FORM 30112-8

OPERATION AND MAINTENANCE INSTRUCTIONS

CATERPILLAR

NO. 27 CABLE CONTROL

REAR DOUBLE DRUM

SERIAL NUMBERS

13C1-UP
82C1-UP
87C1-87C97
71E1-UP

Caterpillar Tractor Co., General Offices, Peoria, Illinois. • Caterpillar Americas Co., Peoria, Illinois. • Caterpillar Overseas C.A., Caracas. • Caterpillar of Australia Pty. Ltd., Melbourne. • Caterpillar Brasil S.A., São Paulo. • Caterpillar Tractor Co. Ltd., Glasgow. • Caterpillar of Canada Ltd., Toronto.

Warranty

The Manufacturer warrants its products for six (6) months after the date of delivery to the initial user. This warranty is limited to the repair or replacement, as the Manufacturer may elect, at one of its factories designated by it, of such parts as shall appear to the Manufacturer upon inspection to have been defective in material or workmanship but does not include any installation or transportation costs. No warranty is made with respect to items made by others when such items are warranted by their respective makers or when they are supplied by the Manufacturer on special order. This warranty is in lieu of all other warranties, express or implied, and no other warranty of any kind is made or authorized by the Manufacturer. No recommendation by the Manufacturer of items made by others shall imply or constitute any warranty with respect to such items.

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Foreword

Caterpillar products are a result of advanced engineering, skilled manufacturing, and the finest materials metallurgical science can select. Thousands of satisfying, economical working hours are built into each machine.

Whether or not the owner derives the maximum service from his machine depends largely on the care exercised in its operation and maintenance. This book is written to give the operator essential information regarding the day-to-day operation, lubrication and adjustment of the machine. Careful adherence to these instructions will result in assured economy.

More and more Caterpillar owners are depending upon their dealer for service other than the care and adjustments described in this book. This practice is recommended because Caterpillar dealers have stocks of genuine Caterpillar parts and are equipped with tools designed and built by Caterpillar. Their servicemen are factory-trained and are kept closely informed by the factory regarding advanced methods of servicing Caterpillar products — thus, in all ways they are equipped to render the best of service.

T20841

Avoid Accidents

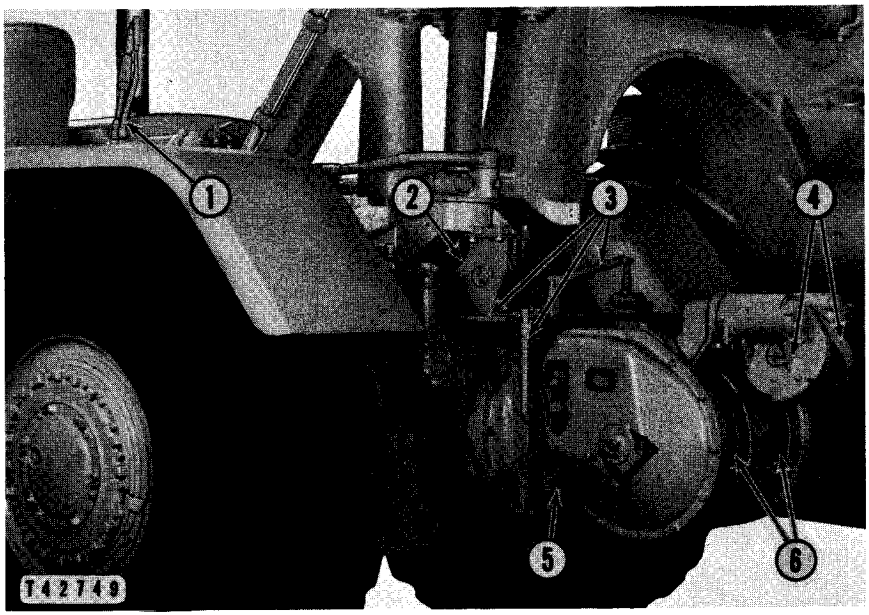
Most accidents, whether they occur in the air, in industry, on the farm, at home, on the highways, or at sea, are caused by someone's failure to follow simple and fundamental safety rules or precautions. For this reason most accidents can be prevented by recognizing the real cause and doing something about it before the accident occurs.

Regardless of the care used in the design and construction of any type of equipment, there are many conditions that cannot be completely safeguarded against without interfering with reasonable accessibility and efficient operation.

A careful operator is the best insurance against an accident.

