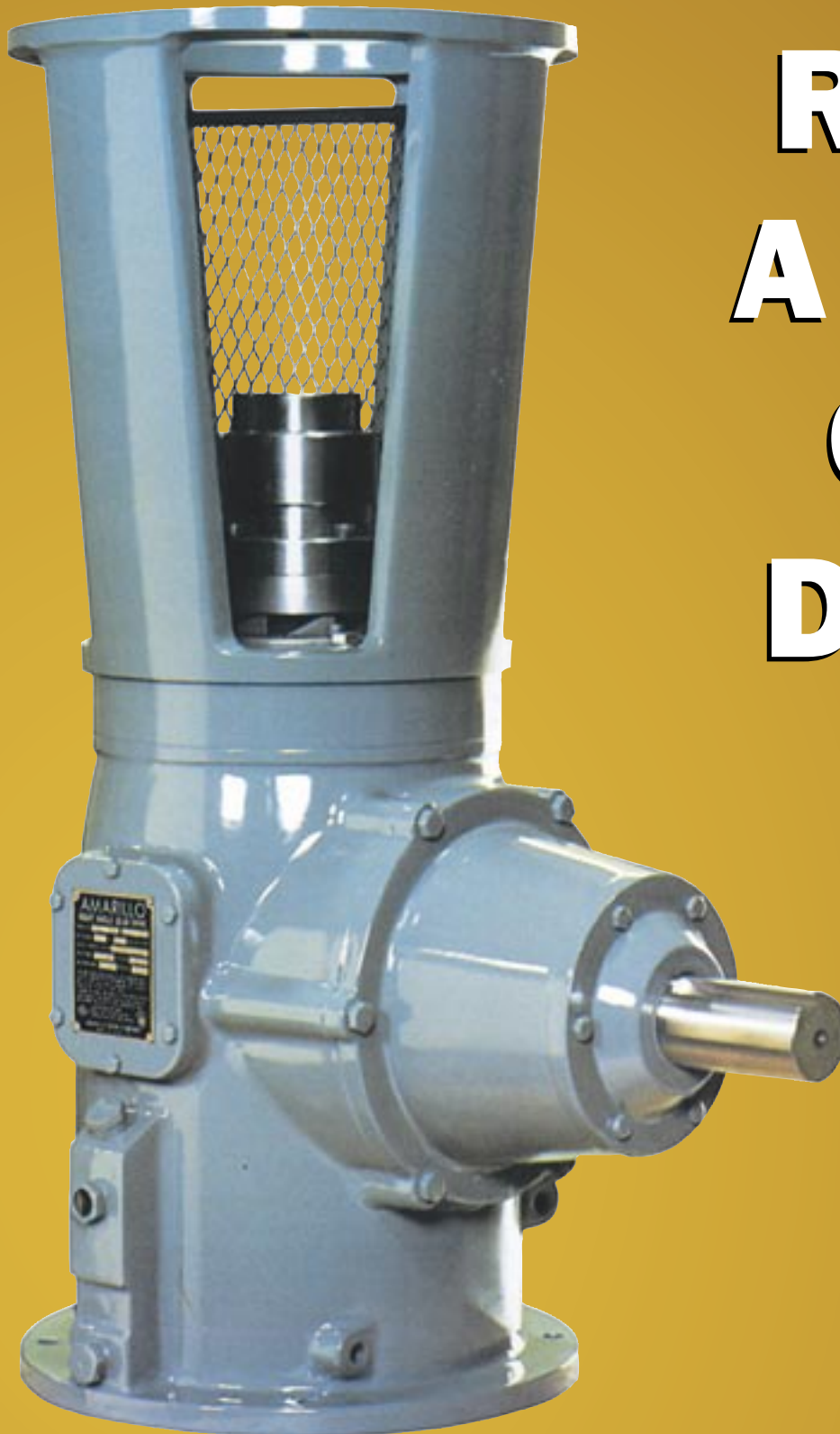


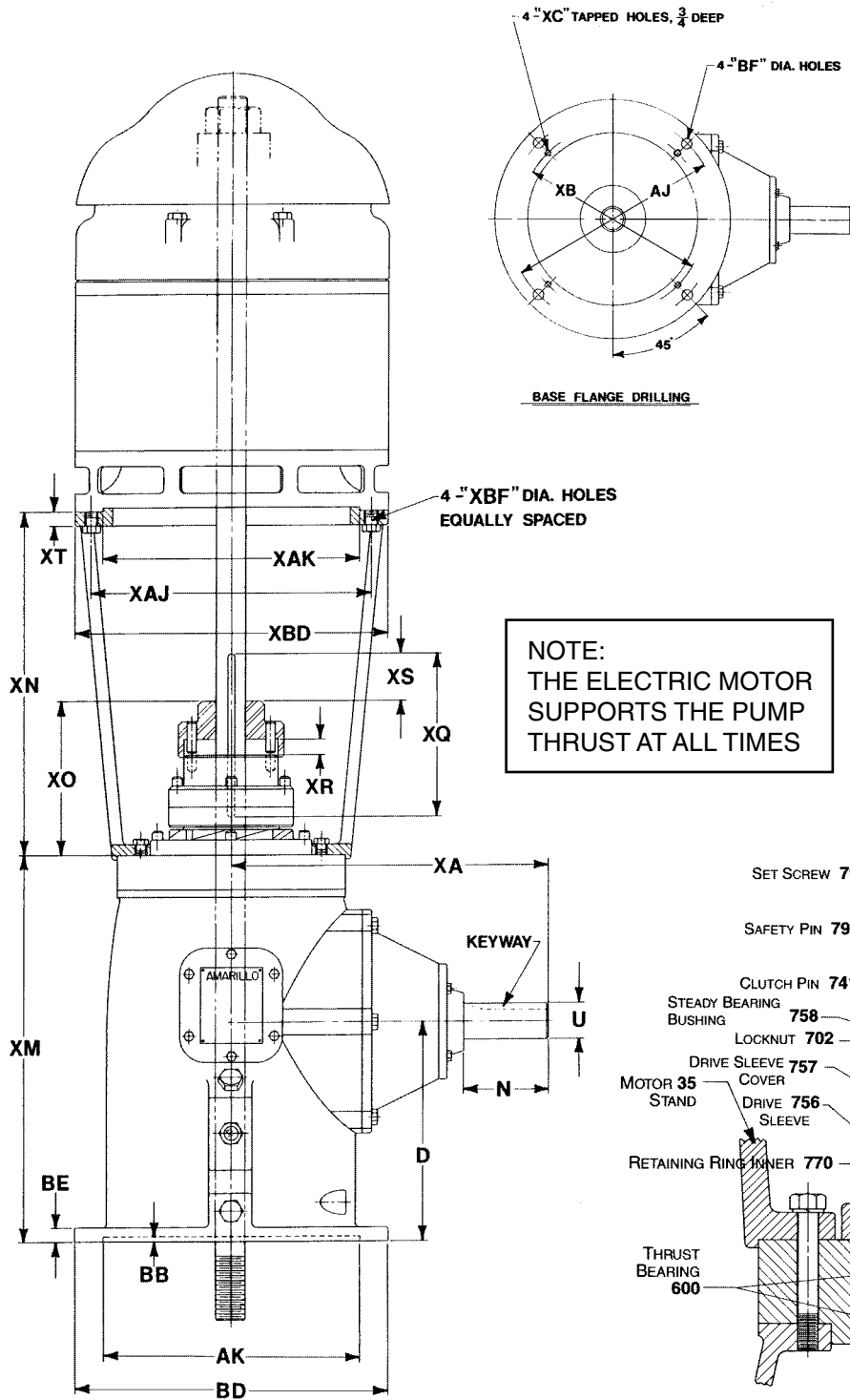
Amarillo® Gear Company



T.M.

COMBINATION RIGHT ANGLE GEAR DRIVE





COMBINATION DRIVE

In response to the need for utmost reliability, a combination drive may be specified. This drive is normally installed with an electric motor top-mounted for constant service. In the event of power failure or motor failure the drive is simply converted for engine or turbine operation by lowering the integral sliding clutch into drive position. No additional pins or bolts are required for this conversion. These combination drives may be furnished with either solid or hollow shafts. Consult combination drive installation instructions located on back of this brochure.

