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LUFKIN

AIR BALANCED PUMPING UNITS



**BULLETIN
A-3**

LUFKIN FOUNDRY AND MACHINE COMPANY
LUFKIN, TEXAS

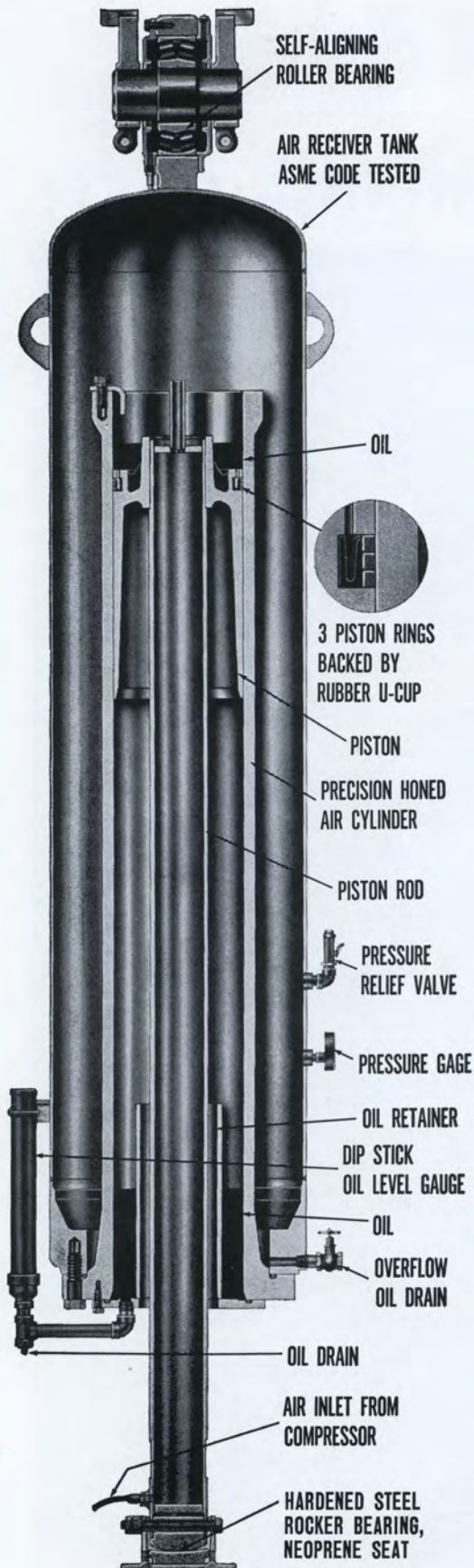


FIGURE 1

LUFKIN AIR BALANCED PUMPING UNITS

1. Perfect counterbalance with finger-tip control.
2. Lower installation cost.
3. Compact and portable; ideal for well testing.
4. Small size and lighter weight make it ideal for export.
5. Stroke lengths to 20 feet for high volume production from great depths.
6. Automatic counterbalance control available.

These are some of the outstanding advantages of LUFKIN AIR BALANCED PUMPING UNITS. These units employ compressed air to counterbalance the well load rather than beam weights or crank weights. The air system has been so simplified that the only continuously operating parts are the balance cylinder and piston. The reservoir capacity of the cylinder is enlarged by a steel receiver which moves with the cylinder as a unit.

On engine-driven units, when the system is in need of air, an automatic regulator engages an air operated clutch (driven by one belt from the unit sheave) and replaces any lost air. The operator sets regulator, initially, at a pressure sufficient to counterbalance well load, and this pressure is maintained automatically. Should the load change appreciably, a slight adjustment of this regulator will restore perfect counterbalance.

A safety shut-off switch is available, which will ground out engine, or shut off motor, if pressure should exceed a pre-set figure or fall below a minimum pre-set figure.

For units pumping with electricity, a separate motor-driven compressor assembly is standard equipment.

Since the Lufkin Air Balanced Units are approximately 35% shorter and 40% lighter than crank-type units, they are ideal for use as portable or test units, and for installation on piling or superstructures. Since changing counterbalance effect is a matter of adjusting a valve, the air balanced unit is ideal for use in testing wells.

All the ruggedness and simplicity of the conventional Lufkin Pumping Units are incorporated in the design of the Lufkin Air Balanced Pumping Unit.

