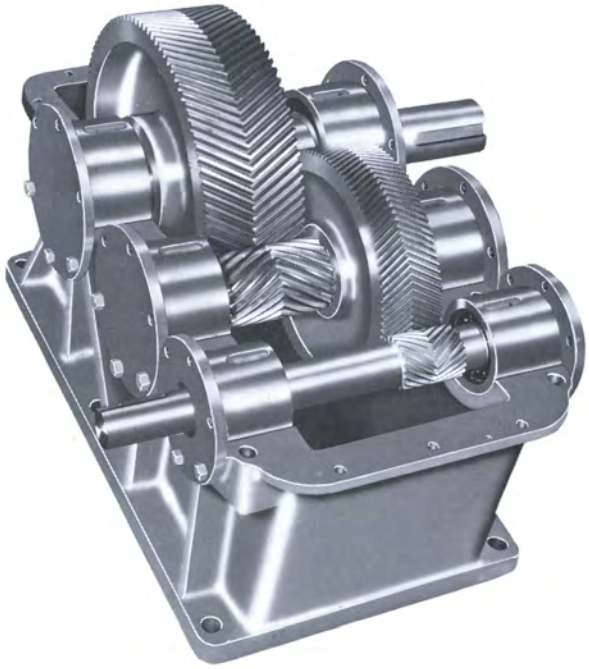


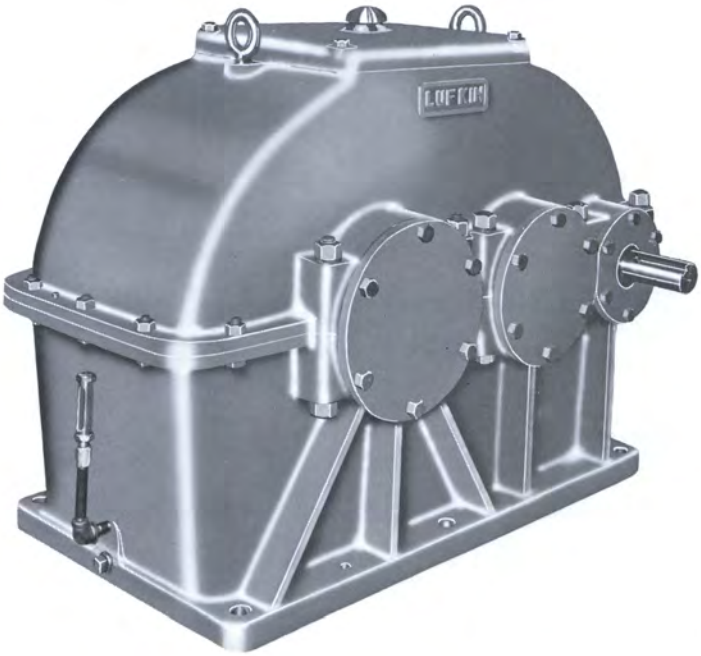
Two of Eight Identical Lufkin S2712B Reducers in water flood service driven by multi-cylinder engines at 900 RPM driving reciprocating pumps at 185 RPM, delivering 515 horsepower.

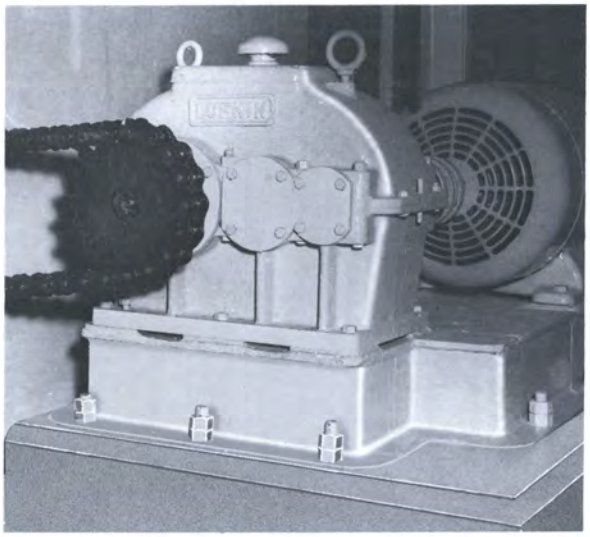
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Type D

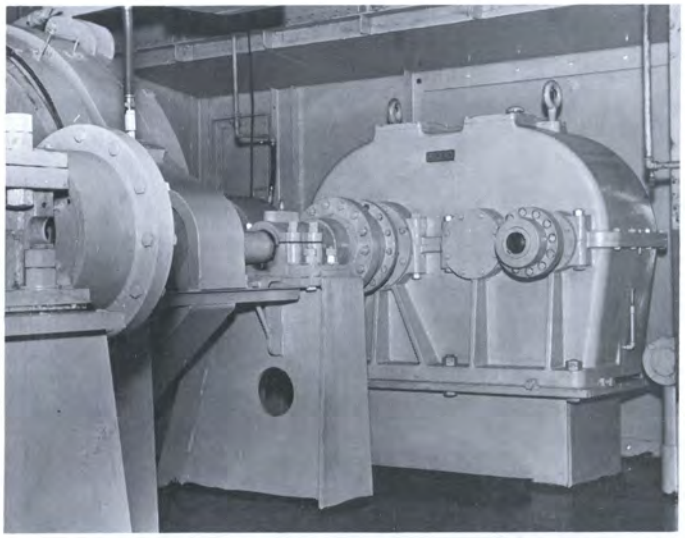
DOUBLE REDUCTION HERRINGBONE GEAR REDUCERS







Lufkin D120B Reducer with overhung load application in a paper mill.



Lufkin Model D390B Reducer driving the ladder hoist on a large harbor dredge.

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HORSEPOWER RATING TABLES

TYPE D — DOUBLE REDUCTION UNITS

The Horsepower Ratings listed in the tables below are mechanical ratings calculated by the A.G.M.A. formula using a Service Factor of 1. See pages 6, 7 and 8 for information on selecting reducers.

Size No. D100B

Thermal Rating H.P.	Motor R.P.M.	STANDARD RATIOS																			
		10.7	11.8	12.9	14.2	16.5	18.3	20.3	22.7	25.5	28.7	32.5	37.0	40.5	46.1	49.0	....	....	....	....	....
58	1750	28.0	25.2	23.0	21.3	18.6	16.7	14.7	12.8	11.0	9.7	8.4	7.2	6.3	5.4	5.1	....	....	....	....	....
69	1150	18.3	16.8	15.7	14.4	12.6	11.5	10.2	8.8	7.5	6.4	5.6	4.8	4.3	3.7	3.5	....	....	....	....	....
75	870	14.9	13.6	12.5	11.3	9.8	8.7	7.6	6.6	5.7	5.0	4.3	3.6	3.3	2.8	2.6	....	....	....	....	....
78	720	12.6	11.2	10.3	9.6	8.2	7.4	6.4	5.5	4.9	4.2	3.5	3.0	2.6	2.3	2.2	....	....	....	....	....
81	580	10.3	9.4	8.5	7.8	6.7	5.9	5.2	4.7	4.0	3.4	2.9	2.4	2.2	1.9	1.8	....	....	....	....	....
High Speed Shaft Diameter		7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	3/4	3/4	3/4	3/4	3/4	....	....	....	....	....

Size No. D120B

Thermal Rating H.P.	Motor R.P.M.	STANDARD RATIOS																			
		10.7	12.1	13.8	15.8	18.1	20.5	22.4	25.7	27.3	31.4	36.4	42.1	45.3	47.5	50.7	53.7	61.1	....	....	....
82	1750	46.5	40.6	36.0	31.9	27.4	24.2	21.3	18.1	16.9	14.2	11.8	10.0	9.2	8.8	8.0	7.2	6.3	....	....	....
97	1150	32.4	28.2	24.7	21.9	18.7	16.4	14.7	12.8	11.7	9.8	8.0	6.7	6.2	5.8	5.5	5.1	4.3	....	....	....
133	870	24.6	22.0	19.3	17.0	14.4	12.5	11.2	9.5	9.0	7.5	6.1	5.1	4.7	4.3	4.0	3.7	3.2	....	....	....
139	720	21.2	18.6	16.2	14.2	12.0	10.5	9.4	8.0	7.5	6.2	5.1	4.2	3.9	3.7	3.3	3.1	2.6	....	....	....
143	580	17.3	15.2	13.3	11.5	9.8	8.6	7.7	6.7	6.0	5.1	4.2	3.5	3.1	2.9	2.8	2.6	2.2	....	....	....
High Speed Shaft Diameter		1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1	1	1	7/8	7/8	7/8	7/8	7/8	....	....	....

Size No. D145B

Thermal Rating H.P.	Motor R.P.M.	STANDARD RATIOS																			
		10.7	11.8	13.2	14.7	16.4	19.4	22.0	25.0	28.6	30.5	32.9	37.2	42.4	45.6	49.0	52.5	60.0	64.6	....	....
106	1750	74.5	68.0	61.5	55.5	50.2	42.4	37.0	32.1	27.3	25.6	23.3	19.9	17.1	15.8	14.6	13.4	11.3	10.0		....
126	1150	53.0	48.9	43.3	39.5	34.4	29.1	25.0	21.7	18.5	17.7	15.8	13.7	11.7	10.7	9.8	9.0	7.5	6.9	....	....
137	870	40.5	36.9	33.3	30.0	27.1	22.9	19.8	17.4	14.5	13.5	12.1	10.6	9.0	8.3	7.6	6.9	5.6	4.7	....	....
143	720	34.7	32.1	29.1	26.4	23.9	19.0	16.5	14.2	12.3	11.4	10.1	8.8	7.5	6.8	6.1	5.6	4.8	4.3	....	....
147	580	28.5	26.1	23.3	21.0	18.4	15.3	13.2	11.6	9.7	8.7	8.2	7.0	6.0	5.5	5.0	4.3	3.9	3.5	....	....
High Speed Shaft Diameter		1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/4	1 1/4	1 1/4	1 1/4	1	1	1	1	....	....

Size No. D170B

Thermal Rating H.P.	Motor R.P.M.	STANDARD RATIOS																			
		11.1	13.0	14.6	16.4	18.4	21.0	23.6	26.7	30.4	32.1	36.4	41.4	47.5	50.7	53.6	57.4	64.6	69.4	....	....
146	1750	119	103	96.0	80.4	73.4	64.0	56.8	48.1	41.7	39.6	34.7	29.8	24.8	22.4	21.1	19.8	17.5	16.0	....	....
174	1150	82.4	72.8	64.3	57.4	51.0	44.5	39.5	33.7	29.5	27.3	23.1	19.6	16.7	15.2	13.8	13.2	11.6	10.2	....	....
189	870	64.5	56.9	50.5	43.1	38.8	33.7	29.4	26.6	22.3	20.9	18.0	15.2	13.1	11.6	10.9	10.2	8.8	8.0	....	....
197	720	55.0	47.5	42.6	37.4	32.4	28.7	25.2	21.6	18.0	17.3	14.4	12.3	10.2	9.4	8.8	8.0	7.3	6.6	....	....
203	580	44.4	38.9	34.6	30.2	26.6	23.0	20.1	16.9	14.4	13.7	11.5	10.2	8.8	8.0	7.3	6.6	5.8	5.1	....	....
High Speed Shaft Diameter		1 3/4	1 3/4	1 3/4	1 3/4	1 3/4	1 3/4	1 3/4	1 3/4	1 1/2	1 1/2	1 1/4	1 1/4	1 1/4	1 1/4	1	1	1	1	....	....

Size No. D195B

Thermal Rating H.P.	Motor R.P.M.	STANDARD RATIOS																			
		11.3	12.5	14.2	16.5	18.3	20.5	22.9	25.8	29.1	33.1	36.1	40.0	46.7	49.8	52.3	59.0	66.7	70.5	....	....
194	1750	170	153	138	119	106	92	81	71	63	54	48	43	36	33	31	27	23	21	....	....
230	1150	117	104	91	81	73	64	57	49	44	38	33	29	25	23	21	18	16	15	....	....
250	870	89	81	72	63	56	49	43	38	33	28	24	22	18	17	16	14	12	11	....	....
260	720	76	70	62	53	47	42	36	31	27	23	21	19	15	14	13	12	10	9	....	....
270	580	63	57	50	43	39	34	29	26	23	20	17	14	13	12	11	10	8	7	....	....
High Speed Shaft Diameter		2	2	2	2	2	2	2	2	2	1 3/4	1 3/4	1 3/4	1 1/2	1 1/2	1 1/2	1 1/2	1 1/4	1 1/4	....	....

Size No. D220B

Thermal Rating H.P.	Motor R.P.M.	STANDARD RATIOS																			
		11.1	12.3	13.7	15.2	17.9	20.0	22.6	26.0	30.5	34.2	38.6	43.8	46.6	51.2	53.9	58.1	61.4	65.4	70.0	74.1
233	1750	231	209	178	161	146	132	113	96	80	70	61	54	50	44	40	37	34	32	30	29
277	1150	162	146	131	117	99	89	78	66	55	48	43	36	34	30	28	26	24	22	20	18
300	870	125	112	101	91	78	69	60	51	42	38	32	27	25	22	21	20	18	17	15	14
314	720	105	95	86	78	67	59	51	43	36	32	27	23	21	19	17	16	15	14	13	12
320	580	87	80	71	63	53	48	42	36	29	25	22	19	17	15	14	13	12	11	10	9
High Speed Shaft Diameter		2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	1 3/4	1 3/4	1 3/4	1 3/4	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2

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HORSEPOWER RATING TABLES

TYPE D — DOUBLE REDUCTION UNITS

The Horsepower Ratings listed in the tables below are mechanical ratings calculated by the A.G.M.A. formula using a Service Factor of 1. See pages 6, 7 and 8 for information on selecting reducers.

Size No. D250B

Thermal Rating H.P.	Motor R.P.M.	STANDARD RATIOS																			
		11.3	13.1	14.6	16.0	17.7	20.5	22.7	25.5	28.5	32.1	36.4	40.8	46.2	48.3	53.7	56.4	60.2	63.3	67.8	72.0
285	1750	324	288	256	234	213	181	160	139	124	109	89	81	71	65	57	53	49	46	43	40
340	1150	227	195	176	160	142	126	111	97	84	75	66	56	49	46	40	37	35	33	30	27
370	870	173	150	134	124	111	97	87	75	66	58	49	43	37	35	31	28	27	25	23	20
385	720	148	129	116	106	97	81	73	63	56	48	41	35	30	28	26	24	23	21	19	18
395	580	121	106	95	87	79	68	60	52	40	39	33	29	25	23	21	20	18	17	15	14
High Speed Shaft Diameter		2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2¼	2¼	1¾	1¾	1¾	1¾	1¾	1¾	1½

Size No. D290B

Thermal Rating H.P.	Motor R.P.M.	STANDARD RATIOS																			
		11.7	13.0	14.3	16.7	19.1	22.2	24.8	27.7	29.9	33.2	37.0	41.3	46.5	51.5	55.1	58.0	62.4	65.7	68.7	72.6
344	1750	443	411	378	329	284	242	212	184	170	150	132	118	101	88	82	77	69	66	61	59
410	1150	310	283	261	228	199	163	144	128	116	103	91	80	70	61	57	53	48	44	42	39
445	870	242	220	203	175	155	128	110	97	89	79	71	62	55	47	42	40	37	35	32	30
465	720	204	187	175	149	130	107	94	84	76	66	58	51	44	39	37	34	31	29	27	25
475	580	168	153	142	123	107	89	78	69	61	55	48	42	36	32	29	28	25	23	22	21
High Speed Shaft Diameter		2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2½	2½	2½	2½	2¼	2¼	2¼	2¼	2

Size No. D340B

Thermal Rating H.P.	Motor R.P.M.	STANDARD RATIOS																			
		11.4	12.9	14.7	16.0	18.3	21.2	23.3	25.5	28.7	32.1	36.0	40.1	45.0	47.5	50.7	54.9	58.7	65.7	70.1	74.0
408	1750	709	625	564	516	454	388	348	318	275	242	210	184	164	153	142	126	116	103	94	89
485	1150	495	435	395	368	322	261	234	213	188	169	144	125	111	104	96	88	82	71	64	60
528	870	386	346	303	280	251	212	188	167	149	130	111	98	87	81	74	67	61	52	49	46
550	720	327	290	264	240	209	177	157	143	122	107	94	82	71	67	62	56	52	45	42	37
565	580	273	242	218	197	174	143	130	117	102	91	77	66	58	55	50	46	43	37	34	30
High Speed Shaft Diameter		3	3	3	3	3	3	3	3	3	3	3	3	2⅝	2⅝	2⅝	2⅝	2½	2½	2½	2½

Size No. D390B

Thermal Rating H.P.	Motor R.P.M.	STANDARD RATIOS																			
		11.5	13.5	14.6	16.6	18.9	20.7	22.7	25.0	27.6	31.5	34.7	38.4	42.8	45.5	50.3	54.8	60.8	64.5	68.6	71.6
460	1750	1165	930	790	760	667	603	541	485	431	368	330	288	258	240	213	192	170	156	147	142
545	1150	739	635	589	523	470	424	374	333	300	253	234	204	178	166	148	135	118	108	100	95
600	870	583	500	464	410	366	329	297	258	233	204	181	161	139	129	114	104	89	82	76	73
620	720	490	429	392	350	306	274	246	222	200	167	149	132	117	107	96	87	74	69	65	61
640	580	408	350	324	285	249	227	202	181	162	138	123	110	96	86	78	71	63	57	52	50
High Speed Shaft Diameter		3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3	3	3	2⅝	2⅝	2⅝	2⅝	2⅝	2½

Size No. D440B

Thermal Rating H.P.	Motor R.P.M.	STANDARD RATIOS																			
		11.7	13.0	14.5	16.2	18.2	20.6	22.4	25.4	30.4	33.4	36.7	40.6	45.2	48.6	53.3	56.5	60.0	65.2	68.9	72.0
500	1750	1370	1260	1145	1020	910	805	730	638	525	475	424	374	330	298	268	249	231	211	197	188
590	1150	952	871	786	705	634	566	515	445	364	328	289	257	227	203	184	172	161	144	137	129
635	870	755	689	621	557	495	438	398	343	279	254	224	197	177	158	144	133	123	110	104	98
660	720	630	580	524	468	419	370	335	295	238	213	189	164	147	132	120	113	102	92	87	82
680	580	520	474	430	386	345	310	280	243	197	176	157	136	122	111	99	91	84	76	71	68
High Speed Shaft Diameter		3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¼	3¼	3¼	3¼	3¼	3	3	3

Size No. D500B

Thermal Rating H.P.	Motor R.P.M.	STANDARD RATIOS																			
		11.3	13.0	14.4	16.7	18.8	21.0	23.5	25.3	28.3	31.3	35.0	38.0	42.3	47.2	53.0	57.3	60.0	65.0	69.9	74.0
540	1750	1865	1765	1645	1460	1275	1135	994	930	821	734	651	575	506	445	390	357	338	307	287	270
638	1150	1375	1240	1130	986	876	779	684	643	553	494	445	404	357	316	271	244	230	210	193	180
690	870	1075	970	890	774	687	601	531	515	440	390	346	309	273	241	212	194	179	162	150	140
718	720	940	824	750	648	576	505	448	432	372	333	294	265	228	200	178	163	148	135	124	117
740	580	759	665	611	540	474	424	377	343	313	276	240	216	189	168	146	132	123	113	103	95
High Speed Shaft Diameter		4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	3¾	3¾	3¾	3¾	3¾	3¾

Ratios listed are standard but intermediate ratios are available.

Ratings for intermediate ratios and speeds may be found by direct interpolation.

