

B61 BULLDOZER PARTS CATALOG

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LaPLANT-CHOATE MANUFACTURING CO.
Cedar Rapids, Iowa

THE HYDRAULIC SYSTEM

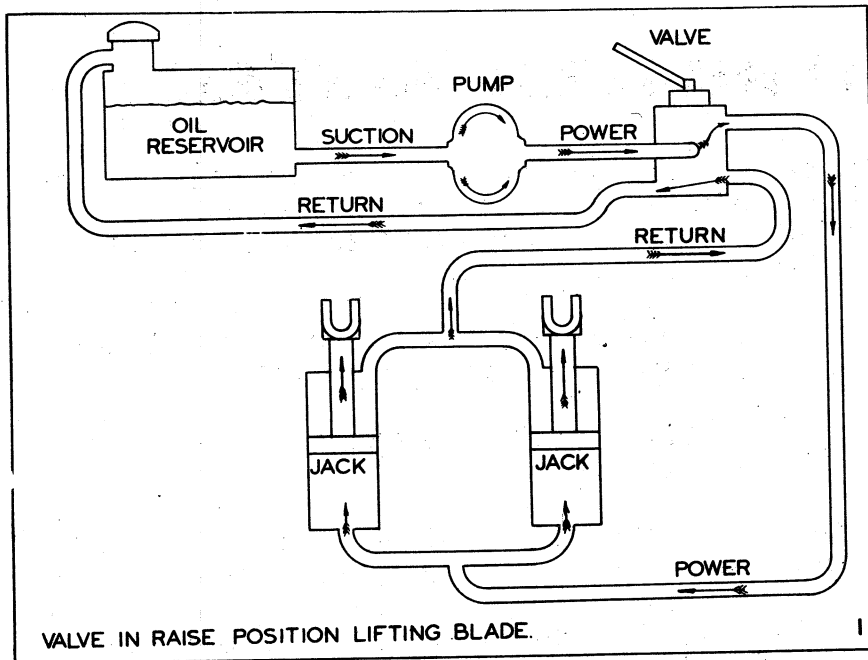
Hydraulic oil power, properly applied, is recognized as one of the simplest methods of actuating power or leverage to operate a machine such as a Scraper or Bulldozer and make it perform its various functions.

Most hydraulic oil systems which operate Scrapers, Bulldozers or similar machines have four principal parts, i.e.:

1. A tank, or oil reservoir which contains the reserve supply of oil for the system.
2. A pump, which takes the oil supplied by the tank and forces it under pressure on through the system.
3. A control valve, which diverts the flow of oil to either end of the jacks, or locks them in any position and returns the oil to the tank at the discretion of the operator.
4. A jack, or jacks, which receives the oil diverted from the high pressure line by the control valve and actuates the various functions of the machine such as raising, lowering or holding a Bulldozer blade or loading or dumping a Scraper.

In addition to these four principal parts of the hydraulic system there are several accessories necessary on all systems, such as:

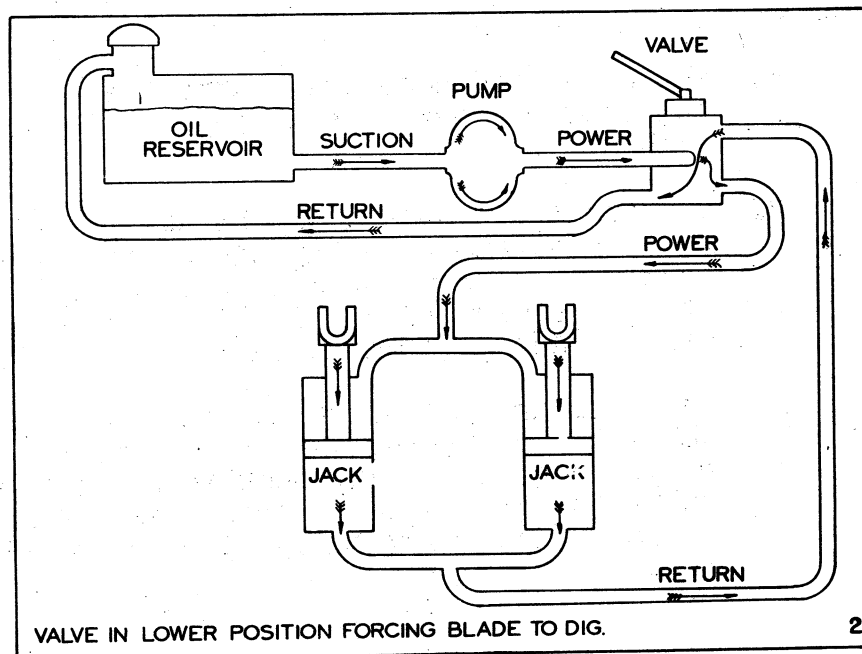
- A. The pipes and hose that carry the flow of oil from the tank, through the system and return it to the tank.
- B. The breather located on the tank which allows air, which may have been introduced into the system by a leak in the line, or any other way, to escape, making it unnecessary to bleed the system. Also to prevent dirt or any foreign matter from entering the system.
- C. The pressure relief valve, which acts as a safety valve to the system and diverts excessive pressure built up by the pump, back into the tank. This relief valve is adjustable to pressures from 0 to whatever pressure necessary to operate the machine on which it is used.



1. Valve Hold Position. We find by consulting this simple diagram that the oil (follow the arrows in the line) leaves the tank and flows by gravity and suction through the low pressure hose called "suction line" to the intake port on the pump where it is picked up by the teeth of the gears

and transported around the outside of the gears to the power port of the pump and enters the "power line".

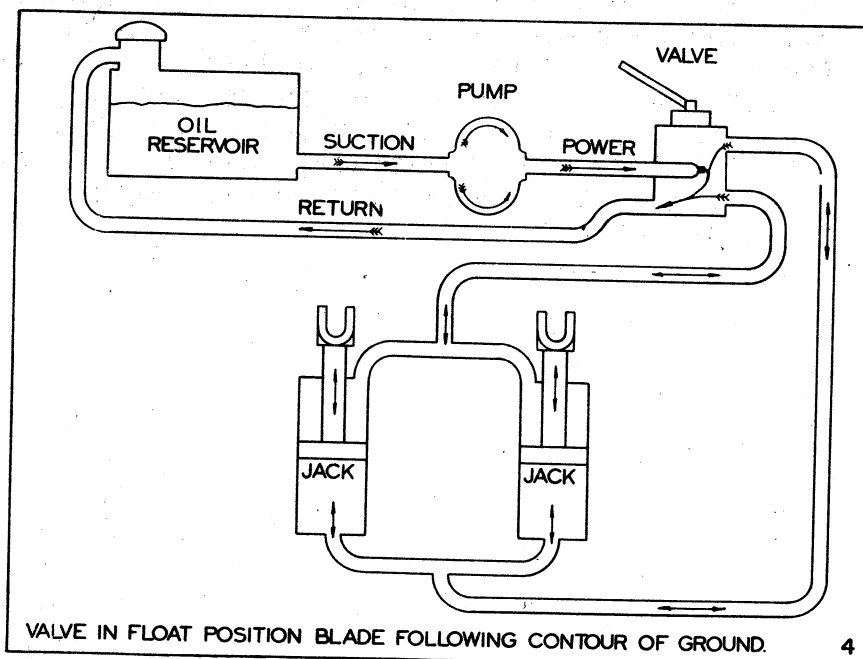
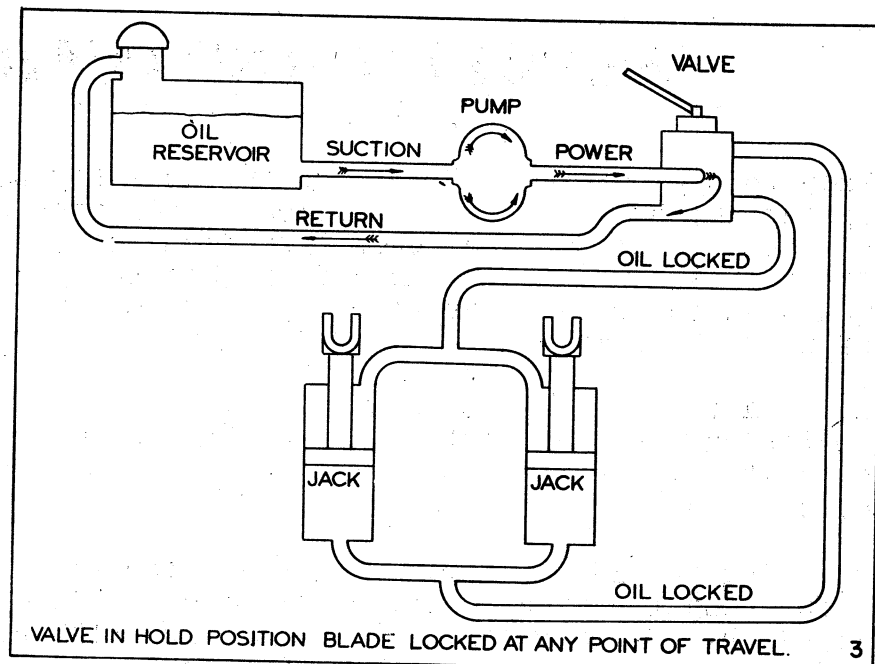
The oil is now being forced under power through the power line. Since the valve is in hold position the oil performs no function but proceeds to the control valve, passes directly on through and returns to the tank. With the control valve in hold position the lines to both ends of the jack are shut off locking the piston in place.



2. Valve - Raise Position.

By following the course of the arrows we find in this illustration that oil from the power line is being diverted by the control valve from entering the tank, and is proceeding instead, to the base or bottom end of the jack cylinder while oil from the top end of the jack cylinder is being forced, by the advancing piston, through the line to the control valve and back into the tank.

3. Valve - Lower Position. Here we see the control valve on the lower position. The only difference being that oil is now being diverted by the control valve to the top end of the jack cylinder while the oil in the bottom or base end is being forced by the advancing piston through the line and back to the tank.



4. Valve Float Position - In this position the ports of the control valve are open allowing oil to flow freely from one end of the jacks to the other end, cross between the two jacks, or enter the return line to the tank, thus enabling the blade to raise or lower freely according

ing to the ground conditions.

RELIEF VALVE

If the control lever is allowed to remain in raise or lower position after the piston has reached the end of its travel in either direction pressure immediately begins to build up because of the oil being forced into the system by the pump. This is the reason for having the pressure relief valve, and the reason it must be placed in the high pressure line between the pump and the control valve or built into the control valve itself.

SAFETY PRECAUTION

When this pressure has built up sufficiently to compress the spring in the relief valve, allowing the port to open, the oil coming through the power line from the pump escapes back directly into the tank instead of into the atmosphere as it would in the case of escaping steam from the pressure valve of a steam boiler.

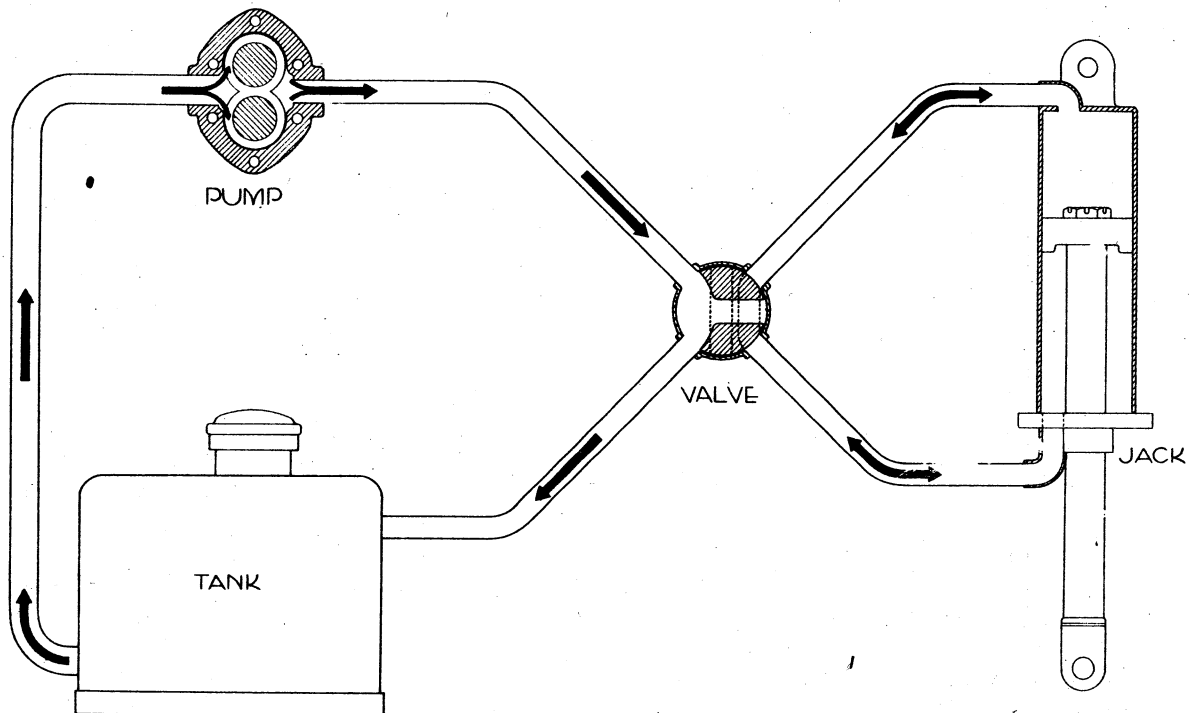
Never attempt to perform any greasing, maintenance or repairing operations on the tractor or trailbuilder without first making sure it is in such a position that it cannot move and trap a hand or foot.

Greasing should be accomplished with the blade resting on the ground and the tractor engine stopped. This will make it impossible for anyone to accidentally move the control lever and injure someone working on the machine.

Changing the cutting edge must be accomplished with the blade in the air but under no circumstances should anyone be permitted to lie under the blade. The safe way is to raise the blade to the desired height, then to shut the engine off and lock the blade in position. A further safety precaution is to block under the side frames of the Trailbuilder so it can not settle to the ground.. Instead of lying under the blade, take a position to the front so it will be unnecessary to have more than the hands or arms under the blade.

THE HYDRAULIC CONTROL SYSTEM

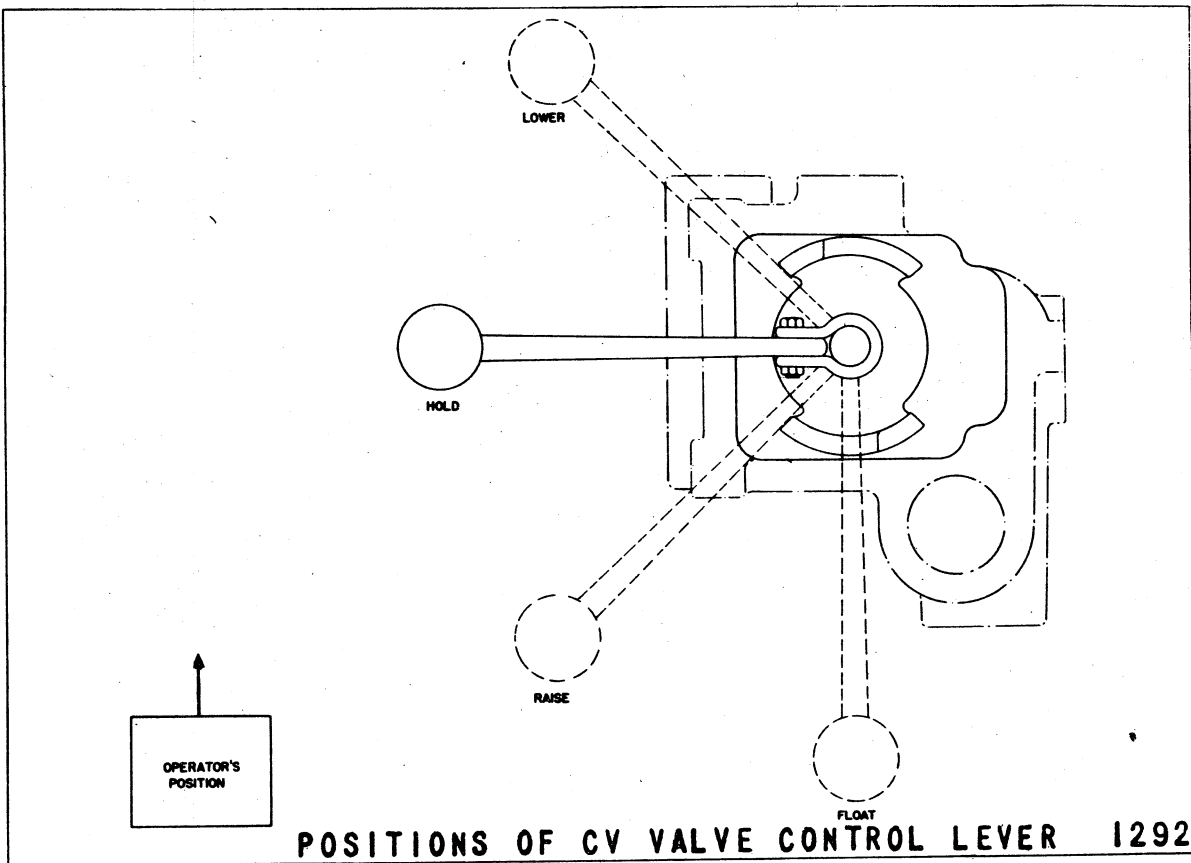
In order to control the adjustment of heavy machinery, such as tractor-mounted Bulldozers, the method which is better adapted than any other is the use of hydraulic power. LaPlant-Choate hydraulic control comes from a pump, mounted on the front of the tractor, driven directly by the crankshaft. Thus any time the engine of the tractor is running, power is available. This pump subjects the oil in the system to pressure, a valve controls the flow of the oil to jacks which apply the power to the tool. This is the most simple and efficient method of applying power to a blade, for only a negligible effort is required to move the valve control lever in order to raise or lower the blade. Response is instantaneous due to the continuous flow of oil which is delivered to the jacks.



In preparing the machine for operation, first check the oil level in the oil supply tank. The tank should be filled within 5 inches of the top with engine lubricating oil, S. A. E. 20 in winter and S. A. E. 40 in summer. (Note: a lighter oil may be used in extremely cold climates and a heavier oil may be used in the tropics). Caution: Always use engine lubricating oil.

The valve is designed with four control positions.

1. "Hold" position - lever should be parallel to the tractor seat or crosswise with regard to the tractor.
2. "Hoist" position - lever should be pulled back 45° from "Hold" position.
3. "Down" position - lever should be pushed forward 45° from "Hold" position.



4. "Float" position - lever may be moved back or forward 90° from "Hold" position, or parallel with the line of travel of the tractor. (Note: the valve has two "Hold", two "Hoist", two "Down" and two "Float" positions, since the control lever can be reversed to the opposite side of the valve. Either position may be used with the same accuracy of control.

Place valve control lever on "Hold" or "Float". Do not leave the lever on "Hoist" or "Down Pressure" at any time except when raising or lowering the blade. As soon as the blade is raised or lowered the desired amount, place lever back on "Hold" position. Lever is parallel with the seat or crosswise with the tractor when in "Hold" position. When the lever is parallel with the tractor, it is in "Float" position.

When lever is in either "Hold" or "Float" position, the oil is free to circulate through the hydraulic system. (Note: when on "Hold", the oil is shut off from the jacks, but circulates throughout the rest of the system).

Do not leave valve control lever on "Hoist" or "Down Pressure" after the piston has traveled to the head or base of the jack. If this is done the oil will be forced through the relief valve and will become heated, which may cause damage to the pump, valve, jacks and hose assemblies. (Caution) The oil is forced through the pressure relief valve, when attempting to lift loads heavier than the maximum loads the valve is set for, as is the case when

moving trees, stumps, rocks and other heavy objects. Therefore, when the lever is placed on "Hoist" and the blade doesn't raise immediately, the lever should be moved to "Hold" until the load has been loosened up, or, in some cases, take only part of the load.

In cold weather the blade should be raised and lowered several times to mix the oil in the jacks with the oil in the supply tank, so all the oil will warm up and flow freely.

LUBRICATION CHART

EQUIPMENT	GREASE GUN FITTINGS	HYDRAULIC SYSTEM
B61- Hydraulic Bulldozer	CG-1 Grease, General Purpose No. 1	Summer SAE-30 OE-30 Winter SAE-10 OE-10

(Note: A lighter oil may be used in extremely cold climates, and a heavier oil may be used in the tropics.)

PREPARING THE BULLDOZER FOR OPERATION

Check the oil in the Hydraulic System. The tank should be filled to Level mark on the gauge, with clean lubricating oil. (See Lubrication Chart above) SAE-10 in winter and SAE-30 in summer.

CAUTION: Always use engine lubricating oil.

The Oil Supply Tank and Hydraulic System, requires approximately twelve gallons of oil for satisfactory operation.

When filling the system the Blade should be raised and lowered so all the pipes, hose, and jacks will be filled with oil before the final check of the oil level gauge.

ABNORMAL OPERATING CONDITIONS

It may be necessary, if operating in extremely cold climates, to thin the oil in the hydraulic system with diesel fuel or kerosene. Never use gasoline. One gallon of diesel fuel added to the oil in the hydraulic system will usually be found to be sufficient, even in extremely cold conditions.

The SAE 30 engine oil specified in the lubricating chart will usually be found to be satisfactory in any hot climate, but if necessary in extremely hot climate, SAE 50 may be used.

When operating on steep inclines, keep the tractor in gear at all times as the machine cannot roll faster than the gear in which it is being operated, whereas, if the master clutch is disengaged or the tractor shifted to neutral, serious consequences may result because of the tractor rolling too fast without the compression of the engine to hold it back.

On the extremely steep inclines it will be necessary to use the opposite steering clutch from that used in normal operation to steer the tractor if the weight of the tractor is pushing the engine while traveling down grade.

Do not wear the cutting edge down until it starts wearing on the bottom of the blade proper as the front and back sheets of the blade are welded together and if this weld is worn off, material will immediately lodge between the front and back sheets of the blade and damage it.

OPERATING INSTRUCTIONS

Check the oil in the Hydraulic System.

The tank should be filled to "level" mark on the gauge after the system has been filled by lifting the blade and lowering it several times.

