

HANCOCK

ELEVATING SCRAPER

HANCOCK MODEL 11E4M



**OPERATION, MAINTENANCE
AND PARTS MANUAL
NO. 1019**

Technical Order Nos.
36C22-3-19-1 and 36C22-3-19-4



**CLARK EQUIPMENT COMPANY
HANCOCK DIVISION**

P.O. Box 1859

Lubbock, Texas 79408



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Clark Equipment Company (CLARK) has warranted to the Distributor (Seller) who, pursuant to agreement with CLARK, hereby, on its own behalf, warrants to the Buyer each new CLARK product to be free from defects in material and workmanship under normal use and maintenance as herein provided.

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Revised May 1, 1966

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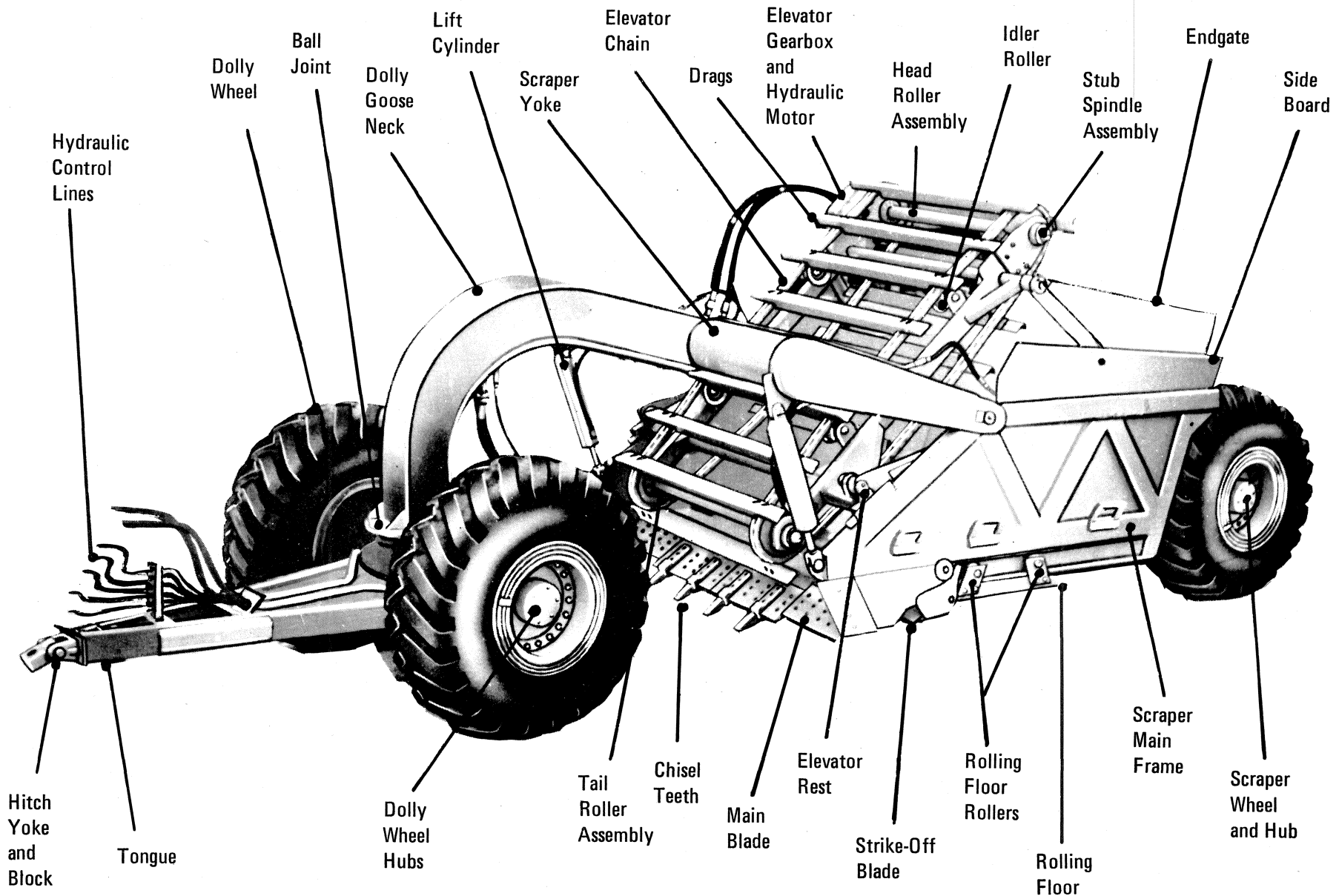
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NOTES



NOMENCLATURE

Hydraulic Control Lines

Dolly Wheel

Ball Joint

Dolly Goose Neck

Lift Cylinder

Scraper Yoke

Elevator Chain

Drags

Elevator Gearbox and Hydraulic Motor

Head Roller Assembly

Idler Roller

Stub Spindle Assembly

Endgate

Side Board

Hitch Yoke and Block

Tongue

Dolly Wheel Hubs

Tail Roller Assembly

Chisel Teeth

Main Blade

Elevator Rest

Strike-Off Blade

Rolling Floor Rollers

Rolling Floor

Scraper Main Frame

Scraper Wheel and Hub

C



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INTRODUCTION

GENERAL

Clark Equipment Company, Hancock Division, is producing the Model 11E4M Pull-Type Elevating Scraper. This machine will operate on pulling units of sufficient horsepower, that have a source of hydraulic power. The Hancock elevating scraper has been used with great success in the moving of earth and preparation of the soil necessary in this industry.

This manual has been produced to guide the new owner and operator in the proper procedures of operation, maintenance and ordering of service parts. These procedures are proven by years of experience. They are designed to help the operator achieve the best results with the Hancock scraper. This will have the net effect of a longer machine life and will reduce repair bills. The time the operator spends reading this manual can result in increased profit.

This manual is published for the information and guidance of the personnel to whom this elevating scraper is issued. It contains information covering the operation and maintenance of the scraper, as well as complete service parts lists with illustrations. This manual applies only to the Hancock Model 11E4M Elevating Scraper. It is arranged in three chapters: Chapter One, Operation; Chapter Two, Maintenance; and Chapter Three, Parts.

SPECIFICATIONS

CAPACITIES:

Heaped Load	11 cu. yds.	8,42 cu m
Rated Load	26,400 lbs.	11 986 kg

AXLE

Make	Hancock Division	
Total Width	85 in.	2 159,0 mm
Track Width	73.75 in.	1 873,3 mm
Outside Tire Width w/17.50 - 25	91.35 in.	2 320,3 mm
Drawbar Height	24.0 in.	609,6 mm

TIRES

Size	17.50 - 25	
Ply Rating	12	
Static Load Radius	24.3	617,2 mm
Rim Size	14.0	355,6 mm
Rated Tire Load @ 5 MPH	13,530 lbs @ 50 PSI	6 137,2 kg @ 3,5 kg/cm ²

LIFT AND EJECTION HYDRAULIC SYSTEM

Flow Range (Furnished by Prime Mover)	23.3 GPM	87,0 liter/min.
Pressure Relief Valve Setting	2,000 PSI	140,6 kg/cm ²



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ELEVATOR HYDRAULICS

Flow	58.2	219,8 liter/min
Pressure Relief Valve Setting	2300 PSI	161,7 kg/cm ²
Type Operation	Fixed Speed, Reversible	
Motor	Vickers 45M130	
Minimum Filtration Required	25 Micron	

ELEVATOR

Gearbox Ratio	27.7:1	
Sprocket: Pitchline Diameter	15.75 in.	400,1 mm
Number of Teeth	16	
Chain: Number of Links	62	
Pitch	3.075 in.	78,1 mm
Flight: Number	15	
Length	66 in.	1 676,4 mm
Width	5.75 in.	146,1 mm
Length:	114 in.	3 302,0 mm

CUTTING BLADES

*Cutting Blades, two sections	1.00 in. x 12.00 in. x 15.00 in. 25,4 mm x 304,8 mm x 381,0 mm
*Cutting Blades, two sections	1.00 in. x 12.00 in. x 30.00 in. 25,4 mm x 304,8 mm x 762,0 mm
*Like sections interchangeable and reversible.	

HYDRAULIC CYLINDER

Bowl Lift	Double Acting	
Bore	4 in.	101,6 mm
Stroke	18 in.	457,2 mm
Rod Diameter	1.625 in.	41,3 mm
Extended Length	50.06 in.	1 271,5 mm
Closed Length	32.06 in.	814,3 mm
Ejection	Double Acting	
Bore	4 in.	101,6 mm
Stroke	18 in.	457,2 mm
Rod Diameter	1.625 in.	41,3 mm
Extended Length	50.06 in.	1 271,5 mm
Closed Length	32.06 in.	814,3 mm

GENERAL DIMENSIONS

Overall Length	362 in.	9 194,8 mm
Overall Width	100.5 in.	2 552,7 mm
Overall Height	104 in.	2 743,2 mm
Wheelbase	214 in.	5 435,6 mm
Track Width	73.75 in.	1 873,3 mm
Maximum Depth of Cut	9 in.	228,6 mm
Minimum Ground Clearance	11.4 in.	289,6 mm

SECTION ONE

OPERATION

310. 101012

101012

SCRAPER HYDRAULIC SYSTEM CONNECTION

Connect the hoses for lift or lower of bowl to the pulling unit control valve (designated numbers 3 & 4). The ends of the hoses supplied with the scraper are stamped with a digit which coincides with a stamped digit on the pulling unit (Fig. 1). Connect the ejection system (numbers 5 & 6) and the elevator drive system (numbers 1, 2 & 7). Start the

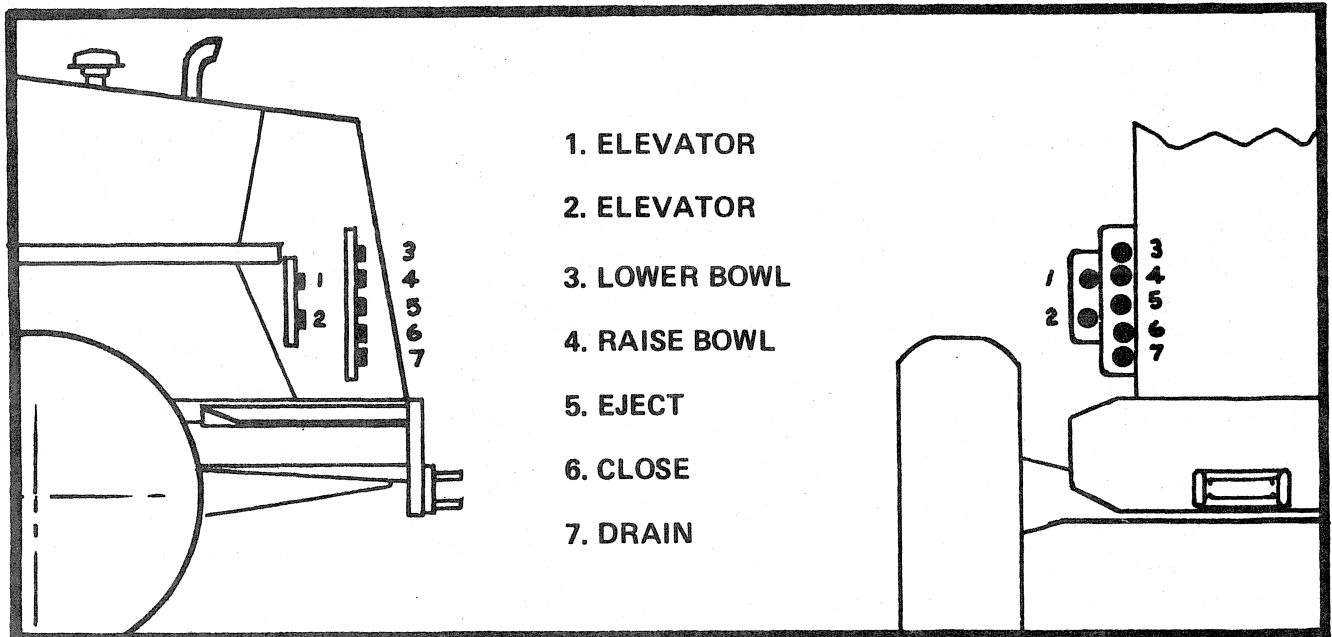


Fig. 1

pulling unit and lift weight off tongue by forcing cutting blade of scraper down. Tongue may now be connected to pulling unit.

After the scraper has been connected to the pulling unit, the operator should start the motor of the pulling unit and set it at fast idle. Use the control levers to actuate the components of the scraper, at the same time watching the level in the hydraulic fluid reservoir in the pulling unit to see that it does not fall to a dangerously low level. Before taking the cap from the reservoir, clean the cap and the area around it. Add oil as the oil is used to fill the components of the scraper system. Use an oil specified in the pulling unit manufacturer's operator's and service manual. Refer to lubrication chart in pulling unit manual for the type oil to be used in scraper elevator system. When continued actuating of the scraper components does not cause the oil level in reservoir to decrease, the cap should be cleaned and replaced on the reservoir. The engine of the pulling unit should continue to be idled at a fast speed and a complete inspection made of all of the hydraulic system of both the pulling unit and the scraper to see that all hydraulic connections are tight and do not leak. Instructions in the pulling unit manufacturer's service and operator's manual for the hook-up of any implement that is hydraulically controlled will be helpful in making this hook-up.

PREPARATION FOR OPERATION

A close visual check should be the first step in preparing to operate your Hancock Scraper. This is done by walking around the machine and checking all the following:

CHECK ALL BOLTS

Bolts should be checked for tightness. This should be done with a wrench, especially any bolt that shows signs of paint cracking around the head. All wheel nuts should be actually tested with a wrench and torqued to 300 foot lbs. dry.

The procedure of checking all bolts with a wrench and retorquing the wheel nuts should again be performed after 10 hours of operation of the scraper. In order to maintain proper care of the unit and save costly repair, the bolts should again be checked after the next 25 hours and again after the next 50 hours of operation. A 50-hour bolt check should then be maintained in addition to the before and after shift visual check.

PRESSURE IN TIRES

Check tire pressures daily at beginning of shift when tires are cold. Use a gauge calibrated to 1 lb. to check tires. Recommended pressures are shown in the table below.

Unit	Tire Size	Ply Rating	Maximum Speed	Recommended Pressure
11E4M	17.5 x 25	12	30 MPH	50 PSI

Fig. 2

Do not bleed pressure from tires during working shift. They are designed to hold the added pressure caused from heat. If a low tire must be inflated while unit is working, put a pound less pressure in the low tire than there is in the fully inflated tires on the unit. If the tire has been under-inflated long enough to develop excessive heat, the operator should let it cool before re-inflating the tire. The same tire pressure should be maintained at all times in all tires. A low tire on the scraper will cause an uneven cut. Any grease or oil should be cleaned from tires at all times. Inspect tires for cuts, bruises, or imbedded rocks. Cuts and bruises should be repaired and imbedded rocks removed before they cause more serious damage.

EJECTION SYSTEM

On this pull-type Hancock Scraper, there is a two-piece forced ejection system, consisting of the rolling floor and the endgate. Fig. 3 shows the clearance between the endgate and the back cross member. When the endgate is fully retracted, that clearance should be 1/2 to 3/4 inch. This clearance should be checked every 50 hours of operation.

Fig. 4 shows the clearance between the strike-off blade and the moldboard. The rolling floor should be in the most

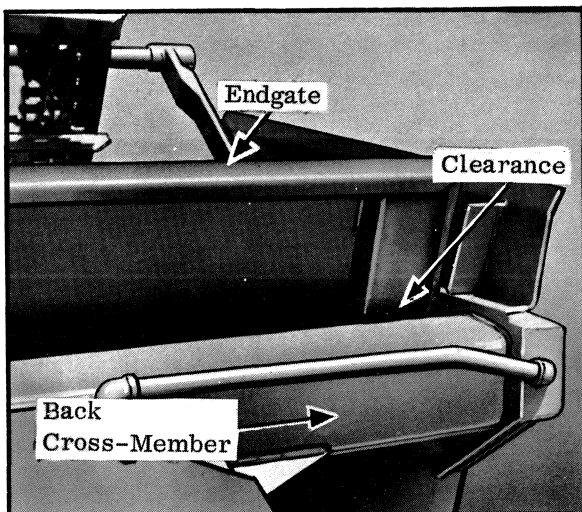


Fig. 3

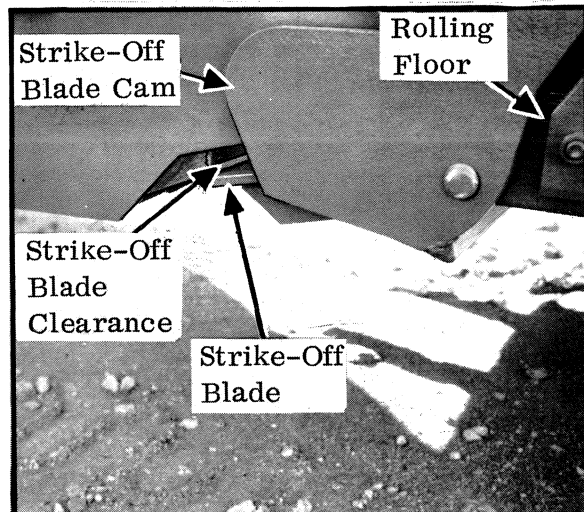


Fig. 4

forward position when this clearance is checked. This clearance should be $\frac{1}{4}$ to $\frac{1}{2}$ inch, and should also be checked every 50 hours of operation.

Fig. 5 shows the location for checking the clearance of rollers of the rolling floor. There should be $\frac{1}{16}$ to $\frac{3}{16}$ inch between the edge of the track and the flange of the roller on each side of the machine. Refer to Adjustment Maintenance in this manual. A 50-hour check should be maintained here also.

ELEVATOR CHAIN SLACK

Fig. 6 shows where and how the chain slack should be checked. There should be approximately nine inches measured downward from the elevator frame to the chain at a point midway between the sprocketed and the tail roller. **CAUTION: DO NOT OPERATE THE SCRAPER WITH THE CHAIN TOO TIGHT.** For adjustment refer to Adjustment Maintenance section. Maintain a 50-hour check on the chain slack also.

The elevator chains should operate squarely in the center of the sprockets and the tail roller. Refer to Adjustment Maintenance section for needed adjustments.

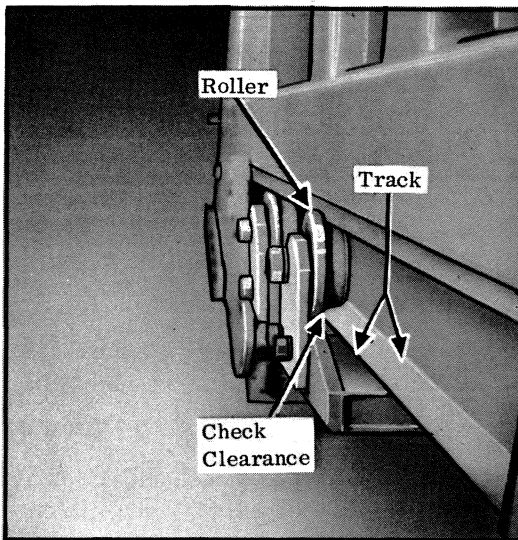


Fig. 5

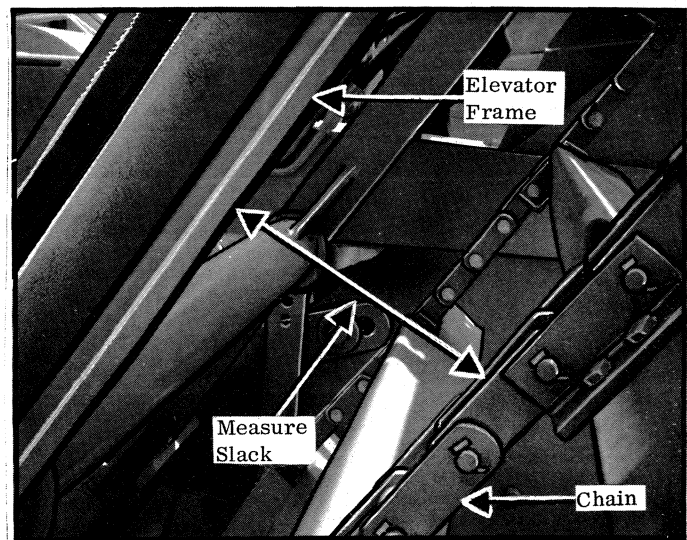


Fig. 6

TEST CONTROLS

Test each lever several times to see that the scraper components are operating smoothly. The Hancock scraper is operated by three controls. One hydraulic control valve raises and lowers the blade. One control valve actuates the opening and closing of the ejection system. The elevator action is controlled by the tractor valve. Check your tractor manual for specific information on the operation of the tractor. If the operation of the components on the scraper is rough, or loud undue noises are heard, the cause should be determined before operating the machine. When cycling the ejector system, it will be noted that at times the rolling floor and the endgate will not operate in the proper sequence with the scraper empty. The system is so designed that the rolling floor goes all the way back, then the endgate moves to the forward position when the scraper is loaded.

ADJUSTMENT MAINTENANCE

ENDGATE ADJUSTMENT

The endgate will stop when returned to loading position to clear the back cross member of the main frame. The

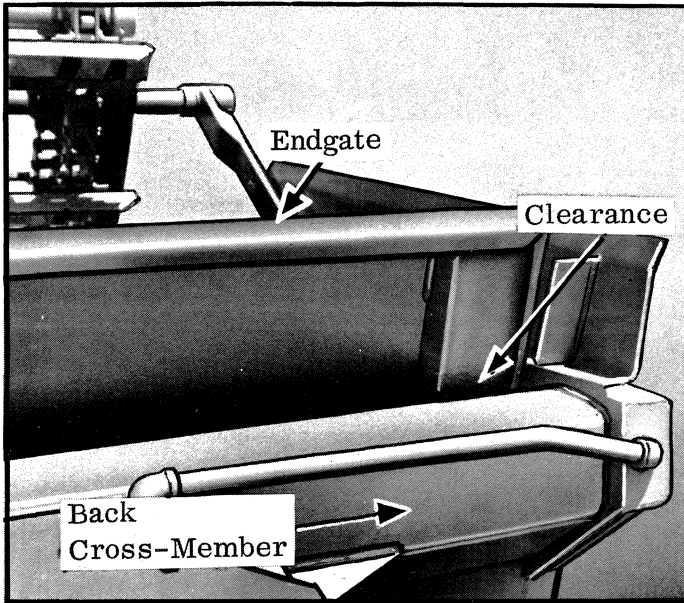


Fig. 7

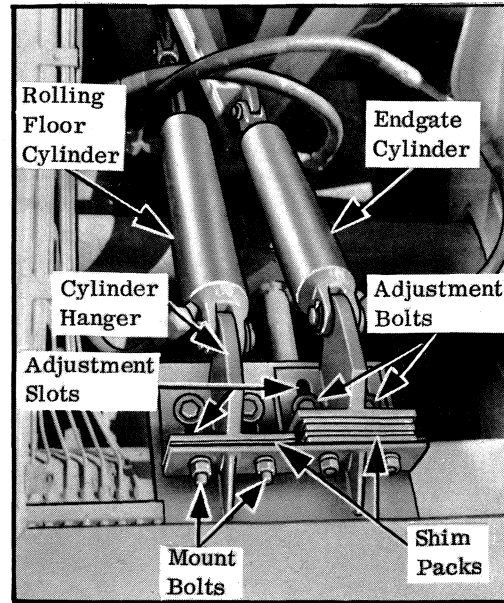


Fig. 8

The adjustment can be made by adding or taking out shims between the endgate cylinder mount and the push bar frame member on which it is mounted. (See Fig. 8). Adding shims increases the clearance and taking out shims decreases the clearance. The endgate cylinder is mounted on a cross member at the rear of the push bar. The bolts have to be removed to add or take out shims. The shims can be obtained from any dealer for these units.

To check endgate centering, the distance between inside main frame wall and edge of endgate should be equal on both sides, as shown in Figure 9. Adjustment is located at the extreme rear of tail frame and accessible underneath. Adjustment is made by observing the following procedure and Figure 10.

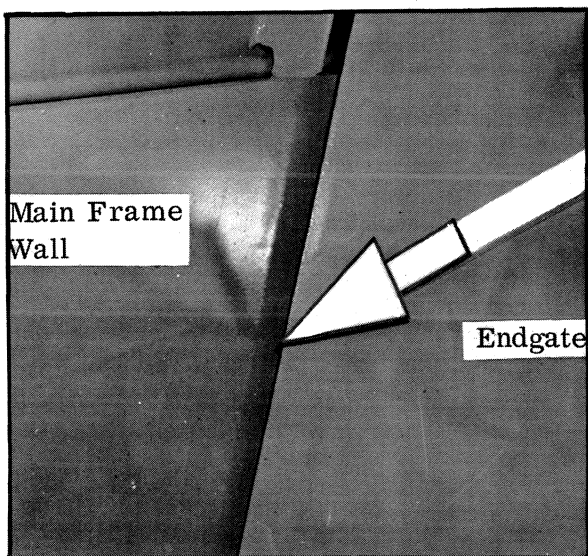


Fig. 9

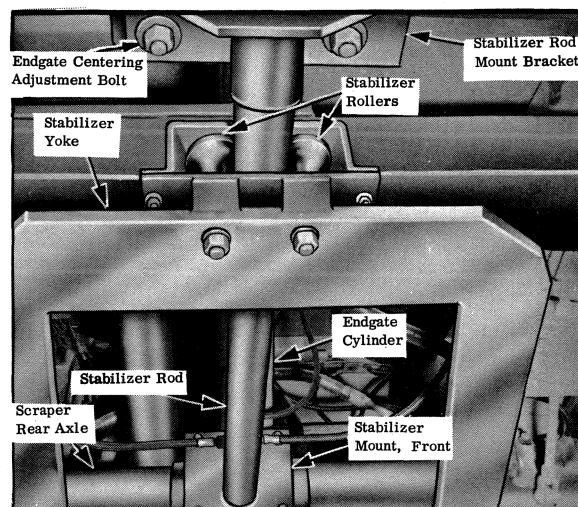


Fig. 10

1. Fully retract endgate.
2. Loosen two bolts attaching endgate traverse rod to tail frame. There is no need to remove bolts due to hanger being slotted.
3. Use a hammer or pry bar to move traverse rod and hanger desired distance. Move hanger left to increase left-hand clearance. To increase right-hand clearance, move hanger right.
4. Securely tighten bolts.

STRIKE-OFF BLADE ADJUSTMENT

The strike-off blade is on the leading edge of the rolling floor. When the rolling floor is in its most forward position, the strike-off blade should be closed. When it is closed, it should clear the back of the moldboard by ¼ to ½ inch. This clearance should be checked every 50 hours of operation in a regular maintenance program (Fig. 4).

To change the clearance, shims are added or taken out. To increase the clearance, shims have to be taken out, and to decrease the clearance, shims have to be added. The adjustment is made at the same location and in a similar manner as the discussion on the endgate clearance. Refer to Fig. 8 in this manual.

There are two rows of holes on the strike-off blade frame. In order to move the blade, take out the bolts which hold the blade to the frame and move to the desired position, depending on application. **CAUTION: REPLACE ALL LOCKWASHERS AND TIGHTEN ALL BOLTS SECURELY.**

CLEARANCE ON ROLLING FLOOR ROLLER FLANGES

This clearance is governed by the number of the shims between the roller hanger and the rolling floor (Shown in Fig. 11). Loosen two bolts in each roller hanger and either remove or add shims. The shims are slotted so that the bolts need not be completely removed. **CAUTION: TIGHTEN BOLTS SECURELY AFTER MAKING THE ADJUSTMENT** This check should be made every 50 hours in a regular maintenance program.

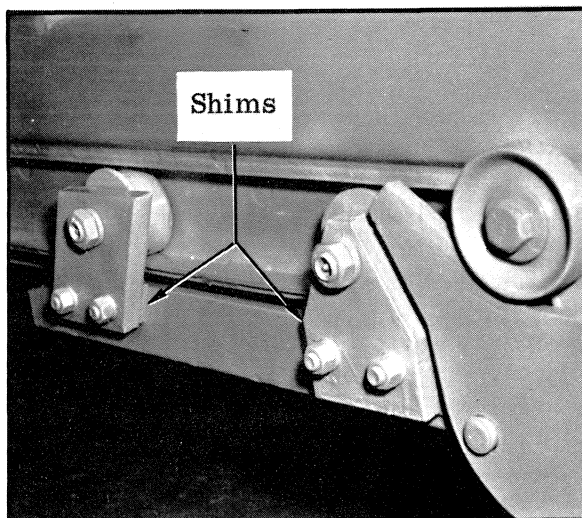


Fig. 11

ELEVATOR CHAIN SLACK ADJUSTMENT

The grease ram tail roller hanger, shown in Fig. 12 is located on the lower end of the elevator frame and can be adjusted to control the slack of the chain. **BE SURE TO LOOSEN THE TWO LOCK BOLTS SECURING TAIL ROLLER HANGER TO ELEVATOR FRAME** (See Fig. 13).

Loosen the grease zerk cover (See Fig. 12). This will reveal a grease zerk and relief valve. Apply grease under pressure in the grease ram. **CAUTION: DO NOT EXTEND TAIL ROLLER HANGERS EXCESSIVELY DURING ADJUSTMENT.** This could permit the hangers under load to deflect outward, allowing the bearing housing to move and expose the seal and bearings to dust and foreign matter.

As chain and sprockets wear, the nine inch measurement may not always be maintained (Fig. 6). Excessive wear may require removing a half link or possibly a full link and readjusting the chains. Loose chains will cause undue chain and sprocket wear and excessively tight chains may promote stub spindle bearing wear and damage.

Often chain slack will be required to vary in order to maintain proper chain centering.

ELEVATOR CHAIN CENTERING ADJUSTMENT

Fig. 14 illustrates measurements that can be made to prove the shafts are parallel and that they do form the two

ends of a rectangle. As shown in the picture, measure diagonally from a point where the sprocket flange is welded to the sprocket shaft to the point where the tail roller on the other side of the elevator is welded to the tail roller shaft in the other diagonal direction. These two measurements should be the same for proper alignment and adjustment.

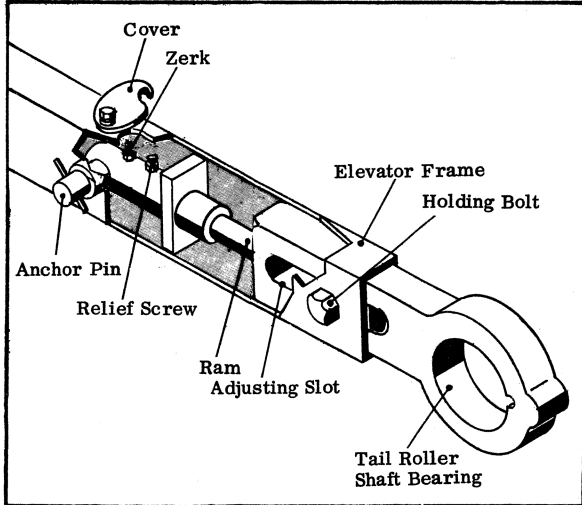


Fig. 12

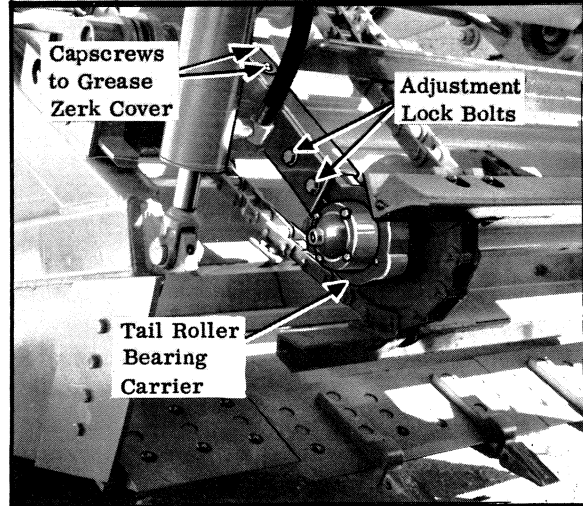


Fig. 13

An adjustment is needed if the chain is rubbing against one side of the sprocket. This means that one side of the elevator assembly is longer than the other. The measurement outlined above will prove this; however, in the field a measurement of chain slack will usually reveal the short or long side. Adjustment can be made even by trial and error, although there is slight wear in the chain. Follow the adjusting procedures outlined in Chain Tension Adjustment.

ELEVATOR HEIGHT ADJUSTMENT

The elevator can be adjusted for three positions of height above the main cutting blade. Some types of material will load better if the drags move closer to the cutting blade and some will do better with the drags farther from the blade.

This adjustment can be made either of two ways. Fig. 15 shows one method that can be used in the field if the material being moved is not too hard, or if the scraper can be moved to the fill area. It will also work in most top soils.

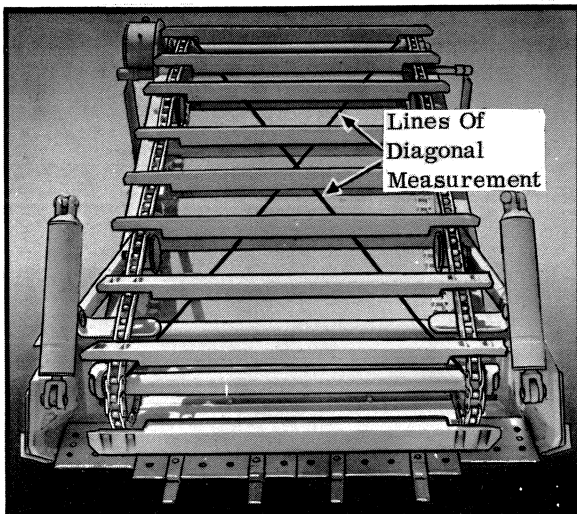


Fig. 14

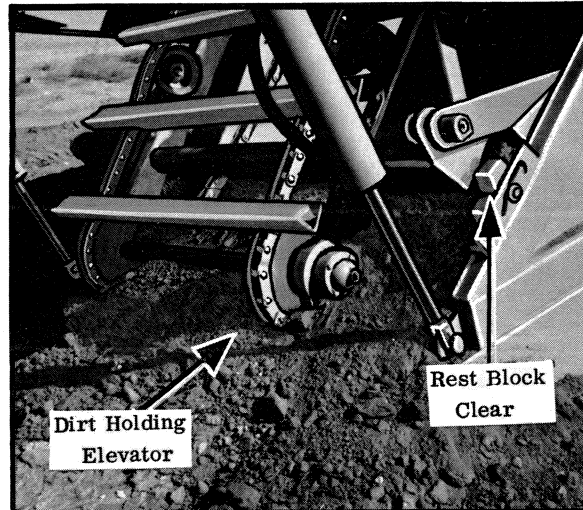


Fig. 15

Lower the blade to the ground without the elevator rotating and move the unit forward digging the blade into the ground, forcing the material to pile up under the elevator until it is raised off the rests. Another variation of this method would be to load the scraper almost full and stop the elevator, then the unit almost at the same time. Several trials of this last procedure may have to be made before the rests are freed to be moved. **CAUTION: BE SURE ELEVATOR IS SECURELY SUSPENDED IN MATERIAL BEFORE MOVING RESTS?**

Fig. 16 shows the method of freeing the rests by using a chain. This method is more often used in the shop, but can be useful in the field. Raise the blade to its highest position. Pass a heavy chain over the yoke cross member, being careful to clear the hydraulic lines. Loop it under the lower cross member of the elevator frame and hook it together. Lower the blade, and the chain holding the elevator will free the rests so that they can be moved to the position desired. **CAUTION: WHEN THE CHAIN IS PASSED OVER THE YOKE AND UNDER THE ELEVATOR FRAME CROSS MEMBER, BE SURE IT CLEARS THE HYDRAULIC LINES AND THE DRAGS TO KEEP FROM DAMAGING THEM. ALSO WORK CAREFULLY TO AVOID INJURY TO YOURSELF AND HELPERS.**

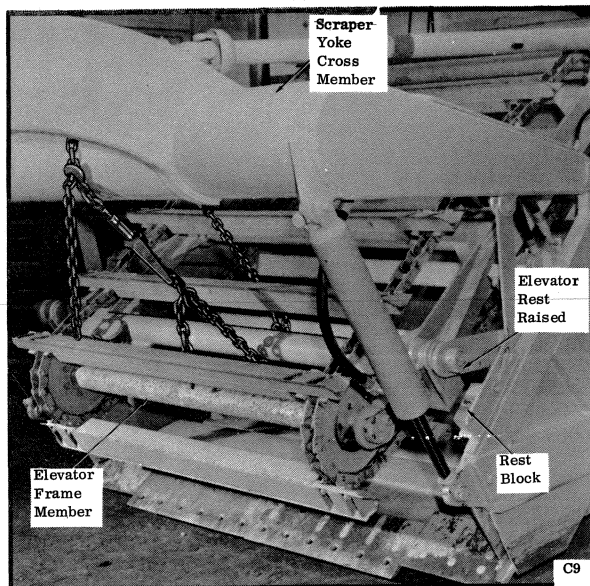


Fig. 16

OPERATION INSTRUCTIONS

GENERAL LOADING PROCEDURES

It will never be necessary to push the Hancock elevating scraper to load it. Pushbars are provided **ONLY** to be used in the case of trouble when the machine has to be moved in an emergency situation. **DO NOT USE A HELPER MACHINE TO PUSH THE HANCOCK ELEVATING SCRAPER WHILE LOADING.**

As the approach is made to the cut, select a loading speed suitable to the material and job conditions. Before lowering the blade, start the elevator rotating, then lower the blade to begin the cut. While loading, the elevator should always rotate so that the drags will sweep the material into the scraper. Keep the engine RPM's high enough to keep the pulling unit from stalling. Adjust the blade depth by raising and lowering it to a position that keeps the engine well loaded, but does not stall it.

When the material being loaded begins to fall over the side boards, the scraper is loaded. Stop the elevator first, then raise the blade to haul position. As the blade comes out of the ground without the elevator rotating it helps to eliminate excessive loss of loose material. Certain materials after this procedure.

It is strongly advised to avoid rocks, stones, and other large objects. It would be far more economical for these to be dozed out and loaded by some other method. Serious damage to the elevator and other components can be caused by attempts to move these objects with the elevating scraper, which will result in large repair costs.

LOADING DIFFERENT MATERIALS

In loose unconsolidated materials such as sand and dry powdery top soil it will be possible to make a deeper cut and use a higher speed range. This type of material may not load well unless the elevator is adjusted to its lowest position.

HARD-PACKED AND CONSOLIDATED MATERIAL:

The operator will find it necessary to take shallower cuts and to use the lowest speed ranges to load. The two outside sections of the blade can be set in the up position on the moldboard, and chisel teeth mounted. (Four on this model, as shown in Fig. 17).

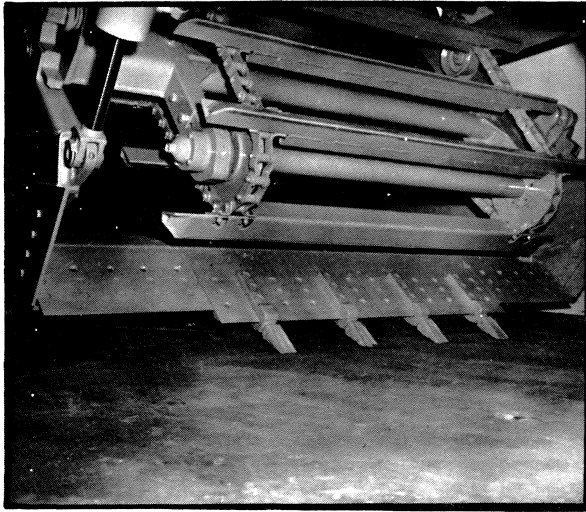


Fig. 17

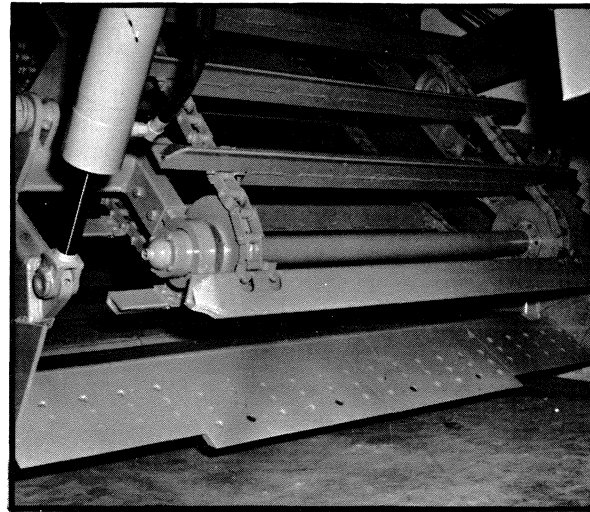


Fig. 18

LOOSE TYPE OF MATERIAL

Tire pressure should be kept at the lowest permissible pressure to give maximum flotation and traction. (See Tire Manual.) Best results are obtained if the two outer sections of the main cutting blade are set in the up position on the moldboard in order to force the materials as high into the elevator as possible, as shown in Fig. 18.

PLASTIC MATERIALS

The following blade arrangements will be helpful in highly plastic materials such as gumbo or clay which carries moisture enough to be plastic.

One of the recommended procedures is to have the two center sections of the standard blade extended and to use chisel teeth set side by side. Six teeth may be used on this model, placed as shown in Fig. 19. Some plastic materials may be loaded with only the drop center blade fully extended to narrow the cut as shown in Fig. 20. Another way is to add a 30" blade, bevel side up, to the center of the drop center blade as shown in Fig. 21. The elevator can be set in its lowest position to pick up as much material as possible.

