Technical Manual

Resistance of CR1-CR4 and CR1-CR5	3.6 Ohms
Resistance of CR2-CR3	288 Ohms

Figure 1 shows the direction of current flow and the voltages measured when crowding "out" with 80 amperes (less than cut-off current) flowing. The circuit for crowding "in" would be the same except that the bias voltage would be across resistor CR1-CR4 instead of across resistor CR1-CR5 and the current and voltage directions would be reversed.

With these conditions, the following readings would be obtained:

Generator Current	80 Amperes
Generator Voltage	575 Volts
Voltage from CR1 to CR5 (crowd out)	7.1 Volts
Voltage from CR1 to CR4 (crowd in)	7.1 Volts
Voltage from CGC2 to CMC1	4.5 Volts

The voltages from CR1 to CR5 and from CR1 to CR4 are obtained from the main generator voltage through rectifiers. These voltages are called "bias voltages". The bias voltage will be across CR1-CR5 for one direction of rotation and across CR1-CR4 for the other direction of rotation. The voltage across CGC2-CMC1 is due to the generator current flowing through the generator series and commutating fields and the motor commutating field. This voltage is called the "current-limit voltage".

As can be seen from the diagram, the bias voltage and current-limit voltage are connected so as to oppose each other. The voltage across the current-limit circuit (CR16 to CAF6) will be the difference between the bias voltage and the current-limit voltage.

Under the above conditions, crowding out, the voltage across CR1-CR5 is greater than the voltage across CGC2-CMC1, and current will try to flow through the current-limit field from CAF5 to CAF8. This current cannot flow, however, since it is blocked by the rectifier between CR5 and CR16. Therefore, there will be no current-limit field current.

The same will be true when crowding in except that the current will be blocked by the rectifier between CR4 and CR16.

Figure 2 shows the direction of current flow and voltages measured when crowding "out" with 200 amperes (greater than cut-off current)

If rotation is wrong, reverse any two leads to the motor. Repeat this procedure for the swing and crowd blower motors.

f. Check the connections to the lower frame oil pump motor and the solenoid steering valves. The propel clutch limit switch must be blocked so that its contacts are closed.

Momentarily close the Propel Brake selector switch on the control station and see that the oil pump motor turns in the proper direction. If it does not rotate in the proper direction, reverse according to the instructions given on the motor.

CAUTION: Do not run this motor backward very long as the pump may be damaged.

With the pump motor connected for proper rotation, connect the A.C. voltmeter across the propel brake solenoid valve. This solenoid valve should be energized when the Propel Brake selector switch is turned to "Release".

With the Propel Brake selector switch closed, connect the A.C. voltmeter across the left hand steering solenoid valve and see that this solenoid is energized when the steering selector switch is turned to "Left". Repeat for the right hand solenoid valve.

Remove the block from the propel clutch limit switch.

g. Start the blowers and reset the undervoltage device by pressing in on the U-shaped plunger beside the oil circuit breaker handle. Momentarily start the motor-generator set (M.G. set) by closing and quickly opening the oil circuit breaker (O.C.B.). See that the M.G. set runs in the direction indicated on the nameplate. If direction is not correct, reverse any two leads to the main motor.

CAUTION: It is very important that the motor generator set does not run backward for any appreciable time.

h. Start the motor generator set and connect the low-reading voltmeter across the main fuses on the D.C. panel. Set the voltage by adjusting the resistor EX1-EX2 to obtain the correct exciter voltage, as shown on the attached curve. It is necessary to determine the temperature of the thermal magnetic shunt which is located between two main poles on the exciter. Knowing the temperature, the correct exciter voltage can be found from the attached curve.

NOTE: If the exciter has been idle and is at room temperature, the room temperature can be used for making the exciter voltage adjustment.

The settings are all based on 125 volts excitation so it is necessary to check the exciter voltage from time to time while

Maximum hoist motor speed raising empty bucket.
Maximum swing motor speed.
Maximum crowd motor speed crowding-in.
Maximum crowd motor speed crowding-out.

17. Trouble Shooting

Since this type of control is new to many electricians, the following list of possible failures and the results of the failures is added as a guide. The equipment is designed and wired to give a minimum of trouble, but failures are bound to occur occasionally.

a. Open current-limit circuit, due to open generator or motor taps, open field or open resistor will cause a very high stall current and serious arcing of the generator and motor brushes.

b. Shorted current-limit rectifiers (between R17 and R4 or between R17 and R5) will result in a high generator voltage at low currents, but normal generator voltage with high currents. This would cause higher speeds and possibly arcing of the brushes with light loads.

c. Open control field circuit due to open field, open resistor or faulty controller will make the motion inoperative.

d. Open anti-hunt field or capacitor will cause the motion to hunt or oscillate.

e. Shorted anti-hunt capacitor will make the motion slow.

f. Faulty amplidyne short-circuiting brushes may make the Amplidyne self energizing and cause the motion to drift, even with the LE contactor open.

CAUTION: If this trouble should occur, the operator must stop the Amplidynes and M.G. set as soon as possible.

D. Solenoid Valves on the Lower Frame

The solenoid is simply an electro-magent arranged mechanically and controlled electrically to actuate lever assemblies. On the A.C. solenoid used on the lower frame propel brake control, it is important that the plunger seats properly or the coil will burn out due to overload. The current through an A.C. solenoid varies with the position of the plunger. When the plunger is fully extended, the current is high, but when it is seated, the current is low. Since the coil is designed to carry continuously only the current taken when the plunger is seated, it immediately becomes apparent that the plunger must be seated when the coil is energized.

It is suggested a spare coil be kept in stock or if uninterrupted service is highly important, a complete solenoid should be carried. In case of coil burn-outs, the complete solenoid can be replaced or new coils installed quickly.

Failure of a solenoid after a short term of operation is almost certain to indicate either excess voltage or excess load applied to the solenoid. These two points should be investigated while the repair is being made and before the valve is again put on the line. The voltage can be checked by the customary methods.

Any solenoid overload must necessarily come from the valve, therefore the pressure should be cut off, piston removed from the valve and thoroughly cleaned, the bore of the valve cleaned, then the valve assembled, making sure all pins and bearings are free. A solenoid must never be overloaded by applying heavier springs to off-set sticking.

Should the valve fail to close at any time, it should first be determined if such failure is due to dirt or any sticky substance in the valve or pin joints. If not, it may be due to continued spring flexing and a new spring will be required. Excess leakage is significant of worn parts and replacement is necessary when this occurs.

E. Feeder Cable

Where 2300 volts and above is used, a feeder cable that contains provision for a ground connection should be used. The power line end must be grounded (see paragraph on ground circuits) to a suitable permanent ground. The end at the shovel must be securely grounded through a bolted connection to the shovel frame. This will always provide a ground for the shovel and electrical equipment. Failure to do this endangers the life of workmen and equipment.

In making a temporary repair job on a feeder cable after splicing the main and ground conductors, proceed as outlined below:

1. Clean and coat insultation and copper with a good grade rubber cement.

POUR COMMANDER DES PIECES

1-9 Le manuel de pièces de rechange donne toutes les instructions pour la commande des pièces. Les pièces commandées par erreur donnent lieu à des frais de manutention.

RENSEIGNEMENTS COMPLEMENTAIRES

1-10 S'adresser à Marion ou à l'agent local.

FRAIS DE MAIN D'OEUVRE

1-11 La compagnie ne les accepte pas sans que l'autorisation écrite en ait été donnée au préalable.

GARANTIE STANDARD

1-12 La compagnie Marion garantit l'équipement fabriqué par elle de tout défaut de matériau ou de fabrication sous réserve d'utilisation normale du matériel. Cette garantie se limitant au remplacement ou à la réparation de toute pièce retournée à l'usine aux frais de l'acheteur dans un délai de six (6) mois après livraison à l'acheteur, cette pièce ayant été reconnue défectueuse par Marion. Les clauses de cette garantie annulent toute autre clause de garantie impliquée ou expliquée lors des transactions. La compagnie Marion ne garantit en aucune manière toute pièce non manufacturée à l'usine Marion. La compagnie Marion ne saurait être tenue pour responsable de dommages quelle qu'en soit la cause.

MESURES DE SECURITE

1-13 Cette machine peut remuer une montagne, mais peut tout aussi efficacement démolir un camion. Elle dépend uniquement de son conducteur. Celui-ci doit penser sécurité et agir de la même façon.

ORDERING PARTS

1-9 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

1-10 If further information is required which is not found in this Manual or in the Parts Book, communicate with the Company at Marion, Ohio.

CHARGES FOR SERVICE, LABOR, ETC.

1-11 No charges for service or labor are accepted unless the work has been previously authorized by the Company in writing.

STANDARD WARRANTY

1-12 Marion Power Shovel Company 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 other warranties, express or implied, and of all other obligations or liabilities on SELLER'S part. Marion Power Shovel Company makes no guaranty or warranty, express or implied, as to adequacy, fitness, quality, or performance of any machinery, equipment, apparatus or accessories not manufactured at its own factory, which are subject only to such guaranty as may be made by the respective manufacturers thereof. Marion Power Shovel Company 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 SELLER harmless therefrom.

