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LUFKIN GEARS

HERRINGBONE GEAR SPEED REDUCERS AND INCREASERS



GEAR CATALOG G-20

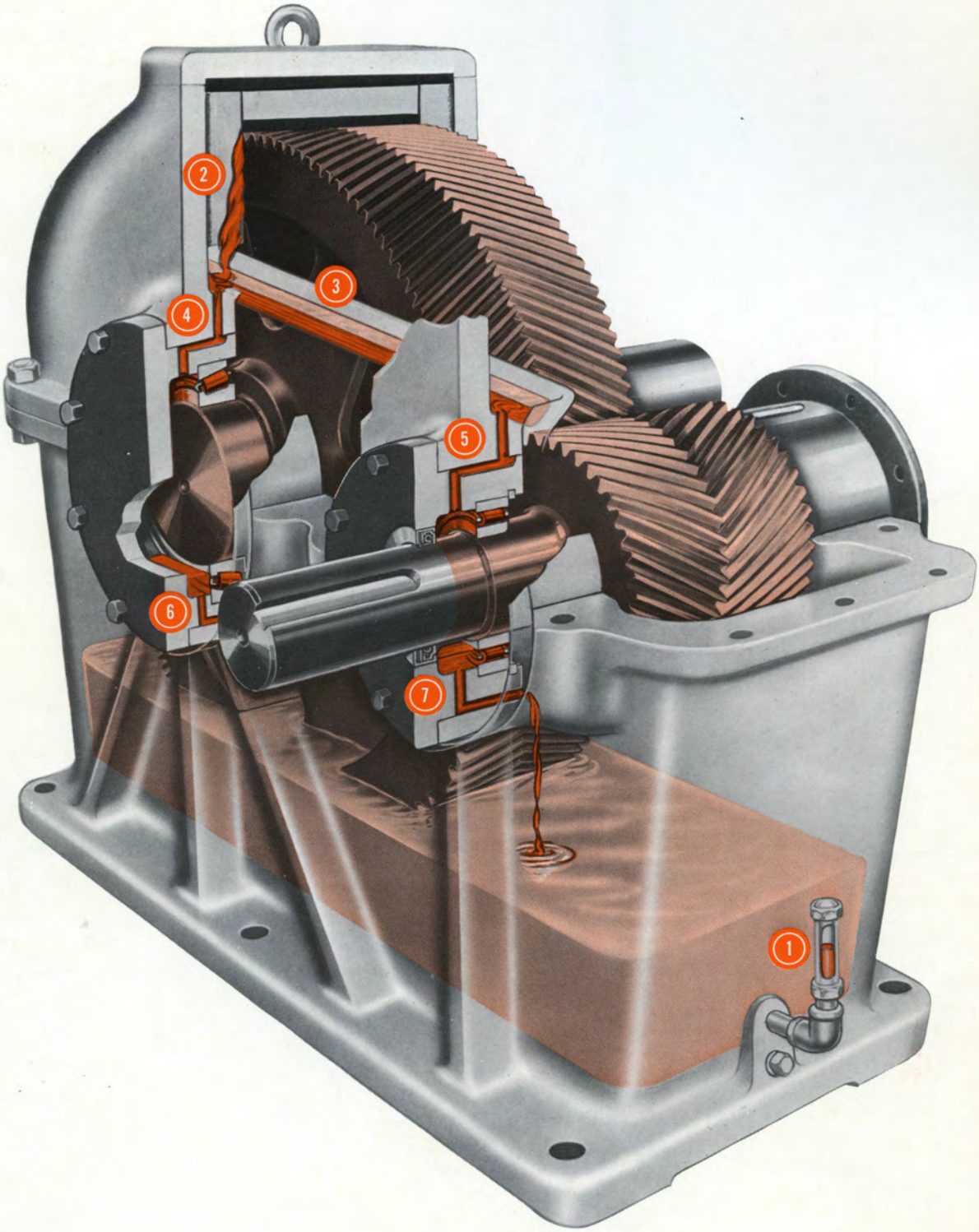
MEMBER OF AGMA

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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2C61

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
Pages 4-9, 21-22

IV. MEDIUM-SPEED SINGLE REDUCTION REDUCERS AND INCREASERS, TYPE M
Ratios 2:1 to 10:1
Pages 4-9, 23-28

V. HIGH SPEED REDUCERS AND SPEED INCREASERS, TYPE N AND NM
Ratios 2:1 to 12:1
Pages 29-36

VI. HI-Q SINGLE AND DOUBLE REDUCTION REDUCERS
Pages 37-41

VII. SPECIAL LUFKIN UNITS
Pages 43-44

LUFKIN FOUNDRY & MACHINE CO.

Factory and Executive Offices

LUFKIN, TEXAS

Branch Offices

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Phone: 45-4822

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Phone: 237-2670

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Suburban-West Bldg.
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Phone: EDison 1-5722

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DALLAS 1, TEXAS
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Phone: RIverside 8-5127

DENVER 2, COLORADO
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Phone: GLadstone 3-5622

HOBBS, NEW MEXICO
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P. O. Box 104
Phone: EXpress 3-5211

HOUSTON 2, TEXAS
1408 C. & I. Life Bldg.
Phone: CApitol 2-0108

KILGORE, TEXAS
P. O. Box 871
Phone: 3875

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MEXICO 4, D. F., MEXICO
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Villarta #1-909-B

MIDLAND, TEXAS
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NATCHEZ, MISSISSIPPI
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Empire State Bldg.
Room 2712
Phone: OXford 5-0460

ODESSA, TEXAS
1020 West Second Street
P. O. Box 1632
Phone: FEderal 7-8649

OKLAHOMA CITY, OKLAHOMA
1317 West Reno
P. O. Box 2337
Phone: CEntral 6-4521

PAMPA, TEXAS
P. O. Box 2212
Phone: MOhawk 5-4120

SHREVEPORT, LOUISIANA
Minden Road,
Highway 80 East
P. O. Box 5578
Phone: 425-3451

SIDNEY, MONTANA
Highway 16
P. O. Box 551
Phone: 861

TULSA, OKLAHOMA
1515 Thompson Bldg.
Phone: LUther 7-7171

WICHITA FALLS, TEXAS
727 Oil & Gas Bldg.
P. O. Box 2465
Phone: 322-1967

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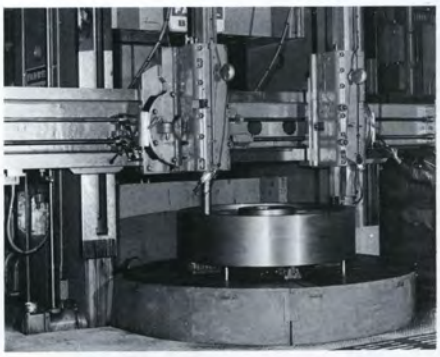
PLANT FACILITIES

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 60 acres. 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 80,000 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.

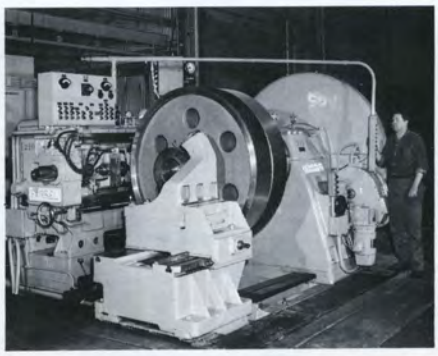
MACHINE SHOP



The main bay of the machine shop is 780 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 which include the capacity to cut a 120 inch pitch diameter, 24 inch face gear.



Vertical Boring Mill.
Capacity: 10 feet diameter.



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



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

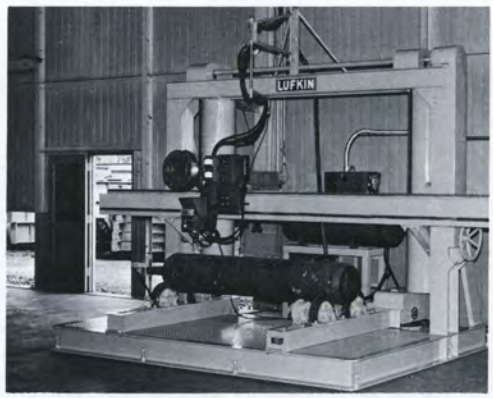
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STRUCTURAL SHOP



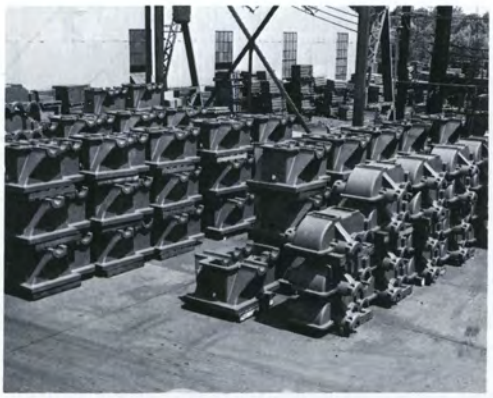
Inside View of Structural and Welding Shop.

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



Modern Automatic Welding Machine.

FOUNDRY



Reducer housing and cover castings on Foundry Yard.

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.



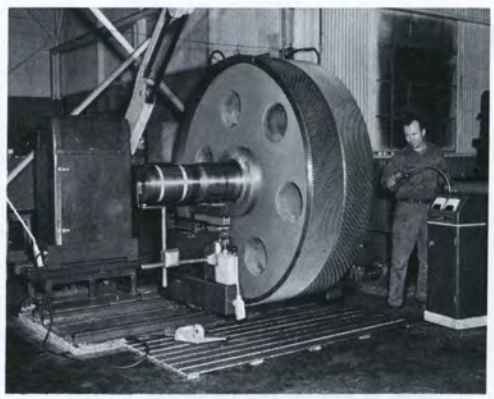
Large Moulding Machine.
Capacity: 12,000 Pounds.

GEAR FINISHING



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

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 and 25.

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 8-10 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 reducer. The Thermal Horsepower Ratings for Type M reducers are shown on page 26. 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 pages 18 and 19. This rating is constant for each size Double Reduction reducer. 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 25. 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 detemine 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 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 Thermal Horsepower Ratings for Type M reducers are on page 26. 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
= 2.0 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 × 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 409 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 291 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 465 horsepower at 1750 RPM and at 1150 RPM it has a rating of 327 horsepower:

$$\frac{1400-1150}{1750-1150} \times (465-327) + 327 = 384 \text{ HP}$$

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 169 and 222 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 6.8 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
	8 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
	8 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
	8 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

	STANDARD RATIOS															
High Speed Shaft R.P.M.	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	150	130	112	94	77	69	61	46	37	30	27	22	19	15.9	14.3	12.1
1150	101	88	76	62	54	47	41	31	25	21	18	14.5	12.3	10	9	8.4
870	83	71	61	50	41	38	32	26	20	17	14.5	12	10	7.8	7.3	6.4
720	69	60	53	42	35	31	27	21	16	13.5	11.8	9.5	8	7	6	5.2
580	56	50	44	36	29	26	22	18	13.7	11.4	9.5	8	6.8	5.8	5.3	4.2
High Speed Shaft Diameter	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1	1	⅞	⅞	⅞	⅞

Size No. S84B

	STANDARD RATIOS															
High Speed Shaft R.P.M.	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	251	251	244	208	171	157	136	103	80	67	58	49	41	36	31	27
1150	179	179	173	145	121	110	95	71	56	45	37	32	27	23	21	19
870	135	135	135	114	93	85	72	56	44	37	29	27	22	19	17	14.5
720	112	112	112	96	79	70	61	47	36	30	25	21	18	16	14.5	12
580	90	90	90	80	67	59	51	39	29	25	20	18	16	13.5	11	10
High Speed Shaft Diameter	1¾	1¾	1¾	1¾	1¾	1¾	1¾	1¾	1¾	1¾	1½	1½	1½	1¼	1	1

Size No. S105B

	STANDARD RATIOS															
High Speed Shaft R.P.M.	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	380	316	291	253	196	151	125	110	92	82	68	63	49
1150	260	260	260	260	222	196	174	133	101	85	73	61	56	47	42	37
870	200	200	200	200	176	157	139	106	83	69	59	50	45	37	34	27
720	166	166	166	166	150	134	117	89	69	57	49	41	37	31	28	22
580	134	134	134	134	124	112	98	74	57	48	41	35	31	26	23	18
High Speed Shaft Diameter	2	2	2	2	2	2	2	2	2	2	2	1¾	1½	1½	1½	1½

Size No. S126B

	STANDARD RATIOS															
High Speed Shaft R.P.M.	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	...	...	740	620	515	465	405	318	250	215	179	151	134	115	98	82
1150	575	575	526	442	358	327	288	224	174	151	123	104	93	77	65	56
870	435	435	411	346	289	260	231	179	135	116	97	80	73	61	52	43
720	360	360	350	296	244	222	193	150	114	98	83	69	61	52	43	37
580	290	290	290	252	205	187	165	123	95	83	68	58	51	45	37	30
High Speed Shaft Diameter	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2	2	1¾	1¾	1½

Size No. S147B

	STANDARD RATIOS															
High Speed Shaft R.P.M.	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	...	...	...	935	784	696	620	475	375	318	278	235	205	176	151	129
1150	890	890	785	650	549	498	425	330	258	215	181	148	134	117	101	88
870	675	675	630	524	431	386	338	266	207	170	145	121	106	95	83	69
720	555	555	537	448	364	330	292	225	176	145	123	105	94	80	70	58
580	450	450	448	375	308	281	246	188	147	121	104	88	77	66	56	48
High Speed Shaft Diameter	3	3	3	3	3	3	3	3	3	3	3	2⅝	2½	2	2	2

Size No. S168B

	STANDARD RATIOS															
High Speed Shaft R.P.M.	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	...	....	....	...	1083	968	850	660	531	448	392	324	289	252	217	186
1150	...	1100	1085	926	761	688	606	468	367	313	271	229	196	168	132	106
870	860	860	860	743	604	547	487	373	296	248	212	179	157	136	115	101
720	710	710	710	632	515	468	408	320	266	208	180	151	132	114	97	84
580	570	570	570	537	438	409	348	266	208	175	148	124	107	94	80	70
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															
High Speed Shaft 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	.....	.....	.....	.....	.....	1187	915	731	605	538	454	403	336	289	263	241
1150	.....	1500	1254	1030	938	823	633	493	409	370	312	278	233	193	179	157
870	1312	1238	1036	829	741	665	515	404	335	300	250	221	187	160	145	133
720	1087	1052	885	705	636	564	433	345	282	252	208	182	153	135	125	111
580	875	901	745	597	540	478	375	292	241	212	177	153	129	112	104	93
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														
High Speed Shaft 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	.....	.....	.....	.....	.....	.....	1197	940	797	695	594	528	447	384	328	.....
1150	.....	.....	1590	1340	1220	1064	823	652	547	476	414	368	297	247	190	.....
870	1320	1320	1320	1087	985	864	667	527	441	390	321	294	237	207	179	.....
720	1090	1090	1090	940	845	734	565	448	375	329	280	246	200	170	145	.....
580	880	880	880	810	729	624	483	379	319	278	232	206	168	145	125	.....
High Speed Shaft Diameter	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¼	2⅝	2⅝	.....

Size No. S2211B

	STANDARD RATIOS														
High Speed Shaft 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	7.8	8.43	9.27	10.0	.....
1150	.....	.....	.....	1773	1598	1366	1041	812	700	603	520	422	394	338	297	.....
870	.....	2015	1710	1400	1277	1091	840	661	560	485	419	359	319	269	235	.....
720	1880	1712	1455	1181	1080	930	710	560	474	409	356	305	268	227	196	.....
580	1520	1466	1231	1022	935	795	609	478	405	348	303	254	224	190	162	.....
High Speed Shaft Diameter	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	3¾	3¾	3¾	3¾	.....

Size No. S2411B

	STANDARD RATIOS															
High Speed Shaft 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	.....	.....	.....	2060	1850	1630	1232	975	818	717	616	549	459	403	347	291
870	.....	2100	1960	1612	1472	1303	984	787	660	565	486	426	358	314	280	241
720	1880	1880	1680	1379	1255	1107	840	666	556	482	412	364	302	269	235	202
580	1520	1520	1445	1182	1097	937	712	562	474	410	347	302	246	219	190	168
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															
High Speed Shaft 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	.....	.....	.....	.....	.....	2105	1600	1265	1064	952	795	711	594	526	442	370
870	.....	.....	3120	2145	1931	1720	1308	1110	824	765	640	580	479	427	358	302
720	.....	2580	2250	1850	1650	1466	1107	863	711	638	538	482	403	347	297	258
580	2080	2080	1900	1557	1410	1238	948	745	605	551	459	408	336	291	246	213
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															
High Speed Shaft 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	.....	.....	.....	.....	.....	2160	1740	1440	1254	1066	955	827	703	582	.....	.....
870	.....	.....	2890	2695	2300	1778	1412	1172	1016	860	770	668	568	470	.....	.....
720	2585	2585	2480	2240	1968	1505	1182	1005	865	740	652	563	483	362	.....	.....
580	2080	2080	2080	1887	1666	1270	1018	837	719	609	555	475	401	330	.....	.....
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

High Speed Shaft 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	.....	.....	.....	.....	.....	2935	2320	1980	1744	1450	1290	1105	956
870	.....	.....	.....	3535	3110	2390	1836	1600	1415	1177	1040	891	770
720	.....	3430	3300	3030	2660	2065	1610	1370	1200	1000	880	755	648
580	2800	2800	2800	2560	2245	1740	1368	1143	1007	832	742	642	547
High Speed Shaft Diameter	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½

Size No. S3824B

High Speed Shaft 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	.....	.....	.....	.....	.....	.....	5290	4570	4020	3330	2950	2510	.....
870	.....	.....	.....	.....	6860	5570	4285	3750	3290	2700	2380	2025	.....
720	.....	.....	5680	5680	5680	4790	3680	3170	2770	2315	2025	1720	.....
580	.....	4575	4575	4575	4575	4080	3115	2725	2355	1930	1708	1435	.....
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.

