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# LUFKIN GEARS

## SPIRAL BEVEL GEAR REDUCERS

TYPE VB




## *for* COOLING TOWER FAN DRIVES

Spiral Bevel Gear Bulletin G-8

MEMBER OF AGMA

**LUFKIN FOUNDRY & MACHINE COMPANY**

LUFKIN, TEXAS

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# LUFKIN TYPE VB SPIRAL BEVEL GEAR REDUCERS

## Cooling Tower Fan Drives

Horsepower ratings listed in the following tables are mechanical ratings calculated in accordance with the American Gear Manufacturers Association formula using a Service Factor of 1. To make proper selection of size, multiply the actual horsepower load to be transmitted by the applicable Service Factor to obtain Equivalent Horsepower. The smallest unit showing a Catalog Horsepower Rating equal to or greater than this Equivalent Horsepower at the desired speed and ratio is the proper selection.

Conversely, the actual Service Rating for any particular ratio and speed may be obtained by dividing the Catalog Horsepower Rating listed here by the applicable Service Factor.

When Cooling Tower Institute specifications are required for an industrial Cooling Tower Fan driven by electric motor or turbine the Service Factor is 2. If service is less severe a modified service factor may be applied.

The ratings shown in red cover standard stock sizes which are generally available for immediate delivery.

The ratings shown in bold face type are for standard ratios which are readily available but not necessarily in stock. The other ratios shown are for rating purposes only. Any ratio desired, or a very close approximation, may be obtained. Approximate ratings for intermediate ratios and speeds may be found by direct interpolation.

EXAMPLE: Reducer desired to deliver 40 horsepower with 1750 RPM motor; fan speed 242 RPM.

$$\text{Gear Ratio} = \frac{\text{Motor RPM}}{\text{Fan RPM}} = \frac{1750}{242} = 7.23$$

Equivalent HP = HP load $\times$ Service Factor = $40 \times 2 = 80$ HP. By inspection of the Rating Tables it is found that at 1750 RPM input speed the smallest reducer having a rating of at least 80 HP at the desired ratio is the 90VB which rates 86 HP at 7.22 ratio.

The actual Service Rating of the 90VB under these conditions =

$$\frac{\text{Catalog Rating}}{\text{Service Factor}} = \frac{86}{2} = 43 \text{ HP}$$

| SIZE | Motor R.P.M. | RATIO | | | | | | | | | | | Thermal H.P.: 7.5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1.79 | 1.94 | 2.53 | 2.64 | 2.94 | 3 | 3.5 | 4 | 4.5 | | | |
| | 1750 | 16.6 | 14.9 | 10.4 | 9.8 | 8.6 | 8.4 | 6.8 | 5.7 | 4.9 | | | |
| 20VB | 1150 | 11.7 | 10.5 | 7.3 | 6.7 | 6.1 | 5.9 | 4.7 | 3.9 | 3.3 | | | |
| | 870 | 9.1 | 8.2 | 5.9 | 5.5 | 4.6 | 4.5 | 3.7 | 3.2 | 2.7 | | | |

| SIZE | Motor R.P.M. | RATIO | | | | | | | | | Thermal H.P.: 11 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | 2.5 | 2.70 | 2.92 | 3.5 | 3.92 | 4.0 | 4.5 | 5 | | | |
| | 1750 | 27 | 19.8 | 17.7 | 16.0 | 12.6 | 10.9 | 10.6 | 9.0 | 7.8 | | | |
| 25 VB | 1150 | 18.4 | 13.7 | 12.5 | 11.0 | 8.8 | 7.5 | 7.3 | 6.3 | 5.5 | | | |
| | 870 | 14.6 | 10.9 | 10 | 8.8 | 6.9 | 5.9 | 5.7 | 4.9 | 4.3 | | | |

| SIZE | Motor R.P.M. | RATIO | | | | | | | | | | Thermal H.P.: 15 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | 2.5 | 2.92 | 3.18 | 3.5 | 3.81 | 3.90 | 4.5 | 5.0 | 5.5 | | |
| | 1750 | 40 | 30.3 | 25.5 | 24.9 | 19.4 | 17.3 | 16.8 | 13.7 | 12.0 | 10.6 | | |
| 30 VB | 1150 | 28 | 21 | 16.8 | 15 | 13.3 | 12.2 | 11.8 | 9.6 | 8.4 | 7.4 | | |
| | 870 | 21 | 16.8 | 13.6 | 12.2 | 10.6 | 9.7 | 9.4 | 7.6 | 6.5 | 5.9 | | |

