

LeTOURNEAU 'DOZER

INSTRUCTION BOOK



FORM O-136

OPERATION MAINTENANCE AND REPAIR

Peoria, Ill. • **R. G. LeTOURNEAU, Inc.** • *Stockton, Calif.*

TOCCOA, GA. (FACTORY ONLY) * LeTOURNEAU (AUSTRALIA) PTY., LTD., SYDNEY, AUSTRALIA.

LeTourneau
'DOZER
INSTRUCTION
BOOK

●

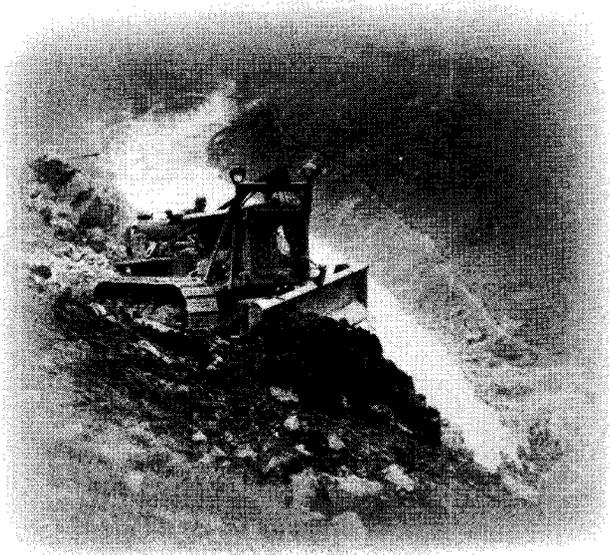
PRINTED IN U. S. A.

Published by
SERVICE DEPARTMENT
OCTOBER, 1942

ALWAYS GIVE SERIAL NUMBER
WHEN ORDERING PARTS

INDEX

	Page
Adjustments	28
Angledozer Adjustments	31
Angledozers having Detachable Pushbeams	31
Angling Adjustment	31
Blade Tilt Adjustment	32
Angledozers having "C" Type Yokes	33
Angling Adjustment	33
Blade Tilt Adjustment	34
Angledozer Models	9
Beginners Instructions	12
Blades	35
Bulldozer Adjustments	28
Knock-down Type Bulldozers	30
Rigid Bowl Type Bulldozers	28
Bulldozer Models	6
Bulldozing	14
Cable	35
Clearing	20
Controls	12
'Dozer Features	10
'Dozer Models	6
Features of LeTourneau 'Dozers	10
Finishing	19
Foreword	5
Frozen Ground	20
Greasing	28
Logging	24
Lubrication	28
Sheave Bearing Lubrication	28
Maintenance Instructions	28
Operating Instructions	11
Beginners Instructions	12
Bulldozing	14
Clearing	20
Controls	12
Finishing	19
Frozen Ground	20
Logging	24
Pushing	25
Removing Rocks and Boulders	23
Side-Hill Cuts	14
Snow and Ice Removal	25
Pushdozers	9
Pushing	25
Removing Rocks and Boulders	23
Repairs	36
Sheave Bearing Lubrication	28
Side-Hill Cuts	14
Snow and Ice Removal	25
Stump Removal	23
Types of LeTourneau 'Dozers	6
Angledozers	9
Bulldozers	6
Pushdozers	9
Tree Removal	20
Welding Repairs	36



Achievement . . .

Cable controlled 'Dozers' contribution to earth-moving and to mankind is immeasurable. Their trigger-quick action and rugged construction make possible the completion of vitally important roadbuilding and construction projects the world over, many of which might be impossible to build without their use.

'Dozer operation should, therefore, be looked upon as one of our most worthwhile occupations. Skill, experience, and courage are required in pioneering, carving roads up mountain sides, "sky-'dozing", etc.

A deep admiration is held for the work of the skilled 'Dozer operator — he should feel proud of his achievement.

FOREWORD

The LeTourneau 'Dozer has become recognized as one of the most useful pieces of equipment used in earthmoving and construction work. Correct design, skilled workmanship, and highest quality materials go together to make it outstanding in its field.

However, the efficiency of the LeTourneau 'Dozer depends to a large extent on you, the operator and the mechanic.

When properly operated and maintained, LeTourneau Dozers are practically trouble-free and will give years of profitable operation with very little maintenance cost.

The instructions in this book are intended to familiarize the inexperienced operator and mechanic with the recommended practices in operation, the correct methods of making adjustments, and proper maintenance procedure. Also, it is intended to serve as a reference book for those who are already experienced in the operation and maintenance of the LeTourneau 'Dozer.

For the convenience of you or others who might be benefited by the operating instructions herein contained, we suggest that you place this book where it may be handy for quick reference or careful study.

This information is prepared for you with just one thought in mind—to make your work easier and more effective. We sincerely hope that it may succeed.



TYPES OF LETOURNEAU DOZERS

LeTourneau 'Dozers are of three general types—Bulldozers, Angledozer, and Pushdozers.

The Bulldozer and Angledozer are similar, and are used for somewhat the same purposes—the main difference between the two being that the position of the Bulldozer bowl, straight across the front of the tractor, is fixed and is non-adjustable either to the left or right, while the bowl of the Angledozer can be either positioned straight across the front of the tractor or angled 30° to the left or right for side-casting.

Bulldozers and Angledozers are used principally for moving earth, rock, etc., short distances on construction jobs, for pioneering roads through hilly mountainous country, for clearing-removing stumps and trees, for logging, stripping, land leveling, digging ditches, snow and ice removal, etc.

Pushdozers, which are similar to Angledozers excepting that they have a "pusher cup" on front instead of the Angledozer bowl, are designed to be used only in pushing Carryall Scrapers when loading or dumping. Angledozers and Bulldozers are also used for this purpose quite extensively.

The above mentioned 'Dozers are available in models for various sizes of track-type tractors, and for some sizes of tractors are available in two or more models which embody slightly different features, in order to answer the varied requirements of the many 'Dozer users.

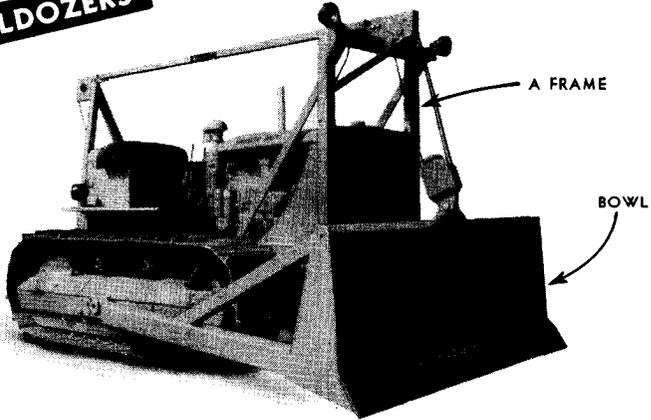
Briefly, the various models of Bulldozers, Angledozers, and Pushdozers can be grouped together into the following general types:

BULLDOZERS—LeTourneau Bulldozers are of two types—the "Rigid Bowl" type and the "Knock-down" type.

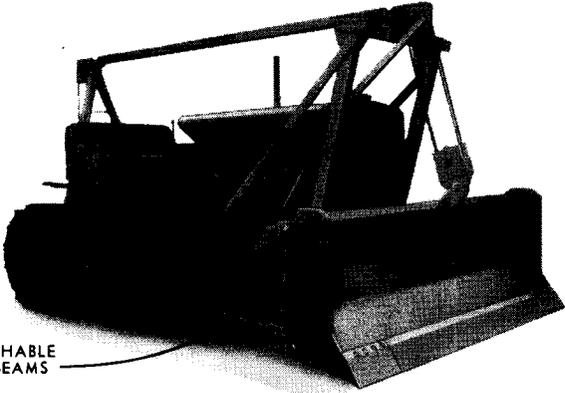
The "Rigid Bowl" type Bulldozers are those models which have sidearms or pushbeams welded solidly to the 'Dozer bowl, making the pushbeams and bowl one piece.

