# CARRYALL SCRAPER

# OPERATOR'S MANUAL

LeTourneau-WESTINGHOUSE Company
A Subsidiary of Westinghouse Air Brake Company
Peoria, Illinois, U.S.A.

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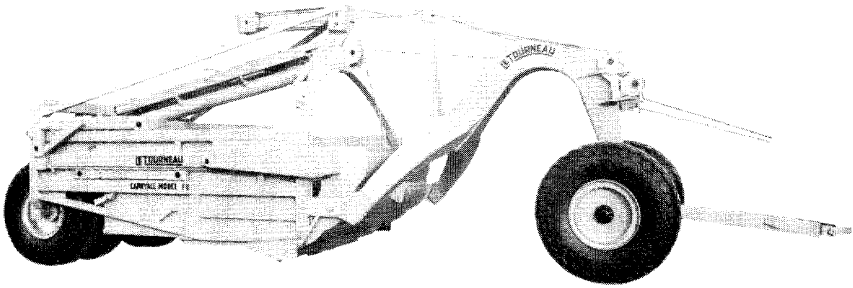


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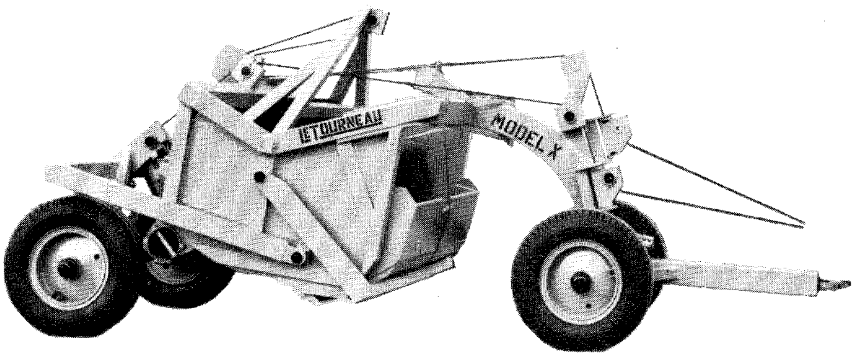


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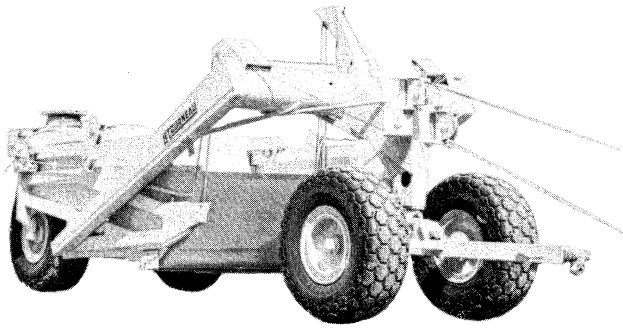


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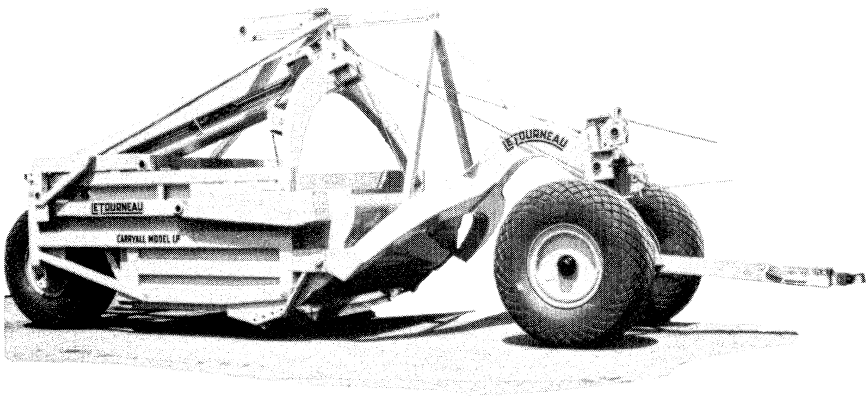



(MODEL LP TYPE)
SINGLE BUCKET CARRYALL SCRAPER

## PRINCIPAL PARTS OF CARRYALL SCRAPER

FRONT AXLE STRUCTURE—Structure at front of Scraper consisting of tongue and horizontal axle beam.

YOKE—The arched member connecting front axle structure with main body structure. Arched construction provides clearance for wheels when turning.

MAIN BODY STRUCTURE—Main structure of Scraper, consisting of bowl, into which dirt is loaded; springpipe, which extends at an angle above the bowl and which houses the tailgate return springs; and arched A-frame, which adds rigidity and supports front end of springpipe.

APRON—Structure hinged to main body which can be raised and lowered to provide an opening at the front of the bowl through which dirt can enter. Apron holds part of the dirt when bowl is filled.

TAILGATE—Structural member which rolls either to the front or to the rear inside the main body structure to eject the dirt and which serves as the rear end of the bowl.

PUSHBEAM—The beam which is hinged at the top of the yoke structure and which extends back through the sheave housing at the top of the main body structure. The pushbeam assists in raising and lowering the front of the bowl and blade.

REAR HITCH—The structural member at rear of main body structure which can be used as a hitch if desired and which supports pusher block used for pusher loading.

UNIVERSAL FORGINGS—Forged parts which are free to turn in steel bushings in the front axle structure and yoke and which, when coupled with another universal forging or hitch block, serve as a universal coupling.

SHEAVE WHEELS—Grooved wheels over which cable passes.

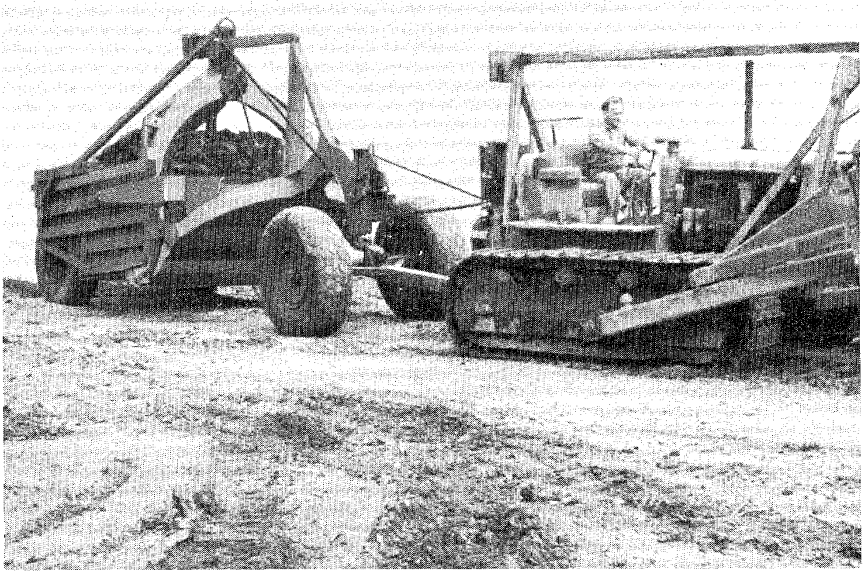
SPIRAL SHEAVE WHEEL—Spiral reduction wheel at rear of main body to which springpipe cable and spiral sheave-to-tailgate cable are attached, that assists in compressing tailgate return springs when tailgate is pulled ahead, and vice-versa.

FAIRLEAD SHEAVES—The two sheave wheels at the front of the yoke which are free to pivot either to the right or left to cause perfect cable alignment when turning.

BLADES—The replaceable cutting edges at the front of the main body which, when pulled through the ground causes dirt to be loaded into the Scraper bowl.

GROUND PLATES—The replaceable blade-like plates which are bolted to the sides of the main body structure at the lower corners to serve as wear strips.

PUSHER BLOCK—The block at the rear of the Scraper which serves as a contact point for the 'Dozer bowl of a pusher tractor to bear against when pusher loading.



The efficiency of the Carryall Scraper is more dependent on the ability and skill of the operator than on any one other thing. For this reason, it is hoped that every operator will recognize the importance of his services, and will operate the scraper to the best of his ability at all times.

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 Scraper work, as practiced by skilled operators with years of experience.

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

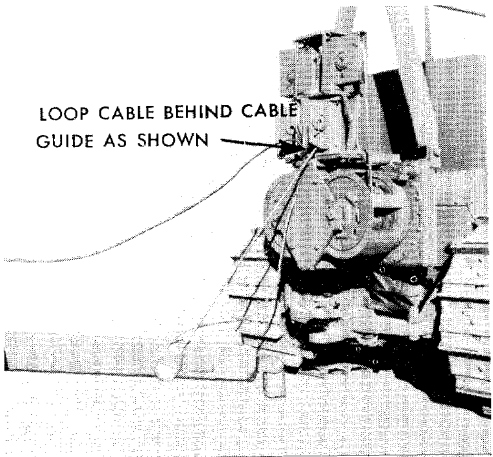
It should be kept in mind, however, that an operator cannot become skilled by reading a book, but can attain skill only through actual operating experience.

On the following pages will be found not only the recommended operating procedures, but also instructions covering the points of maintenance that can be taken care of by the operator.

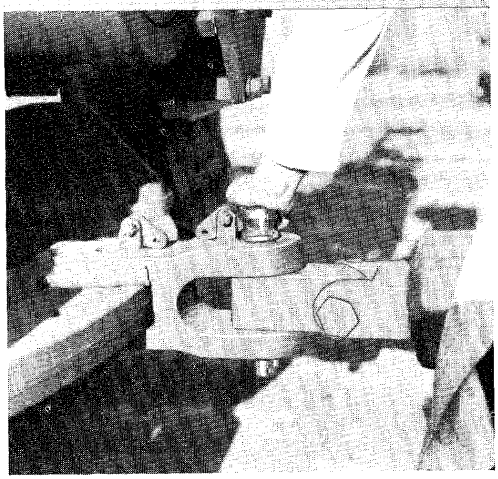
## CONNECTING SCRAPER TO TRACTOR

To connect a Scraper to a tractor, it is usually not necessary to thread the cable through the Scraper, because when uncoupled from the tractor, the cable is usually disconnected from the Power Control Unit on the rear of the tractor and left threaded through the Scraper.

With the cable threaded through the Scraper, back the tractor up to the Scraper tongue and thread the hoist cable thru the double deck sheave assembly and onto the Power Control Unit right hand cable drum. (Refer to Power Control Unit Manual.) Likewise, the dump cable should be threaded thru the double deck sheaves and onto the left cable drum. Since the tongue is too heavy to lift by hand, a cable socket is welded to the side of the tongue so that it can be raised mechanically by the Power Control Unit.




To raise the tongue, pull a few feet of slack in the right cable and loop it down through the cable socket on the side of the tongue as illustrated, and insert the cable wedge from the bottom side. Tap the wedge into place. Then raise the tongue so that the hitch block is even with the tractor drawbar by engaging the Power Control Unit right hand clutch.



After the tongue is raised up even with the tractor drawbar, back the tractor up, positioning the Scraper hitch block between the jaws of the tractor drawbar, and insert the drawbar pin.

Remove the cable wedge from the cable socket on the side of the tongue, and take up slack cable. Keep the wedge in the tractor tool box or some safe place where it can be readily found.

# OPERATION

## CONTROLLING SCRAPER WITH POWER CONTROL UNIT

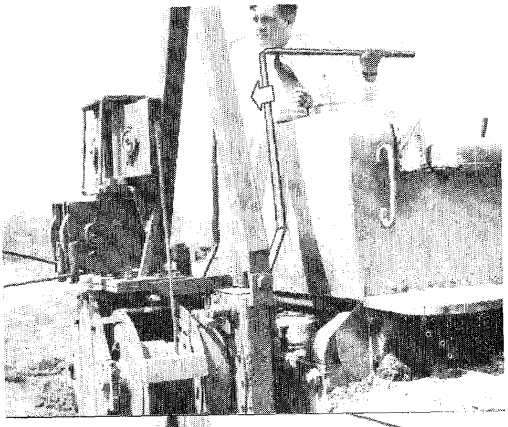
The Scraper is controlled by means of the Power Control Unit on the rear of the tractor.

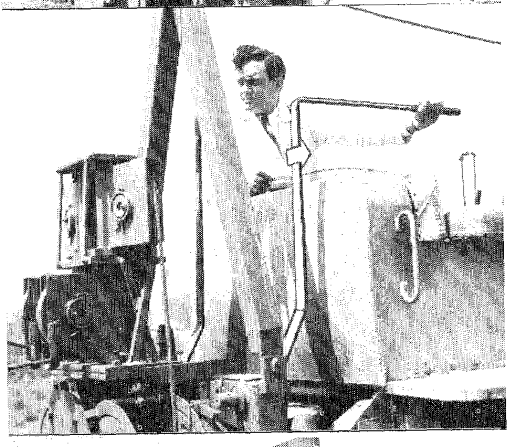
The right control lever (viewed from Scraper to tractor) controls the raising and lowering of the bowl. Moving the lever toward the center of the tractor (to the left) engages the hoist clutch and raises the Scraper bowl. Returning the lever to neutral position applies the brake to the cable drum and holds the bowl in the raised position.

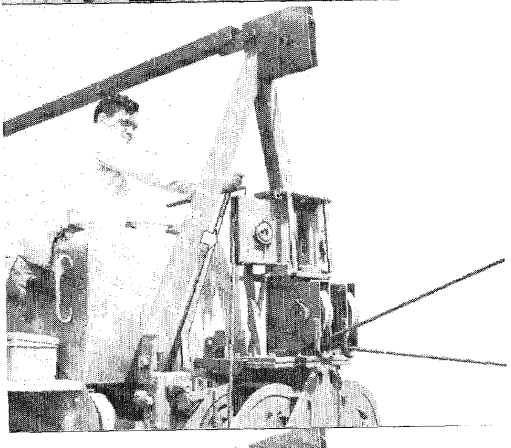
Moving the right lever away from the center of the tractor (to the right) releases the brake from the cable drum and allows the bowl to lower. Returning the lever to neutral position applies the brake to the cable drum and holds the bowl at the level to which it was lowered.

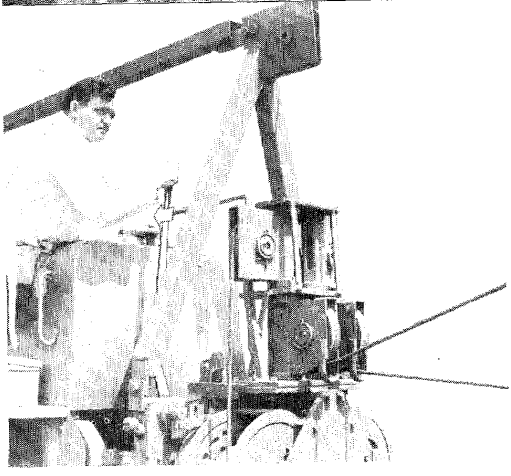
The left control lever of the Power Control Unit controls the apron and tailgate. Moving the lever toward the center of the tractor (to the right) engages the dump clutch and raises the apron. When the apron is raised to its full height, the tailgate is then pulled forward and the tailgate return springs inside the springpipe are compressed. Returning the control lever to neutral position applies the brake to the cable drum and holds the apron and tailgate in the position desired.

Moving the control lever away from the center of the tractor (to the left) releases the brake from the cable drum, allowing the tailgate return springs to return the tailgate to its original position at the rear of the Scraper bowl, and also permits the apron to lower.









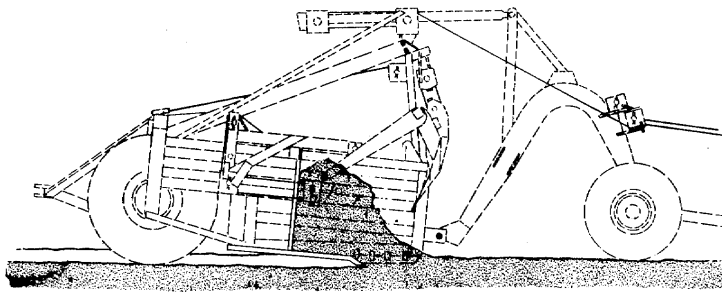
## THE OPERATING CYCLE

The operating cycle of the Carryall Scraper includes the operations of loading, hauling, unloading or spreading, and returning to the cut, as illustrated below.

