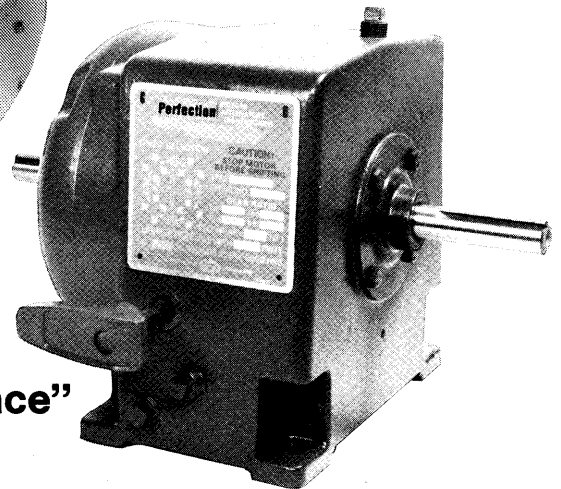
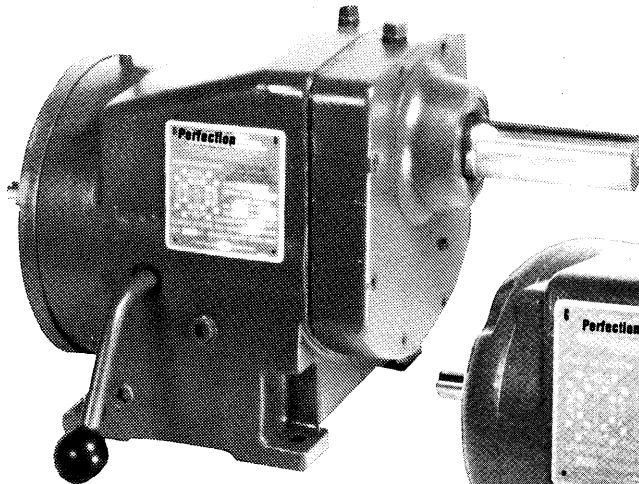
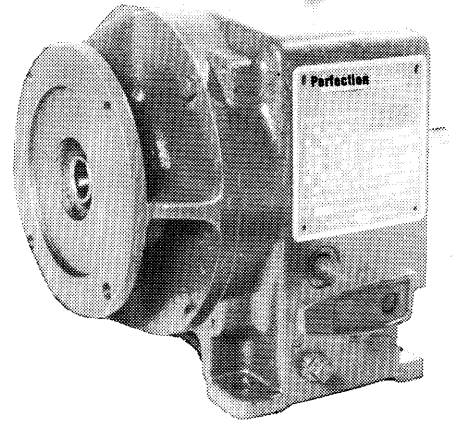
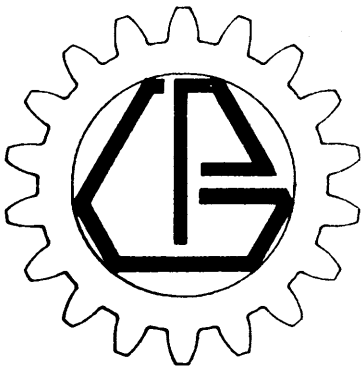


# CATALOG 450

*30 years of perfection and still running smooth!*



**4-Speed  
Motorless and "C-Face"**



# PERFECTION GEAR

"Gearing for the future"

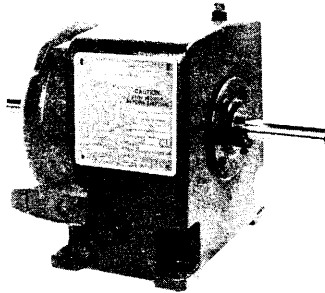


# PERFECTION

## GEARSHIFT TRANSMISSIONS

### General Information

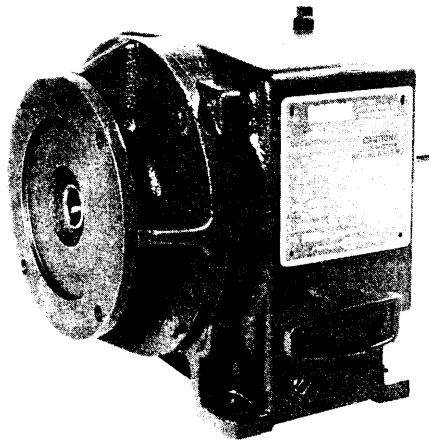
**MOTORLESS  
GEARSHIFT TRANSMISSIONS**



The Perfection Gearshift Transmission offered in this catalog is the most comprehensive line of transmission products in today's market.

Perfection provides, through a nationwide system of authorized distributors, the engineering and field support necessary to service this comprehensive product line.

| <b>Table of Contents</b>  | <b>PAGE</b> |
|---------------------------|-------------|
| Selection Procedure ..... | 1           |
| Product Features .....    | 2           |
| Lubrication Chart .....   | 2           |



| <b>Perfection Gearshift Transmissions</b> |        |
|---|--------|
| RD .....                                  | 3, 4   |
| Adapt-O-Drive II .....                    | 5, 6   |
| R30D .....                                | 7, 8   |
| R31D .....                                | 7, 9   |
| R32D .....                                | 7, 10  |
| R33D .....                                | 7, 11  |
| R30DS .....                               | 12, 13 |
| How to Order .....                        | 14, 20 |

*All dimensions and technical data are subject to change without notice. Dimensions are not to be used for construction unless certified. Tolerances where not stated are  $\pm 1/32$ ". Weights do not include weight of boxing for shipment.*

# PERFECTION

## GEARSHIFT TRANSMISSIONS

### Selection Procedure

#### Type of machine:

##### Class I

- 1.0 Service Factor
- No Shocks
- \_\_\_ Centrifugal Pumps
- \_\_\_ Take-Up/Pay-Out
- \_\_\_ Fans
- \_\_\_ Elevators
- \_\_\_ Machine Tools
- \_\_\_ Valve Actuators

- \_\_\_ Piston Pumps
- \_\_\_ Compressors
- \_\_\_ Crushers, Grinders
- \_\_\_ Printing Machines
- \_\_\_ Winders, Coilers

##### Class III

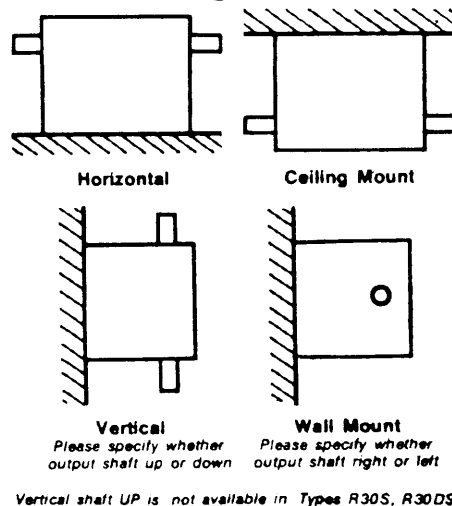
- 1.50 Service Factor
- Heavy Shocks

- \_\_\_ Paper Machines
- \_\_\_ Stone Crushers
- \_\_\_ Rolling Mills
- \_\_\_ Piston Pumps without flywheel
- \_\_\_ Refrigeration Cooling Towers
- \_\_\_ Rotating Table Boring, Drilling
- \_\_\_ Machines (Indexing)

##### Class II

- 1.25 Service Factor
- Moderate Shocks
- \_\_\_ Mixers
- \_\_\_ Looms
- \_\_\_ Mine Fans

#### Mounting Positions



#### Transmission Selection Procedure

1. Establish AGMA service classification as Class I, II or III with above table.
2. Determine the HP of the prime mover.
3. Multiply the service factor in Step 1 by the actual HP in Step 2 to determine the Catalog Horsepower.
4. Make tentative unit selection based upon the HP ranges in the following table:

##### Catalog Horsepower Selection

| TYPE UNIT        | POWER RANGE |
|------------------|-------------|
| /RD              | 1.0 - 2 HP  |
| Adapt-O-Drive II | .75 - 10 HP |
| /R30D, /R32D     | 3 - 7.5 HP  |
| /R31D, /R33D     | 3 - 10 HP   |
| /R30DS           | 3 - 7.5 HP  |
| /R52D            | 10 - 25 HP  |

5. Determine the exact transmission ratios required for the application.
6. Select ratios according to closest available ratios of each unit.

7. The overhung load must be calculated on all shafts which are not integrally mounted or direct coupled:

$$\text{Overhung Load} = \frac{\text{HP} \times 63025}{n \times R}$$

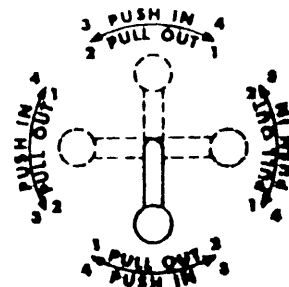
- HP = Transmitted Horsepower
- n = RPM of Shaft
- R = Radius of sprocket, pinion or pulley — inches.

*Overhung load capacities for LIMA units are listed under Specifications for each type unit.*

8. Specify mounting position and shift lever position.

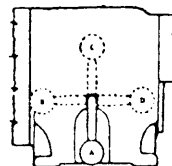
9. If motorized, indicate phases, frequency and voltage of the power supply on which the motorized transmission will be operated.

#### Shift Lever Positions



**STANDARD SHIFT-LEVER POSITIONS**

In addition to the standard position, the shift lever is available in three other optional positions to fit the space requirements of your installation. Shift lever is also available on opposite side from standard. Standard shift lever position is left hand side when facing output shaft.



**OPTIONAL SHIFT-LEVER POSITIONS**

# PERFECTION

## GEARSHIFT TRANSMISSIONS

### Product Features, Lubrication

Ratings from 1.0 to 25 HP in motorless units.  
4 speeds with up to 6:1 speed reduction.

Up to 12.8:1 speed reduction with secondary gearing. (in selected models)

#### Special features and characteristics:

- **Flange Mount:** C-face available with Adapt-O-Drive II, 1.0 - 10 HP.
- **Service Manuals:** Parts and service manuals are provided with all PERFECTION transmissions.
- **Gearing:** High quality gearing which runs quietly and provides exact speed repeatability in all ratios. Reversible rotation is available at all speeds.
- **Secondary Gearing:** Provides lower output speeds only for types R30DS and R52D.
- **Neutral:** Neutral position with no gear engagement standard on all units.
- **Gear Case:** Rugged cast iron construction.
- **Overhung Load:** Bearings and shafts are sized to accommodate most normal overhung loads. Refer to specific data for each type unit for overhung load capacities.
- **Seals:** Seals prevent oil leakage in all mounting positions and protect bearings from outside dust and dirt.
- **Lubrication:** Oil capacity provides adequate lubrication for standard mounting. Oil pump provides positive lubrication in optional mounting positions.
- **Shifting:** All PERFECTION units have 4 standard shift handle positions; Page 1. Shift lever located on both sides of unit is standard feature except Types R30DS and R52D.
- **Mounting:** All PERFECTION units can be mounted in standard horizontal position. Wall, ceiling or vertical mounting is also available; Page 1.
- **Testing:** All PERFECTION units are tested prior to shipment.