The complete observance of one simple rule would prevent many thousands of serious injuries each year. That rule is: "Never attempt to clean, oil or adjust a machine while it is in motion."

T 2646



NO. 27 CABLE CONTROL—LEFT REAR VIEW
(Rear Double Drum)
1–Control levers. 2–Fair-lead sheave. 3–Control lever linkage. 4–Swivel sheaves. 5–Gear case. 6–Cable drums.

Table of Contents

Lubrication Instructions

SERVICE METER

Detailed instructions regarding the lubrication of the cable control are given in the lubrication chart and in the illustrations following. The established intervals in the lubrication chart and maintenance instructions are given in service hours. Service hours are to be interpreted as those recorded on the Service Meter of the tractor. The intervals indicated are for normal service. For operating conditions of extreme water, dust and mud, lubricate more frequently where hydraulic fittings are used. Clean the fittings before lubricating so that dirt will not be carried in with the lubricant.

GENERAL LUBRICATING INFORMATION

Careful attention to the following information on lubricants and their proper selection will add much to performance, economy and long life of the cable control. The lubrication chart specifies the lubricants to be used, the points to be serviced and the intervals of servicing according to service hours.

DESCRIPTION OF LUBRICANTS

The lubricants recommended for use in the cable control can be identified by the sub-heading preceding their descriptions that follow. The proper selection of oil and SAE grade of oil can be made from the information in the topic, TYPE OF LUBRICANTS AND SAE GRADES TO USE.

Crankcase Lubricating Oils

Superior Lubricants (Series 3): These are additive type oils that have been identified as meeting a rigid, high quality standard and certified for use in all Caterpillar diesel engines. See your Caterpillar dealer for brand names of products conforming to this specification.

Lubricating Grease

Ball and Roller Bearing Lubricant: This lubricant is a mixture of mineral oil and metallic soaps. Use No. 2 grade for most temperatures. For extremely low temperatures use No. 0 or No. 1 grade.

This grease can be applied to all bearing points — plain bearings, ball bearings and roller bearings — where equipped with hydraulic pressure fittings or when bearings are hand packed.

Use only a high grade Ball and Roller Bearing Grease of short fiber. This grease must be satisfactory in anti-friction bearings at speeds up to

LUBRICATION CHART
CATERPILLAR
NO. 27 CABLE CONTROL

The folded page is arranged to serve two purposes:

First, it is a complete outline of all the information required to lubricate the cable control.

Second, the illustration and identification of points of lubrication can be used with the detailed illustrations and information on the pages following the chart as a reference for lubrication and service information.

Identification of Points of Lubrication, Lubricant to Apply and Interval of Service

	Point and Identification	Lubri-cant	SERVICE HOURS — 50	125	250	1000
	Clutch Lever Shaft	BR		*L		
1	Fair-Lead Sheave Bearings	BR		†L		
2	Control Lever Bracket and Shaft Front Bearings	BR		L		
	Control Shaft Rear Bearings	BR		L		
3	Brake Lever Shaft and Roller Pins	BR		L		
4	Clutch Engagement Screw and Bearing	BR	L			
5	Swivel Sheave Bearings	BR		†L		
6	Swivel Sheave Shroud Bearings	BR		†L		
7	Gear Case Breather	CO			**W	
8	Gear Case	CO		X		CW

Key to Lubricants:

BR Ball and Roller Bearing Lubricant

CO Crankcase Lubricating Oil

Key to Symbols:

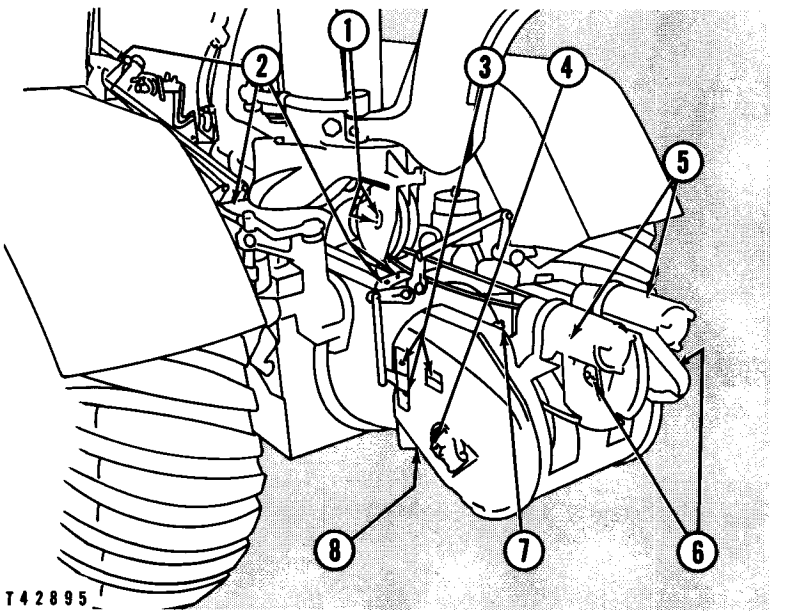
L Lubricate

X Check, add oil when needed

W Wash

CW Change and Wash compartments

Location of Points of Lubrication

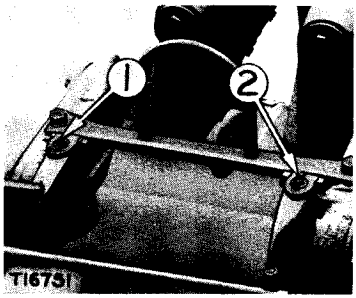


*On 13C1-up only.

**On 70E1-up only.

†Earlier type sheave with unsealed bearings require lubrication every 10 service hours.

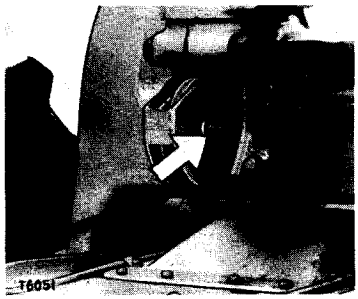
BR Ball and Roller Bearing Lubricant



CLUTCH LEVER SHAFT BEARINGS

(Only 13C1-up)

Lubricate bearings (1) and (2) every 125 service hours.

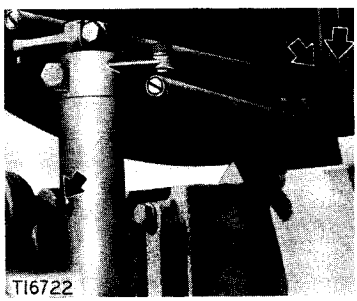


1

FAIR-LEAD SHEAVE BEARINGS

Lubricate sheave bearings every 125 service hours.

The earlier type sheaves equipped with unsealed bearings require lubrication every 10 service hours.



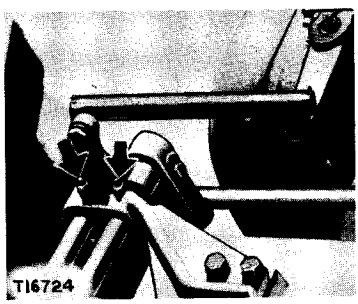
2

CONTROL LEVER BRACKET AND SHAFT FRONT BEARINGS

Lubricate bearings every 125 service hours.

Cable Controls 82C1-up have two fittings.

Earlier models have one fitting on the end of the shaft.



2

CONTROL SHAFT REAR BEARINGS

Lubricate shaft bearings (two fittings) every 125 service hours.

3000 R.P.M. at a maximum temperature of 300° F. It is a grease with sufficient adhesive qualities to cling to the bearings in all extremes of high and low operating temperatures.

Type of Lubricants and SAE Grades to Use

The grade of oil is classified in terms of viscosity (fluidity or flow ability) and is identified with numbers called SAE numbers. The lower SAE numbers are more fluid and flow more readily than do those with the higher numbers.

OIL SPECIFICATION CHART

Compartment	SAE GRADE OF OIL TO USE AT STARTING ATMOSPHERIC TEMPERATURES			
	Above +32°F.	+32°F. to +10°F.	+10°F. to −10°F.	−10°F. and Lower
	Superior Lubricants (Series 3)			
Gear Case	SAE 30	SAE 30	SAE 10W	SAE 10W

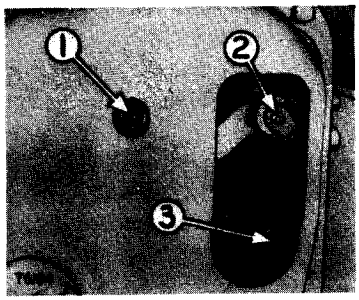
BR Ball and Roller Bearing Lubricant

3

BRAKE LEVER SHAFT, CLUTCH LEVER ROLLER AND ANCHOR LINK ROLLER

Lubricate brake shaft (2) and roller pins (1) and (3) sparingly every 125 service hours. (Three fittings on each side).