| SIZE | Motor R.P.M. | RATIO | | | | | | | | | | Thermal H.P.: 25 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2.0 | 2.56 | 3.07 | 3.42 | 3.60 | 4.00 | 4.55 | 4.86 | 5.12 | 5.5 | 6 | |
| | 1750 | 70 | 52 | 40 | 36 | 34 | 29 | 24 | 22.6 | 21.1 | 18.9 | 17.2 | |
| 40VB | 1150 | 49 | 37 | 28 | 24.6 | 23.5 | 20.1 | 17 | 15.7 | 14.8 | 13.4 | 11.7 | |
| | 870 | 40 | 29 | 22 | 20 | 18.9 | 16 | 13 | 12.2 | 11.5 | 10.4 | 9.3 | |

| SIZE | Motor R.P.M. | RATIO | | | | | | | | | Thermal H.P.: 30 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2.0 | 2.47 | 3 | 3.5 | 4.11 | 4.62 | 5.12 | 5.5 | 6.14 | | | |
| | 1750 | 82 | 65 | 51 | 43 | 35 | 29 | 25.8 | 23.3 | 20 | | | |
| 50 VB | 1150 | 61 | 45 | 36 | 29 | 24.6 | 21 | 18.7 | 16.2 | 15.0 | | | |
| | 870 | 49 | 37 | 29 | 23.9 | 19.3 | 16.6 | 14.8 | 13.2 | 11.3 | | | |

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| SIZE | Motor R.P.M. | RATIO | | | | | | | | | | Thermal H.P.: 45 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2.0 | 2.5 | 2.93 | 3.5 | 4.0 | 4.42 | 4.86 | 5.22 | 5.5 | 5.62 | 5.86 | 6.00 |
| | 1750 | 133 | 106 | 85 | 68 | 57 | 51 | 45 | 41 | 39 | 37 | 35 | 33 |
| 60 VB | 1150 | 98 | 77 | 63 | 48 | 41 | 36 | 32 | 29 | 27 | 27 | 25 | 23.9 |
| | 870 | 80 | 60 | 49 | 39 | 32 | 29 | 25 | 22.6 | 21.7 | 21 | 20.6 | 20 |

| SIZE | Motor R.P.M. | RATIO | | | | | | | | | Thermal H.P.: 60 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 3.0 | 3.5 | 4.0 | 4.5 | 5.0 | 5.5 | 5.75 | 6.0 | 6.5 | 7.0 | | |
| | 1750 | 146 | 121 | 102 | 86 | 76 | 67 | 63 | 60 | 53 | 49 | | |
| 70 VB | 1150 | 104 | 85 | 72 | 61 | 53 | 47 | 44 | 43 | 39 | 35 | | |
| | 870 | 84 | 68 | 59 | 49 | 43 | 37 | 35 | 33 | 31 | 28 | | |

| SIZE | Motor R.P.M. | RATIO | | | | | | | | | Thermal H.P.: 70 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 3.0 | 3.5 | 4.10 | 4.5 | 5.0 | 5.5 | 6 | 6.57 | 6.86 | 7.5 | | |
| | 1750 | 200 | 166 | 138 | 122 | 105 | 93 | 84 | 74 | 69 | 64 | | |
| 80 VB | 1150 | 142 | 117 | 97 | 86 | 73 | 64 | 57 | 51 | 48 | 44 | | |
| | 870 | 114 | 94 | 77 | 69 | 59 | 51 | 47 | 41 | 39 | 35 | | |

| SIZE | Motor R.P.M. | RATIO | | | | | | | | | Thermal H.P.: 90 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4.0 | 4.5 | 5 | 5.5 | 6.0 | 6.5 | 7.22 | 7.86 | 8.29 | | | |
| | 1750 | 189 | 154 | 134 | 120 | 108 | 98 | 86 | 80 | 72 | | | |
| 90 VB | 1150 | 130 | 113 | 98 | 86 | 77 | 70 | 61 | 56 | 52 | | | |
| | 870 | 105 | 90 | 78 | 70 | 63 | 56 | 49 | 44 | 40 | | | |

| SIZE | Motor R.P.M. | RATIO | | | | | | | | | | Thermal H.P.: 100 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4.0 | 4.5 | 5.0 | 5.5 | 6.0 | 6.5 | 7.13 | 7.71 | 7.86 | 8.29 | 8.71 | |
| | 1750 | 245 | 213 | 184 | 166 | 149 | 133 | 118 | 106 | 104 | 96 | 90 | |
| 100 VB | 1150 | 173 | 150 | 133 | 118 | 105 | 93 | 82 | 74 | 72 | 68 | 63 | |
| | 870 | 140 | 121 | 105 | 93 | 82 | 72 | 65 | 60 | 57 | 53 | 51 | |

