

CATALOG 66-67



LUFKIN PUMPING UNITS

LUFKIN FOUNDRY & MACHINE COMPANY



LUFKIN, TEXAS

LUFKIN EQUIPMENT OF ADVANCED DESIGN

1. Oil Field Pumping Units:
 - A. Air Balanced Pumping Units—Pages 3078-3082
 - B. Beam Balanced Pumping Units—Page 3067
 - C. Crank Balanced Pumping Units—Pages 3056-3066
 - D. Mark II Unitorque Pumping Units—Pages 3068-3074
2. Gas Engines for Pumping Service—Pages 3084-3085
3. Truck-Trailers—Page 3083
4. Geared Speed Reducers and Increasers—Pages 3086-3087

Oilfield Sales and Service—Offices and Warehouses of The Lufkin Foundry & Machine Company

- | | | | | |
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Joe Skeeters | CORPUS CHRISTI, TEXAS
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Doyle Herndon
Willard Chappell | TALARA, PERU S. A.
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Jack Hill
John Spring | | | |

**SINGLE REDUCTION, DOUBLE REDUCTION
AND TRIPLE REDUCTION GEAR UNITS
ARE AVAILABLE FOR EVERY PUMPING NEED**

1. Housing especially built for oil well service, of rugged construction with large factors of safety.
2. Precision cut Lufkin herringbone gears are used exclusively in all Lufkin pumping units.
3. Gear Cases are jig bored to same accuracy as gears.
4. All shafts forged from alloy steel, heat treated and precision ground.
5. Oversize Bearings on crankshafts. Easily renewable but seldom requiring replacement.
6. All pinions float on Straight Roller Bearings.
7. No Oil Pumps. Lufkin gears operate in oil bath with gear wipers to flood bearings.
8. Clam Shell Brake. No grabbing. Improved ratchet lever and stand, locomotive type.

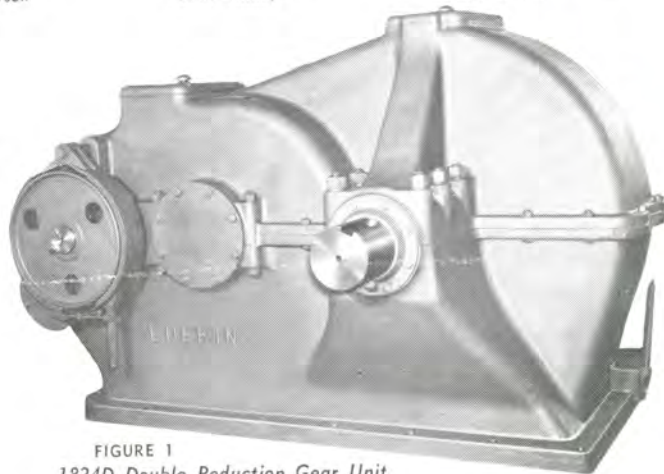


FIGURE 1
1824D Double Reduction Gear Unit

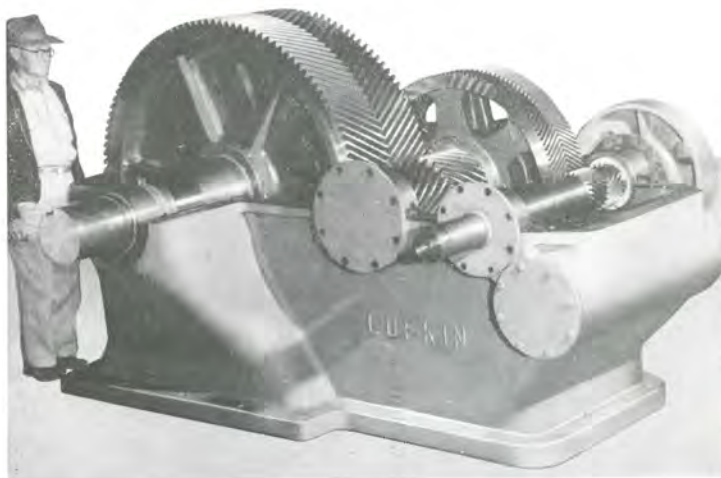
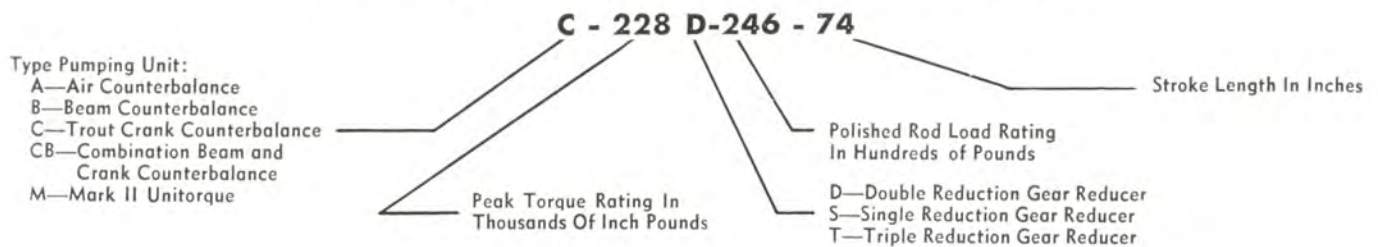


FIGURE 2
1824D Double Reduction Gear Unit, cover removed

EXPLANATION OF PUMPING UNIT DESIGNATIONS



INSTRUCTIONS FOR ORDERING SPARE PARTS

WHEN ORDERING SPARE PARTS, THE DESIGNATION AND SERIAL NUMBER OF THE UNIT MUST BE GIVEN. This information is necessary in addition to the description of the part,

part number, etc. By supplying all the information available our personnel will have a cross check on the particular part wanted and errors in typing, etc. can be circumvented.

LUBRICATION INSTRUCTIONS

LUFKIN PUMPING UNITS

The following instructions are for average operating conditions. For unusual conditions of exceptionally heavy well loads and extremely cold weather lubrication should be watched more closely and one of our field men should be consulted for individual recommendations.

GEAR REDUCER: For temperatures between 10° F. and 100° F. use an SAE 90 mineral oil with rust and oxidation inhibitors and with an anti-foam agent and having a pour point of 0° F. or lower. (This is a mineral gear oil and is not a motor oil or extreme pressure lubricant. It has a viscosity comparable to SAE 40 or SAE 50 motor oil.)

In the event the SAE 90 Mineral Oil is not accessible a good quality SAE 40 or SAE 50 Motor Oil may be used as a substitute; however, care must be taken to use an oil having a pour point at least 10° F. below the minimum outside temperature.

If desired, units can be shipped with the gear reducer filled with oil that will comply with the above specifications.

Maintain the oil level above the bottom pet cock or low mark on gage but do not fill the gear reducer above the top pet cock or high mark on gage.

Every six months the operator should give the oil a good visual inspection for possible dirt, sludge, water emulsion or other forms of contamination.

It is recommended that a quart sample be taken from the reducer every year and checked for acidity.

STRUCTURAL BEARINGS

All structural bearings are lubricated at the factory; however, they do require periodic relubrication as outlined below.

1. **WARM CLIMATES:** (Lowest annual temperature is above 15°F).

Roller Bearings should be relubricated every 12 months (6 months is more desirable). Use a No. 1 lithium soap grease having an extreme pressure additive, preferably lead naphthanate. Do not use soda soap grease.

High Lead Bronze Bearings should be relubricated as required to maintain oil level by removing fill plug and adding oil until reservoir is full. Use an EP140

extreme pressure oil with lead naphthanate additive and a pour point of +15°F or lower. If available, the use of a heavier oil (viscosity up to 6600 SUS at 100°F) is permissible.

2. **COLD CLIMATES:** (Lowest annual temperature is below 15°F).

Roller Bearings should be relubricated every 6 months. Use a No. 0 lithium soap grease having an extreme pressure additive, preferably lead naphthanate. Do not use soda soap grease.

High Lead Bronze Bearings should be relubricated as required to maintain oil level by removing fill plug and adding oil until reservoir is full. Use an EP80 extreme pressure oil with lead naphthanate additive and a pour point of -10°F or lower.

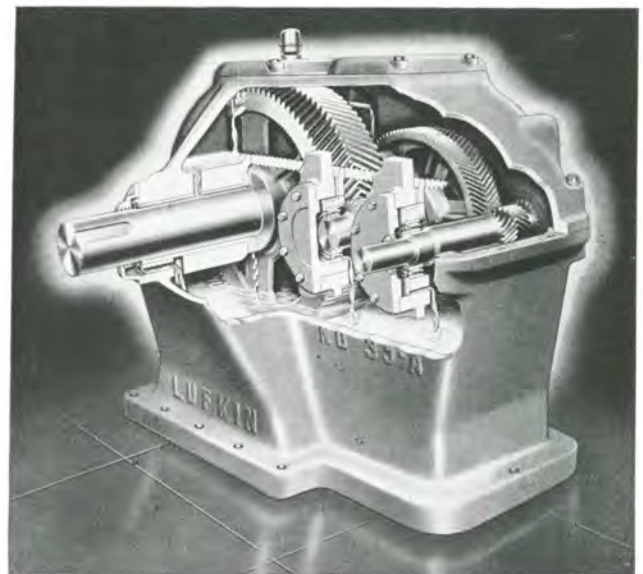


FIGURE 3

As long as the oil is maintained at the proper level, the slow speed and high speed gears dip in oil and provide continuous lubrication to the gear mesh.

Large oil wipers direct a flood of oil into oversized oil troughs which in turn provide each individual bearing with more than adequate lubrication.



FIGURE 4
HORSEHEAD AND WIRE LINE ASSEMBLY

Easily aligned with polished rod without disconnecting well load. One-piece arc plate is used for greater strength.

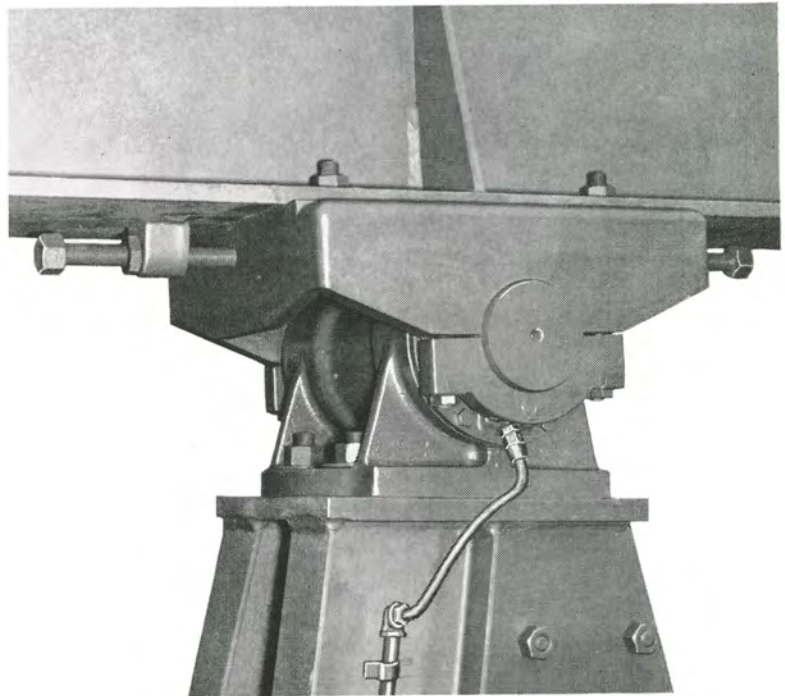


FIGURE 5
CENTER BEARING ASSEMBLY

Furnished with roller bearings on some C-80D and all larger sizes.

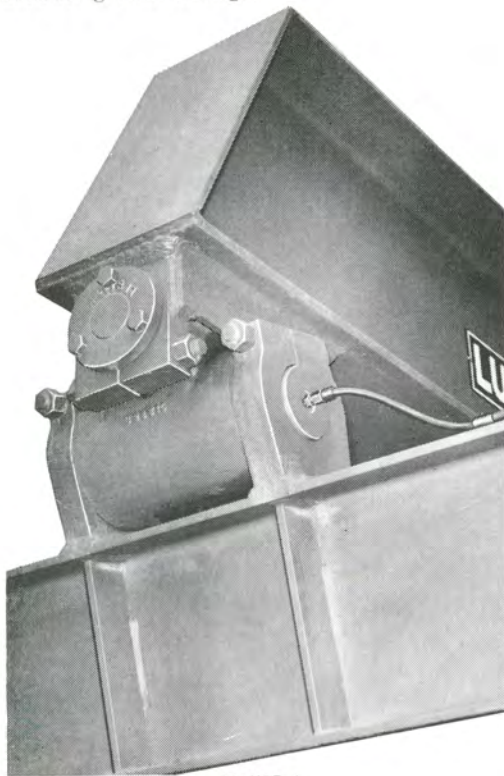


FIGURE 6
CRANK BALANCED UNIT EQUALIZER BEARING ASSEMBLY

Furnished with roller bearings, on all sizes. Cross-pin type connection to walking beam is utilized.

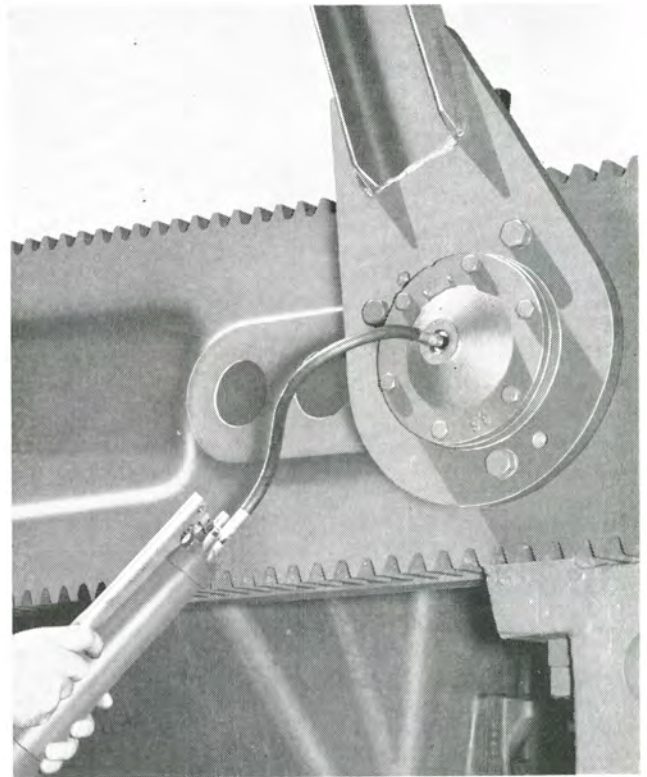


FIGURE 7
CRANK PIN ASSEMBLY

Furnished with roller bearings on all sizes.

All LUFKIN crank pins are furnished with grease fittings and drilled holes to facilitate removal of pins by grease pressure using a grease gun on fitting under cover.

**A WIDER RANGE OF COUNTERBALANCE
AVAILABLE WITH THE TROUT COUNTERBALANCED TYPE B CRANK**

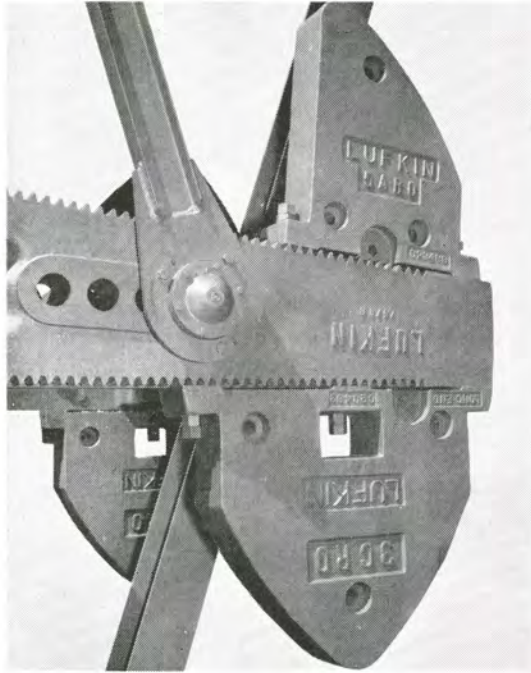


FIGURE 8—Illustrating the wide range of counterweight sizes which can be used on one crank. Different size counterweights are not normally furnished or recommended for the same unit.

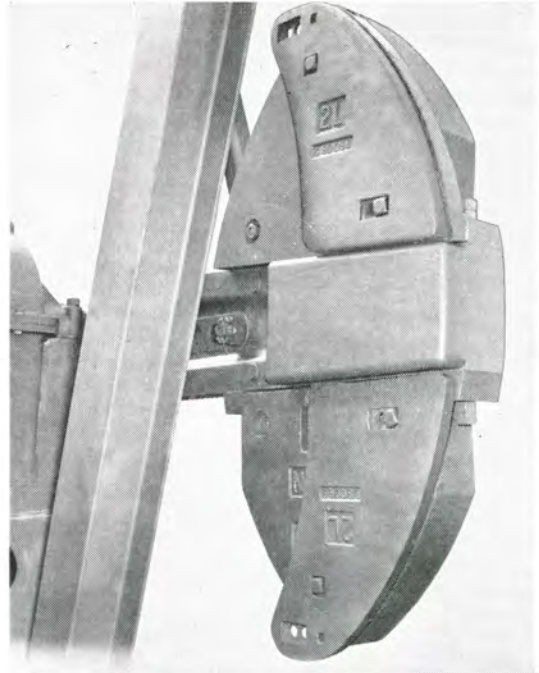


FIGURE 9—L type auxiliary weights can be used alone or with S type auxiliary weights.

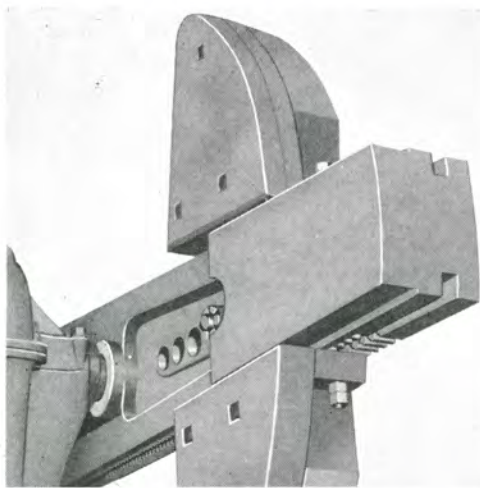


FIGURE 10—Various combinations of type S and D auxiliary counterweights available for additional counterbalance.

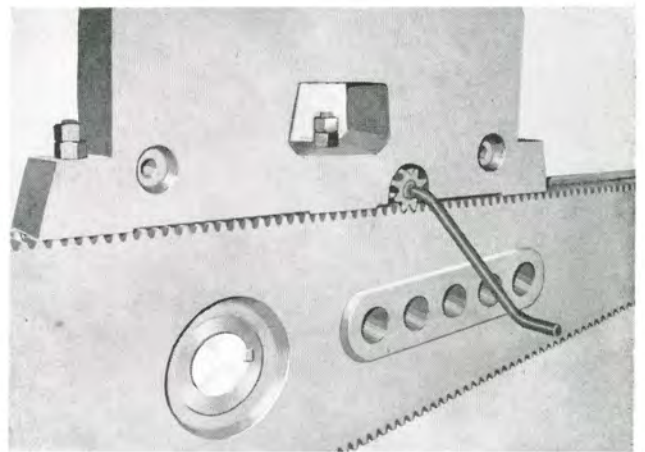


FIGURE 11—New removable pinion (with crank handle attached) is used to adjust all counterweights.

As shown in Figures 8, 9 and 10 a wide range of counterbalance is available on all LUFKIN units. With the various combinations of counterweights and auxiliary counterweights to choose from a very economical selection of counterbalance can be made.

Note in Figure 10 the extra counterbalance made available by the increased thickness at the end of the type B crank. With this type crank, one of two type S (single thickness) auxiliary counterweights can be added or one type D (double thickness) auxiliary counterweight can be added to each counterweight.

Also note in Figure 9 the new L type auxiliary weight. It offers counterbalance in smaller increments than has ever before been possible.

The Trout Counterbalanced Crank, using sliding weights to change the counterbalance effect, is an Original Lufkin

Feature. Moving the counterweights has been made even safer and easier by the addition of a rack and pinion.

One Man Alone, using the special combination pinion and crank shown in Figure 11, can make the adjustment in a matter of minutes. All four weights can be adjusted without changing the position of the cranks.

Rack and pinion type cranks are regularly furnished on the C-25 assemblies and larger.

With the Trout Counterbalanced Crank there is no hazard to the operator or equipment as it is impossible for Trout counterweights to slide off the crank even when bolts are loosened, so long as nuts are not completely removed from bolts.

This same Safe, Simple and Easy Trout Counterbalance has been in use over a period of many years and has been installed on over **NINETY THOUSAND LUFKIN PUMPING UNITS.**



FIGURE 12

HI-PRIME PUMPING UNIT with elevated motor provides protection from high water and drifting sand and snow. If unit is moved to a location where electric power is not available, bolted-on motor support can be easily removed and a jointed gas engine base installed. Short foundation block reduces installation costs. Available in all structures using 25D through 912D gear reducers. Unit shown is a C160D-200-74



FIGURE 13

JOINTED SLOW SPEED ENGINE BASE, tailor made to fit particular prime mover. Since slide rails are not required with this type base the center of gravity is kept low, thus reducing vibration. Unit shown is a C-456D-253-144 driven by a LUFKIN H-795 Engine.