The "Knock-down" type Bulldozers are those which have sidearms or pushbeams attached to the bowl by means of eye bolts and pins, making the pushbeams and bowl three separate pieces. The principle feature of this type 'Dozer is that it can be dis-assembled or "knocked down" for shipment, requiring a comparatively small shipping space. This type of Bulldozer is not available for all sizes of track-type tractors.

BULLDOZERS

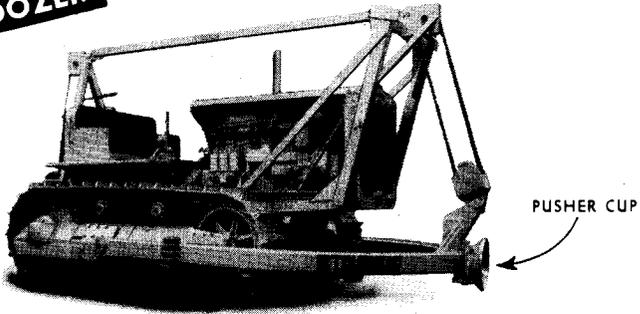


RIGID BOWL TYPE BULLDOZER

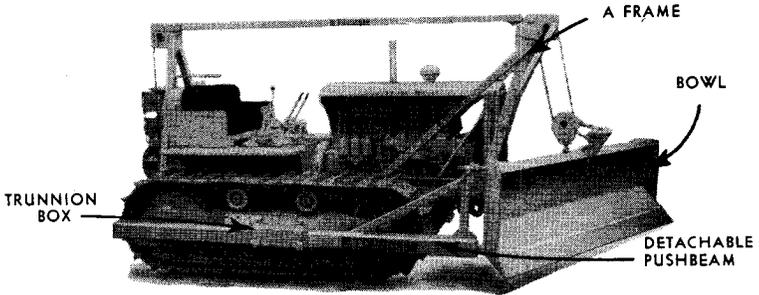


KNOCK-DOWN TYPE BULLDOZER

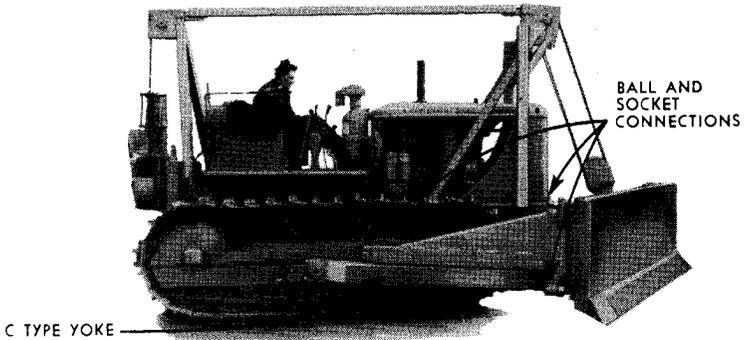
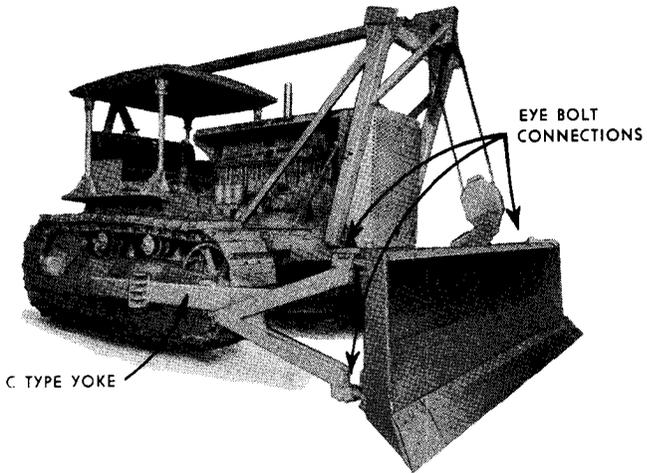
PUSHDOZER



ANGLEDZERS



DETACHABLE PUSHBEAM TYPE ANGLEDZER



ANGLEDZERS HAVING "C" TYPE YOKES

The types of A-frames used with the different models vary somewhat on different sizes of tractors, but this does not conflict with the grouping of the various models of Bulldozers into the two general classifications mentioned above.

ANGLEDYZERS—For convenience in instructions which follow, all LeTourneau Angledozers are herewith grouped into two general classifications—models having “C” type yokes, and models having detachable pushbeams.

The models having “C” type yokes can be recognized by the yoke (shaped similar to the letter “C”) which fits around the front of the tractor, to which the bowl is anchored at a point in the center. Two sidearms connect the ends of the bowl with the yoke, and by merely changing the point of connection between the sidearms and yoke and swinging the bowl on the center pivot point, the bowl can be angled 30° either to the left or to the right. Some of the models of this type make use of ball and socket connections between the sidearms and the yoke and bowl, and also at the center pivot point. Others employ the use of eyebolts and pins to connect the sidearms to the yoke and bowl and a universal forging at the center pivot point.

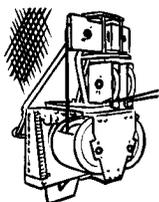
The models of Angledozers which make up the type having detachable pushbeams are those which do not have “C” type yokes, but which have pushbeams connecting either end of the Dozer bowl with the trunnion spools. The pushbeams can be adjusted separately either to the front or to the rear, thereby making it possible to angle the bowl 30° either to the left or to the right. This type of Angledozer is not available for all sizes of track-type tractors.

The types of A-Frames used with the different models vary somewhat on different sizes of tractors, but this does not conflict with the grouping of the various models of Angledozers into the two general classifications mentioned above.

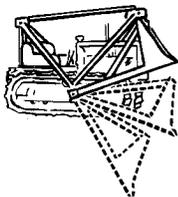
PUSHDOZERS—The current models of LeTourneau Pushdozers are of only one type. The design is identical with that of Angledozers having “C” type yokes, excepting that the bowl and sidearms are eliminated, and the pusher cup is installed in their place. In fact, Angledozers of the above mentioned type can be converted into Pushdozers by substituting the pusher cup in place of the bowl and sidearms, and similarly, the Pushdozer can be converted into an Angledozer by replacing the pusher cup with the bowl and sidearms.

FEATURES OF LeTOURNEAU DOZERS

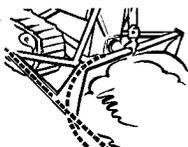
Many exclusive features are embodied in LeTourneau 'Dozers which should be known and appreciated by every 'dozer operator. The most important features are:



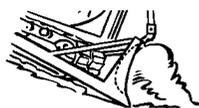
1. Instant response and close control of blade, because of the powerful, sure-acting cable operation of the LeTourneau Power Control Unit. With cable control, operation is always uniform in heat or cold. A minimum of time is lost because cable control is more efficient.



2. Extreme high lift and low drop of the bowl. The low drop enables the bowl to go down under rocks and stumps; the high lift gives plenty of leverage when pushing over trees, etc.



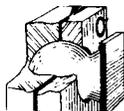
3. The digging angle of the 'Dozer blade gives the bowl a natural digging suction, making for quick, plow-like penetration into the ground.



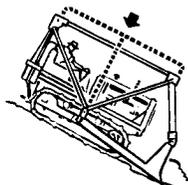
4. The correctly curved 'Dozer bowl gives the dirt a rolling action ahead of the bowl, thus decreasing the dead load weight on the tractor unit.



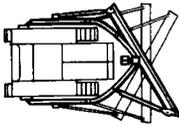
5. Maximum strength at minimum weight, as a result of the sturdy electrically arc welded, alloy steel, boxbeam construction.