When the operator first gets on the tractor, with the engine running, he should practice lifting and lowering the blade, to get the feel of the controls and to find out which movement of the lever lifts the blade and which lowers it.

One of the most important things in operating a Bulldozer is to be able to lift the blade slowly each time and to lower it the same way. This will prevent digging holes and will make a smooth even cut.

It is much easier to make a smooth cut if the blade is kept full so the material can be seen above the blade.

When this amount of material is being moved, it will fill all the uneven spots ahead of the blade and leave level ground over which the tractor can travel.

When cutting hard material and the engine becomes overloaded, the blade should be lifted slightly. The most satisfactory way to prevent the Engine stalling is to release one steering clutch, which cuts the load on the engine in half. The control lever should be placed on hoist or lift simultaneously lifting the blade slightly and as the engine picks up, the steering clutch should be released, placing the full load on the engine.

NOTE: By releasing the steering clutch, the tractor does not stop traveling forward but will swing slightly to the side, on which the steering clutch is released, thereby losing part of the load off the opposite end of the blade, which eliminates lifting the blade enough to be noticeable in the cut.

If the master clutch, (or flywheel clutch) is disengaged when lifting the blade to prevent the engine stalling, the

tractor will stop and the blade will be lifted leaving an uneven cut, then when the tractor travels forward over this abrupt lift in the cut, the tractor will rise at the front, making it necessary to lower the blade, and as the tractor passes over the obstruction the blade will have to be lifted, and it may be necessary to lower and lift the blade several times before the correct cut is attained.

If an uneven cut has been made as above stated, the easiest way to level the cut again, is to lift the blade and drive forward, drop the blade and reverse the tractor and drag the material back into the low spots, thus leveling up the grade or cut. In some instances it is necessary to lift the blade slightly to allow the material to pass under the blade at the desired places.

When handling soft material or sandy loam, the blade is handled in the same manner as with hard material but the shoes should be adjusted so that they are even with the cutting edge of the blade when on level ground. This is done to prevent the blade digging in and gouging deep holes and to make a smooth cut. With the shoes set in this manner a load may still be picked up in a short distance. In particularly rough or hard digging, it may be advisable to remove the shoes entirely. This is often done in rough sidehill work, when digging with one end of the blade. Even though this end of the blade is buried, the tractor will have ample power to push the blade through.

CAUTION: When travelling across country with the unit, **do not** carry blade at extreme raise position. Doing so causes the hydraulic system to become rigid due to the piston being at extreme travel and having no oil on one side of it. Oscillation of the tracks can not then be absorbed by the oil and damage may result to the frame and lifting mechanism. Carry the blade approximately 6" below maximum raise position. This applies only to machines having the lifting mechanism mounted on the tracks.

THE JOB FOR A BULLDOZER



Bulldozers are primarily designed for pioneering trails through hilly or mountainous country, for clearing right-of-way for roads, airports, camp-sites, reservoirs, training bases and similar projects. They are especially useful in the construction of ramps and in the building of trails through dense jungle. Handling rocks, logs, stumps and debris is easy and practical with these efficient units.

Another useful field for the Bulldozer is in trenching and backfilling work, such as oil field pipeline, tiling, sewer and other similar work. Open pit mines find them invaluable in stripping and haul road construction. Road builders fill in around culverts, bridge abutments and use them for traffic by-passes during road construction. Most contractors on industrial plant expansion jobs, do much of their excavation work with Bulldozers and backfilling around basement walls is economically and efficiently done with the same tool.

CLEARING

In removing large trees and stumps, it is necessary to push some of the earth and roots away from the base of the tree or stump thus loosening it so that removal is simple. When pushing the tree or stump, the center of the blade should be placed against it as high as possible for maximum leverage. The "Hoist" should be applied when pushing, but it should not be left on continually. Apply it



and if the load is too great, place the lever on "Hold" until the tree or stump is loosened more by pushing or by digging around it. Push the tree until it starts to lean or fall - then back away immediately and drop the blade below the roots and push the tree out. Never drive over the stump while the tree is falling as it is possible for roots to come up under and behind the blade.



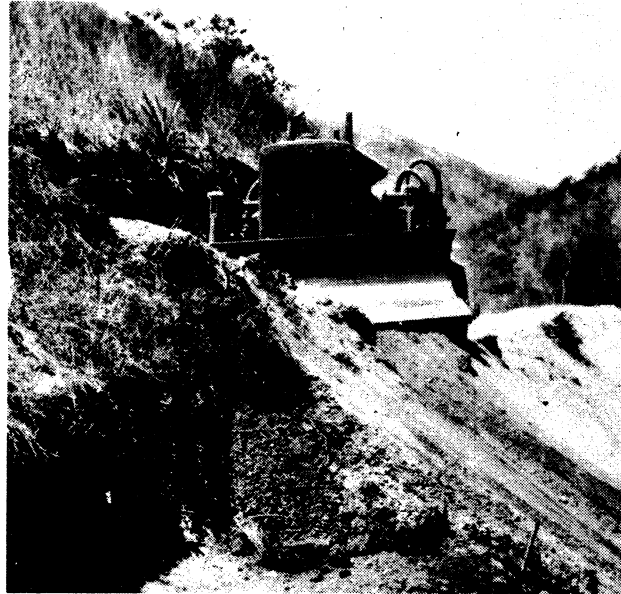
In clearing, if trees are to be removed, the tractor should start at the lowest point to be

cleared, unless it is possible to push all the material in one pass with the machine. Drive up to the tree in low gear and make contact easy. Do not strike the tree at high speed as the top of the tree may break out, damaging the machine or injuring the operator. Nothing is gained by this type of work. Place the blade high on the tree in making contact and try to have the tractor on good footing, so the thrust will fell the tree out of the right-of-way and not on trees to be cleared later. The trees when felled will push into the nearby forest easier lengthwise than crosswise.



HILLSIDE WORK

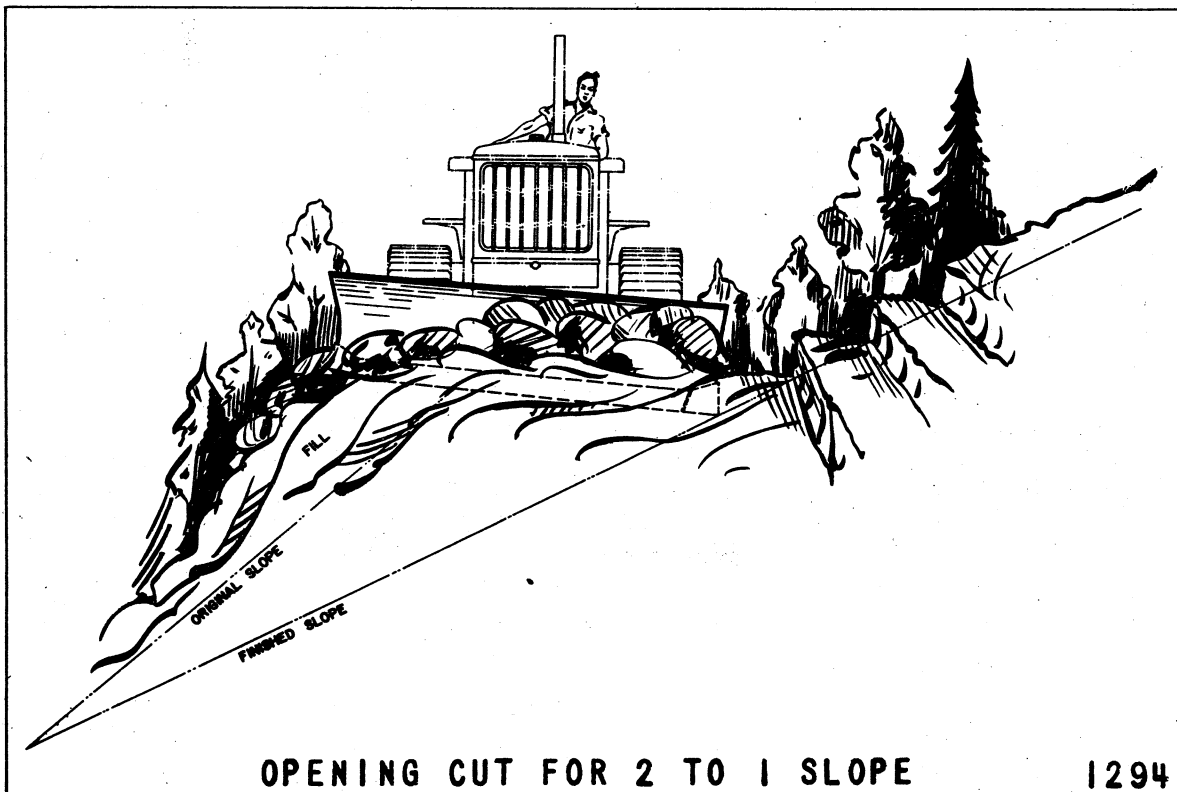
To start a cut or roadway on a sidehill, with the rigid blade of the Bulldozer, it is a little more difficult than with the adjustable blade of the trailbuilder, but it is possible and a very good job can be done if the following instructions are followed.



There are several ways of leveling the tractor before starting the cut in the hillside.

First: Start the cut at the most level point on the roadway to be opened.

Second: Make a cut for the upper track to travel in by dropping the blade and gouging out a channel about twice the length of the tractor, or by pushing up a mound of earth for the track on the low side to travel on.



OPENING CUT FOR 2 TO 1 SLOPE

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Third: Stumps, logs or other material may be used to drive the tractor onto, for leveling up.

If the material in the cut has a division point, that is, if it is to be pushed to two different fills, the cut should be started at the division point, although it may be more difficult.

On roadwork where bank sloping is required, the cut should be started at the outside stake and drop back toward the road center as the cut is made, keeping the slope on the bank as near as possible to the slope desired when finished.

To get full efficiency from the tractor it should be kept as nearly level as possible and worked downhill as much as the job will permit.

After the tractor has been leveled up and the cut started on the hillside, it will be necessary to swing the tractor to the outside of the cut to cast the load off the blade each time a load is gathered.

The blade should be lifted as the tractor is swung, thus keeping the outside of the fill a little higher than the cut, as the fill will pack and settle from the weight of the tractor traveling over it.

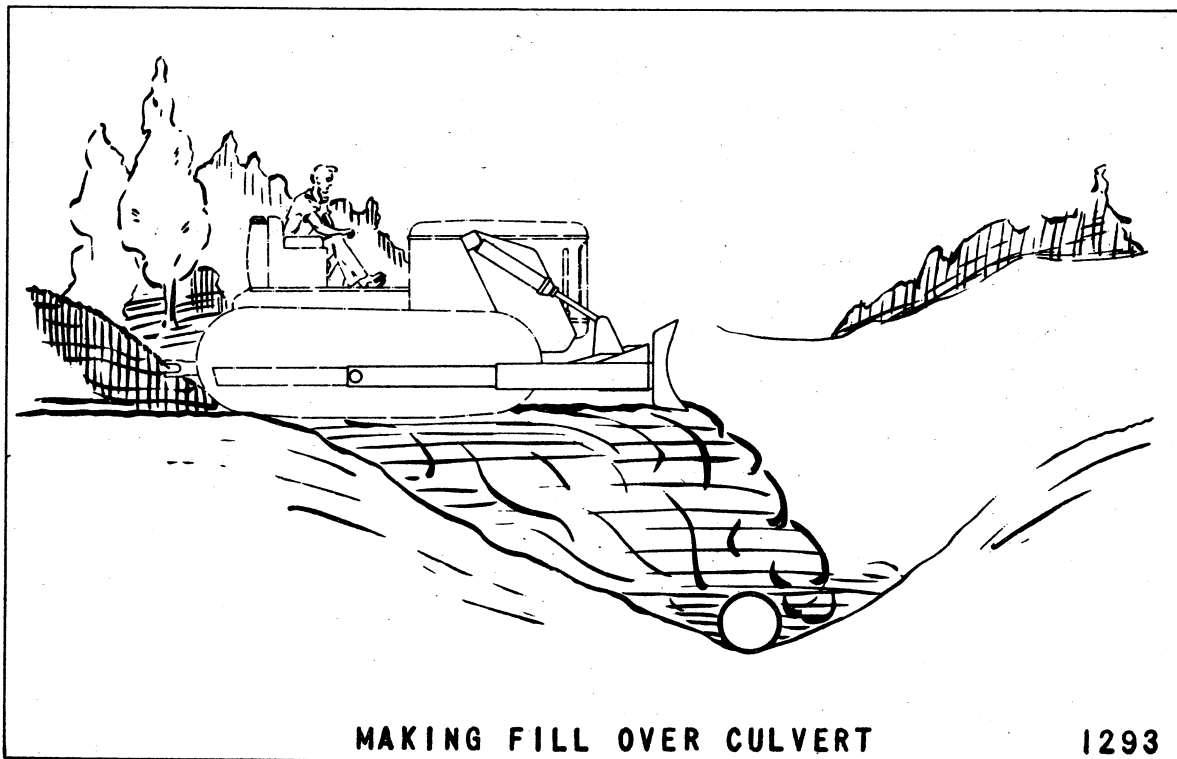
In most cases the lower gears are the most satisfactory for Bulldozer work. When roughing out a trail and making a fill at short distance, low gear is the most practical. Second gear may be used after a load has been gathered if the material is to be pushed some distance, and reverse gear is satisfactory for returning in most cases, which saves wear in turning around to return in forward speeds.

If material has been cast out of a channel, basement or a trench and it is desired to move the material away and level it off, and there isn't room for the machine to work between the material and the trench, the blade may be lifted up and dropped over the material, and with the use of the down pressure and the tractor in reverse, the material may be dragged away and leveled off, or back far enough so the tractor can work behind in the usual manner to level the material.

If a slope of two to one is desired for the upper bank, a first cut should be made only one foot deep. Then the tractor should be moved so the next cut will start two feet from the ledge left by the first cut. The slope will be cut thus in a series of steps. The steps can be trimmed off later by running the tractor along the slope, with the blade lowered just enough to cut off the steps. This will provide a two to one slope for the bank and the material removed is available for the fill for the road itself which should be kept slightly higher on the outside.

MAKING A FILL

When making a fill and the material is to be pushed several feet, it is advisable to push the material over the same path each trip, thus the material that spills off the ends of the blade will form a channel enabling the operator to push larger loads each trip.



MAKING FILL OVER CULVERT

1293

If the material is to be placed in low places where there is mud or water, the blade should be lifted and the material dumped before entering the mud or water, thus building the fill up from the side the material is gathered. The tractor should be kept on the material being pushed in, but it may be possible to travel a little farther forward, with each load, building the fill up above the water level and packing it at the same time.

Do Not push the full load into the fill and then stop the tractor and back away from the load, always lift the blade slightly and lose the load in a thin layer under the blade while traveling forward. Every load should be spread in the same manner.

The above also applies to making a fill over a culvert, always spill the material under the blade before reaching the culvert until the fill has reached the height of the culvert, and to the desired height above the culvert, to support the weight of the tractor when crossing it. Always be sure there has been sufficient material placed over the culvert to support the weight of the tractor before crossing. On some culverts it is necessary to make the fill from both sides before crossing.

The material can be spread over the culvert in the same manner, without placing the tractor on the culvert. Due to the blade being some distance ahead of the tractor tracks, the larger the culvert the thicker the fill must be over it to prevent crushing.

When making a fill over a culvert, it would be possible to push the culvert out of line or crush it with the weight of the tractor if the material used to fill in over the culvert were not properly placed. To do this job correctly, the fill should be kept up to grade, and the tractor should be kept as near level as possible, pushing and spilling the material over the edge of the fill. In this way, by the time the tractor reaches the culvert it will have two or three feet of fill between it and the culvert.

If an uneven cut is made or a hole is gouged out at the beginning of a grade, the blade should be raised, the load dumped and the tractor driven far enough ahead to let the blade drop on the far side of the load. Then the tractor is reversed and down pressure is applied lightly, moving control lever from down pressure to "Hold" and alternating while backing up. The control lever should be placed on "Float" while passing over the low spot. In some cases where the hole is particularly deep, it may be necessary to raise the blade a little, then placing the control lever on "Hold" so the load will spill under the blade.

OIL FIELD SLUSH PITS AND TRENCHES

To open a slush pit or ensilage trench the blade is best used in bulldozing position, straight across the front of the tractor. This is done to push the material out of the trench, which usually has vertical banks on the sides and the ends of which slope upward from the center. A number of passes will be required to bring the trench to the proper depth.



At the end of each pass the tractor is reversed and backed through the trench rather than turned around unless it is desirable to push material from each end of the trench.

When the slush pit has served its purpose and is to be filled the material which was pushed out originally is used. Naturally it is impossible to drive out into the soft slush.

Therefore, when the material is pushed ahead of the blade and as it approaches the pit, the blade should be raised and the material is spilled under the blade so that there is always dry earth under the tractor. Repeated passes until the pit is filled with dry material will eliminate the danger of the tractor bogging down in the slush.



After an ensilage pit has been filled with feed, in most cases it is desired to cover this feed with the original earth. The same procedure is followed for this as is used with slush pit filling except that even more care must be exercised in keeping the fill material to the proper depth, and in avoiding damage to the trench walls.

FINISHING AND LEVELING



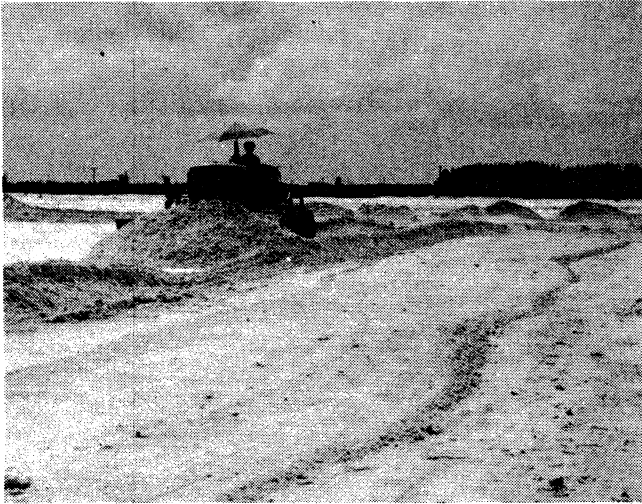
When it is desired to level and finish a job, where the material is very uneven, but not hard, the tractor should be placed on as level a place as possible before dropping the blade to make the first spread or cut, or for dragging the material by reversing the tractor, a small place can be leveled in either of the above operations.

After a small section has been leveled for the tractor to work from, the blade should be lowered to the ground line with the tractor in low gear and the throttle opened just enough to slip the tracks or to prevent stalling. Drive forward watching the end of the blade to see that it does not dig or cut below the finished section. Continue forward until you have lost control



or the tractor has started to nose up and down. Lift the blade and drive forward and drop the blade, reverse the tractor and drag the material into the low places.

Make the next pass in the same manner, but the blade should overlap onto the finished section each time. In other words, keep one track on the finished section when leveling off, either in forward or reverse gear.



If the material is hard, it will have to be loosened up (with a ripper, scarifier or the bulldozer) below the desired level in order to have sufficient material to level and spread in the low places, and it is easier to handle the blade in loose material. When possible, keep the blade full and the engine working about the same all the time, except when losing the material in the low places. Always watch the end of the blade and look ahead for the high and low

places to be cut and filled.

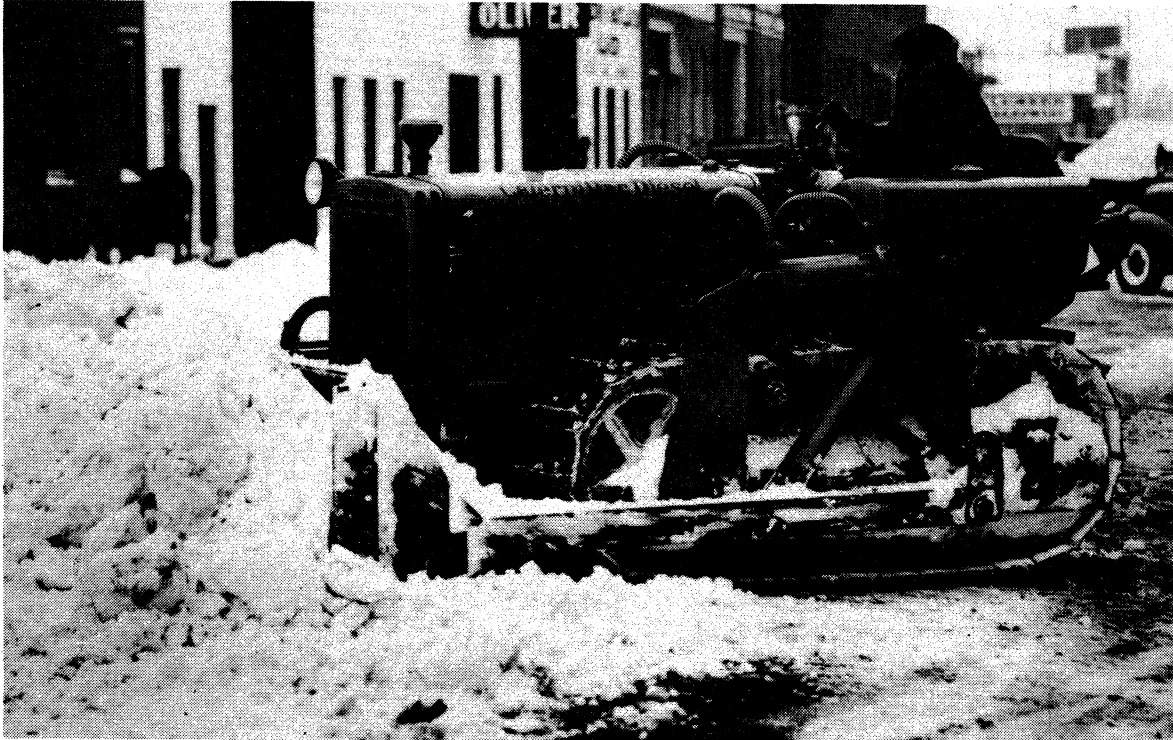
The shoes also should be adjusted about 1/2 inch above the ground line with the cutting edge on the ground. This will prevent gouging out and uneven cutting or spreading.