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	1500	1650	1800	1950	2100	2250	2400	2550	2750
S84B	2000	2450	2650	2975	3200	3400	3550	3800	3950
S105B	2170	2640	3000	3450	3800	4100	4300	4600	4800
S126B	2980	3750	4425	4900	5300	5750	6100	6400	6750
S147B	3550	4320	5015	5710	6155	6700	7100	7500	7850
S168B	6800	7500	7900	8350	9100	9800	10,500	11,450	13,000
S189B	8300	9160	9750	10,000	11,000	12,000	13,000	14,000	15,000
S2010B	8950	10,300	11,950	13,600	14,850	15,950	16,900	17,800	18,600
S2211B	9000	10,500	12,000	13,750	15,000	16,000	17,000	17,900	18,750
S2411B	8900	10,250	11,900	13,500	14,750	15,900	16,800	17,750	18,500
S2712B	9450	10,800	12,275	13,750	14,950	16,150	17,000	18,000	18,850
S3014B	12,300	13,400	14,900	16,400	18,000	19,600	21,000	22,500	26,200
S3318B	13,500	14,800	16,600	18,400	20,300	22,250	23,800	25,400	.....
S3824B	26,000	28,000	30,500	33,250	36,750	40,250	43,500	47,000	.....

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THERMAL HORSEPOWER RATINGS

TYPE S

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 shown on pages 10, 11 and 12.

Size Gear Unit	High Speed Shaft RPM	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	8.45	9.29	10.29
S63B	1750	60	62	64	65	66	67	...	...	...	...	...	...	...	...	...	...
	1150	76	77	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	870	82	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	720	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	580	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
S84B	1750	86	88	91	92	93	94	...	...	...	...	...	...	...	...	...	...
	1150	111	114	116	117	118	...	...	...	...	...	...	...	...	...	...	...
	870	122	123	126	...	...	...	...	...	...	...	...	...	...	...	...	...
	720	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	580	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
S105B	1750	115	118	123	125	127	128	133	145	...	...	...	...	...	...	...	...
	1150	153	156	159	160	162	163	171	...	...	...	...	...	...	...	...	...
	870	169	172	174	178	...	...	...	...	...	...	...	...	...	...	...	...
	720	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	580	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
S126B	1750	...	...	161	164	167	169	177	194	204	212	...	...	...	...	...	...
	1150	208	212	216	218	220	222	230	...	...	...	...	...	...	...	...	...
	870	231	234	238	243	245	248	...	...	...	...	...	...	...	...	...	...
	720	242	244	248	254	...	...	...	...	...	...	...	...	...	...	...	...
	580	248	249	250	...	...	...	...	...	...	...	...	...	...	...	...	...
S147B	1750	...	...	...	199	202	206	217	238	252	259	270	...	...	...	...	...
	1150	263	268	274	276	279	281	292	310	...	...	...	...	...	...	...	...
	870	295	298	304	309	312	315	320	...	...	...	...	...	...	...	...	...
	720	310	312	319	325	328	...	...	...	...	...	...	...	...	...	...	...
	580	319	324	330	336	...	...	...	...	...	...	...	...	...	...	...	...
S168B	1750	...	...	...	...	225	227	242	268	284	295	303	307	...	...	...	...
	1150	...	305	310	316	320	322	328	354	...	...	...	...	...	...	...	...
	870	342	345	351	355	358	362	368	...	...	...	...	...	...	...	...	...
	720	358	362	369	373	376	380	387	...	...	...	...	...	...	...	...	...
	580	367	372	380	387	390	394	...	...	...	...	...	...	...	...	...	...
S189B	1750	...	...	...	...	...	...	268	302	322	339	346	352	356	...	...	...
	1150	...	...	364	370	374	377	384	419	432	...	...	...	...	...	...	...
	870	...	407	415	423	427	430	439	466	...	...	...	...	...	...	...	...
	720	...	429	437	445	448	450	458	...	...	...	...	...	...	...	...	...
	580	...	443	451	460	462	464	474	...	...	...	...	...	...	...	...	...
S2010B	1750	...	...	...	...	...	...	...	328	354	370	381	388	392	...	...	...
	1150	...	...	...	418	422	426	434	476	492	511	...	...	...	...	...	...
	870	...	461	470	479	483	488	497	533	...	...	...	...	...	...	...	...
	720	...	492	501	510	513	520	530	...	...	...	...	...	...	...	...	...
	580	...	509	519	529	531	534	544	...	...	...	...	...	...	...	...	...
S2211B	1150	...	...	...	...	449	453	461	511	531	548	565	...	...	...	...	...
	870	...	...	509	519	524	529	538	577	591	...	...	...	...	...	...	...
	720	...	538	548	559	561	564	575	611	...	...	...	...	...	...	...	...
	580	...	556	567	578	581	584	600	...	...	...	...	...	...	...	...	...
S2411B	1150	...	...	...	...	455	459	475	520	536	557	569	574	...	...	...	...
	870	...	...	518	527	533	538	552	591	612	626	...	...	...	...	...	...
	720	...	550	561	572	577	583	594	630	647	...	...	...	...	...	...	...
	580	...	580	590	602	605	607	619	653	...	...	...	...	...	...	...	...
S2712B	1150	...	...	...	...	...	...	553	600	627	655	665	675	680	...	...	...
	870	...	...	...	630	635	640	653	705	728	810	...	...	...	...	...	...
	720	...	...	670	676	683	689	708	753	778	...	...	...	...	...	...	...
	580	...	701	715	721	725	729	750	796	...	...	...	...	...	...	...	...
S3014B	1150	...	...	...	...	...	...	...	634	672	696	715	725	730	745	...	...
	870	...	...	...	...	687	694	705	775	800	832	845	...	...	...	...	...
	720	...	...	739	745	752	760	780	830	858	886	...	...	...	...	...	...
	580	...	...	795	802	810	817	832	885	908	...	...	...	...	...	...	...
S3318B	1150	...	...	...	...	...	...	...	696	736	771	796	806	821	845	865	...
	870	...	...	...	...	...	796	825	889	925	960	988	995	1002	...	...	...
	720	...	...	...	876	885	893	909	981	1014	1055	1062	.	...	...	...	...
	580	...	...	939	947	956	965	992	1055	1081	1117	...	...	...	...	...	...
S3824B	1150	...	...	...	...	...	...	...	...	747	786	816	833	846	876	...	...
	870	...	...	...	...	...	...	946	1030	1085	1132	1163	1179	1194	1225	...	...
	720	...	...	...	...	1057	1066	1104	1190	1238	1285	1314	1333	1342	1370	...	...
	580	...	...	...	1190	1200	1212	1257	1334	1379	1422	1456	1468	1480	...	...	...

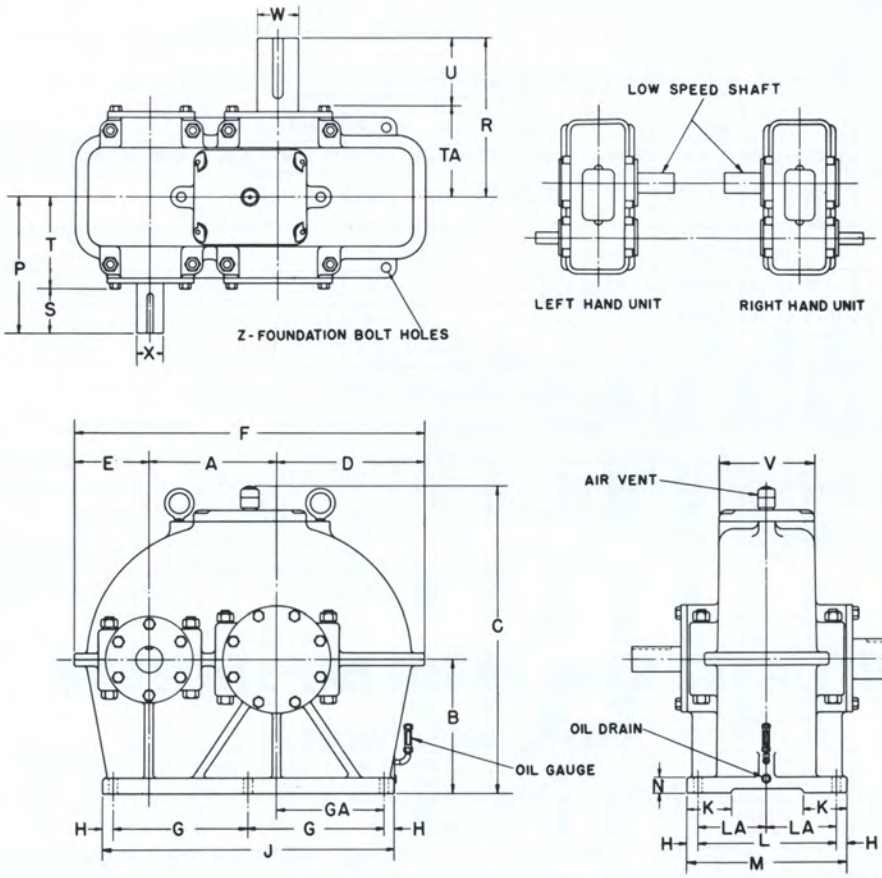
NOTE: Where Thermal Horsepower Ratings are not shown at the right hand side of the above tables, the Thermal Horsepower Rating is higher than the Mechanical Rating of the Reducer shown on pages 10, 11 and 12 for that ratio and speed.

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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.

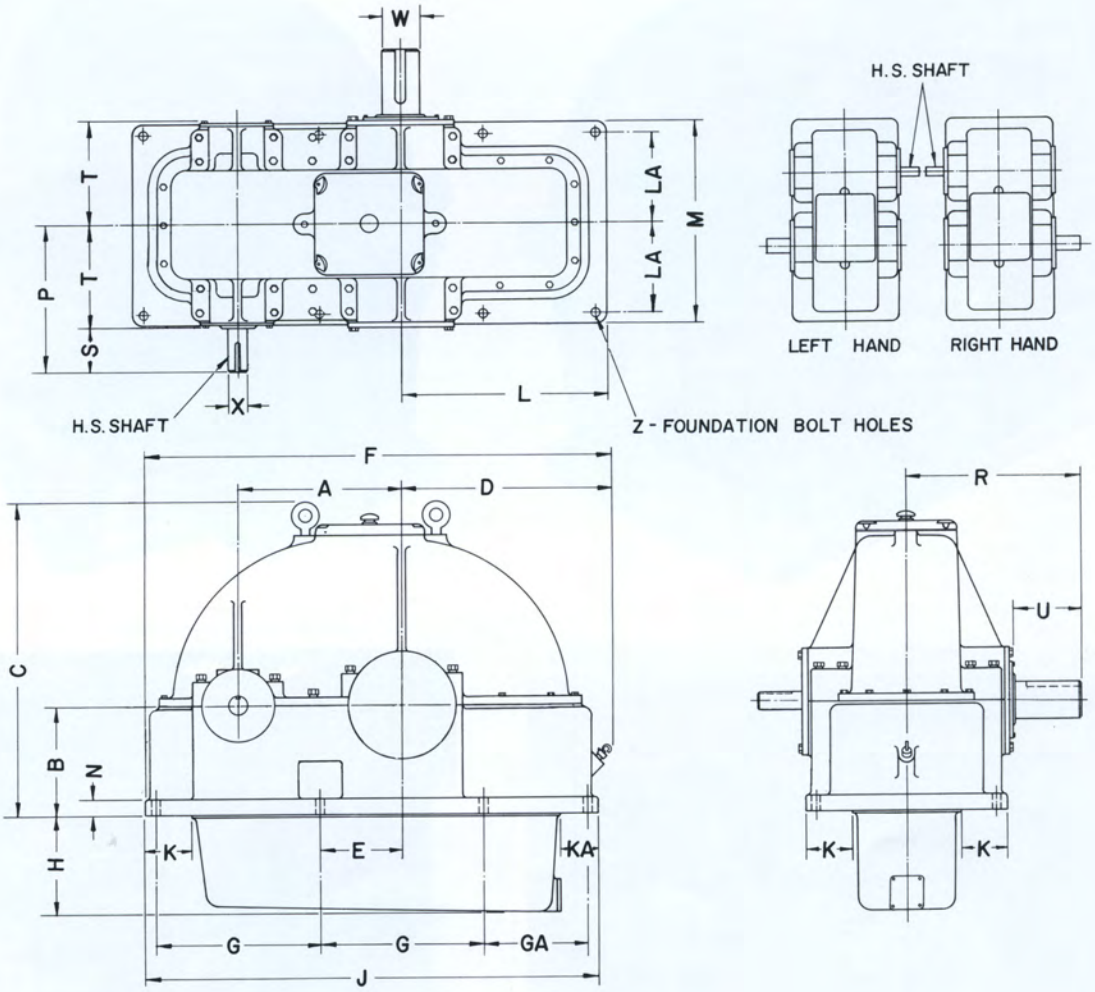
Above dimensions are not to be used for Installation.
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GENERAL DIMENSIONS

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.

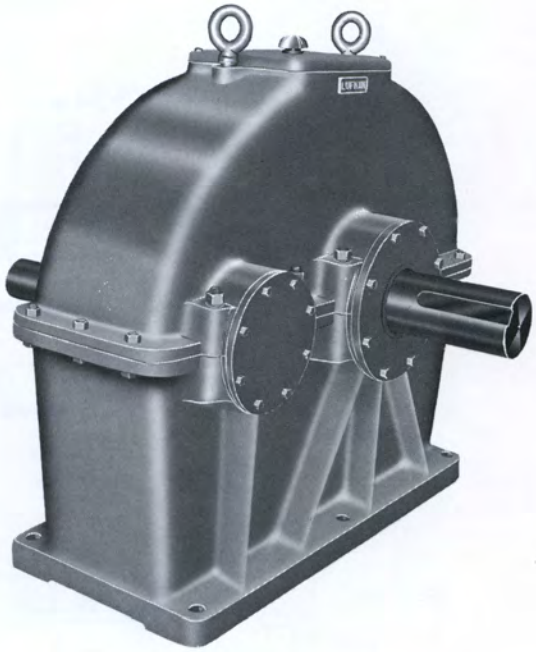
Above dimensions are not to be used for installation.
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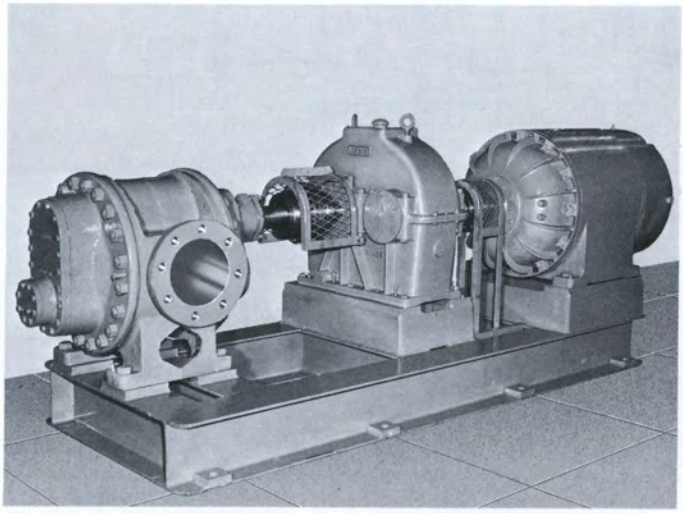
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Type S

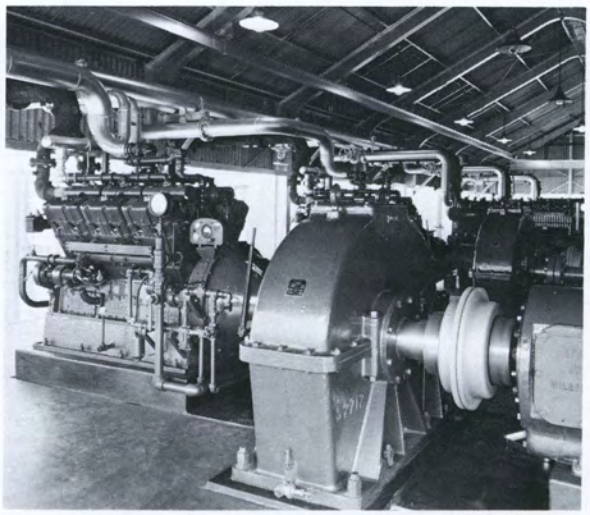
SINGLE REDUCTION HERRINGBONE GEAR REDUCERS