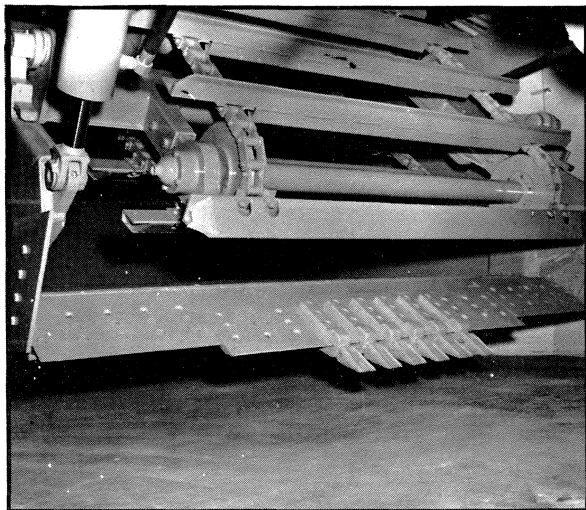


Fig. 19

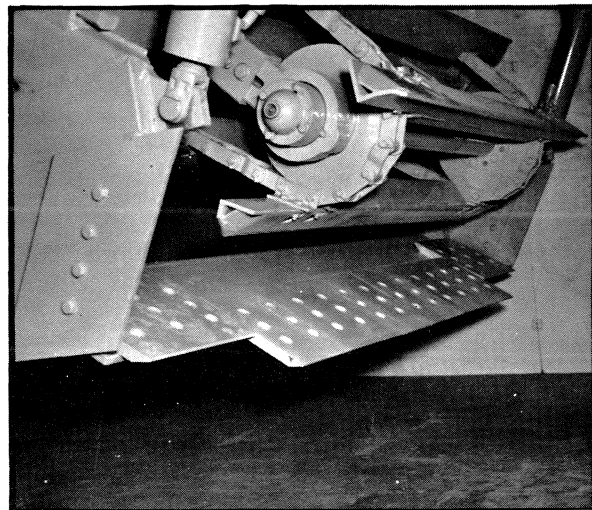


Fig. 20

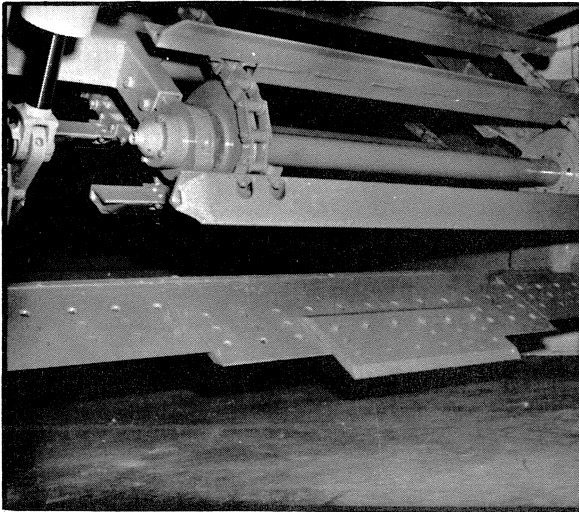


Fig. 21

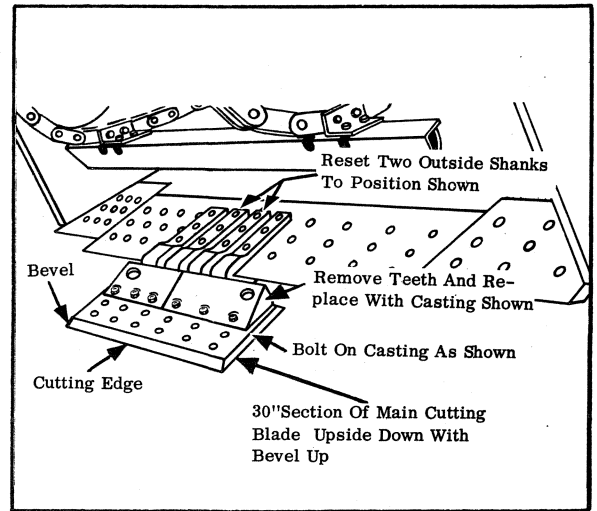


Fig. 22

The hole pattern in the cutting blades and the moldboard are there so that cutting blades can be mounted in the high or low position. The standard blade setting is shown in Fig. 18. **BE SURE ALL BOLTS ARE TIGHTENED SECURELY.**

The flat plastic material blade, shown in Fig. 22 can be installed on existing chisel teeth. Finished parts for the flat plastic material blades are not available at the present time. They will be, however, in the near future and at that time full information and instructions will be published and sent to all Hancock Dealers. Instructions for field installation of built up flat plastic material blades can be obtained from your Hancock Dealer.

The frost blades (Fig. 23) have been designed as a helpful aid in digging in frozen ground which has a tendency to come out in large chunks. Frost blades will have the effect of breaking up these chunks of frozen earth and are more easily handled by the elevator in loading.

Two pointed frost blades are used. Mount the pointed blades in the center portion of the main cutting blade with forty inches between the points of the blade and equal space from each blade point to the side of the main frame of the scraper.

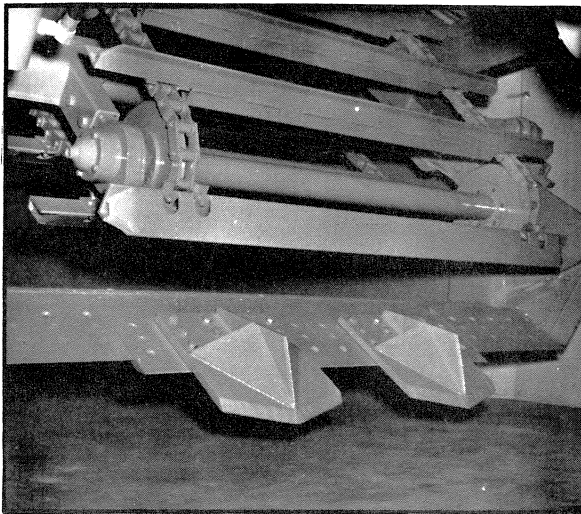


Fig. 23

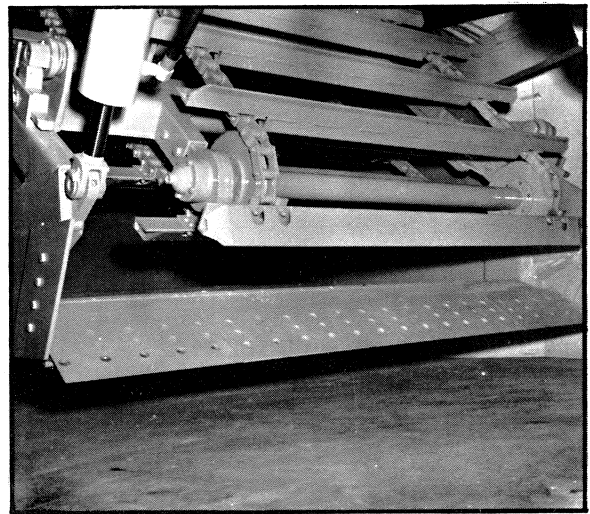


Fig. 24

WINDROWED MATERIAL

To load windrowed material two outside sections of the main cutting blade should be in the down position so the cutting edge is in a straight line with the two center sections of the blade, as shown in Fig. 24. The chisel teeth should be removed. With the blade in this position, the scraper can also be used for fine grading if necessary.

LARGE CUT AREA

In a large cut area a loading pattern should be established. After making the first cut on one side, a berm of four or five feet should be left between it and the next cut. Continue this pattern across the complete area. These berms can then be cut to a greater depth leaving berms for the next pass, shown in Fig. 25.

HAUL TO FILL AREA

To make the haul, the operator should select a speed that is suited to ground conditions and the haul road. Keep the blade at the lowest elevation possible during the haul. A careful selection of the shortest and smoothest ground out of the cut area to the haul road will be of great advantage to the operator and the machine.

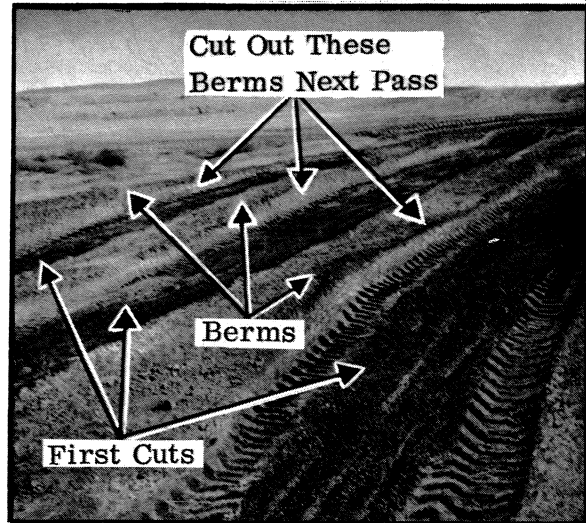


Fig. 25

EJECTION AND SPREADING THE LOAD

The ejection and spreading operation will require some experimentation for the new operator. A slow speed range should be selected for the first unloading effort. The elevation of the blade should be approximately ten inches above the ground when the ejection is started. Pull the ejection lever until the rolling floor has moved back about halfway, then release it, stopping the ejection momentarily. Again pull the lever until the rolling floor is all the way back and release the lever again momentarily. Repeat the operation twice more in the same manner, moving the endgate forward completing the ejection.

Continue to eject and spread at low speed until gaining the feel of the machine, then higher speeds can be used and the ejection done in one motion, however, the operator may find it necessary, even in the higher speed ranges, to eject in stages as explained above. The ejection system is very fast and requires the machine to have a faster forward motion for the material to spread properly.

Weather conditions, type of material, terrain, and spreading requirements are all to be considered in selecting speed ranges for the ejection operation. In selecting a speed range, the operator must keep in mind that he must always maintain forward motion of the machine during an ejection to keep it from stalling out or digging in. It is also easier to maintain a smooth, even spreading operation and a higher speed range. **IT IS A GOOD PRACTICE TO RETURN THE EJECTION COMPONENTS TO THE LOADING POSITION AS THE RETURN TRIP TO THE LOADING AREA IS STARTED.**

OPERATING HINTS

KEEPING TRACTION ON DAMP SURFACES

When digging material that leaves a hard damp surface on which to work, very often traction is very hard to maintain. If the lowest permissible tire pressure is used, it will help to keep traction. (See Tire Manual.)

LOAD DIRECTION

If at all possible, load the scraper going in the direction of the dump area. It will eliminate making a turn loaded and gives a shorter haul distance, allowing the long haul and turn to be made with an empty scraper. This will save time and effort.



HANCOCK DIVISION



TURNING

Do not cut a corner too close when making a sharp turn. Allow enough room to clear; slow down when turning corners.

THE OPERATOR

The importance of the operator cannot be over-emphasized. No matter how well a machine is designed and built, the operator has to put it to work. It is his skill that gets the job done faster. His care in checking maintenance, and proper use of the machine will keep it working.

SAFETY TIPS

These machines are designed with safety as one of the most important features. However, it is impossible to build or design against all dangers of accidents. It is the responsibility of the operator and the men who work with and around them to be careful. Always work with safety in mind. We have listed here several reasons for most of the accidents causing injury to the operator and other workmen.

1. Repairing and servicing equipment in dangerous positions.
2. Striking other persons or vehicles with the machine.
3. Unexpected violent tipping of the equipment.
4. Unexpected violent shocks or jars to the machine.
5. Uncontrolled traffic involving other vehicles.
6. Hazards from limbs of trees or overhead obstructions.
7. Leaving unattended earthmoving or other equipment in dangerous positions.

In order to help prevent accidents, the following safety rules must be observed at all times.

DO NOT LEAVE MACHINE UNATTENDED

Do not leave machine unattended with engine running. Always place directional shift lever in NEUTRAL, lower blade, retract ejector, and shut down engine before leaving operator's seat.

WATCH DIRECTION AT ALL TIMES

Always face or look in direction machine is traveling.

AVOID GREASY HANDS AND FLOORS

Keep hands, floors, and controls free from water, grease, and mud to insure non-slip control.

ENTER AND LEAVE OPERATOR'S COMPARTMENT SAFELY

Always enter and leave operator's compartment using step and hand rail provided. Do not grasp steering wheel.

NEVER GET ON OR OFF A MACHINE IN MOTION

One of the MOST DANGEROUS maneuvers is to get on or off a machine that is in motion. Positively in no case should anyone ride on the outside of the machine, or hitch a ride in any manner.

BE CONSIDERATE OF GROUND CREW

Watch for ground crew and other workers on foot while machine is in motion. Sound horn as a warning when approaching ground crew and before setting machine in motion.

ALWAYS DROP BLADE TO HOLD MACHINE WHEN PARKED

Drop blade when parking machine. If on a grade, block wheels.



HANCOCK DIVISION



NEVER LEAVE MACHINE WITH EJECTOR FORWARD OR RAISED

Always return the ejector system to the retracted or loading position after spread and check to see that it is in that position when parking the machine.

BLADE POSITION FOR TRAVEL

Raise blade approximately twelve (12) inches off the ground when traveling or returning to load area.

BE CAREFUL OF LIFE AND LIMB

Do not place hands on ejector roller track. Keep feet clear of blade. Never enter bowl behind ejector unless it is securely blocked in forward position.

SELECT PROPER SPEED RANGE

Operate machine at safe speeds. Extra caution should be used if haul roads are rough, wet or icy.

CHECK BEFORE MOVING MACHINE

Walk around machine to make certain that no one is in "Danger Area" before entering operator's compartment. Sound horn before moving machine.

SLOW DOWN WHEN TURNING

Do not turn sharp corners at full or high speed over rough terrain.

SELECT LOW SPEED RANGE TO DESCEND STEEP SLOPE

Use a slow speed range and brake application to control when descending a steep slope, if necessary, lower blade and drag cutting edge on ground to maintain safe control of the machine.

LUBRICATION AND MAINTENANCE PROCEDURES

The importance of proper lubrication cannot be over-emphasized. It is the most essential single factor in a well-planned preventive maintenance program. Refer to lubrication diagram located in Section Two to locate the various points to be serviced. Before servicing, always wipe dirt and foreign materials from grease fittings and filler caps, to prevent dirt, grit, or foreign materials from entering.

SERVICE DAILY; GREASE FITTINGS (Every 8 Operating Hours)

Lubricate all points indicated on chassis lubrication charts for 8-hour intervals with lithium base multi-purpose grease. Use grade of lubrication specified in lubrication chart. Select weight grease according to weather temperature.

CHECK TIRE PRESSURE AND CASINGS

Check tire pressure in all tires. Be sure valve caps are in place to prevent dirt, moisture, and foreign materials from damaging valve core.

KEEP TIRES FREE FROM OIL AND GREASE

Repair cuts immediately to prolong tire life. Check tire pressure in the morning when the tires are cold. Do not release increased pressure caused by operation. (See Tire Manual.)

TIGHTEN WHEEL NUT AND INSPECT RIMS

Wheel nuts should be checked regularly and kept tight. Loose wheel nuts will cause undue tire wear, strain axle assemblies, and affect steering and load distribution. Tighten wheel nuts to 300 ft. lbs. torque.

PACKING WHEEL BEARINGS

The wheel bearings on this unit should be checked and packed every 500 hours of operation. This is subject to the information in the above paragraph, "Lubrication Frequency". A method of supporting the tire and wheel should be found in order to provide safe removal. Use the same Lithium Base Multi-Purpose grease for packing the wheel bearings that is used for greasing the zerk stations.

Carefully clean and inspect the parts of the wheel bearing assembly as they are removed. Replace all felt washers and seals each time the wheel packing is done. Also, it is good practice to replace gaskets. Replace all worn parts that may not last until the next time the wheels are packed. This may save valuable down time. Fig. 26 shows the parts in the wheel bearing assembly.

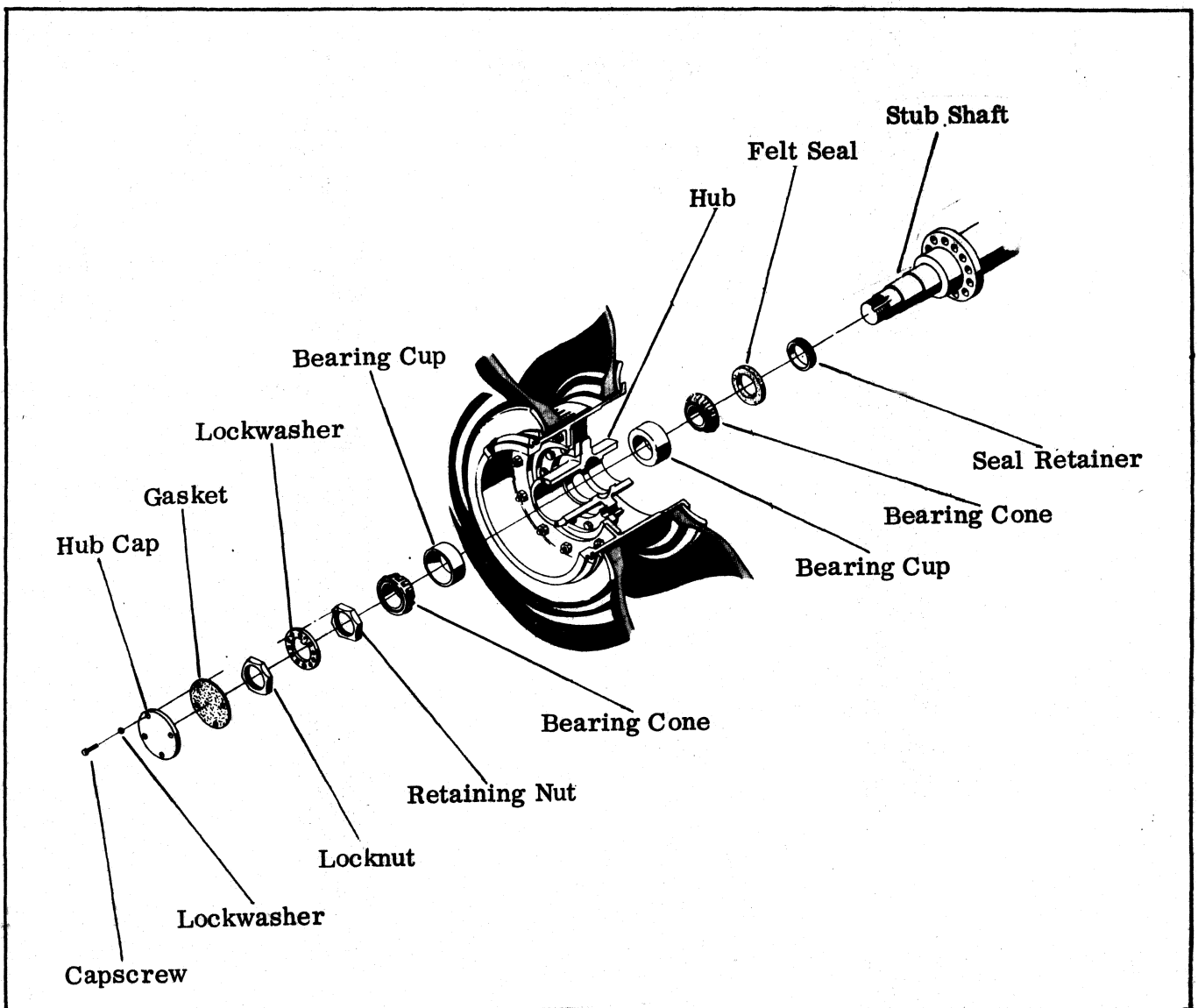


Fig. 26

CHECK ELEVATOR GEARBOX

On a new machine the oil in this gearbox should be drained and flushed, and refilled with an EPGL that meets military specification MIL-L-2105 that gives a lever load of 50 or better, or military specification MIL-L-2105B with no zinc or lead additive. The drain plug and fill plug in this gearbox are of the magnetic type. They should be thoroughly cleaned each time they are removed. It is good practice to inspect them completely before they are cleaned to see if there is an excessive amount of metal cuttings on them. If so, this could be the first indication of serious trouble. The gearbox should be checked every 50 hours of operation and drained for refill every 500 hours. Refer to Lubrication Chart in Maintenance Section.

LUBRICATION FREQUENCY

Refer to the lubrication chart of this manual. The frequency suggested in this chart is based on average job conditions. Change periods and maintenance programs must be established on the basis of individual job conditions. Climatic condition at job locality will be an important factor in establishing a lubrication and maintenance program.

Lubricants showing signs of break-down, oxidation, or those that have been subjected to excessive heat should be changed often enough to prevent these conditions from occurring.

SHIPMENT AND STORAGE

PREPARATION FOR SHIPMENT

Thoroughly clean blades, axles, elevator components, inside scraper bowl and all other parts of the scraper usually exposed to dirt. Dust caps should be placed on hose ends and hoses securely tied to dolly. Always ship scraper with chisels removed and center blade up as shown in Figure 24.

LOADING SCRAPER

Using a loading dock to position the scraper on the carrier on which it is to be hauled. If a loading dock is not available, use a crane with sufficient capacity to lift the weight of the scraper. The shipping weight is 19,000 pounds. Attach cables to tiedown devices provided on each side of scraper as shown in Figure 27.

With scraper on carrier secure all wheels with shipping wedges. Using a suitable cable or chain, secure front dolly as shown in Fig. 28. Pass the cable or chain under the cross member as shown, being careful not to damage the hydraulic lines.

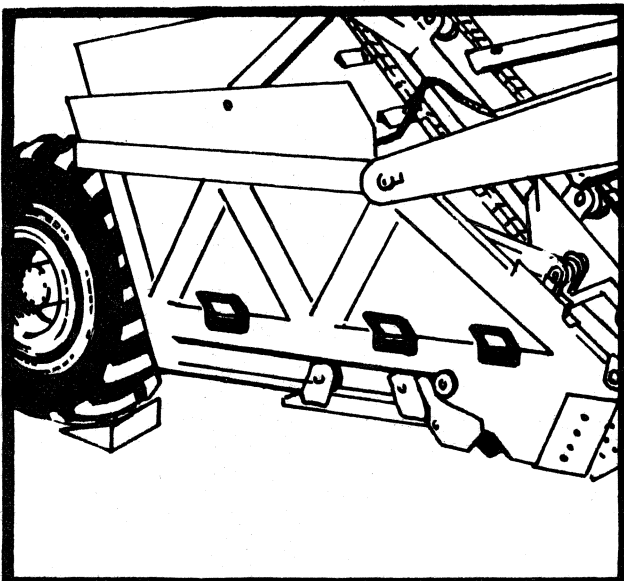


Fig. 27

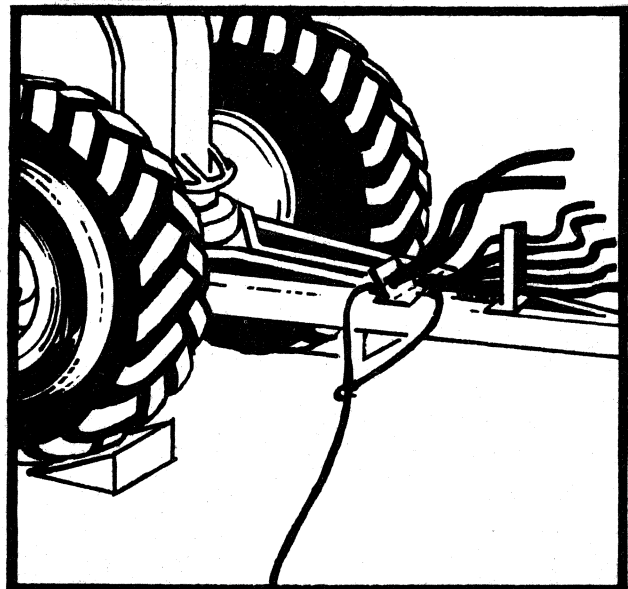


Fig. 28



HANCOCK DIVISION



STORAGE

Thoroughly clean blades, axles, elevator components, inside scraper bowl and all other parts of the scraper usually exposed to dirt. Flush off mud and dirt with a high pressure stream of water. Clean greasy or oily spots with a cloth dampened with solvent.

Remove any rust or corrosion from the scraper using an approved chemical rust remover. Repaint parts from which paint has been chipped or worn.

Scraper should be secured as outlined in loading scraper and Figures 27 and 28.

Regular inspections should be made while scraper is in storage, check for evidence of physical damage such as rusting, accumulations of water, pilferage or other damage sustained while the equipment is being stored. Take steps to correct the conditions producing the damage.

* * * *

SECTION TWO

MAINTENANCE



HANCOCK DIVISION



MAINTENANCE SCHEDULE

SYSTEM	OPERATION	PAGE NO	DAILY OR SHIFT	TIME INTERVAL (Hours)		
				50	100	250
HYDRAULIC	Check System For Leaks		●			
	Clean Cylinder Rods		●			
ELEVATOR	Check Chain Slack			●		
	Check Tail Rollers					●
	Check Head Roller Sprockets					●
	Check Grease Ram Bolts		●			
	Check Chain Rollers and Link Pins					●
	Check Chain Centering		●			
	Check All Bolts For Tightness					●
EJECTION	Check Floor Roller Clearance					●
	Check and Clean Roller Track		●			
	Check Strike-Off Clearance				●	
	Check Endgate Rear Clearance					●
	Check Endgate Side Clearance					●
	Check All Bolts For Tightness					●
WHEEL TIRES AXLES	Check Tire Pressure		●			
	Check Wheel Rims		●			
	Check Wheel Bolts		●			
	Check Cutting Edge For Level					●
MAIN FRAME	Check Cutting Edge For Wear			●		
	Check All Bolts For Tightness					●

HANCOCK

PULL YOKE DESCRIPTION

The pull yoke is the part of the scraper by which the scraper is connected to the tractor. The pull yoke serves a two-fold purpose: (1) It connects the scraper to the tractor and (2) It partially supports the load in the bowl by means of the two lift cylinders attached to the main frame or bowl of the scraper.

The pull yoke is attached to the tractor by means of a flexible hitch which allows the tractor to be turned at a 90 degree angle in either direction from the scraper. The hitch pivots freely so that the unit may be operated over almost any terrain.

REMOVAL

When handling an assembly as heavy as the pull yoke, the following safety precautions are the minimum which must be taken.

1. Make sure that all slings and hoists are in good condition.
2. Make sure that the instructions outlined below for removal of the pull yoke are thoroughly understood before attempting removal of the yoke.

Follow the instructions in the order listed below to remove the pull yoke.

1. Relieve pressure in the hydraulic system by removing the hydraulic reservoir cap and actuating all hydraulic

controls including the steering wheel, elevator control valve and the lift and ejection valve control levers.

2. Disconnect all hydraulic lines which would be affected by removal of the pull yoke.
3. Support the tractor at the front so that it will not fall when the pull yoke is removed from the tractor hitch arrangement.
4. Remove the upper and lower vertical hitch pins from the hitch arrangement connecting the tractor and scraper pull yoke.
5. Support the pull yoke with a hoist as shown in Fig. 1.
6. Using the hoist, move the scraper with the pull yoke attached away from the tractor.
7. Continue to support the pull yoke with the hoist and remove the lift cylinder pins which fasten the lift cylinders to the pull yoke. Allow the cylinders to swing forward as far as they will go.
8. With the pull yoke still supported with the hoist, remove the yoke pins from the main frame by removing the locknuts securing the yoke pins to the main frame and carefully drive the yoke pins from the main frame from the inside of the bowl.
9. The pull yoke may now be lowered to a suitable working surface.

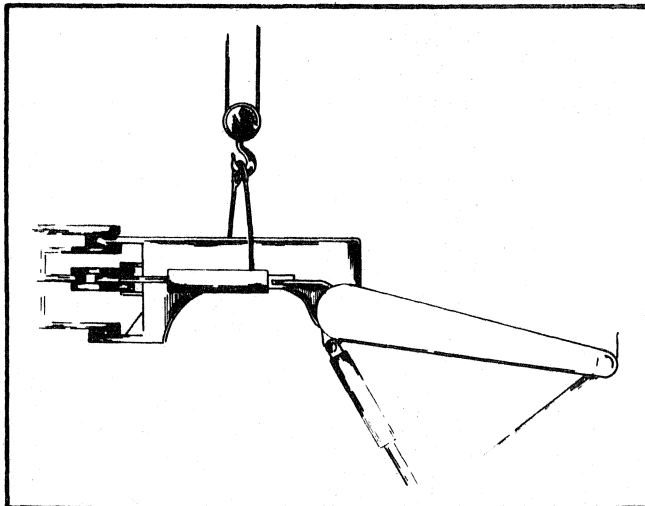


Fig. 1 Supporting Pull Yoke

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PULL YOKE

INSPECTION

The pull yoke should be inspected thoroughly for cracked welds, especially in the hitch arrangement. Check the yoke pin bores for excessive elongation.

Make sure that the bushings in the hitch arrangement are not excessively worn and that they are receiving a sufficient amount of lubricant.

INSTALLATION

Installation of pull yoke is accomplished by reversing removal procedures. Check yoke pins and receiver bushings for galling, burrs and out of roundness. Replace

worn or damaged parts before installation. Check steering linkage for worn bell cranks and worn or damaged pins and cracked welds.

* * * *

HANCOCK

MAIN FRAME

The part of the elevating scraper that carries the load is referred to as the main frame. The moldboard is across the full width of the lower front of the main frame and serves the purpose of a brace as well as a blade base. Welded to the rear of the main frame is the tail frame which houses the ejection cylinders and the brake controls.

The side sheets of the main frame are channel reinforced, jig welded torsion resistant assemblies. A track for the rolling floor rollers is an integral part of the

side sheets of the main frame.

As mentioned before, the moldboard serves the two-fold purpose of a blade base and a horizontal brace for the main frame. There are four cutting edges or blades attached to the moldboard. Many different blade arrangements are possible with these four blades and employment of the different blade arrangements varies with the type of material being loaded. The various materials and the recommended blade arrangements are discussed in the following paragraphs.

PROPER BLADE ARRANGEMENT

SAND AND LOOSE MATERIAL-Best results are obtained with the two outside cutting blades (15 inches) in the UP position as shown in Fig. 1. In most instances, the elevator, should be in the **LOWEST** position. See Elevator, Section for elevator adjustment procedures.

The material is forced over the fixed blade as high into the elevator as possible. Tire pressure should be kept at the lowest permissible pressure to give maximum flotation and traction. See tire inflation chart in the **TIRES** Section of this manual, Section 10.

HARD PACKED AND CONSOLIDATED MATERIAL-The necessity to take a shallower cut and use Lo-Lo speed range is required to load this type material. Four chisel teeth may be mounted on the two center

cutting blades (30 inches) with the outside cutting blades in the UP position as shown in Fig. 2. As a rule, best results are obtained with the elevator on the adjusting blocks in the **CENTER** position.

PLASTIC MATERIAL - Two types of gumbo blades may be fabricated to assist in loading plastic type material such as gumbo or clay. See Fig. 3 and 4. Without the fabricated blades, the recommended method is to raise the two 15 inches outside cutting edges and mount six chisel teeth side by side on the two center 30 inch sections. See Fig. 5. Fig 3 illustrates four chisel teeth mounted on the two center sections of the main cutting edge and a 30 inch cutting edge welded, **BEVEL UP**, to the chisels. In order for the elevator drags to pulverize the material as it passes over the blades, the elevator should be in the lowest practicable operating position.

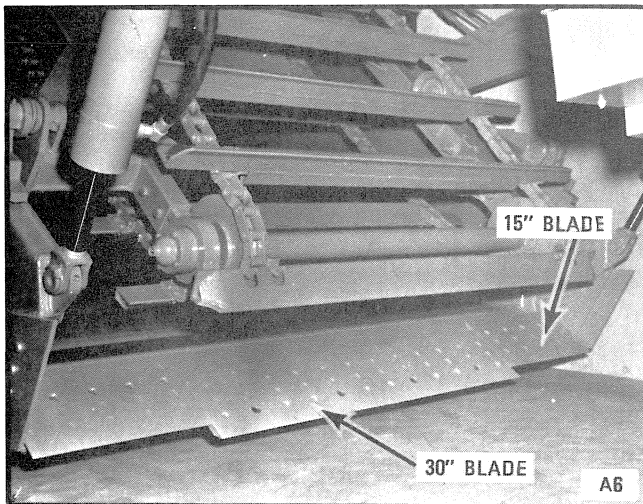


Fig. 1-Drop Center Arrangement

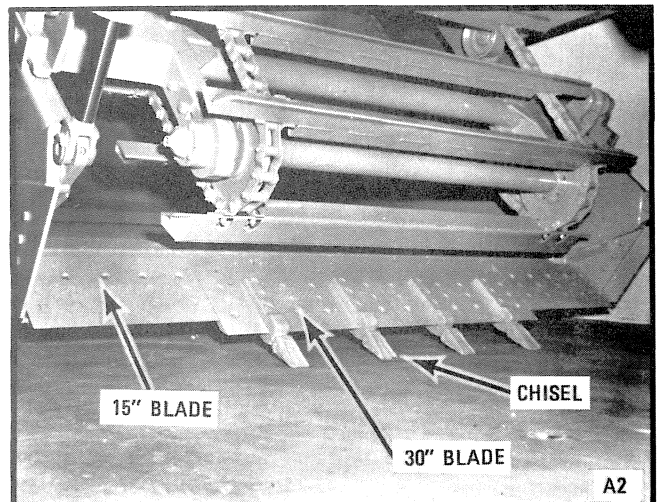


Fig. 2-Drop Center Arrangement With Chisels

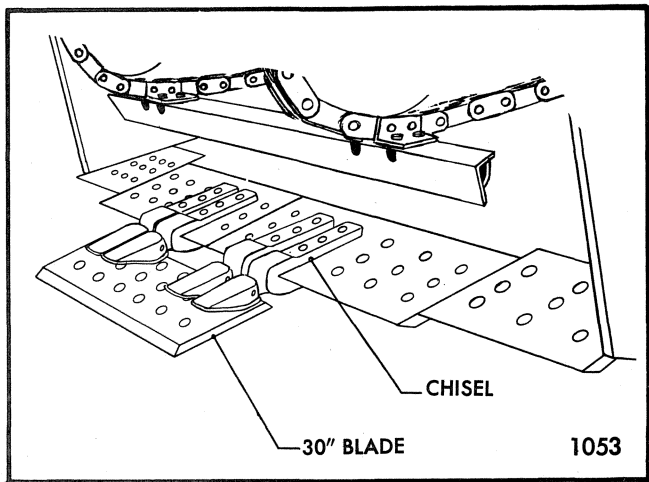


Fig. 3-Gumbo Blade

WINDROWED MATERIAL-Chisel teeth should be removed with the two outside cutting blades mounted in the DOWN position forming a straight cutting edge 90

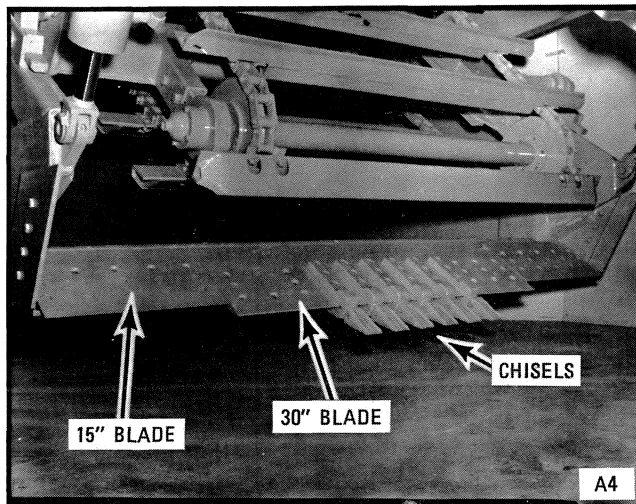


Fig. 5-Drop Center With 6 Chisels

inches wide. Finish grading can also be done with the cutting blades mounted in this manner. See Fig. 6.

TIGHTENING SCRAPER BLADES

In order for the blades to give long service life and to function properly, they must be maintained properly and the proper torque applied to the plow bolts which hold them to the moldboard. Should the plow bolts loosen the mounting holes in the blades become elongated and the moldboard is allowed to wear.

CUTTING BLADES SHOULD NEVER BE ALLOWED TO WEAR TO THE POINT WHERE THE MOLDBOARD IS DOING THE CUTTING!

When replacing or turning blades or when the blade arrangement is changed, utmost care should be taken to assure that the plow bolts holding them to the moldboard are tightened securely.

The plow bolts are flat headed, square-shouldered bolts. The square shoulders are made to fit in the countersunk holes in the cutting blades. These shoulders must be seated firmly in the countersink of the blade or the bolt will never be brought up to its specified torque.

When the nuts on the bolts are being drawn down, the head of the plow bolt should be pounded sharply. Continue pounding the head of the plow bolt until the nuts are drawn up to the required 330 ft. lbs. torque. The plow bolts are firmly seated when the nut cannot be turned with an application of 330 ft. lbs. torque, in a counterclockwise direction.

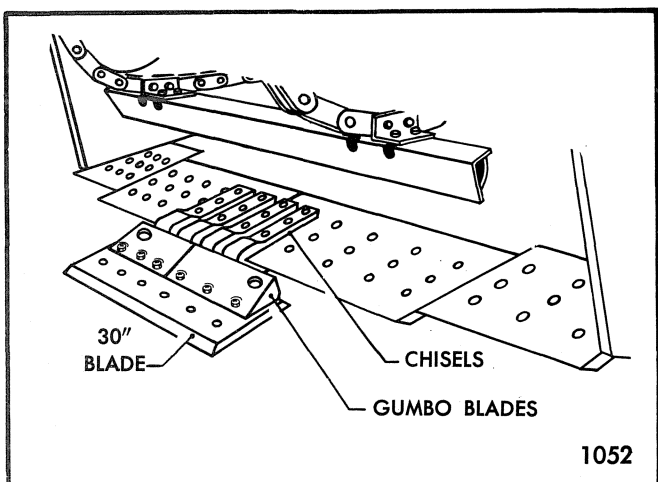


Fig. 4-Gumbo Blade

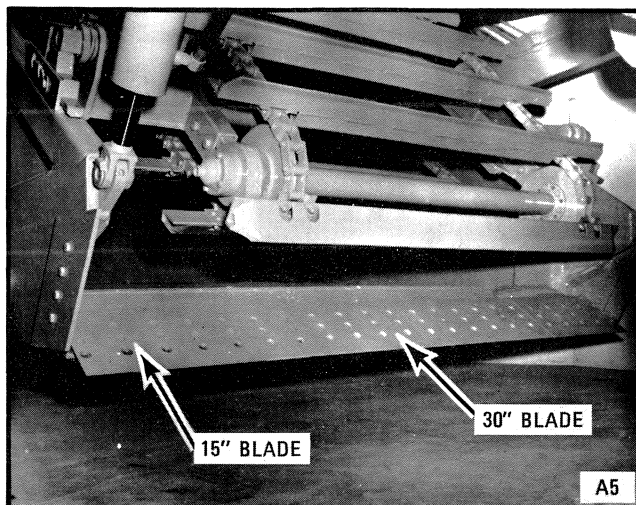


Fig. 6-Straight Edge Arrangement

BLADE CARE AND MAINTENANCE

As mentioned before, the blades should never be allowed to wear to the point where the moldboard is doing the cutting. These blades are double-edged so that they may be reversed when they become worn on one side. If the blades are allowed to wear too long on one side, it is very likely that they will not be useable on the other edge.

Since conditions vary greatly, no recommendation is made as to when to change the scraper blades. Job conditions will dictate and the judgement of the service man must be used in making this decision.

Blades should never be allowed to wear on one side enough that the holes closet to the leading edge of the blade become elongated. When the blade is reversed, these holes will receive most of the pressure and thrust coming from the cutting edge. Therefore, the blades must be turned before the holes in the leading edge become elongated.

When turning or reversing blades, observe the scraper blade tightening procedures outlined above.

CHISELS

Chisels or ripper teeth as they are sometimes called, are standard equipment on all models. Depending on the type of material, these chisels may or may not

be used. See MAIN FRAME Section on chisels. As noted, chisels may be removed or added depending upon job conditions.

* * * *

HANCOCK

ELEVATOR

The heart of the elevating scraper and the feature which sets it apart from other scrapers is the elevator. The elevator is composed mainly of the following: (1) elevator

frame, (2) head roller, (3) tail roller, (4) elevator gearbox, (5) three stub spindles and (6) four idler rollers which support the chain as it rotates around the elevator frame.

REMOVAL OF THE ELEVATOR ASSEMBLY

It is rarely necessary to remove the elevator assembly. The only case in which the elevator assembly should be removed from the unit is when the elevator frame is bent so that the elevator cannot be properly adjusted for rectangularity; in this case the elevator frame must be replaced.

Extreme caution must be exercised when removing the assembly. Thoroughly understand the instructions outlined below before attempting removal of the elevator assembly.

1. Remove the hydraulic motor from the elevator gearbox and tie it back out of the way so that the hoses will not be damaged. Leave the hoses intact on the motor unless the hydraulic fluid is to be changed in the same operation.
2. Remove capscrew, flatwasher and locknut fastening upper elevator arm to elevator rest on main frame.

Support the elevator assembly with a hoist of sufficient capacity to handle the assembly.

3. Lift the elevator assembly slightly to allow better alignment and to ease the tension from lower elevator arm.
4. Remove cotter pin and flatwasher from the lower elevator arm stub. Perform the operation on the opposite side of the elevator.
5. Use a pry bar to remove the lower elevator arms from the lower elevator arm stubs.
6. Lift the elevator straight up and out of the main frame handling it with care to avoid injury to equipment and personnel.
7. Place the elevator on suitable stands or on the floor and begin needed service.

DRIVE SPROCKET SERVICE

The drive sprockets are designed to be reversed after wearing on one side. This design feature allows almost a "double life" for the drive sprockets. The sprockets must not be allowed to wear on one side to the point that it is not advantageous to reverse them.

Sprockets must be turned when they are worn sufficiently to justify turning them. When new chains or chain parts are installed, place new sprockets on the unit.

Turning the sprockets is left largely up to the service man. Since job conditions vary so widely, no flat hourly recommendation is in order to reverse the drive sprockets.

When the sprockets are to be turned, it is best, if possible, to have a full load in the scraper. This will give the serviceman a place to stand and make handling of the chain and drag assembly much easier.

Thoroughly understand the instructions listed before

reversing the sprockets.