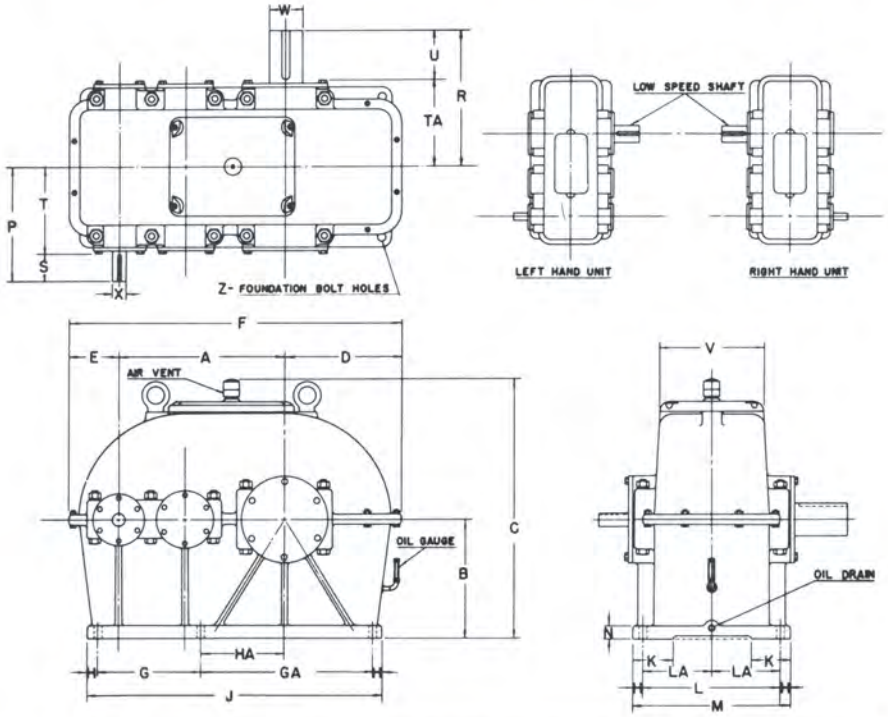
All units may be operated at speeds lower than the minimum shown. The selection of a reducer for a lower speed may be accomplished by multiplying the desired horsepower by 580 and dividing by the desired speed. The result will be the equivalent horsepower at 580 RPM which can be found in the above tables.

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GENERAL DIMENSIONS

Type D

DOUBLE REDUCTION HERRINGBONE GEAR REDUCERS



Size No.	A	B	C	D	E	F	G	GA	H	HA	J	K	L	LA	M	N	P	R	S	T	TA	U	V	W	X**	Slow Speed Shaft Keyway	Z Bolt Holes	Weight
D100 B	10	8	17 9/16	7 1/2	3 3/4	21 1/4	8 1/4	8 1/4	3/4	3 1/8	18	*	10	5	11 1/2	1	8 1/2	10 3/4	2	6 1/2	6 1/2	4 1/4	8	2	For High Speed Shaft Dia. See Table of H.P. Ratings on Pages 18 and 19	1/2 x 1/4 x 3 7/8	6-9/16	250
D120 B	12	9 1/2	21 7/16	9	4 1/2	25 1/2	9 3/4	9 3/4	7/8	3 3/4	21 1/4	3 1/2	12	6	13 3/4	1	9 1/2	11 1/2	2 3/16	7 5/16	7 5/16	4 3/16	9 1/2	2 1/2		5/8 x 5/16 x 3 7/8	6-13/16	600
D145 B	14 1/2	10 1/2	24 1/8	11	6	31 1/2	12	12	1	4 3/4	26	4	13 1/2	6 3/4	15 1/2	1 1/4	10 3/4	14	2 1/4	8 1/2	8 3/4	5 1/4	10 1/2	2 3/4		5/8 x 5/16 x 4 7/8	6-13/16	925
D170 B	17	12 1/2	28 3/16	12	6 1/2	35 1/2	14	14	1	5 3/4	30	4	15	7 1/2	17	1 1/2	13	15 1/2	3 1/2	9 1/2	9 3/4	5 3/4	12	3		3/4 x 3/8 x 5	6-13/16	1,300
D195 B	19 1/2	14	30 5/8	14	6 1/2	40	17	15	1 1/4	5	34 1/2	4 1/2	17 1/2	8 3/4	20	1 1/2	14 1/2	18 1/2	3 3/4	10 3/4	10 7/8	7 5/8	14	3 1/2		7/8 x 3/16 x 5 1/2	6-1 1/16	1,700
D220 B	22	15	35 3/8	15	7 1/2	44 1/2	14 1/2	21	1 1/4	10 1/2	38	5	19	9 1/2	21 1/2	1 3/4	16 1/2	18 1/2	4 7/8	11 5/8	11 3/4	6 3/4	15	4		1 x 1/2 x 5 1/2	6-1 1/16	2,300
D250 B	25	17	39 3/8	17	8	50	17	23	1 1/2	11	43	6	21	10 1/2	24	2	17 3/4	21 1/2	4 3/4	13	13 1/4	8 1/4	15	5		1 1/4 x 3/16 x 7 1/2	6-1 5/16	2,900
D290 B	29	20	44 9/16	19	9	57	20	27	1 1/2	13	50	6 1/2	24	12	27	2 1/2	19 1/2	24	5 1/4	14 1/4	14 1/2	9 1/2	18	5 1/2		1 1/4 x 3/16 x 9	6-1 5/16	4,000
D340 B	34	23	51 1 1/16	21 1/2	10	65 1/2	23	30	2	14 3/4	57	7	27	13 1/2	31	2 3/4	21	25 1/2	5 1/2	15 1/2	15 3/4	9 3/4	20 1/2	6		1 1/2 x 1/2 x 9	6-1 9/16	6,000
D390 B	39	27	58 5/16	26 1/2	10 1/2	76	***	***	2	19 1/2	67	8	30	15	34	3	23	28 1/2	6	17	17 1/2	11	23	7		1 3/4 x 5/8 x 10	8-1 9/16	8,500
D440 B	44	30	63 1 1/16	29	12	85	****	****	2	22	74	9	34	17	38	3 1/4	24 1/2	32	6	18 1/2	19	13	25	8		2 x 3/4 x 12 1/2	8-1 9/16	11,500

All dimensions are in inches.
* D100B Base is not recessed on bottom.
** For High Speed Shaft Keyways see Table of Standard Keyways Page 42.

*** The D390B has 8 Foundation Bolt holes spaced 23 1/2 - 23 1/2 - 16.
**** The D440B has 8 Foundation Bolt holes spaced 26 1/2 - 26 1/2 - 17.
Above dimensions are not to be used for Installation.
USE CERTIFIED INSTALLATION PRINT.

OVERHUNG LOAD CAPACITIES

SLOW SPEED SHAFTS

The table below shows Moderate Overhung Load Capacities for Standard Type D Reducers. It is assumed that the external load is acting one shaft diameter in from the end of the shaft.

The table below does not apply for double extended slow speed shafts. Present your application to us for recommendations.

The actual load imposed on a shaft for a given condition of service may be determined by the formula on the bottom of page 6. For unusual conditions or in case of doubt present your problem to us for recommendations.

Overhung load capacities are figured at the highest speed shown in horsepower rating tables for each size reducer.

Overhung Load	REDUCER NO.										
	D100B	D120B	D145B	D170B	D195B	D220B	D250B	D290B	D340B	D390B	D440B
Moderate (Standard)	2950	4000	4800	5600	7,500	10,500	14,500	18,000	22,000	24,000	25,000
Heavy (Special)	4000	6000	7500	9000	11,500	20,000	30,000	40,000	50,000	55,000	60,000

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TRIPLE REDUCTION HERRINGBONE GEAR REDUCERS

TYPE T

SPECIFICATIONS

The Type T assembly is a modification of the Type D Assembly. The specifications covering all items are the same as those shown for Type D assemblies on page 4.

The dimensions are the same as those shown for Type D assemblies on page 20 or with slight modifications. Certified installation prints will be furnished upon request for specific applications.

Overhung load capacities are the same as the corresponding Type D unit shown on page 20.

The thermal capacity of Type T reducers will always exceed the transmitted load.

SELECTION OF UNITS

The selection of a Type T Gear Reducer is done in the same way as shown for Type D Reducers on pages 6-8 using the service factors shown on page 9.

HORSEPOWER RATING TABLES

TYPE T — TRIPLE REDUCTION UNITS

The Horsepower Ratings listed in the tables below are Mechanical ratings calculated by the A.G.M.A. formula using a Service Factor of 1. See pages 6, 7 and 8 for information on selecting reducers.

Size No. T145B

Motor R.P.M.	STANDARD RATIOS						
	86.5	105.9	129.7	158.9	194.6	238.4	291.9
1750	11.9	9.8	8.1	6.3	5.1	4.0	3.4
1150	8.1	6.3	5.3	4.3	3.4	2.8	2.3
870	6.1	5.0	4.1	3.3	2.5	2.2	1.7
720	5.1	4.2	3.3	2.7	2.2	1.7	1.4
580	4.2	3.4	2.7	2.2	1.7	1.4	1.2
High Speed Shaft Diameter	1	1	1	1	1	1	(1) 7/8

Size No. T170B

Motor R.P.M.	STANDARD RATIOS						
	86.5	105.9	129.7	158.9	194.6	238.4	291.9
1750	19.5	16.0	13.0	10.6	8.4	6.7	5.6
1150	13.3	10.6	8.6	6.9	5.6	4.5	3.7
870	10.1	7.9	6.5	5.3	4.1	3.3	2.8
720	8.7	6.8	5.4	4.3	3.5	2.7	2.3
580	6.8	5.6	4.4	3.5	2.8	2.2	1.9
High Speed Shaft Diameter	1¼	1¼	1¼	1¼	1¼	1¼	(1¼) 1

Size No. T195B

Motor R.P.M.	STANDARD RATIOS						
	86.5	105.9	129.7	158.9	194.6	238.4	291.9
1750	28.5	22.6	18.0	15.1	11.9	9.3	7.9
1150	18.7	14.7	12.3	9.4	8.3	6.5	5.2
870	14.4	11.6	9.4	7.7	6.1	5.0	4.0
720	12.0	9.4	7.9	6.1	5.0	4.0	3.3
580	9.8	7.9	6.1	5.0	4.2	3.3	2.7
High Speed Shaft Diameter	1½	1½	1½	1½	1½	1½	(1½) 1¼

Size No. T220B

Motor R.P.M.	STANDARD RATIOS						
	86.5	105.9	129.7	158.9	194.6	238.4	291.9
1750	38.7	30.0	25.5	20.5	16.5	13.2	10.7
1150	25.6	20.5	16.6	14.0	10.8	8.0	7.2
870	19.4	15.8	13.0	10.8	8.2	6.7	5.5
720	16.5	13.4	11.5	8.7	6.8	5.5	4.6
580	13.3	10.8	8.6	7.1	5.8	4.5	3.7
High Speed Shaft Diameter	1½	1½	1½	1½	1½	1½	1½

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HORSEPOWER RATING TABLES (cont'd.)

TYPE T — TRIPLE REDUCTION UNITS

Size No. T250B

Motor R.P.M.	STANDARD RATIOS						
	86.5	105.9	129.7	158.9	194.6	238.4	291.9
1750	54.3	43.8	35.2	29.1	23.8	19.7	15.5
1150	36.8	29.4	24.7	19.5	15.8	12.7	10.4
870	28.2	22.4	18.1	14.8	12.2	9.7	7.9
720	23.5	18.8	15.1	12.4	10.0	8.0	6.6
580	19.2	15.1	12.3	10.1	8.1	6.5	5.3
High Speed Shaft Diameter	1¾	1¾	1¾	1¾	1¾	1¾	(1¾) 1½

Size No. T290B

Motor R.P.M.	STANDARD RATIOS						
	86.5	105.9	129.7	158.9	194.6	238.4	291.9
1750	78.8	62.2	52.7	41.8	33.8	28.1	23.1
1150	53.5	41.8	35.3	28.3	23.0	18.7	15.8
870	40.8	32.0	27.0	21.6	18.0	14.8	11.9
720	34.1	26.7	22.6	18.0	14.7	12.3	10.1
580	28.0	21.7	18.3	14.6	11.7	9.7	7.9
High Speed Shaft Diameter	2	2	2	2	2	2	2

Size No. T340B

Motor R.P.M.	STANDARD RATIOS						
	86.5	105.9	129.7	158.9	194.6	238.4	291.9
1750	122	101	81.2	67.5	54.7	45.3	36.0
1150	82.5	68.2	54.5	45.3	35.2	30.2	23.8
870	64.0	52.7	42.3	34.5	27.4	23.3	18.4
720	53.2	43.8	35.2	28.8	23.1	19.4	15.3
580	43.1	35.8	28.7	23.7	18.7	15.8	12.3
High Speed Shaft Diameter	2½	2½	2½	2½	(2½) 2¼	(2½) 2	(2½) 2

Size No. T390B

Motor R.P.M.	STANDARD RATIOS						
	86.5	105.9	129.7	158.9	194.6	238.4	291.9
1750	187	153	123	102	80.7	65.5	54.0
1150	128	104	83.0	67.7	53.3	44.6	36.0
870	98.3	80.0	64.5	51.8	41.0	33.8	28.1
720	82.5	67.0	54.0	43.2	34.6	28.1	23.1
580	67.5	55.5	43.0	35.3	28.1	22.3	18.7
High Speed Shaft Diameter	2⅝	2⅝	2⅝	2⅝	2⅝	(2⅝) 2½	(2⅝) 2¼

Size No. T440B

Motor R.P.M.	STANDARD RATIOS						
	86.5	105.9	129.7	158.9	194.6	238.4	291.9
1750	251	203	163	135	109	88.5	73.0
1150	170	138	111	90.7	73.0	60.5	49.7
870	131	106	83.5	69.9	52.5	46.8	37.4
720	110	88.5	72.0	58.5	46.7	38.1	31.7
580	90.0	72.0	57.8	48.3	38.1	32.4	25.2
High Speed Shaft Diameter	3	3	3	3	3	(3) 2¾	(3) 2½

Ratios listed are standard but intermediate ratios are available.

Ratings for intermediate ratios and speeds may be found by direct interpolation.

All units may be operated at speeds lower than the minimum shown. The selection of a reducer for a lower speed may be accomplished by multiplying the desired horsepower by 580 and dividing by the desired speed. The result will be the equivalent horsepower at 580 RPM which can be found in the above tables.

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MEDIUM SPEED HERRINGBONE GEAR REDUCERS AND SPEED INCREASERS

Type M

APPLICATION

Type M Medium Speed Reducers and Increasers are applicable for:

Speeds higher than permitted with standard Type S Reducers and lower than required for Type NM and Type N High Speed Reducers.

SPECIFICATIONS

The Type M assembly is a modification of the Type S assembly. The gear case is exactly the same. The specifications covering all other items except the high speed bearings are also the same as for Type S Reducers. The high speed bearings are straight roller anti-friction similar to those used in the slower speed units but are a type which will permit higher speeds. The rotating elements are more carefully balanced and the gear teeth are more accurately finished to accommodate the higher speed.

The dimensions of Type M reducers when furnished with oil pump and cooler are shown on page 27. The high speed shaft diameters are shown with the Type M Rating Tables on pages 24, 25 and 26.

These medium speed units are normally furnished with an oil pan to prevent excessive splashing of the oil.

LIMITATIONS

Type M units are applicable for speeds higher than shown in the Type S Rating Tables. The top speed must be less than 3600 RPM and 5000 feet per minute pitch line velocity. If the speed should reach these values, use the Type NM or N assembly.

SELECTION OF UNITS

The selection of a Type M Gear Reducer for a particular job is done in the same way as outlined for Type S Reducers on pages 6 and 7 using the same Service Factors on page 9.

For Speed Increasing service the selection is made in the same manner.

EXAMPLE: A Speed Reducer is required to deliver 60 HP, driving an Induced Draft Fan at 480 RPM and driven by Steam Turbine at 3000 RPM, operating 24 hours per day.

SOLUTION: From Character of Load Table 1, page 9, it is found that the driven machine is a Moderate Shock Load and from Table 2 on the same page the Service Factor is found to be 1.5.

Equivalent Horsepower $= 1.5 \times 60 = 90$ HP.

$$\text{Ratio} = \frac{3000}{480} = 6.25.$$

Look in the Rating Tables, page 24, and note that the M84B at 3000 RPM and 6.27 ratio has a Catalog or Equivalent Horsepower Rating of 123 HP, which is more than the 90 HP required.

Check the Thermal Rating on page 13 and note that for this ratio and speed the M84B has a rating of only 45 HP which is lower than the 60 HP required.

The M84B with pump and cooler is, therefore, the proper selection.

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HORSEPOWER RATING TABLES

TYPE M—SINGLE REDUCTION UNITS

MEDIUM SPEED HERRINGBONE GEAR REDUCERS AND SPEED INCREASERS

The Horsepower Ratings listed in the tables below are Mechanical Ratings calculated by the A.G.M.A. formula using a Service Factor of 1. See page 23 for information on Selection of Units. See page 13 for Thermal Horsepower Ratings.

Size No. M63B

	STANDARD RATIOS																		
Motor R.P.M.	1.22	1.50	1.84	2.24	2.72	3.00	3.36	4.19	5.00	5.67	6.20	7.00	7.73	8.60	9.29	10.29	....	....	....
3600	....	203	203	193	160	144	126	97	77	65	57	48	41	35	31	26	....	....	....
3000	170	170	170	167	138	124	109	83	66	55	49	41	35	30	26	22	....	....	....
2400	135	135	135	135	115	104	91	69	55	46	40	34	29	25	22	19	....	....	....
2000	113	113	113	113	99	89	78	59	47	39	35	29	25	21	19	16	....	....	....
1750	99	99	99	99	89	80	70	54	42	35	31	26	22	19	17	14	....	....	....
1150	65	65	65	65	62	56	49	38	29	24	21	18	15	13	11	10	....	....	....
870	49	49	49	49	49	44	38	29	23	19	17	14	12	10	9	7	....	....	....
720	41	41	41	41	41	37	32	25	19	16	14	12	10	8	7	6	....	....	....
High Speed Shaft Diameter	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼	⅞	⅞	⅞	⅞	¾	....	....	....

Size No. M84B

	STANDARD RATIOS																		
Motor R.P.M.	1.22	1.50	1.86	2.20	2.73	3.00	3.36	4.16	5.00	5.67	6.27	7.00	7.53	8.14	9.20	10.20	....	....	....
3600	....	....	....	350	350	316	279	214	170	143	124	106	95	85	70	59	....	....	....
3000	....	....	292	292	292	274	241	185	147	123	107	91	82	73	60	52	....	....	....
2400	234	234	234	234	234	230	202	154	122	103	89	76	68	60	50	43	....	....	....
2000	195	195	195	195	195	195	174	133	105	88	76	65	58	52	43	36	....	....	....
1750	170	170	170	170	170	170	156	120	94	79	68	58	50	42	38	32	....	....	....
1150	112	112	112	112	112	112	110	84	65	55	47	40	34	29	26	22	....	....	....
870	85	85	85	85	85	85	85	66	51	43	37	31	27	23	20	17	....	....	....
720	70	70	70	70	70	70	70	56	43	36	31	26	23	19	17	14	....	....	....
High Speed Shaft Diameter	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1¼	1¼	1¼	1	....	....	....

Size No. M105B

	STANDARD RATIOS																		
Motor R.P.M.	1.22	1.50	1.86	2.24	2.72	3.00	3.35	4.16	4.56	5.00	5.67	6.27	7.00	7.57	8.10	8.42	9.00	10.43	....
3600	....	....	....	....	....	577	511	395	352	312	263	229	195	174	157	148	134	106	....
3000	....	....	....	672	556	502	444	342	305	270	227	197	168	150	135	128	115	91	....
2400	....	....	550	550	468	421	372	286	255	225	190	164	140	125	112	106	96	76	....
2000	460	460	460	460	405	364	322	247	219	194	163	141	120	107	96	91	82	65	....
1750	400	400	400	400	363	327	286	221	197	174	146	126	107	95	86	80	73	58	....
1150	265	265	265	265	258	232	202	156	138	122	102	88	75	66	61	56	51	40	....
870	200	200	200	200	200	183	159	123	107	96	80	69	59	52	47	44	40	31	....
720	166	166	166	166	166	156	135	104	92	81	68	59	50	44	41	37	33	26	....
High Speed Shaft Diameter	2	2	2	2	2	2	2	2	2	2	2	2	2	1½	1½	1½	1½	1	....