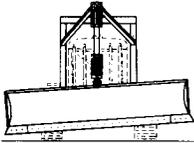
6. Rigidity—a feature that is built into LeTourneau 'Dozers through the use of correctly designed points of connection between sidearms, yoke, and bowl.



7. Balanced weight distribution, which helps to keep the tractor tracks "geared to the ground" to transmit more tractor horsepower at the tips of the blade, and which eliminates excessive wear on tractor front idlers and rollers.



8. Angledozer bowls can be angled 30° to either side quickly and easily for sidecasting.



9. Angledozer bowls can be tilted to cause one corner of blade to dig several inches deeper than the other. This helps to penetrate in hard, frozen ground, and assists in digging ditches, making side hill cuts, etc.



10. The design and workmanship of LeTourneau 'Dozers has been job-proved by the thousands of LeTourneau 'Dozers operating on tough jobs all over the world.

OPERATING INSTRUCTIONS

Probably no piece of earthmoving equipment reflects the skill of the operator more than does the LeTourneau 'Dozer. Also, few machines are more dependent upon the ability of the operator than the LeTourneau 'Dozer.

Pioneering in hilly or mountainous country often requires the courage and confidence which comes only through experience and through an ability to operate a 'Dozer skillfully and efficiently. Without skillful operation the efficiency of the 'Dozer is retarded.

It is hoped that every operator of a LeTourneau 'Dozer will recognize the importance of his services, and will operate the 'Dozer to the best of his ability at all times. Skill in operation comes rapidly to those who are eager to learn; indifference and poor operation go hand in hand.

The operating instructions in this book are brief, and are intended only to familiarize the operator with the accepted methods of operation and the procedure to be used in doing the more common types of 'Dozer work, as practiced by skilled operators with years of experience.

These instructions should help the new operator in becoming more efficient at his work.

It should be kept in mind, however, that an operator cannot become skilled by reading a book, but can attain skill only

through actual operating experience. We herein supply only the fundamentals of 'Dozer operation. Whether an operator becomes skilled after reading this book depends largely upon himself.

THE CONTROLS

Each LeTourneau 'Dozer is controlled by means of a LeTourneau Power Control Unit. Either front or rear mounted Power Control Units may be used, in models with either single, double, or four cable drums.

The 'Dozer requires the use of but one cable drum, and when Power Control Units having more than one cable drum are used, the spare drums may be either used to operate other equipment, such as a Rooter, or may be left idle.

The 'Dozer bowl is connected with the Power Control Unit by means of the control cable or wire rope. By engaging the Power Control Unit clutch, the 'Dozer bowl will be raised. By releasing the Power Control Unit brake, the 'Dozer bowl will be lowered. The bowl is held in position when the Power Control Unit control lever is in the neutral position.

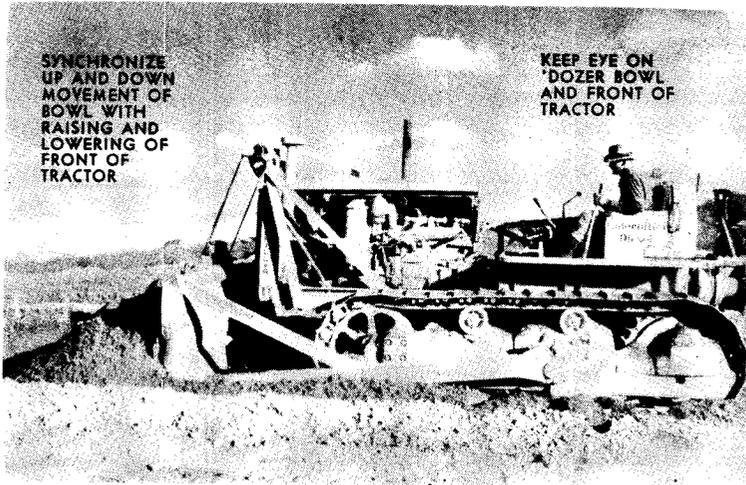
For instructions covering the movement of the Power Control Unit control lever to engage the clutch and release the brake, refer to the Power Control Unit instruction book.

INSTRUCTIONS FOR THE BEGINNER

When the new operator of the LeTourneau 'Dozer gets on a tractor to begin operating, he should raise and lower the 'Dozer bowl until he feels sure of what is going to happen when he moves the Power Control Unit control lever. This is especially true of those who have had no previous experience with cable controlled 'Dozers, Power Control Units, etc.

It should be remembered, however, that a 'Dozer bowl loaded with dirt will act differently than an empty bowl.

One of the most important things to remember when learning to operate a 'Dozer is to raise or lower the bowl only a small amount at a time—approximately $\frac{1}{4}$ " to 1". Otherwise, if the bowl is raised and lowered 2 or 3 inches at a time while operating, it will cause the blade to cut an uneven surface over which the tractor must travel, which will result in the tractor's "nosing" up and down. This in turn would tend to cause the blade to cut still more unevenly, thereby increasing the tendency of the tractor to nose up and down, etc.



SYNCHRONIZE
UP AND DOWN
MOVEMENT OF
BOWL WITH
RAISING AND
LOWERING OF
FRONT OF
TRACTOR

KEEP EYE ON
'DOZER BOWL
AND FRONT OF
TRACTOR

The new operator will soon get in the habit of watching for or anticipating the up and down movement of the front of the tractor when operating over uneven ground. When the front of the tractor starts to rise or "nose up", the operator should move the control lever in the direction that will release the Power Control Unit brake, allowing the blade to lower. When the front of the tractor starts to "nose down", the Power Control Unit Clutch should be engaged to raise the blade, only far enough to compensate for the lowering of the front of the tractor. This is necessary to maintain a smooth cut.

After operating a while, the new operator will be able to automatically raise and lower the 'Dozer bowl as the front of the tractor rises up and down without giving it a great deal of thought or special attention.

One important thing to remember when operating is to keep the slack out of the cable at all times, in order to have immediate control over the 'Dozer bowl. Also, it will be found that the cut or roadway can be kept level more easily if the 'Dozer bowl is kept approximately $\frac{1}{2}$ to $\frac{3}{4}$ full of dirt while traveling forward.

When starting to operate over uneven ground, it is often necessary to lower the bowl and release one of the tractor steering clutches at the same time while moving forward, traveling approximately a half turn or through an arc of 90 degrees, thereby smoothing off the dirt. Repeat this action to keep "fanning" the dirt out smooth or level as the work progresses.

Nearly every job presents new problems to 'Dozer operators, but once the inexperienced operator gets the "feel" of the machine and decides to concentrate on his work, he will find that he can overcome most any operating problem and will find it easy, enjoyable, and profitable work.

BULLDOZING

Either Angledozers or Bulldozers may be used for "bulldozing" or, in other words, for drifting dirt straight ahead in front of the bowl. If an Angledozer is used, the bowl should be positioned straight across the front of the tractor.



The material should be drifted downhill wherever possible in order to increase production. When drifting the material, a ridge of dirt will be formed along either side of the 'Dozer bowl, by dirt spilling out around the ends of the bowl, thereby causing the unit to work within a trench. Care should be exercised to maintain this trench, in order to get the largest possible loads. Working downhill within such a trench assures loads of maximum size, and sometimes makes it possible to operate the tractor in second or third gear, depending upon the grade.

MAKING SIDE HILL CUTS

Both LeTourneau Angledozers and Bulldozers can be used

successfully in making side hill cuts. Angledozer, with their bowls in the angled position, are particularly adapted to this type work. However, Bulldozer operators experienced in side-hill work can offset any advantages that Angledozer might normally offer for side-casting by skillful Bulldozer operation.

To start a side hill cut with a LeTourneau 'Dozer, guide stakes should first be set at the top of the slopes on the cuts, and at the toe of the fills.