FIGURE 14

HEAVY DUTY PORTABLE "STRONGBACK" base is available for all units. Bases are also available with plated bottom to permit installation directly on soil with a minimum bearing capacity of 2000 pounds per square foot. Unit shown is a C-640D-304-144.

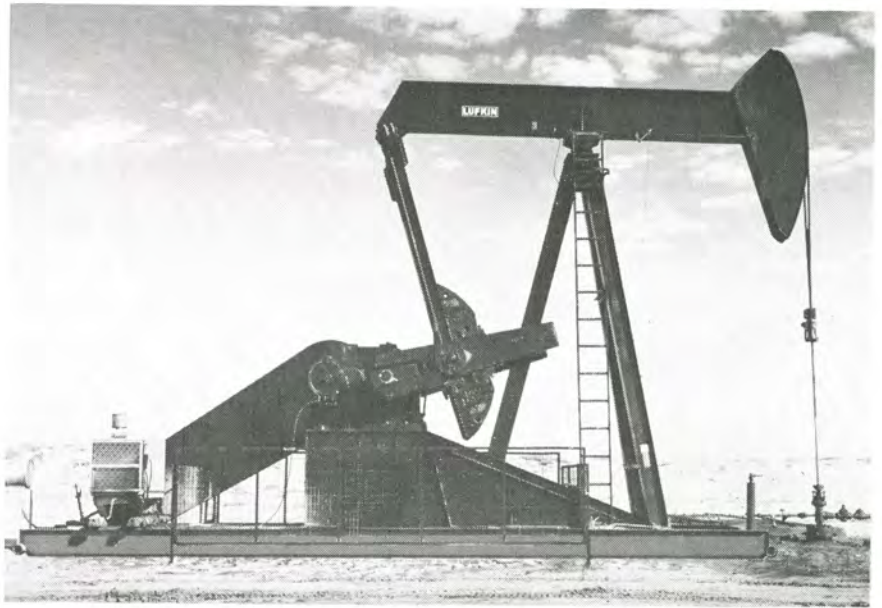
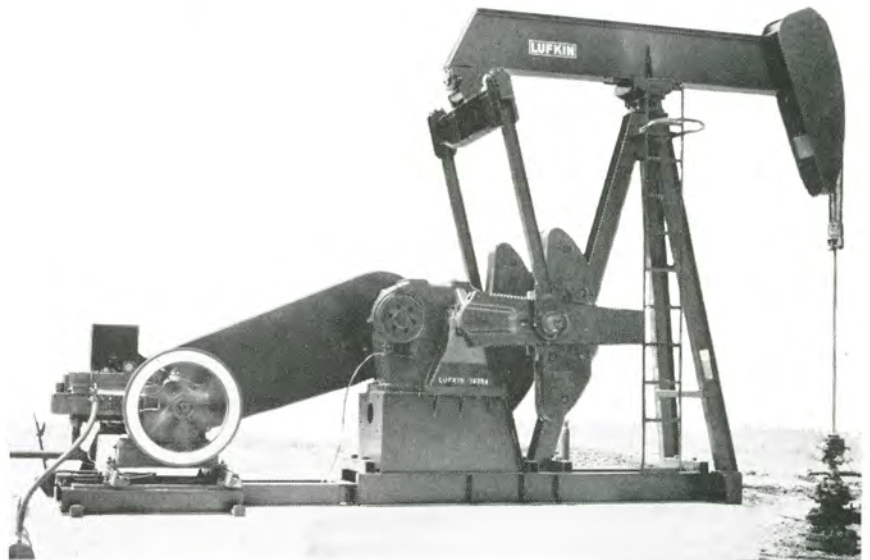


FIGURE 15

HEAVY DUTY PORTABLE BASE unit, full skid, extended front and rear, can be very easily moved, requires a timber foundation. Unit shown is a C-114D-169-64.

FIGURE 16

JOINTED ELL BASE adapts easily to all multi-cylinder engines by using slide rails. This type engine base can also be used with flywheel-clearing slow speed engines as shown on this C-160D-173-74 unit.





CRANK BALANCED PUMPING UNIT SPECIFICATIONS

UNIT DESIGNATION.....	C-912D-356-168 C-640D-356-168	C-912D-305-168 C-640D-305-168	C-912D-427-144 C-640D-427-144	C-912D-356-144 C-640D-356-144	C-640D-304-144 C-456D-304-144
POLISHED ROD CAPACITY, LBS.	35,600	30,500	42,700	35,600	30,400
STROKE LENGTHS, INCHES...	168, 145, 124, 102	168, 145, 124, 102	144, 124, 106, 88	144, 124, 106, 88	144, 124, 106, 88
WALKING BEAM.....	36" x 230 Lbs.	33" x 220 Lbs.	36" x 230 Lbs.	33" x 220 Lbs.	33" x 200 Lbs.
PITMANS.....	8" I-Beam				
WIRELINE HANGER.....	1 3/8" x 40'-2"	1 1/4" x 39'-6"	1 3/8" x 38'-2"	1 3/8" x 38'-2"	1 1/4" x 37'-6"
CRANKS.....	94110B	94110B	94110B	94110B	94110B
STRUCTURAL UNBALANCE....	-1500 Lbs.	-1500 Lbs.	-650 Lbs.	-650 Lbs.	-520 Lbs.

UNIT DESIGNATION.....	C-640D-253-144 C-456D-253-144	C-912D-427-120 C-640D-427-120	C-640D-365-120 C-456D-365-120	C-640D-304-120 C-456D-304-120	C-456D-256-120 C-320D-256-120
POLISHED ROD CAPACITY, LBS.	25,300	42,700	36,500	30,400	25,600
STROKE LENGTHS, INCHES...	144, 124, 106, 88	120, 105, 90, 74	120, 105, 90, 74	120, 102, 85, 67	120, 102, 85, 67
WALKING BEAM.....	30" x 172 Lbs.	33" x 220 Lbs.	30" x 190 Lbs.	30" x 172 Lbs.	27" x 160 Lbs.
PITMANS.....	8" I-Beam			6" I-Beam	
WIRELINE HANGER.....	1 1/4" x 37'-6"	1 3/8" x 37'-2"	1 3/8" x 37'-2"	1 1/4" x 31'-6"	1 1/8" x 31'-6"
CRANKS.....	94110B	94110B	94110B	8495B	8495B
STRUCTURAL UNBALANCE....	-400 Lbs.	570 Lbs.	570 Lbs.	-120 Lbs.	55 Lbs.

UNIT DESIGNATION.....	C-456D-213-120 C-320D-213-120	C-640D-365-100 C-456D-365-100	C-456D-298-100 C-320D-298-100	C-456D-256-100 C-320D-256-100	C-456D-298-86 C-320D-298-86
POLISHED ROD CAPACITY, LBS.	21,300	36,500	29,800	25,600	29,800
STROKE LENGTHS, INCHES...	120, 102, 85, 67	100, 85, 70, 56	100, 85, 70, 56	100, 85, 70, 56	86, 74, 61, 48
WALKING BEAM.....	27" x 145 Lbs.	30" x 172 Lbs.	27" x 160 Lbs.	27" x 145 Lbs.	24" x 145 Lbs.
PITMANS.....	6" I-Beam				
WIRELINE HANGER.....	1 1/8" x 31'-6"	1 3/8" x 32'-2"	1 1/4" x 31'-6"	1 1/8" x 31'-6"	1 1/4" x 31'-6"
CRANKS.....	8495B	8495B	8495B	8495B	8495B
STRUCTURAL UNBALANCE....	0 Lbs.	620 Lbs.	550 Lbs.	500 Lbs.	1000 Lbs.

UNIT DESIGNATION.....	C-320D-246-86 C-228D-246-86	C-320D-212-86 C-228D-212-86	C-320D-246-74 C-228D-246-74	C-228D-200-74 C-160D-200-74	C-228D-173-74 C-160D-173-74
POLISHED ROD CAPACITY, LBS.	24,600	21,200	24,600	20,000	17,300
STROKE LENGTHS, INCHES...	86, 74, 61, 48	86, 74, 62, 51	74, 64, 54, 44	74, 64, 54, 44	74, 62, 51, 39
WALKING BEAM.....	24" x 120 Lbs.	24" x 100 Lbs.	24" x 100 Lbs.	24" x 94 Lbs.	24" x 84 Lbs.
PITMANS.....	5" I-Beam				
WIRELINE HANGER.....	1 1/8" x 31'-6"	1 1/8" x 25'-6"	1 1/8" x 23'-10 1/2"	1" x 23'-10 1/2"	1" x 20'-10 1/2"
CRANKS.....	8495B	7478B	7478B	7478B	6468B
STRUCTURAL UNBALANCE....	800 Lbs.	450 Lbs.	800 Lbs.	800 Lbs.	450 Lbs.

CRANK BALANCED PUMPING UNIT SPECIFICATIONS

UNIT DESIGNATION.....	C-228D-200-64 C-160D-200-64	C-160D-169-64 C-114D-169-64	C-160D-143-64 C-114D-143-64	C-160D-169-54 C-114D-169-54	C-114D-133-54 C-80D-133-54
POLISHED ROD CAPACITY, LBS....	20,000	16,900	14,300	16,900	13,300
STROKE LENGTHS, INCHES.....	64, 54, 44, 34	64, 54, 44, 34	64, 52, 40, 28	54, 44, 34, 24	54, 45, 36, 27
WALKING BEAM.....	24" x 84 Lbs.	24" x 84 Lbs.	18" x 70 Lbs.	18" x 70 Lbs.	18" x 60 Lbs.
PITMANS.....	5" I-Beam	4" I-Beam			
WIRELINE HANGER.....	1" x 20'-10½"	1" x 19'-2"	1" x 17'-8"	1" x 16'-2"	¾" x 15'-2"
CRANKS.....	6468B	6468B	5456B	5456B	4850B
STRUCTURAL UNBALANCE.....	800 Lbs.	550 Lbs.	360 Lbs.	500 Lbs.	330 Lbs.

UNIT DESIGNATION.....	C-114D-119-54 C-80D-119-54	C-114D-133-48 C-80D-133-48	C-80D-109-48 C-57D-109-48	C-80D-95-48 C-57D-95-48	C-80D-109-42 C-57D-109-42
POLISHED ROD CAPACITY, LBS....	11,900	13,300	10,900	9,500	10,900
STROKE LENGTHS, INCHES.....	54, 45, 36, 27	48, 40, 32, 24	48, 37, 25	48, 37, 25	42, 32, 22
WALKING BEAM.....	18" x 55 Lbs.	16" x 58 Lbs.	16" x 45 Lbs.	16" x 40 Lbs.	16" x 45 Lbs.
PITMANS.....	4" I-Beam				
WIRELINE HANGER.....	¾" x 15'-2"	¾" x 14'-2"	¾" x 14'-2"	¾" x 14'-2"	¾" x 12'-6"
CRANKS.....	4850B	4850B	4246B	4246B	4246B
STRUCTURAL UNBALANCE.....	330 Lbs.	440 Lbs.	320 Lbs.	320 Lbs.	500 Lbs.

UNIT DESIGNATION.....	C-57D-89-42 C-40D-89-42	C-57D-76-42 C-40D-76-42	C-57D-89-36 C-40D-89-36	C-40D-67-36 C-25D-67-36	C-40D-56-36 C-25D-56-36
POLISHED ROD CAPACITY, LBS....	8,900	7,600	8,900	6,700	5,600
STROKE LENGTHS, INCHES.....	42, 33, 23	42, 33, 23	36, 28, 20	36, 28, 20	36, 28, 20
WALKING BEAM.....	16" x 36 Lbs.	14" x 34 Lbs.	14" x 34 Lbs.	12" x 31 Lbs.	12" x 27 Lbs.
PITMANS.....	3" I-Beam				
WIRELINE HANGER.....	¾" x 12'-6"	¾" x 12'-6"	¾" x 11'-0"	⅝" x 11'-0"	⅝" x 11'-0"
CRANKS.....	3644B	3644B	3644B	3644B	3644B
STRUCTURAL UNBALANCE.....	150 Lbs.	150 Lbs.	275 Lbs.	275 Lbs.	275 Lbs.

UNIT DESIGNATION.....	C-40D-67-30 C-25D-67-30	C-25D-53-30	C-25D-43-30	C-25D-53-24
POLISHED ROD CAPACITY, LBS....	6,700	5,300	4,300	5,300
STROKE LENGTHS, INCHES.....	30, 20	30, 20	30, 20	24, 16
WALKING BEAM.....	12" x 27 Lbs.	10" x 25 Lbs.	10" x 21 Lbs.	10" x 21 Lbs.
PITMANS.....	3" I-Beam			
WIRELINE HANGER.....	⅝" x 11'-0"	½" x 11'-0"	½" x 11'-0"	½" x 8'-0"
CRANKS.....	2436B	2436B	2436B	2436B
STRUCTURAL UNBALANCE.....	150 Lbs.	150 Lbs.	150 Lbs.	200 Lbs.



LUFKIN FOUNDRY & MACHINE CO.

LUFKIN, TEXAS

CRANK COUNTERBALANCE DATA

Effective Counterbalance At Polished Rod With Weights At Maximum Position, Including Structural Unbalance.

See Example Pages 3062 and 3063.

UNIT	C-912D-356-168 C-912D-305-168 C-610D-356-168 C-640D-305-168	C-912D-427-144 C-912D-356-144 C-640D-427-144 C-640D-356-144	C-640D-304-144 C-456D-304-144	C-640D-253-144 C-456D-253-144	C-912D-427-120 C-610D-427-120 C-610D-365-120 C-456D-365-120	C-640D-304-120 C-456D-304-120	C-456D-256-120 C-320D-256-120	C-456D-213-120 C-320D-213-120
STROKE	168"	144"	144"	144"	120"	120"	120"	120"
Structural Unbalance*	-1,500 Lbs.	-650 Lbs.	-520 Lbs.	-400 Lbs.	570 Lbs.	-120 Lbs.	55 Lbs.	0 Lbs.
CRANKS	94110B	94110B	94110B	94110B	94110B	8495B	8495B	8495B
C'Bal., Cranks Only	4,135	5,920	6,050	6,170	8,350	5,415	5,590	5,535
4 No. OORO Counterweights	18,485	23,490	23,620	23,740	29,150			
4 No. OOS Aux. Weights	22,815	28,770	28,900	29,020	35,420			
4 No. OOD Aux. Weights	27,145	34,050	-----	-----	41,690			
4 No. ORO Counterweights	16,675	21,250	21,380	21,500	26,490	20,245		
4 No. OL Aux. Weights	18,570	23,565	23,695	23,815	29,230	22,555		
4 No. OS Aux. Weights	20,830	26,330	26,460	-----	32,510	25,165		
4 No. OD Aux. Weights	24,985	31,410	-----	-----	38,530	-----		
4 No. OARO Counterweights	15,205	18,835	18,965	19,085	23,650	18,115	18,290	18,235
4 No. OL Aux. Weights	17,100	21,150	21,280	21,400	26,390	20,430	22,220	20,550
4 No. OAS Aux. Weights	18,475	22,835	22,965	23,085	28,390	22,045	-----	-----
4 No. OAD Aux. Weights	21,745	26,835	26,965	-----	33,130	25,975	-----	-----
4 No. 1RO Counterweights	12,315	15,920	16,050	16,170	20,200	15,245	15,420	15,365
4 No. 2L Aux. Weights	13,540	17,420	17,550	17,670	21,975	16,755	16,930	16,875
4 No. 1S Aux. Weights	14,830	18,995	19,125	19,245	23,840	18,265	18,440	18,385
4 No. 1D Aux. Weights	17,345	22,070	22,200	22,320	27,480	21,285	21,460	-----
4 No. 2RO Counterweights	10,935	14,240	14,370	14,490	18,200	13,595	13,770	13,715
4 No. 2L Aux. Weights	12,160	15,725	15,855	15,975	19,955	15,080	15,255	15,200
4 No. 2S Aux. Weights	13,375	17,220	17,350	17,470	21,730	16,525	16,700	16,645
4 No. 2D Aux. Weights	15,815	20,200	20,330	20,450	25,260	19,455	19,630	19,575
4 No. 3CRO Counterweights	9,610	12,600	12,730	12,850	16,275	12,040	12,215	12,160
4 No. 2L Aux. Weights	10,820	14,075	14,205	14,325	18,020	13,520	13,695	13,640
4 No. 3BS Aux. Weights	11,965	15,480	15,610	15,730	19,685	14,890	15,065	15,010
4 No. 3D Aux. Weights	13,850	17,780	17,910	18,030	22,405	17,170	17,345	17,290
4 No. 5ARO Counterweights	8,095	10,770	10,900	11,020	14,100	10,255	10,430	10,375
4 No. 5L Aux. Weights	8,815	11,610	11,740	11,860	15,095	11,100	11,275	11,220
4 No. 5A Aux. Weights	9,690	12,720	12,850	12,970	16,410	12,210	12,385	12,330
4 No. 5AD Aux. Weights	10,975	14,290	14,420	14,540	18,270	13,775	13,950	13,895
4 No. 5CRO Counterweights	7,170	9,460	9,590	9,710	12,530	8,975	9,150	9,095
4 No. 5L Aux. Weights	7,885	10,295	10,425	10,545	13,520	9,820	9,995	9,940
4 No. 5C Aux. Weights	8,675	11,210	11,340	11,460	14,605	10,730	10,905	10,850
4 No. 5CD Aux. Weights	10,180	12,960	13,090	13,210	16,080	12,485	12,660	12,605

UNIT	C-228D-200-64 C-160D-200-64	C-160D-169-64 C-114D-169-64	C-160D-113-64 C-114D-113-64	C-160D-169-54 C-114D-169-54	C-114D-133-54 C-114D-119-54 C-80D-133-54 C-80D-119-54	C-114D-133-48 C-80D-133-48	C-80D-109-48 C-80D-95-48	C-57D-109-48 C-57D-95-48
STROKE	64"	64"	64"	54"	54"	48"	48"	48"
Structural Unbalance*	800 Lbs.	550 Lbs.	360 Lbs.	500 Lbs.	330 Lbs.	440 Lbs.	320 Lbs.	320 Lbs.
CRANKS	6468B	6468B	5456B	5456B	4850B	4850B	4246B	4246B
C'Bal., Cranks Only	4,880	4,630	2,590	3,100	2,790	3,210	2,120	2,120
4 No. 3CRO Counterweights	12,710	12,460	8,565	10,075				
4 No. 2L Aux. Weights	14,510	14,260	9,995	11,745				
4 No. 3BS Aux. Weights	16,075	15,825	11,135	13,075				
4 No. 3D Aux. Weights	18,775	-----	13,195	15,475				
4 No. 5ARO Counterweights	10,780	10,530	7,230	8,520	7,330	8,310	6,620	6,620
4 No. 5L Aux. Weights	11,840	11,590	8,090	9,520	8,185	9,275	7,485	7,485
4 No. 5A Aux. Weights	13,170	12,920	9,115	10,720	9,180	10,390	8,460	8,460
4 No. 5AD Aux. Weights	15,095	14,845	10,630	12,490	10,620	12,010	9,930	-----
4 No. 5CRO Counterweights	9,250	9,000	6,040	7,130	6,190	7,040	5,510	5,510
4 No. 5L Aux. Weights	10,310	10,060	6,900	8,130	7,045	8,000	6,375	6,375
4 No. 5C Aux. Weights	11,410	11,160	7,745	9,120	7,875	8,935	7,185	7,185
4 No. 5C+5L Aux. Weights	12,470	12,220	8,605	10,120	8,730	9,895	8,050	8,050
4 No. 5CD Aux. Weights	13,570	13,320	9,450	11,110	9,560	10,830	8,860	-----
4 No. 6R Counterweights	8,295	8,045	5,300	6,260	5,480	6,240	4,815	4,815
4 No. 6L Aux. Weights	8,935	8,685	5,810	6,855	5,990	6,815	5,325	5,325
4 No. 6 Aux. Weights	9,575	9,325	6,320	7,450	6,500	7,390	5,835	5,835
8 No. 6 Aux. Weights	10,855	10,605	7,340	8,640	7,520	8,540	6,855	6,855
4 No. 7R Counterweights	7,075	6,825	4,345	5,150	4,550	5,190	3,895	3,895
4 No. 7L Aux. Weights	7,565	7,315	4,740	5,610	4,950	5,640	4,295	4,295
4 No. 7 Aux. Weights	8,055	7,805	5,135	6,070	5,350	6,090	4,695	4,695
8 No. 7 Aux. Weights	9,035	8,785	5,925	6,990	6,150	6,990	5,495	5,495

EXAMPLE:

A C-640D-304-144 Unit with 4 No. OARO Counterweights and 4 No. OAS Auxiliary Weights would have a maximum counterbalance effect of 22,965 pounds in the 144" stroke. This effect includes a structural unbalance of -520 pounds. If the counterbalance effect is desired for the 106" stroke, subtract the structural unbalance from the effect in the 144" stroke and multiply this difference by the ratio of 144 ÷ 106; then add the structural unbalance to this product. Thus, counterbalance effect in the 106" stroke = [22,965 - (-520)] × 144/106 + (-520) = 23,485 × 144/106 - 520 = 31,384 pounds.

*Structural Unbalance with a negative (-) sign indicates a walking beam assembly that is heavy on the well end. Structural Unbalance without the negative sign indicates a walking beam assembly that is heavy on the gear reducer end.