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

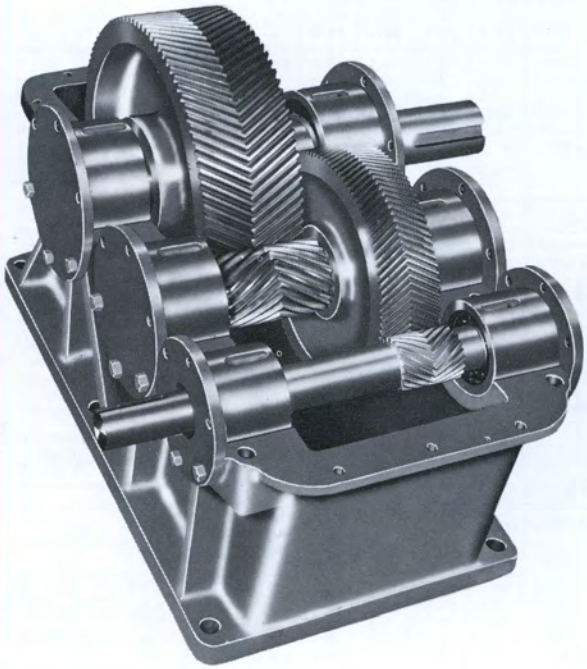


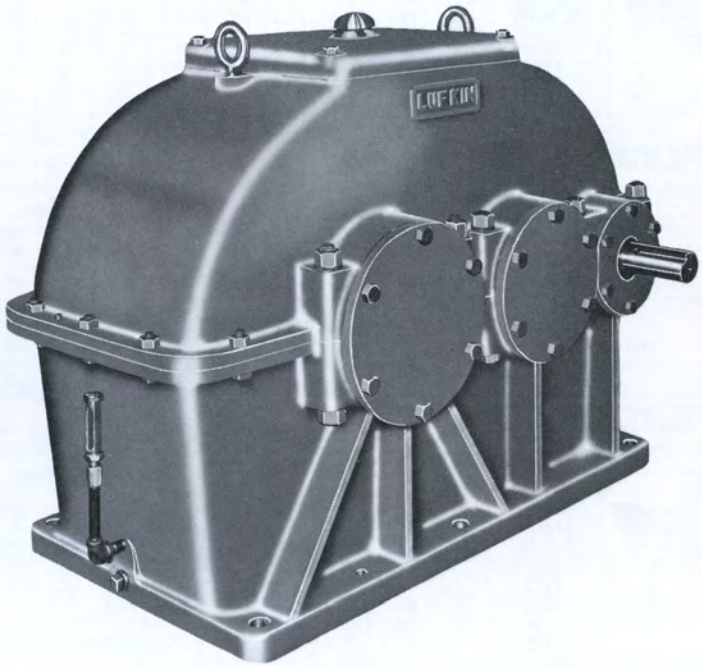
Two of Eight Identical Lufkin S2712B Reducers in water flood service driven by multi-cylinder engines at 900 RPM driving reciprocating pumps at 185 RPM, delivering 515 horsepower.

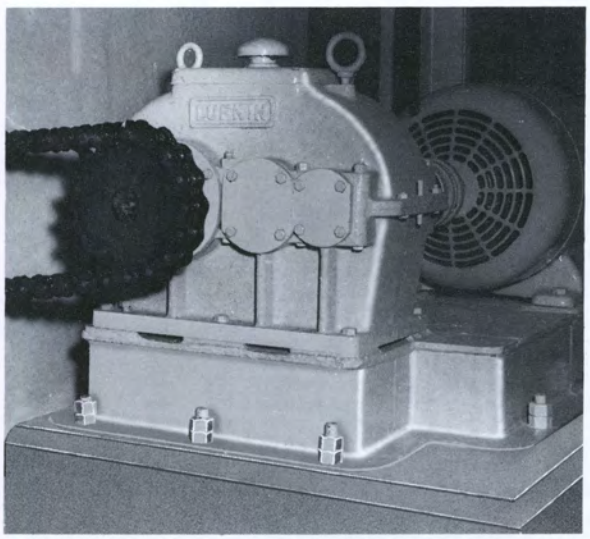
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Type D

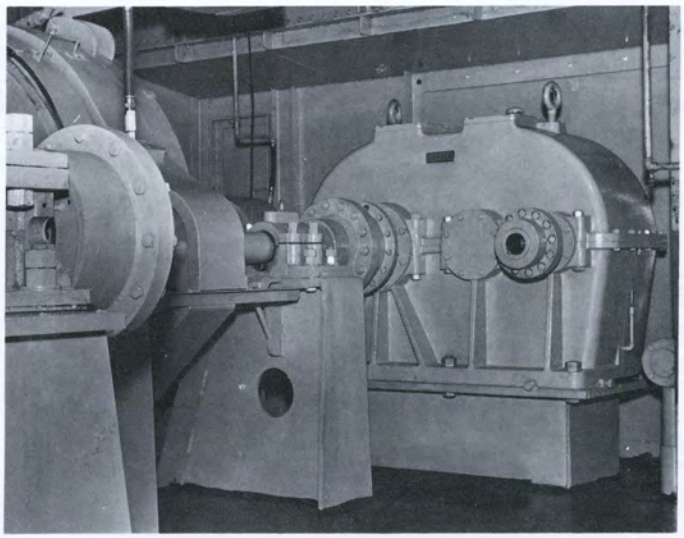
DOUBLE REDUCTION HERRINGBONE GEAR REDUCERS







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.

Reducer No. D100B

Thermal Rating H.P.	Motor R.P.M.	STANDARD RATIO																			
		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	....	....	....	....	....
30	1750	20.0	19.1	18.0	17.1	14.9	14.1	12.9	12.1	11.2	9.7	8.2	7.0	6.1	5.5	5.0	....	....	....	....	....
	1150	14.1	13.0	12.4	11.8	10.6	9.7	8.8	8.4	7.5	6.5	5.7	4.7	4.4	3.6	3.3	....	....	....	....	....
	870	10.8	10.2	9.7	9.1	8.1	7.5	6.9	6.4	5.9	5.0	4.4	3.6	3.3	2.8	2.5	....	....	....	....	....
	720	9.1	8.5	8.0	7.5	6.8	6.3	5.8	5.3	5.0	4.2	3.6	3.0	2.7	2.3	2.1	....	....	....	....	....
	580	7.6	7.3	6.8	6.4	5.7	5.2	4.7	4.4	4.0	3.4	2.9	2.5	2.2	1.9	1.7	....	....	....	....	....
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	....	....	....	....	....

Reducer No. D120B

Thermal Rating H.P.	Motor R.P.M.	STANDARD RATIO																			
		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	....	....	....
40	1750	37.0	34.7	32.4	29.9	27.4	24.8	22.6	19.4	17.6	14.9	12.6	10.2	9.7	8.7	8.5	7.5	6.2	....	....	....
	1150	26.0	24.3	22.5	20.4	18.8	15.9	14.6	12.0	11.3	9.7	8.2	6.8	6.7	6.1	5.8	5.1	4.2	....	....	....
	870	20.2	18.8	17.5	16.0	14.6	12.7	11.6	9.9	9.0	7.5	6.4	5.6	5.1	4.6	4.4	3.9	3.3	....	....	....
	720	17.0	15.8	14.6	13.4	12.1	10.8	9.8	8.5	7.8	6.3	5.2	4.6	4.1	3.7	3.6	3.3	2.8	....	....	....
	580	14.1	13.1	12.1	11.3	9.7	8.5	8.0	6.8	6.3	5.1	4.5	3.8	3.4	3.2	3.0	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	....	....	....

Reducer No. D145B

Thermal Rating H.P.	Motor R.P.M.	STANDARD RATIO																			
		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	....	....
60	1750	60	54	52	48.6	45.8	40.1	37.2	32.8	28.5	26.1	23.8	20.4	17.0	15.5	14.1	13.0	11.5	10.1	....	....
	1150	41.9	38.1	36.3	34.0	31.9	27.6	25.4	21.8	18.7	17.7	16.0	13.6	11.8	10.2	9.6	9.0	7.9	6.9	....	....
	870	33.0	30.1	28.2	26.3	24.9	21.6	19.5	16.9	14.4	13.7	12.5	10.7	9.1	8.1	7.4	6.5	5.9	5.3	....	....
	720	27.4	25.2	23.7	22.4	20.9	18.0	16.7	14.2	12.1	11.4	10.4	9.6	7.5	6.7	6.1	5.6	5.0	4.4	....	....
	580	23.1	21.0	19.8	18.7	17.4	15.4	13.6	11.4	9.8	9.3	8.5	7.4	6.2	5.3	4.8	4.4	3.9	3.0	....	....
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	....	....

Reducer No. D170B

Thermal Rating H.P.	Motor R.P.M.	STANDARD RATIO																			
		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	....	....
75	1750	82	73	68	64	59	54	51	47.6	41.8	38.8	34.2	29.2	24.3	23.0	21.2	18.6	16.7	15.0	....	....
	1150	59	50	48.5	44.7	41.8	38.4	36.0	33.3	28.8	27.0	23.1	19.9	16.5	15.4	14.6	12.7	11.4	10.3	....	....
	870	45.4	39.7	37.4	34.8	32.5	30.0	27.9	25.8	22.6	20.6	17.7	15.4	12.9	11.9	10.9	9.7	8.6	8.4	....	....
	720	38.1	33.8	31.3	29.2	27.1	25.1	23.6	21.4	18.4	17.6	14.9	12.7	10.7	10.2	9.2	8.1	7.3	6.5	....	....
	580	32.2	27.9	26.2	24.5	22.6	21.0	19.5	17.5	15.0	14.3	12.1	10.4	8.7	8.1	7.5	6.5	5.9	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	....	....

Reducer No. D195B

Thermal Rating H.P.	Motor R.P.M.	STANDARD RATIO																			
		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	....	....
100	1750	122	113	103	92	86	80	75	69	62	54	49.2	41.9	35.7	32.2	30.4	26.2	22.6	21.4	....	....
	1150	84	78	71	65	61	57	52	48.6	43	36.5	33.8	28.8	24.6	22.2	20.6	18.1	15.0	14.3	....	....
	870	67	62	56	50	47.0	43.8	40.7	37.8	33.4	28.2	26.0	22.1	18.7	17.0	15.8	14.0	11.8	11.0	....	....
	720	56	52	47.8	42.5	39.4	36.7	34.2	31.6	27.9	23.9	21.6	18.6	15.8	14.1	13.1	11.6	10.1	9.2	....	....
	580	46.6	43.5	39.8	35.4	32.8	30.7	28.5	26.0	22.8	19.4	17.8	15.5	12.7	11.6	10.8	9.7	8.1	7.6	....	....
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	....	....

Reducer No. D220B

Thermal Rating H.P.	Motor R.P.M.	STANDARD RATIO																			
		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
130	1750	172	161	153	141	126	116	108	94	81	71	60	52	48	42	40	36	34	30	28	25
	1150	121	114	104	97	87	81	75	65	54	48	40	35	34	30	28	25	23	20	18	17
	870	93	87	81	75	68	63	59	50	42	36	31	28	26	23	22	19	18	17	14	13
	720	79	74	69	64	58	53	50	42	35	30	26	23	22	19	18	17	16	13	12	11
	580	65	62	57	53	48	45	41	35	29	25	22	19	18	16	14	13	12	11	9	8
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.

Reducer 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
150	1750	217	210	198	187	176	154	145	132	123	109	95	81	69	67	58	55	51	47	42	40
	1150	154	151	140	129	121	107	101	92	86	75	64	54	47	46	40	38	35	33	29	27
	870	121	114	107	101	95	82	78	72	68	58	50	44	36	35	30	29	27	25	23	21
	720	102	97	91	85	79	70	65	61	56	48	41	36	30	29	25	24	23	22	19	17
	580	85	81	76	72	67	59	55	51	47	40	34	29	25	24	22	21	19	18	16	15
High Speed Shaft Diameter		2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2¼	2¼	1¾	1¾	1¾	1¾	1¾	1¾	1½

Reducer 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
200	1750	353	320	300	277	250	226	211	182	170	153	131	115	98	90	81	74	68	64	61	57
	1150	238	228	214	198	179	159	146	129	118	104	90	79	67	59	54	52	46	44	41	39
	870	188	180	166	154	140	121	113	101	92	79	68	61	53	47	42	40	36	34	32	30
	720	159	152	141	131	118	104	95	85	79	68	61	53	45	40	35	34	30	29	27	25
	580	134	125	117	109	98	86	79	69	64	56	48	41	35	33	29	28	24	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

Reducer 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
275	1750	721	504	467	451	389	362	339	305	270	240	215	188	161	154	145	126	118	104	93	87
	1150	384	362	329	312	278	260	242	216	189	169	147	126	110	107	96	86	81	70	63	59
	870	304	282	256	244	219	200	188	166	153	127	114	99	85	81	73	67	63	54	48	46
	720	256	243	219	208	186	171	160	137	124	110	93	82	71	68	60	57	53	46	41	39
	580	216	203	185	175	153	143	134	114	102	91	79	69	58	56	50	46	44	38	34	32
High Speed Shaft Diameter		3	3	3	3	3	3	3	3	3	3	3	3	2⅝	2⅝	2⅝	2⅝	2½	2½	2½	2½

Reducer 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
350	1750	757	676	641	600	558	514	477	450	414	361	334	302	261	234	215	193	167	161	146	142
	1150	510	470	442	428	380	357	330	318	298	262	231	206	180	163	146	134	114	108	101	96
	870	398	373	350	333	298	282	269	250	233	203	180	158	140	125	115	103	91	86	79	74
	720	341	314	296	283	253	238	227	211	194	168	152	131	115	105	96	87	77	73	65	62
	580	289	265	249	234	213	200	188	175	160	137	125	110	96	86	80	71	63	58	53	51
High Speed Shaft Diameter		3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3	3	3	2⅝	2⅝	2⅝	2⅝	2⅝	2½

Reducer 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
400	1750	948	888	847	813	738	672	655	600	502	464	417	364	326	294	267	248	227	210	190	180
	1150	662	632	585	559	512	481	459	413	356	316	284	254	225	203	182	164	157	141	131	119
	870	515	500	460	437	406	377	360	323	273	250	223	193	171	154	141	130	118	110	104	98
	720	438	423	386	373	341	322	308	274	228	209	180	161	147	129	123	109	99	93	85	81
	580	373	361	330	316	288	271	260	231	189	172	157	135	118	108	97	88	82	76	69	67
High Speed Shaft Diameter		3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¼	3¼	3¼	3¼	3¼	3	3	3

Reducer 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
450	1750	....	1308	1220	1122	1050	975	906	863	777	696	620	566	500	439	372	344	321	297	275	248
	1150	1025	944	875	806	747	692	643	615	541	492	422	382	338	301	261	237	218	200	184	172
	870	819	753	702	643	600	554	514	480	398	371	328	297	266	229	198	184	172	156	145	134
	720	702	641	599	552	510	477	432	398	356	316	277	255	224	196	169	155	143	129	120	111
	580	585	539	507	468	430	398	369	339	301	260	230	219	181	160	135	124	119	107	98	91
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.

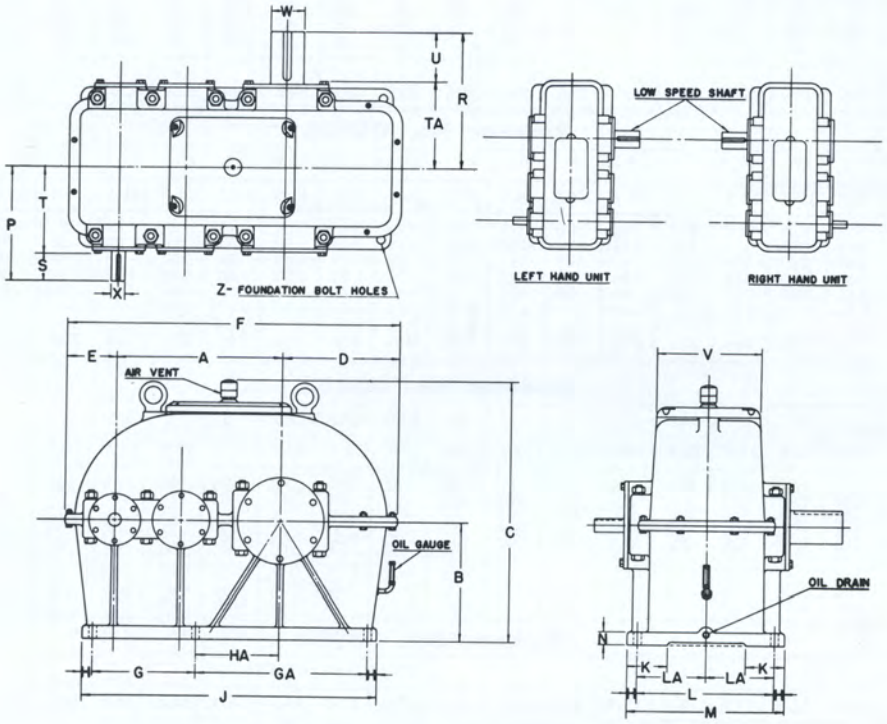
All units may be operated at speeds lower than the minimum shown. The selection of a reducer for a lower speed may be accomplished by multiplying the desired horsepower by 580 and dividing by the desired speed. The result will be the equivalent horsepower at 580 RPM which can be found in the above tables.

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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 7/16 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 7/16 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 7/16 x 9	6-1 5/16	4,000
D340 B	34	23	51 11/16	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 11/16	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 Overhung Load Capacities for Type D Reducers. It is assumed that the external load is acting one shaft diameter in from the end of the shaft.

