Technical Manual

ORDERING PARTS

The Parts Book covering this machine gives complete information on how to order parts. Order carefully so that the right parts in the right quantities can be furnished. Wrong parts, ordered by mistake, which are returned to the company are subject to a rehandling charge.

FURTHER INFORMATION

If further information is required which is not found in the Manual or in the Parts Books, communicate with the Marion Power Shovel Company, Inc., at Marion, Ohio.

CHARGE FOR SERVICE, LABOR, ETC.

No charges for service or labor are accepted unless the work has been previously authorized by the company in writing.

STANDARD WARRANTY

Marion Power Shovel Company, Inc. guarantees the equipment manufactured by it to be free from defects in material and workmanship under normal use and service, its obligation under this warranty being limited to making good at its factory any part or parts thereof manufactured by it which shall, within six (6) months after delivery to Buyer, be returned to it, with transportation charges prepaid, and which its examination shall disclose to its satisfaction to have been thus defective, this warranty being expressly in lieu of all warranties, express or implied, and of all other obligations or liabilities on Marion Power Shovel Company's part.

Marion Power Shovel Company, Inc. shall not be held responsible or liable in any event for special or consequential damages, arising from any cause whatsoever, and Buyer agrees to indemnify and save Marion Power Shovel Company, Inc. harmless therefrom.

Marion Power Shovel Company, Inc. makes no guaranty or warranty, express or implied, as to adequancy, fitness, quality, or performance of any machinery, equipment, apparatus or accessories not manufactured at its own factory,

CODE	NAME	DESCRIPTION
GL	Enclosed Gear Case	SAE 90 and 140 E.P. grades generally recommended for winter and summer operation. Use of as heavy a grade product compatible with the system and ambient temperature is preferred. Special products may be required for sub-zero operating conditions. It has been our experience that gear oils containing leaded type E.P. additives and conforming to our standard and AGMA Standard 252.01 provide optimum performance characteristics. Gear oils meeting MIL-L-2105B and API service GL-5 have proven satisfactory for enclosed gearing on intermediate size machines. USES - Enclosed gears, by splash or circulating systems.
PO	Pneumatic Oil	Petroleum oil especially compounded for use in air line oilers or built in lubricators having the correct viscosity, low pour point, emulsifying ability, film strength and free of deposit forming tendencies. It should not cause swelling or deterioration of rubber or leather seals and gaskets.
HO	Hydraulic Oil	Premium quality petroleum based oils of inherently high viscosity index containing effective rust and oxidation inhibitors and antifoam additives. They must have suitable low pour points for operation in sub-zero ambient temperatures and may or may not contain anti-wear additives. They shall not cause swelling or deterioration of rubber or leather packing and seals, and must be suitable for use in hydraulic leveling, steering and power transmission systems.