CRANK COUNTERBALANCE DATA

Effective Counterbalance At Polished Rod With Weights At Maximum Position, Including Structural Unbalance.

See Example Pages 3062 and 3063.

UNIT	C-640D-365-100 C-456D-365-100	C-456D-298-100 C-320D-298-100	C-456D-256-100 C-320D-256-100	C-456D-298-86 C-320D-298-86	C-320D-246-86 C-228D-246-86	C-320D-212-86 C-228D-212-86	C-320D-246-74 C-228D-246-74 C-228D-200-74 C-160D-200-74	C-228D-173-74 C-160D-173-74
STROKE	100"	100"	100"	86"	86"	86"	74"	74"
Structural Unbalance*	620 Lbs.	550 Lbs.	500 Lbs.	1000 Lbs.	800 Lbs.	450 Lbs.	800 Lbs.	450 Lbs.
CRANKS	8495B	8495B	8495B	8495B	8495B	7478B	7478B	6468B
C'Bal., Cranks Only.....	7,270	7,200	7,150	8,730	8,530	4,730	5,750	4,020
4 No. ORO Counterweights.....	25,070							
4 No. OL Aux. Weights.....	27,845							
4 No. OS Aux. Weights.....	30,970							
4 No. OARO Counterweights.....	22,550	22,480	22,430	26,470				
4 No. OL Aux. Weights.....	25,330	25,260	25,210	29,700				
4 No. OAS Aux. Weights.....	27,270	27,200						
4 No. OAD Aux. Weights.....	31,990							
4 No. 1RO Counterweights.....	19,100	19,030	18,980	22,460	22,260			
4 No. 2L Aux. Weights.....	20,915	20,845	20,795	24,570	24,370			
4 No. 1S Aux. Weights.....	22,730	22,660	22,610	26,650				
4 No. 1D Aux. Weights.....	26,360	26,290						
4 No. 2RO Counterweights.....	17,120	17,050	17,000	20,150	19,950	13,430	15,810	
4 No. 2L Aux. Weights.....	18,905	18,835	18,785	22,225	22,025	15,065	17,700	
4 No. 2S Aux. Weights.....	20,640	20,570	20,520	24,240	24,040	16,540	19,110	
4 No. 2D Aux. Weights.....	24,160	24,090	24,040	28,330		19,650	23,010	
4 No. 3CRO Counterweights.....	15,220	15,150	15,100	17,980	17,780	11,850	13,985	10,870
4 No. 2L Aux. Weights.....	16,995	16,925	16,875	20,045	19,845	13,480	15,870	12,440
4 No. 3BS Aux. Weights.....	18,640	18,570	18,520	21,900	21,700	14,900	17,510	13,815
4 No. 3D Aux. Weights.....	21,390	21,320	21,270	25,150		17,340	20,355	16,175
4 No. 5ARO Counterweights.....	13,090	13,020	12,970	15,485	15,285	10,000	11,845	9,180
4 No. 5L Aux. Weights.....	14,105	14,035	13,985	16,665	16,465	10,950	12,945	10,100
4 No. 5A Aux. Weights.....	15,440	15,370	15,320	18,215	18,015	12,110	14,285	11,270
4 No. 5AD Aux. Weights.....	17,320	17,250	17,200	20,405	20,205	13,805	16,245	12,955
4 No. 5CRO Counterweights.....	11,545	11,475	11,425	13,700	13,500	8,620	10,250	7,845
4 No. 5L Aux. Weights.....	12,560	12,490	12,440	14,880	14,680	9,570	11,350	8,765
4 No. 5C Aux. Weights.....	13,675	13,605	13,555	16,155	15,955	10,540	12,470	9,735
4 No. 5CD Aux. Weights.....	15,765	15,695	15,645	18,610	18,410	12,460	14,690	11,625
4 No. 6R Counterweights.....		10,515	10,465	12,580	12,380	7,760	9,255	7,010
4 No. 6L Aux. Weights.....		11,140	11,090	13,305	13,105	8,330	9,915	7,570
4 No. 6 Aux. Weights.....		11,765	11,715	14,030	13,830	8,900	10,575	8,130
8 No. 6 Aux. Weights.....		13,015	12,965	15,480	15,280	10,040	11,895	9,250
4 No. 7R Counterweights.....		9,310	9,260	11,185	10,985	6,670	7,995	5,940
4 No. 7L Aux. Weights.....		9,785	9,735	11,735	11,535	7,105	8,495	6,370
4 No. 7 Aux. Weights.....		10,260	10,210	12,285	12,085	7,540	9,000	6,800
8 No. 7 Aux. Weights.....		11,210	11,160	13,385	13,185	8,410	10,005	7,660

UNIT	C-80D-109-42	C-57D-109-42	C-57D-89-42 C-57D-76-42	C-40D-89-42 C-40D-76-42	C-57D-89-36	C-40D-89-36 C-40D-67-36 C-40D-56-36 C-25D-67-36 C-25D-56-36	C-40D-67-30 C-25D-67-30 C-25D-53-30 C-25D-43-30	C-25D-53-24
STROKE	42"	42"	42"	42"	36"	36"	30"	24"
Structural Unbalance*	500 Lbs.	500 Lbs.	150 Lbs.	150 Lbs.	275 Lbs.	275 Lbs.	150 Lbs.	200 Lbs.
CRANKS	4246B	4246B	3644B	3644B	3644B	3644B	2436B	2436B
C'Bal., Cranks Only.....	2,560	2,560	1,620	1,620	1,990	1,990	1,370	1,725
4 No. 5ARO Counterweights.....	7,690	7,690						
4 No. 5L Aux. Weights.....	8,675	8,675						
4 No. 5A Aux. Weights.....	9,790	9,790						
4 No. 5CRO Counterweights.....	6,430	6,430	5,120	5,120	6,070	6,070		
4 No. 5L Aux. Weights.....	7,415	7,415	6,050	6,050	7,155	7,155		
4 No. 5C Aux. Weights.....	8,345	8,345	6,920	6,920	8,170	8,160		
4 No. 5C+5L Aux. Weights.....	9,330	9,330						
4 No. 5CD Aux. Weights.....	10,260							
4 No. 6R Counterweights.....	5,640	5,640	4,540	4,540	5,400	5,400	4,400	
4 No. 6L Aux. Weights.....	6,225	6,225	5,095	5,095	6,045	6,045	4,970	
4 No. 6 Aux. Weights.....	6,810	6,810	5,650	5,650	6,690	6,690	5,540	
8 No. 6 Aux. Weights.....	7,980	7,980	6,760		7,980			
4 No. 7R Counterweights.....	4,590	4,590	3,550	3,550	4,240	4,240	3,400	4,265
4 No. 7L Aux. Weights.....	5,045	5,045	3,990	3,990	4,750	4,750	3,860	4,840
4 No. 7 Aux. Weights.....	5,500	5,500	4,430	4,430	5,260	5,260	4,320	
4 No. 7+7L Aux. Weights.....	5,955	5,955	4,870	4,870	5,770	5,770	4,780	
8 No. 7 Aux. Weights.....	6,410	6,410	5,310		6,280			

EXAMPLE:

A C-80D-109-42 with 4 No. 6R Counterweights, 3 No. 6L Auxiliary Weights, and 2 No. 6 Auxiliary Weights would have a maximum counterbalance effect in the 42" stroke of 5640 + 3/4 (6225-5640) + 1/2 (6810-5640) = 6,664 pounds. With this same combination of weights, the counterbalance effect in the 32" stroke is (6664-500) x 42/32 + 500 = 8590 pounds.

*Structural Unbalance with a negative (-) sign indicates a walking beam assembly that is heavy on the well end. Structural Unbalance without the negative sign indicates a walking beam assembly that is heavy on the gear reducer end.

GEAR SPECIFICATIONS

1824D GEAR REDUCER: Double Reduction
 RATING: 1,824,000 In. Lbs. Peak Torque • RATIO OF GEARS: 28.33
 CRANK SHAFT DIA. 9"
 SHEAVE: 46" P.D.—11D Std.,
 68" P.D. Max., 4-15/16" Bore
 GEAR BOX OIL CAPACITY: 165 Gallons

1280D GEAR REDUCER: Double Reduction
 RATING: 1,280,000 In. Lbs. Peak Torque • RATIO OF GEARS: 28.05
 CRANK SHAFT DIA. 8 1/2"
 SHEAVE: 46" P.D.—10D Std.,
 68" P.D., 10D, Max., 4-15/16" Bore
 GEAR BOX OIL CAPACITY: 120 Gallons

912D GEAR REDUCER: Double Reduction
 RATING: 912,000 In. Lbs. Peak Torque • RATIO OF GEARS: 28.72
 CRANKSHAFT DIA.: 7" (Mark II, 9")
 SHEAVE: 47.6" P.D.—8D Standard
 55.2" P.D. Max., 4-3/16" Bore
 GEAR BOX OIL CAPACITY: 107 Gallons

640D GEAR REDUCER: Double Reduction
 RATING 640,000 In. Lbs. Peak Torque • RATIO OF GEARS: 28.6
 CRANKSHAFT DIA.: 7" (Mark II, 9")
 SHEAVE: 34" P.D.—6D Std., 47.4" or 51.4" P.D. Alt.,
 55.4" P.D. Max., 3-7/16" Bore
 GEAR BOX OIL CAPACITY: 70 Gallons

456D GEAR REDUCER: Double Reduction
 RATING: 456,000 In. Lbs. Peak Torque • RATIO OF GEARS: 29.04
 CRANKSHAFT DIA.: 7" (Mark II, 9")
 SHEAVE: 34" P.D.—6D or 8C Std., 47.4" P.D. Alt.,
 51.4" P.D. Max., 3-7/16" Bore
 GEAR BOX OIL CAPACITY: 55 Gallons

456S GEAR REDUCER: Single Reduction
 RATING: 456,000 In. Lbs. Peak Torque • RATIO OF GEARS: 10.71
 CRANKSHAFT DIA.: 7"
 SHEAVE: 47.6" P.D.—8D or 12C Std.,
 47.6" P.D. Max., 3-15/16" Bore
 GEAR BOX OIL CAPACITY: 34 Gallons

320D GEAR REDUCER: Double Reduction
 RATING: 320,000 In. Lbs. Peak Torque • RATIO OF GEARS: 30.12
 CRANKSHAFT DIA.: 6-7/16" (Mark II, 8 1/2")
 SHEAVE: 24.6" P.D.—6C or 5D Std., 29.6" P.D. Alt.,
 47" P.D. Max., 2-15/16" Bore
 GEAR BOX OIL CAPACITY: 50 Gallons

320S GEAR REDUCER: Single Reduction
 RATING: 320,000 In. Lbs. Peak Torque • RATIO OF GEARS: 9.4
 CRANKSHAFT DIA.: 6-7/16"
 SHEAVE: 34" P.D.—8D or 12C Std.,
 34" P.D. Max., 3-7/16" Bore
 GEAR BOX OIL CAPACITY: 25 Gallons

228D GEAR REDUCER: Double Reduction
 RATING: 228,000 In. Lbs. Peak Torque • RATIO OF GEARS: 28.45
 CRANKSHAFT DIA.: 6" (Mark II, 7")
 SHEAVE: 24.6" P.D.—5C or 4D Std., 29.6" P.D. Alt.,
 41" P.D. Max., 2-7/16" Bore
 GEAR BOX OIL CAPACITY: 34 Gallons

228S GEAR REDUCER: Single Reduction
 RATING: 228,000 In. Lbs. Peak Torque • RATIO OF GEARS: 9.94
 CRANKSHAFT DIA.: 6"
 SHEAVE: 34" P.D.—6D or 9C Std.,
 34" P.D. Max., 3-3/16" Bore
 GEAR BOX OIL CAPACITY: 18 Gallons

160D GEAR REDUCER: Double Reduction
 RATING: 160,000 In. Lbs. Peak Torque • RATIO OF GEARS: 28.67
 CRANKSHAFT DIA.: 5-7/16" (Mark II, 7")
 SHEAVE: 24.6" P.D.—4C or 3D Std., 29.6" P.D. Alt.,
 38" P.D. Max., 2-3/16" Bore
 GEAR BOX OIL CAPACITY: 22 Gallons

160S GEAR REDUCER: Single Reduction
 RATING: 160,000 In. Lbs. Peak Torque • RATIO OF GEARS: 10.5
 CRANKSHAFT DIA.: 5-7/16"
 SHEAVE: 31.6" P.D.—4D or 6C Std.,
 31.6" P.D. Max., 2-15/16" Bore
 GEAR BOX OIL CAPACITY: 18 Gallons

114D GEAR REDUCER: Double Reduction
 RATING: 114,000 In. Lbs. Peak Torque • RATIO OF GEARS: 29.4
 CRANKSHAFT DIA.: 4-7/16" (Mark II, 6-7/16")
 SHEAVE: 19.6" P.D.—3C Std., 24.6" or 29.6" P.D. Alt.,
 33.6" P.D. Max., 1-15/16" Bore
 GEAR BOX OIL CAPACITY: 17 Gallons

114S GEAR REDUCER: Single Reduction
 RATING: 114,000 In. Lbs. Peak Torque • RATIO OF GEARS: 9.67
 CRANKSHAFT DIA.: 4-7/16"
 SHEAVE: 27.3" P.D.—6C Std.,
 27.3" P.D. Max., 2-11/16" Bore
 GEAR BOX OIL CAPACITY: 5 1/2 Gallons

80D GEAR REDUCER: Double Reduction
 RATING: 80,000 In. Lbs. Peak Torque • RATIO OF GEARS: 29.15
 CRANKSHAFT DIA.: 4-7/16"
 SHEAVE: 19.6" P.D.—3C Std., 24.6" P.D. Alt.,
 29.6" P.D. Max., 1-15/16" Bore
 GEAR BOX OIL CAPACITY: 17 Gallons

57D GEAR REDUCER: Double Reduction
 RATING: 57,000 In. Lbs. Peak Torque • RATIO OF GEARS: 29.32
 CRANKSHAFT DIA.: 4"
 SHEAVE: 19.6" P.D.—2C Std., 24.6" P.D. Alt.,
 27.5" P.D. Max., 1-15/16" Bore
 GEAR BOX OIL CAPACITY: 13 Gallons

57S GEAR REDUCER: Single Reduction
 RATING: 57,000 In. Lbs. Peak Torque • RATIO OF GEARS: 10.0
 CRANKSHAFT DIA.: 4"
 SHEAVE: 23.8" P.D.—4C Std.,
 23.8" P.D. Max., 2-7/16" Bore
 GEAR BOX OIL CAPACITY: 7 1/2 Gallons

40D GEAR REDUCER: Double Reduction
 RATING: 40,000 In. Lbs. Peak Torque • RATIO OF GEARS: 29.2
 CRANKSHAFT DIA.: 4"
 SHEAVE: 21" P.D.—2C or 3B Std.,
 23.3" P.D. Max., 1-11/16" Bore
 GEAR BOX OIL CAPACITY: 7 Gallons

25D GEAR REDUCER: Double Reduction
 RATING: 25,000 In. Lbs. Peak Torque • RATIO OF GEARS: 28.9
 CRANKSHAFT DIA.: 3"
 SHEAVE: 18" P.D.—2B or 3A Std.,
 18" P.D. Max., 1 3/8" Bore
 GEAR BOX OIL CAPACITY: 5 Gallons

16D GEAR REDUCER: Double Reduction
 RATING: 16,000 In. Lbs. Peak Torque • RATIO OF GEARS: 35.7
 CRANKSHAFT DIA.: 2 1/2"
 SHEAVE 15.3" P.D.—3A or 2B or 1C, 1.180" Bore
 GEAR REDUCER OIL CAPACITY: 5 Gallons

10D GEAR REDUCER: Double Reduction
 RATING: 10,000 In. Lbs. Peak Torque • RATIO OF GEARS: 36.02
 CRANKSHAFT DIA.: 2-3/16"
 SHEAVE: 14.2" P.D.—3A or 2B, 15/16" Bore
 GEAR REDUCER OIL CAPACITY: 4 Gallons

6D GEAR REDUCER: Double Reduction
 RATING: 6,400 In. Lbs. Peak Torque • RATIO OF GEARS: 34.76
 CRANKSHAFT DIA.: 2"
 SHEAVE: 13.1" P.D.—2A, 15/16" Bore
 GEAR REDUCER OIL CAPACITY: 5 Quarts

LUFKIN BEAM BALANCED PUMPING UNIT ASSEMBLIES

STRUCTURAL SPECIFICATIONS AND DIMENSIONS

See preceding page for GEAR Specifications

UNIT	B-570-109-48	B-57D-109-42	B-40D-89-42	B-40D-76-42	B-40D-89-36	B-25D-67-36	B-25D-67-30	B-25D-53-30	B-25D-53-24	B-16D-53-30	B-16D-53-24	B-10D-27-30	B-6D-21-24
Polished Rod Cap., #	10,900	10,900	8,900	7,600	8,900	6,700	6,700	5,300	5,300	5,300	5,300	2,700	2,100
Stroke Lengths, Ins.	48, 36	42, 32	42, 32	42, 32	36, 28	33, 24	30, 20	33, 25	24, 20	30, 25	30, 24	30, 24	24, 20
Walking Beam.....	16"x45 Lbs.	16"x45 Lbs.	16"x36 Lbs.	14"x34 Lbs.	14"x34 Lbs.	14"x34 Lbs.	12"x27 Lbs.	10"x25 Lbs.	10"x21 Lbs.	10"x25 Lbs.	10"x21 Lbs.	8"x17 Lbs.	6"x12 Lbs.
Equalizer Bearing.....	BRONZE BUSHED, OIL BATH TYPE												
Center Bearing.....	BRONZE BUSHED, OIL BATH TYPE												
Crank Pin Bearings.....	SPHERICAL ROLLER BEARINGS												
Wireline Hanger.....	7/8"x14'-2"	7/8"x12'-6"	3/4"x12'-6"	3/4"x12'-6"	3/4"x11'-0"	3/8"x11'-0"	3/8"x11'-0"	1/2"x8'-0"	1/2"x8'-0"	1/2"x8'-0"	1/2"x8'-0"	1/2"x8'-0"	1/2"x6'-8"
*1" thick Beam Wts., #	150	150	150	125	125	125	125	100	100	100	100	90	75
No. of Beam Weights.....	EFFECTIVE COUNTERBALANCE AT POLISHED ROD, LBS.												
0.....	400	550	420	420	550	300	320	170	265	170	265	100	50
1.....	700	880	710	660	830	520	555	345	470	345	470	235	170
2.....	1000	1205	995	895	1105	740	785	515	670	515	670	365	290
3.....	1300	1530	1280	1130	1380	955	1015	685	870	685	870	495	504
4.....	1595	1850	1560	1365	1650	1170	1240	850	1065	850	1065	620	520
5.....	1890	2165	1835	1595	1915	1380	1465	1015	1260	1015	1260	745	630
6.....	2180	2480	2110	1825	2180	1590	1685	1175	1445	1175	1445	870	740
7.....	2490	2790	2380	2050	2440	1795	1905	1330	1635	1330	1635	990	845
8.....	2760	3100	2650	2275	2700	2000	2120	1485	1820	1485	1820	1110	950
9.....	3045	3405	2915	2495	2955	2200	2335	1645	2000	1645	2000	1225	1050
10.....	3325	3710	3180	2715	3210	2400	2545	1795	2175	1795	2175	1340	1150
11.....	3605	4010	3440	2930	3460	2595	2750	1940	2350	1940	2350	1450	1250
12.....	3885	4300	3700	3145	3705	2790	2955	2090	2525	2090	2525	1560	1345
13.....	4160	4595	3955	3360	3950	2980	3155	2230	2690	2230	2690	1670	1440
14.....	4435	4890	4210	3570	4190	3170	3355	2375	2855	2375	2855	1775	1530
15.....	4705	5180	4460	3780	4430	3355	3550	2520	3015	2520	3015	1880	1620
16.....	4975	5470	4710	3985	4665	3540	3745	2665	3175	2665	3175	1980	1705
17.....	5240	5755	4955	4190	4900	3720	3935	2815	3330	2815	3330	2080	
18.....	5505	6040	5195	4390	5130	3900	4125	2920	3485	2920	3485	2175	
19.....	5765	6320	5435	4590	5360	4075	4310	3050	3635	3050	3635		
20.....	6025	6600	5670	4790	5585	4245	4490	3180	3785	3180	3785		
21.....	6280	6875	5905	4985	5810	4415	4670	3300	3925	3300	3925		
22.....	6535	7150	6135	5180	6030	4580	4845	3425	4065	3425	4065		
23.....	6785	7420	6365	5370	6250	4745	5020	3545	4205	3545	4205		
24.....	7035	7685	6590	5560	6465	4905	5190	3660	4340	3660	4340		
25.....	7280	7950	6815	5745	6680	5065	5360	3780		3780			
26.....	7525	8210	7035	5930	6890	5220	5525	3890		3890			
27.....	7770	8470	7255	6110	7100	5375		4000		4000			
28.....	8010												
29.....	8250												
30.....	8485												

Note: *3" thick Beam Weights optional for all Beam Balanced units.
 † On B-25D-53-30, B-25D-53-24, B-16D, B-10D and B-6D units, stroke length changes are obtained by moving equalizer bearing on beam.