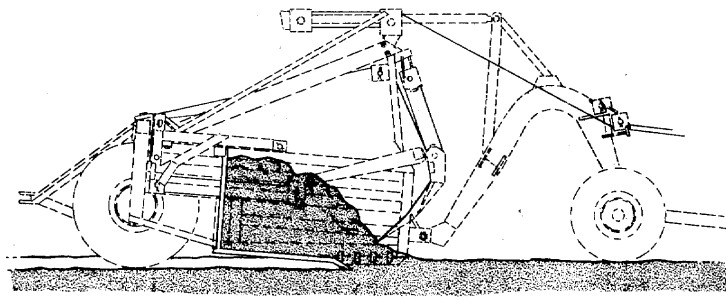
The power for each of these operations is supplied by the tractor. The tractor pulls the Scraper blade through the ground when loading, tows the Scraper when traveling, and provides the power for unloading.

The Power Control Unit, in controlling the working parts of the Scraper, either spools or unspools the cable on or off the cable drums, depending upon the movement of the control levers by the operator. The control cables extend to the various working parts of the Scraper and actuate these parts to perform the necessary functions. The cables pass through sheave blocks at various points on the Scraper. This multiplies the line pull delivered by the Power Control Unit many times at some points, depending on the number of sheave wheels used in the sheave blocks, thus providing the large amount of power needed for operations such as unloading.

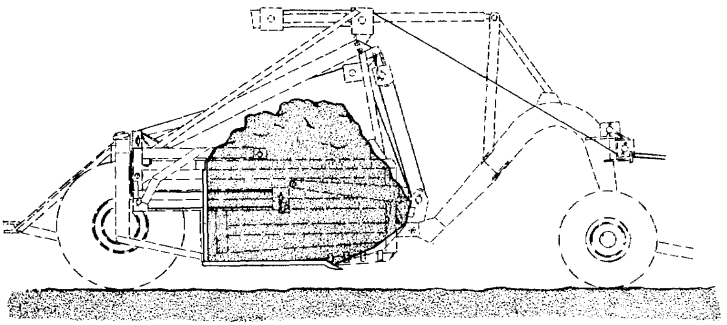
## LOADING CYCLE OF SINGLE BUCKET SCRAPERS



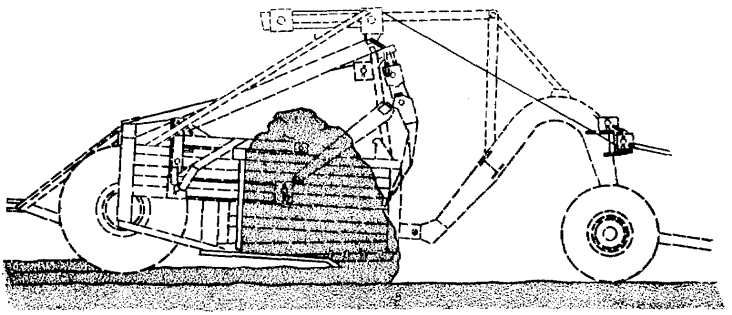
1. Entering the cut, the apron should be raised four to eight inches. Then release the right hand Power Control Unit brake and lower the cutting edge into the ground to the desired cut.



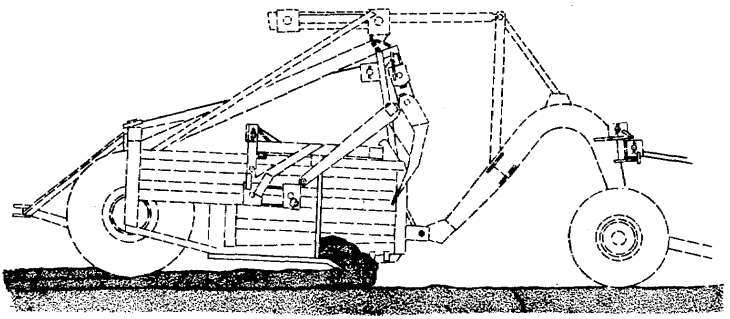
2. As the bowl is being filled, the material will roll back against the tailgate and forward against the apron, thereby assisting in closing the apron. When the bowl is filled, release the Power Control Unit dump brake to close the apron, and at the same time engage the hoist clutch and raise the bowl one or two inches above the surface of the ground.



3. After pulling the Scraper ahead a few feet, spreading the material which was in front of the blade, raise the bowl to the desired traveling position and proceed to the fill, carrying the bowl comparatively close to the ground.



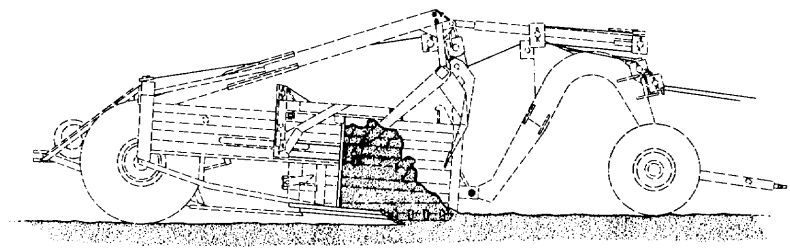
4. Upon arriving at the fill, raise or lower the blade to the desired depth of spread. Raise the apron to its full height by engaging the dump clutch, allowing the dirt to fall out. Shake any sticky material from the back of the apron by releasing the brake, dropping the apron about twelve inches and then immediately engaging the clutch to raise the apron again. Repeat this procedure in sticky material if necessary.



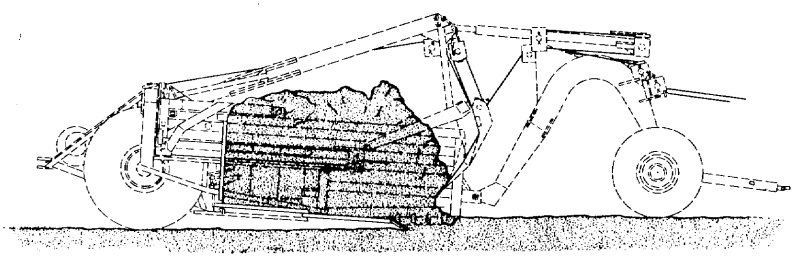
5. After the dirt has fallen out with apron raised, re-engage the power control unit dump clutch, thereby pulling the tailgate forward to eject the remainder of the load. Pull the tailgate forward approximately 12" at a time and then allow it to return a few inches before pulling it forward again. When the bowl is completely emptied, release the Power Control Unit dump brake, allowing the tailgate return spring to return the tailgate to its rear position and also lowering the apron about six or eight inches. The Scraper is now in traveling position.

# LOADING CYCLE OF DOUBLE BUCKET SCRAPERS

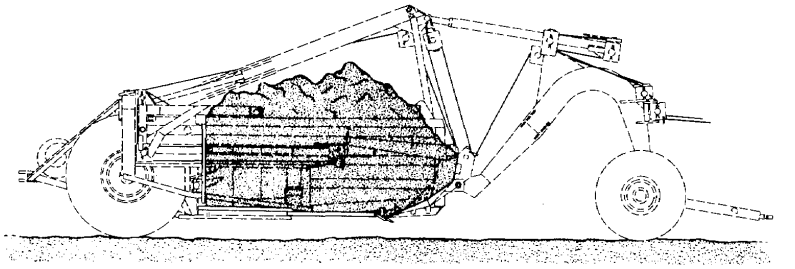
The loading cycle of the double bucket Scraper is the same as the single bucket Scraper except that the double bucket Scraper has a sliding bucket. When loading, this bucket is forward inside the stationary bucket or bowl and as it is loaded, it moves back with the tailgate to allow the front bucket to be loaded. In unloading, the sliding bucket moves forward with the tailgate, thus emptying the front bucket. When the front bucket has been unloaded and the sliding bucket is in its forward position, the tailgate moves forward, unloading the sliding bucket.



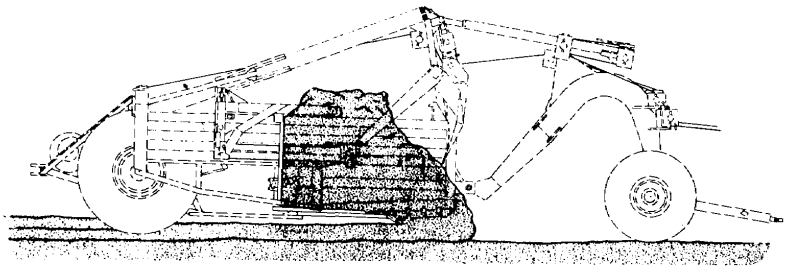
1. With the apron raised, tailgate should be approximately 12 inches from the extreme front. Release the hoist brake lowering the cutting edge into the ground. As dirt falls into the bucket and it hits the tailgate, release the brake enough to allow the gate to slide back about six inches. Repeat this until the gate is to the extreme rear and the Scraper is loaded.



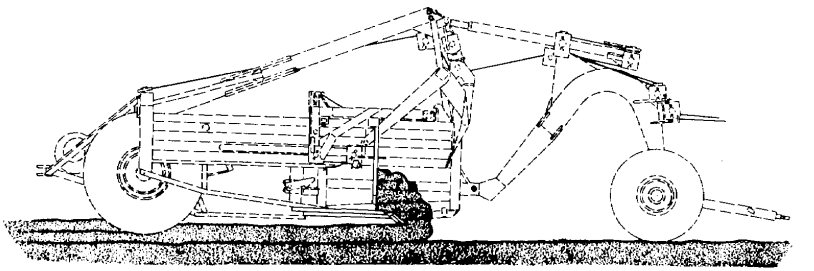
2. After the gate is at the extreme rear, release the brake letting the apron drop at a moderate speed to carrying position and at the same time raise the bowl until it clears the ground at least an inch.



3. After moving ahead a few feet, raise the bowl to the desired height and proceed to the fill area.

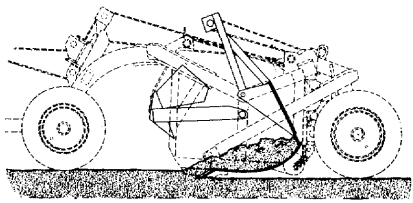


4. Upon arriving at unloading point, raise or lower the bowl to the desired depth of spread and raise the apron to its full height. Shake the dirt from back of the apron by releasing the brake, dropping the apron about twelve inches and immediately engaging the clutch to raise the apron again. If in sticky material, repeat this procedure.



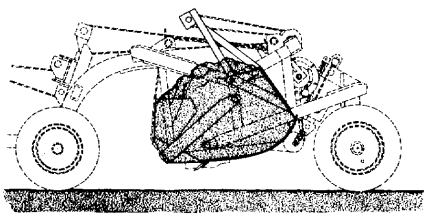
5. Engage tailgate clutch bringing tailgate ahead about twelve inches at a time until the bowl is completely unloaded and then release the brake, lowering the apron about six or eight inches. The Scraper is now in traveling position.

# LOADING CYCLE OF MODELS X AND Z

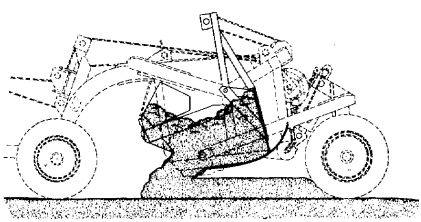


The loading of the Models X and Z requires virtually the same operation as the single bucket Carryalls.

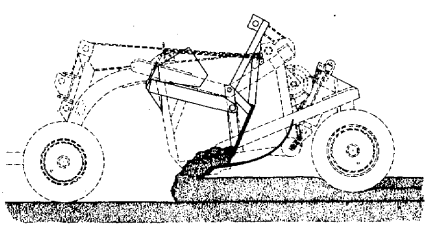
1. Entering cut—the tailgate should be at the extreme rear of the bowl and the apron should be raised four to eight inches to clear dirt entering the bowl. Release the hoist brake, letting the cutting edge into the ground to the desired depth of cut.



2. When loaded, release brake on left drum, letting apron close slowly. Then engage clutch on the right drum lifting the cutting edge until it clears the ground an inch or two, leveling the loose dirt. After traveling a few feet, lift the bowl to the desired traveling height.



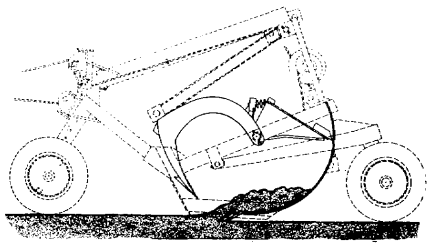
3. Upon arriving at the unloading point, release the hoist brake raising or lowering the cutting edge to the desired depth of spread. Shake the apron by engaging the tailgate clutch, raising the apron to its full height and then release the brake, letting the apron drop six or eight inches. Engage the clutch again, raising the apron to its full height and pull the tailgate ahead about six inches.



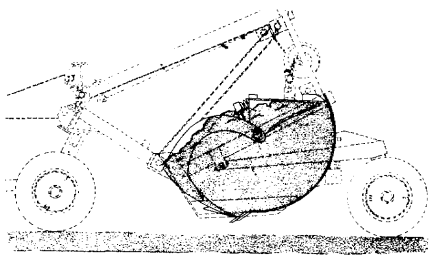
4. Continue moving tailgate forward about six inches at a time until it is in the extreme forward position. Then release the brake, allowing the apron to drop six or eight inches. The Scraper is now in traveling position.

# LOADING CYCLE OF MODEL G SCRAPER

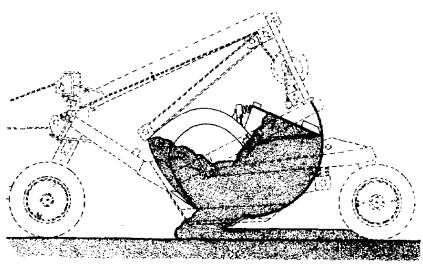
1. When entering cut, engage the left-hand Power Control Unit clutch, lifting the apron four to eight inches. Then release the right hand Power Control Unit brake lowering the bowl into the ground to the desired depth of cut.



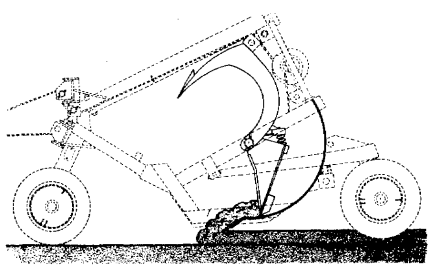
2. When the bowl is loaded, release the apron brake and engage the hoist clutch, raising the bowl just clear of the ground. Notice that in the curved bowl the dirt has a rolling action.

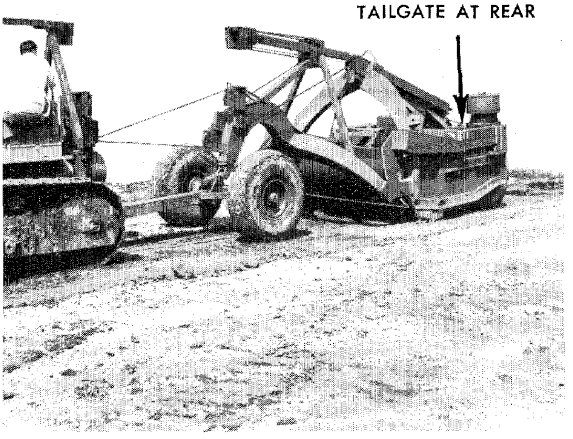


3. Arriving at the unloading point, raise or lower the bowl to the desired height of spread. Then engage the clutch, lifting apron approximately six inches.



4. Repeat, raising the apron six inches at a time until the tailgate is to the extreme front. Then immediately release the brake, letting the apron down about six inches or more. The Scraper is then in traveling position.






## LOADING

To load the Bowl of the Scraper and fully utilize its capacity, enter the cut with the tailgate in the extreme rear position and with the apron raised approximately 6 to 12 inches.

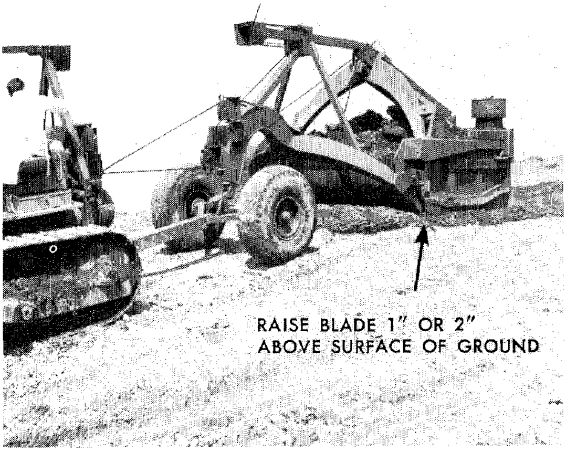
Move forward and lower the blade into the ground, allowing it to penetrate to the desired depth. Keep the apron low, leaving an opening just large enough for the dirt to enter, but not so low as to cause the dirt to bank up in front of the blade. Loading is normally done in low gear.