### LUBRICATION

| TYPE UNIT                                     | LUBRICANT | HORIZONTAL | CEILING   | SHAFT UP              | SHAFT DOWN | WALL     |
|---|-----------|------------|-----------|-----------------------|------------|----------|
| RD<br>ADAPT-O-DRIVE II                        | AMOUNT    | 2 PINTS    | 2.5 PINTS | 2 PINTS               | 3 PINTS    | 3 PINTS  |
|   | TYPE      | SAE #90    | SAE #90   | SAE #90               | SAE #90    | SAE #90  |
| R30D, R31D, R32D,<br>R33D<br>ADAPT-O-DRIVE II | AMOUNT    | 5 PINTS    | 5 PINTS   | 8 PINTS               | 8 PINTS    | 7 PINTS  |
|   | TYPE      | SAE #140   | SAE #140  | SAE #140              | SAE #140   | SAE #140 |
| R30DS   | AMOUNT    | 6 PINTS    | 8 PINTS   | NOT AVAIL-            | 9 PINTS    | 8 PINTS  |
|   | TYPE      | SAE #140   | SAE #140  | ABLE THIS<br>POSITION | SAE #140   | SAE #140 |
| R52D  | AMOUNT    | 12 PINTS   | 12 PINTS  | 17 PINTS              | 22 PINTS   | 23 PINTS |
|   | TYPE      | SAE #140   | SAE #140  | SAE #140              | SAE #140   | SAE #140 |

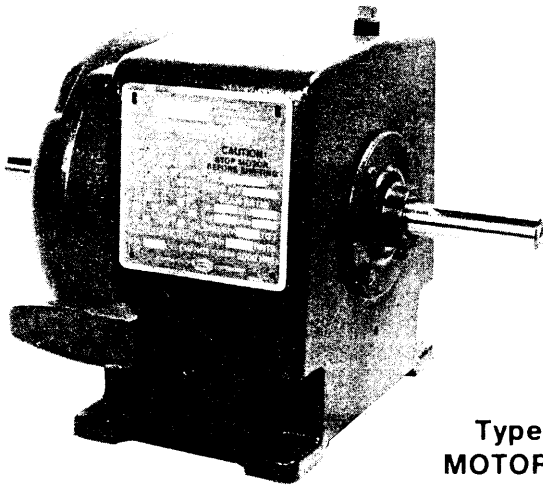
# PERFECTION

## GEARSHIFT TRANSMISSIONS

**Type RD**  
**1.0 to 2 HP**

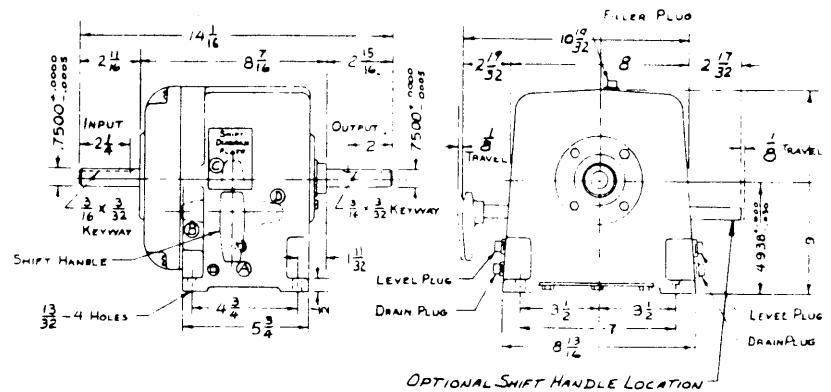
### Features:

- Ratio: 4 - 2 - 1.33 - 1:1 (Nominal)
- Shift handle standard on both sides of unit. See Page 1 for the four (4) shift handle positions and gearcase mounting.
- Service Manual SM100



**Type RD**  
**MOTORLESS**

### Type RD Motorless Dimensions



### Specifications:

Output overhung load  
at midpoint of shaft ... **175 lbs.**  
Minimum sheave dia. ... **5.1 inches**

Approximate dry weight

*Motorless* ..... **42 lbs.**

Max. input speed ..... **2000 rpm**

Table 1 — Output Performance for Standard Electric Motors

| RATIOS | .75 HP    |                |           |                | 2 HP      |                | 1.5 HP    |                |           |                | 1 HP      |                |           |                |
|--------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|
|        | 1750 RPM  |                | 1150 RPM  |                | 1750 RPM  |                | 1750 RPM  |                | 1150 RPM  |                | 1750 RPM  |                | 1150 RPM  |                |
|        | SPEED RPM | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. |
| 4      | 438       | 108            | 288       | 164            | 438       | 288            | 438       | 216            | 288       | 328            | 438       | 144            | 288       | 219            |
| 2      | 875       | 51             | 575       | 82             | 875       | 144            | 875       | 108            | 575       | 164            | 875       | 72             | 575       | 110            |
| 1.33   | 1312      | 36             | 862       | 55             | 1312      | 96             | 1312      | 72             | 862       | 110            | 1312      | 48             | 862       | 73             |
| 1      | 1750      | 27             | 1150      | 41             | 1750      | 72             | 1750      | 54             | 1150      | 82             | 1750      | 36             | 1150      | 55             |

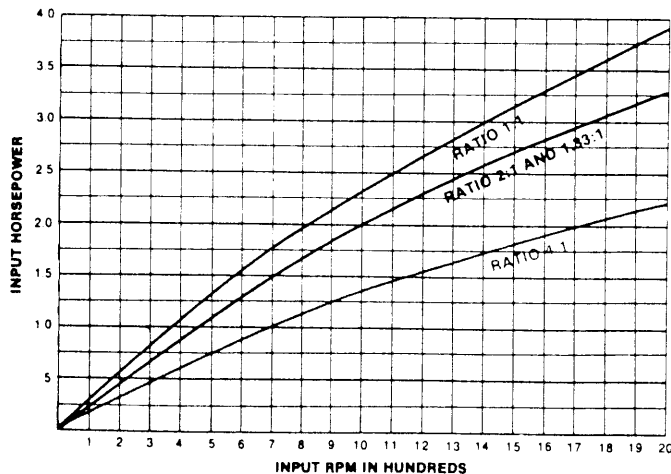
Table 2 — Maximum Input/Output Capacities Representative of Curves 1 and 2.  
(Please use curves for other values of Input Speeds)

| RATIOS | 1750 RPM INPUT |                |           |                | 1150 RPM INPUT |                |           |                | 875 RPM INPUT |                |           |                |
|--------|----------------|----------------|-----------|----------------|----------------|----------------|-----------|----------------|---------------|----------------|-----------|----------------|
|        | INPUT          |                | OUTPUT    |                | INPUT          |                | OUTPUT    |                | INPUT         |                | OUTPUT    |                |
|        | MAX. HP        | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. | MAX. HP        | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. | MAX. HP       | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. |
| 4      | 2.0            | 72             | 438       | 282            | 1.5            | 82             | 288       | 321            | 1.2           | 86             | 219       | 337            |
| 2      | 3.0            | 108            | 875       | 216            | 2.2            | 121            | 575       | 237            | 1.8           | 130            | 438       | 254            |
| 1.33   | 3.0            | 108            | 1312      | 140            | 2.2            | 121            | 862       | 157            | 1.8           | 130            | 656       | 169            |
| 1      | 3.5            | 126            | 1750      | 123            | 2.6            | 142            | 1150      | 139            | 2.1           | 151            | 875       | 145            |

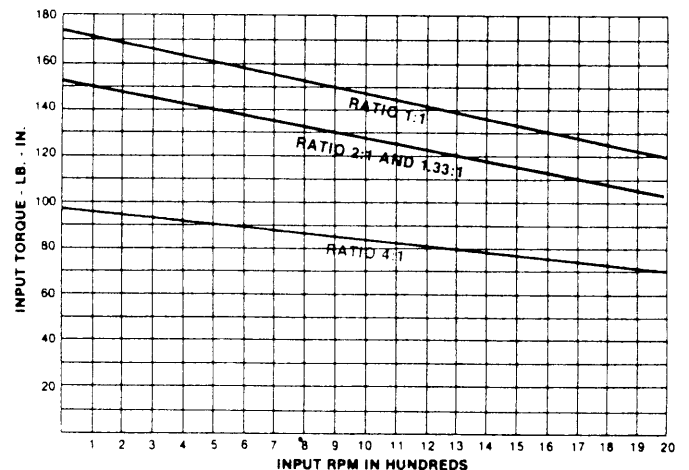
1. The above power ratings (Input HP) are predicated on maximum Torque/Speed and Thermal Capacities of the transmission.

2. These values are for Class I service. A larger unit should be selected if Class II or III calculated values exceed tabular rating.

Curve 1 - Input Horsepower/Speed



Curve 2 - Input Torque/Speed



1. The above performance curves and Table 2 are for Class I (1.0 service factor) only. Class II and Class III ratings can be determined as follows:  
 Class II Service = Class I Rating X 1.25  
 Class III Service = Class I Rating X 1.50

2. The PERFECTION transmission is warranted for D.C. applications up to 2000 RPM. Please contact factory for applications with input speeds greater than 2000 RPM.

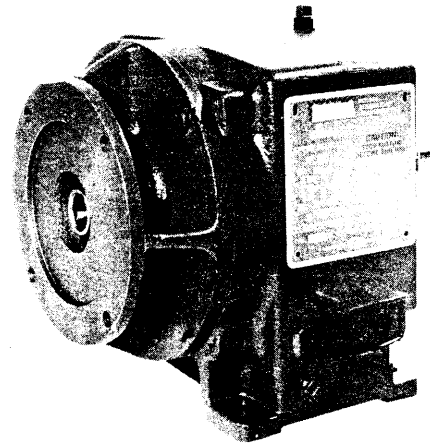
# PERFECTION

## GEARSHIFT TRANSMISSIONS

### Adapt-O-Drive II

The close-coupled, 4-speed gearshift transmission you can add to most .75 to 2 HP motors . . . quickly and easily!

