

FOREWORD

Trackson Tractor Equipment is the result of over a quarter century of pioneering and advanced engineering together with the selection and use of the finest materials that metallurgical science has produced.

Trackson TRAXCAVATORS are manufactured exclusively for installation on "Caterpillar" tractors, therefore are engineered and designed to form a balanced unit with the tractors on which they are mounted.

Regardless of how well designed and built a machine may be, the amount of satisfactory service it will render depends largely on the care exercised in its operation and maintenance. This book provides the operator with those facts on operation, lubrication and adjustments that are necessary for the day-to-day care of HT4 TRAXCAVATORS. Careful attention to these instructions will assure maximum economy and performance.

Trackson products are sold and serviced by your Trackson-"Caterpillar" dealer who supplies parts, trained personnel and facilities for properly servicing your equipment to insure long, troublefree operation. His organization is at your command whenever service or maintenance is needed.

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TRACKSON MODEL HT4 TRAXCAVATOR

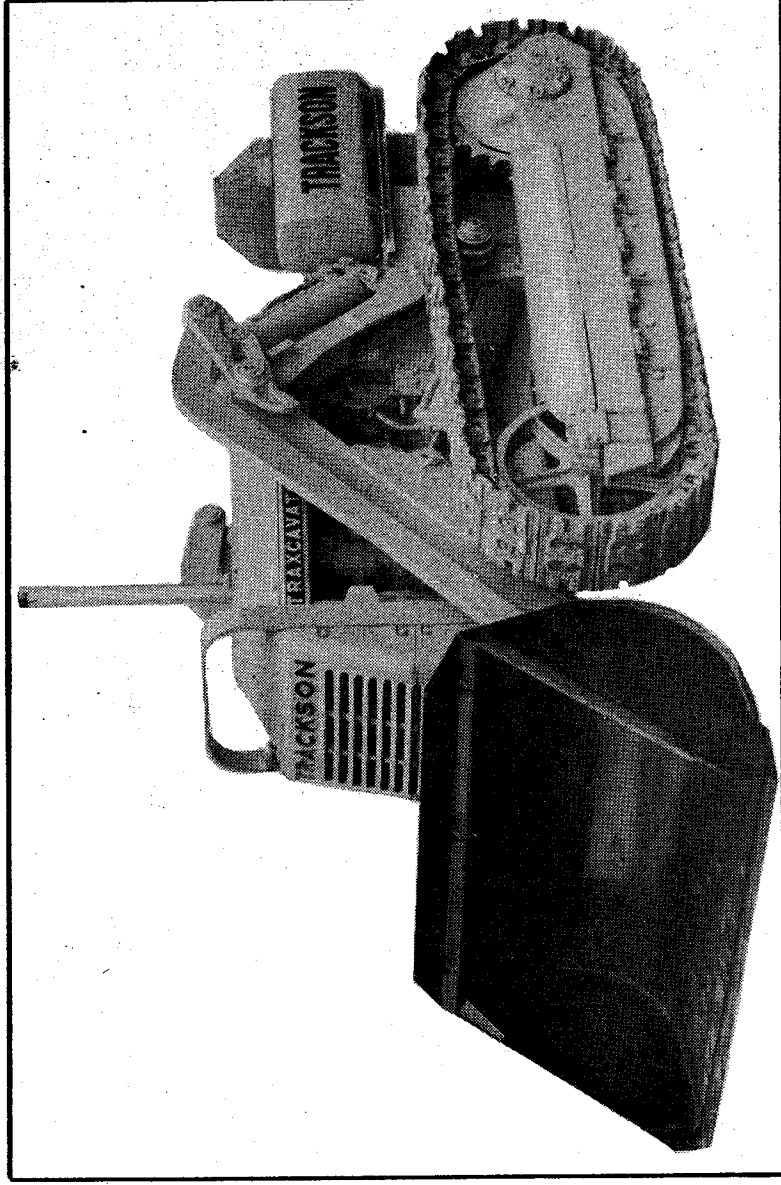


Plate 1 — Model HT4 TRAXCAVATOR

The Model HT4 Hydraulic TRAXCAVATOR is a big, powerful tractor-excavator capable of mastering the tough jobs. Like the T4, it is lower in initial cost, lower in operating cost and lower in yardage cost than any other machine of similar size, power and capacity. As an excavator, this TRAXCAVATOR is able to dig tough soil, shale, clay, caliche and frost because the full tractor drawbar power of over 9,500 lbs. push can be applied directly to bucket.

This machine is more than a highly efficient excavator for it combines the usefulness of a Shovel, Loader, Scraper, Bulldozer, Anglegrader, Trailbuilder, etc. It will strip, sub-grade — load all kinds of bulk material — in fact, will do more kinds of digging, dirt moving and material handling jobs than any other single piece of equipment.

TRAXCAVATORS are successfully serving state highway departments, contractors, counties, cities, townships — sand, gravel and clay pits — asphalt, brick and cement plants — mines, quarries, oil fields, railroads, coal and material yards — foundries and steel mills — smelters and refineries — and many other in-

The HT4 TRAXCAVATOR is regularly equipped with a 1 1/4 cubic yard bucket; also, a variety of special buckets and equipment are available to adapt it to many special jobs and uses. The maximum bucket lift and dumping height is sufficient for loading large trucks, dump trailers and other types of hauling units. The HT4 TRAXCAVATOR is mounted on the CATERPILLAR D4 diesel tractor so is highly mobile, having five speeds forward and one in reverse, enabling the machine to travel under its own power at speeds up to five miles per hour. It can also be readily loaded on a trailer for high speed transportation on streets and highways. The tractor drawbar is always clear and available for drawbar work.

The operation of the TRAXCAVATOR is quickly and easily mastered by the average tractor operator, for a single lever controls both the raising and lowering of the bucket, and another lever provides controlled dumping or return of the bucket.

The Model HT4 TRAXCAVATOR consists of a frame assembly, bucket assembly and all necessary parts and fittings; ready for mounting on a CATERPILLAR D4 track-type tractor special arrangement incorporating wide gauge extra long (5 roller type), non-oscillating track frames, large diameter heavy-duty front idlers, blower-type fan, and a double valve front mounted hydraulic control unit. The tractor, so modified, provides the traction, balance and stability needed for successful high-production TRAXCAVATOR operation. Any style track shoes up to 15 in. wide can be used.

The TRAXCAVATOR serial number plate will be found on the left hand horizontal cross brace of the TRAXCAVATOR frame, facing the operator.

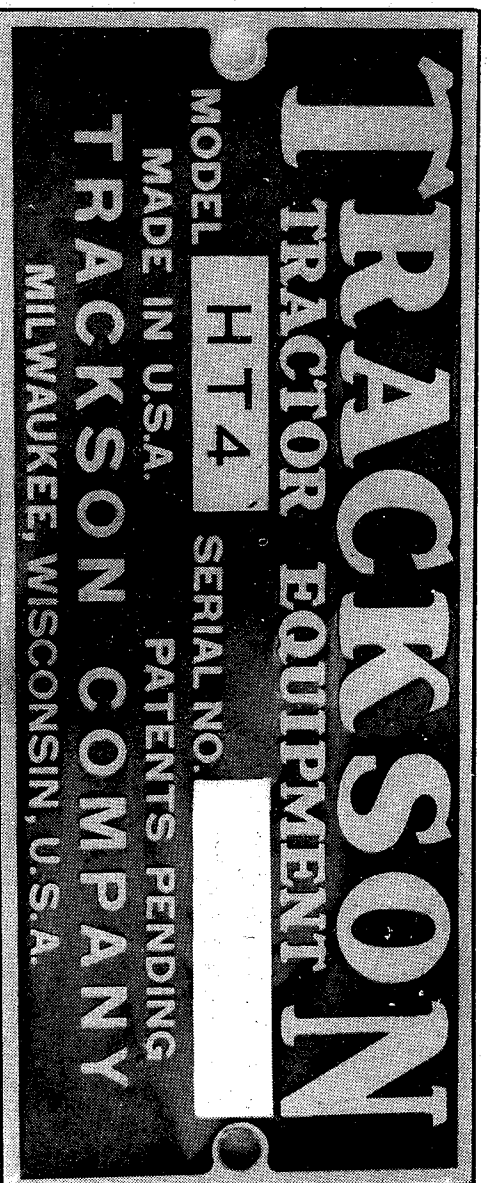


Plate 2 — Serial Number Plate

SPECIFICATIONS

DIMENSIONS (Approx.)

TRAXCAVATOR, mounted on D4 tractor

Height, with bucket lowered	6' 0"
Length, drawbar to bucket bit	14' 1"
Width, outside to outside of Std. Bucket	6' 8"
Dumping clearance, from ground to top of truck or hopper	8' 6"
Lifting height, ground to center of hinge	9' 6"

TRAXCAVATOR, less bucket on skid

Height	5' 4"
Length	10' 0"
Width	4' 1"

BUCKET only (80", 1 1/4 Yard Standard), B80DH4

Height	3' 4"
Length	3' 0"
Width	6' 8"

WEIGHTS (Approx.)

TRAXCAVATOR and Tractor	18,540 lbs.
TRAXCAVATOR only (equipped with 80" Bucket)	5,850 lbs.
FRAME and box of parts on skid	4,825 lbs.
BUCKET, 80"	1,025 lbs.
BUCKET, 60"	850 lbs.

CAPACITY

BUCKET (80", Standard)

Rated	1 1/4 yd.
Struck	1 yd.

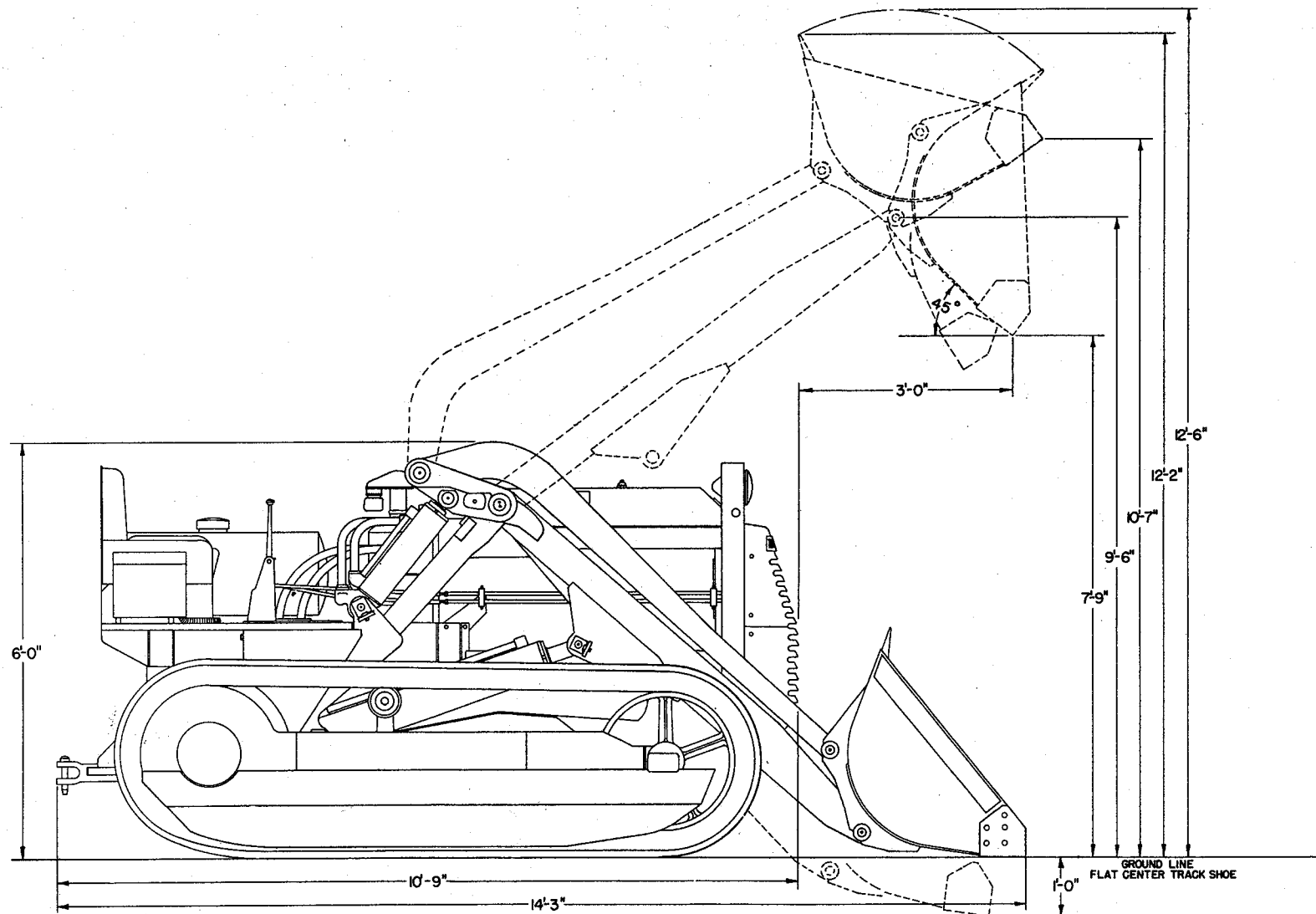


Plate 3 — Dimension Chart

OPERATING INSTRUCTIONS

OPERATING INSTRUCTIONS

PREPARATION OF TRAXCAVATOR FOR DAILY USE

In preparing the TRAXCAVATOR for initial or daily operation a detailed lubrication should be made as directed in "Lubrication Instructions." Check the oil level in the oil storage tank once a week with lift arms raised and bucket dumped. This check should be made in the morning before starting operations while the oil is still cool. Otherwise expansion from heat of operating will cause oil to flow from filter opening when cap is removed.

