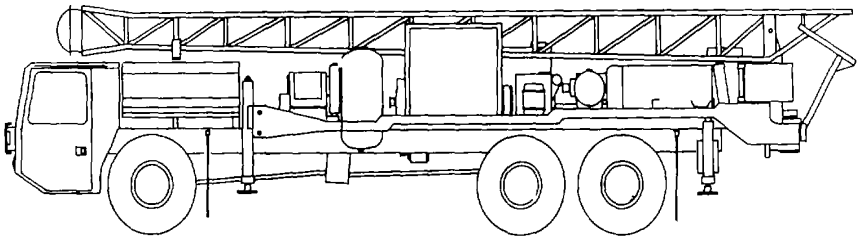
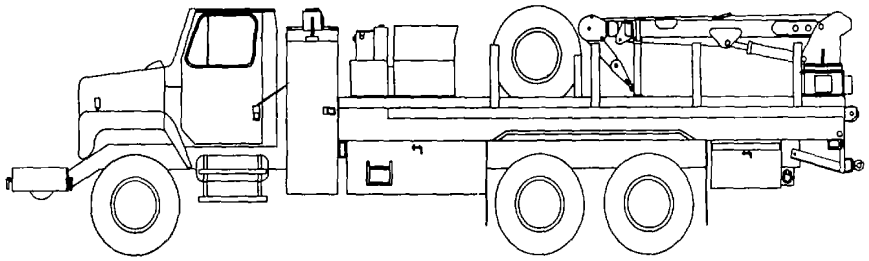
OPERATOR'S MANUAL





DRILLING SYSTEM, WELL, ROTARY,
TRUCK MOUNTED, AIR TRANSPORTABLE,
600 FEET CAPACITY
MODEL LP -12
NSN 3820-01-246-4276

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HEADQUARTERS, DEPARTMENT OF THE ARMY
15 MARCH 1989

TECHNICAL MANUAL

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HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 15 March 1989

Operator's Manual
DRILLING SYSTEM, WELL, ROTARY, TRUCK MOUNTED, AIR TRANSPORTABLE, 600 FEET CAPACITY MODEL NUMBER 165F299 NSN 3820-01-246-4276

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes, or if you know of a way to improve these procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual directly to: Commander, US Army Aviation and Troop Command, ATTN: AMSAT-I-MP, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. You may also submit your recommended changes by E-mail directly to <mpmt%avma28@st-louis-emh7.army.mil>. A reply will be furnished directly to you. Instructions for sending an electronic 2028 may be found at the back of this manual immediately preceding the hard copy 2028.

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CHAPTER 1
INTRODUCTION

Section I. GENERAL INFORMATION

1-1. Scope. This manual contains instructions for operating and servicing the Drilling System, Well, Rotary, Truck-Mounted, Air-Transportable, 600-Feet Capacity (drilling system). The drilling system includes two primary units: a drilling rig, and a support vehicle commonly referred to as a rig tender.

1-2. Maintenance Forms and Records. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750, The Army Maintenance Management System (TAMMS).

1-3. Hand Receipt (-HR) Manuals. This manual has no hand receipt manual.

1-4. Reporting Equipment Improvement Recommendations (EIR's). If your drilling system needs improvement, let us know by sending us an EIR. You, the user can give us valuable information about the equipment's deficiencies. Let us know why you dislike the design or performance. Fill out an SF 368 (Quality Deficiency Report) and mail it to us at AMSAT-I-MP, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. We'll send you a reply.

1-5. Warranty Information. The Drilling rig is warranted by Geo. E. Failing Co., and the rig tender is warranted by Flatwater Fleet, Inc., for 2 years from the date found in block 23, DA Form 2408-9, in the log book. Report all defects in material or workmanship to your supervisor, who will take appropriate action through your organizational maintenance shop.

1-6. Destruction of Army Material to Prevent Enemy Use. Refer to TM 750-244-3, Procedures for Destruction of Equipment to Prevent Enemy Use, for information about destruction.