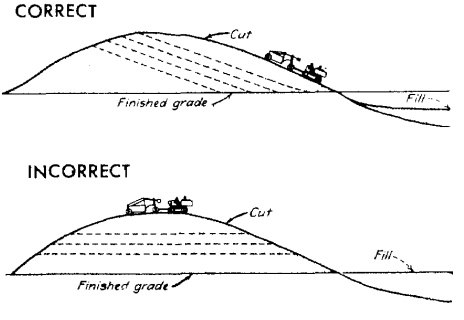
As the unit moves forward, loading the dirt into the bowl, the material will fall forward against the apron as well as back against the tailgate.

When the Scraper is loaded, lower the apron and raise the blade an inch or two above the surface of the ground. Travel several feet before raising the blade to a higher position. This will spread the loose material in front of the blade and thereby leave the cut smooth to pull in and out of.

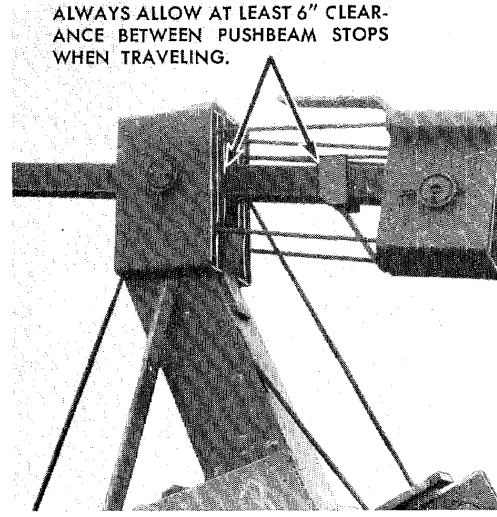
All operators like to obtain as large a load as possible, but in some materials it sometimes takes as much time to get the last yard of dirt as it does to get an average load. On short hauls it is not profitable to take this extra time to get the last yard of dirt. However, on long hauls, it often pays to take the extra time and effort to obtain the added yardage because on long hauls the extra loading time is such a small percentage of the total cycle time.

If possible, arrange the work so that the Scraper can be loaded down hill and in the direction of travel to the fill.



## TRAVELING TO THE FILL




Traveling to the fill with a loaded Scraper is usually done with the tractor in the highest gear possible without over-loading the tractor engine. The bowl of the Scraper should be carried fairly close to the ground, but high enough to clear any objects on the haul road without having to continually raise and lower the bowl. Carrying the bowl close to the ground prevents danger of upsetting the Scraper, particularly when traveling over rough haul roads. It also prevents traveling with the pushbeam stops together which might cause breakage of the hoist cable or upsetting the Scraper when making a short turn to the left. Provide at least 6 inches of clearance between the pushbeam stops at all times when traveling.

When turning sharply on extremely rough ground, the operator should be careful not to cramp the front axle structure beyond reasonable limits, in order to avoid the danger of damaging the tires by bringing them into contact with the yoke.

When there is a choice of two or more routes for traveling from the cut to the fill—one a short steep route that would require traveling in low gear and the other a long gradual incline that would allow traveling in fourth or fifth gear, with each route ending at the same place and taking approximately the same time, the shorter route should normally be taken, even though it requires traveling steep inclines in low gear. The reason for this is that the maintenance cost on tracks, rollers, bearings, etc., is higher while traveling at high speed than at low speed. Several factors should be considered in making the choice, however, such as traveling time, condition of haul roads, wear on equipment, etc.




## UNLOADING OR SPREADING

Spreading is usually done in the highest gear possible. This, of course, is dependent upon material and conditions.

Upon arriving at the fill with the loaded Scraper, either raise or lower the bowl as is required to give the desired thickness of spread. Then engage the Power Control Unit left clutch, raising the apron to its full height, allowing the dirt in the apron to fall out. When the apron reaches its full height, disengage the clutch and release the brake, allowing the apron to drop about twelve inches. Then immediately engage the clutch and raise the apron again. If operating in sticky material, it may be necessary to repeat this operation once or twice to dislodge the dirt from the back of the apron. After the dirt has fallen out of the apron, re-engage the clutch and bring the tailgate forward about twelve inches at a time, letting it move back a few inches after each forward movement, until the bowl is empty. If possible, stop the forward movement of the tailgate just before the tailgate sliding sheave housing above the springpipe reaches its stop block at the rear of the channel in which it slides.

If starting a new spread, the blade should be lowered slightly as the rear wheels come up onto the dirt that is ejected, in order to maintain an even depth of spread.

The operator should be careful not to force the load out too rapidly, as this causes unnecessary strain on the tailgate and cable. Also, it may cause the dirt to stack up in front of the blade, thereby adding additional draft on the tractor. As the tailgate nears its forward position and the load decreases, it is advisable to use less pressure on the control lever, unless the pressure is actually required to pull the tailgate forward. By exerting less pressure as the tailgate nears its forward position, the

clutch would slip rather than the cable breaking, in event the tailgate should accidentally be brought so far forward that the tailgate sliding sheave strikes against the stop block at the rear of the channel above the springpipe. Remember, however, that the clutch should not be allowed to slip during operation unless this extreme forward position is reached, and in this case it is done only to prevent cable breakage. The operator should always disengage the clutch immediately whenever the tailgate sliding sheaves strikes the stop block.

When the Scraper is completely emptied, return the tailgate to its rear position and lower the apron. Then raise the bowl to the desired traveling position and return to the cut. The operator should at no time return to the cut with the apron raised and the tailgate in the extreme forward position, because cable breakage would occur when turning or when traveling over unlevel ground.

## RETURNING TO THE CUT

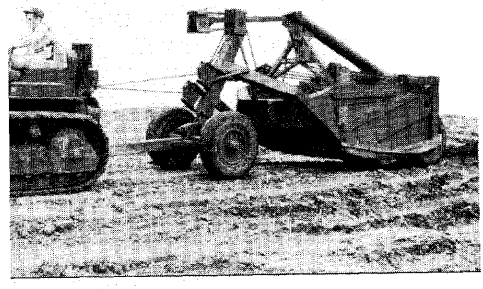
Returning to the cut is usually done in as high a gear as possible.

When returning, the bowl should be carried comparatively close to the ground, but high enough to clear any rocks and obstructions in the path of travel without repeated raising and lowering of the bowl. Carrying the bowl low to the ground prevents upsetting.

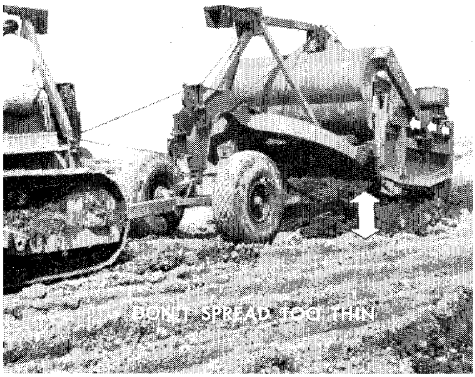
Always allow at least 6" clearance between the pushbeam stops. This will prevent cable breakage when traveling over rough, un-level ground and when turning.

It is sometimes advisable to smooth up the haul road with the empty Scraper by dragging the blade on the ground. With the apron raised and the tailgate within approximately 8" of the extreme forward position, an action similar to that of a 'Dozer or grader is obtained. The tailgate should never be in the extreme forward position during this operation, or cable breakage might occur when traveling over unlevel ground and when turning.

AT LEAST 6" CLEARANCE BETWEEN STOPS



DRAGGING HAUL ROAD ON RETURN TRIP




## HANDLING SPECIAL MATERIALS

### Wet or Sticky Material

When operating in wet or sticky material, difficulty may be experienced in unloading or spreading unless certain precautions are observed.

When unloading, do not try to make too thin a spread. Keep the bowl high enough to allow the material to pass under the Scraper. Material not having enough room to pass under the Scraper will roll up inside the bowl into a solid mass that will be difficult for the tailgate to eject.

Do not try to force the load out too fast, as that too will cause the material to roll up in front, and might result in cable breakage.

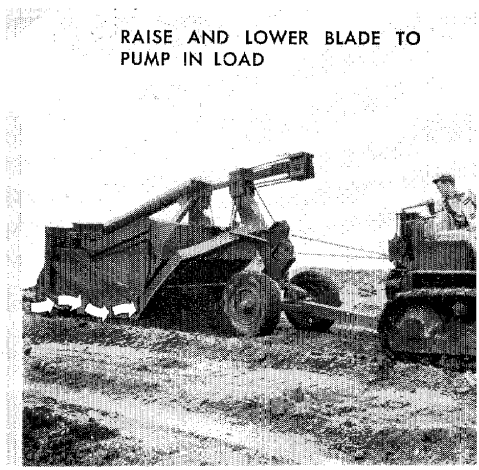
For best results in wet or sticky material, bring the tailgate forward about twelve inches at a time. After each forward movement, permit the tailgate to return approximately six inches, allowing the material inside the bowl to settle back and loosen up. Repeat this operation until the bowl is emptied.

### Loose Sand

Because of the tendency of loose sand to float ahead in front of the blade rather than entering the bowl when loading, the following procedure should be used when loading loose sand.

Start to load with the apron raised 6 to 12 inches and with the tailgate in the rear position. Move forward with the blade in the ground, loading in the conventional manner. When the bowl has become approximately half filled, lower the apron into the pile of sand that will have stacked up in front of the blade and then raise the bowl approximately 2 inches. Then, while moving forward, release the hoist brake, permitting the bowl to drop about 3 or 4 inches. This will force more sand up into the bowl. By repeating this operation, the Scraper can usually be fully loaded.

The above method of raising and lowering the bowl to obtain a load is sometimes referred to as "pumping in a load". When lowering the bowl in this operation, do not leave the hoist brake released long enough to allow the cable to become slack on the drum as that would cause unnecessary cable wear and possible breakage.




In unloading loose sand, make the spread as thin as possible. This will give better compaction and will make traveling over the fill easier.

## Gravel

When loading gravel, it may be necessary to follow a procedure similar to that for loading loose sand in order to obtain a full load. However, little difficulty should be experienced except occasional failure of the apron to completely close, due to interference by large stones, resulting in a partial loss of the load.

BACK UP WHILE LOWERING APRON AND RAISING BLADE

If encountered, this difficulty may be overcome by backing the Scraper up a few inches and at the same time lowering the apron and raising the bowl. As the bowl is raised, the apron will usually drop into the completely closed, carrying position.

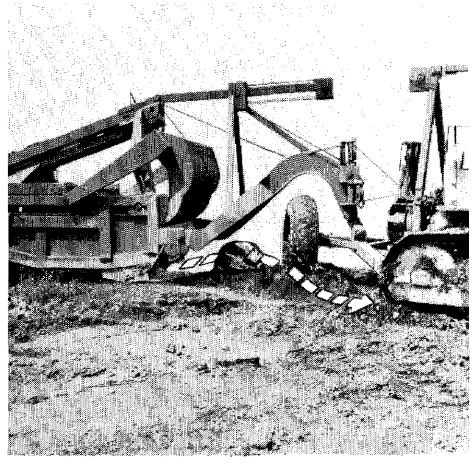
## Large Rocks and Stumps

Rocks and stumps that are too large for the tractor and Scraper to pass over can be loaded into the Scraper easily by proper handling of the Scraper as follows:

With the apron raised and the tailgate in the rear position, move forward with the tractor and Scraper, heading the tractor straight toward the rock or stump. Just before the tractor reaches the object, turn sharply either to the right or to the left, and start to move past the object along either side. When the front wheels of the Scraper have moved up alongside the object, turn the tractor sharply toward the rock or stump and at the same time lower the blade to the ground. By turning the Scraper in this manner, the front wheels will pass around the object but the blade will swing in behind it. At this point, turn the tractor back into its original direction of travel and, with the rock or stump between the front wheels and the blade, pull forward, loading the object into the bowl of the Scraper.

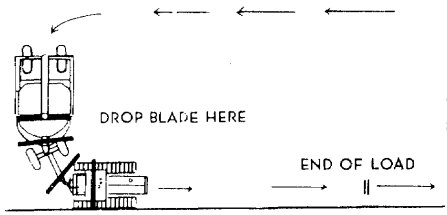
It is sometimes necessary to load a little dirt into the Scraper after the object is loaded in order to push the object far enough into the bowl to allow the apron to close.

To unload the rock or stump, use the regular unloading procedure. If, in unloading, a large rock should be tilted up inside the bowl so that it will not pass under the apron, it is necessary to return the tailgate to the rear to allow the rock to settle back to its flat position before pulling the tailgate ahead again. After the object has fallen out, turn the tractor and back up so that neither the front wheels nor the front axle structure will hit the object when pulling away.



## DOING SPECIAL JOBS

### Making Side Hill Cuts




In starting a side hill cut with a Carryall Scraper, approach the slope stakes from the lower side of the slope and at a right angle to the row of slope stakes. When the front of the tractor reaches the line of stakes, swing the tractor around parallel to the slope stakes and at the same time lower the Scraper blade into the ground. As the tractor moves forward, the Scraper will also turn parallel to the row of slope stakes and the side of the blade nearest the stakes will cut into the hill. By repeating this operation, there will soon be a level bank on which to start loading and loading can then be done in the conventional manner.

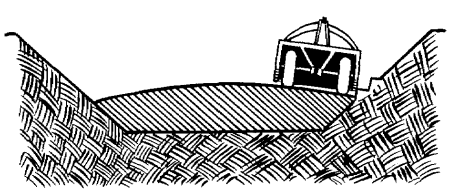
Always keep a side-hill cut low next to the bank and high on the outside. The result will be a neat, easily controlled slope with a minimum of finishing necessary.

To make the side of the cut slope down at the desired angle, follow the procedure of "stepping" in away from the bank or slope with each successive depth of cut, as is outlined in the following instructions for making through-hill cuts Also, if finishing the slope with a Scraper, perform the finishing operation as the work progresses as per the instructions on the following page.

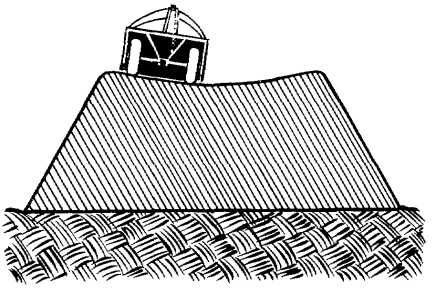
### Making Through-Hill Cuts

In making through-hill cuts, always keep the cut low next to the slopes or sides of the cut and high in the center. This will help maintain a better slope and also make the loads larger and more uniform.

Plan the work so that the sides of the cut slope down at the desired angle. This can be done by "stepping" in away from the bank or slope with each successive depth of cut, just enough to cause the slope to taper down at the desired angle. The slope can be finished by Carryall Scraper, or by other accepted methods of back-sloping. If finishing with a Scraper, the slope should be finished as the cut progresses, or, in other words, the newly cut part of the slope should be finished each time that the unfinished part reaches a width or height equal to or nearly equal to the width of the Scraper blade. (Refer to Finishing instructions on the following page.)



## Building A Fill



In building a fill, it is highly essential to keep the outside or shoulders of the fill higher than the center. This prevents the Scraper from sliding over the shoulder while dumping close to the edge and also helps make the sides of the fill slope at the correct angle as the fill is built up.

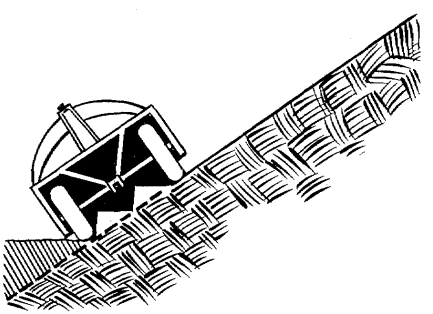
When the shoulders have reached grade level, the center can be filled quickly just before final leveling and finishing. Also, before closing down the job for the night or for any period of time, fill in the low center for better drainage in event it should rain.

## Finishing

Carryall Scrapers are often used for leveling or finishing airports roads, building sites, etc.

