CATALOG 65

LUFKIN

PUMPING UNITS

LUFKIN FOUNDRY & MACHINE COMPANY • LUFKIN, TEXAS

LUFKIN EQUIPMENT OF ADVANCED DESIGN

LUFKIN FOUNDRY & MACHINE CO. LUFKIN, TEXAS

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

ANACO, VENEZUELA, S.A.
Apartado No. 46
Manuel Aguirre

BAKERSFIELD, CALIFORNIA
2500 Parker Lane
P. O. Box 444
Phone: FAirview 7-3563
Carl Frazer
Joe Skeeters

BENGHAZI, LIBYA
Sahara Oilfield Services Company of Libya, Ltd. (Serrag & Co.)
P. O. Box 184
Phone: 3411

BUENOS AIRES, ARGENTINA, S.A.
MATPETROL
Esmeralda Street 155
Phone: 45-4822
Eduardo Hinojosa Acha

CASPER, WYOMING
E. Yellowstone Highway (U.S. 20)
P. O. Box 1849
Phone: 237-2670
Gene Nixon
Bob Butler
Charles Montgomery

CLEVELAND 16, OHIO
Suburban-West Building
Suite 316-A
20800 Center Ridge Road
Phone: EDison 1-5722
David Bishop

CRYSTAL LAKE, ILLINOIS
65 North Williams Street
P. O. Box 382
Phone: 459-5161
E. E. Johnson
Jerry Snell

CORPUS CHRISTI, TEXAS
1413 Casa Grande
Phone: TErminal 5-8987
John Swanson

DALLAS 1, TEXAS
800 Vaughn Building
Phone: RIverside 8-5127
Jack Gissler
H. H. Muller

DENVER 2, COLORADO
Suite 1423, 1700 Broadway
Phone: ALpine 5-1616
Jim Roe

EDMONTON, ALBERTA, CANADA
9950 - 65th Avenue
Phone: 433-3694
Roy Lilley
R. D. Dunlop
John Bowley
Robert Pahl

ESTEVAN, SASKATCHEWAN, CANADA
P. O. Box 622
Phone: 634-5595
Leonard Ruzicki

FARMINGTON, NEW MEXICO
East Bloomfield Highway
P. O. Box 1554
Phone: DAvis 5-4261
G. W. Nichols

GREAT BEND, KANSAS
North Main Street (Hwy. 281)
P. O. Box 82
Phone: GLadstone 3-5622
Steve Garner
John Spring

HOBBS, NEW MEXICO
1212 E. Lincoln Rd.
P. O. Box 97
Phone: EXpress 3-5211
Marion Hightower

HOUSTON 2, TEXAS
1408 C. & I. Life Building
Phone: CApitol 2-0108
W. H. Miner
T. L. Bowers
Joe Randol
Val Gallia

KILGORE, TEXAS
P. O. Box 871
Phone: 3875
W. T. Crowder, Jr.
Vernon Glenn

LAFAYETTE, LOUISIANA
P. O. Box 1353 OCS
Phone: CEnter 4-2846
B. C. Burnette

LA PAZ, BOLIVIA, S.A.
MATPETROL, Ltda.
Casilla De Correo 1734
Phone: 9943
Gonzalo E. Garcia A.

LIBERAL, KANSAS
P. O. Box 63
Phone: MA 4-1240
Eldon Hudson

LOS ANGELES 1, CALIFORNIA
5959 South Alameda
Phone: LUdlow 5-1201
V. J. Fawcett
Glenn Henderson
Al McConville
Dick Couch
Robert Spaulding
Jack Fisher

MARACAIBO, VENEZUELA, S.A.
Apartado No. 1144
Phone: 3132
Sam Curtis

MEXICO, D.F., MEXICO
Apartado No. 7506
Phone: 24-32-40
Gene L. Towle

MIDLAND, TEXAS
1610 North "K"
Phone: MUtual 4-8600
George Henson
R. C. Thompson

NATCHEZ, MISSISSIPPI
P. O. Box 804
Phone: 445-4691
A. L. Christina

NEW YORK 1, NEW YORK
350 Fifth Avenue
Empire State Building
Room 3904
Phone: OXford 5-0460
A. V. Simonson
Robert Gibbs
A. R. Beaulieu

ODESSA, TEXAS
1020 West Second Street
P. O. Box 1632
Phone: FEderal 7-8649
Elvin Read
Bill Champion
A. G. Black
Doyle Herndon
Willard Chappell

OKLAHOMA CITY, OKLAHOMA
1317 West Reno
P. O. Box 2337
Phone: CEntral 6-4521
John Mettauer
Don McCarn
Newell Lynch
Luther Tackett

PAMPA, TEXAS
P. O. Box 2212
Phone: MOhawk 5-4120
Bill Trout

ROME, ITALY
Via Veneto 169/9
Phone: 463-507
Oliver McKay

RIO DE JANEIRO, BRAZIL, S.A.
MAQUIP (Commercial de Maquinas e Equipamentos) S.A.
Caixa Postal 2508
Phone: 23-5840
Edgard Frias Rocha

SHREVEPORT, LOUISIANA
2005 Beck Building
P. O. Box 5578
Phone: 424-3297
T. A. Banta

SIDNEY, MONTANA
Highway 16
P. O. Box 551
Phone: 482-2707
John Fincher

TALARA, PERU, S.A.
OILFIELD IMPORTS, S.A.
Apartado No. 71
John Herasimchuk

TULSA, OKLAHOMA
1515 Thompson Building
Phone: LUther 7-7171
Charles E. Dyer
Ben Queen

TRIPOLI, LIBYA
Sahara Oilfield Services Company of Libya, Ltd. (Serrag & Co.)
P. O. Box 800
Phone: 4-2711

WICHITA FALLS, TEXAS
727 Oil & Gas Building
P. O. Box 2465
Phone: 322-1967
Ernest Slaughter, Jr.
Ed Patterson

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

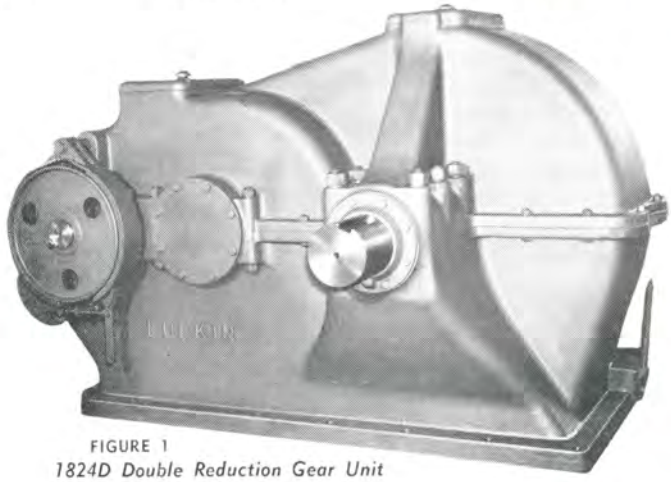

FIGURE 1
1824D Double Reduction Gear Unit

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.

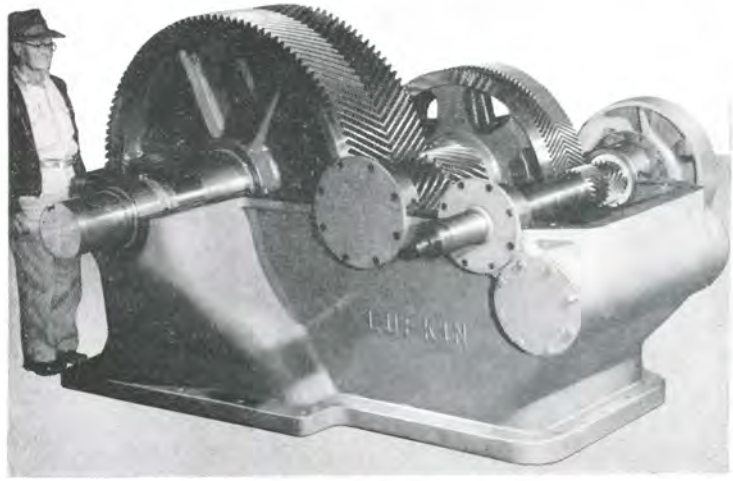

FIGURE 2
1824D Double Reduction Gear Unit, cover removed

EXPLANATION OF PUMPING UNIT DESIGNATIONS

C - 228 D-246 - 74

Type Pumping Unit:
A—Air Counterbalance
B—Beam Counterbalance
C—Trout Crank Counterbalance
CB—Combination Beam and Crank Counterbalance
M—Mark II Unitorque

Peak Torque Rating In Thousands Of Inch Pounds

Polished Rod Load Rating In Hundreds of Pounds

D—Double Reduction Gear Reducer
S—Single Reduction Gear Reducer
T—Triple Reduction Gear Reducer

Stroke Length In Inches

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

1. Factory lubricated Roller Bearings should be relubricated every 5 years. Install grease fittings in place of the pipe plugs which are furnished on these assemblies; use grease gun and flush out old grease through pressure relief fittings. Use NLGI No. 1 lithium base grease An extreme pressure lubricant of the lead napthanate type is satisfactory. Do not use a soda base grease.
2. High Lead Bronze Bearings are the oil bath type and require periodic lubrication. Use extreme pressure oil of the lead napthanate type having a pour point of 15° F or lower. The viscosity should be approximately 6600 S.U.S. at 100° F.

Crank Pin Bearings: All sizes are Factory Lubricated, Roller Bearings.

Center Bearings: All Beam Balanced Units and the smaller Crank Balanced Units are equipped with High Lead Bronze Bearings. The larger Crank Balanced Units utilize Factory Lubricated, Roller Bearings.

Equalizer Bearings: All Beam Balanced Units are equipped with High Lead Bronze Bearings. All Crank Balanced Units utilize Factory Lubricated, Roller Bearings.

Structural Bearings, Mark II and Air Balanced Units: All bearings are Factory Lubricated, Roller type.

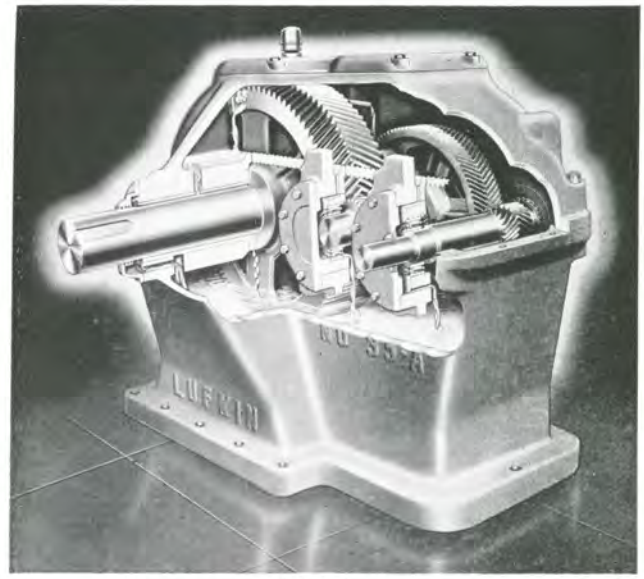

FIGURE 3

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.

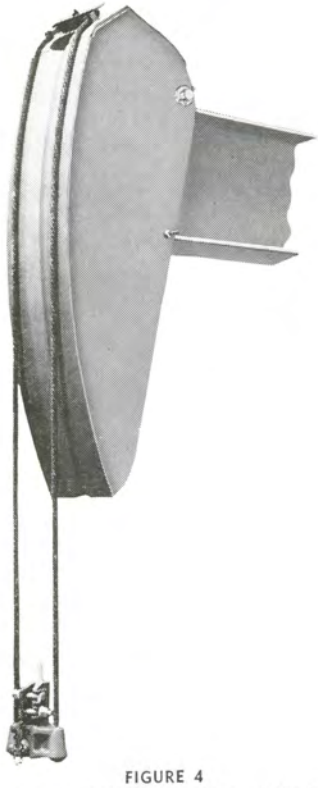

FIGURE 4

HORSEHEAD AND WIRE LINE ASSEMBLY

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

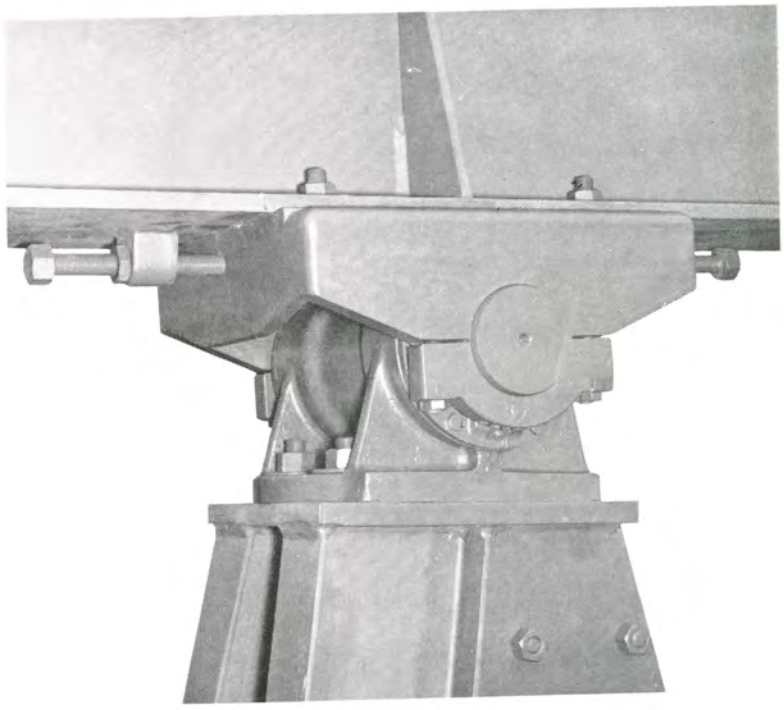

FIGURE 5

CENTER BEARING ASSEMBLY

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

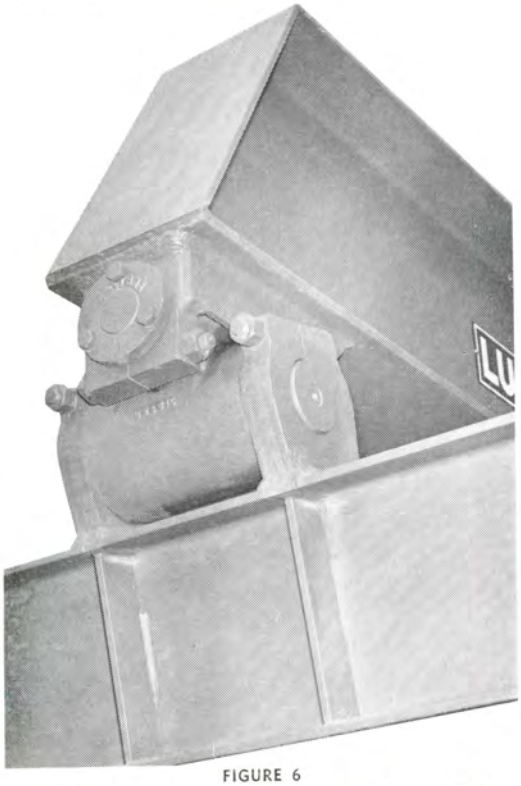

FIGURE 6

CRANK BALANCED UNIT EQUALIZER BEARING ASSEMBLY

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

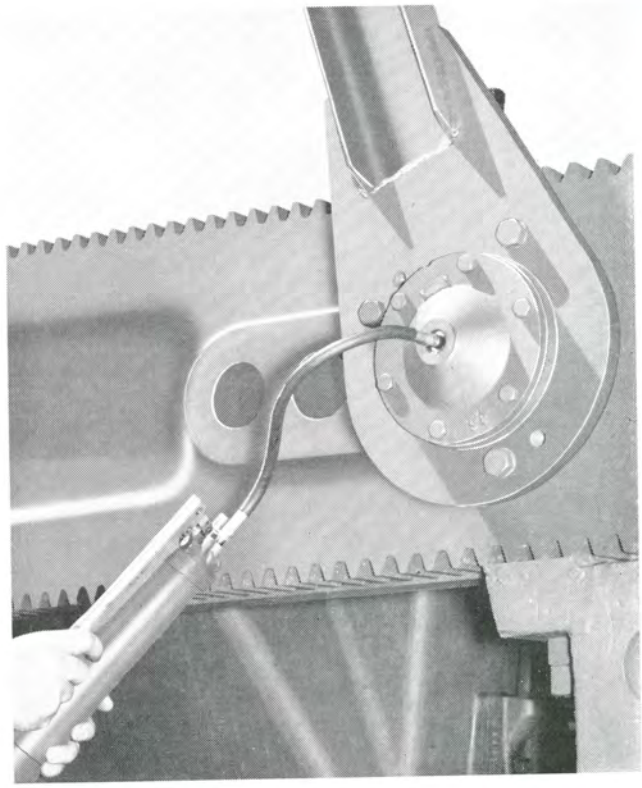

FIGURE 7

CRANK PIN ASSEMBLY

Furnished with roller bearings, factory lubricated, 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

