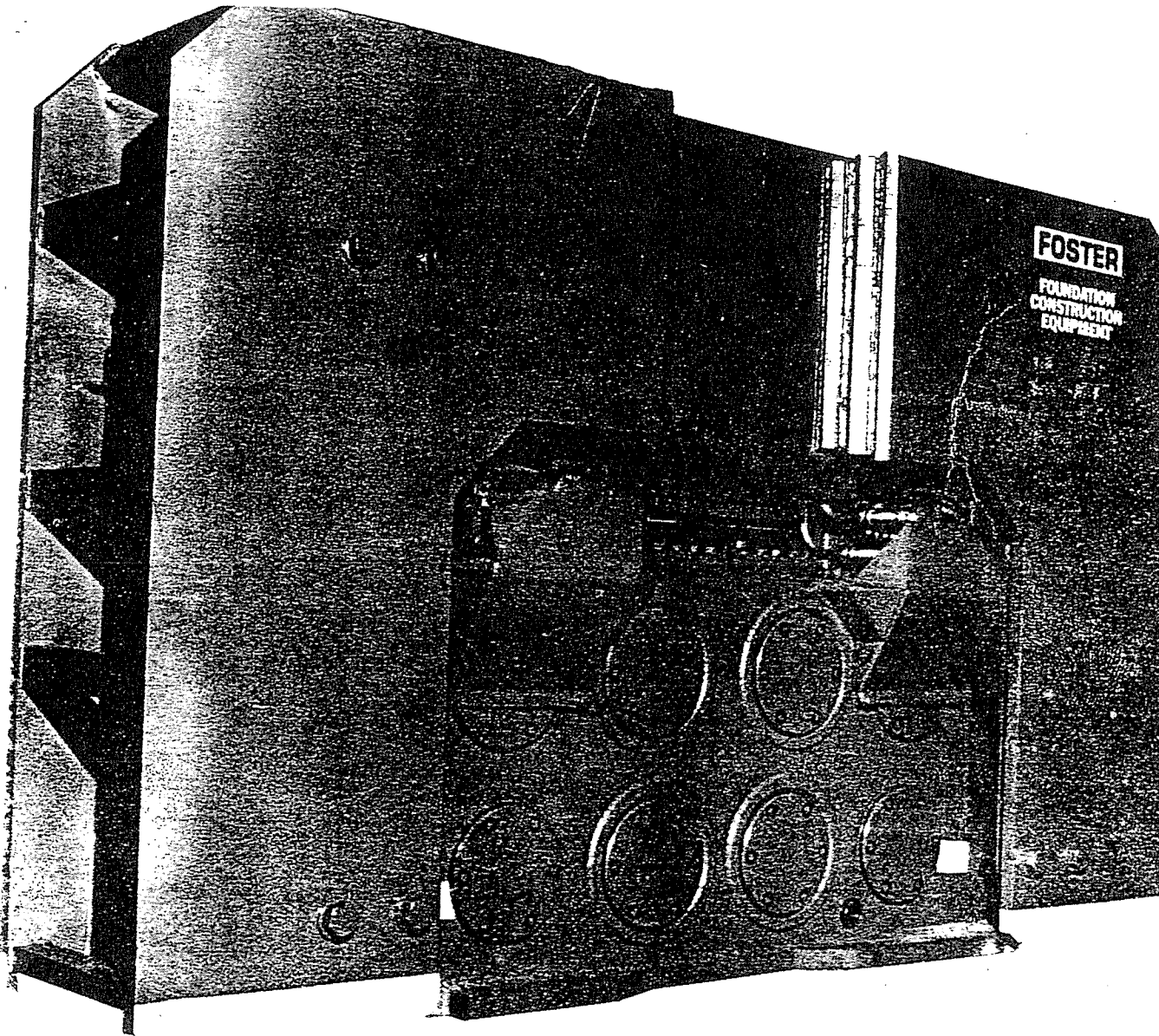


FOSTER

L.B.FOSTER COMPANY

4000
VIBRO DRIVER[®]/EXTRACTOR



OPERATION/MAINTENANCE
MANUAL

L. B. FOSTER
4000
VIBRO DRIVER/EXTRACTOR
OPERATION AND MAINTENANCE MANUAL

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I). GENERAL DESCRIPTION

A). Vibro Driver/Extractor

The Foster 4000 is a low frequency vibrator pile driver designed to drive and extract sheet piling, pipe, timber, and concrete pile, caisson pile, and H, I, and wide flange beams.

The model 4000 operates in a frequency range of 0 to 1400 vibrations per minute to provide maximum pile penetration and extraction rates in a wide variety of soils. Amplitude, the major determinate of pile penetration rate, is governed by the design of the unit and by pile weight and type of soil. Amplitude for the 4000 usually ranges between 5/16 and 1-1/4 inch.

The Vibro/Driver Extractor System consists of two major components - the Drive Extractor itself, with attached driving/extracting head, and the hydraulic power pack with remote control pendant.

The Driver/Extractor consists of two major components - a vibro case, and a suspension case containing a vibration suspension system.

The Vibro case contains eight eccentric weights which rotate in a vertical plane to create vibration. The two hydraulic motors are gear coupled to the eccentrics. The eccentrics and drive shafts are mounted in heavy-duty cylindrical roller bearings. Lubrication is provided by a splash system actuated by the rotating eccentrics and gears.

A unique elastomeric suspension system isolates the suspension case from the vibro case and therefore the crane boom from most vibration.

B). Hydraulic Power Pack

The Hydraulic Power Pack is driven by an Allis Chalmers 25000 Engine. The engine rating is 445 H.P. at 2000 RPM.

The totally enclosed power pack is mounted on a skid type fuel tank sub-base. Located at the rear of the unit is a control panel which houses all operating controls.

and pressure gauges. All 5 hydraulic hoses connect into the power pack below the control panel. The unit utilizes a closed loop hydraulic circuit with rapid response pressure compensation to limit maximum pressure output. A common tank supplies oil for both the hydraulic pumps; one for the clamp in the driving/extracting head and one pump for the vibrator motors. Hydraulic oil temperature is maintained by an oil cooler. The hydraulic system is continually cleaned by 10 micron and 3 micron full flow oil filters.

Control of the output flow is maintained by a hand-held remote control pendant.

