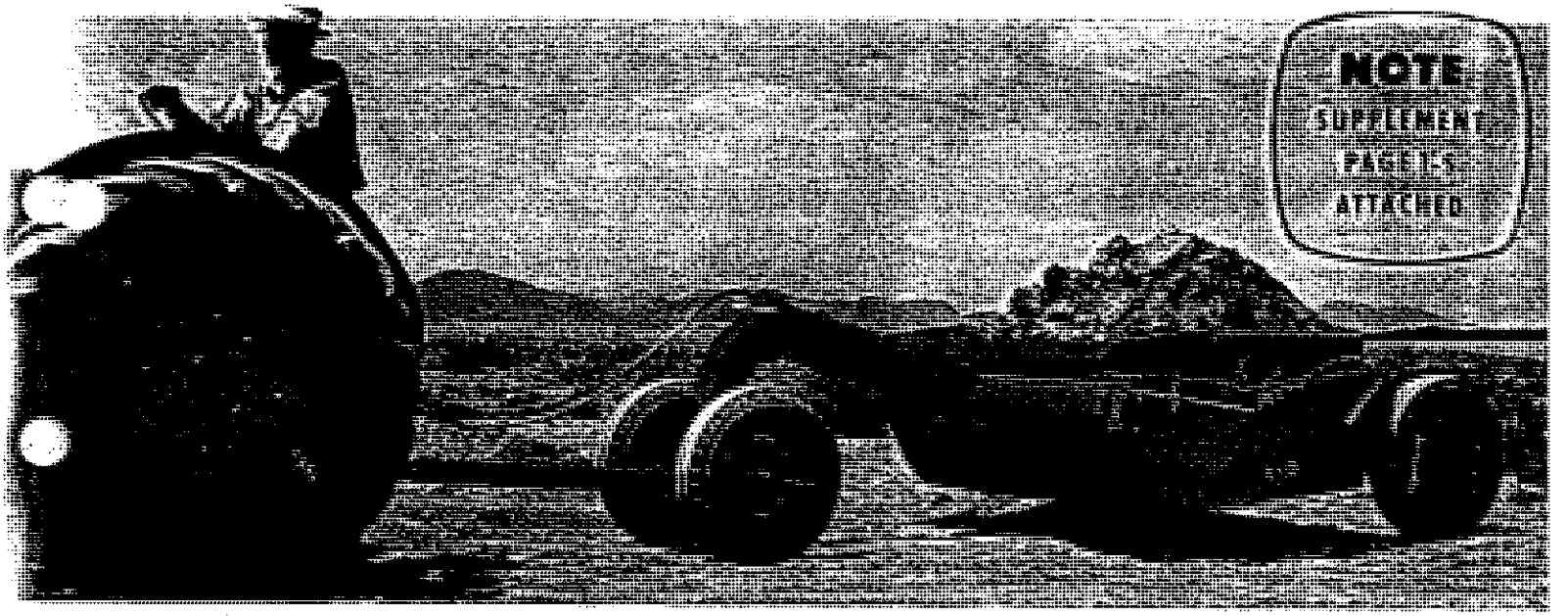


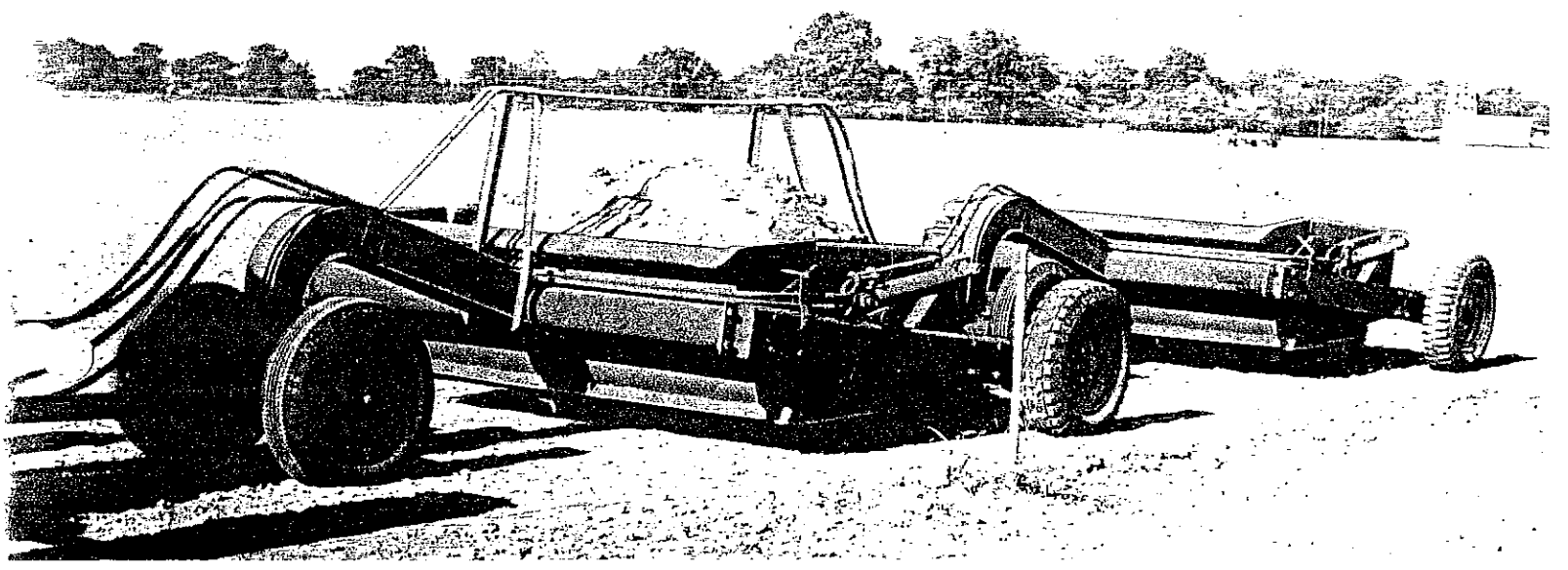
Eversman

scraper MODELS 2S, 2SD AND 2SDT

assembly and operation manual

(including parts list)

THE EVERSMAN MFG. COMPANY CURTIS & FIFTH STS. DENVER, COLO. 80204



MODEL 2S AND 2SD SCRAPER ASSEMBLY INSTRUCTIONS

Figures No. 1 and 2

Remove any tape from bearing posts on ends of bucket (SA 2460). Pull rear cross frame and lift pipe assembly (SA 2456) into position around bucket as shown. Remove Bearing Cap Castings (S 2196).

NOTE: For Tandem Scraper, Model 2 SDT, use rear Cross Frame No. SA 2401.

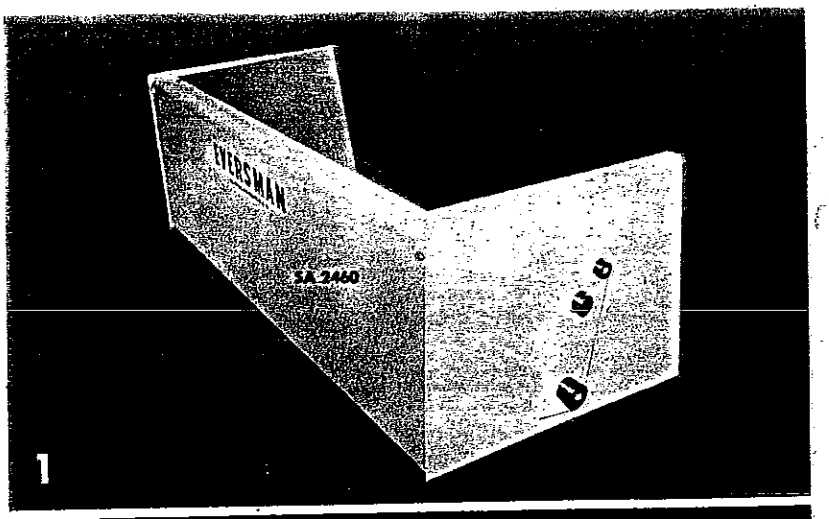
Figure No. 3

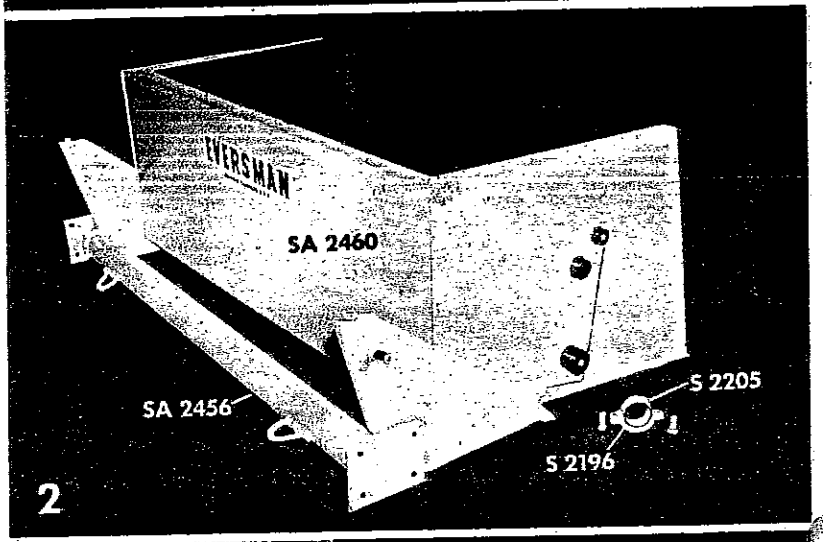
Place Hardened insert bearing sleeves (S 2205, see Fig. 2) over lower bucket trunnions. Pull lift-pipe arms up against bearing sleeves and replace bearing Cap Castings. Be sure small flange on casting is outside end of bearing sleeve, then tighten bolts securely.

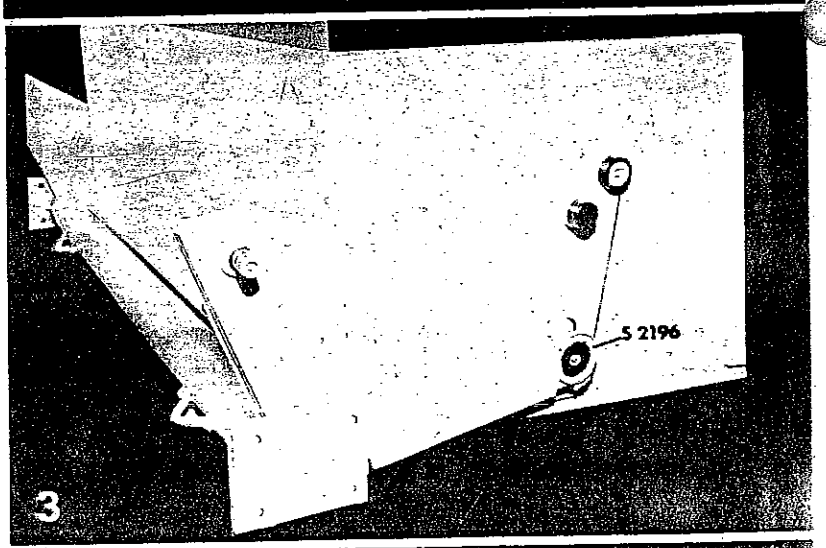
Figure No. 4

Place rollers (S 3056) on upper bucket bearing posts and secure with snap ring (S 2134). Move gate (SA 2449) into position around front of bucket. Connect gate to bucket as shown with Link Bar (SA 2426) using snap ring (S 2151).

NOTE: The Link Bar pivots are subjected to heavy pressure and the two zerks should be lubricated daily while operating the scraper.







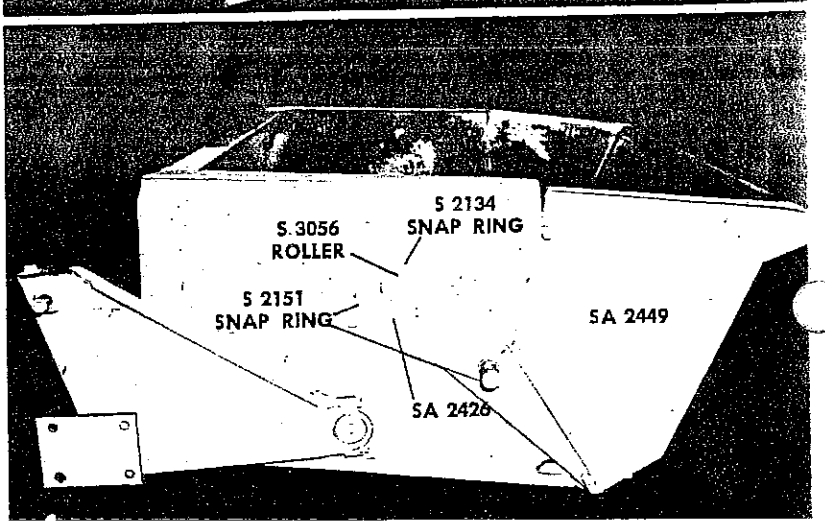


Figure No. 5

Block rear cross frame pipe (SA 2456) up 6 to 10 inches and rotate end plates as necessary to install the four ¾ x 4½" bolts with heads inside as shown. Use lock washers and hex nuts.