SAFETY PRECAUTIONS

1-13 This machine can move a mountain or, just as efficiently, demolish a truck. Its safety and usefulness depend entirely on the man at the controls. The operator is its brains. HE MUST THINK SAFETY AND WORK SAFELY.

ALVES MAGNETIQUES

25 Des valves magnétiques sont utilisées sur cette achine pour commander le relâchement des freins cavage, de levage et d'orientation .

26 Ces valves sont normalement fermées. Lorsqu'elles sont pas sous tension elles ferment la communication tre le réservoir et le cylindre, et ouvrent l'échap- ment du cylindre.

27 Lorsque la valve est sous tension, le cylindre t sous pression et l'échappement est fermé.

28 Les valves magnétiques sont robustes. Si l'air passe pas, la valve doit être nettoyée. L'ouvrir la fermer plusieurs fois à la main à l'aide du levier tué à son sommet. La valve peut être nettoyée de tte manière sans démontage. Sinon démonter et mplacer éventuellement les parties abimées.

29 Appliquer une couche de graisse au zinc nperméable avant remontage.

MAGNET VALVES

2-25 Magnet valves are used on this machine to control the air pressure which releases the crowd brake, hoist check brake and the swing brake.

2-26 These magnet valves are normally closed. When de-energized the valve will shut off the air pressure from the supply tank to the cylinder and open the ports from the cylinder to the exhaust.

2-27 When the valve is energized, the plunger moves down to close the exhaust port and admit air pressure from the supply tank to the cylinder.

2-28 Magnet valves are rugged and require little attention. If the valve fails to admit the proper volume of air, the valve should be cleaned. Open and close the valve several times by means of the hand lever on the top of the valve with full tank pressure. The valve can usually be cleaned this way without disassembling the valve. If not, dismantle the valve, clean and replace worn or damaged parts.

2-29 Apply a good grade of zinc base waterproof grease sparingly to parts before assembling.

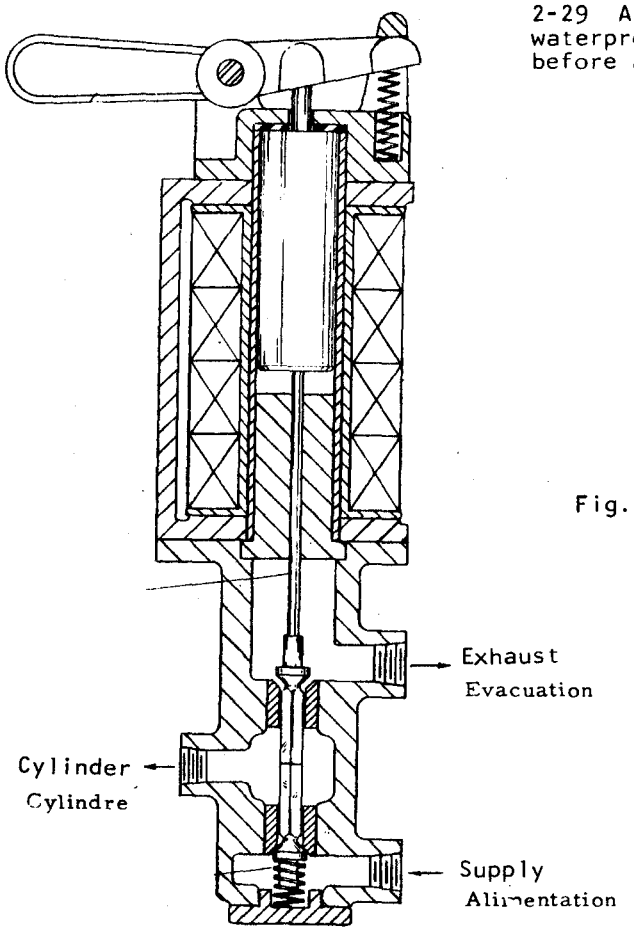
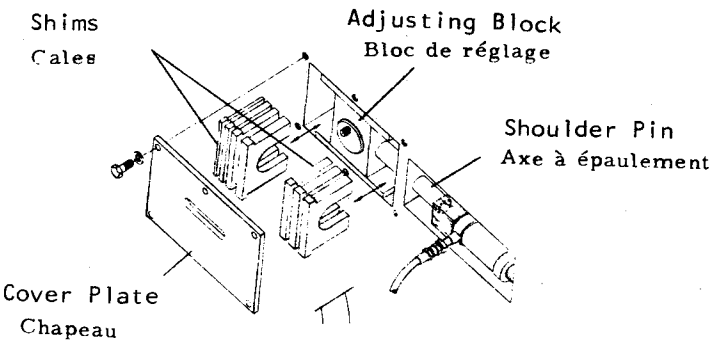