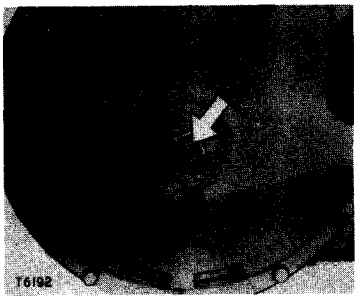
Move the control lever to lockout position on Cable Controls 82C1-up and 71E1-up to reach roller pin (3).



4

CLUTCH ENGAGEMENT SCREW AND BEARING

Lubricate sparingly with two or three shots every 50 service hours. (Each side).

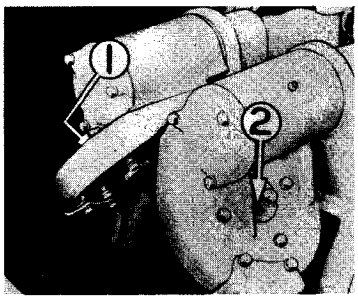


5

SWIVEL SHEAVE BEARINGS

Lubricate bearings (1) and (2) every 125 service hours.

The earlier type sheaves equipped with unsealed bearings require lubrication every 10 service hours.

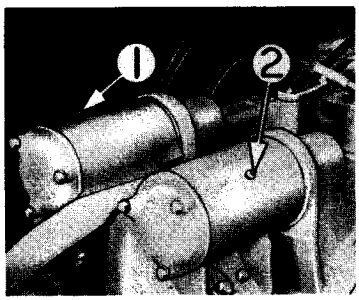


6

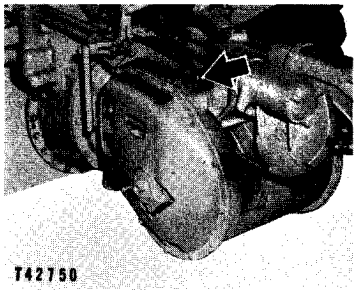
SWIVEL SHEAVE SHROUD BEARINGS

Lubricate fittings (1) and (2) every 125 service hours.

The earlier type sheaves equipped with unsealed bearings require lubrication every 10 service hours.



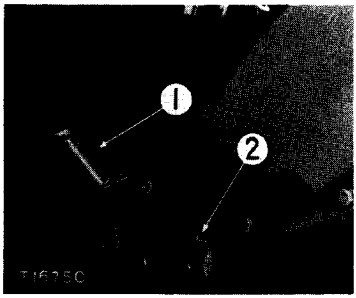
CO Crankcase Lubricating Oil



7

GEAR CASE BREATHER

Remove the breather every 250 service hours and wash thoroughly. Saturate element with oil and reinstall.



8

GEAR CASE

Check oil level every 125 service hours. Oil should be up to the top of the filler neck (1).

On earlier models oil should be up to level plug hole on right side of gear case. To refill remove plug on top of gear case.

8

GEAR CASE

Every 1000 service hours drain gear case at (2), wash and refill until oil is up to the top of the filler neck. See the topic, WASHING GEAR COMPARTMENT. On earlier models refill to level plug hole on right side of gear case.

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Operation Instructions

The cable control is driven by the tractor engine through a coupling shaft which is connected to the transmission lower shaft. When the engine is running and the flywheel clutch is engaged, all of the cable control gears and the clutch driving discs are turning.

Cable is spooled onto the drum when the control lever is moved to the "clutch engaged" position. In this position, the engaging mechanism causes the driven discs to contact the driving discs thereby turning the cable drum.

The cable drum is held by the self energizing brake when the control lever is in the "neutral" position. Cable is unspooled from the drum when the control lever is moved to the "brake released" position. The control lever may be moved to the extreme "brake released" position where it is held in the "lockout" position permitting the drum to be turned by hand with the engine stopped.

PREPARING THE CABLE CONTROL FOR USE

The first duty of any one charged with the care and operation of a cable control is to give it a detailed inspection, and to lubricate all parts as directed in the LUBRICATION INSTRUCTIONS section of this book.