The tractor should then be brought to the highest point on the back slope to start the cut. Operation is started with the tractor at right angles to the line of slope stakes, with the rear of the tractor pointing down hill. The bowl is then dropped into the ground and the tractor is swung around. This is done by engaging the tractor flywheel clutch ("master clutch"), disengaging the right steering clutch, and applying the right steering brake, causing the machine to pivot. The unit should be brought close enough to the line of slope stakes so that when the tractor pivots, the point of the bowl will cut right up to the line. (If an Angledozer is used, the bowl should be angled with the forward point cutting next to the slope stakes. The bowl should also be



PIVOT TRACTOR AS
BLADE APPROACHES
ROW OF SLOPE STAKES

tilted, with the point cutting against the stakes adjusted lower than the opposite side.)

Swing the tractor around until it is almost parallel with the slope stakes, at the same time lifting the 'Dozer bowl so that the dirt will roll no further down the slope than the width of the roadway, and not be wasted down the hillside.

It will be noted that the point of the bowl cutting against the line of stakes swings in a long arc, while the other end of the bowl has very little travel. The point next to the slope stakes is half buried in dirt, while the other is exposed and not moving any material.

This procedure should be repeated until a level shelf is constructed upon which the tractor can work. The unit can then work parallel to the slope stakes, cutting a level shelf as it proceeds. If an Angledozer is used, it will have a tendency to side-cast the material as the tractor travels forward without requiring any great amount of help from pivoting the tractor. When using a Bulldozer, however, it is necessary to do considerable more pivoting of the tractor to side-cast the dirt than with an Angledozer.

In making the cut, the side next to the back slope should always be kept a little lower than the outside, in order to cause



the tractor to lean slightly toward the bank and thereby to stay on solid footing. If the machine is operated when leaning away from the bank, the operator will have trouble in maintaining the back slope. Also, when the bench slopes away from the bank, the tendency of the tractor to "ride" down over the edge of the loose fill material makes it difficult to place the material where it is needed.

In addition to keeping the cut low next to the bank, a small ridge of dirt should be piled up and maintained along the downhill side or outside of the cut or fill. This ridge of dirt is helpful in keeping the work from sloping to the outside, and should be built up as soon as possible after starting the cut.

If the cut once starts sloping down hill, or to the outside, the material in the Dozer bowl will have a tendency to crowd to the outside, loading that corner of the bowl and continually pulling the tractor over to one side, making it difficult to keep the tractor traveling in a straight line. In instances of this kind, the ridge of material formed along the outside edge of the cut may be used to level up the tractor and get the cut sloping slightly toward the bank again by backing one of the tractor tracks up onto the ridge and then traveling forward with the corner of the bowl nearest the bank cutting in deeper than the



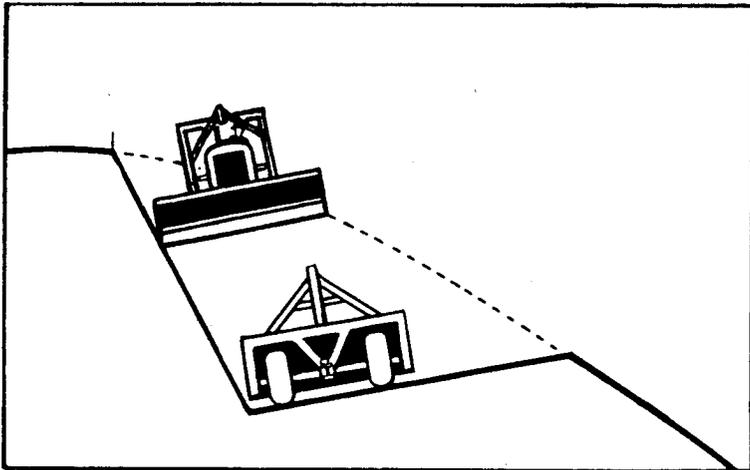
outside. Several passes may have to be taken in this manner to properly level up the cut.

The ridge of dirt on the outside should also be continuously maintained for the purpose of using the material later to fill up any low spots and bring the roadway to the desired grade.

The required back-slopes usually vary in steepness from $\frac{1}{2}$ -to-1 to 2-to-1. When making the cut, try to maintain the correct back slope as the work progresses. The slope is usually cut in a series of steps for a height which is equal to the width of the bowl, and then the steps are trimmed off by running the tractor along the slope with the 'Dozer bowl lowered only enough to cut off the steps.

'Dozers are often used to open up side-hill cuts for Carryall Scrapers. In instances of this kind the cut is usually made with the 'Dozer until the shelf which has been cut is wide enough to run a Carryall Scraper on. Then the Carryall Scrapers proceed with the cut.

In the above operation, the 'Dozer operator should try to make the shelf slope toward the bank at an angle which will cause the Scrapers to maintain the proper slope, if possible, as they proceed with the cut.



FINISHING

Most operators find that it requires somewhat more experience to "finish" efficiently with a 'Dozer than it does to do most other types of 'Dozer work. However, there are many jobs upon which it is found advisable to finish with a 'Dozer, and in instances of this kind any experienced operator can, with a little practice, handle the job without a great deal of difficulty.

When starting to finish, keep the tractor tracks level on the first cut. By doing this the 'Dozer blade will be started level with the finished grade.

Before lowering the bowl, place the tractor in motion. Then lower the bowl gradually and feed it into the ground. Make sure, however, that the tractor tracks are level as the blade enters the ground. If the bowl should be dropped suddenly, the blade will have a tendency to gouge.

Keep the raising and lowering of the 'Dozer bowl synchronized with the up and down movement of the front of the tractor as outlined in previous instructions, in order to keep the work level.

It is usually found that if the tractor is operated in the fastest gear possible without pulling the motor down, and if it is kept



moving at a steady rate of speed, the finished work will be smoother, and the rate of progress will, of course, be faster.

Always keep the bowl at least half full of dirt. This will cause the blade to cut the high spots easier and to fill in the low spots with the extra dirt.

After having finished a part of a job, use the finished work as a guide for the rest of the job by allowing approximately $\frac{1}{4}$ of the blade to overlap the finished work and guide the depth of the cut and spread.

Small irregularities in a finished surface are sometimes smoothed out by dragging the bowl backward over the fill.

FROZEN GROUND

When operating in frozen ground, it is often difficult to break through the top, frozen surface. If using a Bulldozer, it is sometimes necessary to lay a railroad tie or log lengthwise in the path of one of the tractor tracks, so that when one track is run up onto the tie or log, the opposite corner of the blade will dig in. By driving the tractor forward and backward with the corner of the blade in the ground, it will wear down through the frozen top soil.

After once having broken through the top soil, it is a fairly simple matter to break the surrounding frozen soil out in large chunks, by bringing the blade up under the frozen surface and hoisting with the 'Dozer bowl. It will often be necessary to disengage one steering clutch during this operation to prevent stalling the tractor engine.

When using an Angledozer, it is not necessary to employ the use of a log or railroad tie to run the tractor up onto to break through the frozen ground, since Angledozer bowls can be tilted to cause one corner to dig deeper than the opposite corner.

CLEARING

LeTourneau 'Dozers are quite often used to clear land of trees, stumps, brush, mesquite, etc.

Of all clearing operations, that of pushing over trees is the most difficult. However, by following the instructions below, practically any experienced operator can push over surprisingly large trees with a 'Dozer mounted on one of the larger size track type tractors. This operation can be done with either an Angledozer or Bulldozer. If an Angledozer is used, the bowl should be in the straight, bulldozing position.

To remove a large tree, first cut all side roots by encircling the tree trunk with the blade. After the larger side roots have been cut, drive the tractor up to the tree, with the 'Dozer bowl raised to the maximum height. If the ground around the tree slopes, approach the tree from the highest side in order to take advantage of the greatest possible leverage.

In an attempt to push over the tree, do not charge or run up against the trunk of the tree at full speed, but slowly advance the tractor and place the 'Dozer bowl against the tree trunk, as high as possible, and then try to spring the tree by engaging the tractor flywheel clutch with the engine running at full throttle, thereby utilizing the full power of the tractor.