NOTE: For Tandem Scraper, Model 2 SDT, rear cross pipe (SA 2401), install two ¾ x 4½" bolts at rear with heads inside and use lock washers and hex nuts. For front two bolts use ¾ x 4¼" bolts with heads outside of side rails and fasten with jam nuts. Also see Figures 14A and 14B, page 5.

Figure No. 6

First thoroughly grease inside of side rail bearing tubes. Start side rails (SA 2461) and (SA 2462) over the four bolts on the rear cross frame then start the bearing tube on the side rail over the bearing shaft on the end of the gate as shown.

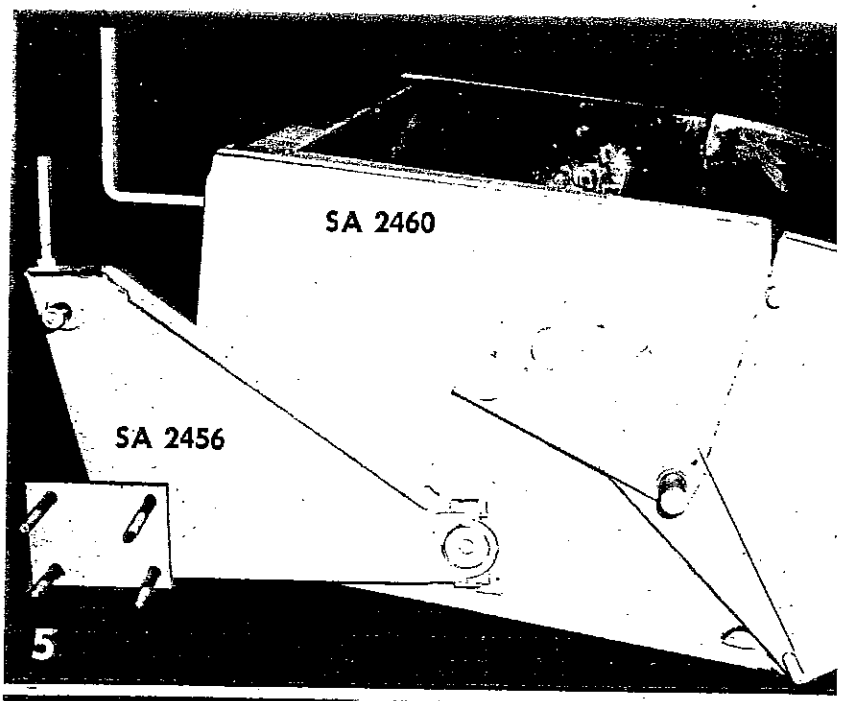
NOTE: (1) It may be necessary to raise or lower the rear cross frame member. (2) It sometimes helps to use one of the 5½ inch long bolts temporarily in place of one of the rear bolts of the rear cross frame. On the side most convenient for the operator to see, screw transport gauges (S 2240) and (S 2245) into welded nuts and lock with ⅝ inch jam nuts. Be certain the gauge rods clear when scraper is run through first cycle.

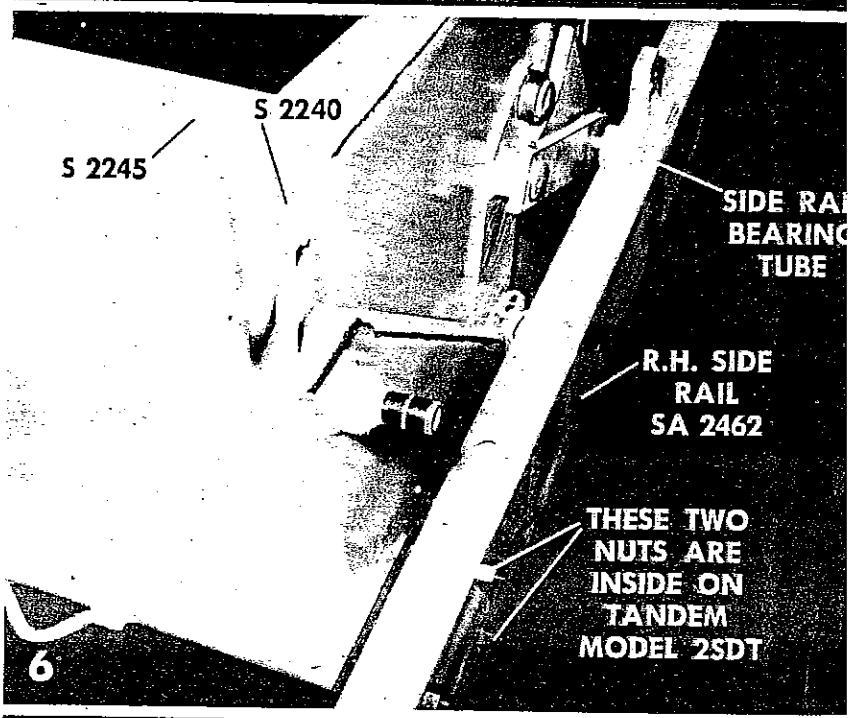
Figure No. 7

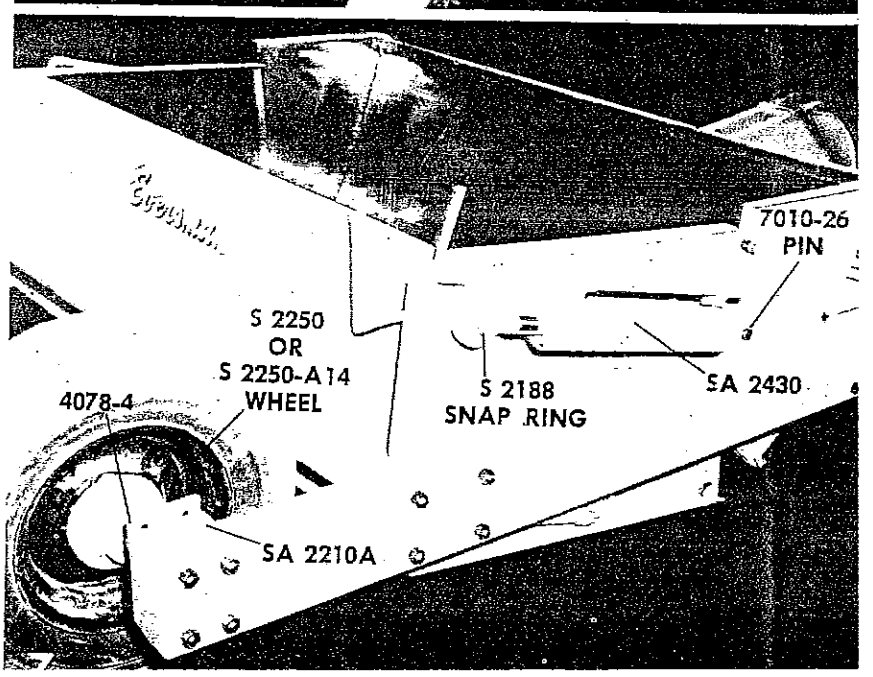
Remove plugs from cylinder (SA 2430) ports. First, attach rod end of cylinder to pin on rear cross frame arm using snap ring (S 2188). Then connect anchor end of cylinder to post on side rail using (7010-26) pin and ½ inch cotter. Attach spindle brackets (SA 2210A) to rear of side rails with ¾ x 6½ inch bolts. Use flat washers over slots in brackets.

NOTE: Attach spindle brackets (with hubs factory installed) on outside of rails if dirt moving is to be done in open field, or attach them to inside, so wheels will be behind bucket, if pit silo or any other operation requiring a vertical cut is necessary. See operating instructions pages 6 and 7. Also note that the slots in the spindle brackets will permit leveling the cutting bit after scraper is completely assembled. Install S 2250-A14, 14" wheels, or S 2250-15" wbeels (optional). Used 8:00 x 15 tires may be installed on the rear wheels; however, care should be taken to be certain tbat tires are the same diameter on both rear wheels. Caution: You must assemble the rear wheels to the hubs with the concave side of the wheel against the hub face and the valve stem hole of the wheel on the opposite side from the hub.

NOTE: It is possible to produce a "built-in" twist in the scraper bucket and gate by improper assembly. Do *not* tighten bolts as each joint is connected. Instead, merely set them snug until all parts are assembled. Then run the scraper through the cutting and dumping cycle several times and progressively tighten the bolts a little at a time by working around the machine until all are thoroughly tightened. Then, after several hours of field operation, recheck tightness of all bolts using a long wrench.







Figures No. 8 and 9

Connect front cross frame and goose neck (SA 2337A, Fig. 8) or straight tongue front end (SA 2338A, Fig. 9) to side rails using two ¾ x 5" and ten ¾ x 4½" bolts. Note that the top rear bolts (¾ x 4½") also hold the hydraulic pipe mounting brackets (S 2373) as shown in Fig. 10. On straight tongue model 2S (SA 2338A) install cast clevis S 2050 using two one-inch pins (SA 2026) and ¼ inch cotters.

NOTE: When connecting S 2050 clevis to tractor be sure to use proper size bolt to fit the hole in your drawbar and tighten nut on this bolt. Do not attach S 2050 to drawbar using only a clevis pin.

Figures No. 10 and 11

The oil pipes, hoses and cylinders may all be assembled before placing any of them on the scraper. It is extremely important that the hydraulic line assembly be followed exactly as detailed:

Line A—Screw one short, bent ½ inch pipe (SA 3118A) and one long bent pipe (SA 3119A) into the the ends of a ½ inch tee (S 3121). Next screw the long, straight 47" pipe (SA 2429) into the front of the tee. Attach 7104 swivel connectors and BA 58 hoses to the rear ends of these pipes and then attach the rear end of the BA 58 hoses to the S 3092 pipes leading to the rear ports of the cylinder (SA 2430).

NOTE: Both sides of the Line A must lead to the same (rear) ports of the cylinders.

Line B—Connect the short, (45") straight front pipe (SA 2428), through a tee, into short and long bent pipes, and then attach the BA 58 hoses through the 7104 swivel connectors. Then connect the rear of the BA 58 hoses to the front ports of the cylinder into 90° street elbows.

NOTE: Both sides of Line B must lead to the same (front) ports of the cylinders.

Figure No. 12

Center the hydraulic pipes over the front cross frame pipe and clamp the rear ends of the pipes to pipe brackets (S 2373) with pipe clips (7058) and ½ by 2 inch bolts. NOTE: that the pipes are *located* on the front cross frame *behind* the gate bumper bracket which is welded on the cross frame. The pipes should *not* be put *through* this bumper fitting. Clamp the front end of the hydraulic pipes to the goose neck or straight front ends of these pipes and install the 88" long hoses (4055). Hook the gate springs (S 2102) into the holes in the gussets at the ends of the front cross pipe. Then connect the rear ends of the springs to the grooved posts on the gate.

Figures No. 13 and 14

For dolly model scraper (2 SD), install 9140 (14") wheels on SA 2343B dolly axle assembly. SA 2347A hubs are factory installed and greased. 15" wheels (9034) are available as optional equipment. Used 6:70 or 7:10 tires may be installed on dolly wheels.

Raise gooseneck front end (SA 2337A) and set socket on ball hitch of axle. Secure ball in place with keeper plates (S 2025). Be certain that keeper plates have machined surfaces fitting against the ball and that the crack between the plates is on the left and right hand sides before tightening the ¾ x 1½" cap screws down securely with lock washers under the heads. *Lubricate* the ball hitch *thoroughly* and *frequently*. Install swivel clevis SA 2300 for use with wheel tractor, or clevis SA 2301 (optional equipment) for crawler tractor, using SA 2026 clevis pin and ¼ x 1½ inch cotter.

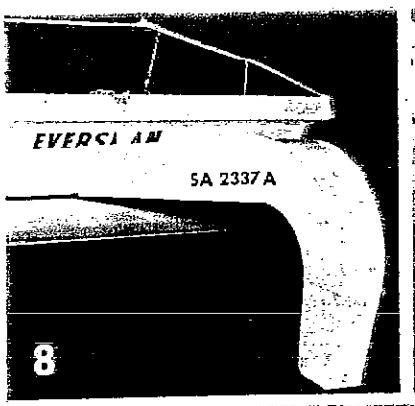
NOTE: When *replacing triple lip seal* (S 2349) on dolly axle spindle proceed as follows:

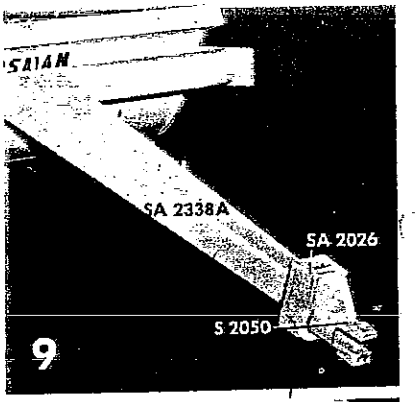
(a) Grease must be thoroughly packed between seal lips before assembly.