1. Part the chain by removing pin cotter and driving a pin through the chain using a heavy hammer or similar object as a back-up. See Fig. 1. Support the head roller with a hoist and sling.
2. Remove the capscrews and locknuts fastening the upper stub spindle to the drive sprocket and the head roller flange.
3. Loosen the capscrews and locknuts fastening the upper stub spindle bracket to the elevator frame a sufficient amount to allow the stub spindle and hanger to be pried from the drive sprocket and head roller flange.
4. Tap the sprocket with a hammer to remove it from the head roller flange.
5. Remove the capscrews and locknuts fastening the

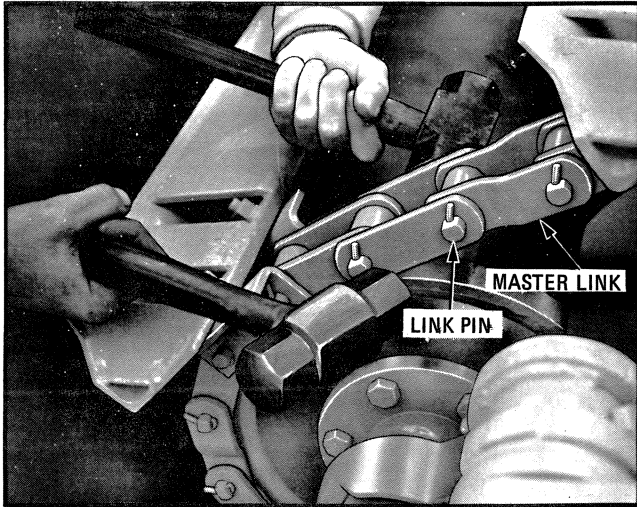


Fig. 1—Parting Chain

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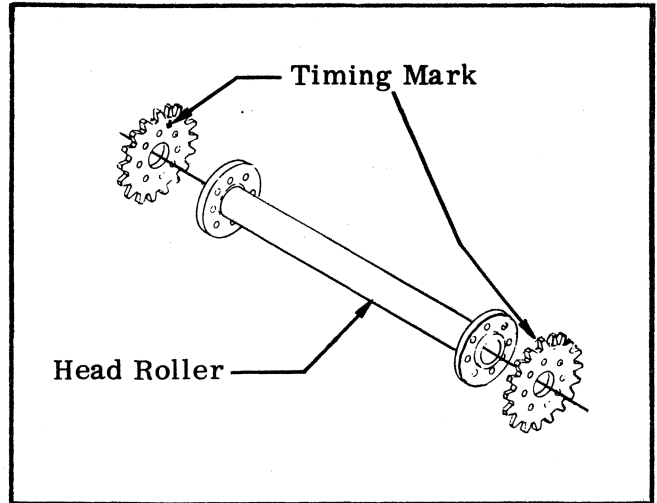


Fig. 2—Timing Mark Alignment

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splined gearbox hub to the drive sprocket and head roller flange.

6. Loosen the gearbox hanger mounting capscrews and locknuts sufficiently to allow the gearbox to be removed from the drive sprocket and head roller flange.
7. Tap the sprocket with a hammer to remove it from the head roller flange
8. Take the stub spindle side sprocket and place it on the gearbox or driving side of the elevator.

9. Place the sprocket removed from the gearbox or driving side of the elevator on the stub spindle side of the head roller.

NOTE: Make sure that the timing marks are properly aligned when placing the sprockets on the head roller. See Fig. 2.

10. Replace the two pins and cotters removed to part the chain with new parts.

The sprockets will not be running on the unworn sides, hence the term “double life”. The instructions listed above will also apply when the sprockets are being replaced with new ones.

* * * *

HANCOCK

STUB SPINDLE

DESCRIPTION

Three stub spindles are used in the elevator assembly. Their purpose is to allow rotation of the head roller and tail roller as the chain travels around the elevator frame.

Stub spindles must be removed from the unit if they need any service other than normal lubrication.

REMOVAL

1. Part chain at a master link as near as possible to the tail roller. Use a heavy hammer and a similar object as a backup to drive the chain pin with the cotter intact through the chain. Repeat this process on the opposite side of the chain.
2. Relieve grease ram pressure before removing capscrews and lockwashers used to lock bearing brackets inside elevator frame tubing.
3. Allow tail roller to slide out onto the floor with the bearing brackets intact. Remove bearing brackets from stub spindles.
4. Remove capscrews and lockwashers fastening stub spindle and tail roller flange to tail roller shaft.
5. Remove the stub spindle and place it on a suitable working surface. The working surface should be free of grit and dirt.

DISASSEMBLY

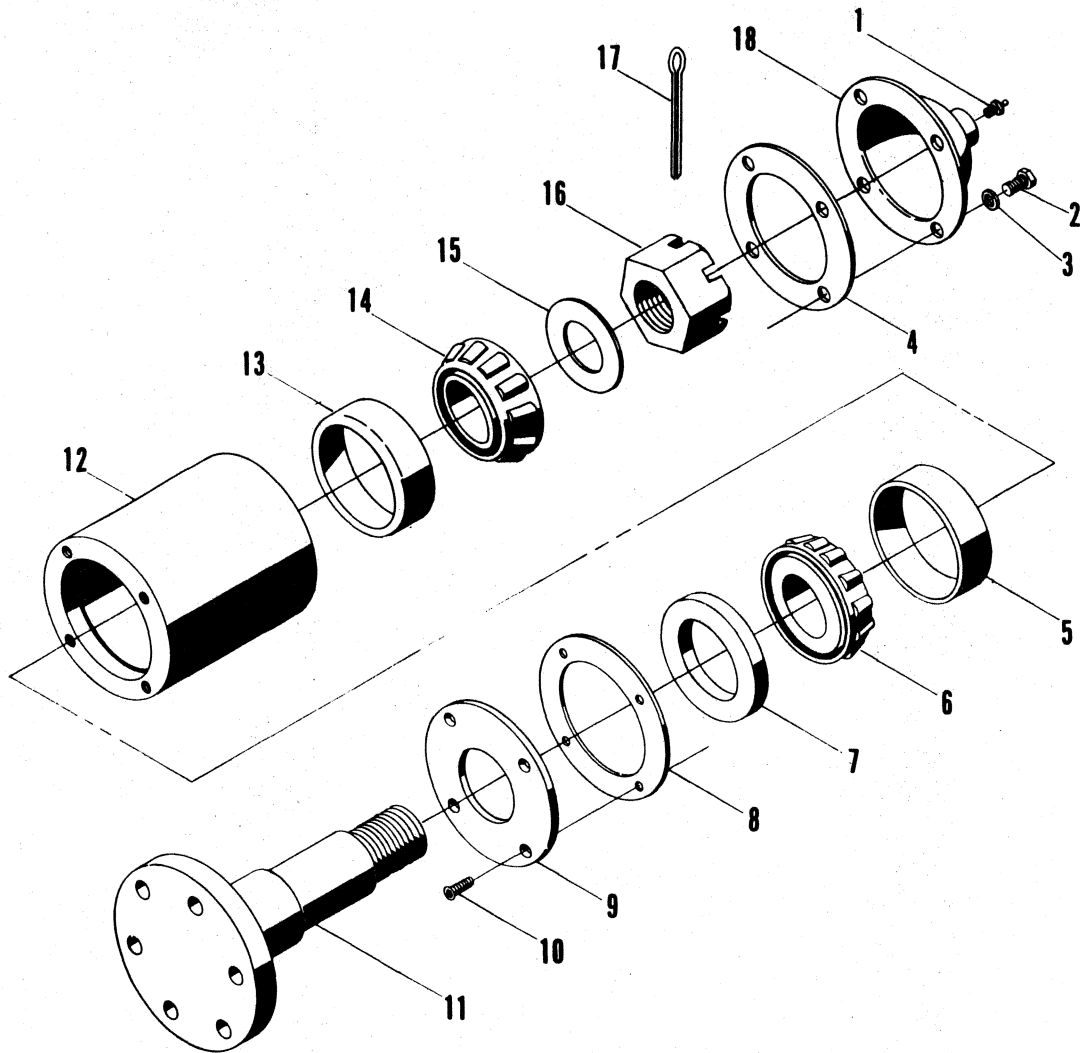
1. Remove capscrews and lockwashers securing stub spindle cap to hub. Remove cap with gasket. Discard gasket.
2. Remove cotter pin from castle nut. Remove castle nut and bearing washer from top of spindle.
3. Support stub spindle above working surface and press it from the hub case. If no press is available, the stub spindle may be driven from the hub case using a soft drift of mild steel and a hammer.
4. Remove the outer bearing cone from the hub case.
5. Invert the hub case and remove the seal protector. Remove and discard seal and gasket.
6. Remove inner bearing cone from stub spindle.
7. Bearing cups may be removed from hub case using a hammer and soft drift.

CAUTION: Do not use a brass drift! Brass particles will become lodged in the bearings which will cause extensive damage.

INSPECTION AND CLEANING

1. Clean all bearings in clean solvent and air dry. If they are not worn to the point that they are unfit for further use, dip them in an oil bath of clean light weight oil and wrap them in a wax paper type wrap.
2. Wash all other parts except those discarded in the same solvent used to wash the bearings. These parts may be dried with compressed air.
3. Inspect all parts for excessive wear, burrs, signs of galling or any other conditions which might make them unfit for further use.

STUB SPINDLE



1—Grease Fitting

2—Capscrew

3—Lockwasher

4—Gasket

5—Bearing Cup

6—Bearing Cone

7—Seal

8—Gasket

9—Dust Cover

10—Allen Screw

11—Stub Spindle

12—Hub

13—Bearing Cup

14—Bearing Cone

15—Washer

16—Castle Nut

17—Cotter Pin

18—Cover

Fig. 1—Stub Spindle

STUB SPINDLE

ASSEMBLY

1. Press bearing cups into hub case.
2. Place inside bearing cone in hub case.
3. Press seal into hub case with seal lip facing downward to allow grease to escape from hub case assembly.
4. Place seal protector over spindle and install new gasket on seal protector.
5. Install the hub case over the spindle and match the holes in the bottom of the hub case with those in the seal protector. Install allen screws and draw them up tight with an allen wrench.
6. Tap around the O.D. of the hub case with a light hammer to seat the inside bearing cone into the inside bearing cup.
7. Install the outside bearing cone on the spindle. Make sure that it is firmly seated against the outside bearing cup in the hub case.
8. Install the bearing washer on the spindle. Place the castle nut on the spindle and draw it down until the bearings bind. This will aid in seating the bearings. Back the castle nut off until the hub case turns freely and has no detectable end play.
9. Install cotter pin.
10. Place a new gasket on the hub cap and install the hub cap using the fasteners removed on disassembly.

INSTALLATION

Installation of the stub spindle assemblies is the opposite of the removal procedures.

Be sure not to cross-thread stub spindle mounting

capscrews. If capscrews are cross-threaded to the point of stripping, it will be necessary to tap stub spindle mounting flange bores and replace capscrew if threads are stripped.

* * * *

HANCOCK

IDLER ROLLER

DESCRIPTION

Four idler rollers are used on this unit. Their purpose is to support the chain and drag assembly and keep it up and away from the elevator frame. This allows the chain and drag assembly to move freely around the elevator frame.

Idler roller consists mainly of flange, shaft and bearings.

The flange houses the bearing hub and keeps the chain and drag assembly in place as it rotates around the elevator frame.

The shaft performs two functions: (1) It acts as an axle for the flange and (2) is threaded for mounting the idler roller to the idler roller lugs welded to the elevator frame.

REMOVAL

When maintenance other than lubrication becomes necessary, the idler roller must be removed from the unit. Read the instructions before attempting to remove the idler rollers from the unit.

1. Lift the chain away from the idler roller using a method similar to that illustrated in Fig. 1.
2. Remove the locknut from the end of the idler roller shaft. Tap the idler roller from its hanger with a light machinist's hammer. Be careful not to damage the threads. Preserve the woodruff key if it is usable.

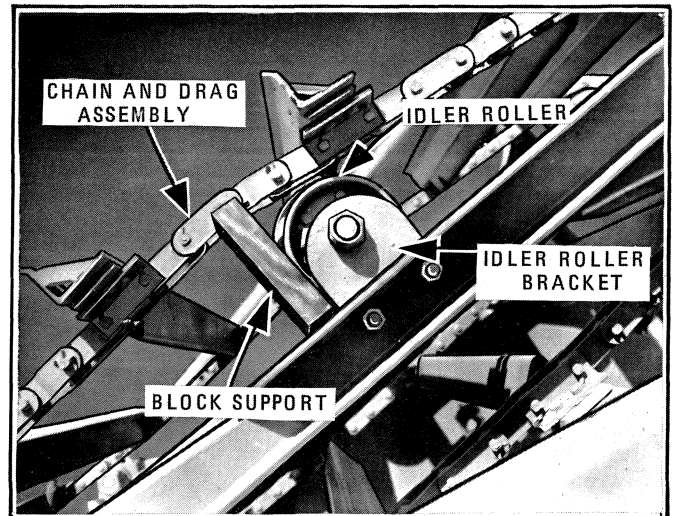


Fig. 1—Supporting Chain & Drag Assembly

C 4 A

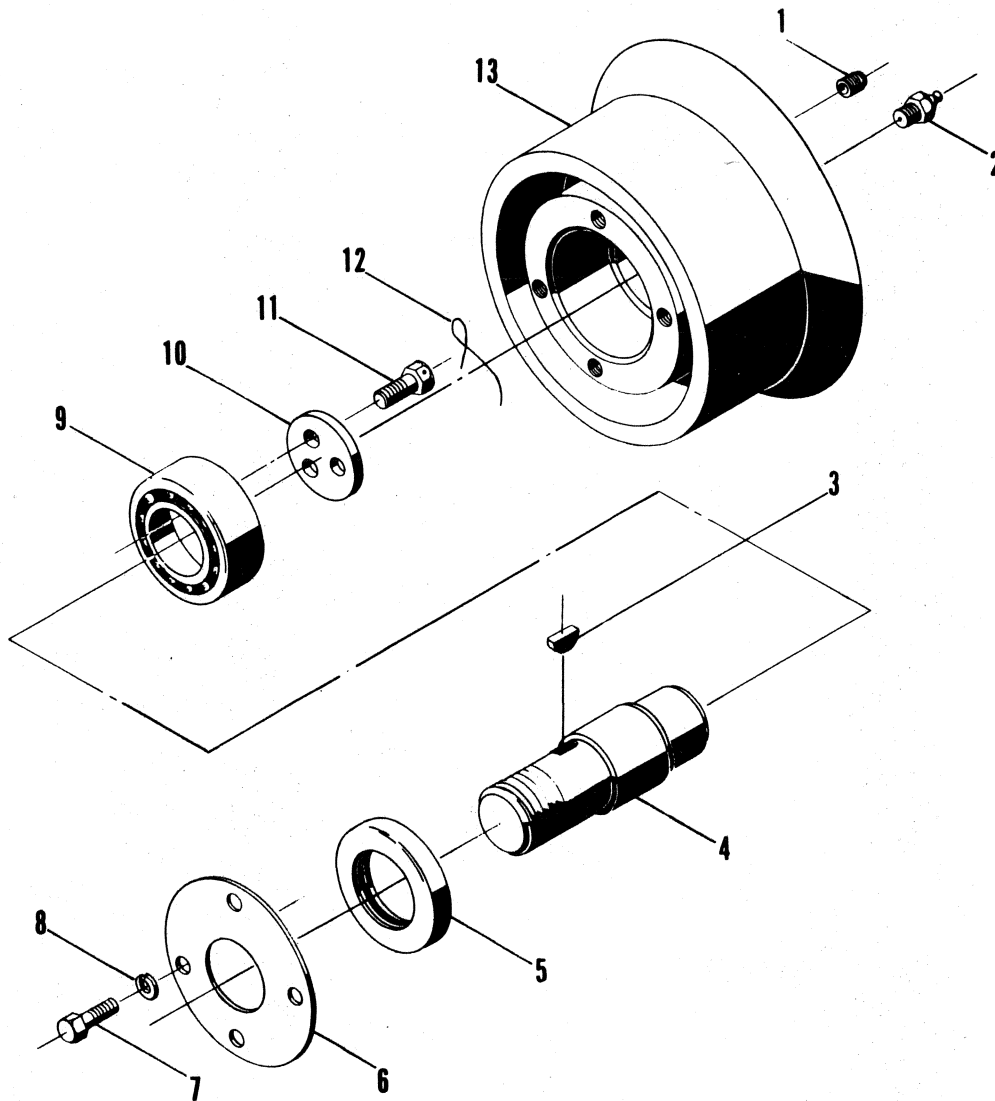
DISASSEMBLY

Refer to Fig. 2 and the following instructions.

1. Place idler roller on a clean working surface and remove capscrews and lockwashers fastening seal plate to roller flange. Remove seal plate.
2. Support the roller so that the shaft will be cleared about 4 inches above the working surface.
3. Remove the grease zerk in the end of the bearing hub.

Insert a long drift and remove bearing, seal and shaft. Discard the seal as a new one will have to be installed on reassembly.

4. Remove the lockwire from the drill head capscrews in the end of the shaft and remove the capscrews. Remove the bearing retainer from the end of the shaft.
5. Press or drive the bearing off the shaft.



1—Pipe Plug

2—Grease Fitting

3—Woodruff Key

4—Idler Roller Shaft

5—Seal

6—Seal Protector

7—Capscrew

8—Lockwasher

9—Ball Bearing

10—Bearing Retainer

11—Capscrew

12—Safety Wire

13—Flange

Fig. 2—Idler Roller

IDLER ROLLER

INSPECTION

1. Clean all parts in a suitable solvent. Air dry all parts.
2. Inspect shaft to see that it has no burrs or galled places on it.
3. Inspect the bearing to see that it is in good condition.
4. Inspect the flange bearing bore for burrs and galled areas.
5. Replace all worn or damaged parts. Remove burrs from shaft and flange with India stone.

ASSEMBLY

1. Press or drive the shaft into the bearing. If no press is available, drive the shaft into the bearing.
2. Replace the bearing retainer and drill head capscrews securing it to the shaft. Tighten the capscrews to 11 ft. lbs. torque. Lockwire the capscrews.
3. Press or drive bearing and shaft assembly SQUARELY into flange bearing bore.
4. Place new seal over shaft being careful to protect seal lip from damage by threads and keyway on roller shaft. Install seal so that the seal lip will allow grease to escape from the bearing bore in the flange of the idler roller.
5. Place seal retainer plate over shaft. Install capscrews and lockwashers to secure seal retainer plate to idler roller flange. Replace woodruff key. Replace grease zerk.

INSTALLATION

1. Align woodruff key with keyway in idler roller hanger on elevator frame. Take care not to damage the threads on the shaft and insert idler roller into shaft bore in idler roller hanger.
2. Fasten idler roller to bracket with locknut and tighten to 450 ft. lbs. torque.
3. Fill with lubricant specified on Lubrication Chart until grease is visible flowing from seal.

* * * *

HANCOCK

CHAIN & DRAG ASSEMBLY

DESCRIPTION

The chain and drag assembly consists of 15 drags and two lengths of chain containing 75 links each. Attached to every fifth link is an angle link or attachment link to which the drags are fastened. The chain and drag assembly is pulled along at the top by a reduction gearbox attached to

the head roller and is idled throughout its travel by idler rollers which support the chain and keep it clear of the elevator frame. The tail roller provides support at the bottom of the elevator for the chain and drag assembly to complete total rotation of the elevator chain.

REMOVAL

A full load of dirt before beginning service on the chain and drag assembly will be helpful in providing a place for the serviceman to stand and for support of the heavy weight of the total assembly. Have a full load of dirt in the bowl if at all possible.

1. Support two drags as near the top of the elevator frame as possible. See Fig. 1.
2. Part the chain at a master link as near as possible to the lowest drag supported by the hoist as shown in Fig. 1. To part the chain, remove cotter pin from link pin and drive link pin from chain. Repeat this procedure on the opposite side of the elevator.

CAUTION: Do not peen the ends of the pins. Strike the pins with a strong blow. Avoid striking the pin repeatedly with several soft blows.

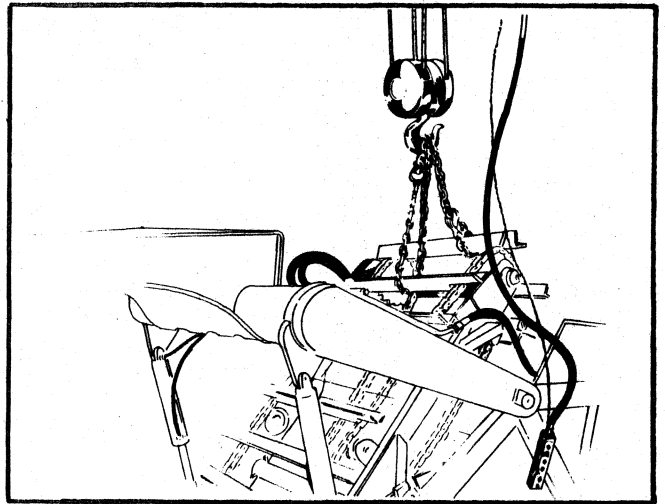


Fig. 1—Hoist on Chain & Drag Assembly

1407

3. Lift the chain and drag assembly from the elevator frame with the hoist and lay it flat on the floor and begin needed repairs.

DISASSEMBLY

1. To disassemble the drags from the chain, remove capscrews, hexnuts and lockwashers fastening drags to chain.
2. To disassemble the chain at any given point, or at all points, follow the instructions used for parting the chain in the REMOVAL portion of this section.

INSPECTION

1. Inspect all drags for cracked welds, straightness and excessive wear, usually indicated by cracked welds. Replace them if they are bent and cannot be straightened cold.

NOTICE: Never heat a drag for straightening! If the drag is heated, the alloy steel will be annealed and will blend easily.

CHAIN & DRAG ASSEMBLY

2. Inspect the attachment links on the chain for elongated holes. Replace the links if they are elongated or otherwise distorted.
3. Inspect all pin cotters to see that they are not sheared or missing.
4. If difficulty is found in installing the chain pins. DO NOT grind them, as this will destroy the press fit that is essential to efficient operation of the chain.

ASSEMBLY

The assembly procedure is opposite of disassembly procedure. Torque drag attachment fasteners to 55 ft. lbs.

INSTALLATION

The installation of the chain and drag assembly is the reverse of the removal procedure.

ADJUSTMENT

The chain on this unit was designed to be run with a slack of 9 inches. This distance is measured at the midpoint between idler rollers and perpendicular to the elevator frame. See Fig. 2 for location and method of measurement.

As shown in Fig. 3, approximately 24 inches above the end of the elevator frame tubing, there is a cover bolted to the top side of the elevator frame tubing. Slack is adjusted by grease-operated rams located at the lower end on either side of the elevator frame.

Adjustment is accomplished by following the steps listed below.

1. Loosen lock bolts.
2. Loosen the capscrews fastening the cover to the elevator frame tubing and move the cover away from the opening. This will reveal a grease zerk and a relief valve.
3. When grease is applied under pressure to the grease zerk, the grease ram is forced forward into the bearing bracket. The bearing bracket is moved forward and the distance is lengthened between the tail roller and head roller, thus tightening the chain.
4. If the chain needs more slack or the distance between the head roller and tail roller needs decreasing, turn the relief valve counterclockwise to release grease pressure and allow the tail roller to move closer to the headroller.

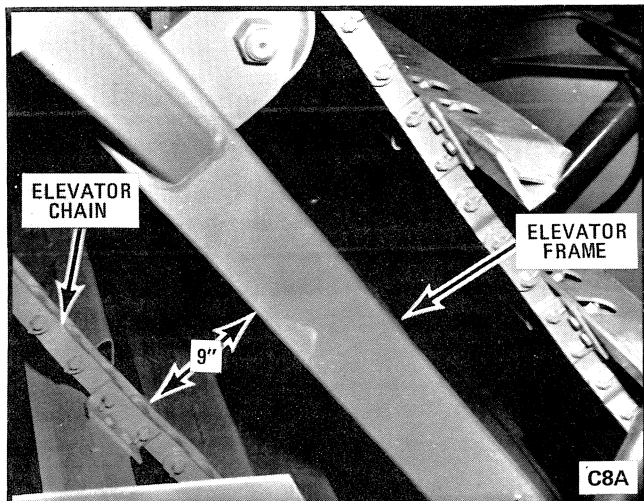


Fig. 2—Measuring Chain Slack

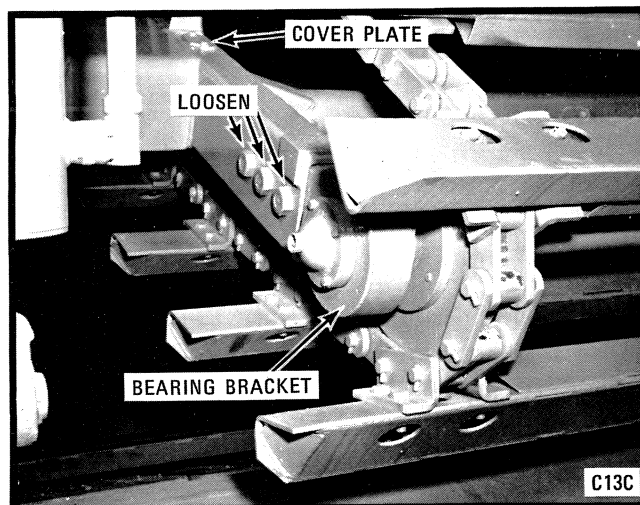


Fig. 3—Grease Ram Location

HANCOCK

TAIL ROLLER

DESCRIPTION

The tail roller and flange assembly is mounted at the bottom part of the elevator assembly. The flanges bolted to the tail roller shaft provide runners for the chain and drag assembly as it travels around the elevator frame. The tail roller assembly is allowed rotation by means of stub

spindles mounted on each end of the tail roller assembly. Hangers holding the stub spindles allow the tail roller to be adjusted so that proper elevator rectangularity and proper chain slack may be maintained.

REMOVAL

1. Part the chain at the master link nearest the tail roller on each side of the chain. See Fig. 1 and the accompanying instructions.
2. Remove capscrews and lockwashers fastening stub spindles to tail roller flange.
3. If flanges are excessively worn, they must be replaced.
4. Place flanges back on tail roller shaft with the stub spindles and tighten the capscrews to 185 ft. lbs. torque.

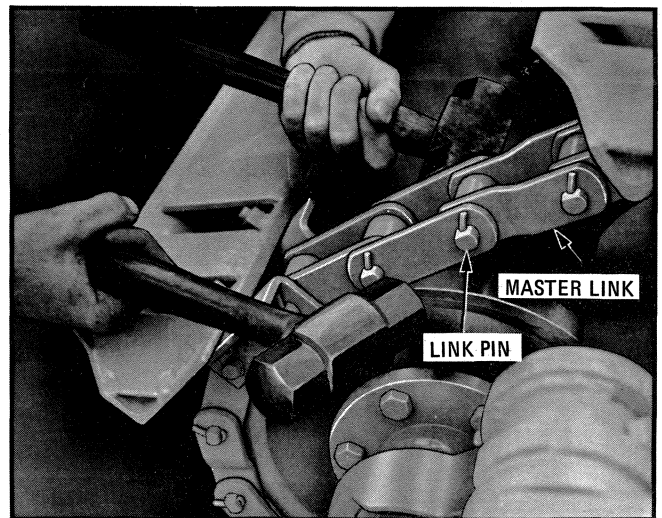


Fig. 1—Parting Chain

C12A

INSTALLATION

1. Place bearing hangers in elevator frame tubing and lift tail roller up into position.
2. Install and tighten capscrews locking bearing bracket into place.
3. Draw chain up and install new pin and cotter in chain.
4. Adjust elevator for rectangularity and slack as described in CHAIN AND DRAG SECTION 17D of this manual.

* * * *

HANCOCK

GREASE ADJUSTER

DESCRIPTION

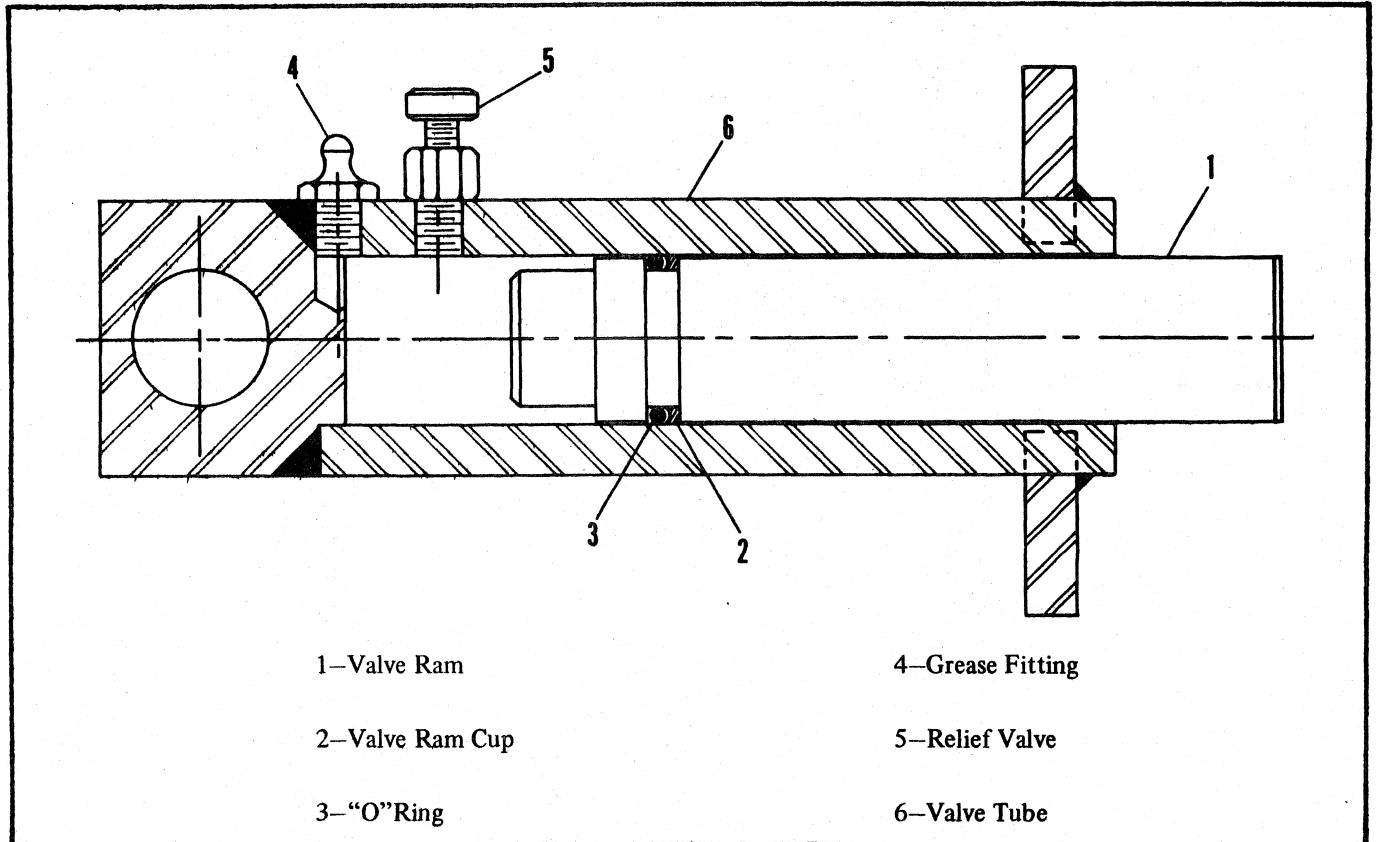


Fig. 1—Grease Adjuster

1283

Two grease adjusters are used in the elevator frame tubing to maintain proper elevator rectangularity and proper chain slack. These grease adjusters are composed of the following: A tube, a ram, an "O"ring and back-up ring, a relief valve and a grease zerk. Earlier units

were equipped with a brake cylinder type cup in place of the "O"ring and back-up ring currently in use. Each of these parts has its function as explained in the following section on operation of the grease ram.

OPERATION

The grease ram is a ram which gets its power from the compression of grease applied to a grease zerk and the force of this grease causes the ram to move away from the compression of the grease. A cup mounted directly behind the ram catches the force of the grease to move the loosely-fitting shaft forward. In later units, the "O"ring

and back-up ring prevent leakage of grease through the ram end of the grease adjuster. Grease pressure is relieved by a relief valve mounted next to the grease zerk. This valve allows grease to escape from the tube, thereby relieving pressure on the ram.

REMOVAL

The tail roller assembly must be removed in order to remove the grease ram assembly. See TAIL ROLLER Section 17E for removal instructions.

1. After tail roller has been removed, pull lock pin which holds grease ram in place. The assembly will then be free to be removed from elevator frame tubing.

DISASSEMBLY

The grease ram may be disassembled by removing the ram from the tube. It may be necessary to remove the relief valve screw and apply compressed air to the ram. See Fig. 1.

apply excessive air or the ram will be forced out quickly causing damage to the ram and possible injury to the serviceman.

CAUTION: If compressed air is used, be careful not to

Remove the cup from the tube and wash it in brake fluid or in denatured alcohol.

ASSEMBLY

Assembly of the grease ram is the opposite of the disassembly procedure.

INSTALLATION

Installation of the grease ram assembly is the opposite of the removal procedure.

* * * *

HANCOCK

ELEVATOR GEARBOX

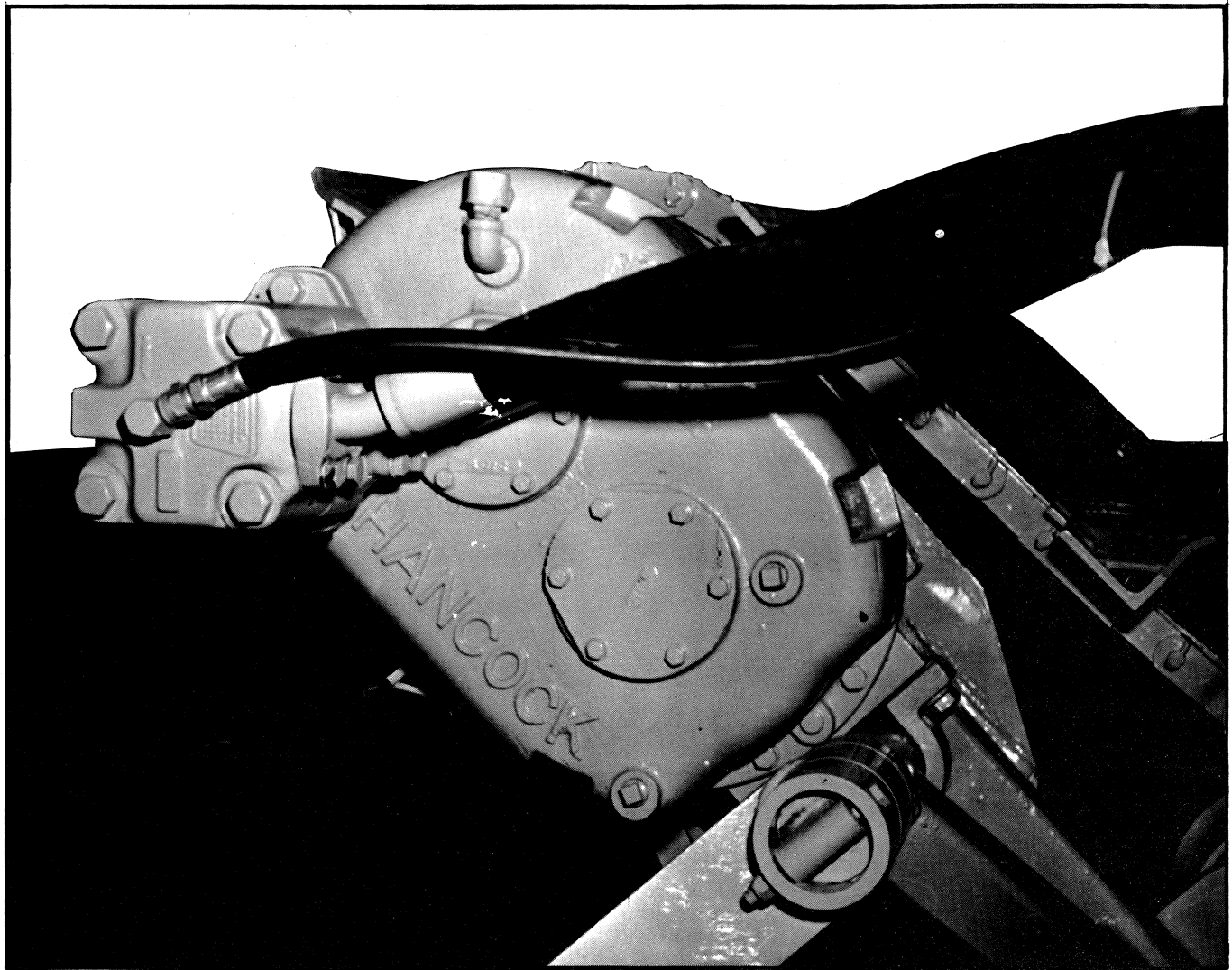


Fig. 1—Elevator Gearbox

F4D

DESCRIPTION

The elevator gearbox is of spur gear construction and encased in cast housings. Bearing preload for shaft adjustment is provided for by removable bearing cap and shim arrangement.

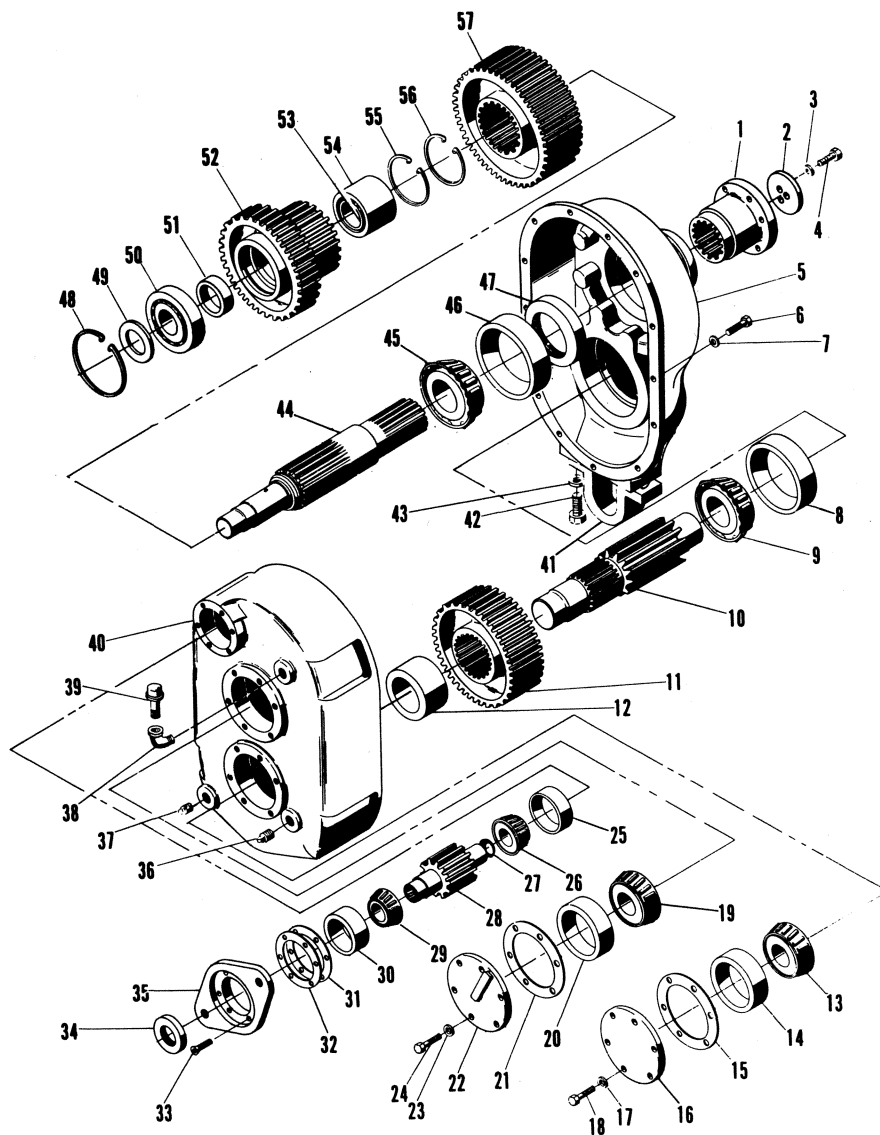
Torque through the gearbox to the head roller is provided for by a hydraulic motor through an adapter to the input pinion. Through process of gear reduction in the gearbox, the final reduction ratio is 27.7:1.

REMOVAL

1. Remove capscrews and lockwashers securing hydraulic motor to gearbox housing.
2. Remove hydraulic motor from gearbox and allow it

to swing downward and out of the way. Tie it with the hoses to a position where it cannot be damaged by removal procedures.

ELEVATOR GEARBOX



- | | | | |
|-----------------------|-----------------|--------------------|------------------------|
| 1—Hub Adapter | 16—Bearing Cap | 31—Shim | 46—Bearing Cup |
| 2—Retainer | 17—Lockwasher | 32—Shim | 47—Seal |
| 3—Lockwasher | 18—Capscrew | 33—Allen Screw | 48—Snap Ring |
| 4—Capscrew | 19—Bearing Cone | 34—Seal | 49—Washer |
| 5—Output Housing | 20—Bearing Cup | 35—Motor Adapter | 50—Ball Bearing |
| 6—Capscrew | 21—Shim | 36—Fill-Check Plug | 51—Spacer |
| 7—Lockwasher | 22—Bearing Cap | 37—Drain Plug | 52—Cluster Gear |
| 8—Bearing Cup | 23—Lockwasher | 38—Street Elbow | 53—Needle Bearing Race |
| 9—Bearing Cone | 24—Capscrew | 39—Breather | 54—Needle Bearing |
| 10—Intermediate Shaft | 25—Bearing Cup | 40—Input Housing | 55—Snap Ring |
| 11—Gear | 26—Bearing Cone | 41—Retainer | 56—Snap Ring |
| 12—Bearing Spacer | 27—Plug | 42—Capscrew | 57—Output Gear |
| 13—Bearing Cone | 28—Pinion | 43—Lockwasher | |
| 14—Bearing Cup | 29—Bearing Cone | 44—Output Shaft | |
| 15—Shim | 30—Bearing Cup | 45—Bearing Cone | |

Fig. 2—Gearbox Assembly

ELEVATOR GEARBOX

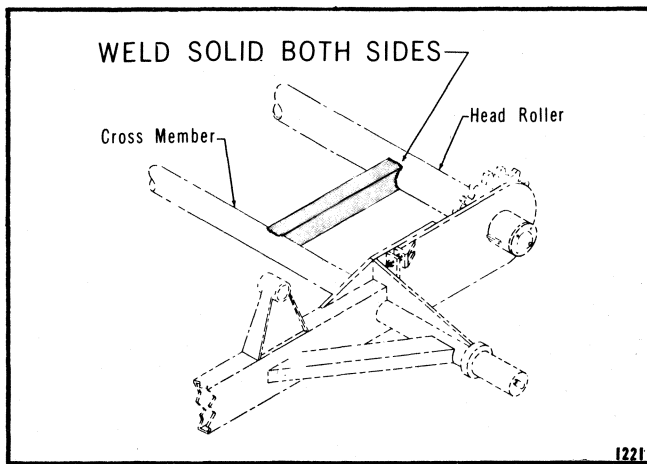


Fig. 3—Supporting Head Roller

3. Support the gearbox with a hoist and chain or nylon sling.
4. Support head roller using method similar to that illustrated in Fig. 3. Spot weld sprocket to head roller in 4 places equally spaced around the flange.
5. Remove capscrews and locknuts fastening splined gearbox hub to head roller.
6. Remove capscrews and locknuts securing two pieces of gearbox retainer. Remove upper half of gearbox retainer.
7. Pry gearbox away from head roller. Using chain and hoist, swing gearbox away from head roller and lower to the floor.

