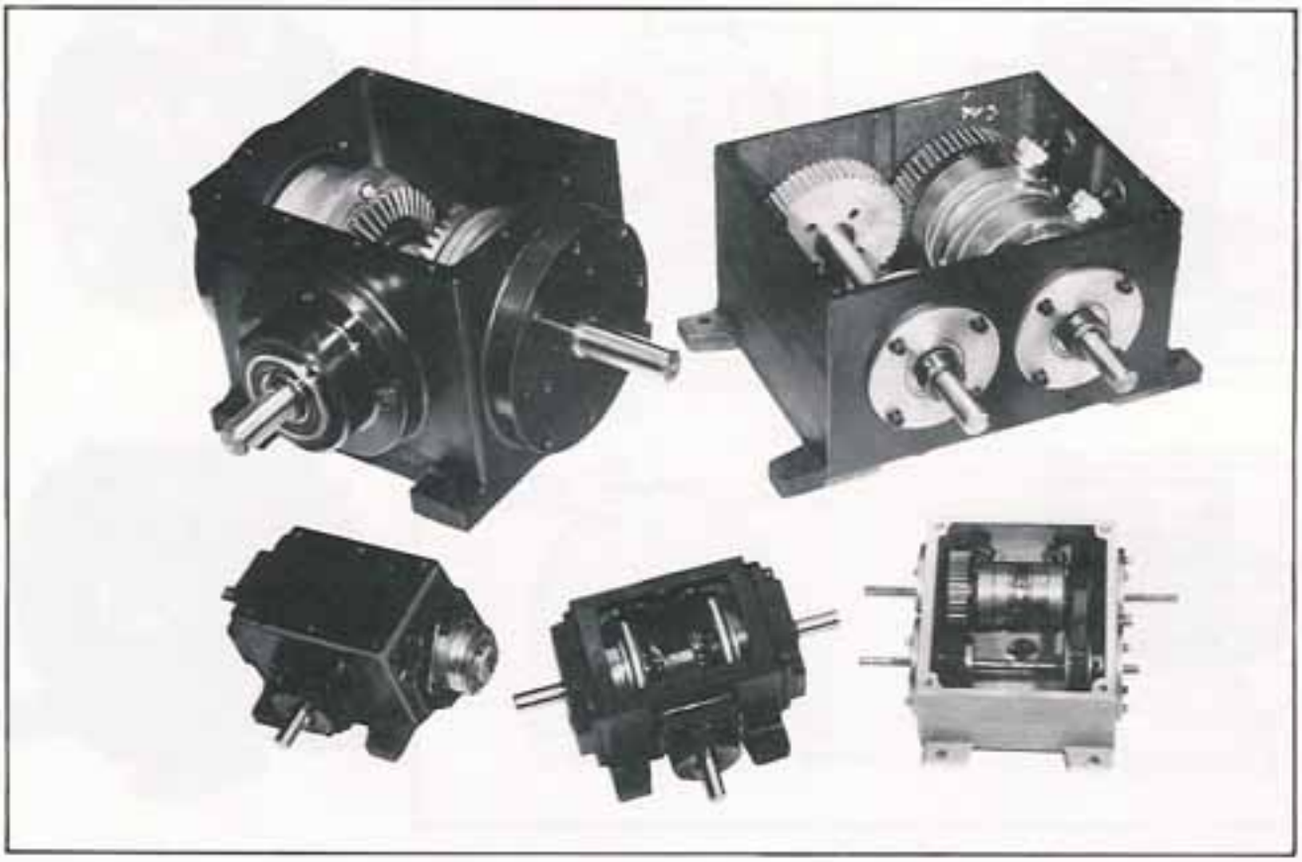
REVERSING DRIVES



ELECTROID'S ELECTROMAGNETIC REVERSING DRIVES

start the motor ... accelerate load ...
stop the motor ... decelerate load ...
reverse rotation of the motor ... start the motor
etc. etc. etc. ...