Size No. M126B

	STANDARD RATIOS																	
Motor R.P.M.	1.22	1.50	1.85	2.24	2.75	3.00	3.36	4.14	4.65	5.00	5.55	6.27	6.74	7.00	7.57	8.23	8.60	9.29	10.43
3600	....	....	....	....	....	....	....	646	558	508	441	373	337	319	284	251	235	209	174
3000	....	....	....	....	....	814	718	561	484	440	382	322	291	275	245	216	203	180	150
2400	....	....	....	918	752	685	604	470	405	368	320	269	243	230	204	180	168	150	125
2000	....	....	930	797	652	594	523	406	350	318	275	232	209	197	176	155	145	128	107
1750	900	900	848	718	591	534	470	365	314	285	247	208	187	177	157	136	129	115	95
1150	600	600	600	514	421	380	334	258	222	201	173	146	130	124	110	95	90	80	66
870	450	450	450	409	334	301	264	204	197	158	137	114	101	97	86	74	69	62	52
720	370	370	370	349	285	257	225	173	145	134	116	97	86	82	73	63	60	53	44
High Speed Shaft Diameter	2⅝	2⅝	2⅜	2¼	2¼	2¼	2¼	2¼	2¼	2¼	2¼	2¼	2¼	2¼	2¼	2	2	1½	1½

Size No. M147B

	STANDARD RATIOS																		
Motor R.P.M.	1.33	1.50	1.84	2.23	2.73	3.00	3.36	3.67	4.16	4.60	5.00	5.67	6.26	7.00	7.62	8.33	9.18	10.20	....
3600	....	....	....	....	....	....	....	....	....	847	760	643	561	479	423	371	320	272	....
3000	....	....	....	....	....	....	....	971	835	736	660	558	486	414	366	320	276	235	....
2400	....	....	....	....	1070	1027	905	817	702	618	554	467	406	346	305	267	230	195	....
2000	....	....	....	1195	984	891	785	708	607	534	479	403	351	298	263	230	198	168	....
1750	....	....	1275	1082	887	803	707	637	546	480	430	361	314	267	235	205	177	150	....
1150	890	890	890	777	635	573	503	444	387	330	304	255	221	188	165	144	124	104	....
870	675	675	675	619	505	456	400	348	307	264	240	201	174	148	130	113	97	82	....
720	555	555	555	530	432	389	341	300	261	229	204	171	148	125	110	96	82	69	....
High Speed Shaft Diameter	3	3	3	3	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2¼	2¼	2	....

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HORSEPOWER RATING TABLES (cont'd.)

TYPE M—SINGLE REDUCTION UNITS

Size No. M168B

Motor R.P.M.	STANDARD RATIOS 1.29	1.50	1.84	2.25	2.73	3.00	3.36	3.67	4.16	4.60	5.00	5.40	6.27	7.00	7.62	8.33	8.85	9.24	9.67	10.64	....
3600	....	....	....	....	....	....	....	....	....	....	....	970	792	678	599	525	480	449	419	362	....
3000	....	....	....	....	....	....	....	....	1179	1040	934	843	687	587	519	455	415	388	362	312	....
2400	....	....	....	....	....	....	1279	1155	993	875	785	708	575	491	434	380	346	324	302	260	....
2000	....	....	....	....	1380	1245	1111	1002	861	758	679	612	497	424	374	327	298	279	260	223	....
1750	....	....	....	1516	1255	1136	1001	903	774	681	610	514	446	380	335	293	267	250	232	214	....
1150	1160	1160	1160	1092	901	814	716	641	551	470	433	364	315	268	236	206	190	175	166	149	....
870	870	870	870	860	719	648	569	510	437	370	343	287	248	211	186	162	146	137	129	117	....
720	710	710	710	710	615	554	486	430	373	321	292	244	211	179	157	137	127	116	109	99	....
High Speed Shaft Diameter	3¼	3¼	3¼	3¼	3¼	3¼	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2½	2½	2¼	....

Size No. M189B

Motor R.P.M.	STANDARD RATIOS 1.50	1.84	2.22	2.72	3.00	3.36	3.80	4.14	4.60	5.00	5.63	6.20	6.64	7.00	7.57	8.00	8.60	9.29	9.67	10.45	....
3600	....	....	....	....	....	....	....	....	....	....	....	1088	989	918	820	756	680	603	575	515	....
3000	....	....	....	....	....	....	....	....	....	1264	1079	946	859	796	711	656	588	527	484	430	....
2400	....	....	....	....	....	....	1501	1353	1185	1064	907	794	720	668	596	549	492	427	401	364	....
2000	....	....	....	....	1710	1500	1304	1175	1028	922	785	687	623	577	514	473	424	376	347	312	....
1750	....	....	....	1707	1540	1357	1175	1058	925	829	699	617	558	518	461	424	393	337	310	281	....
1150	1750	1750	1501	1229	1106	973	818	755	650	590	496	437	390	366	325	296	276	237	218	197	....
870	1320	1320	1202	892	883	776	649	600	514	468	393	345	304	289	256	237	218	186	171	154	....
720	1090	1090	1031	841	756	663	569	513	446	399	334	294	266	245	218	202	185	158	145	131	....
High Speed Shaft Diameter	3¾	3¾	3¾	3¾	3¾	3¾	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	2¾	2¾	2½	....

Size No. M2010B

Motor R.P.M.	STANDARD RATIOS 1.50	1.86	2.24	2.72	3.00	3.36	4.16	4.33	4.71	5.00	5.67	6.27	6.74	7.00	7.57	8.03	8.60	9.00	9.29	9.91	10.43
3600	....	....	....	....	....	....	....	....	....	....	....	....	1269	1203	1075	987	892	833	794	720	666
3000	....	....	....	....	....	....	....	....	....	....	1401	1221	1103	1045	933	856	773	722	688	623	576
2400	....	....	....	....	....	....	....	1677	1508	1395	1179	1026	926	877	783	718	647	604	576	521	481
2000	....	....	....	....	....	1930	1505	1457	1309	1211	1022	888	802	759	677	620	559	521	497	449	415
1750	....	....	....	2236	2018	1780	1335	1313	1179	1090	919	798	720	681	607	556	501	467	445	402	371
1150	1750	1750	1750	1615	1454	1280	988	910	825	777	654	567	500	483	429	401	353	326	309	282	261
870	1320	1320	1320	1293	1163	1022	787	722	648	617	518	449	392	382	339	315	279	261	244	220	205
720	1090	1090	1090	1090	996	875	672	621	562	527	442	382	338	325	288	267	237	222	207	187	174
High Speed Shaft Diameter	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	2¾	2¾

Size No. M2211B

Motor R.P.M.	STANDARD RATIOS 1.50	1.84	2.24	2.73	3.00	3.40	4.18	4.78	5.00	5.42	6.00	6.33	6.70	7.00	7.61	8.06	8.33	9.27	10.00	10.85	....
3600	....	....	....	....	....	....	....	....	....	....	1658	1540	1422	1340	1364	1255	1195	1038	920	804	....
3000	....	....	....	....	....	....	....	....	....	....	1396	1296	1196	1101	1185	1090	1038	896	777	696	....
2400	....	....	....	....	....	....	....	1891	1784	1603	1396	1296	1196	1101	995	914	871	740	654	585	....
2000	....	....	....	....	....	....	1947	1643	1549	1391	1210	1123	1036	950	861	791	752	645	565	500	....
1750	....	....	....	....	....	2245	1756	1480	1395	1253	1089	1010	931	874	773	710	663	574	510	446	....
1150	....	2957	2498	2059	1863	1618	1260	1030	998	881	761	718	660	621	559	491	469	405	359	321	....
870	2280	2280	2008	1651	1492	1294	1005	825	794	701	613	570	506	491	431	391	370	319	283	250	....
720	1885	1885	1727	1418	1280	1109	859	715	678	605	524	486	440	419	362	339	315	271	240	214	....
High Speed Shaft Diameter	4½	4½	4½	4½	4½	4½	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¼	3¼	....

Size No. M2411B

Motor R.P.M.	STANDARD RATIOS 1.50	1.85	2.24	2.73	3.00	3.36	4.19	5.00	5.32	5.86	6.27	6.59	7.00	7.23	7.62	8.00	8.60	9.18	9.50	10.08	10.64
3600	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1330	1207	1145	1078	980
3000	....	....	....	....	....	....	....	....	....	....	....	1697	1559	1489	1380	1286	1156	1048	990	920	849
2400	....	....	....	....	....	....	....	....	1917	1683	1533	1430	1312	1252	1160	1080	970	879	812	760	695
2000	....	....	....	....	....	....	2235	1808	1665	1461	1330	1240	1137	1085	1005	935	839	760	724	671	606
1750	....	....	....	....	....	....	1756	1630	1501	1315	1197	1115	1023	976	903	840	753	682	643	600	535
1150	....	....	2915	2404	2176	1917	1469	1168	1038	984	853	775	727	689	641	590	534	473	441	416	375
870	2280	2280	2280	1931	1745	1535	1173	930	841	782	678	624	577	550	508	468	422	374	353	329	296
720	1885	1885	1885	1659	1498	1317	1005	795	713	668	578	521	492	464	433	398	359	318	311	279	257
High Speed Shaft Diameter	4½	4½	4½	4½	4½	4½	4½	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¼	3¼

Ratios listed are standard but intermediate ratios are available.

Ratings for intermediate ratios and speeds may be found by direct interpolation. When selection falls in the blank space above the ratings listed, the High Speed Type N or NM Units shown on page 30 must be used.

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HORSEPOWER RATING TABLES (cont'd.)

TYPE M—SINGLE REDUCTION UNITS

Size No. M2712B

Motor R.P.M.	STANDARD RATIOS																				
	1.50	1.84	2.24	2.72	3.00	3.36	4.19	5.00	5.35	5.75	6.20	6.56	7.00	7.53	8.00	8.45	8.82	9.22	9.80	10.45	11.00
3000	....	....	....	....	....	....	....	....	....	....	2060	1904	1737	1564	1432	1320	1238	1158	1055	956	883
2400	....	....	....	....	....	....	....	2392	2188	1985	1790	1653	1507	1356	1241	1144	1072	1002	913	826	762
2000	....	....	....	....	....	....	2703	2158	1973	1789	1612	1489	1357	1220	1116	1028	964	901	820	742	684
1750	....	....	....	3195	2881	2540	1950	1551	1390	1298	1153	1045	968	869	780	720	679	639	569	541	465
1150	....	....	....	2571	2316	2038	1560	1238	1111	1034	918	830	769	690	650	570	529	505	455	427	367
870	3110	3110	3110	2212	1991	1751	1337	1060	955	884	784	721	656	588	539	486	468	430	398	364	312
720	2580	2580	2580																		
High Speed Shaft Diameter	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	3¾

Size No. M3014B

Motor R.P.M.	STANDARD RATIOS																				
	1.83	2.24	2.75	3.00	3.36	4.17	5.00	5.32	5.67	6.27	7.00	7.57	8.00	8.33	8.73	9.29	9.71	10.54	11.00	11.50	....
3000	....	....	....	....	....	....	....	....	....	....	2282	2035	1877	1775	2005	1870	1720	1520	1420	1340	....
2400	....	....	....	....	....	....	....	....	....	....	2020	1790	1665	1560	1650	1520	1402	1243	1161	1100	....
2000	....	....	....	....	....	....	2785	2923	2720	2360	1815	1630	1500	1425	1458	1325	1210	1094	1025	958	....
1750	....	....	....	....	....	....	2085	2580	2420	2125	1660	1520	1400	1310	1168	1100	985	925	864	....	
1150	....	....	4110	3760	3320	2510	1660	1870	1735	1500	1285	1155	1060	990	908	840	785	693	644	600	....
870	3120	3120	3120	3070	2725	2030	1410	1520	1400	1200	1040	925	854	790	739	675	636	543	515	471	....
720	2580	2580	2580	2580	2330	1730		1305	1225	1060	895	800	728	685	634	580	544	470	445	411	....
High Speed Shaft Diameter	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	....

Size No. M3318B

Motor R.P.M.	STANDARD RATIOS																				
	1.84	2.26	2.75	3.00	3.34	4.15	5.00	5.35	5.60	6.17	7.00	7.61	8.00	8.43	8.74	9.30	9.70	....	....	....	....
3000	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2460	....	....	....	....
2400	....	....	....	....	....	....	....	....	....	....	....	....	2770	2560	2415	2200	2070	....	....	....	....
2000	....	....	....	....	....	....	....	....	....	3455	2930	2625	2410	2250	2135	1915	1785	....	....	....	....
1750	....	....	....	....	....	....	....	3750	3530	3110	2635	2325	2155	1995	1900	1705	1605	....	....	....	....
1150	....	....	....	5440	4790	3710	2910	2705	2590	2190	1860	1640	1520	1440	1335	1200	1110	....	....	....	....
870	....	4150	4150	4150	3830	2985	2350	2140	2060	1800	1490	1325	1215	1145	1080	955	880	....	....	....	....
720	3430	3430	3430	3430	3300	2560	2020	1850	1775	1540	1290	1160	1060	990	950	825	775	....	....	....	....
High Speed Shaft Diameter	5½	5½	5½	5½	5½	5½	5½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	....	....	....	....

Size No. M3824B

Motor R.P.M.	STANDARD RATIOS																				
	2.75	3.00	3.37	4.14	5.03	5.61	6.17	7.00	7.65	8.05	8.50	....	....	....	....	....	....	....	....	....	....
2000	....	....	....	....	....	....	....	4730	4150	3855	3570	....	....	....	....	....	....	....	....	....	....
1750	....	....	....	....	....	....	4930	4240	3775	3470	3220	....	....	....	....	....	....	....	....	....	....
1150	....	....	....	5800	4710	4070	3575	3020	2685	2470	2280	....	....	....	....	....	....	....	....	....	....
870	6580	6050	5400	4380	3610	3240	2865	2450	2175	2005	1855	....	....	....	....	....	....	....	....	....	....
720	5470	5000	4470	3630	3000	2680	2440	2110	1885	1730	1595	....	....	....	....	....	....	....	....	....	....
High Speed Shaft Diameter	6½	6½	6½	6	6	6	5	5	5	5	5	....	....	....	....	....	....	....	....	....	....

Ratios listed are standard but intermediate ratios are available.

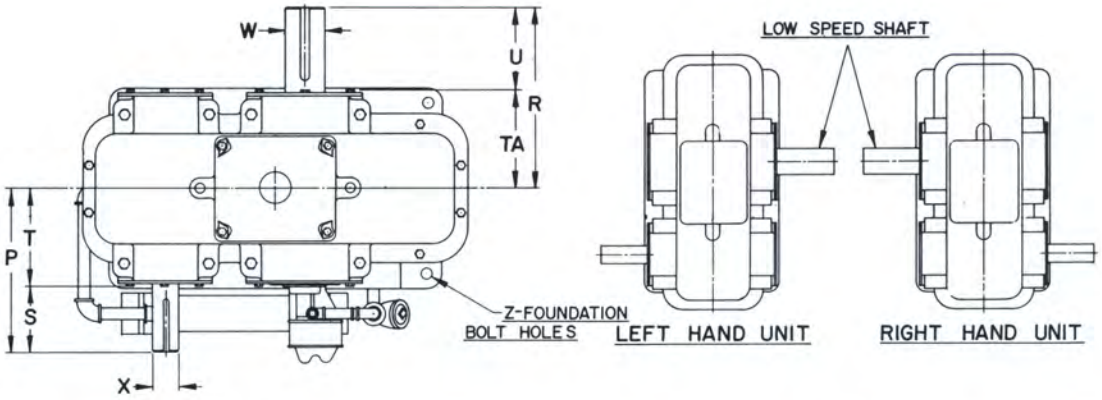
Ratings for intermediate ratios and speeds may be found by direct interpolation. When selection falls in the blank space above the ratings listed, the High Speed Type N or NM Units shown on page 30 must be used.

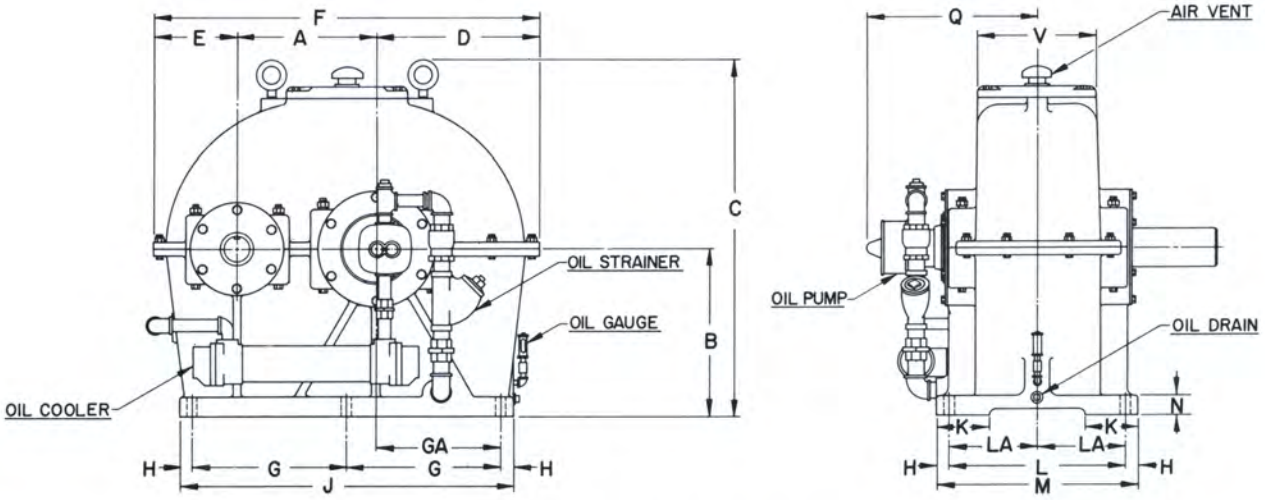
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GENERAL DIMENSIONS

TYPE M—SINGLE REDUCTION UNITS

MEDIUM SPEED HERRINGBONE GEAR REDUCERS AND SPEED INCREASERS





Size No.	A	B	C	D	E	F	G	GA	H	J	K	L	LA	M	N	P	Q	R	S	T	TA	U	V	W	X**	Slow Speed Shaft Keyway	Z Bolt Holes	Weight
M63B	6	8	16 15/16	7 1/2	4 1/2	18	13 1/2	5 1/4	3/4	15	3	8 1/2	4 1/4	10	7/8	8 5/8	9 5/8	9 3/4	3 1/16	5 9/16	5 9/16	4 3/16	6	2	For High Speed Shaft Dia. See Table of H.P. Ratings Pages 24 and 25	1/2 x 1/4 x 3 7/8	4- 1 1/16	280
M84B	8	10 1/2	22 1/2	10	5 1/2	23 1/2	17 1/2	7	1	19 1/2	3 1/4	9 1/2	4 3/4	11 1/2	1	9 1/2	10 1/2	10 1/4	3 3/8	6 1/8	6 1/8	4 1/8	6 3/4	2 1/2		5/8 x 5/16 x 3 7/8	4- 1 3/16	500
M105B	10	12 1/2	27 3/8	12 1/2	7	29 1/2	11	8 3/4	1	24	4	11 1/2	5 3/4	13 1/2	1 1/2	12 1/2	14 3/8	13 3/4	4 3/4	7 3/4	7 7/8	5 7/8	8 1/2	3		3/4 x 3/8 x 5	6- 1 3/16	875
M126B	12	15	32 1/4	15	8	35	14	11 1/2	1	30	4	13	6 1/2	15	1 1/2	14 1/2	15 3/4	16 1/4	5 9/16	8 15/16	8 15/16	7 9/16	9 3/4	3 1/2		7/8 x 7/16 x 5 1/2	6- 1 3/16	1,380
M147B	14	17	37	16 1/2	8 1/2	39	15 1/2	12 1/2	1 1/4	33 1/2	4 1/2	15 1/2	7 3/4	18	2	16 1/2	17 1/2	18	6 1/2	10	10	8	11 1/2	4		1 x 1/2 x 7 1/2	6-1 1/16	1,950
M168B	16	19	40 3/8	18 1/2	9 1/2	44	17	13 1/2	1 1/2	36 1/2	5	16	8	18 1/2	1 3/4	16 1/2	19	20	5 1/4	11 1/4	11 1/2	8 1/2	12	5		1 1/4 x 7/16 x 7 1/2	6-1 1/16	2,600
M189B	18	21	45 1/8	20	10	48	19	15	1 1/2	41	5 1/2	17 1/2	8 3/4	20 1/2	2	18	19 1/4	22	6 1/2	11 1/2	11 1/2	10 1/2	13	5 1/2		1 1/4 x 7/16 x 9	6-1 5/16	2,975
M2010B	20	23	50 1/8	22 1/2	11	53 1/2	22	17 3/4	1 1/2	47	5	19	9 1/2	22	2	19	20 1/2	24	6 1/2	12 1/2	12 1/2	11 1/2	14	6		1 1/2 x 1/2 x 9	6-1 5/16	4,300
M2211B	22	25	52 1/2	24 1/2	12 1/2	59	23	18	2	50	7	21	10 1/2	25	3	21	22 3/4	26	8 1/4	12 3/4	13 1/4	12 3/4	15	7		1 3/4 x 5/8 x 10	6-1 9/16	5,600
M2411B	24	27	58 15/16	26 1/2	13 1/2	64	25 1/2	20	1 3/4	54 1/2	6	21	10 1/2	24 1/2	2 3/4	21	22 3/4	26	8	13	13 1/2	12 1/2	15	7		1 3/4 x 5/8 x 10	6-1 9/16	6,200
M2712B	27	28	59 1/8	29	14	70	*	22	2	60	8	26	13	30	3	22 1/2	24	29 1/2	8 1/2	14	14 1/2	15	17	8		2 x 3/4 x 12 1/2	8-1 9/16	8,800

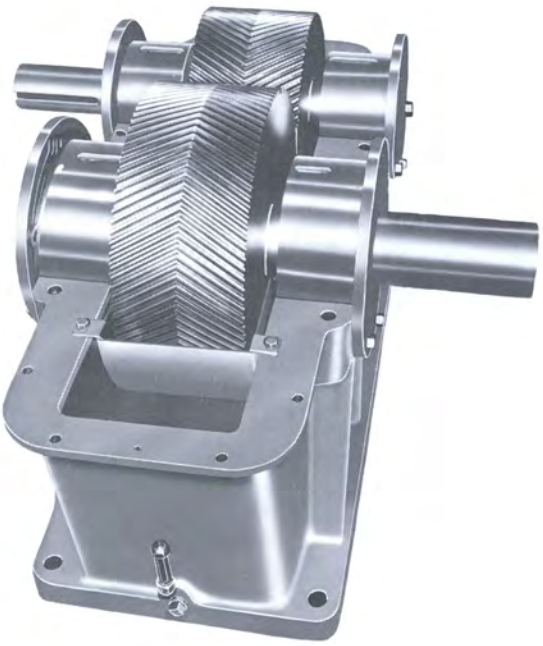
All dimensions are in inches.
* The M2712B has Foundation Holes spaced 16-24-16.
** For High Speed Shaft Keyways, see table of standard Keyways page 42.
For units having four foundation bolts the dimension under G is the distance between bolts.