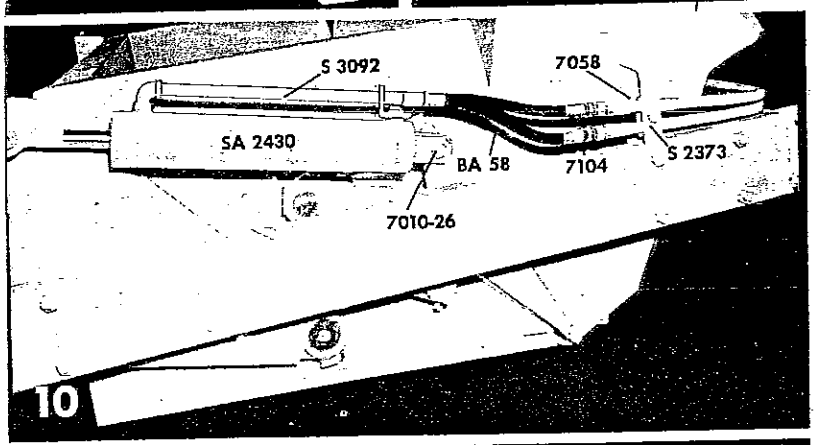
(b) Install on spindle with small metal ridge on *inside* and against spindle shoulder. The larger diameter metal ring will then be *outside*, and against the 5013-29 bearing. To install seal squarely on spindle it is good procedure to drive seal on with inner bearing 5013-29.

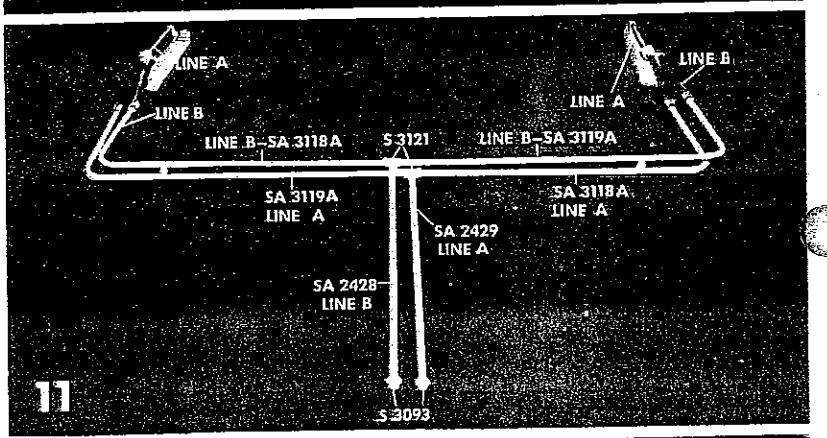
(c) Then install hub casting SA 3109 and outer cone and cup and washer.

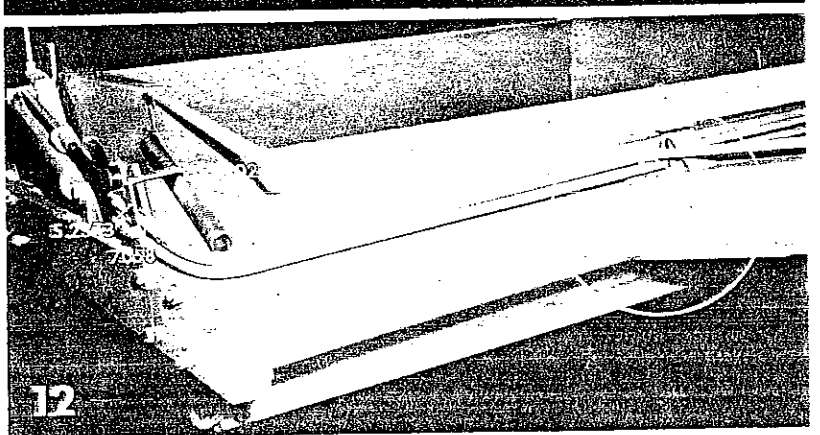
(d) Tighten S 3122 slotted nut with 50 pounds torque to insure that bearings are fully seated. Then back off nut until hub will turn freely without any looseness in the bearings and lock with 7077-18, $\frac{5}{32}$ x 1½" cotter pin. Lubricate hub thoroughly before operating.

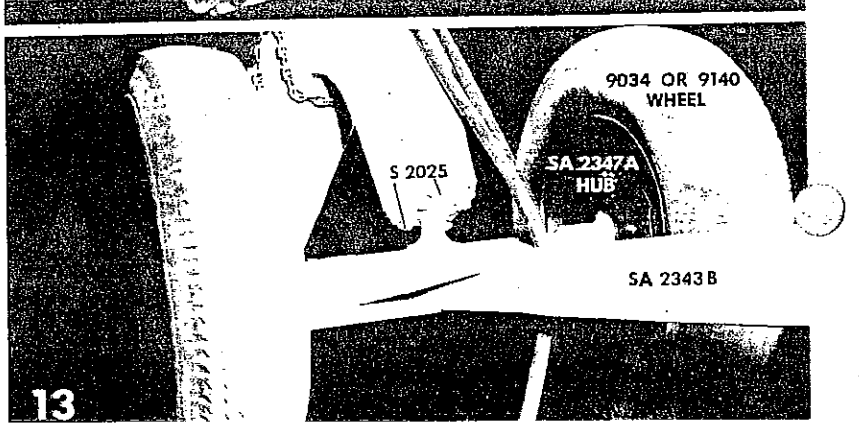












Figures No. 14A and 14B

These pictures cover the special parts necessary for assembly of the model 2 SDT which is the front unit of the tandem scraper combination. All previous assembly is the same as shown for the standard model 2 SD, except for the tandem lift pipe SA 4201. See "note" Fig. 5 for installation instructions of the SA 2401 rear cross frame and lift pipe.

Attach front support SA 2415 by resting cross bar on top of gooseneck and fastening bottom of legs with the ½ x 11" hex bolt. Attach rear support, SA 2420, to angles welded to lift pipe with four ½ x 1¼" hex bolts. Assemble S 2424 hydraulic pipes to front and rear supports with 7058 pipe clips. The front ends of the S 2424 pipes will go between the SA 2428 and SA 2429 pipes and are held in place with the S 2224 pipe clip. Attach 4058 hose to front of S 2424 pipes and 7106 quick-disconnect couplers to rear of oil pipes. Attach S 2301 crawler clevis, with SA 2411 pin and ¼ x 2" cotter, to fitting on rear of SA 2401 cross pipe.

NOTE: (a) The model 2 SDT *must* be the front unit of the tandem combination since the standard lift pipe of the model 2SD is not reinforced to permit pulling the trailing machine (b) The trailing scraper *must* be a model 2 SD. Do *not* attempt to pull a model 2 S since the SA 2401 cross pipe is not designed for large vertical loads. (c) You must have two control valves on the tractor in order to operate both units of the tandem combination. (d) The tandem units can be operated separately on different tractors if desired.

Check tightness of all bolts after assembly and retighten all bolts again after first day's use.

Run cylinders through a complete travel both ways several times to expel air. Then check oil level in tractor pump reservoir and fill if low.

Figure No. 15 (Optional Equipment)

To mount trench bit attachment kit (SA 2380), remove rear bolts which hold rear cross frame pipe to side rails and replace bottom bolts with ¾ x 5" bolts furnished with the attachment. Attach high carbon bit (S 2385) with bevel on back side and cutter end leading using ½ x 1¼" carriage bolts as shown. Also see Figure 29.

Figure No. 16

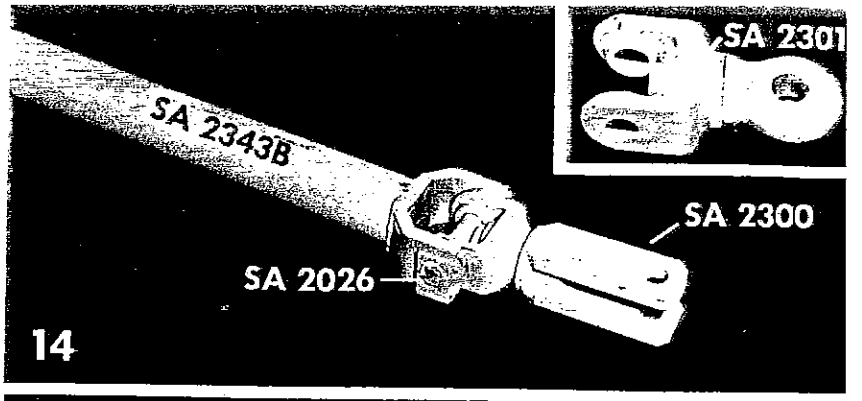
(ROCK SHIELD KIT (SA 2386) (Optional Equipment)

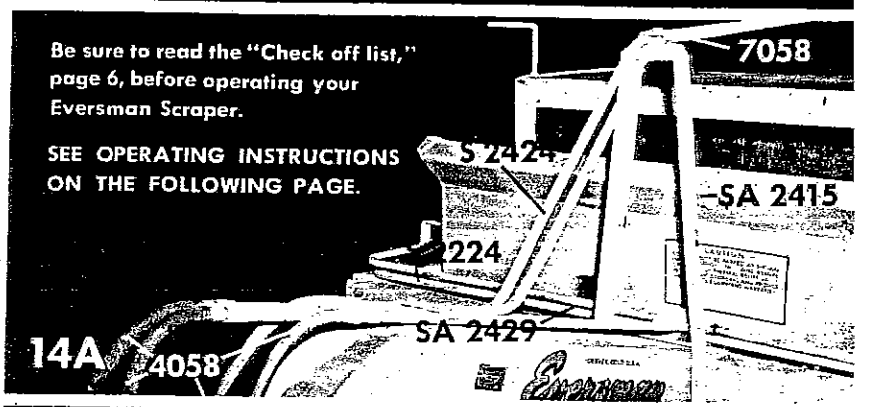
Before operating in rocky or gravel soil it is recommended that this kit be installed. Rocks can spill over the sides of the bucket, lodge between the side rails and bucket and damage the hydraulic cylinders. Put scraper in transport position as per Figure 16. Weld bucket extension plates (S 2021) and (S 2022) to top sides of bucket as shown. Attach rock shields (SA 2387 LH and SA 2388 RH) to the side rails with U-bolts (S 2397), as per Figure 16, with the rear angle brace 1 inch from rod end of cylinder. Run scraper through full cycle before tightening bolts. If operation cycle is satisfactory, tighten shields to side rails.

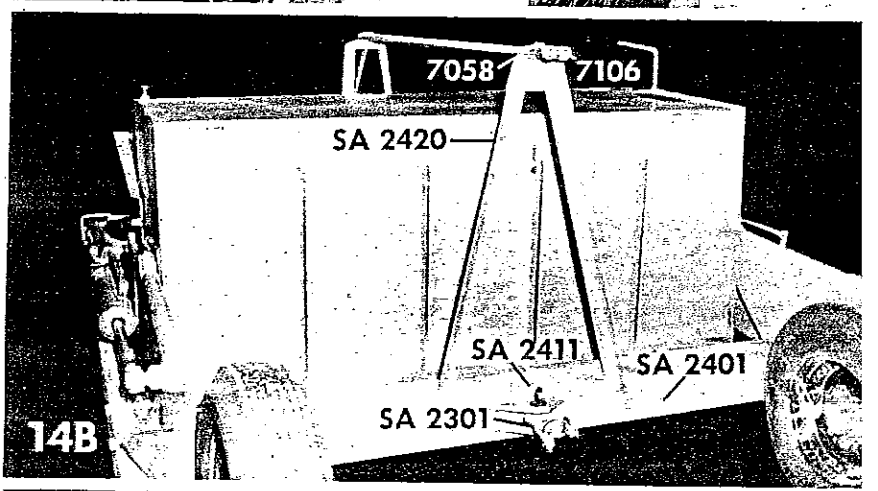
Figure No. 16A

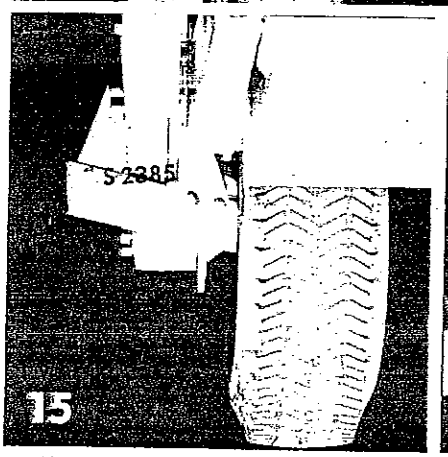
PLEASE NOTE: It is recommended that you install a cushion (or cross-over relief) valve (Kit No. SA 2485, Page 11), BEFORE OPERATING if your tractor has a hydraulic system which develops pressures in excess of 1500 psi. The scraper hydraulic components are not subject to warranty if this valve is not installed where used with tractors with system pressures of 1500 psi and over.