If the ground is very uneven, it will be necessary for the operator to first level a small place from which to start operations. Always start cutting when the tractor is level or from this initial starting point. Do not start cutting when the tractor is tilted to either side because the farther the tractor travels ahead the more it will tilt and the more it will dig in on the lower end of the blade. After part of the work is levelled it is advisable to let the blade overlap the finished work far enough so that one track will always travel on the finished work. By watching this end of the blade now and then, the cutting edge can be kept at the ground line but not cutting on the finished side. The rest of the job will be easy.

Some material can be levelled off by dragging the blade while backing up. It is much easier for the beginner to finish in this manner. Anything which speeds up any operation makes it just that much easier and more efficient.

Where material has been cast out by shovel or other means and it is desired to remove it from the edge of the cut, as in the case of industrial building basements, quarries or other projects where it is impossible to get in back of material to push, the blade may be lifted up and over the material, dropped on the opposite side, locked in the "Down" position, the tractor reversed and the material dragged away. The material may then be spread in the usual manner.

REMOVING SNOW FROM TRAILS, ROADS, HIGHWAYS AND DRIVE WAYS



Light snows and even heavy drifts can be moved with the Bulldozer.

If the snow is to be cast off the road, the snow will cast better when the tractor is traveling in the higher speeds. After making a pass or two and trying the different speeds, it can be determined which speed will be the most efficient. In most cases the higher speeds can be used; and with the higher speed several miles of road may be kept open.

Sometimes it is necessary to push the snow out of a cut on the road or out of a drive way where it can't be cast to the side. First, open up a channel near the center of the road by pushing through.

In most cases it is advisable to return in reverse gear unless the distance is too great. Always eliminate turning when

possible as the snow will pack in the tracks, sprockets and other parts of the machine and may cause damage--gather up the snow and push through the channel made at the beginning. The channel will keep the snow in front of the blade making it possible to push much more snow each trip. Keep the channel intact as long as possible for maximum loads.

TROUBLE CHART

TROUBLE	POSSIBLE CAUSE	REMEDY
Failure of Blade to lift.	Insufficient oil in oil tank.	Fill to level mark.
	Obstruction in hydraulic lines. Valve or jack connections.	Check flow of oil from starting point (at tank) through the system and remove obstruction.
	Insufficient relief valve pressure.	Reset to 450 lbs. using test gauge to check.
	Pump worn or damaged.	Inspect and repair or replace.
	Metal or rubber particles lodged in control valve.	Inspect and remove foreign matter. If core or bowl scored replace.
	Foreign matter lodged under seat of relief valve.	Inspect and remove.
	Broken piston.	Replace. Inspect jack cylinder. Renew if scored.
	Broken hydraulic line.	Check for leak and repair or replace.
Failure of Blade to hold up.	Leaking or broken lines leading from control valve to jacks.	Check for leak. Tighten or replace if broken.
	Oil leaking by control valve.	Check valve core and body for wear. Check valve core and body for scoring. Replace if scored or worn.

TROUBLE	POSSIBLE CAUSE	REMEDY
	Oil leaking by jack pistons.	Check for broken piston or scoring on piston or interior of jack cylinder. Replace if scored or broken.
Blade takes too long to raise.	Badly worn pump.	Repair or replace.
	Insufficient engine speed.	Work Bulldozer with at least $\frac{1}{3}$ to $\frac{1}{2}$ throttle.
	Badly worn piston or rings.	Replace.
	Badly worn valve core or bowl.	Replace.
Oil Heating.	Holding control on hoist or lower after jack pistons have reached end of travel causing oil to bi-pass through relief valve too often.	Let control return to neutral position when not in use. Use correct operational methods.
	Using very light oil in very hot climates.	Use oil specified in lubrication charts.
	Dirty oil.	Re-fill with new oil.
	Insufficient oil in oil tank.	Keep full to level mark on gauge.
Oil Foaming.	Air leaking into suction line from tank to pump.	Tighten or replace suction line.
	Wrong kind of oil used.	Use only oil specified in lubrication chart.
	Too much passage of oil through the relief valve.	Correct operational methods.

TROUBLE	POSSIBLE CAUSE	REMEDY
Oil leaks by packing gland on jacks.	Worn or loose packing.	Replace packing or tighten packing gland.
Blade wearing out at bottom.	Failure to replace cutting edge in time.	Replace cutting edge before wear starts to occur on blade bottom.
Blade lifts when control handle is placed in lowering position.	Lines leading from valve to jacks have been crossed.	Reverse lines.
	Right and left hand jacks have been installed on wrong sides of the tractor.	Re-install jacks correctly.
Relief valve fails to hold pressure of 450 lbs. after being set.	Locking Key has been left out of relief valve adjusting nut.	Insert key.
Failure to hold level grade.	Operating in too high a gear.	Operate in 1st gear with not over half throttle while finish grading.
	Leaving control on lift or lower position too long when changing position of blade.	Move control in a series of quick moves which lifts blade slightly.
	Starting grade level in very uneven ground.	Always level area to start grading from.
Having continual trouble keeping steering clutches and master clutch adjusted.	Failure to fully engage clutches after disengaging.	Never engage master clutch only part way in. Return steering clutches to full engaged position immediately after using.

TROUBLE	POSSIBLE CAUSE	REMEDY
Unable to steer tractor when pushing load.	Blade too full of material to permit traction when one steering clutch is released.	Lift blade slightly before trying to turn.
Unable to keep blade loaded when moving material considerable distance.	Failure to provide channel for blade to operate in.	Follow same pathway each time so material will windrow on each end of blade and hold blade full.
Unable to control tractor on steep inclines.	Failure to keep tractor in first or second gear and master clutch engaged.	Use compression of tractor engine to hold down speed and use opposite steering clutch from that used in normal operation if tractor is pushing engine.

MOUNTING INSTRUCTIONS

B61 BULLDOZER

**For use with "Caterpillar" D-6 Track Type Tractor
Standard and Canopy Top**

The following instructions should be closely followed to insure satisfactory results in a minimum of time. These instructions apply to both the standard and wide gauge machines with exceptions only as noted.

PREPARING TRACTOR PRIOR TO MOUNTING EQUIPMENT

1. Remove front lower radiator bottom guard and guard plate directly under fan pulley.
2. Remove crank jaw on front of crankshaft.
3. Remove plugs in R.H. and L.H. engine support channels at front and in the outside and inside track roller frame channels of both tracks.
4. Remove engine hood.

WHEN TRACTOR IS EQUIPPED WITH EXTRAS

1. It is necessary to remove bumper as the "Caterpillar" bumper can not be used with LaPlant-Choate equipment.
2. It is necessary to remove crankcase guard.
3. It is necessary to remove radiator guard as the "Caterpillar" guard can not be used with LaPlant-Choate equipment.

TO MOUNT CYLINDER BRACKET GROUP

1. To mount R. H. CYLINDER BRACKET refer to parts plate No. 1154 Page 34 and mount as shown. Do not draw the five 7/8" x 3-1/4" SAE capscrews tight.
2. Mount BRACE SUPPORT ASSEMBLY as shown on parts plate No. 1154 Page 34. Use two 5/8" x 2-1/2" SAE Capscrews with nuts and lockwashers and draw tight.
3. Place BRACE GROUP in place and adjust so that there is no slack at the pins.
4. Repeat above operation for L. H. CYLINDER BRACKET. Refer to parts plate No. 1155 on Page 35.
5. Mount CROSS BRACE GROUP as shown on parts plate No. 962 Page 36. Fasten in plate using four 5/8" x 2" and one 5/8" x 3" SAE Capscrews plus Lockwashers and nuts on each side. Draw bolts tight.
6. Draw tight all bolts in right and left hand CYLINDER BRACKET PLATES Pages 34 and 35.

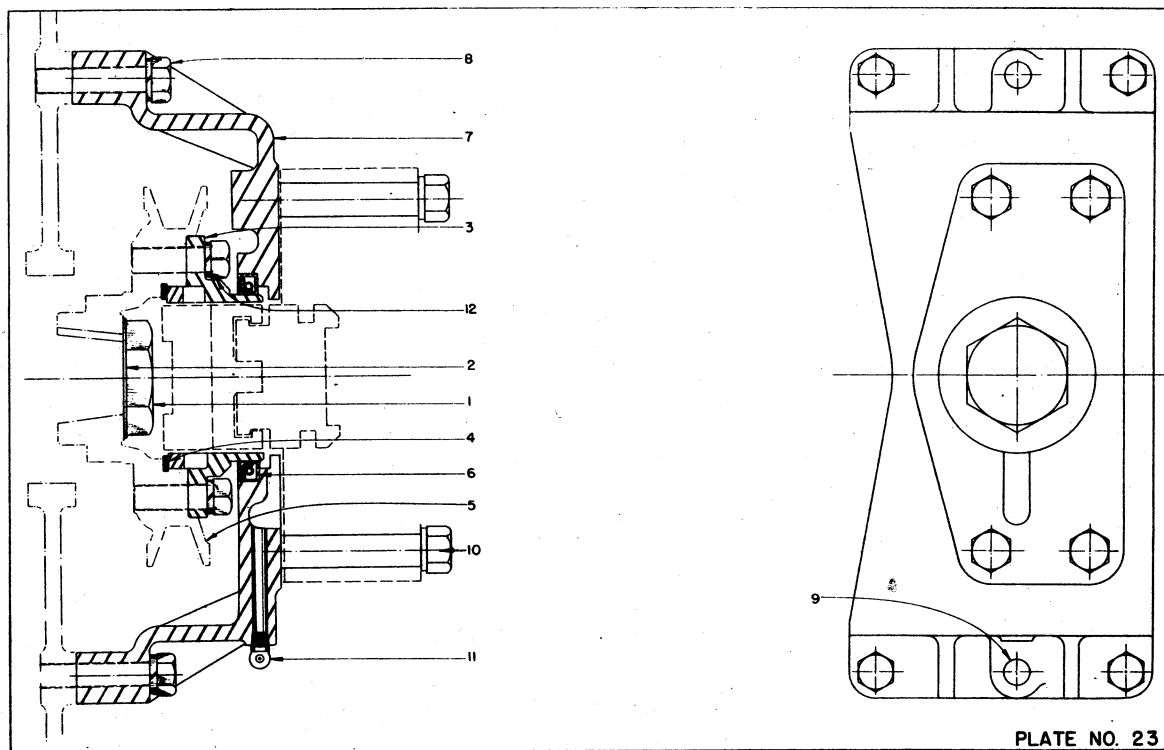
TO MOUNT PUMP ADAPTER ASSEMBLY AND THE PUMP

1. After crank jaw has been removed from front end of crank shaft, insert special capscrew 1 with lockwasher 2 in place, run capscrew down tight, and lock in place with washer by bending edge of washer 2 down over side of capscrew head.

2. Place drive coupling flange assembly 3 to inner face of fan pulley 5 with cork gasket 4 in place between coupling 3 and fan pulley 5.

Fasten assembly 3 to fan pulley 5 with six 1/2" x 1-3/4" USS Cap-screws 12, draw down tight with lockwashers on capscrews.

3. Place oil seal 6 in adapter assembly 7 with the leather lip entering first, so the sealing action will be toward the pump when mounted, as shown.



4. Place adapter assembly 7 over drive coupling flange 3 taking care not to damage oil seal 6 which must slip over bearing on drive coupling flange 3.

NOTE: The seal will slip over bearing on drive coupling flange very easily, if it has been placed in adapter assembly correctly, that is, so the back of the seal contacts the drive coupling flange first, and not the lip of the oil seal.

Insert capscrews 8 but do not draw down tight until dowel pins 9 have been driven into place. Dowel pins should be driven in flush with face of adapter assembly, then draw capscrews 8 down tight with lockwashers in place.

5. Pump may now be fastened to adapter assembly 7. First line up drive coupling by turning the pump so coupling on pump will line

with coupling on drive coupling flange 3. Lift pump in line with coupling flange 3, and by turning the pump slightly the couplings should engage. Insert capscrews 10 and draw down tight with lockwashers in place.

6. Screw zerk fitting 11 into adapter base assembly 7 and fill assembly with zerk gun after pump is in place.

TO MOUNT TANK, VALVE AND PIPING

1. Mount LOWER CROSS PIPE GROUP into proper place.
2. Mount RAISE CROSS PIPE GROUP into proper place.
3. Mount POWER PIPE GROUP into proper place after assembling H.P. HOSE 1" x 28" to front end.
CAUTION: (refer to parts plate No. 1393) Page 47.
Mount these pipes in the above named sequence to insure satisfactory alignment. Do not draw clamps tight.
4. Place TANK, BASE PLATE AND VALVE GROUP (refer to parts plate No. 1460 Page 50) on right hand fender of tractor and slide forward into position so that CROSS PIPES and POWER PIPE can be connected to unions on VALVE.
5. Tighten unions and clamps on CROSSBEAM.
6. Drill holes down thru fender using BASEPLATE as template and fasten BASEPLATE to fender with six 1/2" x 1-1/2" SAE Capscrews, lockwashers and nuts and draw tight.
7. Mount POWER PIPE BRACKET (refer to parts plate No. 1299 Page 45) on top side of L.H. engine support channel using 1/2" x 1-3/4" SAE Capscrews, lockwashers and nuts. Draw tight.
8. Place U CLAMP around POWER PIPE and draw tight.
9. Connect union on H.P. HOSE to fitting on PUMP.
10. Place SUCTION LINE ASSEMBLY (refer to parts plate No. 1393 Page 47) along R.H. side of engine frame and, after tightening union at TANK, clamp pipe to engine frame with J BOLT and draw tight.
11. Connect union to fitting on PUMP.

FILLING THE OIL SUPPLY TANK FOR THE HYDRAULIC SYSTEM

1. The Oil tank holds approximately 12 gallons of oil up to the oil level mark on the gauge stick.
2. Use clean lubricating oil only. S.A.E.-20 in the winter and S.A.E.-40 in the summer. Check the oil level in the tank each time the machine is lubricated, keep the oil level up to the mark on the stick.
3. If the tank is filled too full the oil will be forced out the breather if the control valve is placed on float while the blade is lifted, as the blade will fall, forcing the oil out of the Jack into the tank, which will overflow the tank.
4. Keep all connections tight, as a leak in the system will cause the oil to foam and come out the breather.

TO MOUNT JACK GROUPS

1. Remove capscrews which hold JACK HANGER PIN and remove PIN.
2. Place JACK into support, base end and power pipe to top side.
3. Place PIN and locking capscrew into place and draw tight.
4. Connect H.P. HOSE (3/4" x 28") to JACK and CROSS PIPES and draw tight the connections. Refer to parts plate No. 1393. Page 47.

TO MOUNT TRACTORS MOUNTINGS (Standard Gauge)

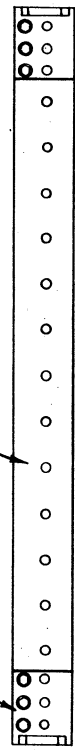
(Refer to Parts Plate No. 1124, Page 37)

1. Mount R.H. TRACTOR MOUNTING to right hand outside track roller frame channel using eight 3/4" x 2" U.S.S. Capscrews and lock-washers. Draw capscrews tight.
2. Mount L.H. TRACTOR MOUNTING to left hand outside track roller frame channel using eight 3/4" x 2" U.S.S. Capscrews and lock-washers. Draw capscrews tight.

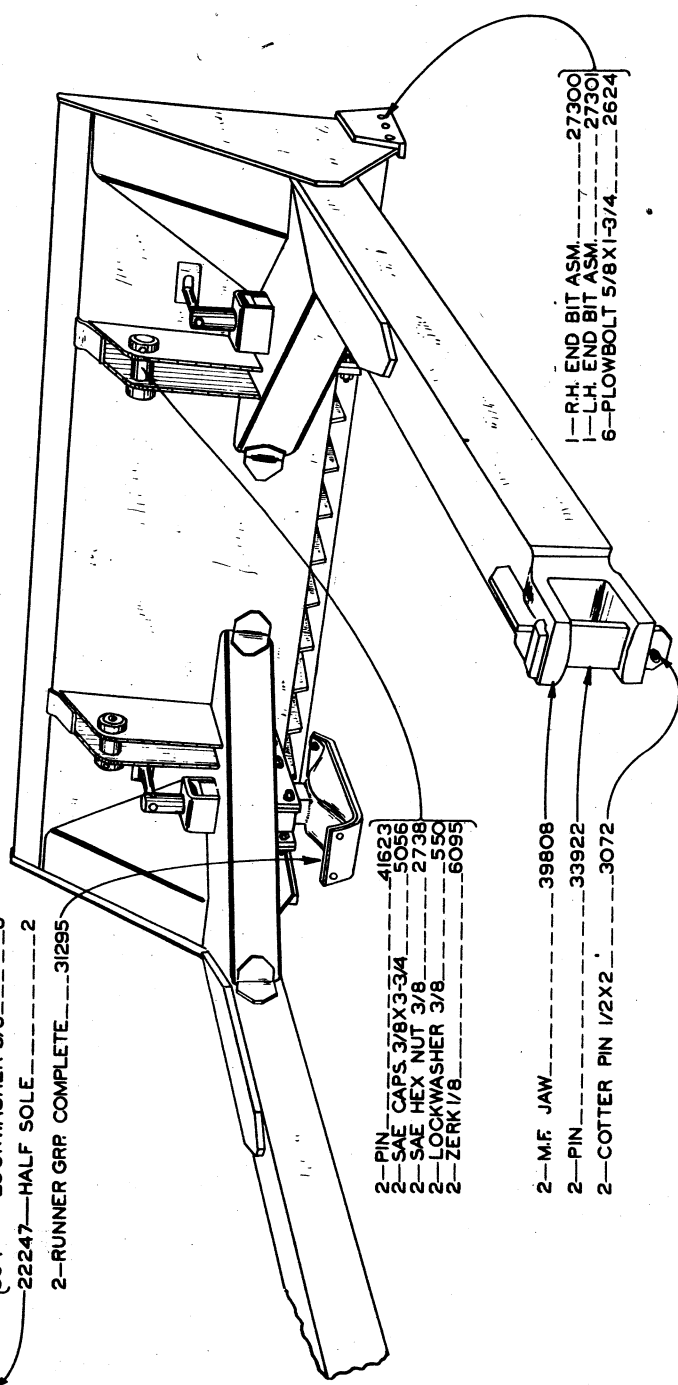
TO MOUNT MAIN FRAME AND BLADE GROUP

1. Block rear of MAIN FRAME to proper height, remove JAW PINS and drive tractor into place. Drop JAW PINS into place and secure with COTTER PINS.
2. Remove JACK CONNECTION PINS, connect JACKS and replace PINS. Draw capscrews tight.

- 40681—R.H. END CUTTING EDGE ASM
- 40682—L.H. END CUTTING EDGE ASM
- 2658—PLOWBOLT 5/8X2-1/4 3HD
- 37041—SPCL. CAPS. 1-1/8X2-9/16
- 27334—CENTER CUTTING EDGE
- 2668—PLOWBOLT 5/8X2 3HD



- 26409—RUNNER ADJ BAR
- 22462—ADJ SHAFT
- 31288—WASHER
- 34394—ADJ SHAFT ASM
- 33695—FELT
- 5128—SAE CAPS. 3/4X2
- 2750—SAE HEX NUT 3/4
- 556—LOCKWASHER 3/4
- 27345—BUSHING ASM
- 2639—PLOWBOLT 5/8X2
- 554—LOCKWASHER 5/8
- 22247—HALF SOLE
- 2—RUNNER GRP COMPLETE



- 41623—PIN
- 2—SAE CAPS. 3/8X3-3/4
- 2—SAE HEX NUT 3/8
- 2—LOCKWASHER 3/8
- 2—ZERK 1/8
- 5056
- 2738
- 550
- 6095

- 2—M.F. JAW
- 2—PIN
- 2—COTTER PIN 1/2X2
- 39808
- 33922
- 3072

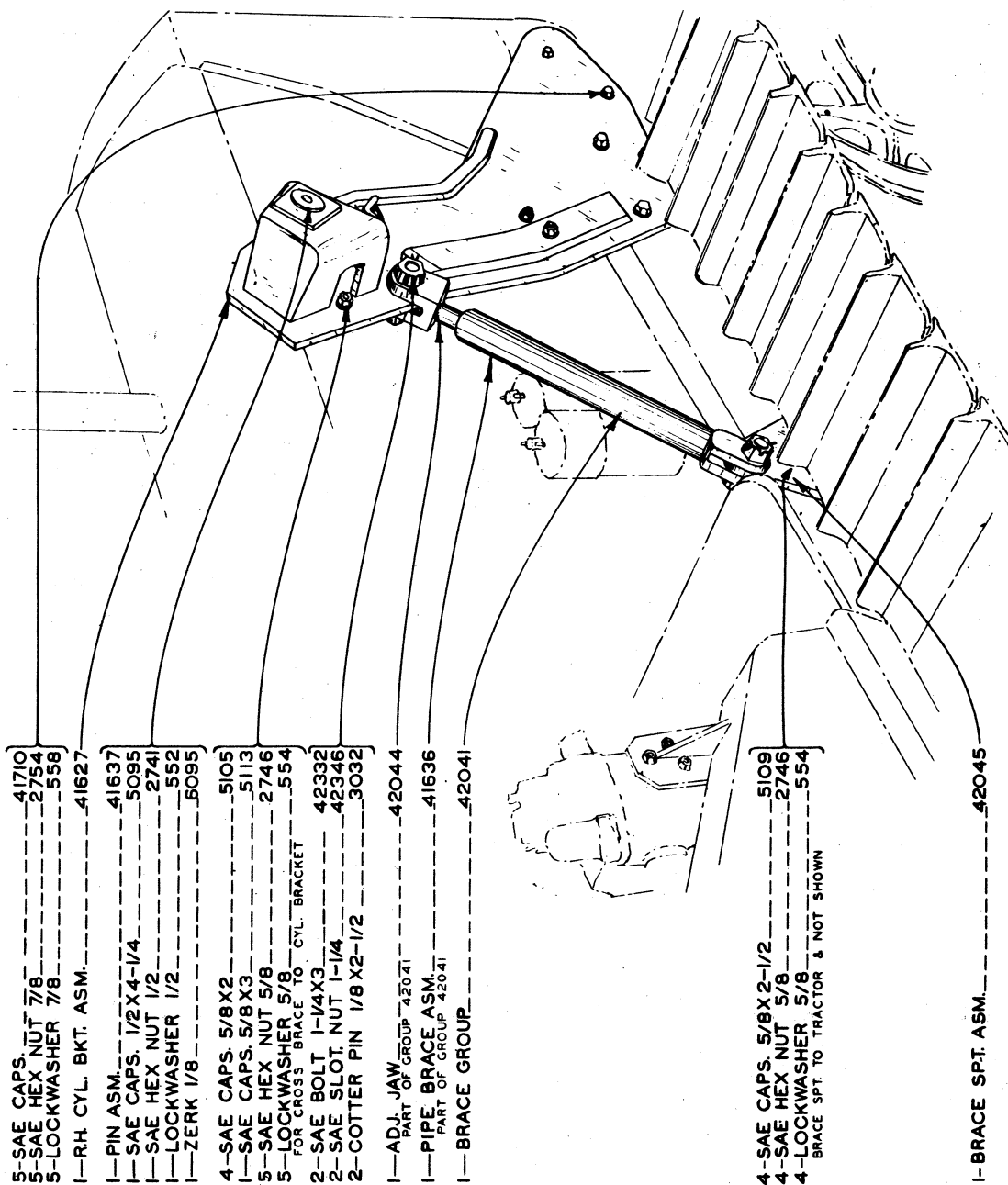
- R.H. END BIT ASM
- L.H. END BIT ASM
- 6—PLOWBOLT 5/8X1-3/4
- 27300
- 27301
- 2624

41678 MAIN FRAME & BLADE GROUP

PLATE 945

MAIN FRAME AND BLADE B61 — I TO INCL.