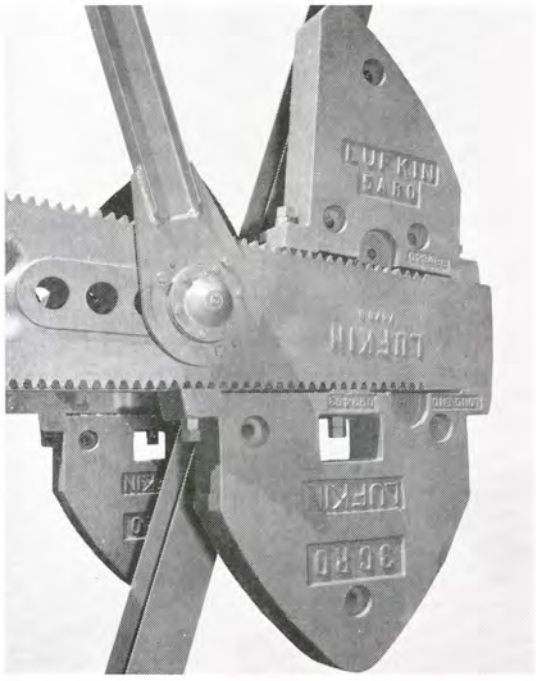

FIGURE 8—*Illustrating the wide range of counterweight sizes which can be used on one crank. Different size counterweights are not normally furnished or recommended for the same unit.*

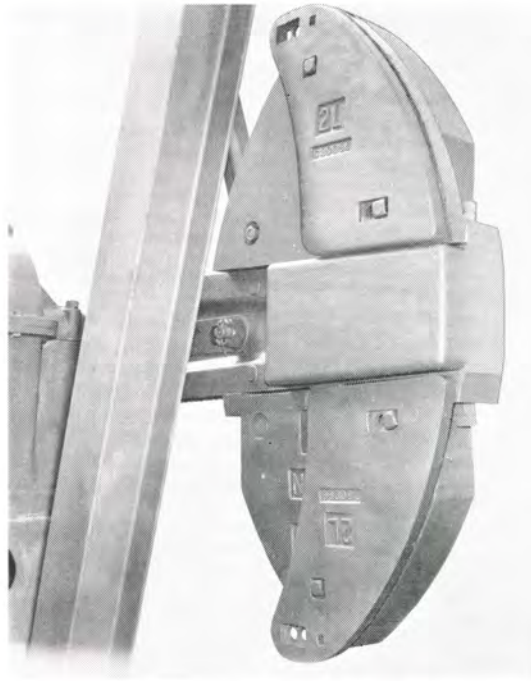

FIGURE 9—*L type auxiliary weights can be used alone or with S type auxiliary weights.*

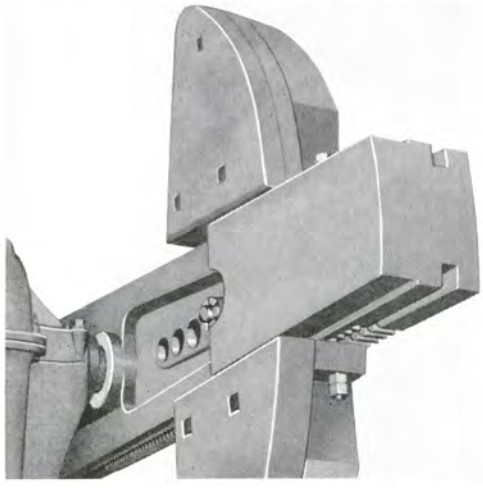

FIGURE 10—*Various combinations of type S and D auxiliary counterweights available for additional counterbalance.*

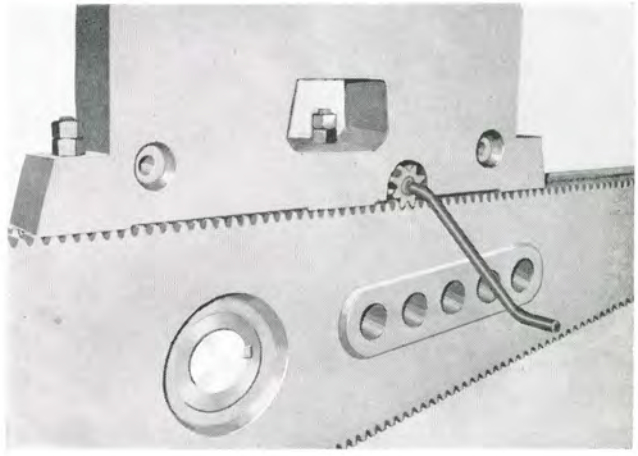

FIGURE 11—*New removable pinion (with crank handle attached) is used to adjust all counterweights.*

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 EIGHTY 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 BASE unit, full skid, can be very easily moved, requires a minimum of foundation. Unit shown is a C-114D-169-64.

FIGURE 15

JOINTED ELL BASE adapts easily to all multicylinder 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	1¼″ x 37′-0″	1¼″ x 37′-0″	1⅜″ x 35′-0″	1¼″ x 35′-0″	1¼″ x 35′-0″
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.	25,000	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	1¼″ x 35′-0″	1⅜″ x 34′-0″	1¼″ x 34′-0″	1¼″ x 29′-0″	1⅛″ x 29′-0″
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	1⅛″ x 29′-0″	1¼″ x 29′-0″	1⅛″ x 29′-0″	1⅛″ x 29′-0″	1⅛″ x 29′-0″
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	1⅛″ x 29′-0″	1″ x 23′-0″	1″ x 22′-0″	1″ x 22′-0″	1″ x 19′-0″
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 19′-0″	1″ x 19′-0″	1″ x 17′-6″	1″ x 16′-0″	⅞″ x 15′-0″
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 LENGHTS, 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	⅞″ x 15′-0″	⅞″ x 14′-0″	⅞″ x 14′-0″	⅞″ x 14′-0″	⅞″ 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.

CRANK COUNTERBALANCE DATA

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

See Example Pages 2978 and 2979.

UNIT	C-912D-356-168 C-912D-305-168 C-640D-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-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	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	.....	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	20,605	20,550
4 No. OAS Aux. Weights	18,475	22,835	22,965	23,085	28,390	22,045	22,220	.....
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	16,680	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-143-64 C-114D-143-64	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 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 2978 and 2979.

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	26,680	.....			
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	19,410	
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	21,960	21,760	14,900	17,510	13,815
4 No. 3D Aux. Weights	21,390	21,320	21,270	25,150	.....	17,340	20,335	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	13,585	13,535	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 $5640 + \frac{3}{4}$ (6225-5640) + ½ (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.

STANDARD CRANK BALANCED PUMPING UNIT ASSEMBLIES
GENERAL DIMENSIONS

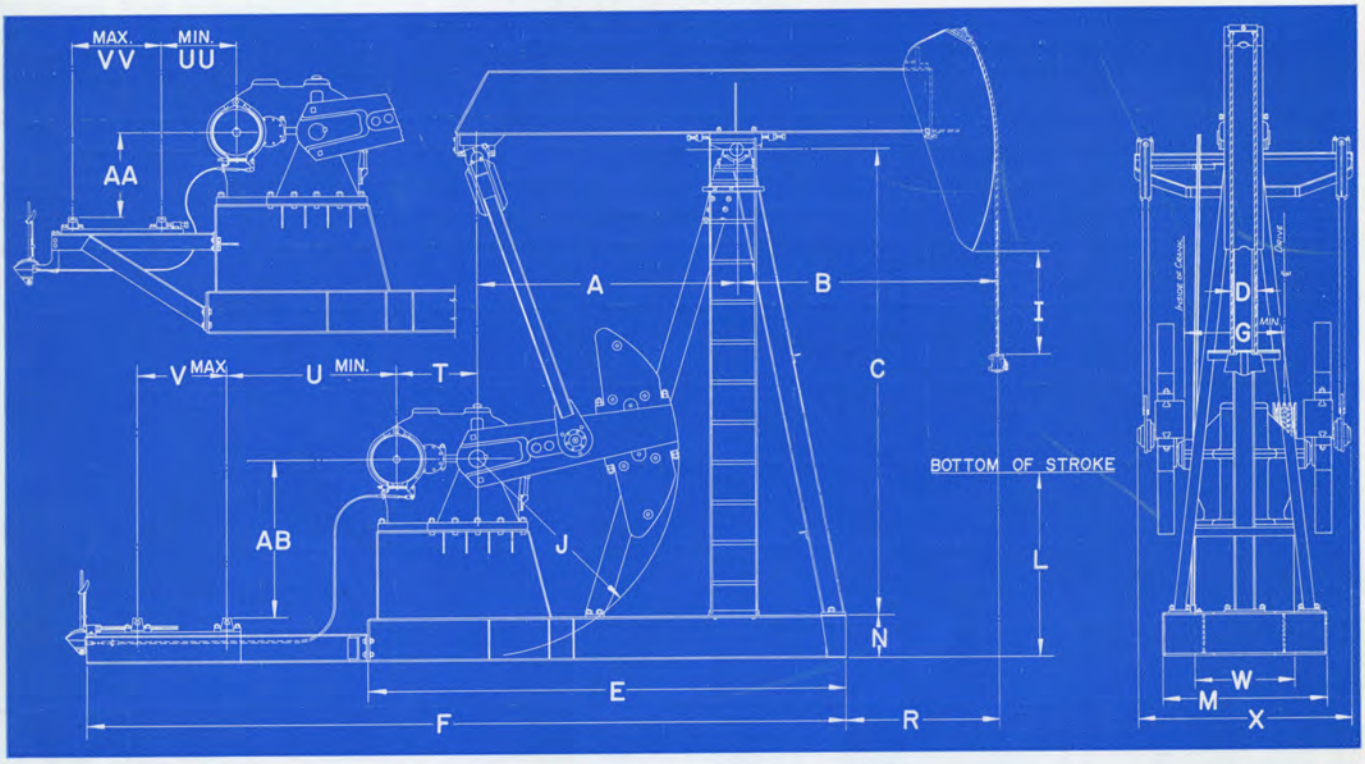

FIGURE 16

UNIT	A	B	C	D	E	F	G	I	J	L	M	N	R	T	U	V	W	X	AA	AB	UU	VV
C-912D-356-168	10′-0″	17′-6″	20′-6″	16″	18′-9½″	29′-4″	53⅛″	21¾″	110″	61″	6′-4″	16″	13′-9½″	48½″	82¾″	48½″	46¾″	8′-2½″	50⅞″	93″	23″	52¾″
C-912D-305-168	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“
C-912D-427-144	“	15′-0″	“	“	“	“	“	34″	“	73¼″	“	“	11′-3½″	“	“	“	“	“	“	“	“	“
C-912D-356-144	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“
C-912D-427-120	“	12′-8″	“	12″	“	“	“	56″	“	75″	“	“	8′-11½″	“	“	“	“	“	“	“	“	“
C-640D-356-168	“	17′-6″	“	16″	18′-6″	29′-0½″	51⅜″	21¾″	“	61″	“	“	13′-9½″	41½″	86¼″	“	“	“	“	“	26¾″	“
C-640D-305-168	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“
C-640D-427-144	“	15′-0″	“	“	“	“	“	34″	“	73¼″	“	“	11′-3½″	“	“	“	“	“	“	“	“	“
C-640D-356-144	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“
C-640D-304-144	“	“	20′-4″	“	“	“	“	“	“	71½″	“	“	“	“	“	“	“	“	“	“	“	“
C-640D-253-144	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“
C-640D-427-120	“	12′-8″	20′-6″	12″	“	“	“	56″	“	75″	“	“	8′-11½″	“	“	“	“	“	“	“	“	“
C-640D-365-120	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“
C-640D-304-120	9′-3″	12′-11″	18′-2″	“	17′-6″	26′-9½″	52½″	26″	95″	77½″	70″	“	9′-5½″	“	71¼″	“	“	8′-1″	51⅜″	78″	“	37¾″
C-640D-365-100	“	10′-9″	“	“	“	“	“	46″	“	77″	“	“	7′-3½″	“	“	“	“	“	“	“	“	“
C-456D-304-144	10′-0″	15′-0″	20′-4″	16″	18′-6″	29′-0½″	51⅜″	34″	110″	71½″	6′-4″	“	11′-3½″	38⅜″	89½″	“	“	8′-2½″	50⅞″	93″	29⅞″	52¾″
C-456D-253-144	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“
C-456D-365-120	“	12′-8″	20′-6″	12″	“	“	“	56″	“	75″	“	“	8′-11½″	“	“	“	“	“	“	“	“	“
C-456D-304-120	9′-3″	12′-11″	18′-2″	“	17′-6″	26′-9½″	52½″	26″	95″	77½″	70″	“	9′-5½″	“	74½″	“	“	8′-1″	51⅜″	78″	29¾″	37¾″
C-456D-256-120	“	“	18′-0″	“	“	“	“	“	“	75½″	“	“	“	“	“	“	“	“	“	“	“	“
C-456D-213-120	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“
C-456D-365-100	“	10′-9″	18′-2″	“	“	“	“	46″	“	77″	“	“	7′-3½″	“	“	“	“	“	“	“	“	“
C-456D-298-100	“	“	18′-0″	“	“	“	“	“	“	75″	“	“	“	“	“	“	“	“	“	“	“	“
C-456D-256-100	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“
C-456D-298-86	“	9′-3″	“	“	“	“	“	61″	“	74¾″	“	“	69½″	“	“	“	“	“	“	“	“	“

GENERAL DIMENSIONS Continued

UNIT	A	B	C	D	E	F	G	I	J	L	M	N	R	T	U	V	W	X	AA	AB	UU	VV
C-320D-256-120	9′-3″	12′-11″	18′-0″	12″	17′-0½″	27′-4½″	44¾″	26″	95″	75½″	69¾″	16″	9′-5½″	34″	86″	48½″	43″	7′-2″	24¾″	80″	30⅜″	34¼″
C-320D-213-120	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	7′-1½″	“	“	“	“
C-320D-298-100	“	10 -9″	“	“	“	“	“	46″	“	75″	“	“	7′-3½″	“	“	“	“	7′-2″	“	“	“	“
C-320D-256-100	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	7′-1½″	“	“	“	“
C-320D-298-86	“	9 -3″	“	“	“	“	“	61″	“	74¾″	“	“	69½″	“	“	“	“	7′-2″	“	“	“	“
C-320D-246-86	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	7′-1½″	“	“	“	“
C-320D-212-86	8′-0″	“	15′-0″	“	15′-4½″	24′-3½″	45¼″	25″	78″	73¾″	57¾″	“	6 -2½″	“	69″	“	“	“	“	63″	“	“
C-320D-246-74	“	8 -0″	“	9″	“	“	“	34½″	“	78″	“	“	59½″	“	“	“	“	“	“	“	“	“
C-228D-246-86	9′-3″	9′-3″	18′-0″	12″	16′-5½″	26′-9½″	38⅝″	61″	95″	74¾″	69¾″	“	69½″	30″	83″	“	37″	6′-6½″	23¾″	80″	27⅜″	“
C-228D-212-86	8′-0″	“	15′-0″	“	14′-9½″	23′-8½″	39⅛″	25″	78″	73¾″	57¾″	“	6 -2½″	“	66″	“	“	“	“	63″	“	“
C-228D-246-74	“	8′-0″	“	9″	“	“	“	34½″	“	78″	“	“	59½″	“	“	“	“	“	“	“	“	“
C-228D-200-74	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“
C-228D-173-74	7′-0″	“	13′-0″	“	13′-5″	22′-4″	“	16½″	68″	68″	51¾″	12″	64″	“	“	“	“	“	“	53″	“	“
C-228D-200-64	“	7′-0″	“	“	“	“	“	25½″	“	68½″	“	“	52″	“	“	“	“	“	“	“	“	“
C-160D-200-74	8′-0″	8 -0″	15′-0″	“	14′-5″	23′-2″	33⅛″	34½″	78″	78″	57¾″	16″	59½″	26″	65¼″	46½″	32″	70½″	“	65″	26⅝″	34¾″
C-160D-173-74	7′-0″	“	13′-0″	“	13′-0½″	21′-9½″	“	16½″	68″	68″	51¾″	12″	64″	“	“	“	“	“	“	55″	“	“
C-160D-200-64	“	7′-0″	“	“	“	“	“	25½″	“	68½″	“	“	52″	“	“	“	“	“	“	“	“	“
C-160D-169-64	“	“	12′-9¾″	“	“	“	“	“	“	67″	“	“	“	“	“	“	“	69¾″	“	“	“	“
C-160D-143-64	6′-0″	7′-0″	11′-0″	“	11′-1¾″	18′-6¼″	“	18″	56″	53¾″	50¾″	“	62¾″	“	48¾″	“	“	“	“	43″	17″	30¼″
C-160D-169-54	“	6′-0″	“	“	“	“	“	19¼″	“	62″	“	“	50¾″	“	“	“	“	“	“	“	“	“
C-114D-169-64	7′-0″	7′-0″	12′-9¾″	“	12′-7″	21′-4″	29⅜″	25½″	68″	67″	51¾″	“	52″	24″	61¾″	“	25″	66¾″	14¾″	55″	23″	34¾″
C-114D-143-64	6′-0″	“	11′-0″	“	10′-8¼″	18′-0¾″	“	18″	56″	53¾″	50¾″	“	62¾″	“	45¼″	“	“	“	“	43″	13½″	30¼″
C-114D-169-54	“	6′-0″	“	“	“	“	“	19¼″	“	62″	“	“	50¾″	“	“	“	“	“	“	“	“	“
C-114D-133-54	5′-4″	“	9 -8″	“	10′-0″	17′-4½″	“	13¼″	50″	50″	46¼″	10″	51″	“	“	“	“	67¼″	“	37″	“	“
C-114D-119-54	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“
C-114D-133-48	“	5′-4″	“	“	“	“	“	14½″	“	54¾″	“	“	43″	“	“	“	“	“	“	“	“	“
C-80D-133-54	“	6′-0″	“	“	“	“	“	13¼″	“	50″	“	“	51″	22″	47¼″	“	“	“	“	“	15½″	“
C-80D-119-54	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“
C-80D-133-48	“	5′-4″	“	“	“	“	“	14½″	“	54¾″	“	“	43″	“	“	“	“	“	“	“	“	“
C-80D-109-48	4′-8″	“	8′-9″	“	9′-3⅞″	16′-8½″	30⅝″	“	46″	43¾″	40¾″	“	“	“	“	“	“	65¼″	“	33″	“	“
C-80D-95-48	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“
C-80D-109-42	“	4′-8″	“	6½″	“	“	“	15½″	“	51″	“	“	35″	“	“	“	“	“	“	“	“	“
C-57D-109-48	“	5′-4″	“	9″	“	“	26″	14½″	“	43¾″	“	“	43″	20″	49¼″	“	“	58¼″	“	“	17½″	“
C-57D-95-48	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“
C-57D-109-42	“	4′-8″	“	6½″	“	“	“	15½″	“	51″	“	“	35″	“	“	“	“	“	“	“	“	“
C-57D-89-42	4′-0″	“	8′-2½″	“	8′-2″	13′-8¾″	28¼″	“	44″	42″	38½″	8″	41″	“	33¾″	40½″	“	58″	“	33¾″	“	“
C-57D-76-42	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“
C-57D-89-36	“	4′-0″	“	“	“	“	“	13″	“	50½″	“	“	33″	“	“	“	“	“	“	“	“	“
C-40D-89-42	“	4′-8″	“	“	7′-9″	13′-6″	23¾″	15½″	“	42″	“	“	41″	17½″	28″	44¾″	20″	51¼″	10¾″	“	17″	21¼″
C-40D-76-42	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“
C-40D-89-36	“	4 -0″	“	“	“	“	“	13″	“	50½″	“	“	33″	“	“	“	“	“	“	“	“	“
C-40D-67-36	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“
C-40D-56-36	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“
C-40D-67-30	3′-0″	3′-9″	7′-0½″	“	6′-8″	12′-5″	24″	“	36″	37½″	31″	6″	31″	“	“	46″	“	“	“	27¾″	“	“
C-25D-67-36	4′-0″	4′-0″	8′-2½″	“	7′-4″	11′-7″	20¼″	“	44″	50½″	38½″	8″	33″	13 9/16″	27″	26¾″	17″	47″	“	33¾″	15½″	“
C-25D-56-36	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“
C-25D-67-30	3′-0″	3′-9″	7′-0½″	“	6′-3″	10′-6″	20½″	“	36″	37½″	31″	6″	31″	“	“	28″	“	“	“	27¾″	“	“
C-25D-53-30	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“
C-25D-43-30	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“
C-25D-53-24	“	3′-0″	“	5½″	“	“	“	12½″	“	49″	“	“	22″	“	“	“	“	“	“	“	“	“