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	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.

Reducer No. T145H

Motor R.P.M.	STANDARD RATIOS						
	86.5	105.9	129.7	158.9	194.6	238.4	291.9
1750	16.5	13.7	11	8.8	7.1	5.6	4.7
1150	11.3	8.8	7.4	6	4.7	3.9	3.2
870	8.5	7	5.7	4.6	3.5	3	2.4
720	7.1	5.8	4.6	3.7	3	2.4	2
580	5.8	4.6	3.8	3.1	2.4	2	1.6
High Speed Shaft Diameter	1	1	1	1	1	1	1

Reducer No. T170H

Motor R.P.M.	STANDARD RATIOS						
	86.5	105.9	129.7	158.9	194.6	238.4	291.9
1750	27.2	22.3	17.5	14.4	11.2	9	7.5
1150	18.5	14.7	11.9	9.6	7.6	6	5.1
870	14	11	9	7.3	5.7	4.6	3.8
720	12	9.4	7.5	5.9	4.8	3.8	3.1
580	9.4	7.5	6.1	4.9	3.9	3.1	2.6
High Speed Shaft Diameter	1¼	1¼	1¼	1¼	1¼	1¼	1¼

Reducer No. T195H

Motor R.P.M.	STANDARD RATIOS						
	86.5	105.9	129.7	158.9	194.6	238.4	291.9
1750	39.6	31.5	24.9	20.7	16.5	12.9	11
1150	26	20.4	16.7	13.1	11.1	9	7.2
870	20	16.1	12.8	10.7	8.5	6.9	5.5
720	16.7	13	10.7	8.5	7	5.6	4.6
580	13.7	11	8.5	7	5.8	4.5	3.8
High Speed Shaft Diameter	1½	1½	1½	1½	1½	1½	1½

Reducer No. T220H

Motor R.P.M.	STANDARD RATIOS						
	86.5	105.9	129.7	158.9	194.6	238.4	291.9
1750	53	41.7	34	28.3	22.7	18.3	14.9
1150	35.5	28	23	19	15	11.1	10
870	27	21.5	17.5	15	11.4	9.3	7.7
720	23	18.7	15.7	12	9.5	7.7	6.4
580	18.5	15	11.7	9.8	8	6.3	5.1
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

Reducer No. T250H

Motor R.P.M.	STANDARD RATIOS 86.5	105.9	129.7	158.9	194.6	238.4	291.9
1750	75.3	61.2	48.8	40.3	32.4	27.3	21.6
1150	50	41	32.9	27	21.9	17.6	14.4
870	38.8	31.3	25.1	20.6	16.6	13.4	11
720	32.5	26.3	20.9	17.2	13.7	11.1	9.1
580	26.7	21	17	14	11.3	9	7.4
High Speed Shaft Diameter	1¾	1¾	1¾	1¾	1¾	1¾	1¾

Reducer No. T290H

Motor R.P.M.	STANDARD RATIOS 86.5	105.9	129.7	158.9	194.6	238.4	291.9
1750	109	86.3	73.2	58	47	38	31.4
1150	74.5	58.2	49.2	39.2	31.6	25.4	21.3
870	57	44.5	37.6	30	24.2	19.5	16.1
720	47.5	37.2	31.4	25	20	16.2	13.4
580	39	30.2	25.5	20.3	16.2	13	10.8
High Speed Shaft Diameter	2	2	2	2	2	2	2

Reducer No. T340H

Motor R.P.M.	STANDARD RATIOS 86.5	105.9	129.7	158.9	194.6	238.4	291.9
1750	170	137	113	94	76	63	49
1150	115	94	76	63	49	42	32
870	89	73	59	48	38	32.4	24.3
720	74	61	49	40	32	27	20.3
580	60	50	40	33	26	22	16.3
High Speed Shaft Diameter	2½	2½	2½	2½	2½	2½	2½

Reducer No. T390H

Motor R.P.M.	STANDARD RATIOS 86.5	105.9	129.7	158.9	194.6	238.4	291.9
1750	260	210	169	142	112	91	74
1150	178	142	113	94	74	62	50
870	136	109	87.5	72	57	47	38
720	114	91	73	60	48	39	32
580	93	74	59	49	39	31	26
High Speed Shaft Diameter	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝

Reducer No. T440H

Motor R.P.M.	STANDARD RATIOS 86.5	105.9	129.7	158.9	194.6	238.4	291.9
1750	350	283	223	187	151	122	102
1150	237	191	153	126	102	83	69
870	183	147	116	97	74	64	51
720	153	123	100	81	65	52	44
580	125	100	80	67	53	44	35
High Speed Shaft Diameter	3	3	3	3	3	3	3

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 and 25.

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 93 HP, which is more than the 90 HP required.

Check the Thermal Rating on page 26 and note that for this ratio and speed the M84B has a rating of only 50 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 26 for Thermal Horsepower Ratings.

Size No. M63B

	STANDARD RATIOS															
High Speed Shaft 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	...	202	202	168	142	127	111	84	67	55	48	41	35	30	26	22
3000	169	169	169	145	121	108	95	73	58	47	42	35	30	25	22	19
2400	135	135	135	122	102	90	78	60	48	40	35	29	25	21	19	16
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															
High Speed Shaft R.P.M.	1.22	1.5	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	...	...	...	349	305	275	244	190	148	125	108	91	81	72	59	51
3000	...	...	290	290	261	238	211	163	128	108	93	79	70	62	51	44
2400	232	232	232	232	221	201	177	136	105	89	77	66	59	52	43	37
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															
High Speed Shaft R.P.M.	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	...	...	...	502	461	343	308	272	229	201	169	151	136	127	116	91
3000	...	583	489	435	400	298	264	231	198	170	145	129	117	110	100	78
2400	550	486	405	366	336	248	222	195	166	141	120	107	97	93	83	65
High Speed Shaft Diameter	2	2	2	2	2	2	2	2	2	2	2	1½	1½	1½	1½	1

Size No. M126B

	STANDARD RATIOS															
High Speed Shaft R.P.M.	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	...	...	...	...	565	490	444	388	333	296	280	249	219	205	182	152
3000	...	...	719	625	486	421	383	335	282	254	240	214	189	175	156	129
2400	785	687	598	529	411	352	322	282	239	212	200	177	156	145	132	109
2000	655	565	515	449	352	304	278	242	203	182	169	151	134	121	112	93
High Speed Shaft Diameter	2¼	2¼	2¼	2¼	2¼	2¼	2¼	2¼	2¼	2¼	2¼	2¼	2	2	1½	1½

Size No. M147B

	STANDARD RATIOS															
High Speed Shaft R.P.M.	...	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	...	...	...	...	...	...	742	667	565	487	419	372	326	282	238	...
3000	...	...	...	...	860	736	645	574	485	422	359	317	279	242	203	...
2400	...	973	890	785	710	612	541	485	410	354	300	267	233	197	169	...
2000	...	850	782	685	615	526	462	416	353	307	259	231	197	171	145	...
High Speed Shaft Diameter	...	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½	2¼	2¼	2	...

Size No. M168B

	STANDARD RATIOS															
High Speed Shaft R.P.M.	...	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	...	...	...	...	...	...	848	696	594	527	457	420	394	369	319	...
3000	...	...	...	1033	914	816	736	597	508	452	370	358	339	316	270	...
2400	...	1098	998	863	761	684	618	502	427	382	335	301	282	264	225	...
2000	...	956	873	746	653	585	529	433	370	328	285	261	243	223	193	...
High Speed Shaft Diameter	...	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2½	2½	2¼	...

Size No. M189B

	STANDARD RATIOS															
High Speed Shaft R.P.M.	...	...	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	...	...	...	...	...	...	...	950	896	802	720	659	591	530	500	443
3000	...	...	...	...	...	1115	950	825	778	692	616	569	508	454	429	376
2400	...	...	1290	1168	1052	922	790	692	657	580	521	478	430	380	361	324
2000	...	...	1127	1028	909	800	678	592	563	498	450	413	370	328	308	276
High Speed Shaft Diameter	...	...	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	2¾	2¾	2½

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HORSEPOWER RATING TABLES (cont'd.)

TYPE M—SINGLE REDUCTION UNITS

Size No. M2010B

High Speed Shaft R.P.M.	STANDARD RATIOS															
	...	...	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	...	...	...	...	...	...	...	1112	1048	940	860	782	730	697	601	582
3000	...	...	...	...	...	1235	1062	962	910	808	742	669	625	597	515	498
2400	...	...	1435	1300	1210	1028	900	810	764	682	622	565	525	489	438	417
2000	...	...	1255	1146	1053	886	768	687	654	585	532	486	454	435	372	360
High Speed Shaft Diameter	...	...	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	2¾	2¾

Size No. M2211B

High Speed Shaft R.P.M.	STANDARD RATIOS															
	...	...	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	...	...	...	...	...	...	...	...	...	...	1176	1077	1036	875	786	692
3000	...	...	...	...	...	...	1440	1337	1230	1147	1012	927	886	760	673	596
2400	...	...	...	1615	1517	1365	1197	1113	1026	970	857	777	751	638	566	504
2000	...	...	1690	1420	1320	1194	1040	960	880	830	744	673	640	547	490	432
1750	...	...	1510	1280	1193	1072	937	872	806	755	672	613	585	501	444	392
High Speed Shaft Diameter	...	...	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¼	3¼

Size No. M2411B

High Speed Shaft R.P.M.	STANDARD RATIOS															
	...	...	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	...	...	...	...	...	...	...	...	...	...	...	1145	1047	989	902	831
3000	...	...	...	...	...	...	1460	1353	1287	1192	1047	995	901	852	780	717
2400	...	...	...	1630	1435	1308	1213	1126	1075	998	874	835	758	715	657	603
2000	...	...	1560	1433	1263	1134	1053	970	932	865	757	715	652	617	560	498
1750	...	...	1396	1290	1135	1032	950	882	837	781	688	654	595	563	514	474
High Speed Shaft Diameter	...	...	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¾	3¼	3¼

Size No. M2712B

High Speed Shaft R.P.M.	STANDARD RATIOS															
	...	...	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	...	...	...	...	...	...	...	...	1541	1456	1337	1247	1173	1065	965	890
2400	...	...	...	...	...	1715	1590	1462	1303	1212	1115	1055	980	894	813	752
2000	...	...	2020	1860	1685	1500	1390	1276	1131	1045	955	902	845	765	699	640
1750	...	...	1812	1665	1510	1363	1257	1151	1053	950	876	822	765	700	637	588
High Speed Shaft Diameter	...	...	4	4	4	4	4	4	4	4	4	4	4	4	4	3¾

Size No. M3014B

High Speed Shaft R.P.M.	STANDARD RATIOS															
	...	...	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	...	...	...	...	...	...	...	...	...	...	1660	1543	1442	1275	1192	1105
2400	...	...	...	...	...	...	1923	1737	1608	1510	1412	1289	1210	1066	1000	931
2000	...	...	...	2485	2280	2000	1682	1530	1400	1317	1218	1110	1033	915	856	797
1750	...	...	2395	2220	2040	1780	1530	1372	1275	1183	1108	1004	944	836	784	732
High Speed Shaft Diameter	...	...	4	4	4	4	4	4	4	4	4	4	4	4	4	4

Size No. M3318B

High Speed Shaft R.P.M.	STANDARD RATIOS															
	...	...	...	5.35	5.60	6.17	7.00	7.61	8.00	8.43	8.74	9.30	9.70	...	...	...
3000	...	...	...	...	...	...	...	...	2155	2050	1895	1744	1930	...	...	...
2400	...	...	...	...	...	...	...	...	...	...	...	...	1627	...	...	...
2000	...	...	...	...	...	2780	2315	2045	1875	1768	1650	1520	1403	...	...	...
1750	...	...	...	3030	2865	2395	2060	1827	1715	1588	1490	1367	1277	...	...	...
High Speed Shaft Diameter	...	...	...	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	...	...	...

Size No. M3824B

High Speed Shaft R.P.M.	STANDARD RATIOS															
	...	...	...	6.17	7.00	7.65	8.05	8.50	...	...	...	...	...	...	...	...
2000	...	...	...	...	3920	3500	3195	2970	...	...	...	...	...	...	...	...
1750	...	...	...	4225	3505	3130	2875	2660	...	...	...	...	...	...	...	...
High Speed Shaft Diameter	...	...	...	5	5	5	5	5	...	...	...	...	...	...	...	...

Ratios listed are standard but intermediate ratios are available.

Ratings for intermediate ratios and speeds my 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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THERMAL HORSEPOWER RATINGS

TYPE M—SINGLE REDUCTION UNITS

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 shown on pages 24 and 25.

Size Gear Unit	High Speed Shaft RPM	RATIOS														
		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
M63B	3600	PC	PC	PC	PC	PC	PC	PC	PC	PC	PC	PC	PC	PC	...	...
	3000	18	20	21	23	27	30	32	33	34	...	...	...	...	...	...
	2400	40	41	42	45	52	...	...	...	...	...	...	...	...	...	...
M84B	3600	PC	PC	PC	PC	PC	PC	PC	PC	PC	PC	PC	PC	PC	...	...
	3000	25	27	28	31	37	40	42	43	44	45	47	49	51	...	...
	2400	57	59	61	65	75	80	85	87	...	...	...	...	...	...	...
M105B	3600	...	...	PC	PC	PC	PC	PC	PC	PC	PC	PC	PC	PC	...	...
	3000	27	30	31	34	40	45	48	50	51	52	55	57	60	...	...
	2400	73	76	78	85	97	106	111	115	117	...	...	...	...	...	...
M126B	3600	...	...	...	...	PC	PC	PC	PC	PC	PC	PC	PC	PC	...	...
	3000	...	...	33	37	44	49	52	54	55	56	60	62	65	...	...
	2400	99	105	108	116	135	147	156	161	164	167	...	...	...	...	...
	2000	152	156	158	168	188	199	208	...	...	...	...	...	...	...	...
M147B	3600	...	...	...	...	...	...	PC	PC	PC	PC	PC	PC	PC	...	...
	3000	...	...	...	...	39	44	47	49	50	51	54	56	59	...	...
	2400	...	106	109	118	140	153	161	166	170	173	182	187	197	...	...
	2000	...	168	171	182	204	219	230	237	242	244	...	...	...	...	...
M168B	3600	...	...	...	...	...	...	PC	PC	PC	PC	PC	PC	PC	...	...
	3000	...	...	...	...	30	33	36	37	38	39	41	42	44	...	...
	2400	...	...	...	125	148	163	171	178	182	185	193	200	211	...	...
	2000	...	...	...	196	225	242	254	261	268	270	281	...	...	...	...
M189B	3600	...	...	...	...	...	...	...	PC	PC	PC	PC	PC	PC	...	...
	3000	...	...	...	...	...	PC	PC	PC	PC	PC	PC	PC	PC	...	...
	2400	...	...	...	119	143	158	165	174	177	181	189	197	205	...	...
	2000	...	...	...	212	244	265	279	287	294	298	311	322	...	...	...
M2010B	3600	...	...	...	...	...	...	...	...	PC	PC	PC	PC	PC	...	...
	3000	...	...	...	...	...	...	PC	PC	PC	PC	PC	PC	PC	...	...
	2400	...	...	...	...	132	146	155	160	164	168	176	183	191	...	...
	2000	...	...	...	...	258	280	297	306	313	318	332	344	378	...	...
M2211B	3600	...	...	...	...	...	...	...	...	...	PC	PC	PC	PC	PC	...
	3000	...	...	...	...	...	...	...	PC	PC	PC	PC	PC	PC	PC	...
	2400	...	...	...	...	...	125	132	137	142	145	152	158	165	170	...
	2000	...	...	...	...	252	276	292	301	309	313	328	339	359	370	...
	1750	...	...	...	...	339	364	382	393	402	406	422	433	...	...	...
M2411B	3600	...	...	...	...	...	...	...	...	...	...	PC	PC	PC	PC	...
	3000	...	...	...	...	...	...	...	...	PC	PC	PC	PC	PC	PC	...
	2400	...	...	...	...	...	...	88	91	93	95	101	104	109	112	...
	2000	...	...	...	...	...	244	257	267	275	279	290	300	315	326	...
	1750	...	...	...	...	...	346	364	375	383	389	405	417	436	455	...
M2712B	3000	...	...	...	...	...	...	...	...	...	PC	PC	PC	PC	PC	...
	2400	...	...	...	...	...	...	...	PC	PC	PC	PC	PC	PC	PC	...
	2000	...	...	...	...	...	230	241	246	250	255	266	277	292	301	...
	1750	...	...	...	...	...	360	380	392	401	408	428	442	468	482	...
M3014B	3000	...	...	...	...	...	...	...	...	...	...	PC	PC	PC	PC	PC
	2400	...	...	...	...	...	...	...	...	PC	PC	PC	PC	PC	PC	PC
	2000	...	...	...	...	...	...	163	169	175	178	188	194	204	210	215
	1750	...	...	...	...	...	326	343	356	366	372	387	400	419	435	448
M3318B	3000	...	...	...	...	...	...	...	...	...	...	...	PC	PC	...	...
	2400	...	...	...	...	...	...	...	...	...	...	PC	PC	PC	...	...
	2000	...	...	...	...	...	...	...	PC	PC	PC	PC	PC	PC	...	...
	1750	...	...	...	...	...	...	258	269	277	282	297	306	323	...	...
M3824B	2000	...	...	...	...	...	...	...	PC	PC	PC	PC	...	...	...	...
	1750	...	...	...	...	...	...	...	PC	PC	PC	PC	...	...	...	...