The operator should be alert to avoid being hit by falling limbs when starting to push.

If the tree does not give or start to fall, the tractor should be backed away and more of the roots cut. If necessary, push additional earth or logs in front of the tree to serve as a ramp and provide increased leverage for the 'Dozer. In this manner, both the weight of the tractor and horsepower are used to full advantage. Under no circumstances should the tractor be operated back and forth with the hope of making the tree give, since this practice is likely to result in damage to the tractor flywheel clutch.

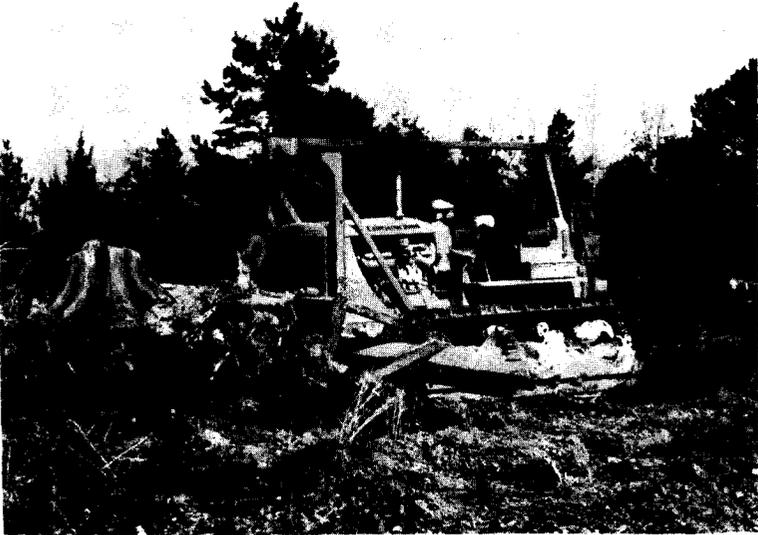


Push the tree until it starts to fall or lean. Then immediately back away and drop the bowl below the roots. (If the tractor is not backed away at this point, the tree may fall on over, allowing the roots to come up under the 'Dozer bowl and tractor, endangering the radiator and pan, and possibly resulting in the equipment getting "hung up" on the mass, requiring considerable trouble in trying to free it.)

After having dropped the 'Dozer bowl below the tree roots, again apply the power of the tractor against the tree with one steering clutch "held out" or disengaged. Leaving one steering clutch disengaged will keep the Power Control Unit in operation while the tractor force is applied against the tree. The upward pressure of the 'Dozer bowl is then applied upon the roots. As the tree continues to fall, the steering clutch should be engaged and the full power of the tractor applied to both tracks. This will bring the tree out with most of the roots.



When clearing, it should be remembered that it is much easier to take out the entire tree with a 'Dozer than to cut it down and remove the stump later. The reason for this is that the additional leverage gained by height and by weight of the tree-tops provides a contributing force that assists in bringing the tree down.



Stumps, however, can be removed with LeTourneau 'Dozers without any great amount of difficulty, by employing somewhat the same procedure as is used when pushing over trees. However, since it is impossible to push high up on a stump as is done on trees, it is necessary to cut deep enough around the stump to get the 'Dozer blade below the roots, and to then move forward and hoist with the 'Dozer bowl at the same time, thereby bringing out the stump.

REMOVING ROCKS AND BOULDERS

The procedure for digging out rocks and boulders is similar to that for removing stumps. However, it is difficult to establish a set of rules to be followed in removing rocks, since it seems that a slightly different procedure is required with each rock.

Usually, it is advisable to first dig around the rock with the 'Dozer blade and then to work one corner of the blade down under the rock. When the corner of the blade is caught firmly under the rock, disengage one steering clutch to keep the tractor engine from stalling, and engage the Power Control Unit clutch, thereby hoisting the 'Dozer bowl, and giving the rock a rolling action.

When moving rock on a side-cast job, such as widening out a cut, cutting roads up the sides of rocky mountains, etc., dig in

with the corner of the blade and then, while moving forward, give the bowl a three or four foot lift. Don't repeatedly let the corner of the blade dig in where the tractor keeps stalling. Instead, disengage the steering clutch opposite the corner of the blade which is against the rock, and raise and lower the blade into the rock, thereby causing it to dislodge itself.

LOGGING

LeTourneau 'Dozers are quite often used around logging camps not only for constructing logging roads, clearing, etc., but also for "cold decking" or piling up logs. This can be easily and effectively accomplished by using the 'Dozer bowl to shove or roll the logs into the desired position, and by rolling logs up one over another into a stack by moving forward and at the same time giving the bowl a quick, high lift as a log is being rolled in front of the bowl, up against the stack.

The quick, high lift of LeTourneau cable controlled 'Dozers makes them particularly well adapted to this type of work.

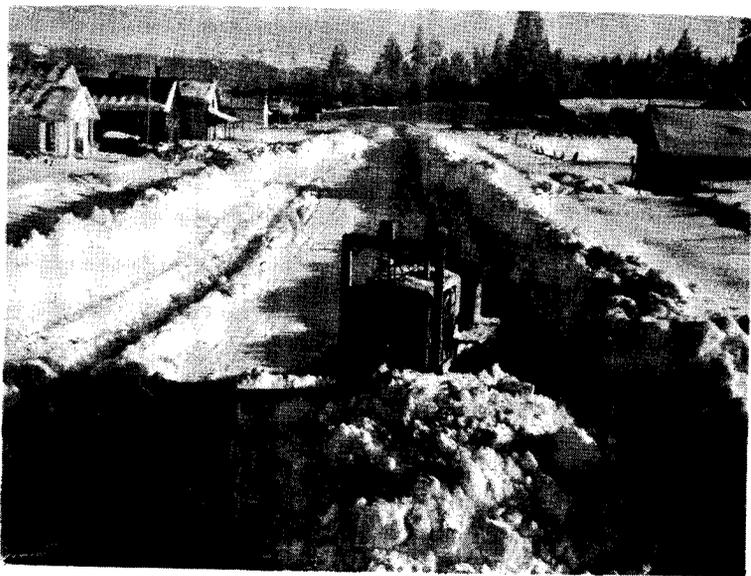
'Dozers used in logging country are usually operated by front end Power Control Units, leaving the rear of the tractor free for mounting a logging winch.



SNOW AND ICE REMOVAL

LeTourneau Angledozer and Bulldozers, although primarily designed as earthmoving tools, are often used successfully in snow and ice removal. An Angledozer, with the bowl angled 30° to one side, can normally be used more efficiently for this type of work than the Bulldozer.

When removing deep snow, it is often necessary to supplement the forward movement of the 'Dozer with a quick, upward lift of the bowl. This will enable the operator to pile the snow high on either side of the 'Dozer. When using a Bulldozer, it will be necessary to pivot the tractor by disengaging either steering clutch in order to side-cast the snow.



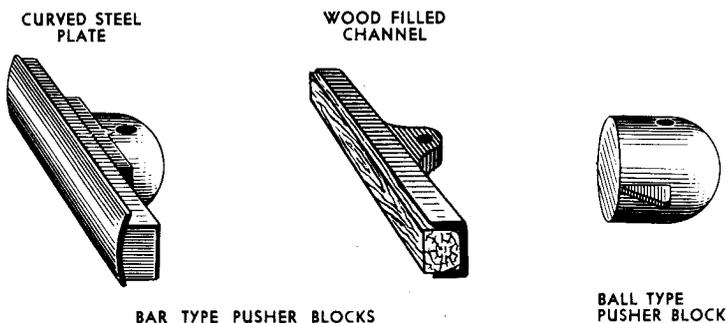
PUSHING

The use of pusher tractors when loading or dumping Carryall Scrapers is often recommended to boost production.