GEAR SPECIFICATIONS*

912D GEAR REDUCER: Double Reduction
RATING: 912,000 In. Lbs. Peak Torque • RATIO OF GEARS: 28.72
CRANKSHAFT DIA.: 7" (Mark II, 9½")
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, 8½")
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. Ibs. 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: 5½ 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: 7½ 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., 1⅜" 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.: 2½"
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, ¾" Bore
GEAR REDUCER OIL CAPACITY: 5 Quarts

*Gear Specifications for the 1824D, 1824T, 1280D, and the 1280T are shown on page 2998

LUFKIN FOUNDRY & MACHINE CO. **LUFKIN, TEXAS** **LUFKIN**

LUFKIN BEAM BALANCED PUMPING UNIT ASSEMBLIES

STRUCTURAL SPECIFICATIONS AND DIMENSIONS

See preceding page for GEAR Specifications

UNIT	B-57D-109-42	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-10D-40-20	B-6D-21-24	B-6D-32-16
Polished Rod Cap., #	10,900	7,600	8,900	6,700	6,700	5,300	5,300	5,300	5,300	2,700	4,000	2,100	3,200
†Stroke Lengths, Inches	42, 32	42, 32	36, 28	36, 24	30, 20	30, 25	24, 20	30, 25	24, 20	30, 24	20, 16	24, 20	16, 13
Walking Beam	16″x45 Lbs.	14″x34 Lbs.	14″x34 Lbs.	14″x30 Lbs.	12″x27 Lbs.	10″x25 Lbs.	10″x21 Lbs.	10″x25 Lbs.	10″x21 Lbs.	8″x17 Lbs.	8″x17 Lbs.	6″x12 Lbs.	6″x12 Lbs.
Equalizer Bearing	BRONZE BUSHED, OIL BATH TYPE												
Center Bearing	BRONZE BUSHED, OIL BATH TYPE												
Crank Pin Bearings	TAPERED ROLLER BEARINGS, FACTORY LUBRICATED												
Wireline Hanger	⅞″x12′-6″	¾″x12′-6″	¾″x11′-0″	⅝″x11′-0″	⅝″x11′-0″	½″x8′-0″	½″x8′-0″	½″x8′-0″	½″x8′-0″	½″x8′-0″	½″x6′-8″	½″x6′-8″	½″x5′-8″
*1″ thick Beam Wts., #	150	125	125	125	125	100	100	100	100	90	90	75	75
No. of Beam Weights	EFFECTIVE COUNTERBALANCE AT POLISHED ROD, LBS.												
0	550	420	550	300	320	170	265	170	265	100	220	50	100
1	880	660	830	520	555	345	470	345	470	235	410	170	280
2	1205	895	1105	740	785	515	670	515	670	365	600	290	460
3	1530	1130	1380	955	1015	685	870	685	870	495	785	504	635
4	1850	1365	1650	1170	1240	850	1065	850	1065	620	970	520	805
5	2165	1595	1915	1380	1465	1015	1260	1015	1260	745	1150	630	975
6	2480	1825	2180	1590	1685	1175	1445	1175	1445	870	1320	740	1140
7	2790	2050	2440	1795	1905	1330	1635	1330	1635	990	1505	845	1300
8	3100	2275	2700	2000	2120	1485	1820	1485	1820	1110	1675	950	1460
9	3405	2495	2955	2200	2335	1645	2000	1645	2000	1225	1845	1050	1615
10	3710	2715	3210	2400	2545	1795	2175	1795	2175	1340	2010	1150	1765
11	4010	2930	3460	2595	2750	1940	2350	1940	2350	1450	2170	1250	1915
12	4300	3145	3705	2790	2955	2090	2525	2090	2525	1560	2330	1345	2060
13	4595	3360	3950	2980	3155	2230	2690	2230	2690	1670	2485	1440	2200
14	4890	3570	4190	3170	3355	2375	2855	2375	2855	1775	2640	1530	2340
15	5180	3780	4430	3355	3550	2520	3015	2520	3015	1880	2790	1620	2470
16	5470	3985	4665	3540	3745	2655	3175	2655	3175	1980	2935	1705	2600
17	5755	4190	4900	3720	3935	2785	3330	2785	3330	2080	3080		
18	6040	4390	5130	3900	4125	2920	3485	2920	3485	2175	3220		
19	6320	4590	5360	4075	4210	3050	3635	3050	3635				
20	6600	4790	5585	4245	4490	3180	3785	3180	3785				
21	6875	4985	5810	4415	4670	3300	3925	3300	3925				
22	7150	5180	6030	4580	4845	3425	4065	3425	4065				
23	7420	5370	6250	4745	5020	3545	4205	3545	4205				
24	7685	5560	6465	4905	5190	3660	4340	3660	4340				
25	7950	5745	6680	5065	5360	3780		3780					
26	8210	5930	6890	5220	5525	3890		3890					
27	8470	6110	7100	5375		4000		4000					

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.

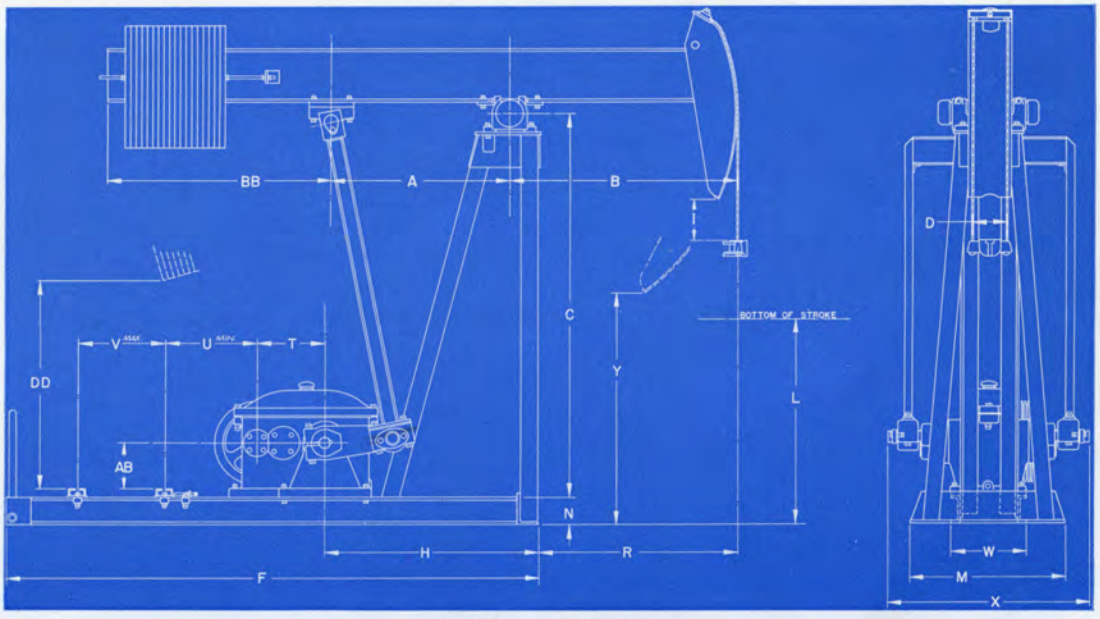

FIGURE 17

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-109-42	46	56	8′-9″	6½	13′-3″	69	15½	51	40¾	10	35	20	24¼	39¾	25	57½	75½	14¾	6′-6″	50
*B-40D-76-42	"	"	8′-2½″	"	11′-8½″	61	"	42	38½	8	41	17½	19	34¼	20	50¾	67	10¾	63	50¾
*B-40D-89-36	"	48	"	"	"	"	13	50½	"	"	33	"	"	"	"	"	72½	"	61½	51¼
B-25D-67-36	32	48	7′-0½″	"	10′-4″	48	"	34½	31	6	34	13½	18	39	16¾	45	56½	12	54½	45
B-25D-67-30	36	45	"	"	"	"	"	37½	"	"	31	"	"	"	"	"	59½	"	50	47¼
B-25D-53-30	33	41¼	70½	5½	9′-7″	39	6	36	28½	"	35¼	"	"	"	"	"	48	"	40	34¾
B-25D-53-24	"	33	"	"	"	"	12½	35¾	"	"	27	"	"	"	"	"	53½	"	36	36¼
B-16D-53-30	33	41¼	70½	5½	8′-0½″	39	6	35	28½	5	35¼	12¾	10½	25¼	13¾	35	47	8½	40	34¾
B-16D-53-24	"	33	"	"	"	"	12½	35¾	"	"	27	"	"	"	"	"	52½	"	36	36¼
B-10D-27-30	27½	41¼	54	"	7′-7¾″	35¾	6	18½	28	"	35½	11½	10¼	25¼	13	30¾	29¾	7	35½	22½
B-10D-40-20	30	30	"	"	"	"	8	27	"	"	24¼	"	"	"	"	"	39¾	"	35	24½
B-6D-21-24	22	33	47	"	70	28	5	17	24	3	29	10	9	16¼	10	27¾	27	6	32	19¾
B-6D-32-16	"	22	"	"	"	"	6	23½	"	"	18	"	"	"	"	"	34	"	"	"

* Base Shown Is For Electric Motor Only, For Gas Engine Drive Dim. "F" Is 13′-4″, Dim "U" Is 19, and Dim. "V" Is 53¾.

LUFKIN MARK II *UNITORQUE* PUMPING UNITS

FIGURE 18
M-228D-256-100 Mark II Unit driven by a Lufkin H-333 engine.

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 21, 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 19
M-456D-253-144 Mark II Unit. Note compactness of drive when a multi-cylinder engine is mounted forward of the samson post.

FIGURE 20
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. 21)
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. 21)

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%.

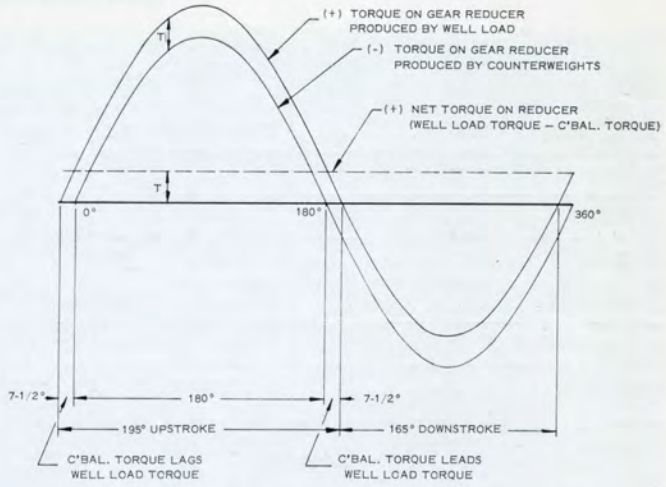

FIGURE 21

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 accomplished 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.

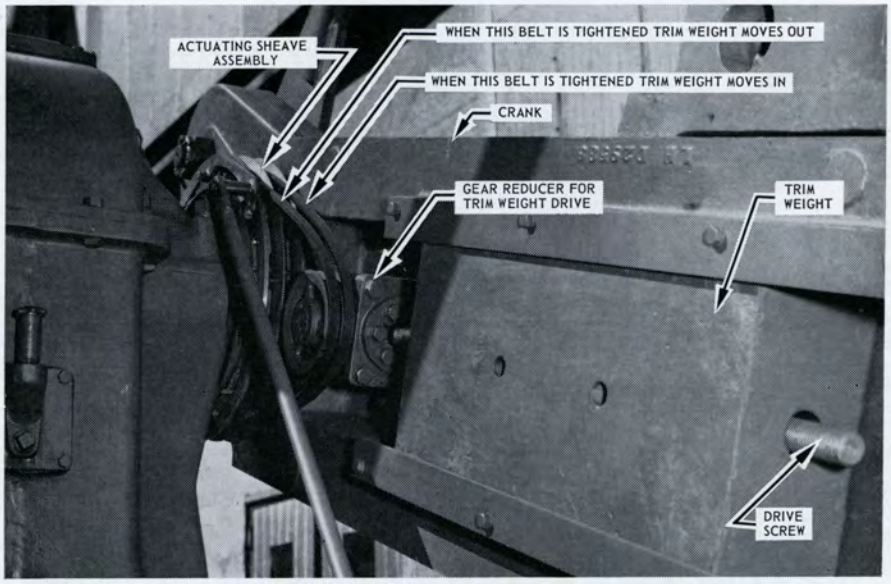

FIGURE 22

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	1¼″ x 40′-0″	1¼″ x 40′-0″	1¼″ x 35′-0″	1¼″ x 35′-0″	1⅛″ x 35′-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	1¼″ x 35′-0″	1¼″ x 35′-0″	1⅛″ x 35′-0″	1⅛″ x 35′-0″	1¼″ x 35′-0″
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	3½″ Std. Pipe	4″ Std. Pipe
WIRELINE HANGER	1⅛″ x 35′-0″	1″ x 25′-0″	1″ x 25′-0″	1″ x 20′-0″	1″ x 25′-0″
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*	3½″ Std. Pipe	3½″ Std. Pipe	3½″ Std. Pipe
WIRELINE HANGER	1″ x 25′-0″	1″ x 25′-0″	1″ x 17′-6″	1″ x 17′-6″	1″ x 17′-6″
CRANKS	7486 M	7486 M	7462 M	6462 M	6462 M

*3½″ Ex. Hvy. Pipe Used On M-114D-200-74 and M-114D-173-74.

