



Caterpillar Operator's Manual

No. 112

Motor Grader

S/n 3U1 & Up, 81C1 & Up



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CT-O-112GR 3U1

Operator's Manual

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FORM FE010937

**OPERATION AND
MAINTENANCE
INSTRUCTIONS**

CATERPILLAR®

NO. 112

MOTOR GRADER

JENSALES.COM

or Call 800-443-0625

SERIAL NUMBERS

3U1-UP

81C1-UP

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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.

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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."

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Railroad Loading Rules

For domestic customers within continental limits of the United States.

The loading rules and specifications published in Association of American Railroads Pamphlet No. MD-6, must be complied with when shipping Tractors, Road Grading, Road Making, and Farm Equipment Machinery, on open top cars. Contact the local railroad agent or inspector for these specifications.

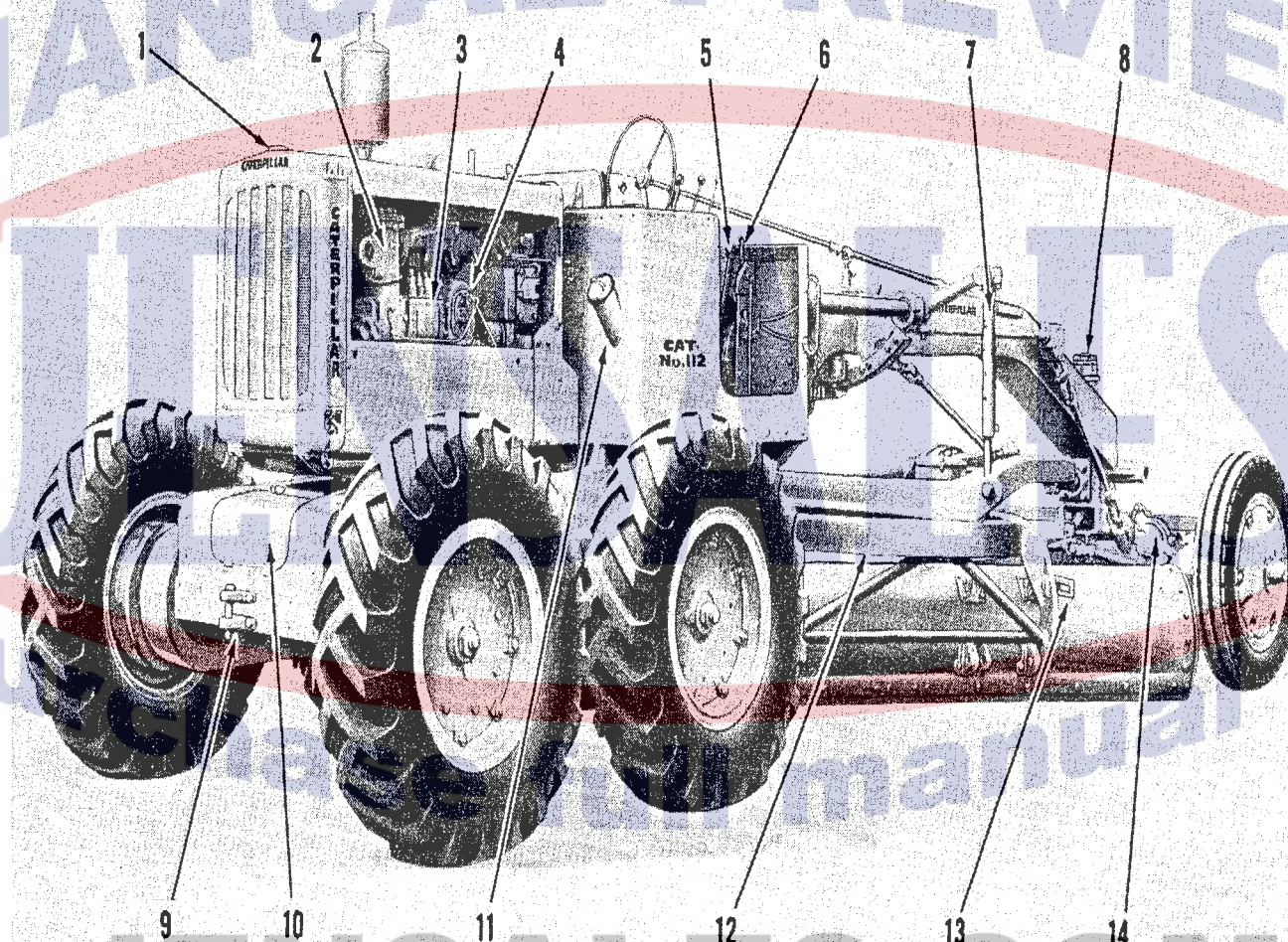
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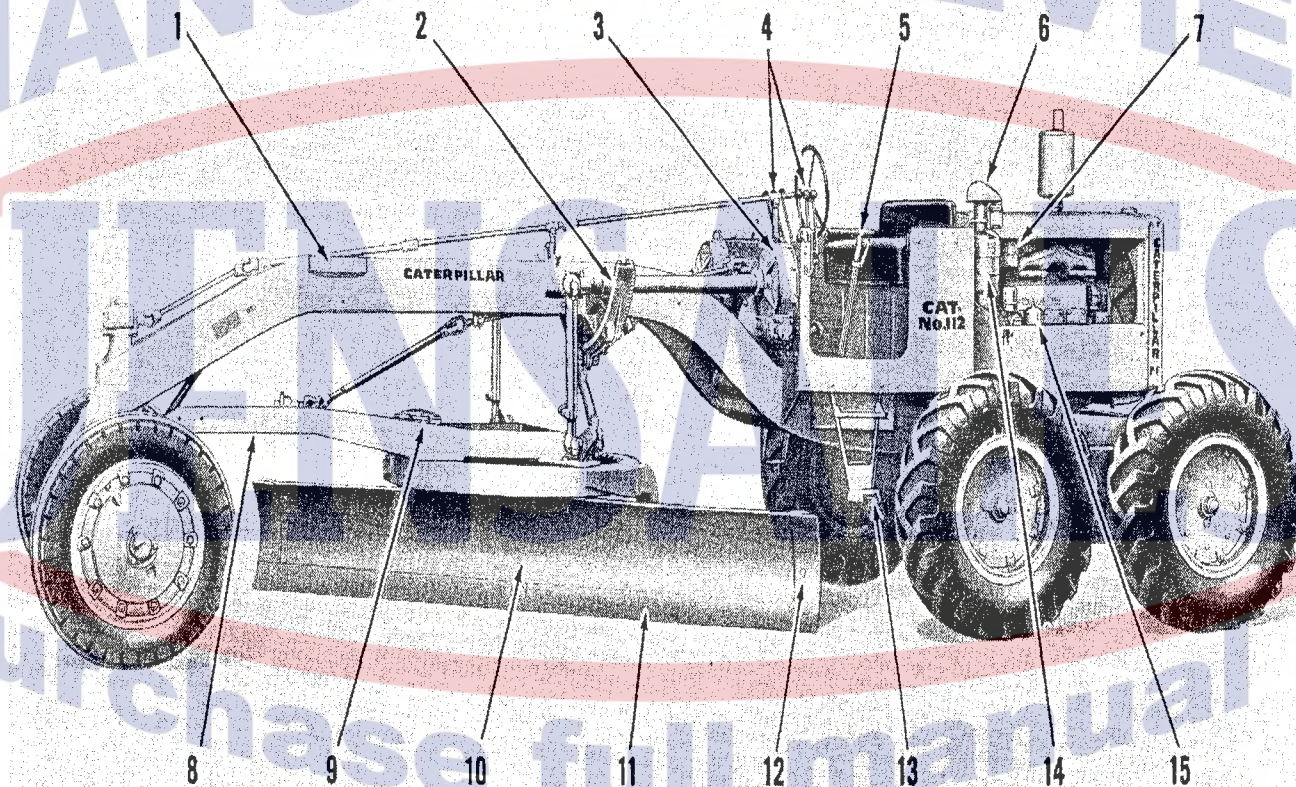
NO. 112 MOTOR GRADER — RIGHT REAR VIEW

1-Radiator filler cap. 2-Fuel filter housing. 3-Fuel injection pump housing. 4-Governor. 5-Speed selector lever. 6-Governor control lever. 7-Blade lift link assembly. 8-Steering gear assembly. 9-Pull lug. 10-Tool box. 11-Diesel fuel tank filler. 12-Circle. 13-Blade tilting links. 14-Leaning wheel control.