- **Rating:** Rated for a maximum of 2 HP @ 1750 rpm. Horsepower and Torque ratings for this unit shown on page 5.
- **Ratios:** 4 - 2 - 1:33 - 1:1 (Nominal)
- **Adaptability:** Fits NEMA C-Face T-Frame AC and DC motors; Frames 56C, 140TC, 160 ATC.
- **Nomenclature:** The RD Adapt-O-Drive is available with C-Face input only (RD-C5 or C7), or with C-Face at input and output (RDC-C5 or C7)



RD-C5  
RD-C7

### Features:

- RD Adapt-O-Drive will accommodate  $\frac{5}{8}$ " input shaft on RD-C5, or  $\frac{7}{8}$ " input shaft on RD-C7.
- Shift handle standard on both sides of unit. See Page 1 for the four(4) shift handle positions and gearcase mounting.
- Service Manual SM200

### Specifications:

Output overhung load at midpoint of shaft . . . **175 lbs.**  
Minimum sheave dia. . . **5.1 inches**

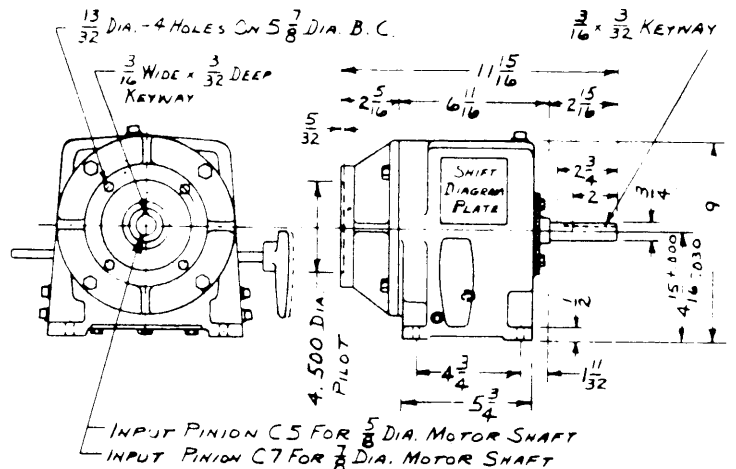
Approximate dry weight

|        |         |
|--------|---------|
| RD-C5  | 45 lbs. |
| RD-C7  | 45 lbs. |
| RDC-C5 | 50 lbs. |
| RDC-C7 | 50 lbs. |

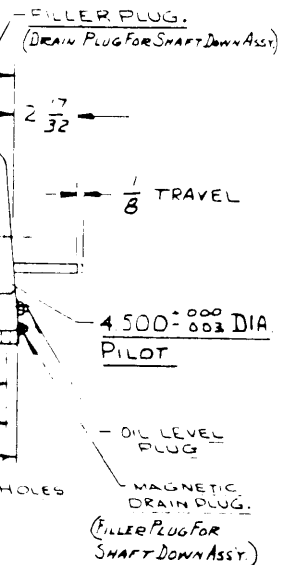
Max. input speed . . . **2000 rpm**

C-Face Input

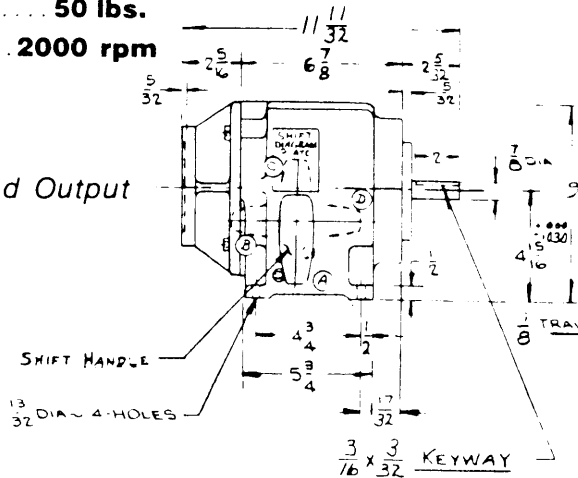
C-Face Input Only



C-Face Output



C-Face Input and Output



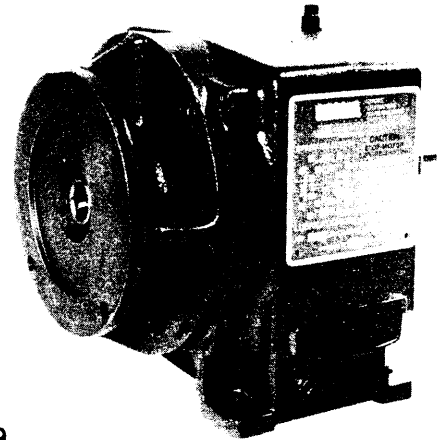
# PERFECTION

## GEARSHIFT TRANSMISSIONS

### Adapt-O-Drive II

*The close-coupled, 4-speed gearshift transmission you can add to most 2 to 10 HP motors . . . quickly and easily!*

- **Rating:** Rated for a maximum of 10 HP @ 1750 RPM; see Table 1 (below).
- **Ratios:** Four sets of standard ratios with 6:1 maximum reduction, see Table 1 (below).
- **Adaptability:** Fits NEMA C-Face T-Frame AC and DC motors; frames 180TC, 210TC, 180ATC, 210ATC.
- **Nomenclature:** The R3XD Adapt-O-Drive is available with C-Face input only (R3XD-C9 or C11), or with C-Face at input and output (R3XDC-C9 or C11).



**R3XD-C9  
R3XD-C11**

### Features:

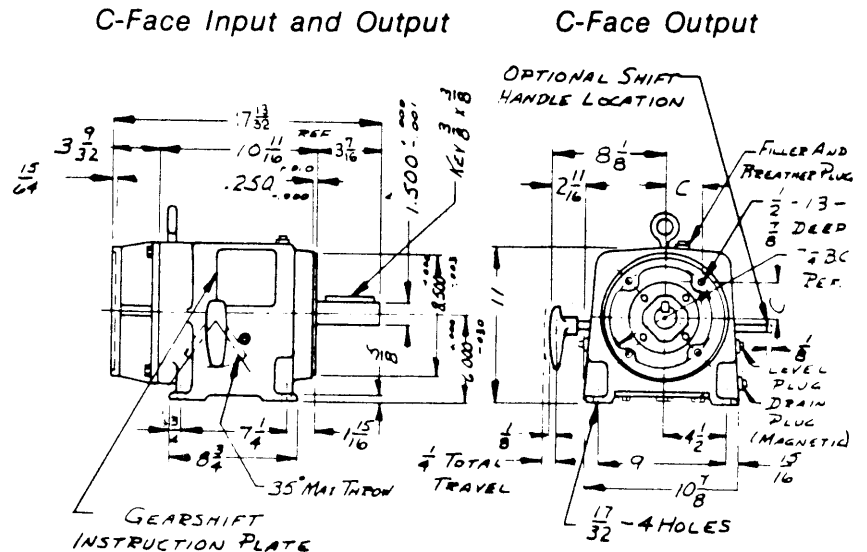
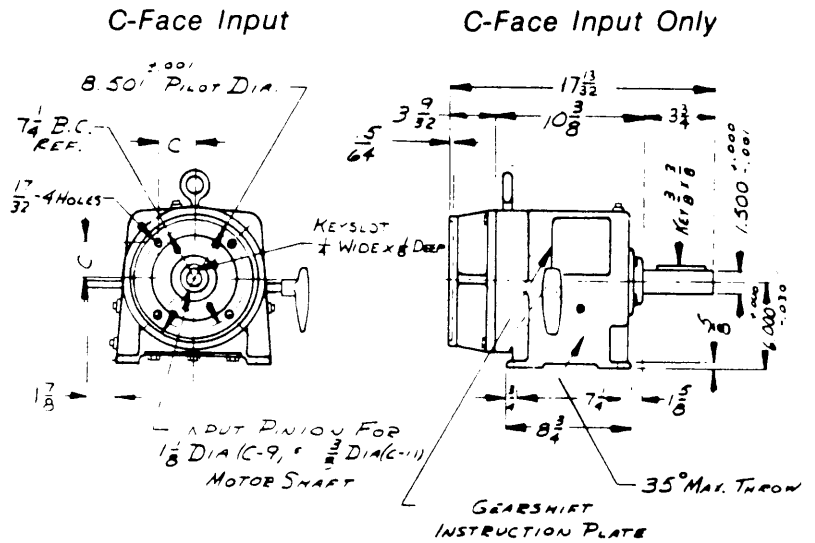
- **Ratios and Ratings:** The R3XD series Adapt-O-Drive II is available with ratios from the R30D, 31D, 32D and 33D transmissions. See Table 1, "Specifications".
- **R3XD Adapt-O-Drive II** will accommodate 1 1/8" input shaft (R3XD-C9), or 1 3/8" input shaft (R3XD-C11).  
*Example: an R3XD Adapt-O-Drive requiring R31 ratios, C-Face on input and output with 1 3/8" input shaft is designated R31 DC-C11.*
- Shift handle standard on both sides of unit. See Page 1 for the four(4) shift handle positions and gearcase mounting.
- Service Manual SM700

### Specifications:

Table 1

| Type Unit | Rating at 1750 RPM | Nominal Ratios           | R3XD Technical Data |
|-----------|--------------------|--------------------------|---------------------|
| R30D      | 7.5 HP             | 4.15 - 3.15 - 1.85 - 1:1 | See Page 8          |
| R31D      | 10 HP              | 4 - 3 - 2 - 1:1          | See Page 9          |
| R32D      | 7.5 HP             | 6 - 4 - 2 - 1:1          | See Page 10         |
| R33D      | 10 HP              | 4 - 2 - 1.33 - 1:1       | See Page 11         |

- Output overhung load at midpoint of shaft ... **425 lbs.**
- Minimum sheave dia. ... **7.9 inches**
- Approximate dry weight
  - R3XDC-C9 ..... **120 lbs.**
  - R3XDC-C11 ..... **125 lbs.**
  - R3XD-C9 ..... **105 lbs.**
  - R3XD-C11 ..... **110 lbs.**
- Max. input speed ..... **2000 rpm**