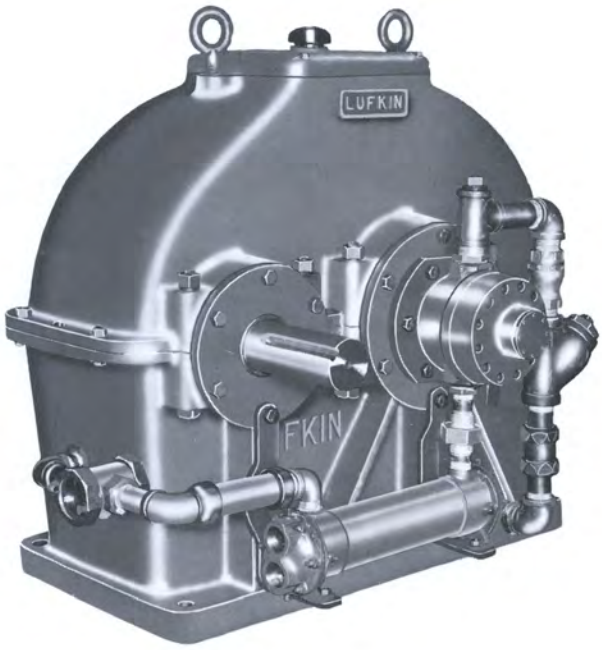
Above dimensions are not to be used for installation.
USE CERTIFIED INSTALLATION PRINT.

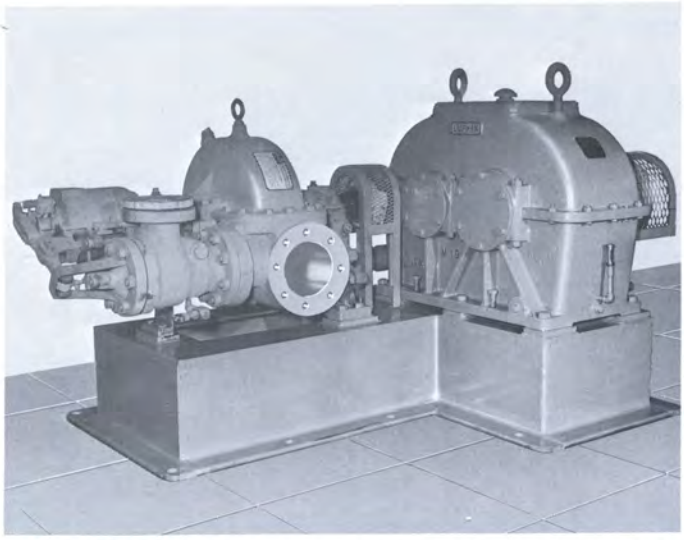
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Type M

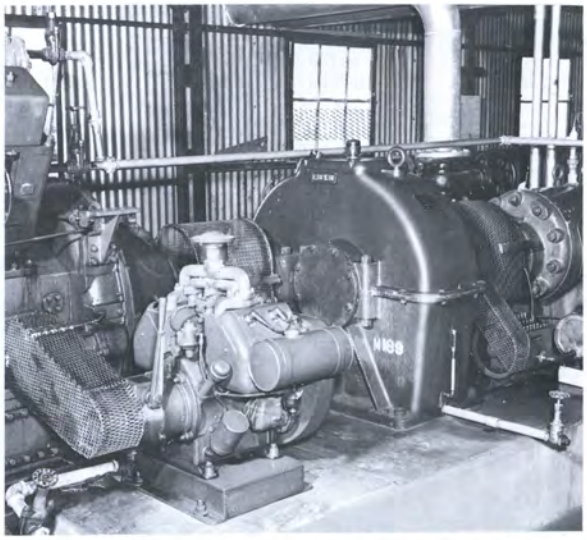
MEDIUM SPEED HERRINGBONE GEAR REDUCERS AND SPEED INCREASERS







Lufkin Model M195B Reducer mounted on a fabricated base with a steam turbine.

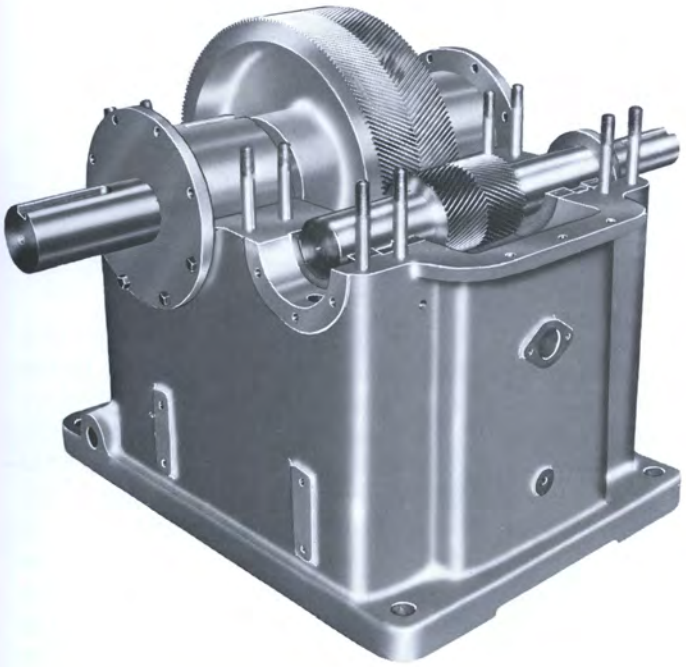


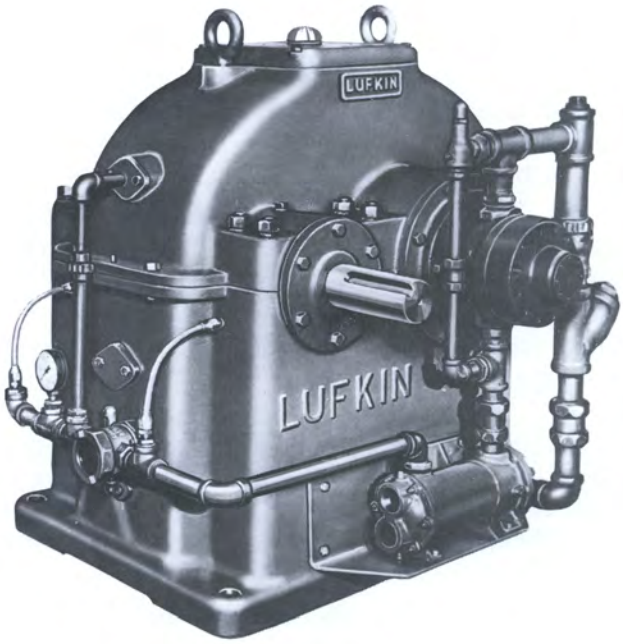
Lufkin Model M189B Reducer driving a hot oil pump from a diesel engine.

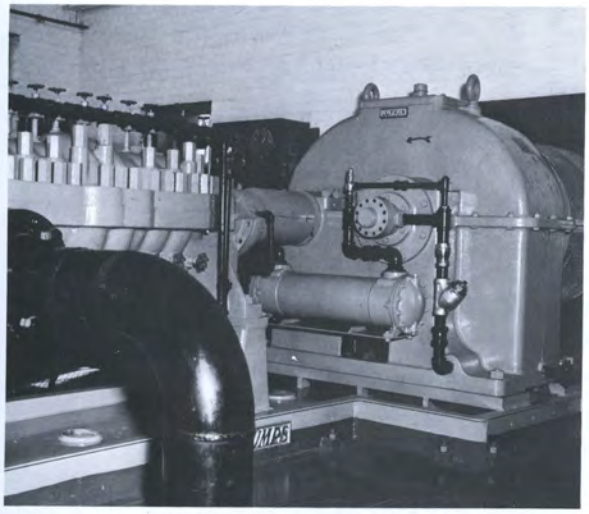
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Type N

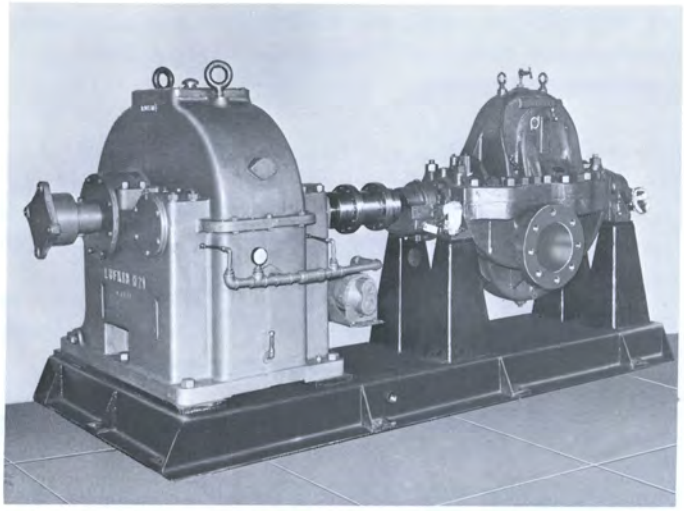
HIGH SPEED REDUCERS AND SPEED INCREASERS







Lufkin Model N2412B High Speed Gear Increaser driving centrifugal pump from a diesel engine in a pipeline pump station.



Lufkin Model N2113B High Speed Increaser Mounted on fabricated steel base with centrifugal pump.

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LUFKIN HIGH SPEED REDUCERS AND INCREASERS

Types N and NM

APPLICATION

Type N and NM High Speed Gear Units are used for both speed Reducing and speed Increasing service. This type assembly must be used when the pinion speed is higher than 3600 RPM or when the pitch line velocity is higher than 5000 feet per minute.

These units are sometimes used at operating speeds lower than those stated above especially when extremely quiet operation is essential.

SPECIFICATIONS

HOUSINGS are high tensile gray iron castings. They are very substantially built, with generous wall sections, heavy ribs and wide bases, for rigidity. These castings are all stress-relieved before machining.

GEARS are herringbone type, made of high tensile alloy steel castings and forgings. Finished gears are very carefully and accurately Dynamically Balanced.

PINIONS are heat-treated alloy steel and are also Dynamically Balanced. The pinion shaft extension is ground to a tolerance of ± .0005".

SHAFTS are heat treated alloy steel and are ground to a tolerance of ± .0005".

BEARINGS:—NM Unit—The slow speed bearings are self-aligning roller type mounted in bearing carriers. The high speed bearings are centrifugally cast babbitt type with solid steel shells.

BEARINGS:—N Unit—The slow speed and high speed are centrifugally cast babbitt type with split steel shell.

LUBRICATION is accomplished by means of a positive feed rotary pump direct connected to the stub end of the slow speed shaft. Oil under pressure is delivered to the babbitted bearings and to the gear mesh. An oil trough inside the cover above the slow speed bearing catches oil from the spray and lubricates the Type NM slow speed bearing. The oil is circulated through an oil cooler of generous size which maintains the oil temperature at only a few degrees higher than that of the cooling water. The oil line is equipped with strainer, flow indicator, pressure gauge and pressure relief valve. The gear housing is sufficiently large for a generous supply of oil below the sweep of the gear. A protected glass oil level gauge permits visual determination of oil level.

1. **Standard Type NM Units permit speeds up to 4,500 RPM and 6,000 feet per minute pitch line velocity.**

2. **Standard Type N Units permit speeds up to 9,000 RPM and 12,000 feet per minute pitch line velocity. Higher speeds may be obtained, however, at extra cost.**

3. **Formula for calculating correct pitch line velocity.**

$$\text{Pinion P.D.} = \frac{2 \times \text{Center Distance}}{\text{Ratio} + 1}$$

$$\text{PLV (ft./min.)} = \frac{\text{Pinion P.D. (inches)} \times 3.14 \times \text{RPM}}{12}$$

4. **Types N and NM Units are built in 55 sizes, each with a complete range of ratios up to the maximum shown on page 32.**

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SELECTION OF TYPE N AND NM UNITS

Explanation of Rating Table

The Horsepower Ratings of Type N and NM Gear Units are given in the Rating Table on the following page. For simplicity, these ratings are tabulated in horsepower per 1000 RPM of the high speed shaft.

To select the proper size gear unit, find the Required Tabulated Rating as follows:

$$\text{Required Tabulated Rating} = \frac{\text{HP Load} \times 1000 \times \text{Service Factor}}{\text{RPM of Pinion}}$$

Select the proper Service Factor from the table on page 33.

The required ratio is found by dividing the RPM of the high speed shaft by the RPM of the slow speed shaft.

After calculating the Required Tabulated Rating and finding the required ratio, refer to the Rating Table on the following page. In the column under the ratio nearest to the required ratio, find the horsepower which is equal to or greater than the Required Tabulated Rating just calculated. On a horizontal line with this horsepower rating, in the extreme left hand column, will be found the size of the unit required.

The horsepower ratings for intermediate ratios not listed in the table may be found by direct interpolation.

The ratios shown in the Rating Table do not constitute the entire list of ratios available. Any ratio required, or a very close approximation, will be furnished without extra charge.

Example of Increaser Selection

REQUIRED: A speed increaser to deliver 575 horsepower driving a centrifugal pipe line pump at 3750 RPM, driven by a multi-cylinder engine at 625 RPM.

SOLUTION: The service factor from page 33 is found to be 1.75 for a centrifugal pump driven by a multi-cylinder engine. Required Tabulated Rating

$$= \frac{575 \times 1000 \times 1.75}{3750} = 269 \text{ Hp.}$$

$$\text{Required Ratio} = \frac{3750}{625} = 6$$

Refer to the Rating Table on page 32 and follow down the column under a ratio of 6 looking for a Tabulated Rating of at least 269 horsepower. It is found that 283 horsepower is the next higher rating and this is for the size 1810B assembly. In order to determine if it is a Type N or Type NM, find the pitch line velocity.

$$\text{Pitch Diameter of Pinion} = \frac{2 \times 18}{6 + 1} = 5.14$$

$$\text{PLV} = \frac{5.14 \times \pi \times 3750}{12} = 5050 \text{ feet per minute}$$

Since the pinion speed is less than 4500 RPM and the pitch line velocity is less than 6000 feet per minute, the unit is a Type NM. The NM1810B is, therefore, the proper selection.

To find the Actual Service Rating of this unit under the above conditions:

$$\text{Service Rating} = \frac{\text{Tabulated Rating} \times \text{RPM of Pinion}}{\text{Service Factor} \times 1000}$$