41625 R.H. CYL. BKT. & BRACE GROUP

PLATE 959

CYLINDER BRACKET AND BRACE B61 — 1 TO 96, INCL., EXCEPT B61 — 88, 89, 93 AND 94

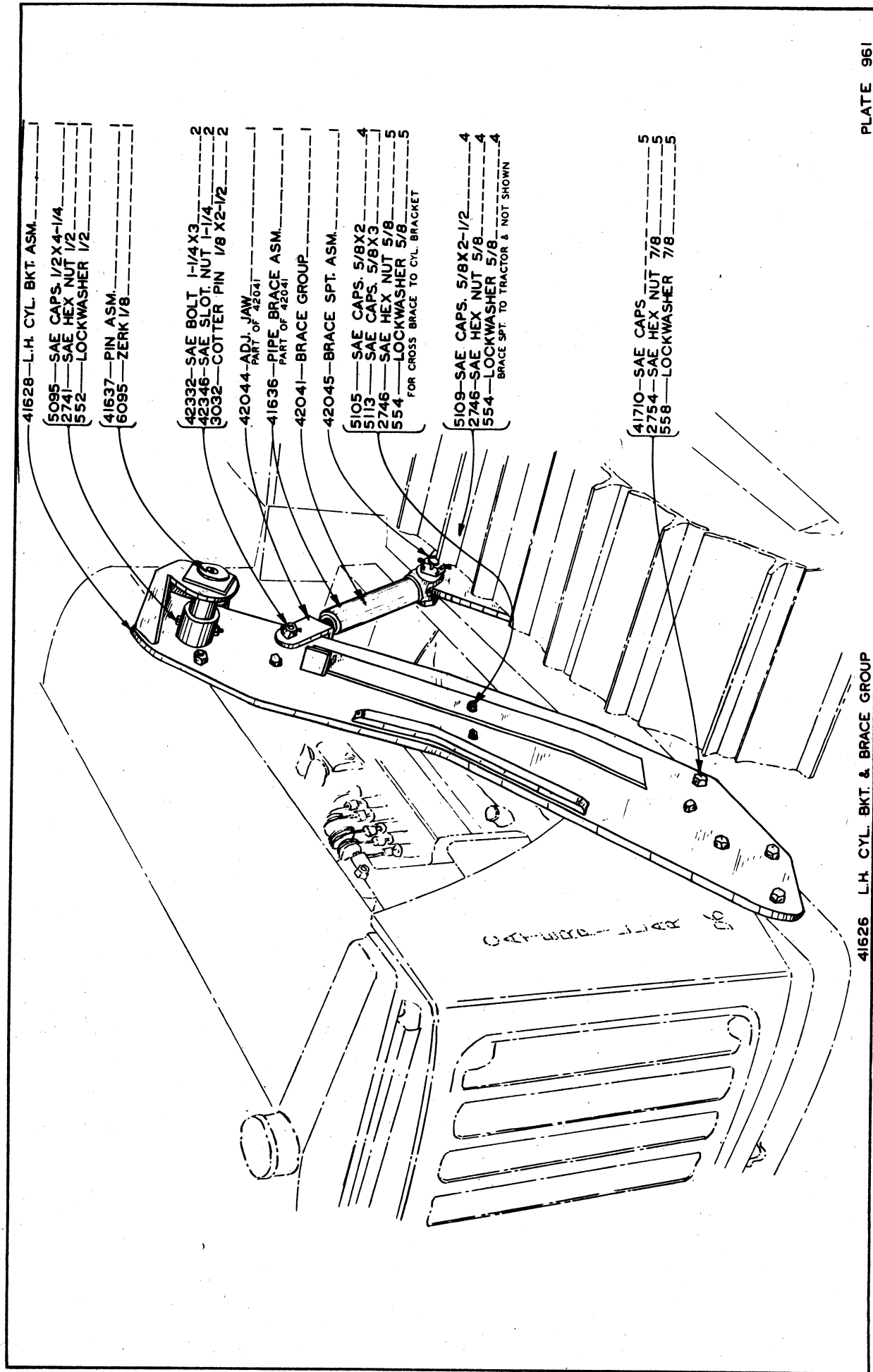
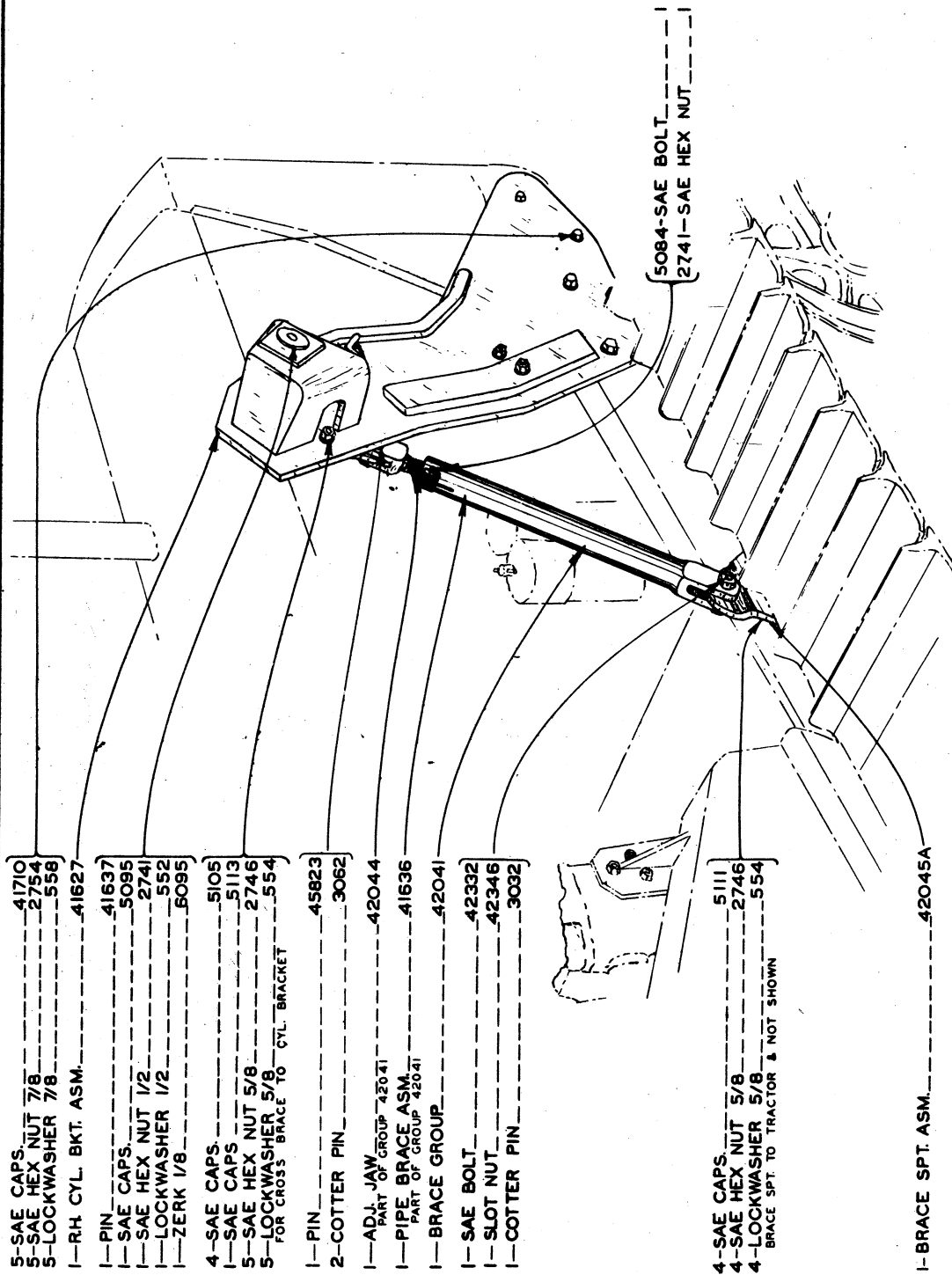


PLATE 961

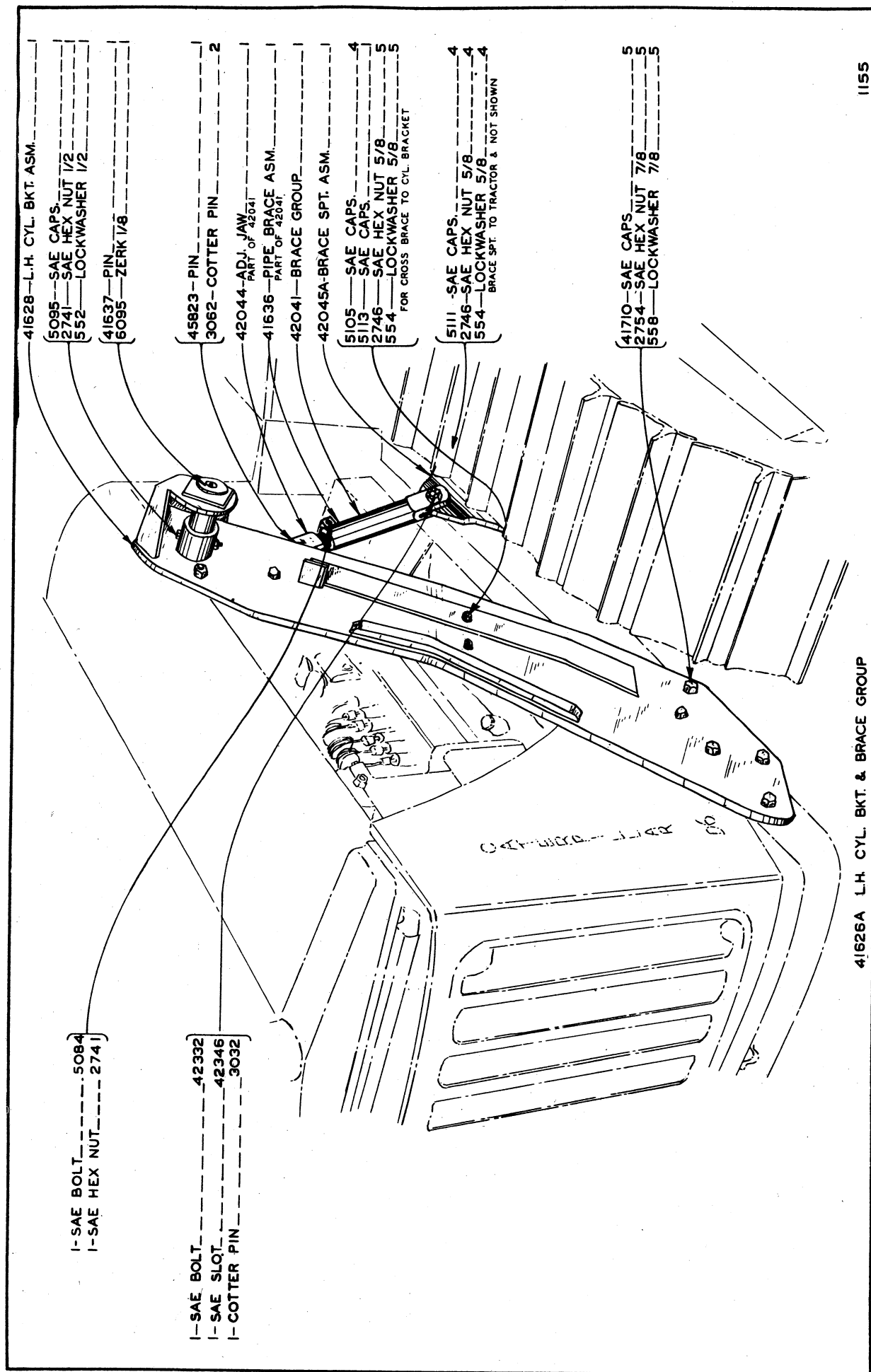
CYLINDER BRACKET AND BRACE B61 — I TO 96, INCL., EXCEPT B61 — 88, 89, 93 AND 94



41625A R.H. CYL. BKT. & BRACE GROUP

1154

CYLINDER BRACKET AND BRACE B61 — 88, 89, 93, 94 AND 97 TO , INCL.



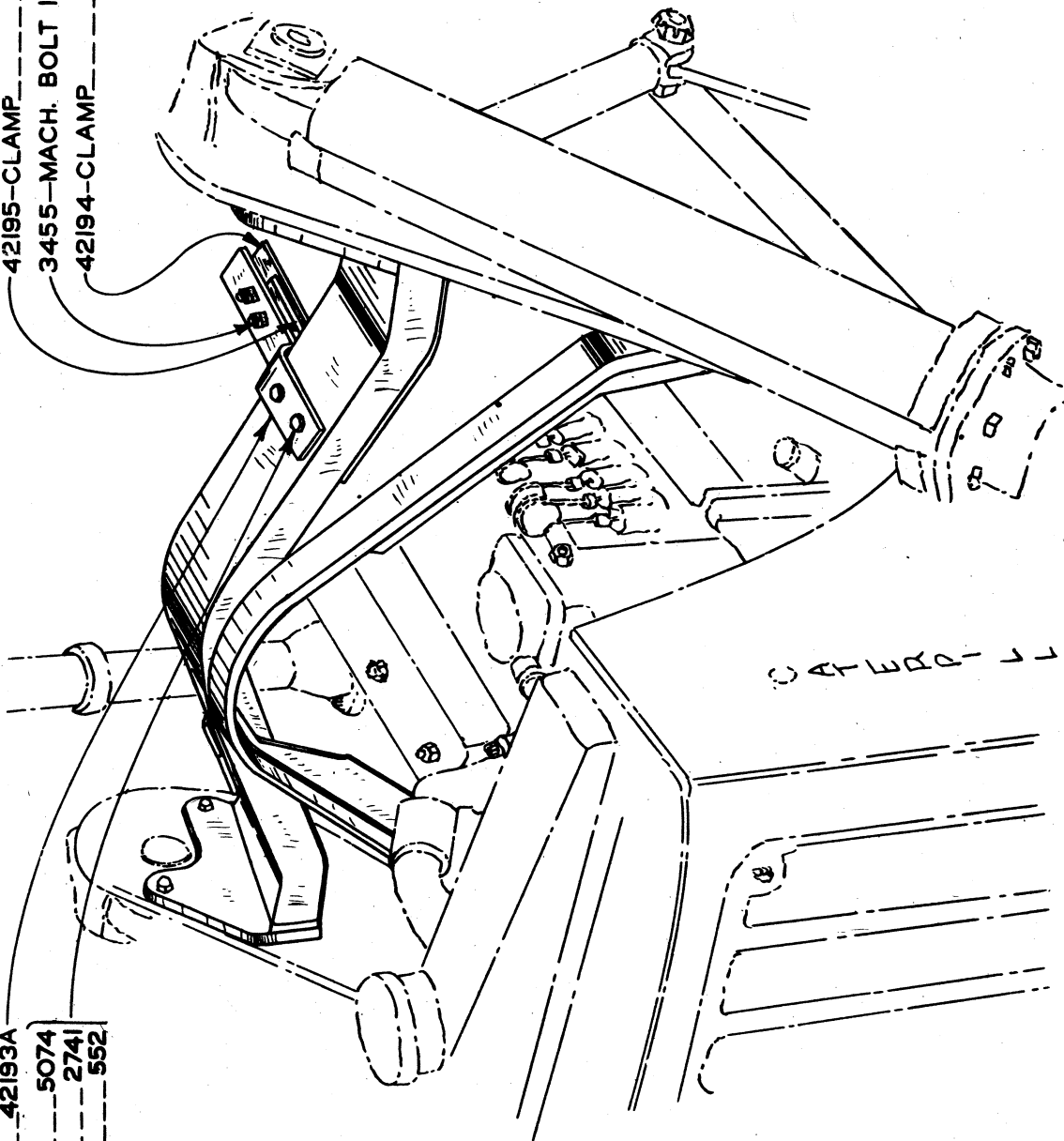
1155

CYLINDER BRACKET AND BRACE B61 — 88, 89, 93, 94 AND 97 TO , INCL.



2-PIPE BRACKET_42193A_2
 4-SAE BOLT_5074_4
 4-SAE NUT_2741_4
 4-LOCKWASHER_552_2

42195-CLAMP_2
 3455-MACH. BOLT 1/2X2-3/4_4
 42194-CLAMP_2

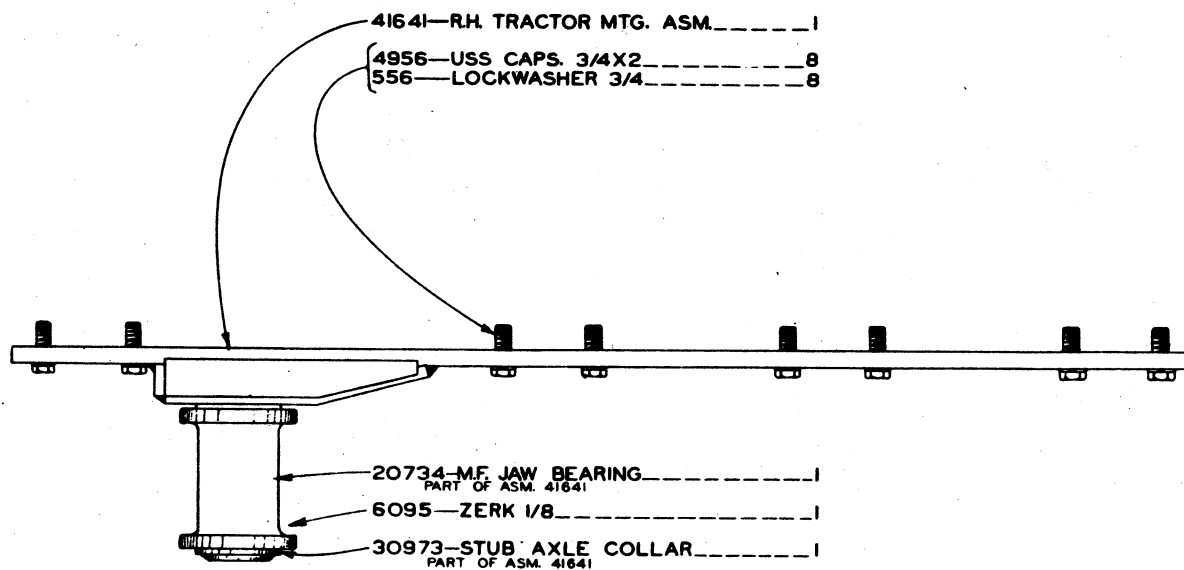


42201A CROSS BRACE GROUP

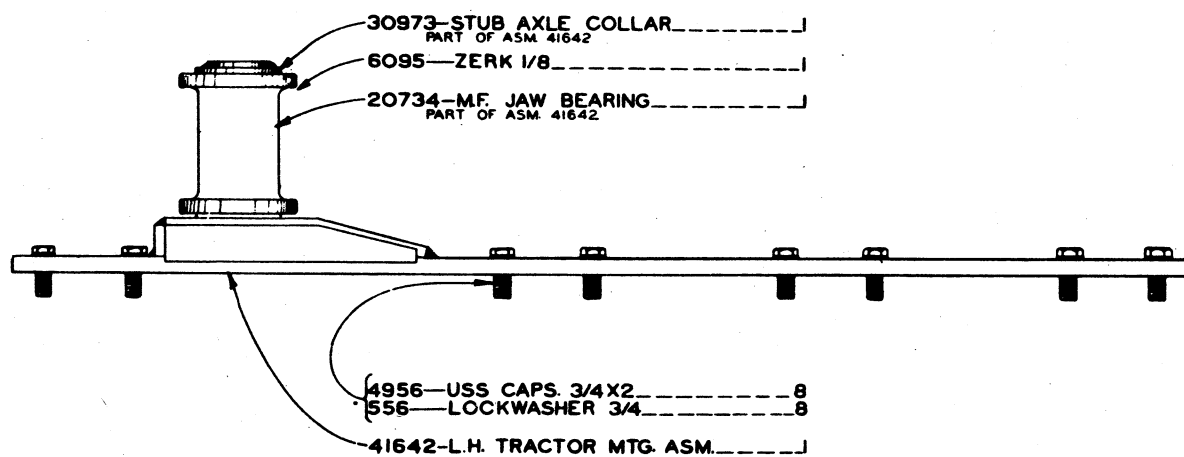
PLATE 962

CROSS BRACE

B61 — 1 TO , INCL.