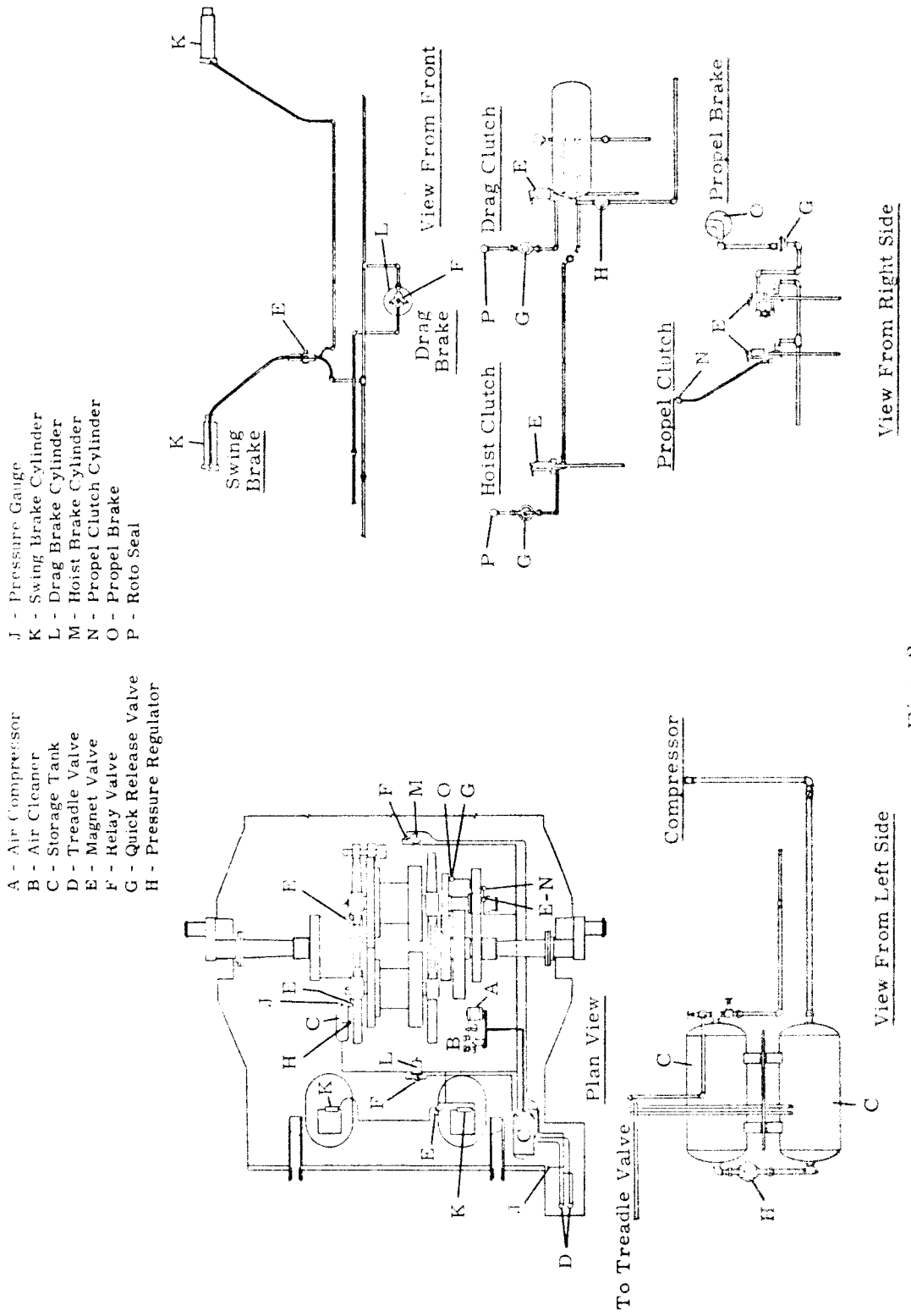

Fig. 2

SCHEMATIC OF AIR SYSTEM

screws (E) so that the clearance between the brake shoes and the brake housing is the same at both sides of the brake housing.

The brake lining should be replaced when less than 3/8" of the lining remains.

HOIST AND DRAG MACHINERY

The hoist and drag drums are powered by an electric motor through a double reduction gear case.

HOIST AND DRAG GEAR CASE

The hoist-drag gear case consists of three shaft assemblies enclosed in an oil tight case. The input shaft is connected to the electric drive motor by a flexible coupling, consisting of a shaft and herringbone pinion attached to the shaft with a special key. The input shaft is supported by two cylindrical roller bearings.