DISASSEMBLY

Read the instructions below before beginning disassembly of gearbox. Refer to Fig. 2 and the following instructions.

1. Remove both bearing caps to avoid damage to small steel lube line in output shaft bearing cap. Place gearbox on working surface with drain plug pointing downward. Drain gearbox of lubricant.
2. Place gearbox on suitable working surface with output shaft pointing upward.
3. Remove capscrews securing output shaft flange retainer plate. If necessary, a suitable puller may be used to remove output shaft hub.
4. Remove capscrews and locknuts securing input shaft housing to output housing.

NOTE: The housings are doweled to assure a

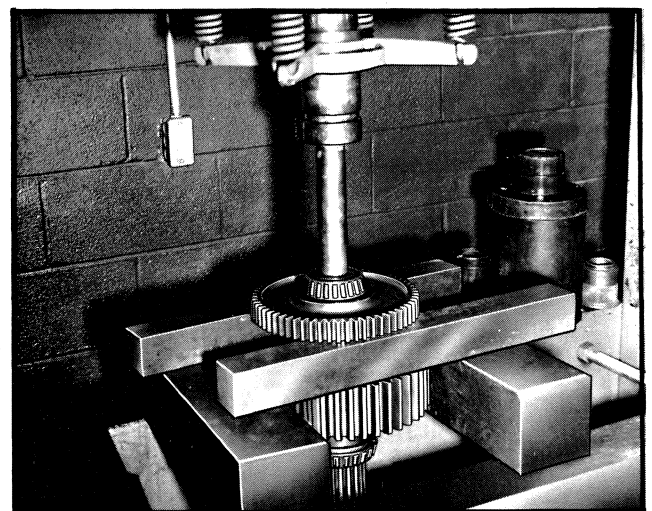
precision fit each time the gearbox is assembled. The output housing is provided with jack screw holes on each side of each dowel pin receiver bore. Insert one of the capscrews removed from the cover into each of the jack screw holes. As these capscrews are tightened down, they will pull the covers apart at the dowels and minimize the danger of cracking the housings due to excessive side pressures applied when the housings are pried apart.

5. Remove output housing.
6. Raise output shaft assembly sufficiently to allow the counter shaft to be removed. Remove the counter shaft.
7. Remove output shaft and lay aside.



F10D

Fig. 4—Removing Bearing Cone From Counter Shaft



F12D

Fig. 5—Removing Bearing Spacer & Gear

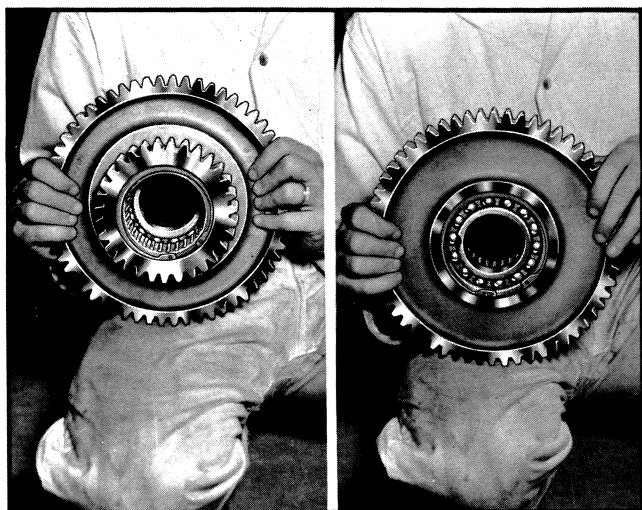


Fig. 6—Double Gear Snap Rings

F13D

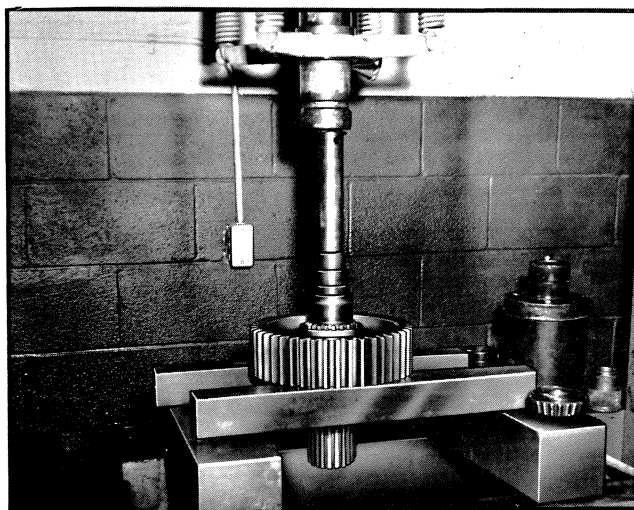


Fig. 7—Removing Single Gear From Output Shaft

F15D

8. Remove input shaft and lay aside.
9. Using hammer and drift, remove seal from input cover.
10. Remove remaining bearing cups from output housing if they appear excessively worn.
11. Remove counter shaft and output shaft covers from input housing if bearing cups are worn to the point of replacement.
12. With a suitable puller, remove bearing cones from input shaft.
13. Secure counter shaft in vise and remove input housing side bearing cone with a suitable puller as shown in Fig. 4.
14. Press bearing spacer and gear from counter shaft as shown in Fig. 5.
15. Remove output housing side bearing cone from counter shaft.
16. Press bearing cone and double output gear from output shaft.
17. Remove snap rings from either side of double gear. See Fig. 6. Remove ball bearing from double gear. Remove needle bearing from double gear.
18. Remove snap ring from output shaft and press shaft through single gear. See Fig. 7.
19. Remove oil seal from output shaft bore and discard as a new seal will have to be installed on reassembly.

INSPECTION

1. Inspect bearings in accordance with bearing service section 22 of this manual.
2. Inspect shafts for galling, burrs and gear splines for wear which might render them unserviceable. Minor burrs may be removed with India stone.
3. Inspect gears for broken teeth, excessive wear or other conditions which might render them unserviceable.
4. Wash all parts in suitable solvent and dry with compressed air. **DO NOT DRY BEARINGS WITH COMPRESSED AIR.**

ASSEMBLY

1. Place oil seal into output shaft housing bore. Make sure sealing element faces inward to retain oil.
2. Install all bearing cups removed from both input and output housings.
3. Press 44 tooth gear on output shaft as shown in Fig.
4. Press needle bearing race onto output shaft.
5. Press needle bearing into double gear and install snap ring.
8. Place snap ring in place on shaft.

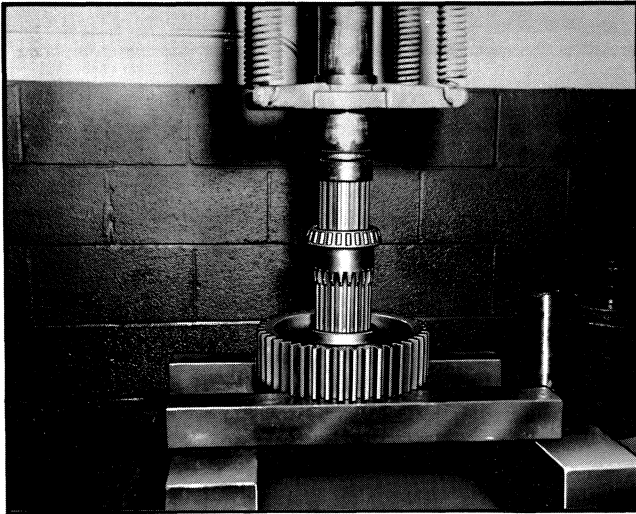


Fig. 8 – Pressing 44 Tooth Gear on Output Shaft ^{F16D}

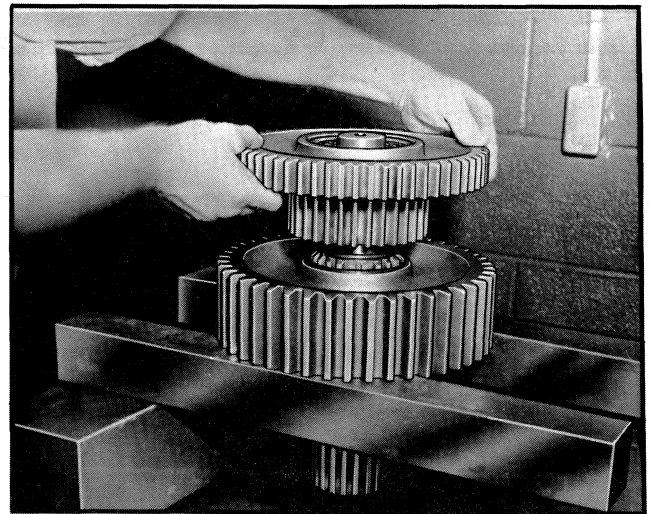


Fig. 9 – Mounting Double Gear on Output Shaft ^{F17D}

6. Slip bearing spacer onto output shaft.
7. Mount double gear assembly onto output shaft assembly as shown in Fig. 9.
8. Slide spacer over end of output shaft assembly.
9. Assemble input housing side bearing cone on end of output shaft.
10. Install counter shaft cone on output housing side of intermediate shaft.
11. Install 55-tooth gear on counter shaft.
12. Install bearing spacer next to gear and press bearing cone on intermediate shaft next to spacer.
13. Place outside bearing cup into input cover.
14. Press both bearing cones on input pinion.
15. Simultaneously install output shaft and counter shaft into output housing. Assemble input pinion into

input housing making sure expansion plug is pointing toward inside of input housing. Install inside bearing cup into input housing, firmly seating it against input pinion bearing cone. Secure input housing to output housing.

16. Place motor adapter on gearbox housing mating surface. Tap with a hammer to seat bearings. Measure distance between motor adapter flange and housing mating surface. Add shims of value equal to feeler gage reading plus .003 to .005 inches.
17. Place output shaft bearing retainer on output shaft bore. Tap lightly with a hammer to seat bearings. Measure distance between retainer flange and gearbox housing mating surface. Add shims of value equal to reading plus .000 to .002. This adjustment will free rotation with no perceptible end play.
18. Position counter shaft bearing retainer on counter shaft bore. Tap lightly with a hammer to seat bearings. Measure distance between retainer flange and gearbox housing mating surface. Add shims of value equal to reading plus .001 to .003 inches.

INSTALLATION

Installation of the gearbox on the unit is the opposite of the removal procedure.

* * * *

HANCOCK

EJECTION SYSTEM

DESCRIPTION

The ejection system is the forced type. Ejection is smooth and positive when the system is properly adjusted and hydraulic components are functioning properly.

Positive ejection is provided by two double-acting cylinders mounted in the tail frame of the unit. One cylinder actuates the rolling floor mechanism while the other operates the engate assembly.

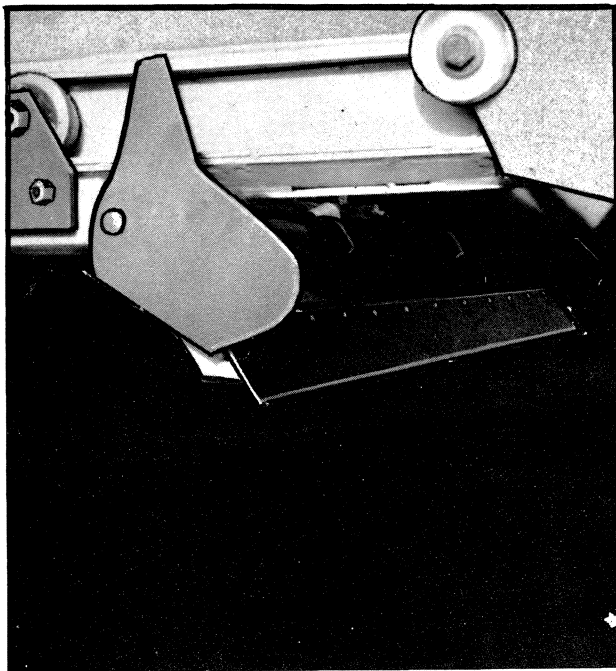


Fig. 1—Strike-Off Frame

B5A

Attached to the front of the rolling floor is the strike-off blade and frame assembly. The strike-off blade provides an effective means of leveling the load as it is ejected. Height of the spread is controlled by the height of the blade. As the rolling floor is opened, the strike-off blade falls into position as shown in Fig. 1.

STRIKE-OFF BLADE

The strike-off blade is secured to the strike-off frame by 12 capscrews, hexnuts and lockwashers. The blade is provided with two rows of bolt holes thereby making it adjustable to control depth of spread. If a deep spread is desired, the blade may be fastened to the frame by the set

When the control valve is actuated, a hydraulic cylinder attached to the tail frame, as shown in Fig. 2, pulls the rolling floor from under the front of the load. Then the engate cylinder, which is also attached to the tail frame, is automatically activated and pushes the balance of the load out of the bowl. This sequence is not always followed to the letter. Sequence depends largely upon which cylinder meets the least resistance in its area of responsibility.

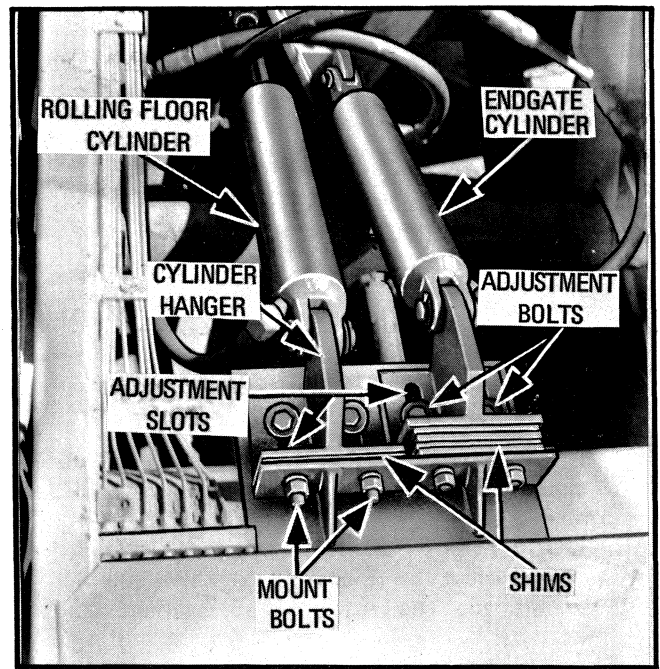


Fig. 2—Ejection System Hydraulics

B4

Service on components of the ejection system will consist mainly of adjustments. The strike-off blade will have to be replaced occasionally and cylinders will naturally have to be rebuilt periodically. These are normal wear items and service of this type is to be expected.

of holes which give the greatest depth of spread or the bottom row of holes. Where medium to light spread is desired, the blade may be extended by fastening it to the frame using the top row of bolt holes.

When the rolling floor is retracted, ham shaped cams butt against rollers fastened to the side of the main frame and lift the strike-off blade to within $\frac{1}{4}$ to $\frac{1}{2}$ inch of the moldboard. See Fig. 1. When the rolling floor is in the retracted position, the strike-off blade of the assembly is closed to complete the formation of the floor of the bowl.

STRIKE-OFF BLADE ADJUSTMENT

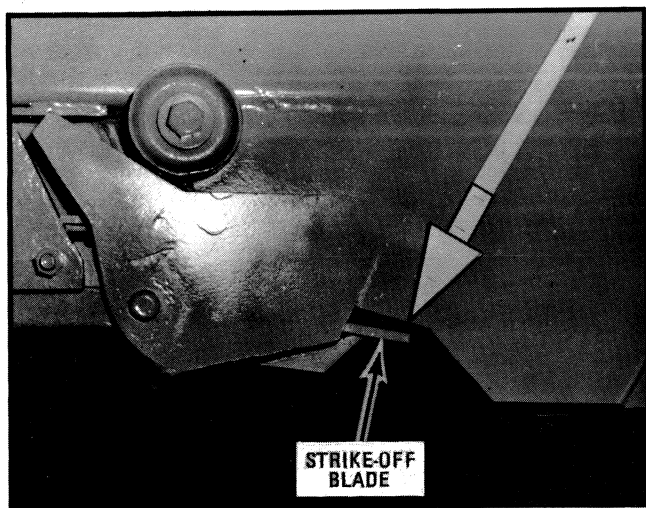


Fig. 3—Strike-Off Blade Clearance

B2C

When the strike-off blade is in its most forward position, there must be clearance between the moldboard and the strike-off blade. Fig. 3 shows this clearance and where it is measured.

It is very important that when the strike-off blade is in its closed position that the rolling floor cylinder be fully extended. **THIS IS IMPERATIVE FOR PROPER EJECTION CYCLING.** Excessively tight adjustment of this cylinder will cause the front rollers of the rolling floor to become overloaded and cause premature bearing failure.

When the rolling floor is in the full forward or closed position, the strike-off blade must be slightly open. If the strike-off blade closes to tightly, the slightest collection of dirt increases the strain on the mechanism and will tend to place unnecessary weight on the front rollers. This could cause the roller track to depress or wrap at the point of strain.

It may be necessary to adjust the hydraulic cylinder so that it does not extend the rolling floor too far forward.

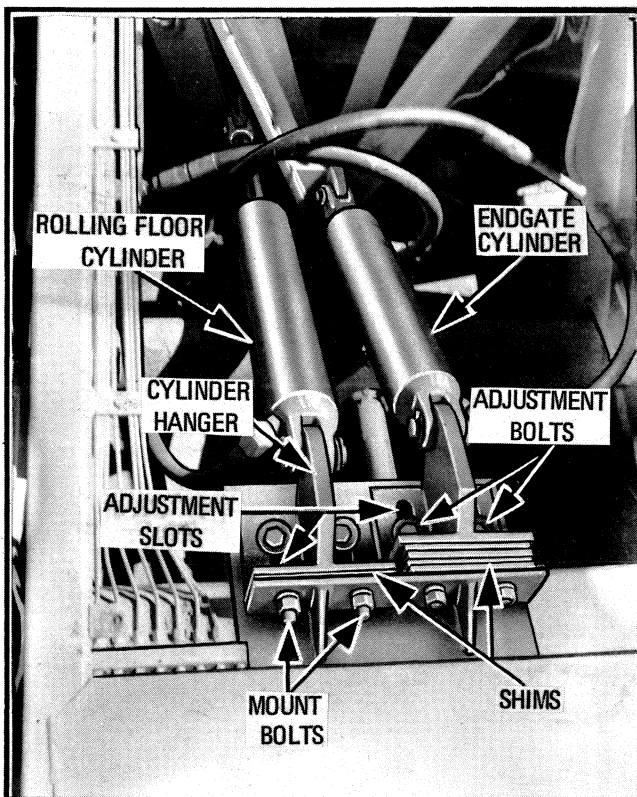


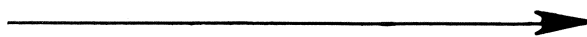
Fig. 4—Rolling Floor & Endgate Adjustment

B4

Excessive forward movement of the rolling floor causes a downward pressure on the front floor rollers and misalignments of the roller hangers.

Should adjustment become necessary, observe Fig. 4 and the following instructions.

1. Make sure no rocks or hard dirt is lodged between the strike-off frame and the moldboard. Make sure it is in its most forward position.
2. Loosen the capscrews in the slotted side of the cylinder mount as shown in Fig. 4.
3. Remove capscrews securing the shim packs to the cylinder hanger. If increased clearance of the strike-off blade with the moldboard is desired, remove shims to obtain proper adjustment. If less clearance is desired, add shims to decrease the clearance to within allowable limits.
4. Tighten all capscrews to 170 ft. lbs. torque.



NEXT PAGE

ROLLING FLOOR

DESCRIPTION

The rolling floor is suspended from a track which is an integral part of the main frame by two floor rollers on either side. The rolling floor yoke is fastened to the rolling floor by drill pins at the rear edge. An actuator connected to the rear cross member of the scraper main frame extends downward and is fastened to the yoke by means of a special threaded pin with a D-shaped head. The actuator is fastened to the rolling floor cylinder by means of a cylinder pin. When the control valve is actuated, the cylinder moves the complete mechanism forward and back. See Fig. 5.

The floor rollers are composed of a roller, shaft or axle, bearing, retainer ring, spacer and grease zerk. It is the function of the roller to roll along the roller track and suspend the load in the bowl.

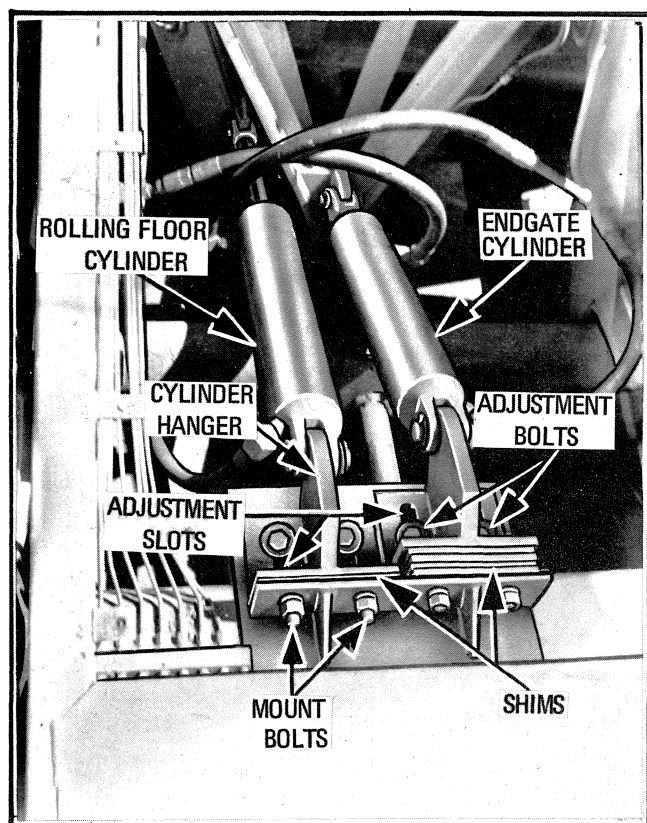


Fig. 5—Rolling Floor Adjustment

B4

REMOVAL

If more than one of the floor rollers are to be removed from the unit, the floor must be blocked with jacks or wooden blocks to prevent accidental falling of the floor. One roller at a time can be safely removed without this support.

To remove the floor rollers, simply remove the capscrews and locknuts fastening the roller hanger to the rolling floor.

DISASSEMBLY

Refer to Fig. 6 and the following instructions.

1. Remove jamnut fastening rolling floor roller axle to rolling floor roller bracket.
2. Preserve the woodruff key if it is still serviceable. Invert the floor roller shaft down. Tap the floor roller shaft lightly on working surface to dislodge spacer.
3. Set spacer aside and remove retaining ring. Lift out bearing and shaft. Remove shaft from bearing.

INSPECTION

1. Thoroughly clean all parts in suitable solvent.
2. Inspect bearing for excess wear.
3. Inspect shaft or axle for burrs and signs of galling. Remove minor scratches and burrs with India stone or fine crocus cloth.
4. Clean out retaining ring groove in roller. See that it is sharp and free of burrs. Clean it with a fine triangle file if necessary.

ASSEMBLY

1. Place bearing on floor roller shaft.
2. Place bearing and shaft assembly in roller.
3. Install retainer ring and make sure that it is properly seated.
4. Slide spacer over shaft and install grease zerk in shaft.
5. Fill with grease as prescribed in Lubrication Section of this manual.

INSTALLATION

Installation is the opposite of the removal procedure.

ROLLING FLOOR ROLLER CLEARANCE

In order to operate properly, the rolling floor rollers should have 3/16 inch clearance between the floor roller flange and the track on which it runs. Fig. 7 illustrates where this measurement is made. This clearance must remain the same within 1/16 inch throughout the full length of travel on the roller track.

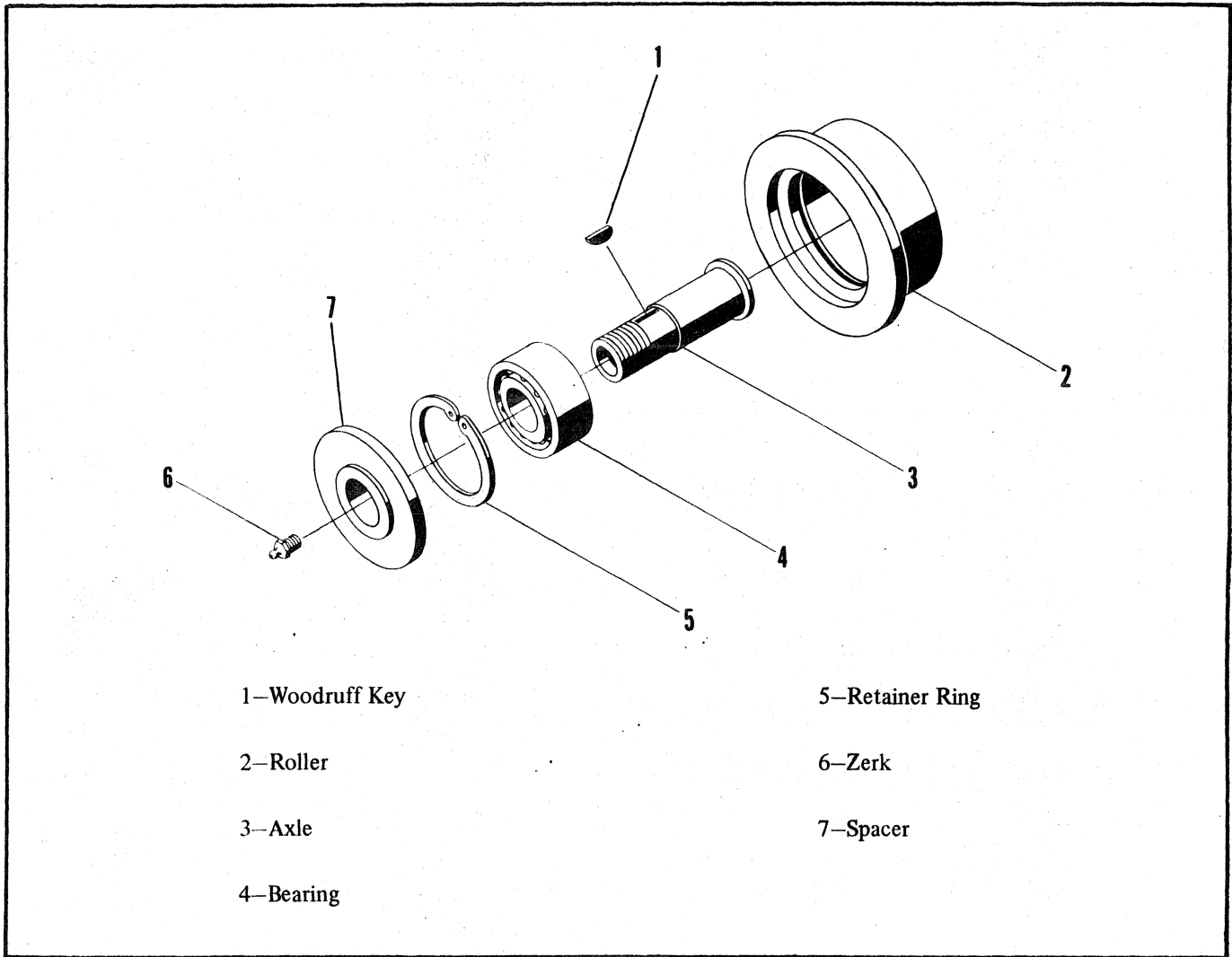


Fig. 6—Rolling Floor Roller

1265



- COMPLETE REPAIR SERVICE
- GENUINE FACTORY PARTS
- FIELD SERVICEMEN

a practical maintenance plan

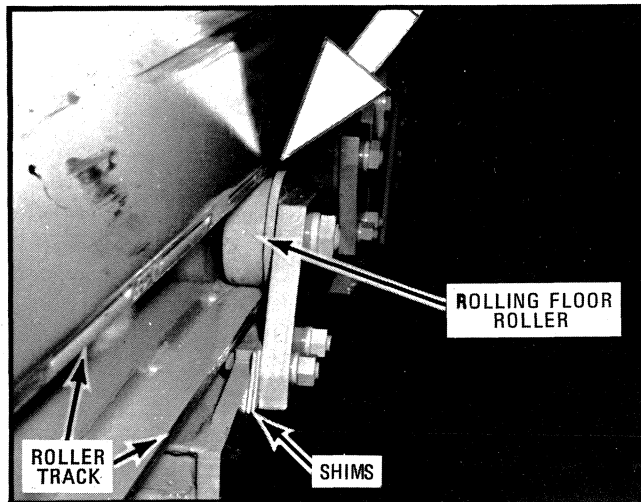


Fig. 7—Rolling Floor Roller Clearance

B4C

This clearance is governed by the number and thickness of shims between the roller hanger and the rolling floor as shown in Fig. 8.

ADJUSTMENT

Adjustment is accomplished by observing Fig. 8 and the following instructions.

1. If excessive clearance is the problem shims must be removed from the hanger. To remove the shims, remove the 2 capscrews and 2 locknuts securing the floor roller bracket to the rolling floor. Remove the floor roller and hanger assembly and remove shims of sufficient thickness to allow the roller to operate in allowable limits of clearance.

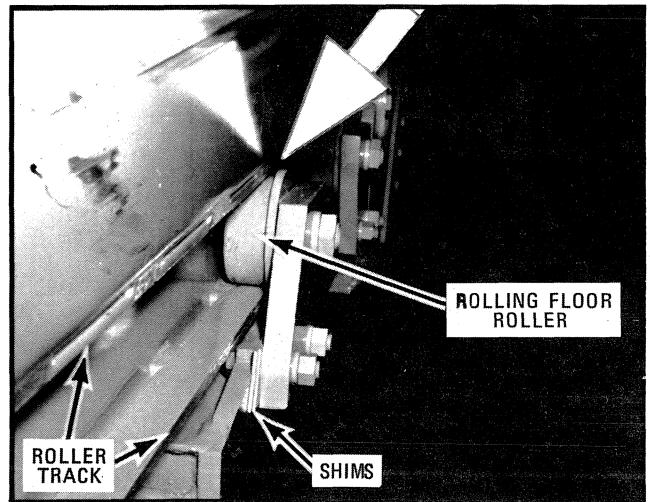


Fig. 8—Rolling Floor Roller Clearance Adjustment

B4C

2. If there is insufficient clearance, follow the above procedure. Instead of subtracting shims, add shims until the roller operates within allowable limits.

MAINTENANCE

Keep the rolling floor roller track as clean as possible. Do not allow gumbo or clay to form on the track to any appreciable depth. When these materials begin to form, they should be scraped off at the earliest opportunity to assure trouble-free operation of the rolling floor.

ENDGATE

The endgate is the part of the ejection system which forms the rear of the bowl. It is forced forward by a hydraulic cylinder mounted on the tail frame to expel the load.

It is imperative that $\frac{1}{2}$ to $\frac{3}{4}$ inch clearance be maintained between the endgate and the rear crossmember when the endgate is in a fully retracted position. This amount of clearance is necessary for proper operation of the endgate assembly. See Fig. 9.

ADJUSTMENT

If the endgate clearance is not within allowable clearance, adjustment must be made at the earliest opportunity. Continuous operation when the endgate does not have sufficient clearance places unnecessary strain on the ejection system.

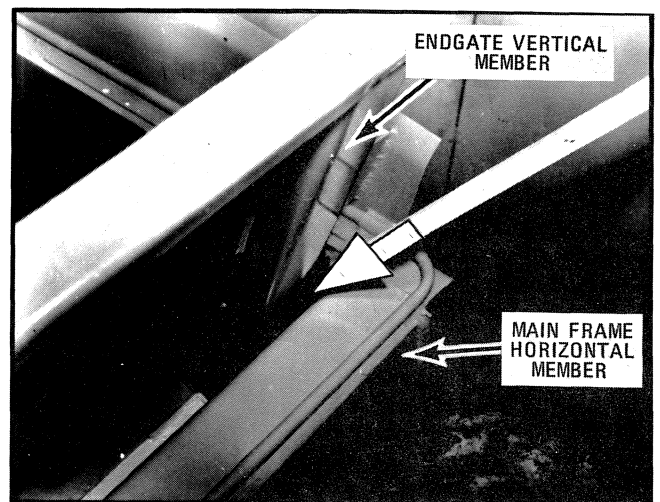


Fig. 9—Endgate Clearance

B1A

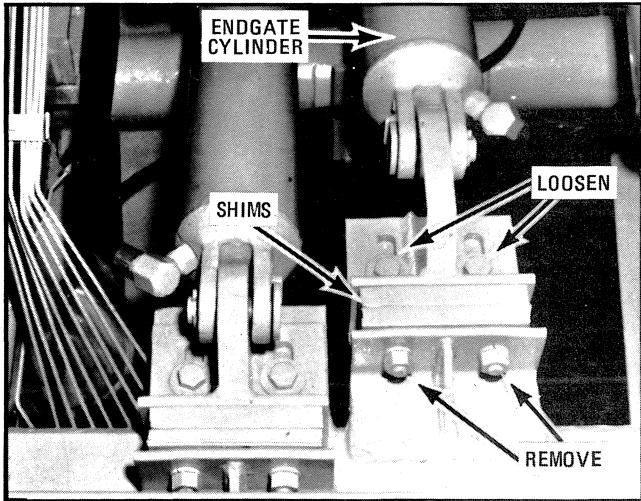


Fig. 10-Endgate Adjustment

B1

Refer to Fig. 10 and following instructions to adjust endgate clearance.

1. Make sure that no obstructions are in the way of the full retraction of the endgate.
2. Loosen the capscrews in the slotted side of the cylinder mount as shown in Fig. 10.
3. Remove capscrews securing the shim packs to the cylinder hanger. If increased clearance of the endgate is desired, add shims of sufficient thickness to obtain proper adjustment. If less clearance is desired, subtract shims of sufficient thickness to decrease the clearance within the allowable limits.
4. Tighten all capscrews to 170 ft. lbs. torque.

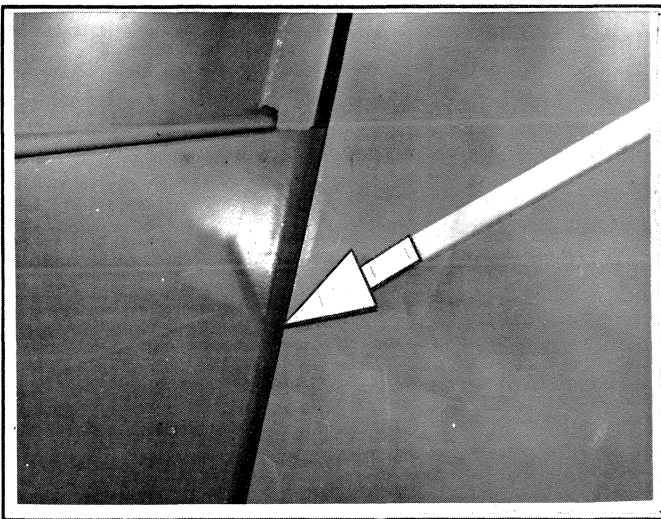


Fig. 11-Endgate Centering

B4A

ENDGATE CENTERING

If proper operation is to be obtained from the endgate, it must be centered properly. Fig. 11 illustrates the place to make measurements on each side of the bowl to determine if the endgate is centered. If the measurements are not equal within 1/16 inch, the endgate must be centered.

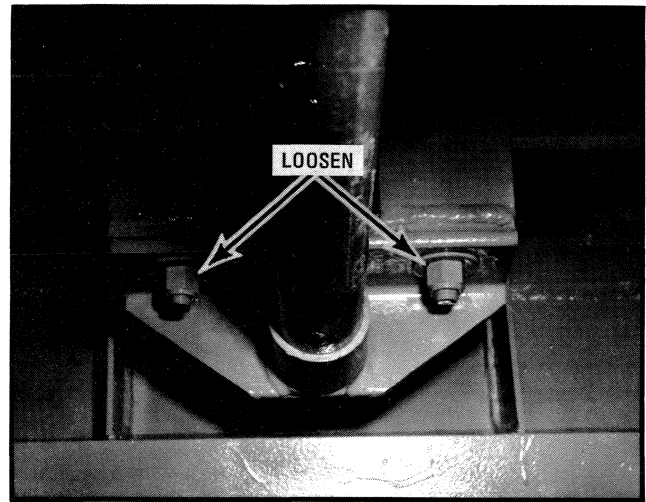


Fig. 12-Endgate Stabilizer System

B10A

ADJUSTMENT

Observe Fig. 12 and the following instructions to center the endgate.

1. Loosen adjusting bolts.
2. Move stabilizer rod to either the right or the left, depending on which side of the endgate needs adjustment.
3. Tighten bolts to 170 ft. lbs.

MAINTENANCE

Periodically, especially when loading mud, clay or plastic material, remove accumulated material from between endgate and rear of lower main frame crossmember. This accumulation will eventually cause the endgate to partially retract and, as mentioned before, will place unnecessary strain on the ejection system.

HANCOCK

ELEVATOR HYDRAULIC MOTOR

SERVICE TOOLS

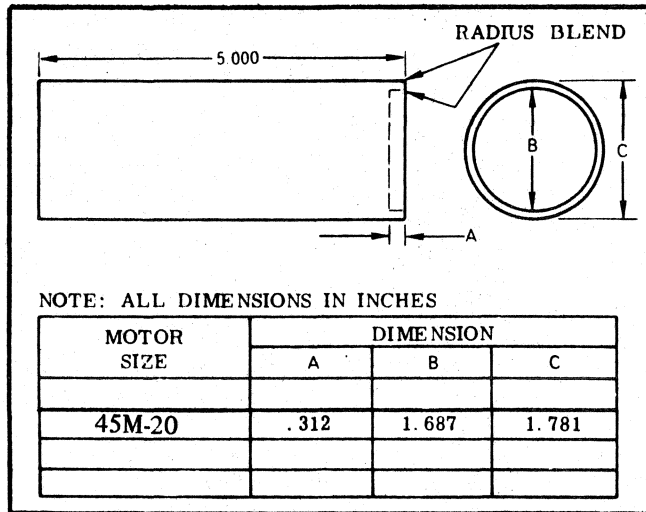


Fig. 1—Shaft Seal Drivers

1413

Special tools required for these units are shaft seal drivers and adapter extractor tool. The seal drivers can be made from round stock machined as shown in Fig. 1.

The recess in the tool will be deep enough so uniform pressure is applied to the recessed area in the seal channel rather than on the seal lip. The outside diameter

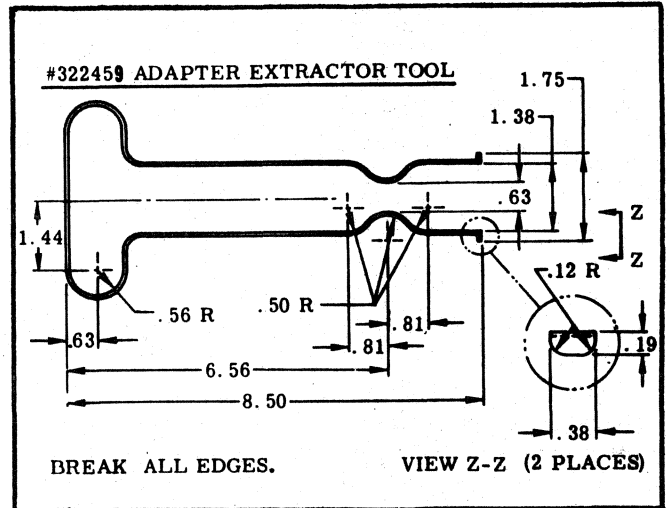


Fig. 2—Adapter Extractor Tool

1414

of the tool will not interfere with the spring around the seal lip.

The adapter extractor tool is designed to remove the hub adapter from the body after the cartridge is removed (See Fig. 2). The extractor tool engages between the ball bearing and the hub adapter.

INSPECTION

Periodic inspection of oil condition and tubing connections can save time-consuming breakdowns and unnecessary parts replacement.

1. All hydraulic connections must be tight. Loose connections will permit air to be drawn into the system, causing noisy and erratic operation or will

permit the hydraulic fluid to leak out.

2. The system filters and reservoir should be checked for contamination. Dirty filters must be replaced. If the oil is contaminated, the system should be thoroughly drained and the reservoir cleaned before adding new oil.

ADDING FLUID TO THE SYSTEM

When hydraulic fluid is added to replenish the system, it should always be poured through a micron filter. If such a filter is not available, a funnel with a fine wire screen (200 mesh or better) can be used.

It is important that oil be clean and free of all substance which will cause improper operation and excessive wear of any unit in the system.

GENERAL INSTRUCTIONS

Plug all removed units and cap all lines to prevent the entry of dirt into the system. During disassembly, pay particular attention to identification of the parts for correct assembly.

Fig. 4 is an exploded view which shows the proper relationship of the parts for disassembly and assembly.

DISASSEMBLY

1. Cover End – Clamp the motor in a vise with protective jaws, cover end up.

Remove the four cover bolts and lift off the cover. Remove the cartridge from the body. If the cartridge is not being replaced as an assembly, remove two screws and separate the pressure plates from the rotor, ring, vanes and springs.

NOTE: Use a standard piston ring compressor of suitable size when disassembling and assembling the cartridge components.

Carefully pull the rotor and vane assembly half way out of ring and install the ring compressor (Fig. 3). Compress the vanes into the rotor and remove this assembly from ring. Release the "O"ring and back-up rings from the pressure plates and body.