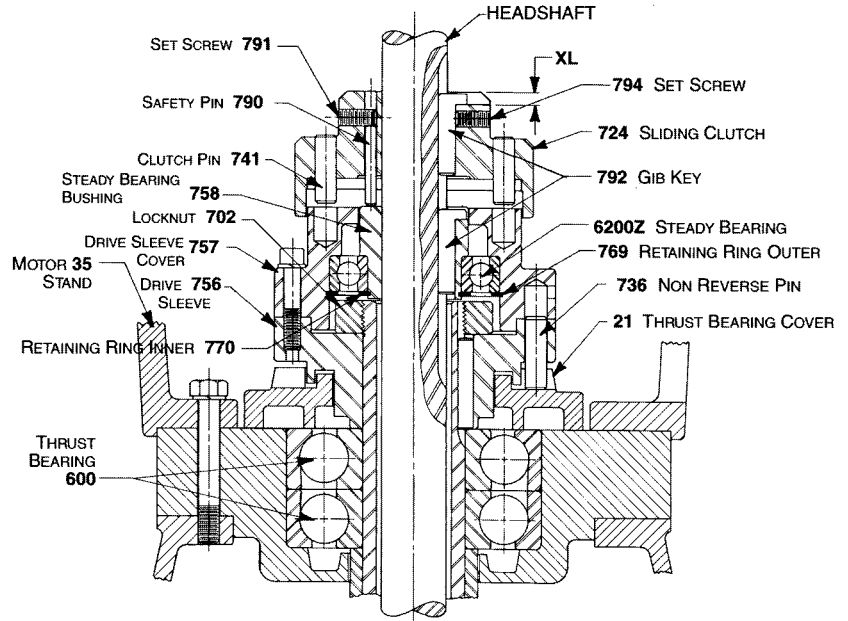
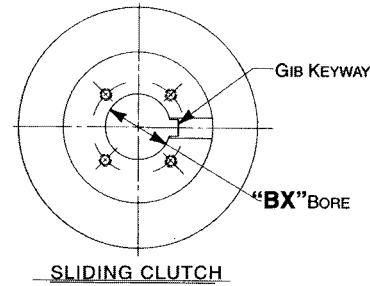


TABLE 1
Motor Stand Base Dimensions
 Size available for NEMA motor at standard cost.

"XBD"	30	40A	40B	60A	80A	100A	125A	150A	200A	250G	300	350	450A	500A	600A	750A	1000G	XAJ	XAK	XBF
10	X																	9 1/8	8 1/4	7 1/16
12	X	X	X	X	X	X	X											9 1/8	8 1/4	7 1/16
16 1/2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			14 3/4	13 1/2	11 1/16
20				X	X	X	X	X	X	X	X	X	X	X	X			14 3/4	13 1/2	11 1/16
24 1/2				X	X	X	X	X	X	X	X	X	X	X	X	X		14 3/4	13 1/2	11 1/16
30 1/2																	X	26	22	13 1/16

*Other sizes are available. Contact the factory for details.

**TABLE 2
DIMENSIONS**

MODEL	D	N	HORIZONTAL SHAFT U			AJ	AK	BB	BD	BE	BF
			NOM	ACT.	KEYWAY						
C30	6 3/4	2 5/8	1 1/4	1.249	5/16 X 5/32	9 1/8	8 1/4	3/16	10	5/8	7/16
C40A	8 1/2	4 3/8	1 1/2	1.499	3/8 X 3/16	9 1/8	8 1/4	1/4	12	13/16	7/16
C40B	8 1/2	4 3/8	1 1/2	1.499	3/8 X 3/16	14 3/4	13 1/2	1/4	16 1/2	13/16	11/16
C60A	11 1/2	4 1/4	1 1/2	1.499	3/8 X 3/16	14 3/4	13 1/2	1/4	16 1/2	3/4	11/16
C80A	11 1/2	4 1/4	1 7/8	1.874	3/8 X 3/16	14 3/4	13 1/2	1/4	16 1/2	3/4	11/16
C100A	11 1/2	4 1/4	1 7/8	1.874	3/8 X 3/16	14 3/4	13 1/2	1/4	16 1/2	3/4	11/16
C125A	11 1/2	4 1/4	1 7/8	1.874	3/8 X 3/16	14 3/4	13 1/2	1/4	16 1/2	3/4	11/16
C150A	11 1/2	4 1/2	2 7/16	2.436	5/8 X 5/16	14 3/4	13 1/2	1/4	16 1/2	3/4	11/16
C200A	13 3/4	5 1/4	2 7/16	2.436	5/8 X 5/16	18 1/4	13 1/2	1/4	20	1 1/8	11/16
C250	13 3/4	5 1/4	2 15/16	2.936	3/4 X 3/8	18 1/4	13 1/2	1/4	20	1 1/8	11/16
*C300	13 3/4	5 1/4	2 15/16	2.936	3/4 X 3/8	18 1/4	13 1/2	1/4	20	1 1/8	11/16
*C350	13 3/4	5 1/4	2 15/16	2.936	3/4 X 3/8	18 1/4	13 1/2	1/4	20	1 1/8	11/16
C450A	16	6	2 15/16	2.936	3/4 X 3/8	23	13 1/2	1/4	24 1/2	1 1/8	13/16
C500A	16	6	3 1/8	3.124	3/4 X 3/8	23	13 1/2	1/4	24 1/2	1 1/8	13/16
C600A	16	6	3 3/4	3.749	7/8 X 7/16	23	13 1/2	1/4	24 1/2	1 1/8	13/16
C750A	18	6	3 3/4	3.749	7/8 X 7/16	23	13 1/2	1/4	24 1/2	1 1/8	13/16
C1000G	21	8	4	3.998	1 X 1/2	28 3/4	22	1/4	30 1/2	1 1/4	13/16