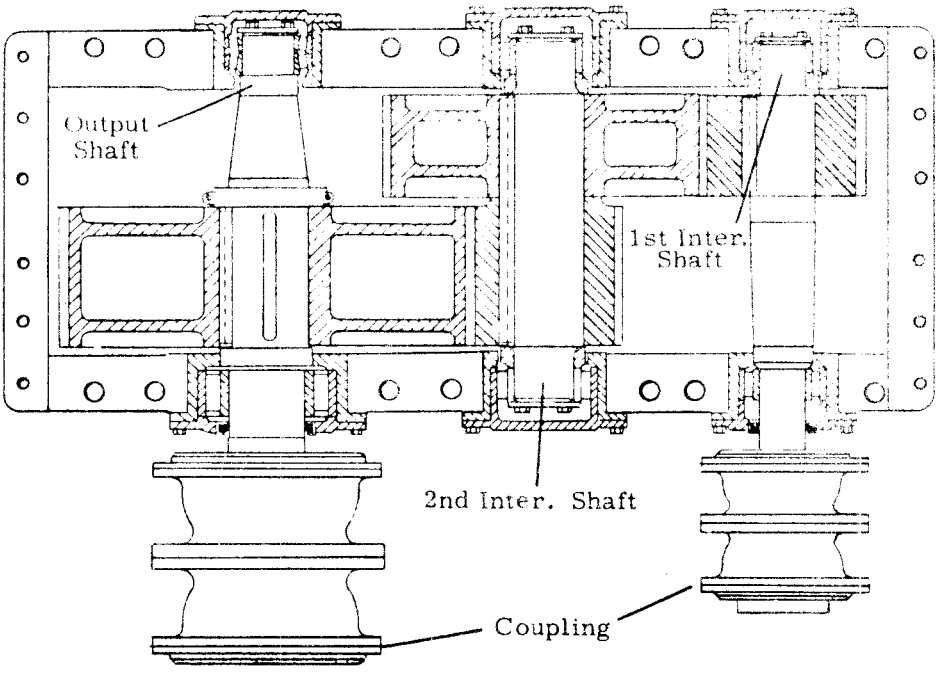

Fig. 12

HOIST AND DRAG GEAR CASE

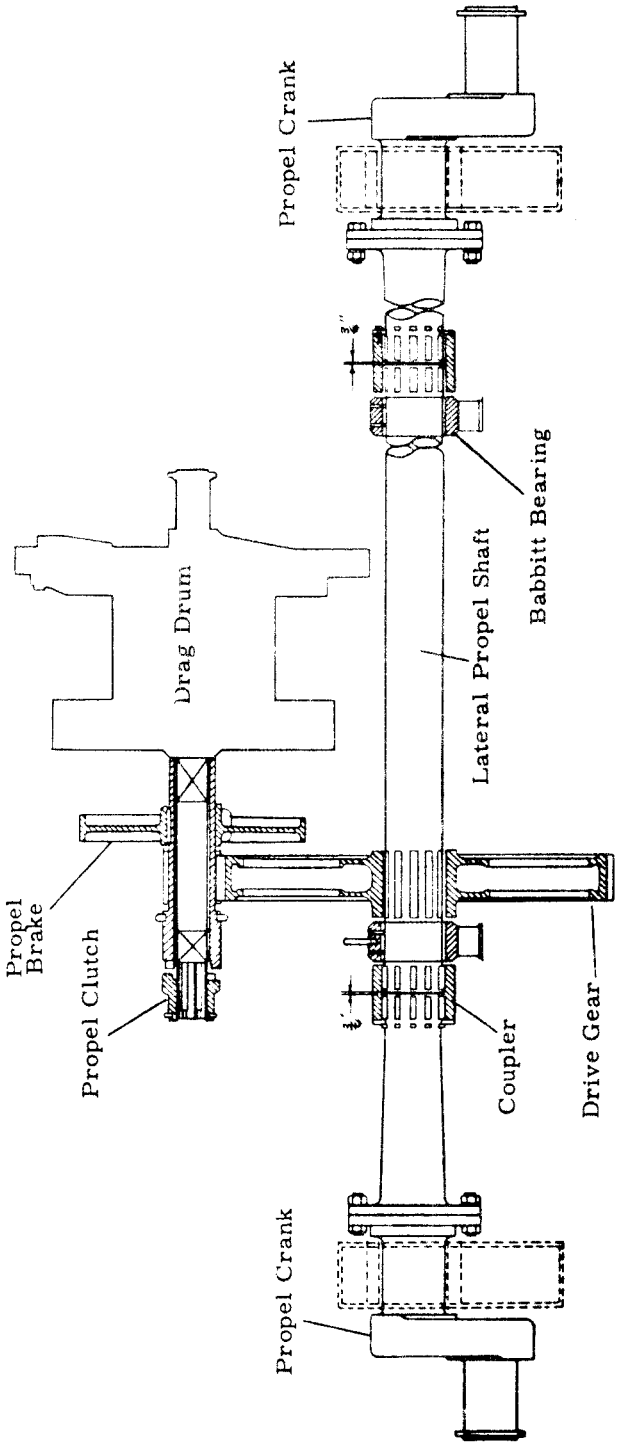

Fig. 17
PROPEL MACHINERY

Raise the boom by operating the boom hoist. Raise the boom a few feet off the cribbing and test the boomhoist brake. Be sure the boomhoist and brake will hold the boom before lifting the boom into working position.

As the boom is raised by the boomhoist, pull in on the pilot line to keep the slack out of the safety rope reeving. When the boom has reached proper working angle, shut off the boomhoist motor and set the boomhoist brake. Pull up on the safety rope (pilot line) enough so there is only noticeable more sag in the safety rope than the boom hoist rope. The load of the boom and the bucket must be carried by the boom hoist rope only.

When the safety rope is in the proper position, tie off the safety rope to the length of rope welded to the left front gantry leg. Use six cable clamps, spaced 6" apart. Recheck the sag in the safety rope with a loaded bucket suspended from the boom point. It may be necessary to boom up slightly to accomplish the proper adjustment.