Fig. 6 MAGNET VALVES
valves magnétiques



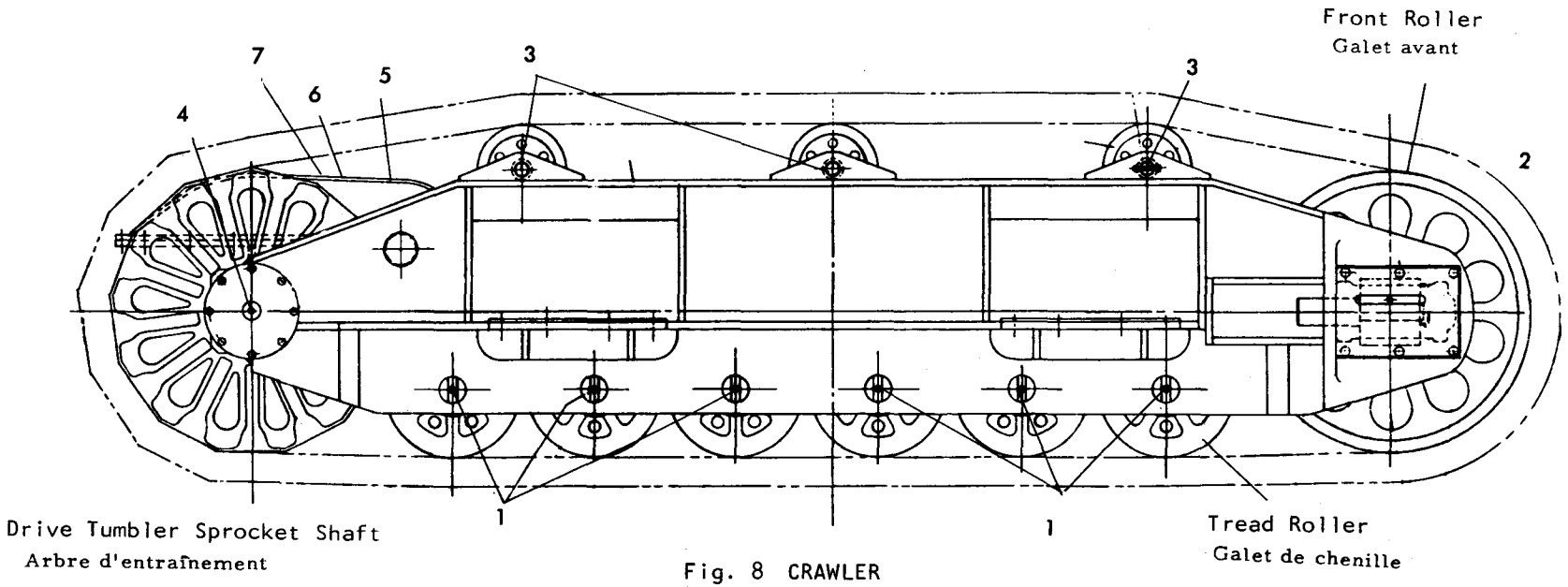


Fig. 8 CRAWLER
Chenille

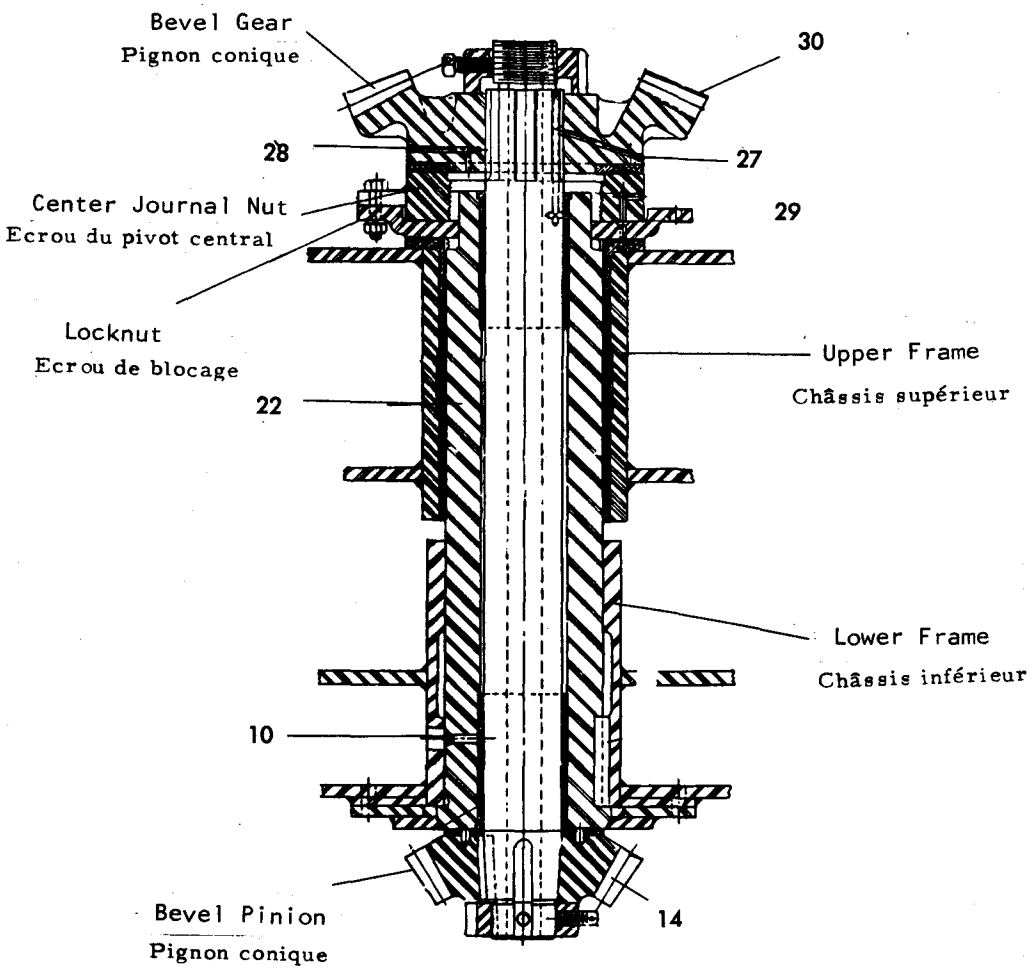


Fig. 15 CENTER JOURNAL
Pivot central

LUBRICATION OF CENTER JOURNAL

PIVOT CENTRAL

LOCATION NO.	NAME OF PART	TYPE	NO. OF FTGS.	LOCATION OF FITTING	LUB SYM	LUB PERIOD IN HRS.
No. DE 'EMPLAC.	DESIGNATION DE LA PIECE	TYPE DE PIECE	NB. DE GRAISSEURS	EMPLACEMENT DES GRAISSEURS	SYMB. GRAISS.	FREQUENCE GRAISSAGE
10	Second Propel Shaft Lower Bearing	Bushing	1	In Grease Block at Rear of L.F. Top Fitting	MPG	4-8
10	Deuxième arbre de translation portée inférieure	Bague	1	Ensemble de graisseurs à l'arrière du châs. Inf. graisseur du haut	MPG	4-8
22	Center Journal Bearing	Bushing	3	Piped to Deck at Front of Center Journal	MPG	4-8
22	Palier du pivot central	Bague	3	Relié au chas. sup. devant le pivot central	MPG	4-8

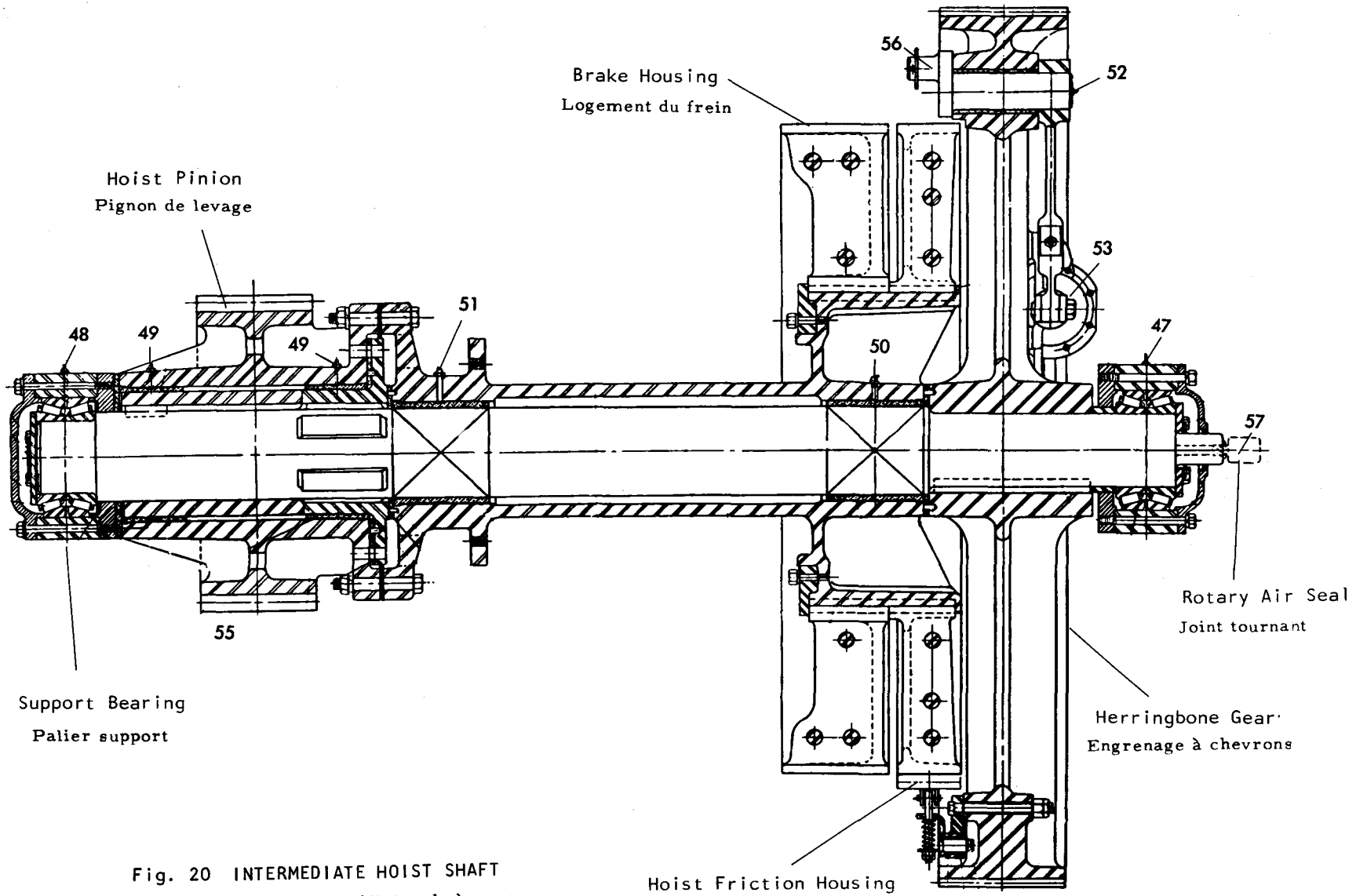
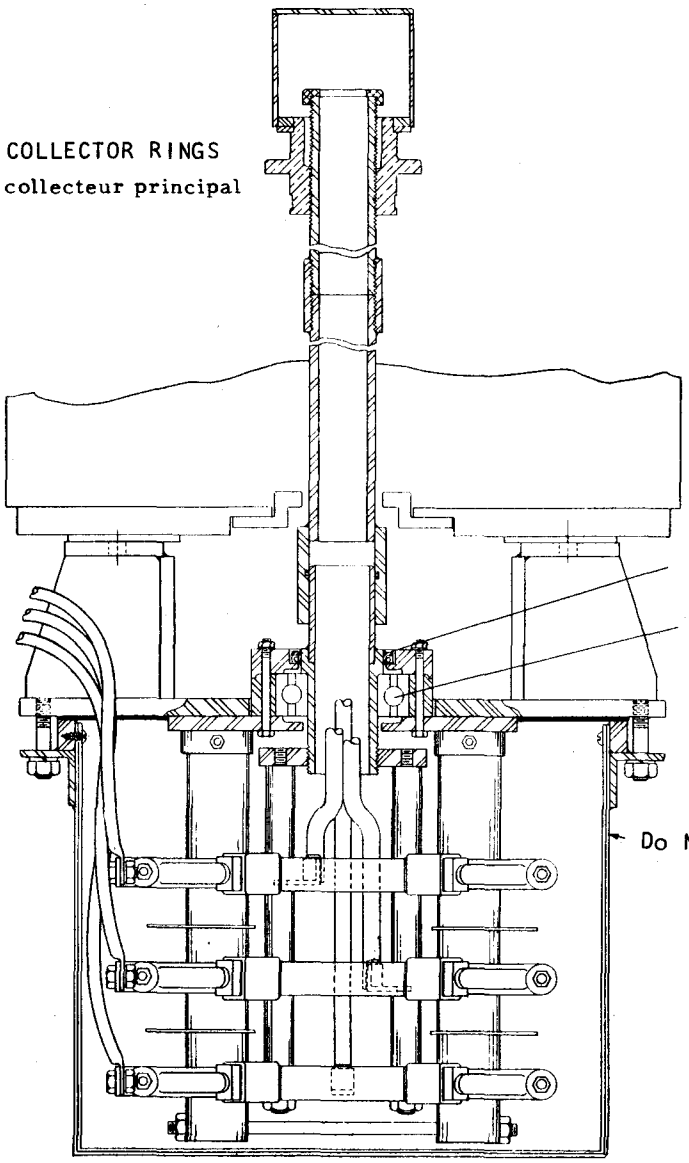


Fig. 20 INTERMEDIATE HOIST SHAFT
Arbre intermédiaire de levage

Fig. 27 MAIN COLLECTOR RINGS
Bagues du collecteur principal



BAGUES DU COLLECTEUR PRINCIPAL (ALIMENTATION)

3-55 Les bagues du collecteur principal font la liaison entre le châssis inférieur et le châssis supérieur. Elles sont placées dans le châssis inférieur sous le pivot central. Les balais sont attachés au châssis inférieur et reliés au câble d'alimentation. Les trois bagues sont reliées à des câbles qui conduisent le courant à travers un tube placé à l'intérieur du 2ème arbre intermédiaire de translation jusqu'aux armoires électriques. Bagues et balais sont immergés dans une huile diélectrique. Le réservoir doit être rempli jusqu'à 11,5 cm du sommet, avec une bonne huile diélectrique. Voir section électrique.