LUFKIN AIR BALANCED PUMPING UNITS



FIGURE 2

A-456D-120-36 Air Balanced Unit, Multi-Cylinder Engine Drive.



FIGURE 3

A-320D-100-32 Air Balanced Unit, Electric Motor Drive.

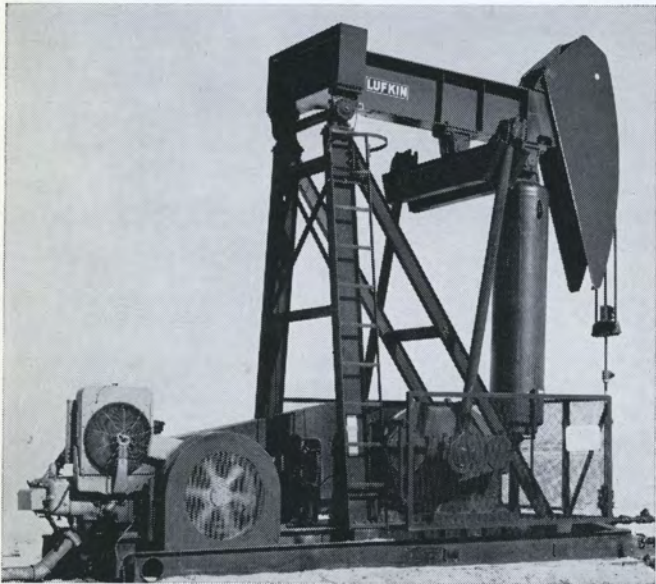


FIGURE 4

A-320D-100-32 Air Balanced Unit, Lufkin H-795 Engine Drive.



FIGURE 5

Mobile A-456D-120-36 Air Balanced Unit, Multi-Cylinder Engine Drive. This trailer-mounted unit with prime mover and diesel fuel tank, built integral is ideal for test purposes.

- Structural Bearings: Roller Bearings.
- Hanger: Horsehead, Wire Line.
- Air Counterbalance Pressure: 450 P.S.I. (Max.)
- Upper Pitman Connection: Rubber Cushioned

ELECTRIC AUTOMATIC COUNTERBALANCE CONTROL

This control automatically adjusts air counterbalance with changing well conditions. It reduces the load on gears and prime movers.

Model 700-1E is used with units powered by electric motors.

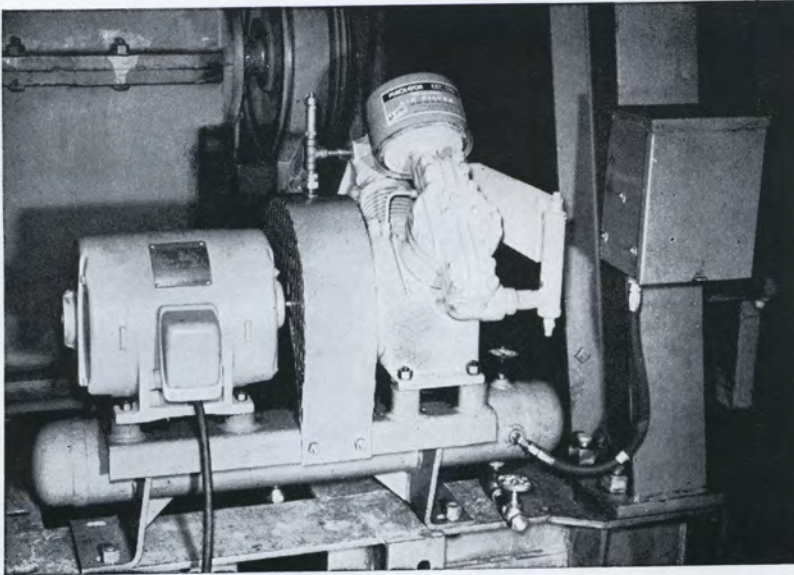


FIGURE 6

MOTOR DRIVEN COMPRESSOR

Furnished on units where electric power is available; compressor operates at optimum speed for maximum air output.