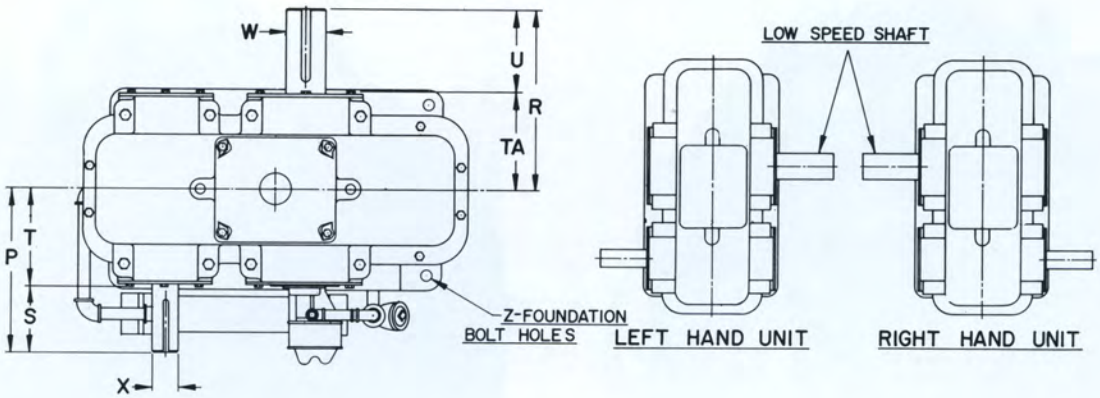
PC in above Table means that an oil pump and cooler must be added to the assembly to prevent over-heating, regardless of the horsepower to be delivered.

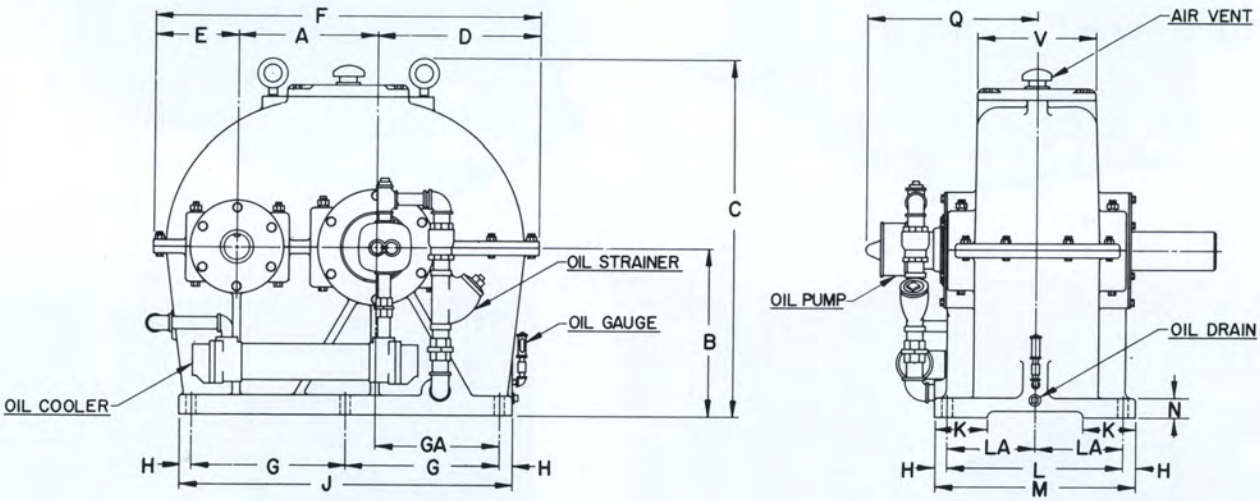
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GENERAL DIMENSIONS

TYPE 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 3/8	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 3/8	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 5/16	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

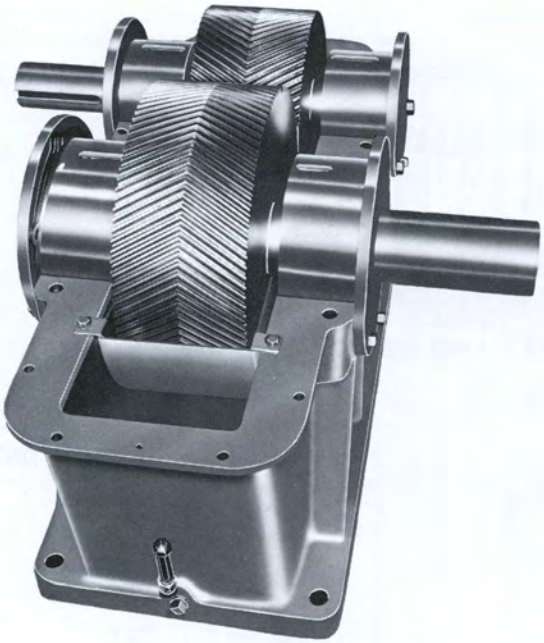
All dimensions are in inches.
* The M2712B has Foundation Holes spaced 16-24-16.
** For High Speed Shaft Keyways, see table of standard Keyways page 42.
For units having four foundation bolts the dimension under G is the distance between bolts.

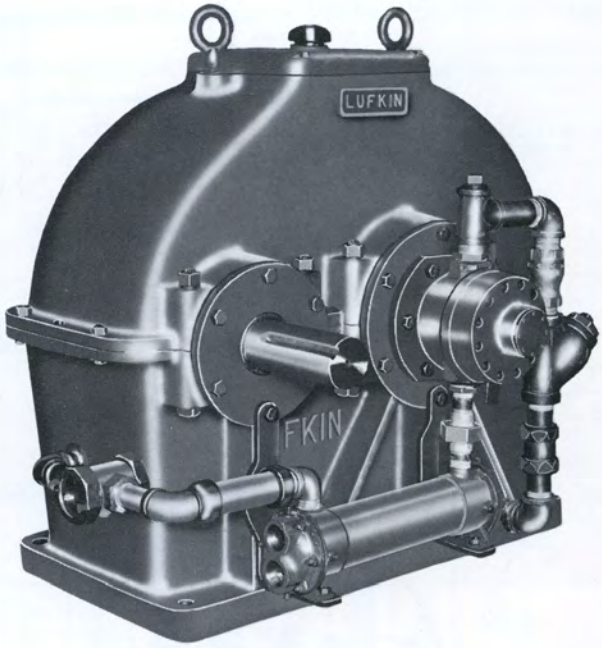
Above dimensions are not to be used for installation.
USE CERTIFIED INSTALLATION PRINT.

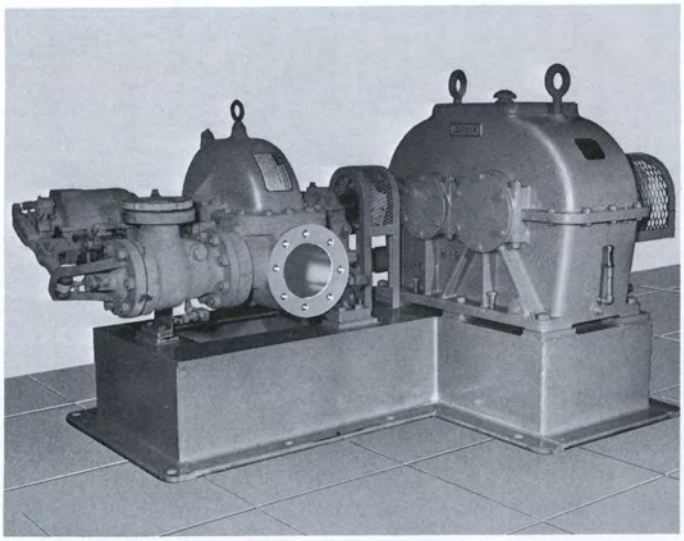
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Type M

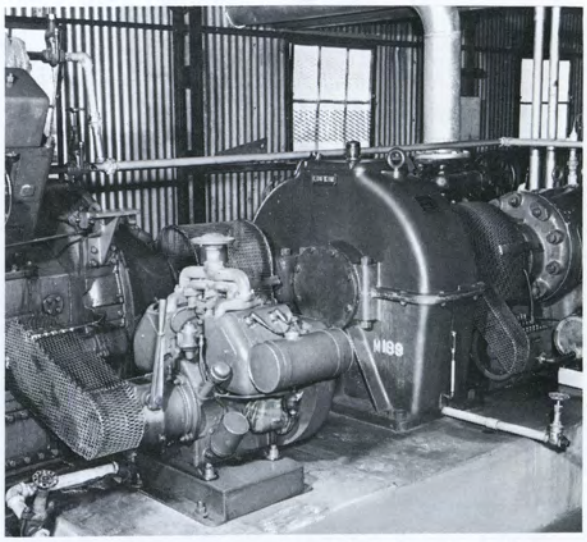
MEDIUM SPEED HERRINGBONE GEAR REDUCERS AND SPEED INCREASERS







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

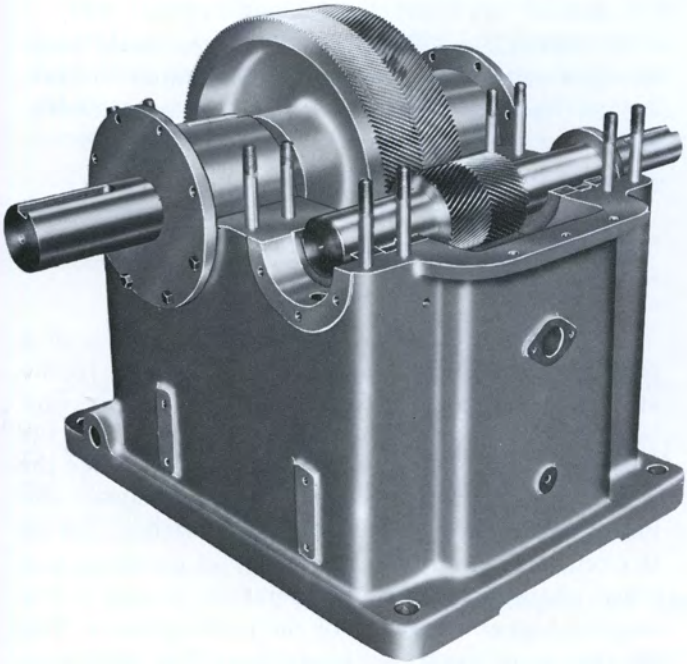


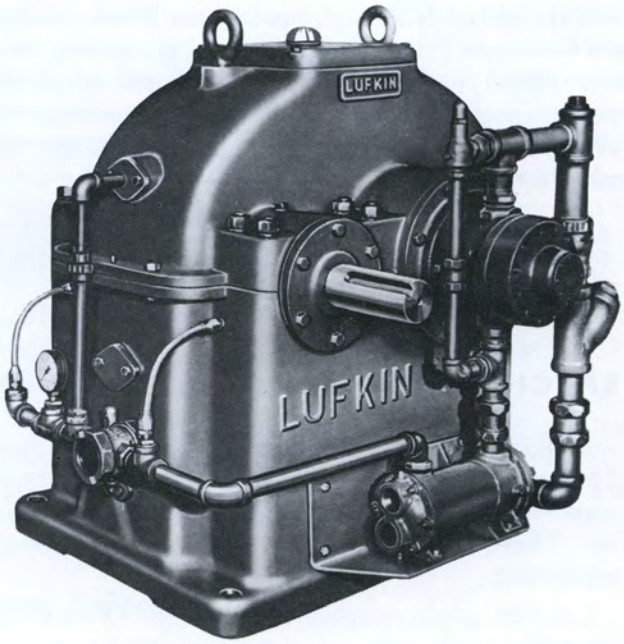
Lufkin Model M189B Reducer driving a hot oil pump from a diesel engine.

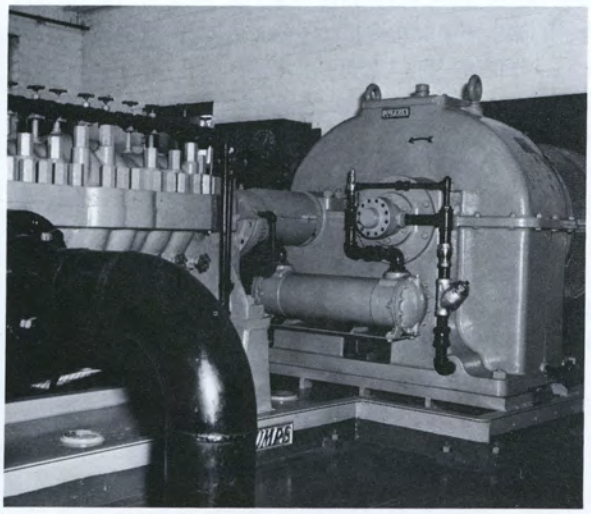
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Type N

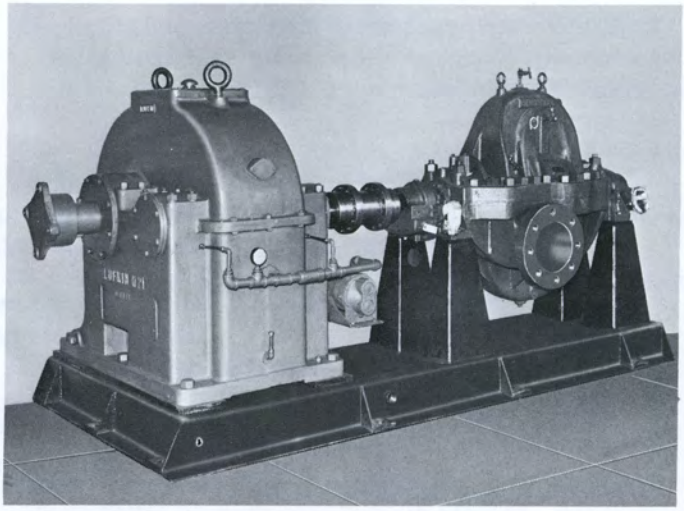
HIGH SPEED REDUCERS AND SPEED INCREASERS







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:

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.

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:

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	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

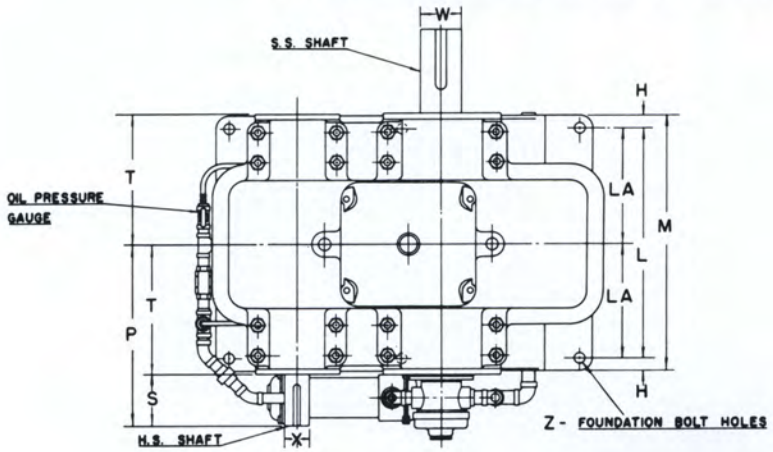
Size N or NM	RATIO UP TO 4.0:1		RATIO 4.1:1 TO 8.0:1		RATIO 8.1:1 AND OVER	
	Dia.	Keyway	Dia.	Keyway	Dia.	Keyway
6	1.500	3/8 x 3/16	1.250	1/4 x 1/8	....	.....
8	1.750	3/8 x 3/16	1.500	3/8 x 3/16	1.250	1/4 x 1/8
10	2.500	5/8 x 5/16	2.000	1/2 x 1/4	1.500	3/8 x 3/16
12	2.500	5/8 x 5/16	2.500	5/8 x 5/16	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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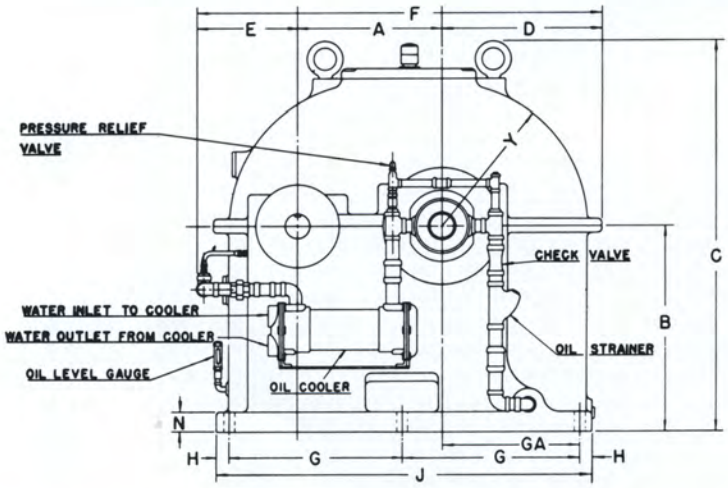
GENERAL DIMENSIONS