MODEL	XA	XB	XC	XL	XM	XN	XO	XQ	XR	XS	XT	MAX BX**
C30	10 7/8	—	—	9/32	12 1/4	12 1/2	5 1/2	5 1/4	1/2	1 1/2	7/16	1
C40A	15 5/8	—	—	9/32	16 3/16	16	6 1/2	7	5/8	2	5/8	1 1/4
C40B	15 5/8	—	—	9/32	16 3/16	16	6 1/2	7	5/8	2	5/8	1 1/4
C60A	16 3/4	—	—	9/32	20 1/4	18	7 13/16	7 3/4	3/4	2 1/4	3/4	1 1/2
C80A	16 3/4	—	—	9/32	20 3/8	18	7 13/16	7 3/4	3/4	2 1/4	3/4	1 1/2
C100A	16 3/4	—	—	9/32	20 3/8	18	7 13/16	7 3/4	3/4	2 1/4	3/4	1 1/2
C125A	16 3/4	—	—	9/32	20 3/8	18	7 13/16	7 3/4	3/4	2 1/4	3/4	1 1/2
C150A	18 3/4	—	—	9/32	20 3/8	18	8 13/16	9	3/4	2 1/4	3/4	1 11/16
C200A	20 3/4	14 3/4	5/8-11 NC	9/32	24 7/8	20	9 3/16	10	7/8	2 3/4	7/8	2
C250	22 3/8	14 3/4	5/8-11 NC	9/32	25 1/16	20	9 11/16	10	7/8	2 3/4	7/8	2 3/16
*C300	22 3/8	14 3/4	5/8-11 NC	9/32	25 1/16	20	9 11/16	10	7/8	2 3/4	7/8	2 3/16
*C350	22 3/8	14 3/4	5/8-11 NC	9/32	25 1/16	20	9 11/16	10	7/8	2 3/4	7/8	2 3/16
C450A	†25 1/2	14 3/4	5/8-11 NC	9/32	30 1/8	27	12	11 1/2	1 1/8	3 1/2	1	2 7/16
C500A	†25 1/2	14 3/4	5/8-11 NC	9/32	30 1/8	27	12	11 1/2	1 1/8	3 1/2	1	2 7/16
C600A	†25 1/2	14 3/4	5/8-11 NC	9/32	30 1/8	27	12	11 1/2	1 1/8	3 1/2	1	2 7/16
C750A	†26 3/4	14 3/4	5/8-11 NC	9/32	34 1/4	27	12 1/4	11 1/2	1 1/8	3 1/2	1 1/8	2 7/16
C1000G	36 7/8	26	3/4-10 NC	7/16	42	30	14 9/16	15	1 1/4	4	1 1/4	2 15/16

† "XA" dimension shown applies to 1:1 ratio and speed increasing ratios only. Request certified drawing for others.

* Models 300 and 350 furnished with heat exchanger.

** Contact the factory for maximum coupling bore for special rotation drive with 1:2, 2:5 and 1:3 ratio.

CONTACT THE FACTORY ABOUT AMARILLO AUTOMATIC COMBINATION DRIVE

Combination Right Angle Gear Drives

On some installations it is desirable to provide alternate power for driving a vertical pump. This can be accomplished by installing a **Right Angle Gear Drive** connected to the horizontal power source, such as an internal combustion engine or a steam turbine and providing a stand over the gear drive for mounting the vertical power source, which is always a vertical electric motor. This arrangement is referred to as a **Combination Drive**.

The vertical electric motor is the primary source of power for the pump. If there is an electric power failure or failure of the motor, the Right Angle Gear Drive and stand-by power source are brought into service by engaging the manual sliding clutch.