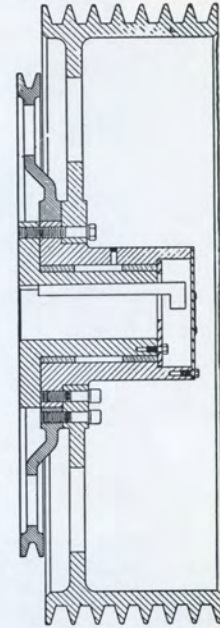


FIGURE 7

FLOATING SHEAVE ASSEMBLY

For Gear Reducer which permits running air compressor at initial starting without operating gear reducer. Note 1-C groove compressor drive rim bolted to floating hub. Select proper size to effect optimum compressor speed; 17 1/4", 23 1/2", 28", 34" and 47 1/4" P.D. rims are available.

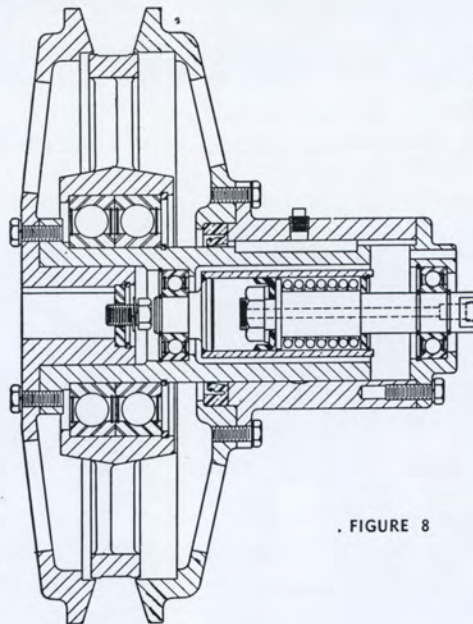


FIGURE 8

CLUTCH, 1 1/2" P.D.

For air compressor—engages by spring pressure at initial starting and also when air pressure drops too low for proper counterbalance; disengages automatically when air pressure builds up to predetermined setting.