REPOSITION OF BOOM HOIST AND SAFETY ROPE

Experience has shown the most likely point of failure of the boom hoist or safety rope to be the area at, or adjacent to, the dead end anchor or at the tangent of the rope and boom hoist sheaves. This is the point of greatest deflection.

The movement of strand against strand will dislodge the lubricant and allow moisture to penetrate the ropes. This will cause deterioration of the rope core. To prevent this condition, the rope should be kept coated with wire rope lubricant (WRL) and the ropes should be repositioned at regular intervals to distribute the wear more evenly along the rope.

To reposition the boom hoist rope, lower the boom onto the safety ropes. Pay out from the boomhoist drum several feet (about 10') of rope. Remove the cable clamp at the dead end anchor and pull the rope through the reeving toward the dead end anchor. Cut off about 4' to 6' of boom hoist rope. Seize

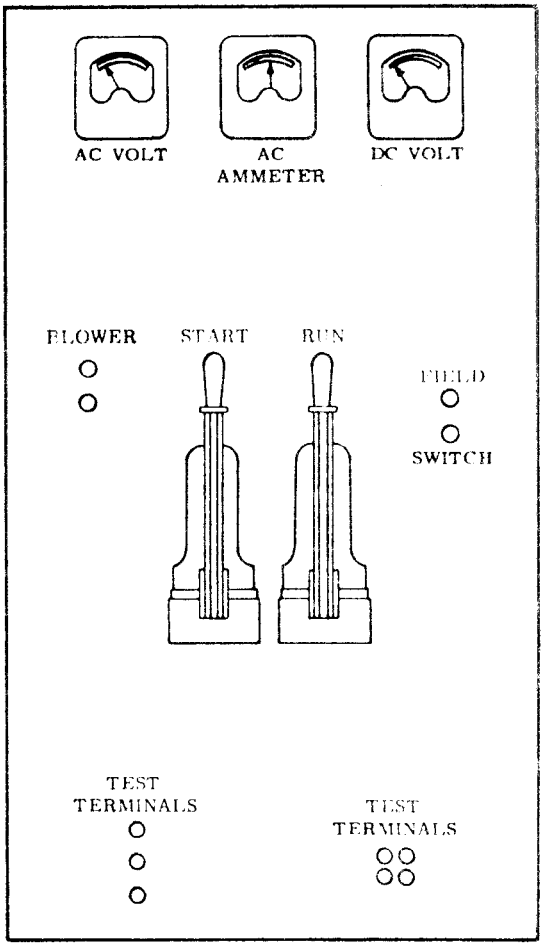

Fig. 27
MAIN AC CABINET

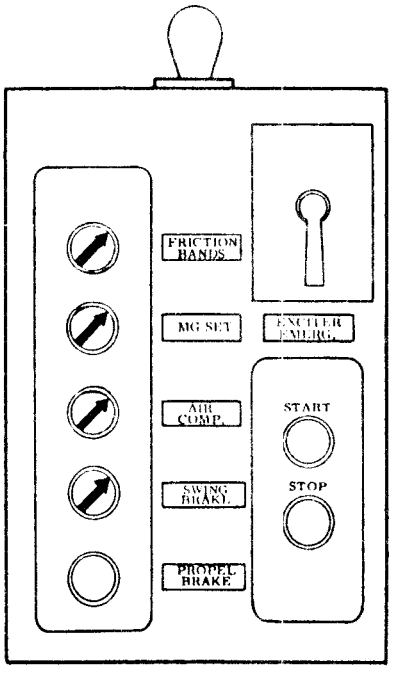

Fig. 28
OPERATOR'S
CONTROL BOX

CHECK LIST

Before initial start up of the machine, make a careful inspection of the machine.

Note especially the following items:

The machine should be thoroughly cleaned. All loose pieces removed or stowed in proper compartments.

Remove all grease spills and wipe grease accumulation around bearings and gears.

All grease piping must be filled and lubricant supplied to all bearings.

Check the oil level in all gear cases and all filter elements installed.

Open or semi-enclosed gear teeth properly coated with lubricant.

Make sure all guards, handrails, cover plates and other protective devices are in place and secure.

Recheck all brake adjustments.

Check all hold down bolts, all bolts tight with proper locking devices.

Check lubricant supply in all automatic lubrication system.

Check boom suspension ropes.

Make sure power source is properly grounded, overload and thermal breakers operative.

