

2044



HYDRAULIC LONG STROKE PUMPING UNIT

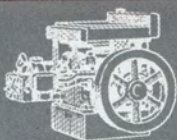


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LUFKIN FOUNDRY & MACHINE COMPANY, LUFKIN, TEXAS



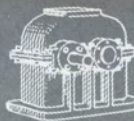
LUFKIN
PUMPING UNITS



LUFKIN-COOPER-BESSEMER
ENGINES



LUFKIN OIL FIELD AND INDUSTRIAL
TRUCK TRAILERS

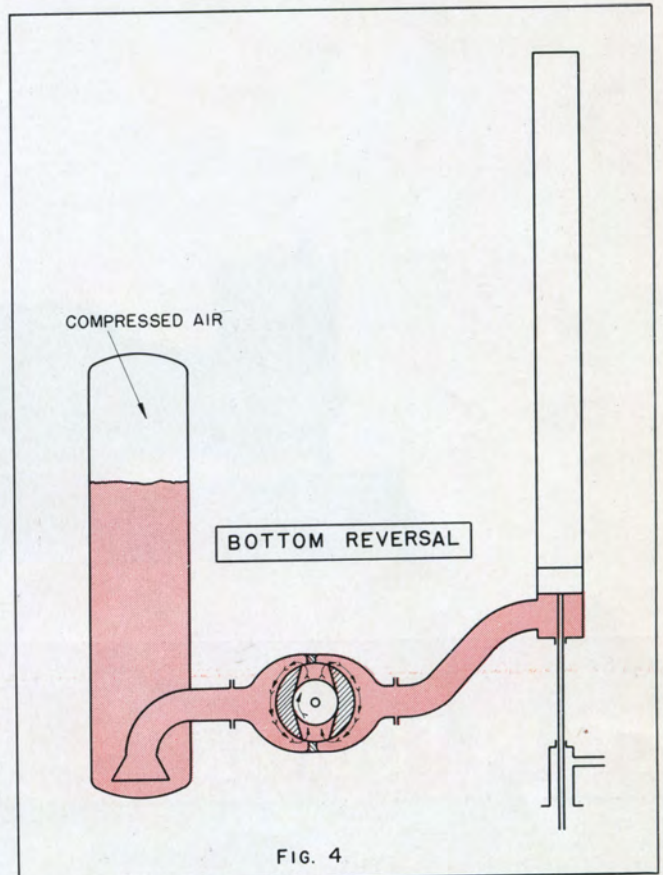
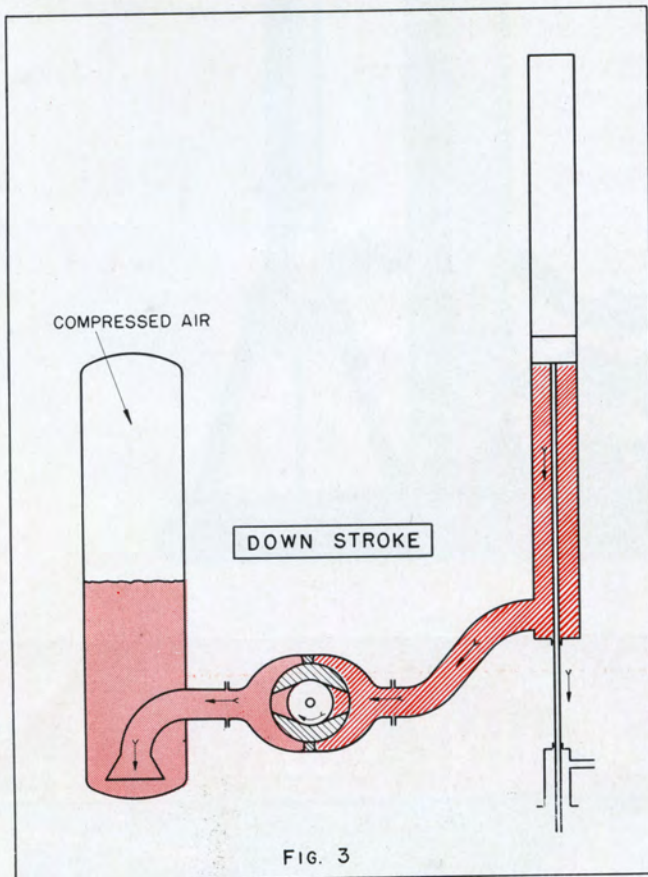
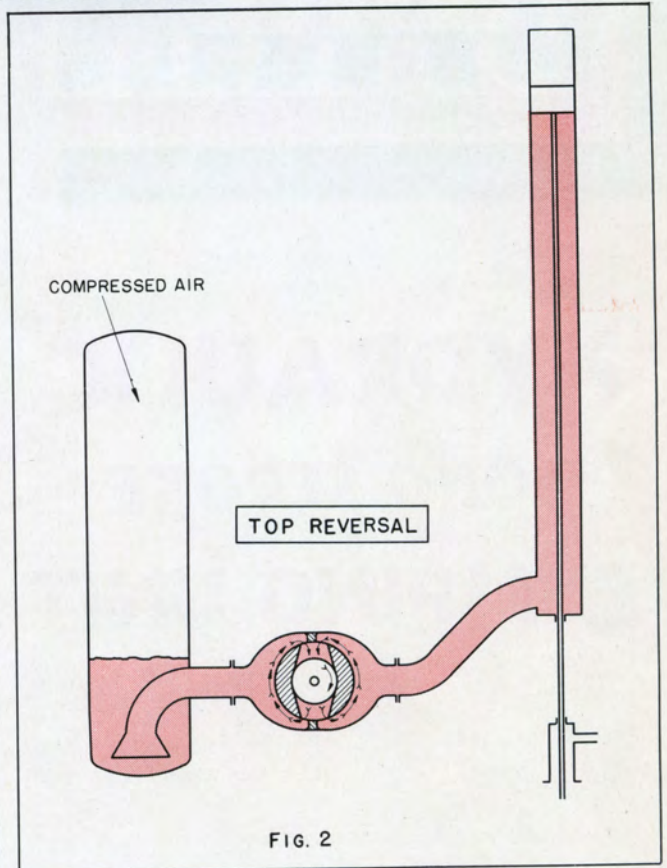
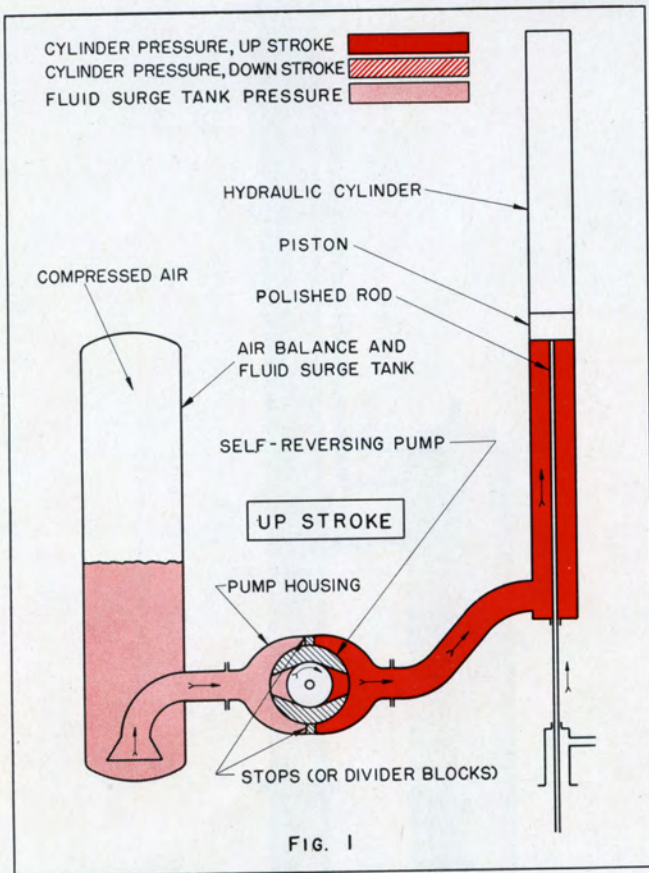


INDUSTRIAL SPEED REDUCERS
AND INCREASES



DIVISION LUFKIN FOUNDRY & MACHINE COMPANY
INDUSTRIAL, MILL AND AUTOMOTIVE SUPPLIES

LUFKIN 3520 HYDRAULIC LONG STROKE UNIT FLOW DIAGRAMS



Explanation of Reversing Principal

(See Figs. 1, 2, 3, and 4)

Lufkin's No. 3520 Hydraulic Pumping Unit incorporates a new and unique method of polished rod reversing. A reversing valve is not used. Instead, flow to and from the hydraulic cylinder is controlled by a patented self-reversing pump.