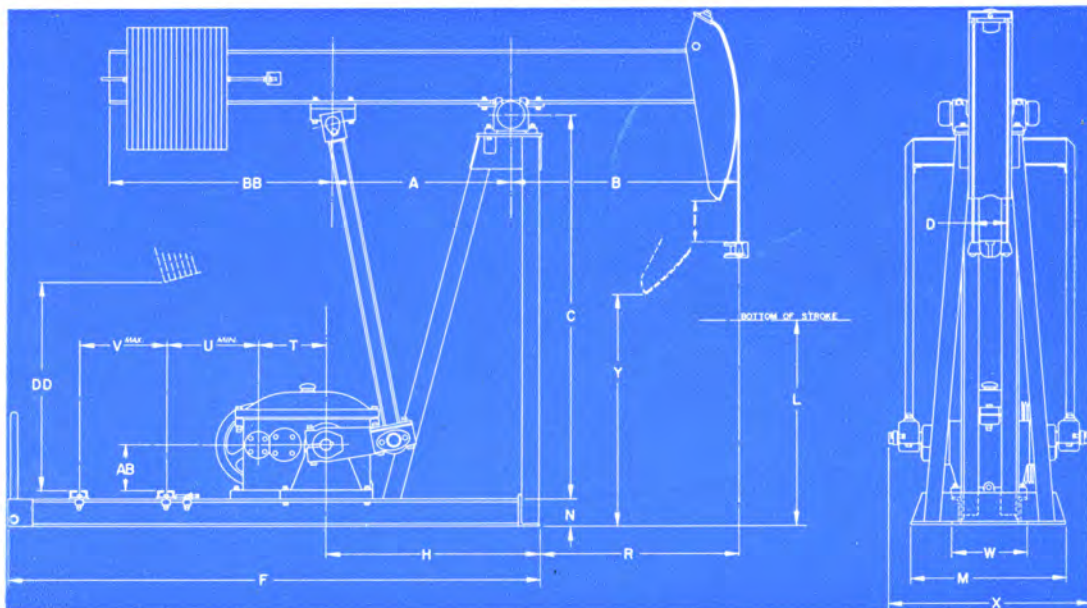


FIGURE 18

GENERAL DIMENSIONS

UNIT	A	B	C	D	F	H	I	L	M	N	R	T	U	V	W	X	Y	AB	BB	DD	
B-57D-109-48	46	64	8'-9"	9	13'-3"	69	14 1/2	43 3/4	40 3/4	10	43	20	24 1/4	39 1/4	25	57 1/2	69 3/4	14 3/4	7'-1"	47 1/4	
B-57D-109-42	"	56	"	6 1/2	"	"	"	51	"	35	"	"	"	"	"	"	75 1/2	6'-6"	50		
*B-40D-89-42	"	"	8'-2 1/2"	"	11'-8 1/2"	61	"	42	38 1/2	8	41	17 1/2	19	34 1/4	20	50 3/4	67	10 3/4	63	50 3/4	
*B-40D-76-42	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
*B-40D-89-36	"	48	"	"	"	"	13	50 1/2	"	33	"	"	"	"	"	"	72 1/2	"	61 1/2	51 1/4	
B-25D-67-36	32	48	7'-0 1/2"	"	10'-4"	48	"	34 1/2	31	6	34	13 1/2	18	39	16 3/4	45	50 1/2	12	54 1/2	45	
B-25D-67-30	36	45	"	"	"	"	"	37 1/2	"	31	"	"	"	"	"	"	59 1/2	"	50	47 1/4	
B-25D-53-30	33	41 1/4	70 1/2	5 1/2	9'-7"	39	6	36	28 1/2	"	35 1/4	"	"	"	"	"	48	"	40	34 3/4	
B-25D-53-24	"	33	"	"	"	"	"	35 3/4	"	27	"	"	"	"	"	"	53 1/2	"	36	36 1/4	
B-16D-53-30	33	41 1/4	70 1/2	5 1/2	8'-0 1/2"	39	6	35	28 1/2	5	35 1/4	12 3/4	10 1/2	25 1/4	13 3/4	35	47	8 1/2	40	34 3/4	
B-16D-53-24	"	33	"	"	"	"	"	35 3/4	"	27	"	"	"	"	"	"	52 1/2	"	36	36 1/4	
B-10D-27-30	27 1/2	41 1/4	54	"	7'-7 3/4"	35 3/4	6	18 1/2	28	"	35 1/2	11 1/2	10 1/4	25 1/4	13	30 3/4	29 3/4	7	33 1/2	22 1/2	
B-6D-21-24	22	33	47	"	70	28	5	17	24	3	29	10	9	16 1/4	10	27 3/4	27	6	32	19 3/4	

* Base Shown Is For Electric Motor Only, For Gas Engine Drive Dim. "F" Is 13'-4", Dim "U" Is 19, and Dim. "V" Is 53 3/4.

LUFKIN MARK II UNITORQUE PUMPING UNITS

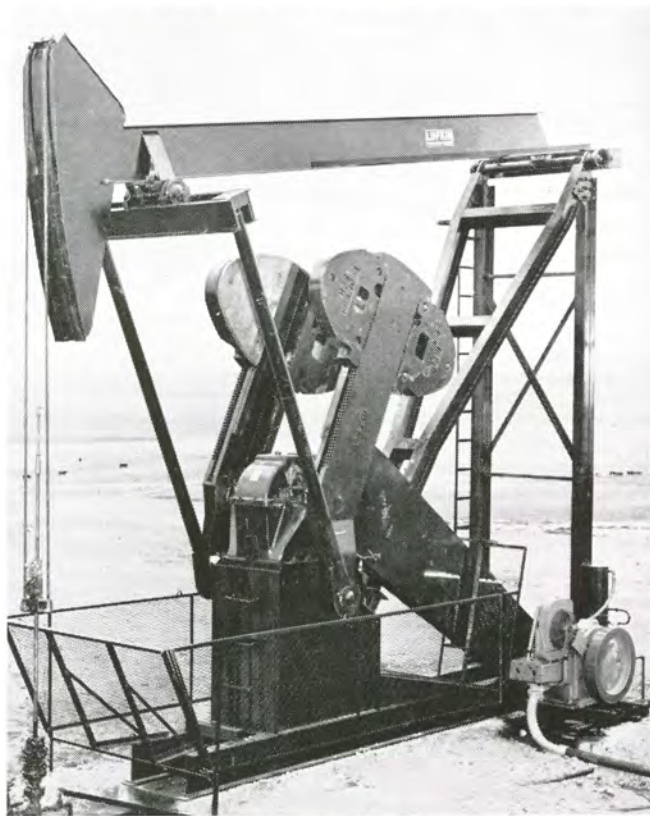


FIGURE 19

M-228D-256-100 Mark II Unit driven by a Lufkin H-333 engine.



FIGURE 20

M-456D-253-144 Mark II Unit. Note compactness of drive when a multi-cylinder engine is mounted forward of the samson post.

A NEW CONCEPT IN OILWELL PUMPING

The LUFKIN MARK II Unitorque Pumping Unit employs a new kinematic concept made of the tried and proven structural components of the conventional mechanical pumping unit. This new, simple and imaginative design of the LUFKIN MARK II furnishes one of the most advanced and trouble-free systems of rod pumping available today, providing for many money saving advantages not heretofore thought possible.

POLISHED ROD MOTION

Due to the unique geometry of the LUFKIN MARK II, the acceleration at the bottom polished rod reversal is decreased as much as 40%. This reduces peak load up to 10% and tends to avoid shock, resulting in longer rod life, lower servicing costs, and less production loss from rod break shutdowns.

PRIME MOVER SAVINGS

The LUFKIN MARK II, due to its more uniform torque demand illustrated in Figure 22 generally permits the use of a smaller prime mover to pump any given well. In the case of a gas engine drive the first costs savings are substantial. With an electric motor drive additional savings may be obtained when electric power charges are based on demand or connected horsepower.



FIGURE 21

M-640D-304-144 Mark II Unit driven by a Lufkin H-795 CCW engine. With a counter-clockwise rotation engine such as this, the engine can be mounted forward of the samson post on the main base beams.

THE UNITORQUE GEOMETRY

(1) The cross yoke (equalizer) is shifted forward toward the horsehead instead of placing it directly over the gear reducer. This produces approximately a 195° upstroke and a 165° downstroke. (See Fig. 22)

The 195° upstroke reduces the acceleration where the load is greatest and thus, effects a reduction in polished rod load.

By locating the cross yoke forward a greater mechanical advantage is obtained for lifting the load, and a lesser mechanical advantage is obtained for the reduced downstroke load, i.e., the maximum upstroke torque factor is decreased and the maximum downstroke torque factor is increased.

(2) The counterbalance weights are offset on the crank. This produces a counterbalance torque which at the beginning of the upstroke "lags" the well load torque approximately 7½°. Similarly, at the beginning of the downstroke this same offset condition produces a counterbalance torque which "leads" the well load torque approximately 7½°. (See Fig. 22)

Independently, these features would not produce a uniform torque, but working together a "unitorque" system is obtained which in turn can effect a torque reduction on the gear reducer up to 35%.

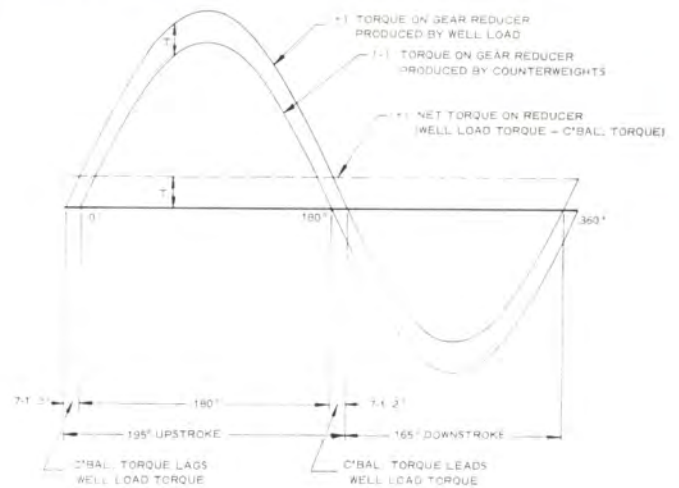


FIGURE 22

Illustration showing how a uniform torque can be obtained under ideal conditions.

NOTE: The Mark II Unit must be operated in a counter-clockwise direction. (Standing at the side of the unit with the well-head to the right.)

SEMI-AUTOMATIC COUNTERBALANCE

(OPTIONAL AT ADDITIONAL COST)

For those applications where changing well conditions necessitate changing counterbalance requirements, a semi-automatic counterbalancing device is available on the LUFKIN Mark II UNITORQUE units. A counterbalance TRIM WEIGHT located in each crank can be moved either in or out depending on whether less or more counterbalance is required. Moving the trim weights is easily accom-

plished while the unit is running by moving a lever either forward or backward. One lever actuates the right hand trim weight; the other lever operates the left hand.

Naturally, when a radical change in counterbalance is required, such as when the stroke length is changed, the main counterweights themselves must be moved.

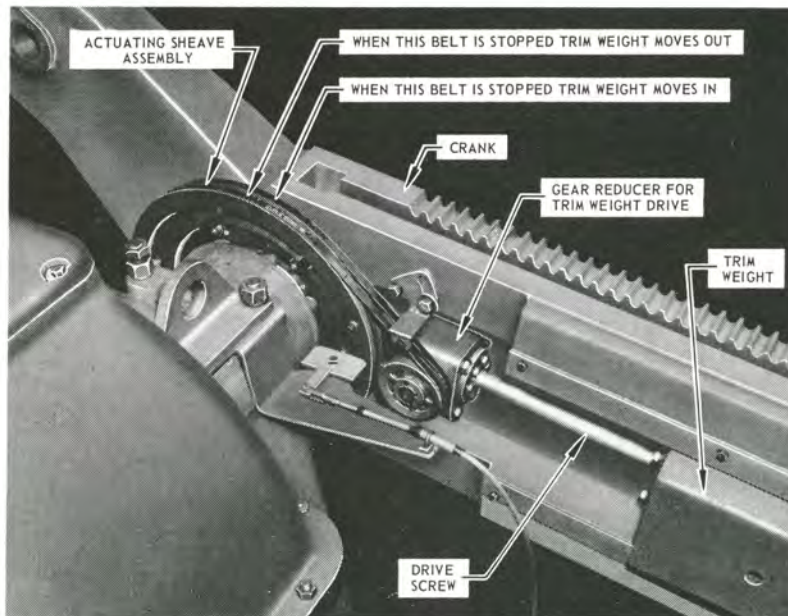


FIGURE 23



LUFKIN FOUNDRY & MACHINE CO.

LUFKIN, TEXAS

MARK II PUMPING UNIT SPECIFICATIONS

UNIT DESIGNATION.....	M-912D-356-168	M-912D-305-168 M-640D-305-168 M-456D-305-168	M-912D-356-144 M-640D-356-144 M-456D-356-144	M-912D-304-144 M-640D-304-144 M-456D-304-144 M-320D-304-144	M-640D-253-144 M-456D-253-144 M-320D-253-144
POLISHED ROD CAPACITY, LBS.	35,600	30,500	35,600	30,400	25,300
STROKE LENGTH, INCHES....	168, 149, 130	168, 149, 130	144, 128, 112	144, 128, 112	144, 128, 112
WALKING BEAM.....	24" x 100 Lbs.	24" x 84 Lbs.	24" x 84 Lbs.	24" x 84 Lbs.	21" x 68 Lbs.
PITMANS.....	6" Ex. Hvy. Pipe	6" Ex. Hvy. Pipe	6" Ex. Hvy. Pipe	5" Ex. Hvy. Pipe	5" Ex. Hvy. Pipe
WIRELINE HANGER.....	1 3/8" x 43'-2"	1 1/4" x 42'-6"	1 3/8" x 38'-2"	1 1/4" x 37'-6"	2-1 1/8" x 18'-0"
CRANKS.....	168108 M	168108 M	144108 M	144108 M	144108 M

UNIT DESIGNATION.....	M-640D-365-120 M-456D-365-120	M-640D-304-120 M-456D-304-120 M-320D-304-120	M-640D-256-120 M-456D-256-120 M-320D-256-120 M-228D-256-120	M-320D-213-120 M-228D-213-120	M-320D-298-100
POLISHED ROD CAPACITY, LBS.	36,500	30,400	25,600	21,300	29,800
STROKE LENGTH, INCHES....	120, 104, 88	120, 104, 88	120, 104, 88	120, 104, 88	100, 84, 68
WALKING BEAM.....	24" x 84 Lbs.	24" x 84 Lbs.	21" x 68 Lbs.	21" x 62 Lbs.	24" x 84 Lbs.
PITMANS.....	6" Ex. Hvy. Pipe	5" Ex. Hvy. Pipe	5" Ex. Hvy. Pipe	5" Ex. Hvy. Pipe	5" Ex. Hvy. Pipe
WIRELINE HANGER.....	1 3/8" x 38'-2"	1 1/4" x 37'-6"	2-1 1/8" x 18'-0"	2-1 1/8" x 18'-0"	1 1/4" x 37'-6"
CRANKS.....	120108 M	120108 M	120108 M	120108 M	100108 M

UNIT DESIGNATION.....	M-320D-256-100 M-228D-256-100	M-228D-246-86 M-160D-246-86	M-228D-200-86 M-160D-200-86	M-114D-143-86	M-228D-246-74 M-160D-246-74
POLISHED ROD CAPACITY, LBS.	25,600	24,600	20,000	14,300	24,600
STROKE LENGTH, INCHES....	100, 84, 68	86, 72.4, 58.6	86, 72.4, 58.6	86, 74, 62	74, 60.4, 46.8
WALKING BEAM.....	21" x 68 Lbs.	16" x 58 Lbs.	16" x 45 Lbs.	14" x 30 Lbs.	16" x 58 Lbs.
PITMANS.....	5" Ex. Hvy. Pipe	4" Std. Pipe	4" Std. Pipe	3 1/2" Std. Pipe	4" Std. Pipe
WIRELINE HANGER.....	2-1 1/8" x 18'-0"	1 1/8" x 26'-10 1/2"	1" x 26'-10 1/2"	1" x 20'-2"	1 1/8" x 26'-10 1/2"
CRANKS.....	100108 M	8686 M	8686 M	8662 M	7486 M

UNIT DESIGNATION.....	M-228D-200-74 M-160D-200-74 M-114D-200-74	M-228D-173-74 M-160D-173-74 M-114D-173-74	M-114D-143-74	M-114D-169-64	M-114D-143-64
POLISHED ROD CAPACITY, LBS.	20,000	17,300	14,300	16,900	14,300
STROKE LENGTH, INCHES....	74, 60.4, 46.8	74, 60.4, 46.8	74, 60, 46	64, 52, 40	64, 52, 40
WALKING BEAM.....	16" x 45 Lbs.	16" x 40 Lbs.	14" x 30 Lbs.	14" x 34 Lbs.	14" x 30 Lbs.
PITMANS.....	4" Std. Pipe*	4" Std. Pipe*	3 1/2" Std. Pipe	3 1/2" Std. Pipe	3 1/2" Std. Pipe
WIRELINE HANGER.....	1" x 26'-10 1/2"	1" x 26'-10 1/2"	1" x 17'-8"	1" x 17'-8"	1" x 17'-8"
CRANKS.....	7486 M	7486 M	7462 M	6462 M	6462 M