C). Driving/Extracting Heads

Various types of driving/extracting heads are available for the 4000 to handle everything from steel sheet piling to the largest caisson pipe. The head bolts to the bottom of the vibrating case and contains one or more hydraulic cylinders to provide up to 200 tons of clamping force. Clamping or unclamping occurs in 5 to 7 seconds.

D). Remote Control Pendant

The Vibro Driver/Extractor is controlled from a hand-held pendant. Switches control clamp and unclamp of the driving/extracting head. A potentiometer controls vibrating speed, and a pressure light indicates that the clamp is closed and vibration can be started.

E). SpecificationsDriver/Extractor

Eccentric Moment	4000 in.-lbs.
Frequency	0 - 1400 VPM
Amplitude	5/16" - 1-1/4"
Pile Clamping Force	100 - 200 tons
Pile Clamping Time	5 - 7 seconds
Working Line Pull for Extraction	45 tons
Oil Capacity - Vibrating Case	5 gals.
Weight with Cable and Hoses	18,800 lbs.
Length	118"
Width	22"
Height	76-1/2"
Throat Width	12"
Maximum Operating Pressure	5000 psi
Maximum Flow	120 gpm
Maximum Output Hydraulic Motors	299 hp

Power Pack

Maximum Pump Pressure	5000 psi
Maximum Flow	120 gpm
Diesel Engine	Allis Chalmers 25000
Engine Power	445 hp at 2000 rpm
Fuel Tank Capacity	125 gal.
Oil Capacity - Hydraulic System	146 gal.
Weight with Fuel	11,160 lbs.
Clamp Pump Pressure	4500 psi
Length	10'8"
Width	3'10"
Height	6'7"

II. PREPARATION FOR OPERATION

A. General

When unloading the Vibro Driver, use extreme care. For your protection, make a thorough inspection of the unit immediately on delivery. In case of any damage or shortage, notify the transit agent at once and have the delivering carrier make a notation on the freight bill.

B. Safety Precautions

Safety is a requirement that must be first in the minds of all people who have occasion to operate equipment. Each job or situation has its own problems which cannot be covered by rules. The following is a general guide to safe operation but your knowledge of standard safety precautions will be your best guide to safety.

1. Never adjust or repair the unit while it is in operation.
2. Never operate the hydraulic power pack when it is not connected to the vibrator.
3. Do not smoke or use open flame in the area of the power pack while refueling.
4. Never store flammable liquids near the engine.
5. When charging or servicing the lead acid batteries, have adequate ventilation and do not smoke or use an open flame in the area, because batteries generate explosive gas during charging.
6. Never operate the diesel engine with the governor linkage disconnected. Hydraulic reactions are not fast enough to control the fuel rack.
7. When operating the power pack in an enclosed area, pipe exhaust fumes out or use an approved method of exhaust condensation in water. Continued breathing of exhaust fumes can be fatal.
8. Remove all tools and rags before restarting after adjustments or repairs.
9. Store oily rags in containers.

REMEMBER ---- SAFETY IS EVERYONE'S BUSINESS

C). Rigging of Vibro Driver/Extractor

A steel wire rope sling must be connected to the support pin of the vibration suppressor. The required strength of this sling depends on the capacity of the crane and the work to be carried out. A safety factor of five or cable capacity of five times the weight to be lifted is recommended.

Attach a safety cable from the crane hook to the Driver/Extractor to hold the unit in case the main sling falls.

D). Connection of Driving Extracting Head

When the Vibro Driver is connected to the crane line, lift the Vibro Driver so that the driving/extracting head can be bolted to the bottom of the vibrating case. All bolts must be in place.

E). Connection of Hydraulic Hoses

1). The vibrator and driving/extracting head are connected to the power pack by five hydraulic hoses.

2). It is important to clean all hose connections with a clean cloth before making connections. All hydraulic lines should be capped immediately after disconnection.

3). Connection of the hoses at the Vibro are color coded. Two 1-1/2" hoses; 1 red, 1 blue, and 1 3/4" yellow hose, and two 3/8" hoses; 1 red and 1 blue. Connections at the Vibro are the high pressure flare type and connections at the power pack are of the quick disconnect type.

4). Color coding for the vibro is as follows:

1 red 1-1/2" - high pressure motor hose

1 blue 1-1/2" - return motor hose

1 yellow 3/4" - drain hose

1 red 3/8" - clamp cylinder hose

1 blue 3/8" - unclamp cylinder hose

5). Make sure that all hose connections are tight.

F). Final Check

1). Check the fluid in the hydraulic reservoir.

2). Check oil level in vibrating case, should be 1/2 level of sight glass.

III). OPERATING INSTRUCTIONS

A). Completion of Set-Up

1). Complete set up as described in Section II.

2). Perform any required maintenance as described in Section IV.

B). Start and Warm-up Engine

1). Before starting the engine, read the engine manufacturer's operating and maintenance instructions carefully. Follow the engine starting, operating and maintenance procedures detailed in the manual.

2). Open all enclosure doors and be sure all pre-start checks have been performed.

3). Turn the main power switch on the control panel to the "on" position, and the "off-on-start" switch to "on".

4). Set the engine speed control (throttle) for idle.

5). Set control pendant potentiometer fully counter-clockwise.

6). Ready light on control panel will indicate when potentiometer is fully counter-clockwise.

7). Press the Murphy switch reset and hold in while simultaneously turning the "off-on-start" switch to start. It will be necessary to hold the reset button in until the engine oil pressure exceeds 30 psi. Release the start switch as soon as the diesel starts.

8). As soon as the engine attains normal operating temperature, adjust the speed control for 2000 RPM.

C. Warming the Hydraulic Fluid

1. The Vibro should not be operated at full speed unless the oil temperature is above 60°F. Check the oil temperature on the thermometer in the oil tank.
2. If temperature is below 60°F. set diesel speed at 1200 RPM and rotate the speed potentiometer to No. 3 on the control pendant to start the vibrator. Operate the vibrator until the oil temperature exceeds 60°F. then full speed operation can be performed.