STANDARD MARK II PUMPING UNIT ASSEMBLIES
GENERAL DIMENSIONS

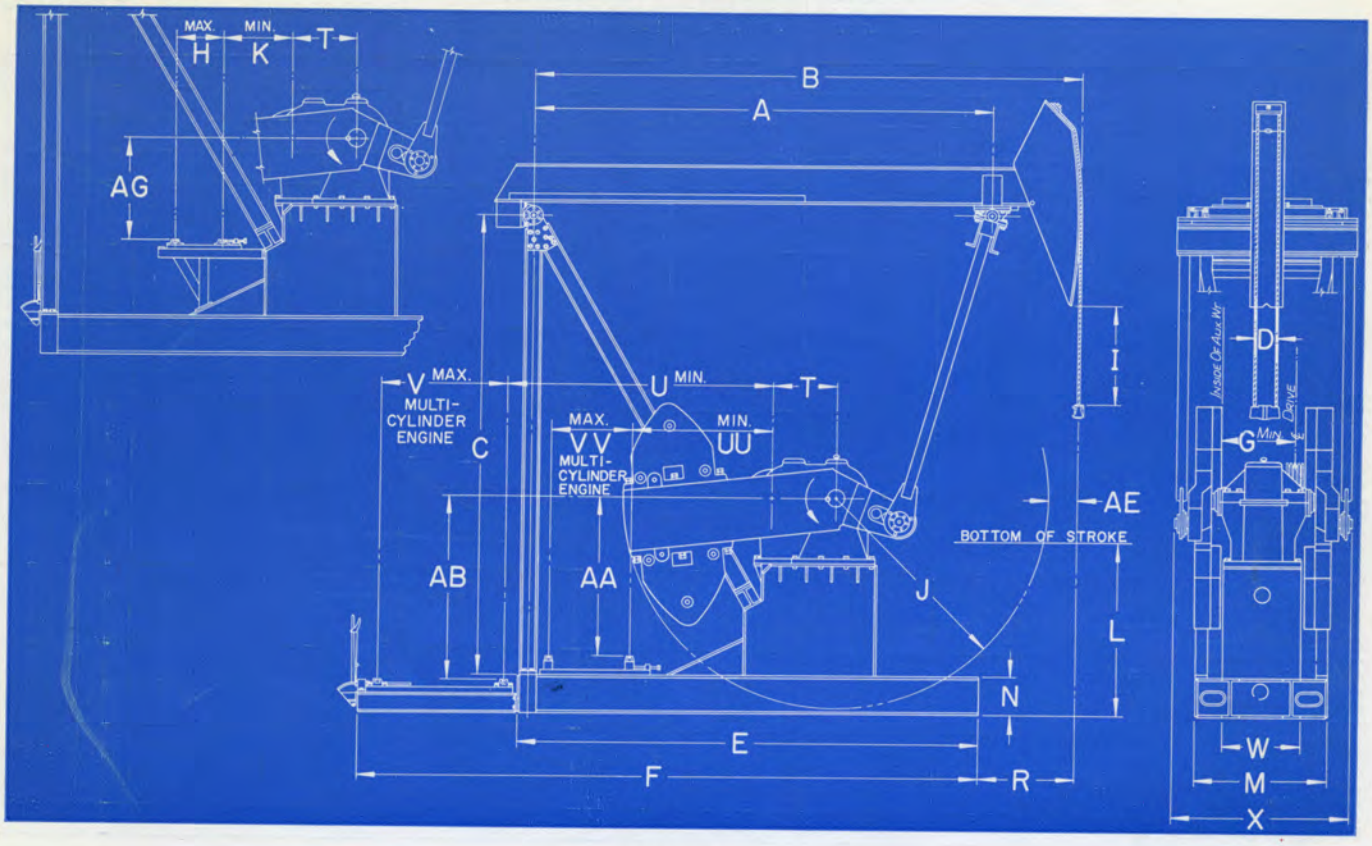

FIGURE 23

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'-0⅞"	12"	23'-1½"	*	54"	46¾"	42⅝"	108"	25⅜"	71⅜"	69¾"	16"	60"	48½"	*	*	49¾"	8'-9"	7'-2"	*	19"	46¼"	6'-10½"	67"
M-912D-305-168	"	"	"	"	"	*	"	"	"	"	"	"	"	"	"	"	*	*	"	"	"	*	"	"	"	"
M-912D-356-144	21'-6"	26'-0"	21'-0⅞"	"	21'-8"	*	"	"	39⅝"	"	"	76⅞"	"	"	55½"	"	*	*	"	"	"	*	13½"	"	6'-6"	55"
M-912D-304-144	"	"	"	"	"	*	"	"	"	"	"	"	"	"	"	"	*	*	"	8'-7⅜"	"	*	"	"	"	"
M-640D-305-168	22'-6"	27'-10"	23'-0⅞"	"	23'-1½"	*	50¼"	"	42⅝"	"	27⅞"	71⅜"	"	"	60"	41½"	*	*	46½"	8'-5"	"	*	23⅜"	"	7'-1"	67"
M-640D-356-144	21'-6"	26'-0"	21'-0⅞"	"	21'-3½"	*	"	"	39⅝"	"	"	76⅞"	"	"	"	"	*	*	"	8'-3⅜"	"	*	18"	"	6'-8½"	55"
M-640D-304-144	"	"	"	"	"	*	"	"	"	"	"	"	"	"	"	"	*	*	"	"	"	*	"	"	"	"
M-640D-253-144	"	"	"	9"	"	*	"	"	44⅝"	"	"	74"	"	"	"	"	*	*	"	8'-3⅜"	"	*	"	"	"	"
M-640D-365-120	"	"	"	12"	"	*	"	"	63⅝"	"	"	76⅞"	"	"	"	"	*	*	"	8'-5"	"	*	"	"	"	"
M-640D-304-120	"	"	"	"	"	*	"	"	"	"	"	"	"	"	"	"	*	*	"	8'-3⅜"	"	*	"	"	"	"
M-640D-256-120	"	"	"	9"	"	*	"	"	69⅛"	"	"	73¼"	"	"	"	"	*	*	"	"	"	*	"	"	"	"
M-456D-305-168	22'-6"	27'-10"	23'-0⅞"	12"	23'-1½"	*	"	"	42⅝"	"	31"	71⅜"	"	"	"	38⅜"	*	*	"	8'-5"	"	*	23⅜"	"	7'-4¼"	67"
M-456D-356-144	21'-6"	26'-0"	21'-0⅞"	"	21'-3½"	*	"	"	39⅝"	"	"	76⅞"	"	"	"	"	*	*	"	8'-3⅜"	"	*	18"	"	6'-11⅝"	55"
M-456D-304-144	"	"	"	"	"	*	"	"	"	"	"	"	"	"	"	"	*	*	"	"	"	*	"	"	"	"
M-456D-253-144	"	"	"	9"	"	*	"	"	44⅜"	"	"	74"	"	"	"	"	*	*	"	8'-3⅜"	"	*	"	"	"	"
M-456D-365-120	"	"	"	12"	"	*	"	"	63⅝"	"	"	76⅞"	"	"	"	"	*	*	"	8'-5"	"	*	"	"	"	"
M-456D-304-120	"	"	"	"	"	*	"	"	"	"	"	"	"	"	"	"	*	*	"	8'-3½"	"	*	"	"	"	"
M-456D-256-120	"	"	"	9"	"	*	"	"	69⅛"	"	"	73¼"	"	"	"	"	*	*	"	"	"	*	"	"	"	"
M-320D-304-144	"	"	"	12"	"	*	44½"	33¼"	39⅝"	"	35⅜"	76⅞"	"	"	"	34"	*	*	43½"	7'-4⅜"	"	*	"	"	7'-4"	51½"
M-320D-253-144	"	"	"	9"	"	*	"	"	44⅜"	"	"	74"	"	"	"	"	*	*	"	"	"	*	"	"	"	"
M-320D-304-120	"	"	"	12"	"	*	"	"	63⅝"	"	"	76⅞"	"	"	"	"	*	*	"	"	"	*	"	"	"	"
M-320D-256-120	"	"	"	9"	"	*	"	"	69⅛"	"	"	73¼"	"	"	"	"	*	*	"	"	"	*	"	"	"	"
M-320D-213-120	"	"	"	"	"	*	"	"	"	"	"	"	"	"	"	"	*	*	"	"	"	*	"	"	"	"
M-320D-298-100	"	"	"	12"	"	*	"	"	6'-11⅝"	"	"	76⅞"	"	"	"	"	*	*	"	"	"	*	"	"	"	"
M-320D-256-100	"	"	"	9"	"	*	"	"	7'-5⅛"	"	"	73¼"	"	"	"	"	*	*	"	"	"	*	"	"	"	"
M-228D-256-120	"	"	"	"	"	*	38⅞"	29¾"	69⅛"	"	41⅛"	"	"	"	"	30"	*	*	37"	6'-9⅜"	"	*	"	47⅞"	7'-8"	"
M-228D-213-120	"	"	"	"	"	*	"	"	"	"	"	"	"	"	"	"	*	*	"	"	"	*	"	"	"	"
M-228D-256-100	"	"	"	"	"	*	"	"	7'-5⅛"	"	"	"	"	"	"	"	*	*	"	"	"	*	"	"	"	"
M-228D-246-86	15'-6"	18'-6"	15'-8⅜"	"	15'-6½"	21'-0"	"	30¼"	45¼"	86⅝"	22¼"	65¼"	57"	"	39"	"	8'-7¾"	51½"	"	6'-8⅜"	**	6'-3"	11⅜"	40½"	**	**
M-228D-200-86	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	**	"	"	"	"	**
M-228D-246-74	"	"	"	"	"	"	"	"	58⅝"	"	"	65½"	"	"	"	"	"	"	"	"	**	"	"	"	**	**
M-228D-200-74	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	**	"	"	"	"	**
M-228D-173-74	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	**	"	"	"	"	**
M-160D-246-86	"	"	"	"	"	"	32⅞"	33¾"	45¼"	"	24½"	65¼"	54"	"	"	26"	8'-11¾"	"	32"	6'-0⅜"	**	"	"	38¾"	**	**
M-160D-200-86	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	**	"	"	"	"	**
M-160D-246-74	"	"	"	"	"	"	"	"	58⅝"	"	"	65½"	"	"	"	"	"	"	"	"	**	"	"	"	**	**
M-160D-200-74	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	**	"	"	"	"	**
M-160D-173-74	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	**	"	"	"	"	**
M-114D-143-86	13'-6"	15'-9"	12'-3½"	"	13'-0¾"	18'-6¼"	29⅜"	30"	14⅜"	62"	20⅛"	53½"	42¾"	12"	36"	24"	8'-0½"	"	25"	67⅜"	**	50"	16"	31½"	**	**
M-114D-200-74	15'-6"	18'-6"	15'-8⅜"	"	15'-6½"	21'-0"	"	30¾"	50⅝"	86⅝"	28"	65½"	54"	16"	39"	"	9'-1¾"	"	"	69"	**	6'-3"	11⅜"	43¼"	**	**
M-114D-173-74	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	**	"	"	"	"	**
M-114D-143-74	13'-6"	15'-9"	12'-3½"	"	13'-0¾"	18'-6¼"	"	30"	25⅞"	62"	20⅛"	53"	42¾"	12"	36"	"	8'-0½"	"	"	67⅝"	**	50"	16"	31½"	**	**
M-114D-169-64	"	"	"	"	"	"	"	"	21"	"	"	67⅜"	"	"	"	"	"	"	"	"	**	"	"	"	**	**
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.

MARK II COUNTERBALANCE DATA

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

UNIT	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
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 4 No. OOS Aux. Weights 4 No. OOD Aux. Weights	11,690 16,170 20,650	12,215 16,695 21,175	16,560 21,920 27,270	16,945 22,305 27,655	16,945 22,305	17,235 22,595	17,235 22,595	21,505 27,945 34,375
4 No. ORO Counterweights 4 No. OL Aux. Weights 4 No. OS Aux. Weights 4 No. OD Aux. Weights	9,805 11,780 14,110 18,415	10,330 12,305 14,635 18,940	14,300 16,665 19,445 24,590	14,685 17,050 19,830 24,975	14,685 17,050 19,830	14,975 17,340 20,120 25,265	14,975 17,340 20,120	18,775 21,605 24,955 31,140
4 No. OARO Counterweights 4 No. OL Aux. Weights 4 No. OAS Aux. Weights 4 No. OAD Aux. Weights	7,840 9,815 11,240 14,640	8,365 10,340 11,765 15,165	11,950 14,315 16,020 20,070	12,335 14,700 16,405 20,455	12,335 14,700 16,405	12,625 14,990 16,695 20,745	12,625 14,990 16,695	15,955 18,785 20,835 25,720
4 No. 1RO Counterweights 4 No. 2L Aux. Weights 4 No. 1S Aux. Weights 4 No. 1D Aux. Weights	5,425 6,710 8,050 10,670	5,950 7,235 8,575 11,195	9,060 10,600 12,120 15,350	9,445 10,985 12,505 15,735	9,445 10,985 12,505	9,735 11,275 12,795 16,025	9,735 11,275 12,795	12,455 14,300 16,220 19,990
4 No. 2RO Counterweights 4 No. 2L Aux. Weights 4 No. 2S Aux. Weights 4 No. 2D Aux. Weights	4,070 5,355 6,655 9,235	4,595 5,880 7,180 9,760	7,440 8,980 10,530 13,605	7,825 9,365 10,915 13,990	7,825 9,365 10,915	8,115 9,655 11,205 14,280	8,115 9,655 11,205	10,515 12,360 14,225 17,945
4 No. 3CRO Counterweights 4 No. 2L Aux. Weights 4 No. 3BS Aux. Weights 4 No. 3D Aux. Weights	2,680 3,960 5,180 7,175	3,205 4,485 5,705 7,700	5,770 7,300 8,760 11,150	6,155 7,685 9,145 11,535	6,155 7,685 9,145	6,445 7,975 9,435 11,825	6,445 7,975 9,435	8,525 10,370 12,115 14,980
4 No. 5ARO Counterweights 4 No. 5L Aux. Weights 4 No. 5A Aux. Weights 4 No. 5AD Aux. Weights			3,875 4,750 5,915 7,550	4,260 5,135 6,300 7,935	4,260 5,135 6,300	4,550 5,425 6,590 8,225	4,550 5,425 6,590	6,265 7,315 8,710 10,670
4 No. 5CRO Counterweights 4 No. 5L Aux. Weights 4 No. 5C Aux. Weights 4 No. 5CD Aux. Weights				2,925 3,800 4,755 6,590	2,925 3,800 4,755	3,215 4,090 5,045 6,875	3,215 4,090 5,045	4,665 5,715 6,865 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

UNIT	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
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. 1RO Counterweights 4 No. 2L Aux. Weights 4 No. 1S Aux. Weights	16,870 19,030 21,280	17,060 19,220 21,470	14,260 16,255 18,170	14,330 16,325 18,240	14,360 16,355 18,270	14,420 16,415 18,330	....	16,840 19,130 21,325
4 No. 2RO Counterweights 4 No. 2L Aux. Weights 4 No. 2S Aux. Weights 4 No. 2D Aux. Weights	14,650 16,810 18,990	14,840 17,000 19,180	12,360 14,355 16,230	12,430 14,425 16,300	12,460 14,455 16,330	12,530 14,525 16,400	6,715 8,010 9,020 11,330	14,660 16,950 19,100
4 No. 3CRO Counterweights 4 No. 2L Aux. Weights 4 No. 3BS Aux. Weights 4 No. 3D Aux. Weights	12,295 14,445 16,495	12,485 14,635 16,685	10,350 12,335 14,150	10,420 12,405 14,220	10,450 12,435 14,250	10,520 12,505 14,320	5,685 6,965 8,015 9,885	12,350 14,625 16,705
4 No. 5ARO Counterweights 4 No. 5L Aux. Weights 4 No. 5A Aux. Weights 4 No. 5AD Aux. Weights	9,635 10,865 12,495	9,825 11,055 12,690	8,080 9,230 10,720	8,150 9,300 10,790	8,180 9,330 10,820	8,250 9,400 10,890	4,475 5,245 6,180 7,550	9,750 11,070 12,780
4 No. 5CRO Counterweights 4 No. 5L Aux. Weights 4 No. 5C Aux. Weights 4 No. 5CD Aux. Weights	7,760 8,990 10,340	7,950 9,175 10,520	6,360 7,505 8,750	6,430 7,575 8,820	6,460 7,605 8,850	6,530 7,675 8,920	3,400 4,165 4,945 6,495	7,780 9,095 10,520
4 No. 6R Counterweights 4 No. 6L Aux. Weights 4 No. 6 Aux. Weights			5,285 5,995 6,705	5,355 6,065 6,775	5,385 6,095 6,805	5,455 6,165 6,875	3,740 4,205 4,670	6,545 7,355 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 19,330 lbs. in the 144″ stroke. (See other examples, pages 2978 and 2979.

*Structural Unbalance with a negative (—) sign indicates a walking beam assembly that is heavy on the well end.