* 3 1/2" Ex. Hvy. Pipe Used On M-114D-200-74 and M-114D-173-74

STANDARD MARK II PUMPING UNIT ASSEMBLIES
GENERAL DIMENSIONS

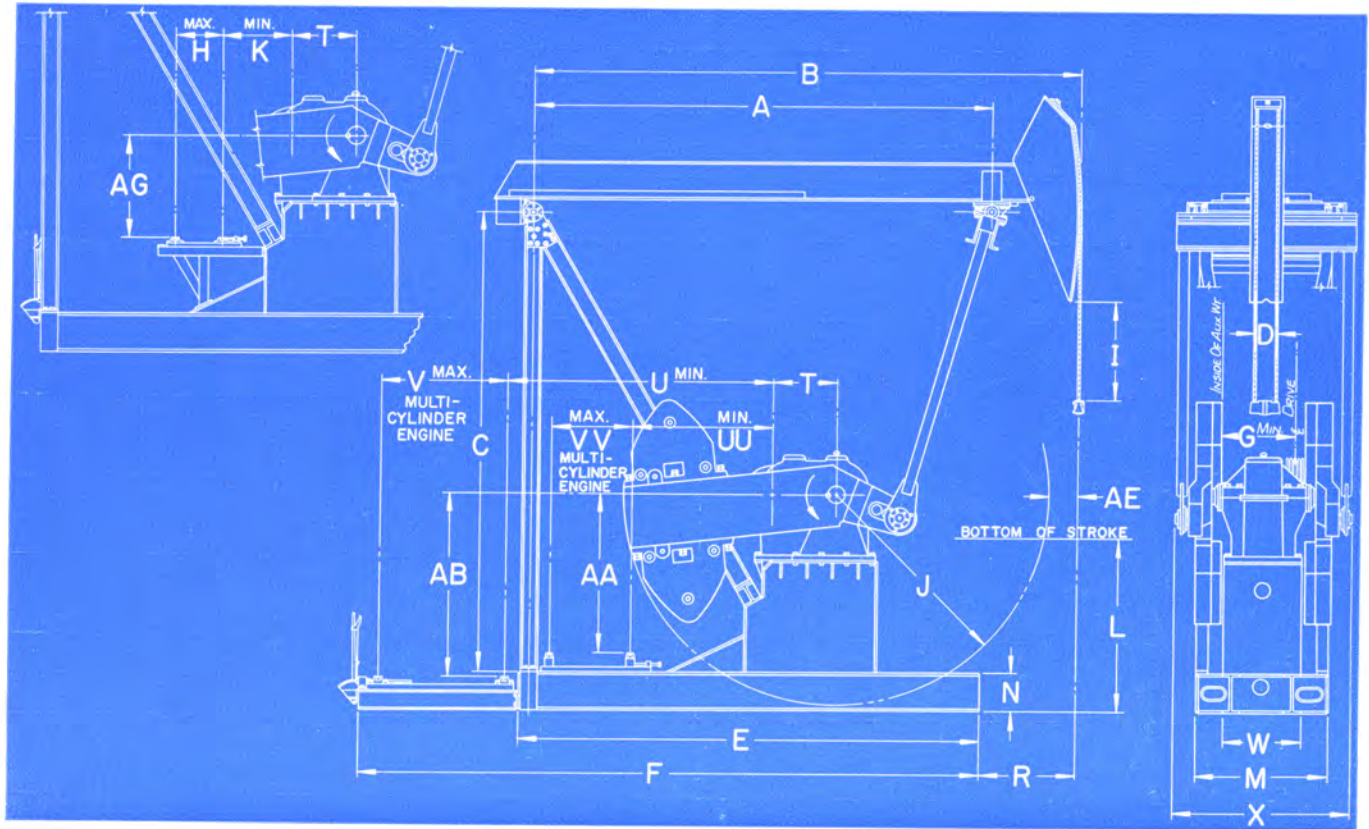


FIGURE 24

UNIT	A	B	C	D	E	F	G	H	I	J	K	L	M	N	R	T	U	V	W	X	AA	AB	AE	AG	UU	VV
M-912D-356-168	22'-6"	27'-10"	23'-0 ⁷ / ₈ "	12"	23'-11 ¹ / ₂ "	"	54"	46 ³ / ₄ "	42 ⁵ / ₈ "	108"	25 ³ / ₈ "	71 ³ / ₈ "	69 ³ / ₄ "	16"	60"	48 ¹ / ₂ "	"	"	49 ³ / ₄ "	8'-9"	7'-2"	"	19"	46 ¹ / ₈ "	6'-10 ¹ / ₂ "	67"
M-912D-305-168	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
M-912D-356-144	21'-6"	26'-0"	21'-0 ⁷ / ₈ "	"	21'-8"	"	"	"	39 ⁵ / ₈ "	"	"	76 ⁷ / ₈ "	"	"	55 ¹ / ₂ "	"	"	"	"	"	"	"	13 ¹ / ₂ "	"	6'-6"	55"
M-912D-304-144	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
M-640D-305-168	22'-6"	27'-10"	23'-0 ⁷ / ₈ "	"	23'-11 ¹ / ₂ "	"	50 ¹ / ₄ "	"	42 ⁵ / ₈ "	"	27 ⁷ / ₈ "	71 ³ / ₈ "	"	60"	41 ¹ / ₂ "	"	"	46 ¹ / ₂ "	8'-5"	"	"	23 ³ / ₈ "	"	7'-1"	67"	
M-640D-356-144	21'-6"	26'-0"	21'-0 ⁷ / ₈ "	"	21'-3 ¹ / ₂ "	"	"	"	39 ⁵ / ₈ "	"	"	76 ⁷ / ₈ "	"	"	"	"	"	"	18"	8'-3 ³ / ₈ "	"	18"	"	6'-8 ¹ / ₂ "	55"	
M-640D-304-144	"	"	"	"	"	"	"	"	44 ⁵ / ₈ "	"	"	74"	"	"	"	"	"	"	"	8'-3 ³ / ₈ "	"	"	"	"	"	"
M-640D-365-120	"	"	"	9"	"	"	"	"	63 ⁵ / ₈ "	"	"	76 ⁷ / ₈ "	"	"	"	"	"	"	"	8'-5"	"	"	"	"	"	"
M-640D-304-120	"	"	"	12"	"	"	"	"	69 ¹ / ₈ "	"	"	73 ¹ / ₄ "	"	"	"	"	"	"	"	8'-3 ³ / ₈ "	"	"	"	"	"	"
M-640D-256-120	"	"	"	9"	"	"	"	"	69 ¹ / ₈ "	"	"	73 ¹ / ₄ "	"	"	"	"	"	"	"	8'-3 ³ / ₈ "	"	"	"	"	"	"
M-456D-305-168	22'-6"	27'-10"	23'-0 ⁷ / ₈ "	12"	23'-11 ¹ / ₂ "	"	"	"	42 ⁵ / ₈ "	"	31"	71 ³ / ₈ "	"	"	38 ³ / ₈ "	"	"	"	"	8'-5"	"	"	23 ³ / ₈ "	"	7'-4 ¹ / ₂ "	67"
M-456D-356-144	21'-6"	26'-0"	21'-0 ⁷ / ₈ "	"	21'-3 ¹ / ₂ "	"	"	"	39 ⁵ / ₈ "	"	"	76 ⁷ / ₈ "	"	"	"	"	"	"	"	18"	8'-3 ³ / ₈ "	"	18"	"	6'-11 ³ / ₈ "	55"
M-456D-304-144	"	"	"	"	"	"	"	"	44 ⁵ / ₈ "	"	"	74"	"	"	"	"	"	"	"	8'-3 ³ / ₈ "	"	"	"	"	"	"
M-456D-365-120	"	"	"	9"	"	"	"	"	63 ⁵ / ₈ "	"	"	76 ⁷ / ₈ "	"	"	"	"	"	"	"	8'-5"	"	"	"	"	"	"
M-456D-304-120	"	"	"	12"	"	"	"	"	69 ¹ / ₈ "	"	"	73 ¹ / ₄ "	"	"	"	"	"	"	"	8'-3 ³ / ₈ "	"	"	"	"	"	"
M-456D-256-120	"	"	"	9"	"	"	"	"	69 ¹ / ₈ "	"	"	73 ¹ / ₄ "	"	"	"	"	"	"	"	8'-3 ³ / ₈ "	"	"	"	"	"	"
M-320D-304-144	"	"	"	12"	"	"	41 ¹ / ₂ "	33 ¹ / ₄ "	39 ⁵ / ₈ "	"	35 ³ / ₈ "	76 ⁷ / ₈ "	"	"	34"	"	"	43 ¹ / ₂ "	7'-4 ¹ / ₂ "	"	"	"	"	7'-4"	51 ¹ / ₂ "	
M-320D-253-144	"	"	"	9"	"	"	"	"	44 ⁵ / ₈ "	"	"	74"	"	"	"	"	"	"	"	8'-3 ³ / ₈ "	"	"	"	"	"	"
M-320D-304-120	"	"	"	12"	"	"	"	"	63 ⁵ / ₈ "	"	"	76 ⁷ / ₈ "	"	"	"	"	"	"	"	8'-5"	"	"	"	"	"	"
M-320D-256-120	"	"	"	9"	"	"	"	"	69 ¹ / ₈ "	"	"	73 ¹ / ₄ "	"	"	"	"	"	"	"	8'-3 ³ / ₈ "	"	"	"	"	"	"
M-320D-213-120	"	"	"	"	"	"	"	"	6'-11 ³ / ₈ "	"	"	76 ⁷ / ₈ "	"	"	"	"	"	"	"	"	"	"	"	"	"	"
M-320D-298-100	"	"	"	12"	"	"	"	"	7'-5 ¹ / ₈ "	"	"	73 ¹ / ₄ "	"	"	"	"	"	"	"	"	"	"	"	"	"	"
M-320D-256-100	"	"	"	9"	"	"	"	"	7'-5 ¹ / ₈ "	"	"	73 ¹ / ₄ "	"	"	"	"	"	"	"	"	"	"	"	"	"	"
M-228D-256-120	"	"	"	"	"	"	38 ⁷ / ₈ "	29 ³ / ₄ "	69 ¹ / ₈ "	"	41 ¹ / ₈ "	"	"	"	30"	"	"	37"	6'-0 ³ / ₈ "	"	"	"	47 ³ / ₄ "	7'-8"	"	
M-228D-213-120	"	"	"	"	"	"	"	"	44 ⁵ / ₈ "	"	"	74"	"	"	"	"	"	"	"	8'-3 ³ / ₈ "	"	"	"	"	"	"
M-228D-256-100	"	"	"	"	"	"	"	"	7'-5 ¹ / ₈ "	"	22 ¹ / ₄ "	65 ¹ / ₂ "	57"	39"	"	"	"	8'-7 ³ / ₄ "	51 ¹ / ₂ "	"	"	6'-8 ³ / ₈ "	"	6'-3"	11 ³ / ₈ "	40 ¹ / ₂ "
M-228D-246-86	15'-6"	18'-6"	15'-8 ³ / ₈ "	"	15'-6 ¹ / ₂ "	21'-0"	"	30 ¹ / ₄ "	45 ¹ / ₄ "	86 ⁵ / ₈ "	"	65 ¹ / ₂ "	51"	"	"	"	"	"	"	"	"	"	"	"	"	
M-228D-200-86	"	"	"	"	"	"	"	"	58 ⁵ / ₈ "	"	"	65 ¹ / ₂ "	"	"	"	"	"	"	"	"	"	"	"	"	"	"
M-228D-246-74	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
M-228D-200-74	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
M-228D-173-74	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
M-160D-246-86	"	"	"	"	"	"	32 ⁷ / ₈ "	33 ³ / ₄ "	45 ¹ / ₄ "	"	24 ¹ / ₂ "	65 ¹ / ₂ "	54"	"	26"	8'-11 ³ / ₄ "	"	32"	6'-0 ³ / ₈ "	"	"	"	38 ³ / ₄ "	"	"	
M-160D-200-86	"	"	"	"	"	"	"	"	58 ⁵ / ₈ "	"	"	65 ¹ / ₂ "	"	"	"	"	"	"	"	"	"	"	"	"	"	"
M-160D-246-74	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
M-160D-200-74	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
M-160D-173-74	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
M-114D-143-86	13'-6"	15'-0"	12'-3 ¹ / ₂ "	"	13'-0 ³ / ₄ "	18'-6 ¹ / ₄ "	29 ³ / ₄ "	30"	14 ³ / ₈ "	62"	20 ¹ / ₈ "	53 ¹ / ₂ "	42 ³ / ₄ "	12"	36"	24"	8'-0 ¹ / ₂ "	"	25"	67 ³ / ₈ "	"	50"	16"	31 ¹ / ₄ "	"	
M-114D-200-74	15'-6"	18'-6"	15'-8 ³ / ₈ "	"	15'-6 ¹ / ₂ "	21'-0"	"	30 ³ / ₄ "	50 ⁵ / ₈ "	86 ⁵ / ₈ "	28"	65 ¹ / ₂ "	54"	16"	39"	"	9'-1 ³ / ₄ "	"	"	69"	"	"	"	"	"	
M-114D-173-74	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
M-114D-143-74	13'-6"	15'-0"	12'-3 ¹ / ₂ "	"	13'-0 ³ / ₄ "	18'-6 ¹ / ₄ "	"	30"	25 ⁷ / ₈ "	62"	20 ¹ / ₈ "	53 ¹ / ₂ "	42 ³ / ₄ "	12"	36"	"	8'-0 ¹ / ₂ "	"	"	67 ³ / ₈ "	"	50"	16"	31 ¹ / ₄ "	"	
M-114D-169-64	"	"	"	"	"	"	"	"	21"	"	"	67 ³ / ₈ "	"	"	"	"	"	"	"	"	"	"	"	"	"	"
M-114D-143-64	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"

* On 100" Stroke And Larger Units, Multi-Cylinder Engines Are Mounted On Main Base Beams Forward Of The Samson Post, See Dimensions UU, VV, And AA.
** On 86" Stroke And Smaller Units, Multi-Cylinder Engines Are Mounted Behind The Samson Post, See Dimensions U, V, And AB.



LUFKIN FOUNDRY & MACHINE CO.

LUFKIN, TEXAS

MARK II COUNTERBALANCE DATA

Effective Counterbalance At Polished Rod With Weights At Maximum Position, Including Structural Unbalance. See Example Below.

	M-912D-356-168	M-912D-305-168 M-640D-305-168 M-456D-305-168	M-912D-356-144 M-640D-356-144 M-456D-356-144	M-912D-304-144 M-640D-304-144 M-456D-304-144	M-320D-304-144	M-640D-253-144 M-456D-253-144	M-320D-253-144	M-640D-365-120 M-456D-365-120
UNIT.....								
STROKE.....	168"	168"	144"	144"	144"	144"	144"	120"
STRUCTURAL UNBALANCE.....	-5,385 Lbs.	-4,860 Lbs.	-4,680 Lbs.	-4,300 Lbs.	-4,300 Lbs.	-4,010 Lbs.	-4,010 Lbs.	-4,510 Lbs.
CRANKS.....	168108 M	168108 M	144108 M	144108 M	144108 M	144108 M	144108M	120108 M
C'Bal., Cranks Only.....	-3,120	-2,595	-1,170	-785	-785	-495	-495	205
4 No. OORO Counterweights.....	11,690	12,215	16,560	16,945	16,945	17,235	17,235	21,505
4 No. OOS Aux. Weights.....	16,170	16,695	21,920	22,305	22,305	22,595	22,595	27,945
4 No. OOD Aux. Weights.....	20,650	21,175	27,270	27,655	27,655			34,375
4 No. ORO Counterweights.....	9,805	10,330	14,300	14,685	14,685	14,975	14,975	18,775
4 No. OL Aux. Weights.....	11,780	12,305	16,665	17,050	17,050	17,340	17,340	21,605
4 No. OS Aux. Weights.....	14,110	14,635	19,445	19,830	19,830	20,120	20,120	24,955
4 No. OD Aux. Weights.....	18,415	18,940	24,590	24,975	24,975	25,265	25,265	31,140
4 No. OARO Counterweights.....	7,840	8,365	11,950	12,335	12,335	12,625	12,625	15,955
4 No. OL Aux. Weights.....	9,815	10,340	14,315	14,700	14,700	14,990	14,990	18,785
4 No. OAS Aux. Weights.....	11,240	11,765	16,020	16,405	16,405	16,695	16,695	20,835
4 No. OAD Aux. Weights.....	14,640	15,165	20,070	20,455	20,455	20,745	20,745	25,720
4 No. IRO Counterweights.....	5,425	5,950	9,060	9,445	9,445	9,735	9,735	12,455
4 No. 2L Aux. Weights.....	6,710	7,235	10,600	10,985	10,985	11,275	11,275	14,300
4 No. 1S Aux. Weights.....	8,050	8,575	12,120	12,505	12,505	12,795	12,795	16,220
4 No. 1D Aux. Weights.....	10,670	11,195	15,350	15,735	15,735	16,025	16,025	19,990
4 No. 2RO Counterweights.....	4,070	4,595	7,440	7,825	7,825	8,115	8,115	10,515
4 No. 2L Aux. Weights.....	5,355	5,880	8,980	9,365	9,365	9,655	9,655	12,360
4 No. 2S Aux. Weights.....	6,655	7,180	10,530	10,915	10,915	11,205	11,205	14,225
4 No. 2D Aux. Weights.....	9,235	9,760	13,605	13,990	13,990	14,280	14,280	17,945
4 No. 3CRO Counterweights.....	2,680	3,205	5,770	6,155	6,155	6,445	6,445	8,525
4 No. 2L Aux. Weights.....	3,960	4,485	7,300	7,685	7,685	7,975	7,975	10,370
4 No. 3BS Aux. Weights.....	5,180	5,705	8,760	9,145	9,145	9,435	9,435	12,115
4 No. 3D Aux. Weights.....	7,175	7,700	11,150	11,535	11,535	11,825	11,825	14,980
4 No. 5ARO Counterweights.....			3,875	4,260	4,260	4,550	4,550	6,265
4 No. 5L Aux. Weights.....			4,750	5,135	5,135	5,425	5,425	7,315
4 No. 5A Aux. Weights.....			5,915	6,300	6,300	6,590	6,590	8,710
4 No. 5AD Aux. Weights.....			7,550	7,935	7,935	8,225	8,225	10,670
4 No. 5CRO Counterweights.....				2,925	2,925	3,215	3,215	4,065
4 No. 5L Aux. Weights.....				3,800	3,800	4,090	4,090	5,715
4 No. 5C Aux. Weights.....				4,755	4,755	5,045	5,045	6,865
4 No. 5CD Aux. Weights.....				6,590	6,590	6,875	6,875	9,065
For Crank Weights Add to The Above.....	2,400	2,400	2,250	2,250	2,250	2,250	2,250	2,690
For Semi-Automatic Counterbalance Add to the Above.....	2,400	2,400	2,880	2,880	1,770	2,880	1,770	3,450

	M-320D-256-100	M-228D-256-100	M-228D-246-86	M-160D-246-86	M-228D-200-86	M-160D-200-86	M-114D-143-86	M-228D-246-74
UNIT.....								
STROKE.....	100"	100"	86"	86"	86"	86"	86"	74"
STRUCTURAL UNBALANCE.....	-3,470 Lbs.	-3,285 Lbs.	-2,140 Lbs.	-2,070 Lbs.	-2,040 Lbs.	-1,970 Lbs.	-1,535 Lbs.	-2,070 Lbs.
CRANKS.....	100108 M	100108 M	8686 M	8686 M	8686 M	8686 M	8662 M	7486 M
C'Bal., Cranks Only.....	2,550	2,740	1,540	1,610	1,640	1,710	275	2,250
4 No. OARO Counterweights.....	20,970	21,160						
4 No. IRO Counterweights.....	16,870	17,060	14,260	14,330	14,360	14,420		16,840
4 No. 2L Aux. Weights.....	19,030	19,220	16,255	16,325	16,355	16,415		19,130
4 No. 1S Aux. Weights.....	21,280	21,470	18,170	18,240	18,270	18,330		21,325
4 No. 2RO Counterweights.....	14,650	14,840	12,360	12,430	12,460	12,530	6,715	14,660
4 No. 2L Aux. Weights.....	16,810	17,000	14,355	14,425	14,455	14,525	8,010	16,950
4 No. 2S Aux. Weights.....	18,990	19,180	16,230	16,300	16,330	16,400	9,020	19,100
4 No. 2D Aux. Weights.....							11,330	
4 No. 3CRO Counterweights.....	12,295	12,485	10,350	10,420	10,450	10,520	5,685	12,350
4 No. 2L Aux. Weights.....	14,445	14,635	12,335	12,405	12,435	12,505	6,965	14,625
4 No. 3BS Aux. Weights.....	16,495	16,685	14,150	14,220	14,250	14,320	8,015	16,705
4 No. 3D Aux. Weights.....							9,885	
4 No. 5ARO Counterweights.....	9,635	9,825	8,080	8,150	8,180	8,250	4,475	9,750
4 No. 5L Aux. Weights.....	10,865	11,055	9,230	9,300	9,330	9,400	5,245	11,070
4 No. 5A Aux. Weights.....	12,495	12,690	10,720	10,790	10,820	10,890	6,180	12,780
4 No. 5AD Aux. Weights.....							7,550	
4 No. 5CRO Counterweights.....	7,760	7,950	6,360	6,430	6,460	6,530	3,400	7,780
4 No. 5L Aux. Weights.....	8,990	9,175	7,505	7,575	7,605	7,675	4,165	9,095
4 No. 5C Aux. Weights.....	10,340	10,520	8,750	8,820	8,850	8,920	4,945	10,520
4 No. 5CD Aux. Weights.....							6,495	
4 No. 6R Counterweights.....			5,285	5,355	5,385	5,455	3,740	6,545
4 No. 6L Aux. Weights.....			5,995	6,065	6,095	6,165	4,205	7,355
4 No. 6 Aux. Weights.....			6,705	6,775	6,805	6,875	4,670	8,170
For Crank Weights Add to The Above.....	3,150	3,150	2,870	2,870	2,870	2,870	1,535	3,290
For Semi-Automatic Counterbalance Add to the Above.....	2,485	2,485	2,280	2,280	2,280	2,280	1,580	2,620

EXAMPLE:
An M-320D-304-144 with 4 No. ORO Counterweights and 4 No. OS Auxiliary Weights would have a maximum counterbalance effect of 19,830 lbs. in the 144" stroke. (See other examples, pages 3062 and 3063.)
*Structural Unbalance with a negative (-) sign indicates a walking beam assembly that is heavy on the well end.

LUFKIN FOUNDRY & MACHINE CO.