D. Operation of the Remote Control Pendant

1. The operation of the vibratory driver/extractor is controlled by the remote control pendant. The pendant is connected to the power pack by a flexible electrical cable, which allows operation from any convenient location near the vibrator.
2. The pendant has one switch, one light, and one speed potentiometer.
 - a. To clamp to the pile, place the clamping head over the pile and turn the clamp switch to close position and the clamp light will light when adequate pressure has been obtained to permit vibration to begin.
 - b. To start vibration rotate the speed potentiometer clockwise and adjust vibrating speed to match soil conditions for driving or extracting.

CAUTION: DO NOT START VIBRATING UNTIL THE CLAMP LIGHT IN THE PENDANT COMES ON.

3. To stop vibration rotate the speed potentiometer counter clock wise to its full extreme. The vibration will stop in a few seconds. If counter clock wise rotation of the speed potentiometer does not stop the Vibro Driver/Extractor, pull the engine stop knob and move the control off/on switch located on the control panel of the power pack to off, and refer to the trouble shooting section, Chapter

4. To Unclamp the Pile

WARNING: THE OPERATOR MUST WAIT UNTIL A VISUAL CHECK HAS PROVED THAT ALL VIBRATIONS HAS STOPPED.

Turn the clamp/unclamp switch to the unclamp position and the jaws of the clamp will open so the vibrator can be removed from the pile. The clamp light on the pendant will go out, indicating that the pressure in the line to the clamp cylinder has been released.

E. Shut Down

1. Stop the vibrator and open jaws.
2. Reduce diesel engine speed to 1500 RPM and allow engine to run for 5 additional minutes, then slowly reduce speed to idle.
3. Pull out the engine stop knob.
4. Turn the main power switch to off, and the 12 volt switch to off.
5. If the diesel engine is shutdown while the vibrator is clamped to the pile, the clamp check valves will keep the vibrator clamped to the pile. (WARNING IT IS NOT RECOMMENDED TO LEAVE THE VIBRATOR CLAMPED TO A PILE WHEN THE DIESEL ENGINE IS NOT RUNNING, BECAUSE SYSTEM LEAKAGE COULD CAUSE A LOSS IN CLAMP PRESSURE).

IV. MAINTENANCE

FOR ALL L.B. FOSTER VIBRO-DRIVER EXTRA

✓ A. GENERAL

Preventive maintenance includes normal servicing that will keep the engine, vibro driver/extractor and power pack in the peak operating condition and prevent unnecessary trouble from developing. This servicing is periodic lubrication and inspection of the moving parts and accessories of the unit.

Lubrication is an essential part of protective maintenance, controlling to a great extent the useful life of the unit. Different lubricants are needed and some components in the unit require more frequent lubrication than others. Therefore it is important that the instructions regarding types of lubricants and frequency of their application be closely followed.

To prevent minor irregularities from developing into serious conditions that might involve shut down and major repair, several other services or inspections are recommended for the same intervals as the periodic lubrication. The purpose of these services, or inspections, is to assure the uninterrupted operation of the unit.

Thoroughly clean all lubrication fittings, caps, filter and level plugs and their surrounding surfaces before servicing. Prevent dirt from entering with lubricants and coolants. The intervals given in the schedule are based on normal operation; perform these services, inspections, etc., more often (as needed) for operation under abnormal or severe conditions.

✓ B. DAILY

1. Check the entire Vibro Driver System prior to and during start-up each day or at the beginning of each shift. Prior to starting the diesel engine at each shift check the following items.

2. Driver/Extractor

- a. Visibly inspect all bolts, nuts and screws, including the bolts fastening the driving heads to the Vibro case to insure they are tight.
- b. Check the oil level in the vibro case. The oil level should be in the center of the sight glass. Change oil if milky or black.

✓ 2. Driver/Extractor - Cont'd..

- c. Check the fluid level in the hydraulic reservoir and refill if necessary.
CAUTION: It is absolutely necessary that no dirt or other impurities be permitted to enter the hydraulic system. Any contamination will drastically reduce the life of the high pressure hydraulic system.
- d. Visually check all hose and hose connections for cuts that could cause hose failure during operation. Check all hose connections for tightness.
- e. Perform all daily maintenance checks and lubrication recommended in the Allis Chalmers operating and maintenance manual.

✓ 3. After start up check the following:

- a. Check all hydraulic lines and fittings for leaks.
- b. Check both pumps and manifolds for leaks.
- c. Inspect the indicators for the filters with the oil at operating temperature to be sure the elements do not need changing.
- d. Before operating attach the vibro to the pile, open and close the clamp jaws to ensure proper operation.
- e. Be sure there are no kinks in the hydraulic lines and that they are hanging freely.
- f. Check the lifting cable for fraying.
- g. Inspect the serrations of the gripping surfaces of the hydraulic clamp.
Replace them if worn.

C. 100 Hours

- 1. Drain and refill the vibrating case. Use Exxon (Imperial to Canada) Terresso or equivalent.
- 2. Remove the 10 bearing covers and check the condition of the bearings.
- 3. Perform all maintenance checks and lubrication indicated in the Allis-Chalmers operating and maintenance manual.

D. 1000 Hours

Change the filter cartridge located in the vibro driver/extractor suspensio yoke assembly.

E. SEVERE CONDITIONS

1. The servicing intervals specified are based on normal operating conditions. Operation under unusual conditions, requires some adjustment in servicing intervals.
2. When the average temperature is above 80°F. or below -10°F., reduce servicing intervals to one-half of those specified in Sections B, C, and D. Also, refer to Allis-Chalmers Manual, Topic 5 (F. & G.).
3. When operating in the presence of dust or sand, reduce servicing intervals to one-third, of those specified in Sections B and C. Also, refer to Allis-Chalmers manual, Topic 5-F, and G.
4. When operating in excess of twelve hours per day, reduce servicing intervals to one-half of those specified in Sections B and C. Also, refer to Allis-Chalmers manual, Topic 5-F, and G.
5. When operating in air with high salt or moisture, the servicing intervals need not usually be changed, however, the unit should be inspected weekly to determine if additional servicing might be required.
6. During stand-by or inactive periods, the servicing intervals may be twice those specified in Sections B and C, and D. The unit should be exercised every 30 days or less, depending on conditions. Also, refer to Allis-Chalmers Manual, Topic 5-H.