Section II. EQUIPMENT DESCRIPTION

1-7. Drilling Rig Equipment Characteristics, Capabilities, and Features. The drilling rig is an air-transportable vehicle. It is capable of drilling a water well to 600 feet depth; it supports both air and mud drilling methods. The drilling rig requires a three-man crew. It is designed for use in all types of environmental conditions. Figure 1-1 shows the rig's lifting and tie-down points.

a. Major Components Features and Capabilities.
   (1) Mast.
      (a) Mud and air discharge piping.
      (b) Hydraulic mast raising cylinders.
      (c) Mast lighting.
      (d) Chain pulldown assembly.
      (e) Chain feed sprocket assembly.
      (f) Crown block assembly.
   (2) Mud Pump System.
      (a) Mud pump drive.
      (b) Air clutch.
      (c) Powerend.
      (d) Fluid end.
   (3) Air Compressor System.
      (a) Air compressor.
      (b) Air/oil separator.
      (c) Oil cooler.
      (d) Air cleaner.
      (e) Air clutch.
   (4) Sub-Drive Assembly.
      (a) Mud pump driveshaft.
      (b) Power take-off.
      (c) Drawworks driveshaft.
      (d) Hydraulic pumps.
   (5) Drawworks.
      (a) Hoist drum.
      (b) Auxiliary drum.
      (c) Third drum.
      (d) Bevel gear box.
      (e) Band-type brakes.
      (f) Air clutch.
   (6) Hydraulic System.
      (a) 3-micron oil filter.
      (b) 40-gal oil reservoir.
      (c) Control valves.
   (7) Water/Foam Injection System.
      (a) Hydraulic motor.
      (b) Water pump.