# PERFECTION

## GEARSHIFT TRANSMISSIONS

**Types**  
**R30D, R31D, R32D, R33D**  
**3 to 10 HP**

### Features:

- |                                    |              |
|------------------------------------|--------------|
|                                    | <b>MODEL</b> |
| ■ Ratio: 4:00 - 3.10 - 2.00 - 1:1  | R31D         |
| (Nominal) 4.15 - 3.15 - 1.85 - 1:1 | R30D         |
| 5.81 - 4.00 - 2.00 - 1:1           | R32D         |
| 4.0 - 2.0 - 1.33 - 1:1             | R33D         |
- C-Face available on input and output
  - Shift handle standard on both sides of unit.  
See page 1 for the four (4) shift handle positions and gearcase mounting.
  - Service Manual SM300

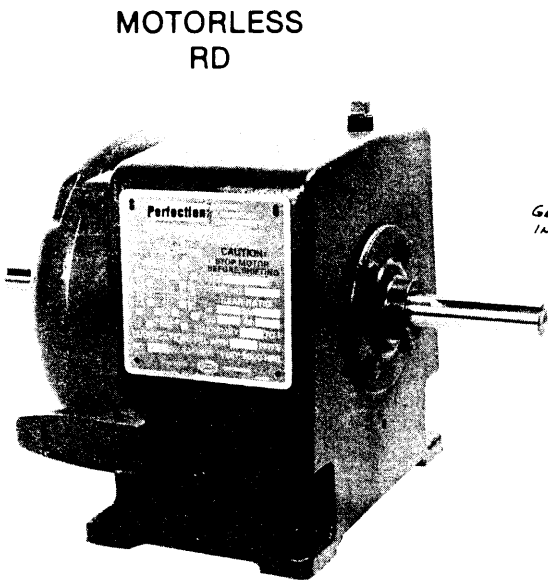
### Specifications:

Output overhung load  
 at midpoint of shaft . . . . . **425 lbs.**  
 Minimum sheave dia. . . . . **7.9 inches**

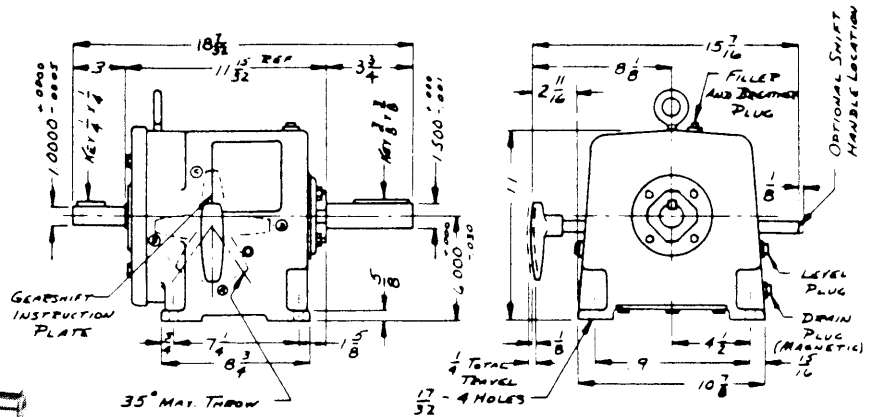
Approximate dry weight

*Motorless* . . . . . **95 lbs.**

Max. input speed . . . . . **2000 rpm**



**Motorless Dimensions**



**Table A**

| HORSEPOWER |          | DIMENSIONS |        |        |        |       |        |
|------------|----------|------------|--------|--------|--------|-------|--------|
| 1750 RPM   | 1150 RPM | FRAME      | A      | B      | C      | D     | E      |
| 3 5        | 2 3      | 215        | 24 1/4 | 20 3/8 | 15 7/8 | 7 3/4 | 10 1/4 |
| 7 1/2 10   | 5 7 1/2  | 254        | 27 7/8 | 24 1/8 | 16 3/4 | 8 1/4 | 11     |

# R30D

**Table 1 – Output Performance for Standard Electric Motors**

| RATIOS | 3 HP      |                |           |                | 5 HP      |                |           |                | 7.5 HP    |                |
|--------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|
|        | 1750 RPM  |                | 1150 RPM  |                | 1750 RPM  |                | 1150 RPM  |                | 1750 RPM  |                |
|        | SPEED RPM | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. |
| 4.15   | 423       | 447            | 278       | 680            | 423       | 744            | 278       | 1133           | 423       | 1116           |
| 3.15   | 561       | 337            | 368       | 513            | 561       | 562            | 368       | 855            | 561       | 843            |
| 1.85   | 942       | 201            | 619       | 305            | 942       | 334            | 619       | 509            | 942       | 502            |
| 1.00   | 1750      | 108            | 1150      | 164            | 1750      | 180            | 1150      | 274            | 1750      | 270            |

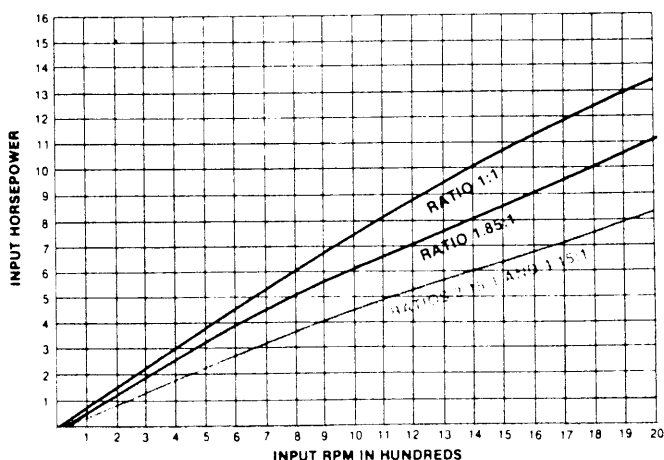
**Table 2 – Maximum Input/Output Capacities Representative of Curves 1 and 2.**  
(Please use curves for other values of Input Speeds)

| RATIOS | 1750 RPM INPUT |                |           |                | 1150 RPM INPUT |                |           |                | 875 RPM INPUT |                |           |                |
|--------|----------------|----------------|-----------|----------------|----------------|----------------|-----------|----------------|---------------|----------------|-----------|----------------|
|        | INPUT          |                | OUTPUT    |                | INPUT          |                | OUTPUT    |                | INPUT         |                | OUTPUT    |                |
|        | MAX. HP        | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. | MAX. HP        | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. | MAX. HP       | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. |
| 4.15   | 7.5            | 270            | 423       | 1098           | 5.2            | 286            | 278       | 1163           | 4.1           | 296            | 212       | 1200           |
| 3.15   | 7.5            | 270            | 561       | 833            | 5.2            | 286            | 368       | 882            | 4.1           | 296            | 280       | 913            |
| 1.85   | 10.0           | 360            | 942       | 652            | 7.1            | 388            | 619       | 703            | 5.6           | 406            | 471       | 736            |
| 1.00   | 12.2           | 438            | 1750      | 429            | 8.6            | 470            | 1150      | 460            | 6.7           | 483            | 875       | 473            |

1. The above power ratings (Input HP) are predicated on maximum Torque/Speed and Thermal Capacities of the transmission.

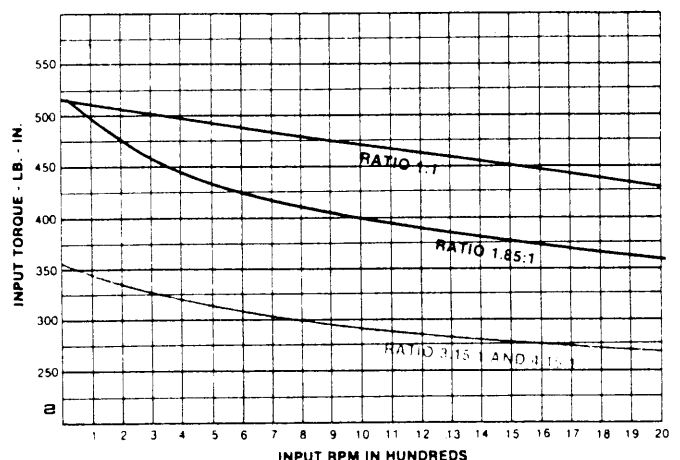
2. These values are for Class I service. A larger unit should be selected if Class II or III calculated values exceed tabular rating.

**Curve 1 - Input Horsepower/Speed**



1. The above performance curves and Table 2 are for Class I (1.0 service factor) only. Class II and Class III ratings can be determined as follows:  
 Class II Service = Class I Rating X 1.25  
 Class III Service = Class I Rating X 1.50

**Curve 2 - Input Torque/Speed**



2. The PERFECTION transmission is warranted for D.C. applications up to 2000 RPM. Please contact factory for applications with input speeds greater than 2000 RPM.

# R31D

**Table 1 – Output Performance for Standard Electric Motors**

| RATIOS | 3 HP         |                   |              |                   | 5 HP         |                   |              |                   | 7.5 HP       |                   |              |                   | 10 HP        |                   |
|--------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|
|        | 1750 RPM     |                   | 1150 RPM     |                   | 1750 RPM     |                   | 1150 RPM     |                   | 1750 RPM     |                   | 1150 RPM     |                   | 1750 RPM     |                   |
|        | SPEED<br>RPM | TORQUE<br>LB.-IN. | SPEED<br>RPM | TORQUE<br>LB.-IN. | SPEED<br>RPM | TORQUE<br>LB.-IN. | SPEED<br>RPM | TORQUE<br>LB.-IN. | SPEED<br>RPM | TORQUE<br>LB.-IN. | SPEED<br>RPM | TORQUE<br>LB.-IN. | SPEED<br>RPM | TORQUE<br>LB.-IN. |
| 4 00   | 438          | 432               | 288          | 657               | 438          | 720               | 288          | 1095              | 438          | 1079              | 288          | 1643              | 438          | 1439              |
| 3 10   | 572          | 331               | 376          | 503               | 572          | 551               | 376          | 838               | 572          | 826               | 376          | 1257              | 572          | 1102              |
| 2 00   | 867          | 218               | 570          | 332               | 867          | 363               | 570          | 553               | 867          | 545               | 570          | 830               | 867          | 727               |
| 1 00   | 1750         | 108               | 1150         | 164               | 1750         | 180               | 1150         | 274               | 1750         | 270               | 1150         | 411               | 1750         | 360               |