LEVEL GROUND—For preliminary finishing where it is necessary to skim off dirt in some spots and fill at others, the Scraper can be operated in somewhat the normal manner, picking up part of a load at one spot and spreading it at another. For final finishing, however, the tailgate should be brought forward to within approximately 8″ of its extreme forward position and the Scraper then used similar to a 'Dozer or grader. Keep the rear tires inflated to equal air pressures or the blade will cut low on one side.

SLOPES—Slopes that are not too steep can be finished with a Scraper without difficulty. For best results and greater safety, the slope should be finished as the work progresses. In other words, each time that the Scraper has cut the slope down far enough to cause the unfinished part of the slope to equal the approximate width of the Scraper blade, it should then be used to finish the unfinished part by running one tractor track and one side of the Scraper up onto the slope with the other track and wheels running along the bottom of the slope. Then, with the tailgate pulled forward to within approximately 8″ of its extreme front position the Scraper can travel along the side of the slope, skimming off the surplus dirt, thus finishing the slope as you go.



When finishing, do not attempt to load the bowl on a slope or the dirt will fall to the low side of the bowl, causing that side of the blade to cut deeper than the other and as a result dig a ditch in the slope.

# BOOSTING PRODUCTION

## Pusher Loading

Equipped with a pusher block on the rear, the Carryall Scraper can be pusher loaded by an Angledozer or Bulldozer in order to increase production.

By using a pusher tractor when loading, larger loads can be obtained and the loading time can be decreased. Also, because less effort is required by the pulling tractor, pusher loading lengthens tractor life.

The Scraper operator should load the Scraper in the normal manner when being assisted by a pusher tractor. It is highly important that he keep the tractor and Scraper moving in a straight line in order to prevent the unit from jack-knifing.

The pulling tractor should be operated at wide open throttle when loading. The speed of the pushing tractor should be synchronized with that of the pulling tractor so that it moves along with the Scraper, assisting in loading. If the motor of the pulling tractor should start to lug down, the pushing tractor should apply full power to prevent the pulling tractor from stalling.

The operator of the pusher tractor should ease the 'Dozer bowl up to the pusher block on the rear of the Scraper when making contact to start pushing.

Extreme care should be used to prevent the 'Dozer blade from contacting the rear tires of the Scraper and possibly cutting them. The pusher tractor should travel straight with the Scraper and pulling tractor to assist in keeping the unit travelling in a straight line.

## Using The Rooter

The loading efficiency of Carryall Scrapers in hard materials can be greatly increased by using a Rooter to break up the material.

Rooters can tear through such materials as decomposed shale, decomposed granite, tough clay, boulder strewn ground, black top, etc., all of which can be easily loaded into a Scraper if properly rooted.

Rooters are equipped with either three or five teeth as standard.

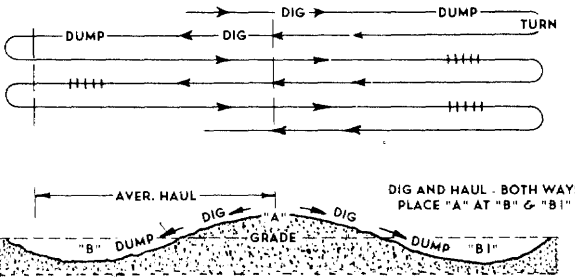
The fewer the teeth the deeper the penetration can be in tough ground and the larger the breakage will be; and vice-versa, with more teeth the shallower the penetration and the more pulverizing the action will be.

For the best Scraper loading the material should not be broken up too fine. Therefore, it is often advisable to remove one or more shanks from the Rooter to prevent fine breakage. This is dependent, of course, upon job conditions, type of material, etc.

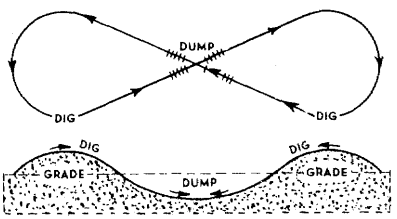
When rooting in a side-hill or through-hill cut, always root parallel with and close to the slope and work away from the slope. This allows the Scrapers to maintain proper slopes as the work progresses. Plan the work to avoid congestion and interference of the Scrapers with the Rooter.

## Eliminating Turns

Whenever possible, plan the work to eliminate all unnecessary turns. By so doing, an accumulated saving of turning time in the course of a day's work will result in several additional yards of material being moved.




Many jobs can be laid out so that there is a fill on each side of the cut or a cut on each side of the fill. With a job of this type, either a job lay-out of the type illustrated above or the figure 8 loading and hauling cycle can be used to great advantage.

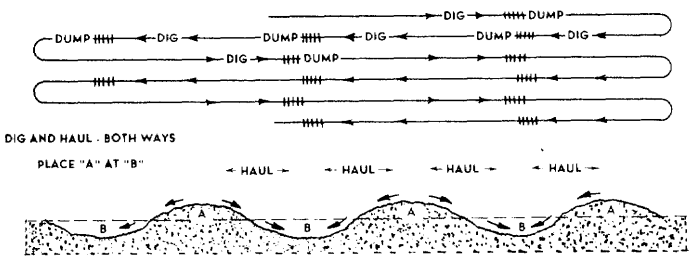



In the first example, load going down the hill and continue with the load to the fill. When unloaded, turn and come back to the hill and this time load going down the opposite side of the hill, continuing on to the second fill, etc., as diagrammed.

The figure 8 lay-out is very effective where there are two cuts on either side of the fill.

By using either method, only two turns are required while two full loads are delivered, whereas normally two turns are required for each load.

On jobs where there are a series of cuts and fills, a lay-out of the type illustrated below can be used.



## SAFETY PRECAUTIONS

As with all heavy equipment, reasonable precautions must be taken when working around the Carryall Scraper. Listed below are safety precautions which should be observed.

1. When changing blades or working underneath the Scraper, always block up under the bowl to prevent it from dropping in event someone should accidentally release the Power Control Unit hoist brake. Likewise, do not work under the apron when in the raised position without first placing blocks between the apron arms and Scraper sides to prevent the apron from dropping.

2. Do not work behind the tailgate when it is pulled forward without first blocking it in the forward position.

3. Keep the hands free from the cable and sheaves while the unit is in operation.

4. Use gloves when handling cable.

5. When traveling down a steep hill, always be ready to drop the blade to the ground to serve as a brake in event the Scraper should start to jack-knife or get out of control.

6. Do not leave Scraper with blade in raised position.

7. Do not use weak, frayed, cable.

8. When replacing springpipe cable or tailgate return springs, use care to avoid being injured in any manner by the springs, which have considerable pressure behind them when under compression.

## PREPARATION FOR INITIAL OPERATION

Thread the cable through the sheave housings.

Check all points of lubrication to determine if properly lubricated.

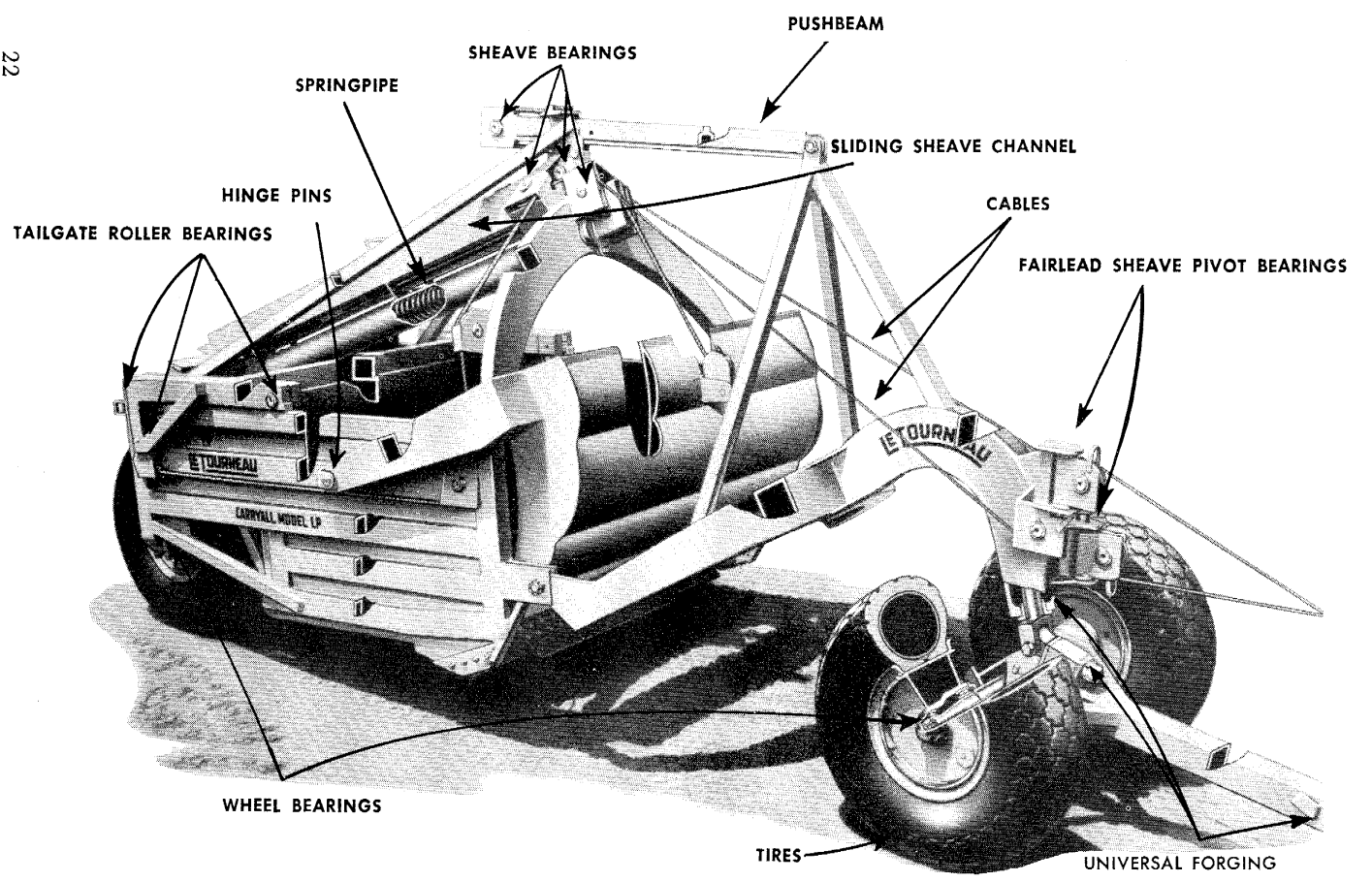
Check cable alignment to determine whether it is fouling at any point.

Check tire pressures.

Check universal forgings which connect yoke with tongue. Make sure they are installed with beveled edge to the front and heavy side down, as illustrated on page 29.

Raise and lower apron and also pull tailgate forward and allow it to return to the rear position, checking for free movement.

When the Scraper has been thoroughly checked and any necessary corrections made, it is ready to be placed in operation.




CUTAWAY VIEW OF MODEL LP CARRYALL SCRAPER

# TIRE INFLATION

Keep the tires correctly inflated at all times.

Check tire pressures every ten hours of operation if possible—never when tires are hot. "Bleeding" tires (reducing pressures to recommended levels when they are hot) is not recommended. If done, this would later result in under-inflation when tires cool off, which might be destructful.

## RECOMMENDED TIRE INFLATIONS

### Current Models

| | FRONT TIRES | | | | REAR TIRES | | | |
|---|---|---|---|---|---|---|---|---|
| Model | Quantity | Size | Ply | Inflation Lbs. | Quantity | Size | Ply | Inflation Lbs. |
| NU | 2 | 24x32 | 34 | 55 | 2 | 30x40 | 34 | 45 |
| RU (1) | 2 | 24x32 | 24 | 35 | 2 | 24x32 | 34 | 65 |
| (2) | 4 | 18x24 | 20 | 30 | 2 | 24x32 | 34 | 65 |
| (3) | 4 | 18x24 | 20 | 30 | 4 | 18x24 | 20 | 50 |
| FU (1) | 2 | 24x32 | 24 | 25 | 2 | 24x32 | 24 | 45 |
| (2) | 4 | 18x24 | 16 | 25 | 2 | 24x32 | 24 | 45 |
| (3) | 4 | 18x24 | 16 | 25 | 4 | 18x24 | 16 | 40 |
| (4) | 2 | 18x24 | 20 | 55 | 4 | 18x24 | 16 | 40 |
| LU (1) | 2 | 18x24 | 16 | 45 | 2 | 24x32 | 24 | 35 |
| (2) | 2 | 18x24 | 16 | 45 | 2 | 18x24 | 20 | 60 |
| (3) | 2 | 14x20 | 20 | 70 | 4 | 14x20 | 16 | 60 |
| N (1) | 2 | 24x32 | 24 | 35 | 2 | 24x32 | 34 | 65 |
| (2) | 4 | 18x24 | 20 | 30 | 2 | 24x32 | 34 | 65 |
| (3) | 4 | 18x24 | 20 | 30 | 4 | 18x24 | 20 | 55 |
| W (1) | 2 | 24x32 | 24 | 25 | 2 | 24x32 | 24 | 45 |
| (2) | 4 | 18x24 | 16 | 25 | 2 | 24x32 | 24 | 45 |
| (3) | 4 | 18x24 | 16 | 25 | 4 | 18x24 | 16 | 40 |
| FP (1) | 2 | 18x24 | 16 | 40 | 4 | 18x24 | 16 | 30 |
| (2) | 2 | 18x24 | 16 | 40 | 2 | 18x24 | 20 | 60 |
| (3) | 2 | 14x20 | 20 | 65 | 4 | 14x20 | 16 | 60 |
| LP (1) | 2 | 18x24 | 12 | 30 | 2 | 18x24 | 16 | 50 |
| (2) | 2 | 14x20 | 16 | 55 | 2 | 14x20 | 16 | 50 |
| LPO | 2 | 18x24 | 16 | 40 | 2 | 18x24 | 16 | 40 |
| LS (1) | 2 | 16x20 | 16 | 30 | 2 | 16x20 | 16 | 50 |
| (2) | 2 | 14x20 | 12 | 40 | 4 | 14x20 | 12 | 30 |
| (3) | 2 | 10x20 | 12 | 75 | 4 | 10x20 | 12 | 60 |
| M | 2 | 10x20 | 12 | 55 | 4 | 10x20 | 12 | 40 |
| G | 4 | 7.50x20 | 8 | 35 | 4 | 7.50x20 | 8 | 50 |
| X | 2 | 8.25x20 | 8 | 40 | 2 | 8.25x20 | 8 | 50 |
| Z | 2 | 8.25x20 | 6 | 35 | 2 | 8.25x20 | 6 | 45 |
| D | 2 | 8.25x20 | 8 | 40 | 2 | 8.25x20 | 8 | 50 |

(continued on next page)

## RECOMMENDED TIRE INFLATIONS — (Continued)

### Non-Current Models

| Model | FRONT TIRES | | | | REAR TIRES | | | |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Size | Ply | Inflation Lbs. | Quantity | Size | Ply | Inflation Lbs. |
| SU (1) | 2 | 18x24 | 16 | 40 | 2 | 18x40 | 20 | 50 |
| (2) | 2 | 18x24 | 16 | 40 | 2 | 18x24 | 20 | 40 |
| (3) | 2 | 14x20 | 16 | 55 | 4 | 14x20 | 16 | 55 |
| AU | 4 | 18x24 | 16 | 40 | 4 | 18x24 | 16 | 40 |
| U20 | 4 | 18x24 | 16 | 40 | 4 | 18x24 | 16 | 40 |
| U18 | 4 | 18x24 | 16 | 40 | 4 | 18x24 | 16 | 40 |
| U12 | 2 | 18x24 | 12 | 30 | 2 | 18x24 | 16 | 40 |
| BU | 2 | 18x24 | 12 | 30 | 2 | 18x24 | 16 | 40 |
| U9 | 2 | 14x20 | 10 | 35 | 4 | 14x20 | 10 | 35 |
| CU | 2 | 14x20 | 10 | 35 | 4 | 14x20 | 10 | 35 |
| U6 | 2 | 14x20 | 10 | 35 | 2 | 14x20 | 10 | 35 |
| DU | 2 | 14x20 | 10 | 35 | 2 | 14x20 | 10 | 35 |
| E (1) | 2 | 18x24 | 16 | 40 | 4 | 18x24 | 12 | 30 |
| (2) | 2 | 18x24 | 16 | 40 | 2 | 18x24 | 16 | 40 |
| F (1) | 2 | 18x24 | 12 | 30 | 4 | 18x24 | 12 | 30 |
| (2) | 2 | 18x24 | 12 | 30 | 2 | 18x24 | 16 | 40 |
| (3) | 2 | 14x20 | 16 | 55 | 4 | 14x20 | 16 | 55 |
| YR13 (1) | 2 | 18x24 | 12 | 30 | 2 | 18x24 | 16 | 40 |
| (2) | 2 | 14x20 | 16 | 55 | 4 | 14x20 | 16 | 55 |
| P (1) | 2 | 18x24 | 12 | 30 | 2 | 18x24 | 16 | 40 |
| (2) | 2 | 14x20 | 16 | 55 | 4 | 14x20 | 16 | 55 |
| YR12 (1) | 2 | 18x24 | 12 | 30 | 2 | 18x24 | 16 | 40 |
| (2) | 2 | 14x20 | 16 | 55 | 4 | 14x20 | 16 | 55 |
| B | 2 | 14x20 | 12 | 45 | 4 | 14x20 | 12 | 45 |
| K (1) | 2 | 18x24 | 12 | 30 | 4 | 18x24 | 12 | 30 |
| (2) | 2 | 18x24 | 12 | 30 | 2 | 18x24 | 16 | 40 |
| (3) | 2 | 14x20 | 16 | 55 | 4 | 14x20 | 16 | 55 |
| Y (1) | 2 | 18x24 | 12 | 30 | 2 | 18x24 | 16 | 40 |
| (2) | 2 | 14x20 | 16 | 55 | 4 | 14x20 | 16 | 55 |
| J12 | 2 | 14x20 | 16 | 55 | 4 | 14x20 | 16 | 55 |
| L | 2 | 10x20 | 12 | 60 | 4 | 10x20 | 12 | 60 |
| J8 | 2 | 10x20 | 12 | 60 | 4 | 10x20 | 12 | 60 |
| JR8 | 2 | 10x20 | 12 | 60 | 4 | 10x20 | 12 | 60 |
| J6 | 2 | 10x20 | 12 | 60 | 4 | 10x20 | 12 | 60 |
| JR6 | 2 | 10x20 | 12 | 60 | 4 | 10x20 | 12 | 60 |

## CARE AND MAINTENANCE OF TIRES

Maintenance of roads and patrolling to throw off large boulders, etc., pay big dividends in production and in tire conservation.