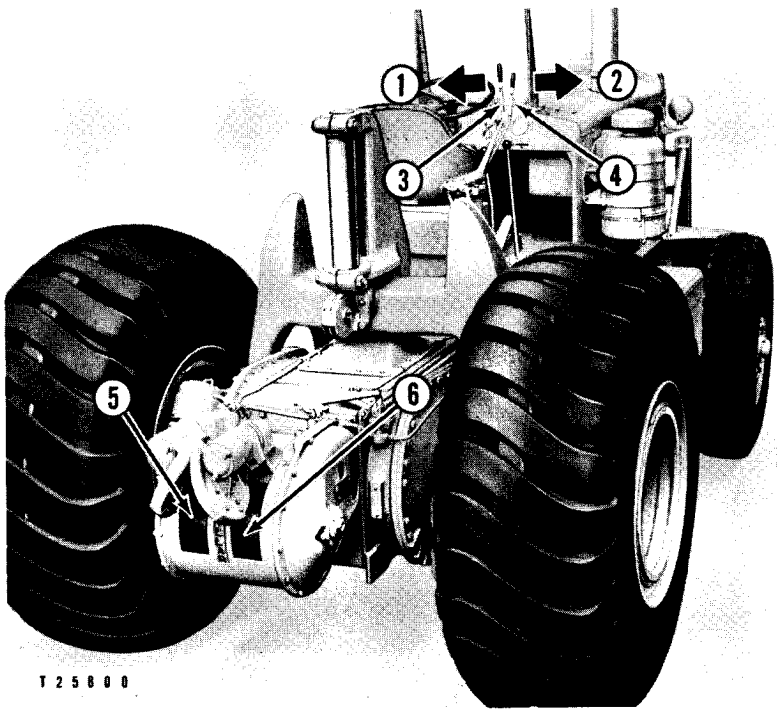
Second, the cable control should have any necessary adjustments made to obtain satisfactory performance. See the MAINTENANCE INSTRUCTIONS section of this book. If the cable is not installed, do so as outlined in the topic, CABLE REPLACEMENT. Make sure that the cable is reeved in even layers on the drum.

OPERATION OF THE CABLE CONTROL

Two control levers for the cable control are mounted within easy reach of the operator, to the right of the seat. The front control lever **(4)** operates the right drum of the cable control to which the bowl cable **(6)** of the scraper is attached. The rear lever **(3)** operates the left drum of the cable control to which the ejector cable **(5)** of the scraper is attached. Moving either lever to the left as shown at **(1)** or toward the operator's seat engages the clutch on that particular side of the cable control to reeve in the cable. Engage the clutch with a quick full movement of the lever in order to avoid clutch slippage and over heating. Do not continue to engage the clutch after the ejector or bowl of the scraper have reached

their limit of travel, but immediately release the brake slightly. Returning the lever to "neutral" disengages the clutch and holds the amount of cable reeved on the drum.

Moving the lever to the right as shown at **(2)** or away from the operator releases the brake and permits the cable to unspool or free spool from the drum. This should be an easy short movement. Return the lever to "neutral" at the instant the particular part of the scraper is in the desired position. If the cable is permitted to free spool completely, parts of the scraper such as ejector, apron or bowl will take an undesirable shock and the cable may kink or be fouled. If this should be done accidentally, reeve in the cable slowly, making sure that it is free of kinks and not fouled.



CONTROL LEVERS IN "NEUTRAL" POSITION
1—Clutch engaged position. 2—Brake released position. 3—Ejector control lever. 4—Bowl control lever. 5—Left drum. 6—Right drum.

DAILY CARE

Attention should be given to the operations mentioned in this topic, every 10 service hours or daily whichever occurs first.

A daily check of the cable control should be made to see if there are any loose nuts, bolts, or parts worn to such an extent that they

are no longer serviceable. If corrective steps are taken immediately upon discovery of loose or worn parts, fewer forced stops and more economical operation will result.

Dirt should not be allowed to accumulate and pack on the cable control. A few minutes spent daily in keeping it clean are well repaid in greater ease and safety of operation.

Check the clutch and brake adjustment daily and adjust if necessary.

Check the cable daily for excessive wear, kinks and fraying which may result in cable breakage. Excessive slack in the cable may cause it to become kinked. Avoid this as much as possible. Make sure that all the sheaves turn, as the cable will wear more rapidly if one of the sheaves does not turn freely. The cables should be replaced when they show signs of sufficient wear to permit breakage or interference with proper operation. See the topic, CABLE REPLACEMENT.

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Maintenance Instructions

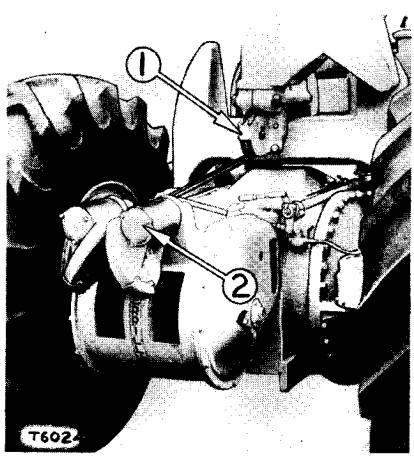
The Caterpillar Cable Control has but a few moving parts which, if properly maintained, should give long trouble-free service. Maintenance of the cable, clutches, and brakes will be covered on the following pages.