MAIN COLLECTOR RINGS (POWER SUPPLY)

3-55 The main collector rings provide an electrical connection between the upper frame and the lower frame for the power supply. The main collector rings are located directly under the center journal in the lower frame. The brushes are anchored to the lower frame and connected to the trail cable. The three rings are connected to cables that conduct the power through a tube inside the second intermediate propel shaft and into the electrical cabinets. The collector rings and brushes are immersed in a dielectric oil. The oil tank should be kept filled to within 4-1/2" of the top with a good grade dielectric oil. See Electrical Section.

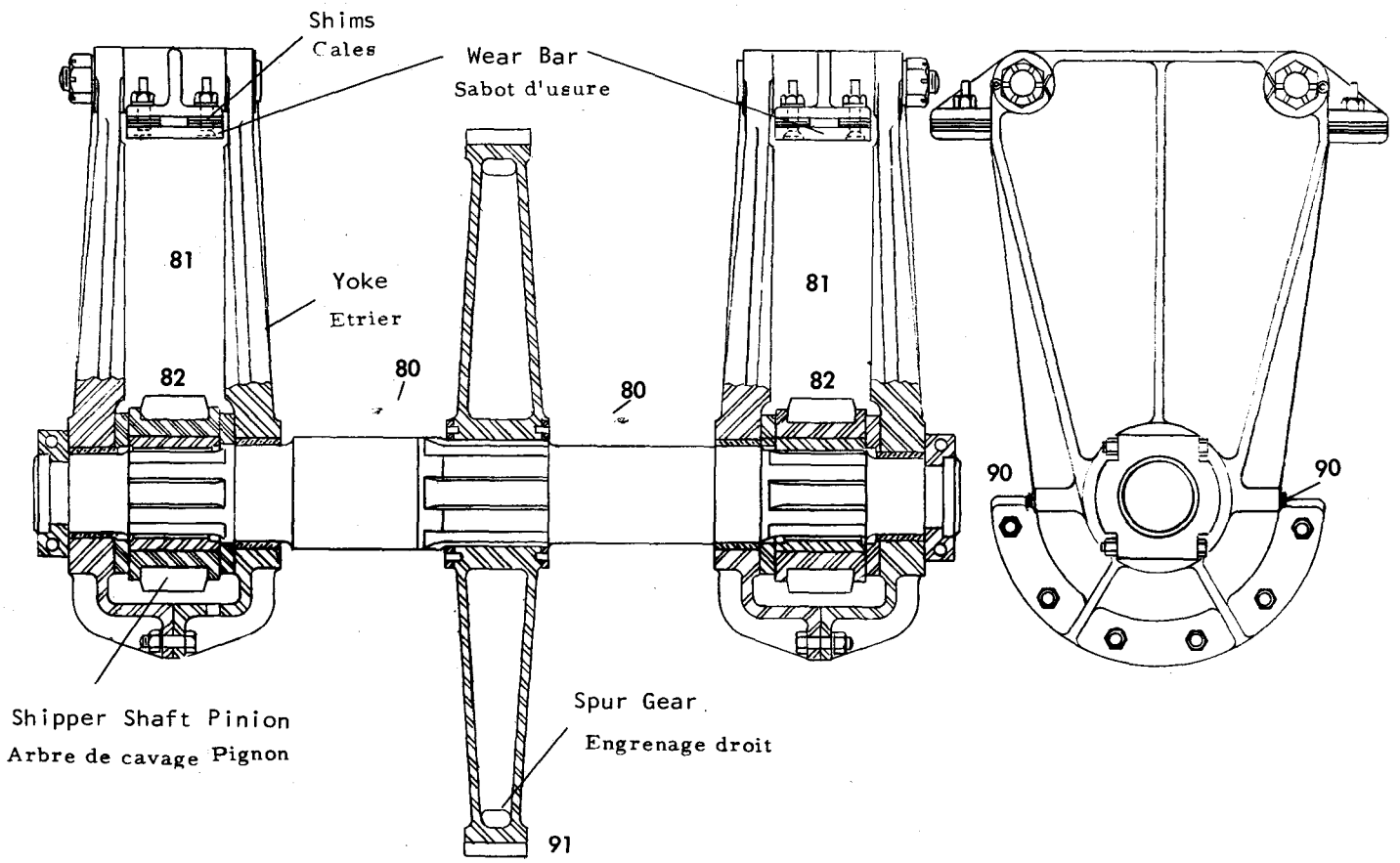


Fig. 32 SHIPPER SHAFT
Arbre de cavage

INS A DONNER AUX CABLES

37 Lorsque l'on enroule un câble on doit
iter de le salir en le dévidant directement du
vidoir sur la machine, en partant du point
e et en allant vers le tambour. Placer le
vidoir aussi près que possible de la poulie la
is proche du point fixe. Le monter sur une
rre ou un tuyau avec des supports de chaque
té, de telle façon que le brin se déroule en
rtant du sommet du dévidoir. Ne jamais poser
dévidoir à terre pour prendre le câble lové,
r les boucles ne pourront jamais être redressées
tendant le câble, et risquent de provoquer des
sions permanentes qui affaibliront la câble.
ceci n'est pas possible, les bobines peuvent
e déroulées sur le sol, le câble se dévidant
r le dessous.

38 Une fois que le câble est posé sur la machine,
rifier toutes les poulies et le tambour pour voir
e câble repose convenablement dans les réas
s poulies et les rainures des tambours. Inspecter
câble pour voir s'il est propre. Brosser la
leté et au besoin la souffler à l'air comprimé.

39 Lorsque le câble est propre, graisse
igneusement, en utilisant une huile moteur
gère ou une huile à câbles (ne pas utiliser de
aisse collante). Les poulies et les rainures
ivent être recouvertes d'une couche fine d'huile.
a soin doit être apporté à la lubrification du
ble de dragline afin d'éviter qu'il ne cumule
excès de matériaux abrasifs, ceci réduisant
vie du câble. Cependant nous répétons que les
oulies de fairlead et les rainures de tambours
ivent être fréquemment graissées pour éviter
sure. Lorsqu'un câble est stocké, il doit
alement être soigneusement nettoyé et graissé.

INSTRUCTIONS FOR CARE OF WIRE ROPE

4-37 When reeving a wire rope, it should be kept as clean as possible by reeving directly from the coil or reel, working from the dead end toward the drum. Locate the coil or reel as near as practical to the sheave nearest the dead end. Mount the coil or reel on a round bar or pipe with supports on each side, so that the wire rope will unspool off the top of the coil or reel when the free end of the wire rope is pulled toward the first sheave to be reeved. Never lay a coil or reel down and take the wire rope off in loops, because the loops will become kinks, which can never be straightened, when the line is pulled taut. A kink in a wire rope permanently weakens it at that point. If no facilities are available for unspooling the wire rope, the coil or reel may be rolled along the ground with the wire rope coming off the bottom.

4-38 After the reeving is complete, check all sheaves and the drum, if grooved, to determine, if the wire rope is laying properly in the grooves, if not, make any necessary corrections. Also inspect the wire rope to see if it is clean. Wire brush all dirt off, and if available, blow off with compressed air.

4-39 After the wire rope is cleaned, lubricate thoroughly, using regular cable dressing or a light weight motor oil (do not use gear compound or any tacky lubricant). Sheaves and lagging grooves must be kept lightly coated with lubricant. Care must be exercised in lubricating dragline drag cable to avoid picking up excessive abrasive material when the cable is dragged through a cut. Dirt thus picked up will shorten the life of wire rope. However, lagging grooves and fairlead sheaves must be kept lightly coated with fluid lubricant to prevent excessive wear. In addition to periodic cleaning and lubrication, all wire ropes should be thoroughly cleaned and lubricated, when taken out of service to be put in storage.

à l'avance ; il s'agit d'une question de bon sens pour déterminer si elle est trop ou pas assez élevée.

Il faut vérifier l'entrefer en même temps pour s'assurer qu'il est légèrement concentrique ou excentrique dans la direction vers laquelle, lorsque l'accouplement est serré, l'entrefer tendra à devenir concentrique.

Si l'accouplement suivant vérification ci-dessus, semble être en alignement, il faut alors remettre et serrer tous les boulons.

L'élément suivant du groupe du même côté de l'élément à deux paliers doit alors être vérifié de la même façon et si tout se présente d'une manière satisfaisante, il faut également serrer les boulons ; s'il s'agit du dernier élément, l'accouplement doit être correct aussi bien en haut qu'en bas que sur les côtés.