2. Shaft End – Remove the shaft key. Carefully pull the hub adapter from the body with the adapter tool (See Fig. 2). Remove spirolox ring next to the shaft bearing from the body then tap the shaft and bearing assembly out. If it is necessary to remove the small snap ring and bearing from the shaft, support the bearing inner race in an arbor press, remove snap ring and press bearing off the shaft. Remove washer and then shaft seal and wiper from the body.

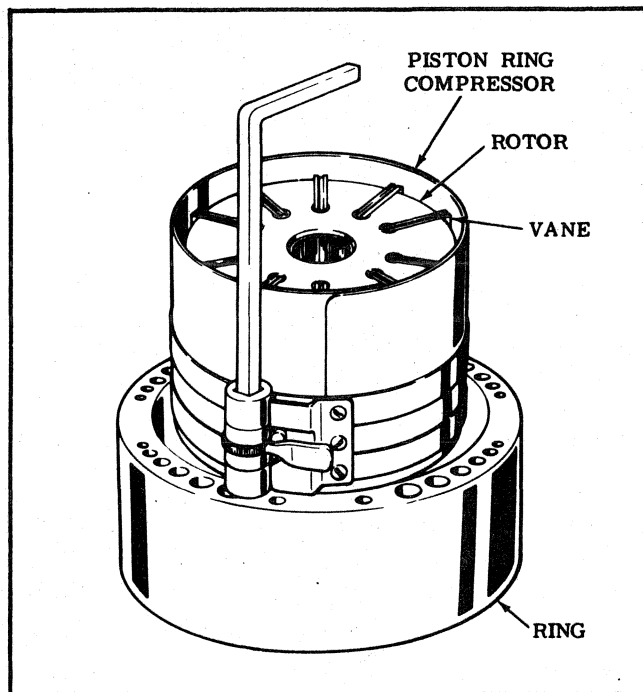


Fig. 3—Cartridge Kit Disassembly

1415

INSPECTION AND REPAIR

1. Discard the shaft seal, wiper, "O"rings and back-up rings. Use a new seal kit for reassembly. (See parts catalog). Wash the metal parts in clean mineral oil solvent, blow them dry with filtered compressed air and place on a clean surface for inspection.

NOTE: Preassembled and tested cartridge kits are available for service. If the cartridge parts are badly worn, it is recommended that a new cartridge kit be used. The kit eliminates the costly stocking and procurement of loose parts.

2. Check the wearing surfaces of the cartridge pressure plates and ring for scoring and excessive wear. Remove light score marks by lapping. Replace any heavily scored or badly worn parts.

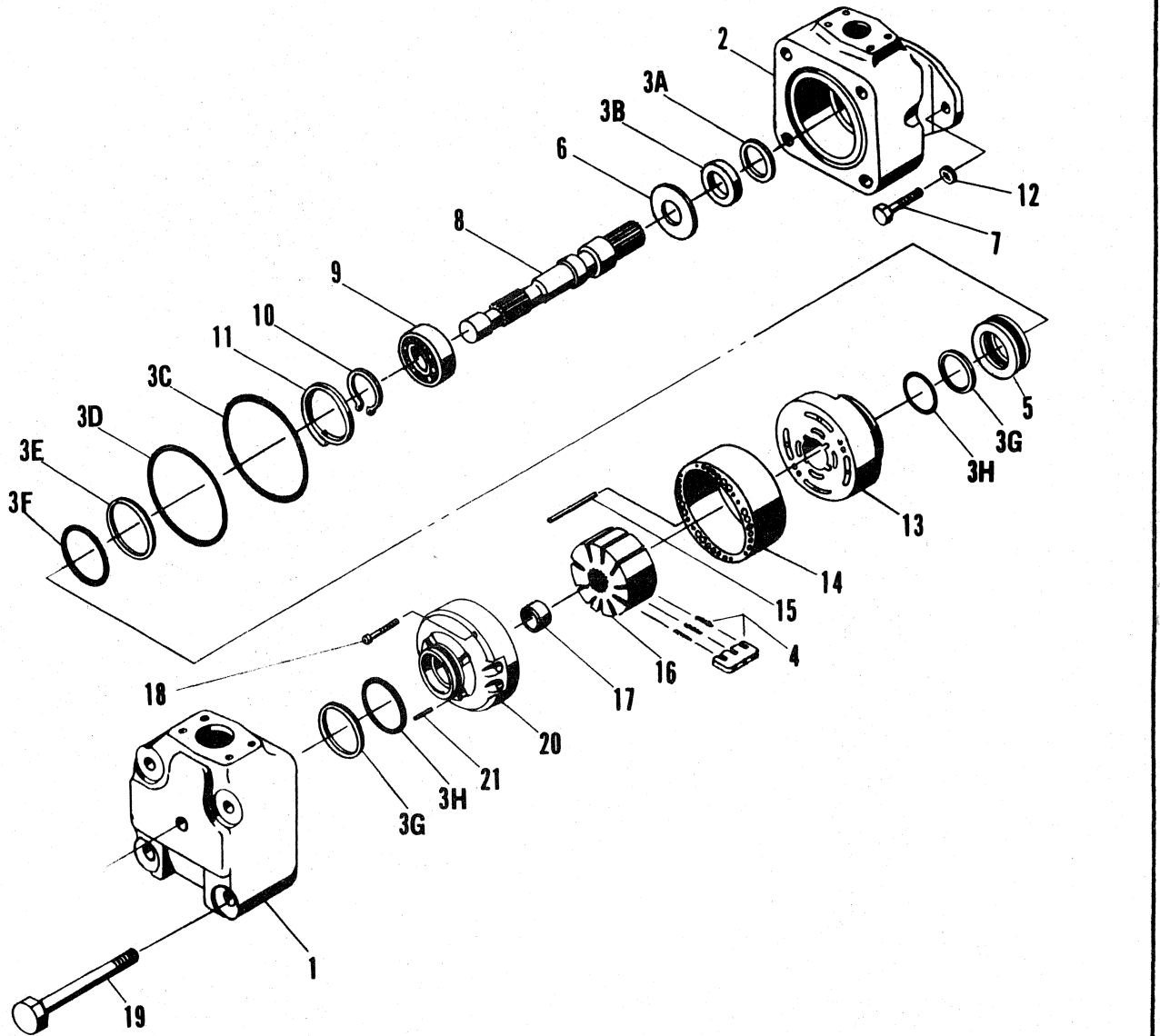
3. Inspect the vanes for burrs, wear and excessive play in the rotor slots. Carefully dress down burrs with a medium India stone (Norton abrasives MF724 or equivalent). Replace the rotor if the slots are worn. Replace vanes with a new vane and spring kit if the vane tips are rounded.
4. Rotate the bearing on the shaft while applying pressure to check for wear, looseness, roughness and pitted or cracked races.
5. Inspect the seal and bushing mating surfaces on the shaft for scoring or wear. Replace the shaft if marks cannot be removed by light polishing.
6. Be sure that any paint or burrs raised on body and cover mating surfaces are removed before reassembly.

ASSEMBLY

NOTE: Coat all parts with clean hydraulic fluid to facilitate reassembly and provide initial lubrication. Use small amounts of petroleum jelly to hold the "O"rings in place during assembly. Soak the shaft wiper in oil before reassembly.

1. Shaft Seal Assembly – Install the shaft wiper in the body. Grease the shaft and press it into the body with the seal driver (Fig. 1). The spring on the shaft seal must be toward the bearing. Place the washer in the body against the shaft seal.

ELEVATOR HYDRAULIC MOTOR



- 1-Cover
- 2-Body
- 3A-Wiper
- 3B-Shaft Seal
- 3C-"O"Ring
- 3D-"O"Ring
- 3E-Back-up Ring
- 3F-"O"Ring
- 3G-Back-up Ring
- 3H-"O"Ring

- 4-Vane Kit
- 5-Hub Adapter
- 6-Washer
- 7-Capscrew
- 8-Shaft
- 9-Bearing
- 10-Snap Ring
- 11-Lockring
- 12-Lockwasher
- 13-Pressure Plate

- 14-Ring
- 15-Pin
- 16-Rotor
- 17-Bushing
- 18-Screw
- 19-Bolt
- 20-Pressure Plate Sub-Assembly
- 21-Pin

Fig. 4 -Hydraulic Motor

2. Shaft Assembly – Support the bearing inner race and press in the shaft. Install the tru-arc snap ring on the shaft. Lightly tap the shaft and bearing assembly into the body with a plastic hammer. Install the spirolox ring in the body to secure the bearing and shaft. Thoroughly inspect to insure that spirolox ring is correctly installed.
3. Cartridge Assembly – With the rotor lying on a clean, flat surface, slide the vanes and springs into the rotor slots. Lift the vanes slightly to insure the springs are positioned in the spring recesses of the rotor. With a piston ring compressor of suitable size, compress the vanes in the slots so the vanes will clear the minor diameter of the ring. (See Fig. 3).

CAUTION: Be certain the springs remain seated in the spring recesses of the rotor as vanes are compressed.

4. Position the ring on a flat surface and insert the rotor and vane assembly 1/4 way into the ring. Use a suitable size hard wood plug as a driver for positioning the rotor and vane assembly. Release the compressor carefully so the vanes do not snap out against the ring surface. With the hard wood plug, press the vanes and rotor flush with the rings.

NOTE: Vanes may become cocked if not pushed down uniformly.

5. Install the cartridge pins on the body end pressure

plate (plate without bushing). Place the rotor, ring and vane assembly over the pins on the plate.

Install the cover end pressure plate against the rotor and ring. The porting in this plate will be 90° from the other plate. Carefully install the two capscrews in the cartridge. Tighten the screws, being certain the peripheral edges of the ring and plates are flush. Tap with a plastic hammer if necessary to effect alignment.

6. Install “O”rings first, and then back-up rings on the pressure plate hubs. Grease with petroleum jelly. Inspect this assembly to insure that the “O”ring is positioned in the concave side of the back-up ring.
7. Cartridge Installation – Clamp the body in a vise with protective jaws. Assemble the hub adapter on the cartridge pressure plate (body end). Install the “O”ring and then back-up ring on the hub adapter. Grease with petroleum jelly. Install the cartridge on the shaft, with the hub adapter toward the body. Tap the cartridge into position. Install the “O”ring in the body.
8. Cover Assembly – Install the teflon ring in the cover, greasing liberally. Carefully install the cover, being sure the locating pin engages the pin hole in cover. To check engagement, turn the cover 30 degrees in both directions and be certain the cartridge moves with it. Install four cover bolts and tighten to torque requirement shown in Fig. 4.



**What can service
save you - besides
money?**

ELEVATOR HYDRAULIC MOTOR

HYDRAULIC MOTOR DIAGNOSIS CHART

TROUBLE	PROBABLE CAUSE	REMEDY
MOTOR FAILS TO START	System leakage - loose port connections or broken lines.	Inspect and tighten port connections and lines.
	No fluid - inadequate fluid supply at inlet or in system.	Check fluid level in reservoir. Replenish as necessary.
	System return line or drain line restricted.	Check drain filter. Clean and/or replace filter element.
	System inlet line restricted.	Check all strainers and filter for dirt and sludge. Clean if necessary.
	Fluid viscosity too heavy to pick up prime.	Completely drain the system. Add new filtered fluid of proper viscosity.
	Air in system.	Tighten any loose connections. Bleed air from highest point in system and replenish fluid.
	Drive train damaged.	Check and repair drive train.
	Pump driven in wrong direction.	Drive direction must be reversed immediately to prevent seizure.
	Pump coupling or shaft sheared.	Check shaft engagement and damage. Replace the necessary parts.
	System relief valve stuck open.	Disassemble and clean the valve with solvent. Use pressure gauge to adjust the relief valve.
Pump or motor binding.	Remove and disassemble the unit. Check for correct assembly of parts. Also check for dirt or metal chips. Clean the parts thoroughly and replace any damaged parts.	
MOTOR NOT DEVELOPING SUFFICIENT SPEED OR TORQUE	Insufficient pump speed.	Check pump drive speed.
	Insufficient fluid pressure.	Check delivery of pump. Make certain sufficient hydraulic fluid is available to the pump.
	System overload relief valve set too low.	Check pressure and reset relief valve.
	Motor requiring excessive torque.	Remove motor and check torque requirements of driven shaft.
	Parts of motor cartridge scored due to excessive pressure or foreign matter in oil.	Remove motor for overhaul.
MOTOR TURNING IN WRONG DIRECTION	Improper port connections or control valve in wrong position.	Reverse port connections or shift valve.
	Components in system not functioning as intended.	Check complete system for proper operation.
MOTOR NOISY	Air in system.	Bleed air from highest point in system and replenish fluid.
	Motor internally damaged.	Remove motor for overhaul.
	Noise from other system components telegraphing back through lines and emerging from motor.	Check complete system for proper operation.
EXTERNAL LEAKAGE FROM MOTOR	Worn seals or cut "O" rings.	Install new seals and "O" rings.
MOTOR SHAFT CONTINUING TO ROTATE WHEN CONTROL IS IN "OFF" POSITION	Control valve is not functioning properly.	Check control valve for correct spool and leakage.

HANCOCK

HYDRAULIC CYLINDER

The hydraulic cylinders on these units are the doubleacting type. The "Double Acting" hydraulic cylinder is extended by hydraulic oil pressure and retracted by

reversing the pressure, rather than retracting by pressure-release method.

REMOVAL

When removing the lift cylinders from the machine, the lift cylinders are connected to the yoke and lower front of the main frame to lift and lower the moldboard. Care should be taken to avoid damaging the cylinder and to avoid injury to the service man. The cutting edge must be on supports or ground before the cylinders can be removed. Follow the steps in the order listed below to remove the lift cylinders.

1. Remove cotter pin from upper cylinder pin. Remove cylinder pin washer.
2. Support the cylinder so that it will not fall in the direction of the serviceman when the cylinder pin is

removed.

3. Remove the cylinder pin by driving it from the cylinder base and yoke and pull yoke cylinder lug. After moving it flush with the cylinder base end, a drift may be used to finish the removal procedure.
4. Lower the cylinder to the floor using the lower cylinder pin (still intact) as a hinge.
5. Remove the lower cylinder pin using the same procedure as on the upper cylinder pin.
6. Reinstallation of the cylinder assembly is the reverse of the above procedure.

DISASSEMBLY

In the disassembly of the hydraulic cylinder, every precaution should be taken to keep dirt and other foreign matter from the cylinder. The presence of any foreign matter in the cylinder can cause expensive damage to any or all of the components. Refer to Fig. 1 and the following instructions.

The following service procedures apply to the lift cylinders and the endgate cylinder located at the rear of the machine.

1. Secure the cylinder on a substantial work bench equipped with a large vise to securely hold the cylinder assembly. A chain vise, if available is ideal to use in this situation.
2. Remove 3 capscrows fastening the gland to the head. See Fig. 2.
3. Slide the gland assembly down the rod to make visible the retaining ring securing the barrel. See Fig. 3.

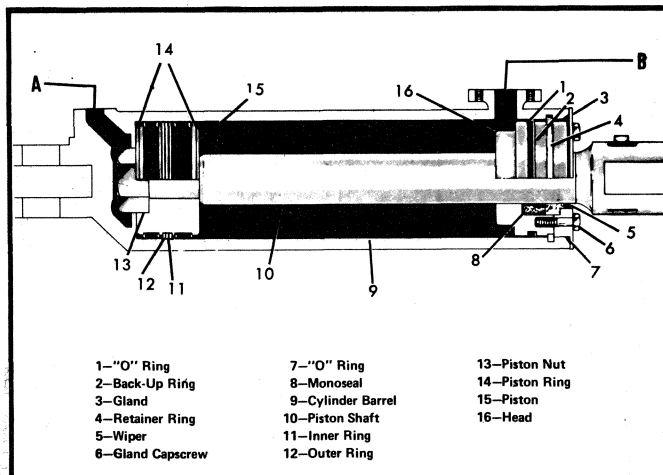


Fig. 1—Hydraulic Cylinder Assembly

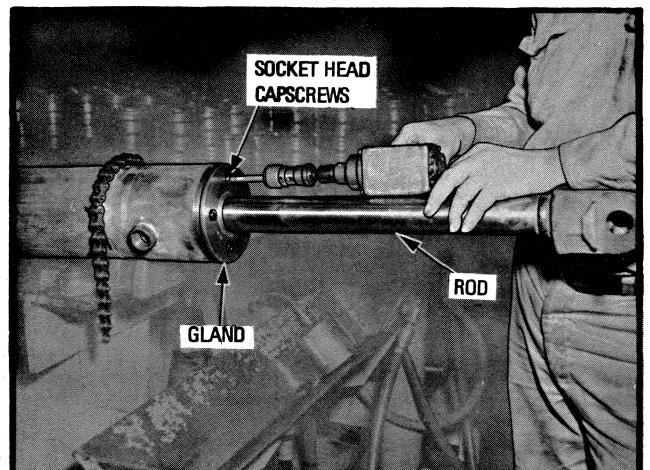


Fig. 2—Disassembly of Gland Assembly

L1

HYDRAULIC CYLINDER

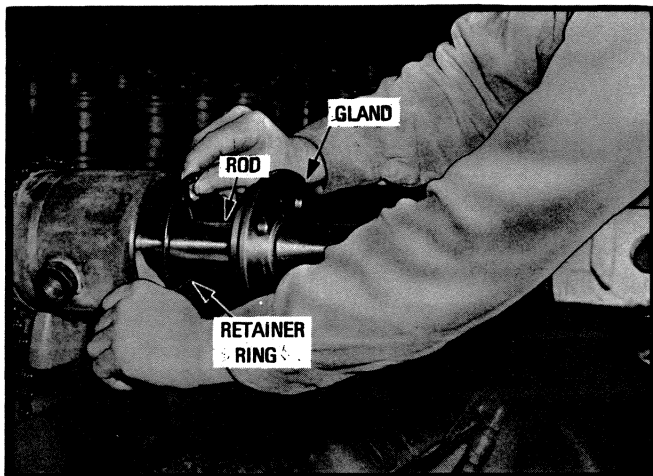


Fig. 3—Removal of Retaining Ring

4. Remove the retaining ring from the groove in the barrel.
5. The rod and piston assembly may then be removed from the barrel as shown in Fig. 4.
6. Remove the piston locknut from the end of the piston rod and remove the piston.

CAUTION: Care must be taken to avoid scratching or denting the cylinder rod.

7. The gland assembly, monoseal and head may then be removed from the rod.
8. Remove outer ring, inner ring and piston rings from piston.
9. Remove gland sleeve, "O" ring and wiper from gland.
10. Clean and inspect all parts and replace all worn parts.

A rod or barrel with very light scratches can be repaired by using fine crocus cloth to remove the rough edges. If a rod or barrel has deep scratches, in most cases it must be replaced.

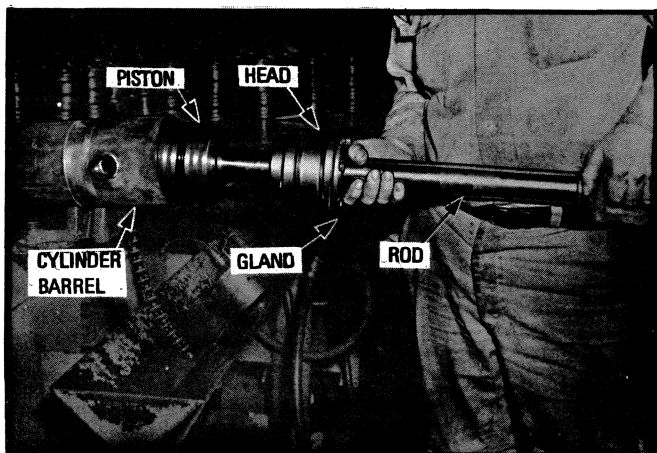


Fig. 4—Removal of Rod and Piston Assembly

It is a good practice, while in the field, to inspect the rod wiper frequently. Wipe the cylinder rods with a slightly oily cloth to remove the dirt and sand or foreign material. The oil will tend to soften the dirt and it will not leave scratches as it is wiped away. Do not leave excess oil on the surface of the rod so that heavy sand and dirt deposits can stick to the rod. Reassembly of the lift cylinder and the endgate cylinder is the reverse of the disassembly procedure. It is recommended that all "O" rings, seal rings, back-up rings, shaft wipers and monoseals be replaced each time the cylinders are disassembled.

Service procedures outlined above apply to all hydraulic cylinders on this unit. When assembling piston rod assembly into cylinder barrel, place used "O" ring from head into retaining groove in barrel. This procedure will reduce the chances of damaging outer ring and inner ring on piston by retaining ring groove in cylinder barrel.

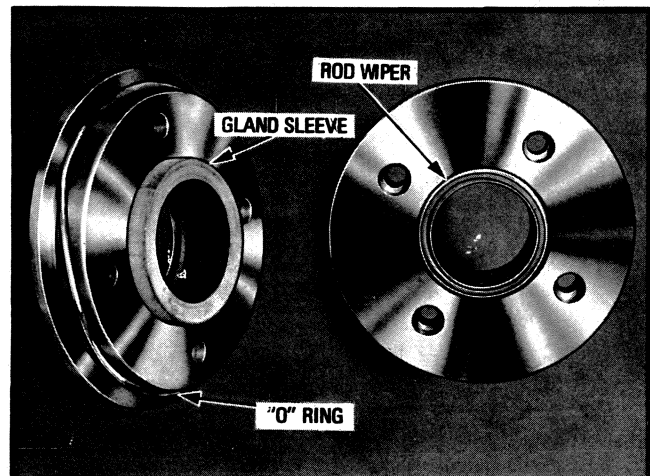


Fig. 5—Gland Assembly

1. Place new wiper, gland sleeve and barrel-to-gland "O" ring on gland as shown in Fig. 5.

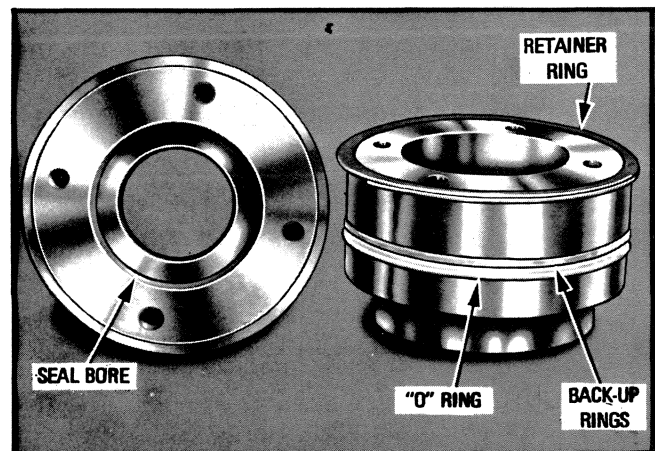


Fig. 6—Head Assembly

HYDRAULIC CYLINDER

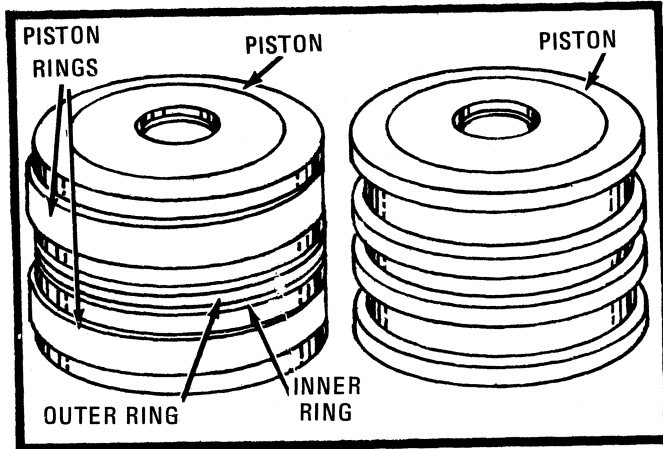


Fig. 7—Piston Assembly

2. Place new "O" ring and back-up ring on cylinder head. The concave side of the back-up ring must be turned toward the "O" ring. The flat side of the "O" ring must be facing to the same end of the gland as the rod monoseal. See Fig. 6.
3. The new monoseal is to be assembled with flared end toward piston.
4. Install one new inner ring first in the center recessed slot.
5. Install new rings, one each inner and outer. Be careful that outer ring does not get scuffed from assembly. See Fig. 7.
6. Install the piston rings (2) in the grooves on either side of the center groove containing the inner ring and outer ring. Make certain that the ends where the piston rings come together are opposite each other.
7. Install the new "O" ring in the inside bore of the piston.

* * *

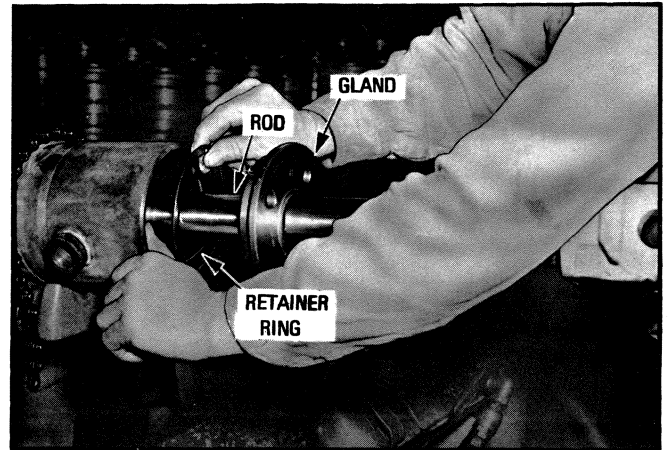


Fig. 8—Installation of Retaining Rings

8. Be careful not to damage the wiper seal or gland sleeve, when installing the gland assembly on the cylinder rod.
9. Place a new retainer ring on the shaft.
10. Place the head assembly on the rod. The rod monoseal must go next to the gland.
11. Place the piston assembly onto the small end of the rod and fasten it to the rod with the locknut removed to disassembly the rod assembly.
12. Thoroughly coat the inside of the barrel and the rod assembly with the same oil that is used in the hydraulic system.
13. Install the rod assembly, piston first in the barrel. When the piston and head are in place, install the retainer ring. See Fig. 8.
14. Slide the gland down the cylinder rod until it is flush with the barrel and insert the capscrews. Start them into the head and screw them finger tight all the way around.
15. Tighten two capscrews opposite each other first, then tighten all capscrews to 40 ft. lbs. of torque.



LUBRICATION

The unit is equipped with a unique system known as "Centralube". This system was designed with the serviceman in mind. Hard-to-get-to places may now be lubricated with ease from a central location. A block with 10 grease fittings is mounted on the tail frame assembly. These 10 grease fittings lubricate 10 extremely difficult but essential lubrication points in the ejection system. All these points should be lubricated at 8 to 10 hour intervals.

If the shift is 8 to 10 hours long, one greasing a day will suffice. If the shift is 16 or 24 hours long, the 10 hour lubrication interval should be strictly adhered to.

The importance of proper lubrication practices cannot be over-emphasized. It comes at the head of the list in the well-planned preventive maintenance program. Grease fittings must be wiped clean before each entrance of foreign matter. When lubricant is introduced through the zerk under pressure, dirt can be forced through the port in the zerk and introduced into the system. It is common knowledge that sand and dirt are among the best bases for an abrasive compound.

DAILY LUBRICATION — All points indicated on lubrication chart for 10 hour intervals must be lubricated daily. A lithium base grease must be used. The grade of grease to be used in relation to the ambient temperature is specified below.

Temperature Range	Grease Consistency
0°F. and Above	Heavy oil base—Grade 2
Below 0°F.	Light oil base—Grade 0

LUBRICATE PERIODICALLY — Check and service the following items at intervals specified.

EVERY 250 HOURS OF OPERATION

ELEVATOR GEARBOX — Check fluid level observing the following conditions:

1. Machine must be level.
2. Elevator must be stopped.
3. Blade must be down.
4. Area around fill — check plug must be clean.

Remove ½" plug. Maintain fluid level to bottom of fill — check plug opening. Fill as necessary, adding fluid

through the fill — check plug opening. Refer to "Every 1,000 Operating Hours" section for drain and refill instructions.

EVERY 1000 HOURS OF OPERATION

ELEVATOR GEARBOX — The elevator gearbox is filled with EPGL (extreme pressure gear lube) at the factory. This lube meets MIL-L-2105B specifications. When adding or refilling, it is recommended that this type lubricant be maintained. See the chart below for consistency recommendations.

Temperature	SAE Consistency
Below 10°F.	SAE 80
Up to 100°F.	SAE 90
Above 100°F.	SAE 140

BE SURE TO MAINTAIN FREQUENT CHECKS AND CHANGES!!

Drain and refill elevator gearbox every 1,000 operating hours or when gearbox is repaired or overhauled for any reason. Follow the instructions outlined in the order listed below to properly drain and refill the elevator gearbox.

1. Always drain gearbox while fluid is at operating temperature. Hot oil flows more freely and carries more foreign matter with it.
2. Remove magnetic drain plug from bottom of gearbox. Thoroughly drain gearbox housing.
3. Remove breather from street elbow located at top right side of gearbox housing. Wash in suitable solvent. Blow dry with compressed air and reinstall.
4. Clean magnetic drain plug and reinstall.
5. Remove fill-check plug. Refill gearbox with recommended lubricant through plug opening. Bring fluid level to bottom of plug opening. Reinstall fill-check plug. See Fig. 1.

The gearbox housing holds approximately 10 quarts of lube.

WHEEL BEARINGS — Wheel bearings should be checked and packed every 2000 operating hours or more often as job conditions dictate.

The following procedure is recommended whenever bearing service is indicated.

1. Remove tire and rim assembly in accordance with instructions outlined in tires section of this manual.
2. Remove hub and brake drum in accordance with instructions outlined in tires section.
3. Inspect wheel bearings and replace worn or damaged parts.
4. Repack using a lithium base grease, as specified in this section.
5. Reinstall components as outlined in tires section.

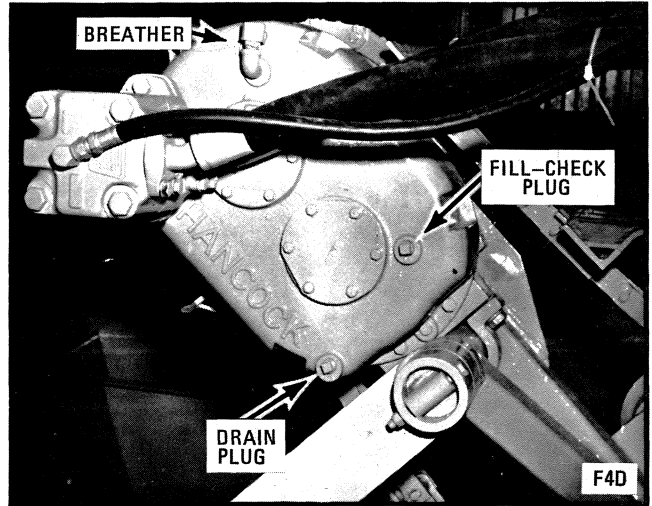
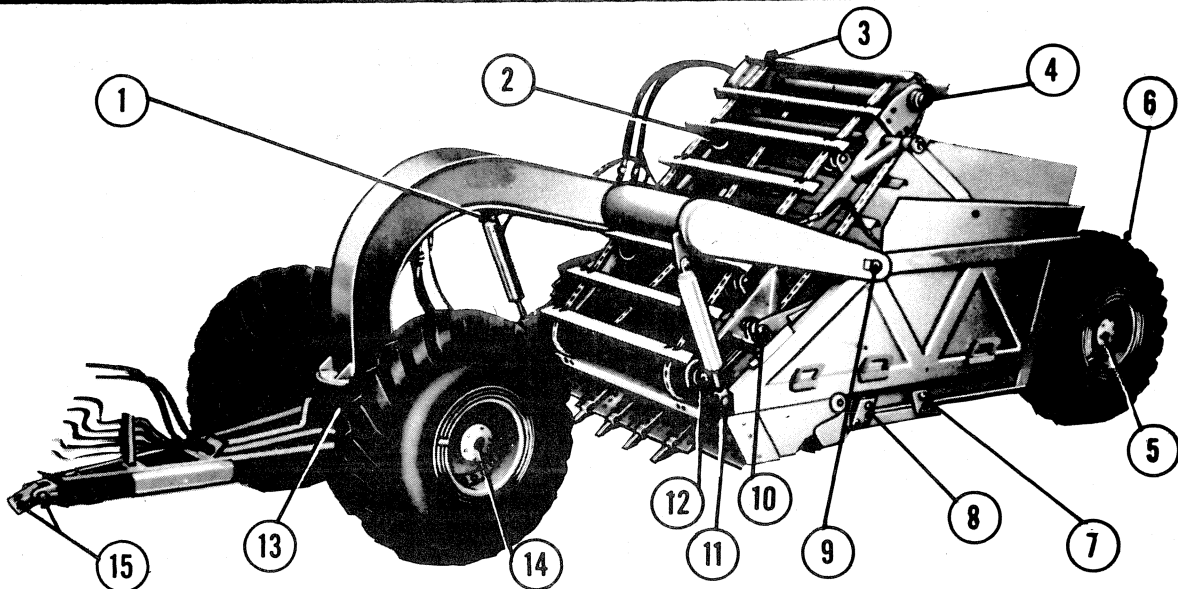


Fig. 1—Check and Drain Plug



**You reduce downtime and
save money with . . .**

Regular maintenance



11E4M LUBRICATION CHART

Station No.	Assembly	No. Zerks	Type Grease	Frequency Hours	Operation
1	Top Lift Cylinder Hanger	2	LBG	8 to 10	Grease
2	Elevator Idler Rollers	4	LBG	8 to 10	Grease
3	Elevator Sprocket Drive Gearbox		EPGL	*50	Change
			EPGL	500	Change
4	Sprocket Shaft Bearing	1	LBG	8 to 10	Grease
5	Scraper Axle Wheel Bearing (2)		LBG		Check-Pack
6	Central Grease Station		LBG	8 to 10	Grease
7	Rear Rolling Floor Rollers	2	LBG	8 to 10	Grease
8	Front Rolling Floor Rollers	2	LBG	8 to 10	Grease
9	Yoke Hanger Bearings	2	LBG	8 to 10	Grease
10	Elevator Rest Flat Bushing	2	LBG	8 to 10	Grease
11	Tail Roller Shaft Bearings	2	LBG	8 to 10	Grease
12	Bottom Lift Cylinder Hanger	2	LBG	8 to 10	Grease
13	Fifth Wheel Ball Joint	1	LBG	8 to 10	Grease
14	Dolly Wheel Bearings (2)		LBG	500	Check-Pack
15	Universal Hitch Block	2	LBG	8 to 10	Grease

*Drain and refill after first 50 hours operation on new machines.

KEY			
		Weather Temperature	Weight
LBG	Lithium Base Multi-Purpose Grease	0°F to Above	Grade 2
		Below 0°F	Grade 0
EPGL	Extreme Pressure Gear Lubricant	Below 10°F	SAE 80
		Up to 100°F	SAE 90
		Above 100°F	SAE 140
HO	Motor Oil - MS API Service Classification Sequence Tested	100°F Up	30W
		75°F to 100°F	20 - 20W
		0°F to 75°F	10W
HF	Automatic Transmission Fluid Type A Suffix A		10W

Use only an EP Gear Lube that is classified as meeting a Military Specification MIL-L-2105B with NO ZINC ADDITIVE. DO NOT USE AN "SCL" (Sulphur-Chlorine-Lead) GEAR LUBE.

HANCOCK

BEARING SERVICE

The importance of proper care in assembly and disassembly of bearings cannot be over-emphasized. Extreme care should be taken in removal, handling, cleaning, inspection, installation and adjustment on these parts. Illustrations in this section furnished by Anti-Friction Manufacturers Association, Inc.

Listed below are a few rules for working with bearings, which will be beneficial in service on assemblies.

1. Work with clean tools, in clean surroundings, with dry, clean hands.
2. Clean housing thoroughly before exposing and replacing bearings.
3. Treat a used bearing as carefully as a new one.
4. Use clean solvents and flushing oils. Place bearings on clean paper.
5. Keep bearings wrapped in oil proof paper, protecting them from dirt and moisture.
6. Always use clean, lint-free rags.

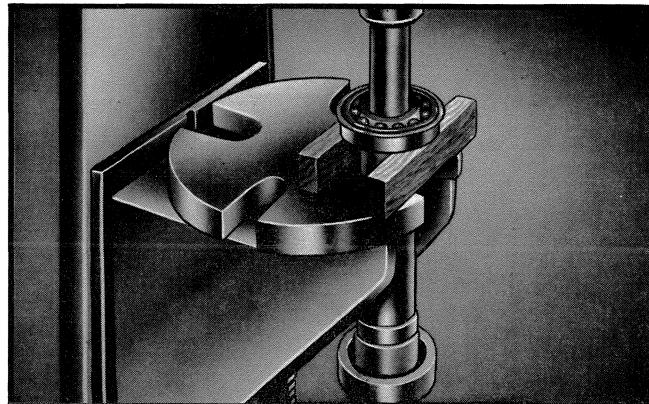


Fig. 2

F6

7. Install new bearings as removed from package without washing.
8. Keep bearing lubricants clean and cover containers when not in use.
9. Don't use wooden mallets, dirty, brittle or chipped tools.

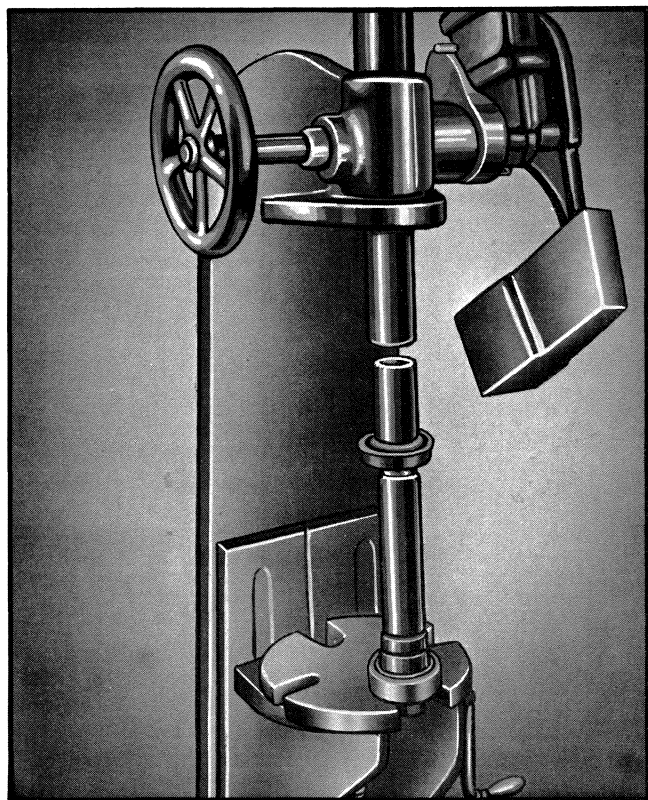


Fig. 1

F2

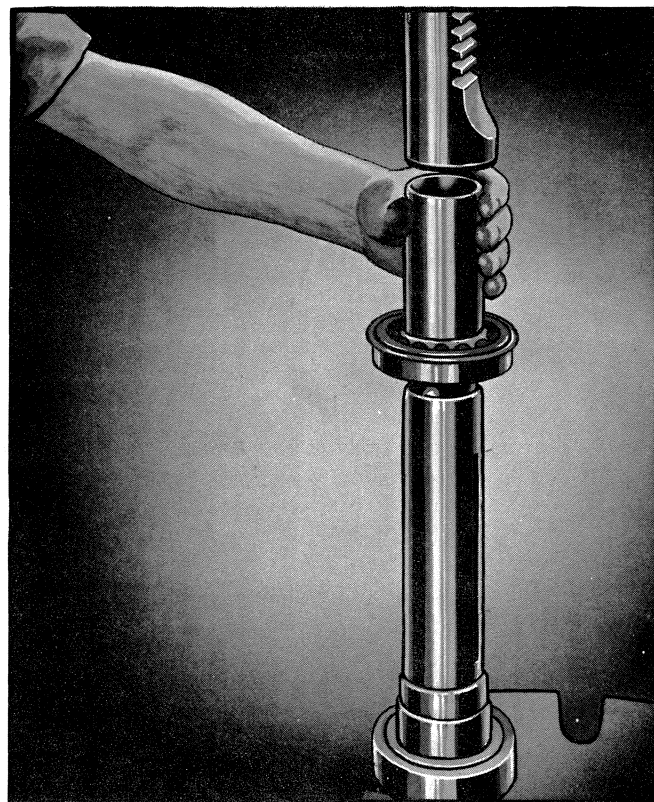


Fig. 3

F7

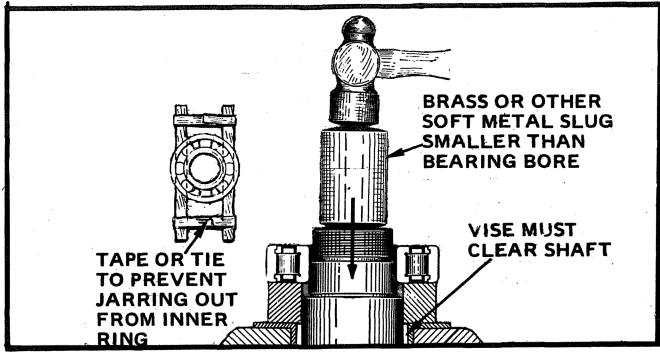


Fig. 4

F10

10. Don't spin uncleaned bearings, or spin ANY bearings with compressed air.
11. Don't use the same container for cleaning and rinsing of bearings.

Service men can never be too careful when servicing bearings. Most of the above list has become habit with the good service man.

Proper tools are an essential part of servicing assemblies with bearings. They not only provide a safe method of assembly and disassembly of critical parts; they also save time. Tools should always be used properly and kept clean.

One tool for removing and replacing certain bearings is the arbor press, Fig. 1 and Fig. 2. The correct method of using this tool is shown in Fig. 3.

In a shop if there is no press available, a vise, soft metal slugs and a hammer can be used effectively, as shown in Fig. 4. Pullers in combination with a vise can also be effective, illustrated in Fig. 5 and Fig. 6.

It is a necessity to have a complete set of pullers to meet every need in the field. Pictured in Fig. 7 is a group of pullers that should be in every service tool kit. Figs. 8, 9 and 10 show several applications of pullers.