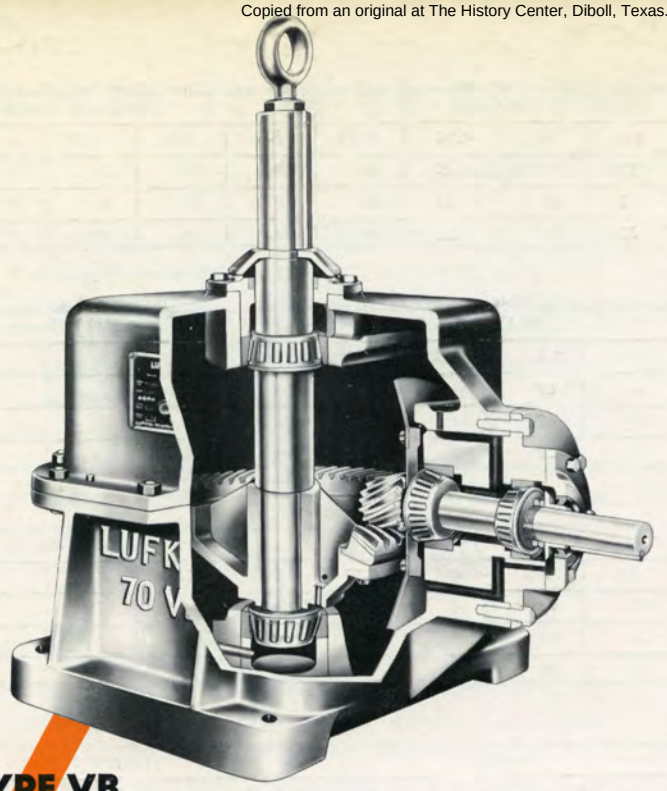
| SIZE | Motor R.P.M. | RATIO | | | | | | | | | Thermal H.P.: 120 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4.5 | 5.0 | 5.5 | 6.0 | 6.5 | 7.13 | 7.50 | 8.00 | 8.5 | 9.17 | | |
| | 1750 | 249 | 218 | 194 | 176 | 157 | 140 | 130 | 120 | 110 | 100 | | |
| 110 VB | 1150 | 177 | 153 | 138 | 124 | 110 | 98 | 92 | 84 | 78 | 70 | | |
| | 870 | 141 | 124 | 110 | 100 | 89 | 78 | 73 | 67 | 61 | 55 | | |

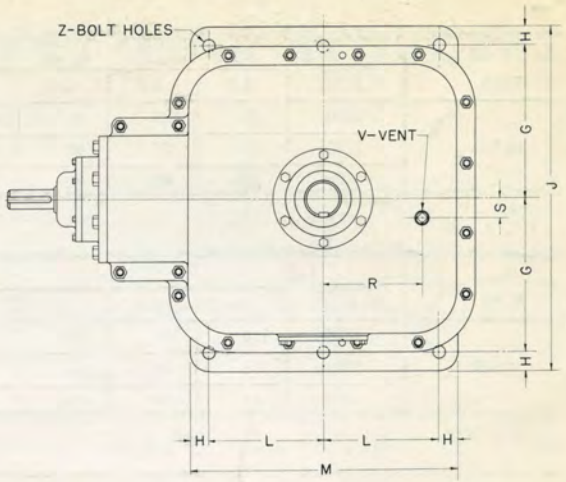
| SIZE | Motor R.P.M. | RATIO | | | | | | | | | | Thermal H.P.: 135 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4.5 | 5.0 | 5.5 | 6.11 | 6.5 | 6.75 | 7.0 | 7.5 | 8.0 | 8.5 | 9.17 | 9.83 |
| | 1750 | 275 | 239 | 214 | 188 | 173 | 166 | 158 | 148 | 134 | 126 | 120 | 120 |
| 115 VB | 1150 | 201 | 174 | 156 | 136 | 126 | 121 | 116 | 106 | 97 | 89 | 83 | 83 |
| | 870 | 164 | 145 | 126 | 109 | 100 | 96 | 92 | 84 | 77 | 72 | 66 | 66 |