CLICK ANYWHERE FOR MORE DETAILS

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MANUAL PREVIEW



T31365

NO. 112 MOTOR GRADER — LEFT FRONT VIEW

1-Scarifier mounting bracket. 2-Center shift rack. 3-Blade lift control. 4-Blade lift, center shift, circle reverse and front wheel lean control levers. 5-Hand brake control lever. 6-Diesel engine precleaner. 7-Starting engine air cleaner. 8-Circle drawbar. 9-Circle reverse control. 10-Moldboard. 11-Cutting edge. 12-End bit. 13-Step. 14-Diesel engine air cleaner. 15-Crankcase lubricating oil filter.

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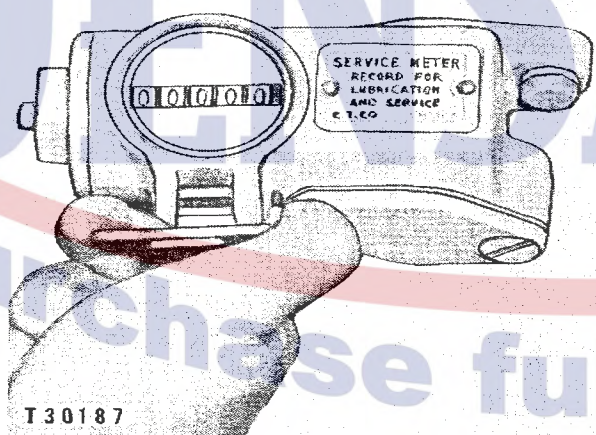
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Lubrication Instructions

SERVICE METER

The Service Meter is located on the right side of the engine near the bottom of the fuel filter housing. It is geared to the engine, and when the crankshaft turns as many revolutions as are made in an hour at normal operating speed, the dial advances one number. There are many applications that will result in a lower than normal average engine speed. Under this condition, the advance in the Service Meter reading will be less than the number of clock hours of operation.

The purpose of the Service Meter is to indicate when to perform the recommended maintenance and lubrication operations. The established intervals in the lubrication chart and maintenance instructions are given in service hours, so daily readings will tell when to service the engine. Rely on the Service Meter and not on the clock to measure service intervals.



SERVICE METER LOCATED ON
RIGHT SIDE OF ENGINE

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 your motor grader. The lubrication chart specifies the lubricants to be used, the points to be serviced and the intervals of servicing according to service hours. Lubricate all miscellaneous points, not equipped with fittings, with crankcase lubricating oil every 50 service hours.

CRANKCASE LUBRICATING OIL

(Abbreviated CO)

Type of Oils

(CO) Superior Lubricants (Series 3): Only those lubricating oils known as Superior Lubricants (Series 3) for Caterpillar Diesel Engines should be

used in the diesel engine crankcase. For recommended oil change periods, see the topic, CRANKCASE LUBRICATING OIL CHANGE PERIODS.

NOTE

Detergent type oils that are recommended for use in Caterpillar Diesel Engines will, within a short period of operation, become much darker in color. This should not be any cause for concern. The darkening of the oil is due to minute particles of carbon, resulting from the combustion process, being held in suspension in the oil. This ability to hold carbon particles in suspension is one of the primary functions of a detergent type lubricant. Otherwise, these particles would settle out, eventually leading to objectionable deposits in the engine. When the oil darkens, therefore, it is an indication that it is keeping the engine clean and insuring satisfactory lubrication performance.

If Superior Lubricants (Series 3) are not available, crankcase lubricating oils meeting the requirements of MIL-L-2104A specifications can be used successfully in the diesel engine crankcase when the fuel sulphur content is less than 0.4%. For the recommended oil change periods see the topic, CRANKCASE LUBRICATING OIL CHANGE PERIODS.

(CO) Straight Mineral, MIL-L-2104A Oils Or Superior Lubricants (Series 3): In compartments other than the diesel engine crankcase where crankcase lubricating oil is recommended (such as starting engine crankcase, diesel and starting engine air cleaners† and fuel injection pump housing on earlier models) use either straight mineral crankcase lubricating oil, or oil conforming to MIL-L-2104A specifications or Superior Lubricants (Series 3), whichever is most convenient and economical.

(CO) Superior Lubricants (Series 3) or MIL-L-2104A Oils: Use either Superior Lubricants (Series 3) or an oil conforming to the requirements of MIL-L-2104A specifications in the hydraulic control tank.

S.A.E. Grade of Oil

At temperatures above freezing, S.A.E. No. 30 oil should be used in all compartments except in the hydraulic system. See the topic, HYDRAULIC SYSTEM.