Where Scrapers are working in scarified or blasted material, avoid striking sharp stones with front tires, and depend on the Scraper blade and bowl to protect the back tires.

Where a grader is not patrolling regularly, occasionally drop the Scraper blade and drag the road on the return trip, as the road becomes littered with sharp stones and spillage from the Scraper.

Repair at once any deep injuries which penetrate to the cord body of the tire, allowing dirt and water to enter. Single small cuts which do not gap or bulge, but leave only a hair line opening, will cause no damage. However, when a cut shows any sign of a gap or bulge, it should be repaired.

Knock out rocks or wood from between dual tires, as they cause failures that seldom are repairable.

Keep oil off tires as much as possible. Oil causes very rapid deterioration.

When pusher loading Scrapers with a Bulldozer or Angledozer, don't allow 'dozer blade to gouge rear tires.

## LUBRICATION

### Sheave Bearings

The roller bearings in the sheave wheels receive lubrication through the grease fittings in the ends of the sheave pins. Insert one or two shots of the recommended grease through the grease fittings every 10 hours of operation, using a pressure grease gun. This will force out a small amount of grease at the sheave hub, removing any dirt or grit that may have worked in at this point.

Use heavy Chassis grease in temperatures above +32°F. and medium Chassis grease in temperatures below +32°F.

### Fairlead Sheave Housing Bearings

The tapered roller bearings at the top and bottom of the fairlead sheaves on which the sheave housings pivot receive lubrication through the grease fittings located at the upper and lower ends of the housings.

Lubricate every 10 hours of operation, using the same grease and the same procedure as is recommended for sheave bearings.

### Tailgate Roller Bearings

The bearings in the tailgate rollers receive lubrication through the grease fittings in the ends of the roller pins.

Lubricate every 10 hours of operation, using the same procedure as is recommended for sheave bearings.

### Spiral Sheave Wheel Bearings

The bearings in the spiral sheave wheel at the rear of the Scraper receive lubrication through the grease fitting on the side of the spiral wheel.

Lubricate every 10 hours of operation, using the same grease and the same procedure as is recommended for sheave bearings.

### Wheel Bearings

The wheel bearings receive lubrication through the grease fittings located on the wheel hub caps. Lubricate the wheel bearings every 60 hours with grease gun, or hand pack every 600 hours.

Use medium weight wheel bearing grease.

## Universal Forgings

The universal forgings at the front and rear of the tongue and in the bottom of the yoke receive lubrication through the grease fittings in the side of the tongue and yoke.

Lubricate every 10 hours of operation, using a conventional pressure grease gun. Pump one or two shots of grease through the fittings, forcing out a small amount of grease at the bushings in which the forgings pivot, removing any dirt or grit that may have worked in at this point.

Use the same grease as is used in the sheave bearings.

## Hinge Pins

Hinge pins requiring lubrication are lubricated through the grease fittings in the ends of the pins.

Lubricate every 10 hours of operation, using the same procedure as is recommended for sheave bearings.

## Springpipe Lubrication

Lubricate the inside of the spring pipe every 300 hours of operation.

To lubricate the spring pipe, remove the cover plate from the upper end of the pipe and pour in approximately one quart of S.A.E. #140 gear oil so that it will work down the lower side of the pipe where the springs are moving back and forth.

## Pushbeam and Sheave Channel Lubrication

Apply medium weight Chassis grease whenever needed to the sides of the pushbeam and also to the sheave channel above the spring pipe in which the apron and tailgate sheaves slide. There should be some grease at these points at all times.

## Cable Lubrication

Coat the cable (wire rope) sparingly with cable dressing at infrequent intervals to serve as a rust preventive. If the Power Control unit that is used to operate the Scraper is equipped with woven clutch and brake facings, do not coat that portion of the cable which wraps onto the cable drums, because of the danger of oil getting on the facings and causing clutch and brake slippage.

The cable should not be lubricated in extreme dusty conditions, due to the abrasive action of the dirt that would collect on the cable.

## CABLE

Carryall Scrapers are designed for use with Tournarope or other high quality wire rope.

Always use only recommended size cable, otherwise frequent cable breakage or damage to the equipment will result.

Illustrated is a self-explanatory cable chart for each model Scraper, giving size and lengths needed. *A cable threading diagram will be found in the Parts Catalog for each of the different model Scrapers.*

### CABLE SPECIFICATIONS

| MODEL | Hoist | Dump | Standard Reel size for dump | Apron Lift | Spiral Sheave to Tailgate | Tailgate Forward | Spring-pipe | Pushbeam to sliding Sheave |
|---|---|---|---|---|---|---|---|---|
| AU (U18, U20) | 165 | 175 | *300 | | 18 (5/8) | | 29 (5/8) | |
| B12 | 65 | 115 | | | | | | |
| BU (U12) | 150 | 125 | *300 | | 18 (5/8) | | 21 (5/8) | |
| CU (U9) | 110 | 115 | *300 | | 18 (5/8) | | 21 (5/8) | |
| D | 65 | 95 | *300 | 8 1/2 | | 8 | 9 1/2 | |
| DU (U6) | 90 | 55 | *300 | | 18 (5/8) | | 16 (5/8) | |
| E (YR15) | 165 | 195 | *300 | | 18 (5/8) | | 23 (5/8) | |
| E (YR15) (c) | 165 | 185 | *300 | 17 (3/4) | 20 (5/8) | | 20 (5/8) | |
| F (YR13) | 165 | 185 | *300 | | 18 (5/8) | | 21 (5/8) | |
| F (YR13) | 165 | 185 | *300 | 15 1/2(3/4) | 18 (5/8) | | 21 (5/8) | |
| FP | 125 | 130 | *300 | 14 (7/8) | 13 1/2(5/8) | 51 (7/8) | 17 (5/8) | |
| FU | 95 | 135 | *300 | 14 1/2(3/4) | 21 (5/8) | 52 (7/8) | 23 (5/8) | 17 (3/4) |
| FU (d) | 140 | 140 | *300 | 16 (7/8) | 21 (5/8) | 52 (7/8) | 24 (7/8) | |
| G (G6) | 70 | 65 | | | 8 1/2 | | 16 | |
| G (G6) (b) | 70 | 65 | | | | | 16 | |
| H8 | 65 | 95 | | | | | | |
| J6 | 65 | 100 | | | 15 | | | |
| J8 | 65 | 106 | *300 | | 16 | | | |
| J12 | 100 | 140 | *300 | | 18 | | | |
| J13 | 115 | 150 | *300 | | 18 | | | |
| JR12 | 100 | 140 | *300 | | 13 | | 19 | |
| JR13 | 100 | 150 | *300 | | 14 | | 20 | |
| K(YR12) | 165 | 185 | *300 | | 12 | | 19 | |
| L (JR8) | 65 | 116 | *300 | | 10 1/2 | | 15 | |
| LP | 95 | 126 | *300 | 14 1/2(3/4) | 13 1/2(5/8) | 51 (7/8) | 17 (5/8) | 18 (3/4) |
| LP (d) | 125 | 126 | *300 | 14 1/2(7/8) | 13 1/2(5/8) | 51 (7/8) | 17 (5/8) | |
| LPO | 100 | 160 | *300 | | | | | |
| LS | 85 | 126 | *300 | 11 1/2(5/8) | 11 | 37 (5/8) | 15 | |
| LU | 95 | 135 | *300 | 14 1/2(3/4) | 21 (5/8) | 52 (7/8) | 23 (5/8) | 17 (3/4) |
| LU (d) | 140 | 135 | *300 | 14 1/2(7/8) | 21 (5/8) | 52 (7/8) | 23 (5/8) | |
| M (JR6) | 65 | 100 | *300 | | 10 1/2 | | 15 | |
| N | 245 | 265 | *500 | 15 (7/8) | 25 (5/8) | | 30 (5/8) | |
| NP | 200 | 265 | *500 | 16 (7/8) | 20 (5/8) | | 25 (5/8) | |
| NU | 245 | 315 | *500 | 15 (7/8) | 20 (5/8) | | 35 (5/8) | |
| P | 120 | 185 | *300 | | 20 (5/8) | | 25 (5/8) | |
| Q | 35(3/8) | | | | | 49 (3/8) | | |
| R5 | 55 | | | | | | | |
| RU | 165 | 240 | *500 | | 21 (5/8) | | 32 (5/8) | |
| RU (c) | 165 | 245 | *500 | 17 (3/4) | 20 (5/8) | | 29 (5/8) | |

(Continued on next page)

## CABLE SPECIFICATIONS — Continued

| MODEL | Hoist | Dump | Standard Reel size for dump | Apron Lift | Spiral Sheave to Tailgate | Tailgate Forward | Spring-pipe | Pushbeam to sliding Sheave |
|---|---|---|---|---|---|---|---|---|
| S | 120 | 160 | *300 | | 13 (⅝) | | 25 (⅝) | |
| SU | 120 | 215 | *300 | | 18 (⅝) | | 25 (⅝) | |
| W | 165 | 220 | *500 | | 20 (⅝) | | 26 (⅝) | |
| W (c) | 165 | 220 | *500 | 13 (¾) | 20 (⅝) | | 25 (⅝) | |
| X4 | 60 | 50 | | | 8½ | | 14 | |
| X4 (b) | 60 | 50 | | | | | 15 | |
| Y12 | 115 | 140 | *300 | | 17 | | | |
| Y13 | 115 | 150 | *300 | | 17 | | | |
| Z4 | 60 | 50 | | | 8½ | | 14 | |
| Z4 (b) | 60 | 50 | | | | | 15 | |

NOTE: All Scrapers use ½"x6x19 TOURNAROPE unless otherwise specified.

(a)..... (⅝) is ⅝" TOURNAROPE

(b)—Spiral Sheave is not used on this Model.....(¾) is ¾" TOURNAROPE

(c)—Single Line Apron Cable—Sliding Sheave on Spring Pipe.....(⅞) is ⅞" TOURNAROPE

(d)—Multiple Sheave Pushbeam. (Early Models had Single Sheave Pushbeam with Sliding Sheave)

*—Furnished with machine as standard for Dump Cable. Suggest order same length reels for replacement.

**—Also uses 12½' (⅞") TOURNAROPE for safety cable.

## CARE OF CABLE

Proper care and treatment of cable is very important and will pay big dividends in the way of longer cable life. Listed below are a few helpful suggestions along this line.

(1) Use the recommended sizes of cable, as the design of the sheave wheels vary somewhat for cables having different diameters.

(2) Check cable every 10 hours of operation for excessive wear, kinks, etc., which might result in cable breakage or failure.

The dump cable normally wears faster than the other cables. To obtain maximum life from this cable, it is necessary to occasionally cut off the end of the cable that wraps onto the cable drum and to feed through enough cable from the spare cable reel to replace that which was cut off. If in checking the cable at the above interval, it is found that the part that wraps onto the cable drum has become frayed with possibly one or more of the six main strands broken, it is then necessary to cut off the bad portion back to the point where the cable is not damaged.

Due to difference in operators, job conditions, etc., the time intervals at which this cable must be cut off varies considerably.

(3) When installing new cables on the Power Control Unit cable drums, make sure the cables reeve evenly onto the drum. Do not permit the cable to criss-cross or stack up on the drum.

(4) Replace sheave wheels having badly worn cable grooves, especially those having a rope lay impression worn into them.

(5) Always make sure that the sheave wheels and tailgate rollers are turning and that none are broken, because if either of these are not functioning properly, the cable will wear extremely fast.

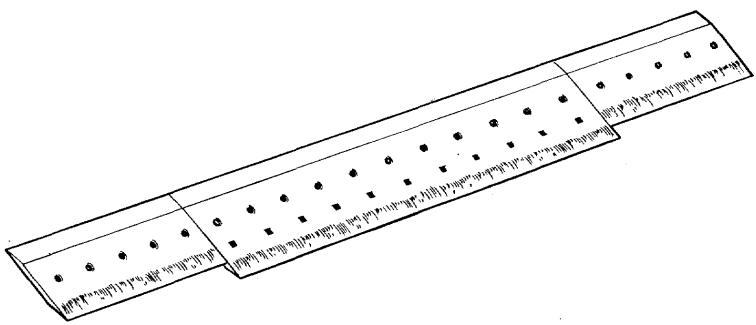
(6) Do not cause cable to become kinked by allowing an excessive amount of slack in the cables.

(7) Unless operating in dusty conditions, lubricating the cable will normally add to cable life. Apply cable dressing when needed.

## BLADES

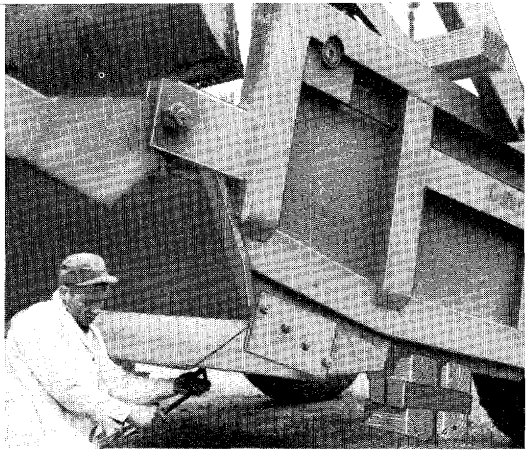
The current model Scrapers are usually equipped with three piece, reversible, hard faced, off-set blades.

The off-set center section makes possible easier and faster loading. The hard-facing gives the blade self sharpening qualities. The blade properly mounted, with the hard face on top, allows the softer bottom to wear more rapidly keeping the blade sharp.



By being hard-faced along both edges, the blades are reversible. Therefore, when a blade has become worn along one edge, it can be reversed rather than replaced, and the blades will therefore last approximately twice as long as blades that are non-reversible.

In addition to the three piece off-set blade on current models, some Scrapers are equipped with one piece straight blades. The off-set blades are also replaceable with straight blades for finishing with the Scraper. Although finishing can be done with the off-set blade, the straight blade will do a more efficient job. These blades are hard-faced and reversible.