CABLE

The cable recommended is: ½", 6 x 25 filler wire, right Lang lay, independent wire rope center, preformed, improved plow steel type. Be sure to use the recommended size and type of cable. With exception of the apron lift cable on scrapers the entire line of equipment is designed for this particular cable for maximum efficiency, from the contour of the groove in the sheaves to the sheave size, sheave bearings and all working parts.

There should be approximately 2 wraps of cable on the drum when the scraper bowl is operated at its deepest point, or when the scraper ejector is at the extreme rear position and the apron is down. This will provide enough cable to prevent unreeving it to the end and causing it to kink or pull out of the clamp. However, an excess amount of cable on the drum only tends to become frayed and worn. Also a greater amount of line pull is required to operate the equipment when excess cable is used. Approximately 5 to 6 wraps of cable should be on the right drum when the bowl is at ground level.

Cable Replacement: As a safety precaution **do not attempt cable replacement with the engine running** since the gears and driving discs of the cable control will always be rotating unless the flywheel clutch is disengaged. Loosen the cable wedge or clamp **(4)** and remove the old cable. Thread the cable on the scraper as described in the Operation and Maintenance Instructions for the Scraper. Bring the cables down through



CABLE REPLACEMENT

1—Fair-lead sheave.
2—Swivel sheave.

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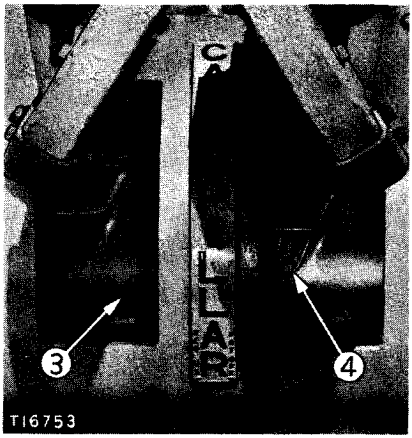
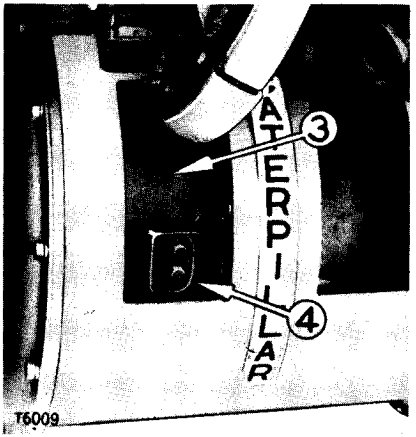


CABLE REPLACEMENT
(Later Models)
3—Cable drum. 4—Cable wedge.



CABLE REPLACEMENT
(Earlier Models)
3–Left cable drum. 4–Cable clamp.

the hole in the king bolt of the scraper, through the fair-lead sheave **(1)**, around the swivel sheaves **(2)** over and around the cable control drum **(3)**. On later models make a loop around the wedge so the end is past the bottom of the wedge. On earlier models put the cable into the cable clamp so the end is about flush with the top edge of the clamp.

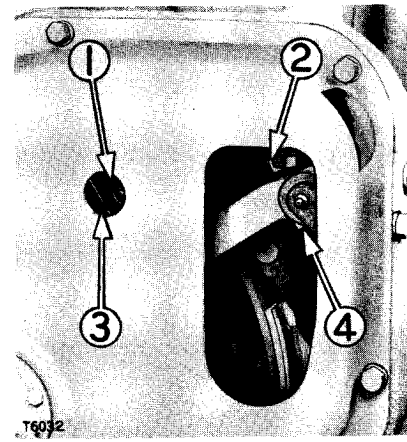
Drive the wedge into place or tighten the cable clamp securely.

ADJUSTMENTS

The clutch and brake are operated by the control rod which is connected to the clutch engagement lever. A roller on the clutch lever contacts a ramp on the brake lever which actuates the brake.

Wear in the brake mechanism causes the roller on the clutch lever to move from its original position on the brake lever ramp and in turn changes the amount of free movement in the clutch mechanism. Therefore, it is necessary to make the brake adjustment before making the clutch adjustment.