41639 R.H. TRACTOR MTG. GROUP



41640 L.H. TRACTOR MTG. GROUP

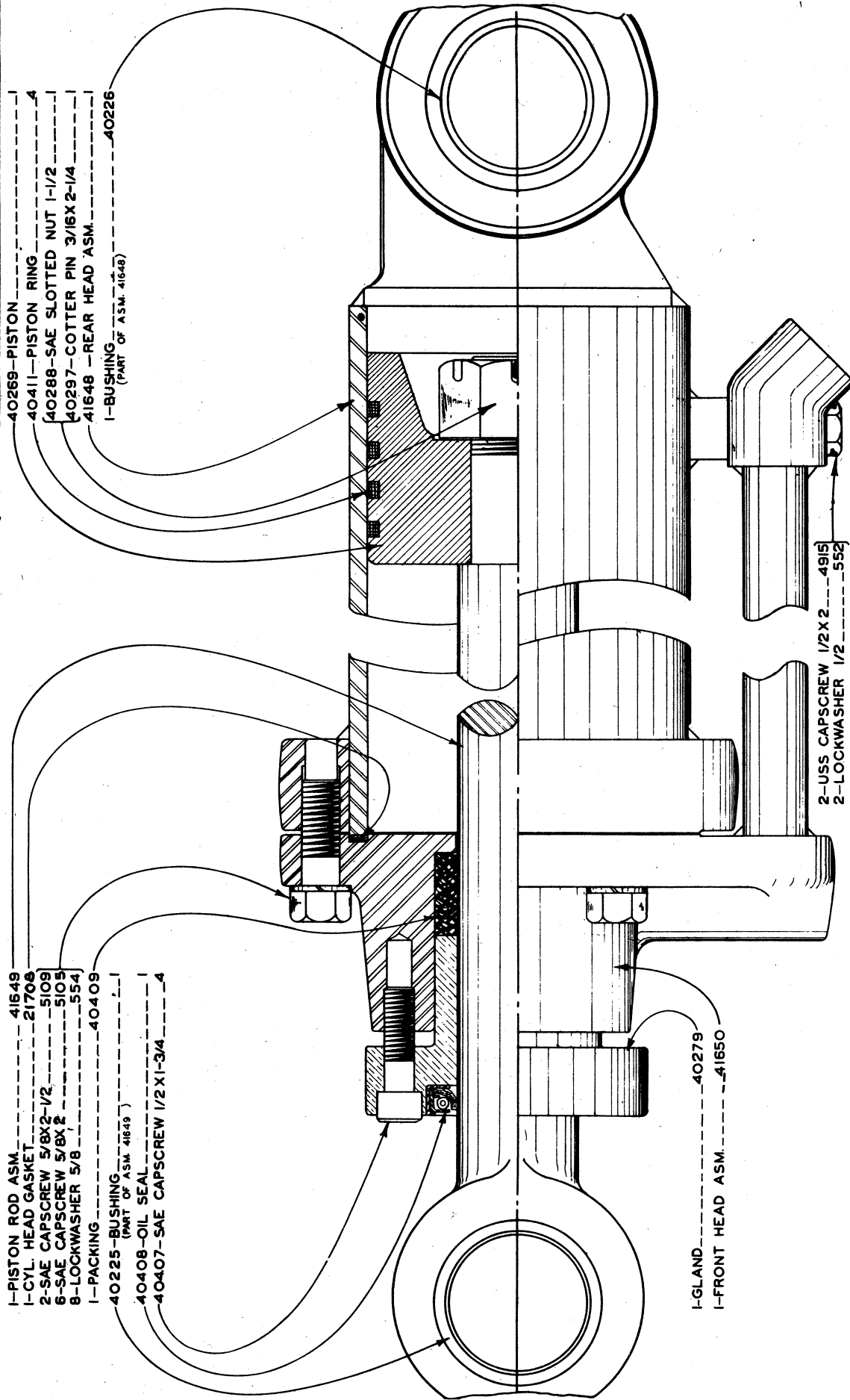
B61 — I TO , INCL.

TRACTOR MOUNTING



1-PISTON ROD ASM.-----41649
 1-CYL. HEAD GASKET-----21708
 2-SAE CAPSCREW 5/8X2-1/2-----5109
 6-SAE CAPSCREW 5/8X2-----5105
 8-LOCKWASHER 5/8-----554
 1-PACKING-----40409
 40225-BUSHING-----
 (PART OF ASM. 41649)
 40408-OIL SEAL-----1
 40407-SAE CAPSCREW 1/2X1-3/4-----4

40269-PISTON-----1
 40411-PISTON RING-----4
 40288-SAE SLOTTED NUT 1-1/2-----1
 40297-COTTER PIN 3/16X2-1/4-----1
 41648-REAR HEAD ASM.-----1
 1-BUSHING-----40226
 (PART OF ASM. 41648)



1-GLAND-----40279
 1-FRONT HEAD ASM.-----41650

2-USS CAPSCREW 1/2X2-----4915
 2-LOCKWASHER 1/2-----552

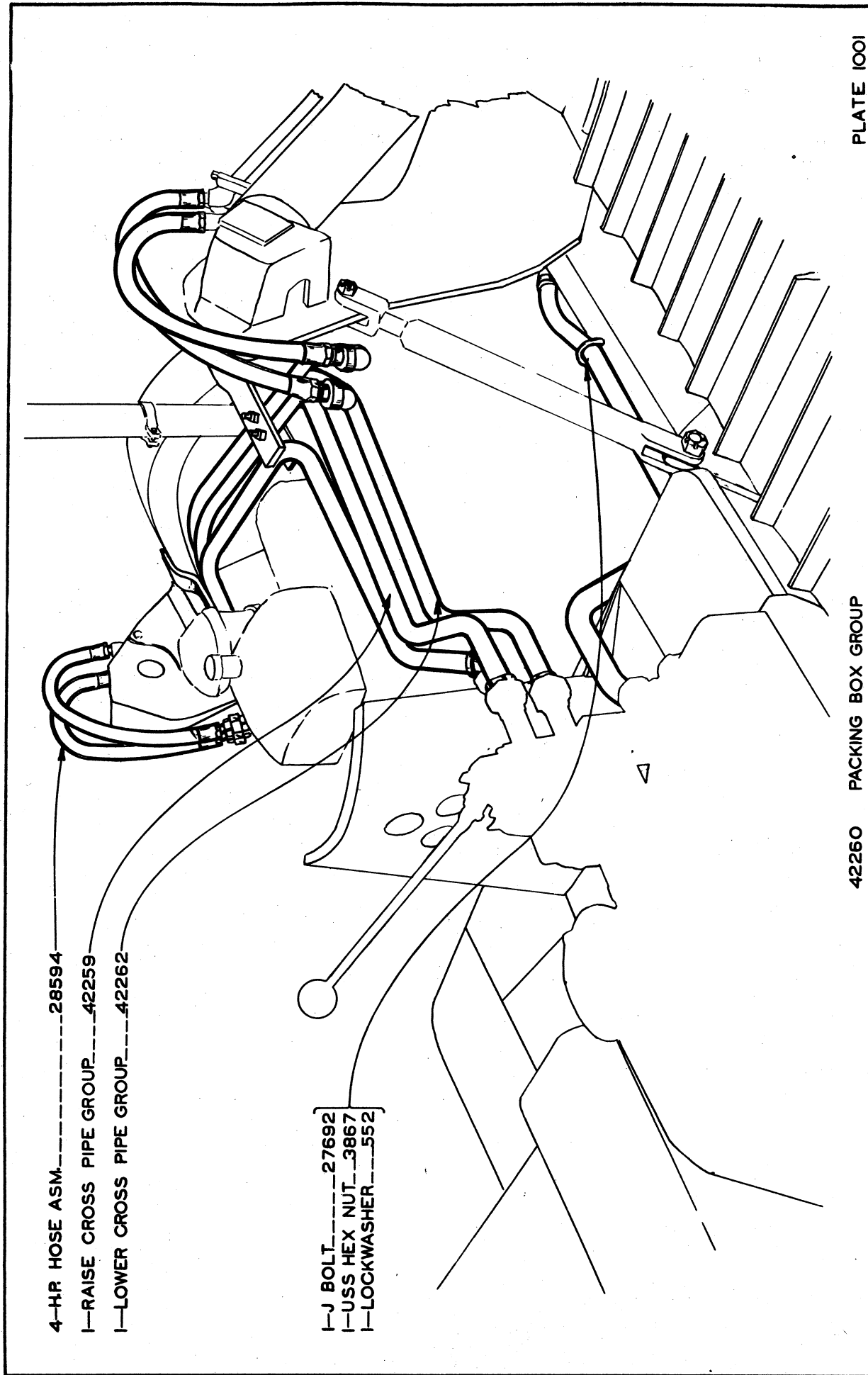
41647 - JACK GROUP

TWO GROUPS REQUIRED

PLATE 957

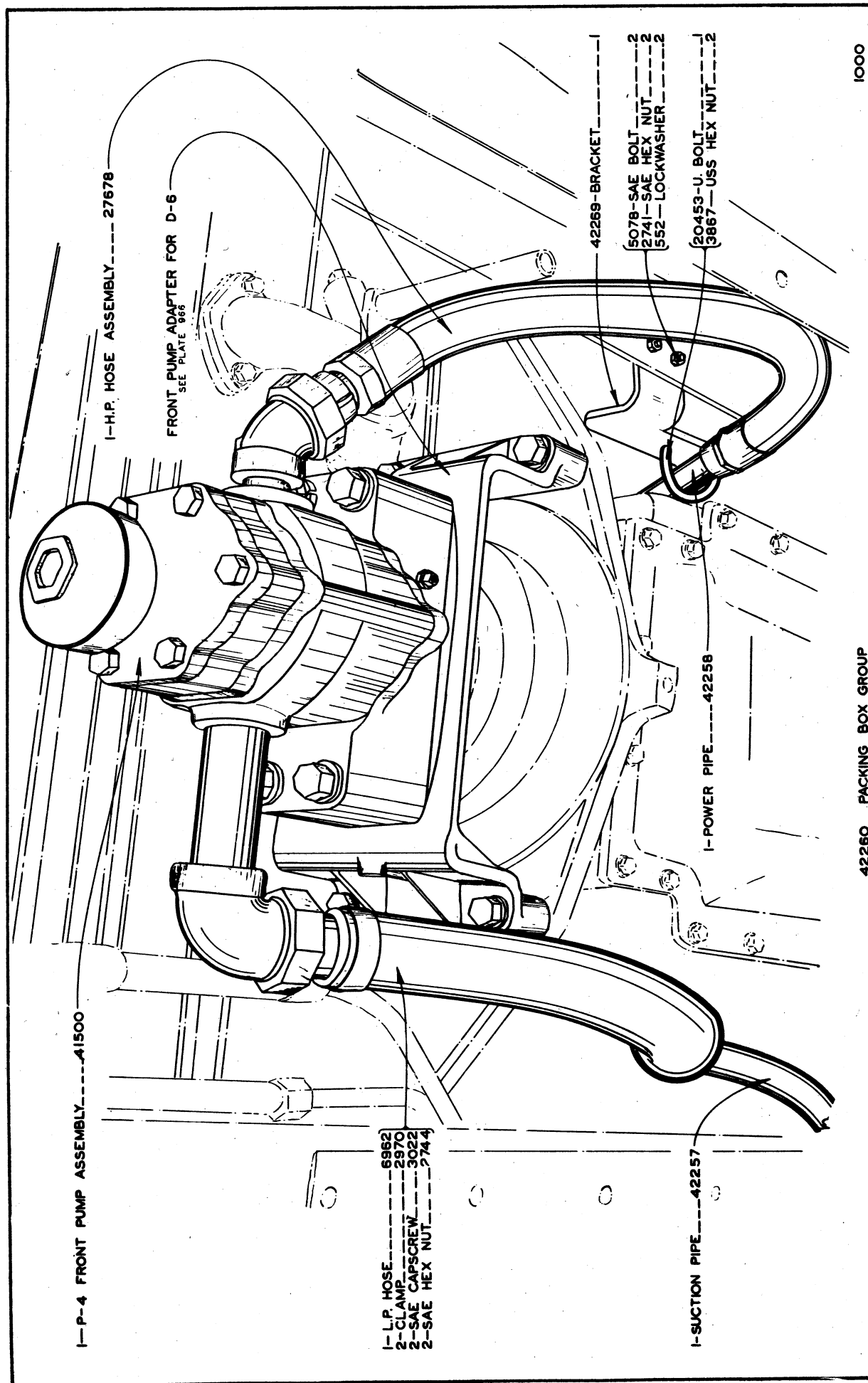
JACK

B61 -- 1 TO , INCL.



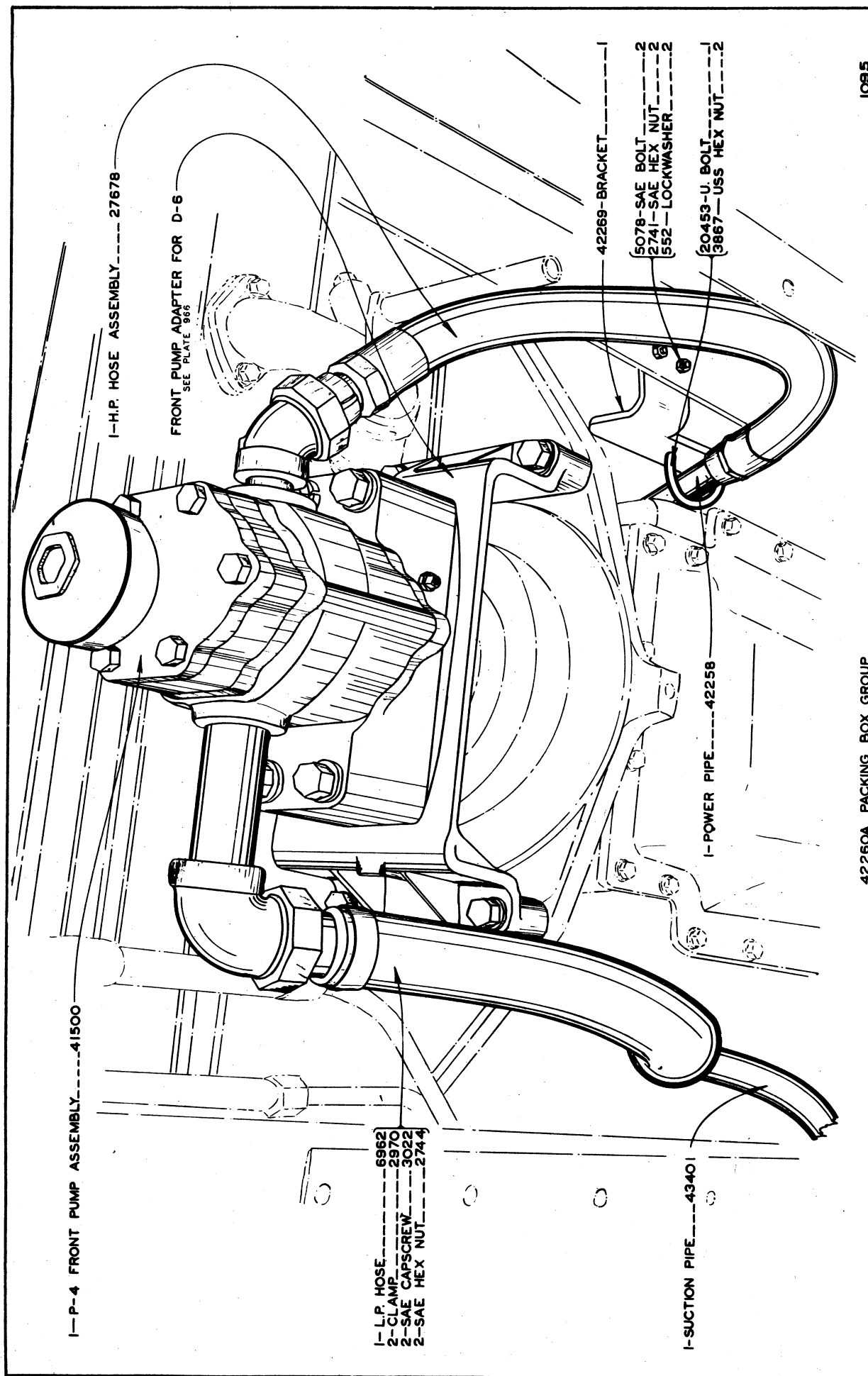
B61 — 1 TO 188, INCL.

HYDRAULICS



B61 — 1 TO 49, INCL.

HYDRAULICS

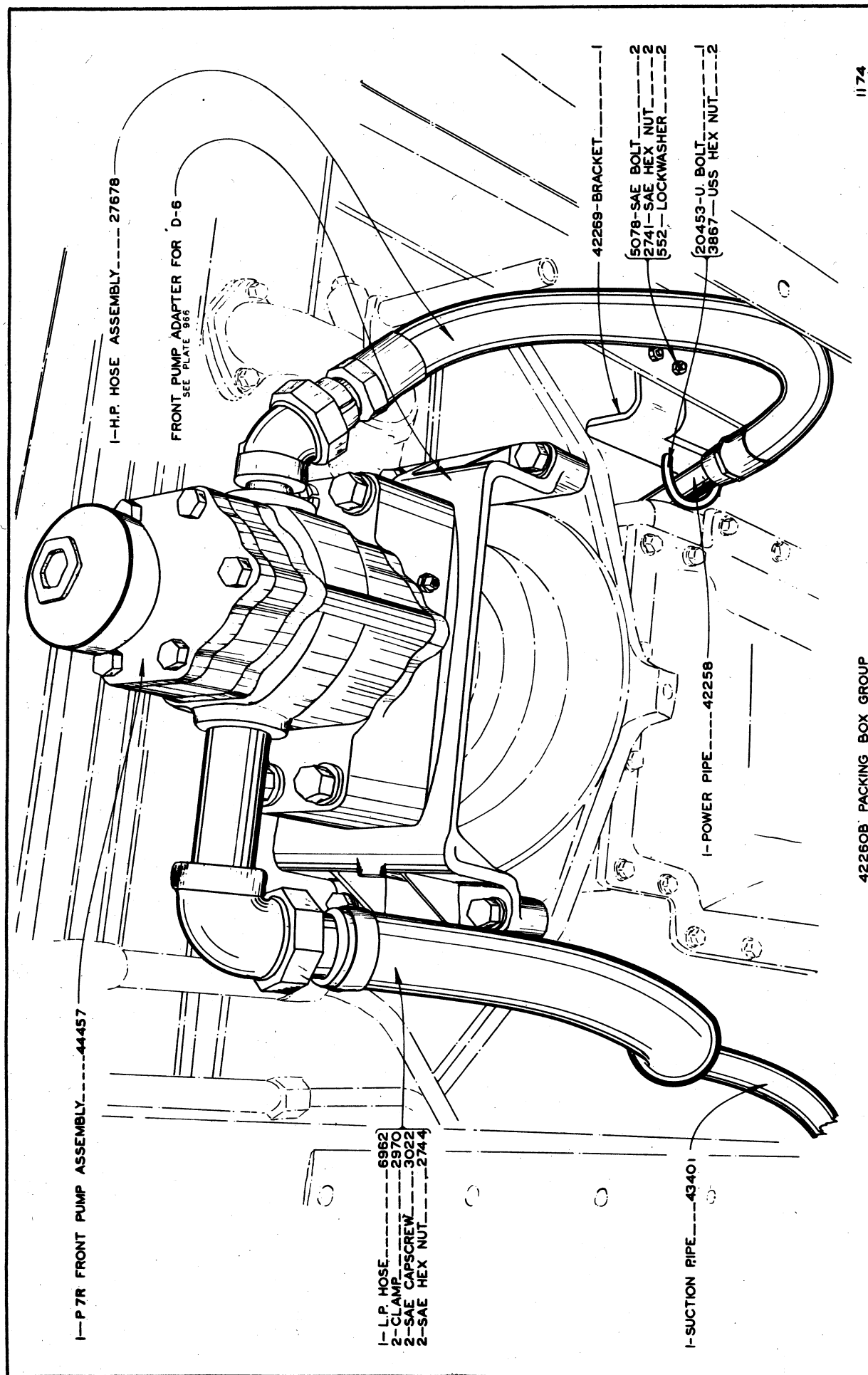


42260A PACKING BOX GROUP

1095

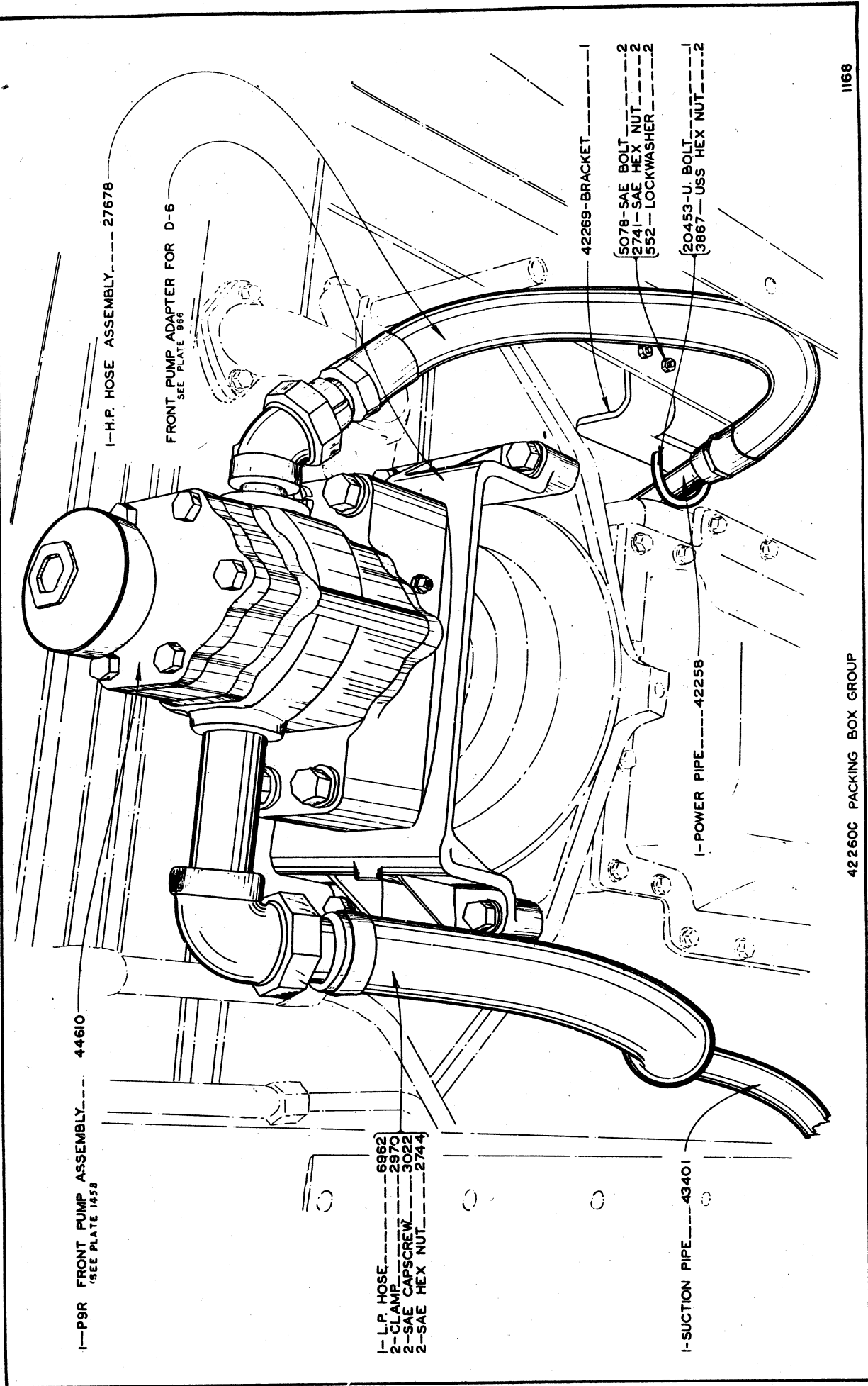
B61 — 50 TO 85, INCL., EXCEPT B61 — 74

HYDRAULICS



B61 — 74 AND B61 — 86 TO 102, INCL.