Before the advent of ELECTROID'S reversing drives, this was the only way that industry had to control the direction of rotary motion of the load. Hence: slow response time, considerable energy loss, wear and tear on the motors and associated gears and couplings, were the common problems associated with this speed reversal procedure

ELECTROID'S **ARD** and **RD** SERIES of Reversing Drives have been designed to solve these problems by providing a unique way **to control direction of rotary motion without reversal of motor rotation or changing its angular speed — instantaneously.**

Today, ELECTROID offers a wide choice of reversing drives to fit the specific need of a particular application. Here are just a few common features that you find in ELECTROID'S family of reversing drives:

- Instantaneous speed reversal
- Wide torque range (8in.-lbs. to 600 in. lbs.)
- Zero backlash
- Choice of shaft configurations
- Precision sealed ball bearings in totally enclosed housing
- Choice of input voltages
- Easy change of output speeds
- Optional braking capability

REVERSING DRIVES

ARD SERIES

ANGLE REVERSING DRIVES

Refering to Fig. 1, note that here two separate finger springs provide axial elasticity, while simultaneously providing torsional rigidity. They are used as the suspension of the armatures in a pair of electromagnetic clutches. These clutches alternately couple the output shaft of the drive to either one of a pair of contra-rotating bevel gears that are driven by the unidirectionally rotating pinion on the input shaft of the transmission. By using the finger springs, the only parts that move axially as well as rotationally within the drive are the clutch armatures.

When neither clutch is energized, the output shaft remains at rest with bevel gears idling on the stationary output shaft. Whenever one of the clutches is energized, the output shaft starts rotating in appropriate direction. To reverse the motion, the energized clutch is de-energized while the other clutch is energized. Throughout this, the motor keeps running in the same direction. Such reversal can be accomplished within the response time of respective clutches.

A major advantage of this drive is the elimination of any mechanical or electrical reversal shock on the driving motor. Since the motor continues to run in the same direction, and assuming the torque load on the output in the reverse direction is the same as that in the foward directon, the motor essentially sees no difference in the load in the short time it takes to shift from one clutch to the other. In addition, since the bevel gears are always fully engaged with the pinion gear, shock and wear are also minimized.

The full impact of load reversal upon the shaft is borne by and dissipated in the clutch friction facing and torsional strain created in the shaft assembly. Since the clutch faces are easily replaced and shaft can be adequately sized for the application, the ARD arrangement results in a reversing drive that is long lasting, requires a minimum of maintenance, and wastes the least amount of input energy.

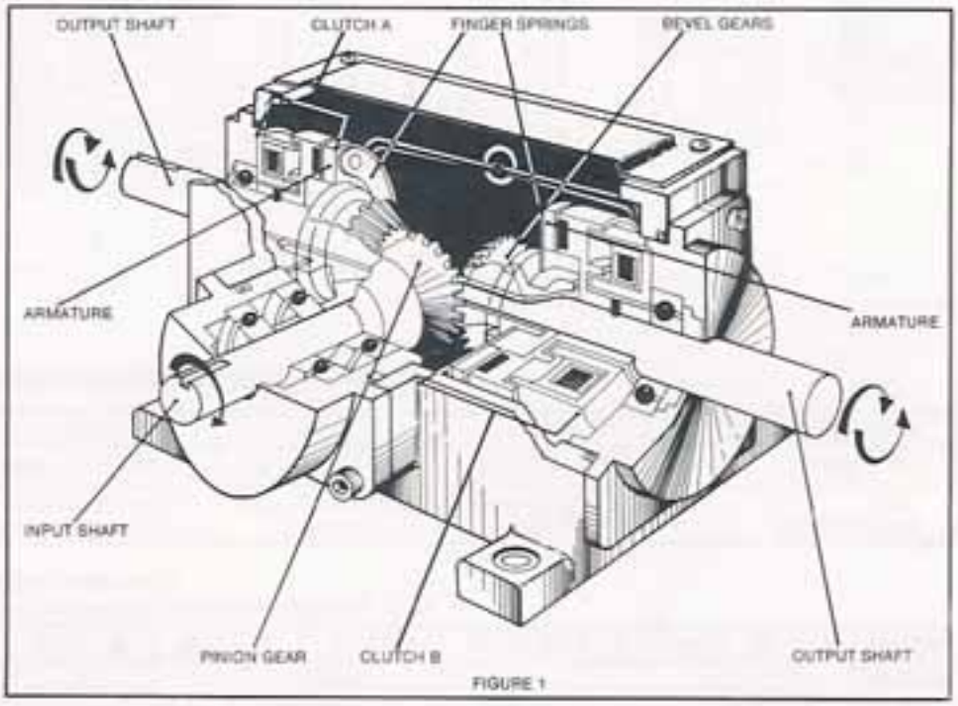


FIGURE 1

RD SERIES

PARALLEL REVERSING DRIVES

A somewhat different reversing principle is employed in the RD reversing drives. Referring to Fig. 2, an RD reversing drive operates as follows: As the input shaft rotates, it causes the rotors of clutches "A" and "B" to rotate in opposite directions. Clutch "A" is coupled to the input shaft by means of a timing belt, while clutch "B" is coupled by means of a gear.