Lorsque tous les éléments sur un des côtés de l'élément du groupe à deux paliers ont été vérifiée, il faut procéder à la vérification des éléments qui se trouvent de l'autre côté de la même façon.

En général, il faut observer les règles suivantes :

I) Lorsque l'on commence la vérification d'un alignement, il faut toujours desserrer les accouplements.

2) Toujours débuter par l'élément du groupe à deux paliers, puis aller en s'en éloignant en procédant d'un seul côté à la fois

3) Après avoir terminé la vérification d'un accouplement, toujours le resserrer avant de commencer celle du suivant.

4) Vérifier toujours les entrefers sur toutes les machines pour être bien sûr qu'une pièce mobile ne peut venir frapper ou frotter sur une pièce fixe.

5) Vérifier les jeux sur les protections et les joints d'huile.

6.4. L'excitatrice SCR étant desexcitée, mettre en route le groupe moteur-générateur. Le courant d'induit ne doit pas excéder 5% du courant de calage.

6.5. Tout en observant le courant d'induit, exciter les excitatrices SCR. Le courant d'induit n'excédera pas I0% de l'intensité nominale. Sinon, contrôler les tensions de chevauchement.

6.6. Déplacer légèrement l'interrupteur principal de manière à faire passer moins de la moitié du courant d'induit de calage. Tout en observant le courant d'induit, fermer provisoirement le circuit du limiteur d'intensité. Le courant d'induit sera réduit aussi longtemps que le circuit est fermé. Déplacer l'interrupteur principal à la position hors circuit et brancher dans le circuit du limiteur d'intensité en laissant la résistance fictive.

6.7. Régler la résistance en série avec les champs de régulation du limiteur d'intensité, pour obtenir le gain spécifié par le constructeur de la pelle. Répéter dans le sens inverse.

6.8. Fermer la commande et enlever la résistance fictive.

6.9. Remettre la commande et régler les résistances II RS et I2 RS pour obtenir le courant de calage spécifié.

6.I0. Sur les commandes à circuits bouclés multiples, les induits des boucles non asservies doivent être fermés à raison d'une boucle à la fois pour s'assurer que le courant de calage de chaque boucle a la grandeur requise.

7. Enlever les barres de mise en court-circuit et recontrôler le courant de calage. Rebrancher les champs et vérifier les nombres de tours des moteurs.

8. Régler les intensités de champ pour obtenir les vitesses spécifiées.

ORIENTATION
(Régulateur d'intensité avec limiteur de tension).

9. Courant de calage

Rebrancher le circuit d'induit réglé. Excepté pour les champs, le circuit doit maintenant être branché selon les schémas élémentaires.

9.I. Débrancher le circuit de réaction aux champs de contrôle de l'amplistat, et vérifier la continuité et le nombre d'ohms du circuit.

99.2. Les excitatrices SCR étant desexcitées, mettre en route le groupe moteur-génératrices. Le ou les courants d'induit ne doivent pas excéder I0% de la valeur nominale.

9.3. Tout en observant le courant d'induit, appliquer le courant alternatif aux excitatrices SCR. Le courant d'induit ne doit pas excéder I0% de la valeur nominale. Sinon, vérifier les réglages de la tension de chevauchement.

9.4. Déplacer l'interrupteur principal pour obtenir un courant d'induit inférieur à la valeur nominale. En observant le courant d'induit, fermer provisoirement le circuit de réaction. Il faut réduire le courant d'induit aussi longtemps que le circuit est fermé. Raccorder le circuit de réaction.

WELDING INFORMATION FOR MAINTENANCE OF MARION MACHINES

Castings

Materials M.P.S. Symbol	Electrode A.W.S. Classification	Minimum Preheat - °F.
CA, CB (Medium Carbon)	E-7016, E-7018	200
CC-1	E-9018-D1	300
CC-2A, CC-9 (Low Alloy)	E-9018-D1	300
CC-2B, CC-6 (Low Alloy)	E-9018-D1	350
SE-1045	E-9018-D1	500
CC-7	E-9018-D1	400
CC-9	E-9018-D1	300
CC-10	E-9018-D1	300
CC-11, CC-12 (Low Alloy)	E-10016-D2	300
CD, CD-1	E-9018-D1	200
CFC, CFC-1 (Low Alloy)	E-10016-D2	*500-700° over 2" thickness
CH (Hadfield Manganese)	E-309 (Note 2), E-FeRMn-A (Note 2)	See General Notes
CHN	E-309 (Note 2), E-FeRMn-A (Note 2)	See General Notes
AISI-4140-4330-4340	E-10016-D2	*600
CJ	E-9018-D1	250
CK, CK-1, CK-2, CK-2B, CK-3	E-10016-D2	350
CL, CK-4, CK-5, CK-6, CK-7	E-11018-G	400
CKF, CKF-1	E-10016-D2	*600
CL-2, CL-3	E-11018-G	400
CL-4, CL-5	E-9018-D1	350
C-74 Alloy	E-11018-G	400
CN	E-7016, E-7018	75
KO	E-10016-D2	*650

RECOMMANDATIONS DE SOUDURE POUR LES MACHINES MARION

ırtèlement

martèlement peut être utilisé pour maintenir les formes originales et les gnements , et pour éviter les fissures dans les sections rigides. Un outil rond it être utilisé . La première et la dernière passes ne doivent pas être martelées.

nforcement

s précautions extrêmes doivent être prises. Beaucoup d'ennuis proviennent de ıuvais renforcements. La soudure seule doit être suffisante pour rendre la pièce ssi forte qu'elle l'était à l'origine. Cependant dans les cas où le renforcement est commandé, suivre les recommandations suivantes : les plaques de renforcement doivent pas dépasser les 3/4 de l'épaisseur de la pièce à renforcer. Le renforcement doit se prolonger au-delà des endroits critiques. Les plaques de renforcement ivent se terminer en biseau. Les soudures doivent entourer complètement les ıques et "se fondre" dans l'ensemble de la pièce. Tout doit être fait pour éliminer s concentrations de contraintes comme les bouts aigus, les discontinuités de section, s plaques découpées au chalumeau etc...

Plaque de renforcement biseautée recommandée

Figure 5

Plaque de renforcement carrée déconseillée

Figure 6

'aitement final

le préchauffage a été utilisé ou si le temps est froid, la soudure doit être ıtement ramenée à température normale. Ceci veut dire qu'il y encore du chauffage rès la soudure. Tous les bords coupants doivent être arrondis. Les zones parées doivent être nettoyées et repeintes.

our renseignements complémentaires, s'adresser à Marion.

DO

1. Carefully read this manual and Parts Book.
2. Lubricate regularly. Establish a systematic procedure and stick to it.
3. When lubricating, check all bolts, nuts, locknuts and cotter pins.
4. Keep loose objects in tool box or in suitable enclosure or cabinet.
5. Always replace guards.
6. Be careful where you park machine.
7. Avoid all overhead wires.
8. Always watch your clearances when swinging.
9. Watch the load at all times.
10. Unroll all cable like a hoop.

DON'T

1. Service or lubricate when parts are in motion.
2. Swing over groundmen.
3. Swing over the cab of a truck.
4. Leave the load suspended in air.
5. Try to lift the whole bank - slice it off.
6. Steer while the machine is moving.
7. Be a "Cowboy" operator.

- A LITTLE PRIDE PAYS OFF -

AIR SYSTEM

The operating controls of the Marion 151-M rotating frame and front end are actuated by compressed air. The compressed air is controlled by electric solenoid valves.

The Marion air control system is simple in operation and with reasonable care and maintenance it will have a long and trouble-free service life. The air control system can best be explained by a brief description of its components and their function in the system. A schematic view of the complete system used for the machine is shown.

The operator must be constantly aware of the air pressure reading of the gauge. If at anytime the air pressure drops below the operating pressure differential (90 psi.), the operator should shut down the machine and investigate. DO NOT OPERATE THE MACHINE WITHOUT FULL TANK PRESSURE. If the proper air pressure is not maintained, check the following. Is the:

1. Compressor operating properly?
2. Pressure switch operating properly?
3. "V" belt drive properly adjusted and in good condition?
4. Air intake line obstructed?

AIR COMPRESSOR

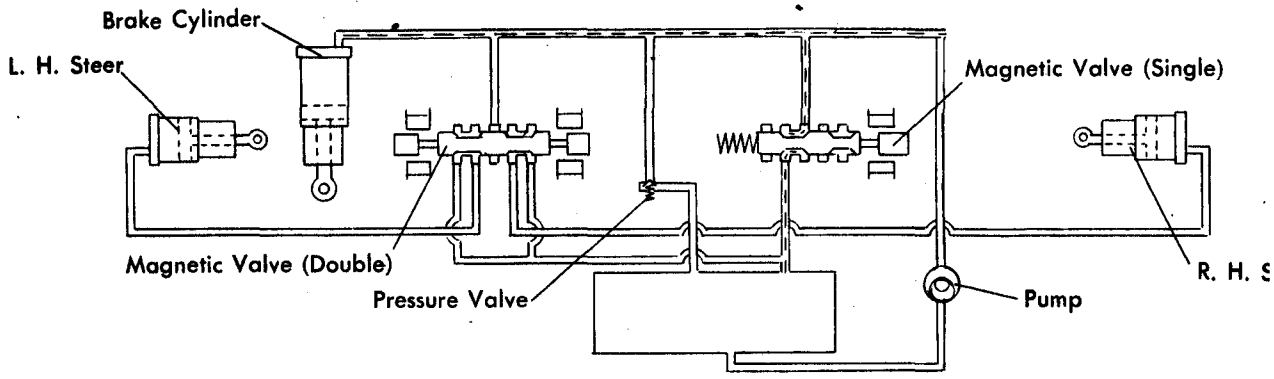
The air compressor which supplies the system is located at the front right corner of the machinery deck. The compressor is a complete unit including a supply tank, electric motor and a two stage compressor with pressure switch.