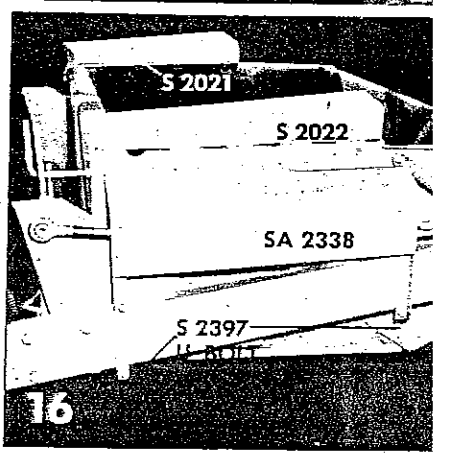
The Eversman Scraper does not require a pressure greater than 800 to 1000 psi for operation. Some tractor systems can develop pressure considerably over 2000 psi when the control valve is held open at the end of the cylinder stroke. Since these pressures are not necessary to operate the scraper, the cross-over valve is designed to by-pass the excess and to protect the other parts of the hydraulic system—and at less cost than to install special high-pressure cylinders.

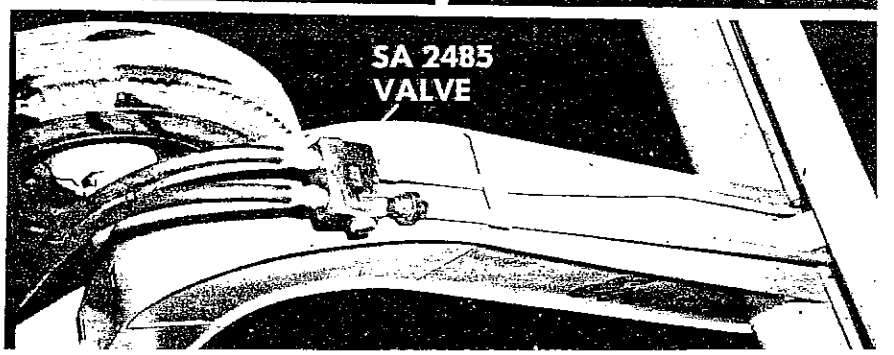












CHECK OFF LIST—How to Get Best Results From Your Eversman Scraper

Before entering the field to start moving dirt, check the following points so your Scraper will function properly from the start and give the best possible performance. A few minutes taken now may avoid much time lost in field delays.

1. Inflate all scraper tires to 40 pounds pressure.

2. Run cylinders through full cycle several times to expel air and fill the scraper hydraulic system with oil.

3. Check the hydraulic fluid in your tractor and fill if low. If your tractor pump is not delivering proper pressure or flow, you cannot obtain good performance and accurate control of the scraper.

4. Place the scraper on a smooth, level (or flat) surface (preferably on floor or driveway). (*a*) Lower the bucket until the cutting bit just touches the floor and notice if both ends of the bit touch simultaneously. (*b*) If not, jack up the frame on the low side and lower the spindle bracket S2210 the necessary amount. (Recheck part "*a*".)

5. Check depth gauge. (Fig. 19) With the cutting bit approximately ⅛ to ¼ inch off the floor, notice if the leading edge of the rear pipe brackets (or cutting gauge) S2373 lines up with the marker on the front of the gate. If not, bend it slightly until it does.

6. Recheck tightness of all bolts (especially any side rail bolts that were loosened). Use a long wrench and thoroughly tighten all the ¾ bolts.

7. Check hauling gauge. (Fig. 7) The top of the haul position indicator rods should line up when the gate is closed and the bucket is at the correct height for hauling the load.

8. Carefully read the lubrication chart page 9. Long service life depends on liberal use of grease.

9. Be sure the couplers connecting scraper hoses to the tractor are wiped free of dirt and are positively connected.

10. A forward movement of the tractor control valve handle should cause the bucket to raise. (for normal operation) If not, correct by reversing hose connections to tractor.

11. For the Model 2S Scraper, check if the swinging drawbar will carry 2000 to 2500 lbs. vertical load without excessive bending. If not, it must be shortened or reinforced. Never connect the Model 2S directly to a loop drawbar. When connecting the Model 2S to your tractor, adjust the height of the tongue clevis so the lower hole in the clevis is 12 inches off the ground. With this heavy load on the drawbar extreme caution should be exercised to prevent lifting the front tractor wheels off the ground and possibly overturning the tractor.

12. To allow for thermal expansion in hydraulic system, particularly during periods of warm days and cold nights, bleed about a teaspoonful of oil out of each coupler of the scraper system after disconnecting from tractor.

PLEASE NOTE: It is recommended that you install a cushion (or cross-over relief) valve (Kit No. SA 2485, Page 11), BEFORE OPERATING if your tractor has a hydraulic system which develops pressures in excess of 1500 psi. The scraper hydraulic components are not subject to warranty if this valve is not installed where used with tractors with system pressures of 1500 psi and over.

The Eversman Scraper does not require a pressure greater than 800 to 1000 psi for operation. Some tractor systems can develop pressure considerably over 2000 psi when the control valve is held open on the end of the cylinder stroke. Since these pressures are not necessary to operate the scraper, the cross-over valve is designed to by-pass the excess and to protect the other parts of the hydraulic system—and at less cost than to install special high-pressure cylinders.

CAUTION: Check and be sure your tractor brakes are in good working order. For road gear hauling the rear wheel brakes should be ganged together to engage simultaneously. *Always Operate Safely!*

OPERATING INSTRUCTIONS

The Eversman Scraper will work under a very wide variety of soil and moisture conditions, however, dirt moving is primarily a dry soil operation. If the soil sticks to the wheels and builds up excessively, it is too wet to work. Excessive slippage, unnecessary power consumption, and over compaction of the fill areas may result. On extremely hard "dried-out" soil it may be more economical to loosen it first with plow, stiff shank teeth, or subsoiler.

The questions of top soil removal, proper finished grade and balancing out your cuts and fills can be answered by your local, state, or federal technicians if you are in doubt.

It does not require any special skill or training to operate the Eversman Scraper. However, a little experience plus good management can help get the job done more quickly. The *TOTAL YARDS MOVED PER HOUR* depends on:

(1) *Having a Definite Planned Program* and following it.
(2) The *Average Load Size.*
(3) The *Hauling Distance.*
(4) The *Speed of Operations* (or total time per cycle).
(5) The amount of *Lost Time* from interruptions, unnecessary stops, etc.

It will pay in time and fuel saved to lay out a definite program before you start your project, especially on field leveling or terracing. Some suggestions on planning "cut-haul-fill" patterns are covered below under "Field Grading."

LOADING—(Figures 17 and 18)

The *size* of your *Loads* will depend on: (1) the tractor power and traction; (2) the soil conditions; and (3) your operating skill and procedure. Your average load size can usually be increased with practice. While the Eversman 2S and 2SD can be heaped to a 2½ yard capacity, in general, more yards per hour can be moved by taking the largest load you can pick up quickly, then hauling, unloading, and returning as fast as you can safely.

Under some conditions (like loading sand) speed may help in heaping the load, while in others power is more often a factor. Generally, its preferrable to make long, *Thin, Smooth Cuts* and *Keep the Tractor Moving.* It is better for succeeding loads to keep the cut area relatively smooth.

Normally the *Best Gear for Loading* is the highest gear in which the tractor will spin the wheels before stalling the engine. When possible, make the cut in the same direction as you haul to save time and avoid turning with a full load. Start to make your cut as you approach a slight ridge, or high spot. It requires power to take the dirt back and up in the bucket which can best be supplied by cutting into the ridge.

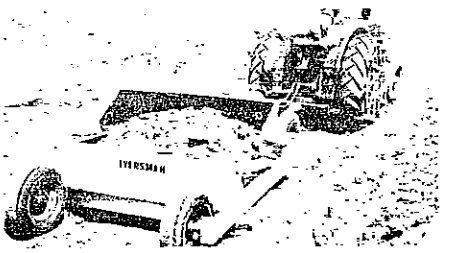


Figure 17

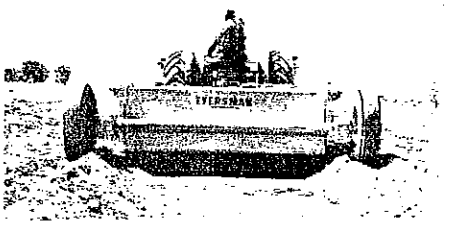


Figure 18

For work where it is not required to have the rear wheels inside the frame (Fig. 35), you will find it easier to *Control The Cut Accurately* with the *Wheels Outside* (Fig. 36) (unless your field is very rough or corrugated.)

CUTTING GAUGE—(Figure 19)—The cutting gauge will aid you in making smoother cuts with the wheels inside the frame and permit you to judge the depth of cut when working with the wheels outside. The gauge line or marker at each side on the front of the gate should line up with the top of the rear hydraulic pipe brackets when the cutting edge is ⅛ to ¼ inch off a level floor. (See item 5 of "Check off list") This represents "zero cut" with the wheels outside the frame.

When the wheels are behind the bucket, the cutting edge is lowered progressively deeper as the rear wheels enter the cut area. By raising the bucket until the cutting gauge lines up, you can "level-off" and maintain a smooth constant depth cut. If you are short on power, "level-off" sooner and make a thinner cut.

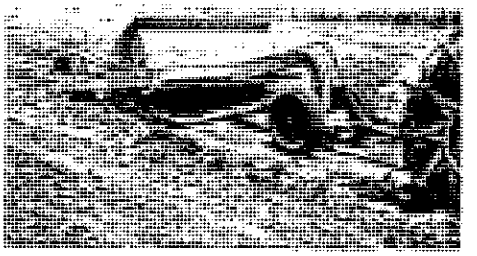


Figure 19

HAULING—(Figures 20 and 21)

If the field or work area is rough or the distance to haul is rather long, it will be worthwhile to make a *Smooth Hauling lane* and possibly a separate return path so that you can haul and return in a high gear. (For route patterns see Field Grading)

As you are leaving the loading area, raise the load to the indicated hauling position.

HAULING INDICATOR GAUGE—(Figure 6)—The rods (S2245 and S2240 shown in Figure 6 are a visual aid to help the operator stop the bucket in (approximately the optimum) "haul position" (that is, when the top of the rods are even).

The gate should close automatically. If in some soil conditions the gate is reluctant to close, raising the bucket slightly above the haul position and jogging it back down will usually close it. If the soil is so damp or gummy the gate will not close it will not spill out even with the gate partially open.

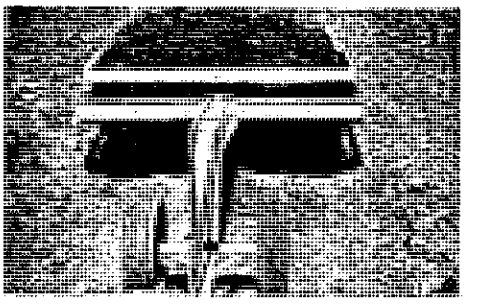


Figure 20

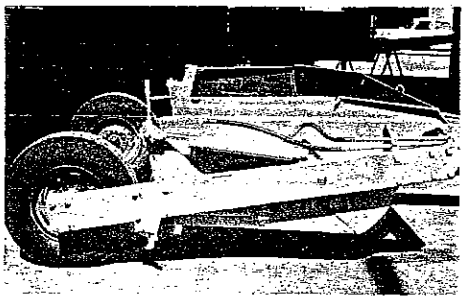


Figure 21

SPREADING AND DUMPING—(Figures 22 and 23)

One of the best features of the Eversman Scraper is the wide range of dumping and spreading which can be easily controlled from the tractor. From the hauling position, the bucket rotates swinging the cutting edge down and back thru a minimum spread position and up to a full dump position. Since bucket can be stopped at any point, the thickness of the spread can be varied from approximately 3 to 12 inches.

The gate opens automatically as the bucket moves from minimum to maximum spread. Thus the operator can *determine* the *Minimum Spread Position* by noting when the gate starts to leave its rest or stop.

All the load, even in damp sticky soils, should be emptied without difficulty since the bottom of the bucket rotates past vertical. To save time the bucket can be returned to the hauling position or slightly below while enroute back to the loading site.

You can avoid pulling full loads over loose fills, by spreading the first load at the far side of the low spot, then placing each succeeding load behind the previous one.

Some owners attempt to spread dirt with the cutting bit by backing up the scraper in full dump position. This practice can result in serious damage to the cylinder piston rods unless the tractor control valve is opened to return the scraper to transport position.