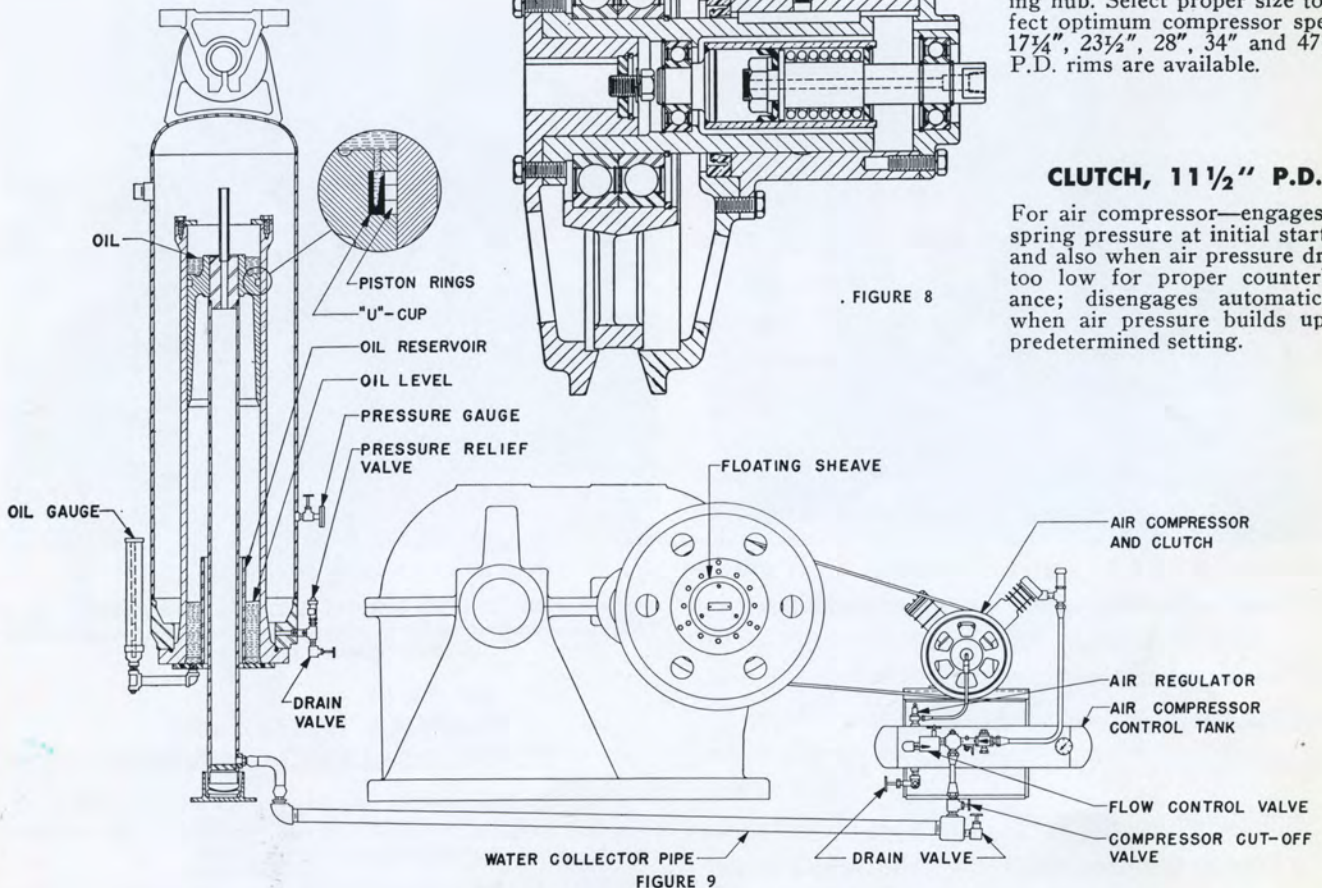


FIGURE 9

Schematic Outline of Air System, Clutch Driven Compressor

GENERAL DIMENSIONS—Lufkin Air Balanced Pumping Units

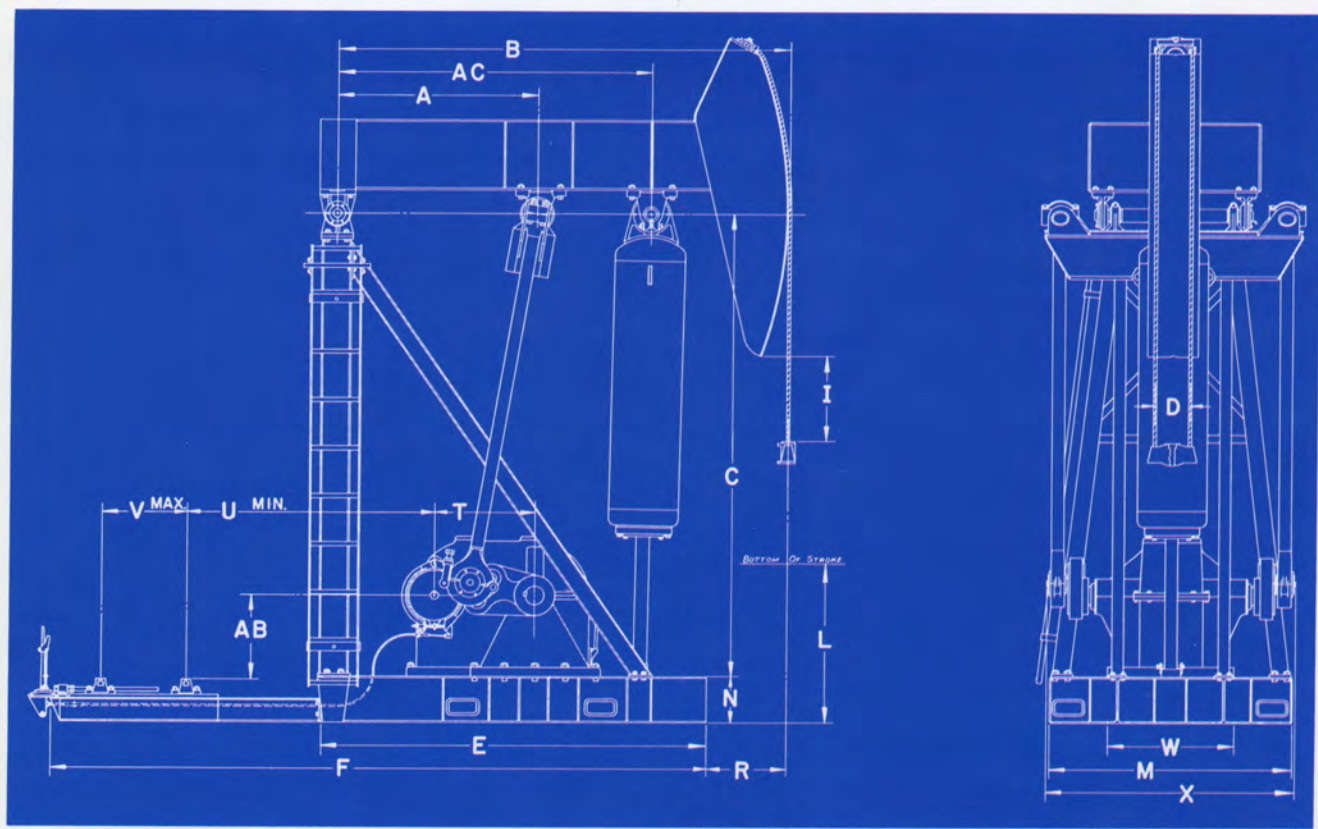


FIGURE 10

UNIT	A	B	C	D	E	F	I	L	M	N	R	T	U	V	W	X	AB	AC
A-1824D-240-47	11'-2 1/2"	28'-0"	25'-3 1/2"	16"	*	32'-0"	16 1/2"	56"	8'-0"	21"	48"	58 7/8"	8'-8 3/8"	44 3/4"	50 1/4"	9'-5 1/8"	30"	19'-5 1/2"
A-1824D-216-41	10'-1 1/2"	25'-8"	21'-0"	"	22'-0 3/8"	29'-9 7/8"	12"	34"	7'-11 1/2"	"	"	"	8'-1"	41"	"	"	34 7/8"	14'-3 1/2"
A-1824D-192-42	"	23'-0"	"	"	19'-4 5/8"	27'-1 7/8"	16 1/2"	53"	"	"	"	"	"	"	"	"	"	"
A-1280D-240-47	11'-2 1/2"	28'-0"	25'-3 1/2"	"	*	32'-0"	"	56"	8'-0"	"	"	52 1/2"	9'-3"	44 3/4"	"	8'-11 1/8"	30"	19'-5 1/2"
A-1280D-216-41	10'-1 1/2"	25'-8"	21'-0"	"	22'-0 3/8"	29'-9 7/8"	12"	34"	7'-11 1/2"	"	"	"	8'-7 3/8"	41"	"	"	34 7/8"	14'-3 1/2"
A-1280D-192-42	"	23'-0"	"	"	19'-4 5/8"	27'-1 7/8"	16 1/2"	53"	"	"	"	"	"	"	"	"	"	"
A-1280D-427-144	7'-4"	16'-8"	17'-10"	"	12'-3 1/2"	19'-5 1/2"	19 1/2"	55"	"	16 1/8"	59"	"	6'-0"	"	"	"	38 1/8"	10'-11 1/2"
A-912D-216-41	10'-1 1/2"	25'-8"	21'-0"	"	22'-0 3/8"	29'-9 7/8"	12"	34"	"	21"	48"	48 1/2"	9'-2"	"	50"	8'-4 1/8"	28 7/8"	14'-3 1/2"
A-912D-192-42	"	23'-0"	"	"	19'-4 5/8"	27'-1 7/8"	16 1/2"	53"	"	"	"	"	"	"	"	"	"	"