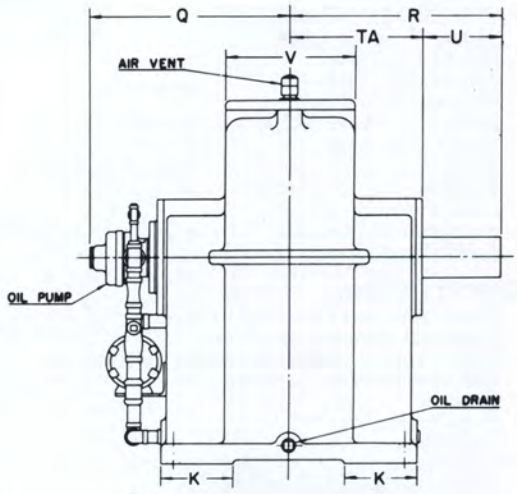
Types N and NM

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	7⁷⁄₁₆	4⁹⁄₁₆	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	9¹⁵⁄₁₆	5¹⁄₁₆	10¾	2½		8½	⅝ x ⁵⁄₁₆ x 5	4–1¹⁄₁₆	1,000
10	10	17	32¾	12	9⅝	31⅝	26½	9¾	1¼	29	6½	20½	10¼	23	2	16½	20¹⁄₁₆	17½	4¼	12¼	12¼	5¼	11¾	3		10½	¾ x ⅜ x 5	4–1¹⁄₁₆	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	4–1⁵⁄₁₆	2,400
14	14	22	40½	16	10¾	40¾	35	13½	1½	38	7½	24	12	27	2¼	20½	22	21½	6⁵⁄₁₆	14⁵⁄₁₆	14⁷⁄₁₆	7¹⁄₁₆	13½	4		14½	1 x ½ x 5½	4–1⁵⁄₁₆	3,400
16	16	24	45⅜	18½	12	46½	20	15¾	1½	43	9	28	14	31	2½	23	24½	24¾	6¹³⁄₁₆	16³⁄₁₆	16½	8½	15	4½		16⅝	1 x ½ x 7½	6–1⁵⁄₁₆	4,400
18	18	26	50¾	20	12¼	50¼	22	17¼	1½	47	9	29	14½	32	2½	23	24¾	26½	6⁵⁄₁₆	16¹¹⁄₁₆	17	9½	16	5		18⅛	1¼ x ⁷⁄₁₆ x 7½	6–1⁵⁄₁₆	5,400
21	21	28	55	22½	15	58½	24½	19¼	2	53	9	29	14½	33	2¾	24½	25¼	27½	7⁵⁄₁₆	17³⁄₁₆	17½	10	16¾	5¾		20⅝	1½ x ½ x 8¾	6–1⁵⁄₁₆	6,600
24	24	30	61	27	17¼	68¼	29¼	23½	2	62½	10	24	*12	36	3	27	27¹⁄₁₆	30	8⁵⁄₁₆	18¹¹⁄₁₆	19	11	18½	6⅜		24¾	1½ x ½ x 9	6–1⅝	10,000

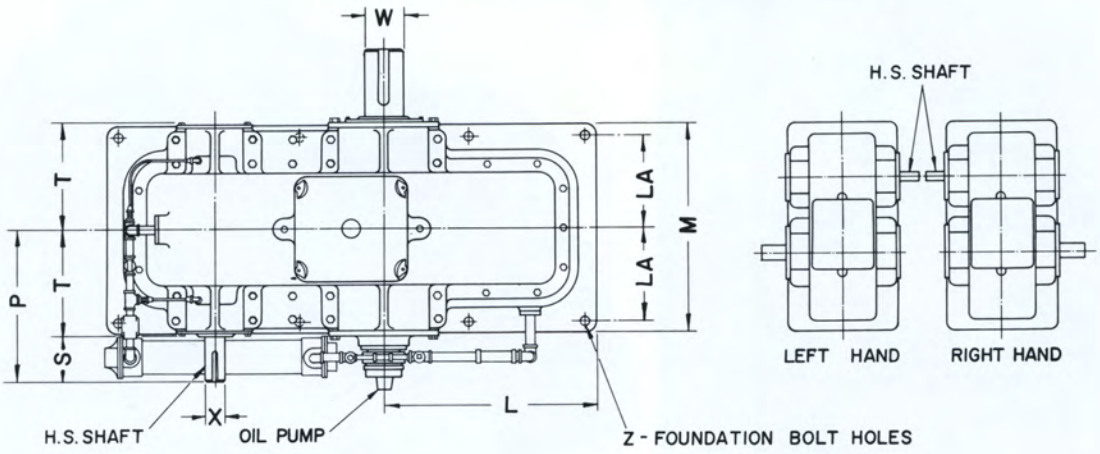
For units having four foundation bolts the dimension under G is the distance between bolts.
*N24 has center holes spaced 16".
All dimensions are in inches.
The external dimensions shown are the same for each Housing Assembly regardless of the face width of gears.
The above dimensions are not to be used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

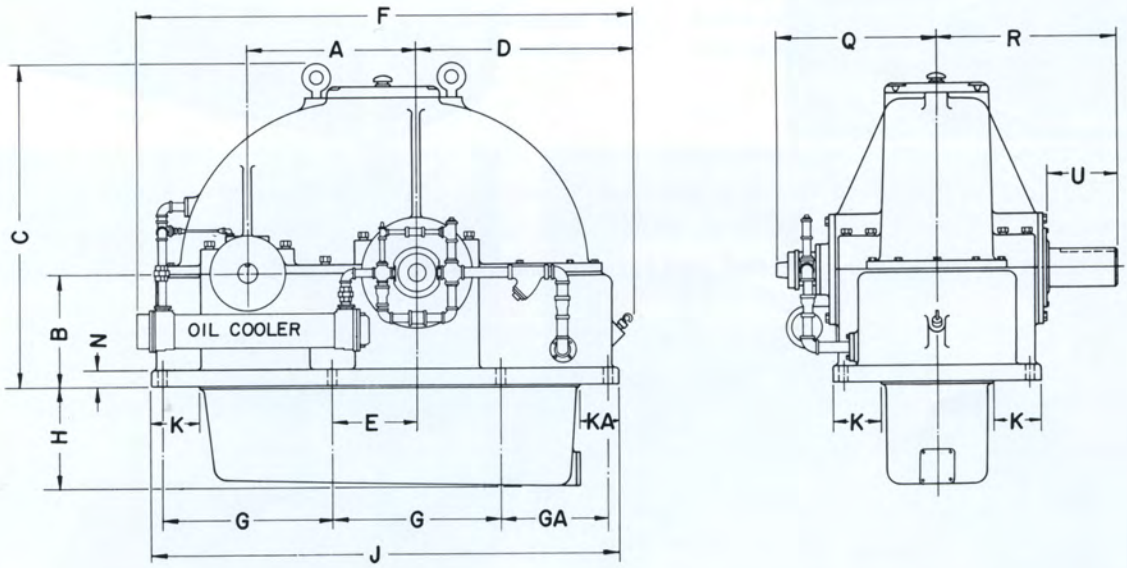
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GENERAL DIMENSIONS

LARGE Types N and NM

HIGH SPEED REDUCERS AND SPEED INCREASERS



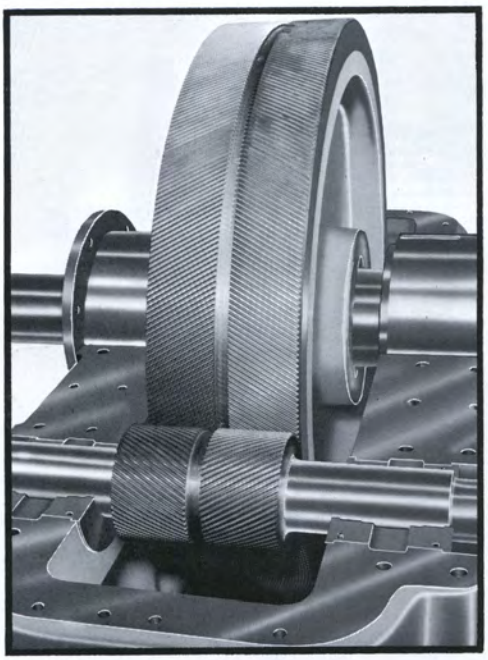


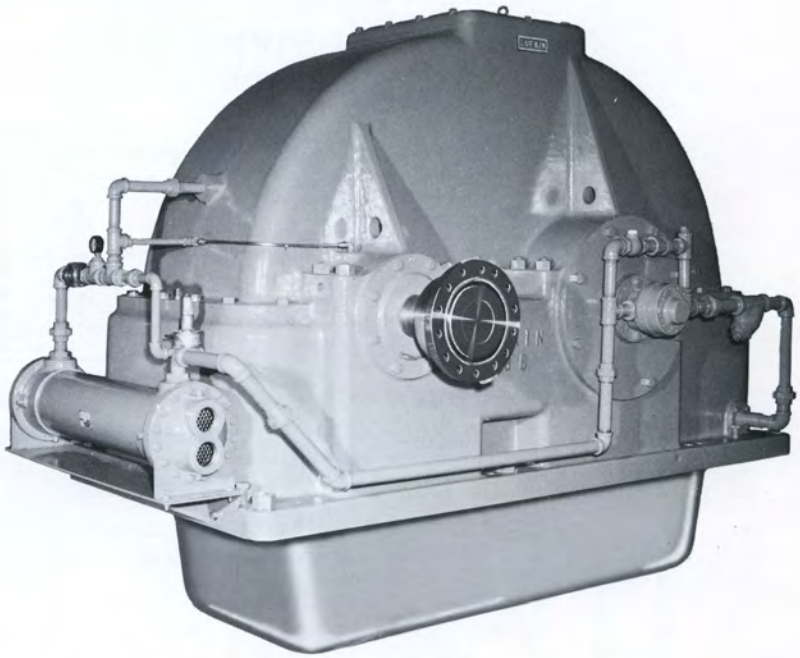
Size No. N or NM	A	B	C	D	E	F	G	GA	H	J	K	KA	L	LA	M	N	P	Q	R	S	T	U	W	X	S.S. Shaft Keyway	Z	Weight
30	30	20	57½	38	15	88	30	19	18	83	8½	7	36	16½	27	3	27	28½	32	7⅞	19⅛	12¼	6⅞	*	1¾ x ⅝	8–1⅝	14,750
33	33	20	60¼	39½	17	100½	32	20	19	88	8½	7	37	18¼	40½	3	30	31¼	36	9	21	14	7½	*	1¾ x ⅝	8–1⅝	20,000
38	38	24	66	44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

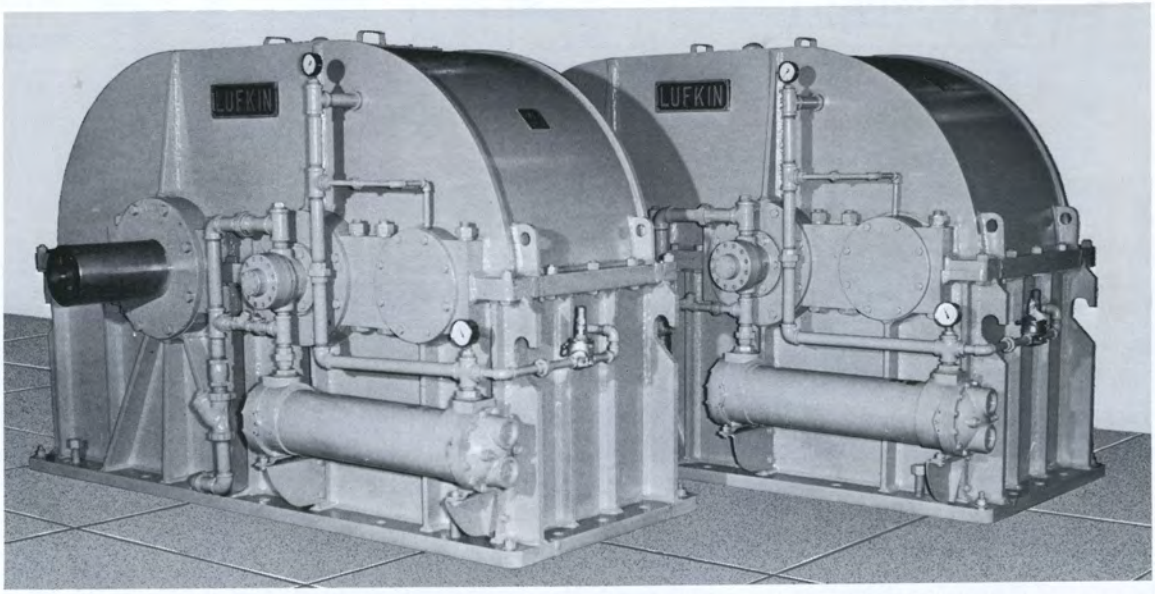
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LARGE
Type N
HIGH SPEED REDUCERS AND SPEED INCREASERS





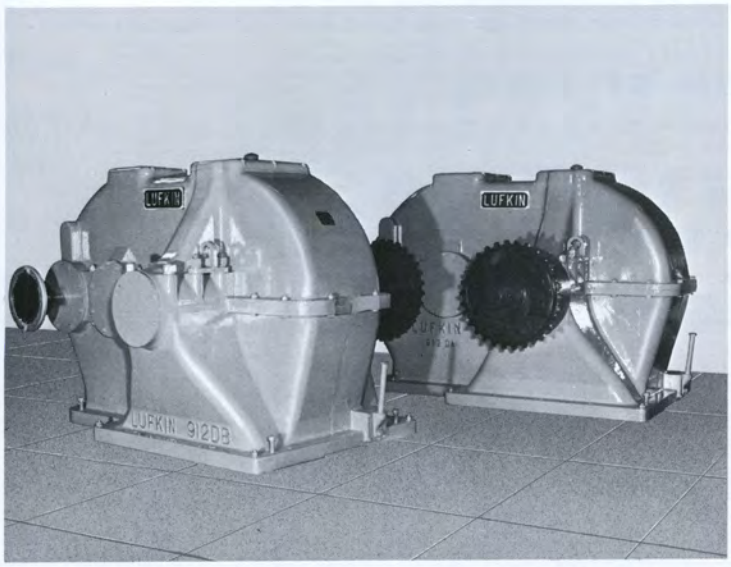
Lufkin Large Type N Speed Increasers and High Speed Reducers size N30, N33 and N38 are furnished with cast iron housings as shown above. Large single reduction units and large double reduction units are furnished with fabricated steel housings similar to the N500 Speed Increasers shown below.



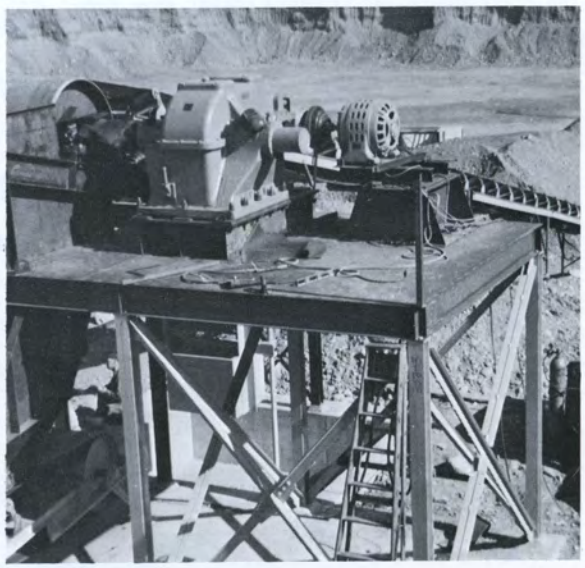
Two Lufkin Model N500B double reduction high speed gear increasers for shipment to a major oil company for driving centrifugal pumps at 6500 RPM from diesel engine at 515 RPM delivering 2000 HP each.

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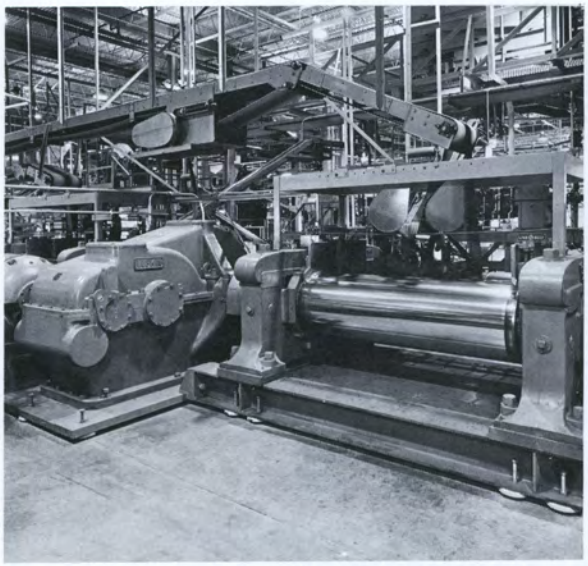
LUFKIN HI-Q SPEED REDUCERS



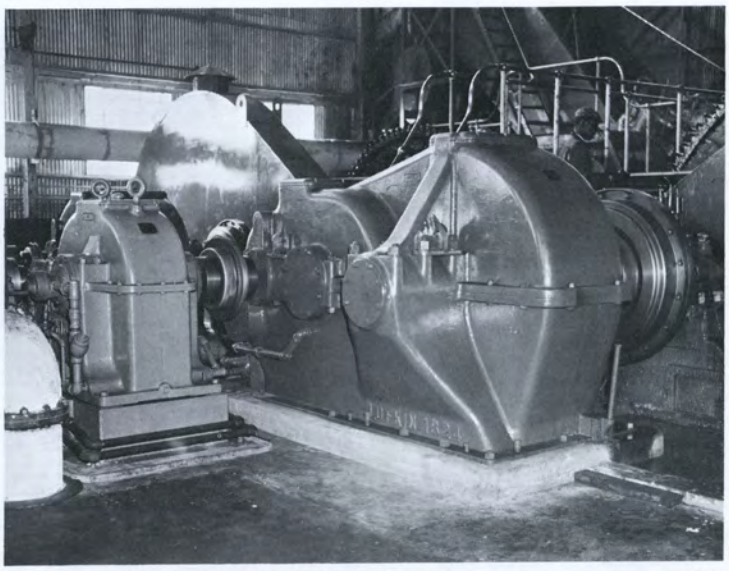
Two Lufkin Model D912 Double Reduction Hi-Q Reducers with Lufkin chain couplings for shipment to a major rubber manufacturer.