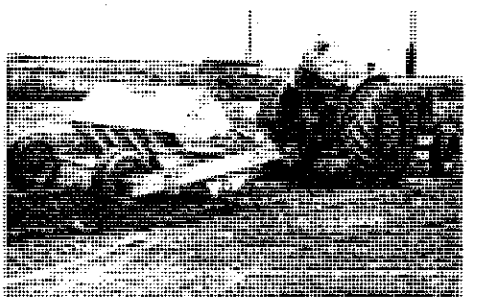


Figure 22

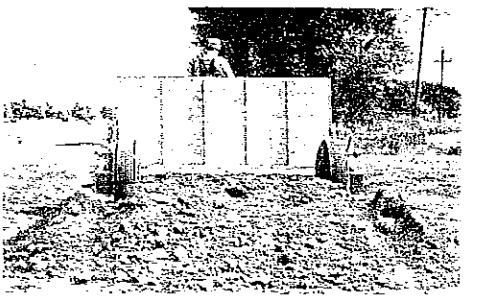


Figure 23

Figure 27

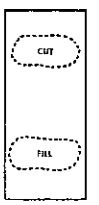


Figure 24

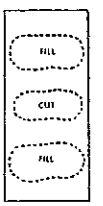


Figure 25

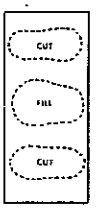


Figure 26

FIELD GRADING

It will pay to determine, before you start operations, the areas to be cut and filled, the depth of each cut and fill, and the best haul route pattern. It is cheaper to haul in two directions from the same cut if possible. There are, in general, three "cut-haul-fill" patterns, as noted above. Sometimes they can be combined at a definite saving.

If you can work plan shown in Fig. 25 or 26, rather than 24, it will save travel and turning time. It may be possible to reduce empty travel time by combining several cuts, hauls and fills on the field in one overall or continuous circuit. Often it is profitable to pause and walk around the project to review your progress.

Figure 27 shows an efficient method of working in a cut area. For cuts up to 3 or 4 inches, you can put the wheels outside the frame, and leave strips 2 to 5 feet wide so the amount cut off can be easily seen. Clean out the strips and repeat the process as many times as necessary. Add the depth between levels to determine the total removed. CAUTION: If cuts are made more than 4 inches deep and the strips are long, it will be easy to get "high-centered" with a load.

POND CONSTRUCTION—(Figure 28)

Start the base of a dam or levee wide enough so there is width for the tractor and scraper on top of the finish structure with proper side slopes. Thin spreading will give the firmest fill and make succeeding passes easier. Avoid sharp turns and pulling loads up steep inclines.

PIT SILO AND TRENCH CONSTRUCTION—(Figure 29)

Mount the rear wheels inside the frame. Move the tractor tires in to less than 95 inches overall width. Install the trench bit attachments (Optional Equipment) under the side frame rails (Figure 29) so that you can cut deeper than 10 inches. Make your cuts downhill if power is limited. It is best to take long thin cuts and keep the bottom of the trench fairly smooth. The loading indicator will aid in this (see section on Loading). If one side of the trench gets deeper than the other, this can be corrected by crowding the bank on the shallow side.

FREEING STUCK SCRAPER—(Figure 30)

Should you become stuck and cannot lift the load enough so you can move forward, try to get the bucket in the full dump position by first backing then dumping the bucket as you move forward. This gives 12" under the cutting edge. If this fails, move the tractor behind the scraper as shown in Figure 30 and pull to the rear. CAUTION: *Pull only from the lugs provided. The rear pipe contains bearings and will not function if bent.*

TANDEM SCRAPER (Figures 31 and 32)

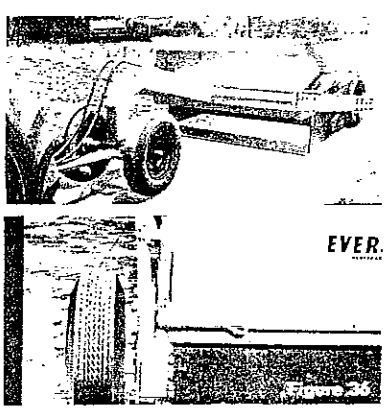
For long haul, large yardage dirt moving the tandem scraper combination is an economical, low operating cost system. It requires very little more power to carry 5-yards per trip since the front unit is loaded, then raised to transport position before the rear machine is lowered to cut (Fig. 32). A four-plow tractor is sufficient power. The front unit is the model 2 SDT with reinforced lift pipe to enable pulling the second machine (Fig. 14B). The rear unit is a standard model 2 SD. Do *not* use a model 2 S as the following machine. Two hydraulic control valves are required on tractor. The scrapers may be operated in tandem, or used separately on different tractors for small construction jobs such as drainage ditches, pit silos, pot hole filling, etc.

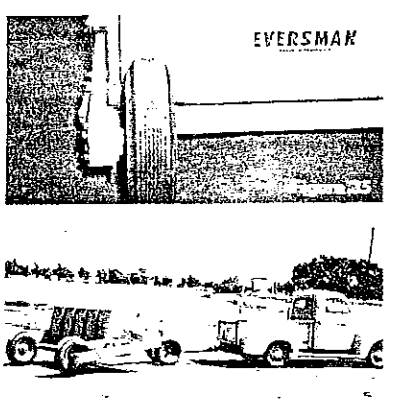
FIELD FINISHING—(Figure 33)

After completing your dirt moving work, you still must finish your field by smoothing, especially the cut and fill areas. A few times over the field with an Eversman Land Smoother will wipe out the rough spots and surface irregularities.

AFTER EXTENSIVE EARTH MOVING and land forming, you should consider the need to; (*a*) use a subsoiler or pan breaker if moisture conditions and heavy traffic have caused excessive compaction; (*b*) apply proper fertilizer to the cut areas; (*c*) Plant an aunual crop the first season while permitting the fill areas to settle; (*d*) recheck the grades and correct any settlement by again leveling before planting a perennial crop; (*e*) maintain the correct surface (and produce a good seedbed) by always using a land smoother ahead of your seeder. Seek the advice of your local technician on these matters.

It takes time, money and effort to establish correct grades on your fields. Erosion and tillage operations cause surface irregularities. To protect your investment keep the surface smooth and maintain correct grades by using an Eversman Land Leveler.





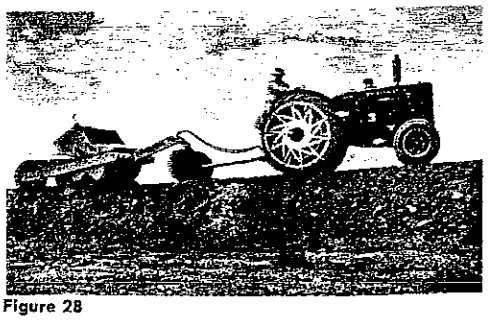


Figure 28


Figure 29

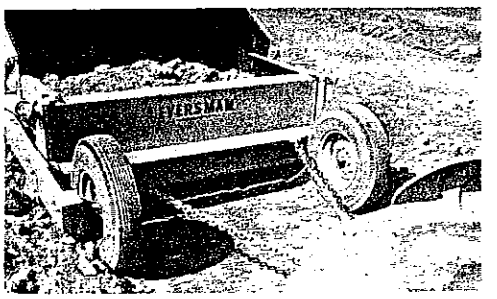


Figure 30

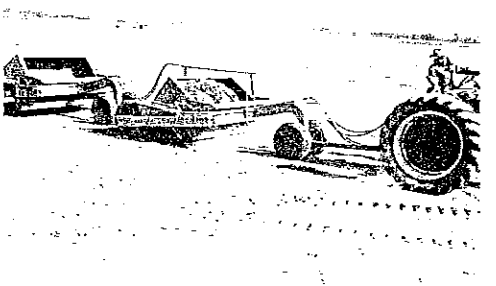


Figure 31

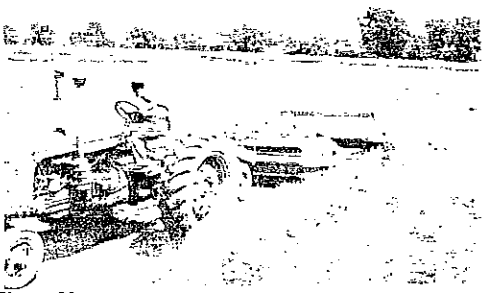


Figure 32

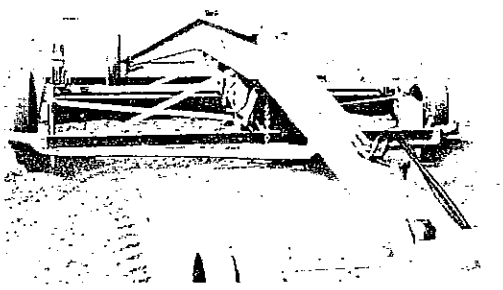
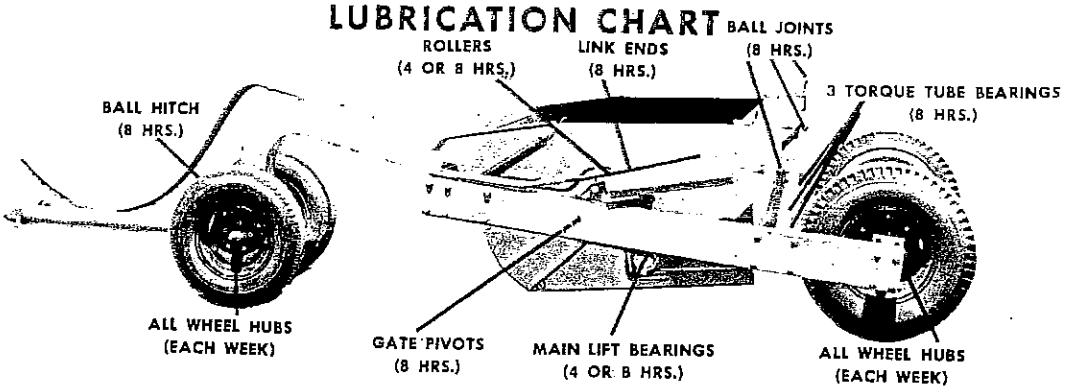


Figure 33

LUBRICATION CHART



GREASE ALL ZERKS ON BOTH SIDES
(EVERY PERIOD OF HOURS USED AS INDICATED)

TROUBLE SHOOTING

1. Bucket does not load evenly on both sides.

(a) Check tires for unequal pressures. Inflate all scraper tires to 40 lbs. pressure.

(b) Be certain you have the same size tires on both the rear wheels.

(c) The cutting bit may need leveling by adjusting the rear spindle brackets. (see "check-off-list" item 4)

2. Scraper will not cut or dig properly.

(a) The cutting bit may be worn and need reversing or replacing.

(b) Soil or trash may be packed or lodged on the bottom of the bucket behind the cutting edge. Put bucket in full dump for easy cleaning.

3. Can not lift or can not dump load.

(a) Check quick couplers attaching scraper hoses to tractor. If couplers are not tightly connected, the oil flow to the scraper may he restricted.

(b) Check stroke of cylinders. They should expand 16 inches. Shorter extension indicates inadequate oil flow or pressure. Check oil level in tractor reservoir and fill if low. Change oil if it is "thinned-out" and watery.

4. Bottom of cut left "wavy."

Take a shallow cut over a longer distance. If the work permits, you can have better control and smoother cutting by placing the rear wheels outside the frame.

5. Tractor Stalls and engine dies.

You may be cutting too deep, or loading in too high a gear, or the ground may be too hard for the power available. Try a thinner cut over a greater distance. Read section on "Loading" page 6.

6. Hydraulic System Drifts.

This is indicated by a lowering of the bucket without any movement of the control valve. It may be caused by:

(a) Air in the hydraulic system. Run the cylinders completely in and out several times to expel air.

(b) Low oil level in pump reservoir which permits pump to draw air. Check oil level and fill if low. Then repeat step (a).

(c) "Internal leakage in the tractor hydraulic pump system. If this is the difficulty, install pressure lock valve, Part No. 4100 (optional equipment), hetween the front hoses (4058) and the scraper oil pipes."

(d) "If the scraper is to be operated with the Minneapolis-Moline "Uni-matic" hydraulic pump system, it is essential that you install pressure lock valve, Part No. 4100 (Optional Equipment).

7. External leakage of cylinders.

The rod packing seal or outer rod guide seal is worn or defective. Eversman will repair and recondition the cylinders at a nominal price. Also, repair parts are available, see part list page 11, however great care must be exercised in disassembling the cylinders.

8. Gate does not close evenly.

(a) One of the stops welded to the front, bottom lip of the bucket (Fig. 4) may be mislocated. Check both sides to see if gate is contracting one stop sooner than the opposite side. If so, relocate stop.

9. Gate catches under cutting bit.

(a) Bit is probably worn. Reverse bit or install new one.

NOTE: *Warranty does not apply if these parts are damaged by incorrect disassembly or misuse.*

IMPORTANT—CYLINDER REPAIR INSTRUCTIONS

PHOTO A

Disassembly of the cylinder is a simple operation if done correctly, however, considerable damage to parts is possible if caution is not exercised.

(a) Support cylinder in vise by clamping the ball fitting at end of piston rod.
(b) Remove the allen set screw which holds the 4010-8 snap ring in place. (Not on earlier model cylinders.)
(c) Use a pair of number 5 snap-ring pliers to remove the snap ring from groove in cylinder barrel and pull barrel away from rod guide and piston. This normally requires a jerky motion since the piston "O" ring expands into the barrel groove and adds considerable friction.

NEVER (1) Use a hammer to beat on rod guide or barrel. This has been unsuccessfully tried many times; or (2) clamp the piston rod in vise while disassembling cylinder. If the chrome plating on the piston rod is nicked or scratched the rod is ruined and must be scrapped.