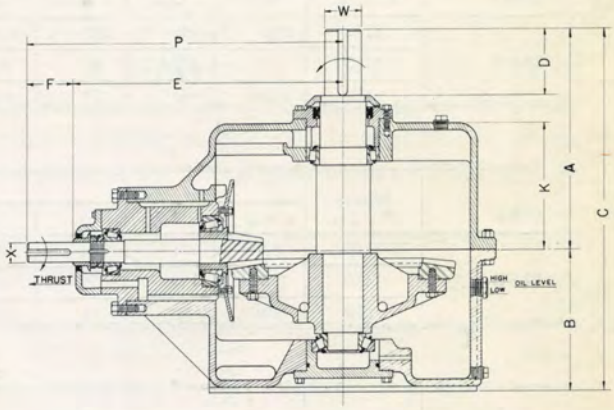
| SIZE | Motor R.P.M. | RATIO | | | | | | | | | | Thermal H.P.: 145 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 5.0 | 5.5 | 6.0 | 6.5 | 6.75 | 7.0 | 7.5 | 8.14 | 9.17 | 9.83 | | |
| | 1750 | 326 | 287 | 257 | 233 | 222 | 211 | 196 | 174 | 150 | 150 | | |
| 120 VB | 1150 | 229 | 201 | 180 | 164 | 156 | 149 | 134 | 122 | 105 | 105 | | |
| | 870 | 186 | 165 | 146 | 133 | 126 | 120 | 109 | 98 | 84 | 84 | | |

| SIZE | Motor R.P.M. | RATIO | | | | | | | | | | Thermal H.P.: 200 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 5.0 | 5.5 | 6.0 | 6.5 | 7.0 | 7.5 | 8.0 | 9.17 | 9.83 | 10.1 | | |
| | 1750 | 490 | 440 | 389 | 368 | 347 | 311 | 275 | 232 | 210 | 200 | | |
| 150 VB | 1150 | 346 | 312 | 277 | 253 | 229 | 210 | 190 | 163 | 150 | 120 | | |
| | 870 | 285 | 257 | 229 | 208 | 187 | 171 | 155 | 131 | 120 | 92 | | |

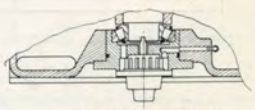
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# TYPE VB
# SPIRAL BEVEL GEAR REDUCERS
## . . for Cooling Tower Fan Drives . .
# LUFKIN