The pusher tractor may be equipped with either an Angledozer, Bulldozer or the Pushdozer, which is designed especially for the pushing operation. If an Angledozer is used, it should be adjusted to the straight, bulldozing position. When using a Bulldozer or Angledozer as pusher, it should be remembered that these tools were designed primarily for other purposes, and that

if improperly operated, or if used with a Scraper having the wrong type of pusher block, the 'Dozer bowl may become damaged through abuse.

Pusher blocks for installation on the rear of Scrapers are of two general types. One is a steel block which is designed to fit the pusher cup which is on the front of the Pushdozer. The other type consists of a horizontal bar, either of all steel construction with a curved face to fit the curvature of the 'Dozer bowl, or of wood filled channel construction, as illustrated. The bar type pusher block provides the comparatively large amount of contact surface required to prevent localizing shocks on 'Dozer bowls, and should be used exclusively with Angledozer and Bulldozers.



When pushing, always try to make easy contact with the pusher block on the rear of the Scraper when starting to push. After having brought the Pushdozer cup or 'Dozer bowl into contact with the pusher block, move forward with the lead tractor and Scraper, assisting in the loading of the Scraper.

The speed of the pusher tractor should be synchronized with that of the lead tractor, traveling along at the same rate of speed. When pushing a tractor-drawn Carryall Scraper, the lead tractor should be allowed to labor harder than the pusher tractor in order to prevent pushing the Scraper faster than the lead tractor is moving, which would cause the Scraper to "jack-knife". However, when pushing a Tournapull-drawn Scraper, the tractor engine should be allowed to labor harder than the engine in the Tournapull, in order to prevent unnecessary Tournapull tire wear. In the latter case, the Tournapull engine may be speeded up to straighten the machine up if it should start to "jack-knife" while loading.



Do not push the rear of the Scraper sideways while pushing. If done, this practice may cause chafing and cutting of tires, and might even cause the tires to be pulled off the wheels. Try to keep the lead tractor, Scraper and pusher tractor operating in a straight line at all times.

If pushing with an Angledozer or Bulldozer, be very careful not to permit the Dozer blade to cut into the rear tires of the Scraper.

If the Scraper should start to "hang-up" or stall by cutting too deep or by the blade striking an obstruction, both the lead and pusher tractors should be operated at wide open throttle until the Scraper is made free and can be moved forward more easily.

An efficient operator on a pusher tractor will plan his work so that he can make contact with the Scraper that is to be pushed with the least possible delays, thereby eliminating unnecessary lost motion of the Scraper unit. If using an Angledozer or Bulldozer as "pusher", the Dozer may be used for leveling, etc., while waiting for another Scraper, especially when using the pusher to assist in dumping or unloading.

MAINTENANCE INSTRUCTIONS

LeTourneau Dozers are comparatively simple in design and are sturdily constructed of special analysis alloy steel by the electric arc welding process. They have few working parts and points of adjustment and if properly operated and maintained, they should give trouble-free service.

The maintenance instructions on the following pages should be closely followed.

LUBRICATION

SHEAVE BEARINGS:

The sheave bearings receive lubrication through the zerk grease fittings in the end of the sheave pins.

One or two shots of a grease which meets the following specifications should be inserted at the end of each operating shift:

Use a high quality chassis grease which is suitable for use in roller bearings and which can be applied with a conventional pressure grease gun. The grease should be free from any fillers, grit, or other harmful impurities.

A slightly heavier grease should be used when operating in extreme heat than that which is used in extreme cold.

ADJUSTMENTS

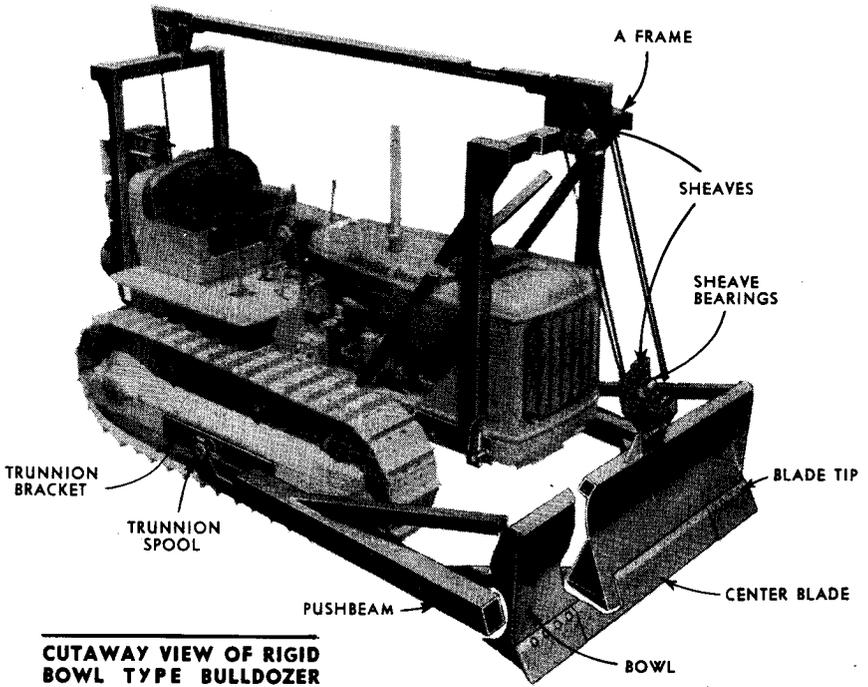
BULLDOZER ADJUSTMENTS

LeTourneau Bulldozers have few points of adjustment. The adjustment instructions follow:

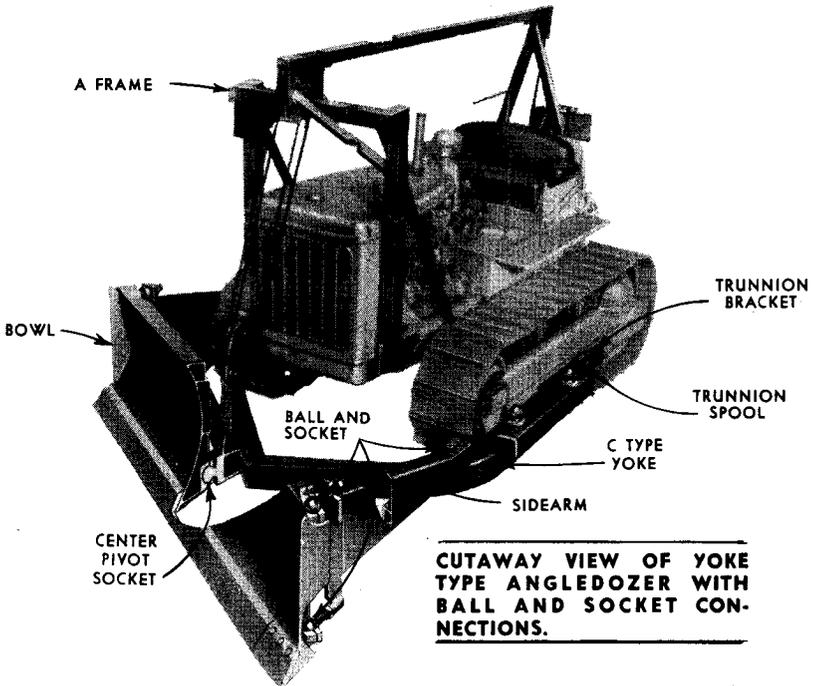
Rigid Bowl Type Bulldozers

Many of the "Rigid Bowl" type Bulldozers (those having sidearms welded solidly to the bowl) have no points of adjustment requiring attention. However, some of the larger models have double trunnion blocks, to make possible a slight change in the digging angle or forward tilt of the bowl and to increase or decrease the down pressure exerted on the Dozer bowl by the sidearms.