To reassemble cylinder, follow same procedure of clamping ball fitting end of piston rod in vise. Slip rod guide to forward end of rod (against ball fitting end). Push barrel over piston, and completely collapse barrel. Then collapse snap ring with snap ring pliers and force barrel over guide rod until ring is in position to expand into barrel groove, and lock rod guide in place.

Whenever the cylinder is disassembled, it is recommended that *all* seals, washers, and "O" rings be replaced. It is very easy to cut or nick one of the parts ao exercise extreme caution. For complete seal kit, order part No. 4010-52RK for the 1¼" diameter piston rod cylinders, or part No. S2450 RK for the 1½" diameter piston rod cylinders.

PHOTO B

To install inner U-cup seal (S 2435) in rod guide groove, start seal into groove and then use blunt tool such as pictured to force it into place around circumference. Note detail cut-away of rod guide and piston on page 11 showing correct position and direction of seals and other parts.

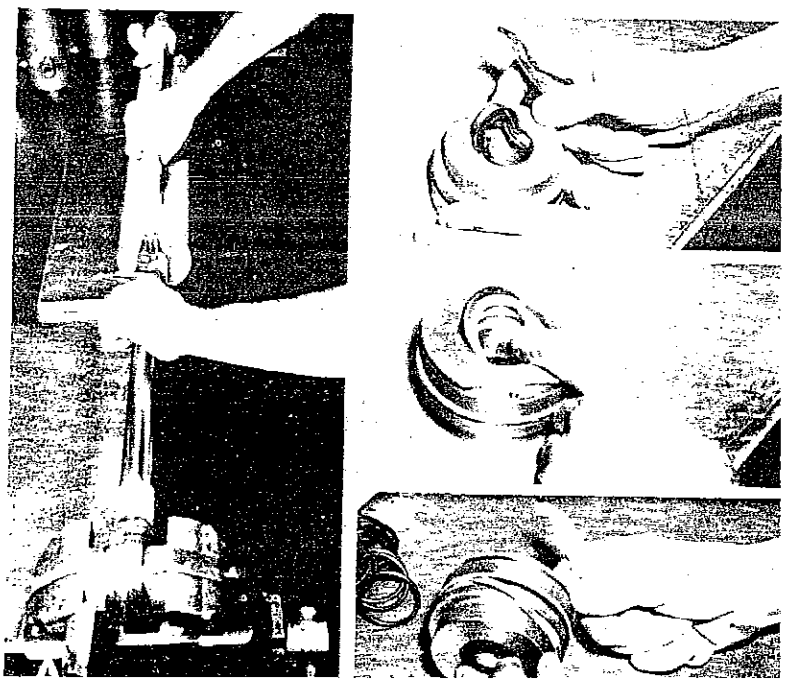
PHOTO C

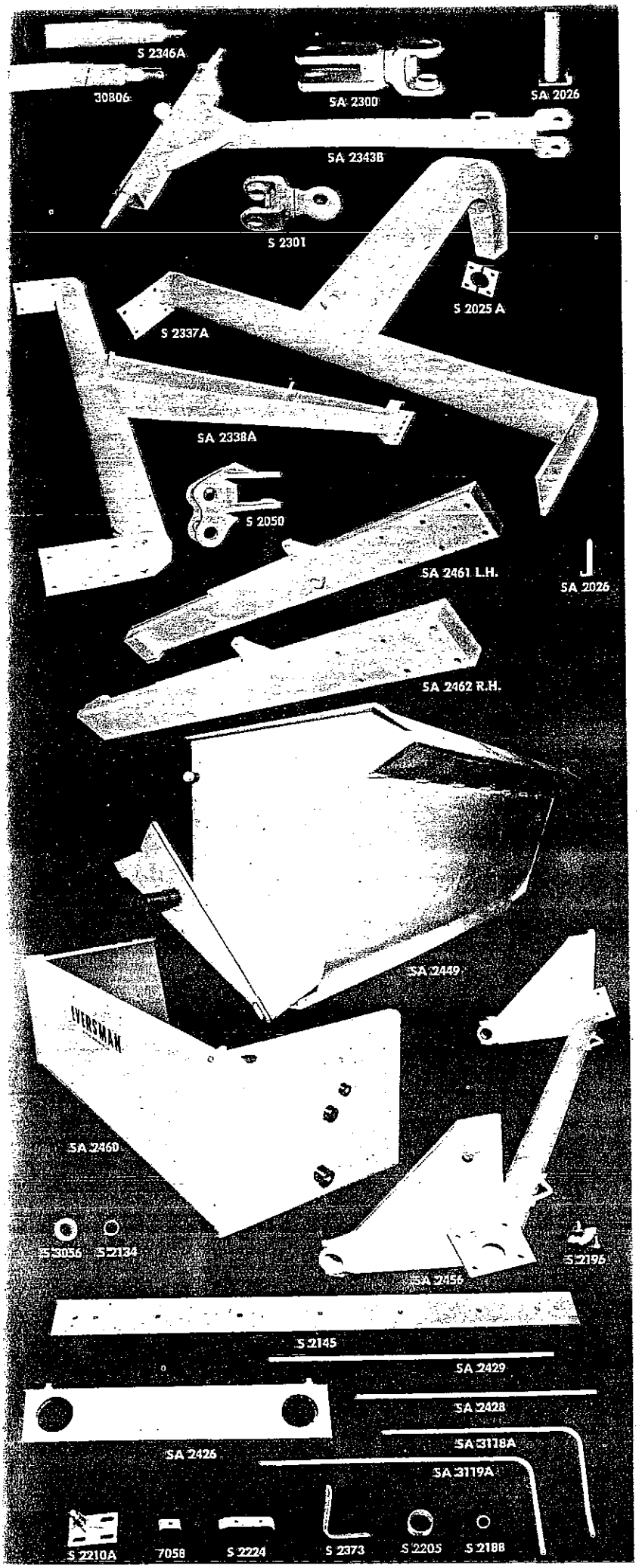
To install inner "O" ring (S 2437) and back-up washer (S 2438) in rod guide, start as shown in photo. These parts can normally be pushed into the groove with finger and the blunt tool is not required.

PHOTO D

To install outer "O" ring (4010-4) and back-up washer (S 3046) on rod guide, first push washer in place, and then force "O" ring into groove. The same blunt tool is helpful for this installation, and oiling washer and "O" ring will also assist. Follow this same procedure to install "O" rings (4010-18) and back-up washers (S 3010) on 4010-43A piston.

To install the piston rod wiper seal (S 2436) in rod guide note that metal backing rests against shoulder of rod guide. This seal may be forced into place by laying a small flat piece of bar stock over seal and tapping with hammer.

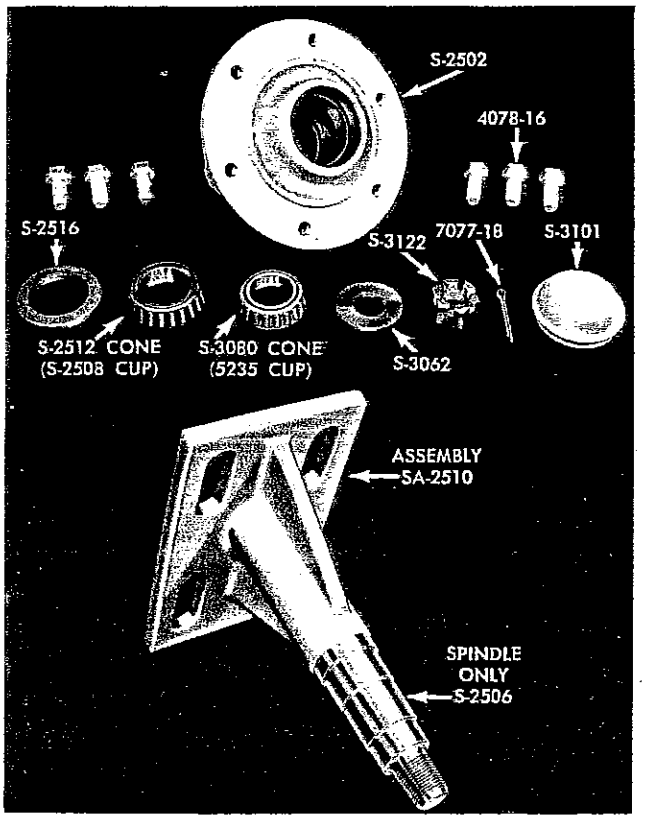


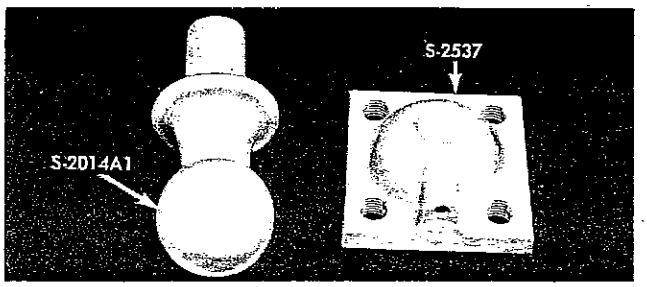


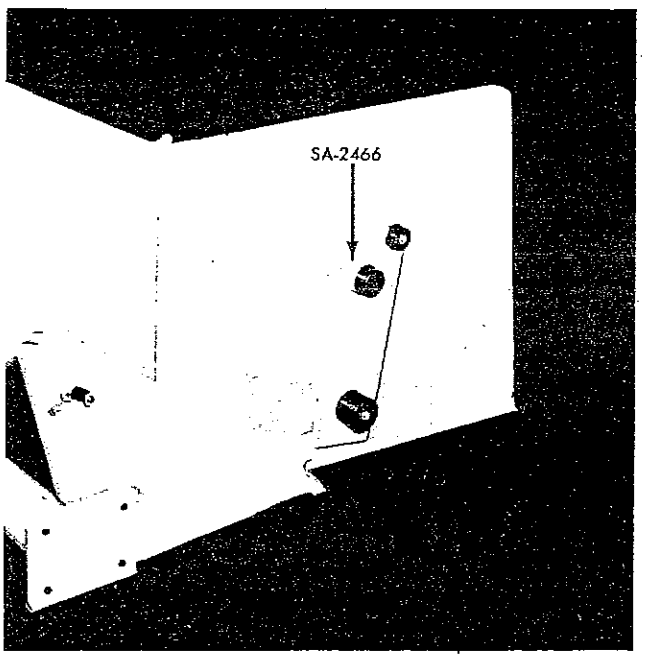
Model 2S and 2SD Hydraulic Scraper Parts List