✓ F. LUBRICATION

1. Diesel Engine

Follow the engine manufacture's operating and maintenance instructions

Recommended crankcase oils are as follows:

Amoco	300
Arco	Fleet 53 Plus
Cities Service	C500
Exxon	HDX Plus
Gulf	Super Duty
Lubriplate	Super G.P.O.
Mobil	Delvac 1330
Phillips	Super HD
Sun	Sun Fleet Diesel Lube or Sunfleet Super C
Shell	Rimula
Texaco	URSA Super 3
Union	Gardol

✓ 2. Vibro Case

- a. When adding or changing oil in the vibro case - care should be taken to insure no dirt or foreign particles enter the transmission.
- b. The recommended oils for the vibrating case are as follows:

SAE 20 non-detergent type

Exxon-Terresso 53

Gulf Harmony 53

Shell Turbo 33

Sun Sunvis 931

✓ 3. Hydraulic Fluid

- a. When adding or changing hydraulic fluid care should be taken to insure no dirt or foreign particles enter the hydraulic system.
- b. Mixing of the two different manufactures oils is not recommended. However if both oils contain the same base and additives it can be done in an emergency situation. Check with oil suppliers on compatibility.

✓ c. It is recommended that the hydraulic fluid be drained and changed at least once a year. It may be necessary to change it more often in severe operating conditions.

Recommended hydraulic fluids are as follows:

Amoco	ATF Type F
Arco	ATF Type F
Cities Service	ATF Type F
Exxon	ATF Type F
Gulf	ATF Type F
Lubriplate	ATF Type F
Mobil	ATF 220
Phillips	ATF Type F
Shell	Donax T-7
Sun	Sunoco Type F Transmatic Fluid
Texaco	Texamatic Fluid Type F
Union	ATF Type F

H. HYDRAULIC CIRCUITY

A. CLAMP

With the diesel engine running, hydraulic fluid is taken from the reservoir through the intake filter to the pump suction. Low pressure oil is directed from the pump discharge to the clamp circuit manifold. If the clamp switch has not been moved, the oil returns to the reservoir through the clamp system directional valve.

Turning the clamp/unclamp switch to the clamp position energizes the clamp solenoid on the clamp/unclamp directional valve. Hydraulic fluid is then directed through the directional valve to the clamp side of the driving/extracting head cylinder. The clamping pressure switch de-energizes the clamp directional valve solenoid at approximately 4500 psi, and the oil flow returns through the directional valve to the reservoir again.

H. HYDRAULIC CIRCUITRY - CONT'D.+A. CLAMP - CONT'D.

Turning the clamp switch on the control pendant to the unclamp position activates the time delay relay which activates the unclamp solenoid. The pressure in the open clamp circuit opens the clamp check valve allowing oil pressure to be relieved from the clamp close cylinder. The clamp then opens. Pressure in the clamping circuit is limited by the clamp pump relief valve to a setting of 4700 psi.

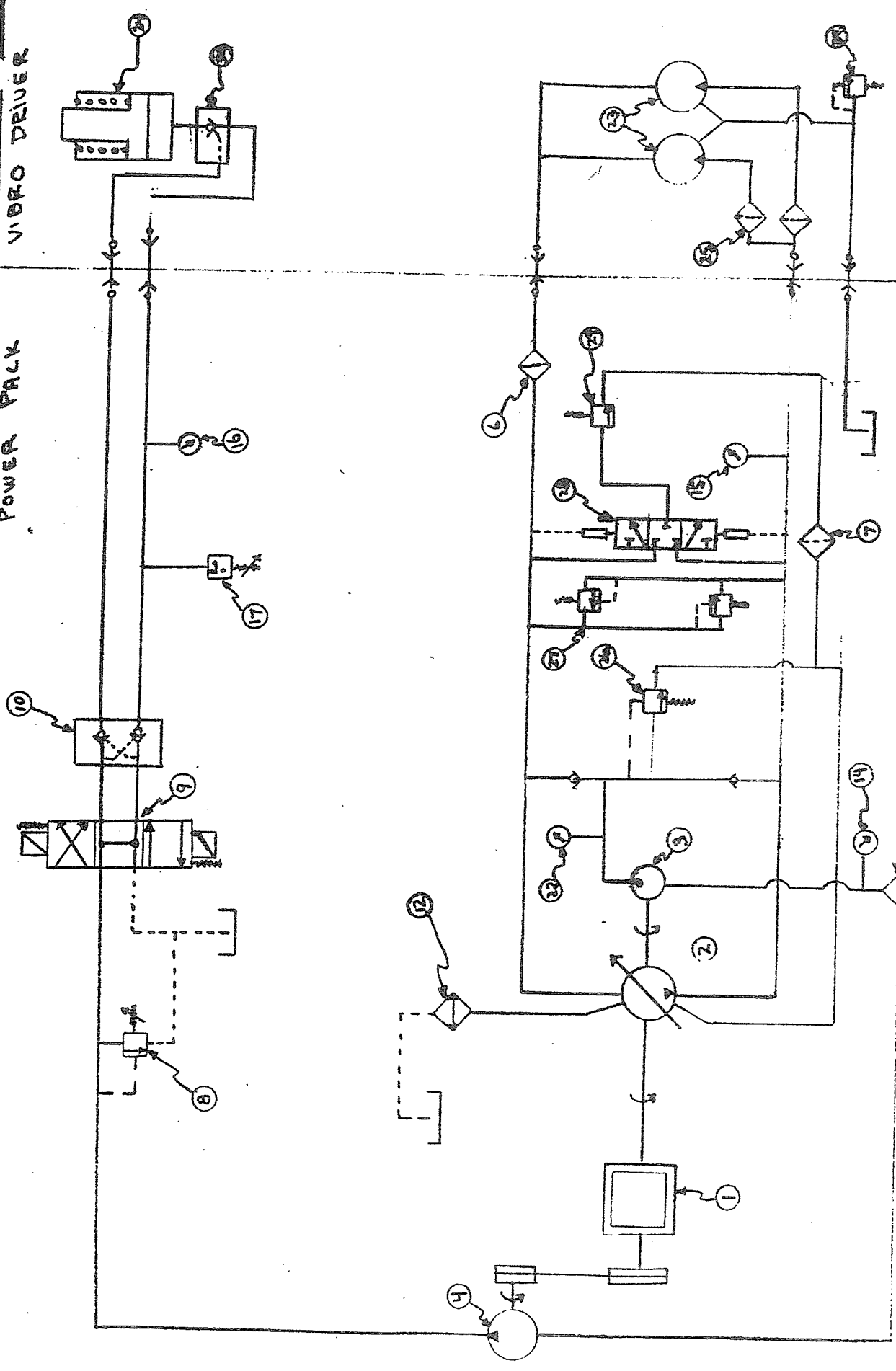
B. MOTORS

With the diesel engine running, hydraulic fluid is taken from the reservoir through the intake filter to the charge pump suction. The purpose of the charge pump is to provide a flow of fluid through the pump and motor cases for cooling purposes, to maintain minimum system pressure, and to supply fluid for control purposes. Charge pump pressure is limited by the charge pump and motor manifold relief valves. Case drain fluid from the motor is filtered to ten microns before entering the pump case. It then passes through the oil cooler before entering the reservoir. The main circuit is a continuous closed loop system. The quantity of fluid flow is determined by pump speed and swash plate angle.