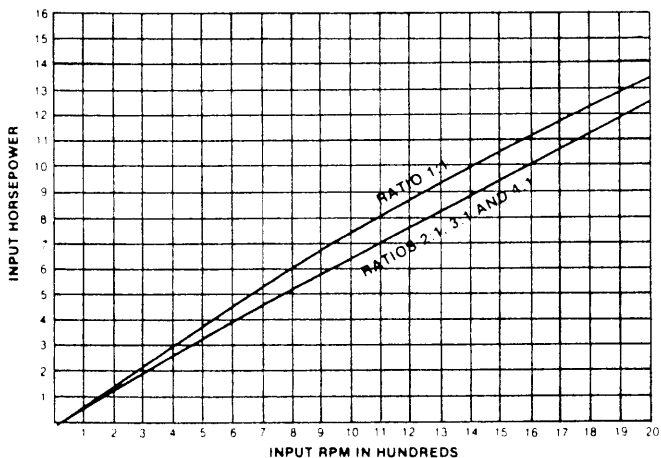
**Table 2 – Maximum Input/Output Capacities Representative of Curves 1 and 2.**  
(Please use curves for other values of Input Speeds)

| RATIOS | 1750 RPM INPUT |                   |              |                   | 1150 RPM INPUT |                   |              |                   | 875 RPM INPUT |                   |              |                   |
|--------|----------------|-------------------|--------------|-------------------|----------------|-------------------|--------------|-------------------|---------------|-------------------|--------------|-------------------|
|        | INPUT          |                   | OUTPUT       |                   | INPUT          |                   | OUTPUT       |                   | INPUT         |                   | OUTPUT       |                   |
|        | MAX.<br>HP     | TORQUE<br>LB.-IN. | SPEED<br>RPM | TORQUE<br>LB.-IN. | MAX.<br>HP     | TORQUE<br>LB.-IN. | SPEED<br>RPM | TORQUE<br>LB.-IN. | MAX.<br>HP    | TORQUE<br>LB.-IN. | SPEED<br>RPM | TORQUE<br>LB.-IN. |
| 4 00   | 11.1           | 400               | 438          | 1598              | 7.5            | 411               | 288          | 1642              | 5.8           | 418               | 219          | 1670              |
| 3 10   | 11.1           | 400               | 572          | 1224              | 7.5            | 411               | 376          | 1240              | 5.8           | 418               | 286          | 1269              |
| 2 00   | 11.1           | 400               | 867          | 784               | 7.5            | 411               | 570          | 805               | 5.8           | 418               | 434          | 819               |
| 1 00   | 12.2           | 438               | 1750         | 429               | 8.6            | 470               | 1150         | 460               | 6.7           | 483               | 875          | 429               |

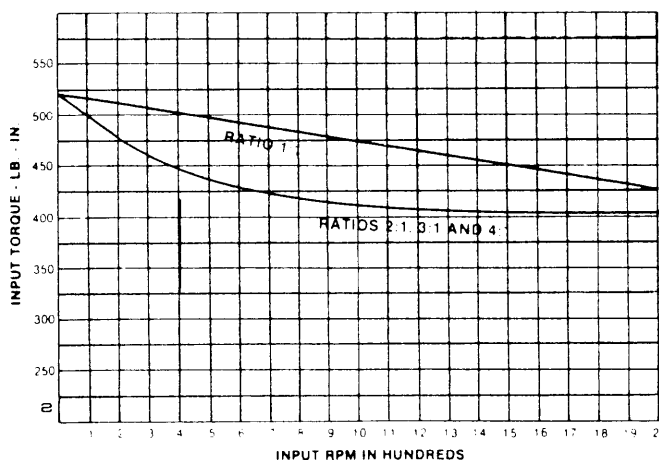
1. The above power ratings (Input HP) are predicated on maximum Torque Speed and Thermal Capacities of the transmission.

2. These values are for Class I service. A larger unit should be selected if Class II or III calculated values exceed tabular rating.

**Curve 1 - Input Horsepower/Speed**



**Curve 2 - Input Torque/Speed**



1. The above performance curves and Table 2 are for Class I (1.0 service factor) only. Class II and Class III ratings can be determined as follows:

Class II Service - Class I Rating X 1.25  
Class III Service - Class I Rating X 1.50

2. The PERFECTION transmission is warranted for D.C. applications up to 2000 RPM. Please contact factory for applications with input speeds greater than 2000 RPM.

# R32D

**Table 1 — Output Performance for Standard Electric Motors**

| RATIOS | 3 HP      |                |           |                | 5 HP      |                |           |                | 7.5 HP    |                |
|--------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|
|        | 1750 RPM  |                | 1150 RPM  |                | 1750 RPM  |                | 1150 RPM  |                | 1750 RPM  |                |
|        | SPEED RPM | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. |
| 5.81   | 301       | 628            | 198       | 956            | 301       | 1047           | 198       | 1593           | 301       | 1570           |
| 4.00   | 438       | 432            | 288       | 657            | 438       | 720            | 288       | 1095           | 438       | 1079           |
| 2.00   | 867       | 218            | 570       | 332            | 867       | 363            | 570       | 553            | 867       | 545            |
| 1.00   | 1750      | 108            | 1150      | 164            | 1750      | 180            | 1150      | 274            | 1750      | 270            |

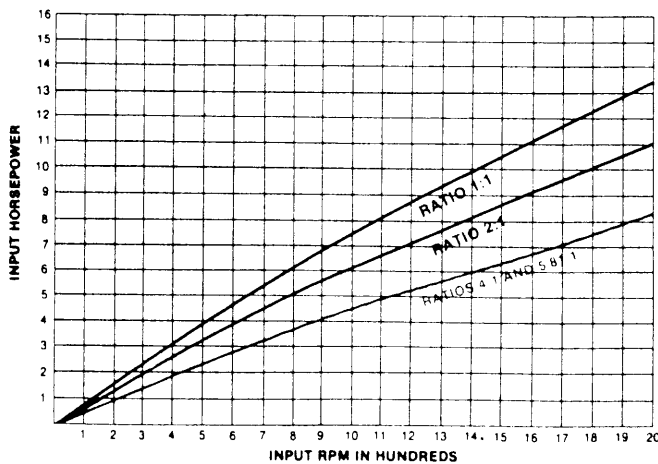
**Table 2 — Maximum Input/Output Capacities Representative of Curves 1 and 2.**  
(Please use curves for other values of Input Speeds)

| RATIOS | 1750 RPM INPUT |                |           |                | 1150 RPM INPUT |                |           |                | 875 RPM INPUT |                |           |                |
|--------|----------------|----------------|-----------|----------------|----------------|----------------|-----------|----------------|---------------|----------------|-----------|----------------|
|        | INPUT          |                | OUTPUT    |                | INPUT          |                | OUTPUT    |                | INPUT         |                | OUTPUT    |                |
|        | MAX. HP        | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. | MAX. HP        | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. | MAX. HP       | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. |
| 5.81   | 7.5            | 270            | 301       | 1537           | 5.2            | 280            | 198       | 1598           | 4.0           | 292            | 151       | 1662           |
| 4.00   | 7.5            | 270            | 438       | 1058           | 5.2            | 280            | 288       | 1097           | 4.0           | 292            | 219       | 1144           |
| 2.00   | 10.0           | 360            | 867       | 705            | 7.1            | 388            | 570       | 760            | 5.6           | 406            | 434       | 795            |
| 1.00   | 12.2           | 438            | 1750      | 424            | 8.6            | 470            | 1150      | 460            | 6.7           | 483            | 875       | 473            |

1. The above power ratings (Input HP) are predicated on maximum Torque/Speed and Thermal Capacities of the transmission.

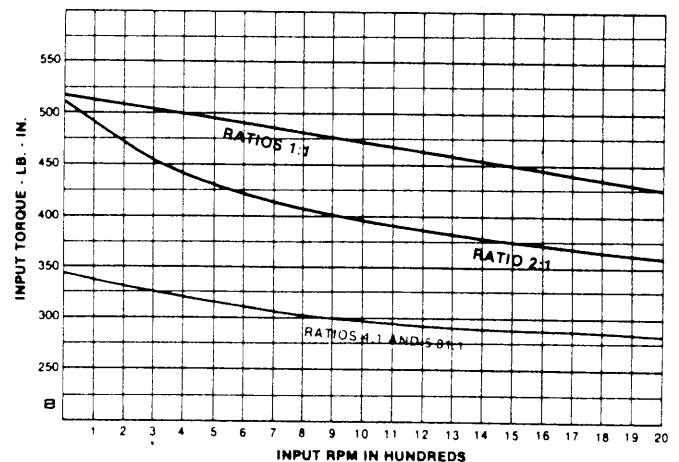
2. These values are for Class I service. A larger unit should be selected if Class II or III calculated values exceed tabular rating.

**Curve 1 - Input Horsepower/Speed**



1. The above performance curves and Table 2 are for Class I (1.0 service factor) only. Class II and Class III ratings can be determined as follows:  
 Class II Service = Class I Rating X 1.25  
 Class III Service = Class I Rating X 1.50

**Curve 2 - Input Torque/Speed**



2. The PERFECTION transmission is warranted for D.C. applications up to 2000 RPM. Please contact factory for applications with input speeds greater than 2000 RPM.

# R33D

## Table 1 — Output Performance for Standard Electric Motors

| RATIOS | 3 HP      |                |           |                | 5 HP      |                |           |                | 7.5 HP    |                |           |                | 10 HP     |                |
|--------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|
|        | 1750 RPM  |                | 1150 RPM  |                | 1750 RPM  |                | 1150 RPM  |                | 1750 RPM  |                | 1150 RPM  |                | 1750 RPM  |                |
|        | SPEED RPM | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. |
| 4.00   | 438       | 432            | 288       | 657            | 438       | 720            | 288       | 1095           | 438       | 1079           | 288       | 1643           | 438       | 1439           |
| 2.00   | 867       | 218            | 570       | 332            | 867       | 363            | 570       | 553            | 867       | 545            | 570       | 830            | 867       | 727            |
| 1.33   | 1316      | 144            | 865       | 219            | 1316      | 239            | 865       | 364            | 1316      | 359            | 865       | 547            | 1316      | 479            |
| 1.00   | 1750      | 108            | 1150      | 164            | 1750      | 180            | 1150      | 274            | 1750      | 270            | 1150      | 411            | 1750      | 360            |