The self-reversing pump consists essentially of a rotor housing and three screws, or rotors. The rotational speed of the rotor housing is geared down to a fraction of the speed of the rotors. (Speed of rotor housing ranges from 2 to 7 RPM, whereas speed of rotors range from 500-1200 RPM, both depending on desired pumping conditions.) The rotor housing, with its suction and discharge ports 180° apart, slowly rotates within the main pump housing. The pump housing has two "stops" or divider blocks, also 180° apart, located at the top and bottom of the housing between which the self-reversing pump rotates. (See Fig. 1.) These stops effectively seal off one side of the pump housing from the other. Thus, as the self-reversing pump rotates, its discharge port is on one side of the pump housing half the time and on the other side of the pump the other half of the time. This condition of course causes an intermittent change of direction of flow through the pump housing. On the up stroke of the polished rod, flow is from the collector tank (or surge tank) into the hydraulic cylinder. On the down stroke flow is from the hydraulic cylinder back into the surge tank. (See Figs. 1 and 3.)

When the suction and discharge ports of the rotor housing line up or "straddle" the stops on the pump housing, fluid is discharged into both sides of the pump housing, and likewise, at the suction port of the rotor housing, fluid is sucked in from both sides of the pump housing. When this condition occurs, a change in the direction of flow is effected, and a polished rod reversal takes place. (See Figs. 2 and 4.)

As the size of the ports on the rotor housing are considerably wider than the stops on the pump housing, the polished rod gradually decreases in velocity, stops, and then uniformly increases to a constant velocity in the opposite direction. This makes for smooth polished rod reversals at both the top and bottom of the stroke.

AUTOMATIC COUNTERBALANCE

The Lufkin hydraulic unit employs an automatically controlled pneumatic counterbalance system which maintains perfect counterbalance air pressure under all operating conditions. Not only does this unique device compensate for air loss and pressure

fluctuations due to changes in ambient temperatures but actually regulates the air pressure to suit varying well loads due to gas heads, fluid level fluctuations, or any condition that might bring about such change.

"Slip" past the pump due to difference in pressure on the up and down strokes brought about by any unbalanced condition is harnessed to operate a simple spool type valve which starts and stops the air compressor, or releases air from the receiver tank. Once the unit is in operation this completely automatic system requires no attention or adjustment.

Specifications

PEAK POLISHED ROD LOAD—35,000#

MAXIMUM COUNTERBALANCE—26,200#

MAXIMUM OPERATING PRESSURE—
Hydraulic Fluid—270 P.S.I.
Counterbalance Air—200 P.S.I.

STROKE LENGTHS—16, 20 and 25 Ft.

PUMPING SPEED RANGE—2 to 7 - 20 Ft.
Strokes Per Minute

HYDRAULIC CYLINDER—13" Dia. x 30 Ft.,
Nickel Alloy Cast Iron

POLISHED ROD—1½" Dia. Alloy Steel or Monel
as Ordered

STROKE CHANGE—Length of Stroke May be
Changed in a Matter of Minutes by Replacing
Two Small Spur Gears in Pump Housing

HYDRAULIC FLUID—SAE 20 Hydraulic Oil,
490 Gal. Req'd. (Consult our Engineering Dept.)