Be sure all electrical terminals are tight and wiring harness secure.

Check ventilating system blowers, fans, etc.

Check air system anti-freezer unit.

measure the separate and the self field currents of the generator being adjusted and in this case the 50 and 15 ampere shunts listed above are to be used. The proper shunt is inserted in the circuit where called for in the following instructions.

It should be noted that the 60 millivoltmeter and shunts are standard for all Ward-Leonard generator adjustments.

When adjusting the generator for the stall current and no-load volts, it is necessary that all the readings be taken with the generators hot or the temperature equivalent to normal operating conditions. It has been found from actual field experience that the stall current readings will vary approximately 10% from cold to hot conditions.

It is possible to warm the generator to a temperature equivalent to operating conditions by short circuiting the generator armature, opening the controller and keeping 50 to 70 per cent of the stall current on the generator until the desired approximate temperature is reached. This temperature can be easily determined by the feel of the amount of radiation of heat from the generator armature by a competent electrical man. If necessary, the generator can be stopped and the temperature of the armature taken by thermometer. This temperature is suitable if it is between the range of 30° to 50° rise above ambient temperature.

It is very difficult to obtain the exact operating temperatures on the generators during test so the recommended procedure is to warm the generators as described above to a suitable temperature and then make the preliminary adjustments. After the machine has been placed in operation and has operated for three or four hours in good fast digging, it is well to stop the machine on a day when all the electrical equipment is at operating temperature and make final adjustments of the stall currents and no load voltages.

At this point, it is well to insert a word of caution as to the application of the short circuit current on the generators when warming the generators and also when making the final stall settings. DO NOT hold the controller in the full on po-

oil pumps rotating, but the power is cut off before they pick up speed. By visual inspection of the oil pump and of the blowers, the direction of rotation can be determined.

The direction of rotation of the swing gear oil pump should be such that the oil drains into the pump through the line from the lower part of the gear case and is forced out the pump through the pipe that leads to the top of the gear case, thus running the oil down through the bearings and over the gears. It is to be emphasized at this point that the swing gear oil pumps should not be run with reverse rotation as severe damage will result to the oil seals of the pump itself.

The rotation of the blowers should be such so that the blades of the portion of fan directly over the spout that leads into the mill motor are rotating in the direction toward the motor to which the spout is attached, thus forcing the air into the mill motor. If the rotation of the motion of the blower units should be reversed, it may easily be corrected by reversing any two of the loads at the blower motor itself.

3. Turn the selector switch marked "Air Compressor" in the operator's cab to the "On" position and the direction of rotation of the motor should conform to the direction of the arrow marked on the flywheel of the air compressor. After the direction of the motor has been checked, the air compressor should be allowed to build up pressure and the setting of the pressure switch adjusted to cut out at 115 pounds and to cut in when the pressure has been reduced to 95 pounds. (See Air Compressor Instructions in Repair Parts Catalog).

4. The direction of the large cab ventilating fan at the rear of the machine can be easily checked by momentarily closing the manually operated motor starting switch located along side the large double doors at the rear of the machine. If the direction of either the ventilating fan or air compressor motor should be reversed, they may be easily corrected by reversing any two of the leads to that motor.

The resistance should be shorted out by inserting a short jumper between the selected terminals on terminal board, or several jumpers between combinations of terminals. If it is necessary to short out a minimum value of resistance, smaller than any single step value between any two terminals on the terminal board, it is sometimes possible to parallel two of the steps of resistance at the terminals and thus obtain the minimum step of resistance required.

It should not be necessary during any of the tests to make changes in the internal connections of the resistor, but if so, it can be simply done by loosening the two bolts holding the resistor frame in the rack and sliding the whole frame of resistance out to work on. The change can be made by adding jumpers between the taps on the bars themselves or by paralleling sections of the bars themselves, using the same method explained in the above paragraph.

8. Record the separately excited field amperes when the correct stall current is set. The separately excited field amperes should be approximately as specified on test sheet.

9. Check the value of stall current and the separately excited field amperes in the opposite direction of the control. These should check with the values previously taken in 7 and 8.

10. Adjust the propel stall by turning the hoist-propel transfer switch to propel and by moving the lead P from the propel contactor toward HVO until the recommended value is reached with the hoist-drag controller in the full-on drag position.

11. Record the propel stall current and record the separately excited field current at stall.

12. Return the hoist-drag controller to neutral, turn transfer switch to hoist and stop the M-G set.

13. Stop the M-G set.