A-912D-168-33.5	7'-4"	19'-3"	17'-10"	"	14'-10 1/2"	22'-0 1/2"	17 1/2"	36 1/2"	"	16 1/8"	59"	"	6'-4"	"	"	8'-1 3/8"	32 1/8"	10'-11 1/2"
A-912D-427-144	7'-4"	16'-8"	"	"	12'-3 1/2"	19'-5 1/2"	19 1/2"	55"	"	"	"	"	"	"	"	"	"	"
A-640D-168-33.5	"	19'-3"	"	"	14'-10 1/2"	22'-0 1/2"	17 1/2"	36 1/2"	"	"	"	41 1/2"	7'-0"	"	46 3/4"	"	30 1/8"	"
A-640D-427-144	"	16'-8"	"	"	12'-3 1/2"	19'-5 1/2"	19 1/2"	55"	"	"	"	"	"	"	"	"	"	"
A-640D-144-31	6'-5"	17'-4"	15'-7"	12"	12'-11 1/4"	20'-1 1/4"	14"	35 1/2"	7'-6"	"	57"	"	7 1/8"	"	"	"	"	9'-10"
A-456D-144-34.2	"	"	"	"	"	"	"	"	"	"	"	38 3/8"	6'-2"	"	"	"	"	"
A-456D-120-36	"	14'-7"	"	"	10'-11 3/4"	18'-1 3/4"	14"	57 1/2"	"	"	47 1/2"	"	"	"	"	"	"	"
A-320D-120-30.2	70"	15'-4"	13'-4"	"	11'-3 1/2"	18'-11 1/4"	10"	35"	7'-1 1/2"	"	53"	34"	6'-6"	"	43 1/4"	7'-2 7/8"	"	8'-11"
A-320D-100-32	"	12'-11"	"	"	10'-0 1/4"	17'-8 1/4"	13 1/2"	51 1/2"	"	"	39"	"	"	"	"	"	"	"
A-228D-86-28	56"	10'-11"	12'-5"	"	8'-3 1/4"	15'-0 1/4"	15 1/2"	52 1/2"	6'-1 1/2"	"	36"	30"	47"	50"	37 1/4"	6'-5 7/8"	29 1/8"	7'-3 1/2"
A-228D-74-28	"	"	"	"	"	"	"	58 1/2"	"	"	"	"	"	"	"	"	"	"
A-160D-74-25	50"	10'-0"	11'-9"	"	7'-11"	14'-6 3/4"	"	51"	"	9 3/4"	35 1/2"	26"	57"	43 1/2"	32"	66 7/8"	22"	6'-5 1/2"
A-160D-64-25	"	"	"	"	"	"	"	56"	"	"	"	"	"	"	"	"	"	"
A-114D-64-19	48"	9'-7"	11'-0"	9"	7'-5 1/2"	14'-5 3/4"	15"	55 1/2"	63 3/4"	"	36"	24"	64"	42"	25 1/4"	63 3/8"	13 3/4"	6'-0 1/2"