HYDRAULIC REVERSING PUMP DATA—
Type—Triple Screw "IMO" With Gear Driven
Reversing Mechanism

Material—Pump Housing and Other Critical
Parts Nickel-Moly Cast Iron

Capacity—1,900 GPM at 1,000 RPM

Input Speed—1,000 RPM for 6-20 Ft. Strokes
Per Minute

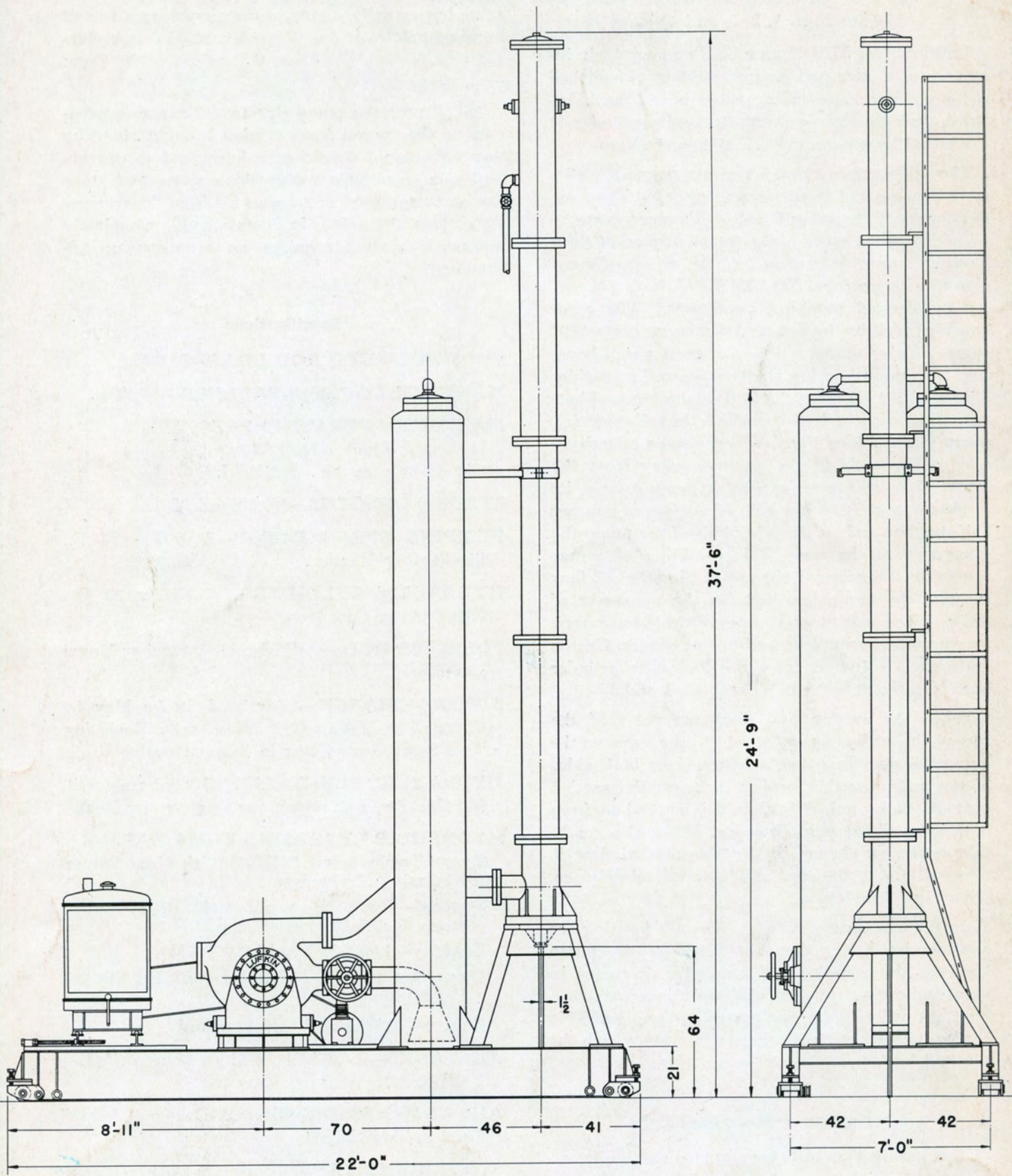
Sheave—20" P.D.—7 "D" Standard

AIR TANKS—2 - 30" Dia. x 22 Ft. Long. ASME—
200 Lb. Safe Working Pressure

AIR COMPRESSOR—Gardner-Denver "ADD"
Duplex, Two Stage

SCAVENGING TANK—Built into Base With Ca-
pacity for All Fluid in the System

SCAVENGING PUMP—Gerotor No. 0-30 Gear
Driven. Mounted Inside Pump Housing



GENERAL ASSEMBLY