As long as neither clutch is energized, the output shaft will remain at rest. As soon as one of the clutches is energized, the output shaft begins to rotate in the direction rotation of its rotor.

To reverse the direction of rotation, one releases one of the clutches while simultaneously energizing the other clutch.

In those applications where a load must be stopped quickly, an optional brake unit can be mounted. The addition of a brake allows output shaft to be stopped while input shaft continues to rotate.

Clutching and braking causes output shaft to "jog" resulting in positive positioning of load.

Brake can be either an electrically operated version or a fail safe brake which applies braking force when its coil is de-energized.

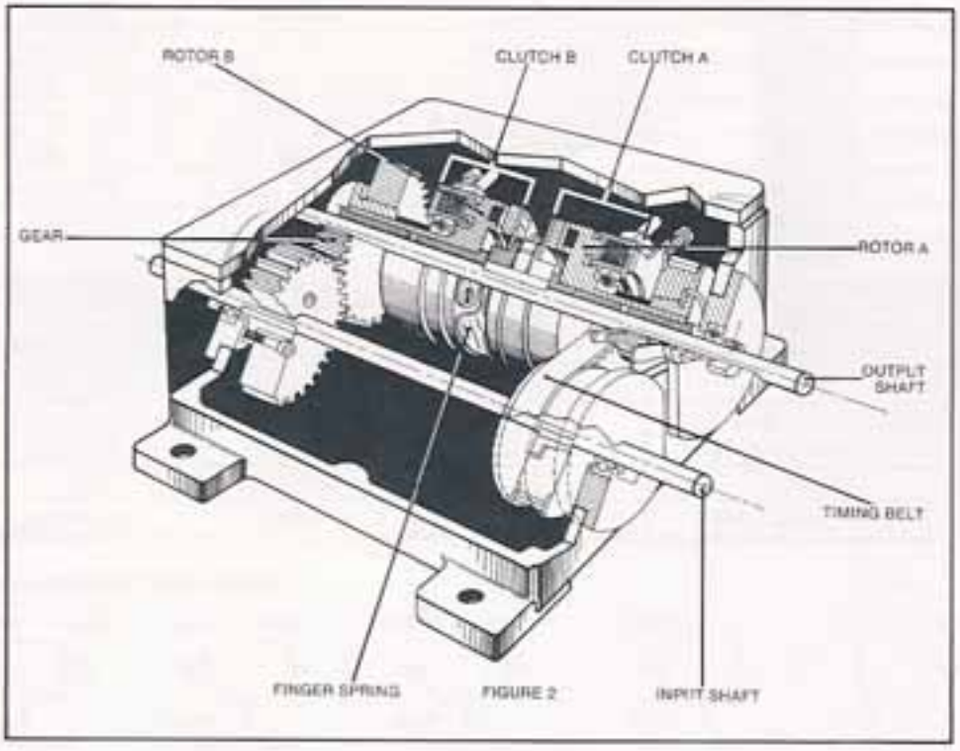
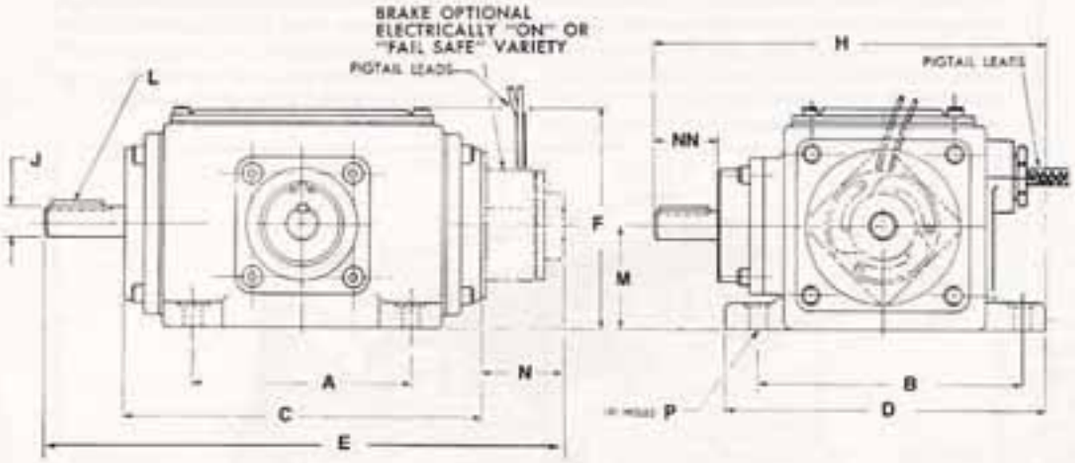