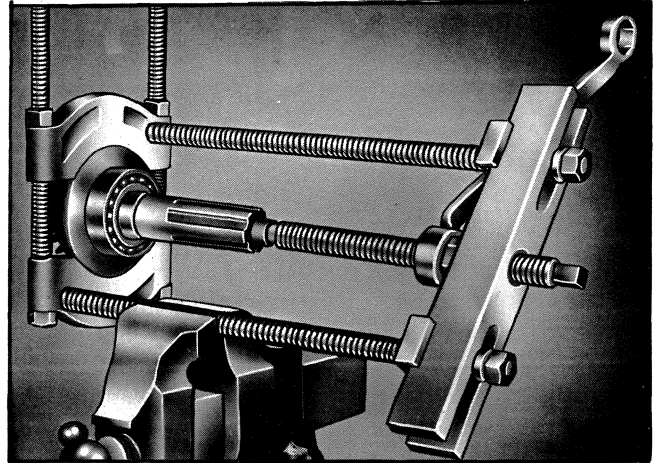


Fig. 6

F8

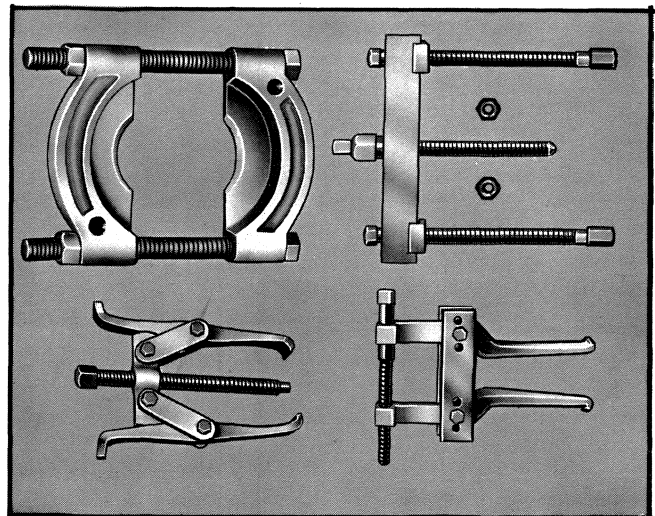


Fig. 7

F9

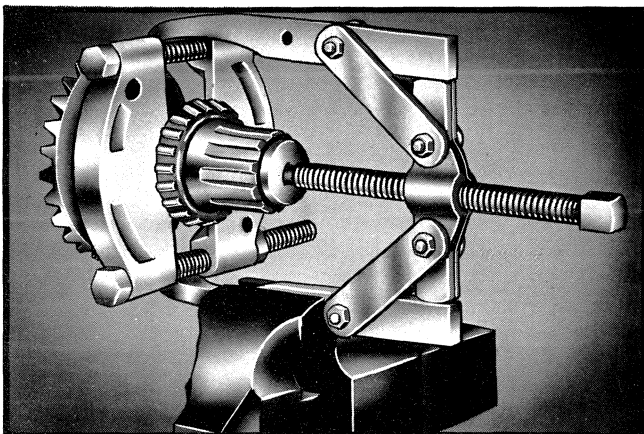


Fig. 5

F4

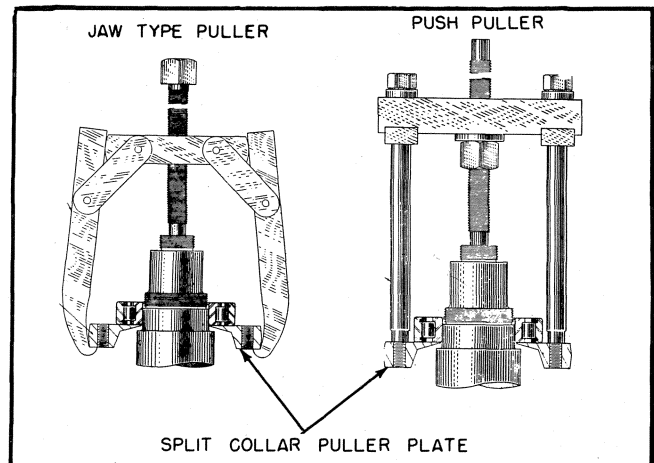


Fig. 8

F12

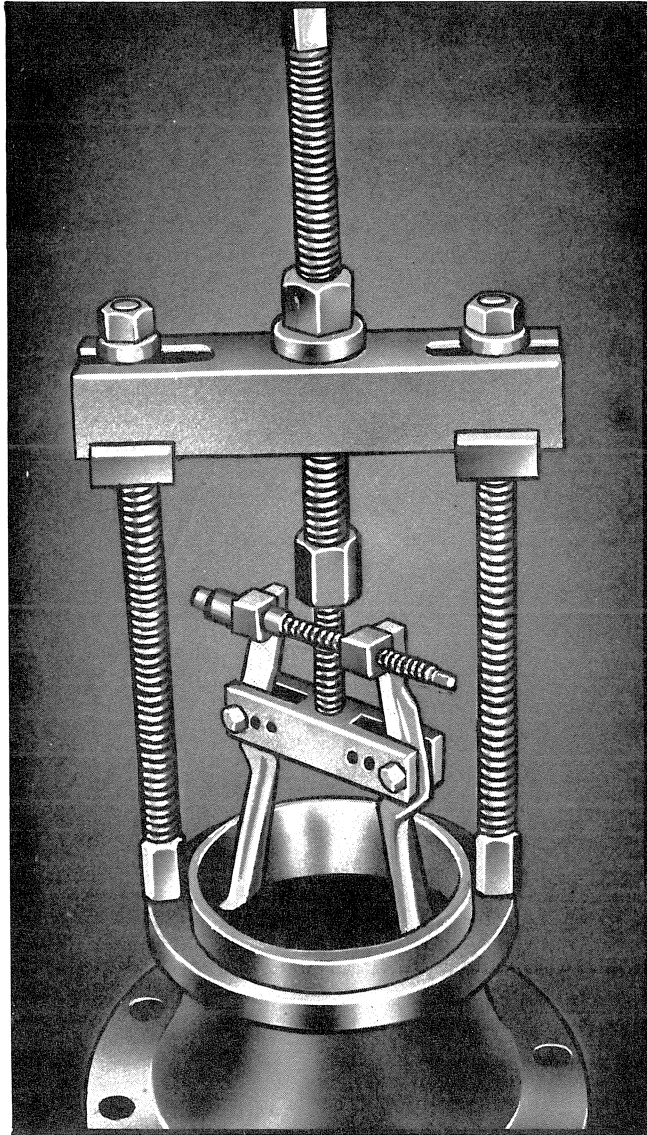


Fig. 9

F1

Remember that the ring, which does the turning, is usually put on with the tightest fit. This means that it is installed with a tight press fit. It is stationary and usually installed just tight enough to be kept from moving when the bearing is turning under load. The shaft, or housing, where the bearings fit should be true dimensionally. Every precaution should be exercised in installation of bearing rings to be sure they are square with the seat when started. A crooked start will gouge the bearing seat and affect the bearing's operation.

The following defects are cause to discard bearings.

1. Broken or cracked rings.
2. Dented shields.
3. Cracked or broken separators.
4. Broken or cracked rollers or balls.
5. Flaked areas on balls, rollers, or races.

* * * *

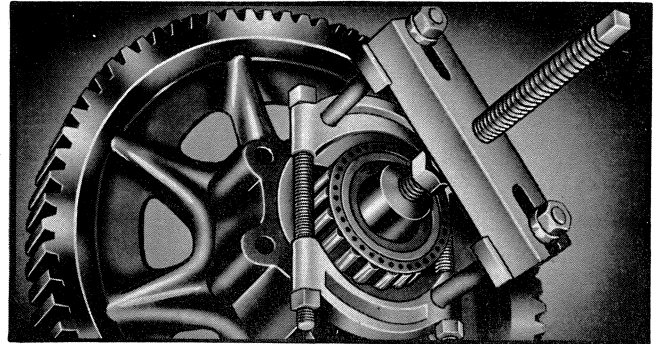


Fig. 10

F3

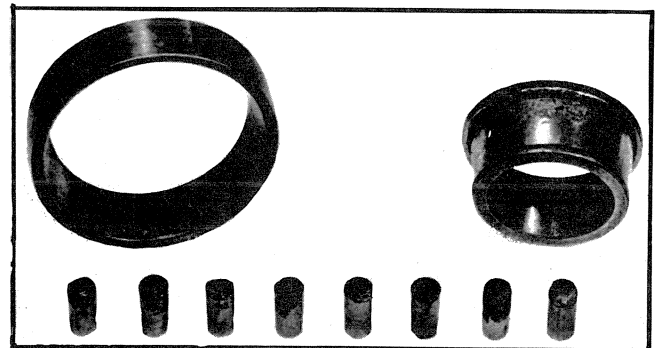


Fig. 11

F11

6. Bearings which have been overheated are generally discolored to a brownish-blue or blue-black color.
7. Bearing races which are indented or "Brinelled" by balls or rollers.

The illustration in Fig. 11 and in Fig. 12 are examples of defective bearings.

In some cases it may be necessary to heat the bearings in order to install them, especially large diameter bearings. This should be done in an oil bath 200 to 250 degrees F. not to exceed 250 degrees F. to avoid overheating. Never use a torch, because the heat cannot be controlled. It is necessary sometimes to freeze the shaft in dry ice to reduce its size to install a large bearing.

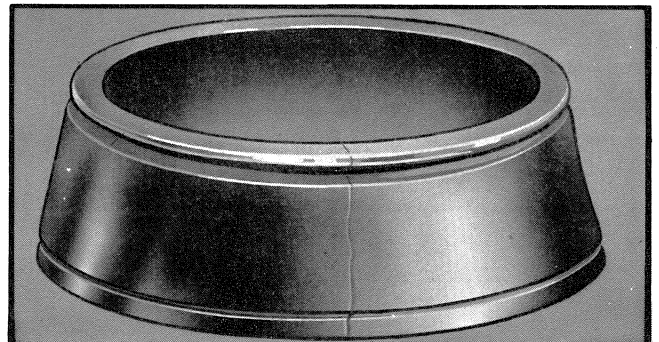


Fig. 12

F5



STANDARD BOLT AND NUT SPECIFICATIONS

The following torque specifications chart is based on S.A.E. bolt steel classifications. These specifications should be observed in all cases unless specifically mentioned elsewhere in this manual.

To prevent the standard threaded bolts and nuts used on this unit from being over stressed during assembly, and to establish a uniform value to which these fasteners can safely be tightened, the following bolt and nut torque chart has been compiled.

The torque values listed in the torque chart have been established over a period of years and cover all conditions of assembly. The maximum torque values are




based on 75% of the specified minimum proof strength of the bolt steel in order to provide a safety factor to compensate for the variation in the accuracy of torque wrenches, skill of the assembler and variance in fractional conditions. The torque values vary for dry or lubricated threads. The term "lubricated" includes the application of thread lubricants, lubricizing cadmium plating and the use of hardened washers.







To provide a quick method of determining the material classification of a particular bolt, compare the bolt head markings to those in the chart, then locate the maximum torque value for that bolt size in the column under that marking.

RECOMMENDED MAXIMUM TORQUE VALUES ± 5%

Size	S.A.E. SYMBOL ○ ⊕ GM 280 - M STEEL (S.A.E. GRADES 2 & 3)			S.A.E. SYMBOL ⊗ GM 280 - M STEEL (S.A.E. GRADE 5)		
	Torque Foot/Lbs.		Clamp Load Lbs.	Torque Foot/Lbs.		Clamp Load Lbs.
	Dry	Lub.		Dry	Lub.	
1/4 -20	5	4	1308	8	6	2020
1/4 -28	6	5	1495	10	7	2310
5/16-18	11	8	2155	17	13	3330
5/16-24	13	10	2390	19	15	3690
3/8 -16	20	15	3190	31	24	4930
3/8 -24	23	17	3610	35	27	5580
7/16-14	32	25	4370	49	38	6760
7/16-20	36	27	4890	55	42	7550
1/2 -13	49	38	5830	75	58	9030
1/2 -20	55	42	6590	85	65	10200
9/16-12	70	54	7070	110	84	11580
9/16-18	78	60	7900	120	93	12930
5/8 -11	92	71	8790	150	115	14400
5/8 -18	105	81	9950	170	130	16300
3/4 -10	165	125	13200	270	205	21300
3/4 -16	180	140	14520	295	230	23750
7/8 -9	140	108	9650	395	305	27000
7/8 -14	155	120	10670	435	335	29800
1-8	212	163	12700	590	455	35400
1-14	230	178	13900	660	510	39700
1-1/8 -7	300	230	16000	795	610	42300
1-1/8 -12	338	260	18000	890	685	47500
1-1/4 -7	425	325	20400	1120	860	53800
1-1/4 -12	465	360	22400	1240	955	59500
1-3/8 -6	555	425	24200	1470	1130	64200
1-3/8 -12	620	480	27600	1670	1290	73000
1-1/2 -6	735	565	29500	1950	1500	78000
1-1/2 -12	825	635	33000	2190	1690	87700
1-3/4 -5	995	765	39800	3075	2370	105500
2-4-1/2	1310	1005	52300	4620	3550	138500

STANDARD BOLT AND NUT TORQUE SPECIFICATIONS

Size	S.A.E. SYMBOL  			S.A.E. SYMBOL 		
	GM 290 - M STEEL (S.A.E. GRADES 6 & 7)			GM 300 - M STEEL (S.A.E. GRADE 8)		
	Torque Foot/Lbs.		Clamp Load Lbs.	Torque Foot/Lbs.		Clamp Load Lbs.
	Dry	Lub.		Dry	Lub.	
1/4 -20	10	8	2490	12	9	2855
1/4 -28	12	9	2850	14	11	3260
5/16-18	21	16	4110	24	18	4700
5/16-24	24	18	4560	27	21	5210
3/8 -16	38	29	6080	44	34	6950
3/8 -24	43	33	6900	49	38	7880
7/16-14	61	47	8350	70	54	9550
7/16-20	68	52	9330	78	60	10675
1/2 -13	93	72	11150	105	82	12750
1/2 -20	105	80	12580	120	90	14380
9/16-12	135	105	14300	155	120	16350
9/16-18	150	115	15950	170	132	18250
5/8 -11	185	145	17750	210	165	20300
5/8 -18	210	160	20100	240	185	23000
3/4 -10	330	250	26300	375	290	30000
3/4 -16	365	280	29300	420	320	33500
7/8 -9	530	405	36300	605	455	41500
7/8 -14	585	450	40000	670	515	45800
1-8	795	610	47700	905	695	54500
1-14	890	685	53500	1030	785	61200
1-1/8 -7	1125	865	60000	1285	990	68700
1-1/8 -12	1260	970	67300	1440	1110	77000
1-1/4 -7	1590	1225	76300	1820	1400	87200
1-1/4 -12	1765	1355	84400	2010	1550	96500
1-3/8 -6	2085	1600	91000	2380	1830	104000
1-3/8 -12	2370	1830	103500	2710	2085	118300
1-1/2 -6	2765	2130	110800	3160	2430	126500
1-1/2 -12	3110	2400	124500	3555	2730	142200
1-3/4 -5	4370	3360	149500	4980	3840	171000
2-4-1/2	6550	5050	1967000	7480	5760	225000

TYPES OF STEEL	ROCK HARDNESS RANGE	SAE BOLT HEAD SYMBOLS
Plain Low Carbon (E.G. SAE 1018 or 1020)	Rockwell "B" 85-100	 
Plain Medium Carbon (E.G. SAE 1035, 1038 & 1045)	Rockwell "C" 19-30	
Medium Carbon Alloy (E.G. SAE 4140, 8642 & 5147)	Rockwell "C" 28-34	 
Medium Carbon Alloy (E.G. SAE 4140, 8642 & 5147)	Rockwell "C" 32-38	

SECTION THREE
PARTS



HANCOCK DIVISION



WHEN ORDERING REPAIR PARTS

To assure the best results and to maintain the original quality built into the machine it is important that only Clark-Approved Parts be used when new parts are required.

IMPORTANT: Always furnish the distributor with the machine serial number when ordering parts.

Order through your nearest franchised Hancock Dealer, for THE HANCOCK LINE.

Always give serial number of machine.

Furnish: Quantity, Part Number and Description.

WHEN PARTS ARE RECEIVED

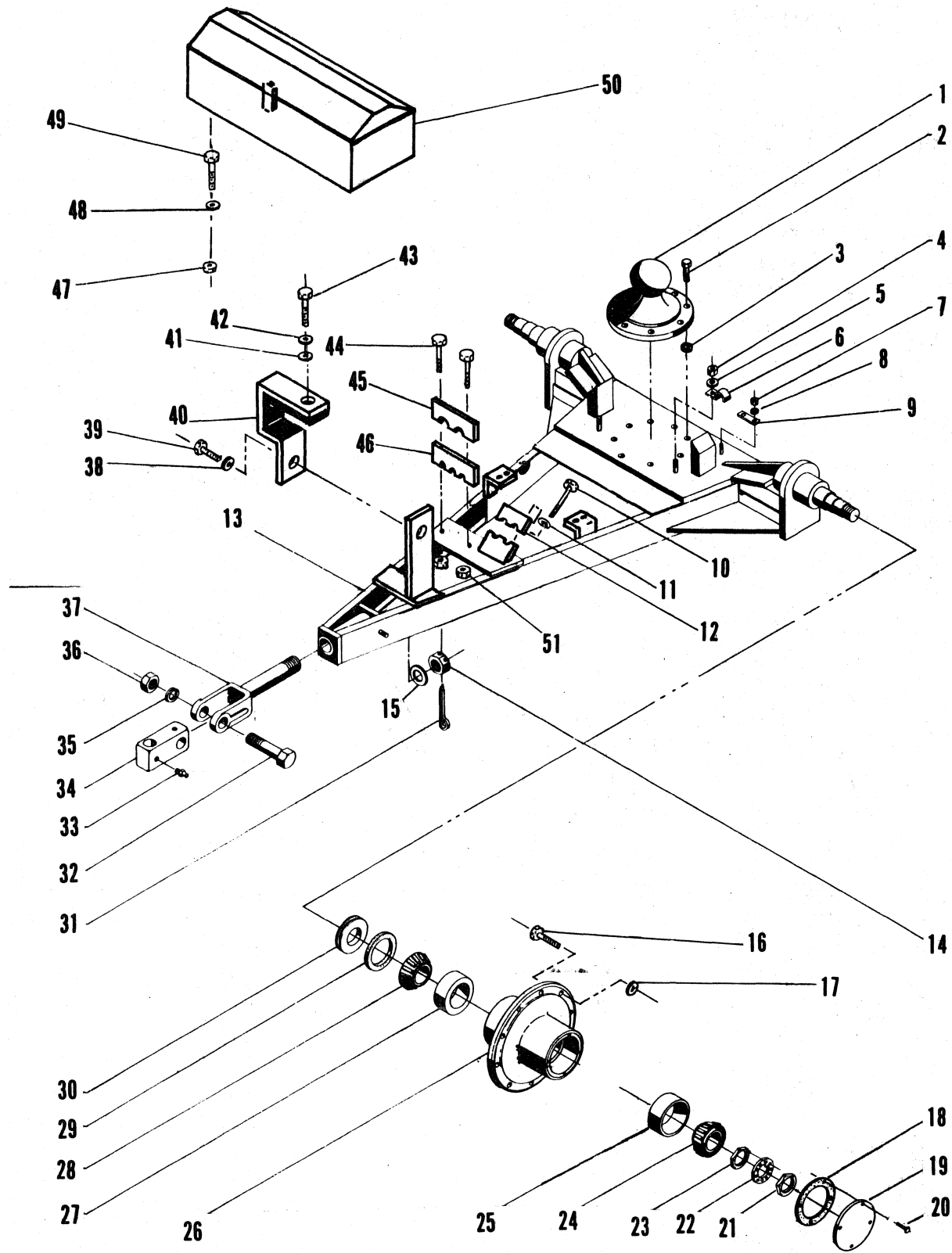
Check immediately for quantity, correctness and condition.

Advise your Hancock Dealer of any error.

Claims for damages, during shipment, should be made to the carrier immediately.

**Record Your Machine
Serial Number Here**

NOTES



FRONT DOLLY

ALWAYS STATE MODEL AND SERIAL NUMBER, WHEN ORDERING PARTS



HANCOCK DIVISION



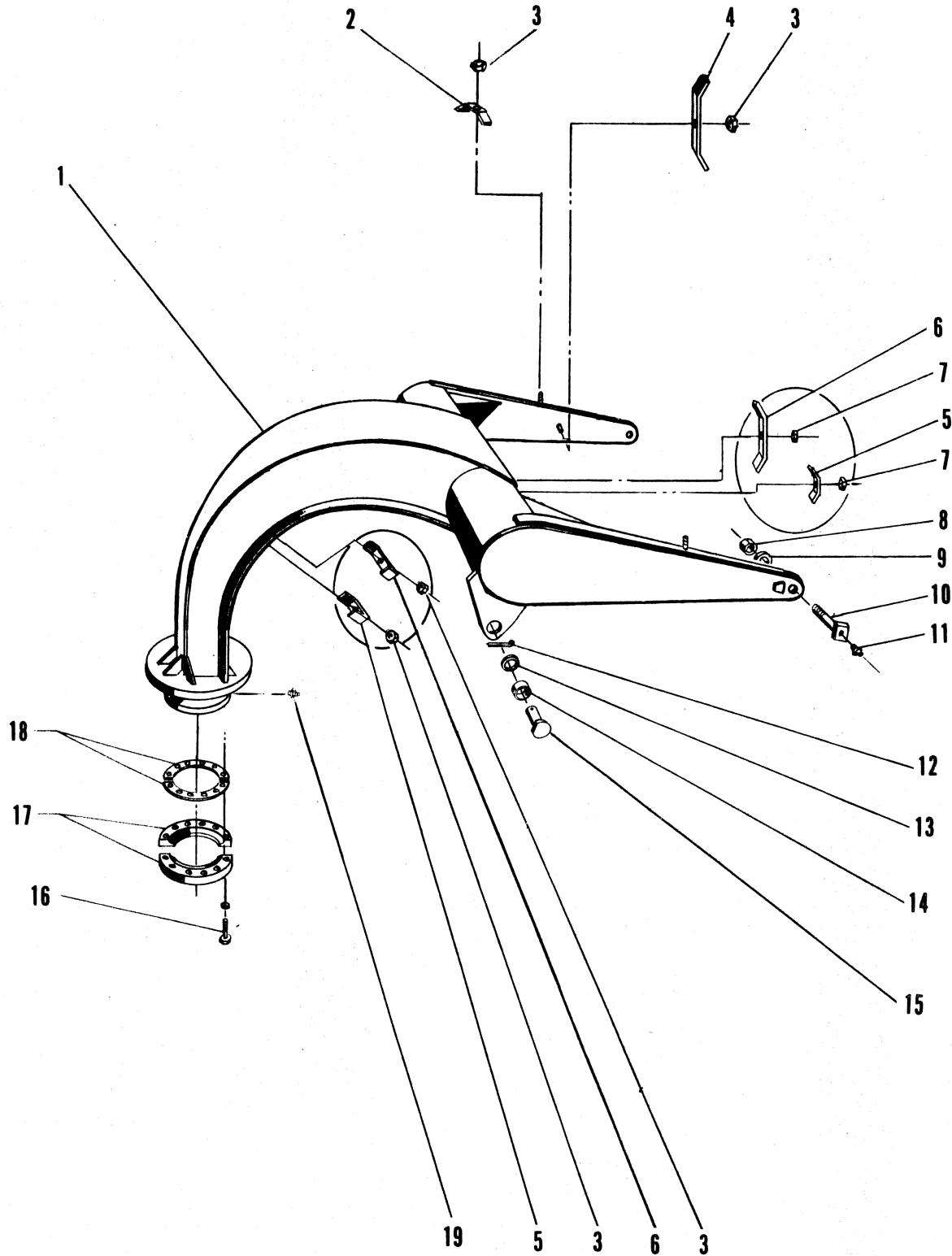
FRONT DOLLY

Item	Part No.	Description	Qty.
1	1559513	BALL ASSY	1
2	23C-1232	BOLT	8
3	4E-12	LKWSHR	8
4	17D-03	NUT	3
5	619024	WASHER	2
6	1557806	CLAMP	3
7	17D-03	NUT	4
8	619024	WASHER	4
9	1557908	CLAMP	4
10	23C-532	BOLT	2
11	4E-05	LKWSHR	2
12	1573406	CLAMP	1
13	1573401	DOLLY	1
14	522642	NUT, Slotted	1
15	1559329	WASHER, Outer	1
15A	1313867	†WASHER, Inner	1
16	1573033	STUD, Wheel	24
17	102832	NUT, Wheel	24
18	1559739	GASKET, Cover	2
19	1559738	COVER, Hub	2
20	1550938	BOLT, Self Tapping	8
21	1552279	NUT, Outer Spindle	2
22	1552013	NUT, Spindle Lock	2
23	1568668	NUT, Inner Spindle	2
24	1313683	CONE, Bearing	2
25	710990	CUP, Bearing	2
26	1573035	HUB, Wheel (Inc 16, 25 & 27)	2
27	711368	CUP, Bearing	2
28	662739	CONE, Bearing	2
29	1559149	*SEAL, Felt	2
30	1559148	*RETAINER, Seal	2
31	1F-856	COTTER	1
32	1559396	BOLT	1
33	10H-25	FITTING, Grease	2
34	1573056	BLOCK, Clevis	1
35	4E-28	LKWSHR	1
36	61D-28	NUT	1
37	1559325	CLEVIS	1
38	4E-05	LKWSHR	1
39	23C-516	BOLT	1
40	1573428	SUPPORT, Hose	1
41	664422	WASHER	1
42	4E-05	LKWSHR	1
43	23C-516	BOLT	1
44	23C-564	BOLT	2
45	1573426	CLAMP	1
46	1573427	CLAMP	1
47	17D-02	NUT	4
48	664422	WASHER	4
49	23C-520	BOLT	4
50	1573413	TOOLBOX	1
51	17D-02	NUT	2

* NOTE: 1559147 Grease Seal Assy includes 29 & 30.

† Not Illustrated

WHEN ORDERING PARTS, ALWAYS STATE MODEL AND SERIAL NO. OF MACHINE



SCRAPER YOKE

ALWAYS STATE MODEL AND SERIAL NUMBER, WHEN ORDERING PARTS



HANCOCK DIVISION

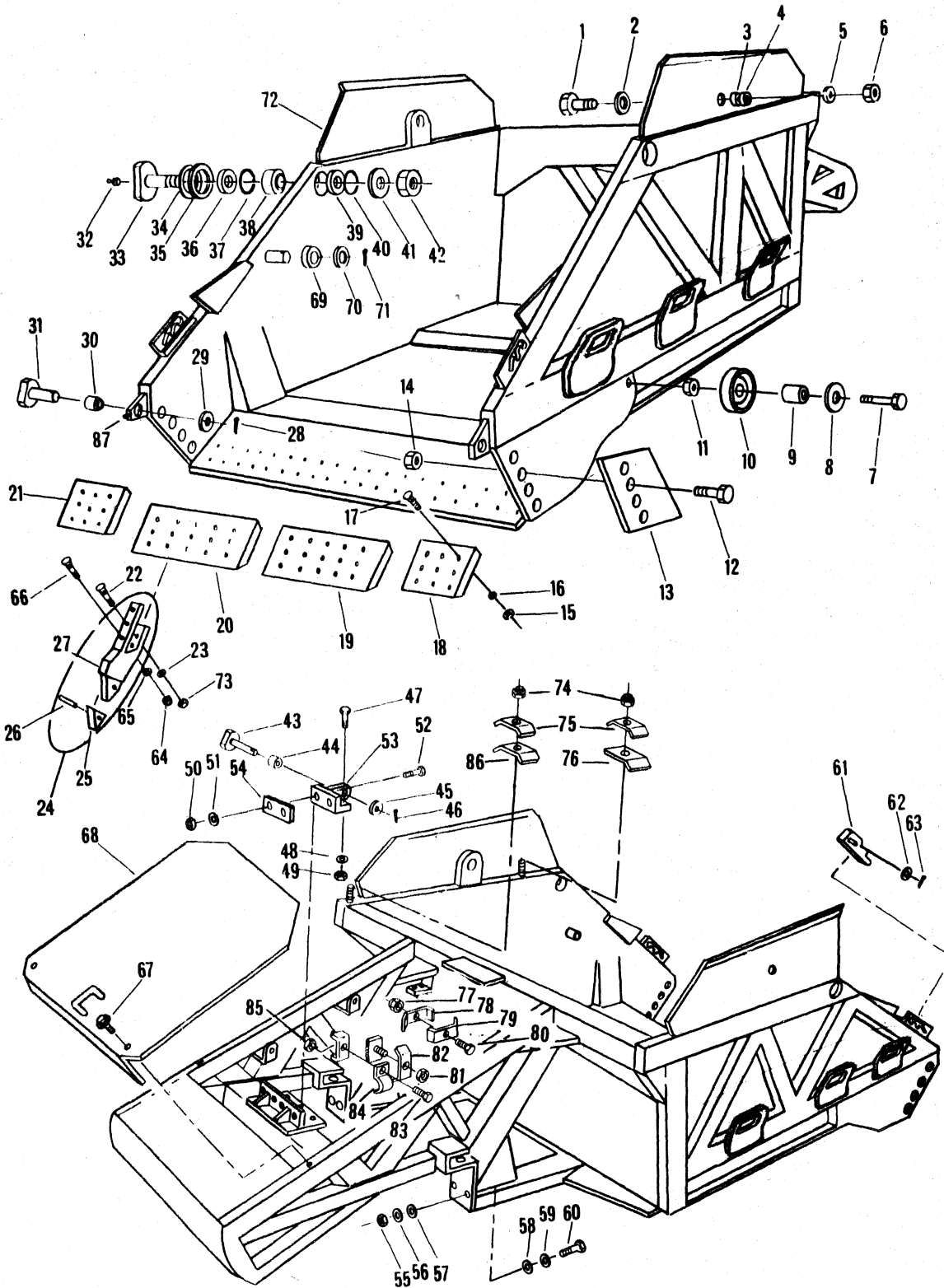


SCRAPER YOKE

Item	Part No.	Description	Qty.
1	1552994	YOKE, Scraper	1
2	1557908	CLAMP	2
3	17D-03	NUT	7
4	1557821	CLAMP	1
5	1557908	CLAMP	6
6	1557821	CLAMP	4
7	17D-03	NUT	4
8	65D-24	NUT	2
9	1554856	‡SHIM (See 'Main Frame' Group)	—
9A	1554857	‡SHIM	—
10	1554833	PIN, Yoke	2
11	10H-25	FITTING, Grease	2
12	1F-832	PIN, Cotter	2
13	619028	WASHER	2
14	665199	BUSHING	2
15	1562797	PIN, Cylinder	2
16	23C-1040	BOLT	12
16A	4E-10	LKWSHR	12
17	1559514	RING, Lock — 2 Pieces	1
18	1559516	SHIM — 2 Pieces	1
19	10H-25	FITTING, Grease	1

‡ As Required

WHEN ORDERING PARTS, ALWAYS STATE MODEL AND SERIAL NO. OF MACHINE



FRAME - SCRAPER MAIN

ALWAYS STATE MODEL AND SERIAL NUMBER, WHEN ORDERING PARTS



HANCOCK DIVISION

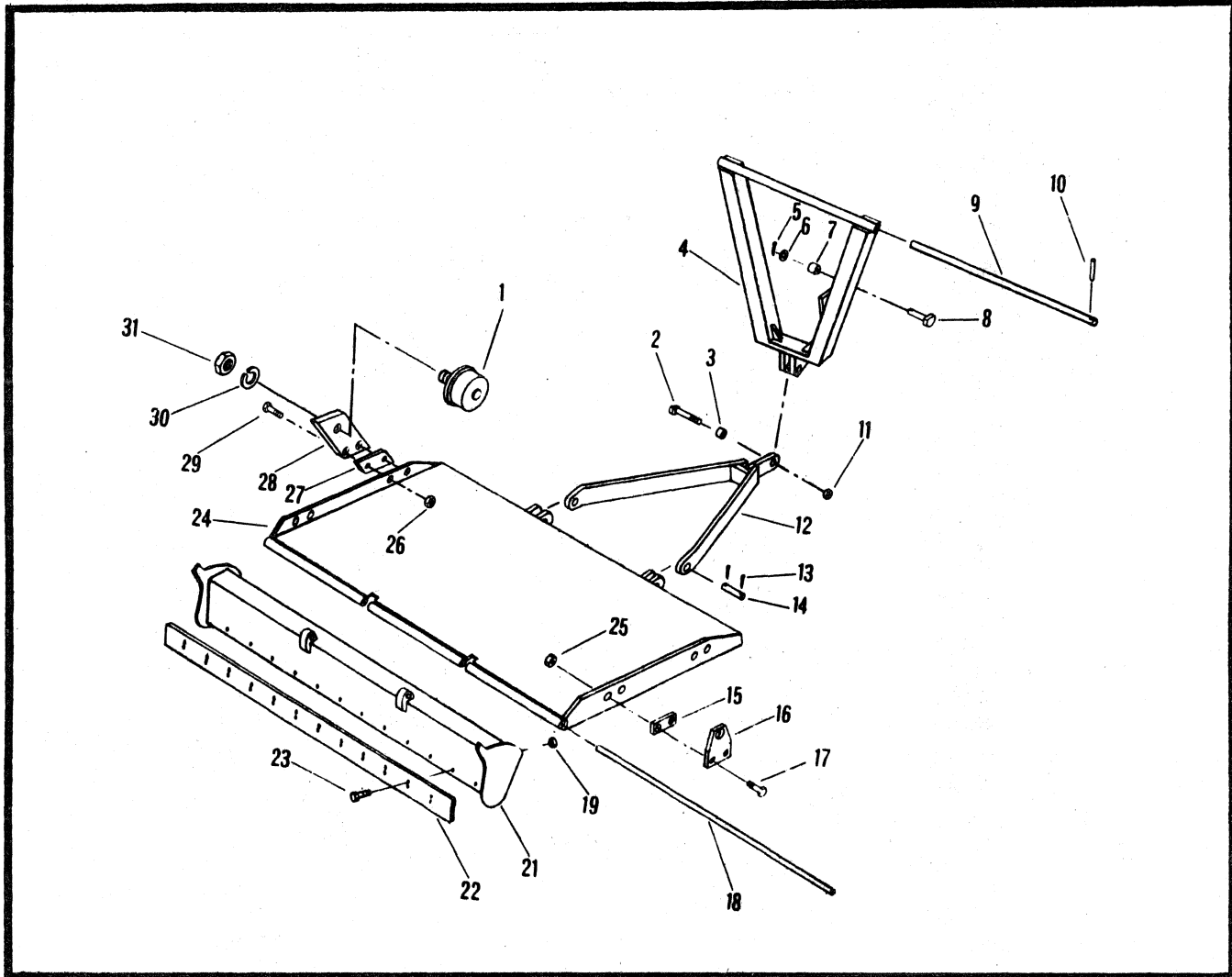


FRAME - SCRAPER MAIN

Item	Part No.	Description	Qty.	Item	Part No.	Description	Qty.
1	15C-1672	BOLT, Elevator Arm Mounting	2	48	4E-12	LKWSHR, Cylinder Hanger Mounting	4
2	619037	WASHER, Elevator Arm Mounting	2	49	61D-12	NUT, Cylinder Hanger Mounting ...	4
3	1554797	BUSHING, Elevator Arm Mounting	2	50	61D-12	NUT, Cylinder Hanger Mounting ...	4
4	1554798	BUSHING, Elevator Arm Mounting	2	51	4E-12	LKWSHR, Cylinder Hanger Mounting	4
5	619037	WASHER, Elevator Arm Mounting	2	52	17C-1272	BOLT, Cylinder Hanger Mounting	4
6	17D-12	NUT, Elevator Arm Mounting	2	53	1553880	HANGER, Cylinder	2
7	15C-1688	BOLT, Stop Roller Mounting	2	54	1553883 †	SHIM - 1"	-
8	619037	WASHER, Stop Roller Mounting ...	2	54A	1553884 †	SHIM - 1/2"	-
9	1555779	BUSHING, Stop Roller Mounting	2	54B	1553885 †	SHIM - 3/8"	-
10	1562333	ROLLER, Stop	2	54C	1553886 †	SHIM - 1/4"	-
11	17D-12	NUT, Stop Roller Mounting	2	54D	1553887 †	SHIM - 1/8"	-
12	17C-1032	BOLT, Side Cutter Mounting	4	55	17D-10	NUT, Axle Mounting	4
13	1554804	CUTTER, Side	2	56	619036	WASHER, Axle Mounting	2
14	17D-09	NUT, Side Cutter Mounting	4	57	619036	WASHER, Axle Mounting	2
15	61D-12	NUT, Blade Mounting	22	58	619036	WASHER, Axle Mounting	2
16	4E-12	LKWSHR, Blade Mounting	22	59	619036	WASHER, Axle Mounting	2
17	1552071	PLOWBOLT, Blade Mounting	22	60	17C-1244	BOLT, Axle Mounting	4
18	1550009	BLADE - 1 x 12 x 15	1	61	1560945	BLOCK, R.H. Adjustment	1
19	1550008	BLADE - 1 x 12 x 30	1	61A	1560944 †	BLOCK, L.H. Adjustment	1
20	1550008	BLADE - 1 x 12 x 30	1	62	619036	WASHER, Adjustment Block	2
21	1550009	BLADE - 1 x 12 x 15	1	63	654722	PIN, Adjustment Block Roll	2
22	1552075	PLOWBOLT, Chisel Mounting	8	64	61D-12	NUT, Chisel Mounting	4
23	4E-12	LKWSHR, Chisel Mounting	8	65	4E-12	LKWSHR, Chisel Mounting	4
24	1550029	* CHISEL ASSY (Inc 25, 26 & 27) ...	4	66	1552074	PLOWBOLT, Chisel Mounting	4
25	1550031	POINT, Chisel	1	67	1550938	BOLT, Cover Mounting	2
26	1550588	PIN, Chisel	1	68	1554821	COVER, Tail Frame	1
27	-----	§ SHANK, Chisel	1	69	1561002	BUSHING, Lower Elevator Arm Mounting	2
28	1F-832	COTTER, Cylinder Pin	2	70	1313624	WASHER, Lower Elevator Arm Mounting	2
29	619028	WASHER, Cylinder Pin	2	71	1F-1648	COTTER, Lower Elevator Arm Mounting	2
30	665199	BUSHING, Cylinder Pin	2	72	1552026	FRAME, Scraper Main	1
31	1562797	PIN, Cylinder	2	73	61D-12	NUT, Chisel Mounting	8
32	1550756	FITTING, Yoke Pin Grease	2	74	17D-03	NUT, Clamp to Tubing	2
33	1554833	PIN, Yoke	2	75	1557908	CLAMP, Tube to Frame	2
34	1554856	† SHIM, Yoke Pin	-	76	1569238	CLAMP, Tube to Frame	1
35	1554857	† SHIM, Yoke Pin	-	77	17D-03	NUT, Clamp to Tubing	1
36	1554831	SPACER, Yoke Pin	2	78	1557395	CLAMP, Tube to Frame	1
37	1554828	SEAL, Yoke Pin	2	79	1557908	CLAMP, Tube to Frame	1
38	1300558	BUSHING, Yoke Pin	2	80	17C-640	BOLT, Clamp to Frame	1
39	1554831	SPACER, Yoke Pin	2	81	17D-03	NUT, Clamp to Tubing	1
40	1554828	SEAL, Yoke Pin	2	82	1557395	CLAMP, Tube to Frame	1
41	1554832	WASHER, Yoke Pin	2	83	17C-624	BOLT, Clamp to Frame	1
42	65D-24	NUT, Yoke Pin	2	84	1558167	CLAMP, Tube to Frame	1
43	1567404	PIN, Cylinder	2	85	17D-03	NUT, Clamp to Tube	1
44	1553489	BUSHING, Cylinder Pin	2	86	1557395	CLAMP, Tube to Frame	1
45	619028	WASHER, Cylinder Pin	2	87	10H-25	FITTING, Grease	2
46	1F-832	COTTER, Cylinder Pin	2				
47	17C-1240	BOLT, Cylinder Hanger Mounting ..	4				

* NOTE: Four (4) Chisels are used per machine - Quantities listed for items 25, 26 and 27 are for one (1) Chisel.
† Not Illustrated
‡ As Required
§ Not Sold Separately