LUFKIN, TEXAS



MARK II COUNTERBALANCE DATA

Effective Counterbalance At Polished Rod With Weights At Maximum Position, Including Structural Unbalance. See Example Page 3072

UNIT.....	M-640D-304-120 M-456D-304-120	M-320D-304-120	M-640D-256-120 M-456D-256-120	M-320D-256-120	M-228D-256-120	M-320D-213-120	M-228D-213-120	M-320D-298-100
STROKE.....	120"	120"	120"	120"	120"	120"	120"	100"
STRUCTURAL UNBALANCE.....	-4,130 Lbs.	-4,130 Lbs.	-3,840 Lbs.	-3,620 Lbs.	-3,435 Lbs.	-3,560 Lbs.	-3,235 Lbs.	-3,700 Lbs.
CRANKS.....	120108 M	120108 M	120108 M	120108 M	120108 M	120108 M	120108 M	100108 M
C'Bal., Cranks Only.....	605	605	895	1,115	1,300	1,175	1,500	2,320
4 No. OORO Counterweights.....	21,905	21,905	22,195	22,415	22,600			
4 No. OOS Aux. Weights.....								
4 No. OOD Aux. Weights.....								
4 No. ORO Counterweights.....	19,175	19,175	19,465	19,685	19,870	19,745	20,070	24,070
4 No. OL Aux. Weights.....	22,005	22,005	22,295	22,515	22,700			27,380
4 No. OS Aux. Weights.....	25,355	25,355						
4 No. OD Aux. Weights.....								
4 No. OARO Counterweights.....	16,355	16,355	16,645	16,865	17,050	16,025	17,250	20,740
4 No. OL Aux. Weights.....	19,185	19,185	19,475	19,695	19,880		20,080	24,050
4 No. OAS Aux. Weights.....	21,235	21,235	21,525	21,745	21,930			
4 No. OAD Aux. Weights.....	26,120							
4 No. IRO Counterweights.....	12,855	12,855	13,145	13,365	13,550	13,425	13,750	16,640
4 No. 2L Aux. Weights.....	14,700	14,700	14,990	15,210	15,395	15,270	15,595	18,800
4 No. 1S Aux. Weights.....	16,620	16,620	16,910	17,130	17,315	17,290	17,515	21,050
4 No. 1D Aux. Weights.....	20,390		20,680					
4 No. 2RO Counterweights.....	10,915	10,915	11,205	11,425	11,610	11,485	11,810	14,420
4 No. 2L Aux. Weights.....	12,760	12,760	13,050	13,270	13,455	13,330	13,655	16,580
4 No. 2S Aux. Weights.....	14,625	14,625	14,915	15,135	15,320	15,195	15,520	18,760
4 No. 2D Aux. Weights.....	18,335		18,625					
4 No. 3CRO Counterweights.....	8,925	8,925	9,215	9,435	9,620	9,495	9,820	12,065
4 No. 2L Aux. Weights.....	10,770	10,770	11,060	11,280	11,465	11,340	11,665	14,215
4 No. 3BS Aux. Weights.....	12,515	12,515	12,805	13,025	13,210	13,085	13,410	16,265
4 No. 3D Aux. Weights.....	15,380		15,670					
4 No. 5ARO Counterweights.....	6,665	6,665	6,955	7,175	7,360	7,235	7,560	9,405
4 No. 5L Aux. Weights.....	7,715	7,715	8,005	8,225	8,410	8,285	8,610	10,635
4 No. 5A Aux. Weights.....	9,110	9,110	9,400	9,620	9,805	9,680	10,005	12,265
4 No. 5AD Aux. Weights.....	11,070		11,360					
4 No. 5CRO Counterweights.....	5,065	5,065	5,355	5,575	5,760	5,635	5,960	7,530
4 No. 5L Aux. Weights.....	6,115	6,115	6,405	6,625	6,810	6,685	7,010	8,760
4 No. 5C Aux. Weights.....	7,265	7,265	7,555	7,775	7,960	7,835	8,160	10,110
4 No. 5CD Aux. Weights.....	9,465		9,755					
For Crank Weights Add To The Above.....	2,690	2,690	2,690	2,690	2,690	2,690	2,690	3,150
For Semi-Automatic Counterbalance Add To The Above.....	3,450	2,125	3,450	2,125	2,125	2,125	2,125	2,485

UNIT.....	M-160D-246-74	M-228D-200-74	M-160D-200-74	M-228D-173-74 M-160D-173-74 M-114D-200-74	M-114D-173-74	M-114D-143-74	M-114D-169-64 M-114D-143-64
STROKE.....	74"	74"	74"	74"	74"	74"	64"
STRUCTURAL UNBALANCE.....	-2,000 Lbs.	-1,960 Lbs.	-1,890 Lbs.	-1,860 Lbs.	-1,820 Lbs.	-1,440 Lbs.	-1,420 Lbs.
CRANKS.....	7486 M	7486 M	7486 M	7486 M	7486 M	7462 M	6462 M
C'Bal., Cranks Only.....	2,320	2,360	2,430	2,460	2,500	820	1,310
4 No. 1RO Counterweights.....	16,910	16,950	17,020	17,050			
4 No. 2L Aux. Weights.....	19,200	19,240					
4 No. 1S Aux. Weights.....	21,395	21,435					
4 No. 2RO Counterweights.....	14,730	14,770	14,840	14,870	14,910	8,205	9,970
4 No. 2L Aux. Weights.....	17,020	17,060	17,130	17,160	17,160	9,690	11,710
4 No. 2S Aux. Weights.....	19,170	19,210		19,310		10,850	13,070
4 No. 2D Aux. Weights.....						13,495	16,175
4 No. 3CRO Counterweights.....	12,420	12,460	12,530	12,560	12,600	7,025	8,585
4 No. 2L Aux. Weights.....	14,695	14,735	14,805	14,835	14,875	8,495	10,305
4 No. 3BS Aux. Weights.....	16,775	16,815	16,885	16,915	16,955	9,700	11,720
4 No. 3D Aux. Weights.....						11,840	14,230
4 No. 5ARO Counterweights.....	9,820	9,860	9,930	9,960	10,000	5,635	6,955
4 No. 5L Aux. Weights.....	11,140	11,180	11,250	11,280	11,320	6,515	7,990
4 No. 5A Aux. Weights.....	12,850	12,890	12,960	12,990	13,030	7,595	9,250
4 No. 5AD Aux. Weights.....						9,165	11,095
4 No. 5CRO Counterweights.....	7,850	7,890	7,950	7,990	8,030	4,405	5,510
4 No. 5L Aux. Weights.....	9,165	9,205	9,275	9,305	9,345	5,280	6,540
4 No. 5C Aux. Weights.....	10,590	10,630	10,700	10,730	10,770	6,180	7,590
4 No. 5CD Aux. Weights.....						7,955	9,670
4 No. 6R Counterweights.....	6,615	6,655	6,725	6,755	6,795	3,650	4,625
4 No. 6L Aux. Weights.....	7,425	7,465	7,535	7,565	7,605	4,185	5,250
4 No. 6 Aux. Weights.....	8,240	8,280	8,350	8,380	8,420	4,715	5,875
4 No. 7R Counterweights.....	5,110	5,150	5,220	5,250	5,290	2,655	3,460
4 No. 7L Aux. Weights.....	5,735	5,775	5,845	5,875	5,915	3,065	3,940
4 No. 7 Aux. Weights.....	6,360	6,400	6,470	6,500	6,540	3,475	4,420
For Crank Weights Add To The Above.....	3,290	3,290	3,290	3,290	3,290	1,760	2,065
For Semi-Automatic Counterbalance Add To The Above.....	2,620	2,620	2,620	2,620	2,620	1,810	2,125



FIGURE 25

“TWO-POINT” SUSPENSION bases are available for all Lufkin Mark II Pumping Units. The “two point” base reduces concrete requirements approximately 80% by permitting the use of small salvageable precast concrete blocks in front and rear. This simple foundation assures a completely portable unit and foundation which requires a minimum of installation time.

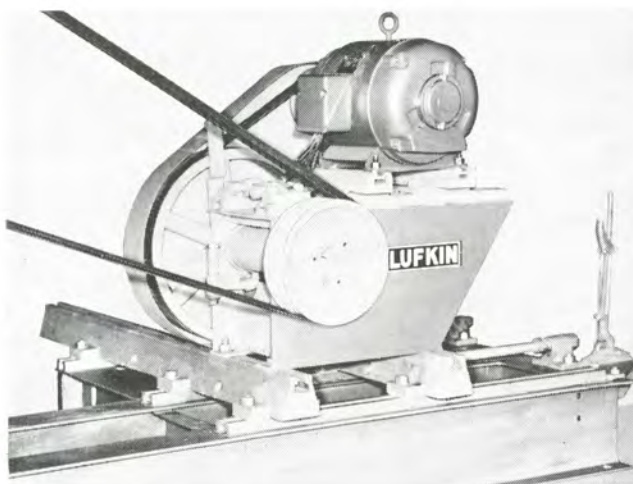


FIGURE 26

This assembly utilizes an electric motor and countershaft and provides a reduction ratio up to 4:1. This compact reduction unit package will fit on conventional slide rails and was designed for use with single reduction gear reducers where slow pumping speeds are encountered. This type assembly is manufactured in two sizes:

No. 1—25-50 HP

No. 2—up to 20 HP

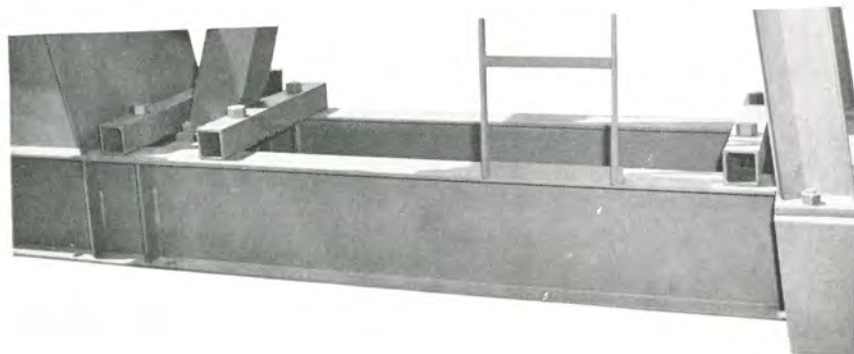


FIGURE 27

Typical top flange hold-down installation. Two bolt clamps are standard on the C-160 size and larger. One bolt clamp is standard on all smaller units. The number and location of clamps on the base is dependent on the size of the unit.

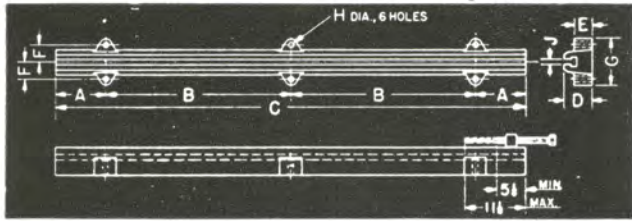


FIGURE 28

LUFKIN TYPE "A" ENGINE RAILS

Designed especially with minimum edge distance for flywheel clearance.

SIZE	A	B	C	D	E	F	G	H	J
A57 Rail.....	3"	25½"	57"	4"	2½"	2⅜"	6¼"	1"	1"
A69 Rail.....	3"	31½"	69"	4"	2½"	2⅜"	6¼"	1"	1"
A84 Rail.....	9"	33"	84"	5"	3¼"	3⅝"	8½"	1"	1½"

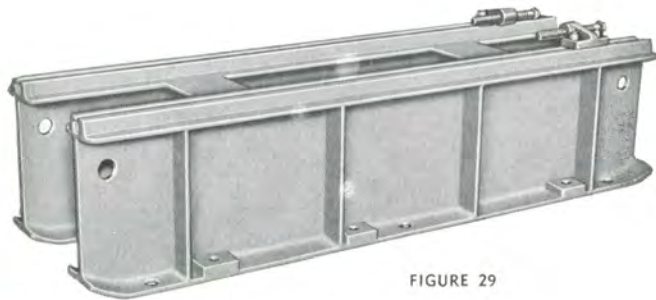


FIGURE 29

STRUCTURAL SUB-BASE FOR HORIZONTAL ENGINES.

Height to clear flywheel. Engine sits on T-slots fitted with adjusting screws. To be used when engine is mounted separately from stub-base pumping unit assembly.

FOUNDATION ANCHOR NUTS

Suspended in concrete forms before foundation is poured.

Provides flush foundation. Wide foot at base of nut insures more than adequate holding power.

Available in the following sizes:

BOLT DIA.	Length
¾"	6"
1"	10"
1¼"	12"
1½"	12"
2"	12"



FIGURE 30

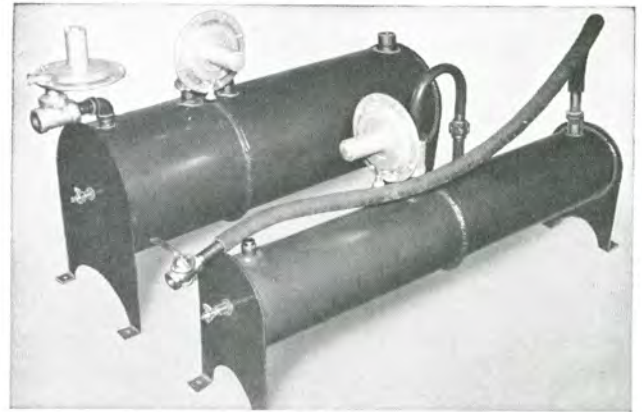


FIGURE 31

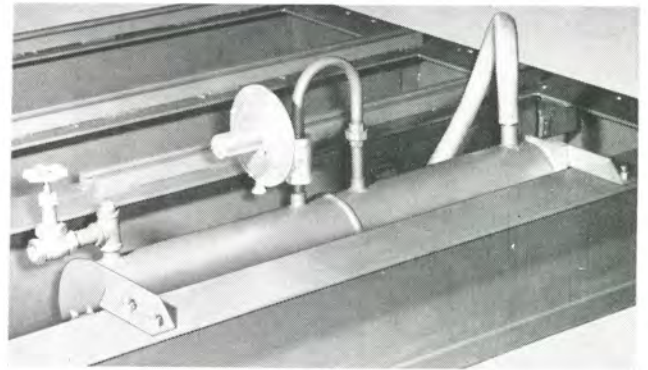


FIGURE 32

VOLUME TANK AND REGULATOR FOR GAS ENGINES

Double chamber, floor mounting, volume tanks for gas engines are furnished in two sizes. Both are equipped with regulators. The smaller size is for multi-cylinder gas engines and is 8" diameter by 48" long with partition in center. It has hose connection to engine. The larger size is recommended for Lufkin engines and is 14" diameter by 42" long with a volume chamber of 2.5 cu. ft. A high pressure regulator can be furnished at inlet if necessary.

For units having a portable base, a volume tank that bolts directly to the outrigger as is shown in Fig. 31 is recommended.

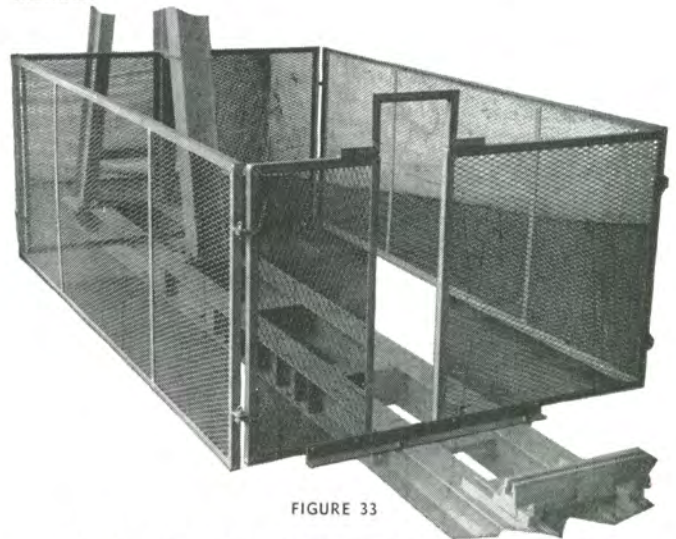


FIGURE 33

TYPE W (WIRE MESH) CRANK GUARDS

A new standard design available in stock for all Lufkin Units. No holes required in Base or Post—clamps to top flanges of Base and to Post—and can be fitted to any unit already installed. Sides are hinged and can be easily removed.



FIGURE 34

Two zones produced independently in one well by the use of two pumps with separate strings of tubing and rods.

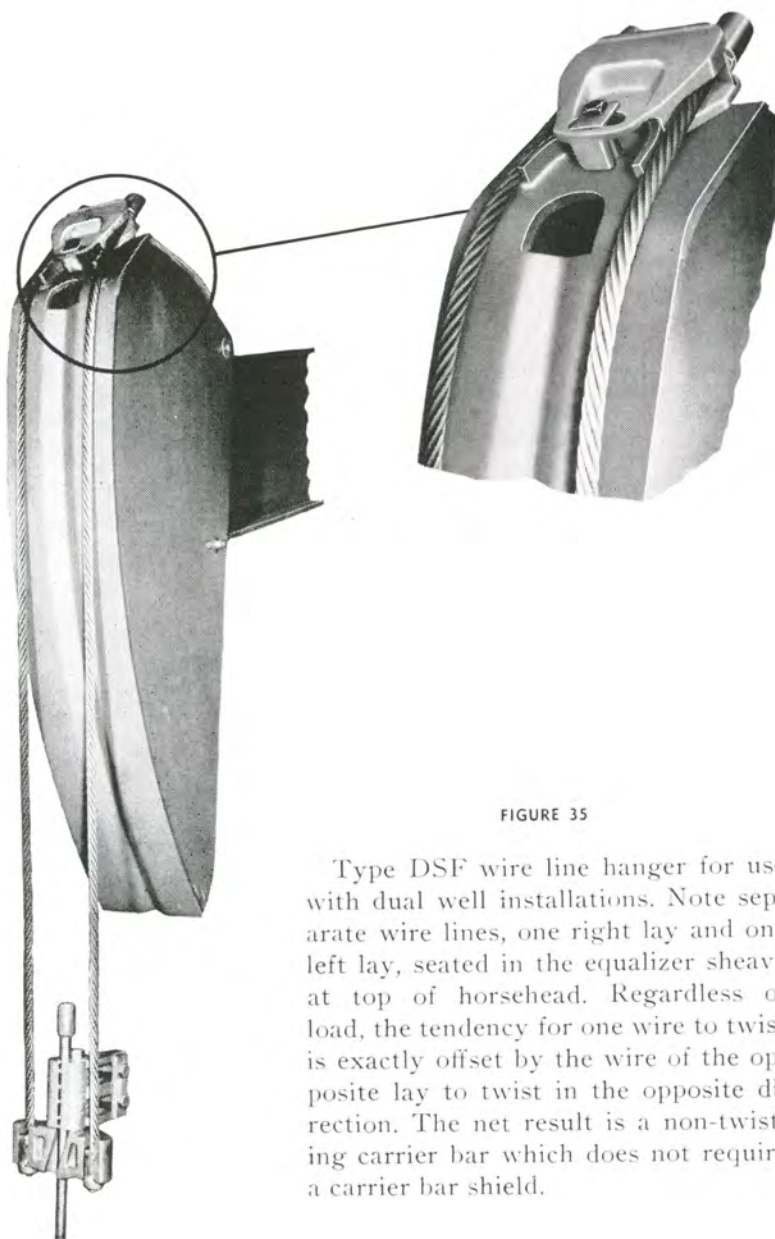


FIGURE 35

Type DSF wire line hanger for use with dual well installations. Note separate wire lines, one right lay and one left lay, seated in the equalizer sheave at top of horsehead. Regardless of load, the tendency for one wire to twist is exactly offset by the wire of the opposite lay to twist in the opposite direction. The net result is a non-twisting carrier bar which does not require a carrier bar shield.

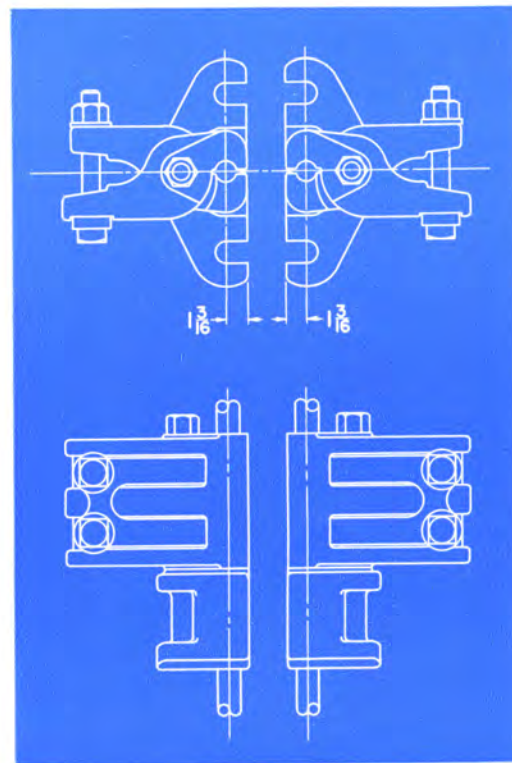


FIGURE 36

Type DSF carrier bar and polished rod clamp designed for dual-completed wells to give maximum clearance between carrier bars.



FIGURE 37

Three pumping units with three separate tubing and rod strings operating in a single casing. In this type installation the units can be operated simultaneously or selectively. These units utilize the Type SA wire line hanger assembly shown below.



FIGURE 38

Lufkin's Type SA hanger assembly utilizes a double wire line and a quick-disconnect attachment to the polished rod. A standard sucker rod coupling attaches to the top of the polished rod and rests on a recessed shoulder of the wire line connection. A lock bolt screws into the top of the coupling and tightens against the top of the wire line connection.

Well spacing can be effected by moving the bolt at the top of horsehead to a different hole. Two horsehead alignment set screws, which are fabricated into the horsehead side plates, bear against the walking beam. These set screws can be used to properly align the horsehead without removing the well load.

The Type SA hanger assembly can be used for dual, triple, or other multiple installation applications.



FIGURE 39

Shown above is a dual track horsehead used for pumping two zones with one pumping unit. It utilizes two separate wire lines and hangers operating on individual tracks. With this arrangement each zone may be pumped independently, or both zones may be pumped simultaneously.



LUFKIN AIR BALANCED PUMPING UNITS



FIGURE 40

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



FIGURE 41

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



FIGURE 42

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



FIGURE 43

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.

Gear Reducer Data: See page 3066.

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-IE is used with units powered by electric motors.

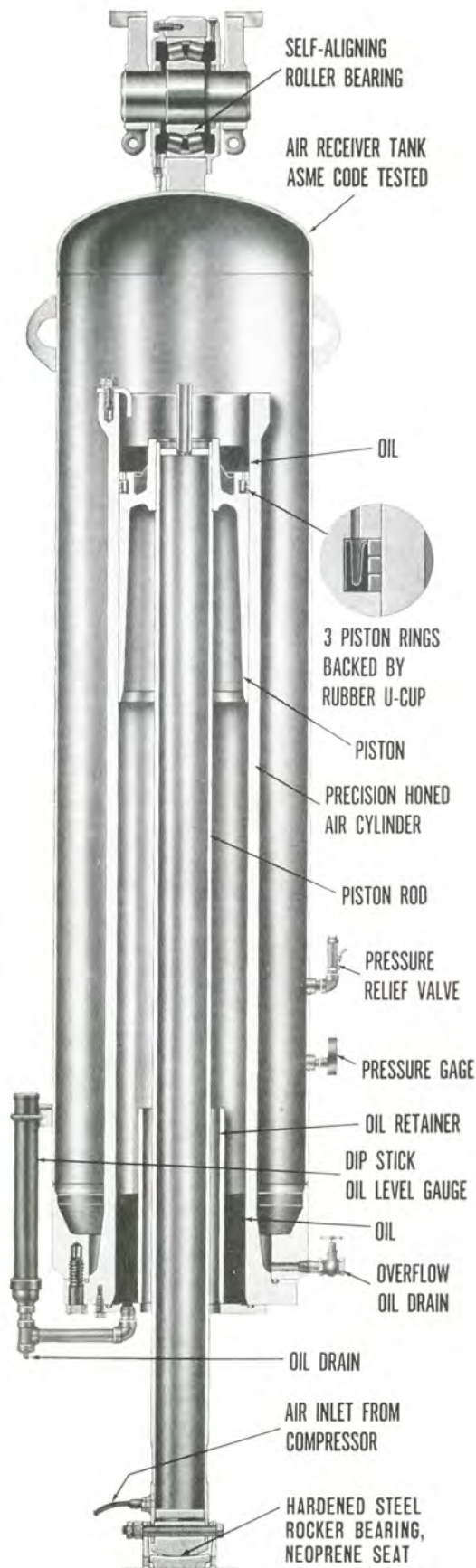


FIGURE 44

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.