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	9.5	8.9	8.3	8.0	7.6	7.0	6.6	6.1	5.7	5.2	4.8	4.4	...	...	...	...	...	...
	1150	6.4	6.0	5.7	5.4	5.0	4.6	4.4	4.1	3.8	3.5	3.2	2.9	...	...	...	...	...	...
	870	5.1	4.8	4.5	4.3	4.0	3.7	3.5	3.2	3.0	2.8	2.6	2.5	...	...	...	...	...	...
	720	4.3	4.0	3.8	3.6	3.4	3.1	3.0	2.8	2.5	2.3	2.2	2.0	...	...	...	...	...	...
	580	3.5	3.3	3.1	2.9	2.8	2.6	2.4	2.3	2.1	1.9	1.8	1.6	...	...	...	...	...	...

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	18	17	16	15	14	12	11	10.5	9.5	8.5	7.7	6.8	...	...	...	...	...
	1150	13	12	11.6	10.6	9.8	9.1	8.3	7.6	6.9	6.3	5.7	5.2	4.6	...	...	...	...	...
	870	10.2	9.6	9.1	8.5	7.8	7.3	6.6	6.1	5.5	4.9	4.5	4.1	3.6	...	...	...	...	...
	720	8.8	8.2	7.8	7.2	6.6	6.2	5.6	5.2	4.7	4.2	3.8	3.5	3.0	...	...	...	...	...
	580	7.2	6.7	6.3	5.9	5.5	5.0	4.6	4.2	3.9	3.5	3.1	2.8	2.5	...	...	...	...	...

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	25	24	23	22	20	19	17	16	15	13	12	11	...	...	...	...	...
	1150	19	18	17	16	15	14	13	12	11	10	8.9	7.8	7.3	...	...	...	...	...
	870	14	13.5	13	12.5	12	11	10	9.2	8.5	7.9	7.1	6.2	5.8	...	...	...	...	...
	720	12	11.5	11	10.5	9.8	9.1	8.6	7.8	7.2	6.7	6	5.3	5	...	...	...	...	...
	580	9.7	9.3	8.8	8.4	7.9	7.5	7.1	6.4	5.8	5.5	4.9	4.3	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	52	49	47	44	40	37	34	31	27	26	24	21	...	...	...	...	...	...
	1150	36	34	32	30	28	26	24	22	19	18	16	14	...	...	...	...	...	...
	870	28	27	26	24	22	20	18	17	15	14	13	11	...	...	...	...	...	...
	720	24	23	22	20	19	17	16	15	13	12	11	9.4	...	...	...	...	...	...
	580	20	19	18	17	16	14	13	12	10	9.8	8.7	7.7	...	...	...	...	...	...

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	77	72	68	64	60	55	51	47	44	40	36	33	29	26	...	...	...
	1150	56	52	49	47	44	41	38	36	33	30	28	25	23	20	18	...	...	...
	870	42	41	38	36	35	32	31	28	26	24	22	20	18	16	14	...	...	...
	720	35	34	32	30	29	27	25	24	22	20	18	16	15	13	12	...	...	...
	580	29	28	27	26	24	22	21	20	18	17	15	14	12	11	10	...	...	...

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	117	111	104	100	97	92	88	84	81	76	72	66	61	56	52	47	43	39
	1150	78	75	71	69	67	65	62	59	55	53	49	46	42	39	36	33	30	27
	870	61	59	55	52	50	48	46	44	43	42	38	36	34	31	29	26	24	21
	720	51	48	46	44	43	41	39	37	36	35	32	30	28	26	24	22	20	18
	580	41	39	37	36	35	34	32	31	30	29	26	25	23	21	20	18	16	14

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	155	148	144	138	133	128	120	116	108	102	95	89	81	75	69	64	58	53
	1150	106	103	99	95	91	88	84	78	74	70	65	61	57	52	49	44	40	37
	870	83	78	76	73	69	68	64	62	60	55	52	48	45	41	38	35	32	29
	720	68	66	64	61	59	55	53	52	49	46	43	40	38	35	32	29	27	24
	580	55	53	52	51	48	46	44	43	41	39	36	33	31	29	26	24	22	20

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	226	216	206	203	196	183	176	173	160	153	146	140	132	**119**	108	101	...	...	...	...	...	...
	1150	156	150	145	140	132	122	120	116	110	105	100	97	88	**81**	73	66	...	...	...	...	...	...
	870	123	117	114	109	105	100	95	90	82	80	77	75	72	**66**	59	54	...	...	...	...	...	...
	720	100	98	95	90	87	82	78	75	70	68	65	62	59	**57**	51	47	...	...	...	...	...	...
	580	83	78	76	73	68	67	65	62	58	57	55	51	48	**43**	41	38	...	...	...	...	...	...

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	218	210	198	193	180	174	161	148	135	126	115	107	99	**87**	...	...	...	...	...	...	...	...
	870	166	163	159	149	144	137	126	118	111	105	94	89	79	**72**	...	...	...	...	...	...	...	...
	720	142	138	133	125	121	113	104	98	93	86	78	71	63	**58**	...	...	...	...	...	...	...	...
	580	114	111	107	104	100	94	90	83	79	72	67	61	56	**51**	...	...	...	...	...	...	...	...

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	308	286	271	256	248	237	233	222	209	196	183	170	156	**134**	127	...	...	...	...	...	...	...
	870	222	218	214	203	196	192	181	169	162	160	150	133	125	**110**	101	...	...	...	...	...	...	...
	720	192	188	184	169	158	154	150	147	139	128	122	114	103	**90**	87	...	...	...	...	...	...	...
	580	158	154	151	141	135	132	128	120	113	111	103	96	86	**75**	71	...	...	...	...	...	...	...

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	406	380	375	371	362	348	340	326	322	309	300	274	265	256	240	223	**207**	182	...	...	...	...
	870	336	327	309	300	287	274	269	256	247	234	221	216	216	212	199	190	**162**	151	...	...	...	...
	720	274	269	261	247	234	230	225	212	208	199	190	181	181	177	168	155	**133**	125	...	...	...	...
	580	230	225	212	207	199	190	185	177	172	159	154	150	143	143	139	130	**113**	104	...	...	...	...

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	629	593	567	531	505	495	489	464	452	436	410	385	348	321	**303**	282	257	...	...	...	...	...
	870	489	474	464	438	412	392	381	371	355	335	319	304	278	261	**242**	224	200	...	...	...	...	...
	720	428	392	386	371	350	345	330	314	304	294	278	263	248	239	**212**	188	169	...	...	...	...	...
	580	355	330	324	309	299	288	278	258	247	237	227	211	201	191	**174**	163	144	...	...	...	...	...

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	780	754	712	683	653	611	572	533	507	471	435	401	370	**340**	...	...	...	...	...	...	...	...
	870	622	603	570	539	525	483	458	426	406	379	352	324	294	**272**	...	...	...	...	...	...	...	...
	720	530	509	485	462	448	415	384	362	341	317	294	271	248	**227**	...	...	...	...	...	...	...	...
	580	455	433	408	394	380	349	224	305	290	266	248	230	210	**191**	...	...	...	...	...	...	...	...

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	838	797	776	742	698	673	636	600	561	545	506	477	447	406	**386**	355	...	...	...	...	...	...
	720	708	676	653	619	594	557	541	514	475	458	429	399	373	350	**318**	298	...	...	...	...	...	...
	580	599	585	562	536	511	484	456	428	410	386	358	337	313	293	**272**	254	...	...	...	...	...	...

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	1233	1220	1164	1080	1050	1000	940	905	855	804	752	729	675	638	598	**542**	515	473	...	...	...	...
	720	1049	1029	975	915	883	835	800	749	726	689	636	612	572	534	499	**467**	423	397	...	...	...	...
	580	868	855	816	792	759	723	687	650	612	574	550	516	478	451	418	**391**	363	336	...	...	...	...

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	1730	1693	1644	1580	1522	1480	1436	1346	1288	1210	1151	1106	1045	982	918	870	823	**757**	714	675	623	573
	720	1466	1416	1394	1322	1280	1250	1218	1143	1084	1023	980	934	889	842	777	745	698	**649**	598	565	514	480
	580	1230	1172	1143	1086	1058	1036	994	976	932	887	843	795	750	702	671	621	590	**559**	567	474	440	406

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.

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	131	232	.....	.....	.....	.....
	1150	88.2	158	199	316	468	530
	870	71.6	127	163	245	367	430
	720	60.6	107	135	212	322	353
	580	49.6	89	113	174	260	297

Ratios shown for single reduction units are standard stock ratios.

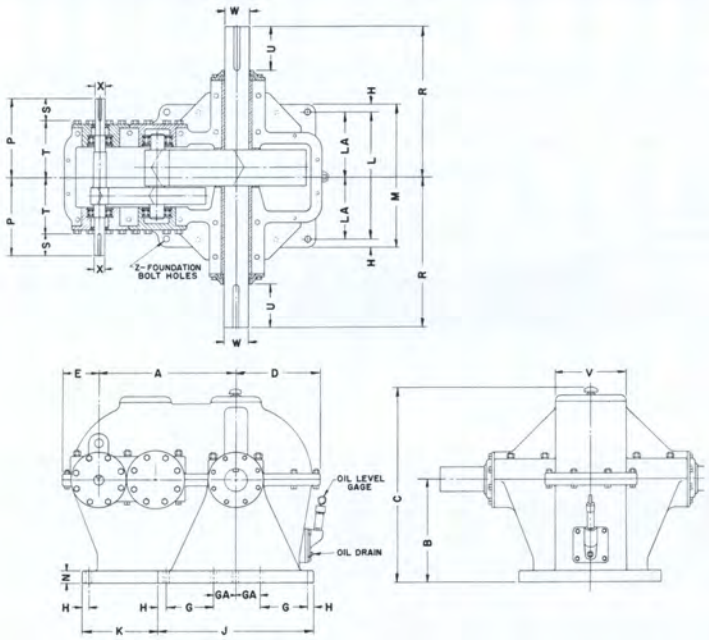
Ratios shown in Blue are standard stock ratios.

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GENERAL DIMENSIONS

HI-Q

DOUBLE REDUCTION HERRINGBONE GEAR REDUCERS



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	17⅝	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	5⅛	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	11⅝	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	¾	4–13/16	3/16 x 3/32 x 1 19/32	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	19⅝	2⅝	8	7	12⅞	4	1 1/16	7–1	½ x ⅛ x 2¾	1 x ¼ x 6	1,250
D57	11¾	23	2¾	9	7½	16⅛	4	1 5/16	9–1⅛	½ x ¼ x 2⅞	1 x ¼ x 7	1,840
D80	13⅜ 13¾	26½	4 4⅜	9¾	8½	11¾	4 7/16	1 5/16	9–1⅜	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 5/16	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 1/16	12–1⅜	⅞ x ¼ x 7	1½ x ⅜ x 7¾	9,100
D640	23½	41	7½	16	8¼	24¾	7	3 1/16	12–1⅜	⅞ 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	17–1⅝	1¼ x 7/16 x 11	2 x ¾ x 9⅜	19,000
D1824	35 30	47½	6⅞ 11⅝	28⅛ 18⅜	9 15/16	26½	9	4 15/16	17–1⅝	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.

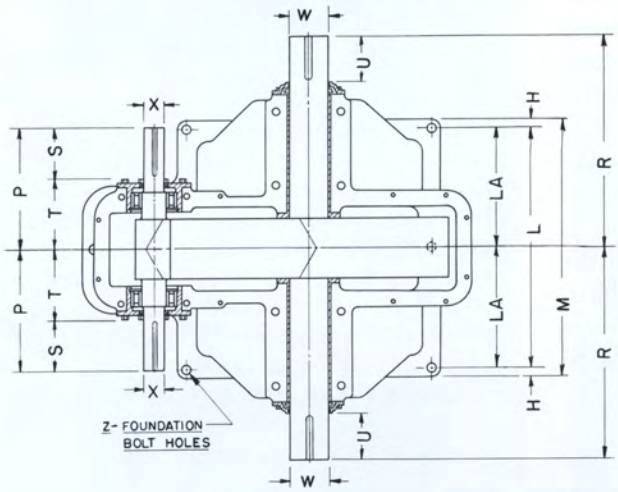
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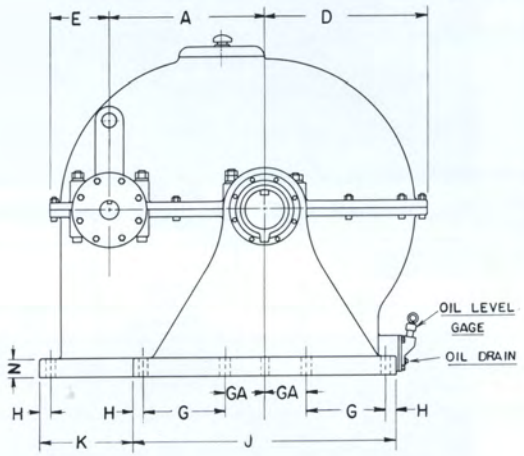
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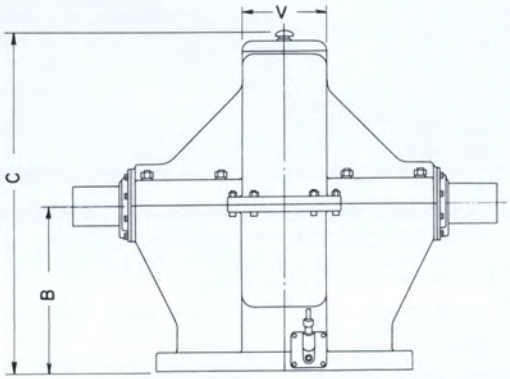
GENERAL DIMENSIONS

HI-Q

SINGLE REDUCTION HERRINGBONE GEAR REDUCERS







SIZE NO.	A	B	C	D	E	G	GA	H	J	K	L	LA	M	N
S57	17⅞	18	38 3/16	18¾	6 13/32	8½	4	1¼	27½	13¼	22½	11¼	25	2¼
S114	20	21	44 1/16	21	6½	8½	4	1¼	27½	13¼	22½	11¼	25	2
S160	23	27	52¾	24¼	8	10½	5¼	1¼	34	15¼	29½	14¾	32	2½
S228	25	27	54 11/16	26¼	8¼	8½	8½	1½	37	13½	34	17	37	3
S320	26	28	56¾	27¼	10	10¼	10¼	1½	44	15½	40	20	43	3¼
S456	32 13/16	34	69¾	34½	15 5/16	11⅜	11⅜	1½	48½	25⅛	43½	21¾	46½	3

SIZE NO.	P	R	S	T	U	V	W	X	Z	H.S. Keyway	S.S. Keyway	Weight
S57	11¼	23	4 7/16	6 13/16	7½	7⅞	4	2 7/16	9–1 1/16	11/16 x 5/32 x 4	1 x ¼ x 7	1,935
S114	12¾	26½	3¾	9	7¾	9¾	4 7/16	2 11/16	9–1 1/16	11/16 x 5/32 x 4	1¼ x ⅜ x 7¼	2,535
S160	14⅜	28	4 11/16	9 11/16	8	10	5 7/16	2 15/16	9–1⅜	13/16 x 3/16 x 4¼	1¼ x ⅜ x 7	3,720
S228	18½	32	7 1/16	11 7/16	7⅜	13	6	3 3/16	12–1⅜	13/16 x 3/16 x 5	1½ x ⅜ x 7½	5,035
S320	20⅜	35½	8 11/16	11 11/16	8⅛	14¼	6 7/16	3 7/16	12–1½	⅞ x ¼ x 8	1½ x ⅜ x 7¾	7,005
S456	21¼	41	8 5/16	12 15/16	9	16	7	3 15/16	12–1⅜	1 x ¼ x 8	1½ x ⅜ x 7¾	10,330

Above dimensions are not to be used for installation.
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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

GEAR UNIT NUMBER:	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	2	280–360	3	490–700
S105B, S126B, S147B, S168B, S189B, S2010B, S57, S114, D100B, D120B, D6, D10, D16	2	280–360	4	700–1000
S2211B, S2411B, S2712B, S3014B, S3318B, S3824B, S160, S228, S320, S456, D145B, D170B, D195B, D220B, D250B, D290B, D340B, D390B, D25, D40, D57, D80, D114, D160, D228, D320, D456, D640, D912, D1280, D1824, T145B, T195B	3	490–700	4	700–1000
T220B, T250B, T290B, T340B, T390B, T440B, T1280, T1824, T540, T720	4	700–1000	5	1000–1500
All Type "M" Units	2	280–360	3	490–700
All Type "N" and "NM" Units	1	180–240	2	280–360