FIGURE 2

REVERSING DRIVES



OPERATING TORQUE RANGE

TORQUE RANGE	80%	100%	120%
LIFE (EST.)	8 Million Cycles	3 Million Cycles	1 Million Cycles
COIL SELECTION	Std. Continuous Duty Coil	Std. Continuous Duty Coil	Intermittent Duty Coil and Burnishing

DIMENSIONS

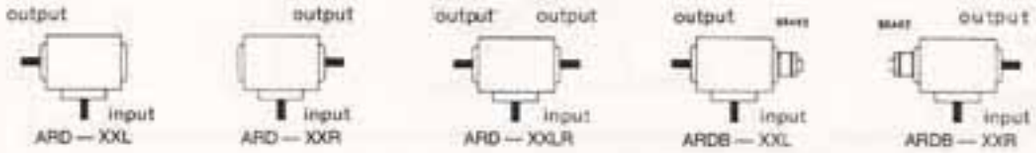
NOTE: All linear dimensions are engineered in inches.

MODEL	A	B	C	D	E	F	H	J	L	M	N	NN	P
ARD-22 ARD-26	3.50	4.375	5.81	5.12	8.32	3.62	6.32	.500 .499	⅛ x ⅛	1.65	1.25	1.00	.312
ARD-56	8.00	9.00	11.50	10.00	17.50	8.25	13.00	1.000 .999	¼ x ¼	4.00	3.00	2.00	.530

MECHANICAL AND ELECTRICAL FEATURES

CHARACTERISTICS	ARD-22	ARD-26	ARD-56
TORQUE	35 LB. INS.	75 LB. INS.	600 LB. INS.
COIL #1	90 V.D.C. @ .133 A.	90 V.D.C. @ .090 A.	90 V.D.C. @ .35 A.
COIL #2	24 V.D.C. @ .422 A.	24 V.D.C. @ .290 A.	24 V.D.C. @ 1.12 A.
COIL #3	12 V.D.C. @ 1.00 A.	12 V.D.C. @ .680 A.	12 V.D.C. @ 2.6 A.
COIL #4	6 V.D.C. @ 2.00 A.	6 V.D.C. @ 1.360 A.	SPECIAL
WEIGHT	6 LBS.	7 LBS.	70.0 LBS.
INERTIA CLUTCH DE-ENERGIZED	.358 LB. INS.²	.537 LB. INS.²	73.6 LB. INS.²
INERTIA CLUTCH ENERGIZED	.624 LB. INS.²	.936 LB. INS.²	101.5 LB. INS.²
RPM	1800 MAX.	1800 MAX.	1200 MAX.
ESTIMATED LIFE AT FULL LOAD AND MAX. RPM	3 MILLION CYCLES	3 MILLION CYCLES	3 MILLION CYCLES
RATIO	1 TO 1	1 TO 1	2 TO 1
RESPONSE TIME	38 MSEC.	42 MSEC.	110 MSEC.

SPECIAL SHAFT CONFIGURATIONS



DESIGN FEATURES

- Instantaneous speed reversal
- Brake optional
- Selection of shaft configurations
- Totally enclosed housing
- Precision sealed ball bearings
- Choice of input voltages
- Electrical connection - 18" pigtail leads

NOTES:

The addition of a brake (optional) allows output shaft to "jog" thus resulting in positive positioning of load.

Brake can be supplied in an electrically operated version (specify ARDB-XX) or a fail safe brake which applies braking force when its coil is de-energized (specify ARD-FSB-XX).