OIL PUMP OPTIONAL

## GENERAL DIMENSIONS

**Dimensions Are Not to Be Used for Installation. Use Certified Installation Print.**

| Unit | A | B | C | D | E | F | G | H | J | K | L | M | N* | P | R | S | V-Vent Pipe Size | W | W Keyway | X | X Keyway | Z** | Net Weight, Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20VB... | 8¼ | 4½ | 12¾ | 3½ | 6⅞ | 2⅛ | 3⅞ | ⅝ | 9 | †2¼ | 2½ | 6¼ | 1 | 9 | †3⅛ | †0 | ¼ | 1¼ | ¼ x ⅛ | 11/16 | 3/16 x 3/32 | 7/16-4 | 75 |
| 25VB... | 8¼ | 4½ | 12¾ | 3½ | 7¾ | 2¼ | 4⅜ | ⅝ | 10 | †2¼ | 3 | 7¼ | 1 | 10 | †3⅝ | †0 | ¼ | 1¼ | ¼ x ⅛ | ⅞ | 3/16 x 3/32 | 9/16-4 | 85 |
| 30VB... | 12 11/32 | 6 | 18 11/32 | 5 | 9⅜ | 2⅞ | 4⅞ | ¾ | 11¼ | 5¾ | 3¼ | 8 | 1⅛ | 12¼ | 2⅞ | 2⅞ | 1 | 1¾ | ⅜ x 3/16 | ⅞ | 3/16 x 3/32 | 9/16-4 | 140 |
| 40VB... | 13¼ | 7 | 20¼ | 5 | 9 11/16 | 3 1/16 | 5½ | ¾ | 12½ | 6¾ | 3⅝ | 9¼ | 1⅛ | 13 | 2 11/16 | 2 11/16 | 1 | 1¾ | ⅜ x 3/16 | 1 | ¼ x ⅛ | 9/16-4 | 210 |
| 50VB... | 16⅞ | 8½ | 25⅜ | 7 | 11 1/16 | 3 11/16 | 6¾ | 1¼ | 16 | 8 | 4½ | 11½ | 1½ | 15 | 4½ | 1⅞ | 1 | 2 | ½ x ¼ | 1⅛ | ¼ x ⅛ | 13/16-4 | 305 |
| 60VB... | 16⅞ | 8½ | 25⅜ | 7 | 13 1/16 | 3 11/16 | 8 | 1¼ | 18½ | 8 | 5¾ | 14 | 1½ | 17⅝ | 5⅛ | 1½ | 1 | 2 | ½ x ¼ | 1¼ | ¼ x ⅛ | 13/16-4 | 450 |
| 70VB... | 18 | 10 | 28 | 6½ | 15 11/16 | 3¼ | 9 | 1½ | 21 | 9⅛ | 6½ | 16 | 2 | 19 1/16 | 6 | 1½ | 1 | 2¼ | ½ x ¼ | 1⅜ | ⅜ x 3/16 | 13/16-4 | 590 |
| 80VB... | 18 | 10 | 28 | 6½ | 18 | 3½ | 9¾ | 1½ | 22½ | 9⅛ | 7¼ | 17½ | 2 | 21½ | 6 | 1½ | 1 | 2¼ | ½ x ¼ | 1⅝ | ½ x ¼ | 13/16-4 | 865 |
| 90VB... | 20¾ | 12 | 32¾ | 7 | 20⅞ | 3 1/16 | 11⅞ | 1¾ | 27¼ | 11⅜ | 8⅜ | 20¼ | 2½ | 24 3/16 | 7 | 1½ | 1 | 2¾ | ⅝ x 5/16 | 1⅞ | ½ x ¼ | 1 1/16-6 | 1,125 |
| 100VB... | 20¾ | 12 | 32¾ | 7 | 22¼ | 3¼ | 12½ | 1¾ | 28½ | 11⅜ | 9 | 21½ | 2½ | 25½ | 8 | 1½ | 1 | 2¾ | ⅝ x 5/16 | 1⅞ | ½ x ¼ | 1 1/16-6 | 1,340 |
| 110VB... | 22¾ | 14 | 36¾ | 7 | 24⅛ | 4⅜ | 14¼ | 1¾ | 32 | 13⅛ | 10¾ | 25 | 2½ | 28½ | 9½ | 2 | 1 | 3¼ | ¾ x ⅜ | 2⅛ | ½ x ¼ | 1 1/16-6 | 1,650 |
| 115VB... | 22¾ | 14 | 36¾ | 7 | 25⅞ | 5 | 15 | 1¾ | 33½ | 13⅛ | 11½ | 26½ | 2½ | 30⅞ | 10½ | 2 | 1 | 3¼ | ¾ x ⅜ | 2⅛ | ½ x ¼ | 1 1/16-6 | 1,850 |
| 120VB... | 23½ | 15 | 38½ | 7 | 28⅝ | 4⅞ | 16¼ | 2 | 36½ | 13⅝ | 12¼ | 28½ | 2¾ | 33½ | 10½ | 2 | 1 | 3⅞ | 1 x ½ | 2⅜ | ⅝ x 5/16 | 1 5/16-6 | 2,150 |
| 150VB... | Refer to Factory for Dimensions. | | | | | | | | | | | | | | | | | | | | | | |

* N—Thickness of Base Flange ** Z—Bolt Hole Size and Quantity Bolts Required † Vent Located on Side of Unit Shaft Tolerances ± .0005

# LUFKIN FOUNDRY & MACHINE CO. LUFKIN, TEXAS

*Branch offices:* Dallas, Houston, Tulsa, Los Angeles, New York, Oklahoma City, Chicago, Cleveland, Corpus Christi, Kilgore, Wichita Falls, Casper, Wyo., Great Bend, Kan., Odessa, Tex., Seminole, Okla., El Dorado, Ark., Lafayette, La., Sidney, Mont., Edmonton, Alberta, Canada, Bakersfield, Denver, Regina, Hobbs, Midland, Natchez.

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