HYDRAULICS

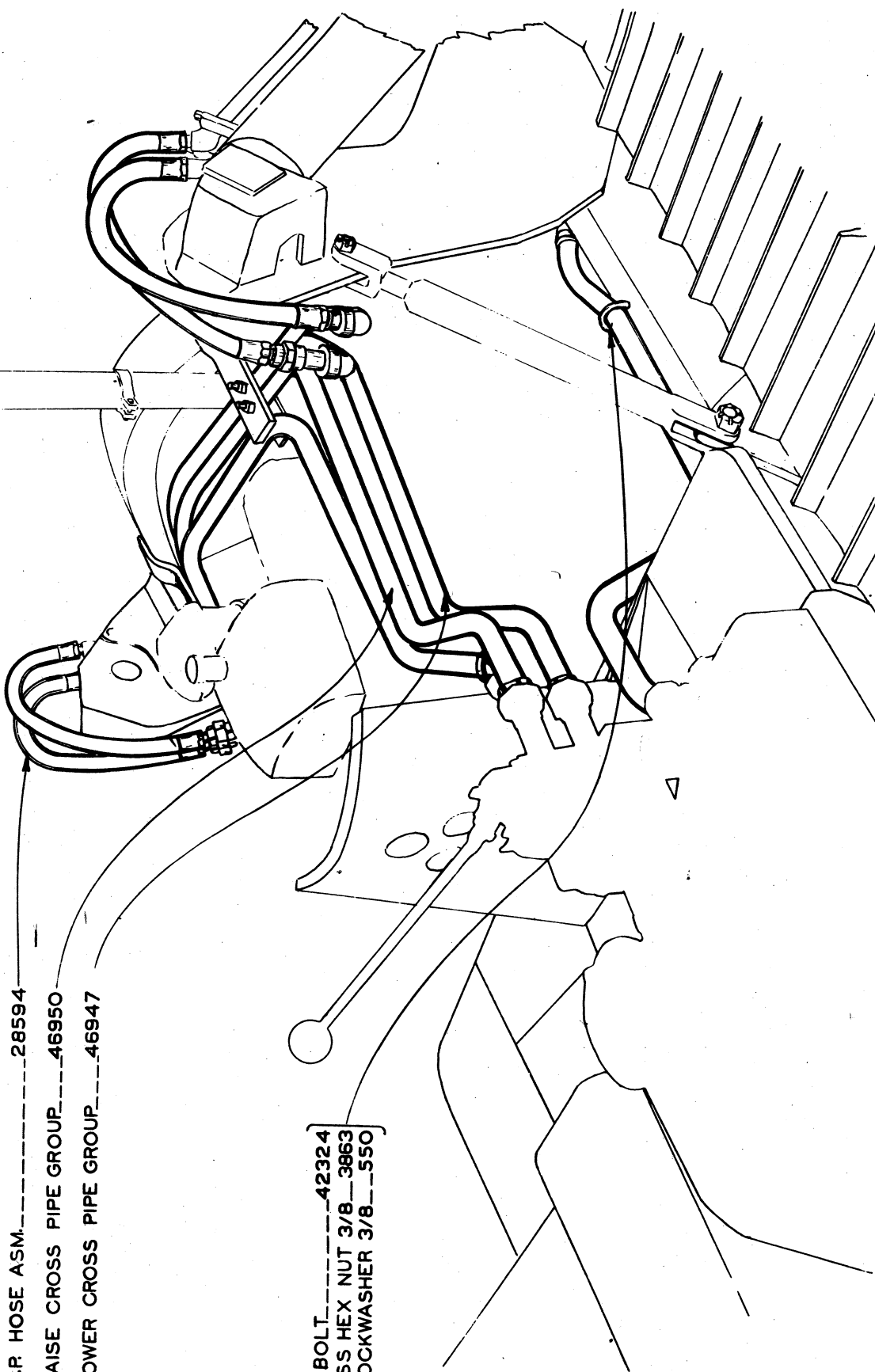


B61 — 103 TO 188, INCL.

HYDRAULICS

4-HR HOSE ASM.-----28594
 I-RAISE CROSS PIPE GROUP_46950
 I-LOWER CROSS PIPE GROUP_46947

I-J BOLT_42324
 I-USS HEX NUT 3/8_3863
 I-LOCKWASHER 3/8_550



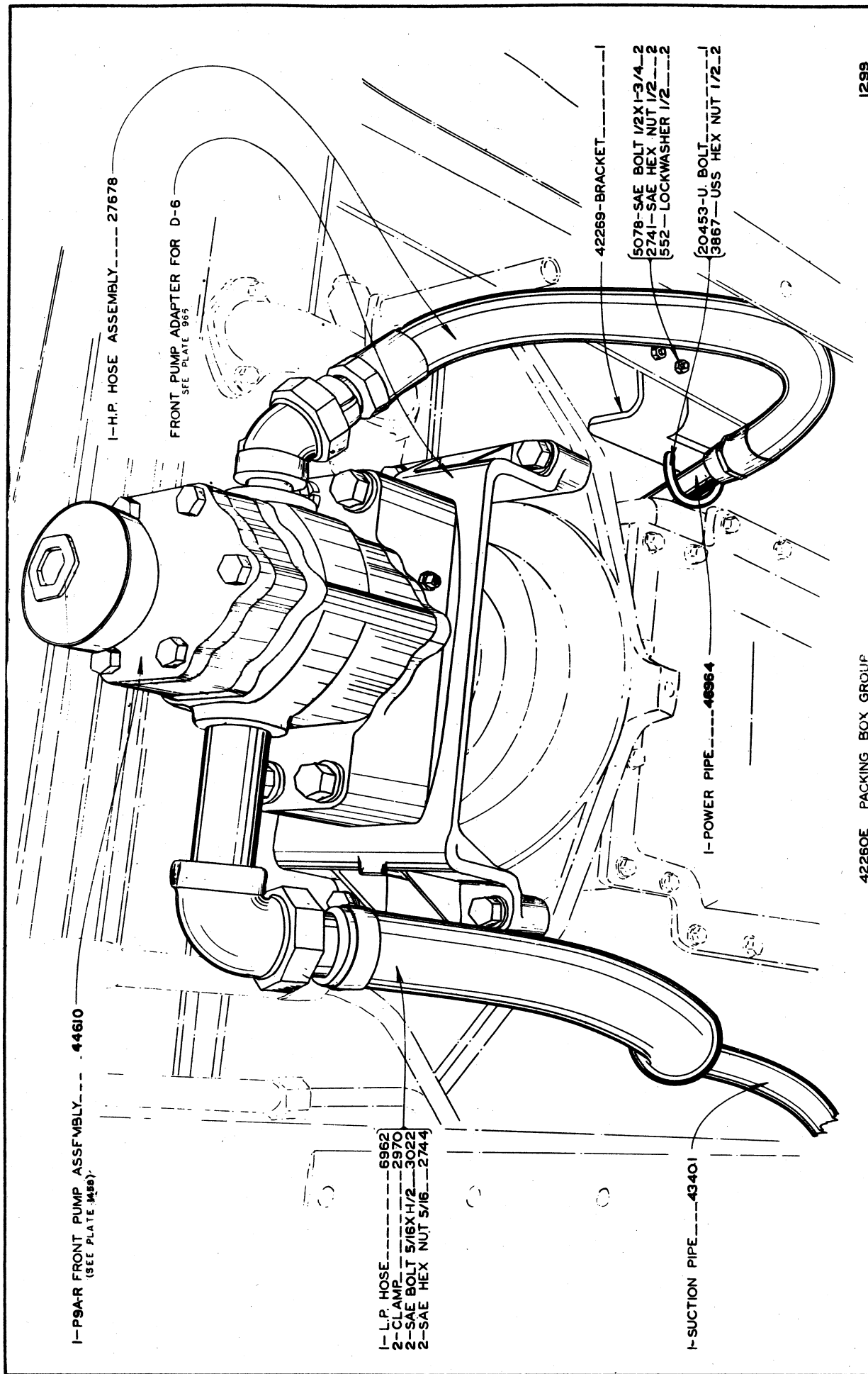
42260E PACKING BOX GROUP

1298

B61 — 189 TO 217, INCL.

HYDRAULICS





4226OE PACKING BOX GROUP

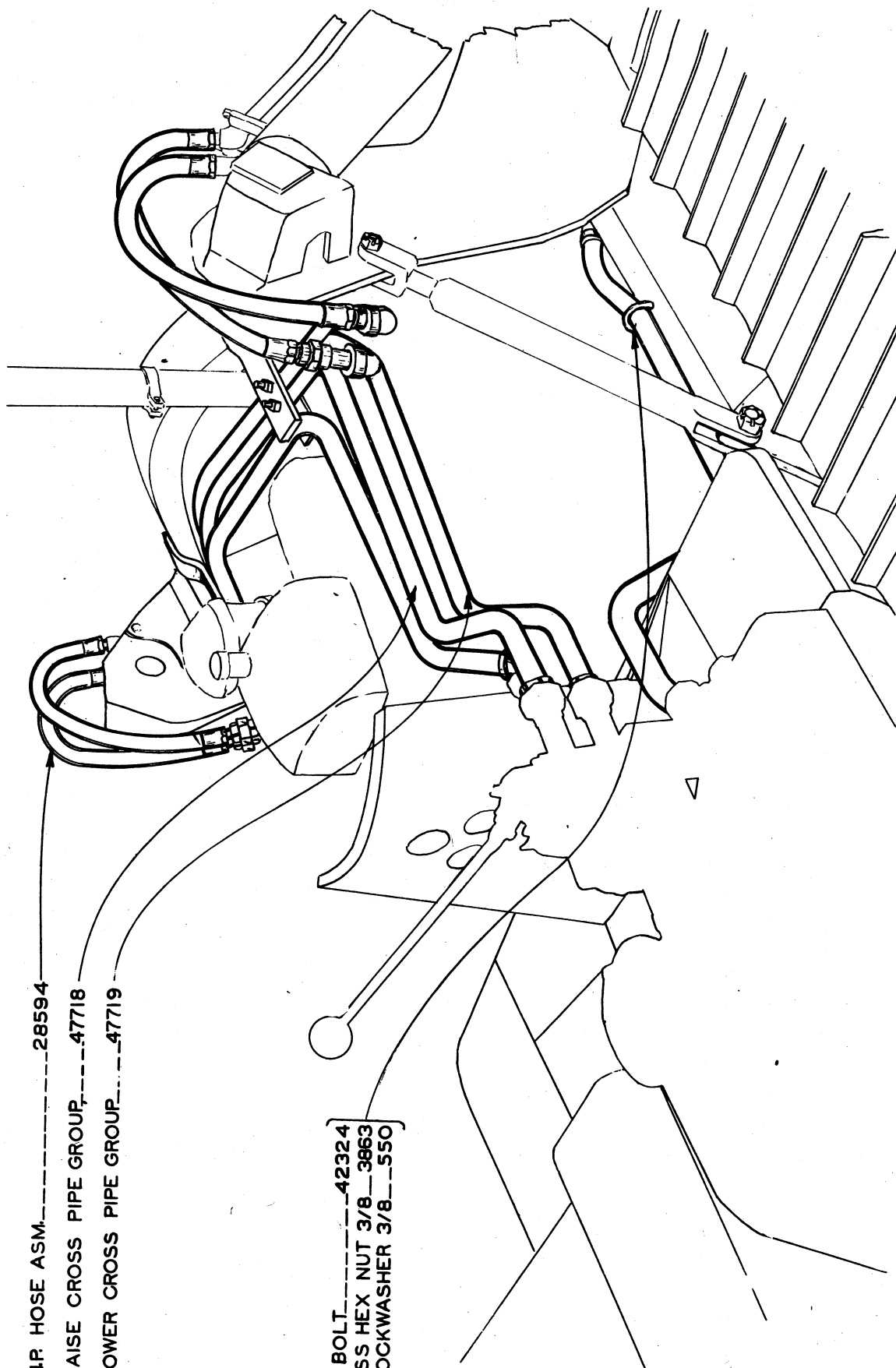
1299

HYDRAULICS

B61 — 189 TO — , INCL.

4-HR HOSE ASM.-----28594
 1-RAISE CROSS PIPE GROUP.---47718
 1-LOWER CROSS PIPE GROUP.---47719

1-J BOLT.-----42324
 1-USS HEX NUT 3/8-3863
 1-LOCKWASHER 3/8-550



42260 F PACKING BOX GROUP

1447

B61 — 218 TO 250, INCL.

HYDRAULICS

4-HR HOSE ASM.-----28594
 1-RAISE CROSS PIPE GROUP---49799
 1-LOWER CROSS PIPE GROUP---49800

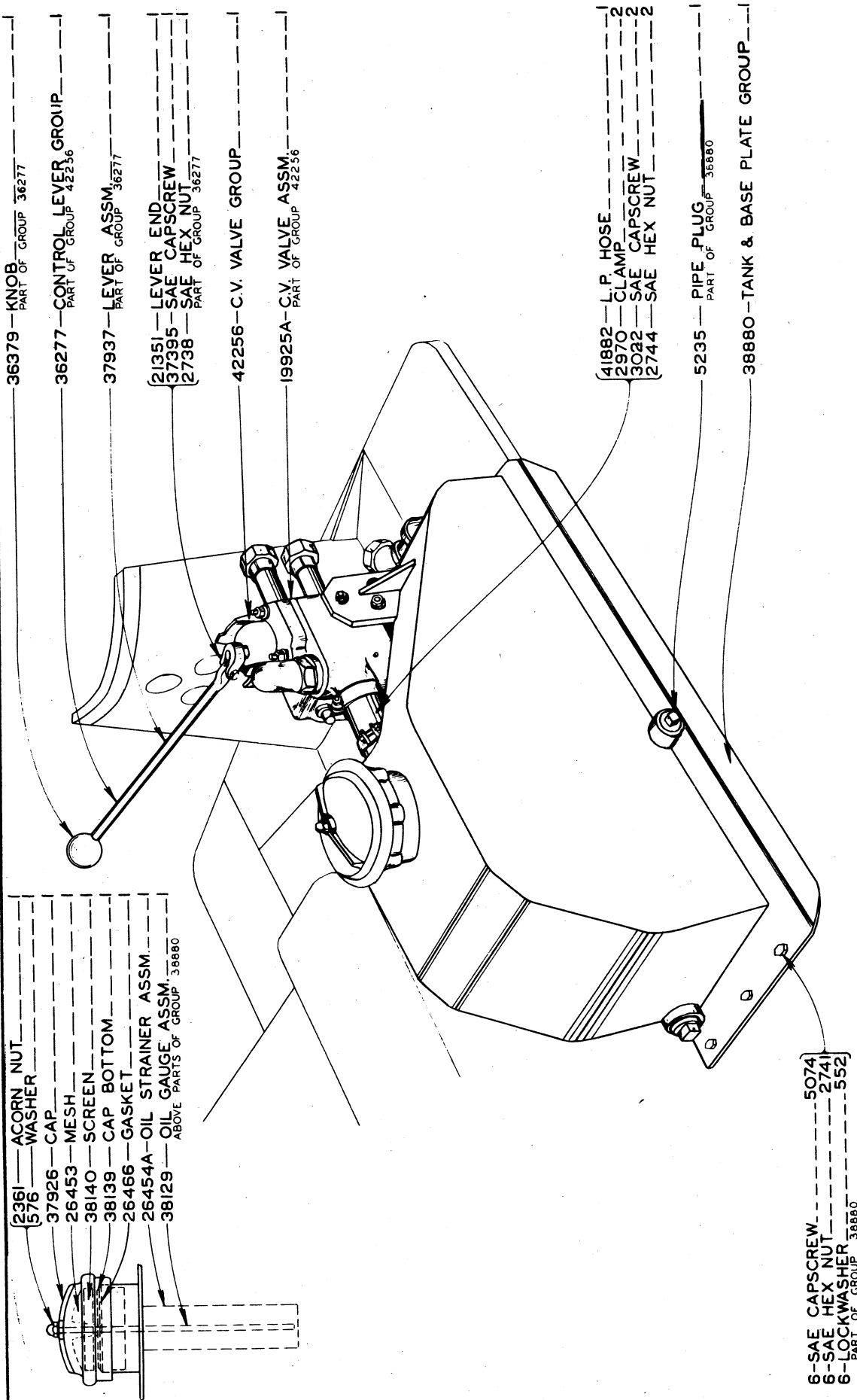
1-J BOLT-----42324
 1-SS HEX NUT 3/8-3863
 1-LOCKWASHER 3/8-550

42260G PACKING BOX GROUP

1393

B61 — 251 TO , INCL.

HYDRAULICS



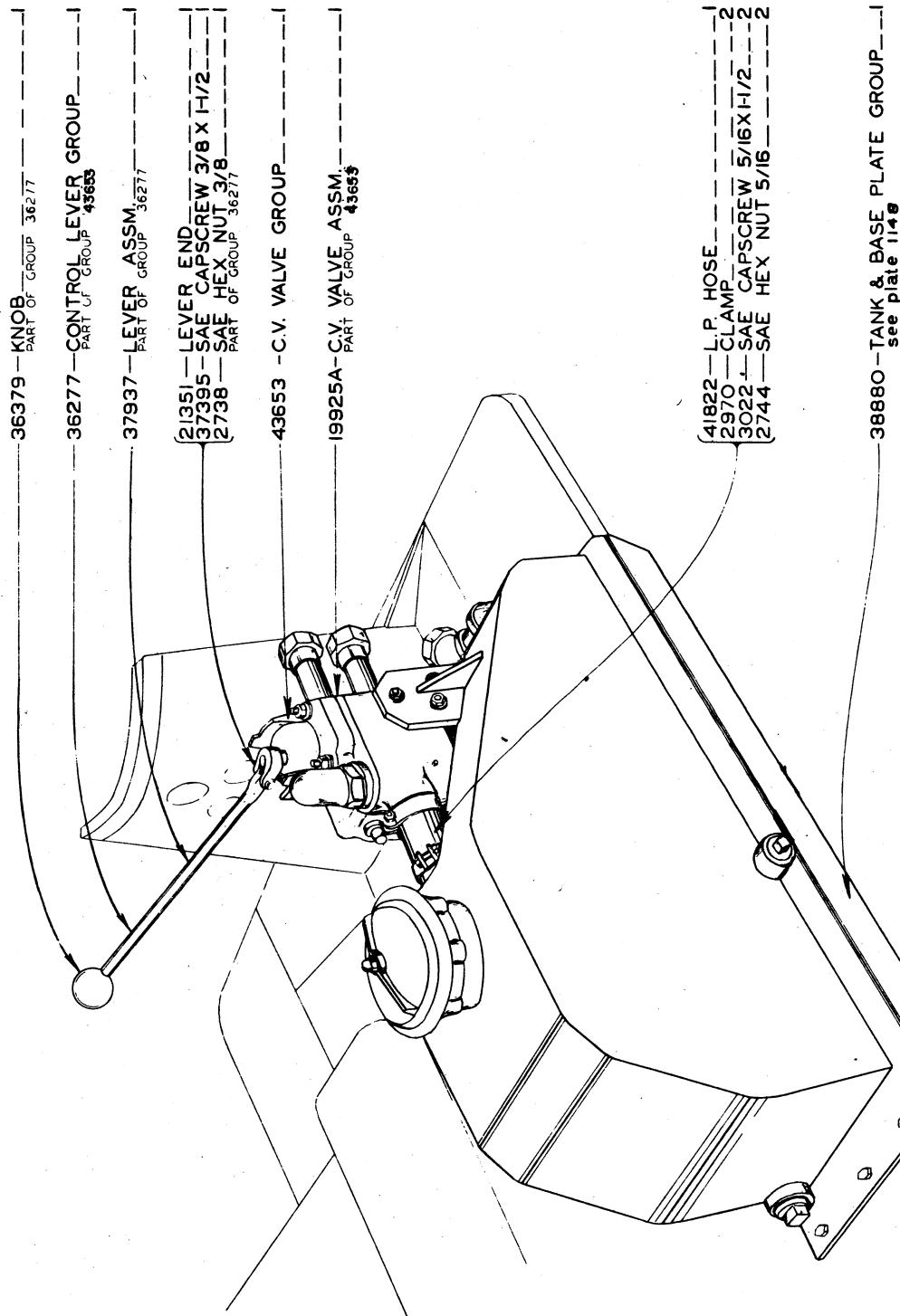
963

42249 TANK, BASE PLATE & VALVE GROUP

B61 — I TO 49, INCL.

TANK, BASE PLATE AND VALVE





43652 TANK, BASE PLATE & VALVE GROUP

1096

TANK, BASE PLATE AND VALVE B61 — 50 TO 217, INCL.