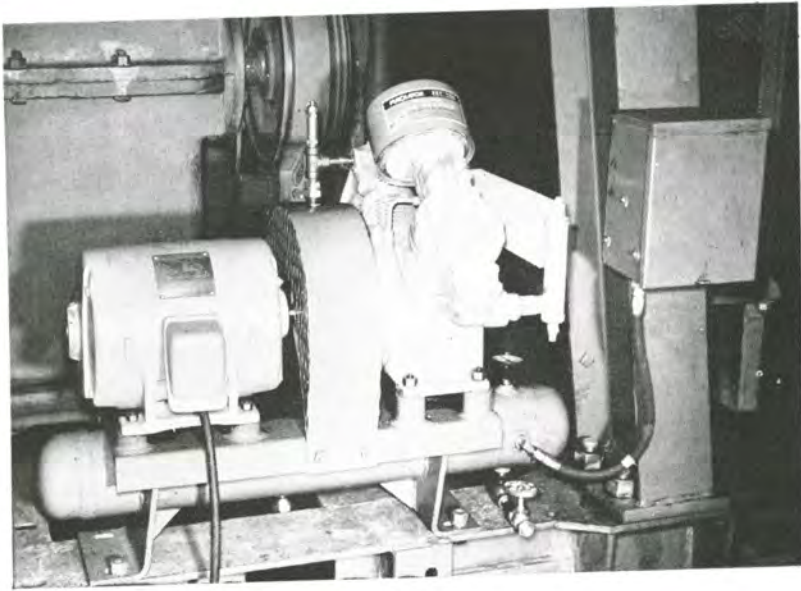


FIGURE 45

MOTOR DRIVEN COMPRESSOR

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

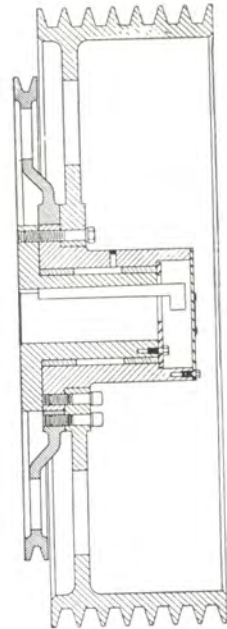


FIGURE 46

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.

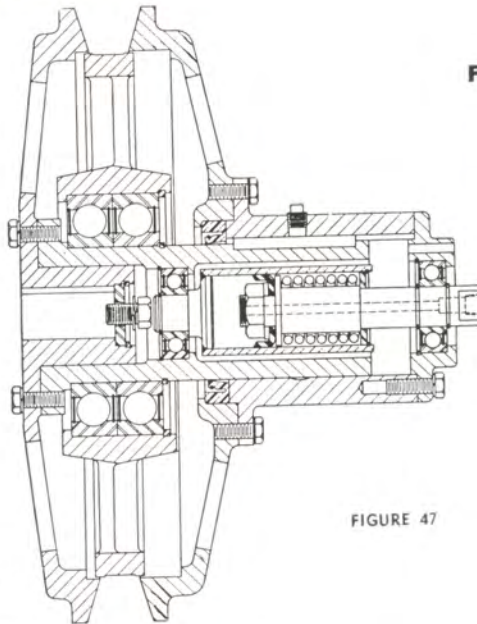


FIGURE 47

CLUTCH, 11 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.

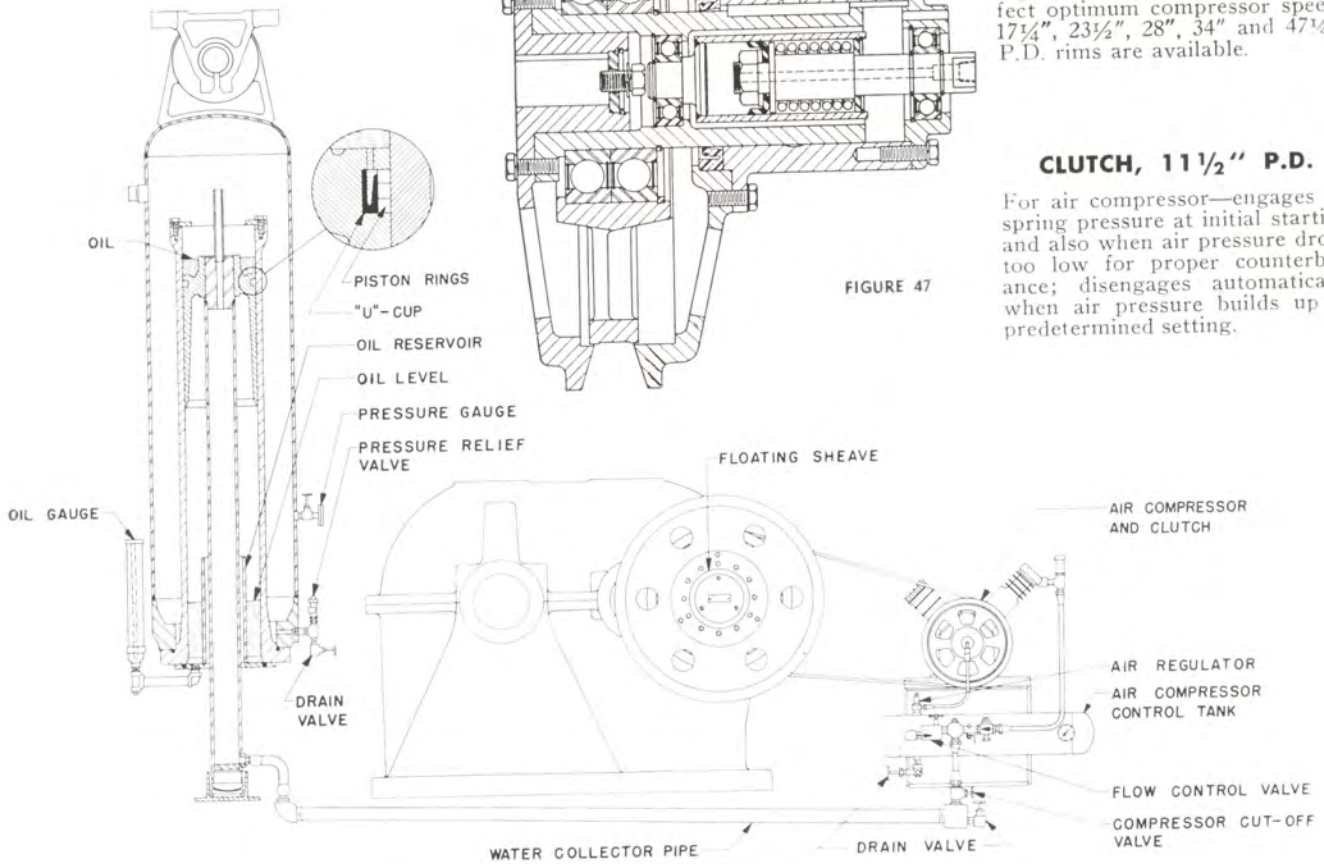


FIGURE 48

Schematic Outline of Air System, Clutch Driven Compressor



GENERAL DIMENSIONS—Lufkin Air Balanced Pumping Units

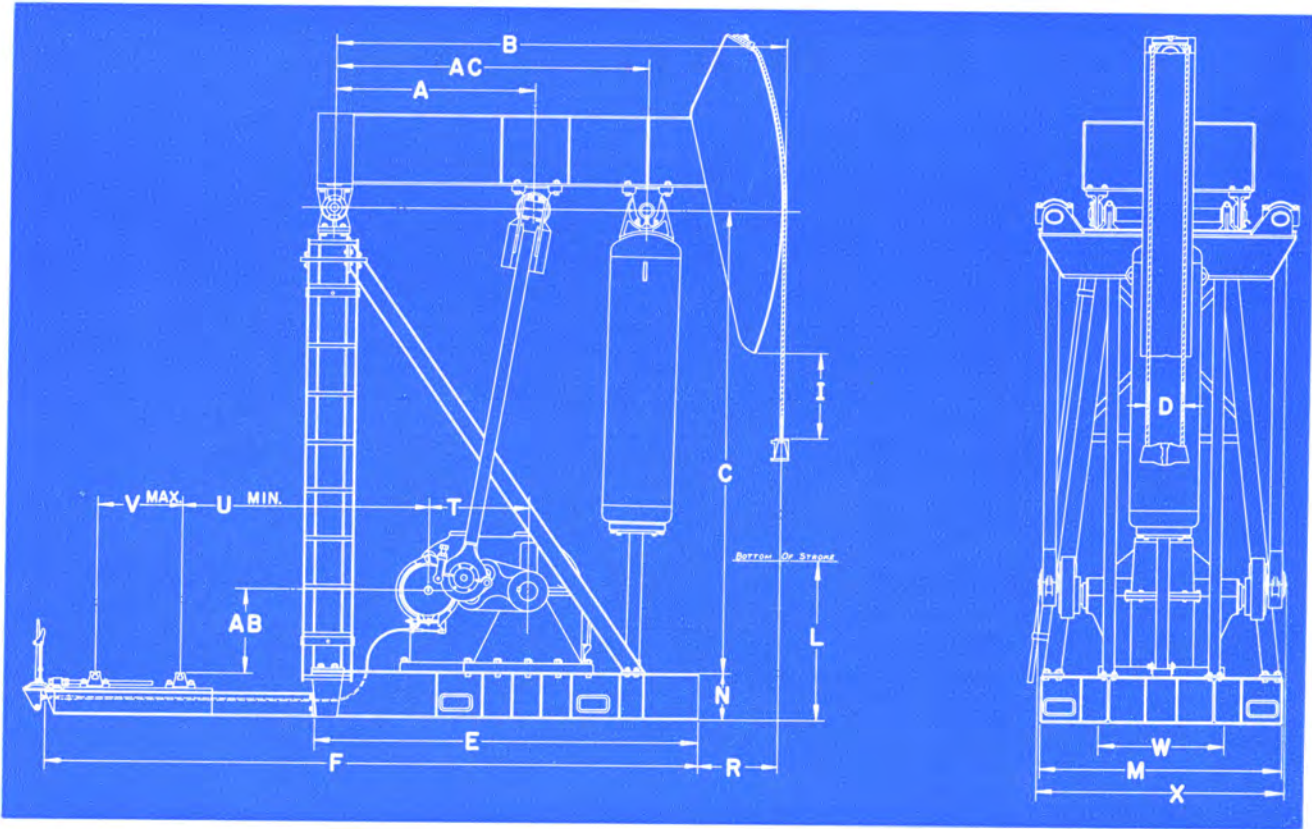


FIGURE 49

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"	* 22'-0 3/8"	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 1/2"	30"	19'-5 1/2"
A-1824D-216-41	10'-1 1/2"	25'-8"	21'-0"	"	19'-4 5/8"	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 1/2"	16 1/2"	53"	"	"	"	"	"	"	"	"	"	"
A-1280D-240-47	11'-2 1/2"	28'-0"	25'-3 1/2"	"	* 22'-0 7/8"	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"	"	19'-4 5/8"	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"	"	"	12'-3 1/2"	27'-1 1/2"	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 1/2"	59"	"	6'-0"	"	"	"	38 1/8"	10'-11 1/2"
A-912D-216-41	10'-1 1/2"	25'-8"	21'-0"	"	* 22'-0 7/8"	32'-0"	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"	29'-9 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 1/2"	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"	"	71 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 1/4"	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 3/8"	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 7/8"	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	33 x 15¼ @ 200#	8	1¾" x 52'-0"	40, 46, 51, 55, 68 (11D)	28.33	71,332
A-1824D-216-41	"	216-190-162	41,000	"	24,830	"	"	1¾" x 42'-10"	"	"	63,667
A-1824D-192-42	"	192-168-144	42,000	"	30,635	"	"	1¾" x 44'-4"	"	"	60,850
A-1280D-240-47	1,280,000	240-200	47,000	"	34,000	"	"	1¾" x 52'-0"	"	28.05	68,330
A-1280D-216-41	"	216-190-162	41,000	"	24,830	"	"	1¾" x 42'-10"	"	"	61,117
A-1280D-192-42	"	192-168-144	42,000	"	30,635	"	"	1¾" x 44'-4"	"	"	58,300
A-1280D-427-144	"	144-120-100	42,700	13	27,935	27 x 14 @ 160#	6	1¾" x 37'-2"	"	"	44,800
A-912D-216-41	912,000	216-190-162	41,000	14½	24,830	33 x 15¼ @ 200#	8	1¾" x 42'-10"	28, 34, 40, 46, 51 (7D)	28.72	52,817
A-912D-192-42	"	192-168-144	42,000	"	30,635	"	"	1¾" x 44'-4"	"	"	50,000
A-912D-168-33.5	"	168-141-118	33,500	13	22,450	27 x 14 @ 160#	6	1¾" x 39'-10"	"	"	38,978
A-912D-427-144	"	144-120-100	42,700	"	27,935	"	"	1¾" x 37'-2"	"	"	37,200
A-640D-168-33.5	640,000	168-141-118	33,500	"	22,450	"	"	1¾" x 39'-10"	28, 34, 40, 46, 51 (6D)	28.6	37,978
A-640D-427-144	"	144-120-100	42,700	"	27,935	"	"	1¾" 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 33'-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, 47¼ (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#	"	1½" x 24'-6"	24¼, 30, 36, 41¼ (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 8½ @ 77#	3½	1½" x 22'-6"	24¼, 29¼, 33¼, 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"	19¼, 24, 29¼, 33¼ (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.

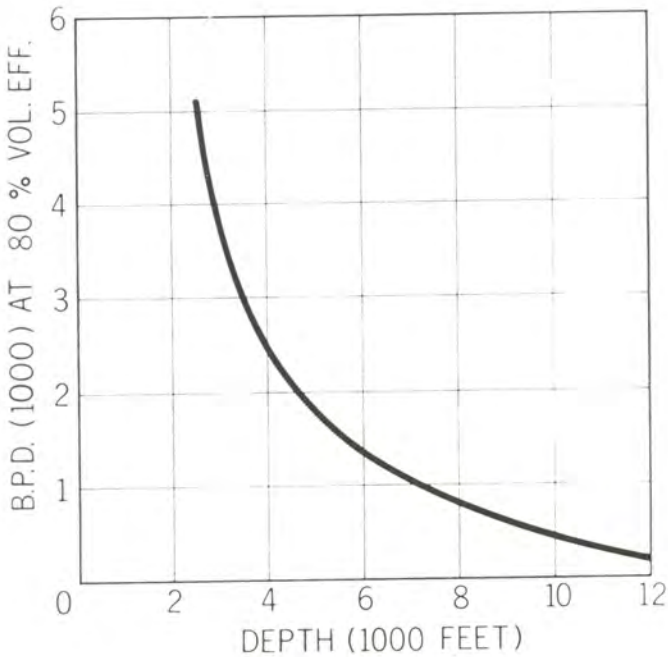


FIGURE 50

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 51

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

**LUFKIN OFFERS A TRAILER TO COMPLY
WITH YOUR EVERY HAULING NEED**



FIGURE 52
Hi Tensile Oilfield Float



FIGURE 53
*Model THD-2—Lufkin's Hydraulic Tandem
Dump Trailer.*



FIGURE 54
*Custom Built Low-Bed
All Low-Bed Models offered custom made to every need*

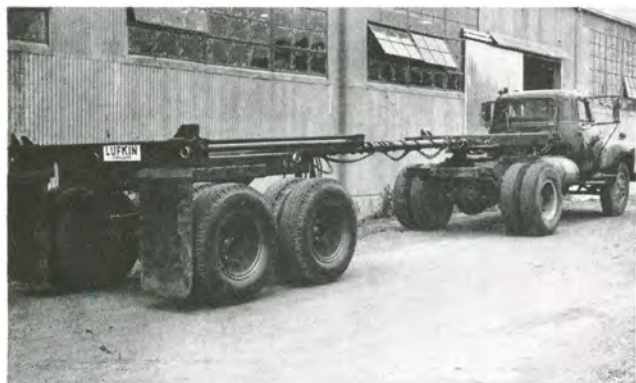


FIGURE 55
*Model TOP
For hauling pipe, poles & other oilfield supplies*

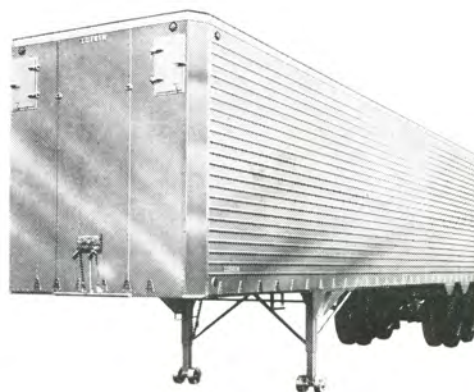


FIGURE 56
All Aluminum Van

LUFKIN HORIZONTAL, TWIN CYLINDER TWO CYCLE GAS ENGINES

Model	Speed Range	Continuous Rating
HT-333-C	350-650 RPM	20- 30 BHP
H-795	300-600 RPM	45- 65 BHP
H-795-CCW	300-600 RPM	45- 65 BHP
H-1770-B	200-475 RPM	62-130 BHP
H-2165-B	200-475 RPM	75-160 BHP

Lufkin Engines are built as heavy duty, slow speed, twin cylinder, two cycle, horizontal design, in a range of sizes from 20 to 160 continuous usable horsepower. Lufkin Engines are compact and easily mounted to all types of oilfield equipment. They are ruggedly built and provide dependable low cost power for pumping, injection pumps, pipeline pumps, gas compressors, and other oilfield pumping requirements.

The Model H-795-CCW engine is built for counterclockwise rotation, and is used with Mark II units and other counterclockwise rotation machinery.

All Lufkin Engines are thermosyphon cooled, and are furnished complete with radiator, fan, and piping. Oil cooled pistons are available on the H-795 and H-2165 engines, and are recommended for heavy duty, continuous loading.

Fuel injection, for a material savings in natural gas, is available for Models H-1770 and H-2165 engines.