Part No.	Name of Part	No. Req.	Serial No.
SA 2300	Swivel Clevis	1	All
SA 2026	Clevis Pin	1 (2SD)	All
SA 2026	Clevis Pin	2 (2S)	All
SA 2301	Crawler Clevis (Optional)	1	All
SA 2010	Dolly Axle	1 (2SD)	Up to 2045
30806	Spindle (For SA 2010 Axle)	2 (2SD)	Up to 2045
7077	Dolly Hub Assembly (For SA 2010)	2 (2SD)	Up to 2045
	7077-2 Hub Casting	2 (2SD)	Up to 2045
	7077-4 Outer Cup (09195)	2 (2SD)	Up to 2045
	7077-6 Outer Cone (09067)	2 (2SD)	Up to 2045
	7077-8 Inner Cup (14276)	2 (2SD)	Up to 2045
	7077-10 Inner Cone (14136A)	2 (2SD)	Up to 2045
	7077-12 Inner Seal (Nat. 59195)	2 (2SD)	Up to 2045
	7077-14 ¼" SAE Flat Washer	2 (2SD)	Up to 2045
	7077-16 Hub Cap	2 (2SD)	Up to 2045
	7077-18 Cotter Pin	2 (2SD)	Up to 2045
	7077-20 ¾" NF Castle Nut	2 (2SD)	Up to 2045
	7077-22 ½" x 1½" SAE Lug Bolt	10 (2SD)	Up to 2045
	S3038 Straight "Zerk"	2 (2SD)	Up to 2045
SA 2343B	Dolly Axle	1 (2SD)	2046 and up
S 2346A	Spindle (For SA 2343B Axle)	2 (2SD)	2046 and up
SA 2347A	Dolly Hub Asmbly. (For SA 2343B Axle)	2 (2SD)	2046 and up
	SA 3109 Hub Casting	2 (2SD)	2046 and up
	5013-30 Inner Cup (LM48510)	2 (2SD)	2046 and up
	5013-29 Inner Cone (LM 48548)	2 (2SD)	2046 and up
	5235 Outer Cup (LM 67010)	2 (2SD)	2046 and up
	S 3080 Outer Cone (LM 67048)	2 (2SD)	2046 and up
	S2351 Wear Sleeve	2 (2SD)	All
	S 3038 Straight "Zerk"	2 (2SD)	2046 and up
	S 3127 ½" NF x 1 9/32" Lug Bolt	10 (2SD)	2046 and up
	S 2349 Triple Lip Seal	2 (2SD)	2046 and up
	S 3062 ⅞" SAE Flat Washer	2 (2SD)	2046 and up
	S 3101 Hub Cap	2 (2SD)	2046 and up
	S 3122 Spindle Nut	2 (2SD)	2046 and up
	7077-18 Cotter Pin	2 (2SD)	2046 and up
9034	Dolly Wheel (Optional) (For 15" Tires)	2 (2SD)	All
9140	Dolly Wheel (For 14" Tires)	2 (2SD)	All
S 2025A	Ball Keeper Plate	2 (2SD)	All
SA 2030	Goose Neck	1 (2SD)	Up to 1446 (a)
SA 2337A	Goose Neck	1 (2SD)	1447 and up (a)
SA 2060	Straight Tongue	1 (2S)	Up to 158 (a)
SA 2338A	Straight Tongue	1 (2S)	159 and up (a)
S 2050	Adjustable Hitch Clevis	1 (2S)	All
SA 2461	Side Rail—L. H.	1	All (a)
SA 2462	Side Rail—R. H.	1	All (a)
SA 2449	Gate Assembly	1	All (a)
S 2102	Gate Spring	2	All
SA 2460	Bucket Assembly (Less Bit)	1	All (a)
S 2145	Reversible Cutting Bit	1	All
S 2133	Bucket Roller	2	Up to 1446 (a)
S 3056	Bucket Roller	2	1447 and up (a)
S 2134	Roller Snap Ring	2	All
S 2150	Link Bar	2	Up to 1446 (a)
SA 2320	Bell Crank Assembly	2	1447 to 2440 (b)
SA 2470	Link Conversion Kit	1	1447 to 2440 (b)
SA 2426	Link Bar Assembly	2	2441 and up
S 2151	Snap Ring	2	All
S 2188	Snap Ring	2	All
S 3038	Straight "Zerk"	16	All
4044-74	90° "Zerk"	4	1447 to 2440
30721	45° "Zerk"	2	All
SA 2160	Rear Cross Frame and Lift Pipe	1	Up to 1446 (a)
SA 2332	Rear Cross Frame and Lift Pipe	1	1447 to 2440 (b)
SA 2456	Rear Cross Frame and Lift Pipe	1	2441 and up
S 2196	Bearing Cap	2	All
S 2205	Bearing Insert	2	All
SA 2210A	Rear Spindle Bracket	2	All
S 3108	Rear Spindle (For SA 2210A	2	All
4030-11	Spindle Washer	2	Up to 2408
4078-4	Rear Hub Assembly (For SA 2210A	2	All
	4078-6 Hub Casting	2	All
	4078-8 Hub Cap	2	All
	4078-10 Dirt Seal	2	All
	8567-2 Outer Cup (14276	2	All
	8567-3 Outer Cone (14137A)	2	All
	8567-5 Inner Cup (332)	2	All
	8567-6 Inner Cone (342A)	2	All
	S 3122 ⅞" NF Spindle Nut	2	All
	S 3062 ⅞" SAE Flat Washer	2	All
	4030-11 Spindle Washer	2	Up to 2409
	S 3127 ½" NF x 1 9/32" Lug Bolt	12	All
S 2250	Rear Wheel (Optional) (For 15" Tires	1	All
S 2250A-14	Rear Wheel (For 14" Tires	1	All
SA 2428	Hydraulic Pipe—Short, Straight	1	All
SA 2429	Hydraulic Pipe—Long, Straight	1	All
SA 3118A	Hydraulic Pipe—Short, Bent	1	All
SA 3119A	Hydraulic Pipe—Long, Bent	1	All
S 3093	Pipe Coupling	1	All
S 3121	Pipe Tee	1	All
S 2224	Front Pipe Clip	1	All
S 2373	Rear Pipe Bracket	1	All
7058	Pipe Clip	1	All
4058	½" Hydraulic Hose 88" Long	1	Up to 1516
S 2227	½" Cylinder Hose 85" Long	1	All
BA 58	½" Cylinder Hose 15" Long	1	All
710A	½" Swivel Connector	1	All
S 2240	Hauling Gauge—Straight	1	All
S 2245	Hauling Gauge—Bent	1	All
SA 2430	Hydraulic Cylinder Assembly	1	2441 and up
	S 3091 Hydraulic Pipe Bracket	2	All
	SA 3098 Cylinder Barrel	1	All
	SA 2431 Piston Rod (1½" Dia.	1	2441 and up
	S 2434 Rod Guide	1	2441 and up
	4010-43A Piston	2	All
	4010-40 Piston Rod Nut	1	All
	4010-8 Snap Ring	2	All
	S 2226 Street Elbow	4	1517 and up
	S 3092 Hydraulic Pipe	2	1517 and up
	S 3093 Pipe Coupling	4	1517 and up
	7010-26 Clevis Pin	2	All
	¼" x 1½" Cotter Pin	2	All
	¼-20 NC x ⅜" Allen Set Screw	2	1903 and up
S 2450RK	Cylinder Seal Kit (For SA 2430	1	2441 and up
	S 2435 U-Cup Seal (Guide-Inner)	1	2441 and up
	S 2436 Seal (Rod Wiper)	1	2441 and up
	S 2437 O-Ring Seal (Guide-Inner)	1	2441 and up
	S 2438 Back-Up Washer (Guide-Inner)	1	2441 and up
	S 3010 Back-Up Washer (Piston-Outer)	2	2441 and up

SUPPLEMENT TO EVERSMAN SCRAPER
Assembly and Operation manual







At Serial No. 4291 a new rear hub assembly, S-2501, replaced the 4078-4 hub assembly, and a new rear spindle bracket, SA-2510, replaced part No. S-2210A. Both the S-2250 (15") rear wheel and the S-2250A-14 (14") rear wheel will fit either hub.

Part No.	Description	No. Req.	Serial No.
S-2501	Hub Assembly	2	4291
S-2502	Hub Casting	1	"
S-3062	7/8" Washer	1	"
S-3122	7/8" Slotted Nut	1	"
4078-16	Hub Bolt	6	"
7077-18	Cotter	1	"
S-3038	Grease Fitting	1	"
S-2508	Inner Cup LM29710	1	"
S-2512	Inner Cone LM29749	1	"
S-2516	Seal	1	"
S-3080	Outer Cone LM67048	1	"
5235	Outer Cup LM67010	1	"
S-3101	Hub Cap	1	"
SA-2510	Rear Spindle Bracket	2	"
S-2506	Spindle Only	2	"

NOTE: When ordering replacement parts for the various hubs specify the following kit numbers. These kits are priced less than the individual parts and include the cones, cups, grease seal and hub cap.

For Hub Number	Order Kit Number	Serial No.
S-2501 (Rear)	S-2503RK	4291 and up
4078-4 (Rear)	4078-32RK	Up to 4290
SA-2347A (Dolly)	S-2352RK	2046 and up
7077 (Dolly)	7077-32RK	Up to 2045

4078-4 (Rear) 4078-32RK 5284-1

At Serial No. 3200 a new, non-machined, ball was used on the scraper dolly axle. This affects the dolly axle, gooseneck fitting and the ball keeper plates.

Part No.	Description	No. Req.	Serial No.
SA-2343B	Dolly Axle	1	2046 and Up
S-2014	Hitch Ball	1	Up to 3199
S-2025A	Ball Keeper Plate	2	Up to 3199
S-2037	Gooseneck Ball Socket Casting	1	Up to 3199
SA-2543	Dolly Axle	1	3200 and Up
S-2014A1	Hitch Ball	1	3200 and Up
S-2525	Ball Keeper Plate	2	3200 and Up
S-2537	Gooseneck Ball Socket Casting	1	3200 and Up

If any of the bucket pins are bent and need to be replaced, it is recommended that the entire sub-weldment plate and three pins be substituted. To make this repair, first scribe around the old plate, then torch it off the bucket side and weld on the new assembly, locating it carefully by the scribe marks. For this replacement, order the following:

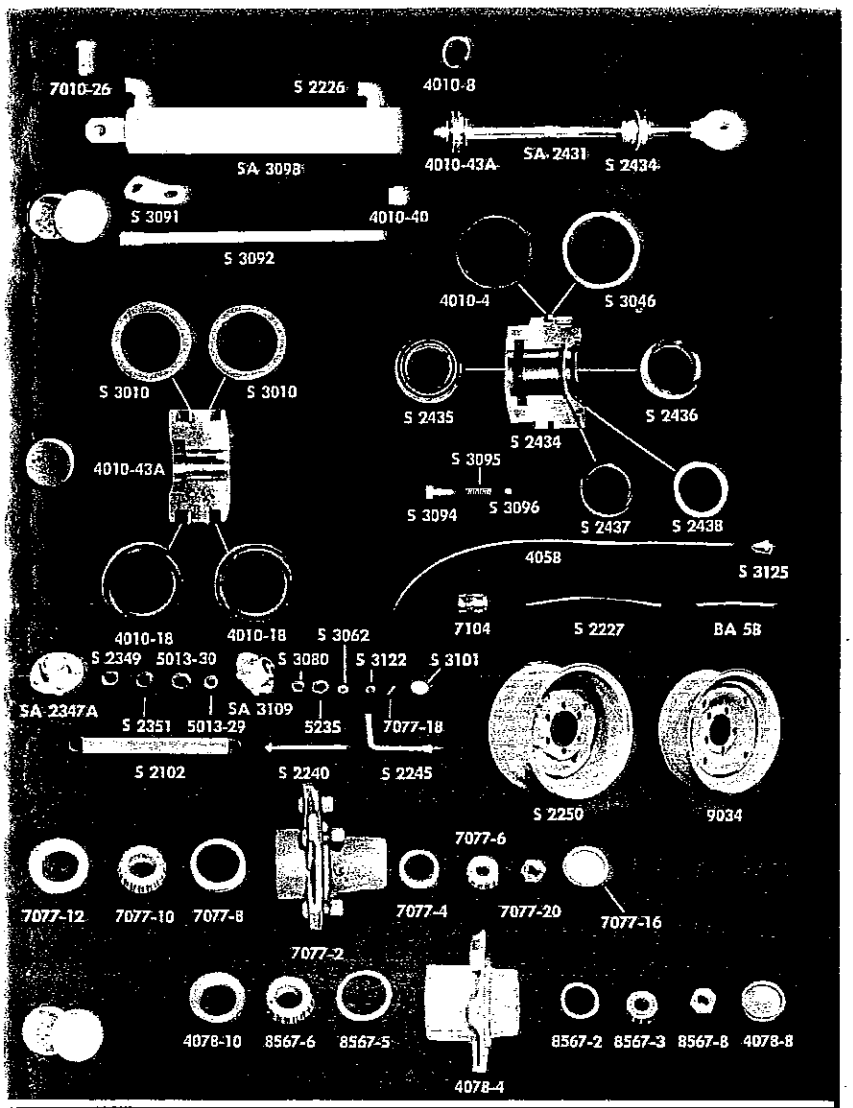
1 — SA-2465 L.H. Pin Plate
1 — SA-2466 R.H. Pin Plate
2 — S-3056 Roller
2 — S-2134 Snap Ring
2 — S-2151 Snap Ring

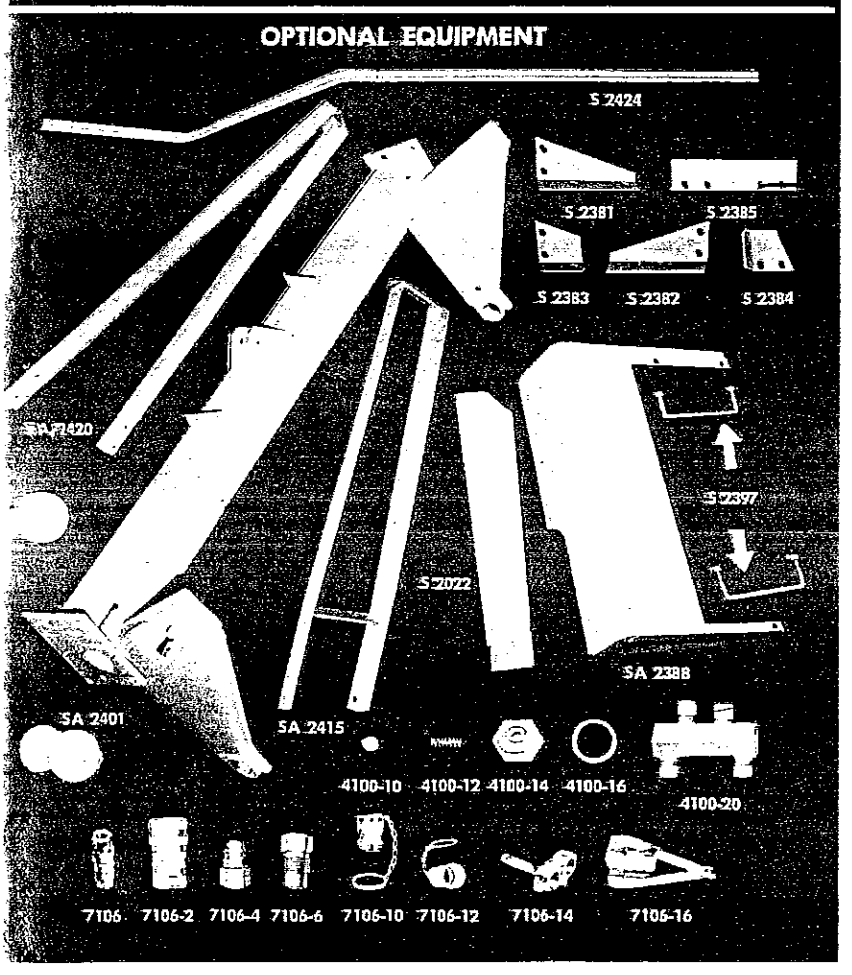
and

2 — S-2426 Link Bar for all scrapers except serial numbers from 1447 to 2440.

or

2 — SA-2470 Link conversion kits for serial number scrapers from 1447 to 2440 only.