36379—KNOB
PART OF GROUP 36277

36277—CONTROL LEVER GROUP

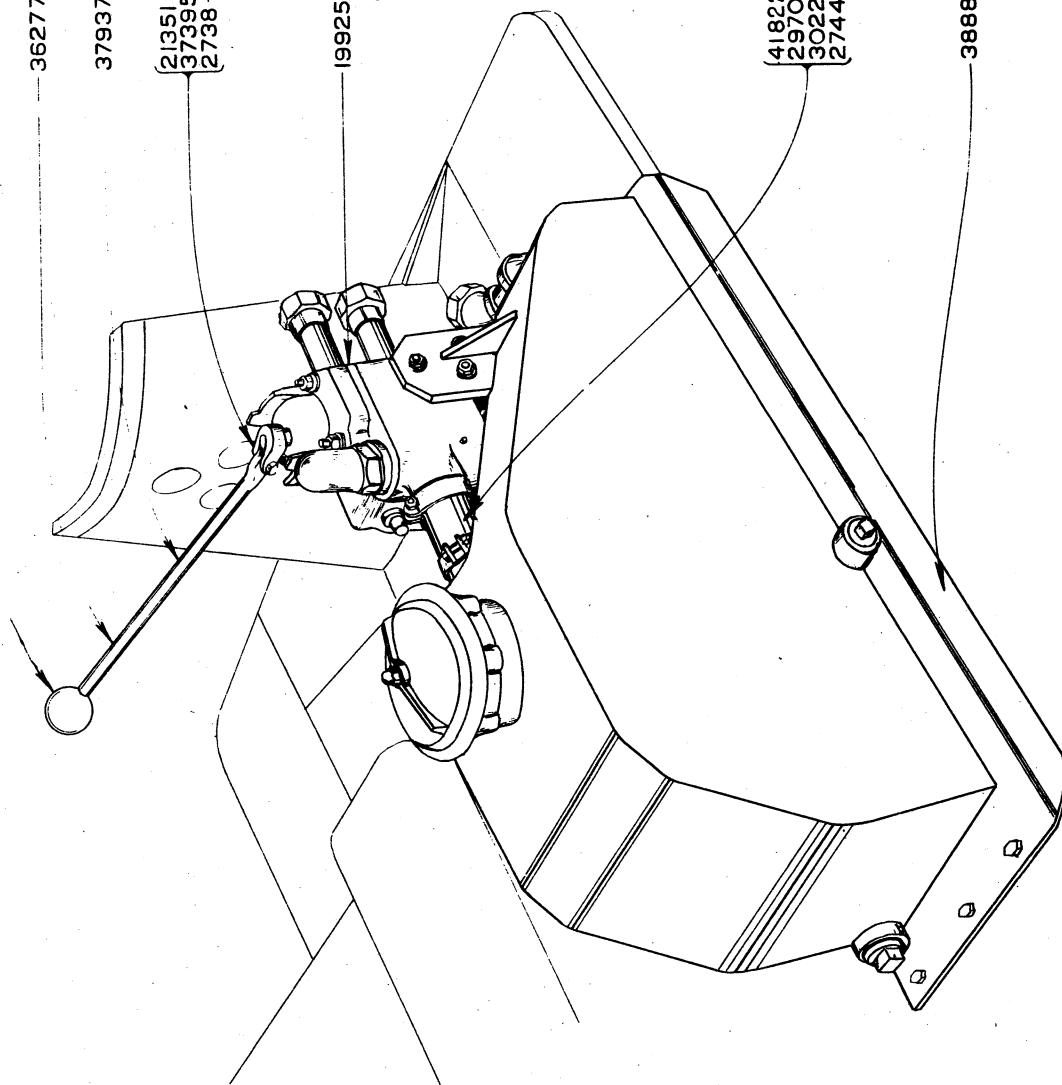
37937—LEVER ASSM.
PART OF GROUP 36277

21351—LEVER END
37395—SAE CAPSCREW 3/8 X 1 1/2
2738—SAE HEX NUT 3/8
PART OF GROUP 36277

19925A—C.V. VALVE ASSM.

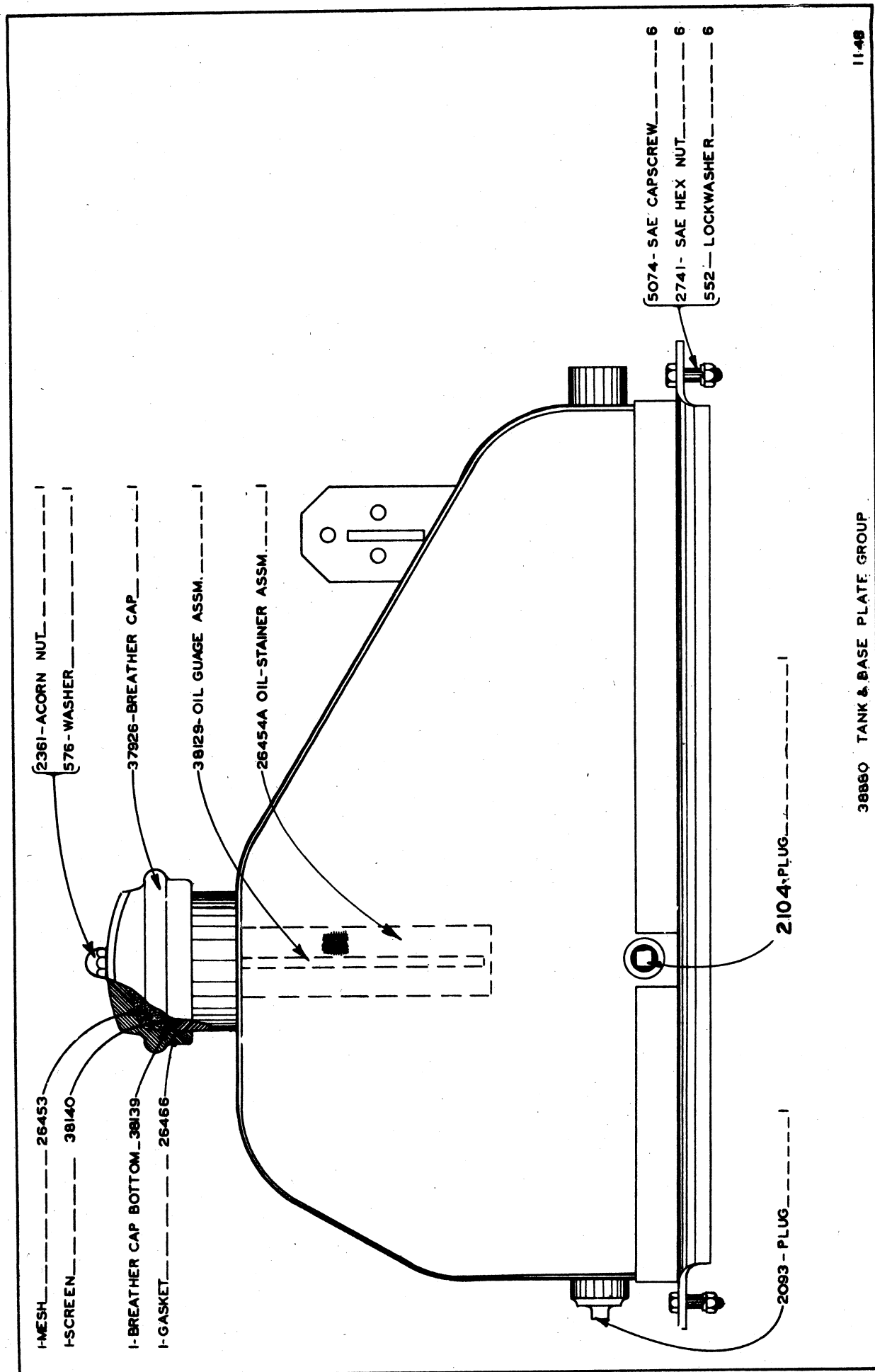
41822—L.P. HOSE
2970—CLAMP
3022—SAE CAPSCREW 5/16 X 1/2
2744—SAE HEX NUT 5/16

38880—TANK & BASE PLATE GROUP
see plate 1148



47713 TANK, BASE PLATE & VALVE GROUP

TANK, BASE PLATE AND VALVE B61 — 218 TO , INCL.

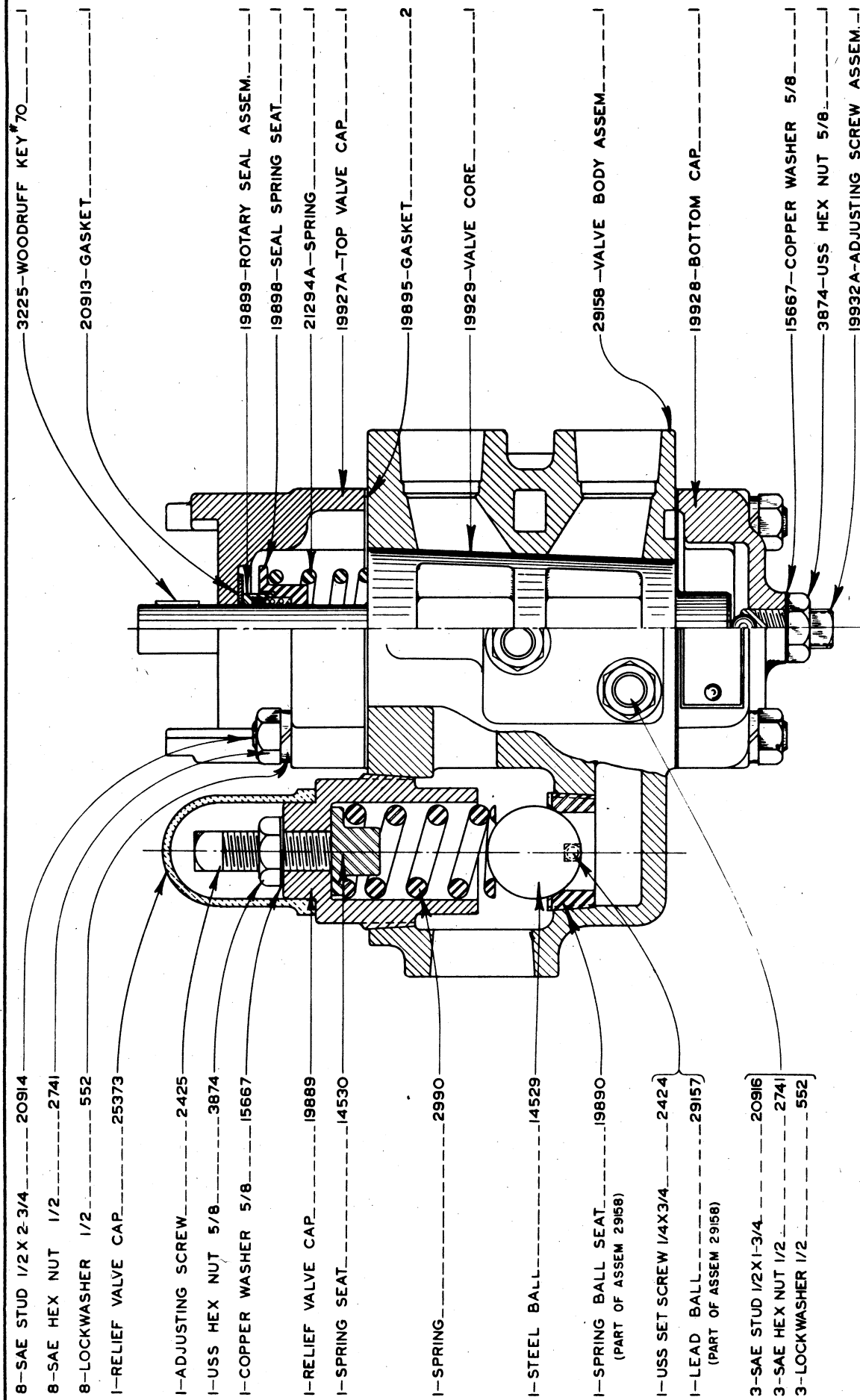


38860 TANK & BASE PLATE GROUP

11-48

TANK AND BASE PLATE

B61 — 50 TO , INCL.



19925A-C.V. VALVE GROUP

PLATE 511

VALVE B61 - I TO , INCL.

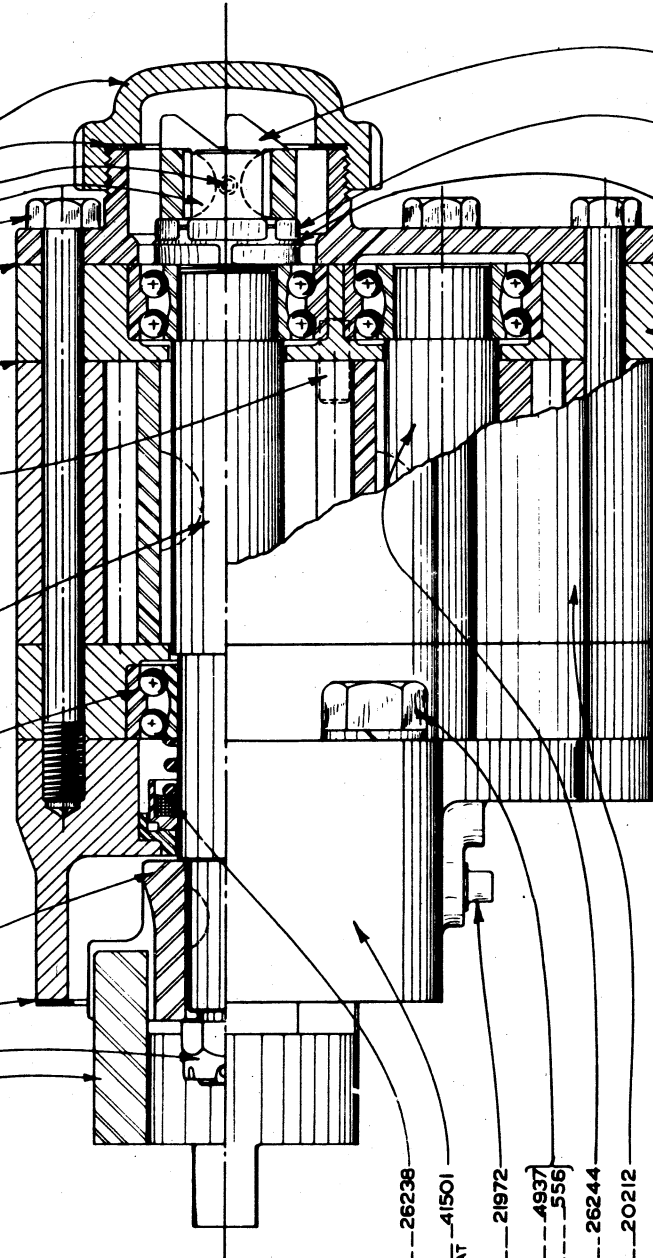
PUMP PLATES

NOTE: Repair parts are sold by LaPlant-Choate Manufacturing Company for servicing all pump models shown on the following pages. When you wish to purchase a complete pump, however, order the current model (P9AR Pump Group #44407A), regardless of the model now being used on your equipment.

1—DRIVE SHAFT & GEAR ASM.-----26241
 4—BEARING-----26239
 1—PUMP DRIVE HUB-----41497
 1—GASKET-----21887
 1—SAE CAST. NUT-----26231
 1—COTTER PIN 1/8X1-1/4-----3029
 1—PUMP DRIVE COUPLING-----41498
 26230—DOWEL PIN-----2
 19270—GASKET-----2
 26253—GASKET-----2
 4920—USS CAPS. 1/2X7-----6
 3219—WOODRUFF KEY-----4
 2427—SET SCREW 1/4X3/8-----4
 25375—GASKET-----1
 21864A—COVER-----1

1—ROTARY SEAL ASM.-----26238
 1—COUPLING HOUSING ASM.-----41501
 INCLUDES 26236 ROTARY SEAL SEAT
 1—PLAIN PLUG ASM.-----21972
 4—USS CAPS. 3/4X4-1/2-----4937
 4—LOCKWASHER 3/4-----556
 1—IDLER SHAFT & GEAR ASM.-----26244
 1—GEAR HOUSING-----20212

2—BEARING HOUSING-----26257
 1—BEARING CAP-----26256
 1—LOCKWASHER-----26237
 2—LOCKNUT-----26240
 1—CRANK JAW-----21867



41500 P-4 PUMP GROUP

PLATE 947

PUMP

THESE PARTS FORM A GROUP AND CANNOT
BE PURCHASED SEPARATELY.
ORDER GROUP 44209A

(A)

I-COUPLING HOUSING ASSM. 41501
(consists of)

I-HOUSING 41502

I-SEAL SEAT 26236

I-SEAL ASSM. 26238

I-DRIVE SHAFT & GEAR ASSM. 41517

I-GASKET 21887

I-DRAIN PLUG 21972

I-IDLER SHAFT & GEAR ASSM. 26244

42320-PLATE 2

26239-BEARING 4

25375-GASKET 1

21864B-COVER 1

21867-CRANK JAW

2427-SET SCREW

3219-KEY 2

43912-DOWEL PIN 4

26256-OUTER BEARING CAP 1

4920-USS, CAPSCREW 6

26253-GASKET 2

42316-GASKET 2

SPECIAL NOTE FOR ORDERING REPAIRS

PUMPS WITH ROUND POWER & SUCTION PORT

BOSSES USE 2-19270-GASKETS AT (B)

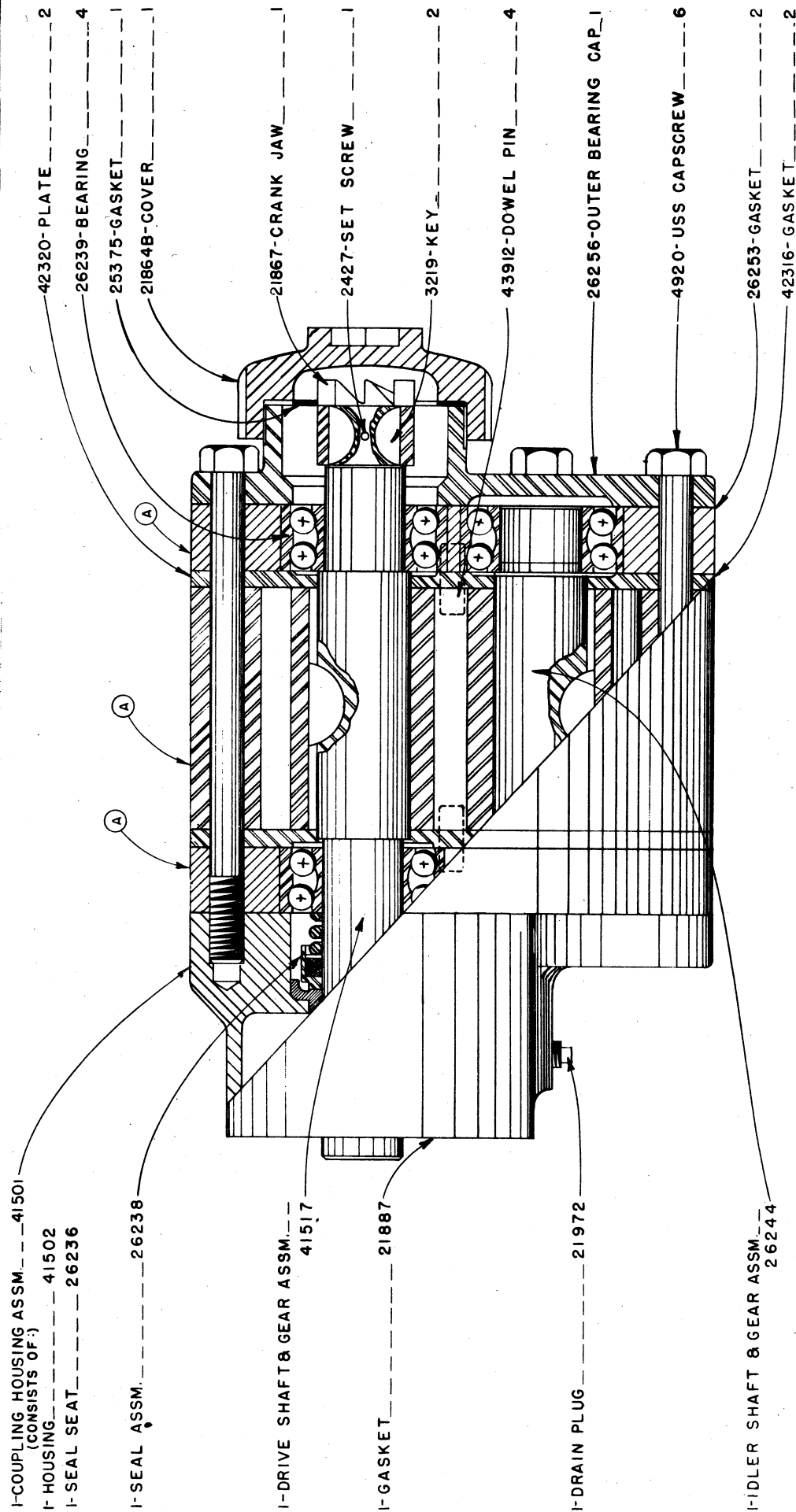
PUMPS WITH OCTAGON POWER & SUCTION

PORT BOSSES DO NOT USE GASKETS AT (B)

42323A PUMP GROUP (P7AR)