$$= \frac{283 \times 3750}{1.75 \times 1000} = 606 \text{ Hp.}$$

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HORSEPOWER RATING TABLE

Type N or NM HIGH SPEED REDUCERS AND SPEED INCREASERS

Horsepower per 1000 R.P.M. of High Speed Shaft

Size N or NM	RATIO																										
	1	1.25	1.5	1.75	2	2.25	2.5	2.75	3	3.25	3.5	3.75	4	4.25	4.5	4.75	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10	11
64B	90	79	68	60	53	47	42	37	33	30	27	25	23	21	19	18	16	14	12	11	9	....	....	....	....	....	...	...
65B	112	99	85	76	66	59	52	46	42	38	34	31	28	26	24	22	21	18	....	....	....	....	....	....	....	....	...	...
66B	134	119	102	91	80	71	62	56	50	45	41	37	34	31	29	....	....	....	....	....	....	....	....	....	....	....	...	...
85B	199	175	153	134	118	105	93	83	75	67	61	56	51	47	43	40	37	32	28	24	21	19	....	....	....	....	...	...
86B	239	210	184	161	142	125	111	100	90	81	73	67	61	56	52	47	44	38	33	....	....	....	....	....	....	....	...	...
87B	279	245	214	188	165	146	131	116	105	94	85	78	71	65	60	55	52	....	....	....	....	....	....	....	....	....	...	...
106B	374	327	286	252	218	196	174	155	140	125	114	104	95	88	81	74	69	60	52	46	41	36	32	....	....	....	...	...
107B	435	382	335	292	254	229	202	182	163	148	133	122	111	102	94	87	81	70	61	53	....	....	....	....	....	....	...	...
108B	499	437	380	334	290	262	233	208	187	169	152	139	127	117	108	99	92	80	....	....	....	....	....	....	....	....	...	...
126B	...	472	412	363	319	282	250	224	202	182	165	151	137	126	116	107	100	86	75	66	58	52	46	41	38	35	...	...
127B	...	551	482	423	372	329	293	262	236	213	192	176	161	148	136	125	116	101	87	77	68	60	54	....	....	....	...	...
128B	...	630	551	485	426	377	336	300	269	243	220	202	184	169	156	143	133	115	101	88	78	....	....	....	....	....	...	...
129B	...	707	620	545	478	424	377	337	304	273	247	226	206	190	175	161	150	130	113	....	....	....	....	....	....	....	...	...
147B	...	751	655	576	506	450	400	356	322	290	261	240	219	201	185	171	158	137	120	105	93	83	75	65	61	56	51	...
148B	...	858	748	657	580	515	455	407	367	331	300	274	250	229	212	195	181	157	136	121	107	95	85	75	....	....	...	...
149B	...	965	843	742	650	580	512	458	413	372	336	306	282	258	239	220	204	176	154	135	120	106	....	....	....	....	...	...
1410B	...	1072	936	823	725	644	568	510	460	414	374	342	312	287	264	244	226	196	171	150	....	....	....	....	....	....	...	...
168B	...	1120	976	861	755	670	593	532	480	433	390	358	326	300	276	256	236	205	178	154	139	126	112	98	92	83	76	...
169B	...	1260	1100	970	850	755	667	600	540	486	440	403	368	338	312	287	267	230	201	177	157	141	126	110	....	....	...	...
1610B	...	1400	1220	1078	945	837	741	665	600	541	490	447	408	375	346	319	296	256	224	196	174	156	....	....	....	....	...	...
1611B	...	1540	1340	1181	1038	920	815	731	660	594	536	492	450	412	381	352	325	282	245	216	191	....	....	....	....	....	...	...
189B	...	....	1392	1225	1080	956	848	758	684	617	558	511	465	427	394	364	339	292	254	225	198	178	160	148	131	119	109	...
1810B	...	....	1550	1362	1200	1060	944	842	760	685	620	568	517	475	438	404	374	326	283	249	221	197	178	164	....	....	...	...
1811B	...	....	1700	1500	1320	1169	1035	928	835	754	682	625	566	523	482	445	412	354	311	274	243	217	195	....	....	....	...	...
1812B	...	....	1858	1638	1440	1272	1138	1014	913	820	744	682	618	570	526	486	450	386	339	299	264	....	....	....	....	....	...	...
1813B	...	....	2015	1770	1560	1380	1225	1099	986	890	805	738	670	616	570	525	488	418	368	324	....	....	....	....	....	....	...	...
2110B	...	....	2107	1857	1633	1450	1282	1150	1032	920	845	770	705	647	596	550	510	443	386	339	300	269	242	212	198	180	165	...
2111B	...	....	2315	2040	1791	1595	1410	1263	1140	1010	930	849	775	712	655	605	562	487	424	374	331	296	266	232	218	199	...	...
2112B	...	....	2530	2220	1960	1740	1540	1376	1240	1105	1013	927	845	775	715	662	612	531	462	408	361	323	290	254	....	....	...	...
2113B	...	....	2740	2408	2120	1885	1669	1493	1342	1195	1098	1000	915	840	775	717	663	575	500	442	391	350	....	....	....	....	...	...
2411B	...	....	....	2661	2343	2075	1845	1648	1484	1340	1215	1107	1011	927	857	790	732	634	553	487	432	386	347	314	284	259	237	201
2412B	...	....	....	2904	2560	2260	2016	1800	1621	1460	1325	1208	1103	1010	935	862	800	691	603	532	472	422	379	343	311	283	259	...
2413B	...	....	....	3142	2770	2445	2179	1950	1752	1585	1435	1308	1198	1095	1014	935	865	749	653	574	510	457	410	371	335	....	...	...
2414B	...	....	....	3388	2980	2635	2344	2100	1891	1703	1545	1408	1290	1182	1092	1050	933	806	704	620	550	492	442	....	....	....	...	...
3010B	...	....	....	....	3325	2945	2620	2342	2105	1900	1725	1572	1438	1320	1219	1120	1041	900	785	690	614	549	493	446	404	368	337	286
3011B	...	....	....	....	3660	3240	2880	2575	2315	2090	1895	1730	1582	1452	1340	1232	1145	990	865	760	675	604	542	491	444	405	371	314
3012B	...	....	....	....	3990	3530	3140	2810	2530	2280	2065	1890	1723	1585	1460	1349	1250	1080	942	830	735	659	592	535	485	442	405	343
3013B	...	....	....	....	4320	3825	3405	3042	2735	2470	2240	2042	1867	1718	1582	1460	1355	1170	1020	900	796	714	641	578	525	477	439	372
3014B	...	....	....	....	4660	4120	3670	3280	2945	2662	2410	2200	2010	1850	1705	1570	1455	1260	1100	969	859	769	690	624	566	515	473	400
3312B	...	....	....	....	4835	4277	3805	3403	3060	2773	2506	2285	2090	1915	1765	1630	1510	1307	1140	1005	892	797	716	646	587	536	490	415
3313B	...	....	....	....	5240	4630	4120	3690	3315	2990	2705	2480	2260	2070	1915	1765	1635	1420	1235	1090	966	863	776	700	636	580	530	450
3314B	...	....	....	....	5640	4980	4440	3970	3570	3220	2915	2670	2435	2230	2065	1905	1760	1528	1330	1174	1040	930	836	754	685	625	572	485
3315B	...	....	....	....	6050	5340	4760	4260	3825	3450	3120	2860	2610	2390	2210	2040	1885	1638	1425	1258	1115	996	895	807	734	670	612	...
3316B	...	....	....	....	6450	5700	5075	4540	4080	3680	3330	3050	2785	2550	2360	2175	2015	1745	1520	1342	1188	1062	955	862	783	714	653	...
3317B	...	....	....	....	6850	6070	5390	4820	4335	3910	3540	3240	2960	2710	2520	2310	2140	1855	1615	1425	1262	1130	1015	915	832	758	...	...
3318B	...	....	....	....	7250	6420	5710	5100	4590	4140	3750	3430	3130	2870	2655	2445	2265	1965	1710	1508	1338	1196	1073	970	881	....	...	...
3816B	...	....	....	....	8546	7562	6727	6017	5408	4884	4431	4037	3692	3389	3120	2883	2671	2311	2018	1778	1577	1409	1266	1144	1038	947	...	...
3817B	...	....	....	....	9080	8034	7147	6393	5746	5189	4708	4289	3923	3600	3315	3063	2838	2455	2144	1889	1676	1497	1314	1215	1103	1006	...	...
3818B	...	....	....	....	9614	8507	7567	6769	6084	5495	4985	4542	4153	3812	3511	3243	3005	2599	2271	1999	1775	1585	1392	1287	1168	1065	...	...
3819B	...	....	....	....	....	8980	7988	7145	6422	5800	5262	4794	4384	4024	3706	3423	3171	2744	2397	2111	1873	1673	1469	1358	1233	1124	...	...
3820B	...	....	....	....	....	9452	8408	7521	6760	6105	5539	5046	4615	4236	3901	3603	3338	2888	2523	2222	1972	1761	1546	1430	1298	1184	...	...
3821B	...	....	....	....	....	9925	8829	7897	7098	6411	5816	5299	4846	4448	4096	3783	3505	3033	2649	2333	2070	1849	1624	1501	1363	....	...	...
3822B	...	....	....	....	....	....	9249	8273	7436	6716	6093	5551	5076	4659	4291	3964	3672	3177	2775	2444	2169	1937	1701	1573	....	....	...	...
3823B	...	....	....	....	....	....	9669	8649	7774	7021	6370	5803	5307	4871	4486	4144	3839	3321	2901	2555	2268	2025	1748	....	....	....	...	...
3824B	...	....	....	....	....	....	9879	8837	7943	7174	6508	5929	5422	4977	4584	4234	3922	3393	2964	2611	2317	2069	....	....	....	....	...	...

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SERVICE FACTORS FOR SPEED INCREASER SELECTION

Types N and NM

APPLICATION	PRIME MOVER: Motor or Turbine	PRIME MOVER: Internal Combustion Engine (Multi-Cyl.)
GENERATOR (Normal Application)	1.0	1.5
PUMPS		
Centrifugal (General Service)	1.1	1.5
Centrifugal—Hot Oil	1.5	....
Centrifugal—Boiler Feed	1.5	....
Centrifugal—Pipeline	1.5	1.75
Centrifugal—Water Works	1.5	1.75
Centrifugal—Descaling (with Surge Tank)	2.0	....
Dredge	2.2	2.5
Gear	1.5	1.75
Rotary—Lobe Type	1.7	2.0
Reciprocating—3 or more Cylinders	1.7	2.0
Reciprocating—2 Cylinders	2.0	2.25
FANS AND COMPRESSORS		
Sliding Vane Compressor	1.2	1.5
Forced Draft Fan	1.3	1.5
Centrifugal Compressor	1.3	1.75
Induced Draft Fan	1.5	1.75
Industrial Blower (Repeated starting and stopping cycle such as in Steel Mill)	1.5	1.75
Nash Compressor	1.7	2.0
Reciprocating Compressor—3 or more Cylinders	1.7	2.0
Reciprocating Compressor—2 Cylinders	2.0	2.25
Lobe Type Compressor	1.7	2.0
Refrigerant Compressor for Air Conditioning Service	1.0	....
Axial Compressor	1.3	1.75
MISCELLANEOUS		
Paper Machines—Sectional Drives	1.5	....
Paper Machines—Line Shaft	1.1	....
Belt or rope drive for Reciprocating Apparatus	1.3	1.5
Belt or rope drive for other than Reciprocating Apparatus	1.1	1.5
Jordans	1.5	....
Pulp Beaters	1.5	....
Cane cutters	1.7	2.0
Pulverizers	1.7	2.0
Reciprocating Apparatus	1.7	2.0
Sugar Mill	1.5	1.75
Sugar Centrifugal	1.7	2.0
Chipper	2.2	....

HIGH SPEED SHAFT DIAMETERS FOR TYPE N AND NM UNITS

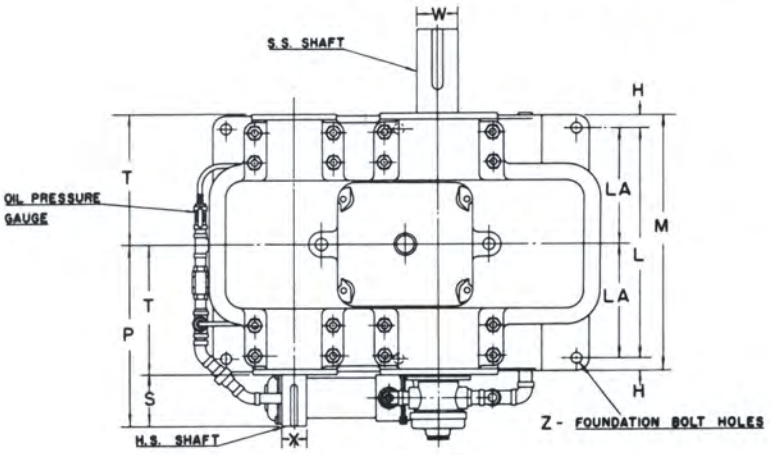
Size N or NM	RATIO UP TO 4.0:1 Dia.	RATIO UP TO 4.0:1 Keyway	RATIO 4.1:1 TO 8.0:1 Dia.	RATIO 4.1:1 TO 8.0:1 Keyway	RATIO 8.1:1 AND OVER Dia.	RATIO 8.1:1 AND OVER Keyway
6	1.500	3/8 x 3/16	1.250	1/4 x 1/8	....	.....
8	1.750	3/8 x 3/16	1.500	3/8 x 3/16	1.250	1/4 x 1/8
10	2.500	5/8 x 5/16	2.000	1/2 x 1/4	1.500	3/8 x 3/16
12	2.500	5/8 x 5/16	2.500	5/8 x 5/16	2.000	1/2 x 1/4
14	3.000	3/4 x 3/8	2.500	5/8 x 5/16	2.000	1/2 x 1/4
16	3.500	7/8 x 7/16	3.000	3/4 x 3/8	2.500	5/8 x 5/16
18	3.500	7/8 x 7/16	3.000	3/4 x 3/8	2.500	5/8 x 5/16
21	3.500	7/8 x 7/16	3.000	3/4 x 3/8	3.000	3/4 x 3/8
24	4.000	1 x 1/2	3.500	7/8 x 7/16	3.000	3/4 x 3/8
30	4.000	1 x 1/2	3.500	7/8 x 7/16	3.000	3/4 x 3/8
33	4.500	1 x 1/2	4.000	1 x 1/2	3.500	7/8 x 7/16
38	5.000	1 1/4 x 7/16	5.000	1 1/4 x 7/16	4.000	1 x 1/2

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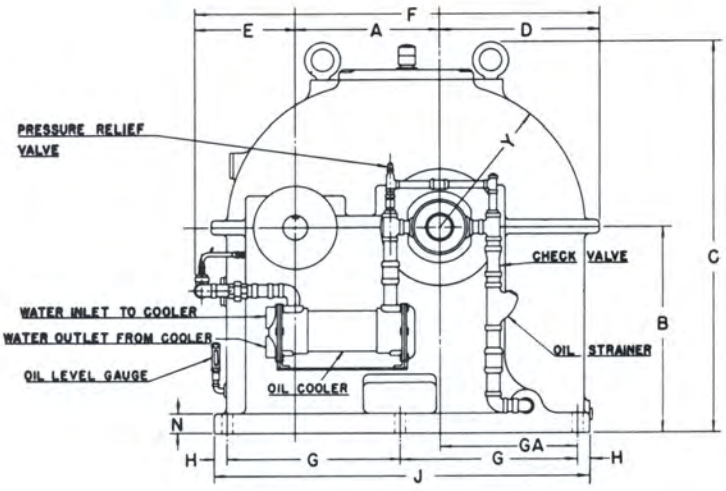
GENERAL DIMENSIONS

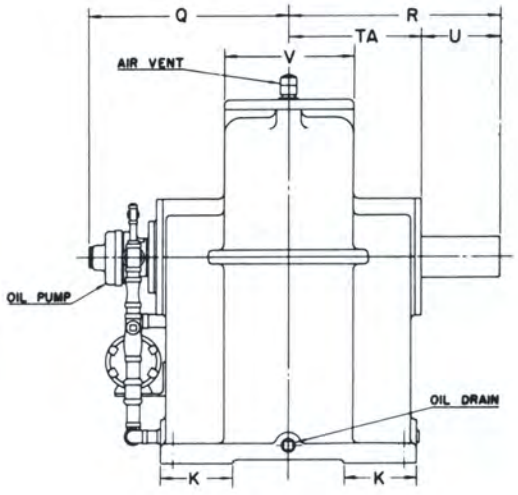
Types N and NM

HIGH SPEED REDUCERS AND SPEED INCREASERS



RIGHT HAND ASSEMBLY SHOWN





Size No. N or NM	A	B	C	D	E	F	G	GA	H	J	K	L	LA	M	N	P	Q	R	S	T	TA	U	V	W	X	Y	Slow Speed Shaft Keyway	Z Bolt Holes	Weight
6	6	12½	21¾	7¼	8	21¼	15½	5½	1	17½	4	12	6	14	1½	10¾	14	12	3⅜	7⅜	7 7/16	4 9/16	9½	2	For High Speed Shaft Dia. See Table on Page 33	6	½ x ¼ x 4	4– 13/16	600
8	8	14	26½	10	8½	26½	21	7¾	1¼	23½	5	16½	8¼	19	1¾	14	17¼	15	4⅛	9⅞	9 15/16	5 1/16	10¾	2½		8½	⅝ x 5/16 x 5	4–1 1/16	1,000
10	10	17	32¾	12	9⅝	31⅝	26½	9¾	1¼	29	6½	20½	10¼	23	2	16½	20 1/16	17½	4¼	12¼	12¼	5¼	11¾	3		10½	¾ x ⅜ x 5	4–1 1/16	1,750
12	12	20	36⅝	14	9⅝	35⅝	30	11½	1½	33	7	21	10½	24	2	19	20¼	20	6¼	12¾	12¾	7¼	12½	3¾		12½	⅞ x 7/16 x 5½	4–1 5/16	2,400
14	14	22	40½	16	10¾	40¾	35	13½	1½	38	7½	24	12	27	2¼	20½	22	21½	6 3/16	14 5/16	14 7/16	7 1/16	13½	4		14½	1 x ½ x 5½	4–1 5/16	3,400
16	16	24	45⅜	18½	12	46½	20	15¾	1½	43	9	28	14	31	2½	23	24½	24¾	6 13/16	16 3/16	16½	8½	15	4½		16⅝	1 x ½ x 7½	6–1 5/16	4,400
18	18	26	50¾	20	12¼	50¼	22	17¼	1½	47	9	29	14½	32	2½	23	24¾	26½	6 5/16	16 1 1/16	17	9½	16	5		18⅛	1¼ x 7/16 x 7½	6–1 5/16	5,400
21	21	28	55	22½	15	58½	24½	19¼	2	53	9	29	14½	33	2¾	24½	25¼	27½	7 5/16	17 3/16	17½	10	16¾	5¾		20⅝	1½ x ½ x 8¾	6–1 5/16	6,600
24	24	30	61	27	17¼	68¼	29¼	23½	2	62½	10	24	*12	36	3	27	27 1/16	30	8 5/16	18 1 1/16	19	11	18½	6⅜		24¾	1½ x ½ x 9	6–1⅝	10,000

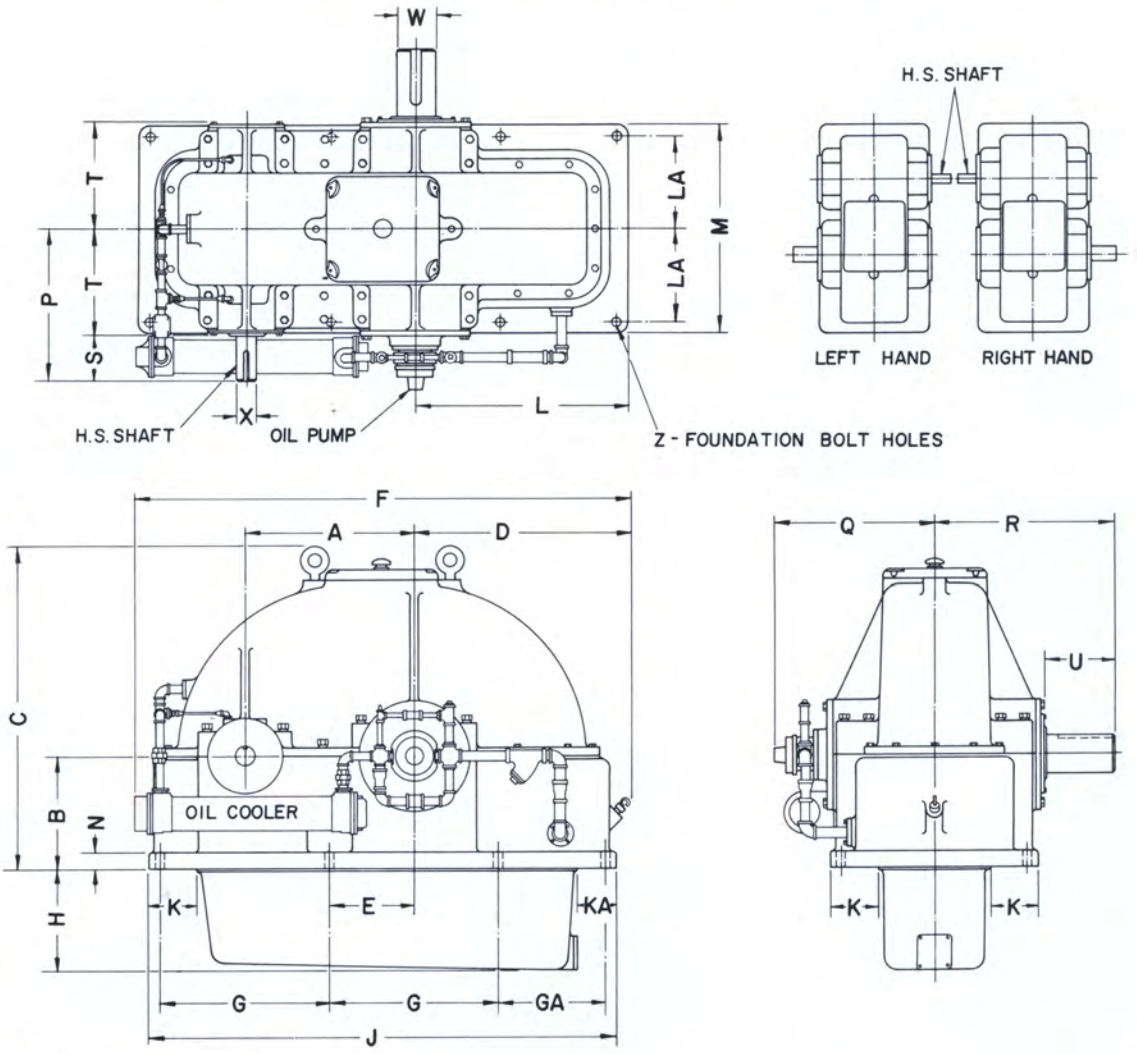
For units having four foundation bolts the dimension under G is the distance between bolts.
*N24 has center holes spaced 16".
All dimensions are in inches.
The external dimensions shown are the same for each Housing Assembly regardless of the face width of gears.
The above dimensions are not to be used for installation.
USE CERTIFIED INSTALLATION PRINT.