Brake Adjustment: The brake should be adjusted by aligning the center of the roller **(1)** on the clutch lever with the point of roller and brake lever contact and with the drilled hole **(3)** on the brake lever. To adjust, loosen the lock nut **(2)** and tighten the adjusting nut **(4)** to move the brake lever back. This allows the clutch return spring to pull the center of the roller to the drilled hole as shown. Tighten the lock nut. Adjustment is made to the left side in the same manner although some of the parts are located in slightly different positions.



BRAKE ADJUSTMENT
(Right Side)

1—Brake roller. 2—Lock nut. 3—Drilled hole. 4—Adjusting nut.

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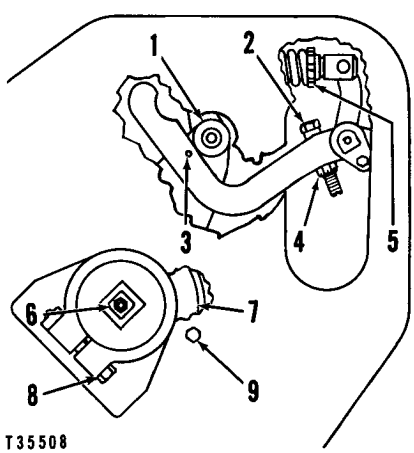
Clutch Adjustment: Adjust the brake as previously described. As a safety precaution **do not attempt to adjust the clutch with the engine running** since the gears and driving discs of the cable control will always be rotating unless the flywheel clutch is disengaged.

To adjust either clutch on later cable controls equipped with bolt **(9)**:

1. Loosen the clamp bolt **(8)**.
2. Turn retainer (adjusting screw) **(6)** counterclockwise until the retainer is tight and the clutch is fully engaged.
3. Loosen lock nut on bolt **(9)** and then tighten the bolt until it contacts the pressure plate retainer **(7)**. Loosen the bolt **(9)** one complete turn.
4. Turn retainer **(6)** to loosen and disengage clutch until bolt **(9)** prevents turning.
5. Tighten clamp bolt **(8)**.
6. Loosen bolt **(9)** at least 5 turns and tighten the lock nut.



CLUTCH AND BRAKE SPRING ADJUSTMENT

1-Brake roller. 2-Lock nut. 3-Drilled hole. 4-Adjusting nut. 5-Brake spring adjusting nut. 6-Retainer (adjusting screw). 7-Pressure plate retainer. 8-Clamp bolt. 9-Bolt.

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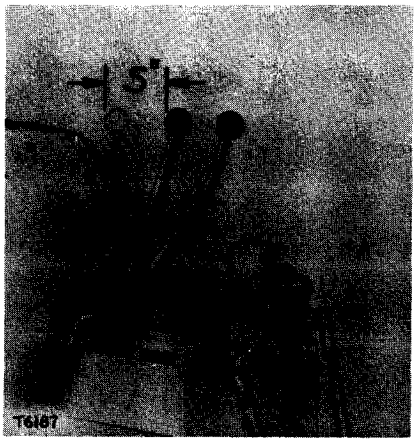

FREE MOVEMENT

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To adjust earlier cable controls that are not equipped with the bolt **(9)**, loosen the clamp bolt **(8)**. Turn the retainer (adjusting screw) **(6)** on either right or left side counterclockwise to tighten the clutch until there is a free movement between the "neutral" and "clutch engaged" positions of the control lever of 5 inches, more if desired, but never less than 5 inches. This free movement is necessary but should not include looseness in the linkage. Tighten the clamp bolt securely after making the adjustment. Both clutches are adjusted in the same manner.

Brake Spring Adjustment: The adjustable brake springs are provided in all No. 27 Cable Controls. These springs are adjusted at the factory for average operation. It may be necessary to increase or decrease the spring pressure depending upon the requirements of the operating conditions. The spring should be adjusted just tight enough so the brake will hold the load without slipping. Turn the brake spring adjusting nut **(5)** with a punch or bar. Turning the nut toward the spring will compress the spring and increase the spring pressure. Increasing the spring pressure will increase the load that can be applied to the brake.

Check the brake and clutch adjustment after adjusting the brake spring.

WASHING GEAR COMPARTMENT

Washing the Cable Control Gear Case: Remove the drain plug from the housing when the oil is warm and allow the oil to drain. Replace the drain plug and fill to the proper level with kerosene or clean Diesel fuel. Start the Diesel engine and allow it to idle for five minutes to operate the gears and wash the housing. Stop the Diesel engine and drain the cleaning fluid. Refill the housing to the proper level as instructed in the LUBRICATION INSTRUCTIONS section of this book.