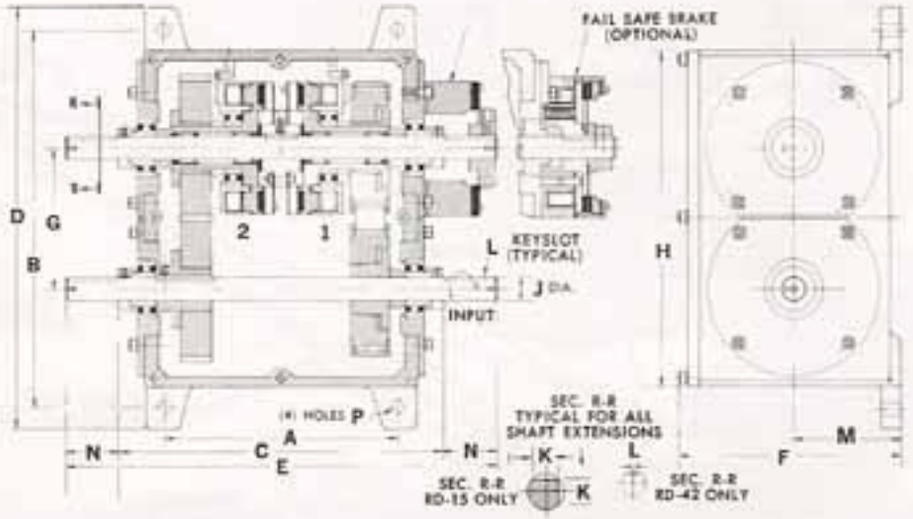
ORDERING SEQUENCE:

(as an example)

ARD B - 22 L COIL #1

- ARD: Basic Model
- B: Brake Supplied Electrically "On"
- 22: Unit Size
- L: Output Shaft Configuration (left)
- COIL #1: Coil #

REVERSING DRIVES



DESIGN FEATURES

- Instantaneous speed reversal
- Optional shaft configurations available on request.
- Precision sealed ball bearings.
- Total enclosed housing.
- Choice of input voltages.
- Standard speed ratio — 1:1. Other speed ratios available on request.
- Brake may be added (optional).
- Large capacity units available, upon special request.
- Electrical terminations 18" long pigtail leads.

NOTES:
The addition of a brake (optional) allows output shaft to "jog" thus resulting in positive positioning of load.

Brake can be supplied in an electrically operated version (specify RDB-XX) or a fail safe brake which applies braking force when its coil is de-energized (specify RDFSB-XX).

ORDERING SEQUENCE:

(as an example)

RD FSB 42 COIL #1

- RD — Basic Model
- FSB — Brake Supplied (Fail Safe)
- 42 — Unit Size
- COIL #1 — Coil #

OPERATING TORQUE RANGE

TORQUE RANGE	80%	100%	120%
LIFE (EST.)	8 Million Cycles	3 Million Cycles	1 Million Cycles
COIL SELECTION	Std. Continuous Duty Coil	Std. Continuous Duty Coil	Intermittent Duty Coil and Burnishing

DIMENSION

NOTE: All linear dimensions are engineered in inches.

MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P
RD-15	3.750	5.750	5½ Max.	6½	7 13/16	3¼	2.000	5.0	.2500 .2498	.235	—	1.500	1⅜	7/32 D.
RD-19	3.750	5.750	5½ Max.	6½	8	3¼	2.000	5.0	.3750 .3745	.328	—	1.500	1⅜	7/32 D.
RD-42	7.500	12.000	10½	13½	14⅜	7⅛	4.500	10¾	.7495 .7500	—	3/16 x 3/32	3.464 3.474	1 15/16	23/64 D.

MECHANICAL AND ELECTRICAL FEATURES

CHARACTERISTICS	RD-15	RD-19	RD-42
TORQUE	8 LB. INS.	15 LB. INS.	240 LB. INS.
COIL #1	90 V.D.C. @ .052 A.	90 V.D.C. @ .055 A.	90 V.D.C. @ .122 A.
COIL #2	24 V.D.C. @ .212 A.	24 V.D.C. @ .235 A.	24 V.D.C. @ .462 A.
COIL #3	12 V.D.C. @ .390 A.	12 V.D.C. @ .471 A.	12 V.D.C. @ .925 A.
COIL #4	6 V.D.C. @ .770 A.	6 V.D.C. @ .941 A.	6 V.D.C. @ 1.820 A.
WEIGHT	5 LBS.	6 LBS.	32 LBS.
INERTIA CLUTCH DE-ENERGIZED	.464 LB. INS.²	.634 LB. INS.²	5.394 LB. INS.²
INERTIA CLUTCH ENERGIZED	.534 LB. INS.²	.735 LB. INS.²	20.226 LB. INS.²
RPM	1800 MAX.	1800 MAX.	1800 MAX.
ESTIMATED LIFE AT FULL LOAD AND MAX. RPM	3 MILLION CYCLES	3 MILLION CYCLES	3 MILLION CYCLES
RESPONSE TIME	25 MSEC.	35 MSEC.	90 MSEC.