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GENERAL DIMENSIONS

LARGE Types N and NM

HIGH SPEED REDUCERS AND SPEED INCREASERS

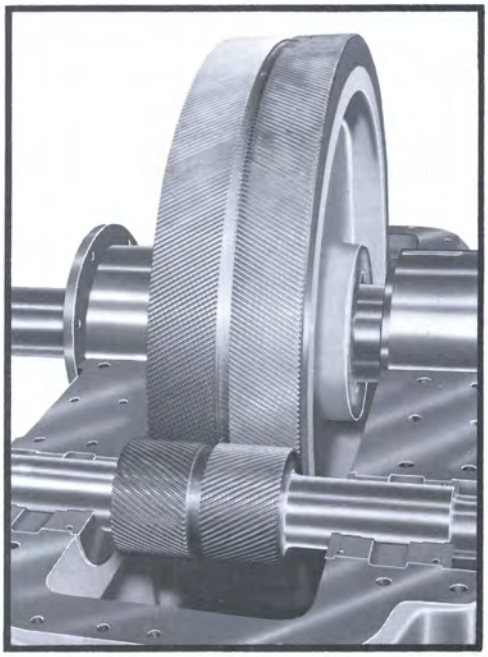


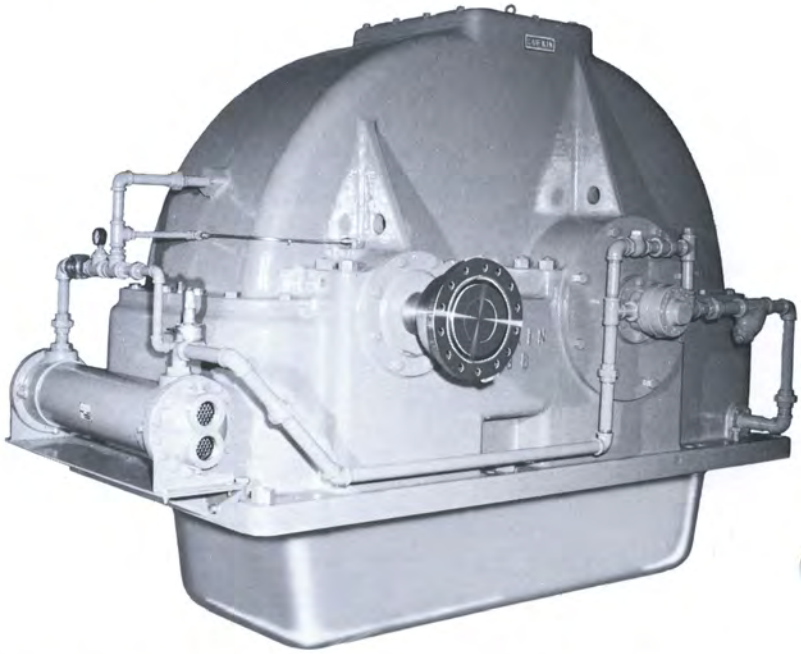
Size No. N or NM	A	B	C	D	E	F	G	GA	H	J	K	KA	L	LA	M	N	P	Q	R	S	T	U	W	X	S.S. Shaft Keyway	Z	Weight
30	30	20	57½	38	15	88	30	19	18	83	8½	7	36	16½	27	3	27	28½	32	7⅞	19⅛	12¼	6⅞	*	1¾ x ⅝	8–1⅝	14,750
33	33	20	60¼	39½	17	100½	32	20	19	88	8½	7	37	18¼	40½	3	30	31¼	36	9	21	14	7½	*	1¾ x ⅝	8–1⅝	20,000
38	38	24	66	44	20	114	37¼	22	20	101	8½	7	41½	22¼	49	3¼	36	34½	42	10⅞	25⅛	15⅞	9	*	2½ x ⅞	8–1⅝	24,000

* For H. S. Shaft Dia, See Table on Page 33.
All dimensions are in inches.
The external dimensions shown are the same for each Housing Assembly regardless of the face width of gears.
The above dimensions are not to be used for installation.
USE CERTIFIED INSTALLATION PRINT.

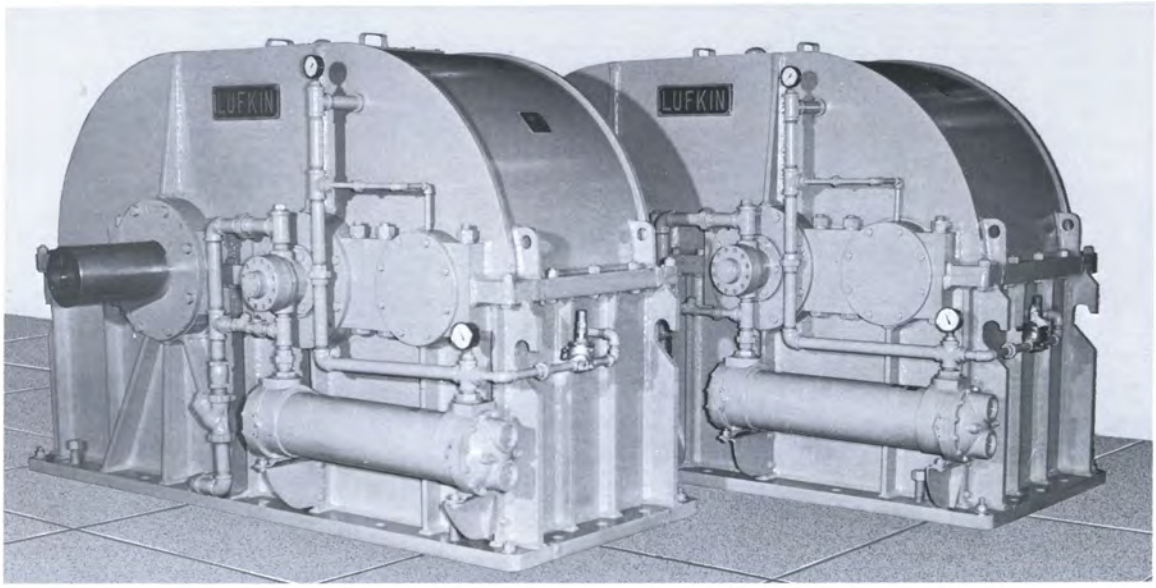
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LARGE
Type N
HIGH SPEED REDUCERS AND SPEED INCREASERS





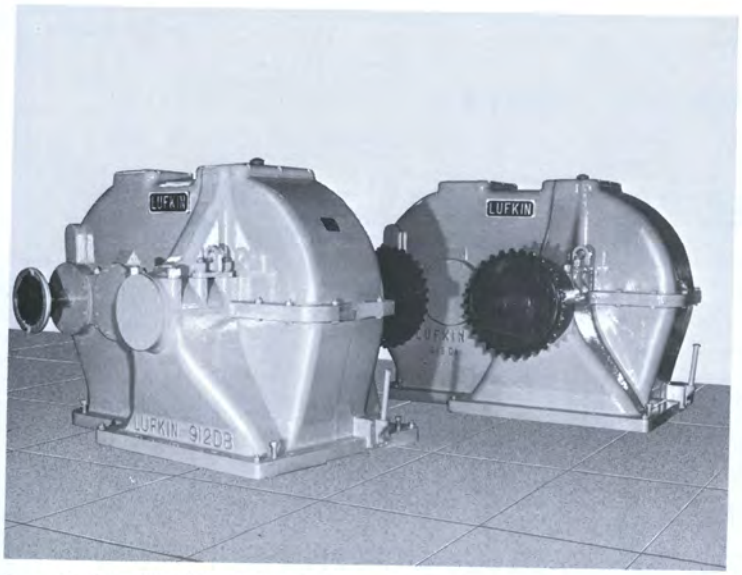
Lufkin Large Type N Speed Increasers and High Speed Reducers size N30, N33 and N38 are furnished with cast iron housings as shown above. Large single reduction units and large double reduction units are furnished with fabricated steel housings similar to the N500 Speed Increasers shown below.



Two Lufkin Model N500B double reduction high speed gear increasers for shipment to a major oil company for driving centrifugal pumps at 6500 RPM from diesel engine at 515 RPM delivering 2000 HP each.

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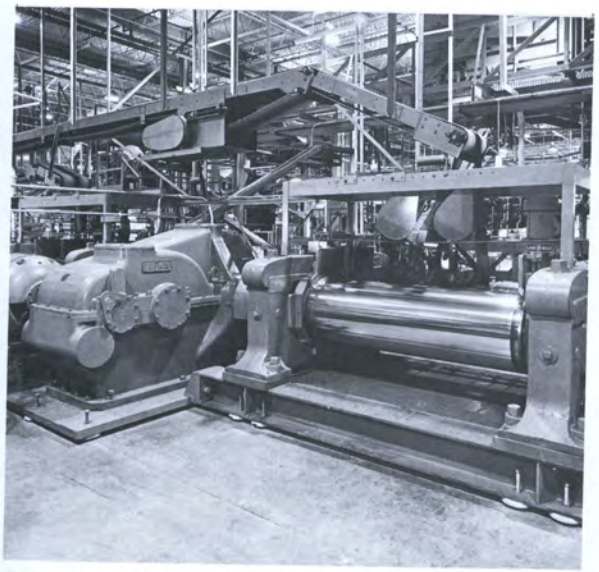
LUFKIN HI-Q SPEED REDUCERS



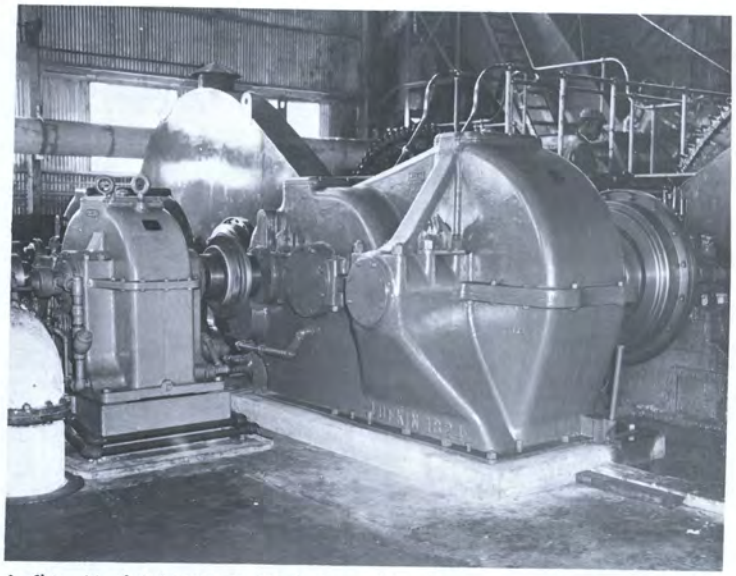
Two Lufkin Model D912 Double Reduction Hi-Q Reducers with Lufkin chain couplings for shipment to a major rubber manufacturer.



Lufkin Model D640 Double Reduction Hi-Q Reducer driving a conveyor in a rock quarry.



One of eight identical Lufkin D1824 Double Reduction Hi-Q Reducers driving two 84" rubber mills in a California tire plant.



Lufkin Model N1610B High Speed Reducer connected to a Lufkin Model D1824 Hi-Q Reducer driving a sugar mill in a Louisiana sugar factory.

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LUFKIN HI-Q HERRINGBONE GEAR SPEED REDUCERS
DOUBLE AND SINGLE REDUCTION UNITS
SPECIFICATIONS

Hi-Q Reducers are built to the same general specifications as those shown for Type S and D assemblies on Page 4 with the exception of the bearings on the slow speed shaft which are bronze bushings. These assemblies are carried in stock with the standard ratios shown in blue below with double extended high speed and slow speed shafts. Other ratios shown are available but are not carried in stock.

SELECTION OF UNITS

Hi-Q Reducers are selected in the same manner as shown for Type S and D assemblies on pages 6-8 using service factors shown on page 9.

HORSEPOWER RATING TABLES
HI-Q DOUBLE REDUCTION UNITS

The Horsepower Ratings listed in the tables below are mechanical ratings calculated by the A.G.M.A. formula using a Service Factor of 1. See pages 6, 7 and 8 for information on selecting reducers.

Size No.	High Speed Shaft R.P.M.	RATIOS																	
		20.0	20.9	21.6	22.6	23.8	25.0	26.2	27.6	29.2	30.9	32.6	34.8	....	....	....	....	....	....
D6	1750	9.9	9.7	9.2	8.7	8.4	7.7	7.3	6.8	6.4	6.2	5.9	**5.1**	....	....	....	....	....	....
	1150	6.8	6.5	6.3	6.1	5.8	5.2	5.1	4.9	4.7	4.6	4.1	**3.8**	....	....	....	....	....	....
	870	5.3	5.1	4.9	4.6	4.4	4.1	3.9	3.7	3.5	3.3	2.9	**2.7**	....	....	....	....	....	....
	720	4.4	4.3	4.2	4.0	3.9	3.5	3.4	3.2	2.9	2.8	2.6	**2.3**	....	....	....	....	....	....
	580	3.6	3.5	3.4	3.3	3.1	2.7	2.6	2.5	2.3	2.2	2.0	**1.8**	....	....	....	....	....	....

Size No.	High Speed Shaft R.P.M.	RATIOS																	
		18.2	19.2	20.3	21.4	22.6	24.0	25.5	27.2	29.0	31.0	33.4	36.0	39.0	....	....	....	....	....
D10	1750	19.9	18.7	18.0	16.8	15.5	14.4	12.8	11.9	11.0	10.0	8.8	**8.0**	7.0	....	....	....	....	....
	1150	14.0	13.0	12.5	11.5	10.5	9.7	8.9	8.3	7.7	7.1	6.1	**5.6**	4.9	....	....	....	....	....
	870	10.9	10.2	9.8	9.1	8.2	7.6	6.9	6.4	6.0	5.5	4.9	**4.4**	3.3	....	....	....	....	....
	720	9.4	8.8	8.3	7.7	7.1	6.5	5.8	5.5	5.0	4.6	4.1	**3.8**	3.2	....	....	....	....	....
	580	7.7	7.1	6.7	6.1	5.7	5.2	4.8	4.5	4.1	3.8	3.4	**3.0**	2.7	....	....	....	....	....

Size No.	High Speed Shaft R.P.M.	RATIOS																	
		19.3	20.3	21.3	22.4	23.6	24.8	26.2	27.8	29.5	31.3	33.4	35.7	38.2	....	....	....	....	....
D16	1750	26.6	25.9	24.2	23.4	22.1	21.3	19.8	19.0	17.7	16.2	14.8	**13.7**	12.2	....	....	....	....	....
	1150	18.3	17.5	16.7	16.0	14.9	14.6	13.7	13.1	12.0	11.1	10.3	**9.5**	8.2	....	....	....	....	....
	870	14.2	13.4	12.8	12.2	11.6	11.1	10.7	10.2	9.4	8.6	8.0	**7.3**	6.6	....	....	....	....	....
	720	11.6	11.2	10.6	10.3	9.7	9.3	9.0	8.4	7.9	7.3	6.8	**6.1**	5.5	....	....	....	....	....
	580	9.6	9.2	8.8	8.4	7.9	7.6	7.2	6.8	6.4	5.9	5.5	**5.0**	4.4	....	....	....	....	....

Size No.	High Speed Shaft R.P.M.	RATIOS																	
		13.8	14.6	15.5	16.4	17.5	18.6	19.9	21.3	22.9	24.6	26.6	28.9	....	....	....	....	....	....
D25	1750	53.8	51.5	49.1	46.7	44.6	41.9	38.2	35.1	32.1	29.7	25.8	**23.1**	....	....	....	....	....	....
	1150	37.6	35.6	33.5	31.5	29.8	28.0	26.6	24.3	21.8	20.3	18.4	**16.1**	....	....	....	....	....	....
	870	28.4	27.4	26.4	24.4	23.2	22.3	20.9	19.3	17.8	16.0	14.2	**12.3**	....	....	....	....	....	....
	720	24.4	22.8	22.3	20.3	19.3	18.7	17.7	16.5	15.0	13.8	12.3	**10.4**	....	....	....	....	....	....
	580	19.9	18.9	18.1	16.9	15.8	15.4	14.4	13.3	12.3	10.9	9.7	**8.5**	....	....	....	....	....	....

Size No.	High Speed Shaft R.P.M.	RATIOS																	
		14.4	15.2	16.0	16.8	17.7	18.7	19.8	21.0	22.3	23.0	25.4	27.2	29.2	31.5	34.1	....	....	....
D40	1750	80.6	77.2	72.5	69.5	67.5	63.5	59.5	56.5	54.4	52.2	46.8	43.7	**39.0**	35.2	32.3	....	....	....
	1150	56.4	52.4	50.5	48.5	45.4	43.4	41.4	39.4	38.6	37.2	32.8	30.4	**26.3**	24.2	21.6	....	....	....
	870	42.5	40.6	39.4	38.4	36.3	33.9	32.2	31.2	30.1	28.8	25.6	23.8	**19.2**	18.6	17.0	....	....	....
	720	36.6	34.4	32.4	31.2	29.8	28.2	27.2	26.2	25.4	24.5	22.0	20.3	**17.9**	16.1	14.5	....	....	....
	580	30.2	28.2	27.2	25.8	24.2	23.2	22.2	21.3	20.4	19.5	17.5	16.3	**14.4**	13.1	11.5	....	....	....

Size No.	High Speed Shaft R.P.M.	RATIOS																	
		14.5	15.1	15.8	16.5	17.3	18.1	19.0	19.9	20.9	22.0	23.2	24.6	26.0	27.6	29.3	31.2	33.4	36.8
D57	1750	118	112	105	101	97.3	94.0	91.3	85.0	82.0	80.0	78.5	74.8	69.8	64.2	**59.2**	53.5	49.5	44.0
	1150	80.1	75.6	72.1	67.7	66.4	65.3	62.5	59.6	58.0	57.0	55.4	52.5	49.2	44.8	**42.0**	37.5	34.6	30.4
	870	62.5	60.2	57.7	53.2	52.1	49.7	48.6	45.1	44.0	43.0	42.0	41.1	38.6	35.6	**33.1**	29.8	26.2	23.5
	720	51.5	49.7	47.5	45.1	44.0	42.8	41.3	40.0	39.1	38.0	37.3	35.0	32.8	29.9	**27.7**	25.5	23.3	20.4
	580	42.8	40.5	39.4	37.5	35.9	34.2	33.1	32.5	31.8	31.2	30.5	29.3	27.1	24.5	**22.7**	20.7	19.0	16.5

Size No.	High Speed Shaft R.P.M.	RATIOS																	
		14.9	15.5	16.2	16.9	17.6	18.4	19.2	20.2	21.2	22.2	23.4	24.6	26.0	27.5	29.2	31.0	33.0	35.3
D80	1750	156.1	151.0	141.0	138.5	133.5	128.5	123.4	118.5	113.2	109.5	105.8	98.4	94.5	87.6	**79.8**	74.5	57.6	61.7
	1150	105.8	104.5	98.3	94.5	92.0	87.0	84.5	82.0	78.0	73.0	71.9	68.0	66.8	62.5	**56.6**	52.1	47.1	43.4
	870	83.1	80.6	75.6	73.0	70.5	69.4	66.8	64.3	60.5	58.0	55.5	53.0	51.4	48.0	**44.0**	41.0	37.0	34.1
	720	70.6	68.0	65.5	61.7	60.5	58.0	56.7	54.1	50.5	49.1	46.5	44.6	43.6	41.7	**37.8**	35.1	31.7	29.2
	580	58.0	56.6	53:0	51.6	49.1	47.9	45.4	44.1	41.5	40.4	37.8	36.5	35.5	32.8	**29.9**	27.7	25.2	23.0

Ratios shown in Blue are standard stock ratios.

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HORSEPOWER RATING TABLES (cont'd.)

Size No.	High Speed Shaft R.P.M.	RATIOS																				
		15.2	15.9	16.6	17.4	18.1	19.0	19.9	21.0	22.1	23.3	24.7	26.0	27.6	29.4	31.3	33.5	...	...	...	...	...	...
D114	1750	228	222	212	205	198	192	179	172	165	159	147	142	134	**127**	117	113	...	...	...	...	...	...
	1150	159	151	146	137	134	129	122	119	114	109	101	97	92	**86**	83	78	...	...	...	...	...	...
	870	122	119	114	109	104	101	97	92	86	84	79	76	71	**68**	63	59	...	...	...	...	...	...
	720	103	99	96	93	88	84	79	77	73	69	65	63	60	**56**	53	50	...	...	...	...	...	...
	580	84	82	79	76	71	69	66	63	60	56	54	52	48	**46**	43	40	...	...	...	...	...	...