WHEN ORDERING PARTS, ALWAYS STATE MODEL AND SERIAL NO. OF MACHINE



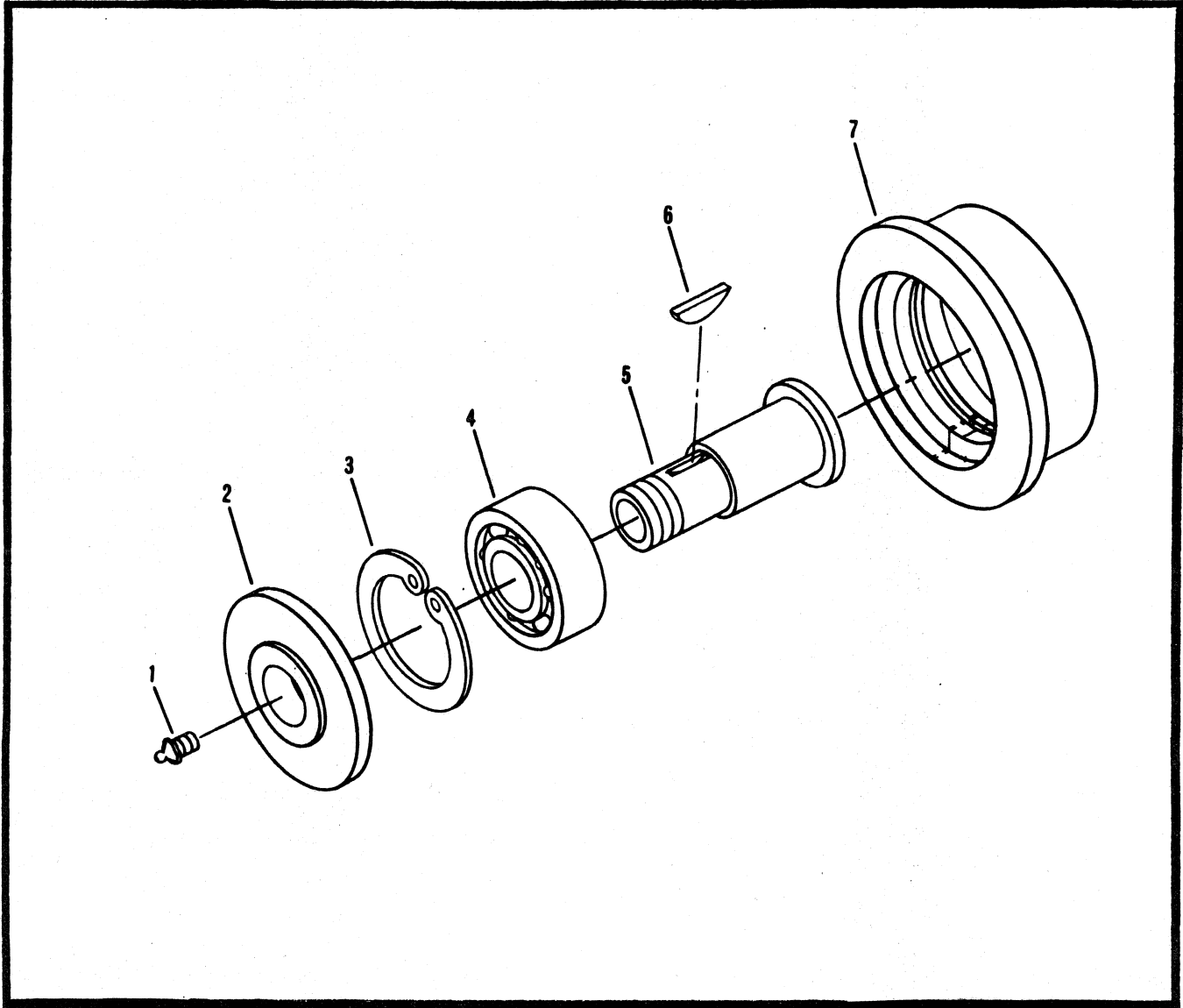
FLOOR – SCRAPER ROLLING

Item	Part No.	Description	Qty.
1	----	ROLLER, Floor (See Index)	4
2	1555882	PIN, Actuator to Yoke	1
3	1555857	BUSHING	1
4	1555844	ACTUATOR, Floor	1
5	1F-832	PIN, Cotter	1
6	619037	WASHER	1
7	665199	BUSHING	1
8	1562797	PIN, Cylinder	1
9	1555766	ROD, Actuator	1
10	730131	PIN, Roll	1
11	18D-22	NUT	1
12	1555854	YOKE, Connecting	1
13	1F-840	PIN, Cotter	4
14	1550948	PIN, Yoke to Floor	2
15	1568829	‡SHIM	—
15A	1555762	‡SHIM	—
16	1556400	HANGER, Front Roller	2

Item	Part No.	Description	Qty.
17	23C-1240	BOLT, Hanger to Floor	4
18	1555778	ROD, Hinge	1
19	17D-06	NUT	12
20			
21	1555771	FRAME, Strike-Off Blade	1
22	1555886	BLADE, Strike-Off	1
23	23C-828	BOLT, Blade to Frame	12
24	1555750	FLOOR, Rolling	1
25	17D-10	NUT	4
26	17D-10	NUT	4
27	1568831	‡SHIM	—
27A	1555922	‡SHIM	—
28	1556405	HANGER, Rear Roller	2
29	23C-1240	BOLT, Hanger to Floor	4
30	4E-18	LKWSHR	4
31	8D-18	NUT, Jam	4

‡ As Required

ALWAYS STATE MODEL AND SERIAL NUMBER, WHEN ORDERING PARTS

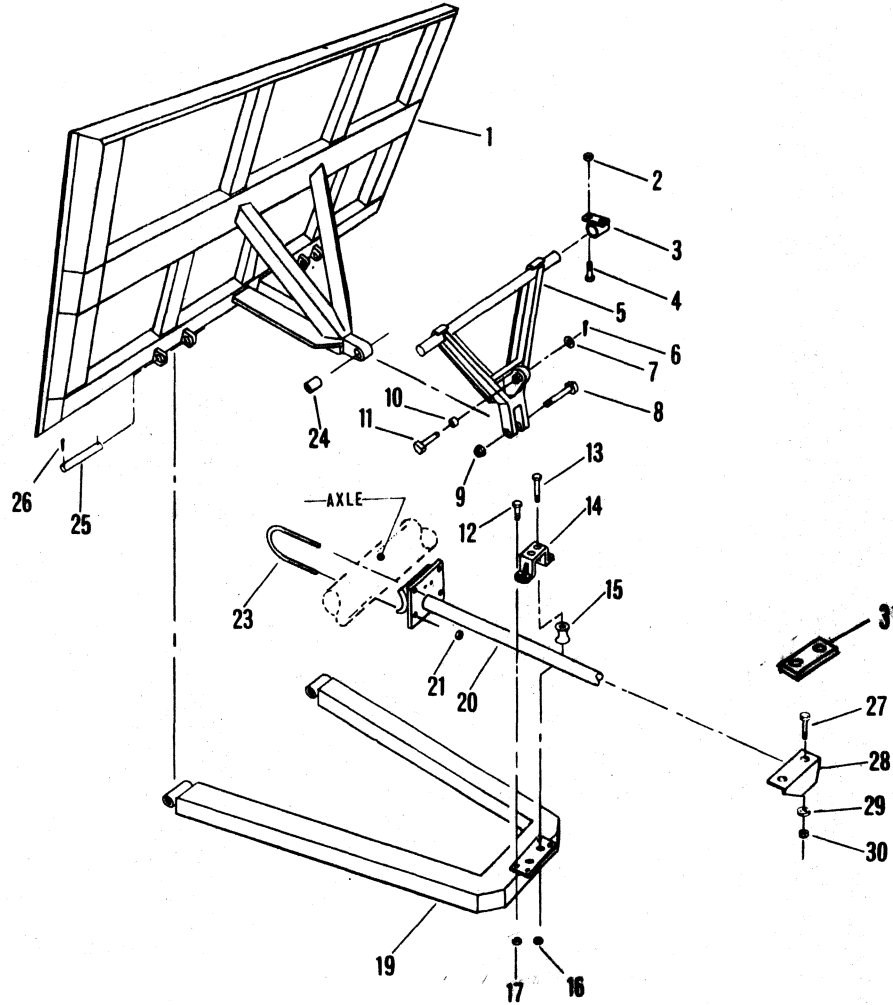


ROLLER – ROLLING FLOOR

Item	Part No.	Description	Qty.
A	1556403	ROLLING FLOOR ROLLER ASSY (Inc 1 thru 7)	4
<p>*NOTE: Four (4) Roller Assemblies required per machine – Quantities listed below are for one (1) Roller Assembly.</p>			
1	10H-25	FITTING, Grease	1

Item	Part No.	Description	Qty.
2	1556401	SPACER	1
3	711406	RING, Retaining	1
4	1550985	BEARING	1
5	1556395	AXLE	1
6	5J-806	KEY, Woodruff	1
7	1556402	ROLLER	1

ALWAYS STATE MODEL AND SERIAL NUMBER, WHEN ORDERING PARTS

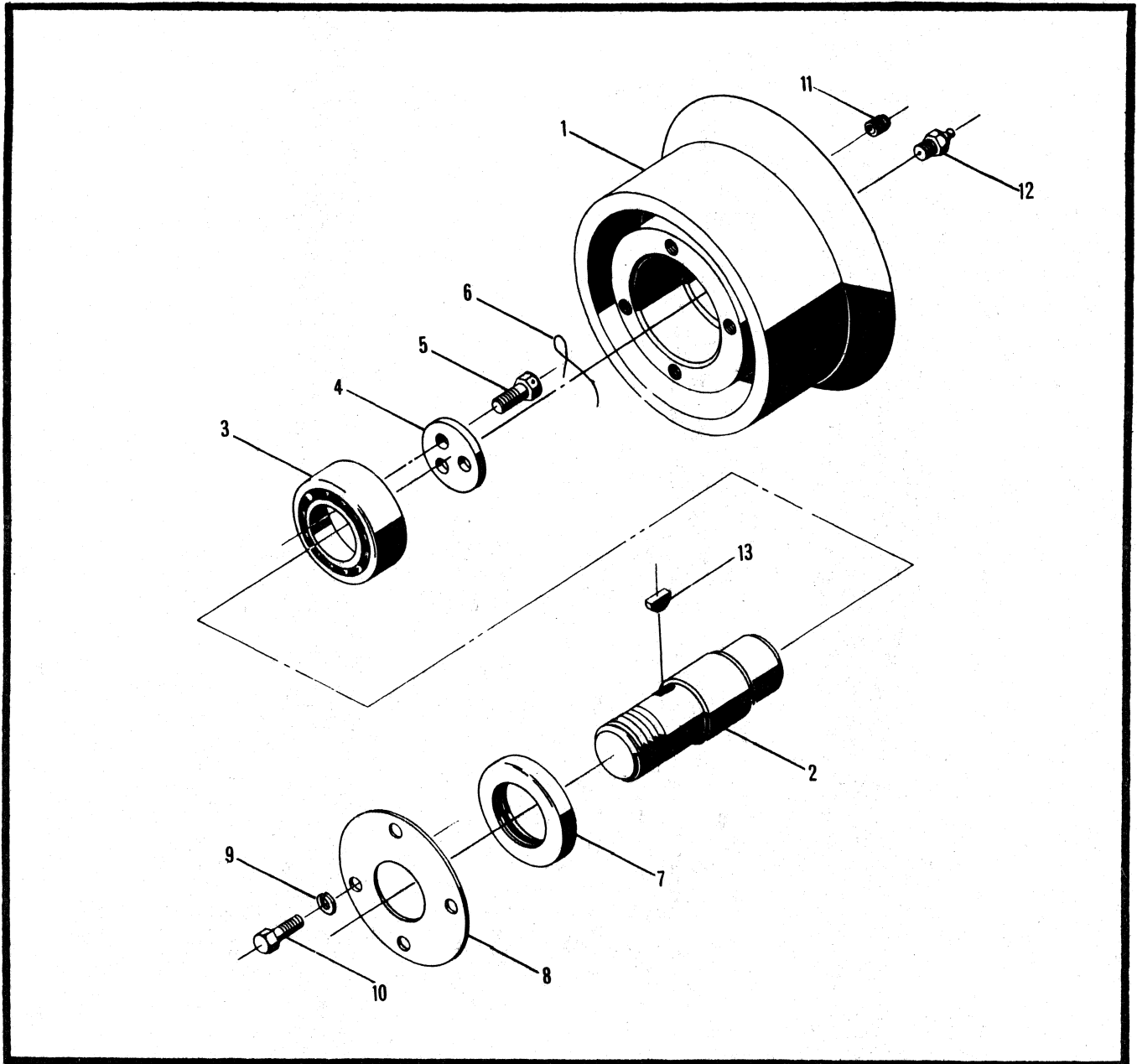


ENDGATE AND STABILIZER GROUP

Item	Part No.	Description	Qty.
1	1556413	ENDGATE	1
2	17D-10	NUT	4
3	1553690	BEARING, Actuator	2
4	23C-1232	BOLT	4
5	1555872	ACTUATOR, Endgate	1
6	1F-832	PIN, Cotter	1
7	619037	WASHER	1
8	1555882	PIN	1
9	18D-22	NUT	1
10	665199	BUSHING, Actuator	1
11	1562797	PIN	1
12	23C-620	BOLT.....	4
13	23C-12112	BOLT	2
14	1555784	BRACKET, Roller	1
15	1555785	ROLLER, Track	2

Item	Part No.	Description	Qty.
16	17D-10	NUT	2
17	17D-03	NUT	4
18			
19	1552023	YOKE, Stabilizer	1
20	1555893	TRACK, Roller	1
21	17D-06	NUT	4
22			
23	1555901	"U" BOLT	2
24	1555857	BUSHING	1
25	1550951	PIN	2
26	1F-840	PIN, Cotter	4
27	23C-1252	BOLT	2
28	1555899	HANGER, Track	1
29	619036	WASHER	2
30	17D-10	NUT	2
31	1573403	SPACER	1

ALWAYS STATE MODEL AND SERIAL NUMBER, WHEN ORDERING PARTS

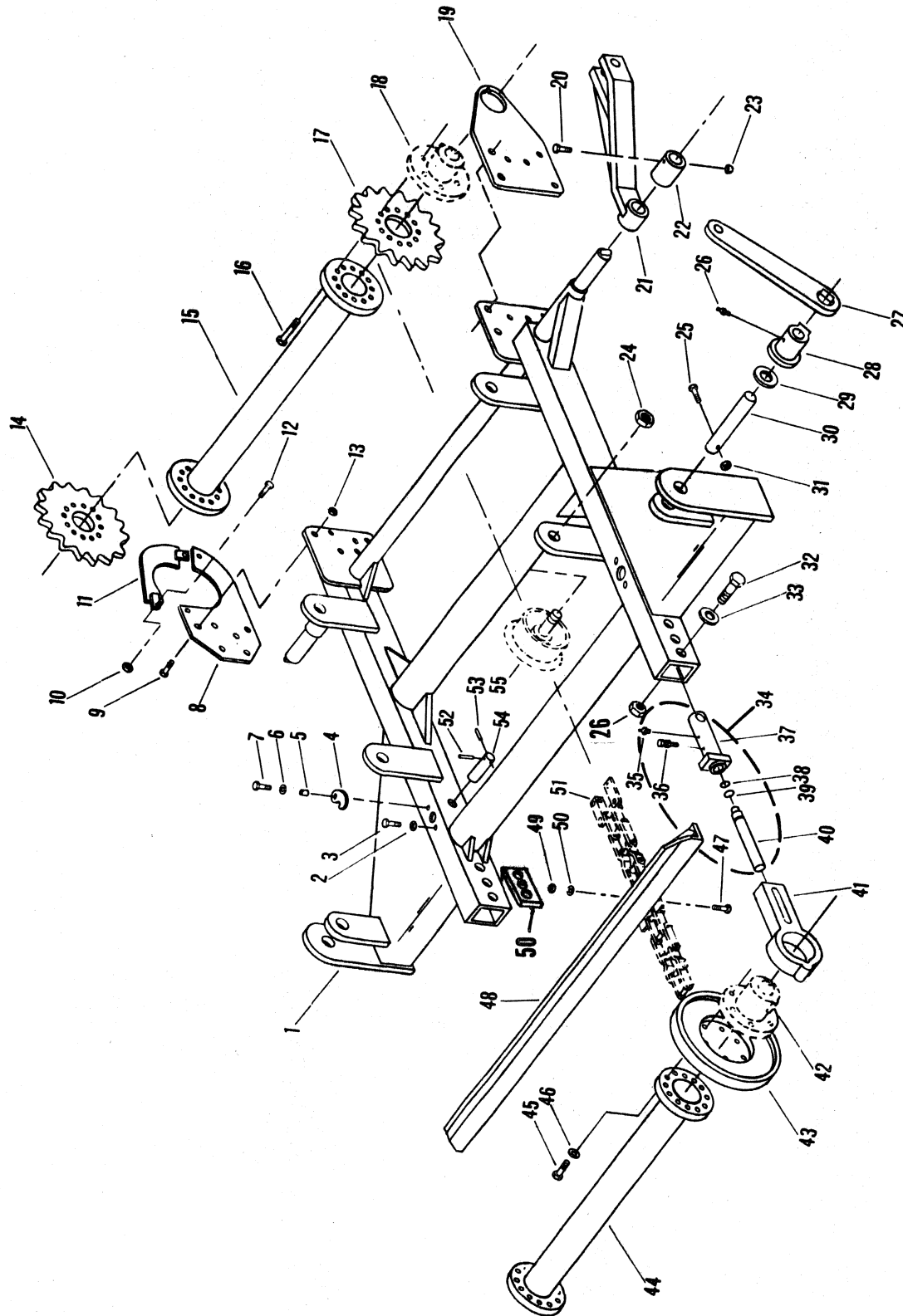


ROLLER – CHAIN IDLER

Item	Part No.	Description	Qty.
A	1560314	*IDLER ROLLER ASSY (Inc 1 thru 13)	4
<p>*NOTE: Four (4) Idler Roller Assemblies required per machine – Quantities listed below are for one (1) Idler Roller Assembly.</p>			
1	1560315	ROLLER	1
2	1560316	SHAFT, Roller	1
3	710048	BEARING, Ball	1

Item	Part No.	Description	Qty.
4	1560318	RETAINER, Bearing	1
5	3C-412	BOLT, Drilled Head	3
6	28H-17060	WIRE, Safety	1
7	1550556	SEAL	1
8	1560317	COVER, Seal	1
9	4E-04	LKWSHR	4
10	23C-412	BOLT, Cover to Roller	4
11	15F-01	PLUG, Headless Pipe	2
12	10H-25	FITTING, Grease	1
13	5J-606	KEY, Woodruff	1

ALWAYS STATE MODEL AND SERIAL NUMBER, WHEN ORDERING PARTS



ELEVATOR ASSEMBLY

ALWAYS STATE MODEL AND SERIAL NUMBER, WHEN ORDERING PARTS



HANCOCK DIVISION

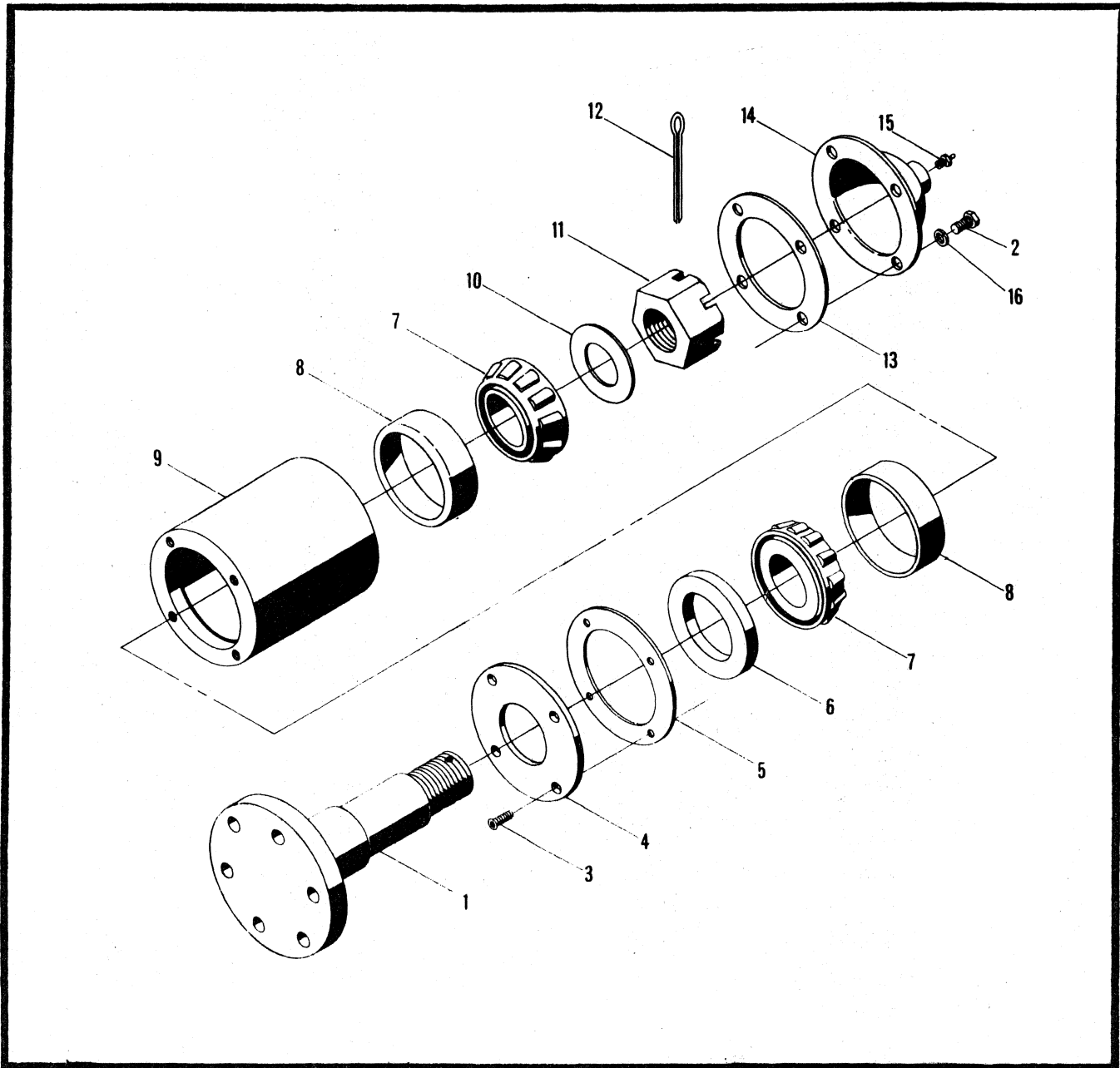


ELEVATOR ASSEMBLY

Item	Part No.	Description	Qty.	Item	Part No.	Description	Qty.
A	1573402	*ELEVATOR ASSY	1	28	1560159	BUSHING	2
1	1560962	FRAME, Elevator	1	29	1560298	SPACER.....	2
2	619024	WASHER	2	30	1560290	ROD	2
3	23C-612	BOLT	2	31	17D-09	NUT	2
4	1560994	COVER	2	32	23C-1272	BOLT	6
5	1560995	SPACER	2	33	1562676	WASHER	6
6	619024	WASHER	2	34	1561017	CHAIN ADJUSTER ASSY (Inc	
7	23C-612	BOLT	2			35 thru 40)	2
8	1560660	HANGER, Gearbox	1	35	10H-25	FITTING, Grease	2
9	24C-1248	BOLT	10	36	1560991	VALVE, Relief	2
10	7D-12	NUT	2	37	1561016	TUBE ASSY	2
10A	4E-12	†LKWSHR	2	38	25K-40100	"O" RING	2
11	1560665	RETAINER	1	39	1550994	RING, Back-Up	2
12	23C-1232	BOLT	2	40	1561019	RAM	2
13	17D-10	NUT	10	41	1560961	HANGER, Tail Roller	2
14	1560940	SPROCKET (16T)	1	42	-----	STUB SPINDLE ASSY	
15	1560949	ROLLER, Head	1			(See Index)	2
16	23C-1044	BOLT	18	43	1560982	ROLLER, Chain	2
17	1560940	SPROCKET (16T)	1	44	1560949	ROLLER, Tail	1
18	-----	STUB SPINDLE ASSY		45	23C-1044	BOLT	12
		(See Index)	1	46	4E-10	LKWSHR	12
19	1561000	HANGER	1	47	23C-824	BOLT	120
20	23C-856	BOLT	2	48	1562437	DRAG	15
21	1560955	ARM, Upper	2	49	17D-06	NUT	120
22	1561008	RETAINER	2	50	1572103	PLATE, Crush	2
23	17D-03	NUT	2	51	-----	CHAIN SET (See Index)	1
24	18D-20	NUT	4	52	668312	PIN, Roll	2
25	23C-1064	BOLT	2	53	731714	PIN, Roll	2
26	17D-10	NUT	6	54	1560977	PIN	2
27	1561001	ARM, Lower	2	55	-----	IDLER ROLLER ASSY (See Index)	4

* NOTE: Include items 1 thru 19, 24 and 32 thru 55, plus Elevator Gearbox and Hydraulic Motor.
† Not Illustrated

WHEN ORDERING PARTS, ALWAYS STATE MODEL AND SERIAL NO. OF MACHINE

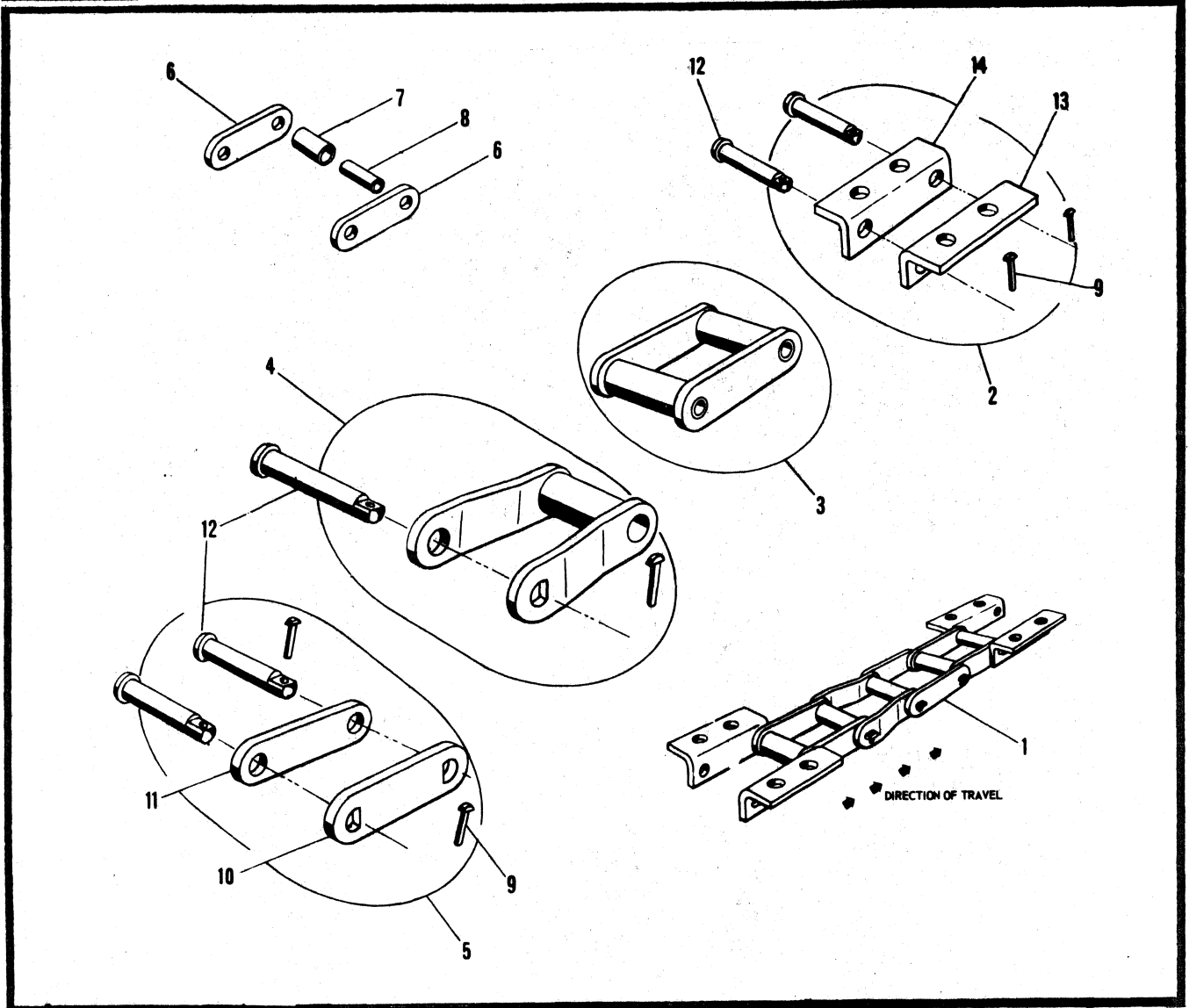


STUB SPINDLE

Item	Part No.	Description	Qty.
A	1560958	*STUB SPINDLE ASSY (Inc 1 thru 16)	3
*NOTE: Three (3) Stub Spindle Assemblies required per machine – Quantities listed below are for one (1) Stub Spindle Assembly.			
1	1560957	SPINDLE, Stub	1
2	23C-712	BOLT, Cap to Hub	4
3	763281	SCREW, Flat Head	4
4	1560418	COVER	1
5	1560419	GASKET	1

Item	Part No.	Description	Qty.
6	1550990	SEAL	1
7	742242	CONE, Bearing	2
8	742240	CUP, Bearing	2
9	1560959	HUB	1
10	1550754	WASHER	1
11	1566120	NUT, Slotted	1
12	1F-848	PIN, Cotter	1
13	1560005	GASKET	1
14	1560423	CAP	1
15	10H-25	FITTING, Grease	1
16	4E-07	LKWSHR	4

ALWAYS STATE MODEL AND SERIAL NUMBER, WHEN ORDERING PARTS



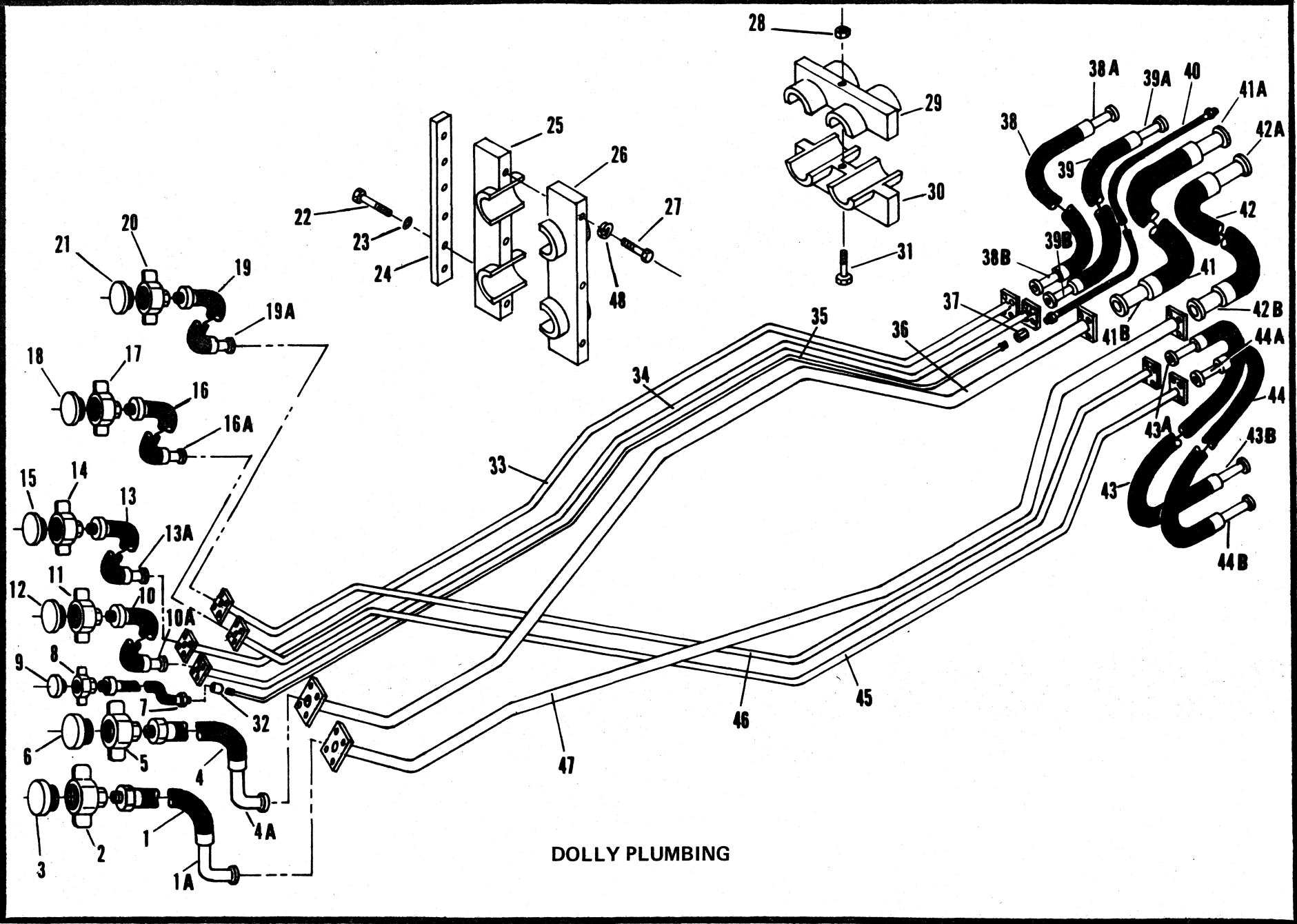
CHAIN – ELEVATOR

Item	Part No.	Description	Qty.
1	1551947	*CHAIN SET (Inc LH Assy & RH Assy)	1
<p>*NOTE: One (1) Chain Set required per Elevator – Quantities listed below are for one (1) Chain Assembly. It is strongly recommended that chains be installed in pairs to assure equal lengths.</p>			
2	1569858	ATTACHMENT LINK ASSY (Inc 9, 12, 13 & 14)	15
3	1569855	BLOCK LINK ASSY (Inc 6, 7 & 8)	30

Item	Part No.	Description	Qty.
4	1566478	MASTER LINK ASSY (Inc 12)	15
5	1569856	CONNECTING LINK ASSY (Inc 9, 10, 11 & 12)	15
6	1551952	BAR, Link	60
7	1566480	ROLLER	75
8	1551923	BUSHING	75
9	1566481	KEY (Sold in lots of 100 only)	75
10	1551951	BAR, Link (Key Side)	15
11	1551950	BAR, Link (Head Side)	15
12	1566479	PIN (Inc 9)	75
13	1551954	LINK, Attachment (Key Side)	15
14	1551953	LINK, Attachment (Head Side)	15

ALWAYS STATE MODEL AND SERIAL NUMBER, WHEN ORDERING PARTS

ALWAYS STATE MODEL AND SERIAL NUMBER, WHEN ORDERING PARTS



DOLLY PLUMBING



HANCOCK DIVISION



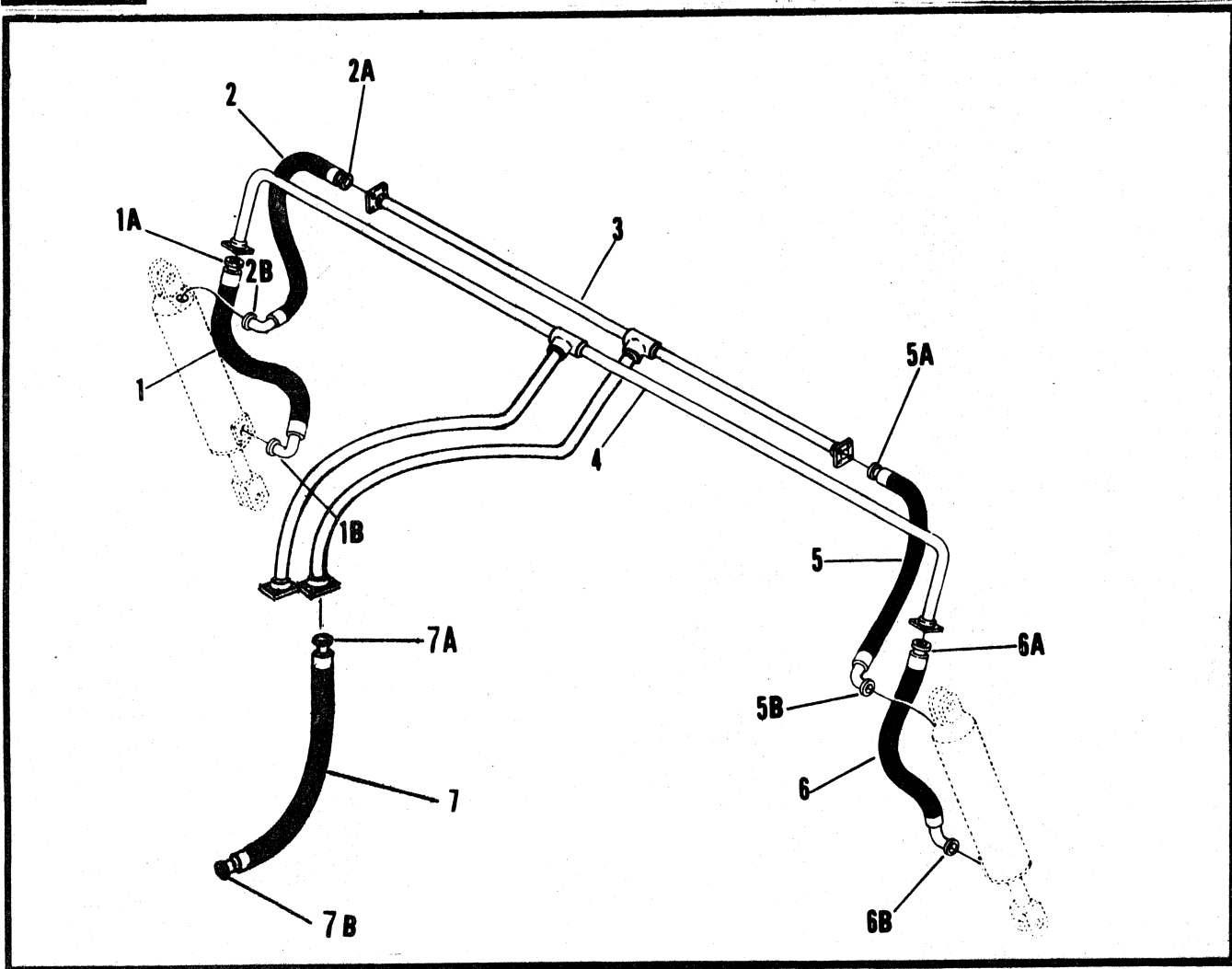
DOLLY PLUMBING

Item	Part No.	Description	Qty.	Item	Part No.	Description	Qty.
1	1567170	HOSE, Scraper to Tractor – 1½ x 104	1	27	23C-540	BOLT	3
1A	-----	† FLANGE, Split (See Group 'A')	—	28	17D-03	NUT	1
2	1573431	QUICK DISCONNECT	1	29	1568662	CLAMP, Hose	1
3	1573434	PLUG, Dust	1	30	1568662	CLAMP, Hose	1
4	1567170	HOSE, Scraper to Tractor – 1½ x 104	1	31	23C-656	BOLT	1
4A	-----	† FLANGE, Split (See Group 'A')	—	32	75F-4	COUPLING	1
5	1573431	QUICK DISCONNECT	1	33	1573175	LINE, Hydraulic	1
6	1573434	PLUG, Dust	1	34	1573174	LINE, Hydraulic	1
7	1567180	HOSE – ½ x 68	1	35	1573163	LINE, Hydraulic Drain	1
8	1573429	QUICK DISCONNECT	1	36	1573158	LINE, Hydraulic	1
9	1573432	PLUG, Dust	1	37	545204	ADAPTER	1
10	1573640	HOSE, Tractor to Scraper	1	38	1562542	HOSE – ¾ x 66	1
10A	-----	† FLANGE, Split (See Group 'B')	—	38A	-----	† FLANGE, Split (See Group 'B')	—
11	1573430	QUICK DISCONNECT	1	38B	-----	† FLANGE, Split (See Group 'B')	—
12	1573433	PLUG, Dust	1	39	1562542	HOSE – ¾ x 66	1
13	1567171	HOSE, Tractor to Scraper	1	39A	-----	† FLANGE, Split (See Group 'B')	—
13A	-----	† FLANGE, Split (See Group 'B')	—	39B	-----	† FLANGE, Split (See Group 'B')	—
14	1573430	QUICK DISCONNECT	1	40	1564255	HOSE, Drain	1
15	1573433	PLUG, Dust	1	41	1551516	HOSE – 1¼ x 62	1
16	1573640	HOSE, Tractor to Scraper	1	41A	-----	† FLANGE, Split (See Group 'A')	—
16A	-----	† FLANGE, Split (See Group 'B')	—	41B	-----	† FLANGE, Split (See Group 'A')	—
17	1573430	QUICK DISCONNECT	1	42	1551516	HOSE – 1¼ x 62	1
18	1573433	PLUG, Dust	1	42A	-----	† FLANGE, Split (See Group 'A')	—
19	1573640	HOSE, Tractor to Scraper	1	42B	-----	† FLANGE, Split (See Group 'A')	—
19A	-----	† FLANGE, Split (See Group 'B')	—	43	1562542	HOSE – ¾ x 66	1
20	1573430	QUICK DISCONNECT	1	43A	-----	† FLANGE, Split (See Group 'B')	—
21	1573433	PLUG, Dust	1	43B	-----	† FLANGE, Split (See Group 'B')	—
22	23C-536	BOLT	6	44	1562542	HOSE – ¾ x 66	1
23	4E-05	LKWSHR	6	44A	-----	† FLANGE, Split (See Group 'B')	—
24	1573411	CLAMP	1	44B	-----	† FLANGE, Split (See Group 'B')	—
25	1573409	CLAMP	1	45	1573169	LINE, Hydraulic	1
26	1573410	CLAMP	1	46	1573167	LINE, Hydraulic	1
				47	1573162	LINE, Hydraulic	1
				48	4E-05	LKWSHR	3

† Not Illustrated

GROUP	FLANGE HALF	O-RING	BOLT	LKWSHR	SIZE
No. Req'd Per Connection	2	1	4	4	
A	663094	1306623	23C-724	4E-07	1¼"
B	663092	791553	23C-620	4E-06	¾"
C					