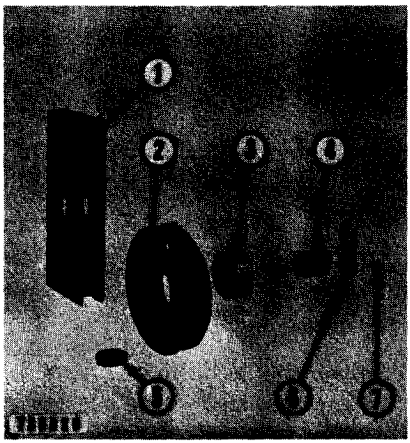
SHEAVES AND SHEAVE BEARINGS

Sheave bearings **(3)** are the straight roller type, later ones are sealed requiring no adjustment. Sheaves should be checked occasionally for free turning without excessive play, breakage, other damage or binding, to obtain normal cable life.

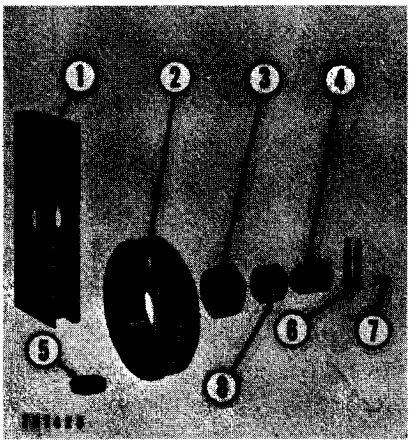
Sheave shafts are securely retained in sheave block assemblies by the method shown in the illustrations. The retainer **(5)** is tapped to take two long bolts **(6)** which go through shaft **(4)** to hold the shaft securely in the sheave block **(1)**. If the sheave **(2)** fails to turn, check for lubrication and damage to the bearing. Check the condition of the fitting **(7)** and the lubricant passage in the shaft. If the sealed bearing in the later type sheave is damaged, press the damaged bearing from the sheave and install a new bearing.

If the unsealed bearing in the earlier type sheave is damaged install a new bearing. If the earlier type bearing, sheave and race **(8)** are damaged replace with a later type sheave and sealed bearing.

Check the cable grooves in the sheaves occasionally for excessive wear. Replace sheaves where this condition exists to prolong cable life.



(Later Type Sheave)



(Earlier Type Sheave)

TYPICAL SHEAVE ASSEMBLY

1–Sheave block. 2–Sheave. 3–Bearing. 4–Shaft. 5–Retainer. 6–Bolts. 7–Fitting. 8–Race (earlier type).

Index

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FORM 30112-8

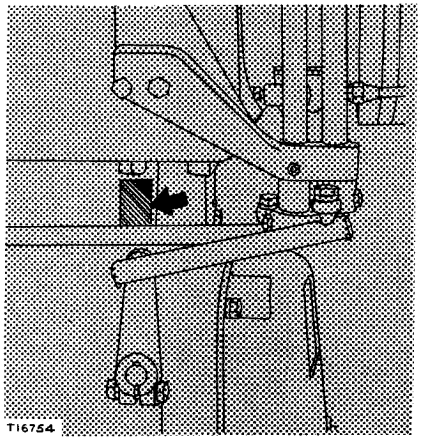
PRINTED IN U.S.A.

Capacity

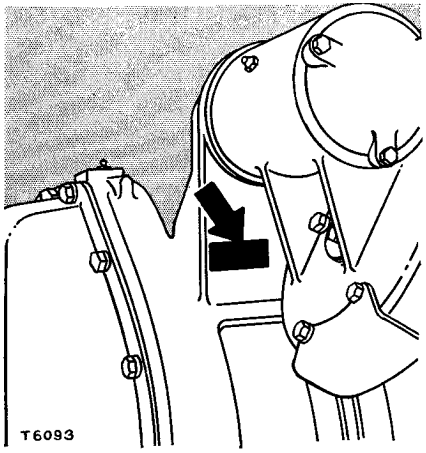
(Approximate Quantity)

	U.S. Measure	Metric Measure Liters	Imperial Measure
Gear Compartment	1.5 gals.	5,5	1.2 gals.

Location Of Serial Number



(Later Models)



(Earlier Models)

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- - - - - - Earthmoving Equipment - - - - - -

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