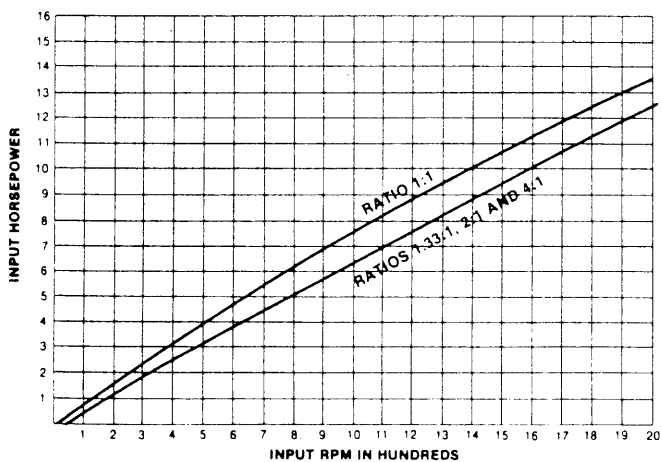
## Table 2 — Maximum Input/Output Capacities Representative of Curves 1 and 2. (Please use curves for other values of Input Speeds)

| RATIOS | 1750 RPM INPUT |                |           |                | 1150 RPM INPUT |                |           |                | 875 RPM INPUT |                |           |                |
|--------|----------------|----------------|-----------|----------------|----------------|----------------|-----------|----------------|---------------|----------------|-----------|----------------|
|        | INPUT          |                | OUTPUT    |                | INPUT          |                | OUTPUT    |                | INPUT         |                | OUTPUT    |                |
|        | MAX. HP        | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. | MAX. HP        | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. | MAX. HP       | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. |
| 4.00   | 11.1           | 400            | 438       | 1568           | 7.5            | 411            | 288       | 1642           | 5.8           | 418            | 219       | 1638           |
| 2.00   | 11.1           | 400            | 867       | 784            | 7.5            | 411            | 570       | 805            | 5.8           | 418            | 434       | 819            |
| 1.33   | 11.1           | 400            | 1316      | 521            | 7.5            | 411            | 865       | 536            | 5.8           | 418            | 658       | 544            |
| 1.00   | 12.2           | 438            | 1750      | 429            | 8.6            | 470            | 1150      | 460            | 6.7           | 483            | 875       | 473            |

1. The above power ratings (Input HP) are predicated on maximum Torque/Speed and Thermal Capacities of the transmission.

2. These values are for Class I service. A larger unit should be selected if Class II or III calculated values exceed tabular rating.

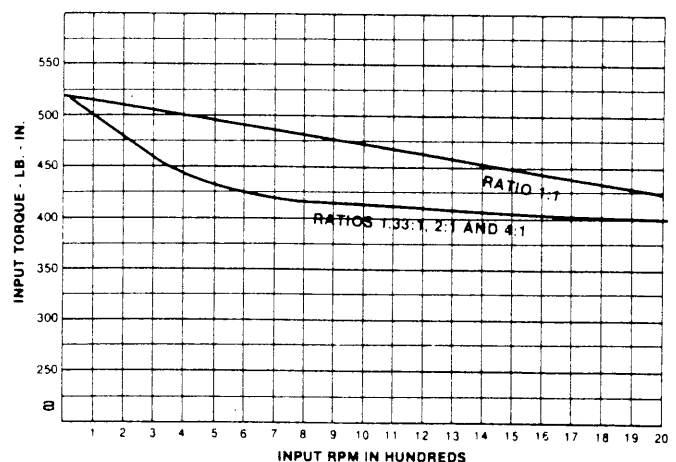
### Curve 1 - Input Horsepower/Speed



1. The above performance curves and Table 2 are for Class I (1.0 service factor) only. Class II and Class III ratings can be determined as follows:

Class II Service = Class I Rating X 1.25  
Class III Service = Class I Rating X 1.50

### Curve 2 - Input Torque/Speed



2. The PERFECTION transmission is warranted for D.C. applications up to 2000 RPM. Please contact factory for applications with input speeds greater than 2000 RPM.

# PERFECTION

## GEARSHIFT TRANSMISSIONS

### Type R 30 DS

### 3 to 7.5 HP

This unit uses standard R30D transmission gearing but had additional secondary reductions. These two secondary reductions, 1.85 and 2.22, extend the torque range and speed reduction characteristics.

### Features:

- Ratios: 7.66 - 5.81 - 3.42 - 1.85  
(Nominal) 9.20 - 6.99 - 4.10 - 2.22
- C-Face available on input of R30DS
- Shift handle also available opposite side of unit. See page 1 for the four (4) shift handle positions and gear case mounting
- Service Manual SM400

### Specifications:

Output overhung load at midpoint of shaft . . . . . **820 lbs.**  
 Minimum sheave dia. . . . . **9.1 inches**

Approximate dry weight  
*Motorless* . . . . . **142 lbs.**  
 Max. input speed . . . . . **2000 rpm**

Type R30DS "ADAPTO DRIVE"

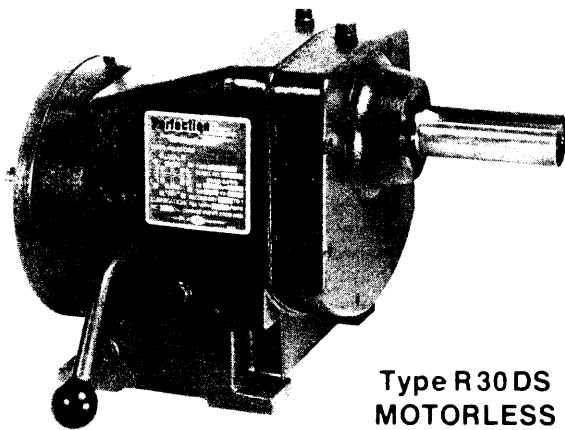
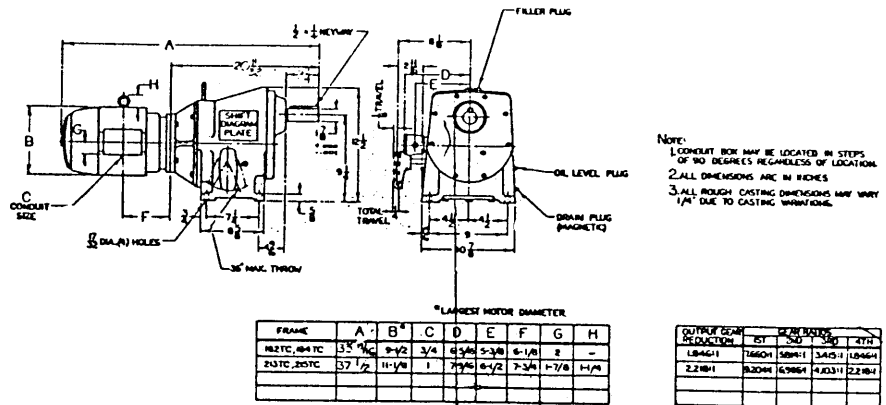
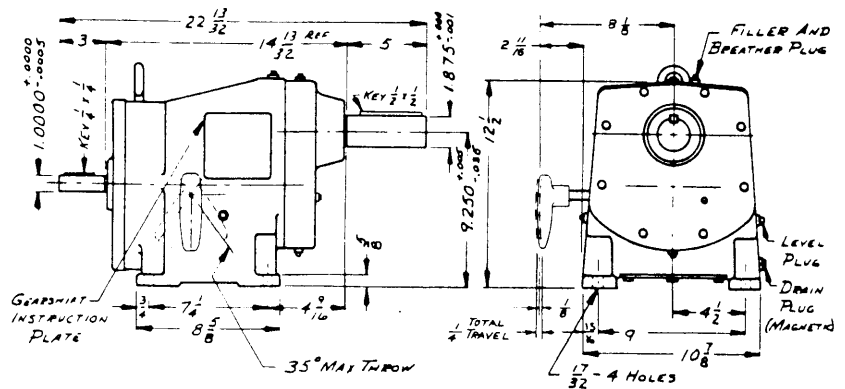


Table B

| HORSEPOWER |          | DIMENSIONS |         |         |        |       |        |
|------------|----------|------------|---------|---------|--------|-------|--------|
| 1750 RPM   | 1150 RPM | FRAME      | A       | B       | C      | D     | E      |
| 3.5        | 2.3      | 215        | 28 1/16 | 23 5/16 | 15 7/8 | 8 1/8 | 10 1/4 |
| 7 1/2      | 5        | 254        | 32 1/16 | 27 1/16 | 16 5/8 | 8 1/4 | 11     |

Type R30DS Motorless Dimensions



# R30DS

**Table 1 – Output Performance for Standard Electric Motors**

| SECONDARY RATIO | RATIOS | 3 HP      |                |           |                | 5 HP      |                |           |                | 7.5 HP    |                |
|-----------------|--------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|
|                 |        | 1750 RPM  |                | 1150 RPM  |                | 1750 RPM  |                | 1150 RPM  |                | 1750 RPM  |                |
|                 |        | SPEED RPM | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. |
| 1.85:1          | 7.66   | 229       | 824            | 151       | 1255           | 229       | 1374           | 151       | 2091           | 229       | 2061           |
|                 | 5.81   | 304       | 623            | 200       | 948            | 304       | 1038           | 200       | 1579           | 304       | 1557           |
|                 | 3.42   | 511       | 370            | 335       | 564            | 511       | 617            | 335       | 939            | 511       | 926            |
|                 | 1.85   | 948       | 199            | 623       | 304            | 948       | 332            | 623       | 506            | 948       | 499            |
| 2.22:1          | 9.20   | 191       | 990            | 125       | 1507           | 191       | 1650           | 125       | 2511           | 191       | 2476           |
|                 | 6.99   | 253       | 478            | 166       | 1138           | 253       | 1246           | 166       | 1897           | 253       | 1870           |
|                 | 4.10   | 425       | 445            | 279       | 677            | 425       | 741            | 279       | 1128           | 425       | 1112           |
|                 | 2.22   | 789       | 240            | 519       | 365            | 789       | 399            | 519       | 608            | 789       | 599            |