Part No.	Name of Part	No. Req.	Serial No.
	S 3046 Back-Up Washer (Guide-Outer)	1	2441 and up
	4010-4 O-Ring Seal (Guide-Outer)	1	2441 and up
	4010-18 U-Cup Seal (Piston-Outer)	2	2441 and up
SA 3090	Hydraulic Cylinder Assembly	2	Up to 2440 (c)
	SA 2241 Piston Rod 1¼" Dia.	2	Up to 2440 (c)
	S 3126 Rod Guide	2	Up to 2440 (c)
	S 3094 Relief Valve Cap Screw	2	1518 to 1996
	S 3095 Relief Valve Spring	2	1518 to 1996
	S 3096 Relief Valve Ball	2	1518 to 1996
	S 3125 Relief Valve	2	1997 to 2440
	(See SA 2430 for other parts common to all Cylinders)		
4010-52RK	Cylinder Seal Kit (For SA 3090)	1	Up to 2440 (c)
	S 3010 Back-Up Washer (Piston-Outer)	2	Up to 2440 (c)
	S 3046 Back-Up Washer (Guide-Outer)	1	Up to 2440 (c)
	4010-4 O-Ring Seal (Guide-Outer)	1	Up to 2440 (c)
	4010-6 O-Ring Seal (Guide-Inner)	1	Up to 2440 (c)
	4010-12 U-Cup Seal (Guide-Inner)	1	Up to 2440 (c)
	4010-18 U-Cup Seal (Piston-Outer)	2	Up to 2440 (c)
	4010-36 Back-Up Washer (Guide-Inner)	1	Up to 2440 (c)
	4010-38 U-Cup Seal (Guide-Inner)	1	Up to 2440 (c)

Tandem Scraper, Model 2 SDT, Parts

SA 2401	Rear Cross Frame and Lift Pipe	1	2441 and up
SA 2415	Front Pipe Support	1	2441 and up
SA 2420	Rear Pipe Support	1	2441 and up
S 2424	Hydraulic Pipe	2	2441 and up
SA 2301	Crawler Clevis	1	2441 and up
SA 2411	Clevis Pin	1	2441 and up
7106	Quick-Disconnect Coupler	2	2441 and up
S 3093	Pipe Coupling	2	2441 and up
7058	Pipe Clip	2	2441 and up
4058	Hydraulic Hose	2	2441 and up

Cushion (or Pressure Cross-Over Relief) Valve

(For Installation on Tractors with hydraulic pressure in excess of 1500 psi)

SA 2485	Kit—consisting of:—		
SA 2486	Cushion Valve (Gresen part No. DLV-50)	1	All
S 2488	Pipe Nipple (For Scraper) ½" x 2"	1	All
S 2489	Pipe Nipple (For 329 and 410 Leveler) ½" x 1½"	1	All
S 2487	Pipe Nipple ½" x 1¼"	1	All
S 2490	Pipe Union STD—½" x ½"	1	All

OPTIONAL EQUIPMENT

SA 2380	Trenching Kit	1	2197 and up
	S 2381 Outer Bracket—L. H.	1	2197 and up
	S 2382 Outer Bracket—R. H.	1	2197 and up
	S 2383 Inner Bracket—L. H.	1	2197 and up
	S 2384 Inner Bracket—R. H.	1	2197 and up
	S 2385 Cutting Bit	2	2197 and up
	¾-10 NC x 5" Hex Bolt	4	All
	¾-10 NC Std. Hex Nut	4	All
	½-13 NC x 1¼" Carriage Bolt	8	All
	½" Std. Lock Washer	8	All
	½-13 NC Std. Hex Nut	8	All
SA 2339	Trenching Kit	1	Up to 2196
	S 2280 Inner Bracket—L. H.	1	Up to 2196
	S 2281 Inner Bracket—R. H.	1	Up to 2196
	S 2282 Outer Bracket—L. H.	1	Up to 2196
	S 2283 Outer Bracket—R. H.	1	Up to 2196
	S 2285 Cutting Bit	2	Up to 2196
SA 2386	Rock Shield Kit	1	2197 and up
	SA 2387 Rock Shield—L. H.	1	2197 and up
	SA 2388 Rock Shield—R. H.	1	2197 and up
	S 2397 U-Bolt	4	2197 and up
	½-13 NC Hex Nut	8	All
	½" Std. Lock Washer	8	All
	S 2021 Bucket Extension—L. H.	1	All
	S 2022 Bucket Extension—R. H.	1	All
SA 2023	Rock Shield Kit	1	Up to 2196
	SA 2051 Rock Shield—L. H.	1	Up to 2196
	SA 2052 Rock Shield—R. H.	1	Up to 2196
	S 2059 U-Bolt	4	Up to 2196
4100	¾" Check Valve Assembly	1	All (D)
	4100-10 Ball	2	All
	4100-12A Spring	2	All
	4100-14A End Plug	2	All
	4100-16 Gasket	2	All
	4100-20 Body Assembly	1	All
	S 3051 Pipe Union	1	All
7106	Quick-Disconnect Coupler	2	All
	7106-2 Body Only	2	All
	7106-4 Male Tip	2	All
	7106-6 Male Screw Tip	2	All
	7106-8 O-Ring	2	All
	7106-10 Dust Plug	2	All
	7106-12 Dust Cap	2	All
	7106-14 Double Breakaway Clamp	1	All
	7106-16 Single Breakaway Clamp	2	All

NOTES:

(a) At serial No. 1447 for 2 SD models and 159 for 2 S models, and again at serial No. 2441 for 2 SD models and 239 for 2S models several design changes were made which effects interchangeability. The notation (a) designates the parts involved. When ordering these parts be certain to specify the scraper serial number.

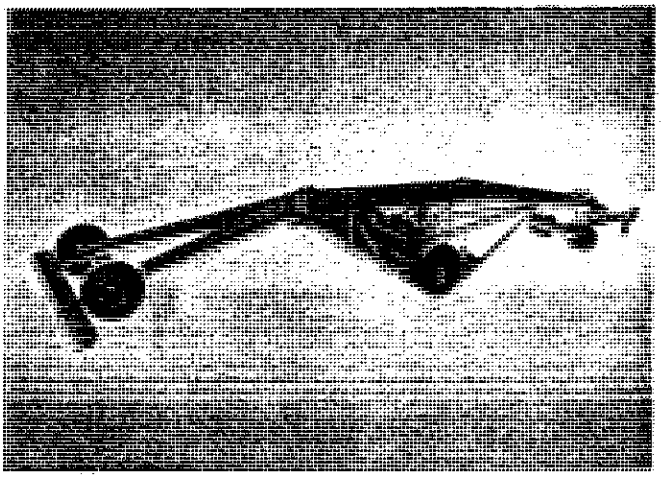
(b) On 2 SD models serial No. 1447 through 2440, and 2 S models 159 through 238, the SA 2320 bell crank assembly has been obsoleted. If parts are required for the bell crank assembly order straight link replacement kit No. SA 2470 and replace the bell crank on both sides of the scraper.

(C) A number of changes have been made in the cylinder internal parts. If seals only are required for 1¼" dia. piston rod cylinders, order seal kit No. 4010-52RK. If your cylinder does not require all these parts, the extra ones may be returned for credit. If a piston rod, piston, or rod guide must be replaced in older cylinders you will have to order a new 1½" dia. rod, SA-2431; rod guide, S-2434; piston, 4010-43A; and flex nut, 4010-40; since older parts are no longer available, and the larger diameter rod is an improved design.

(D) The ¾" check valve #4100 is no longer available. For replacement, order ½" valve No. 311025.

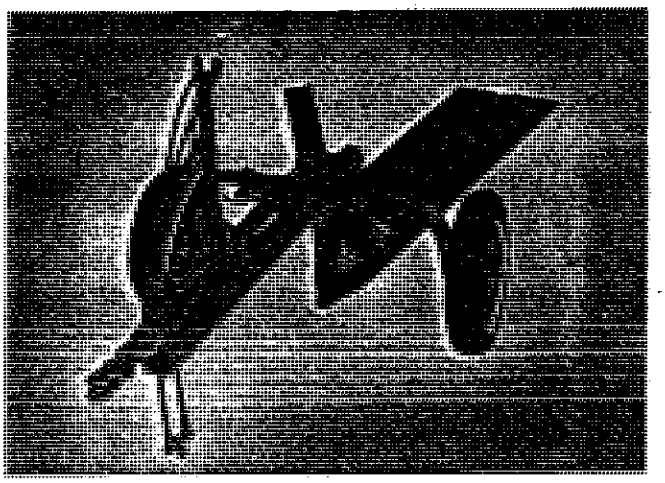
TO OBTAIN CORRECT PARTS PLEASE SPECIFY SCRAPER SERIAL NUMBER OR PURCHASE DATE

OTHER *Eversman* PRODUCTS



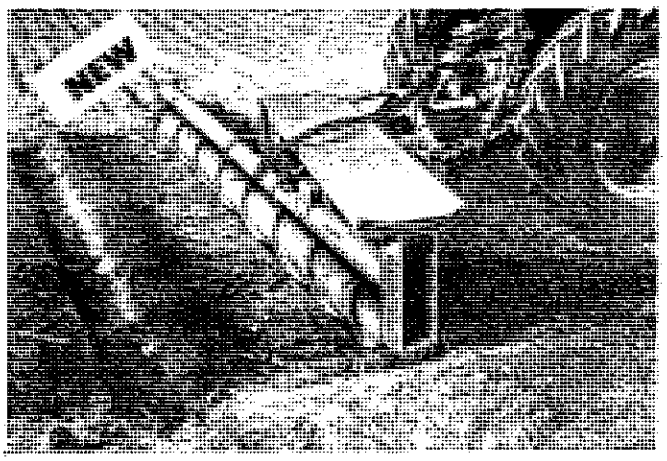
Cover 30% more ground with your regular 3-4 plow tractor and the Eversman *Model 3212* automatic land smoother—32 feet long, with a 12-foot wide cutting blade. Also available, the *Model 329*, 32 feet long, 9'3" blade—for 3-plow tractors, the *Model 410*, 40 feet long with a 10' blade for 4-plow tractors and the *Model 4012*, 40 feet long with a 12' blade for 4-5 plow tractors.

All models utilize the famous Eversman crank axle design for a fully automatic operation, and will do a complete job of land smoothing, dirt moving and seed bed preparation.

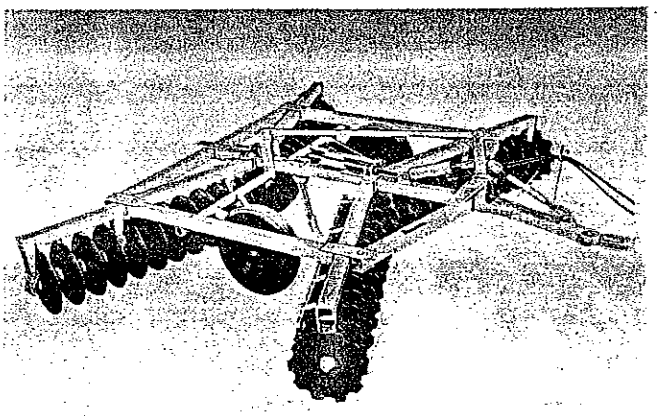


A modern Ditcher for building or cleaning ditches for either irrigation or drainage. Outstanding maneuverability and transportability features makes it possible for one man to do his ditching work fast and at low cost. Operated either mechanically or hydraulically with standard farm tractors.

Available in three models to fit all size ditches and farm tractors. A model is also available for tractors with standard 3-point hitch systems.



The new Model 130 Headland Furrow Opener. Saves work and time and you can eliminate hand digging the 10 to 12 feet required to run water from the siphon tubes to the rows. Hydraulic control. Cutting length 13'2", depth of furrow 3" to 5", roter speed 250 RPM. Direction of rotation towards tractor. Swivel 37° both directions. Sealed, self-aligning ball bearings. P.T.O. drive. Mounts on standard 3 point hitch, category 1 or 2. Weight 800 lbs.



A Heavy Duty, Quality Tandem Disk Harrow Welded boxed 4" channel construction, welded gang hangers, heavy duty scrapers, depth gauge, screw adjustment for easier, faster changes of front and rear angles of gangs, center ridge buster, heavy duty swivel clevis, rear hitch plate and many other features. Available in 8'8" to 14'6" cutting widths.

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