## CHANGING BLADES

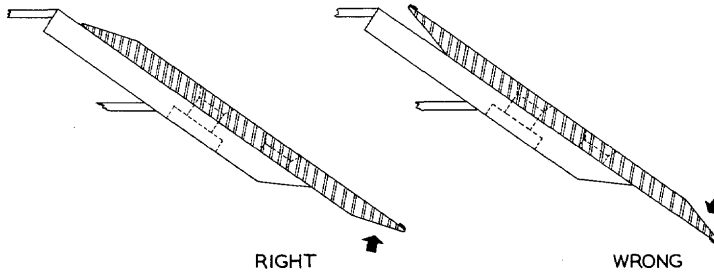
The Scraper blades should be changed before they wear back into the blade base. When worn back to the point where they should be changed, the procedure below should be followed.

Hoist the Scraper bowl to its full height and place blocks under the bowl to prevent it from dropping in case some one should accidentally release the power control unit hoist brake. The apron should likewise be raised to its full height and blocks placed between the apron arms and side sheets to keep it from dropping in case the brake on the dump cable is accidentally released. Then, using the blade wrench, remove the bolts that secure the blades to the blade base. If the blades have not already been reversed, they can be used again by turning them over and wearing them along the other edge. If reversing the end blades, it is necessary not only to turn them over but also to move them from one side of the Scraper to the other.

After laying the blades in place, the use of a round drift punch will be very helpful in lining up the holes. Re-install the blade bolts, tightening them down evenly and making sure they are all tight.

When installing new blades instead of reversing worn ones, the same procedure as outlined above should be used.

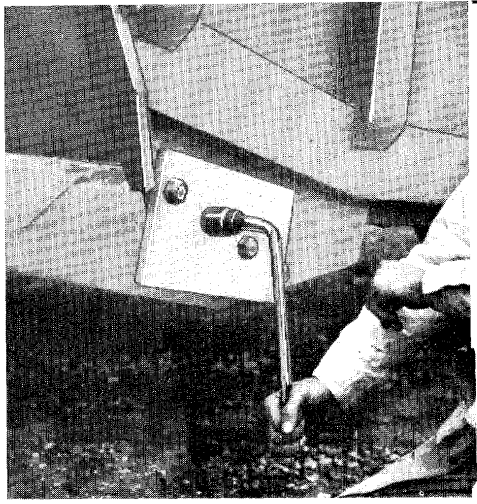
When installing blades, make sure that they are turned with the beveled edges positioned as illustrated.




## CHANGING GROUND PLATES

The Scraper ground plates should be changed before they wear back into the base to which they are bolted. When they have worn to the point where it is necessary to change them, the procedure outlined below should be followed.

First, block the apron arms and bowl in the raised position as when changing blades.



Remove bolts which secure ground plates to Scraper side sheets. If the ground plates have not already been reversed, they can be used again by turning them over and wearing them along the other edge.

If reversing a ground plate, turn it over and end for end. After reversing, insert the bolts and draw them up tight.

Use the same procedure when installing new ground plates.

On Scrapers that have the ground plates welded on, it will be necessary to cut off the old plate and weld on the new one. Due to this fact, replacing these plates is usually taken care of by the mechanic or maintenance man.

## OPERATION UNDER DUSTY, MUDDY, LOW TEMPERATURE AND OTHER ABNORMAL CONDITIONS

When operating in extreme dusty conditions, it is very important that the Scraper be thoroughly lubricated at the specified intervals. (Refer to lubrication instructions.) Unless this is done, fine particles of dirt and grit will work into the bearings and working parts of the Scraper. By lubricating regularly, the dust and dirt that accumulates around the bearings is forced out and away from the bearings by the new grease.

Watering or oiling haul roads is often resorted to in order to keep the dust down.

When working in muddy conditions, it is important that the mud be kept out of the sheaves. In some muddy conditions, it may be necessary to stop the Scraper once or twice a shift and clean the mud out of the Scraper bowl, as the mud will gather on the bottom and sides of the bowl, making it hard for the tailgate to come fully ahead, and in some cases breaking the cable.

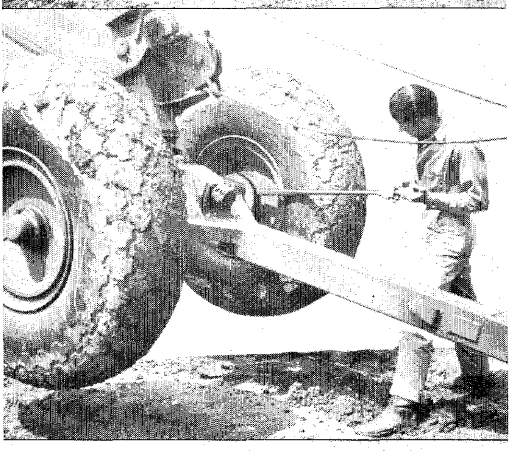
For instructions for loading and unloading in wet, sticky material, refer to page 14.

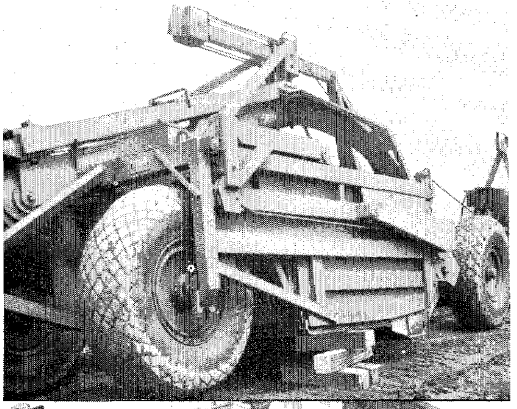
When operating in cold weather, the use of a Rooter may be necessary in order to break up the frozen top soil ahead of the Scraper.

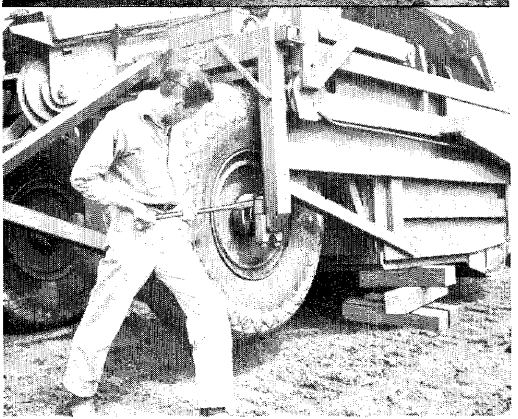
Use lighter greases when operating in cold temperatures than those used when operating in warm temperatures. Refer to lubrication instructions.)

Be sure there is no dirt left in the bowl at the end of the shift in cold weather, as it will be frozen tight by morning, and it would then be necessary to thaw it out before the load could be ejected. When shutting down for the night, lower the bowl onto planks rather than onto the ground to prevent the Scraper bottom from freezing tight to the ground.

LOWER BOWL AND BACK UP TO RAISE FRONT WHEELS









# ADJUSTMENTS

## WHEEL BEARING ADJUSTMENT

### Checking Adjustment

Check the wheel bearings for looseness every 60 hours of operation.

FRONT WHEELS—To check the front wheel bearings, first raise the wheels off the ground. To do this, load the Scraper bowl and lower the blade to the ground. Release the brake from the Power Control Unit hoist drum and then back up slowly, thereby raising the front wheels off the ground. When the wheels are raised to the desired height, lock the tractor brake to hold the wheels in this position.

Insert a pry bar between the wheel and axle housing. Pry back and forth with the bar, noticing any movement of the wheel on the axle. If there is perceptible movement, the bearings are loose and an adjustment should be made as outlined on the following page.

REAR WHEELS—To check the rear wheel bearings, first raise the wheels off the ground. To raise either wheel, raise the bowl and place a block under the bowl just back of the balance point. Then lower the Scraper bowl. This will tip the front of the Scraper forward, raising the rear wheel.

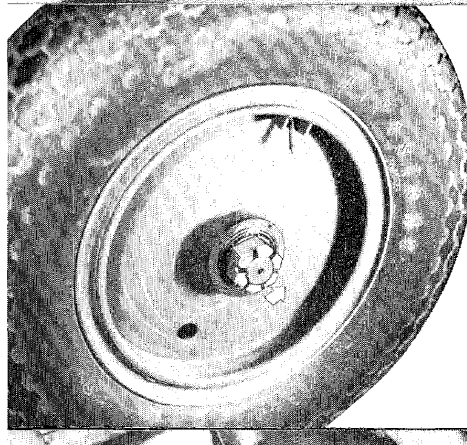
Insert a pry bar between the wheel and body structure. Pry back and forth with the bar, noticing any movement of the wheel on the axle. If there is perceptible movement, the bearings are loose and an adjustment should be made, as outlined on the following page.

## Making Adjustment

FRONT WHEELS—To adjust the front wheel bearings, first remove hub cap by removing capscrews.

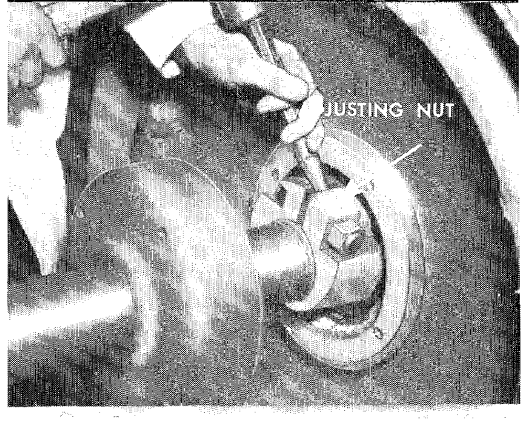

Remove cotter pin from end of axle and loosen the adjusting nut clamp bolt.

Start the wheel rotating slowly. While rotating, turn adjusting nut in a clockwise direction until wheel binds heavily. Then relieve binding by backing off adjusting nut ⅛ turn minimum and not more than ¼ turn. Lock adjustment by re-inserting cotter pin and tightening adjusting nut clamp bolt. Check adjustment by rotating wheel, making certain that it is free rolling without perceptive end play. If adjustment is correct, reinstall hub cap.



REAR WHEELS—Each rear wheel is equipped with two adjusting nuts, one on each side of the wheel. However, only one of these adjusting nuts needs to be tightened in making the adjustment, and since the adjusting nut on the inner side of the wheel is easier to reach, it is normally used.

To make the adjustment, follow the same procedure as is used for front wheel bearings. The only difference is that no cotter pins are used in the adjusting nuts in the rear wheels.

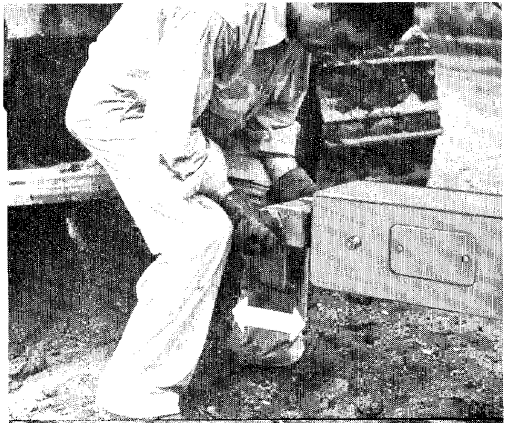


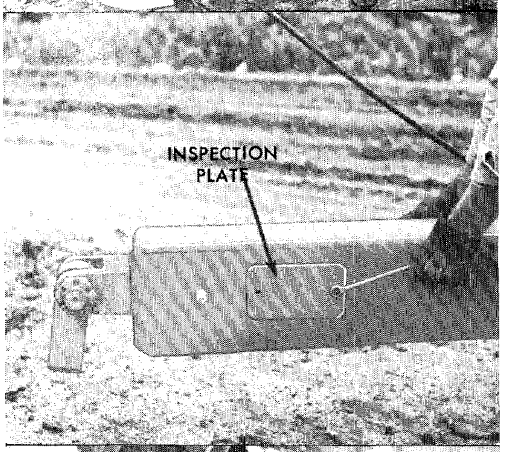
## UNIVERSAL FORGING ADJUSTMENT

Check the three universal forgings for end-play every 60 hours of operation.

The procedures for checking and making the adjustment on each of the forgings are as follows:

DRAWBAR UNIVERSAL FORGING — If Scraper is disconnected from tractor, check end play by moving forging back and forth by hand. If Scraper is hitched to tractor, drive tractor forward and backward while watching forging for end movement. If end movement is found, an adjustment should be made.






To make adjustment, first remove inspection plate from side of tongue by removing capscrews. (Tongue disconnected from tractor and supported off the ground by a jack or block.)

Remove cotter pin from end of forging and loosen adjusting nut clamp bolts.

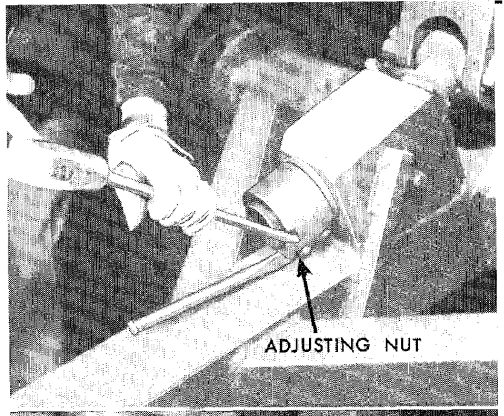
Insert a chisel in slot in adjusting nut to keep nut from turning. Then insert a bar through hitch block and turn forging in a clockwise direction until all end play has been eliminated with forging still left free to turn. Lock the adjustment by reinstalling cotter pin and tightening adjusting nut clamp bolts. Then reinstall inspection plate.

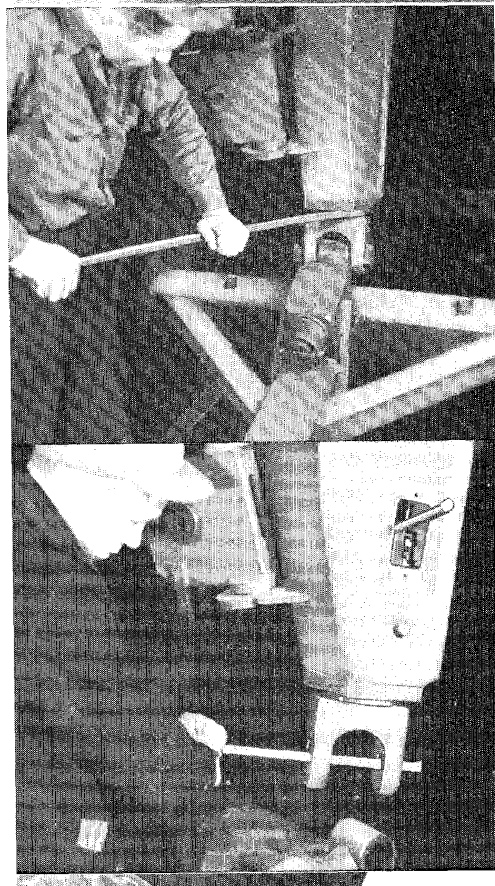
AXLE UNIVERSAL FORGING —Check universal forging on top of front axle structure for end play by driving tractor forward and backward while watching forging for end movement in housing. If end movement is found, an adjustment should be made. To make adjustment, remove cotter pin and loosen adjusting nut clamp bolts. Then turn adjusting nut clockwise until all end play has been eliminated with forging still left free to turn. Lock adjustment by re-inserting cotter pin and tightening adjusting nut clamp bolts.

YOKE UNIVERSAL FORGING —To check yoke universal forging for looseness, first lower Scraper blade to ground and then insert a pry bar between forging and bottom of yoke and pry up and down with pry bar. If noticeable end movement of forging is found, an adjustment should be made.

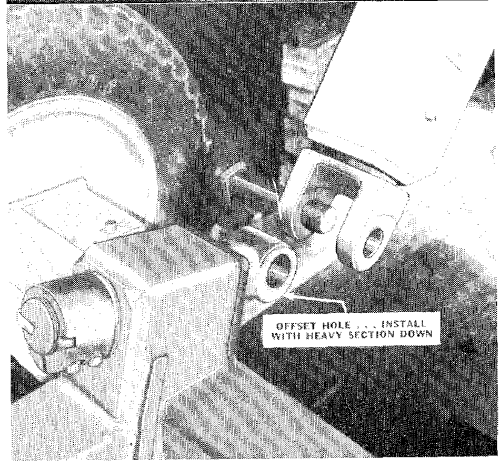
To make adjustment, first remove bolt connecting axle universal forging with yoke universal forging. In doing this, it is first necessary to wrap a hoist chain around top of yoke and raise yoke only enough to relieve bolt of weight. Then remove bolt and hoist yoke, enough to raise yoke forging free from axle forging, and then make the adjustment, eliminating all end play but leaving forging free to turn, using the same procedure as is used for adjusting drawbar universal forging described on opposite page.