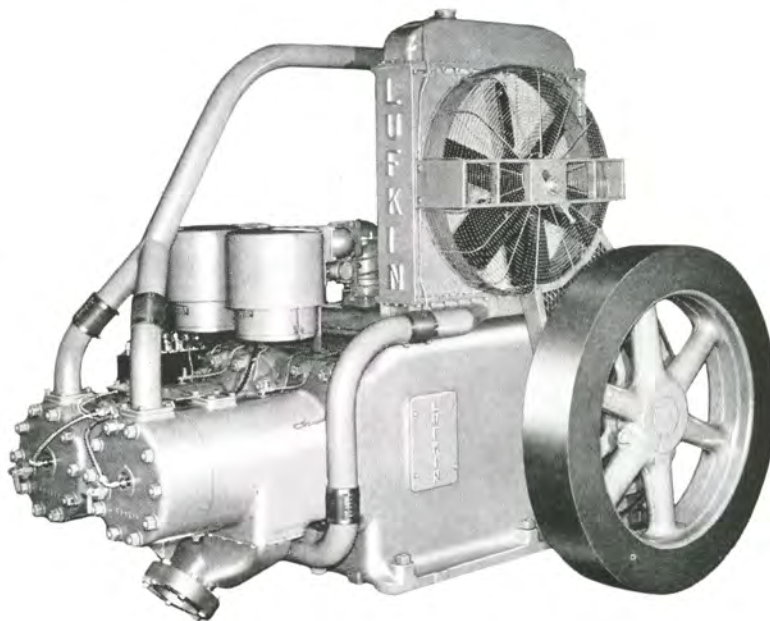


FIGURE 57
Flywheel Side of Lufkin H-1770 and H-2165 Engines

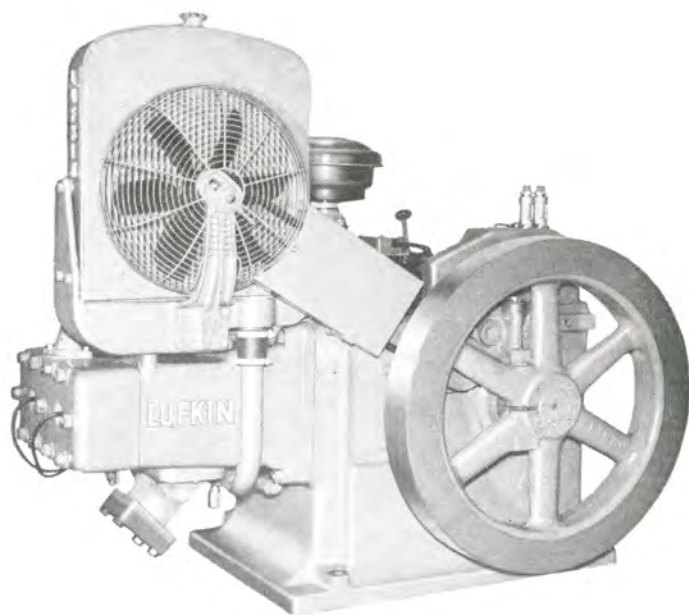


FIGURE 58
Flywheel Side Lufkin HT-333 Engine

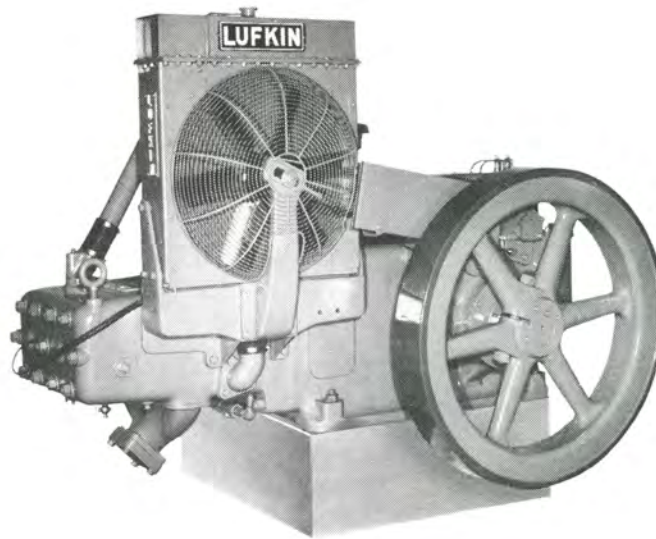


FIGURE 59
Front View—Lufkin H-795 Engine

LUFKIN ENGINE SPECIFICATIONS

MODEL	HT-333-C	H-795 H-795-CCW	H-1770-B	H-2165-B
No. Cylinders	2	2	2	2
Bore, In.	5½	7½	9½	10½
Stroke, In.	7	9	12½	12½
Displacement, Cu. In.	333	795	1770	2165
Compression Ratio	5.5	5.3	5.5	5.3
Speed Range, RPM	350-650	300-600	200-475	200-475
Dia. Flywheel, In.	35½	40	48	48
Flywheel WR ² , Ft. ² Lbs.	1200	1580	5250	5250
Cooling System		Thermosyphon		
Capacity, Gal.	7½	14	23	25
Lubrication		Full Pressure		
Crankcase Capacity, Gal.	5	5	16	16
Cylinder Lubricator		McCord (Automatically filled by pressure system)		
Oil Filter		Cuno, By-Pass Type		
Ignition—Standard		Rotary High Tension Magneto		
Optional		Rotary Low Tension Magneto		
Gas Mixer	1½" XG Ensign	2" XG Ensign	Rotary Valve	Rotary Valve
Air Filter			Oil Bath	
Clutch, Twin Disc	SPE-111	SPE-114	SPE-214	SPE-314
Size Shaft, In.	2¼ x 6½	3 x 8½	3½ x 10	3½ ₁₆ x 10
Keyway, In.	¾ x ¼ ₁₆	¾ x ¾	¾ x 7 ₁₆	1 x ½
Dia. Exhaust Pipe, In.	4	4	6	6
Dia. Gas Inlet, In.	1	1	2	2
Weight, Lbs.	3250	4500	9800	10,250
Safety Controls:			Standard	Standard
Water and Oil			Standard	Standard
Overspeed	Optional	Optional		
Starting Systems:			Standard	Standard
Air Starting Valve	Optional	Optional		
Electric Motor			Optional	
Air-Gas Motor			Optional	
Friction Wheel			Optional	

Performance curves below are for continuous service, but must be corrected for altitude and temperature.

Lufkin Foundry & Machine Company reserves the right to make changes or add improvements at any time without notice or obligation.

THE FOLLOWING FEATURES GIVE DEPENDABLE, LONG LIFE, LOW UPKEEP SERVICE:

TWIN CYLINDERS—for smoother flow of power

TWO CYCLE CROSSHEAD DESIGN—for low cost maintenance

FULL PRESSURE LUBRICATION—oil under pressure to all bearings

OIL FILTER—assure clean oil

BRONZE CROSSHEAD SHOES and Pin Bushings—for less wear and longer life

SADDLE MOUNTED CROSSHEAD PIN—for more bearing surface

PRECISION CONNECTING ROD BEARINGS—longer life and easy replacement

PRESSURE FILLED CYLINDER LUBRICATOR

BUILT-IN SAFETY SWITCHES

HEAVY DUTY CLUTCH

OIL COOLED PISTONS (Optional on Models H-795 and H-2165)—for extreme heavy duty service

STANDARD EQUIPMENT

Lufkin Engines are furnished as a complete power unit with full pressure lubrication, oil filter, automatically filled cylinder lubricator, rotary magneto, centrifugal governor, oil bath air filter, Ensign natural gas mixer, thermosyphon cooling system with radiator, fan, belts and guards, Twin Disc extended service heavy duty clutch and built-in water temperature and oil pressure safety switches.

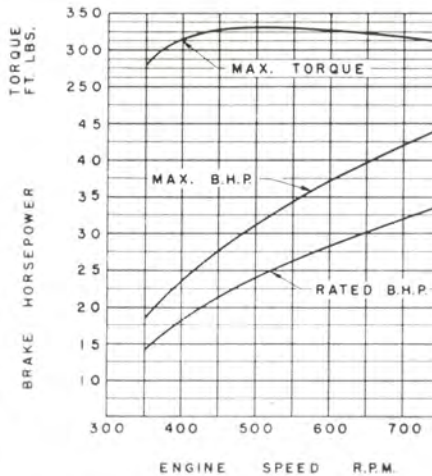


FIGURE 60
Performance Curves H-333 Gas Engine

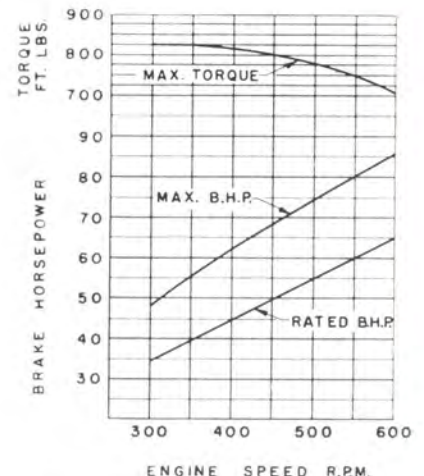


FIGURE 61
Performance Curves H-795 Gas Engine

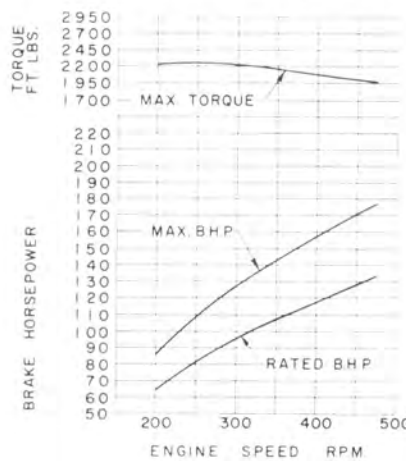


FIGURE 62
Performance Curves H-1770 Gas Engine

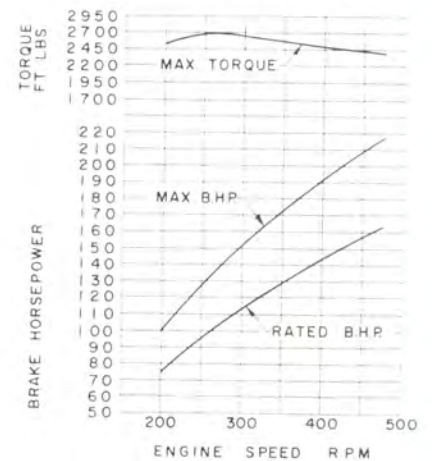


FIGURE 63
Performance Curves H-2165 Gas Engine

LUFKIN GEAR REDUCERS

A complete line of Single, Double and Triple Reduction Herringbone Gear Reducers, also Single and Double Reduction Speed Increasers are available.

Write for Gear Catalog G-20.

Spiral Bevel Gear Reducers are also available for such service as cooling tower fan drives. Bulletins G-7A and G-24 are available on request.

A complete line of Marine Gears including reduction, reverse and reduction, and multiple pinion units are available. Write for Marine Gear Bulletins G-10 and G-11.

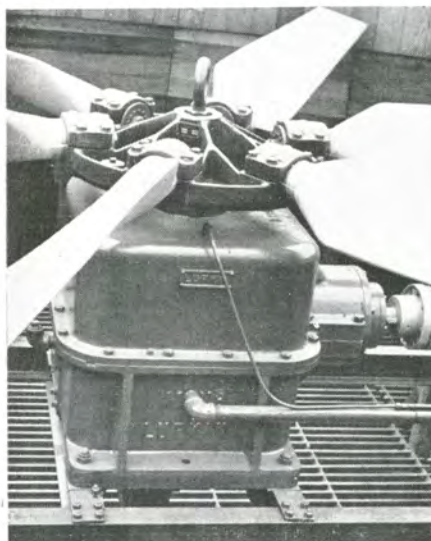


FIGURE 66
115VB Spiral Bevel Gear Reducer for Cooling Tower Fan Drive. A complete range of sizes available.

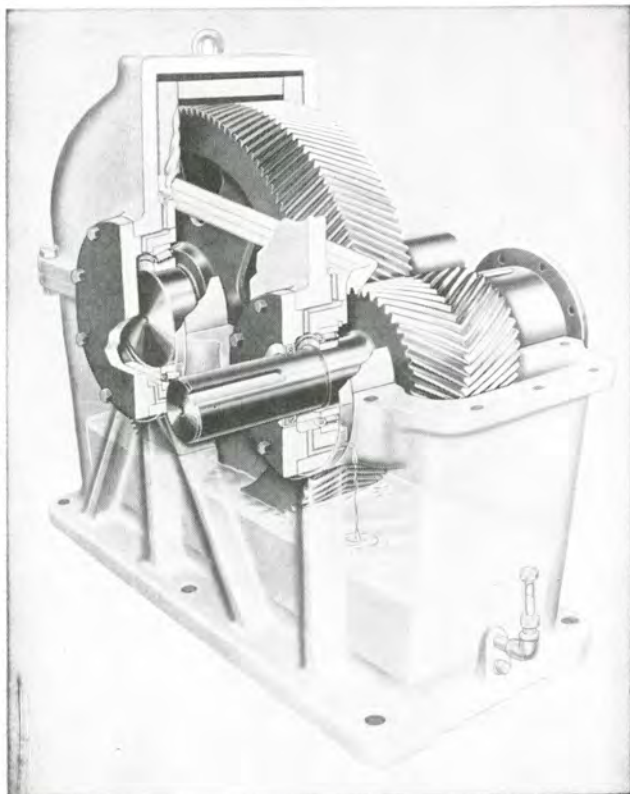


FIGURE 64

Typical Type S Single Reduction Herringbone Gear Reducer. Note simple but positive and fool-proof Lubrication System.

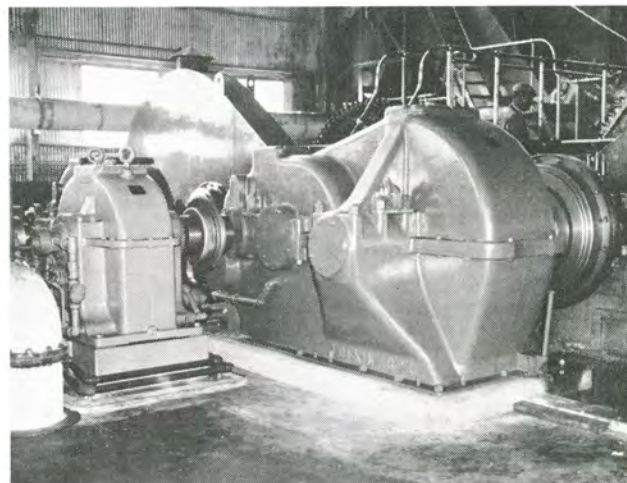


FIGURE 67

Lufkin Model N1610B High Speed Reducer Connected to a Lufkin Model D1824 Hi-Q Reducer Driving Sugar Mill in Louisiana Sugar Factory.

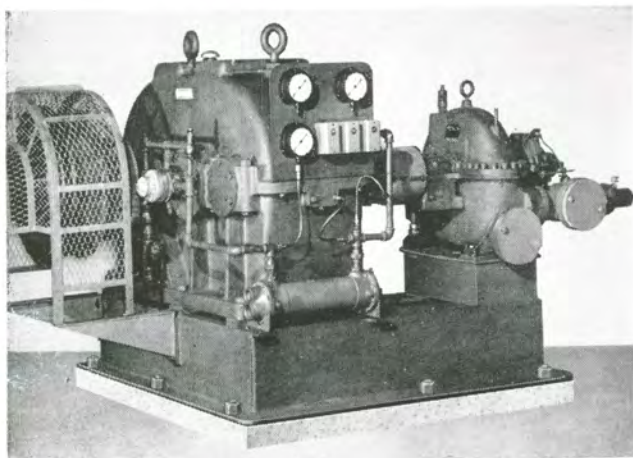


FIGURE 65

Lufkin N290 High Speed Reducer, Ratio 33.6:1, Delivering 227 H. P. From a 6670 RPM Turbine to a Reciprocating Pump.

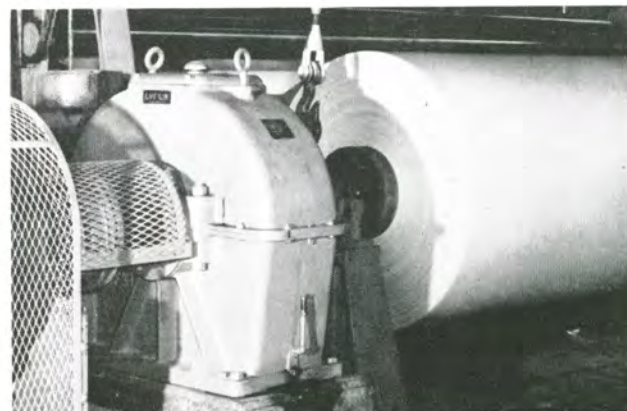


FIGURE 68

Lufkin S189 Single Reduction Herringbone Reducer Driving Rewind Machine at Newsprint Mill.

LUFKIN FOUNDRY & MACHINE CO.

LUFKIN, TEXAS

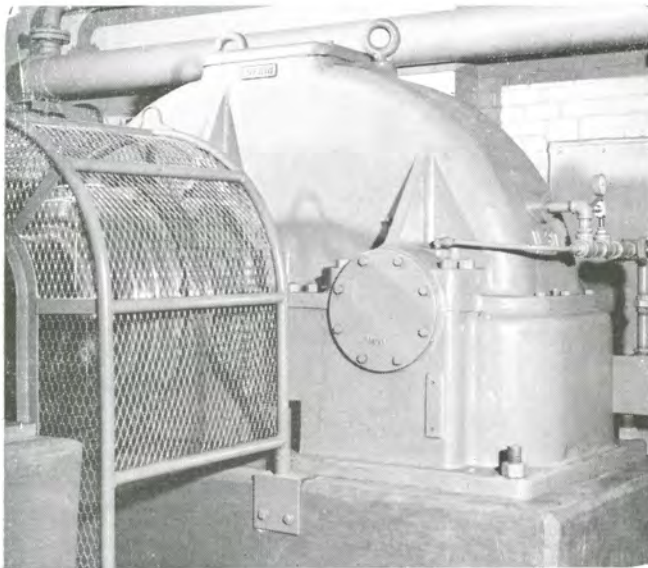


FIGURE 69

Lufkin's Big N3012 Pipe Line Pump Speed Inserter, 1060 h.p. Capacity at 3600 r.p.m. pump speed and 7:1 ratio.

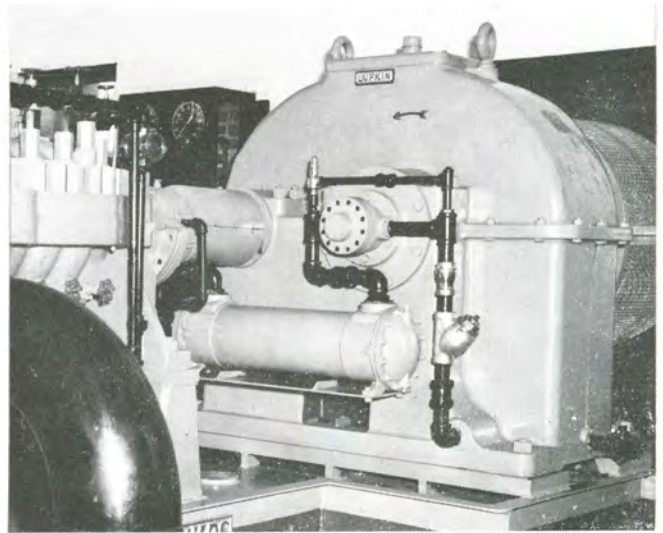


FIGURE 70

Lufkin N2110 High Speed Inserter, delivering 540 h.p. to pipe line pump going 3750 r.p.m.

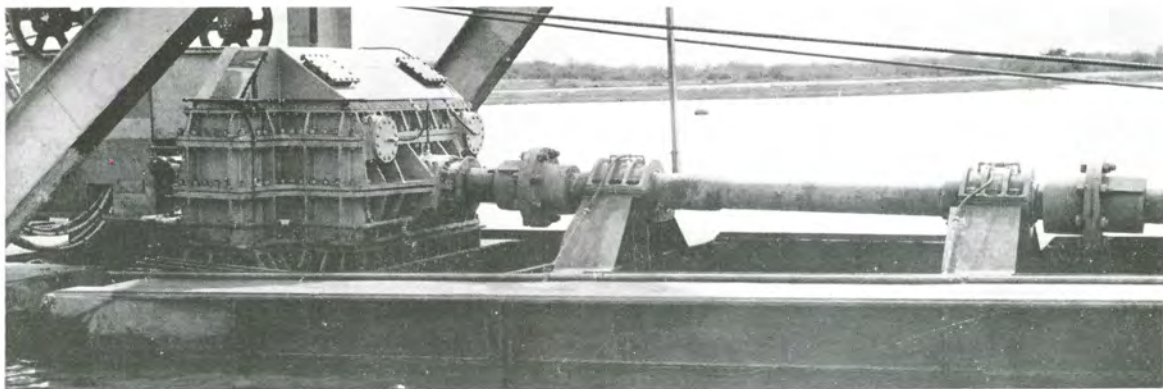


FIGURE 71

Lufkin DC3620 Dredge Cutter Reduction Gear Ratio 32. 6:1 Delivering 1200 h.p. at 1200 r.p.m.

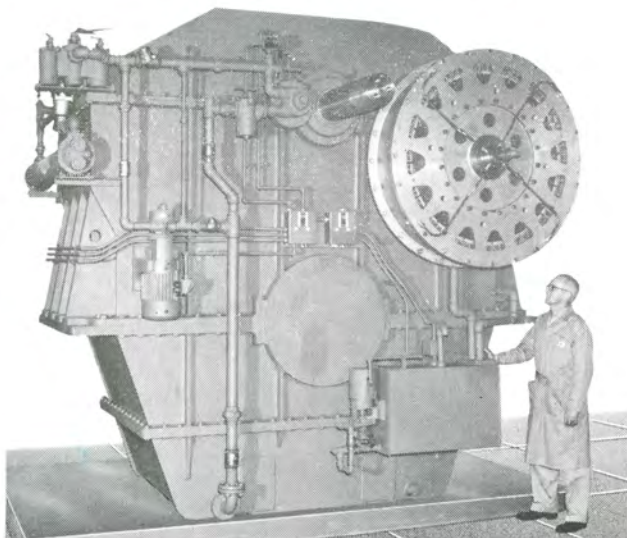


FIGURE 72

Lufkin RS6024 with Water Cooled Clutches for 604 ft. Great Lakes Ore Boat. Rating 3240 HP, 515 RPM, 4.68:1 Ratio.

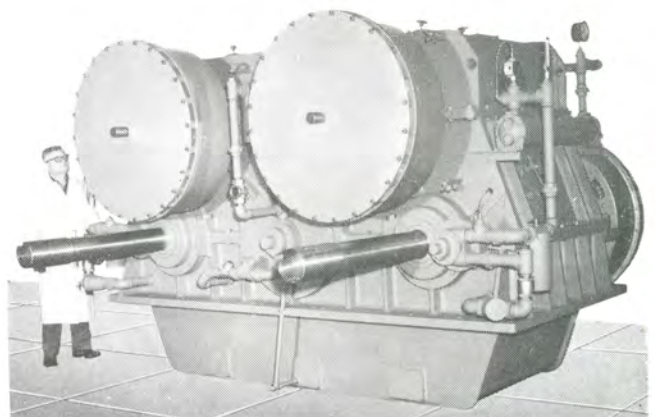


FIGURE 73

Lufkin RCS8414 Marine Reverse-Reduction Compound Propulsion Gear. Driven by two 1700 HP Diesels, 515 RPM, 3.33:1 Ratio.

LUFKIN INSTALLATIONS

TYPICAL OF THE MORE THAN NINETY THOUSAND LUFKIN PUMPING UNITS NOW GIVING SATISFACTORY SERVICE



FIGURE 74

Lufkin M-912D-305-168 Mark II Unitorque Pumping Unit With Electric Motor Drive.



FIGURE 75

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

LUFKIN

EQUIPMENT OF ADVANCED DESIGN