1139

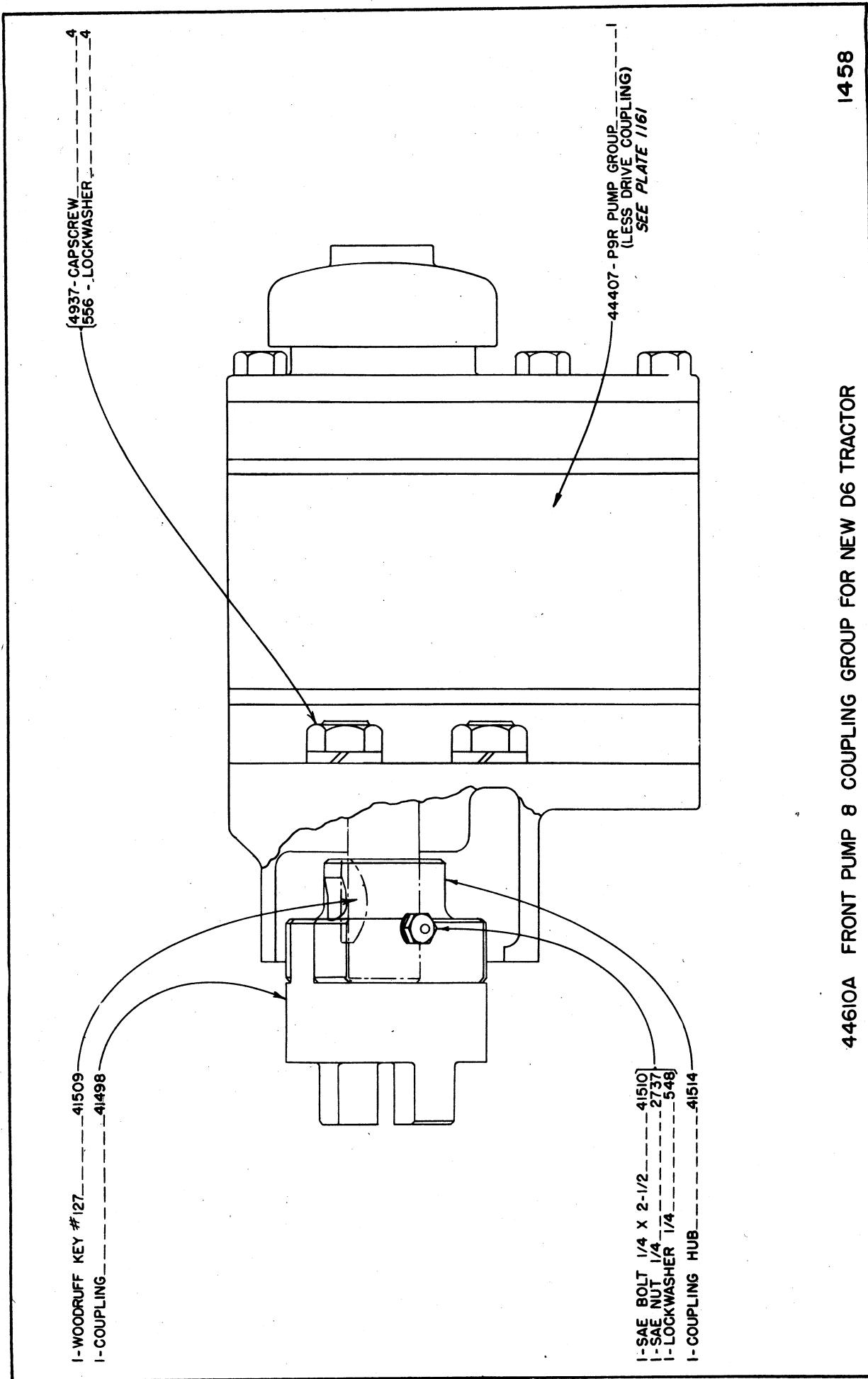
PUMP



44568 PUMP GROUP (P7L)

1176

PUMP



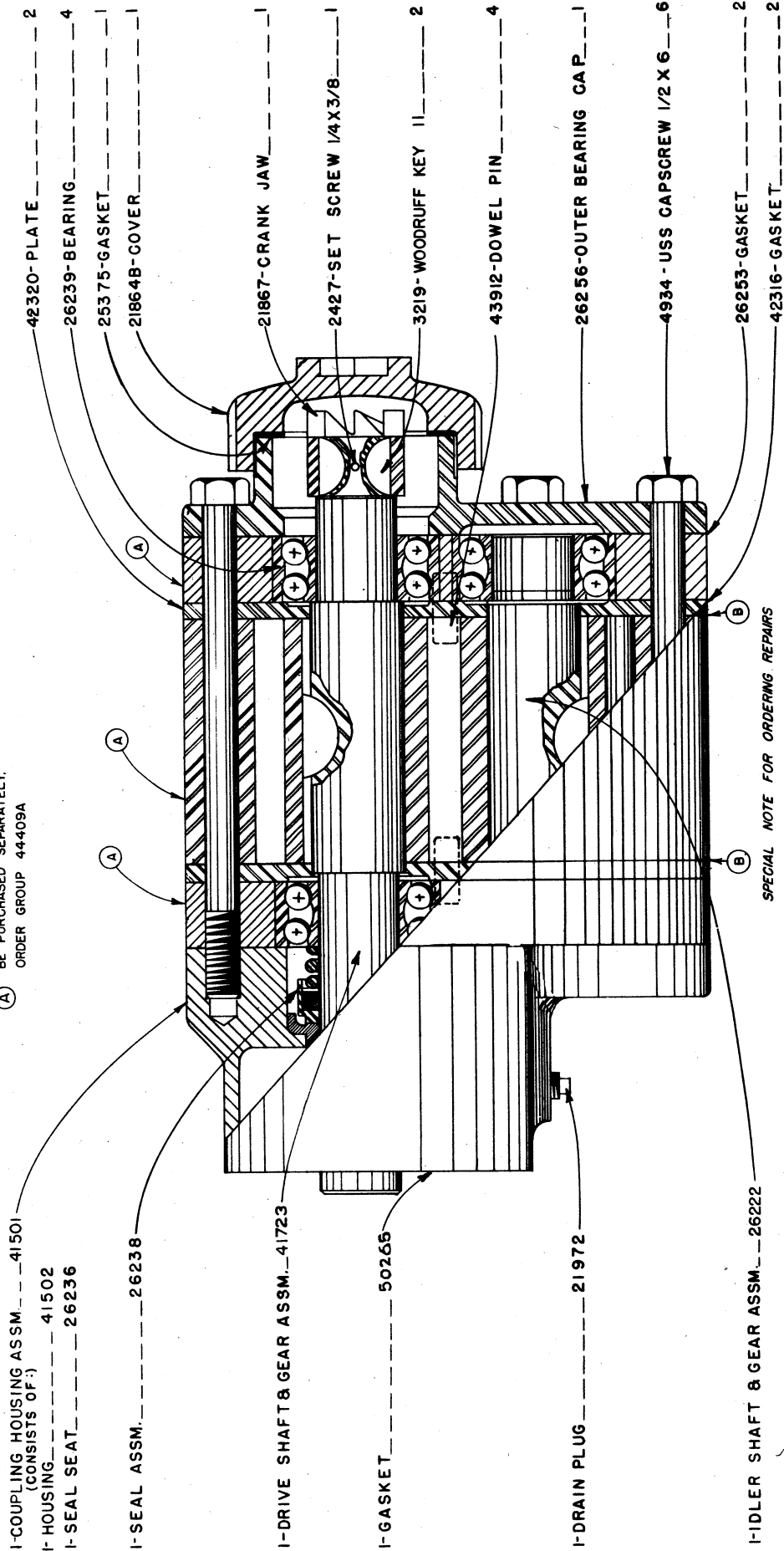
1458

44610A FRONT PUMP 8 COUPLING GROUP FOR NEW D6 TRACTOR

PUMP

THESE PARTS FORM A GROUP AND CANNOT
BE PURCHASED SEPARATELY.
ORDER GROUP 44409A

(A)

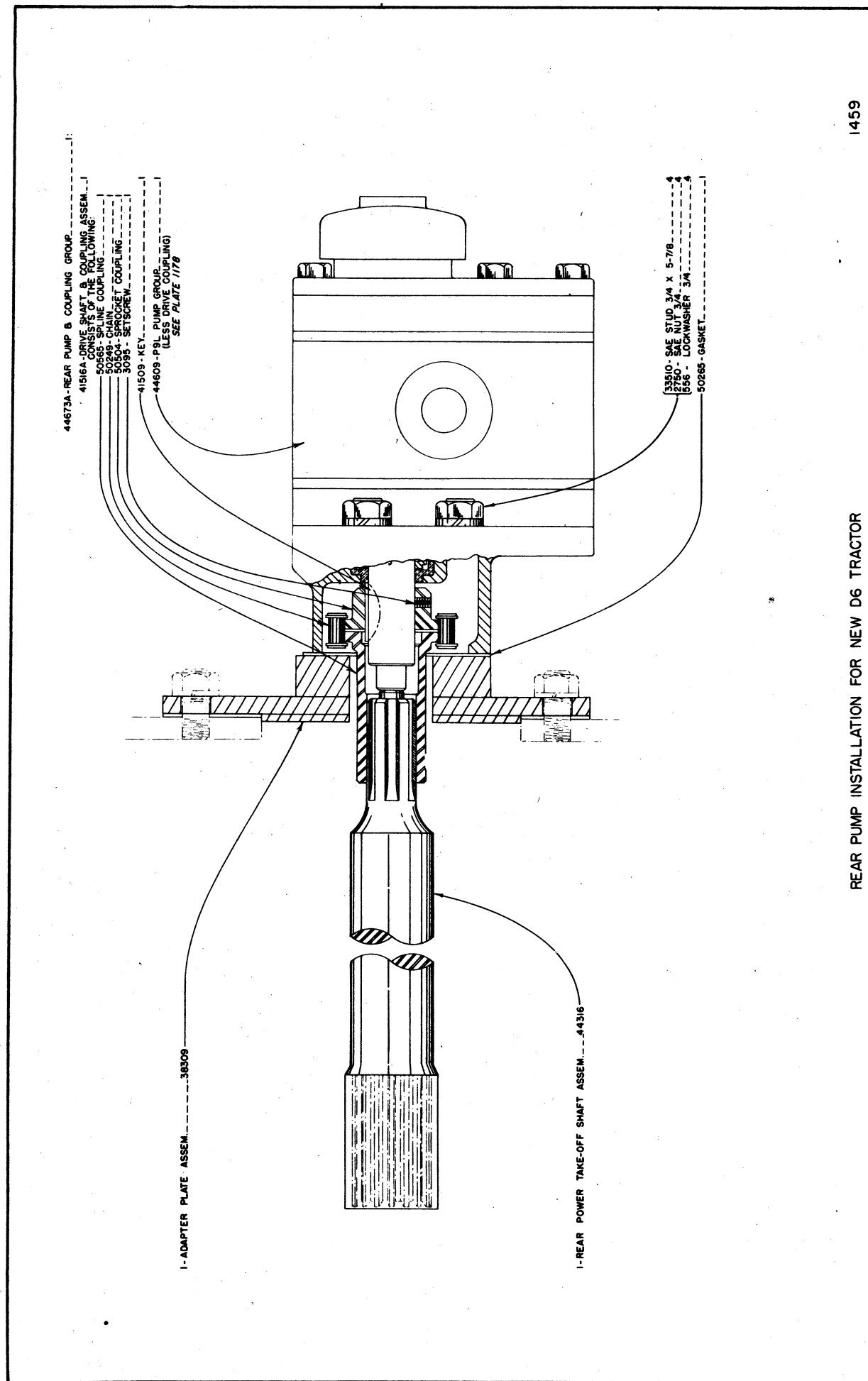


SPECIAL NOTE FOR ORDERING REPAIRS
PUMPS WITH ROUND POWER & SUCTION PORT
BOSSSES USE 2-19270-GASKETS AT (B)
PUMPS WITH OCTAGON POWER & SUCTION
PORT BOSSSES DO NOT USE GASKETS AT (B)

44407A PUMP GROUP (P9AR)

1161

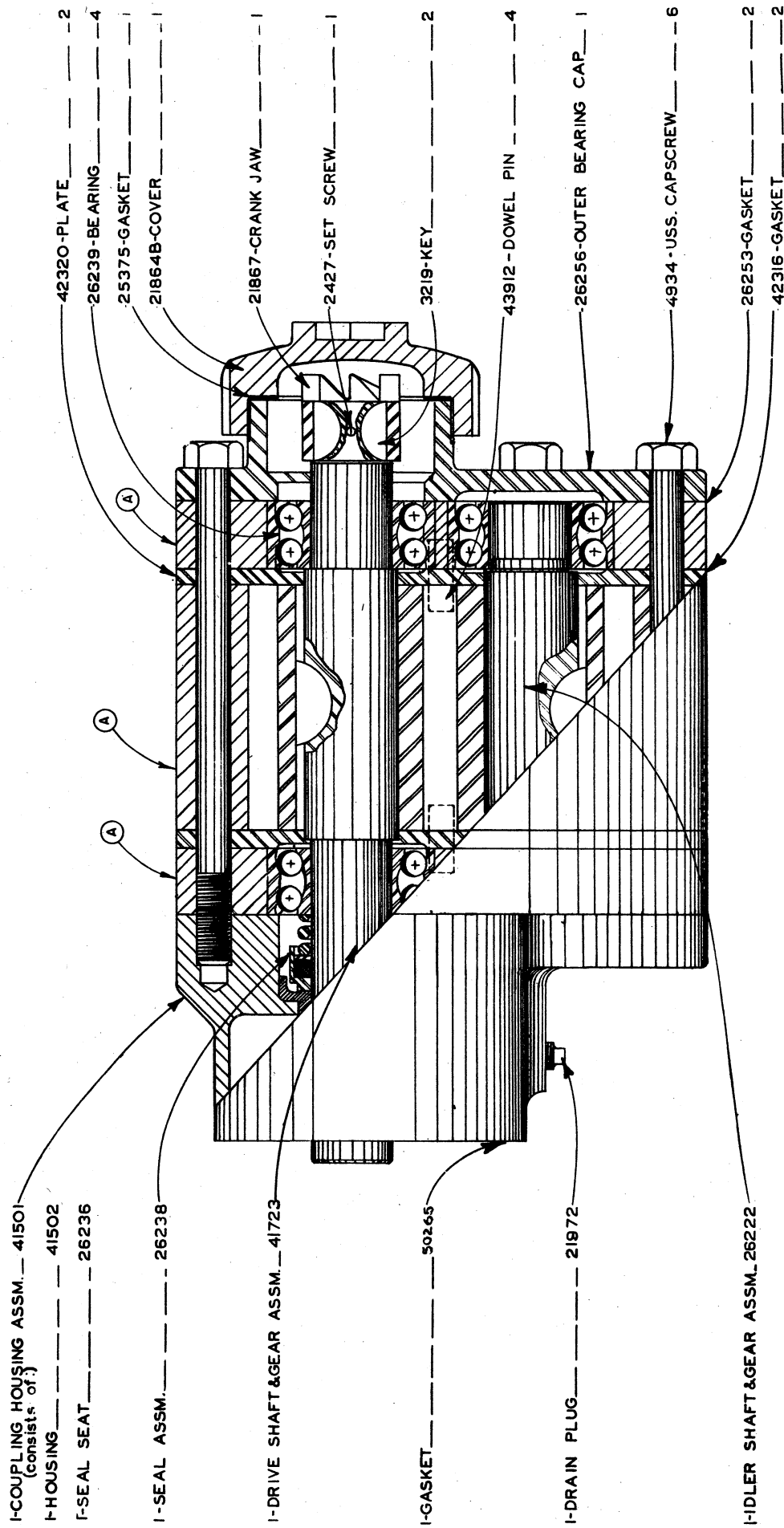
PUMP



REAR PUMP INSTALLATION FOR NEW D6 TRACTOR

1459

PUMP

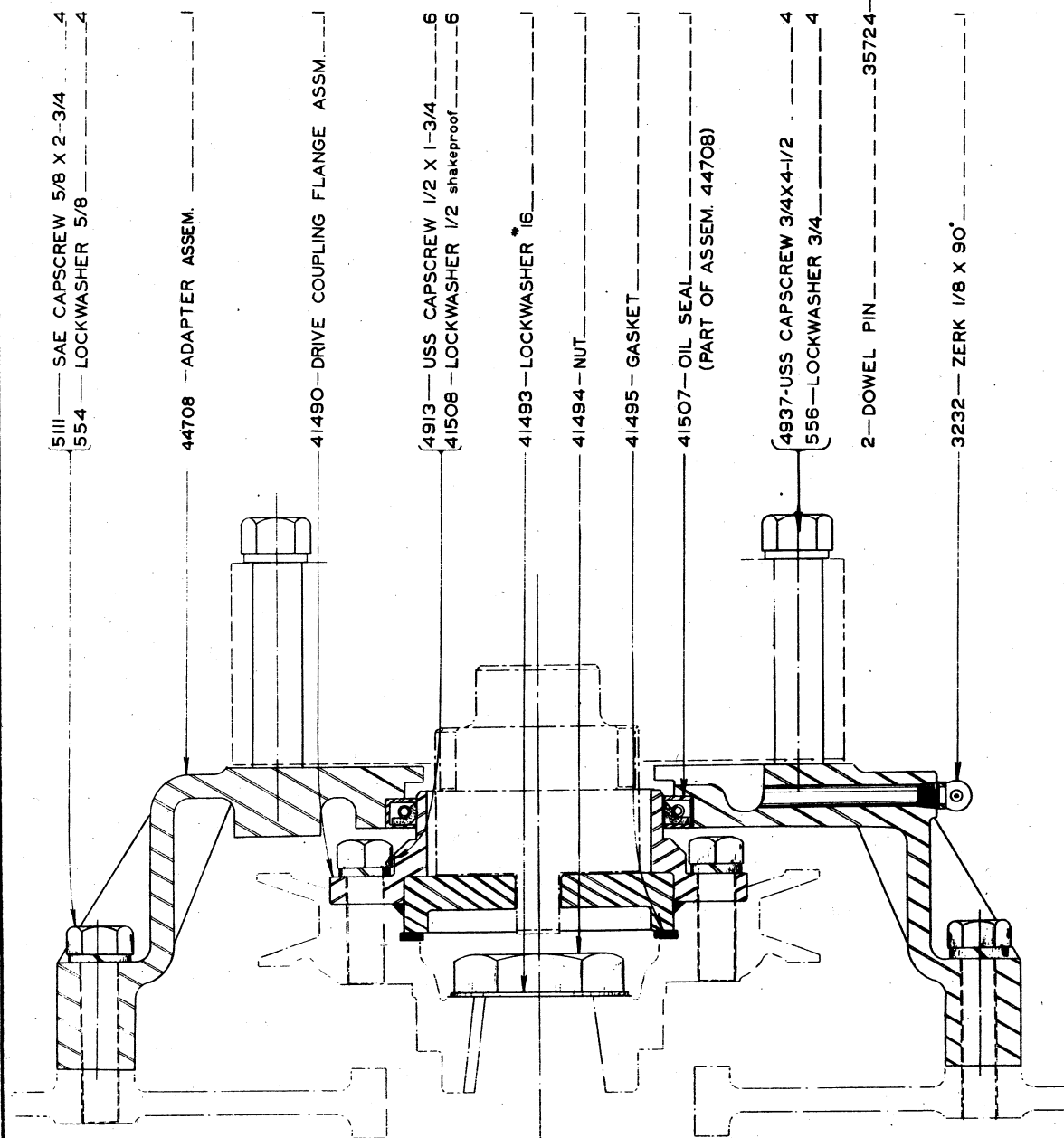


A THESE PARTS FORM A GROUP AND CANNOT
 BE PURCHASED SEPARATELY.
 ORDER GROUP 44409

44609 PUMP GROUP (P9L)

1178

PUMP



FRONT PUMP ADAPTER FOR NEW D-6 TRACTOR

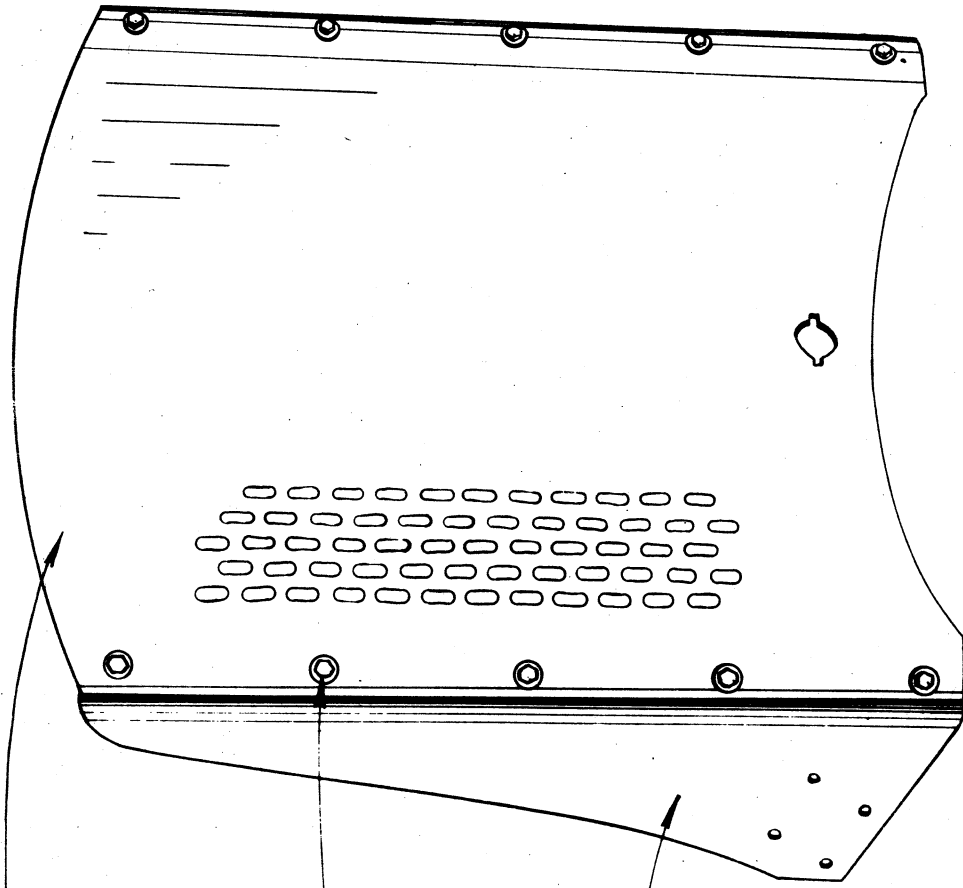
PUMP

1—RADIATOR GUARD FRONT PLATE-----44233

10—USS CAPSCREW 1/2 X 1-1/4-----4909
10—LOCKWASHER 1/2-----552

1—R H SIDE PLATE ASSEMBLY-----43384
1—L H SIDE PLATE ASSEMBLY-----43385

FOR USE WITH LAPPLANT CHOATE
EQUIPMENT ONLY



43383 — RADIATOR GUARD GROUP FOR NEW D-6 TRACTOR

1146

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