* Portable Base is Standard. One Piece and Portable Bases Available On All Units.

RATING CHART

UNIT	Peak Torque Rating, Inch Lbs.	Stroke, Inches	Polish Rod Load Class, Lbs.	Piston Dia., Inches	Effective Counter-Balance, Lbs.	Walking Beam Size	Pitman Side Member Size, Ex.-Hvy. Pipe	Wireline Hangers	*Standard Sheave Sizes P.D. Inches	Gear Ratio	Weight, Lbs.
A-1824D-240-47...	1,824,000	240-200	47,000	14½	34,000	36 x 16½ @ 245#	8	1⅝" x 52'-0"	40, 46, 51, 55, 68 (11D)	28.33	71,332
A-1824D-216-41...	"	216-190-162	41,000	"	24,830	33 x 15¾ @ 200#	"	1⅝" x 42'-10"	"	"	63,667
A-1824D-192-42...	"	192-168-144	42,000	"	30,635	"	"	1⅝" x 44'-4"	"	"	60,850
A-1280D-240-47...	1,280,000	240-200	47,000	"	34,000	36 x 16½ @ 245#	"	1⅝" x 52'-0"	"	28.05	68,330
A-1280D-216-41...	"	216-190-162	41,000	"	24,830	33 x 15¾ @ 200#	"	1⅝" x 42'-10"	"	"	61,117
A-1280D-192-42...	"	192-168-144	42,000	"	30,635	"	"	1⅝" x 44'-4"	"	"	58,300
A-1280D-427-144...	"	144-120-100	42,700	13	27,935	27 x 14 @ 160#	6	1⅝" x 37'-2"	"	"	44,800
A-912D-216-41...	912,000	216-190-162	41,000	14½	24,830	33 x 15¾ @ 200#	8	1⅝" x 42'-10"	28, 34, 40, 46, 51 (7D)	28.72	52,817
A-912D-192-42...	"	192-168-144	42,000	"	30,635	"	"	1⅝" x 44'-4"	"	"	50,000
A-912D-168-33.5...	"	168-141-118	33,500	13	22,450	27 x 14 @ 160#	6	1⅝" x 39'-10"	"	"	38,978
A-912D-427-144...	"	144-120-100	42,700	"	27,935	"	"	1⅝" x 37'-2"	"	"	37,200
A-640D-168-33.5...	640,000	168-141-118	33,500	"	22,450	"	"	1⅝" x 39'-10"	28, 34, 40, 46, 51 (6D)	28.6	37,978
A-640D-427-144...	"	144-120-100	42,700	"	27,935	"	"	1⅝" x 37'-2"	"	"	36,200
A-640D-144-31...	"	144-120-100	31,000	12	20,200	24 x 14 @ 130#	"	1¼" x 33'-9"	"	"	32,528
A-456D-144-34.2...	456,000	144-120-100	34,200	"	"	"	"	"	28, 34, 40, 46, 51 (6D or 8C)	29.04	31,210
A-456D-120-36...	"	120-100-86	36,000	"	24,535	"	"	1¼" x 30'-0"	"	"	29,900
A-320D-120-30.2...	320,000	120-104-90	30,200	11	18,400	24 x 12 @ 100#	4	1¼" x 25'-4"	25, 30, 36, 42, 47½ (6C or 5D)	30.12	25,000
A-320D-100-32...	"	100-86-74	32,000	"	21,910	"	"	1¼" x 26'-6"	"	"	24,500
A-228D-86-28...	228,000	86-74-64	28,000	10	17,695	21 x 9 @ 82#	"	1⅝" x 24'-6"	24½, 30, 36, 41½ (5C or 4D)	28.45	18,500
A-228D-74-28...	"	74-64-54	28,000	"	"	"	"	"	"	"	18,300
A-160D-74-25...	160,000	74-64-54	25,000	"	17,595	18 x 8¾ @ 77#	3½	1⅝" x 22'-6"	24½, 29½, 33½, 38 (4C or 3D)	28.67	14,600
A-160D-64-25...	"	64-54	25,000	"	"	"	"	"	"	"	14,600
A-114D-64-19...	114,000	64-54	19,000	8	11,000	16 x 8½ @ 64#	"	1" x 19'-0"	19½, 24, 29½, 33½ (3C)	29.4	11,600