Check all cap screws and bolts fastening TRAXCAVATOR to tractor as well as nuts and cotters locking all pivot pins in position.

Dirt should not be allowed to accumulate and pack on the TRAXCAVATOR, especially under and above the lift cylinders. A few minutes spent daily in keeping it clean are well repaid in greater ease and safety of operation.

Connections in the hydraulic system should be checked for looseness that might result in leakage. This inspection can be made more easily by keeping the TRAXCAVATOR and tractor clean.

OPERATING PROCEDURE

The operation of the HT4 TRAXCAVATOR is dependent upon the operation of the D4 "Caterpillar" tractor on which it is mounted since the crowding action necessary to load the bucket is secured by the forward motion of the tractor. Before attempting to operate the TRAXCAVATOR it is therefore necessary for the operator to become familiar with the operation of the tractor.

The TRAXCAVATOR is operated by a "Caterpillar" front mounted, double valve hydraulic control unit. The control levers are located to the right and in front of the operator's seat. The hydraulic control unit is directly connected to the engine and when the engine is running it is always ready to operate the TRAXCAVATOR.

Always operate the hydraulic control with quick full movements of the control levers with the engine running at full governed speed.

Refer to Plate 4. Raising or lowering of the bucket is accomplished through the inner control lever, A. This lever has four positions, each of which functions as follows:

Position No. 1: Center, neutral—The bucket is held at any desired height.

Position No. 2: Pulled back—The bucket raises. The lever is held in this position by a detent until forced forward by the operator or by the knock-out assembly attached to the rear frame member.

Position No. 3: Partially forward—The bucket will lower under power.

Position No. 4: Extreme forward—The bucket will lower under its own weight or float.

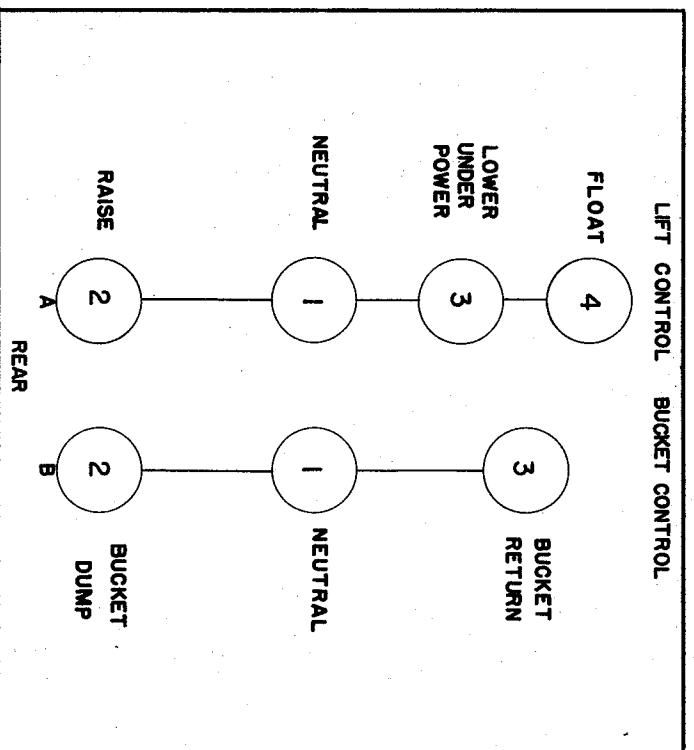


Plate 4 — Operating Chart

The control lever will remain in float and neutral positions until moved by the operator.

Dumping and return of the bucket is accomplished through the outer lever, B. This lever has three positions.

Position No. 1: Center, neutral—The bucket will be held at any desired angle of dump.

Position No. 2: Pulled back—Bucket will dump.

Position No. 3: Pushed forward—Bucket will return to digging position.

Each operation may be performed at any desired height of bucket travel either while the bucket is in motion or at rest. The operation of this lever can be reversed if desired. See page 16 for details.

Every material to be dug or loaded has its own characteristics which determine the most efficient method of filling the bucket. In hard digging operations, fast penetration is secured by tilting the bucket, which will give a slight downward angle. The usual procedure for digging or excavating is to lower the bucket to the ground with the tractor in forward motions. Hold the control lever forward so the bucket will penetrate below the track line. The depth of the penetration to maintain will be governed by the characteristics of the material or the depth of excavation desired.

After the bucket has reached the desired depth it should be stopped by putting bucket control lever in neutral or raising it slightly, depending upon the conditions. The tractor can be continued in forward motion until the bucket is filled, after which bucket should be raised and material carried to disposal point, dumped into a truck or otherwise disposed of as desired.

When most of the work involves loading or handling loose materials or light digging and skimming operations, etc., the bucket digging angle should be flat. When loading from a bank, windrow or stock pile, the method of filling the bucket is to drive the tractor forward with the bucket in a flat position. After

OPERATING INSTRUCTIONS

bucket has entered the material a sufficient distance (depending on kind of material, ease of penetration and height of bank), it should be raised while the tractor is still in motion, to complete filling.

OPERATING SUGGESTIONS

Tilting Bucket: Do not move bucket control (outer) lever if the bucket bit is wedged tight or if any part of the bucket is caught against an immovable object.

Carrying Loads: The proper height of the bucket for carrying loads is approximately 3 feet off the ground. This will tip the bucket back sufficiently to carry a heaped load. Loads can be carried with the bucket raised higher but at sacrifice to overall stability. When carrying loads uphill from an excavation always travel forward—the visibility is better, also the balance of the machine. When carrying loads down a steep incline, the tractor should, whenever possible, go down in reverse.

Spilled Loads: If solid objects such as stone or brick spill over the back of the bucket, they should be removed from the TRAXCAVATOR immediately so they do not get wedged between the hydraulic cylinders and the frame or tracks, otherwise damage may result.

Excavating Below Ground: In small excavations such as pits, basements, etc., the best practice is to excavate the entire area in successive layers 6 to 8 inches deep, digging a ramp outside the excavation line for the TRAXCAVATOR to carry its loads out of the excavation. In larger excavations, when trucks cannot enter the pit, a ramp inside the excavation line can be used by the TRAXCAVATOR to carry its loads out to trucks or bank. Two heavy timbers are sometimes used as a ramp to drive the TRAXCAVATOR out of the hole after the earth ramp is taken out as a part of final clean-up operations.

Loading Trucks: Maximum loading speed is obtained when trucks are spotted so that tractor travel and turning for the loading cycle is reduced to a minimum. The operator should also become accustomed to loading trucks both to the right and to the left instead of to one side only. This equalizes the wear on the tractor steering clutches.

Loose, Dry Materials: These are best handled with the wind from the rear. This prevents dust from affecting the visibility and comfort of the operator, as well as keeping dust and dirt off machine.

Clean, Level Footing: If the floor or footing for the TRAXCAVATOR is kept level and clean, turning is accomplished with greater ease and safety. When working in a quarry, the TRAXCAVATOR working floor should be kept free from large stones; however, if the floor is rough the fine rock dust should be left to absorb some of the shocks caused by maneuvering.

Selecting of Proper Equipment: Although most all jobs can be accomplished with the standard 80" wide bucket, there is a variety of special buckets and blades. The proper selection of these will facilitate the handling of a specific job. The 60" wide, $\frac{7}{8}$ Cu. Yd. Bucket is used for heavy digging and if concentrated penetration is desired. It is also desirable to use this bucket where heavy material is being loaded or the footing is very soft. The Quarry Bucket is used in handling rock and similar material where extra hard operation requires a stronger bucket. The 2 Yd. Light Material Bucket is used for handling cinders, coal, snow, etc., and should not be used as a digging bucket for ordinary materials.

Detachable bucket teeth are available for both the standard and 60" wide buckets. These are used to obtain easier penetration when necessary but should be removed when not required. The Bulldozer Blade and Anglegrader are used for grading, leveling and backfilling. A Crankcase Guard is also available to protect the engine from rocks, stumps, etc.

SAFETY PRECAUTIONS

1. Before attempting to remove the hydraulic control cover or loosen any hydraulic connection, rest the lift arms on the support pins and dump the bucket all the way. See Plate 5.
Reason: As soon as any hydraulic connection is loosened, the bucket will lower or tilt and spray oil.
2. Do not operate outer lever to tilt bucket when it is caught or wedged.
Reason: Possible damage to bucket or control linkage.
3. Do not ease operating levers into position.
Reason: Valve will operate sticky preventing smooth operation.
4. Carry loaded bucket as low as practical.
Reason: Improves stability and prevents spillage.
5. Never travel over rough or uneven ground at high speed with loaded bucket raised to high point.
Reason: Unsafe operation and causes excessive strains on machine.
6. Lower bucket to ground or lock in raised position with support pins in TRAXCAVATOR frame when servicing or lubricating.
Reason: Accidental dropping of bucket may cause injury to personnel.
7. Lower bucket to ground when machine is not in operation.
Reason: Accidental dropping of bucket may cause injury to personnel.

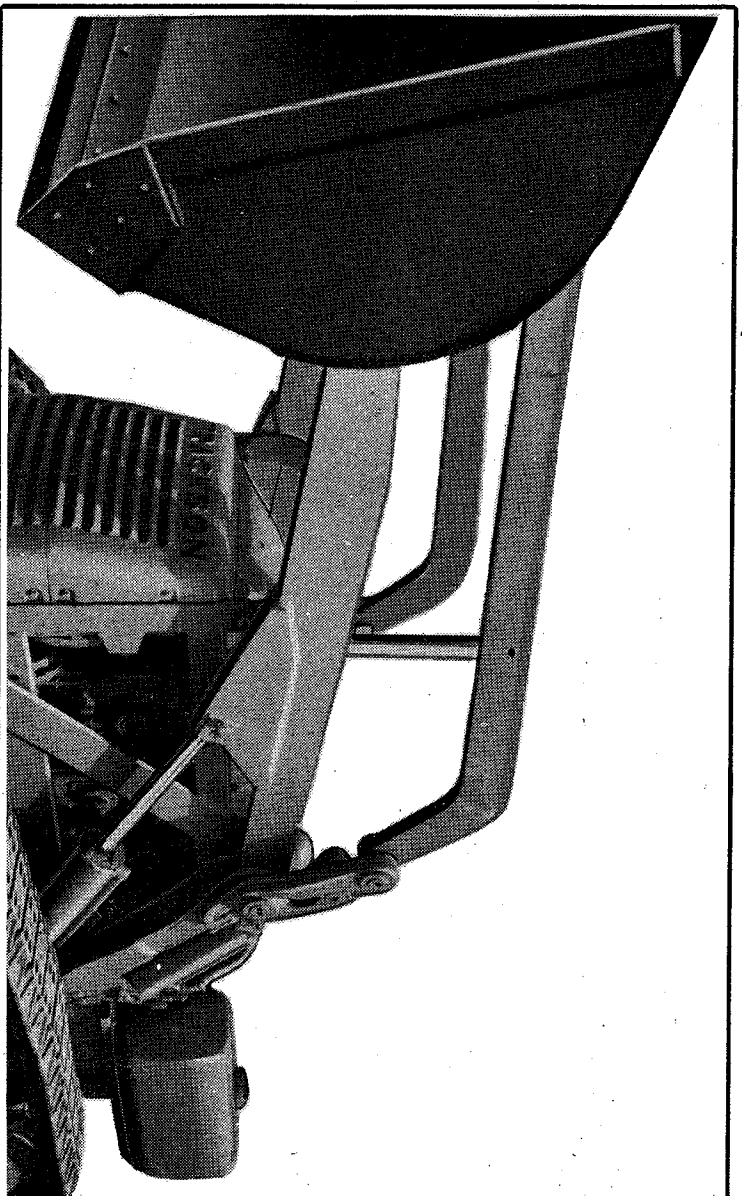


Plate 5

OPERATING INSTRUCTIONS

8. Never operate machine with frayed hoses.
Reason: Broken hoses cause costly down time and can spray operator with oil.
9. Be sure that operating levers are in neutral position before starting engine.
Reason: Prevents possible injury to personnel.
10. Do not operate machine with leaky packings.
Reason: Possible damage to hydraulic system.
11. Do not hold operating levers engaged after cylinder has reached end of stroke.
Reason: Excessive heating of oil and possible damage to pump.
12. When operating in freezing temperatures, keep mud and ice cleaned out from between frame and cylinders, both above and below.
Reason: Possible damage to cylinders due to restricted travel caused by frozen mud and ice.
13. Keep oil reservoir filled as instructed.
Reason: Should the oil level get low enough, the pump will be damaged.
14. Never run tractor engine when hydraulic system is leaking or empty.
Reason: Pump will be damaged.