MARK II COUNTERBALANCE DATA

Effective Counterbalance At Polished Rod With Weights At Maximum Position, **Including Structural Unbalance.** See Example Page 2988

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 4 No. OOS Aux. Weights 4 No. OOD Aux. Weights	21,905	21,905	22,195	22,415	22,600			
4 No. ORO Counterweights 4 No. OL Aux. Weights 4 No. OS Aux. Weights 4 No. OD Aux. Weights	19,175 22,005 25,355	19,175 22,005 25,355	19,465 22,295	19,685 22,515	19,870 22,700	19,745	20,070	24,070 27,380
4 No. OARO Counterweights 4 No. OL Aux. Weights 4 No. OAS Aux. Weights 4 No. OAD Aux. Weights	16,355 19,185 21,235 26,120	16,355 19,185 21,235	16,645 19,475 21,525	16,865 19,695 21,745	17,050 19,880 21,930	16,925	17,250 20,080	20,740 24,050
4 No. 1RO Counterweights 4 No. 2L Aux. Weights 4 No. 1S Aux. Weights 4 No. 1D Aux. Weights	12,855 14,700 16,620 20,390	12,855 14,700 16,620	13,145 14,990 16,910 20,680	13,365 15,210 17,130	13,550 15,395 17,315	13,425 15,270 17,290	13,750 15,595 17,515	16,640 18,800 21,050
4 No. 2RO Counterweights 4 No. 2L Aux. Weights 4 No. 2S Aux. Weights 4 No. 2D Aux. Weights	10,915 12,760 14,625 18,335	10,915 12,760 14,625	11,205 13,050 14,915 18,625	11,425 13,270 15,135	11,610 13,455 15,320	11,485 13,330 15,195	11,810 13,655 15,520	14,420 16,580 18,760
4 No. 3CRO Counterweights 4 No. 2L Aux. Weights 4 No. 3BS Aux. Weights 4 No. 3D Aux. Weights	8,925 10,770 12,515 15,380	8,925 10,770 12,515	9,215 11,060 12,805 15,670	9,435 11,280 13,025	9,620 11,465 13,210	9,495 11,340 13,085	9,820 11,665 13,410	12,065 14,215 16,265
4 No. 5ARO Counterweights 4 No. 5L Aux. Weights 4 No. 5A Aux. Weights 4 No. 5AD Aux. Weights	6,665 7,715 9,110 11,070	6,665 7,715 9,110	6,955 8,005 9,400 11,360	7,175 8,225 9,620	7,360 8,410 9,805	7,235 8,285 9,680	7,560 8,610 10,005	9,405 10,635 12,265
4 No. 5CRO Counterweights 4 No. 5L Aux. Weights 4 No. 5C Aux. Weights 4 No. 5CD Aux. Weights	5,065 6,115 7,265 9,465	5,065 6,115 7,265	5,355 6,405 7,555 9,755	5,575 6,625 7,775	5,760 6,810 7,960	5,635 6,685 7,835	5,960 7,010 8,160	7,530 8,760 10,110
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 4 No. 2L Aux. Weights 4 No. 1S Aux. Weights	16,910 19,200 21,395	16,950 19,240 21,435	17,020	17,050			
4 No. 2RO Counterweights 4 No. 2L Aux. Weights 4 No. 2S Aux. Weights 4 No. 2D Aux. Weights	14,730 17,020 19,170	14,770 17,060 19,210	14,840 17,130	14,870 17,160 19,310	14,910	8,205 9,690 10,850 13,495	9,970 11,710 13,070 16,175
4 No. 3CRO Counterweights 4 No. 2L Aux. Weights 4 No. 3BS Aux. Weights 4 No. 3D Aux. Weights	12,420 14,695 16,775	12,460 14,735 16,815	12,530 14,805 16,885	12,560 14,835 16,915	12,600 14,875 16,955	7,025 8,495 9,700 11,840	8,585 10,305 11,720 14,230
4 No. 5ARO Counterweights 4 No. 5L Aux. Weights 4 No. 5A Aux. Weights 4 No. 5AD Aux. Weights	9,820 11,140 12,850	9,860 11,180 12,890	9,930 11,250 12,960	9,960 11,280 12,990	10,000 11,320 13,030	5,635 6,515 7,595 9,165	6,955 7,990 9,250 11,095
4 No. 5CRO Counterweights 4 No. 5L Aux. Weights 4 No. 5C Aux. Weights 4 No. 5CD Aux. Weights	7,850 9,165 10,590	7,890 9,205 10,630	7,950 9,275 10,700	7,990 9,305 10,730	8,030 9,345 10,770	4,405 5,280 6,180 7,955	5,510 6,540 7,590 9,670
4 No. 6R Counterweights 4 No. 6L Aux. Weights 4 No. 6 Aux. Weights	6,615 7,425 8,240	6,655 7,465 8,280	6,725 7,535 8,350	6,755 7,565 8,380	6,795 7,605 8,420	3,650 4,185 4,715	4,625 5,250 5,875
4 No. 7R Counterweights 4 No. 7L Aux. Weights 4 No. 7 Aux. Weights	5,110 5,735 6,360	5,150 5,775 6,400	5,220 5,845 6,470	5,250 5,875 6,500	5,290 5,915 6,540	2,655 3,065 3,475	3,460 3,940 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 24

A complete line of Beam Balanced Units are available. For specifications see page 2983. Unit shown is a B-16D-53-30.

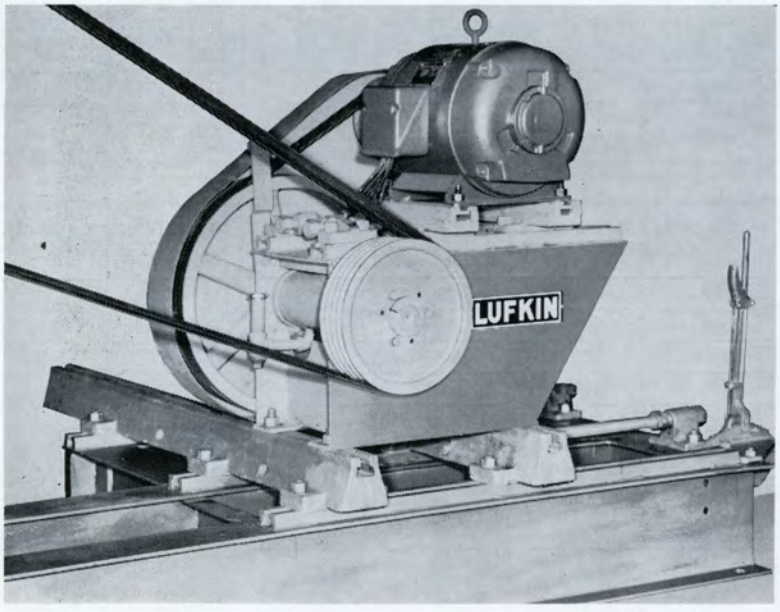

FIGURE 25

COUNTERSHAFT ASSEMBLY

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—25-50HP
No. 2—up to 20HP

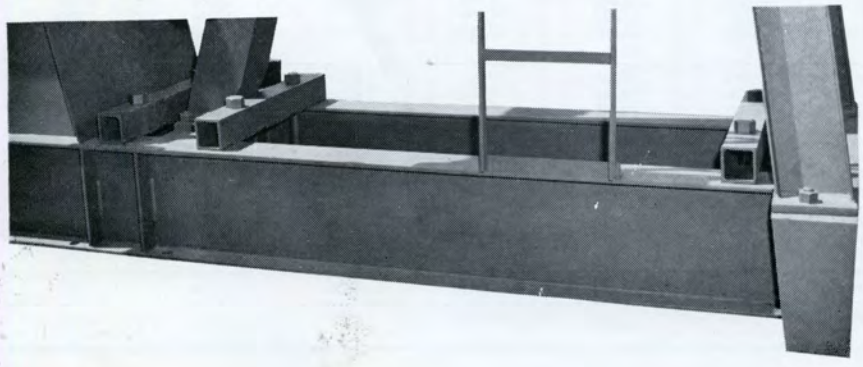

FIGURE 26

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

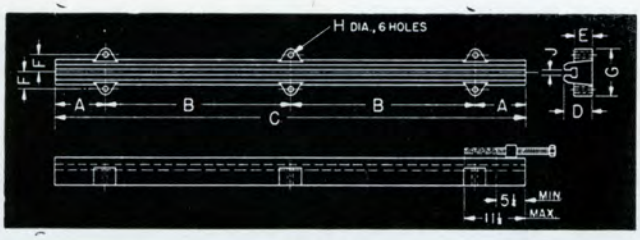

FIGURE 27

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″	2⅛″	6¼″	1″	1″
A69 Rail	3″	31½″	69″	4″	2½″	2⅛″	6¼″	1″	1″
A84 Rail	9″	33″	84″	5″	3¼″	3⅛″	8½″	1″	1⅛″

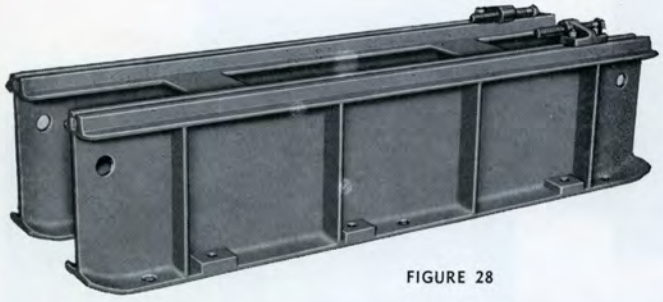

FIGURE 28

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 29

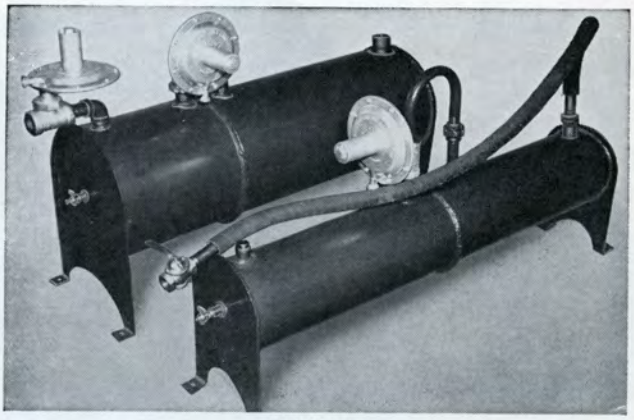

FIGURE 30

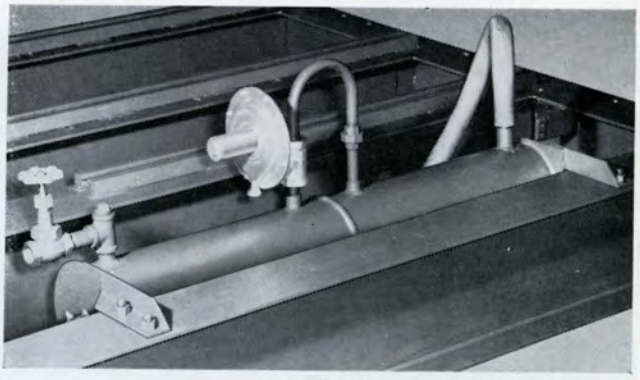

FIGURE 31

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.

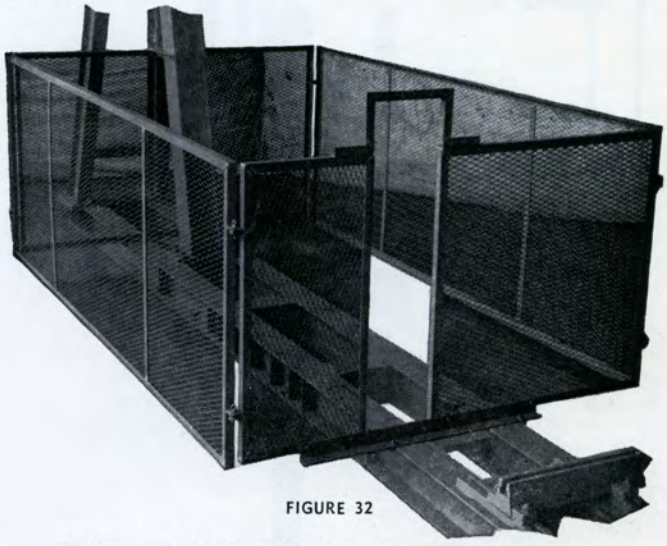

FIGURE 32

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 33

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

FIGURE 34

Type DB wire line hanger for use with dual well installations. Note separate wire lines, one right lay and one left lay, babbitted to 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 35

Lufkin Type DA carrier bar and wireline assembly with polished rod clamp built-in. Ideal for dual-completed wells.

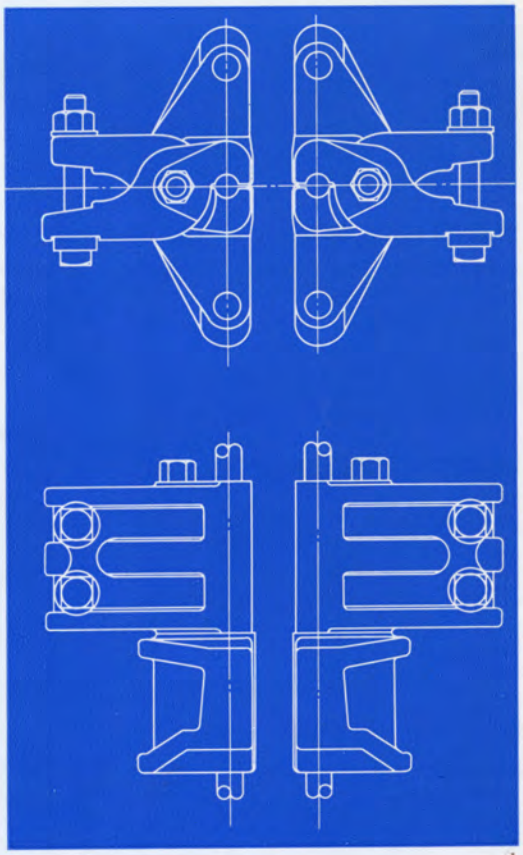

FIGURE 36

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

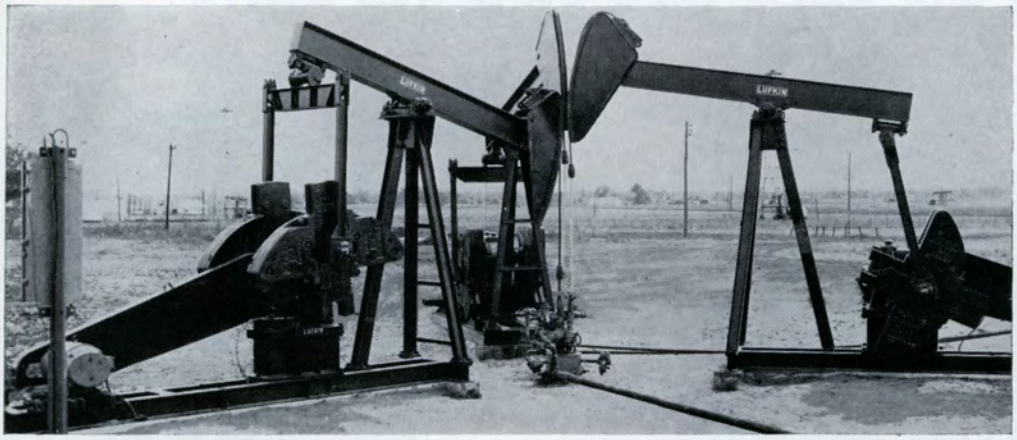

FIGURE 37

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 S wire line hanger assembly shown below.

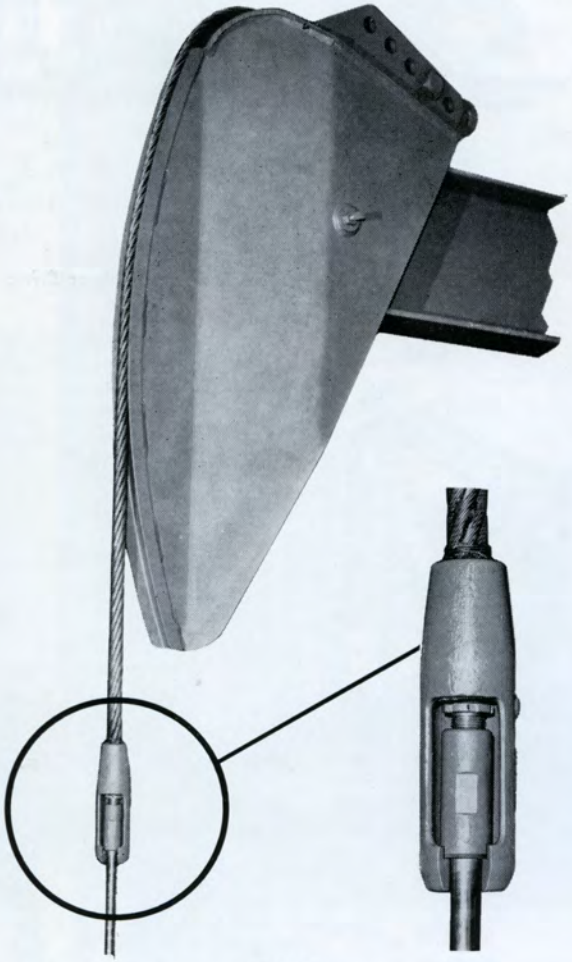

FIGURE 38

Lufkin's Type S hanger assembly utilizes a single 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 S 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.