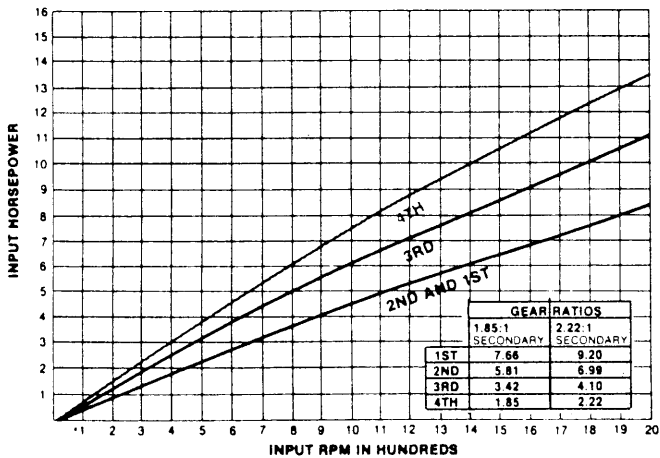
**Table 2 – Maximum Input/Output Capacities Representative of Curves 1 and 2.**  
(Please use curves for other values of Input Speeds)

| SECONDARY RATIO | RATIOS | 1750 RPM INPUT |                |           |                | 1150 RPM INPUT |                |           |                | 875 RPM INPUT |                |           |                |
|-----------------|--------|----------------|----------------|-----------|----------------|----------------|----------------|-----------|----------------|---------------|----------------|-----------|----------------|
|                 |        | INPUT          |                | OUTPUT    |                | INPUT          |                | OUTPUT    |                | INPUT         |                | OUTPUT    |                |
|                 |        | MAX. HP        | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. | MAX. HP        | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. | MAX. HP       | TORQUE LB.-IN. | SPEED RPM | TORQUE LB.-IN. |
| 1.85:1          | 7.66   | 7.5            | 270            | 229       | 2061           | 5.2            | 286            | 151       | 2175           | 4.1           | 296            | 115       | 2254           |
|                 | 5.81   | 7.5            | 270            | 304       | 1557           | 5.2            | 286            | 200       | 1642           | 4.1           | 296            | 152       | 1702           |
|                 | 3.42   | 10.0           | 360            | 511       | 1206           | 7.1            | 388            | 335       | 1300           | 5.6           | 406            | 255       | 1360           |
|                 | 1.85   | 12.2           | 438            | 948       | 794            | 8.6            | 469            | 623       | 850            | 6.7           | 482            | 474       | 873            |
| 2.22:1          | 9.20   | 7.5            | 270            | 191       | 2476           | 5.2            | 286            | 125       | 2612           | 4.1           | 296            | 95        | 2707           |
|                 | 6.99   | 7.5            | 270            | 253       | 1870           | 5.2            | 286            | 166       | 1973           | 4.1           | 296            | 126       | 2044           |
|                 | 4.10   | 10.0           | 360            | 425       | 1446           | 7.1            | 388            | 279       | 1558           | 5.6           | 406            | 213       | 1631           |
|                 | 2.22   | 12.2           | 438            | 789       | 952            | 8.6            | 469            | 519       | 1020           | 6.7           | 482            | 395       | 1055           |

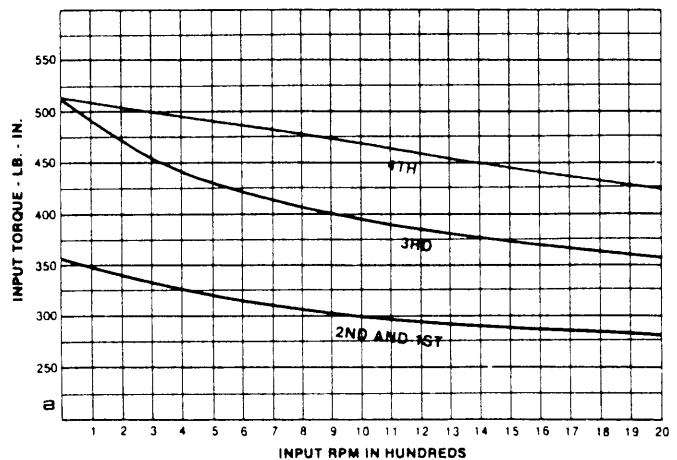
1. The above power ratings (Input HP) are predicated on maximum Torque/Speed and Thermal Capacities of the transmission.

2. These values are for Class I service. A larger unit should be selected if Class II or III calculated values exceed tabular rating.

**Curve 1 - Input Horsepower/Speed**



**Curve 2 - Input Torque/Speed**



1. The above performance curves and Table 2 are for Class I (1.0 service factor) only. Class II and Class III ratings can be determined as follows:

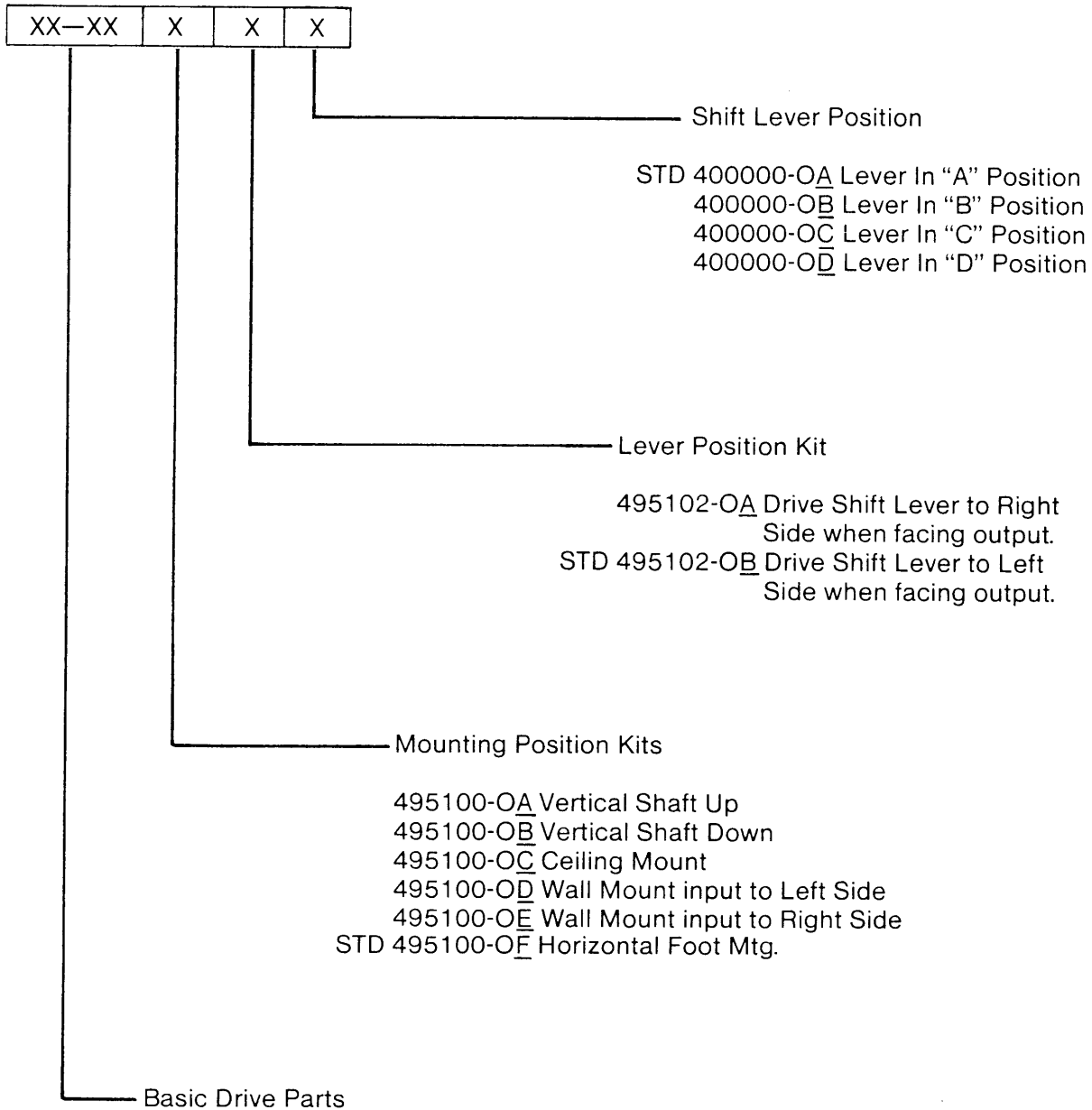
Class II Service = Class I Rating X 1.25  
Class III Service = Class I Rating X 1.50

2. The PERFECTION transmission is warranted for D.C. applications up to 2000 RPM. Please contact factory for applications with input speeds greater than 2000 RPM.

# Please Order Transmissions As Follows:

RATIOS (4:1) (2:1) (1.33:1) (1:1)  
RD MOTORLESS

EXAMPLE MODEL NUMBER  
RD-OAFBA

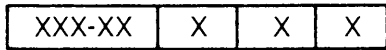


| Catalog No. | Input                          | Output                |
|-------------|--------------------------------|-----------------------|
| RD          | RD-O <u>A</u> 3/4" keyed shaft | 3/4 keyed shaft       |
| RDC         | RD-O <u>B</u> 3/4" keyed shaft | C face 7/8 shaft      |
| RD-C5       | RD-O <u>C</u> C face 5/8 shaft | Keyed shaft 3/4 shaft |
| RD-C7       | RD-O <u>D</u> C face 7/8 shaft | Keyed shaft 3/4       |
| RDC-C5      | RD-O <u>E</u> C face 5/8 shaft | C face 7/8 dia. shaft |
| RDC-C7      | RD-O <u>F</u> C face 7/8 shaft | C face 7/8 dia. shaft |



RATIOS (4.15:1) (3.15:1) (1.85:1) (1:1)

R30D MOTORLESS



Shift Lever Position

- STD 400000-OA Lever in Position "A"
- 400000-OB Lever in Position "B"
- 400000-OC Lever in Position "C"
- 400000-OD Lever in Position "D"

Lever Position Kit

- 495203-OA Drive Shift Lever to Right Side  
When Facing Output.
- STD 495203-OB Drive Shift Lever to Left Side  
When Facing Output.
- 495203-OC Drive Shift Lever  
Both Sides

Mounting Position

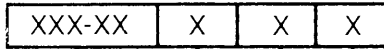
- 495200-OA Vertical Shaft Up
- 495200-OB Vertical Shaft Down
- 495200-OC Ceiling Mount
- 495200-OD Wall Mtg. Input to Left Side
- 495200-OE Wall Mtg. Input to Right Side
- STD 495200-OF Horizontal Foot Mtg.