LUBRICATION INSTRUCTIONS

GENERAL LUBRICATION INFORMATION

Careful attention to the following information on lubricants and their proper selection will add much to performance, economy and long life of your TRAXCAVATOR. The lubrication chart, Plate 6, shows all points to be lubricated with chassis lubricant.

When draining, checking and refilling the hydraulic control, do so with the tractor on level ground.

Use the brush supplied in the tractor tool equipment when removing dirt from fittings and when cleaning around the filler opening and covers. Lubricate all miscellaneous points, not equipped with fittings, with crankcase lubricating oil every 60 hours.

The following topic "LUBRICANTS" recommends the types, viscosities and grades of lubricants best suited for use in your hydraulic HT4 TRAXCAVATOR for various operating temperatures. The S. A. E. number refers only to the viscosity of the oil, and has reference to no other characteristic or property.

Since all grease fittings are not readily visible on tractors having TRAXCAVATORS installed, it should be kept in mind that the hydraulic control drive coupling in the lower fan pulley hub should be lubricated at regular intervals as well as all other tractor lubrication fittings.

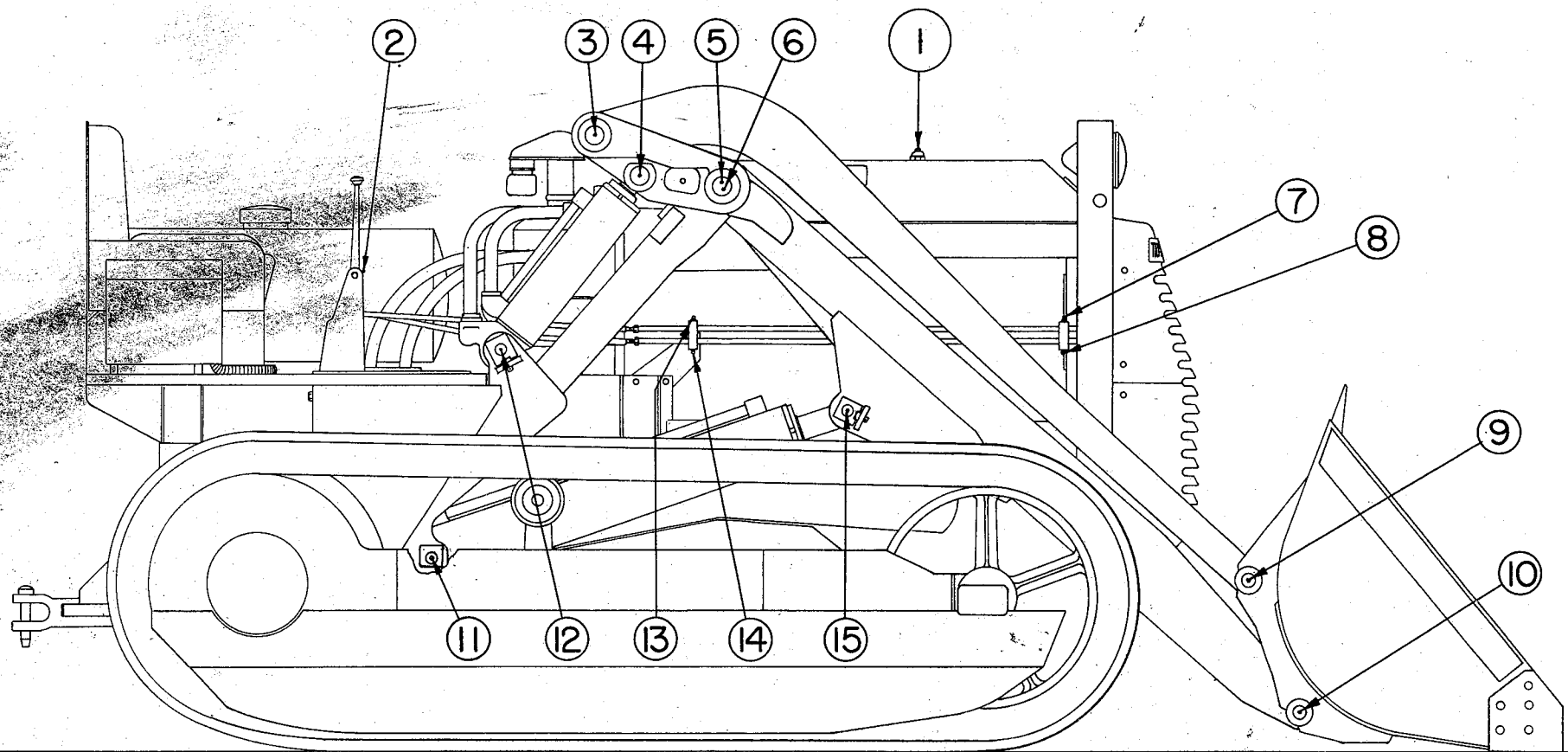


Plate 6 — Lubricating Chart

OPERATING INSTRUCTIONS

LUBRICANTS

Hydraulic Fluid:

Use only straight mineral crankcase lubricating oil in the hydraulic control tank. For temperatures above 0° F., use S. A. E. No. 10 oil. For temperatures below 0° F., dilute S. A. E. No. 10 oil with kerosene up to 25% to maintain fluidity.

Straight mineral oil will provide a better protection to seals and hydraulic lines and only the best quality oil purchased from a reputable manufacturer is recommended.

It is extremely important in handling the oil to keep it clean. Every precaution should be taken to use only clean filler cans and to be sure that all dirt is removed from the filler cap for the hydraulic control before it is taken off for filling.

Careful attention was given to the design of the hydraulic system to guard against oil leaks. Connections were eliminated where possible and metal to metal joints, with rubber ring seals, are used instead of the usual pipe thread joints.

Oil leaks should not be neglected as the loss of oil is an unnecessary expense as well as a possible cause of damage to the hydraulic system.

Every precaution should be taken by the operator to prevent wear of the hydraulic pump by dirt getting into the system.

Chassis Lubricant:

This lubricant is a stringy, tacky mixture of mineral oil and metallic soap. It should not contain fillers or harmful materials. It is made for lubrication of points which do not normally operate at high temperatures.

Lubricants of this kind have been classified by grades by the N. L. G. I. (National Lubricating Grease Institute) designed in order of "worked" penetration or consistency. For normal temperature above freezing use No. 1 Grade, and for temperatures below freezing use No. 0 Grade. As a more accurate guide, use the grade of lubricant that is just fluid enough so it can be handled in the standard hydraulic compressor at the prevailing atmospheric temperature. If the lubricant is too light it may leak out of the bearing too rapidly. In hot weather use No. 2 Grade.

Lubricate all fittings on the TRAXCAVATOR every 5 hours. There are bushings in these locations and enough lubricant should be added to force out all dirt and dust.

OIL STORAGE TANK

Check oil level once a week when oil is cool. Clean off dirt from around filler neck cap. Raise lifting arms to the top and dump bucket all the way. With the bucket in this position, remove the filler cap. The oil level should be visible in the filler strainer. If it is not, fill with oil to the top of the pipe. Check to see that filler neck cap gasket is in good condition and install cap tightly. Never check oil when it is hot or oil will overflow from the tank due to expansion. There is a stand pipe in the tank, Plate 7, which provides air space to take care of the oil displaced by the piston rods when the bucket is lowered. The stand pipe allows only one inch of oil in the tank before it rises in the pipe. Drain and refill hydraulic system and replace filter element in hydraulic control unit every 900

FILLING THE HYDRAULIC SYSTEM

If the hydraulic system is completely drained, it must be re-filled step by step in accordance with the procedure outlined below. Only S. A. E. No. 10 straight mineral crankcase lubricating oil should be used. The entire system holds approximately 16 gallons of oil.

FILLING PROCEDURE: CAUTION—During the process of filling the system the operator should perform all operations from the rear between the arms rather than from the side to prevent possible injury if bucket is accidentally lowered.

1. Tractor must be on level blocks so that the closed bucket can drop below ground line, thus closing the lifting cylinders completely.
Alternate Method: Tractor must be on level surface with the closed bucket dropped over the end of a ramp to close the lifting cylinders completely.
2. Tractor engine to be running at idle speed.
3. Fill the reservoir tank with oil until the oil is visible in the strainer (do not put filler cap in place at this time).
4. Pull the inner control lever back in the "raised" position and hold until the large cylinder piston rods extend 5" to 6".
5. Add additional oil until the level again becomes visible in the strainer.
6. Raise the lift arms an additional 6".
7. Again add additional oil until it becomes visible in the strainer.
8. Repeat above process (Items 6 and 7) until lifting arms reach maximum height.

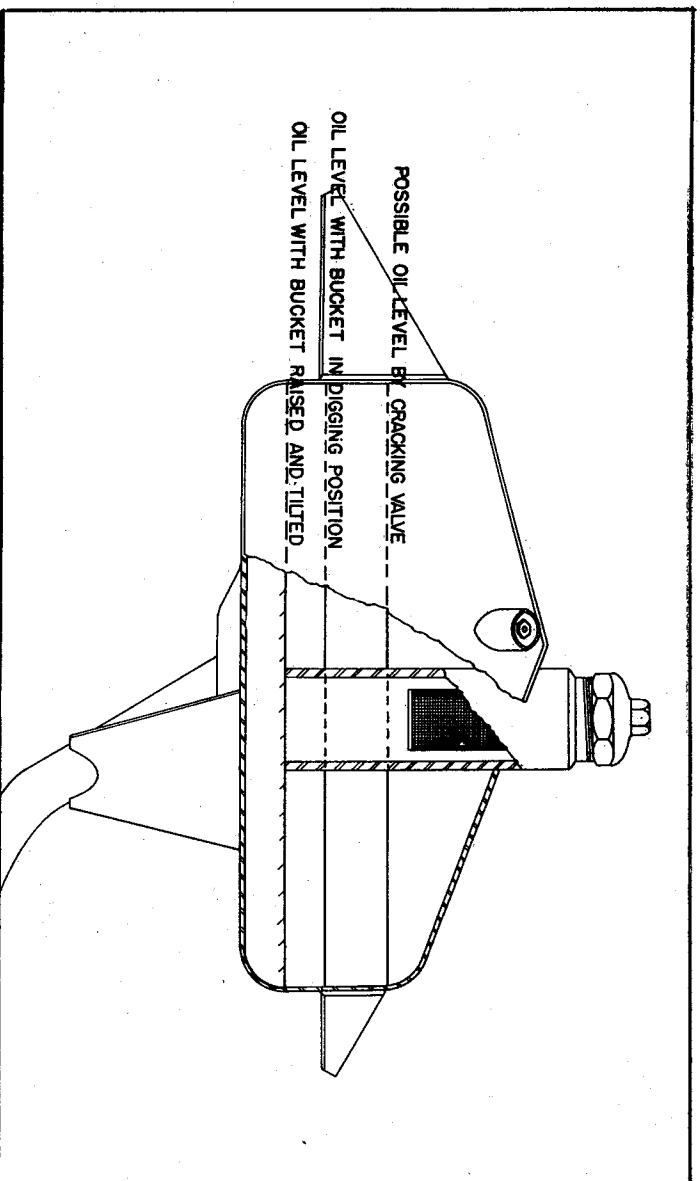


Plate 7

OPERATING INSTRUCTIONS

9. Add additional oil until it becomes visible in the strainer, and screw on filler cap tightly.
10. Lower the lifting arms to the extreme "low" position. The cylinders are now completely closed.