GENERAL SPECIFICATIONS

Gear Reducer Data: See pages 2982 and 2995

Crank Pin Bearings: Tapered Roller, Factory Lubricated

Samson Post Bearings: Spherical Roller, Factory Lubricated

Equalizer Bearing: Spherical Roller, Factory Lubricated

Air Cylinder Bearing: Spherical Roller, Factory Lubricated

Hanger: Horsehead, Wire Line.

Air Counterbalance Pressure: 450 P.S.I. (Max.)

Upper Pitman Connection: Rubber Cushioned

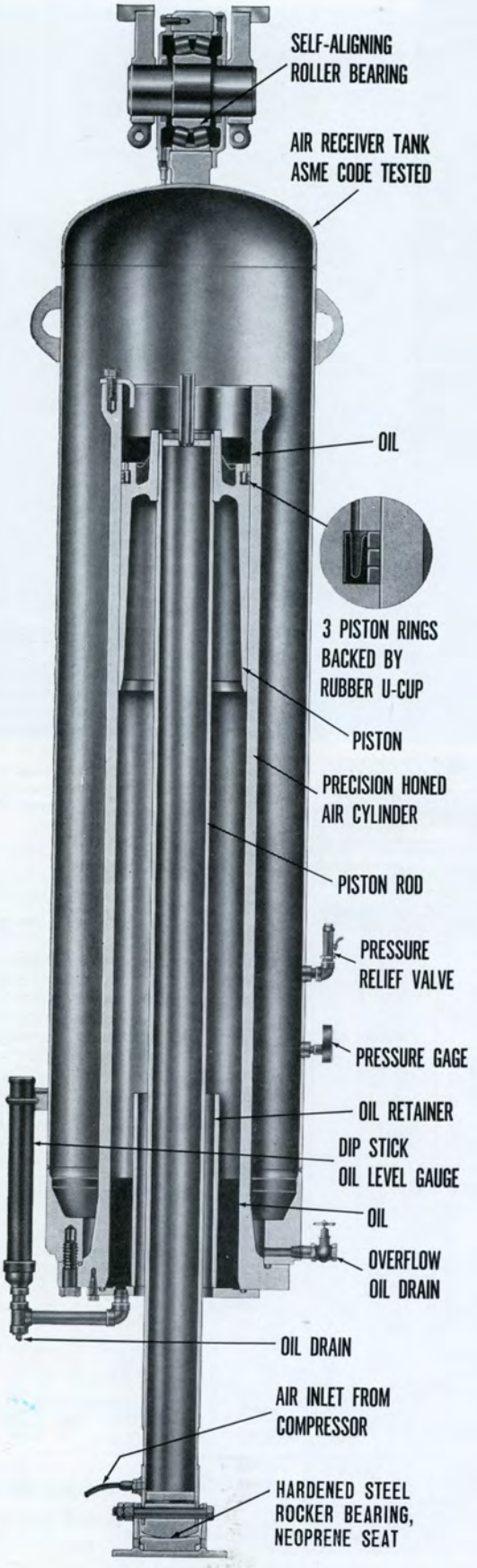

FIGURE 44

LUFKIN *AIR BALANCED* PUMPING UNITS

1. Perfect counterbalance with finger-tip control.
2. Lower installation costs.
3. Compact and portable, ideal for well testing.
4. 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.

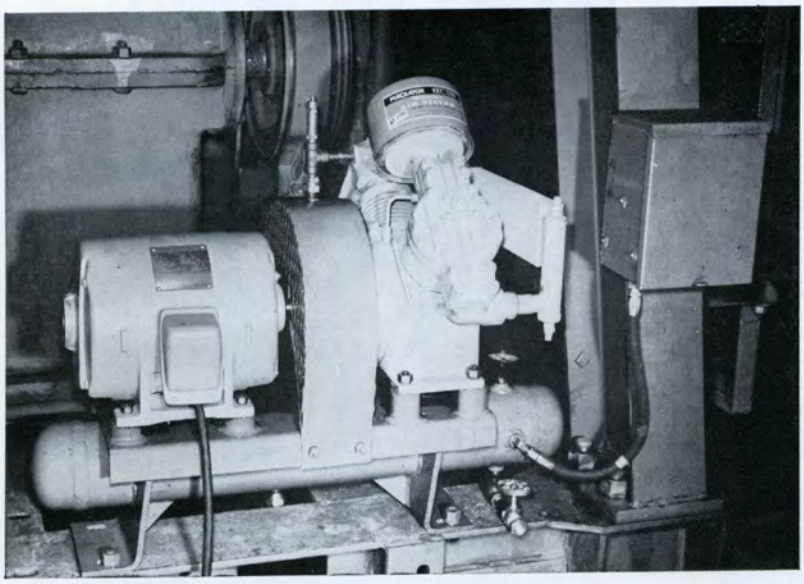

FIGURE 45

MOTOR DRIVEN COMPRESSOR

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

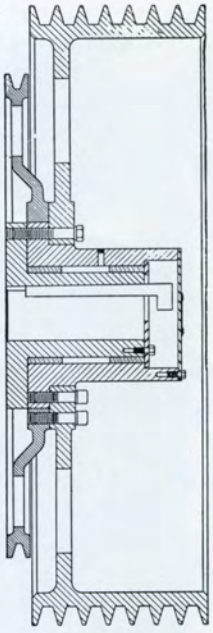

FIGURE 46

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; 17¼", 23½", 28", 34" and 47¼". P.D. rims are available.

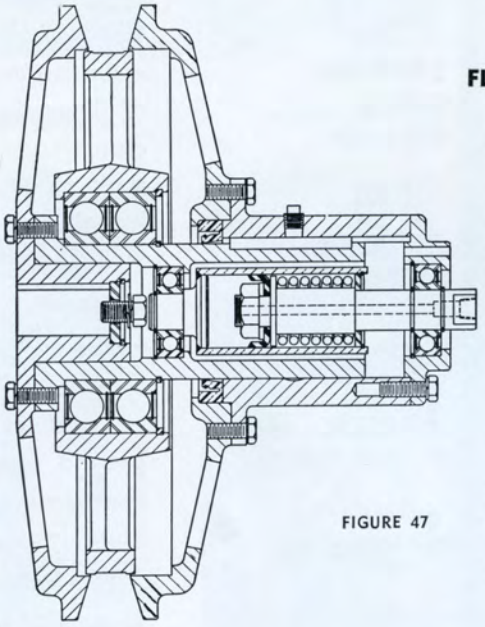

FIGURE 47

CLUTCH, 11½" 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

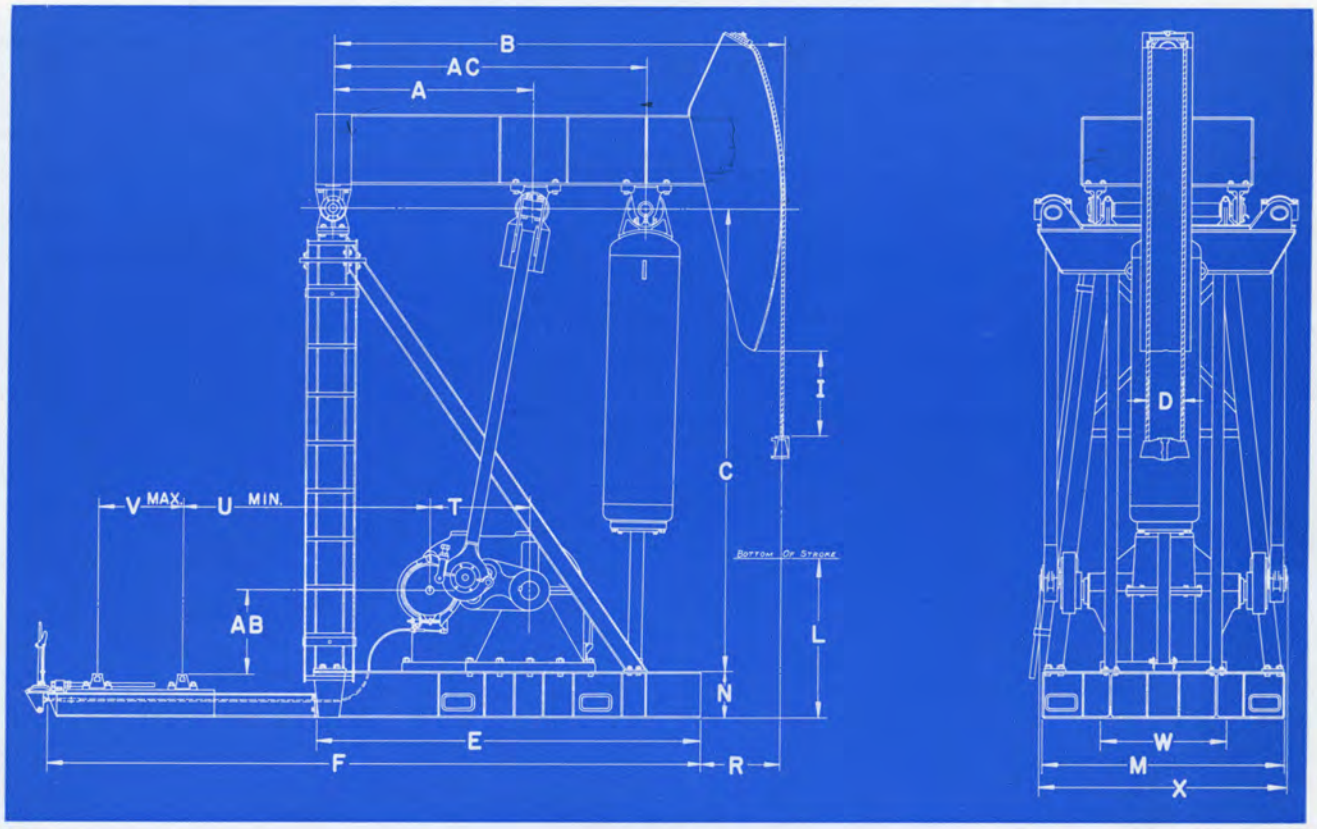

FIGURE 49

UNIT	A	B	C	D	E	F	I	L	M	N	R	T	U	V	W	X	AB	AC
A-80D-54-19.....	48″	9′- 7″	11′- 0″	9″	7′- 5½″	14′- 5¾″	7⅞″	67½″	63¾″	9¾″	36″	22″	66″	42″	25¼″	63⅞″	13¾″	6′-0½″
A-114D-54-19.....	“	“	“	“	“	“	“	“	“	“	“	24″	64″	“	“	“	“	“
A-114D-64-19.....	“	“	“	“	“	“	“	62½″	“	“	“	“	“	“	“	“	“	“
A-160D-64-25.....	50″	10′-0″	11′-9″	12″	7′-11″	14′-6¾″	8⅝″	62¾″	6′-1½″	“	35½″	26″	57″	43½″	32″	66⅞″	22″	6′-5½″
A-160D-74-14.9...	48″	11′-1″	11′-0″	9″	7′-5½″	14′-1¼″	7⅞″	52½″	“	“	54″	“	55″	“	“	“	“	6′-0½″
A-160D-74-25.....	50″	10′-0″	11′-9″	12″	7′-11″	14′-6¾″	8⅝″	57¾″	“	“	35½″	“	57″	“	“	“	“	6′-5½″
A-228D-74-25.....	“	“	“	“	“	14′-8″	“	64⅛″	“	16⅛″	“	30″	40½″	50″	37¼″	6′-5⅞″	29⅛″	“
A-228D-74-28.....	56″	10′-11″	12′-5″	“	8′-3¼″	15′-0¼″	15⅞″	64⅜″	“	“	36	“	47″	“	“	“	“	7′-3½″
A-228D-86-19.8...	50″	11′-6½″	11′-9″	“	7′-11″	14′-8″	10″	45¾″	“	“	56″	“	40½″	“	“	“	“	6′-5½″
A-228D-86-28.....	56″	10′-11″	12′-5″	“	8′-3¼″	15′-0¼″	9⅜″	58⅝″	“	“	36″	“	47″	“	“	“	“	7′-3½″
A-228D-100-24.8..	“	12′-7″	“	“	“	“	“	46¾″	“	“	56″	“	“	“	“	“	“	“
A-320D-86-28.....	“	10′-11″	“	“	9′-9¼″	17′-5¼″	“	58⅝″	7′-1½″	“	18″	34″	64″	41″	43¼″	7′-2⅞″	30⅛″	“
A-320D-86-32.....	70″	12′-11″	13′-4″	“	10′-0¼″	17′-8¼″	18⅛″	62⅝″	“	“	39″	“	6′-6″	“	“	“	“	8′-11″
A-320D-100-22.3..	56″	12′-7″	12′-5″	“	9′-9¼″	17′-5¼″	9⅜″	46¾″	“	“	38″	“	64″	“	“	“	“	7′-3½″
A-320D-100-26.9..	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“
A-320D-100-32....	70″	12′-11″	13′-4″	“	10′-0¼″	17′-8¼″	9⅞″	55⅛″	“	“	39″	“	6′-6″	“	“	“	“	8′-11″
A-320D-120-30.2..	“	15′-4″	“	“	11′-3¼″	18′-11¼″	10″	34⅞″	“	“	53″	“	“	“	“	“	“	“
A-456D-100-36....	6′-5″	14′-7″	15′-7″	“	10′-11¾″	18′-1¾″	18¾″	73⅜″	7′-6″	“	47½″	38⅜″	6′-2″	“	46¾″	8′-1⅝″	“	9′-10″
A-456D-120-27.3..	69″	15′-4″	13′-4″	“	11′-3¼″	18′-5¼″	10″	34⅞″	“	“	53″	“	65½″	“	“	“	“	8′-11″
A-456D-120-36....	6′-5″	14′-7″	15′-7″	“	10′-11¾″	18′-1¾″	16⅝″	53¾″	“	“	47½″	“	6′-2″	“	“	“	“	9′-10″
A-456D-144-34.2..	“	17′-4″	“	“	12′-11¼″	20′-1¼″	15⅜″	33⅜″	“	“	57″	“	“	“	“	“	“	“
A-640D-120-36....	“	14′-7″	“	“	10′-11¾″	18′-1¾″	16⅝″	54¾″	“	“	47½″	41½″	71″	“	“	“	“	“
A-640D-427-120...	7′-4″	16′-8″	17′-10″	16″	12′-3½″	19′-5½″	21″	78¼″	7′-11½″	“	59″	“	7′-0″	“	“	“	“	10′-11½″
A-640D-144-31....	6′-5″	17′-4″	15′-7″	12″	12′-11¼″	20′-1¼″	15⅜″	33⅜″	7′-6″	“	57″	“	71⅛″	“	“	“	“	9′-10″
A-640D-144-37 ...	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	“	10′-10¾″
A-640D-427-144...	7′-4″	16′-8″	17′-10″	16″	12′-3½″	19′-5½″	19½″	55″	7′-11½″	“	59″	“	7′-0″	“	“	“	“	10′-11½″
A-640D-168-33.5..	“	19′-3″	“	“	14′-10½″	22′-0½″	“	34⅝″	“	“	“	“	“	“	“	“	“	“
A-640D-192-42....	10′-1½″	23′-0″	21′-0″	“	19′-4⅝″	27′-1⅞″	12¼″	55″	“	21″	48″	“	9′-9″	“	“	8′-4⅛″	28⅞″	14′-3½″
A-912D-120-36....	6′-5″	14′-7″	15′-7″	12″	12′-3″	19′-5″	16⅝″	54¾″	7′-6″	16⅛″	47½″	48½″	6′-6″	“	50″	8′-1⅝″	32⅛″	9′-10″
A-912D-427-120...	7′-4″	16′-8″	17′-10″	16″	12′-3½″	19′-5½″	21″	78¼″	7′-11½″	“	59″	“	6′-4″	“	“	“	“	10′-11½″
A-912D-427-144...	“	“	“	“	“	“	19½″	55″	“	“	“	“	“	“	“	“	“	“
A-912D-168-33.5..	“	19′-3″	“	“	14′-10½″	22′-0½″	19½″	34⅝″	“	“	“	“	“	“	“	“	“	“
A-912D-192-42....	10′-1½″	23′-0″	21′-0″	“	19′-4⅝″	27′-1⅞″	12¼″	55″	“	21″	48″	“	9′-2″	“	“	8′-4⅛″	28⅞″	14′-3½″
A-912D-216-41....	“	25′-8″	“	“	22′-0⅞″	29′-2⅞″	“	31″	“	“	“	“	“	“	“	“	“	“
A-912D-240-47....	11′-2½″	28′-0″	25′-3½″	20½″	†	32′-0″	17½″	55″	8′-0″	“	“	“	9′-7″	44¾″	50¼″	“	24″	19′-5½″
‡A-1280D-427-144..	7′-4″	16′-8″	17′-10″	16″	12′-3½″	19′-5½″	19½″	“	7′-11½″	16⅛″	59″	52½″	6′-0″	41″	“	8′-11⅛″	38⅛″	10′-11½″
‡A-1280D-192-42...	10′-1½″	23′-0″	21′-0″	“	19′-4⅝″	27′-1⅞″	12¼″	“	“	21″	48″	“	8′-7⅜″	“	“	“	34⅞″	14′-3½″
‡A-1280D-240-47...	11′-2½″	28′-0″	25′-3½″	20½″	†	32′-0″	17½″	“	8′-0″	“	“	“	9′-3″	44¾″	“	“	30″	19′-5½″
‡A-1824D-192-42...	10′-1½″	23′-0″	21′-0″	16″	19′-4⅝″	27′-1⅞″	12¼″	“	7′-11½″	“	“	58⅞″	8′-1″	41″	“	9′-5⅛″	34⅞″	14′-3½″
‡A-1824D-240-47...	11′-2½″	28′-0″	25′-3½″	20½″	†	32′-0″	17½″	“	8′-0″	“	“	“	8′-8⅝″	44¾″	“	“	30″	19′-5½″

† Portable Base is Standard; one-piece and portable bases available on all units.
‡ Available with 1280T and 1824T triple reduction gear reducers.