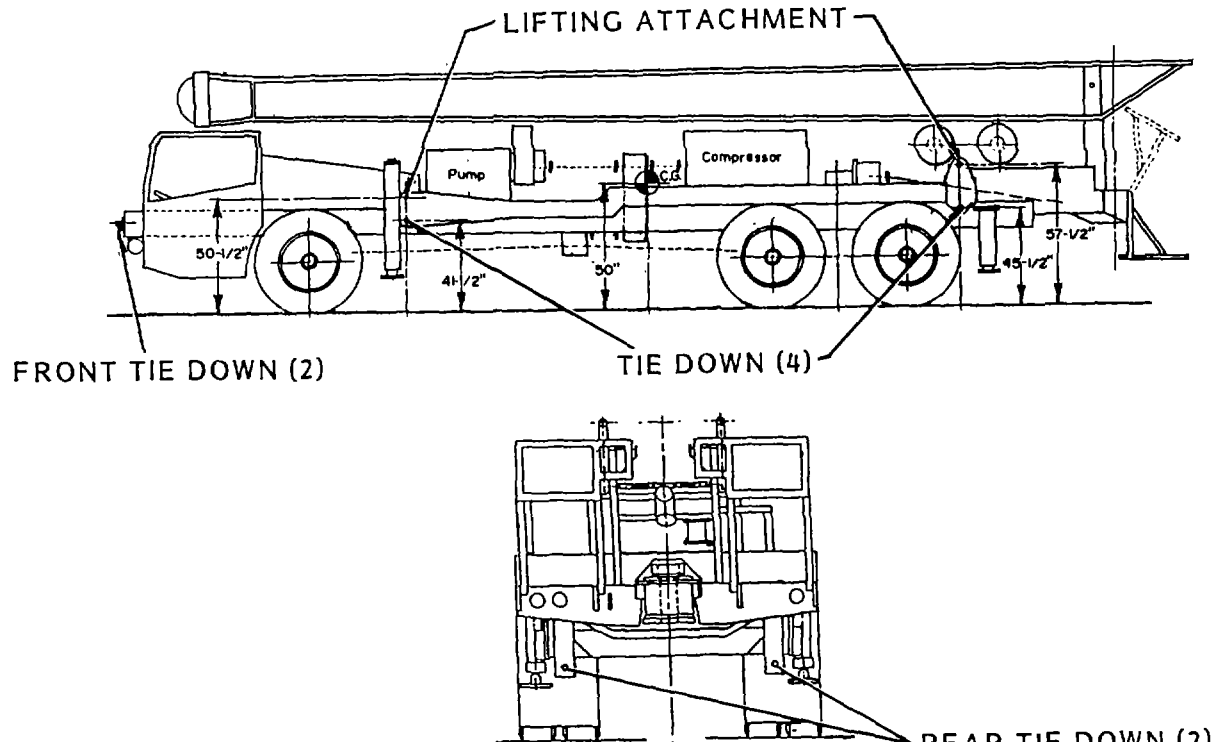

Figure 1-1. Drilling Rig Lifting and Tie-Down Point

(8) Force-Feed Lubricator.
  (a) Electric motor driven pump.
  (b) Reservoir.
(9) Break-Out Assembly.
  (a) Break-out wrench.
  (b) Break-out tongs.
  (c) Hydraulic break-out cylinder.
(10) Rotary Table and Drive.
  (a) Transfer cylinders.
  (b) Hydrostatic transmission.
  (c) Hydraulic motor.
  (d) Rotary table.
(11) Pulldown Drive System.
  (a) Chain feed drive.
  (b) Hydraulic motor.
  (c) Pulldown transmission.
(12) Operator's Instrument Cluster.
  (a) Air control valves.
  (b) Air line conditioner.
  (c) Gages and meters.

(13) Frame Components.
  (a) Frame lighting.
  (b) Operator's and helper's platform.
  (c) Front and rear hydraulic leveling jacks.
(14) Truck.
  (a) Rear axle or front and rear axle drive.
  (b) Air brakes.
  (c) 6-cylinder diesel engine.
  (d) Turbocharger.
  (e) Five-speed transmission.
  (f) Two-speed transfer case.
  (g) Power steering.

b. Location and Description of Major Components.

(1) Mast (1, Figure 1-2). The mast is mounted to mast pivot brackets at the rear of the drilling rig. Hydraulic cylinders raise and lower the mast to upright or transport positions. The mast's height (32') permits the use of 20' drill pipe or'20' lengths of casing. The mast is equipped with a chain feed, hydraulic-motor powered pulldown system for applying drilling pressure on the bit. A lighting system allows use of the drilling system at night.

(2) Mud Pump (2, Figure 1-2). The mud pump provides circulation of drilling fluid during drilling operations. It is a duplex, double-acting, piston-type pump with removable, hardened-steel cylinder liners. The pump is driveshaft driven from the sub-drive, by way of an air-clutch operated mud pump drive unit.

(3) Air Compressor (3, Figure 1-2). The air compressor provides air for air rotary drilling; it can also be used to supply air for drilling large diameter holes using the foam method. The compressor is powered from the sub-drive through an air clutch.

(4) Sub-Drive (4, Figure 1-2). The sub-drive assembly is a power transfer unit that receives power from the truck's power take-off. One side of the subdrive delivers power to drive the drawworks and the air compressor; the other side delivers power to drive the mud pump and the four hydraulic pumps used to deliver hydrostatic power to other rig systems.

(5) Drawworks (5, Figure 1-2). The drawworks consists of three cable drums used for lifting drilling components at the drilling site. The hoist drum supports the swivel, kelly, drill pipe, drill collars, and bits-elements that make up the "drill string." The auxiliary drum is used to handle drill pipe when adding joints of drill pipe to the drill string. These two drums have a relatively short length of cable, typically long enough for raising and lowering items the height of the mast. The third drum has much more cable, of smaller diameter, and is used to lower tools and instruments to the bottom of the hole. The drawworks is drive-shaft driven from the sub-drive, through a bevel gear box. Each drum is independently operated by an air clutch.