The high pressure main pump section is protected by rapid response pressure compensation and motor manifold relief valves which limit output pressure to 5000 psi.

VIBRO DRIVER

POWER PALK



EQUIPMENT DIVISION
CORAOPOLIS, PENNA. 15108

L.B. FOSTER CO.

1205-C + 4000 HYDRAULIC SCHEMATIC

PROPRIETARY INFORMATION
OF THE L.B. FOSTER COMPANY
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<u>FIND NO.</u>	<u>ITEM</u>	<u>MANUFACTURER</u>	<u>IDENTIFICATION</u>
1	Diesel Engine	Allis Chalmers	25000 Mark II
2	Variable Displacement Pump	Sundstrand	Series 26# (262004)
3	Charge Pump	Sundstrand	2.0 Cubic Inch
4	Clamp Pump	Rivett	PF-2006-1807
5	Intake Filter	Schroeder	ST-2K10-S-C-Y
6	Return Filter	Pall	HH9660E2OUP TBD-02
7	Case Drain Filter	Schroeder	LF-1-1K10-P40-L-D
8	Clamp Pump Relief Valve	Rexroth	DBDS10G10/400/5
9	Clamp Directional Valve	Rexroth	4WE10H4/G24NZ
10	Clamp P. O. Check Valves	Rexroth	Z2S101.2-0-3
11	Clamp Circuit Manifold	Rexroth	VA10B0-53-10, VA10J2-10 VA10F-53-10, VA10F-00-1
12	Oil Cooler	Modine	1E1866C
13	Reservoir		
14	Intake Vacuum Gage	Lenz	BAC 30HG 25RC-FFC
15	Output Pressure Gage	Wika-1PG	Type 213, 4"LBM, U Clam with Bezel, 5000 P.S.I.
16	Clamp Pressure Gage	Wika-1PG	Same as No. 15
17	Clamp Pressure Switch	Rexroth	HED 3.0A
18	Oil Level Gage with Dial Thermometer	Lube Devices	10", Type L-4, G620, Se 1" Dial
19	Filler	Schroeder	ATB-780
20	Breather	Schroeder	ATB-764 3/4"
21	Drain		
22	Charge Pressure Gage	Lenz	BAC-800-25RC-FFC
23	Fixed Displacement Motor	Volvo	FIID-110
24	Clamp Cylinder		
25	Supply Filter	Pall	HH9660F2OUP TBD-02
26	Charge Pressure Relief Valve	Sundstrand	
27	Motor - High Pressure Relief	Sundstrand	
28	Motor Shuttle Valve	Sundstrand	
29	Charge Pressure Relief Valve	Sundstrand	
30	Clamp Pressure Check Valve	Sundstrand	
31	Drain Relief Valve	Sundstrand	

VI). ELECTRICAL SYSTEMA). Starting the Diesel Engine

The batteries provide 24 volt direct current to start the diesel engine. Turning on the main power switch and rotating the control pendant potentiometer fully clockwise, allows relay RI to be energized and closes its related contacts. Power comes from the on-off-start switch through a closed normally open contact of Relay RI to the start solenoid. Turning on-off-start switch to the start position energizes the starter motor solenoid and turns over the diesel engine. If fuel is available the diesel will start. In order to obtain fuel, the fuel solenoid must be energized. This is accomplished by pressing the Murphy Switch reset. This allows power to go from the on-off-start switch through a normally closed contact in the Murphy Safety Switch to open the normally closed fuel solenoid valve. When the valve is energized fuel flows to the diesel and the engine starts.

Four safety controls shut the fuel supply off, stopping the diesel engine in the event a malfunction occurs. The system operates by the use of a Murphy Safety Switch with manual reset. If any safety switch closes during operation (indicating a malfunction) the Murphy switch coil will be energized interrupting current to the fuel solenoid valve and stopping the fuel to the diesel. The relay is energized by the following devices.

- 1). Engine oil pressure - If oil pressure is below 15 PSI, the contacts of the oil pressure safety switch will close, energizing the Murphy switch coil.
- 2). Engine water temperature - if cooling water temperature exceeds 210°F, the contacts of the water temperature safety switch will close, energizing the Murphy switch coil.
- 3). Engine overspeed switch - if the engine exceeds the recommended maximum speed, the over speed switch will close, energizing the Murphy Switch coil.

The over speed switch is located on the front of the engine and is a manual reset via a button on the switch housing

4). Charge oil pressure - if charge pressure is below 75 psi, the contacts of the charge pressure switch will close, energizing the Murphy switch coil. All safety switches are bypassed at start up by the Murphy switch reset.

B). Stopping the Diesel Engine

The diesel engine is normally stopped with the manual fuel control on the control panel. However, the engine may be stopped by turning the main power switch to off which de-energizes the fuel solenoid valve and shuts off fuel to the diesel engine.

C). Closing the Hydraulic Clamp in the Driving/Extracting Head

With the diesel engine running turn the clamp/unclamp switch to clamp position. Power will go from the on-off-start switch through the clamp/unclamp switch to the normally closed contacts of the clamp pressure switch to the relay R2 coil. This allows hydraulic pressure to close the clamp. When the hydraulic pressure in the clamp hydraulic circuit reaches 4100 psi, the clamp pressure switch energizes the clamp line solenoid. The clamp valve will not move until 4500 psi when the pressure switch de-energizes the clamp line solenoid. If the hydraulic pressure in the close clamp circuit drops below 4100 psi the clamp pressure switch will re-energize the close clamp solenoid to rebuild the hydraulic pressure to 4500 psi. When the pressure reaches 4500 psi, the clamp pressure switch will de-energize the clamp close solenoid. This system then maintains between 4100 and 4500 psi in the clamp close hydraulic circuit automatically any time the clamp/unclamp switch is in the detented clamp position.