To increase or decrease the down pressure, remove the trunnion cap bolts and then either raise or lower both the left and



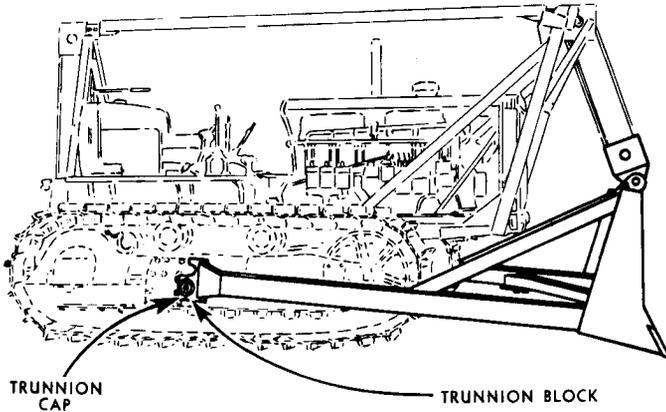
CUTAWAY VIEW OF RIGID BOWL TYPE BULLDOZER



CUTAWAY VIEW OF YOKE TYPE ANGLEDZER WITH BALL AND SOCKET CONNECTIONS.

right trunnion blocks, positioning the trunnion spool in the remaining socket in each trunnion block, and reinstall the trunnion caps and bolts.

TRUNNION BLOCK SHOWN POSITIONED
IN LOWER SETTING TO GIVE
MAXIMUM DOWN PRESSURE
AT BOWL

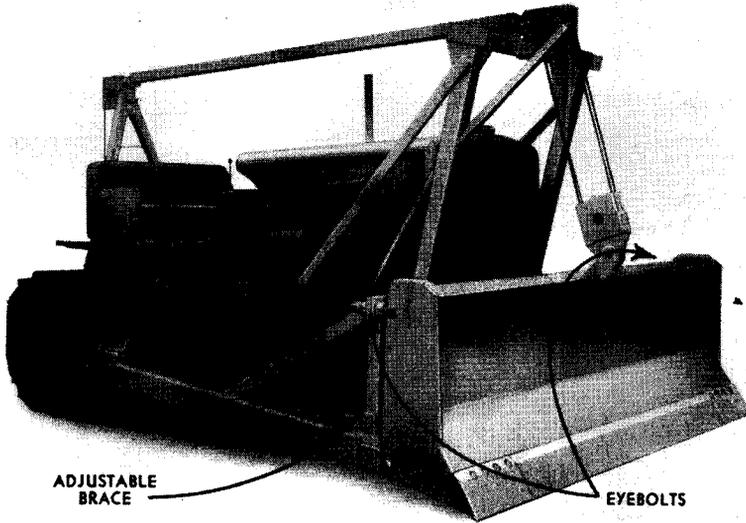


When the trunnion block is in the lower setting, the 'Dozer bowl is given maximum down pressure. When in this position, the blade will normally penetrate into hard soil better than when in the upper position. When "bulldozing", or, in other words when drifting loose dirt ahead of the bowl, the trunnion blocks may be in either the upper or lower setting, as preferred by the operator.

Knock-Down Type Bulldozer

All models of LeTourneau Bulldozers that are of the "knock-down" type (those having detachable sidearms) have adjustable eye-bolts at the upper corners of the bowl, which make possible a slight change in the digging angle or forward tilt of the bowl.

To change the digging angle of the blade, first remove the eyebolt pins from the ends of the adjustable braces which extend from the sidearms to the bowl. Then adjust the eyebolts at the upper corners of the bowl in or out as desired by turning the eyebolt nuts on the eyebolts. This will cause the bowl to tilt a short distance either to the front or to the rear. Make sure that both the left and right eyebolts are adjusted in equal amounts in order to prevent throwing a bind in the 'Dozer bowl.



After having tilted the bowl to the desired digging angle, re-install the adjustable braces, turning the eyebolts in the end of the braces enough to compensate for any change required in the length of the braces due to tilting the bowl. The braces should be tight when installed, thereby tending to increase the rigidity of the Dozer bowl and sidearm assembly.

ANGLEDZER ADJUSTMENTS

The only points of adjustment on LeTourneau Angledozer are those for angling the bowl, either to the right or left for side-casting, and the adjustment for tilting the bowl to cause one corner to dig deeper than the other.

The methods of making these above mentioned adjustments on the different types of Angledozer follow:

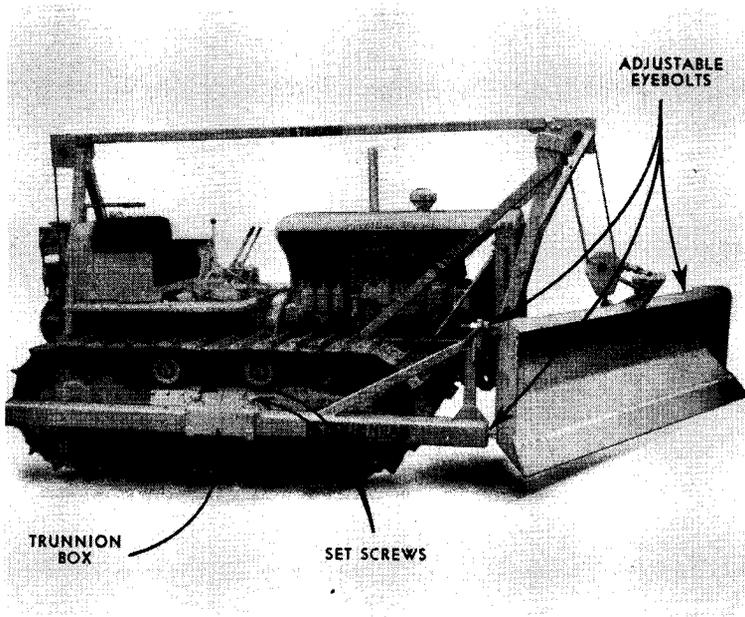
Angledozer Having Detachable Pushbeams

ANGLING ADJUSTMENT: When the Angledozer is operated with the bowl straight across the front of the tractor like a Bulldozer, the bowl is braced to both pushbeams or sidearms by two diagonal braces, which are fastened to the center of the rear of the bowl and which extend to either pushbeam.

To angle the bowl either to the left or to the right, first remove the diagonal braces.

Then back off the two set screws in the top of each trunnion box, and by sliding the pushbeams through the trunnion boxes, angle the bowl either to the left or to the right, 30° from the straight "bulldozing" position. Tighten the tapered set screws in the top of the trunnion boxes down into the tapped holes provided in the pushbeams for the angled bowl setting.

Reinstall the adjustable diagonal brace or "equalizer bar", connecting it to the pushbeam that is farthest forward. The eyebolt provides the necessary adjustment in the diagonal brace with which the proper clearance can be obtained between the pushbeams and the tractor tracks when the bowl is set at an angle.



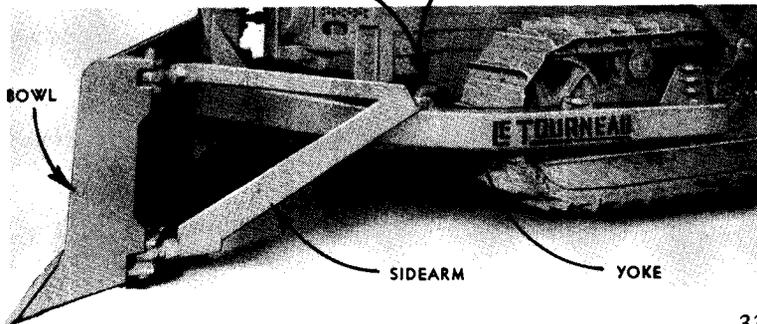
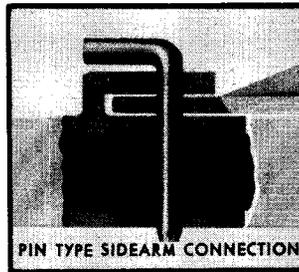
BLADE TILT ADJUSTMENT (For Digging Deeper with One Side Than With the Other): The bowl can be tilted so that the blade will dig deeper on one side than on the other by means of the adjustable eyebolts at the upper corners of the bowl.