Size No.	High Speed Shaft R.P.M.	RATIOS																				
		14.8	15.4	16.1	16.8	17.7	18.4	19.3	20.4	21.5	22.6	24.0	25.4	26.9	28.7	....	....	...	...	...	...	...
D160	1150	222	212	205	198	188	180	174	167	156	151	138	127	114	**107**	....	....	...	...	...	...	...
	870	173	166	156	153	148	142	139	132	125	118	108	99	91	**84**	....	....	...	...	...	...	...
	720	148	142	139	132	125	120	115	108	104	99	93	85	77	**72**	....	....	...	...	...	...	...
	580	120	115	109	106	104	99	94	90	85	82	75	69	62	**58**	....	....	...	...	...	...	...

Size No.	High Speed Shaft R.P.M.	RATIOS																				
		14.7	15.4	16.1	16.8	17.5	18.4	19.4	20.3	21.4	22.4	23.8	25.3	26.8	28.4	30.3	....	...	...	...	...	...
D228	1150	310	296	281	269	262	254	239	228	220	209	198	186	182	**166**	153	....	...	...	...	...	...
	870	239	228	220	209	202	197	186	182	170	165	156	148	139	**133**	120	....	...	...	...	...	...
	720	202	197	186	182	171	165	158	152	145	139	135	126	120	**108**	98	....	...	...	...	...	...
	580	164	158	152	148	143	140	135	126	120	112	106	102	95	**90**	80	....	...	...	...	...	...

Size No.	High Speed Shaft R.P.M.	RATIOS																				
		14.8	15.4	15.9	16.6	17.2	17.8	18.7	19.5	20.3	21.2	22.2	23.3	24.4	25.7	26.9	28.5	30.1	31.9	...	...	...
D320	1150	430	413	405	392	379	365	352	343	321	317	300	286	273	264	251	238	**229**	216	...	...	...
	870	343	330	313	308	295	286	277	260	250	242	237	225	220	215	205	195	**173**	168	...	...	...
	720	282	278	264	255	251	242	233	224	216	207	202	196	183	174	165	158	**150**	143	...	...	...
	580	238	229	220	212	202	198	194	183	174	167	161	154	150	141	136	123	**121**	119	...	...	...

Size No.	High Speed Shaft R.P.M.	RATIOS																				
		14.9	15.5	16.1	16.8	17.6	18.4	19.2	20.1	21.2	22.1	23.4	24.5	25.9	27.4	29.0	30.8	32.8	...	...	...	...
D456	1150	637	610	584	560	537	522	502	480	458	443	422	407	381	360	**350**	332	304	...	...	...	...
	870	487	475	458	443	422	407	385	375	360	349	333	315	302	282	**271**	261	239	...	...	...	...
	720	417	400	385	375	360	348	333	315	302	285	276	266	250	240	**228**	220	206	...	...	...	...
	580	349	333	317	307	290	282	273	260	250	239	224	219	208	198	**187**	180	167	...	...	...	...

Size No.	High Speed Shaft R.P.M.	RATIOS																				
		14.4	15.1	15.8	16.5	17.3	18.2	19.1	20.2	21.2	22.5	23.7	25.2	26.8	28.6	....	....	...	...	...	...	...
D640	1150	915	856	826	791	742	716	659	630	576	539	506	463	432	**398**	....	....	...	...	...	...	...
	870	743	695	671	625	596	570	530	495	459	431	410	365	341	**311**	....	....	...	...	...	...	...
	720	645	596	584	546	517	490	461	431	400	372	350	317	296	**272**	....	....	...	...	...	...	...
	580	527	489	474	446	427	405	381	350	323	304	290	258	247	**227**	....	....	...	...	...	...	...

Size No.	High Speed Shaft R.P.M.	RATIOS																				
		15.0	15.6	16.3	17.0	17.7	18.5	19.3	20.2	21.1	22.1	23.2	24.4	25.7	27.2	28.7	30.4	...	...	...	...	...
D912	870	995	925	898	835	814	751	720	695	650	620	572	542	500	464	**431**	397	...	...	...	...	...
	720	836	799	760	719	696	655	629	599	565	534	492	460	435	400	**377**	347	...	...	...	...	...
	580	679	650	621	591	576	536	515	488	466	445	414	390	358	330	**304**	284	...	...	...	...	...

Size No.	High Speed Shaft R.P.M.	RATIOS																				
		14.6	15.2	15.7	16.3	17.0	17.7	18.4	19.2	20.1	21.0	21.9	23.0	24.1	25.3	26.6	28.1	29.7	31.4	...	...	...
D1280	870	1452	1380	1341	1320	1268	1230	1191	1090	980	937	881	824	766	717	671	**625**	581	529	...	...	...
	720	1230	1192	1125	1080	1029	991	970	910	849	805	749	704	661	629	582	**538**	496	459	...	...	...
	580	976	932	902	880	842	813	776	736	690	657	619	586	543	510	475	**434**	410	374	...	...	...

Size No.	High Speed Shaft R.P.M.	RATIOS																				
		14.5	15.0	15.5	16.0	16.6	17.2	17.8	18.5	19.2	20.0	20.8	21.6	22.6	23.6	24.6	25.8	27.0	28.3	29.8	31.4	33.1	35.0
D1824	870	1872	1792	1731	1700	1645	1600	1535	1480	1442	1402	1367	1280	1203	1138	1082	1031	997	**880**	863	745	725	643
	720	1560	1522	1484	1445	1366	1328	1290	1250	1220	1205	1188	1160	1083	1036	959	928	873	**809**	766	701	640	579
	580	1290	1250	1210	1170	1130	1092	1052	1014	976	960	948	920	863	813	715	681	665	**629**	589	553	512	471

Ratings for intermediate ratios and speeds may be found by direct interpolation.

All units may be operated at speeds lower than the minimum shown. The selection of a reducer for a lower speed may be accomplished by multiplying the desired horsepower by 580 and dividing by the desired speed. The result will be the equivalent horsepower at 580 RPM which can be found in the above tables.

Ratios shown in Blue are standard stock ratios.

HI-Q SINGLE REDUCTION UNITS

Size		S57	S114	S160	S228	S320	S456
Ratio		10.0	9.67	10.5	9.94	9.4	10.71
High Speed Shaft R.P.M.	1750	170	298	....	....	....	....
	1150	120	210	253	414	574	657
	870	92	163	200	323	459	515
	720	79	140	172	281	398	455
	580	64	113	139	229	321	373

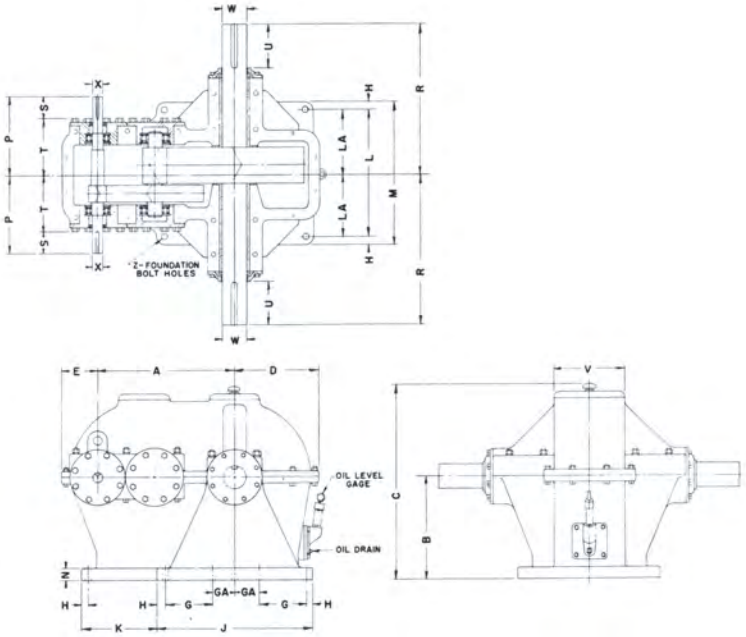
Ratios shown for single reduction units are standard stock ratios.

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GENERAL DIMENSIONS

HI-Q

DOUBLE REDUCTION HERRINGBONE GEAR REDUCERS



Sizes D6 through D57 are available in one-piece housings only—not split at horizontal centerline as illustrated.

SIZE NO.	A	B	C	D	E	G	GA	H	J	K	L	LA	M	N
D6	10	7½	15¾	6¾	2¾	16¾	....	...	18½	....	6¾	3⅜	8½	1⅛
D10	11 11/32	8½	17⅜	8½	3⅞	13	6½	⅞	14¾	8⅜	11½	5¾	13¼	1⅛
D16	12¾	10	20⅝	9½	4	15	7½	⅞	16¾	9	12¼	6⅛	14	1¾
D25	13 9/16	14	25½	9 13/16	5½	8⅝	8⅝	⅞	19	8¾	15	7½	16¾	1½
D40	17½	14	27¼	11 9/16	5 11/16	11	11	1	24	11⅝	18	9	20	1½
D57	20	18	32¾	12 5/16	5½	8½	4	1¼	27½	13¼	22½	11¼	25	2¼
D80	22	18	33 15/16	14	5¾	8½	4	1¼	27½	13¼	22½	11¼	25	2
D114	24	18	34 11/16	14¾	6 9/16	8½	4	1¼	27½	13¼	22½	11¼	25	2
D160	26	27	44¾	15¾	7¼	10½	5¼	1¼	34	15¼	29½	14¾	32	2½
D228	30	27	47½	18¾	8	8½	8½	1½	37	18½	34	17	37	3
D320	34	28	52	20½	8½	10¼	10¼	1½	44	21¾	40	20	43	3¼
D456	38⅜	28	52¾	22¾	9½	11⅜	11⅜	1½	48½	25⅛	43½	21¾	46½	3
D640	41 33/64	28	54½	24½	9½	11⅜	11⅜	1½	48½	25⅛	43½	21¾	46½	3
D912	48½	30	61	29¾	10⅝	12¼	12¼	1½	52	26½	46¾	23⅜	49¾	3
D1280	52 9/16	36	69½	32	20½	13¾	13¾	1½	58	39½	47	23½	50	3½
D1824	58⅞	36	72½	35⅜	16 57/64	13¾	13¾	1½	58	39½	47	23½	50	3½

SIZE NO.	P	R	S	T	U	V	W	X	Z	H.S. Shaft Keyway	S.S. Shaft Keyway	Weight
D6	6⅝	10	1 27/32	4 25/32	3 3/16	8¾	2	15/16	4–13/16	¼ x ⅛ x 1⅞	½ x ¼ x 2⅞	300
D10	7¾	11½	2¼	5½	3 19/32	10¼	2 3/16	15/16	5–13/16	¼ x ⅛ x 2¼	⅝ x 5/16 x 3½	370
D16	8⅛	12½	2⅝	5½	4 3/16	10½	2½	1.18	5–13/16	¼ x ⅛ x 2 11/16	⅝ x 5/16 x 4	540
D25	9	17½	2⅛	6⅞	5⅜	8½	3	1⅜	7–13/16	⅜ x 3/32 x 2¼	13/16 x 3/16 x 5	760
D40	10⅝	19⅜	2⅝	8	7	12⅞	4	1 11/16	7–1	½ x ⅛ x 2¾	1 x ¼ x 6	1,250
D57	11¾	23	2¾	9	7½	16⅛	4	1 15/16	9–1⅛	½ x ¼ x 2⅞	1 x ¼ x 7	1,840
D80	13⅜ 13¾	26½	4 4⅜	9⅜	8⅛	11¾	4 7/16	1 15/16	9–1⅛	9/16 x ⅛ x 4	1¼ x ⅜ x 7½	2,350
D114	13¾	26½	4¼	9½	7 15/16	12½	4 7/16	1 15/16	9–1⅛	9/16 x ⅛ x 4¼	1¼ x ⅜ x 7½	2,450
D160	16⅝	28	5¼	11⅜	8	15¼	5 7/16	2 3/16	9–1⅜	9/16 x ⅛ x 5¼	1¼ x ⅜ x 7	3,695
D228	18 27/32	32	6	12 31/32	7¾	17½	6	2 7/16	12–1⅜	11/16 x 5/32 x 6	1½ x ⅜ x 7½	4,950
D320	23	35½	8 1/16	14 15/16	8¼	20	6 7/16	2 15/16	12–1½	13/16 x 3/16 x 7¾	1½ x ⅜ x 7¾	7,210
D456	23½	41	7 25/32	15 23/32	8¼	22	7	3 7/16	12–1⅜	⅜ x ¼ x 7	1½ x ⅜ x 7¾	9,100
D640	23½	41	7½	16	8¼	24¾	7	3 1/16	12–1⅜	⅜ x ¼ x 7⅞	1½ x ⅜ x 7¾	11,000
D912	26¼	41	9¾	16 7/16	8⅛	26¼	7	4 3/16	12–1⅜	1 x ¼ x 10	1½ x ⅜ x 7¾	12,000
D1280	30¾ 27⅜	44½	6¾ 11⅝	24 15⅞	10	23	8½	4 15/16	17–1⅜	1¼ x 7/16 x 11	2 x ¾ x 9⅜	19,000
D1824	35 30	47½	6⅞ 11⅝	28⅛ 18⅝	9 15/16	26½	9	4 15/16	17–1⅜	1¼ x 7/16 x 11	2 x ¾ x 9⅜	20,941

D6, D10, and D16 Reducers have single extended high speed shafts and are assembled as left hand units.

Where two dimensions are shown under P, S, and T, the first dimension is for the right hand side and the second dimension for the left.

The above dimensions are not to be used for installation.

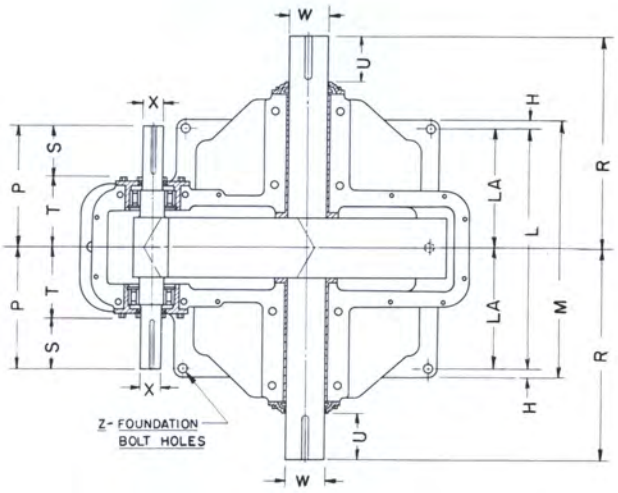
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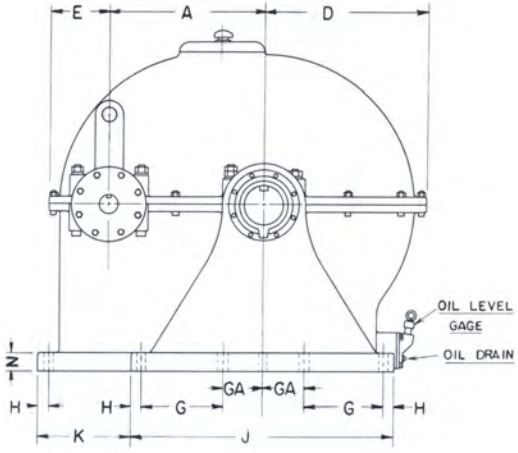
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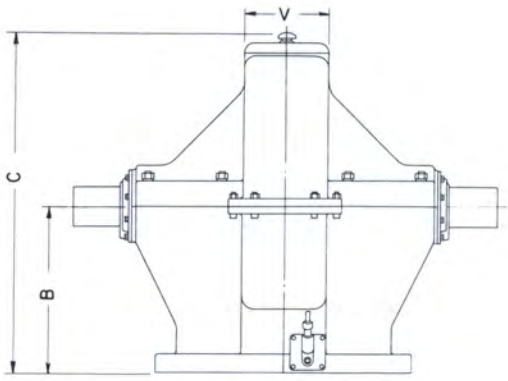
GENERAL DIMENSIONS

HI-Q

SINGLE REDUCTION HERRINGBONE GEAR REDUCERS







SIZE NO.	A	B	C	D	E	G	GA	H	J	K	L	LA	M	N
S57	17 7/8	18	38 3/16	18 3/4	6 13/32	8 1/2	4	1 1/4	27 1/2	13 1/4	22 1/2	11 1/4	25	2 1/4
S114	20	21	44 1/16	21	6 1/2	8 1/2	4	1 1/4	27 1/2	13 1/4	22 1/2	11 1/4	25	2
S160	23	27	52 3/4	24 1/4	8	10 1/2	5 1/4	1 1/4	34	15 1/4	29 1/2	14 3/4	32	2 1/2
S228	25	27	54 11/16	26 1/4	8 1/4	8 1/2	8 1/2	1 1/2	37	13 1/2	34	17	37	3
S320	26	28	56 3/4	27 1/4	10	10 1/4	10 1/4	1 1/2	44	15 1/2	40	20	43	3 1/4
S456	32 13/16	34	69 3/4	34 1/2	15 5/16	11 3/8	11 3/8	1 1/2	48 1/2	25 1/8	43 1/2	21 3/4	46 1/2	3

SIZE NO.	P	R	S	T	U	V	W	X	Z	H.S. Keyway	S.S. Keyway	Weight
S57	11 1/4	23	4 7/16	6 13/16	7 1/2	7 7/8	4	2 7/16	9–11 1/16	11/16 x 5/32 x 4	1 x 1/4 x 7	1,935
S114	12 3/4	26 1/2	3 3/4	9	7 3/4	9 3/4	4 7/16	2 11/16	9–11 1/16	11/16 x 5/32 x 4	1 1/4 x 3/8 x 7 1/4	2,535
S160	14 3/8	28	4 11/16	9 11/16	8	10	5 7/16	2 15/16	9–13/8	13/16 x 3/16 x 4 1/4	1 1/4 x 3/8 x 7	3,720
S228	18 1/2	32	7 1/16	11 7/16	7 7/8	13	6	3 3/16	12–13/8	13/16 x 3/16 x 5	1 1/2 x 3/8 x 7 1/2	5,035
S320	20 3/8	35 1/2	8 11/16	11 11/16	8 1/8	14 1/4	6 7/16	3 7/16	12–1 1/2	7/8 x 1/4 x 8	1 1/2 x 3/8 x 7 3/4	7,005
S456	21 1/4	41	8 5/16	12 15/16	9	16	7	3 15/16	12–1 3/8	1 x 1/4 x 8	1 1/2 x 3/8 x 7 3/4	10,330

Above dimensions are not to be used for installation.
USE CERTIFIED INSTALLATION PRINT.

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LUBRICATION INSTRUCTIONS

The lubricating oils used in Lufkin Gear Units should be high grade, high quality, well refined petroleum oils. It is essential that the oils be clean; they must also be non-corrosive to gears and bearings. They must be neutral in reaction and possess good defoaming properties. When operating temperature is high the oil must have good resistance to oxidation.

Straight mineral type lubricants are to be used under ordinary operating conditions. The tabulation below shows the viscosity of oil to use for all types of Lufkin Gear Units. When operating in the range of 0 to 40° F. ambient temperature, the lubricant should be carefully selected to make certain that the pour point is below the lowest anticipated temperature.

When a new Gear Unit is started in operation the oil should be drained at the end of two weeks and the case thoroughly flushed. The original oil may be used for refilling only if it has been filtered. Under ordinary operating conditions the oil should be changed every 2500 hours of operation or every six months, whichever occurs first.

It is very important to the successful and satisfactory operation of a Gear Unit that careful attention be given to proper lubrication and that the lubricant be kept clean. Every precaution should be taken to prevent water and foreign particles from entering the gear case. In unusually dusty atmospheres and where there is rapid rise and fall in temperatures causing excessive condensation inside the case, it will be necessary to change the oil more frequently than specified above.