After adjustment has been completed, lower the yoke and re-insert the bolt connecting the axle forging and yoke forging. IMPORTANT—In installing the bolt, make certain thick side of axle forging is on bottom and that beveled side of yoke forging faces the front. Otherwise the forgings may bind when traveling across ditches or at other times when axle structure and yoke are at extreme angles, possibly resulting in damage to forgings, tongue or yoke.

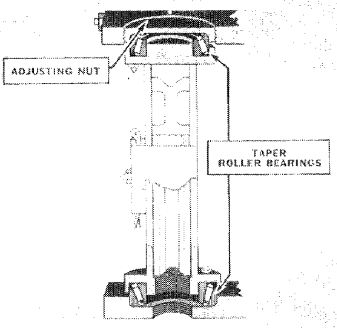


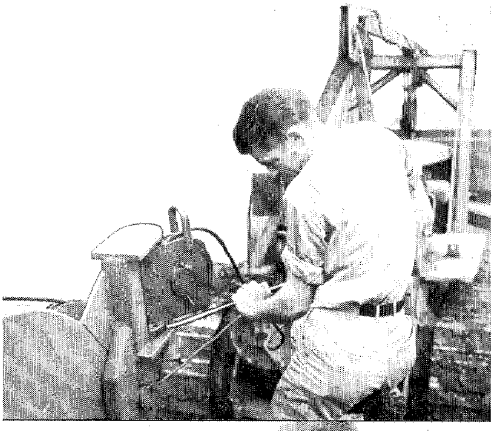




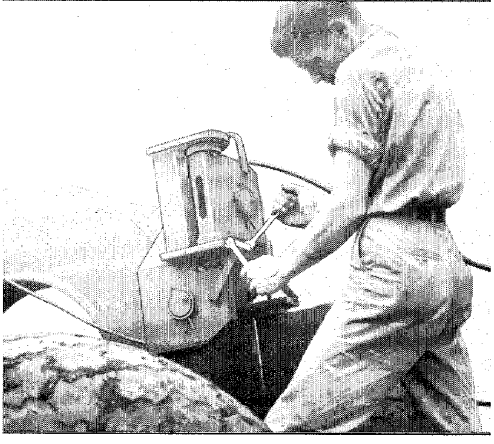
# FAIRLEAD SHEAVE HOUSING BEARING ADJUSTMENT



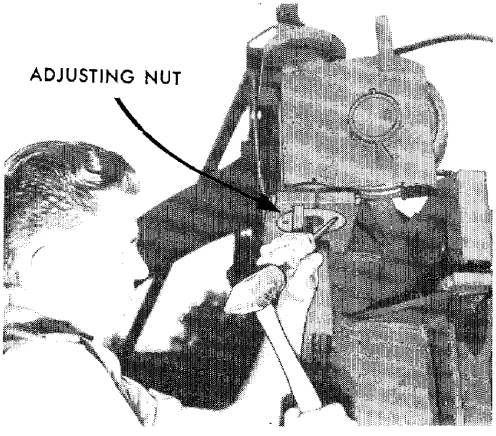

Check the fairlead housing bearing for looseness every 120 hours of operation.



To check the adjustment, insert a pry bar between the bottom of the sheave housing and the bracket in which it is held. Then, by prying up and down with the bar, detect any end movement of the housing in the bracket. If end movement is noticeable, an adjustment should be made.



To make the adjustment, first loosen the clamp bolt from the sheave bracket.




Turn the adjusting nut at the upper end of the housing in a clockwise direction until all up and down movement of the sheave housing in the bracket is eliminated and until a slight drag is felt when turning the sheave housing to either side by hand. Lock the adjustment by tightening the clamp bolt.

## REMOVING AND INSTALLING TIRES

To remove the rear tires, it is necessary that the wheels and axles first be removed from the Scraper. To remove the front tires, it is not absolutely necessary that the wheels first be removed. However, due to the large size and weight of the tires, it is usually advisable to also remove the front wheels before changing the tires.

To remove a tire, first let all the air out of the tire. Insert a small pry bar in the slot in the locking ring. Then, while prying up on the locking ring, use a sledge hammer to drive the sliding ring toward the center of the rim. This will release the locking ring, and both the locking ring and sliding ring can then be removed from the wheel.

If available, place a round valve cap on the valve stem. Push the valve stem through the rim, into the tire. Then insert a bar between the tire and the retainer ring on the side of the tire opposite the locking ring, and pry the tire off the wheel.

Before re-installing a tire on the wheel inspect the wheel rim for rust. If rust is present, remove the rust with a wire brush and if time permits, paint the rim and allow it to dry.

To install a tire, reverse the procedure described above for removing a tire. Be careful not to pinch the inner tube with the bar. Insert only enough air in the inner tube to hold it in place. Be sure the valve stem is in the center of the hole in the rim before installing the sliding ring and locking ring. Then install the sliding ring and locking ring and inflate the tires to the correct pressures. (Refer to tire inflation instructions on page 23.)


# CARE OF SCRAPER

The instructions on the pages which follow give complete information needed for correctly servicing and repairing the Carryall Scraper. It has been prepared to be of assistance to Maintenance and Repair men in keeping the Scraper running and in good condition.

## CARE OF SCRAPER

Time spent on inspection and care of the Scraper will be many times repaid in long life and trouble-free operation.

The Scraper should be serviced as specified below at the intervals shown:

ONCE EVERY 10 HOURS

Lubricate sheave bearings.
Lubricate fairlead sheave pivot bearings.
Lubricate spiral sheave wheel bearings.
Lubricate tailgate roller bearings.
Lubricate hinge pins.
Lubricate universal forgings.
Check tire pressure.
Check cables.

ONCE EVERY 60 HOURS

Lubricate universal forging.
Check wheel bearing adjustment.
Check universal forging adjustment.

ONCE EVERY 120 HOURS

Check fairlead sheave bearing adjustment.

ONCE EVERY 300 HOURS

Lubricate springpipe.

ONCE EVERY 600 HOURS

Lubricate (handpack) wheel bearings, or pressure lubricate every 60 hours.

WHEN NEEDED

Lubricate cable.
Lubricate Pushbeam and Sliding Sheave Channels.

## LUBRICATION

For lubrication instructions, refer to page 25

## TIRE INFLATION

Refer to instructions on page 23

## CHANGING BLADES

Refer to instructions on page 30

## CHANGING GROUND PLATES

Refer to instructions on page 30

## CABLE THREADING

Refer to instructions on page 27

## POWER CONTROL UNIT MAINTENANCE

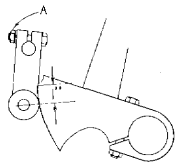
The successful operation of the Power Control Unit is more dependent upon proper adjustment than any one other thing. If properly adjusted, the Unit should give trouble-free operation. However, if not in correct adjustment, difficulty in its operation may result.

The clutch adjustments, brake adjustments, and brake shaft bearing adjustments can be made without disassembling the unit, and can therefore be taken care of by the operator (refer to instructions which follow). The cable drum bearing adjustments, main gear bearing adjustments, and pinion bearing adjustment require partial disassembly of the unit, and are therefore usually taken care of by maintenance and repair men. The double-deck sheave bearing adjustments are also usually taken care of by maintenance and repair men. (For complete instructions on Power Control Units, refer to Power Control Unit Repair Manuals.)

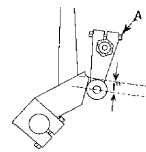
## BRAKE ADJUSTMENT

Occasional adjusting of the Power Control Unit brakes is necessary because of brake lining wear.

Check brake adjustment every 10 hours of operation. To check adjustment, follow the instructions below:




"T" SERIES




"R" SERIES

### HOW TO CHECK ADJUSTMENT

With the control lever in neutral position, check the position of the brake roller against the brake cam.

The accompanying drawings illustrate the correct relative positions of the Model "R" and "T" brake rollers against the cams when the control lever is in neutral position (with slack in cable).

If the position of the rollers against the cams is not approximately as illustrated, an adjustment should be made.

### IF ADJUSTMENT IS INCORRECT

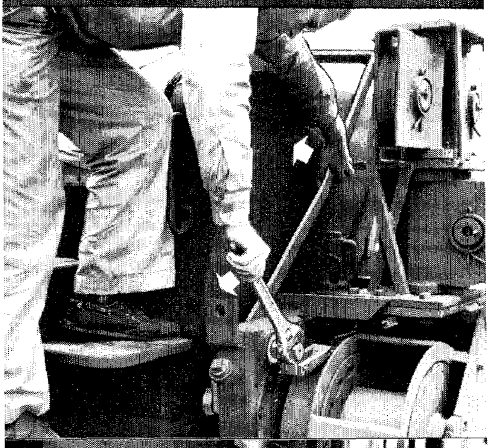
If the unit should be operated with the brake roller not correctly positioned against the brake cam (refer to illustrations above) the action of the brake cam against the roller will be affected and may cause the brake to not properly release.

Also, the tension of the brake spring will be affected, possibly resulting either in brake slippage or in more effort being required to disengage the brake than should be necessary.

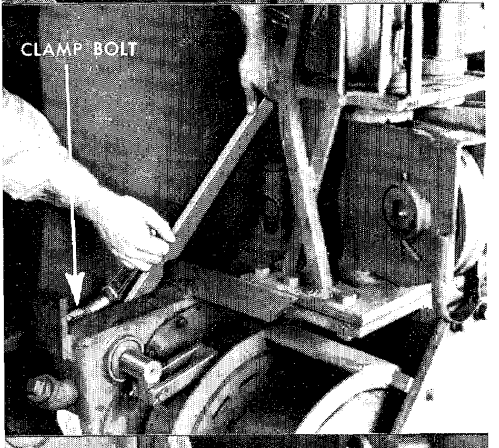
## HOW TO MAKE BRAKE ADJUSTMENTS

1. Loosen clamp bolt at upper end of brake roller arm. (The use of two wrenches may be necessary to prevent bolt from turning with nut.)

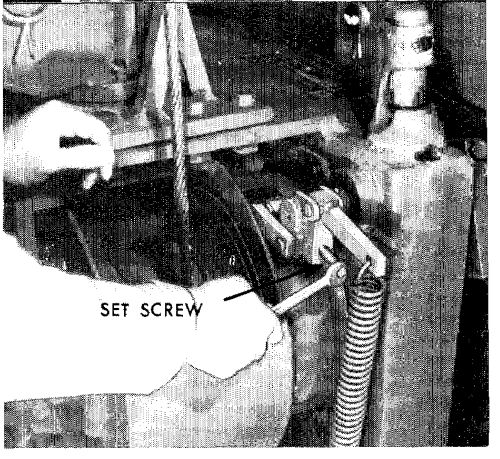

2. On the Model R units, place a wrench on rear end of brake shaft as illustrated and move wrench away from center of unit, using force, tightening brake band on drum. Move the control lever and cam against the roller as required on either unit to bring the brake roller into the correct position against the brake cam. (Refer to illustrations on preceeding page.)



3. With brake roller correctly positioned against brake cam, hold the control lever and tighten clamp bolt at upper end of brake roller arm. Give bolt final tightening by using two wrenches as in one.




4. To increase the brake spring tension on the Model T units, turn the set screw on the brake arm in a clockwise direction. To decrease the spring tension, turn the set screw counter-clockwise. The brake spring should be adjusted only tight enough to prevent the brake from slipping when under load.



## BRAKE SHAFT BEARING ADJUSTMENT

Since the brake shafts rotate only a part of a turn during operation, there is very little wear on the bearings. Therefore, the adjustment does not require frequent attention.

Check the brake shaft bearings for correct adjustment every 900 hours of operation or when brake slippage is experienced and cannot be traced to any other source.

### HOW TO CHECK ADJUSTMENT

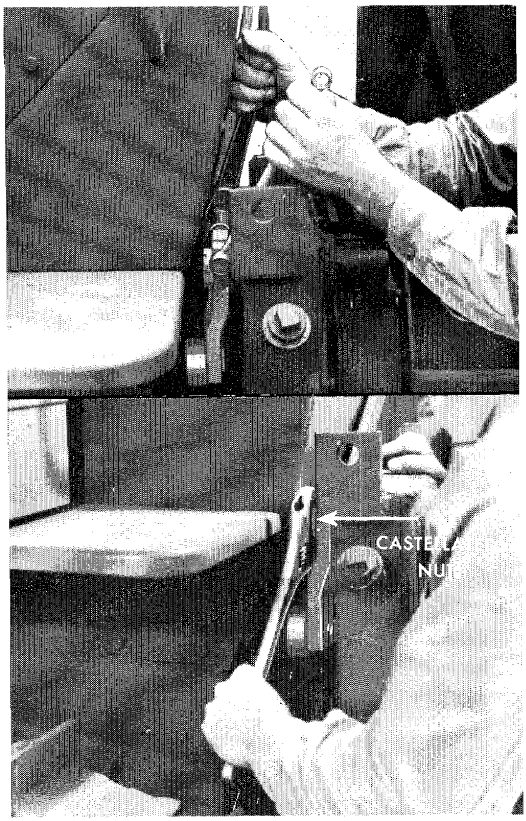
To check for bearing looseness, insert a pry bar or similar tool between brake roller and gear case, and by prying in and out, detect any end movement of shaft. If end movement is noticeable, the bearings are loose.

To check for bearing tightness, remove brake spring and disconnect brake band from brake shaft. Then rotate by hand. If shaft does not turn freely, the bearings are adjusted too tight.

If bearings are adjusted either too tight or if there is noticeable looseness, an adjustment should be made.

### IF ADJUSTMENT IS INCORRECT

If the Power Control Unit is operated with the bearings adjusted too tight, brake slippage may result. If the bearings are noticeably loose, the brake shaft and linkage will have excessive play, affecting the brake action, and the life of the bearings may be shortened.




### HOW TO MAKE ADJUSTMENT

To make adjustment, first remove brake spring. Then proceed as follows:

1. Loosen clamp bolt at upper end of roller arm. Then remove cotter pin from castellated nut at end of brake shaft.
2. To tighten the bearings, turn the castellated nut located at the upper end of the roller arm clockwise on brake shaft. To loosen the bearings, turn the nut counterclockwise.

The adjustment is correct when bearings are free rolling and without end play.

When correct adjustment is reached, reinstall cotter pin and tighten clamp bolt.

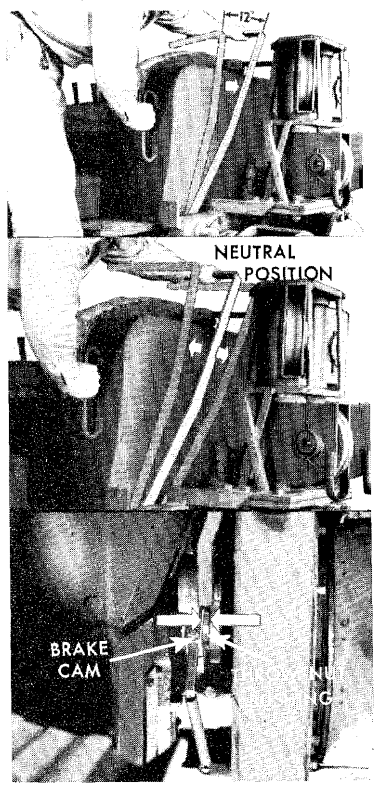
## CLUTCH ADJUSTMENT

There is no set interval for checking the clutches for adjustment. Rather, the operation of the unit by the operator serves as a constant check on the adjustment.

If operating a Power Control Unit having an incorrectly adjusted clutch, the operator will have difficulty in making the Power Control Unit function properly, and there will be symptoms which will indicate to the operator that the clutch is incorrectly adjusted. These symptoms are: (1) Travel of control lever from neutral to the fully engaged position too great for efficient operation, (2) Clutch won't fully engage, (3) Clutch slippage, (4) Clutch won't release, (5) Clutch dragging, (6) Brake won't fully release, (7) Overheating as a result of the above.