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	Wire Line Hangers	*Standard Sheave Sizes, P.D., Inches	Gear Ratio	Weight, Lbs.
A-80D-54-19.....	80,000	54-44	19,000	8	11,000	16 x 8½ @ 64 lb.	3½	1 x 16'-0"	19¼, 24, 29¼ (3C)	29.15	11,500
A-114D-54-19.....	114,000	54-44	19,000	8	11,000	16 x 8½ @ 64 lb.	3½	1 x 16'-0"	19¼, 24, 29¼, 33¼ (3C)	29.4	11,600
A-114D-64-19.....	114,000	64-54	19,000	8	11,000	16 x 8½ @ 64 lb.	3½	1 x 16'-0"			11,600
A-160D-64-25.....	160,000	64-54	25,000	10	17,595	18 x 8¾ @ 77 lb.	3½	1⅛ x 18'-6"	24¼, 29¼, 33¼, 38 (4C or 3D)	28.67	14,600
A-160D-74-14.9.....	160,000	74-64	14,900	8	9,450	16 x 8½ @ 64 lb.	3½	1⅛ x 18'-6"			12,814
A-160D-74-25.....	160,000	74-64-54	25,000	10	17,595	18 x 8¾ @ 77 lb.	3½	1⅛ x 18'-6"			14,600
A-228D-74-25.....	228,000	74-64-54	25,000	10	17,595	18 x 8¾ @ 77 lb.	4	1⅛ x 18'-6"	24¼, 30, 36, 41¼ (5C or 4D)	28.45	16,310
A-228D-74-28.....	228,000	74-64-54	28,000	10	17,695	21 x 9 @ 82 lb.	4	1⅛ x 20'-0"			18,300
A-228D-86-19.8.....	228,000	86-74-64	19,800	10	14,960	18 x 8¾ @ 77 lb.	4	1⅛ x 20'-6"			16,535
A-228D-86-28.....	228,000	86-74-64	28,000	10	17,695	21 x 9 @ 82 lb.	4	1⅛ x 21'-0"			18,500
A-228D-100-24.8....	228,000	100-86-74	24,800	10	14,750	21 x 9 @ 82 lb.	4	1⅛ x 23'-10"			18,823
A-320D-86-28.....	320,000	86-74-64	28,000	10	17,695	21 x 9 @ 82 lb.	4	1⅛ x 21'-0"	25, 30, 36, 42, 47¼ (6C or 5D)	30.12	21,233
A-320D-86-32.....	320,000	86-74-64	32,000	11	21,910	24 x 12 @ 100 lb.	4	1¼ x 22'-0"			24,425
A-320D-100-22.3....	320,000	100-86-74	22,300	10	15,250	21 x 9 @ 82 lb.	4	1⅛ x 23'-10"			21,098
A-320D-100-26.9....	320,000	100-86-74	26,900	10	15,250	24 x 12 @ 100 lb.	4	1⅛ x 23'-10"			21,348
A-320D-100-32.....	320,000	100-86-74	32,000	11	21,910	24 x 12 @ 100 lb.	4	1¼ x 23'-6"			24,500
A-320D-120-30.2....	320,000	120-104-90	30,200	11	18,400	24 x 12 @ 100 lb.	4	1¼ x 26'-9"			25,000
A-456D-100-36.....	456,000	100-86-74	36,000	12	24,535	24 x 14 @ 130 lb.	6	1¼ x 25'-0"	28, 34, 40, 46, 51 (6D or 8C)	29.04	26,786
A-456D-120-27.3....	456,000	120-104-90	27,300	11	18,400	24 x 12 @ 100 lb.	6	1¼ x 26'-9"			27,046
A-456D-120-36.....	456,000	120-100-86	36,000	12	24,535	24 x 14 @ 130 lb.	6	1¼ x 28'-0"			29,900
A-456D-144-34.2....	456,000	144-120-100	34,200	12	20,200	24 x 14 @ 130 lb.	6	1¼ x 32'-0"			31,210
A-640D-120-36.....	640,000	120-100-86	36,000	12	24,535	24 x 14 @ 130 lb.	6	1¼ x 28'-0"	28, 34, 40, 46, 51 (6D)	28.6	31,500
A-640D-427-120.....	640,000	120-100-86	40,000	13	27,935	27 x 14 @ 160 lb.	6	1⅜ x 28'-0"			36,200
A-640D-144-31.....	640,000	144-120-100	31,000	12	20,200	24 x 14 @ 130 lb.	6	1¼ x 32'-0"			32,528
A-640D-144-37.....	640,000	144-120-100	37,000	12	22,439	24 x 14 @ 130 lb.	6	1¼ x 32'-0"			32,600
A-640D-427-144.....	640,000	144-120-100	40,000	13	27,935	27 x 14 @ 160 lb.	6	1⅜ x 32'-0"			36,200
A-640D-168-33.5....	640,000	168-141-118	33,500	13	22,450	27 x 14 @ 160 lb.	6	1⅜ x 35'-0"			37,978
A-640D-192-42.....	640,000	192-168-144	42,000	14½	30,635	33 x 15¾ @ 200 lb.	8	1⅜ x 39'-2"			49,500
A-912D-120-36.....	912,000	120-100-86	36,000	12	24,535	24 x 14 @ 130 lb.	6	1¼ x 28'-0"	28 34, 40, 46 51 (7D)	28.72	34,500
A-912D-427-120.....	912,000	120-100-86	40,000	13	27,935	27 x 14 @ 160 lb.	6	1⅜ x 28'-0"			37,200
A-912D-427-144.....	912,000	144-120-100	40,000	13	27,935	27 x 14 @ 160 lb.	6	1⅜ x 32'-0"			37,200
A-912D-168-33.5....	912,000	168-141-118	33,500	13	22,450	27 x 14 @ 160 lb.	6	1⅜ x 35'-0"			38,978
A-912D-192-42.....	912,000	192-168-144	42,000	14½	30,635	33 x 15¾ @ 200 lb.	8	1⅜ x 39'-2"			50,000
A-912D-216-41.....	912,000	216-190-162	41,000	14½	24,830	33 x 15¾ @ 200 lb.	8	1⅜ x 43'-2"			52,817
A-912D-240-47.....	912,000	240-200	47,000	14½	34,000	33 x 15¾ @ 200 lb.	8	Double 1¼"			65,000
A-1280D-427-144....	1,280,000	144-120-100	40,000	13	27,935	27 x 14 @ 160 lb.	6	1⅜ x 32'-0"	†40, 46, 51, 55, 68 (11D)	28.05	44,800
A-1280D-192-42.....	1,280,000	192-168-144	42,000	14½	30,635	33 x 15¾ @ 200 lb.	8	1⅜ x 39'-2"			58,300
A-1280D-240-47.....	1,280,000	240-200	47,000	14½	34,000	33 x 15¾ @ 200 lb.	8	Double 1¼"			68,330
A-1824D-192-42.....	1,824,000	192-168-144	42,000	14½	30,635	33 x 15¾ @ 200 lb.	8	1⅜ x 39'-2"	†40, 46, 51, 55, 68 (11D)	28.33	60,850
A-1824D-240-47.....	1,824,000	240-200	47,000	14½	34,000	33 x 15¾ @ 200 lb.	8	Double 1¼"			71,332

* 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.

† Standard Floating Hub Sheaves for 1280T Gear Reducer are 28, 34, 40, 46, 51, 53½ (7D).
Standard Floating Hub Sheaves for 1824T Gear Reducer are 28, 30, 40, 46 (11D).

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.

1824D DOUBLE REDUCTION AND 1824T TRIPLE REDUCTION GEAR REDUCER SPECIFICATIONS

Rating: 1,824,000 In. Lbs. Peak Torque
Ratio of Gears: 1824D—28.33, 1824T—112.14
Crank Shaft Dia. 9"
Sheave: 46" P.D.—11D Std., 4-15/16" Bore
1824D—68" P.D. Max., 1824T—46" P.D., 11D Max.
Distance Centerline Unit to Centerline of Drive: 28⅛"
Gear Box Oil Capacity: 165 Gallons

1280D DOUBLE REDUCTION AND 1280T TRIPLE REDUCTION GEAR REDUCER SPECIFICATIONS

Rating: 1,280,000 In. Lbs. Peak Torque
Ratio of Gears: 1280D—28.05, 1280T—111.02
Crank Shaft Dia. 8½"
Sheave: 1280D—68" P.D.,10D, Max.; 1280T—53½" P.D., 7D, Max.
Bore (1280D)—4-15/16", Bore (1280T)—3-7/16"
Distance Centerline Unit to Centerline of Drive: 1280D—23⅝",
1280T—21½"
Gear Box Oil Capacity: 120 Gallons

LUFKIN HORIZONTAL, TWIN CYLINDER TWO CYCLE GAS ENGINES

Model	Speed Range	Continuous Rating
HC-333	350-650 RPM	20- 30 BHP
HT-333	350-650 RPM	20- 30 BHP
H-795	300-600 RPM	45- 65 BHP
H-1770	200-475 RPM	57-120 BHP
H-2165	200-475 RPM	70-145 BHP

Lufkin Engines are built as heavy duty, slow speed, twin cylinder, two cycle, horizontal design, in a range of sizes from 20 to 145 continuous useable 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.

All Lufkin Engines except the Model HC-333 are thermosyphon cooled, and are furnished complete with radiator, fan and piping. The Model HC-333 is a condenser version which has had wide acceptance.

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

The Model H-795 Engine can also be furnished for counterclockwise rotation, for use with Mark II units and other counterclockwise rotation machinery.

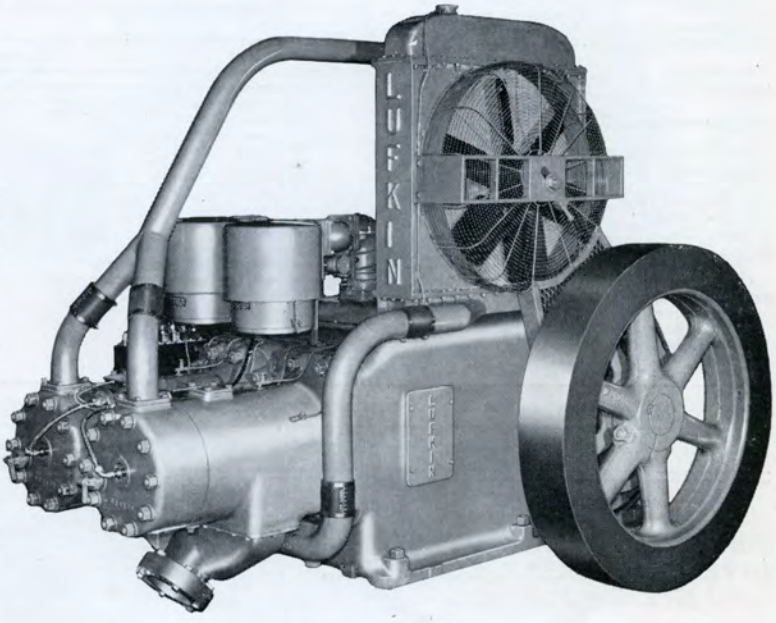

FIGURE 50

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

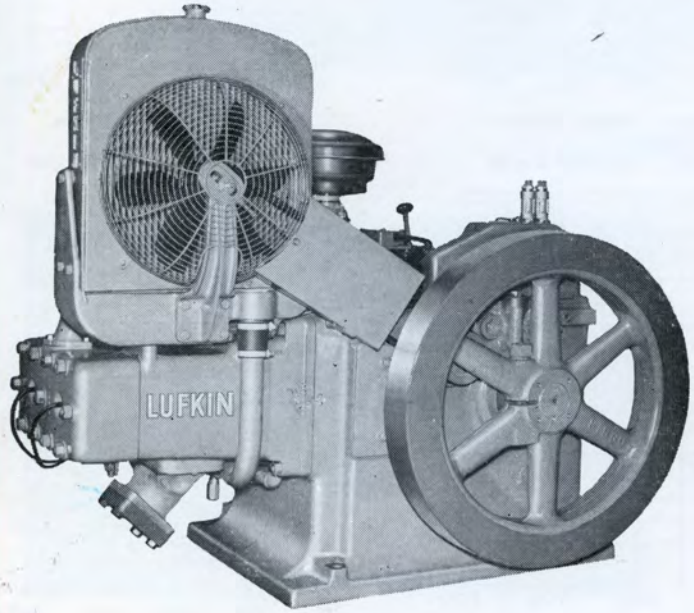

FIGURE 51

Flywheel Side Lufkin HT-333 Engine

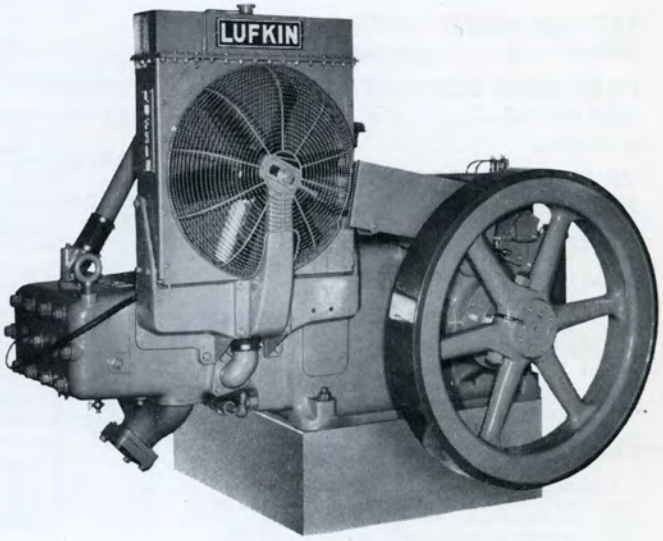

FIGURE 52

Front View—Lufkin H-795 Engine

LUFKIN **LUFKIN FOUNDRY & MACHINE CO.** **LUFKIN, TEXAS**

LUFKIN ENGINE SPECIFICATIONS

MODEL	HC-333	HT-333	H-795	H-1770	H-2165
No. Cylinders	2	2	2	2	2
Bore, In.	5½	5½	7½	9½	10½
Stroke, In.	7	7	9	12½	12½
Displacement, Cu. In.	333	333	795	1770	2165
Compression Ratio	5.75	5.75	5.3	5.2	5.2
Speed Range, RPM	350–650	350–650	300–600	200–475	200–475
Diam. Flywheel, Inches	35½	35½	40	48	48
Flywheel WR², Ft.² Lbs.	1200	1200	1580	5250	5250
Cooling System Type	Condenser		Thermosyphon		
Capacity, Gallons	7½	7½	14	28	28
Lubrication			Full Pressure		
Crankcase Capacity, Gals.	5	5	5	16	16
Cylinder Lubricator			McCord Model 55 (Automatically filled by Pressure System)		
Oil Filter			Cuno By-Pass Type		
Ignition—Standard			Rotary High Tension Magneto		
Optional			Rotary Low Tension Magneto		
Gas Mixer—Ensign	1½"XG	1½"XG	2"XG	3½" DG	3½" DG
Air Filter			Oil Bath Type		
Clutch, Twin Disc	SPE 111	SPE 111	SPE 114	SPE 214	SPE 314
Size Shaft	2¼x6½	2¼x6½	3x8½	3½x10	3 15/16x10
Keyway	5/8"x 5/16"	5/8"x 5/16"	¾"x⅜"	⅞"x 1/16"	1"x½"
Dia. Exhaust Pipe	4"	4"	4"	6"	6"
Dia. Gas Inlet	1"	1"	1"	1½"	2"
Weight, Lbs.	3250	3250	4500	9000	9500
Safety Controls					
Water & Oil			Standard		
Overspeed			Optional		
Starting Systems (Optional)					
Air Starting Valve					
Electric Motor					
Air-Gas Motor					
Friction Wheel					

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.