RECOMMENDED LUBRICANTS FOR LUFKIN GEAR UNITS

	AMBIENT TEMPERATURE			
	15°F.—60°F.		50°F.—125°F.	
	AGMA Lubricant No.	Viscosity S.U.V. Secs. at 100° F.	AGMA Lubricant No.	Viscosity S.U.V. Secs. at 100° F.
S63B, S84B, D100B, D120B, D6, D10, D16, D25	2	280–360	3	490–700
S105B, S126B, S147B, S168B, S189B, S2010B, S57, S114	2	280–360	4	700–1000
S2211B, S2411B, S2712B, S3014B, S3318B, S3824B, D145B, D170B, D195B, D220B, D250B, D290B, D340B, D390B, D440B, D500B, T145B, T170B, T195B, T220B, T250B, T290B, T340B, S160, S228, S320, S456, D57, D80, D114, D160, D228, D320, D456, D640, D912, D1280, D1824	3	490–700	4	700–1000
T390B, T440B	4	700–1000	5	1000–1500
All M Units	2	280–360	3	490–700
All N and NM Units	1	180–240	2	280–360

AGMA STANDARD KEYWAYS

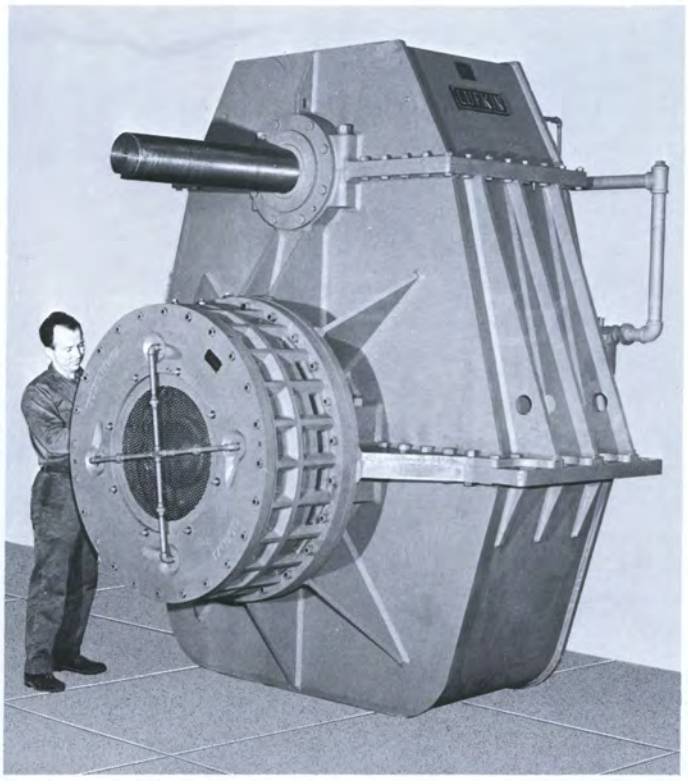
Diameter of Shafts, Inclusive	RECOMMENDED STANDARD KEYWAYS Width	Depth	Key Stock
5/16 to 7/16"	3/32	3/64	3/32 x 3/32
1/2 to 9/16"	1/8	1/16	1/8 x 1/8
5/8 to 7/8"	3/16	3/32	3/16 x 3/16
15/16 to 1 1/4"	1/4	1/8	1/4 x 1/4
1 5/16 to 1 3/8"	5/16	5/32	5/16 x 5/16
1 7/16 to 1 3/4"	3/8	3/16	3/8 x 3/8
1 13/16 to 2 1/4"	1/2	1/4	1/2 x 1/2
2 5/16 to 2 3/4"	5/8	5/16	5/8 x 5/8

Diameter of Shafts, Inclusive	RECOMMENDED STANDARD KEYWAYS Width	Depth	Key Stock
2 13/16 to 3 1/4"	3/4	3/8	3/4 x 3/4
3 5/16 to 3 3/4"	7/8	7/16	7/8 x 7/8
3 13/16 to 4 1/2"	1	1/2	1 x 1
4 9/16 to 5 1/2"	1 1/4	7/16	1 1/4 x 7/8
5 9/16 to 6 1/2"	1 1/2	1/2	1 1/2 x 1
6 9/16 to 7 1/2"	1 3/4	5/8	1 3/4 x 1 1/4
7 9/16 to 8 15/16"	2	3/4	2 x 1 1/2

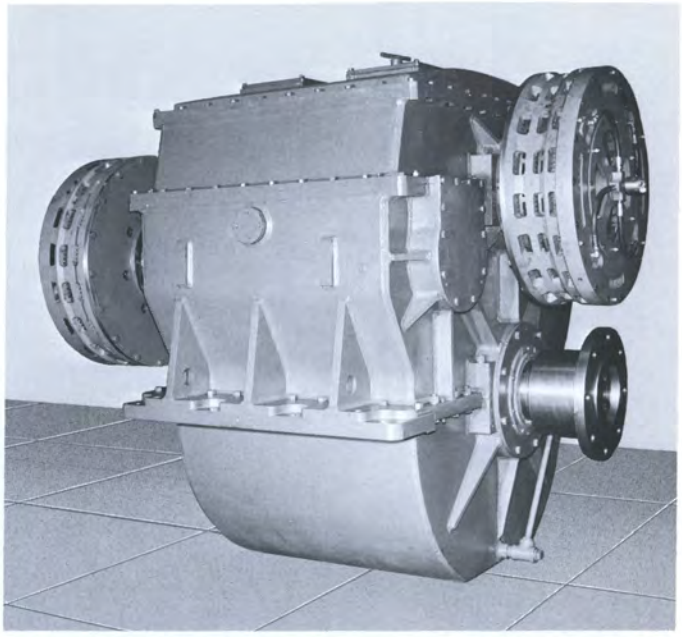
Lufkin Commercial Gear Reducers and Increasers are furnished with the above standard keyways in the low speed and high speed shafts. The depth of the keyway in the coupling, pulley or sprocket is the same as the depth of the keyway in the shaft; that is, the depth is one-half of the key height measured from the edge of the keyway.

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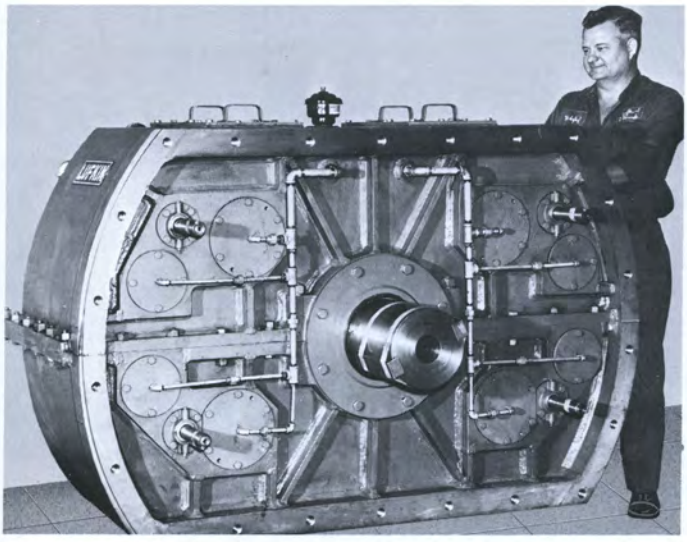
SPECIAL LUFKIN GEAR UNITS



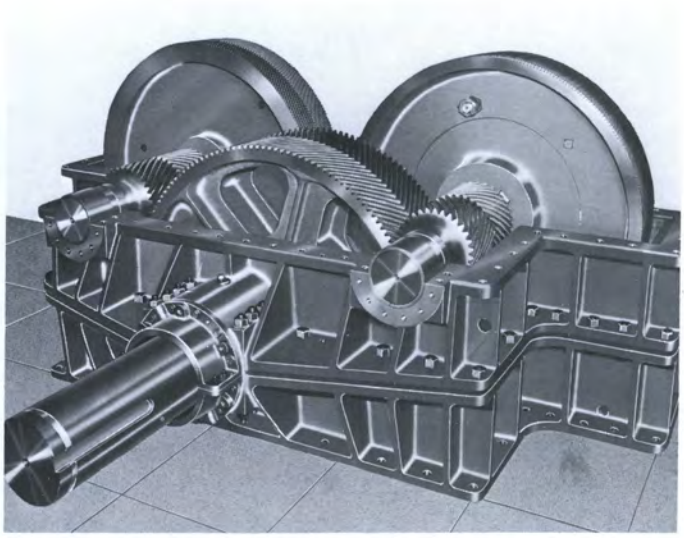
Lufkin Model V4800 Marine Propulsion Gear Reducer with tail shaft brake.



Lufkin Model RS3600 Forward and Reverse Reduction Marine Gear Reducer with air clutches for Tow Boat Propulsion.



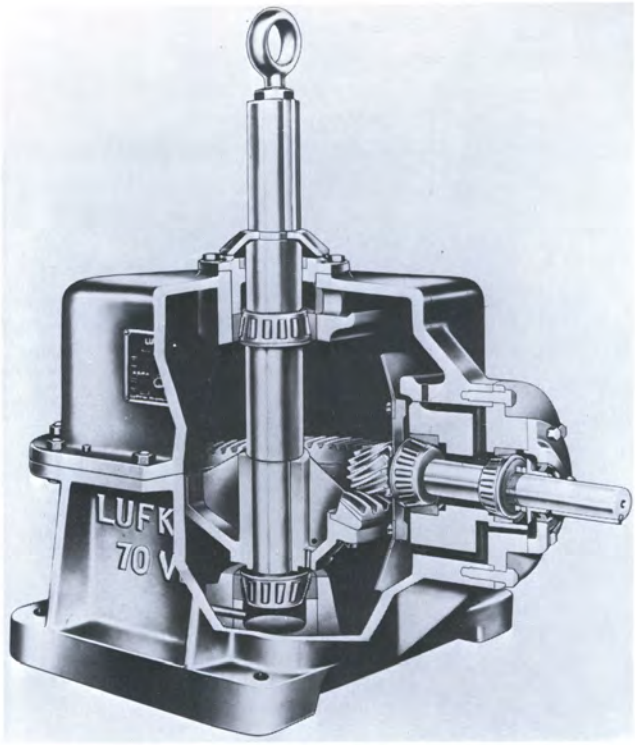
Special Triple Reduction Reducer with four input pinion shafts for driving rock boring machine.



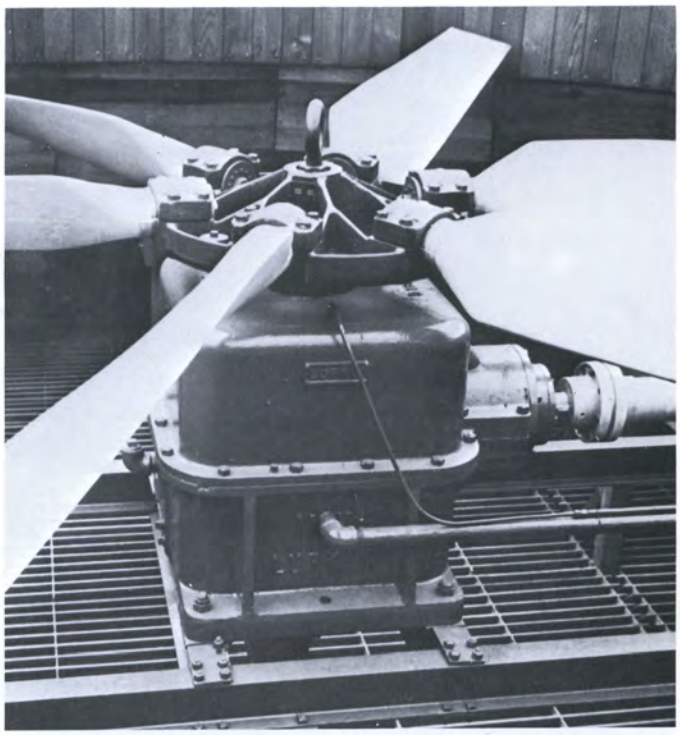
One of eight identical Lufkin Model DC3620 Double Reduction Compound Reducers for driving cutter head in dredging service for a Gulf Coast Dredging Company.

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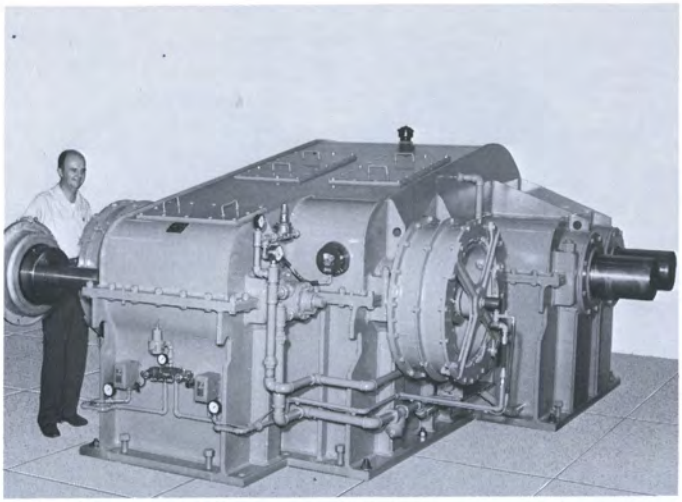
SPECIAL LUFKIN GEAR UNITS



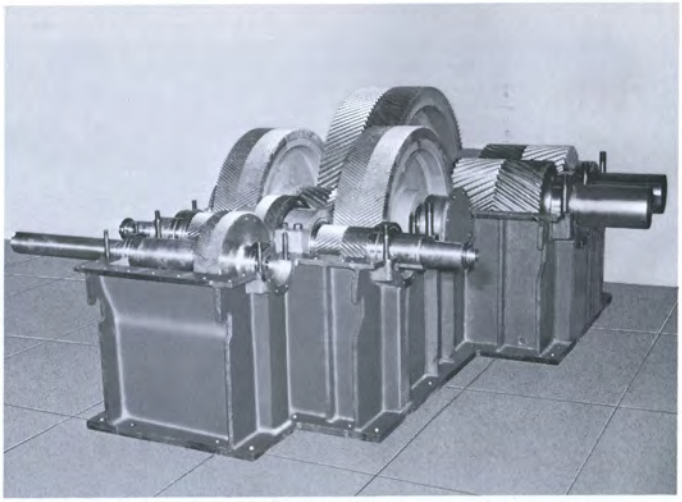
Cut away showing construction of Lufkin Type VB Spiral Bevel Gear Reducer for Cooling Tower Fan Service.



Lufkin Model 115VB Reducer driving 20 foot diameter fan in a large cooling tower.



Lufkin Model D860S two speed Reducer with air clutches for driving mixer in rubber mill.

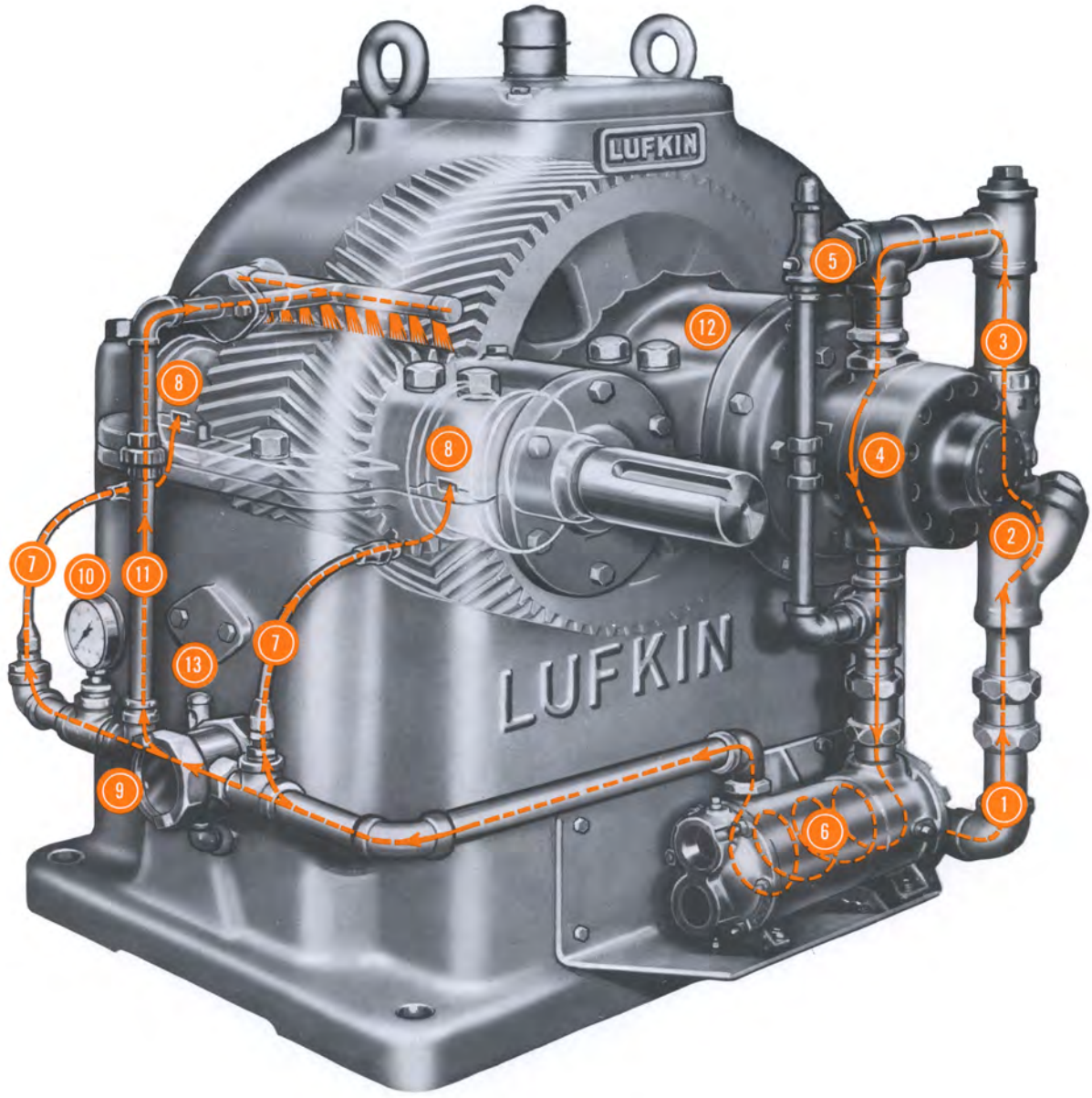


Lufkin Model D860S Two Speed Reducer with cover removed showing gear arrangement.

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TYPE N AND NM SPEED INCREASERS

Lubrication System



Oil is stored in the bottom of the housing below the sweep of the gear. The oil leaves the storage by Pipe 1 through Strainer 2 and past Check Valve 3 into the positive displacement Pump 4 which is driven by the slow speed shaft. A Pressure Relief Valve is at 5. Oil passes around the tubes in Cooler 6 while cooling water is circulated through the tubes. Oil under pressure passes through Pipes 7 into babbitt-type high speed Bearings 8. A visual Oil Flow Gage is at 9 and Pressure Gage at 10. Through Pipe 11 oil flows to a Spray Pipe and lubricates and cools the gear teeth. The slow speed self-aligning Roller Bearing 12 on the Type NM unit is lubricated by an oil trough which catches oil from the spray. Type N units with babbitted slow speed bearings are equipped with lines similar to 7 which deliver oil under pressure to bearing 12. The oil level in the storage sump is determined by the protected glass gage 13.

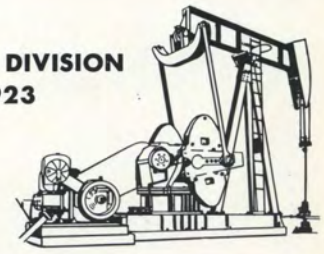
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LUFKIN MILESTONES OF GROWTH

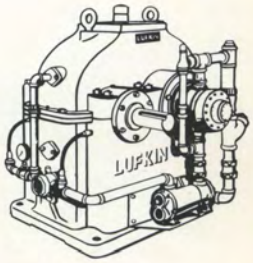
Lufkin Foundry & Machine Company founded 1902 as a repair shop for sawmill and railroad machinery . . . guided by progressive leadership . . . gifted with technical ability . . . located strategically in the growing Southwest . . . of humble origin . . . this company has grown proudly in scope and stature with the advent of each new manufacturing division.

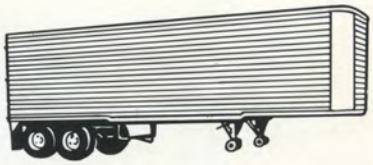


OILFIELD DIVISION
1923



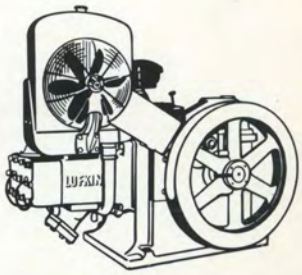
GEAR DIVISION
1939





TRAILER DIVISION
1939

ENGINE
DIVISION
1940



LUFKIN

FOUNDRY & MACHINE COMPANY
LUFKIN, TEXAS