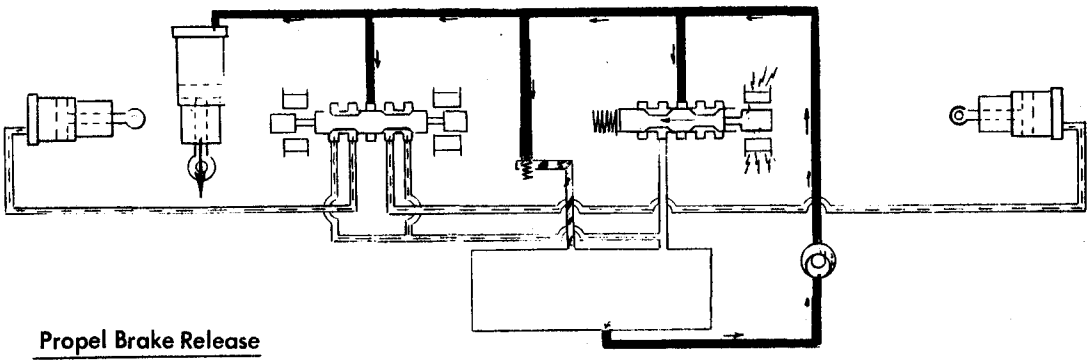
The compressor is driven by a matched set of "V" belts. "V" belts transmit power to the compressor pulley through the sides of the belt; not the bottom of the belt. For this reason, "V" belts must never be allowed to bottom in the pulley grooves.