CAUTION: In performing this operation of lowering, DO NOT push the lever more than 3" forward or it will go into the "Float" position and circulate the air throughout the entire system, which will take a long time to work out.

11. Raise the lifting arms to reach maximum height.
 12. To fill bucket control cylinders (with lifting arm still in maximum raised position) pull the outer lever back until the small cylinder rods extend half way.
 13. Remove filler cap and fill tank until oil is visible in strainer.
 14. Extend the rods to the end of their stroke. Fill tank until oil is visible in strainer. Replace filler cap and tighten.
 15. Push the outer lever forward to close the bucket.
 16. Pull outer lever back until the small cylinder rods are fully extended (bucket in dumped position).
 17. Remove cap and add oil until visible in the strainer.
- IMPORTANT!** The system is now completely filled. Install cap tightly, using a wrench.

18. With the engine at full throttle, run lifting arms up and down and open and close bucket, for about 20 cycles. This will force any small amounts of air which might be in the system up into the reservoir tank.

Any entrapped air in the system is apt to cause jerky operation of the cylinders or a "howling" noise in the pump. This air, however, will rapidly work itself up into the air reservoir. Additional operation will, of course, cause heating of the oil. The expansion in the oil thus produced makes it impractical to check the oil level until such time as the system has been cooled to its original starting temperature.

19. Recheck oil level as per the standard oil level checking procedure.

HYDRAULIC SYSTEM

The hydraulic system is designed so that few adjustments are necessary. There are, however, a few precautionary measures which should be followed. Cleanliness is of great importance in the hydraulic system and great care should be taken to keep out dirt.

Check the oil level weekly and fill with fresh oil if necessary. If the oil is low, make a thorough inspection of the hoses and connections for leaks. It should not be necessary to add oil if all the connections are tight and the hoses are in good condition. See the LUBRICATION INSTRUCTIONS section of this book for type of oil and filling of hydraulic system.

PRESSURE CONTROL VALVE

The pressure control valve for the hydraulic system is located inside the hydraulic control unit. It is properly set at the factory and requires no further adjustment in the field. If the relief valve is suspected of being set too low, it can be easily checked. Time the raise cycle from the ground to the full raised position with the empty bucket and then with the loaded bucket (not overloaded). If it takes longer to raise the loaded bucket, it is a sign the pressure is too low. Contact your local Trackson-"Caterpillar" Dealer and have it checked.

HYDRAULIC HOSE INSTALLATION

The Installation Instructions cover assembly of Hydraulic Hose to the bucket dump cylinder to provide for dumping the bucket by pulling the outer control lever back. This arrangement provides the operator minimum motion during an average loading cycle; that is, both levers are pulled back to raise and dump and both pushed forward to lower and return to digging position.

The Operation Instructions have been written to provide for operation in this manner; however, it has been observed that some operators prefer to dump the bucket by pushing the outer lever forward. The hoses controlling the dump cylinders can be installed to provide whichever direction of throw on the outer lever is desired, and for your reference, we are showing below the two methods of connecting the hoses to the dump cylinders.

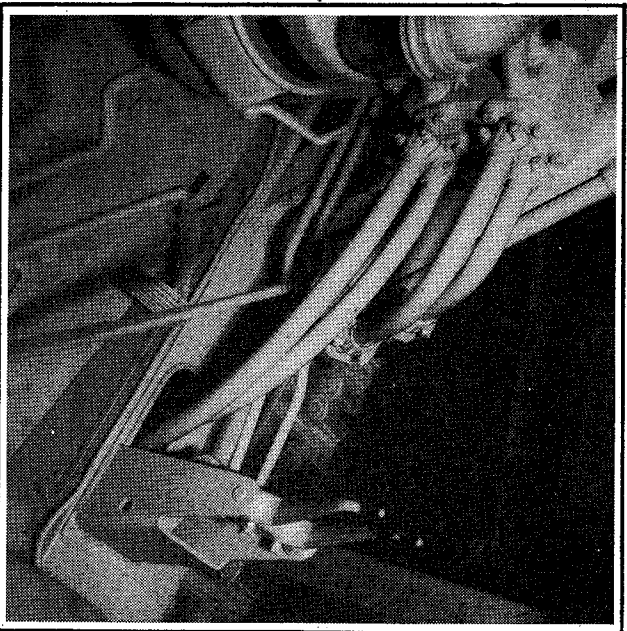


Plate 8

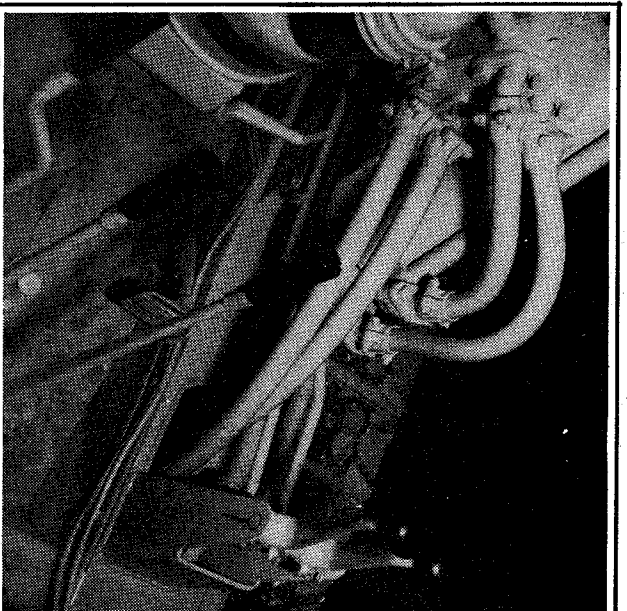


Plate 9

Plate 8 shows the hoses connected to dump the bucket by pulling the operating lever back. This is the way our instructions call for assembly and is the way units are mounted at the factory. Note that the 35° sleeve fittings on the hoses are attached to the cylinder and point directly across the tractor.

Plate 9 shows the hoses connected to dump the bucket by pushing the outer lever forward. Note that the 35° sleeve fittings are attached to the manifold

ADJUSTMENT INSTRUCTIONS

with the short hose pointing down approximately 20° and the long hose pointing up approximately 50°.

When connecting the hoses either way, make sure both sides are connected the same; that is, the hoses going to the lower connection on each cylinder to both outer holes or both inner holes on the manifold.

ADJUSTMENT INSTRUCTIONS

OPERATOR'S SEAT

The operator's seat is provided with various sets of holes so it can be moved up or down, forward or back, depending upon the length of the operator's legs. This is done by removing the six capscrews holding the seat to the seat riser and relocating the seat and reinstalling capscrews.

KICK-OUT

Refer to Plate 10. The kick-out arrangement should be adjusted so the "raise" lever is forced into the neutral position before the lift cylinders reach the end of their stroke. If they hit the end of their stroke it puts unnecessary strains on the cylinders, the pump and the entire system.

The kick-out plunger, 1, can be adjusted by screwing it in or out of the adjustable yoke end, 2, until the proper adjustment is reached.

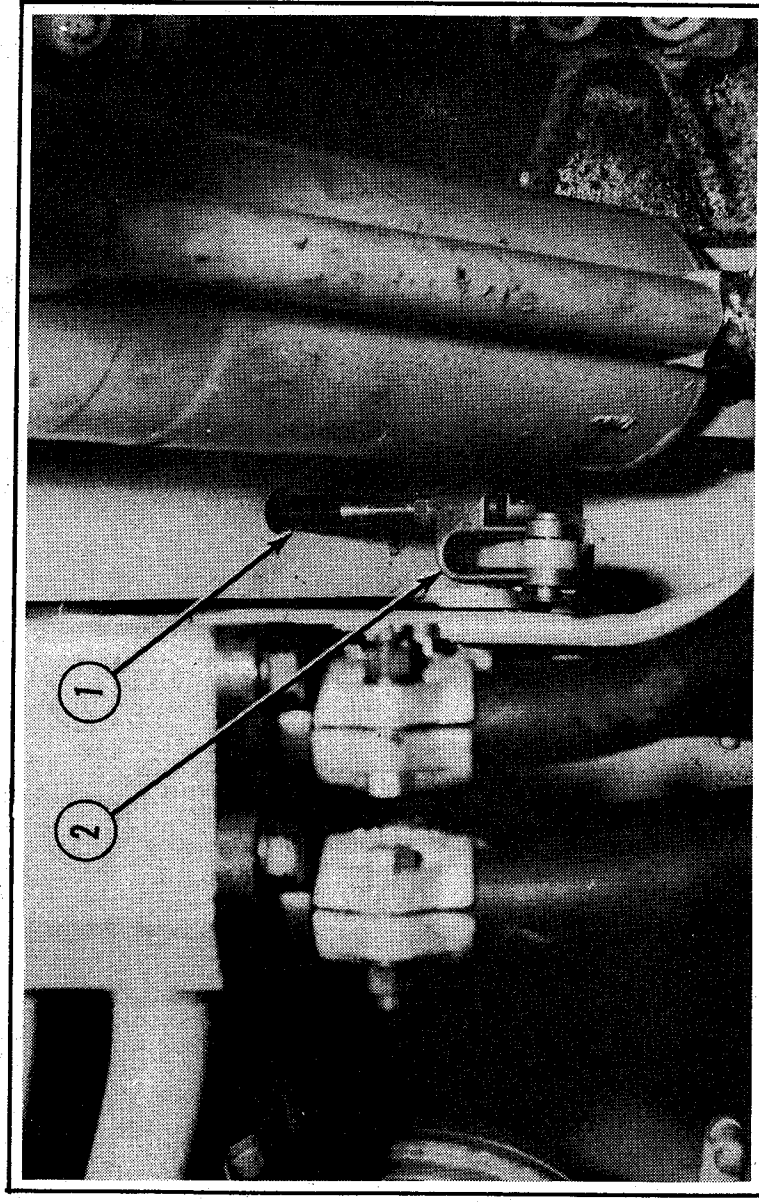


Plate 10

OPERATING RODS

Refer to Plate 11. The operating rod brackets, 1 and 2, should be adjusted so the levers snap back to neutral when released, operate freely, and allow the inner lever to be held in the raise, neutral or float position.

If the levers do not operate freely, disconnect the rods from the levers on top of the pump and see if the valves are free. If they are, the forward rods are probably binding. Disconnect the yoke ends and check the rods to see that they slide freely. Adjust the brackets as required by bending or shimming with washers.

Refer to Plate 12. The lower rod should be adjusted in length so the inner lever holds in engagement when it has thrown the valve as far as possible. The lever is held in engagement by a spring loaded block, 1, on the control lever bracket. The roller, 2, on the lever should go over the high point on the block so it will hold. There is a set screw, 3, to back the block away from the lever if the "hold" is not desired. The adjustment should be set carefully to hold the valve in full open position. If it is not, there is a possibility the roller will travel over the end of the spring loaded block and catch there. This adjustment should be checked from time to time since it changes as the yoke pins wear. The upper rod, 4, should be adjusted in length so the operating levers are parallel when both are in the neutral position.