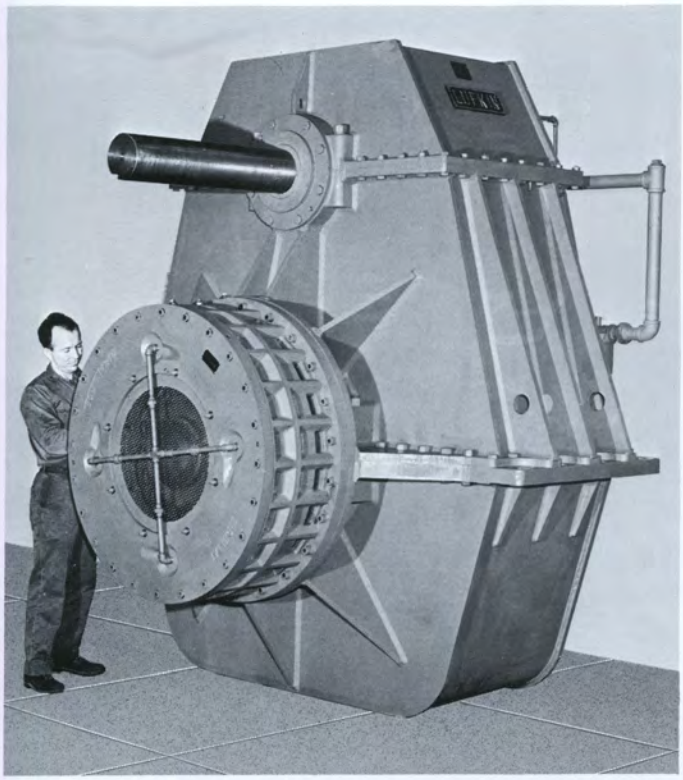
AGMA STANDARD KEYWAYS

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
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

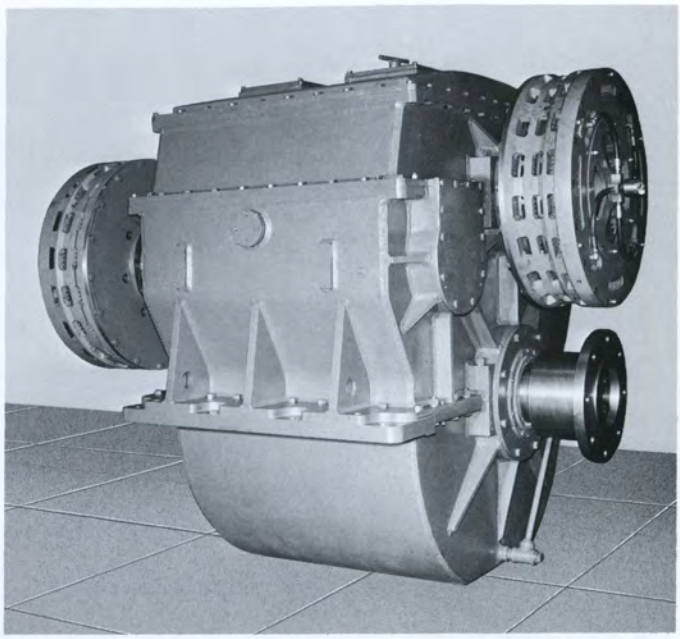
Lufkin Commercial Gear Reducers and Increasers are furnished with the above standard keyways in the low speed and high speed shafts. The depth of the keyway in the coupling, pulley or sprocket is the same as the depth of the keyway in the shaft; that is, the depth is one-half of the key height measured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

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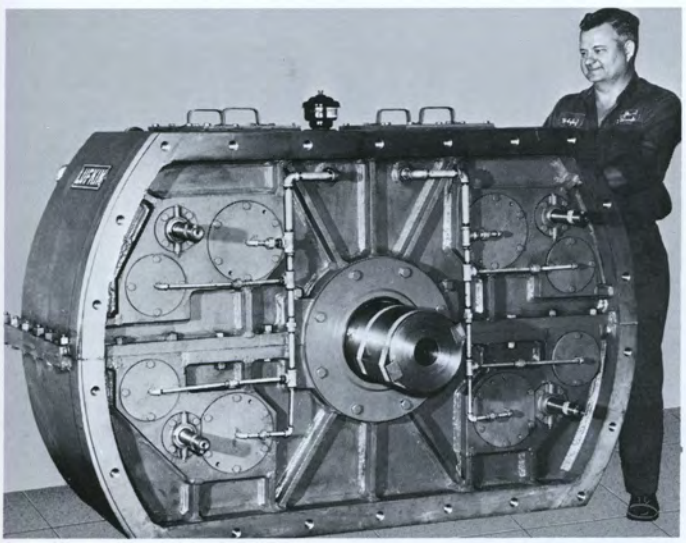
SPECIAL LUFKIN GEAR UNITS



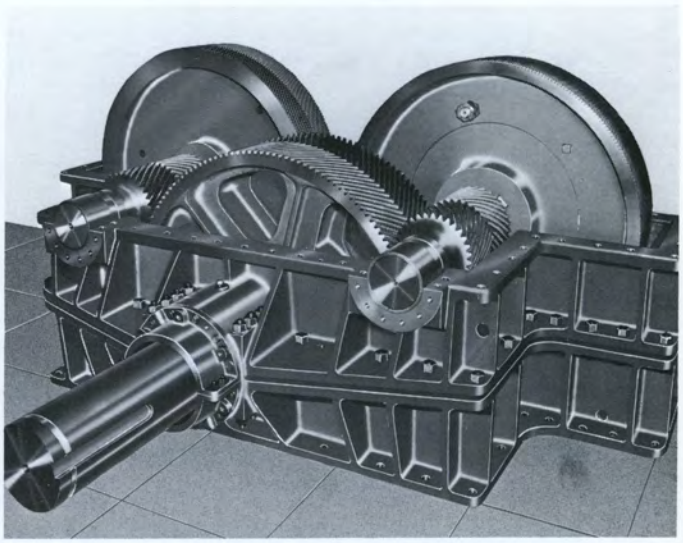
Lufkin Model V4800 Marine Propulsion Gear Reducer with tail shaft brake.



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



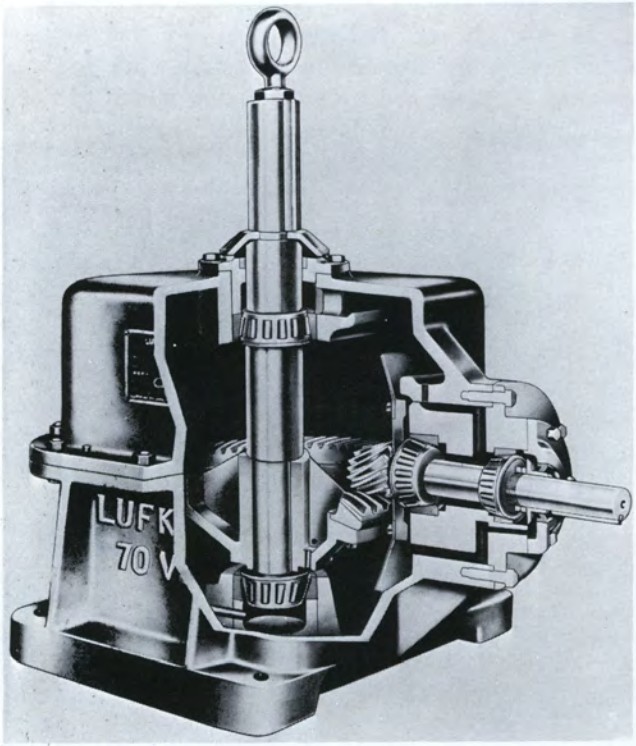
Special Triple Reduction Reducer with four input pinion shafts for driving rock boring machine.



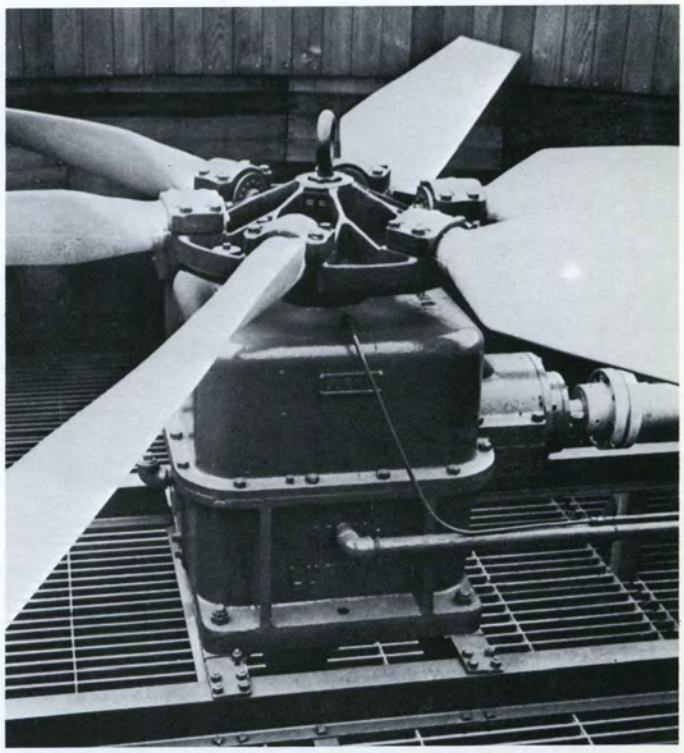
One of eight identical Lufkin Model DC3620 Double Reduction Compound Reducers for driving cutter head in dredging service for a Gulf Coast Dredging Company.

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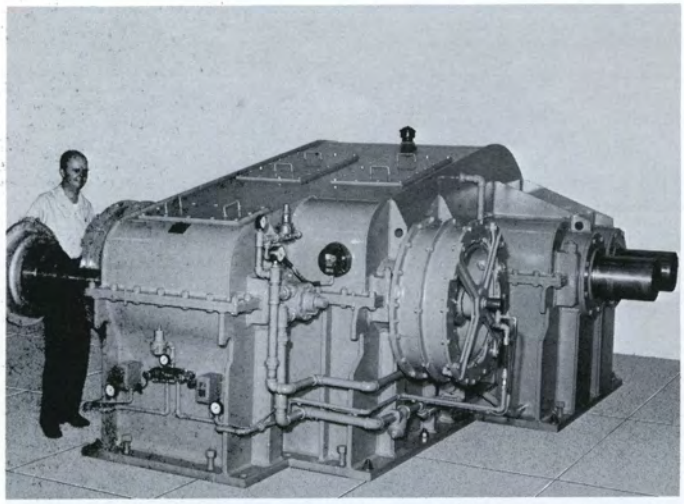
SPECIAL LUFKIN GEAR UNITS



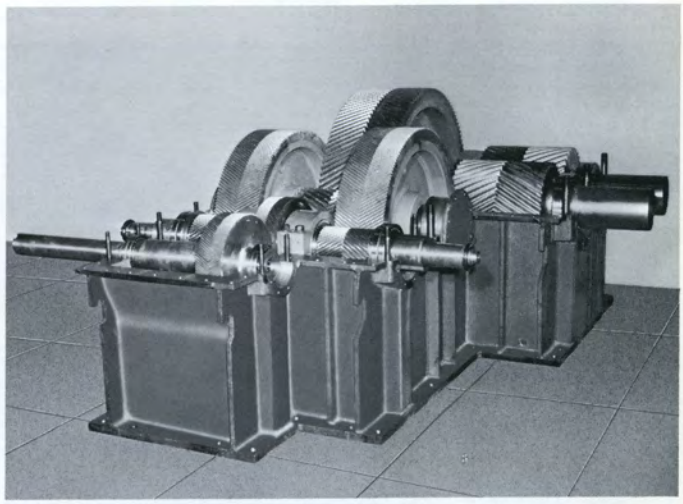
Cut away showing construction of Lufkin Type VB Spiral Bevel Gear Reducer for Cooling Tower Fan Service.



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.

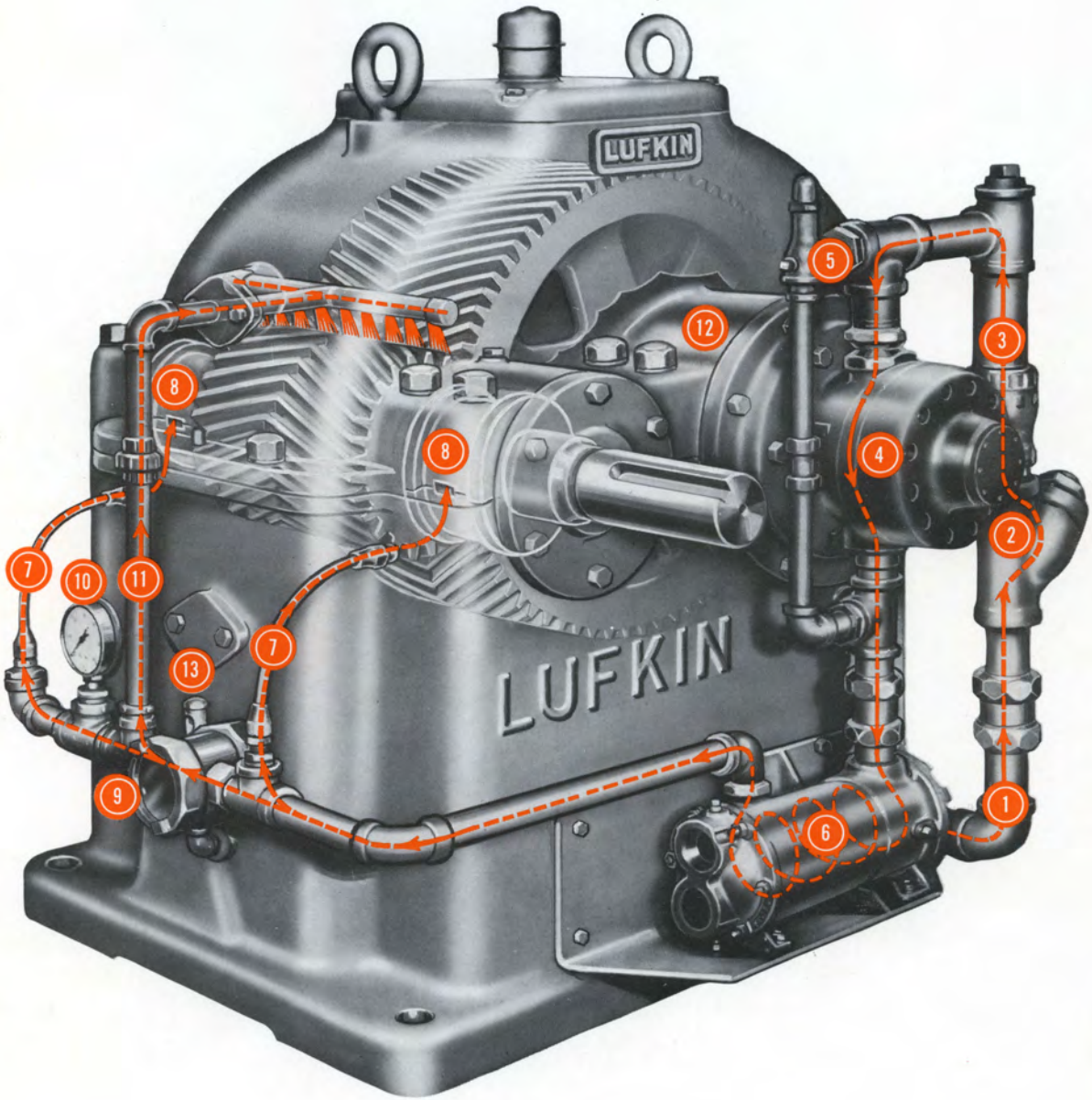


Lufkin Model D860S Two Speed Reducer with cover removed showing gear arrangement.

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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.

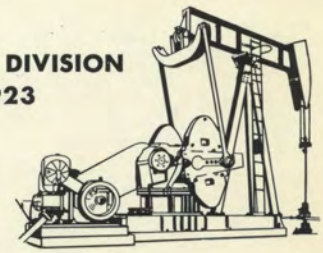
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LUFKIN MILESTONES OF GROWTH

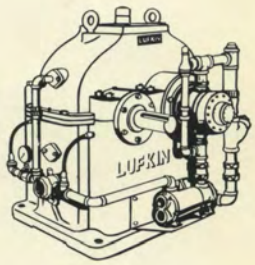
Lufkin Foundry & Machine Company founded 1902 as a repair shop for sawmill and railroad machinery . . . guided by progressive leadership . . . gifted with technical ability . . . located strategically in the growing Southwest . . . of humble origin . . . this company has grown proudly in scope and stature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

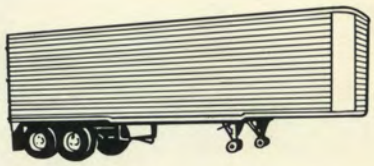


OILFIELD DIVISION
1923



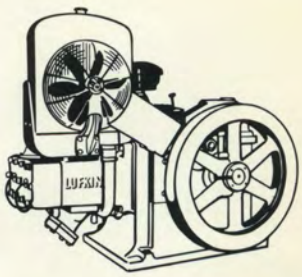
GEAR DIVISION
1939





TRAILER DIVISION
1939

ENGINE
DIVISION
1940



LUFKIN

FOUNDRY & MACHINE COMPANY
LUFKIN, TEXAS