SECTION 4

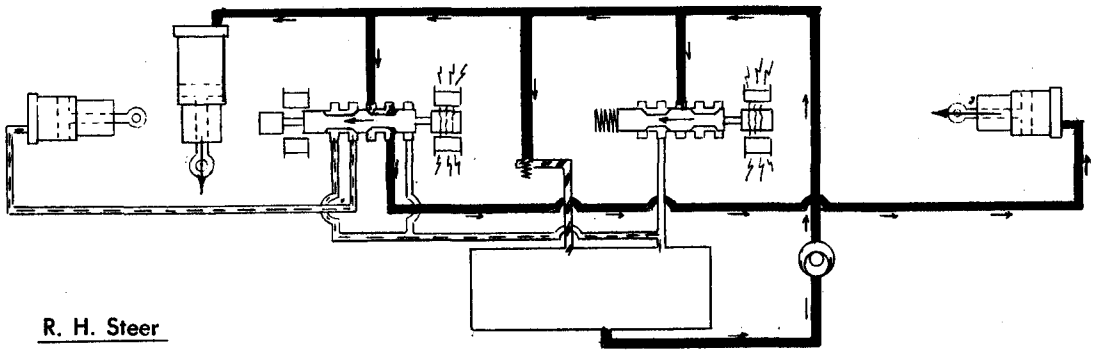
BASIC MACHINE

INDEX

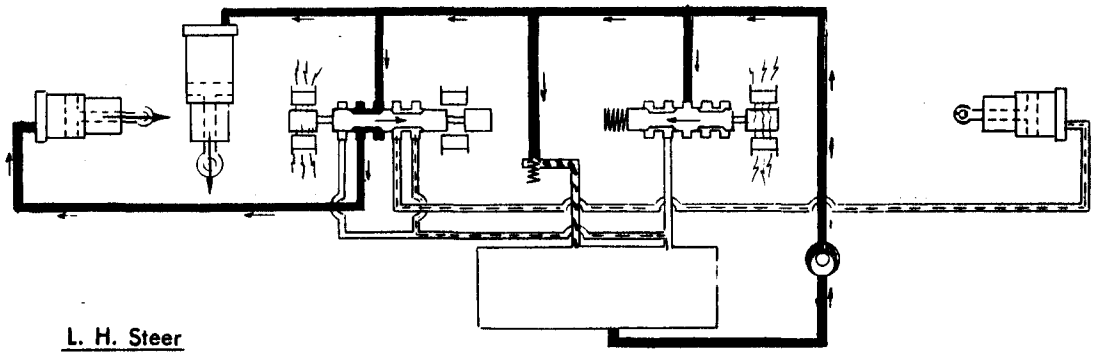




Propel Brake Release

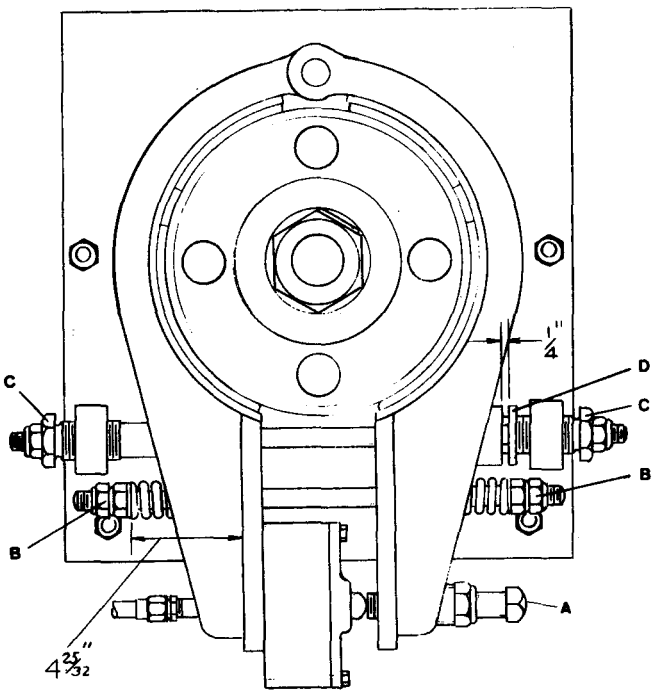


R. H. Steer



L. H. Steer

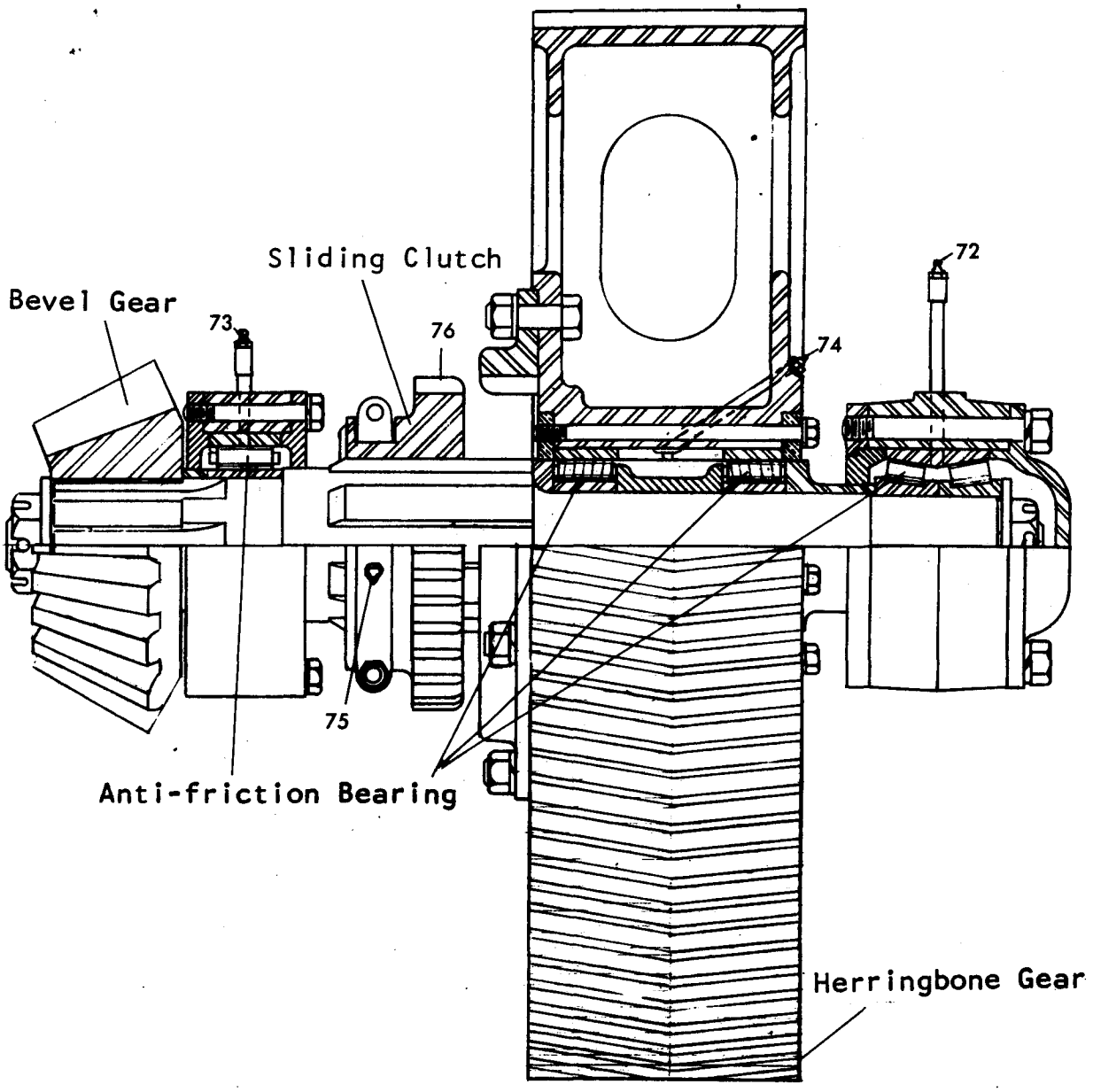
HYDRAULIC PIPING DIAGRAM



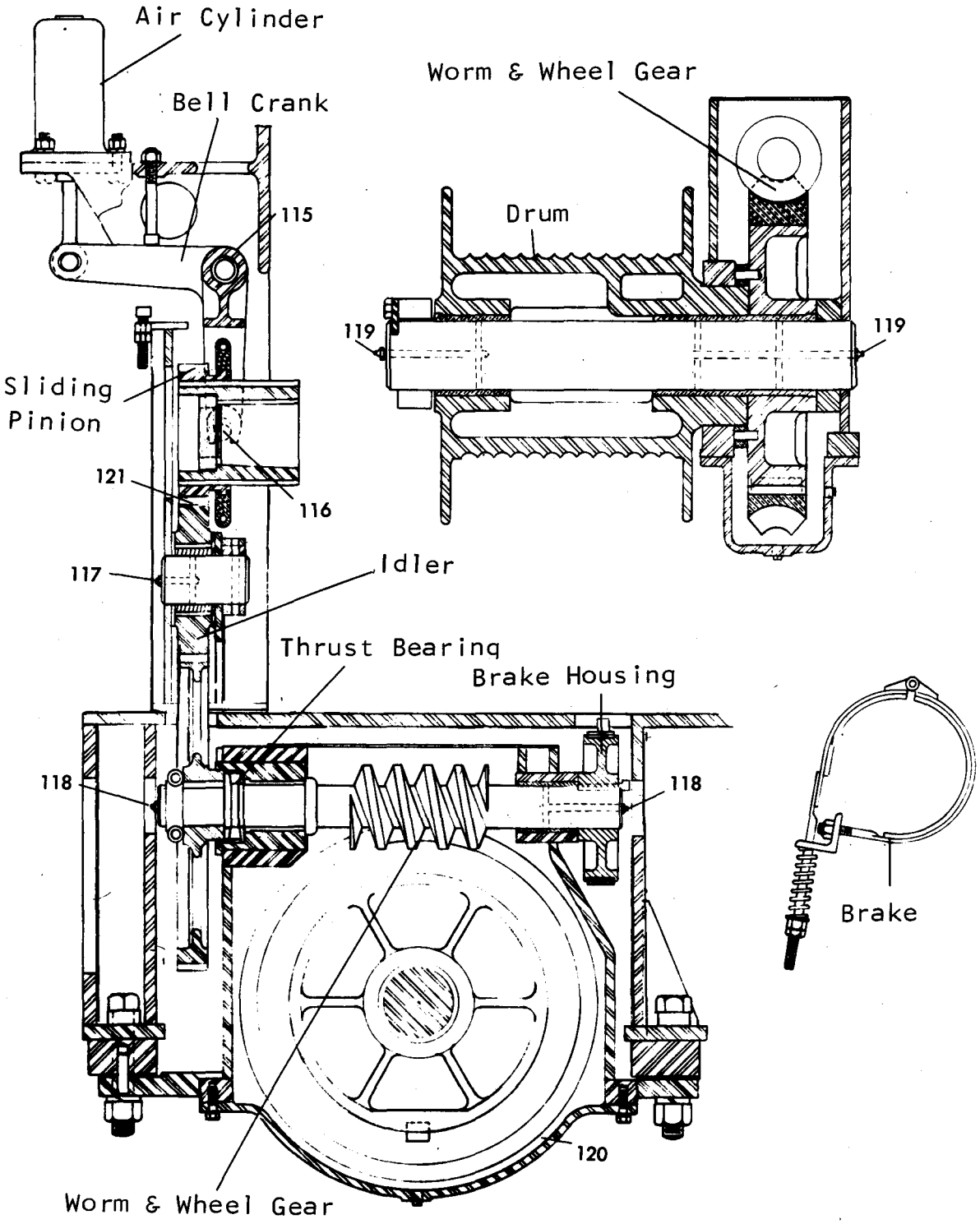
MAIN ROTATING BRAKE

MAIN ROTATING BRAKE

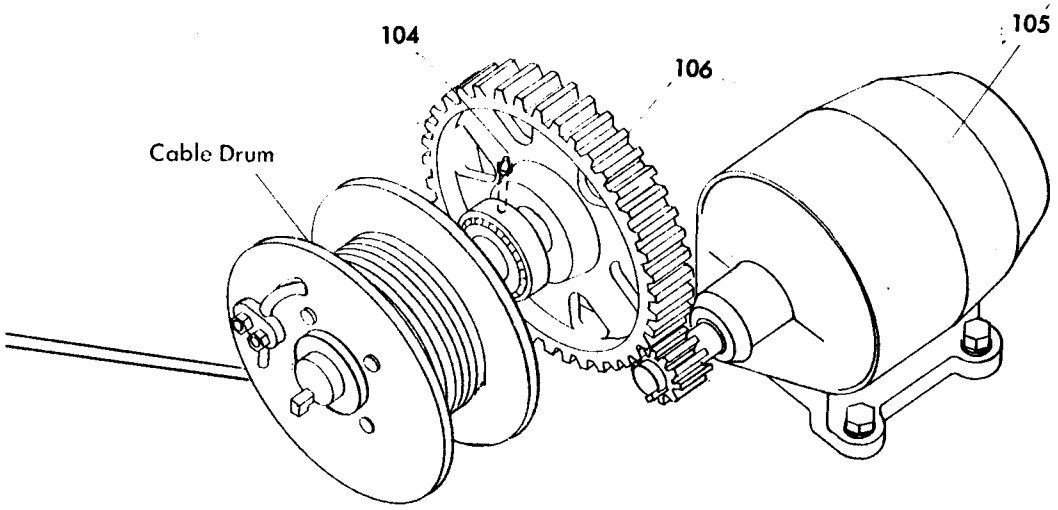
The main rotating brake is mounted at the top of each swing motor.The brake housing is keyed to the extended shaft of the vertical motor. The brake is not intended to retard or stop the swing motion but is intended to act as a holding brake only. The rotation is stopped by "plugging" or reversing the motors (see Operation Section for Details).