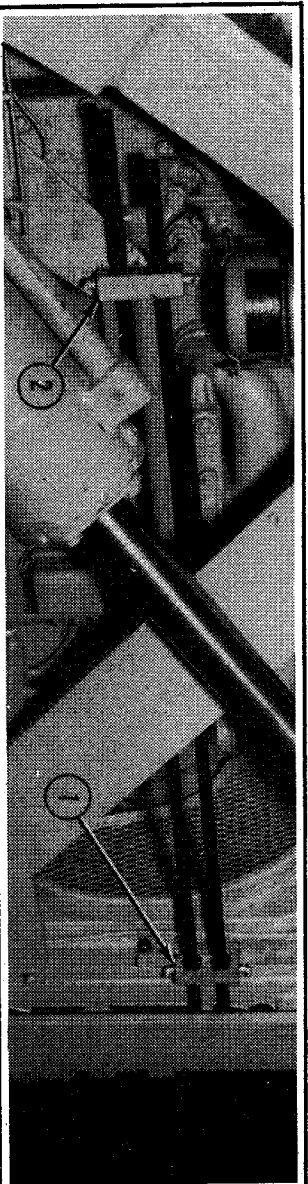


Plate 11

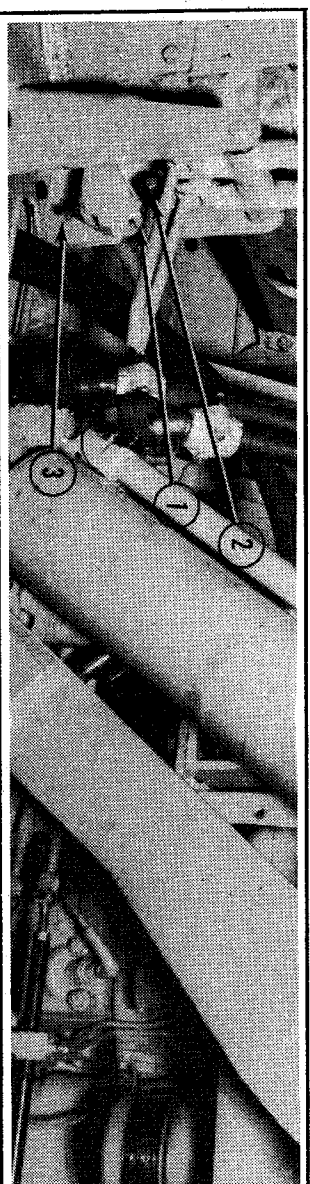


Plate 12

ADJUSTMENT INSTRUCTIONS

ADJUSTMENT OF PISTON ROD PACKINGS

Refer to Plate 13. When making this adjustment, rest arms on pins in frame and dump bucket. The piston rod packing on all four cylinders should be adjusted so that there is a light oil film on the rods when the unit is in operation. If excessive oil is leaking through the packings, loosen the capscrews and slide the packing gland, 1, up the piston rod. Remove one shim, 2, from between the cylinder head and the packing gland and reinstall packing gland with capscrews. Tighten the capscrews evenly.

Excessive tightening of these glands will result in rapid wear of the piston rod packings and severe wiping of the piston rod. If the packings leak oil after being tightened properly, it is an indication that they are worn and should be replaced.

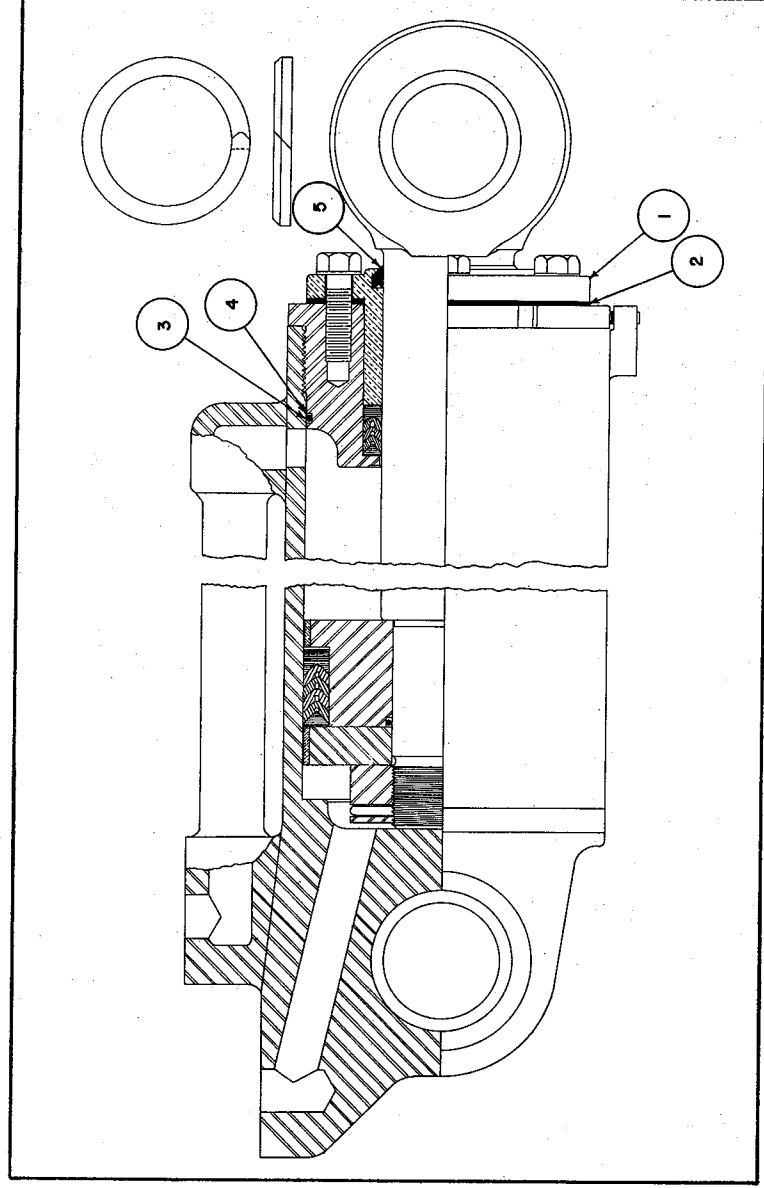


Plate 13

REPLACEMENT INSTRUCTIONS

PISTON ROD PACKINGS

Refer to Plate 13. If the packings leak and all the shims have been removed, the packings need replacement. The packings are furnished solid and should be installed as solid rings if the complete cylinder is disassembled. If only the packings are being replaced, this can be done by loosening the packing gland, 1, sliding it up the rod and removing the used packings. Split the new packings with a razor at 45° angle as shown and slip them over the rod as shown, with the male adapter ring going on first. Stagger the cuts in the packing at about 120° intervals. Place the packing gland, 1, in position, hold tight and measure the number of shims, 2, required. Install the shims and packing gland and tighten the capscrews evenly.

STUFFING BOX SEAL RINGS

If oil leaks from between the stuffing box and the tube, it indicates the seal ring, 3, needs replacement.

Disconnect the piston rod connecting pin, remove the stuffing box locking set screws, unscrew the stuffing box and slide it up the rod. Remove the old seal ring, 3, and install a new one. Make sure that the new ring is installed inside (towards the inside of the cylinder) with the back-up washer towards the stuffing box threads, 4, as shown. Slide the stuffing box into the tube, centering it up with the hole so the threads will not ruin the seal ring, and lubricate the ring well so it will not bind as the stuffing box is screwed in. Draw the stuffing box tight, lock with set screw and reconnect rod end.

If the back-up washer, 4, needs replacement, the complete cylinder must be disassembled and the washer installed over the small end of the stuffing box.

WIPER RINGS

Refer to Plate 13. The wiper rings, 5, serve to wipe the dirt off the piston rod so it does not get into the packings, 3. They should be replaced when there are indications that they are no longer wiping the rod surface properly and should be replaced whenever the cylinder is disassembled. To replace this wiper ring, it is necessary to remove the stuffing box, pull the piston rod from the cylinder and remove the pistons and stuffing box from the rod. Remove the old wiper ring, install new one and reassemble.

REPLACEMENT OF HOSES

Check the hoses weekly for any signs of leakage or wear. Do not wait for actual breakage before replacing the hoses.

Check the hose clamps frequently after installing new hoses, to make certain they are tight. A loose clamp could cause a separation of the hose from the sleeve.

Refer to Plate 14. Remove the hose by disconnecting the flange connections at the cylinder and manifold assembly. Cap all openings of the hydraulic system when the hoses are removed. Remove the clamp, 2, and cut half way around the hose at a 45° angle from the end of the hose until it can be removed from the sleeve, 4. It is necessary to cut only the wire braids in the hose. They may be cut with an 18 teeth to the inch hack saw by using short choppy strokes or by use of a grinding wheel. Lift the blade slightly on the return stroke. If the sleeve is cut or burrs are noticed, remove the burrs or replace the sleeve with a new one. Replace the hose with new $\frac{3}{4}$ inch two wire braid high pressure hydraulic hose. Clean the cuttings from the hose before installing the coupling.

Place the flange, 3, on the sleeve, 4, next to the large shoulder. Push the hose, 1, forward over the sleeve, 4, until the end of the hose is against the shoulder. Lubricating the sleeve will help in putting on the hose. If a vise is not available, force the sleeve into the hose by pushing or striking it against a wood block. Place the clamps, 2, in position on the hose. The lip on the inside of the clamp should fit into the large groove in the sleeve. Place the two bolts in the clamp but do not tighten. Replace the ring seal at the end of the sleeve. Before installing the lines make sure the faces and seal seats are free from all dirt. Make sure all twists are removed from the hose when installing. After the hose is installed, tighten the two bolts in the clamp evenly until a slight bulge of the hose appears between the clamps.

REPLACEMENT INSTRUCTIONS

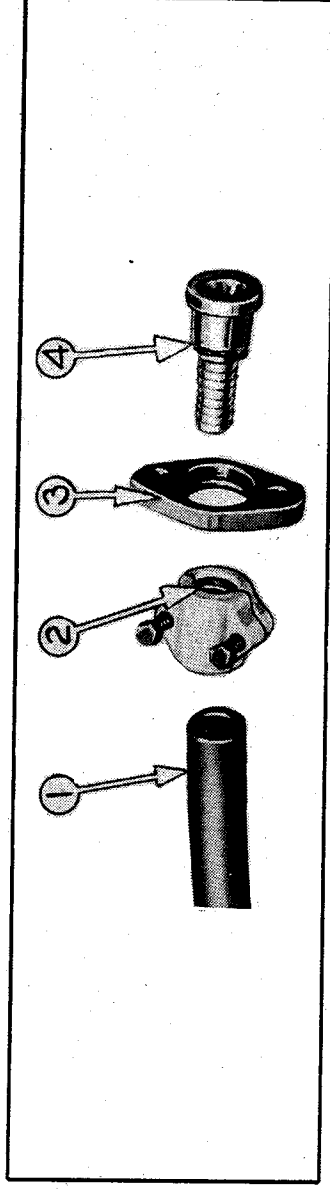


Plate 14

QUARRY BUCKET CUTTING EDGE TIP REPLACEMENT

Refer to Plate 15. Use cutting torch to remove worn cutting bit along a line $5\frac{1}{4}'' + 0-1/16$ forward of the rear edge of the original cutting bit. Position replacement edge and weld as follows:

Tack weld at several points.

Butt weld in approximately 6 inch lengths alternating above and below cutting edge, if convenient, thus minimizing warping.

Complete the butt weld by filling in the remaining spaces, once again alternating above and below the cutting edge, if convenient.

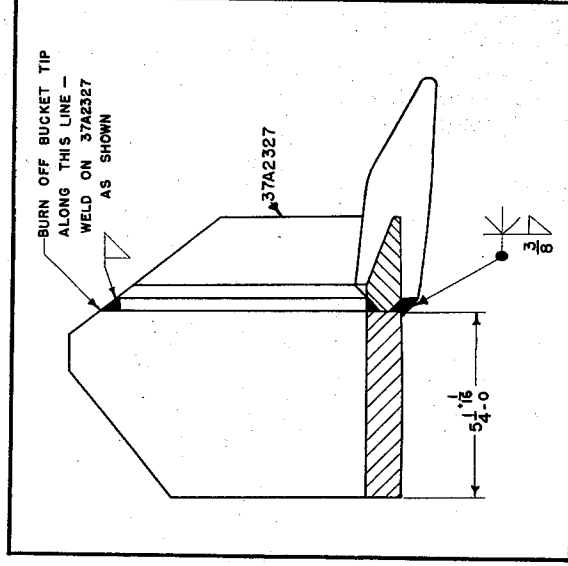


Plate 15

PISTON ROD REPLACEMENT

The piston rod supplied for replacement does not have a hole drilled in the threaded end to accommodate the locking cotter pin. It is necessary when making such a replacement to draw the piston rod nut tight and then, using a $13/64''$ drill, make a hole passing completely through nut and rod. Lock nut in position by placing a cotter pin in drilled hole.