The cross section print in this brochure shows a Right Angle Gear Drive arranged as a combination drive. The vertical electric motor is mounted on the motor stand (35), above the drive. The stand is available in standard NEMA motor sizes.

When the vertical electric motor is operating the pump, the sliding clutch (724) is in the raised position, which disengages the Right Angle Drive from the vertical pump shaft. Two screws, (791) and (794), hold the clutch in the disengaged position. As a safety measure, pin (790) is permitted to drop by loosening screw (791). When the pin has dropped below screw (791), the screw is then tightened above the pin. The pin is the correct length to prevent the sliding clutch from dropping down and engaging, should screw (794) become loose. A sealed ball bearing (6200Z) is provided to prevent run-out in the top shaft. The motor stand guard should be in place at all times during pump operation.

To engage the Right Angle Gear Drive to operate the pump from the horizontal power source, remove the motor stand guard and loosen screws (791) and (794) until pin (790) is free and the clutch (724) slides on the pump shaft. Slide the clutch down until the pins (741) engage the holes in the drive sleeve cover (757). Make sure the clutch is seated in the drive sleeve cover and tighten screws (791) and (794). Attach the motor stand guard before starting operation of the pump.

We do not furnish or manufacture the vertical pump shaft shown in the drawing for standard hollow shaft Combination Drives. However, on Combination Drives, we suggest the use of two top shafts with a screw coupling located below the drive and above the packing gland of the pump. One shaft would be long enough to extend through the Right Angle Gear Drive and to the top of the electric motor (the motor would carry the pump thrust at all times). A shorter (spare) shaft would be recommended in the event that the electric motor is damaged and removed for repair. The short shaft would extend through the Right Angle Gear Drive to the top of the sliding clutch (724) and would transmit the pump thrust to the thrust bearings in the drive.

The Combination Drive may be provided with numerous arrangements for use with solid or hollow shaft electric motors and any type of vertical pump.

COMBINATION DRIVE INSTALLATION

- 1.0 Place the gear drive on the pump discharge head, align with the engine and secure with correctly sized bolts. Refer to the **Operation and Maintenance Instructions for Amarillo Right Angle Gear Drives**.
- 2.0 Remove the motor stand guard from the motor stand (35).
- 3.0 Remove the screws holding the drive sleeve cover (757) to drive sleeve (756).
- 4.0 Lift the drive sleeve cover (757), with the sliding clutch (724), bearing bushing (758) and steady bearing (6200Z), off the gear drive. The non-reverse pins, if so equipped, will stay in the drive sleeve (756). Remove the non-reverse pins from the drive sleeve (756) if the non-reverse feature is not required in the gear drive.
- 5.0 Carefully fit the drive sleeve cover (757) with the bearing bushing (758) and steady bearing (6200Z) and the sliding clutch (724) on the headshaft. The bearing bushing (758) and the sliding clutch (724) should both slide freely on the headshaft.
- 6.0 Fit the gib keys (792) in the bearing bushing (758) and the sliding clutch (724). NOTE: It is very important that these components, especially the bearing bushing (758), slide freely on the headshaft with the gib key installed. If the bearing bushing binds in the headshaft, the thrust load from the pump could overload the steady bearing (6200Z), causing it to fail after a short period of operation.
- 7.0 Slide the headshaft, with the combination clutch components installed, through the gear drive being careful not to hit the oil tube, located in the bottom of the gear drive, with the end of the shaft.
- 8.0 Couple the top shaft and the pump shaft. Install the electric motor according to the motor manufacturer's instructions. Install the motor and adjust the pump impellers according to the pump manufacturer's instructions.
- 9.0 At this point, check that the combination clutch components still slide freely on the headshaft and that there is plenty of keyway length in the headshaft to provide a full depth keyway under both gib keys.
- 10.0 Align the drive sleeve cover (757) on the drive sleeve (756) and alternately tighten the cap screws to make sure the drive sleeve cover is pulled down squarely.
- 11.0 Slide the sliding clutch (724) into the position illustrated with the safety pins installed as shown. Tighten the set screws over the safety pin and gib key in the sliding clutch.
- 12.0 Install the guard in the motor stand (35).

Catalog C 11/04



Amarillo® Gear Company

Post Office Box 1789 • Amarillo, TX 79105 • 2401 Sundown Lane (79118) • 806-622-1273 • FAX 806-622-3258
www.amarillogear.com e-mail: info@amarillogear.com © AGC 2004