Basic Drive Part No.

| Catalog Part No. |                | Input                   | Output                   |
|------------------|----------------|-------------------------|--------------------------|
| R30D             | <u>R30D-OA</u> | 1" Dia. Shaft           | 1 1/2 Dia. Shaft         |
| R30DG            | <u>R30D-OB</u> | 1" Dia. Shaft           | C Face with 1 1/2" Shaft |
| R30D-C9          | <u>R30D-OC</u> | C Face 1 1/8 Shaft      | 1 1/2 Dia. Shaft         |
| R30D-C11         | <u>R30D-OD</u> | C Face with 1 3/8 shaft | 1 1/2 Dia. Shaft         |
| R30DC-C9         | <u>R30D-OE</u> | C Face with 1 1/8 shaft | C Face 1 1/2" Shaft      |
| R30DC-C11        | <u>R30D-OF</u> | C Face with 1 3/8 shaft | C Face with 1 1/2" Shaft |

RATIOS (4:1) (3.1:1) (2:1) (1:1)

R31D MOTORLESS



Shift Lever Position

- STD 400000-OA Lever in Position "A"
- 400000-OB Lever in Position "B"
- 400000-OC Lever in Position "C"
- 400000-OD Lever in Position "D"

Lever Position Kit

- 495203-OA Drive Shift Lever to Right Side  
When Facing Output.
- STD 495203-OB Drive Shift Lever to Left Side  
When Facing Output.
- 495203-OC Drive Shift Lever  
Both Sides

Mounting Position

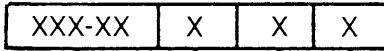
- 495200-OA Vertical Shaft Up
- 495200-OB Vertical Shaft Down
- 495200-OC Ceiling Mount
- 495200-OD Wall Mtg. Input to Left Side
- 495200-OE Wall Mtg. Input to Right Side
- STD 495200-OF Horizontal Foot Mtg.

Basic Drive Part No.

| Catalog Part No. |                | Input                   | Output                   |
|------------------|----------------|-------------------------|--------------------------|
| R31D             | <u>R31D-OA</u> | 1" Dia. Shaft           | 1 1/2 Dia. Shaft         |
|                  | <u>R31D-OB</u> | 1" Dia. Shaft           | C Face with 1 1/2" Shaft |
| R31D-C9          | <u>R31D-OC</u> | C Face 1 1/8 Shaft      | 1 1/2 Dia. Shaft         |
| R31D-C11         | <u>R31D-OD</u> | C Face with 1 3/8 Shaft | 1 1/2 Dia. Shaft         |
| R31DC-C9         | <u>R31D-OE</u> | C Face with 1 1/8 shaft | C Face 1 1/2" Shaft      |
| R31D-C11         | <u>R31D-OF</u> | C Face with 1 3/8 shaft | C Face with 1 1/2" Shaft |

RATIOS (5.81:1) (4:1) (2:1) (1:1)

R32D MOTORLESS



Shift Lever Position

- STD 400000-OA Lever in Position "A"
- 400000-OB Lever in Position "B"
- 400000-OC Lever in Position "C"
- 400000-OD Lever in Position "D"

Lever Position Kit

- 495203-OA Drive Shift Lever to Right Side  
When Facing Output.
- STD 495203-OB Drive Shift Lever to Left Side  
When Facing Output.
- 495203-OC Drive Shift Lever  
Both Sides

Mounting Position

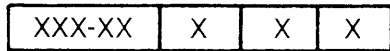
- 495200-OA Vertical Shaft Up
- 495200-OB Vertical Shaft Down
- 495200-OC Ceiling Mount
- 495200-OD Wall Mtg. Input to Left Side
- 495200-OE Wall Mtg. Input to Right Side
- STD 495200-OF Horizontal Foot Mtg.

Basic Drive Part No.

| Catalog Part No. |                | Input                   | Output                   |
|------------------|----------------|-------------------------|--------------------------|
| R32D             | <u>R32D-OA</u> | 1" Dia. Shaft           | 1 1/2 Dia. Shaft         |
|                  | <u>R32D-OB</u> | 1" Dia. Shaft           | C Face with 1 1/2" Shaft |
| R32D-C9          | <u>R32D-OC</u> | C Face 1 1/8 Shaft      | 1 1/2 Dia. Shaft         |
| R32D-C11         | <u>R32D-OD</u> | C Face with 1 3/8 Shaft | 1 1/2 Dia. Shaft         |
| R32DC-C9         | <u>R32D-OE</u> | C Face with 1 1/8 shaft | C Face 1 1/2" Shaft      |
| R32D-C11         | <u>R32D-OF</u> | C Face with 1 3/8 shaft | C Face with 1 1/2" Shaft |

RATIOS (4:1) (2:1) (1.33:1) (1:1)

R33D MOTORLESS



Shift Lever Position

- STD 400000-OA Lever in Position "A"
- 400000-OB Lever in Position "B"
- 400000-OC Lever in Position "C"
- 400000-OD Lever in Position "D"

Lever Position Kit

- 495203-OA Drive Shift Lever to Right Side  
When Facing Output.
- STD 495203-OB Drive Shift Lever to Left Side  
When Facing Output.
- 495203-OC Drive Shift Lever  
Both Sides

Mounting Position

- 495200-OA Vertical Shaft Up
- 495200-OB Vertical Shaft Down
- 495200-OC Ceiling Mount
- 495200-OD Wall Mtg. Input to Left Side
- 495200-OE Wall Mtg. Input to Right Side
- STD 495200-OF Horizontal Foot Mtg.

Basic Drive Part No.

| Catalog Part No. |                | Input                   | Output                   |
|------------------|----------------|-------------------------|--------------------------|
| R33D             | <u>R33D-OA</u> | 1" Dia. Shaft           | 1 1/2 Dia. Shaft         |
|                  | <u>R33D-OB</u> | 1" Dia. Shaft           | C Face with 1 1/2" Shaft |
| R33D-C9          | <u>R33D-OC</u> | C Face 1 1/8 Shaft      | 1 1/2 Dia. Shaft         |
| R33D-C11         | <u>R33D-OD</u> | C Face with 1 3/8 Shaft | 1 1/2 Dia. Shaft         |
| R33DC-C9         | <u>R33D-OE</u> | C Face with 1 1/8 shaft | C Face 1 1/2" Shaft      |
| R33D-C11         | <u>R33D-OF</u> | C Face with 1 3/8 shaft | C Face with 1 1/2" Shaft |

RATIOS (7.66:1) (5.81:1) (3.42:1) (1.846:1)  
 R30DS MOTORLESS (1.846) SECONDARY



Shift Lever Positions

- STD 40000-O $\underline{A}$  Lever in Position "A"
- 40000-O $\underline{B}$  Lever in Position "B"
- 40000-O $\underline{C}$  Lever in Position "C"
- 40000-O $\underline{D}$  Lever in Position "D"

Mounting Position

- 495201-O $\underline{A}$  Vertical Shaft Down
- STD 495201-O $\underline{B}$  Horizontal Foot Down
- 495201-O $\underline{C}$  Wall Mount Input to Right Side

Basic Drive Part No.

R3DS1-OA  
R3DS1-OB  
R3DS1-OC  
R3DS1-OD  
R3DS1-OE  
R3DS1-OF

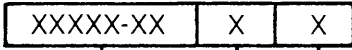
Input

1" Keyed Shaft  
 1" Keyed Shaft  
 C Face 1 1/8 Shaft  
 C Face 1 1/8 Shaft  
 C Face 1 3/8 Shaft  
 C Face 1 3/8 Shaft

Output

Keyed Shaft STD Lever Left  
 Keyed Shaft OPP Lever Right  
 Keyed Shaft STD Lever Left  
 Keyed Shaft OPP Lever Right  
 Keyed Shaft STD Lever Left  
 Keyed Shaft OPP Lever Right

RATIOS (9.20:1) (6.99:1) (4.10:1) (2.218:1)  
 R30DS MOTORLESS (2.218) SECONDARY



Shift Lever Positions

- STD 400000-OA Lever in Position "A"
- 400000-OB Lever in Position "B"
- 400000-OC Lever in Position "C"
- 400000-OD Lever in Position "D"

Mounting Position

- 495201-OA Vertical Shaft Down
- STD 495201-OB Horizontal Foot Down
- 495201-OC Wall Mount Input to Right Side

Basic Drive Part No.

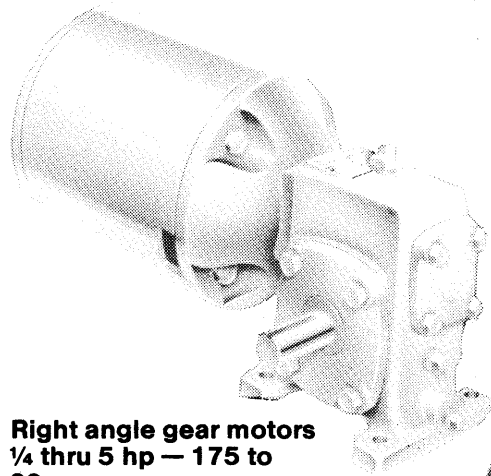
- R3DS2-OA
- R3DS2-OB
- R3DS2-OC
- R3DS2-OD
- R3DS2-OE
- R3DS2-OF

Input

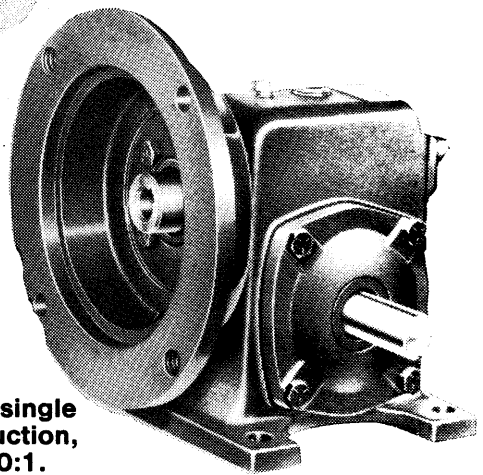
- 1" Keyed Shaft
- 1" Keyed Shaft
- C Face 1 1/8 Shaft
- C Face 1 1/8 Shaft
- C Face 1 3/8 Shaft
- C Face 1 3/8 Shaft

Output

- Keyed Shaft STD Lever Left
- Keyed Shaft OPP Lever Right
- Keyed Shaft STD Lever Left
- Keyed Shaft OPP Lever Right
- Keyed Shaft STD Lever Left
- Keyed Shaft OPP Lever Right

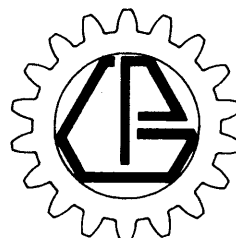


**Right angle gear motors  
1/4 thru 5 hp — 175 to  
20 rpm.**



**Worm reducers single  
and double reduction,  
ratios up to 3600:1.**

**PERFECTION GEAR, INC.**  
A Subsidiary of Peerless-Winsmith, Inc.  
9 North Bear Creek Road  
Asheville, NC 28806  
Phone (828) 253-0000  
Area Watts 800-532-5314  
FAX (828) 253-2649



**"Gearing for the future"**