PISTON PACKING REPLACEMENT

When the piston packing is to be replaced, the piston must first be assembled without the packing, and the nut drawn up tight. Then the packing set is placed alongside of the assembled piston and the width of the packing compared with the opening in the piston. If the packing set is oversize, the laminated top (thickest) ring may be peeled off until the proper size is achieved. This is necessary to prevent an oversize packing from expanding when the piston nut is tightened. Such expansion of the packing would prevent placement of the assembly in the cylinder.

EXTRA EQUIPMENT

A number of attachments and extra equipment are available to further increase the usefulness of the TRAXCAVATOR and the variety of jobs it will handle. Below is a list of this equipment together with specifications, use for which it was designed and installation instructions.

B60DH4 NARROW BUCKET

Construction: Made of $\frac{3}{8}$ " high tensile steel plate with a replaceable $\frac{3}{4}$ " thick bit, equipped with holes for installation of bolt-on bucket teeth.

Use: Heavy digging where more concentrated penetration is desired.

Rated Capacity: $\frac{7}{8}$ cu. yd.
Struck Capacity: .71 cu. yd.

Height: 40".
Length: 36".
Width: 60".
Weight: 835 lbs.

Installation Instructions

Position bucket on lifting arms. Install hinge pins from outside and lock in place by inserting locking bolts through hinge pins and hinge mounting on bucket.

Line up dumping arms with bucket control link anchor and install hinge pins and locking bolts using same method as incorporated in lifting arm hook-up.

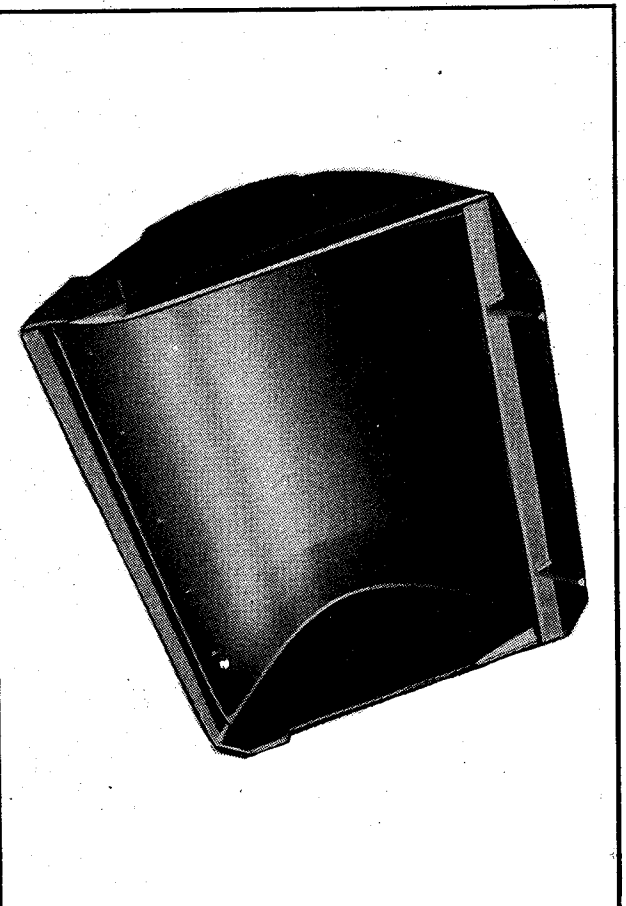


Plate 16 — Narrow Bucket, 60" Wide $\frac{7}{8}$ cu. yd. Bucket

B80QH40 QUARRY BUCKET

Construction: Made of heavy steel plate, welded and reinforced with a special hard-faced alloy steel bit and 8 teeth welded to bucket.

Use: Handling of rock and broken concrete where continuous use of teeth is required and extra width of bucket is desired to protect tractor tracks.

Rated Capacity: 1 cu. yd.
Struck Capacity: 1.0 cu. yd.

Height: 40".
Length: 36".
Width: 80".
Weight: 1,190 lbs.
Installation Instructions: Same as 60" wide $\frac{7}{8}$ cu. yd. bucket.

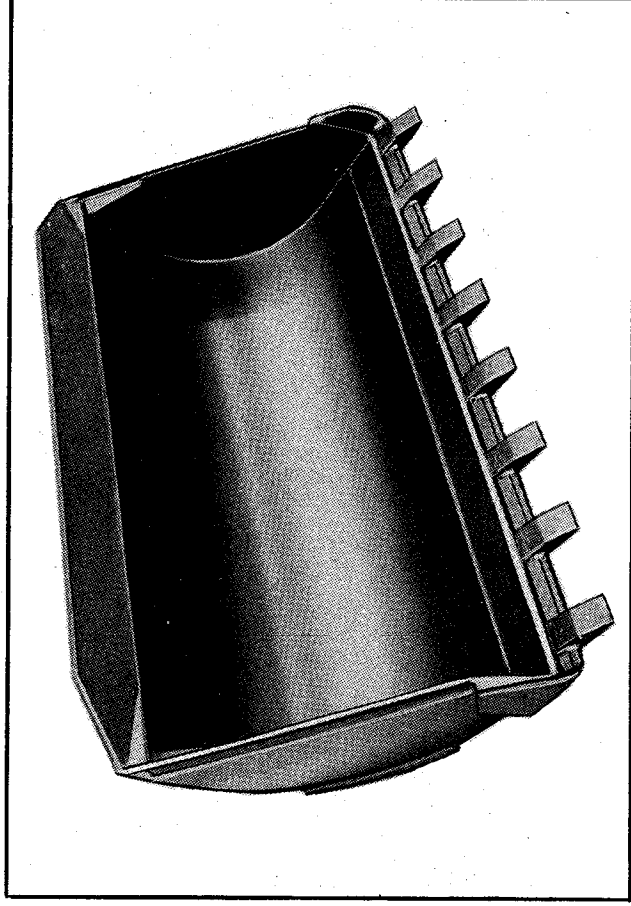


Plate 17 — Quarry Bucket

B80SH40 SKELETON ROCK BUCKET

Construction: Welded fabrication of steel plate and bars having openings 7"x8". Equipped with replaceable hard-faced alloy steel bit.

Use: Handling of large grade rock or stone.

Installation Instructions: Same as 60" wide $\frac{7}{8}$ cu. yd. bucket.

Rated Capacity: 1 cu. yd.
Struck Capacity: .90 cu. yd.
Height: 36".
Width: 80".

Weight: 1,170 lbs.

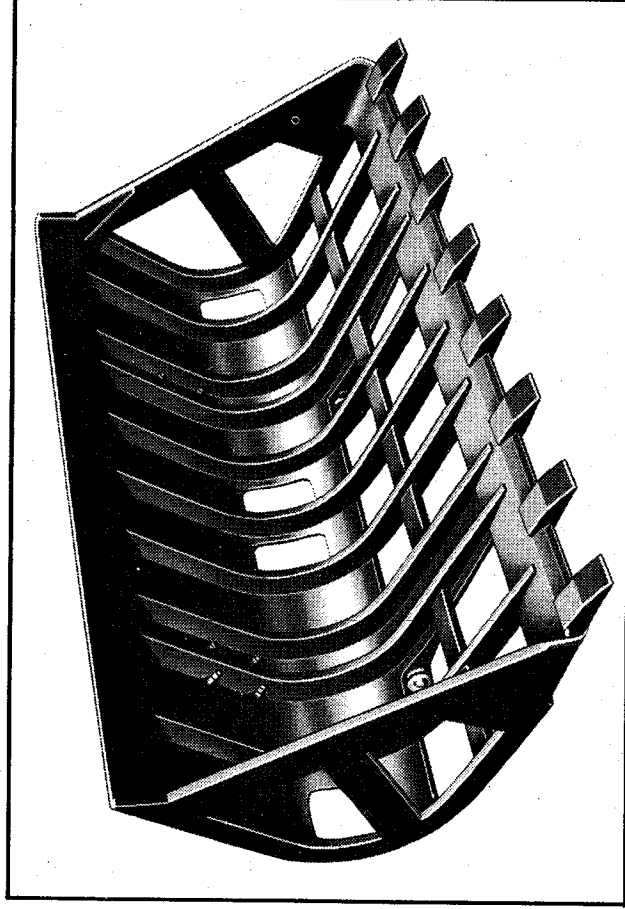


Plate 18 — Skeleton Rock Bucket

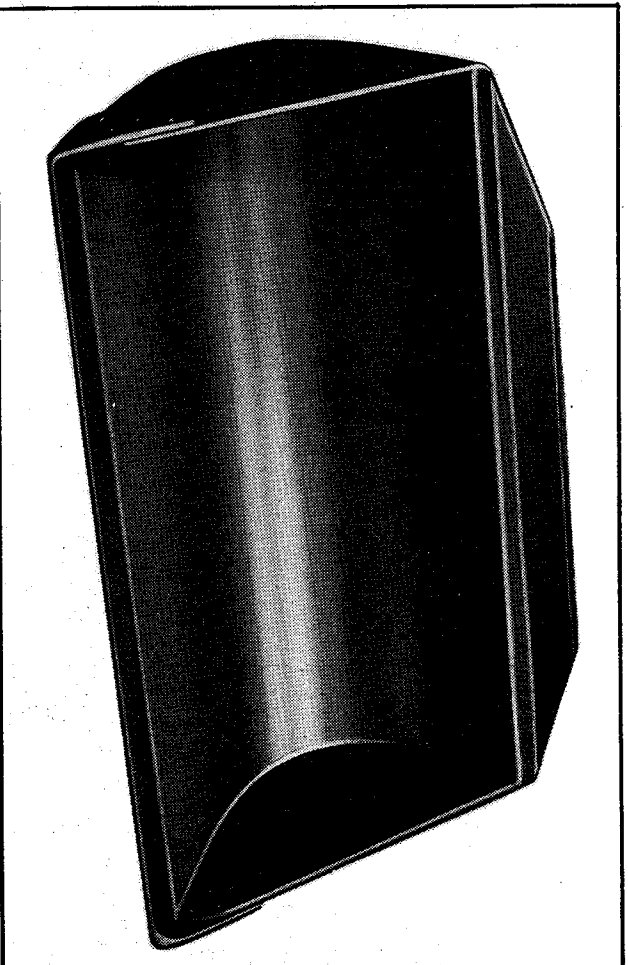


Plate 19 — Light Material Bucket

B80LH40 LIGHT MATERIAL BUCKET

Construction: Made of $\frac{1}{4}$ " high tensile steel plate with a replaceable $\frac{3}{8}$ " heat treated high carbon steel bit.

Use: Provides extra capacity for handling snow, coal, cinders and similar light materials.

Installation Instructions: Same as 60" wide $\frac{7}{8}$ cu. yd. bucket.

Rated Capacity: 2 cu. yd.

Struck Capacity: 1.5 cu. yd.

Height: 44".

Width: 80".

Weight: 1,160 lbs.

BUCKET TEETH

Construction: Made of heat-treated, alloy steel. Bolted to bucket.

Use: For better penetration with standard or 60" wide buckets.

Weight: 11 lbs.

Number Required:

TS8DDH4—Set of 8 with bolts for 80" bucket.

TS6DDH4—Set of 6 with bolts for 60" bucket.