* Standard Sheave Sizes Shown are Floating Hub Sheaves for Clutch Driven Compressors; Largest Size Shown is Maximum Available. For Electric Motor Driven Compressors, Use Solid Type Reducer Sheave as Shown in Crank Balance Unit Specifications.

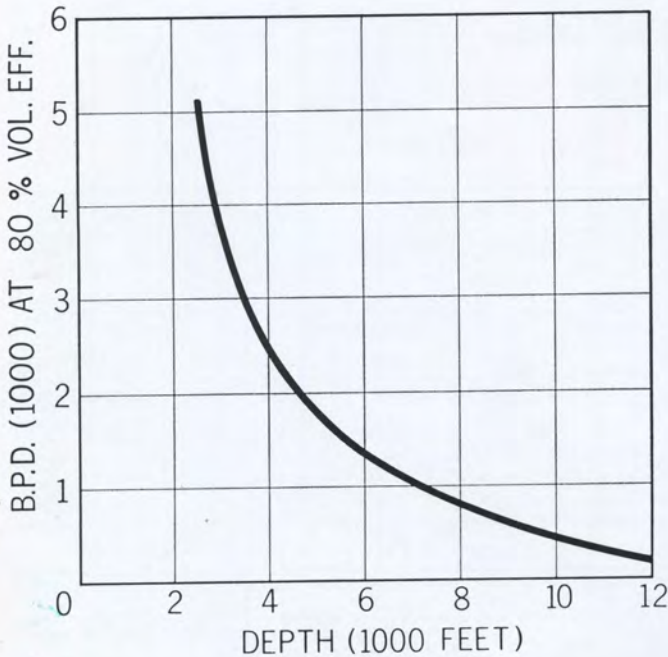


FIGURE 11

Figure 50 shows the production that can be expected from a given depth using the 20 foot stroke air balanced unit. Curve is based on 80% volumetric efficiency, 11 S.P.M., and a maximum rod stress of 35,000 P.S.I.



FIGURE 12

A-1824D-240-47 Air Balanced Pumping Unit, Multi-Cylinder Engine Drive.

LUFKIN AIR BALANCED UNIT INSTALLATIONS



FIGURE 13

Platform installation of A-160D-74-25 Air Balanced Pumping Unit driven by slow speed engine.

FIGURE 14
Lufkin A-1824D-192-42 Air Balanced Unit With Multi-Cylinder Engine Drive.



LUFKIN

AIR BALANCED PUMPING UNITS

LUFKIN AIR BALANCED UNITS
ARE APPROXIMATELY 35%
SHORTER AND 40% LIGHTER
THAN CONVENTIONAL UNITS.

IDEAL FOR

1

1

OFFSHORE PUMPING

2

PORTABLE TEST UNITS

3

ELEVATED PLATFORMS

4

BIG VOLUME PUMPING



2