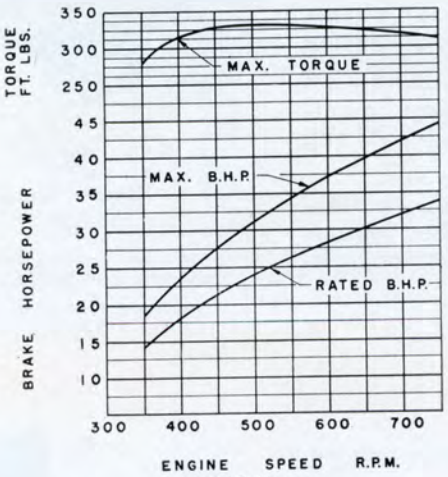

FIGURE 53
Performance Curves H-333 Gas Engine

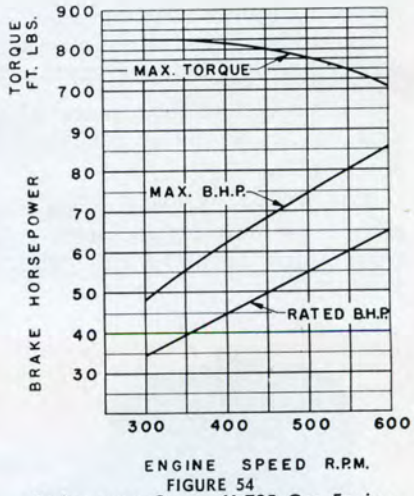

FIGURE 54
Performance Curves H-795 Gas Engine

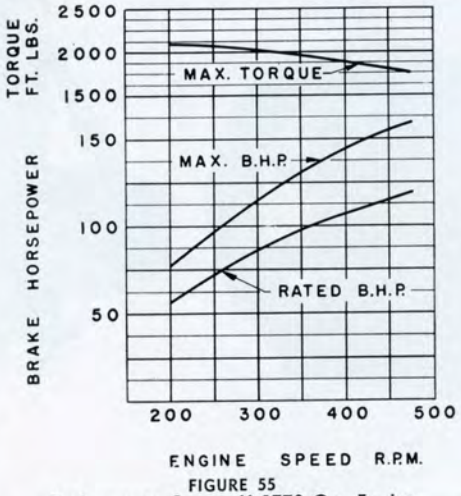

FIGURE 55
Performance Curves H-1770 Gas Engine

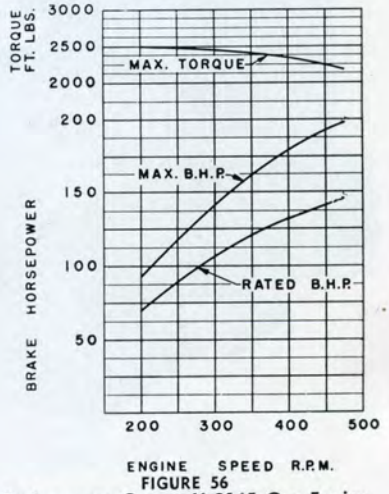

FIGURE 56
Performance Curves H-2165 Gas Engine

LUFKIN OFFERS A TRAILER TO COMPLY WITH YOUR EVERY HAULING NEED

FIGURE 57
Hi Tensile Oilfield Float

FIGURE 58
Model THD-2—Lufkin's Hydraulic Tandem Dump Trailer.

FIGURE 59
Custom Built Low-Bed
All Low-Bed Models offered custom made to every need

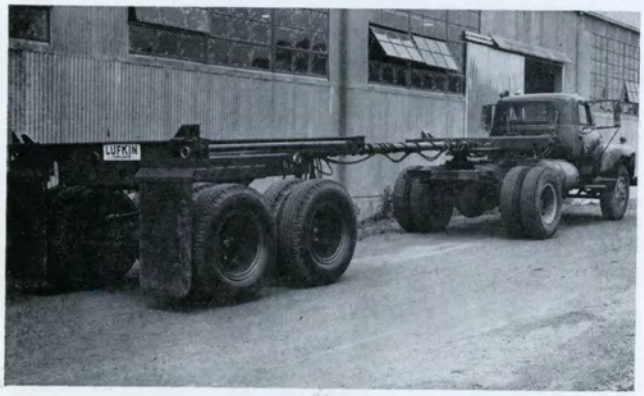

FIGURE 60
Model TOP
For hauling pipe, poles & other oilfield supplies

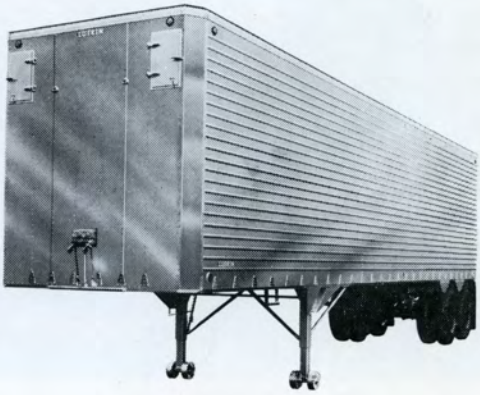

FIGURE 61
All Aluminum Van

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-7 and G-8 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.

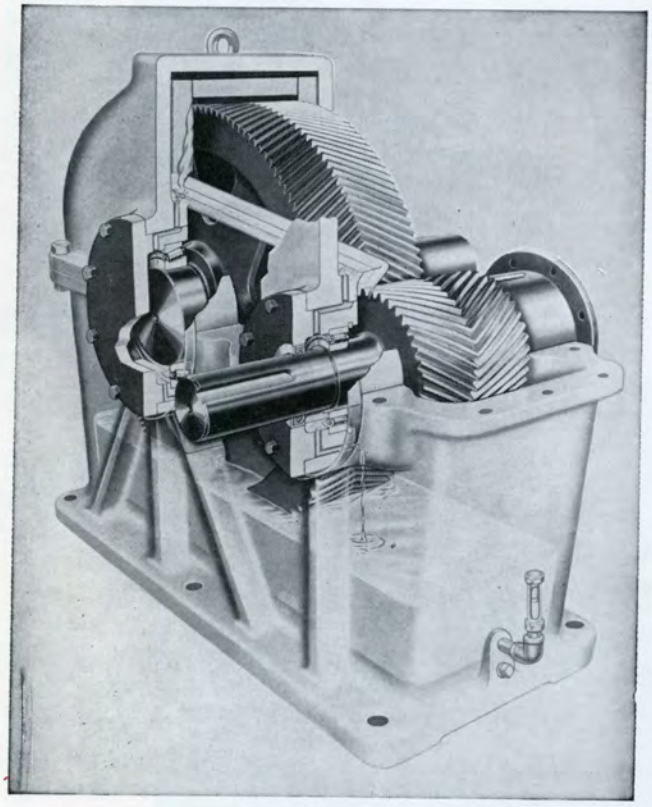

FIGURE 62
Typical Type S Single Reduction Herringbone Gear Reducer. Note simple but positive and fool-proof Lubrication System.

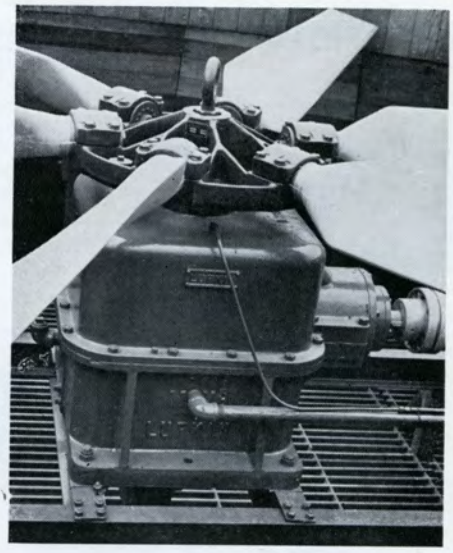

FIGURE 64
115VB Spiral Bevel Gear Reducer for Cooling Tower Fan Drive. A complete range of sizes available.

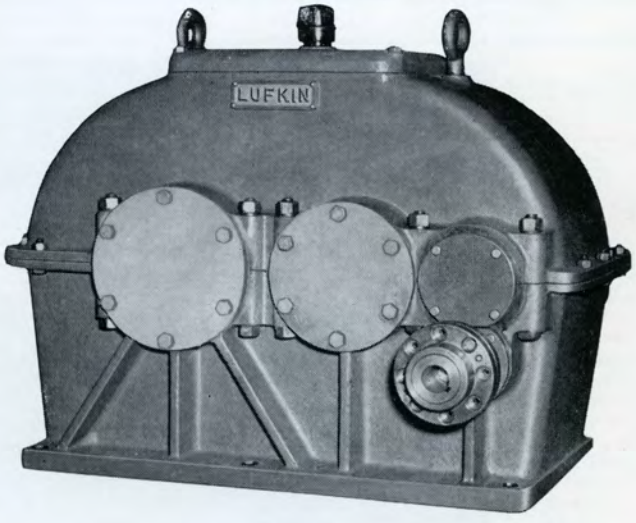

FIGURE 65
Lufkin T195 Typical Type T Triple Reduction Herringbone Gear Reducer.

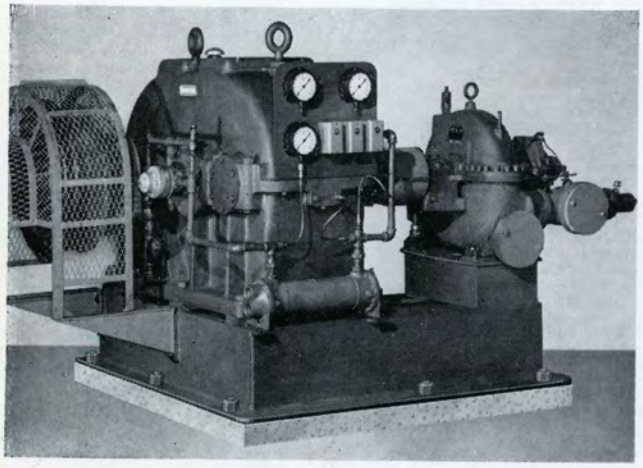

FIGURE 63
Lufkin N290 High Speed Reducer, Ratio 33.6:1, Delivering 227 H. P. From a 6670 RPM Turbine to a Reciprocating Pump.

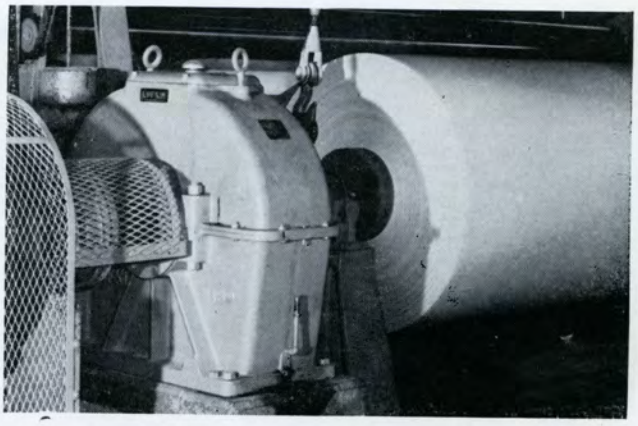

FIGURE 66
Lufkin S189 Single Reduction Herringbone Reducer Driving Rewind Machine at Newsprint Mill.

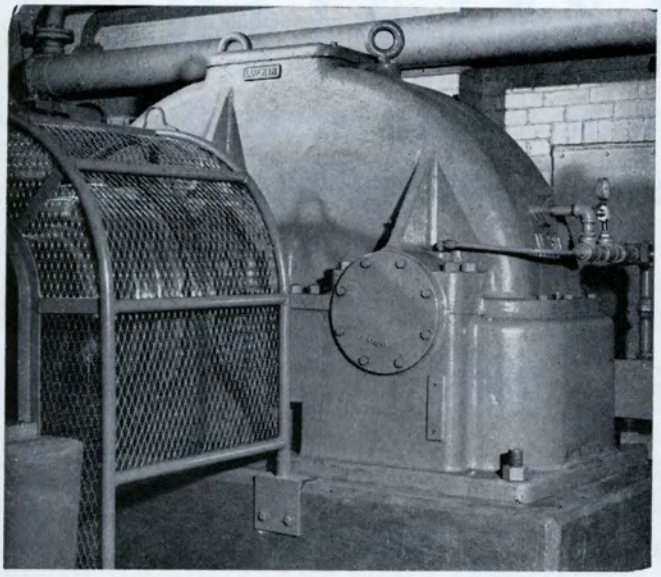

FIGURE 67

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

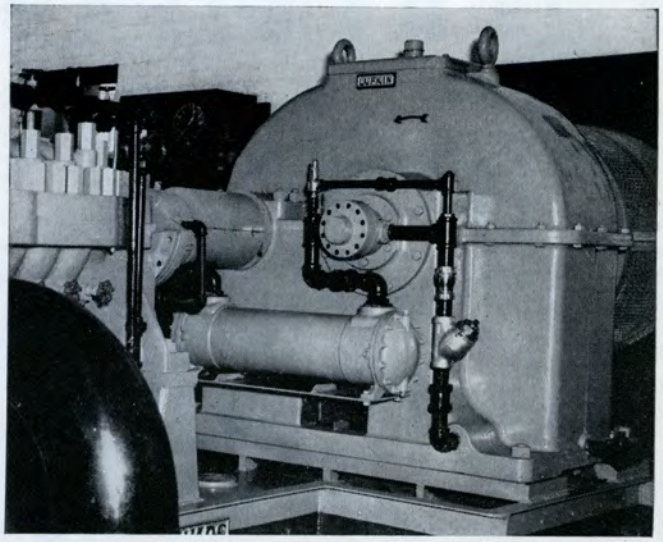

FIGURE 68

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

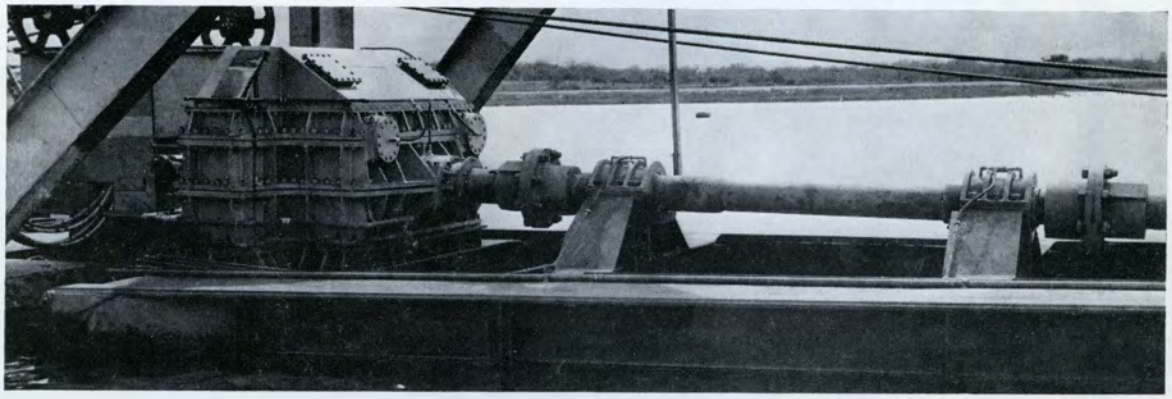

FIGURE 69

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

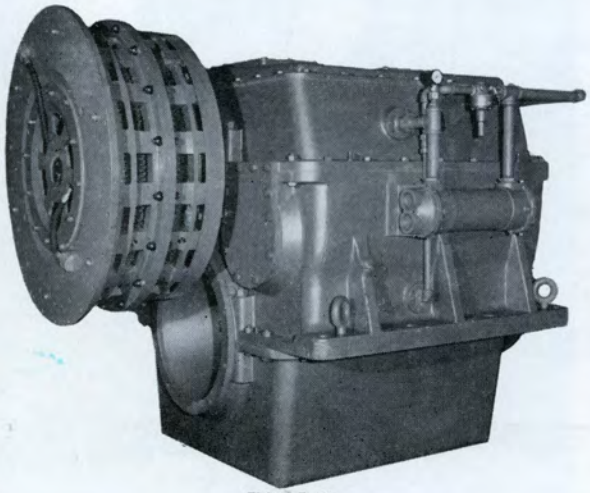

FIGURE 70

Lufkin R2520 Marine Reverse and Reduction Unit, 1600 h.p., 750 r.p.m., 3:1 ratio.

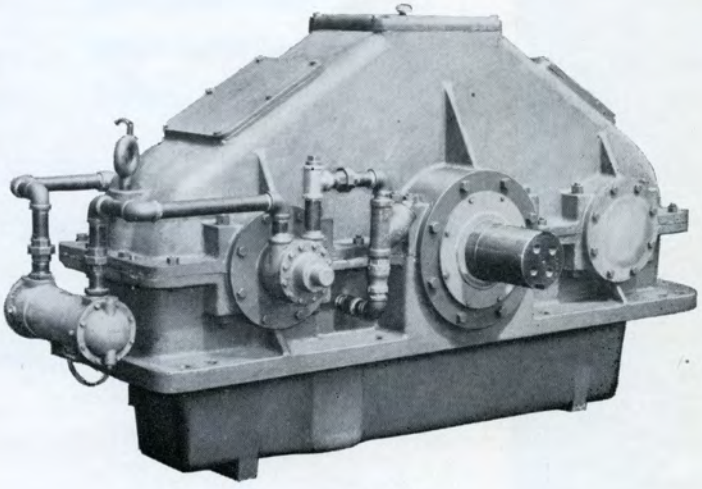

FIGURE 71

Lufkin LM608C Compound Marine Gear delivering 1100 h.p.

LUFKIN INSTALLATIONS

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

FIGURE 72

Lufkin M-160D-200-74 Mark II Unitorque Pumping Unit equipped with semi-automatic counterbalance feature.

FIGURE 73

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

Printed in U.S.A.

LUFKIN

EQUIPMENT OF ADVANCED DESIGN