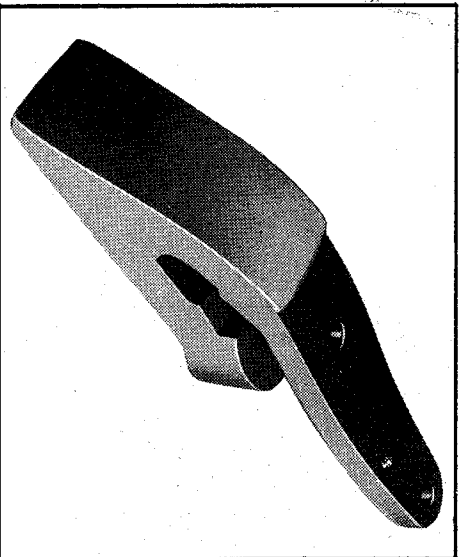


Plate 20 — Bucket Teeth

EXTRA EQUIPMENT

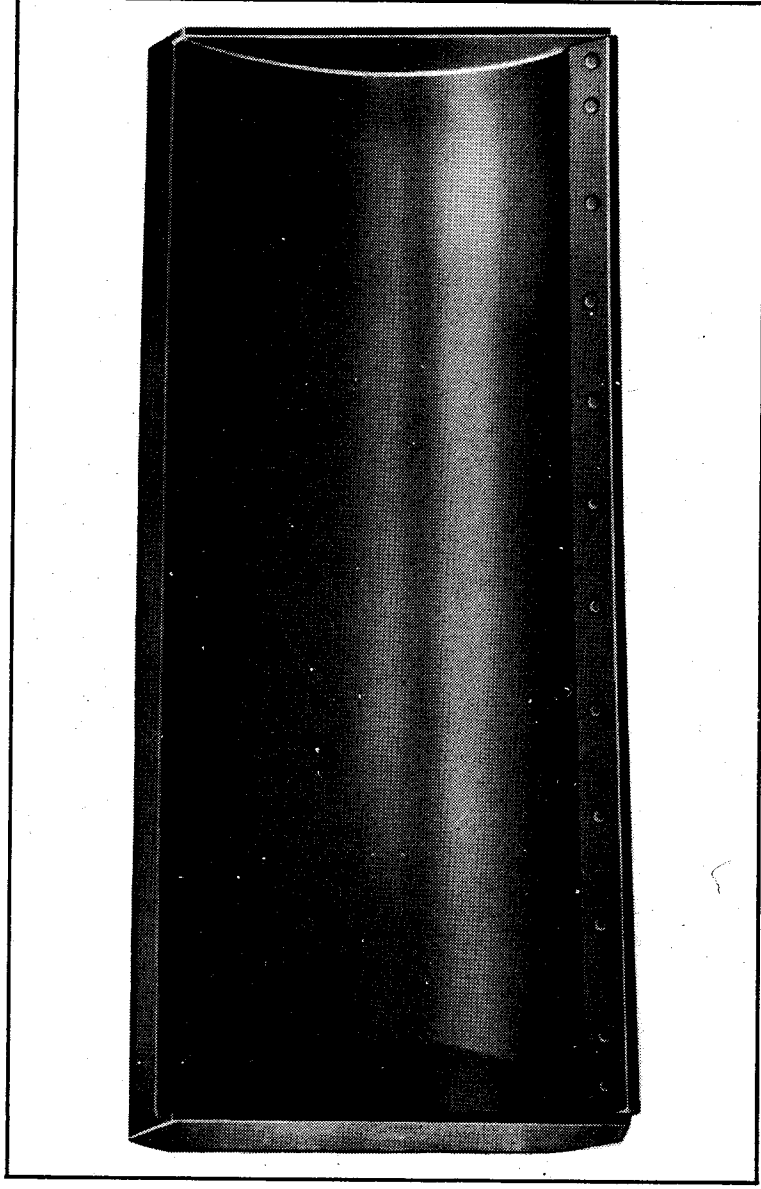


Plate 21 — Bulldozer Blade

BDH40 BULLDOZER BLADE

Construction: Made of heavy steel plate and channels, reinforced and welded into a rigid structure; equipped with bolted, replaceable and reversible high carbon steel cutting edge.

Use: Leveling, backfilling and spreading.

Height: 33".

Depth: 12 $\frac{3}{8}$ ".

Width: 90".

Weight: 710 lbs.

Installation Instructions: Same as 60" wide $\frac{7}{8}$ cu. yd. bucket.

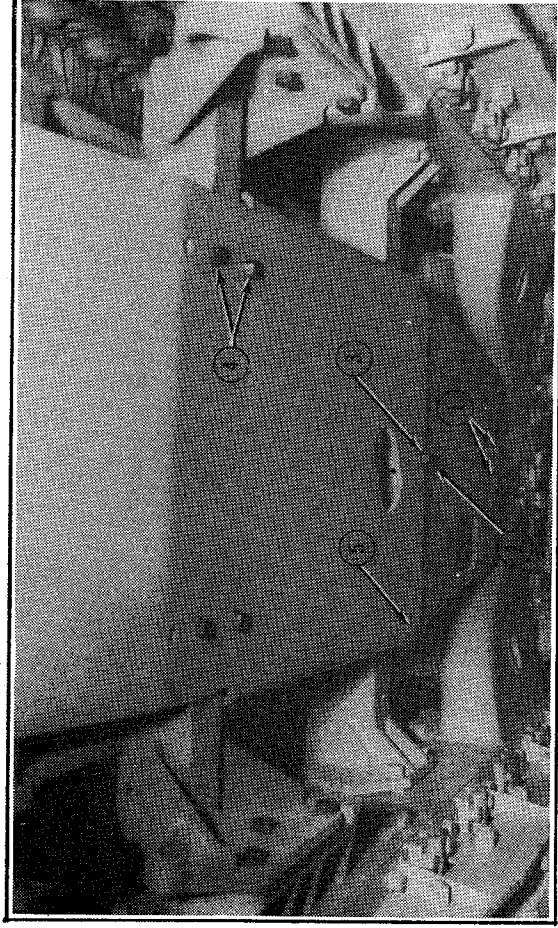


Plate 22 — Crankcase Guard

CG40 CRANKCASE GUARD

Construction: Heavy steel plate.

Weight: 220 lbs.

Use: Operation in rough rocky terrain where protection to underside of all vital parts of the tractor is desirable.

Installation Instructions

Refer to Plate 22. Install rear plate by first placing two capscrews, 1, through holes in drawbar anchor casting and rear center capscrew, 2, into stabilizing axle. Then install front plate by sliding it forward so as to have lugs on front of plate engage the lower front cross member of the TRAXCAVATOR frame. Install capscrew, 3, and front mounting bolts, 4, clamping plates, lockwashers and nuts to TRAXCAVATOR front axle. Then install bolts, 5, from the bottom, clamping plates, nuts and lockwashers to stabilizing axle. Draw all capscrews and nuts tight.

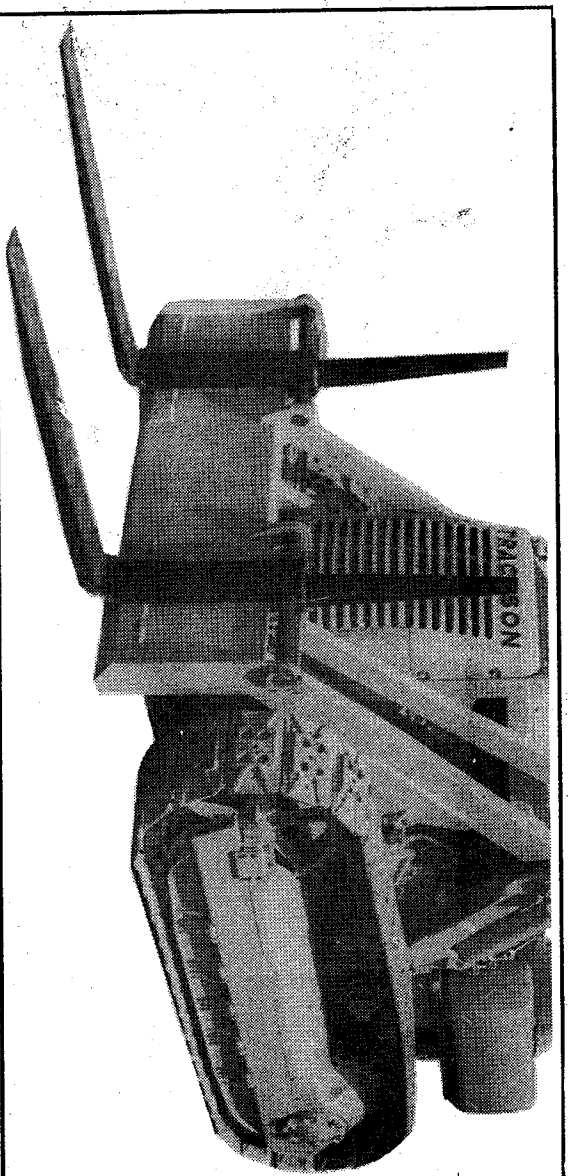


Plate 23 — Lift Fork

FHT40 LIFT FORK ATTACHMENT

Construction: Welded steel.

Weight: 1,015 lbs.

Use: For moving bulk packages, boxes, steel, plate, logs, lumber and similar large heavy pieces.

Capacity: 3' off ground 9,000 lbs.;

full height 6,000 lbs.

Prong Length: 54".

Side Adjustment of Tines: 38" to 74".

Prong Thickness: 2".

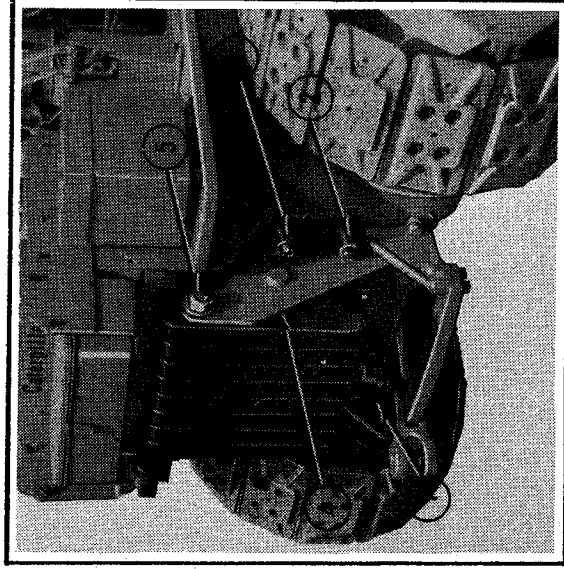
Prong Width: 6".

Installation Instructions

Install Lift Fork carriage using method similar to installation of 60" wide $\frac{7}{8}$ cu. yd. bucket. Position tine upright in front of carriage. Lock in position using shaft and locking bolts on top of carriage. Slide tine sideways to desired position and lock in place with locking pin attached to top of carriage with chain.

EXTRA EQUIPMENT

WT4 COUNTERWEIGHT SEGMENT SET



Construction: Cast iron, mounted on rear of tractor.

Use: To improve balance and performance where machine is digging and load extra heavy materials or operating over unfavorable terrain. Segment Set, consisting of rack and 8 weights, 1,000 lbs.

Plate 24 — Counterweights

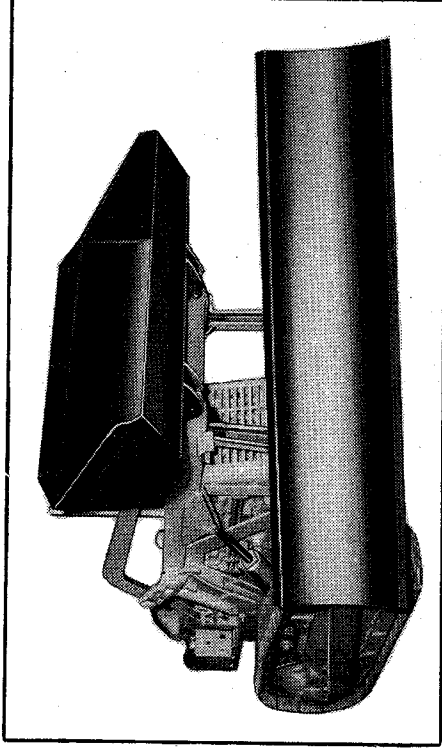
Installation Instructions

Refer to Plate 24. Remove inside bottom, 1, and also top, 2, bolts from drawbar bracket on each side. Replace with studs. On each side remove cork from two upper holes in the rear of the differential housing. Insert a stud, 3, in outside hole on each side. Hang counterweight rack, 4, on studs. Remaining hole on each side takes a capscrew through the rack bracket. Tighten nuts and capscrews, then place counterweight segments on rack. Lock in position by placing locking bar through holes provided in top of rack and segments. Threaded end of locking bar, 5, extends to the right. Segments are held in position by tightening nut on right hand side of counterweight rack.

AGH4 ANGLEGRADER ATTACHMENT

Construction: Blade of heavy steel plate, strongly gusseted and reinforced, and has a reversible high carbon steel cutting edge. Welded "A"-frame pivots on trunnions attached to track roller frames.

Use: Can be used with bucket. Will grade, spread, level, backfill, remove snow, build dikes, etc. Raised and lowered by means of bucket lifting arms.



Height: 28"

Width: 124".

Angle: 0 to 30°

Weight: 2,480 lbs.