WHEN ORDERING PARTS, ALWAYS STATE MODEL AND SERIAL NO. OF MACHINE



SCRAPER LIFT LINES

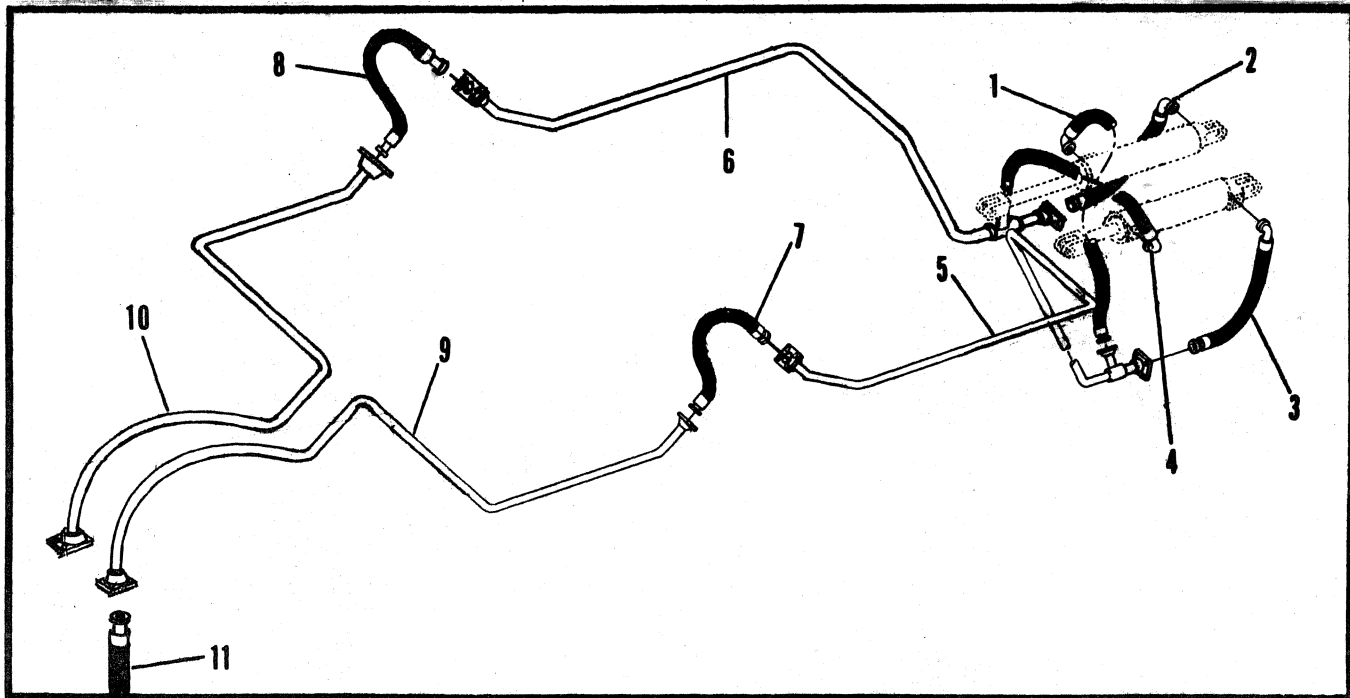
Item	Part No.	Description	Qty.
1	1562536	HOSE - 3/4 x 30	1
1A	-----	†FLANGE, Split (See Group 'A')	-
1B	-----	†FLANGE, Split (See Group 'A')	-
2	1562536	HOSE - 3/4 x 30	1
2A	-----	†FLANGE, Split (See Group 'A')	-
2B	-----	†FLANGE, Split (See Group 'A')	-
3	1562669	LINE, Hydraulic	1
4	1562670	LINE, Hydraulic	1
5	1562536	HOSE - 3/4 x 30	1

Item	Part No.	Description	Qty.
5A	-----	†FLANGE, Split (See Group 'A')	-
5B	-----	†FLANGE, Split (See Group 'A')	-
6	1562536	HOSE - 3/4 x 30	1
6A	-----	†FLANGE, Split (See Group 'A')	-
6B	-----	†FLANGE, Split (See Group 'A')	-
7	1562542	HOSE - 3/4 x 66	2
7A	-----	†FLANGE, Split (See Group 'A')	-
7B	-----	†FLANGE, Split (See Group 'A')	-

† Not Illustrated

GROUP	FLANGE HALF	O-RING	BOLT	LKWSHR	SIZE
No. Req'd Per Connection	2	1	4	4	
A	663092	791553	23C -620	4E-06	3/4"
B					

ALWAYS STATE MODEL AND SERIAL NUMBER, WHEN ORDERING PARTS



SCRAPER EJECTION LINES

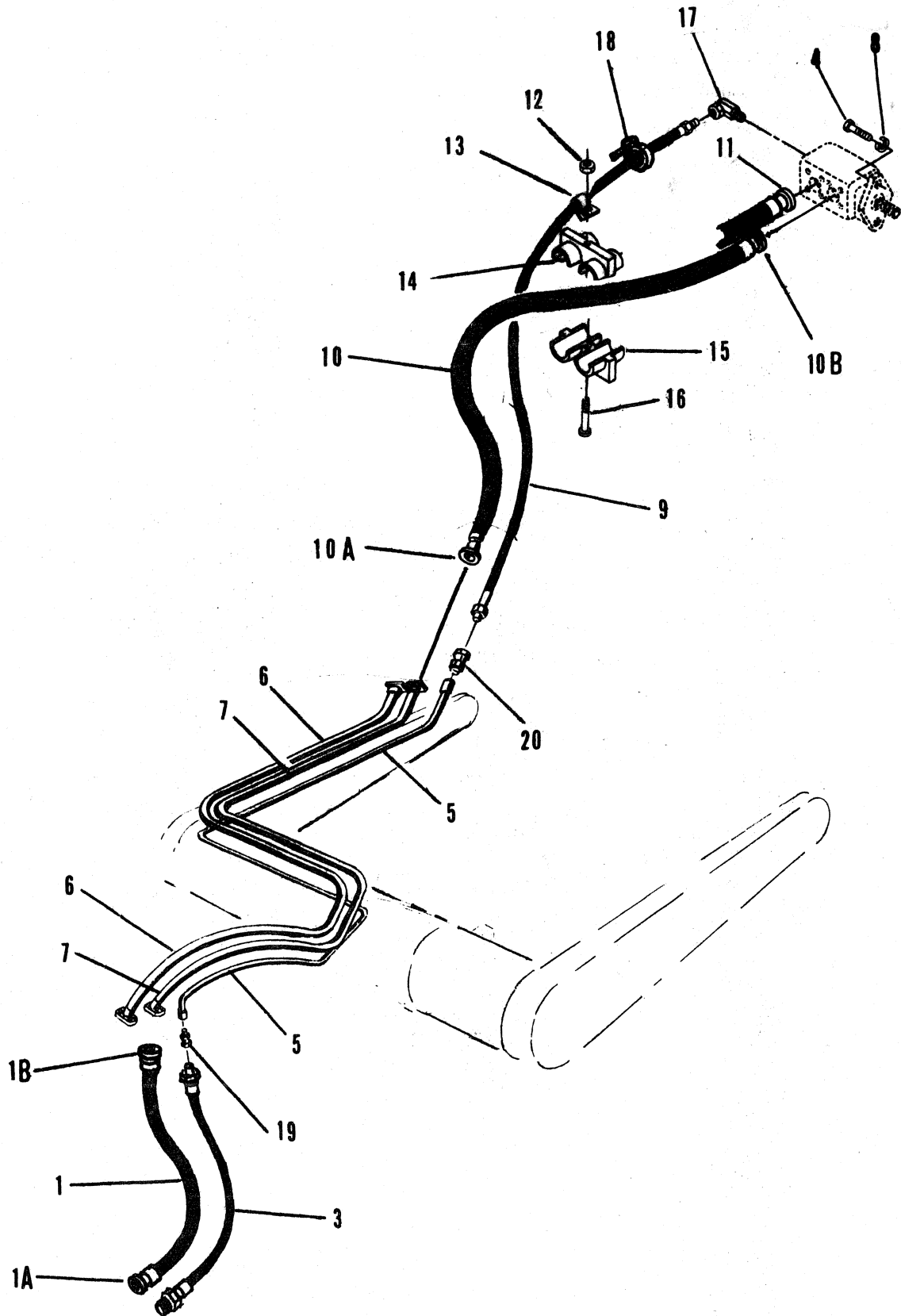
Item	Part No.	Description	Qty.
1	1562536	HOSE - 3/4 x 30	1
1A	-----	† FLANGE, Split (See Group 'A')	—
1B	-----	† FLANGE, Split (See Group 'A')	—
2	1562536	HOSE - 3/4 x 30	1
2A	-----	† FLANGE, Split (See Group 'A')	—
2B	-----	† FLANGE, Split (See Group 'A')	—
3	1562536	HOSE - 3/4 x 30	1
3A	-----	† FLANGE, Split (See Group 'A')	—
3B	-----	† FLANGE, Split (See Group 'A')	—
4	1562536	HOSE - 3/4 x 30	1
4A	-----	† FLANGE, Split (See Group 'A')	—
4B	-----	† FLANGE, Split (See Group 'A')	—
5	1567631	LINE, Hydraulic	1
6	1567629	LINE, Hydraulic	1

Item	Part No.	Description	Qty.
7	1562537	HOSE - 3/4 x 30	1
7A	-----	† FLANGE, Split (See Group 'A')	—
7B	-----	† FLANGE, Split (See Group 'A')	—
8	1562537	HOSE - 3/4 x 30	1
8A	-----	† FLANGE, Split (See Group 'A')	—
8B	-----	† FLANGE, Split (See Group 'A')	—
9	1562671	LINE, Hydraulic	1
10	1562672	LINE, Hydraulic	1
11	1562542	HOSE - 3/4 x 66	2
11A	-----	† FLANGE, Split (See Group 'A')	—
11B	-----	† FLANGE, Split (See Group 'A')	—
12	1562542	† HOSE - 3/4 x 66	1
12A	-----	† FLANGE, Split (See Group 'A')	—
12B	-----	† FLANGE, Split (See Group 'A')	—

† Not Illustrated

GROUP	FLANGE HALF	O-RING	BOLT	LKWSHR	SIZE
No. Req'd Per Connection	2	1	4	4	
A	663092	791553	23C-620	4E-06	3/4"
B					
C					

WHEN ORDERING PARTS, ALWAYS STATE MODEL AND SERIAL NO. OF MACHINE



HYDRAULIC MOTOR SYSTEM

ALWAYS STATE MODEL AND SERIAL NUMBER, WHEN ORDERING PARTS



HANCOCK DIVISION



HYDRAULIC MOTOR SYSTEM

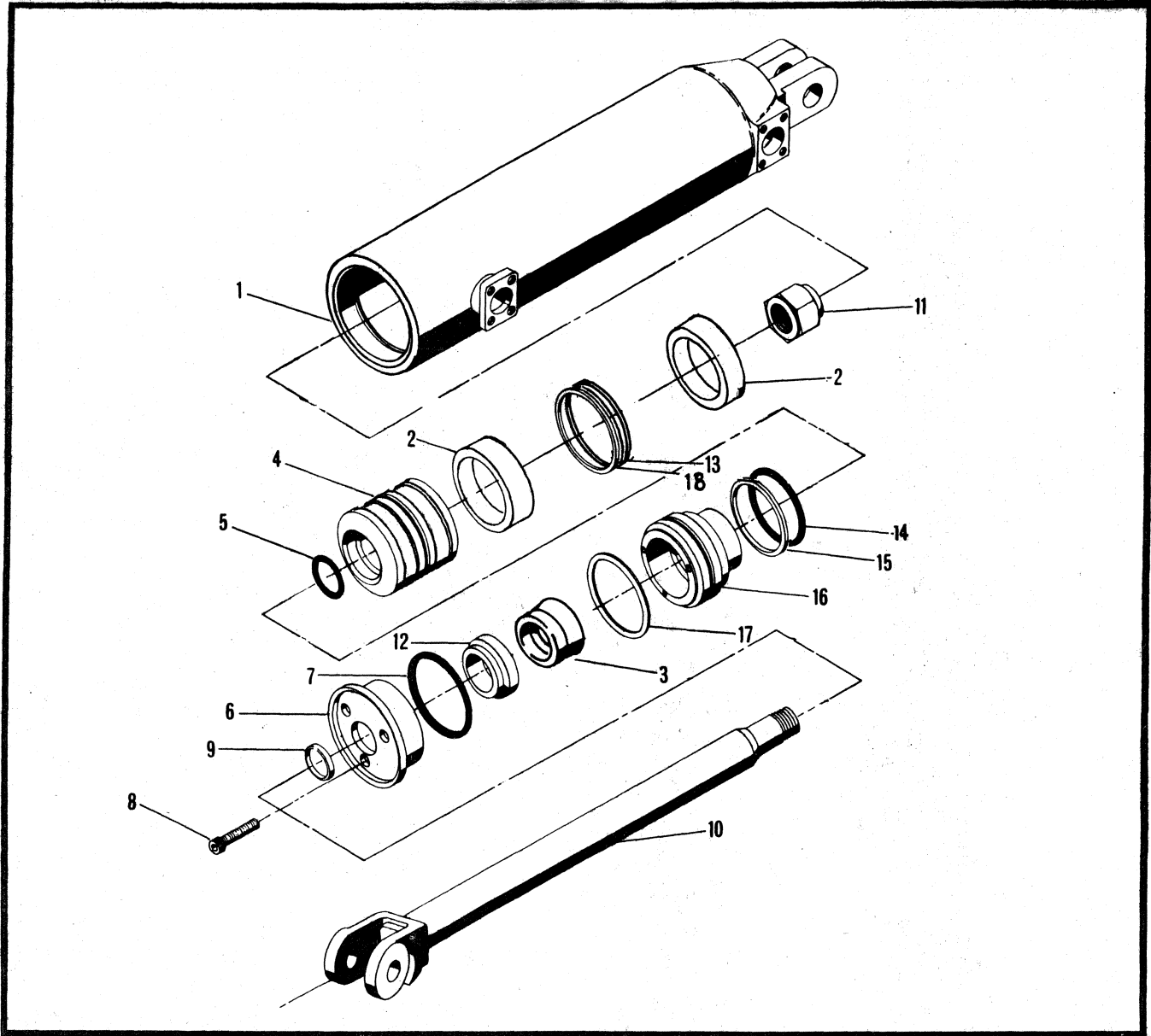
Item	Part No.	Description	Qty.
1	1551516	HOSE - 1/4 x 62	1
1A	-----	† FLANGE, Split (See Group 'A')	-
1B	-----	† FLANGE, Split (See Group 'A')	-
2	1551516	† HOSE - 1/4 x 62	1
2A	-----	† FLANGE, Split (See Group 'A')	-
2B	-----	† FLANGE, Split (See Group 'A')	-
3	1564255	HOSE - 1/2 x 88	1
4	23C-1028	BOLT, Motor Mounting	2
5	1557845	LINE, Hydraulic Drain	1
6	1557836	LINE, Hydraulic Return	1
7	1557835	LINE, Hydraulic Pressure	1
8	4E-10	LKWSHR	2
9	791233	HOSE - 1/2 x 80	1
10	1573424	HOSE - 1/4 x 62	1
10A	-----	† FLANGE, Split (See Group 'A')	-
10B	-----	† FLANGE, Split (See Group 'B')	-
11	1573424	HOSE - 1/4 x 72	1
11A	-----	† FLANGE, Split (See Group 'A')	-
11B	-----	† FLANGE, Split (See Group 'B')	-
12	17D-03	NUT	1
13	6H-41	CLAMP	1
14	1568662	CLAMP, Hose	1
15	1568662	CLAMP, Hose	1
16	23C-656	BOLT, Hose Clamp	1
17	31F-4	ADAPTER, 90°	1
18	1736442	‡ TIE-DOWN	-
19	545204	ADAPTER, Union	1
20	1314465	ADAPTER, Union	1

† Not Illustrated

‡ As Required

GROUP	FLANGE HALF	O-RING	BOLT	LKWSHR	SIZE
No. Req'd Per Connection	2	1	4	4	
A	663094	1306623	23C-724	4E-07	1 1/4"
B	663096	1306625	23C-824	4E-08	2"

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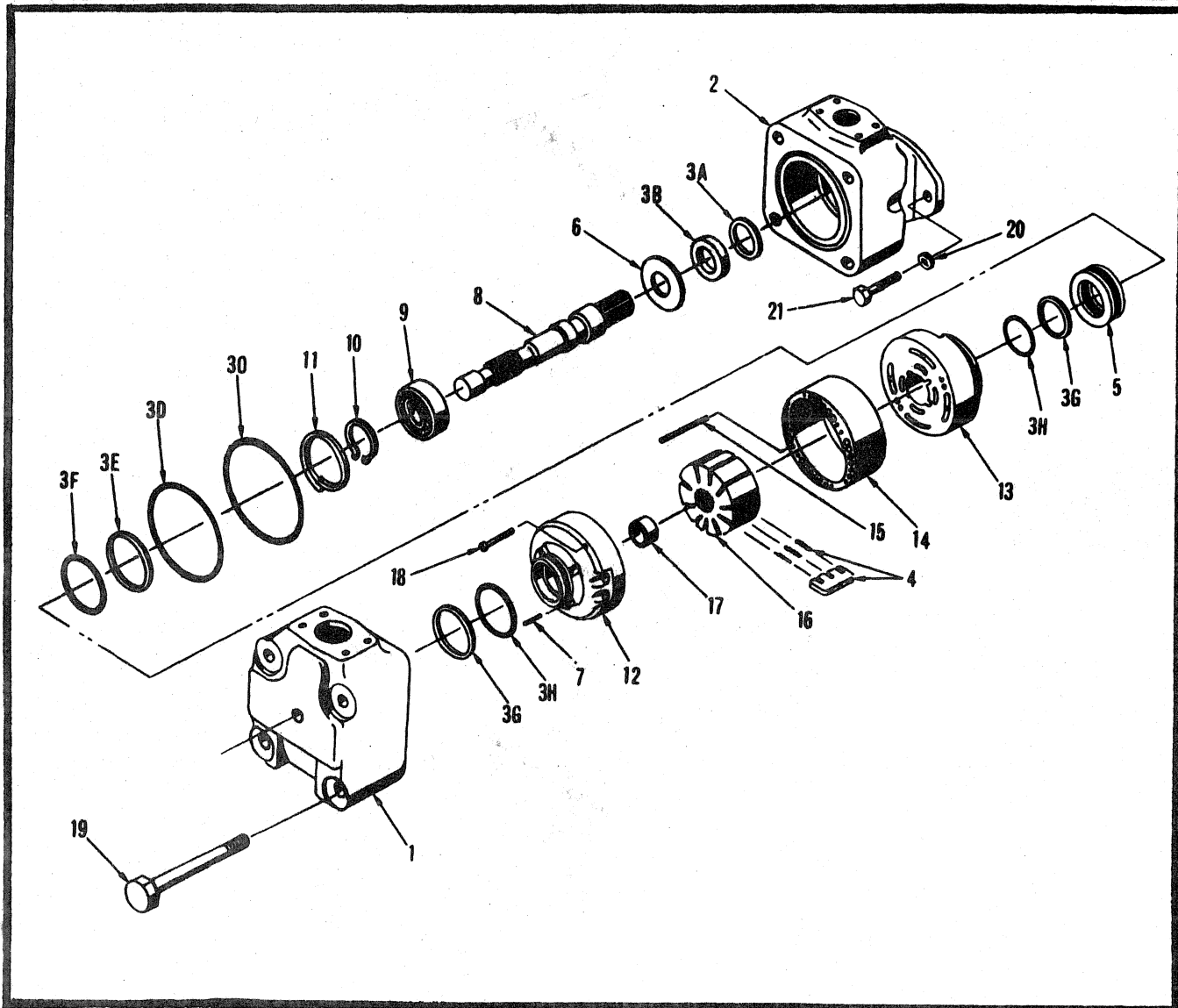
LIFT AND EJECTION HYDRAULIC CYLINDER

Item	Part No.	Description	Qty.
A	1546005	*HYDRAULIC CYLINDER ASSY – 4"	4
*NOTE: Four (4) Cylinder Assemblies required per machine – Quantities listed below are for one (1) Cylinder Assembly.			
1	1567211	✓ BARREL, Cylinder	1
2	X 1503012	RING	2
3	1569520	✓ MONOSEAL	1
4	X 1572219	PISTON	1
5	25K-40104	✓ O" RING	1
6	1562795	** GLAND	1

Item	Part No.	Description	Qty.
7	25K-40400	✓ O" RING	1
8	11G-616	✓ BOLT, Socket Head	3
9	1550560	✓ SEAL, Wiper Rod	1
10	1571812	X ROD, Piston	1
11	1562802	✓ NUT	1
12	1562796	* SLEEVE, Gland	1
13	1503463	X RING, Inner	1
14	25K-60320	✓ O" RING	1
15	1550563	✓ RING, Back-Up	1
16	1562789	✓ HEAD	1
17	763750	✓ RING, Retaining	1
18	1503018	✓ RING, Outer	1

** NOTE: 1562790 Gland Assy includes 6 & 12.

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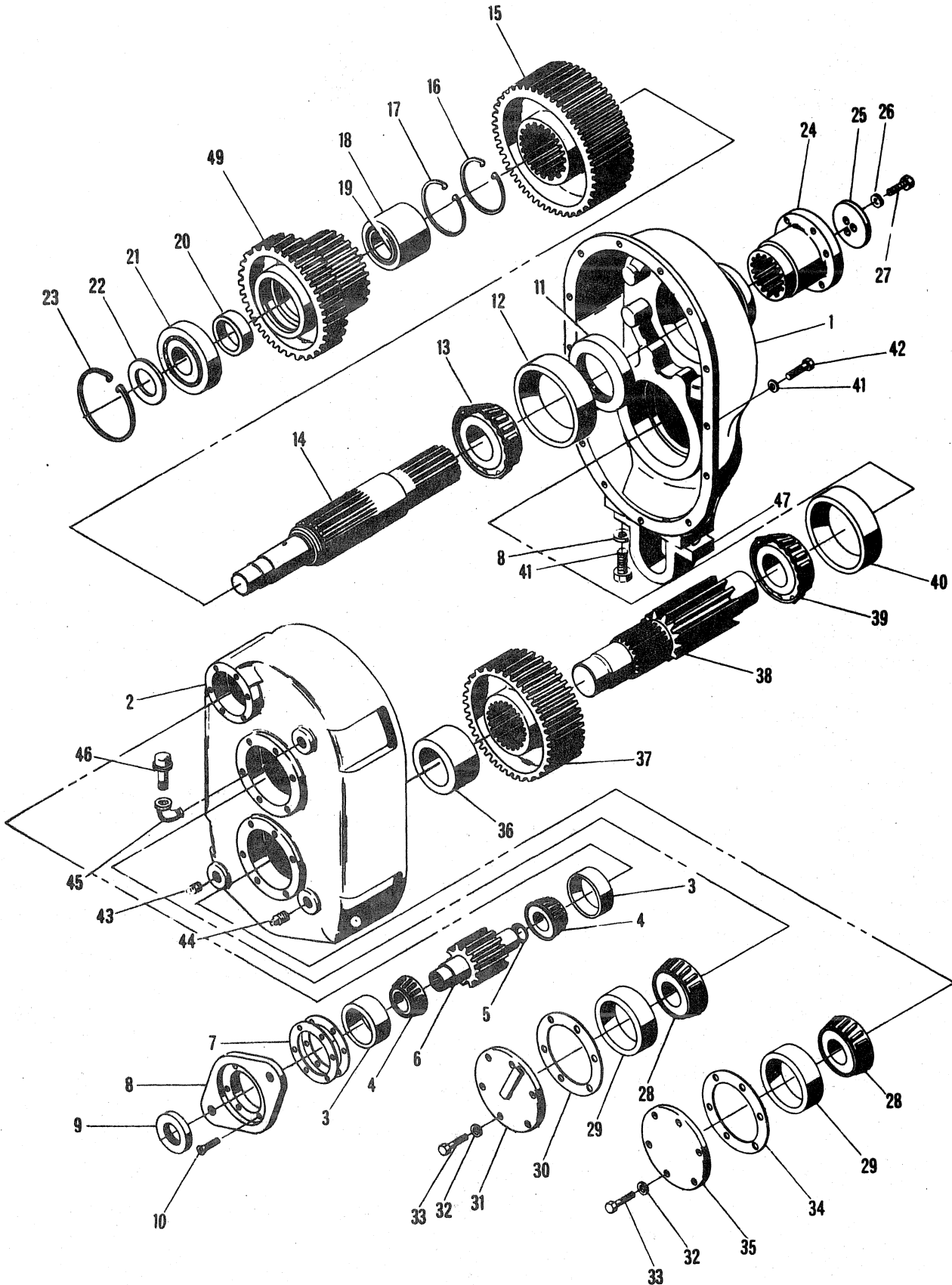
HYDRAULIC MOTOR

Item	Part No.	Description	Qty.
A	1551211	HYDRAULIC MOTOR ASSY	1
B	1551212	CARTRIDGE KIT (Inc 4 & 7, also 12 thru 18)	1
1	1550917	COVER, Motor	1
2	1550914	BODY, Motor	1
3	1551031	SEAL KIT (Inc 3A thru 3H)	1
3A	----	§ WIPER	1
3B	----	§ SF AL, Shaft	1
3C	----	§ "O" RING	1
3D	----	§ "O" RING	1
3E	----	§ RING, Back-Up	1
3F	----	§ "O" RING	1
3G	----	§ RING, Back-Up	2
3H	----	§ "O" RING	2
4	1551209	VANE & SPRING KIT (Inc 10 Vanes & 40 Springs)	1

§ Not Sold Separately

Item	Part No.	Description	Qty.
5	1550921	ADAPTER, Hub	1
6	892125	WASHER, Shaft	1
7	1568755	PIN, Cover	2
8	1550913	SHAFT, Motor	1
9	654299	BEARING, Ball	1
10	658128	RING, Retaining	1
11	799371	RING, Lock	1
12	1550922	PLATE, Pressure (Inc 17)	1
13	1550915	PLATE, Pressure	1
14	1571274	RING	1
15	1568757	PIN, Ring	2
16	1550923	ROTOR	1
17	946227	BUSHING	1
18	1568754	SCREW, Pressure Plate	2
19	17C-1292	BOLT, Cover to Body	4
20	4E-10	LKWSHR	2
21	23C-1028	BOLT, Motor Body to Gearbox	2

ALWAYS STATE MODEL AND SERIAL NUMBER, WHEN ORDERING PARTS



GEARBOX - ELEVATOR

ALWAYS STATE MODEL AND SERIAL NUMBER, WHEN ORDERING PARTS



HANCOCK DIVISION



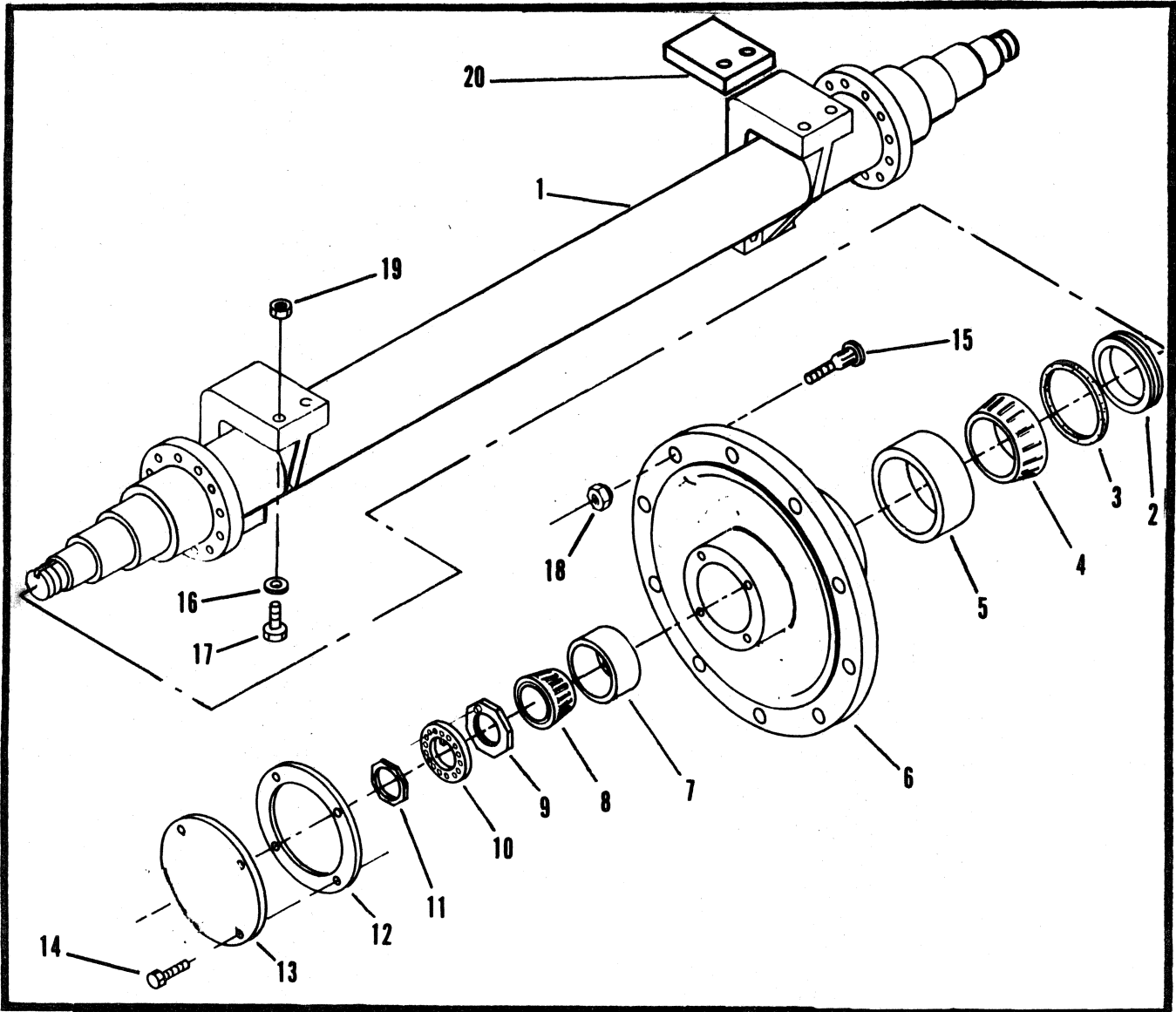
GEARBOX - ELEVATOR

Item	Part No.	Description	Qty.	Item	Part No.	Description	Qty.
A	1550840	GEARBOX ASSY (Inc 1 thru 50)	†	25	1565221	LOCKPLATE	1
1	1565219	HOUSING, Output	1	26	4E-08	LKWSHR	3
2	1565218	HOUSING, Input	1	27	24C-824	BOLT, Lockplate to Hub	17
3	654166	CUP, Bearing	2	28	658970	CONE, Bearing	2
4	791943	CONE, Bearing	2	29	710790	CUP, Bearing	2
5	1551575	PLUG, Expansion - 1 3/8"	1	30	1563593	‡PACK, Shim	-
6	1551562	SHAFT, Input (13T)	1	31	1565231	COVER, Output Shaft	1
7	1563597	‡PACK, Shim	-	32	4E-06	LKWSHR	12
8	1551561	COVER, Input	1	33	23C-616	BOLT, Cover to Housing	12
9	1550988	SEAL, Oil	1	34	1563593	‡PACK, Shim	-
10	1550643	SCREW	6	35	1566649	COVER, Counter Shaft	1
11	111482	SEAL, Oil	1	36	1551565	SPACER	1
12	755873	CUP, Bearing	1	37	1561475	GEAR, Counter (55T)	1
13	1313684	CONE, Bearing	1	38	1551563	SHAFT, Counter (13T)	1
14	1551564	SHAFT, Output	1	39	742273	CONE, Bearing	1
15	1561482	GEAR, Output (44T)	1	40	731994	CUP, Bearing	1
16	1551571	RING, Retaining	1	41	23C 1232	BOLT, Bracket to Housing	2
17	655071	RING, Retaining	1	42	23C-824	BOLT, Housing to Housing	14
18	763196	SHELL, Bearing w/ Needles	1	43	13F-08	PLUG, Level	1
19	1315187	RACE, Bearing Inner	1	44	1566344	PLUG, Magnetic Drain	1
20	1551566	SPACER	1	45	26F-4	ELBOW, Street	1
21	713999	BEARING, Ball	1	46	1551419	BREATHER	1
22	1551567	SPACER	1	47	1561110	BRACKET, Mounting	1
23	660411	RING, Retaining	1	48	4E-12	LKWSHR	2
24	1551560	HUB, Flanged	1	49	1551568	GEAR, Output (60T & 31T)	1
				50	1313948	†DOWEL	2

† Not Illustrated

‡ As Required

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SCRAPER AXLE AND HUB

Item	Part No.	Description	Qty.
1	1552268	AXLE, Scraper Rear	1
2	1559148	*RETAINER	2
3	1559149	*SEAL, Felt	2
4	662739	BEARING, Cone	2
5	711368	BEARING, Cup	2
6	1573035	HUB, Wheel (Inc 5, 7 & 15)	2
7	710990	BEARING, Cup	2
8	1313683	BEARING, Cone	2
9	1568668	NUT, Inner Spindle	2
10	1552013	NUT, Spindle	2
11	1552279	NUT, Outer Spindle	2

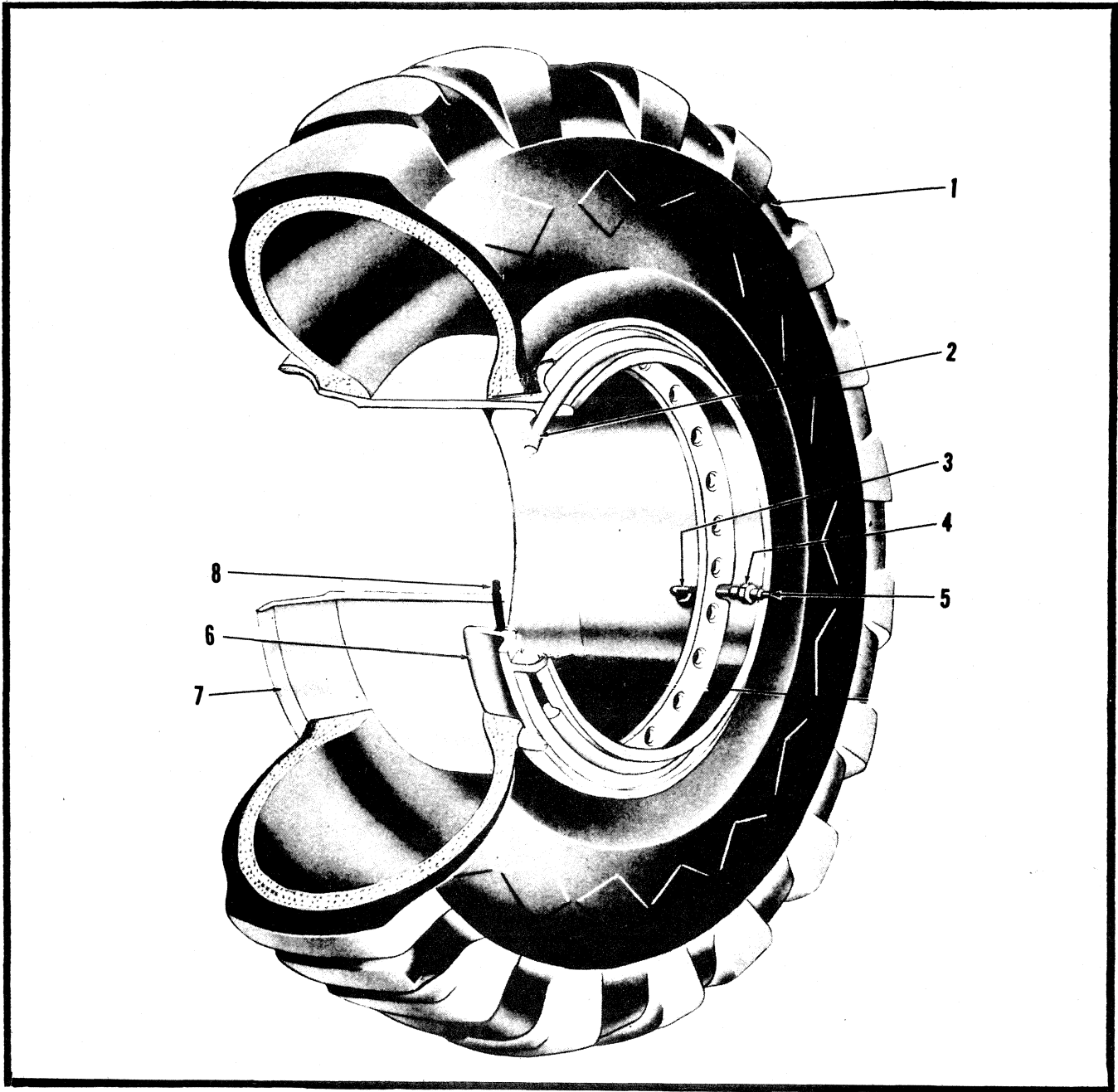
Item	Part No.	Description	Qty.
12	1559739	GASKET	2
13	1559738	COVER, Hub	2
14	1550938	BOLT, Self-Tapping	8
15	1573033	STUD, Headed - Wheel Mounting	24
16	619036	WASHER	4
17	24C-1296	BOLT, Axle to Main Frame	4
18	102832	NUT, Front Cap	24
19	18D-12	NUT	4
20	1573057	SPACER	2
20A	1554717	‡SHIM	-

* NOTE: Grease Seal Assy 1559147 includes 2 & 3.

† Not Illustrated

‡ As Required

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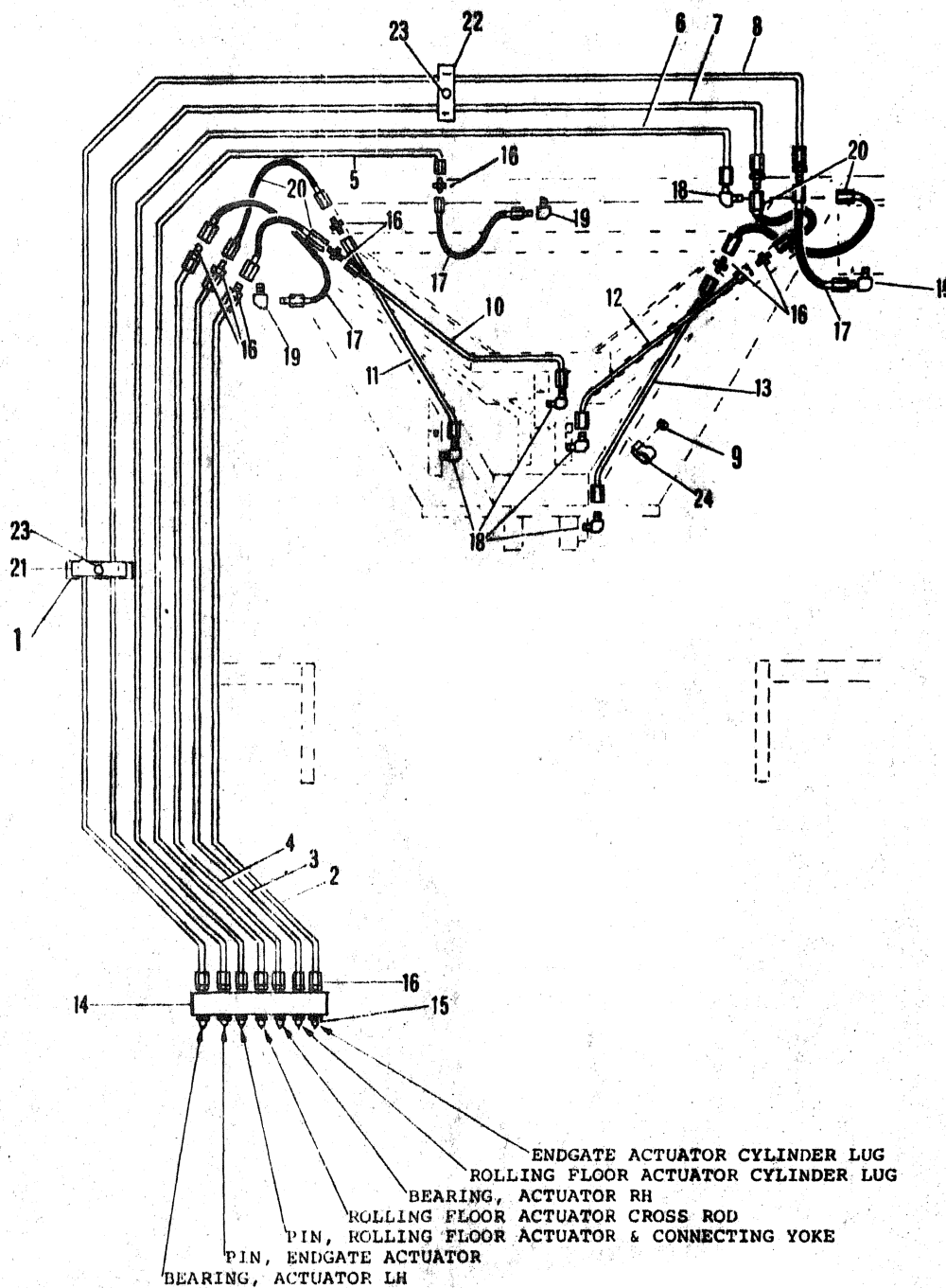


WHEEL AND TIRE DATA

Item	Part No.	Description	Qty.
A	1573400	WHEEL ASSY (Inc 2 thru 8)	4
1	-----	§TIRE - 17.5 x 25 - 12 ply	4
2	112460	RING, Lock	4
3	588044	VALVE STEM ASSY (Inc 4 & 5)	4
4	551684	ADAPTER, Valve Stem	1
5	551685	CAP, Valve	1
6	112461	RING, Side	4
7	1573367	WHEEL	4
8	112462	"O" RING, Rim	4

§ Not Sold Separately

ALWAYS STATE MODEL AND SERIAL NUMBER, WHEN ORDERING PARTS



CENTRAL LUBRICATION

ALWAYS STATE MODEL AND SERIAL NUMBER, WHEN ORDERING PARTS



HANCOCK DIVISION



CENTRAL LUBRICATION

Item	Part No.	Description	Qty.
1	1554858	BRACKET	5
2	1558441	TUBE, Endgate Actuator Cylinder Lug	1
3	1558442	TUBE, Rolling Floor Actuator Cylinder Lug	1
4	1558443	TUBE, Bearing Actuator -RH	1
5	1558444	TUBE, Rolling Floor Actuator Cross Rod	1
6	1558445	TUBE, Pin Rolling Floor Actuator & Yoke	1
7	1558446	TUBE, Pin Endgate Actuator	1
8	1558447	TUBE, Bearing Actuator -LH	1
9	17D-01	NUT	10
10	1558449	TUBE, Endgate Actuator Cylinder Lug	1
11	1558450	TUBE, Rolling Floor Actuator Cylinder Lug	1
12	1558452	TUBE, Pin Endgate Actuator	1
13	1558451	TUBE, Pin Rolling Floor Actuator & Yoke	1
14	1558453	BLOCK	1
15	14H-15	FITTING, Grease	7
16	1551024	FITTING	17
17	1550844	HOSE	3
18	1551025	FITTING	5
19	31F-1	ADAPTER	3
20	1550843	HOSE	4
21	1554860	BRACKET	3
22	1554860	BRACKET	2
23	23C-416	BOLT	5
23A	655629	WASHER	5
23B	17D-01	NUT	5
24	30H-14	CLAMP	10

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