D). Opening the Hydraulic Clamp

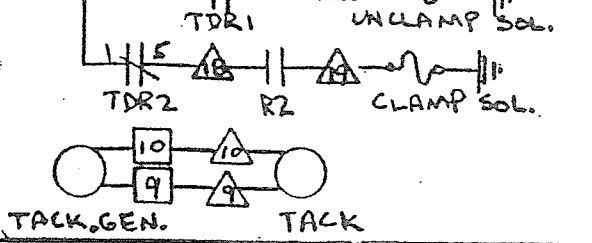
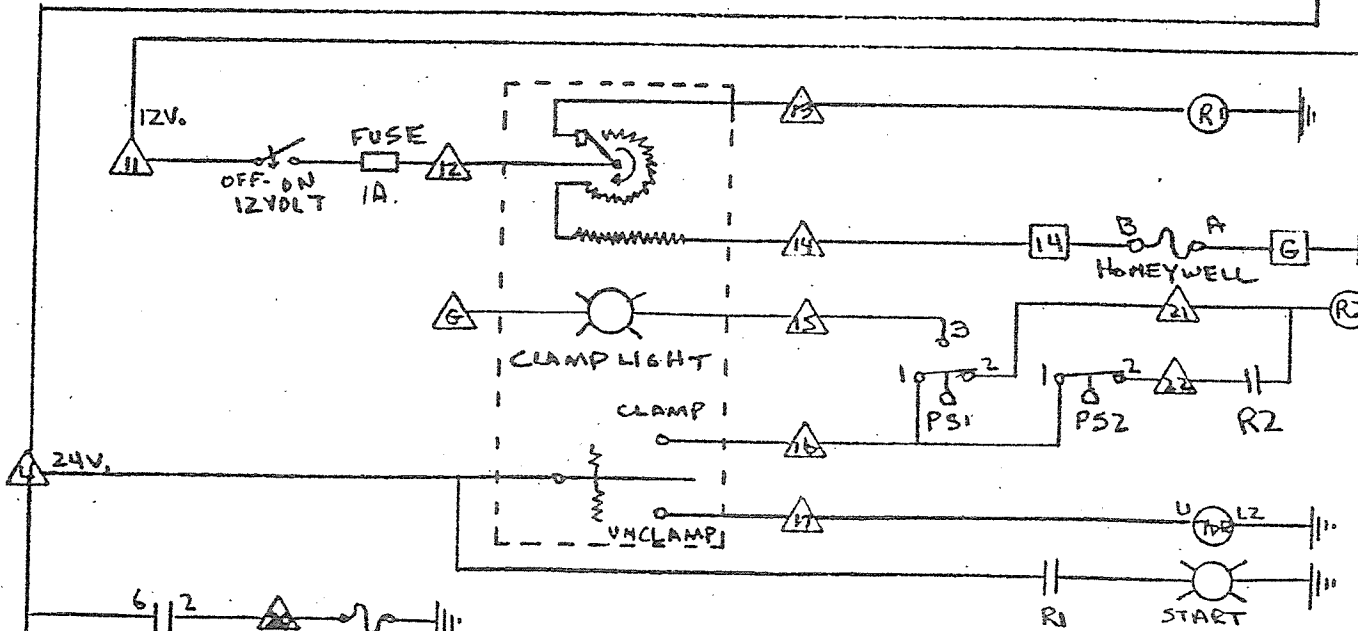
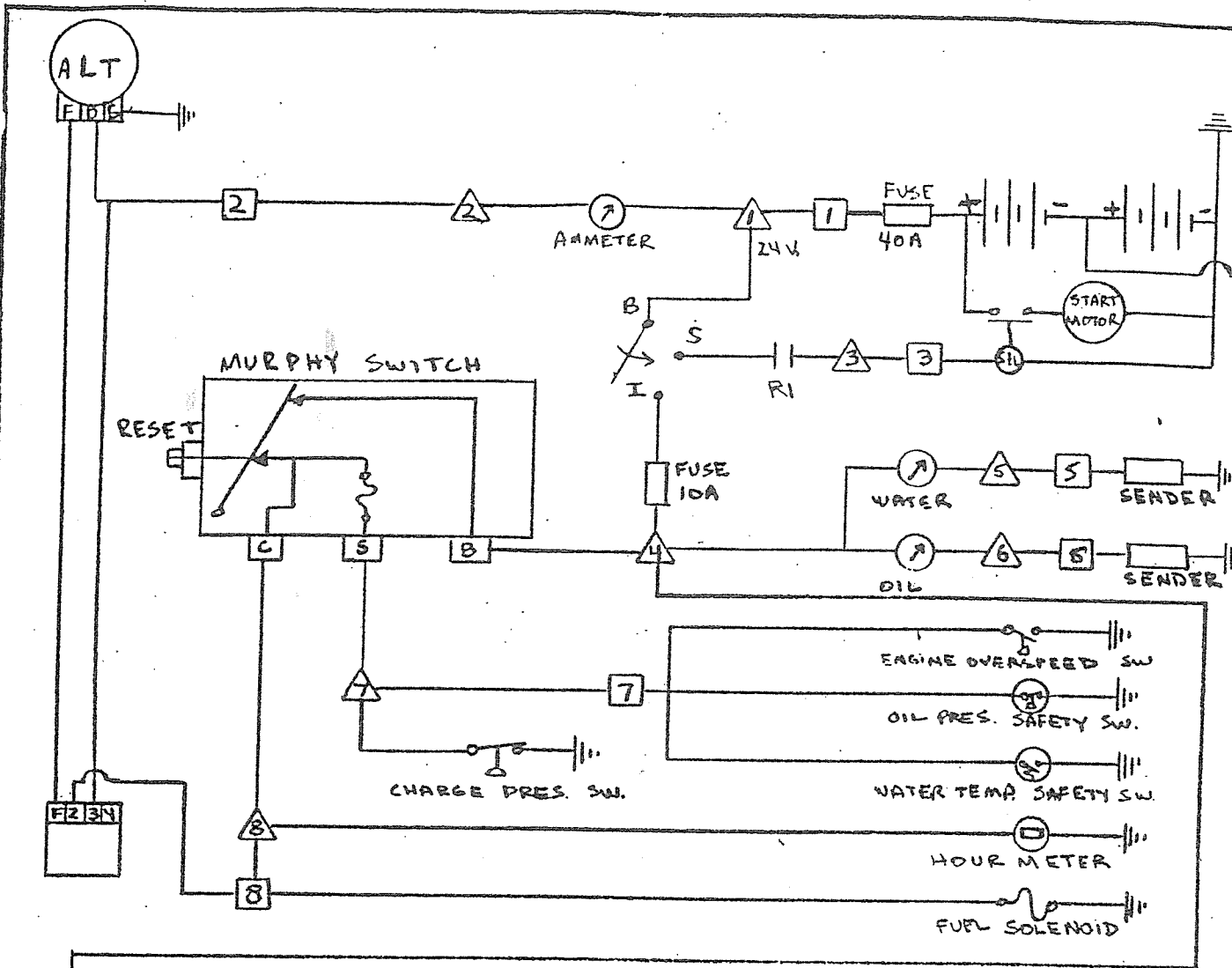
With the diesel engine running, turning the clamp switch to the open position, energizes the time delay relay which closes TDR1 contacts, energizing the unclamp solenoid, opening TDR2 contacts, de-energizing the clamp solenoid if needed. The time delay relay holds the unclamp valve open for about 10 seconds to allow the clamp to fully open. After 10 seconds the TDR2 contacts open de-energizing the unclamp solenoid which centers the clamp valve.