Installation Instructions

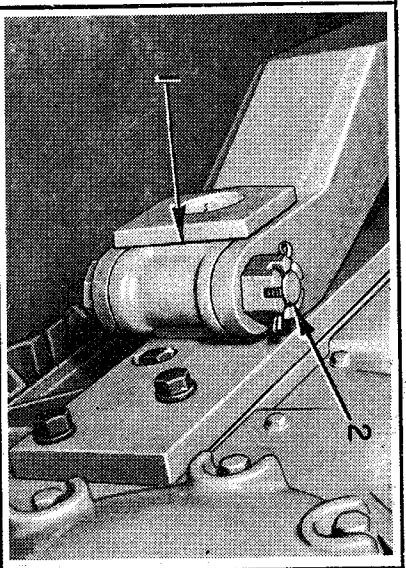


Plate 26

Refer to Plate 26. Attach trunnion brackets, 1, to tractor side frame channels on both right and left hand sides by means of cap screws, 2. Install shorter cap screws in the countersunk holes.

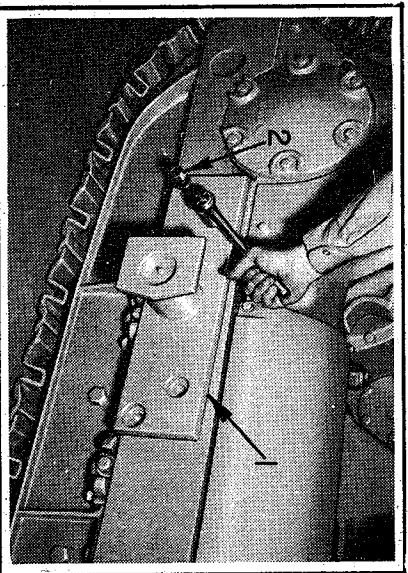


Plate 27

Refer to Plate 27. Block up the hinged end of the "A"-frame and drive tractor into it so "A"-frame ends will fit on trunnion brackets.

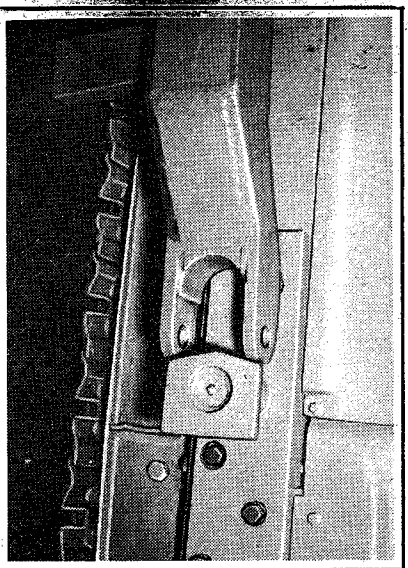


Plate 28

Refer to Plate 28. Place trunnion caps, 1, in place and install bolt, 2, from the bottom. Install nut and lock in place with cotter.

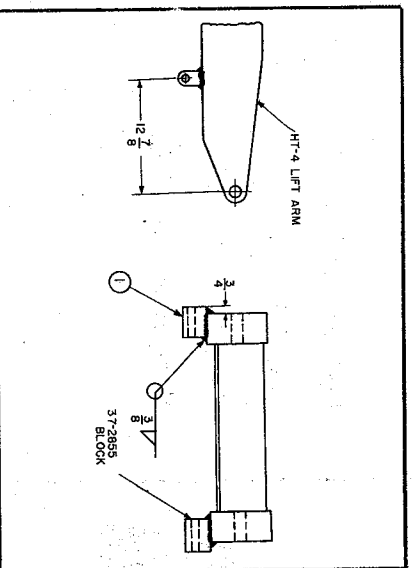


Plate 29

Refer to Plate 29. Locate lug, 1, as shown and weld to underside of right hand lifting arm. Install link between lifting arm lug and lug on "A"-frame. Secure with pin passing through link yoke and lug and lock with cotter. Repeat this process for left hand side of Anglegrader.

EXTRA EQUIPMENT

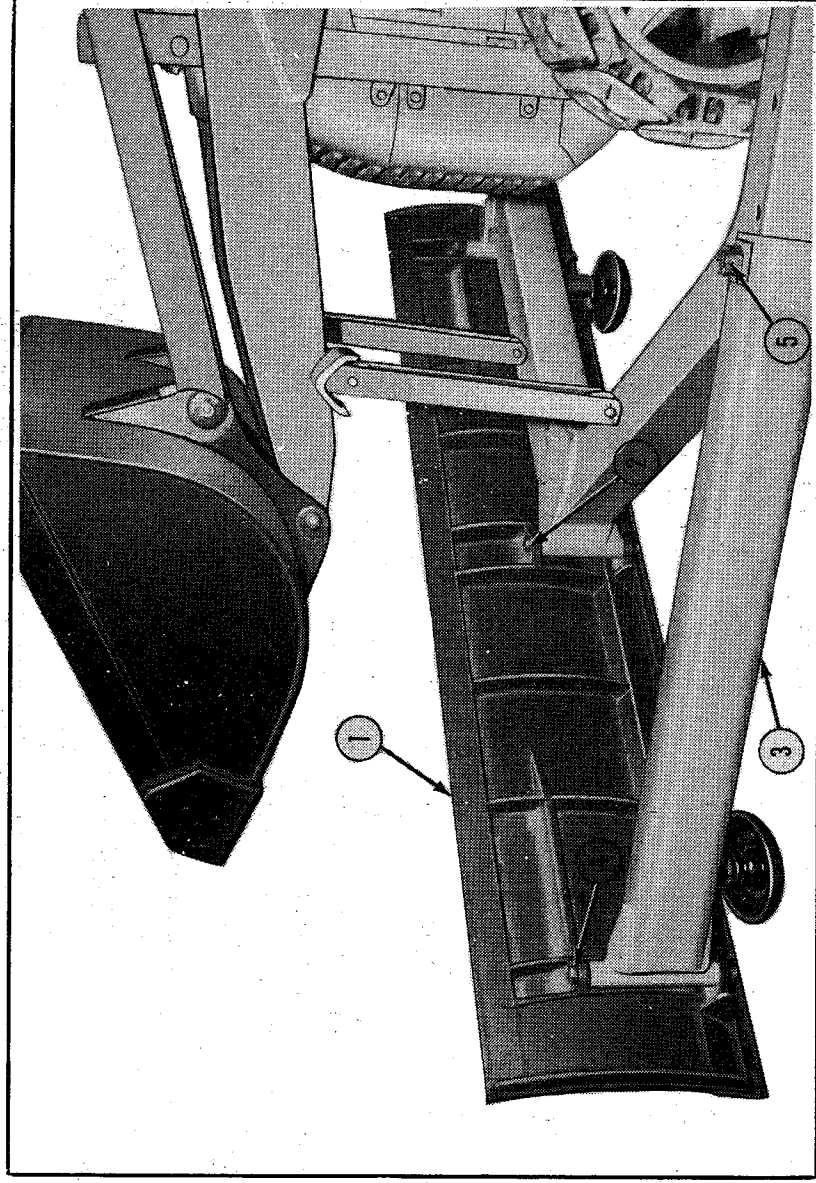


Plate 30

Refer to Plate 30. Place Anglegrader blade, 1, in the vertical position and drive tractor and "A"-frame into position. Insert hinge pin, 2, from the top and lock with cotter. Install the left push arm, 3, to the Anglegrader blade by means of hinge pin, 4, and secure pin with cotter. Install right push arm in the same manner. Set the blade at the desired angle and secure push arms to "A"-frame by inserting machine bolts, 5, in the selected holes from the bottom. Install on top and tighten. Lock in place with cotter.

TROUBLE SHOOTER'S GUIDE

BUCKET WILL NOT RAISE PROPERLY

Possible Cause

Insufficient quantity of oil in hydraulic system.

Remedy

Check hydraulic system for external leaks and make necessary repairs if required. Add oil and check system as per instructions found under "Hydraulic System," page 15.

Pressure control valve set too low.

To check pressure refer to "Pressure Control Valve," page 16.

BUCKET WILL NOT RAISE AND LOSS OF DOWN PRESSURE

Possible Cause

Clamp bolt holding lever 37A2233 to shaft at Hydraulic Control Unit loose.

Remedy

Tighten bolt—before tightening bolt check shaft and lever for damaged keyways.

Failure of Hydraulic Control Unit.

Have a distributor serviceman check control unit.

Failure of tractor front power take-off assembly.

Replace damaged parts in assembly. See tractor manual.

BUCKET WILL NOT LOWER IN FLOAT POSITION

Possible Cause

Hydraulic cylinder assembly damaged.

Remedy

Remove obstruction from around cylinder and replace damaged cylinder parts.

Caution: When operating in freezing temperatures, keep mud and ice cleaned out between frame and cylinder, both above and below.

INNER LEVER WILL NOT STAY IN FLOAT POSITION

Possible Cause

Float arrangement in Hydraulic Control Unit inoperative.

Remedy

Have distributor serviceman check control unit.

INNER LEVER WILL NOT STAY IN RAISE POSITION

Possible Cause

Improper adjustment or worn spring loaded detent block No. 37A2241 located on control lever bracket.

Remedy

Adjust spring loaded block or increase depth of recess in block (see Adjustment Instructions, "Operating Rods," page 18).

TROUBLE SHOOTER'S GUIDE

BUCKET WILL NOT DUMP OR CLOSE

Possible Cause

Clamp bolt holding lever 37A2234 to shaft at Hydraulic Control Unit loose.

Remedy

Tighten bolt. Before tightening bolt check shaft and lever for damaged keyways.

Insufficient quantity of oil in hydraulic system.

Check hydraulic system for external leaks and make necessary repair if required. Add oil and check system as per instructions found under "Hydraulic System," page 15.

Failure of Hydraulic Control Unit.

Have a distributor serviceman check control unit.

Failure of tractor front power take-off assembly.

Replace damaged parts in assembly. See tractor manual.

INNER LEVER WILL NOT RETURN TO NEUTRAL POSITION WHEN BUCKET IS FULLY RAISED

Possible Cause

Automatic kick-out improperly adjusted.

Remedy

Adjust kick-out (see Adjustment Instructions, "Kick-out," page 17.

Improper adjustment of raise lever operating rods.

Adjust operating rods (see Adjusting Instructions, "Operating Rods," page 18).

HYDRAULIC SYSTEM NOISY WHEN RAISING BUCKET

Possible cause

Air being induced into system by lowering bucket in cracked valve position.
*See note.

Remedy

When lowering bucket, be sure inner lever is in either the exact down pressure or float position. (See Plate 4, page 8 for correct lever positions.)

BLOWING OF OIL MIST OUT OF STORAGE TANK RELIEF VALVE WHEN LOWERING BUCKET

Possible Cause

Lowering bucket in cracked valve position. *See note.

Remedy

When lowering bucket be sure inner lever is in either the exact down pressure or float position. (See Plate 4, page 8 for correct lever positions.)

Too much oil in hydraulic system.

With lifting arms raised to the top and bucket dumped all the way remove filler strainer and check amount of oil in tank. With bucket in this position, there should be 1" of oil at the bottom of the tank. If more oil is found, drain surplus until the 1" level is maintained.

COLLAPSE OF RUBBER STORAGE TANK HOSE WHEN RAISING BUCKET

Possible Cause

Insufficient quantity of oil in hydraulic system.

Remedy

Check hydraulic system for external leaks and make necessary repairs if required. Add oil and check system as per instructions found under "Hydraulic System," page 15.

Leaking storage tank relief valve.

Replace relief valve.

EXCESSIVE OIL LEAKAGE AT PISTON RODS

Possible Cause

Piston rod packing leaking.

Remedy

Adjust piston rod packings. (See Adjustment Instructions, page 19.)

OIL LEAKAGE AT STUFFING BOX

Possible Cause

Badly seal ring and back-up washer.

Remedy

Replace seal ring and back-up washer. (See Replacement Instructions, page 20.)

If the inner lever is moved forward past the down pressure position but not far enough to be in full float position, a "cracked" valve condition results. With the lift arm control valve located in Hydraulic Control valve in this position, it is possible to lower arms and still not let oil into the rod side of the cylinder. This forces excess oil into the storage tank and builds up air pressures. Air is then drawn in through the piston rod packings causing a noisy hydraulic system when the bucket is again raised. It also causes higher than normal pressures to be built up in the storage tank. The relief valve in the tank will release normal excess pressures above 25 pounds.