To lower the right point of the blade, screw out the left upper corner and screw in the right. To lower the left point, screw out the right upper corner and screw in the left corner.

Angledozer Having "C" Type Yokes

ANGLING ADJUSTMENT: The bowl on any LeTourneau Angledozer having a "C" type yoke can be angled to the right or left by one man without difficulty.

In the straight "bulldozing" position, the sidearms which extend back from the corners of the bowl are connected to the second sidearm bracket or socket on either side of the yoke. To angle the bowl 30 degrees to the right or left, first raise the bowl off the ground and then disconnect the sidearms from the yoke. (Sidearms can be disconnected from yokes by removing the sidearm pins on some models; by releasing ball sockets on others). Swing to the front the side of the bowl that is to be angled forward, and fasten the sidearm on that side to the yoke at the front sidearm bracket or socket. Then move the opposite sidearm into position to fasten to the rear sidearm bracket or socket on the opposite side of the yoke. If the points of connection between the sidearm and yoke are not in alignment, do not try to effect the connection by force. Instead, bring the two into alignment by adjusting the eyebolts or ball joints for the tilt adjustment (see following instructions) until the points of connection on the yoke and the sidearm are in perfect alignment. Then connect the sidearm to the sidearm bracket or socket on the yoke.



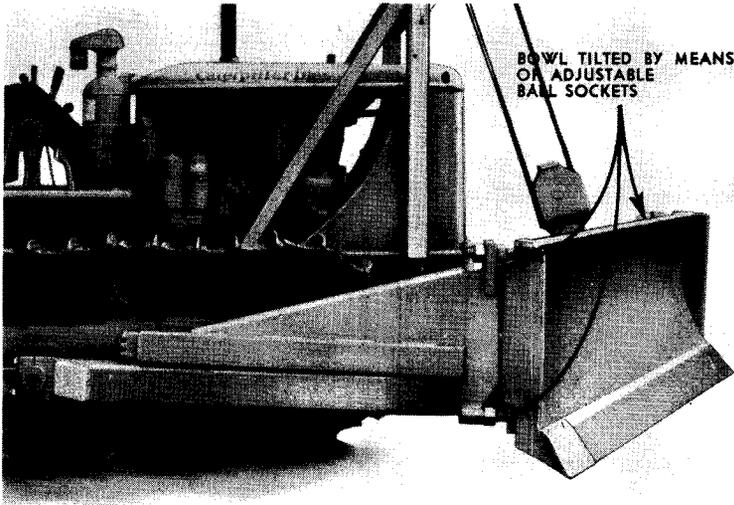
BLADE TILT ADJUSTMENT (For Lowering One Corner of the blade): The bowl can be tilted so that the blade will dig deeper at one corner than the other as follows:

(a) *Yoke Type Angledozer Having Ball and Socket Connections Between Sidearms and Bowl.*

The adjustable ball sockets which connect the sidearms with the corners of the bowl are the means by which the blade is tilted.

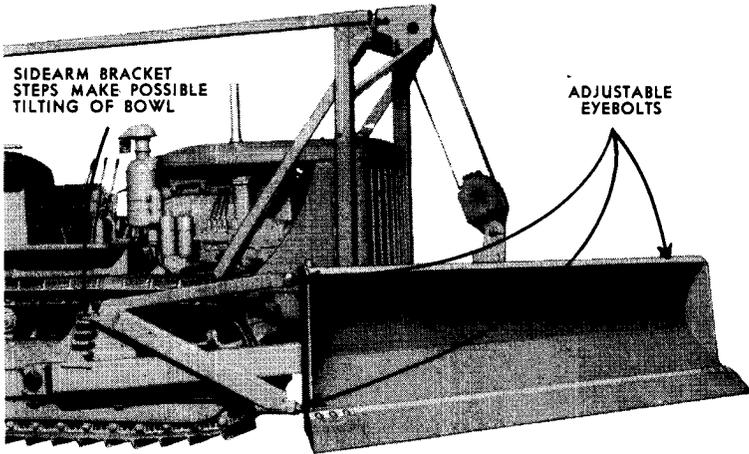
To lower the right point of the blade, screw out the left upper and right lower corners of the bowl, and screw in the right upper and left lower corners. To lower the left point, reverse the above procedure.

If play or "slap" should become evident in the ball and socket joints through wear, a take up in the sockets should be made by removing shims.



(b) *Yoke Type Angledozer Having Eyebolt Connections Between Sidearms and Bowl.*

The bowls on yoke type Angledozer having sidearms connected to the bowl by means of eyebolts can be tilted to cause one corner of the blade to dig deeper than the other by raising one sidearm into the upper step in the sidearm bracket on the yoke when the bowl is in the angled position; and additional tilt can be obtained by means of the adjustable eyebolts which connect the sidearms with the corners of the bowl.



To lower the right point of the blade, raise the left sidearm into the upper step in the sidearm bracket on the yoke, with the right side of the bowl angled to the front. To obtain additional tilt, screw out the left upper and right lower corners of the bowl, and screw in the right upper and left lower corners.

To lower the left point of the bowl, reverse the above procedure.

If it is desired to lower one corner with the bowl straight across the front of the tractor, or, in other words, in the "bulldozing" position, make adjustment with eyebolts only as outlined above.

CABLE

LeTourneau 'Dozers are designed for use with $\frac{1}{2}$ " wire rope which meets the following specifications:

Use 6x19 (with filler wire) wire rope with an independent wire rope center, pre-formed, of "Langlay" construction and manufactured from improved plow steel. It should be internally lubricated. Right lay cable is ordinarily used.

ANGLEDZOZER AND BULLDOZER BLADES

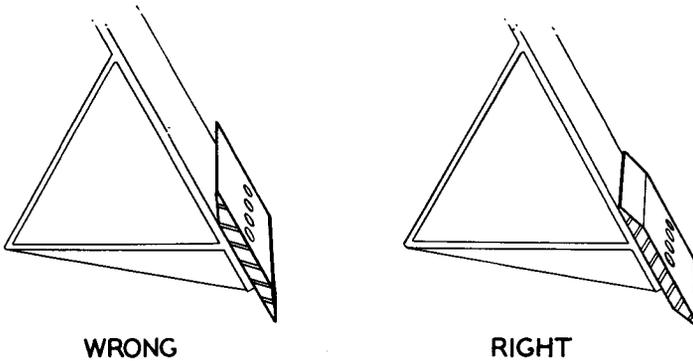
The blades or cutting edges used on LeTourneau Angledozer and Bulldozers are made of special analysis alloy steel and are given a special heat treatment to insure toughness and reduce wear. The reversible feature of the center blade insures doubling the blade life. The blade tips, or end blades, which are subject

to the greatest amount of wear, are removable and can be replaced separately without disturbing the center section. These blade tips are made from heavier stock than the center blades and are faced with hardfacing metal to resist abrasion.

The blade should be changed before it has worn back far enough to cause the bowl to be subjected to wear, which would result in damage to welds and ultimate destruction of the bottom of the bowl.

Heavy duty blade tips are available and recommended for use in rock and abrasive materials.

The center blades should be installed with the beveled edges positioned as illustrated.



WELDING REPAIRS

Since LeTourneau 'Dozers are welded together and made of high alloy steel, breakage of any of the main structures seldom occurs. However, it is impossible to build any type of machinery, even heavily constructed electrically arc welded alloy steel equipment, such as 'Dozers, that will withstand all types of abuse continuously without occasional breakage.

If any welded member of a LeTourneau 'Dozer should start to crack or break through severe abuse, the 'Dozer should be stopped immediately and the crack should be welded up and reinforced before the damage becomes serious.

Only alloy steel should be used in reinforcing LeTourneau 'Dozers and coated arc electrodes used in welding.