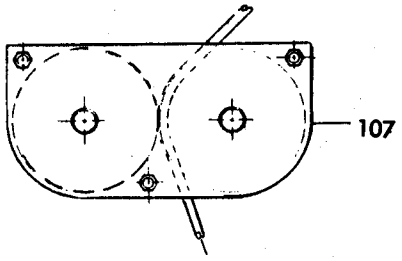


FIRST INTERMEDIATE PROPEL SHAFT



BOOM HOIST
Dragline-
Shovel Optional

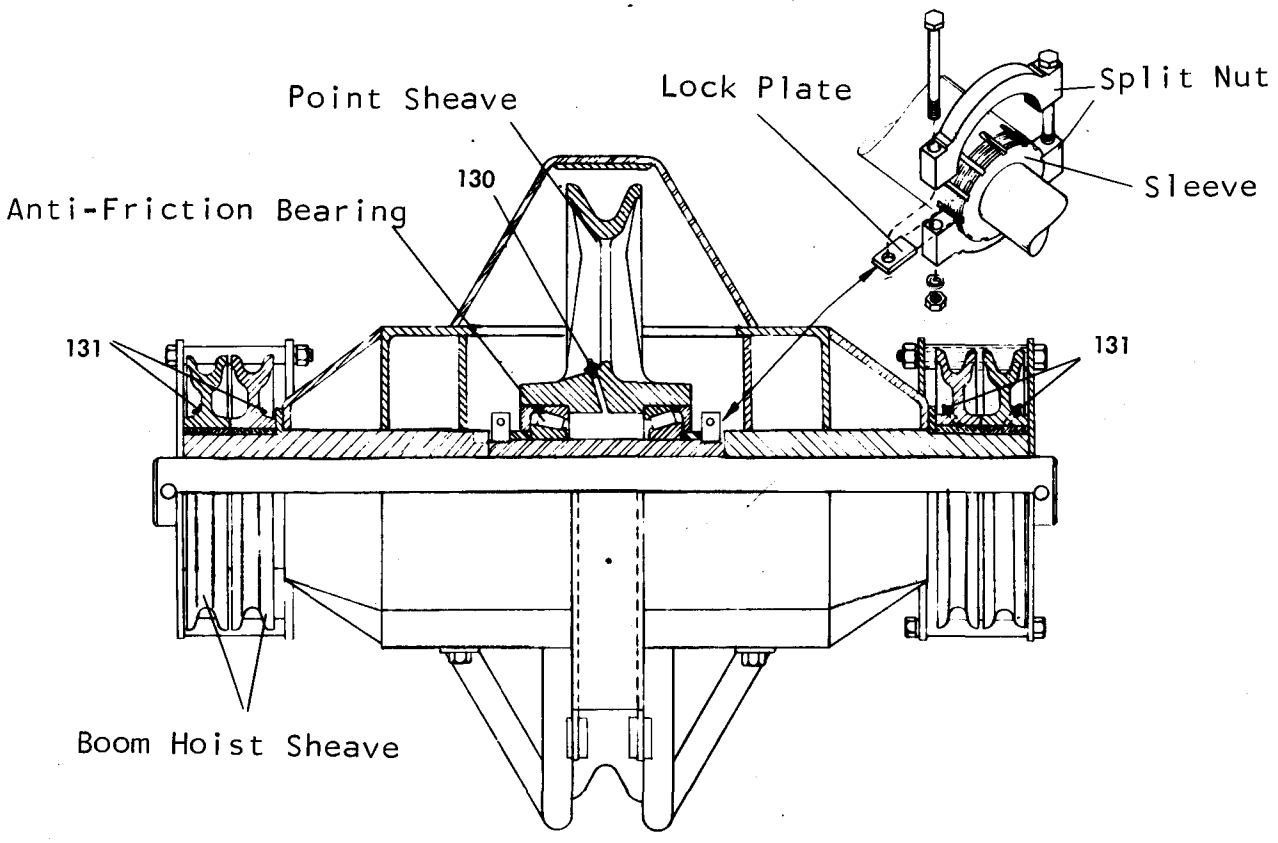




DIPPER TRIP

LUBRICATION OF DIPPER TRIP

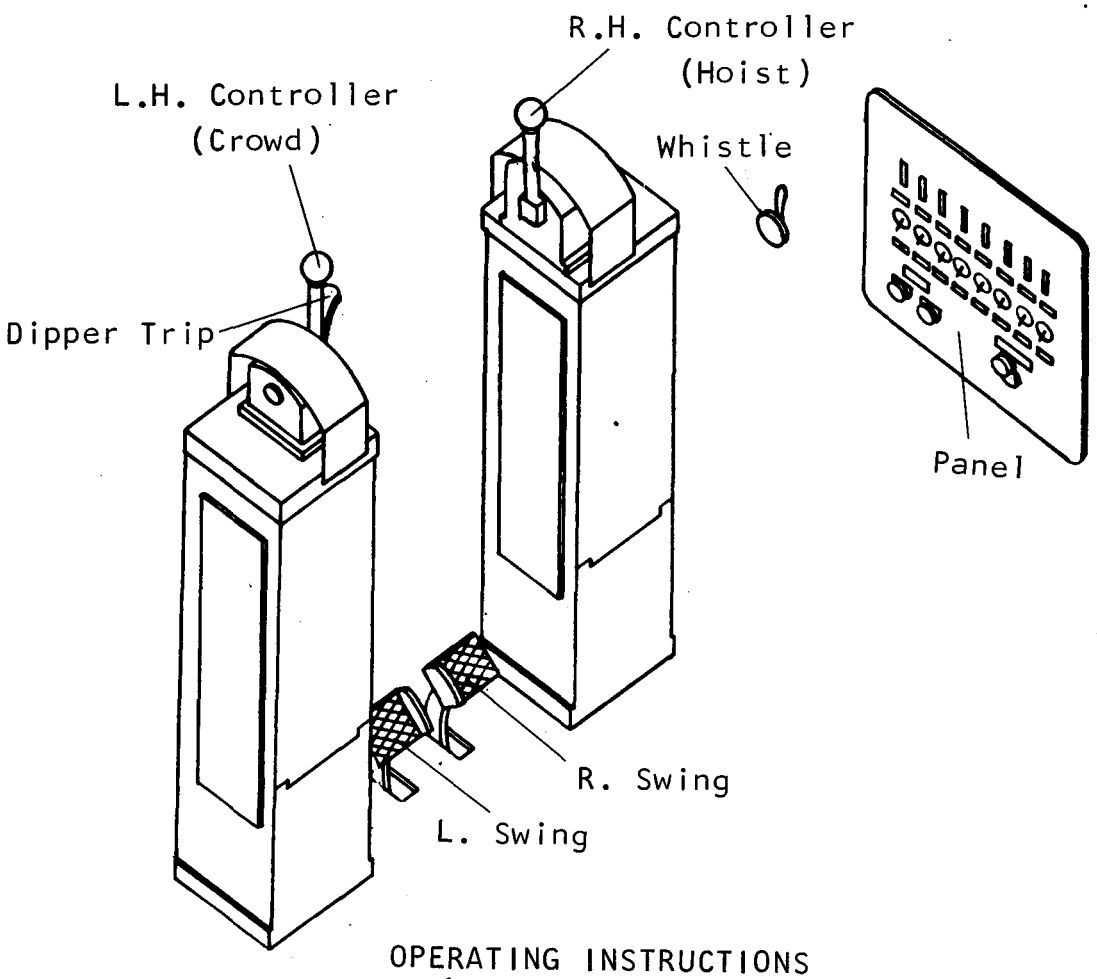
ATION NO.	NAME OF PART	TYPE	NO. OF FTGS.	LOCATION OF FITTING	LUB SYM	LUB PERIOD IN HRS.
04	Dipper Trip Drum & Gear Support	Anti-Friction	2	In Top Of Bearing Housing	MPG	500
05	Dipper Trip Motor			See Manufacturing Specifications		
06	Dipper Trip Pinion & Gear			Apply To Part	OGL	Keep Coated
07	Trip Rope Fairlead Sheave			Oilite Bearing No Lubrication Required		



DRAGLINE BOOM POINT

LUBRICATION OF DRAGLINE FRONT

ATION NO.	NAME OF PART	TYPE	NO. OF FTGS.	LOCATION OF FITTING	LUB SYM	LUB PERIOD IN HRS.
130	Boom Hoist Sheaves On Boom	Bushing	4	One In Hub Of Each Sheave	MPG	As Required
131	Boom Point Sheaves	Anti-Friction	1	One In Hub Of Sheave	MPG	500
132	Boom Hoist Sheaves On Gantry	Bushing	4	One In Hub Of Each Sheave	MPG	As Required
133	Sheave Block Bearing	Bushing	2	One In Each End Of Pin	MPG	4-8
134	Drag Bucket			See Manufacturer's Specifications		



OPERATING INSTRUCTIONS
(For Shovel Only)

OPERATING CONTROLS

Before operating this machine, the operator should familiarize himself with the controls and switches and fix their position firmly in mind. The operator should remember that the amount the controller levers or pedals are moved only determines the speed of the motion. The electric motors will always provide the required torque because the electrical equipment is designed to compensate for the variety of power requirements.

MAIN CONTROLLERS

The main controllers for operating the rotation, hoisting and crowding motions are as follows: The two foot pedals immediately in front of and centered with the operator's seat are the right swing pedal and the left swing pedal. The controller on the operator's right side is for the hoist and the controller on the operator's left side is for the crowd. The dipper trip switch is mounted on the controller. The whistle valve (air) is mounted on the right hand wall of the operator's cab.

FILLING THE BUCKET

Just as the bucket becomes full, release the hoist brake and engage the hoist clutch to raise the drag bucket out of the cut. Although the bucket must be raised high enough to clear any obstacle and make the necessary dump height, raising it higher than necessary should be avoided to save time and power.

ROTATING MACHINE

As soon as the bucket is clear of the cut, the operator begins to rotate the machine toward the dump area. The filled bucket, at the same time, may be moved away from the machine by releasing the drag clutch, and paying out the drag rope with just enough pressure on the drag brake to prevent emptying the bucket. If necessary, the drag bucket may be raised or lowered while moving it away from the machine, provided that sufficient tension is maintained on the drag rope to prevent premature emptying of the drag bucket.

EMPTY THE DRAG BUCKET

The hoisting bridle is attached to the bucket so that when it supports the bucket alone, the bucket will dump with the teeth down. Tension from the drag rope will hold the bucket in a horizontal position and prevent dumping. When the bucket reaches the dump area, the drag brake is released, the drag rope tension is gone and the bucket tilts to the teeth-down position and spills the load from the bucket.

RETURN BUCKET TO PIT

After the bucket is dumped the machine is rotated back to the digging area. At the same time the hoist is lowered and the drag rope payed out with a balance such that the bucket is lowered gently to the desired position on the ground to begin another cycle.

TO PROPEL THE MACHINE

To propel the machine, set the main controllers in neutral, depress both brake pedals and lock them. The boom-hoist switch must be at "release", the hoist clutch switch must be at "release" and then move the propel clutch switch to "engage". Now the main digging controller operates as the propel controller.

To propel the machine ahead, move the propel controller handle forward away from the operator. To propel the machine rearward, move the propel controller handle back toward the operator.