E). Starting Vibrator

With the diesel engine running, rotating the speed potentiometer located in the control pendant allows current to flow to the Honeywell Servo Solenoid. The Honeywell Servo Solenoid positions the swash plate in the hydraulic pump to produce an output which starts the vibrator to operate. By rotating the speed potentiometer clockwise the frequency of the vibrator can be varied from 0 to 1400 vibrations per minute, allowing the operator to best match vibrator frequency to soil conditions for best driving or extracting.

F). Stopping the Vibrator

With the vibrator running, rotating the speed potentiometer fully counterclockwise stops the current flow to the Honeywell Servo Solenoid. This causes the Servo to return the swash plate to the no output position and causes the hydraulic motors in the vibrator to stop.



L.B. FOSTER CO. EQUIPMENT DIVISION
 CORAOPOLIS, PENNA. 15

1205-C WIRING DIAGRAM

DRAWN WMG	DATE 8/19/77	CHECKED	DWG. NO. E-8A-61
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VII. TROUBLE SHOOTING

A. GENERAL

It cannot be repeated too often that 90% of difficulties can be prevented by good periodic lubricating, inspection, and maintenance. The time and energy consumed in so doing is only a fraction of what must be put forth when trouble ties up the operator and his operations. To remedy as quickly as possible any trouble that may develop, the following list of difficulties and trouble shooting charts are provided. If the difficulty cannot be corrected by following the trouble-shooting charts, contact your Foster Representative.

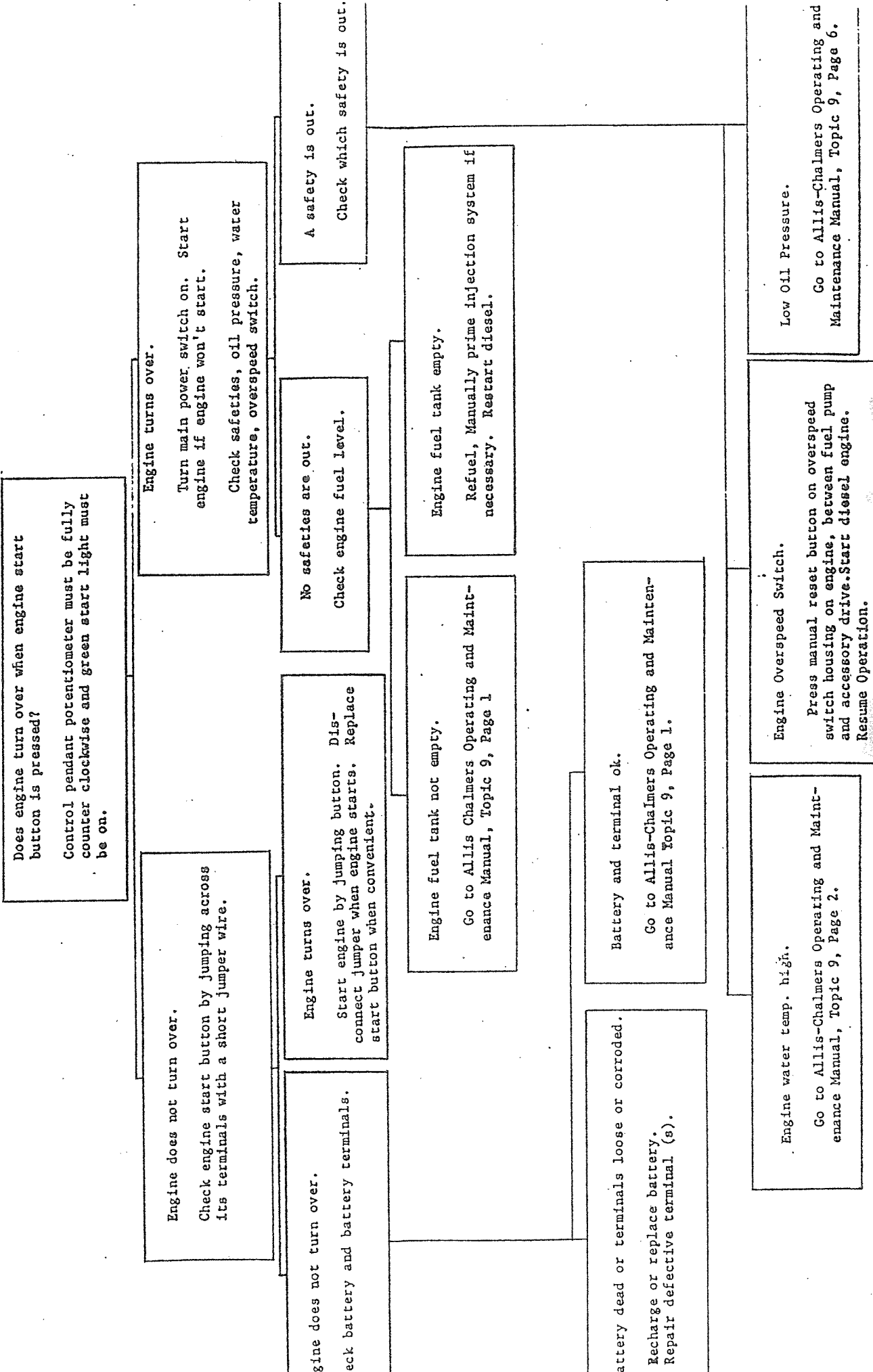
B. DIFFICULTIES:

Trouble shooting charts are provided for the following:

1. Diesel engine will not start - Chart A.
2. Diesel engine does not stop when engine stop knob is pulled - Chart B.
3. Driving/Extracting head clamp cylinder will not clamp when clamp/unclamp switch is turned to the clamp position. Chart C.
4. Clamp light in pendant does not come on when clamp closes - Chart D.
5. Clamp light in Pendant comes on but clamp pressure is below 4000 PSI, - Chart E.
6. Clamp light in pendant blinks off and on. Clamp pressure gage oscillates rapidly - Chart F.
7. Clamp will not open when clamp/unclamp switch is turned to the unclamp position - Chart G.
8. Vibrator will not vibrate when speed control is rotated clockwise - Chart H.
9. Vibrator won't come up to expected speed - Chart I.
10. Vibrator won't stop when speed control is rotated fully counter-clockwise - Chart J.

CHART A

Difficulty: Diesel Engine does not start when start button is pressed.



Does engine turn over when engine start button is pressed?
Control pendant potentiometer must be fully counter clockwise and green start light must be on.

Engine does not turn over.
Check engine start button by jumping across its terminals with a short jumper wire.

Engine turns over.
Turn main power switch on. Start engine if engine won't start.
Check safeties, oil pressure, water temperature, overspeed switch.

Engine does not turn over.
Check battery and battery terminals.

Engine turns over.
Start engine by jumping button. Disconnect jumper when engine starts. Replace start button when convenient.

No safeties are out.
Check engine fuel level.

A safety is out.
Check which safety is out.

Engine fuel tank not empty.
Go to Allis-Chalmers Operating and Maintenance Manual, Topic 9, Page 1.

Engine fuel tank empty.
Refuel, Manually prime injection system if necessary. Restart diesel.

Battery dead or terminals loose or corroded.
Recharge or replace battery.
Repair defective terminal (s).

Battery and terminal ok.
Go to Allis-Chalmers Operating and Maintenance Manual Topic 9, Page 1.

Engine water temp. high.
Go to Allis-Chalmers Operating and Maintenance Manual, Topic 9, Page 2.

Engine Overspeed Switch.
Press manual reset button on overspeed switch housing on engine, between fuel pump and accessory drive. Start diesel engine. Resume Operation.

Low Oil Pressure.
Go to Allis-Chalmers Operating and Maintenance Manual, Topic 9, Page 6.

CHART B

DIFFICULTY: Diesel Engine does not stop when stop knob is pulled.

NOTE: Engine may be stopped by turning main power switch to the off position.

Check at fuel pump to see if cable from the engine stop knob is operating the shut off lever. Make sure shut-off lever is tight on shaft.

Shut off lever operating.

Adjust set screw at shut-off lever to increase travel.

Shut-off lever not operating.

Repair or replace engine stop cable.
After repairs resume operation.

Engine stops.

Resume operation.

Engine does not stop.

Turn main power switch off. Consult with Allis Chalmers dealer or call your Foster Representative.

Clamp pump belts not slipping.

Turn clamp/unclamp switch to unclamp position, wait 10 seconds shutdown diesel engine. Disconnect clamp hydraulic hoses and plug at hydraulic power pack. Start diesel. Turn clamp/unclamp switch to clamp position.

Clamp pump belts slipping.
Tighten belts or replace.
Resume operation.

Clamp pressure gage reads between zero and 4000 PSI.

Refer to Chart C1.

Clamp pressure gage reads zero.

Manually operate the clamp solenoid - go to the clamp solenoid manifold in power pack and press black button on the end of the inboard solenoid and hold for 5 seconds. If button cannot be moved in, clamp directional valve spool is stuck, replace valve.

Clamp pressure gage reads above 4000 PSI.

Clamp hydraulic cylinder in head is leaking internally. Repair or replace after repairs, resume operation

Clamp pressure gage reads zero while clamp close solenoid button is held in.

Refer to Chart C2.

Clamp pressure gage reads above 4000 PSI only while button is held.

In control box jumper from terminal #1 to Terminal #5 on the time delay relay. Turn clamp/unclamp switch to the clamp position.

Clamp pressure gage reads above 4000 PSI after clamp close solenoid button is released.

Refer to Chart C3.

Clamp does not close.

Replace clamp check valve (Item 10) after repairs, resume operation.

Clamp Closes.

Remove jumper wire. Rotate the adjusting knob on the time delay relay back and forth while holding clamp/unclamp switch in the clamp position. If no settings work replace time delay relay. Temporary operation can be performed by jumping from terminal #1 to terminal #5 on the time delay relay. Clamp/unclamp switch must be then held in the unclamp position until clamp is fully opened.

CHART CI

Clamp pressure gage reads between 0 & 4000 PSI. Go to the clamp solenoid manifold and press the black button on the end of the inboard solenoid. If button cannot be moved in, directional valve spool is stuck, replace valve. Observe clamp pressure

Pressure remains the same. Readjust or replace the clamp relief valve to 4700 PSI and repeat the above procedure.

Pressure goes up.
Readjust or replace and adjust the clamp pressure switch to 4500 PSI.

Pressure does not go up.
Replace the clamp directional valve.
Resume operation.

Pressure goes up to 4500 PSI.
Resume operation.

Pressure goes up to 4500 PSI.
Resume Operation.

Pressure does not go up.
Replace the clamp pump.
Repeat the above procedure.