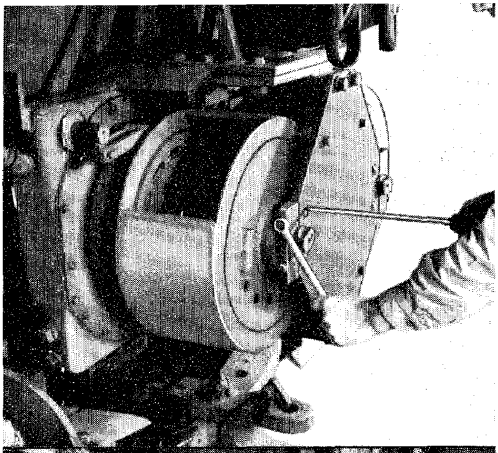
If troubled by one or more of the above symptoms when operating the unit, it is an indication that the clutch is probably incorrectly adjusted and an adjustment should be made.

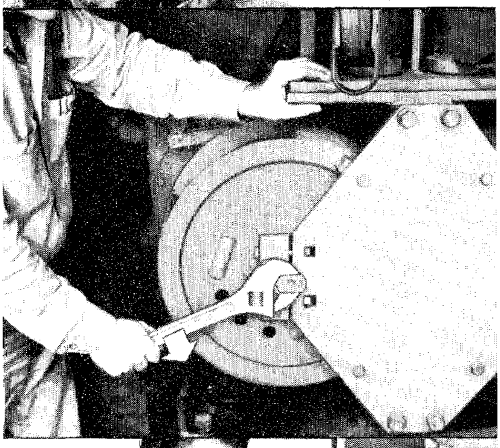
There are three factors which affect the clutch adjustment and which cause the symptoms listed above:

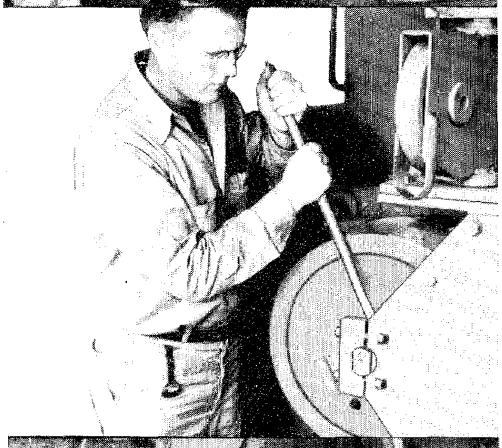


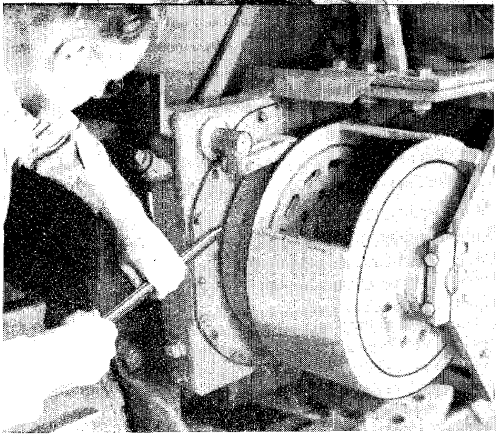

1. *Incorrect amount of clearance between driving cone and driven cone when control lever is in neutral.* This clearance regulates the distance the driving cone must travel to fully engage the driven cone. Since this clearance cannot be measured accurately without difficulty, it is usually thought of in terms of the distance the control lever travels between neutral and the fully engaged position. If the cones are spaced too far apart, the travel of the control lever from neutral to the fully engaged position will be so great that it will be difficult for the operator to efficiently operate the unit. If spaced too close, the driving cone may drag on the driven cone when the control lever is in neutral position. The clearance between the driving and driven cones is correct when the travel at the top of the control lever from the neutral to the fully engaged positions is approximately 12". (Slightly less for efficient Dozer operation.)
2. *Main gear incorrectly spaced inside gear case.* If spaced too far to the rear, the gear will strike rear side of gear case as control lever is moved to engage clutch, preventing the clutch from fully engaging. If spaced too far to the front, it will strike against front side of gear case as control lever is moved in the direction that releases the brake, preventing control lever from being moved into lock-out position, and possibly preventing the brake from fully releasing.
3. *Insufficient clearance between the brake cam and throw-nut bushing.* If there is insufficient clearance at this point, the brake cam will ride against the throw-nut bushing before the driving cone becomes fully engaged in the driven cone, thereby preventing the clutch from fully engaging. With the control lever in the fully engaged position there should be some clearance at this point.

By making the clutch adjustment as outlined on the following pages, the three possible sources of trouble listed above will be corrected. If the same symptoms are present after making the adjustment, the difficulty is caused from some other source, and a different correction must be made.









## HOW TO MAKE CLUTCH ADJUSTMENT

To adjust either clutch, first make sure that brake roller is correctly positioned against brake cam (refer to brake adjustment instructions on Page 40).

Then proceed as follows:

1. Move control lever into the lock-out position (extreme brake released position) and loosen drum shaft clamp bolts at rear end of drum shaft.

2. With control lever in lock-out position, turn drum shaft with a wrench, bringing the driving cone and driven cone together tight. (If adjusting the right clutch, turn the right shaft in a clockwise direction. If adjusting the left clutch, turn the left shaft in a counter-clockwise direction.)

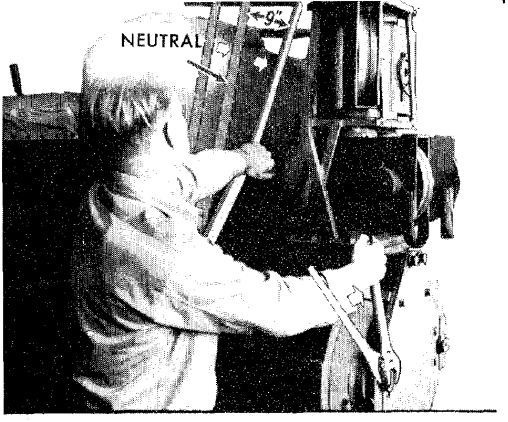
3. Insert a pry bar between rear plate and cable drum and pry drum assembly toward the tractor as far as it will go.

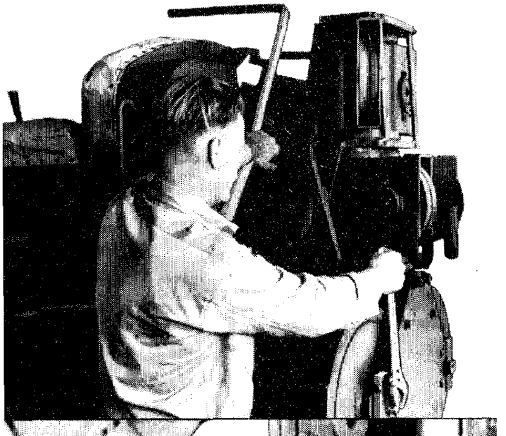
4. Insert the bar between the driving cone and the gear case cover plate and pry the assembly in the opposite direction 1/8" to 3/16". This will correctly space main gear inside gear case.

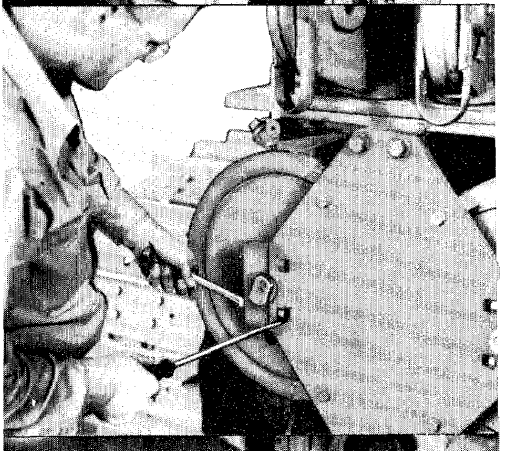
5. Place a wrench on end of drum shaft and move control lever from lock-out position, back to a point approximately 9" past neutral position, allowing the wrench to turn with drum shaft as control lever is moved. (If Unit is hot, 9" movement should be increased slightly due to expanded condition of driven cone.) The drum shaft will turn with the control lever in making this part of the adjustment. (The above 9" travel of control lever from neutral to fully engaged position will give approximately 12" travel of lever in actual operation after adjustment has been completed. This amount of travel will provide proper clearance between driving cone and driven cone when in neutral position.)
6. Hold the drum shaft from turning by holding the wrench stationary, and return the control lever to neutral position.
7. Then, without turning the drum shaft, clamp the drum shaft to the rear plate by tightening the drum shaft clamp bolts, turning them down evenly.
8. Fully engage clutch and check for clearance between brake cam and throw-nut bushing. There should be some clearance at this point. If there is no clearance, release clamp bolt from lower end of control lever and space lever farther out on clutch throw-nut, without changing the relative position of the lever. Then re-tighten clamp bolt.

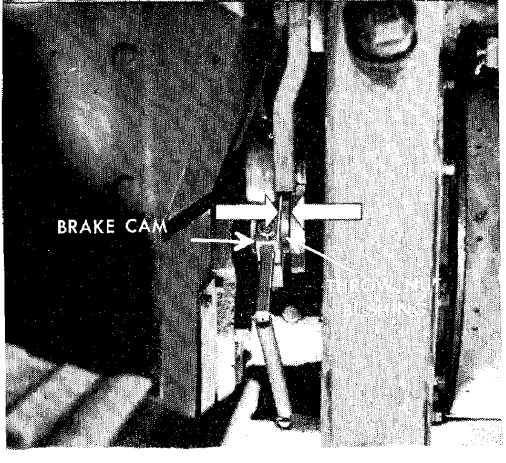
*Important:*

The above steps in making the clutch adjustment must be made in the order given and no steps can be eliminated.



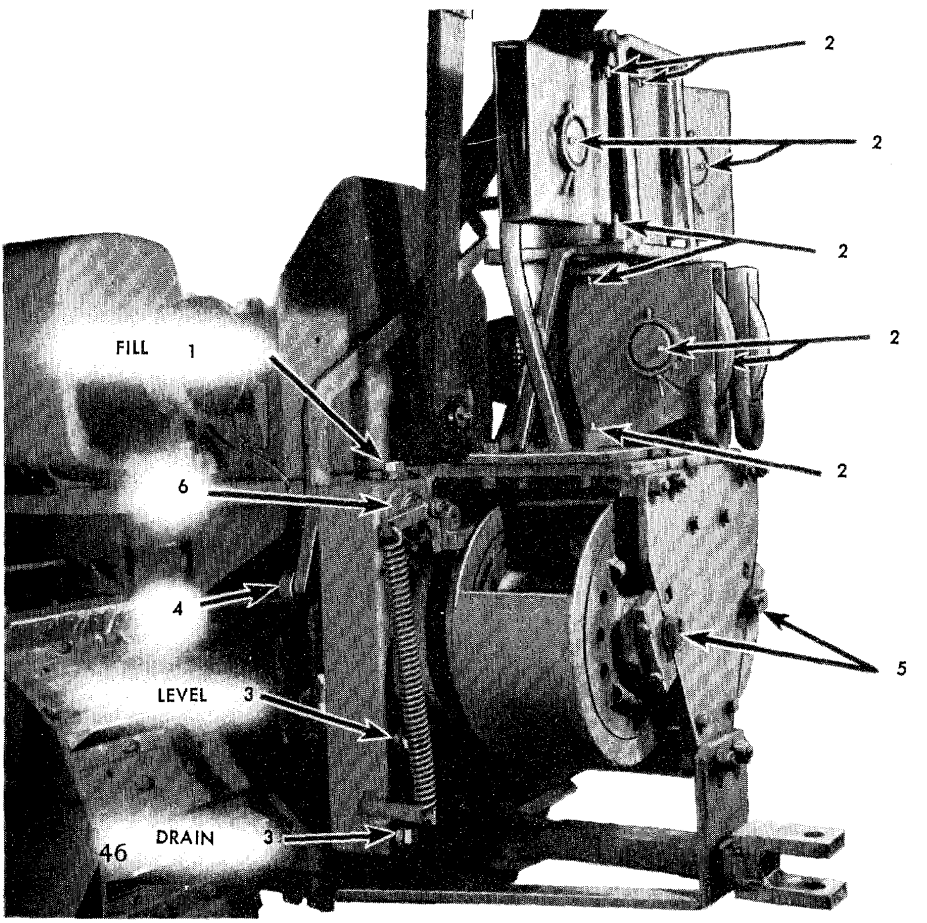



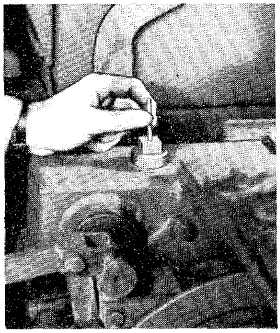




## KEY TO LUBRICANTS

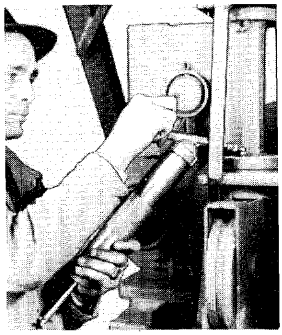
| | |
|---|---|
| **Chassis Grease**<br>Heavy (above +32°F.)<br>Medium (below +32°F.) | **Gear Oil**<br>S.A.E. #90 (above +32°F.)<br>S.A.E. #80 (below +32°F.) |
| **Wheel Bearing Grease**<br>Medium | **Engine Oil**<br>S.A.E. #30 (above +32°F.)<br>S.A.E. #10 (below +32°F.) |





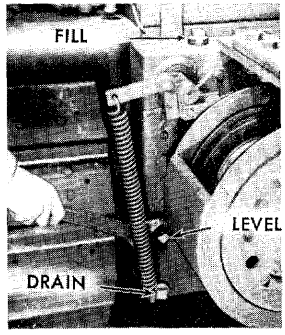
**1. BREATHER HOLE**

When delivered remove cork from breather hole in oil fill plug. Keep hole open at all times.



**2. DOUBLE DECK SHEAVE BEARINGS**

Every **10** hours of operation, lubricate sheave housing pivot bearings with Chassis grease, using grease gun.

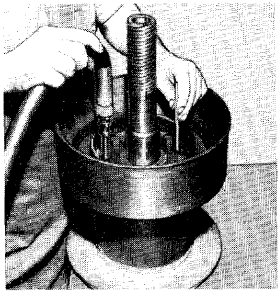



**3. GEAR CASE**

Every **60** hours check oil level in gear case by removing oil level plug. Always keep filled to level plug. Drain, flush, and refill every **900** hours. (Capacity 15 quarts).

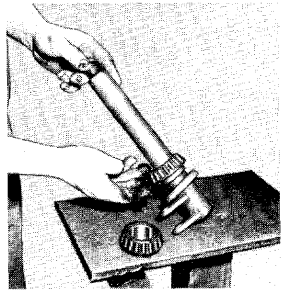
**4. BRAKE ROLLERS**

Every **60** hours of operation, lubricate brake rollers with engine oil.



**5. CABLE DRUM BEARINGS**

Every **3000** hours of operation (or when disassembled) remove cable drum, hand-pack bearings and fill drum 2/3 full of wheel bearing grease. (See note A.)



**6. BRAKE SHAFT BEARINGS**

Every **3000** hours of operation, remove brake shaft bearings and hand-pack with wheel bearing grease.

NOTES: (A) After hand-packing cable drum bearings, reassemble cable drum assembly, leaving out two of the capscrews which secure the driven cone to the cable drum. Then, with the cable drum standing on end, insert recommended grease through one of capscrew holes, filling the drum only ⅔ full of grease. In this operation, use a conventional pressure grease gun or any other suitable means of inserting the grease through the capscrew hole. Also, insert a measuring stick or wire down through the other capscrew hole to serve as a guide in determining when cable drum is ⅔ full of grease.

For emergency lubrication, a drilled grease duct is provided in the drum shaft, extending from rear of shaft to grease chamber inside cable drum. In event an excessive amount of grease is lost around cable drum oil seals and for some reason it is impractical to disassemble the unit until after a few more hours of operation have been completed, the bearings may be temporarily supplied with lubricant by removing plug from end of drum shaft and inserting a grease fitting in its place. Then inject enough grease through grease fitting to replace that which was lost around the seals, using a conventional pressure grease gun. As soon as possible thereafter, disassemble cable drum assembly to replace leaky oil seals and again hand-pack bearings and fill cable drum ⅔ full of recommended grease.