At temperatures below freezing S.A.E. No. 10W oil should be used to provide better lubrication at low temperatures and also to make cranking easier.

† For air cleaners it is permissible to use clean undiluted reclaimed oil or the most inexpensive straight mineral oil. Be sure to change oil in the air cleaners regularly.

S.A.E. No. 10W oil should be fluid enough for easy cranking at temperatures down to at least -10°F . In lower temperatures it may be necessary to dilute S.A.E. No. 10W oil with kerosene (except in air cleaners) so it will be fluid enough to insure free circulation. Evaporation in the engine crankcase under steady operation may make it necessary to again add kerosene to maintain proper fluidity. This should be done before stopping, then operate the engine for a few minutes to mix the kerosene and oil.

For an approximate check to determine if the oil will flow, remove the oil level gauge and if the oil on it will flow off, the oil is fluid enough to properly circulate in the engine.

Hydraulic System: The oil in the hydraulic system should be fluid enough to flow freely at the lowest temperature at which the engine will be started in order to insure maximum service life from the hydraulic system. For this reason use S.A.E. No. 10W oil for temperatures above 10°F . For temperatures below 10°F , dilute the oil with kerosene up to 25% so it will be fluid enough to insure free circulation.

Naturally, any precautions taken during cold weather to keep the motor grader and hydraulic system warm will reduce the need for diluting the hydraulic system oil.

The oil in the hydraulic system should be drained and replaced with undiluted S.A.E. No. 10W oil at the end of the cold season when dilution of the oil is no longer required.

It is extremely important in handling the oil to keep it clean. Every precaution should be taken to use only clean filler cans and to be sure that all dirt is removed from the filler cap for the hydraulic control before it is taken off for filling. The operator should take every precaution to prevent dirt getting into the hydraulic system to prolong the life of the hydraulic pump.

Careful attention was given to the design of the hydraulic system to guard against oil leaks. Connections were eliminated where possible and metal to metal joints, with rubber ring seals are used instead of the usual pipe thread joints. Oil leaks should not be neglected as the loss of oil is an unnecessary expense as well as a possible cause of damage to the hydraulic system.

Crankcase Lubricating Oil Change Periods

The crankcase lubricating oil change periods for the engine have been carefully established for the purpose of protecting the service life of the engine as economically as possible.

Change oil and filter elements after the first 10 service hours of operation of a reconditioned engine. Experience shows that dirt and foreign material is present in reconditioned engines even though best service practices have been followed.

SUPERIOR LUBRICANTS (SERIES 3) CHANGE PERIOD CHART

FUEL SULPHUR CONTENT	OIL CHANGE PERIOD ‡	FILTER ELEMENT FULL FLOW	CHANGE PERIOD BY-PASS **
0.4% or Less	500 Service Hrs.	250 Service Hrs.	250 Service Hrs.
0.4% to 1.0%	500 Service Hrs.*	250 Service Hrs.	250 Service Hrs.

MIL-L-2104A OIL CHANGE PERIOD CHART

FUEL SULPHUR CONTENT	OIL CHANGE PERIOD ‡	FILTER ELEMENT FULL-FLOW	CHANGE PERIOD BY-PASS **
0.4% or Less	250 Service Hrs.	250 Service Hrs.	250 Service Hrs.

*Reduce change period one half when sulphur content is greater than 1.0%.

**Change by-pass filter elements every 250 service hours except under severe dusty operating conditions when changes should be made at 125 service hour intervals.

‡Regardless of time operated, the crankcase oil should be changed at least every six months.

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BALL AND ROLLER BEARING LUBRICANT

(Abbreviated BR)

(BR) 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 lubricant can be applied to all bearing points — plain bushings, 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 3000 RPM 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.

TRANSMISSION OIL

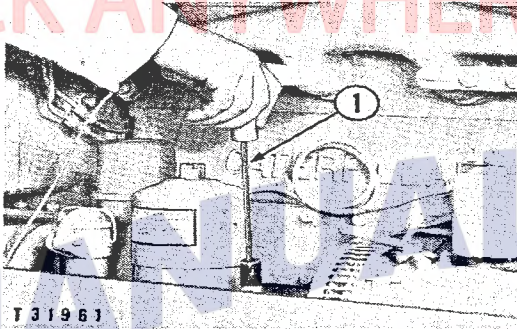
(Abbreviated TO)

(TO) MIL-L-2105 or Straight Mineral Oil: Use either an oil conforming to the requirements of MIL-L-2105 specifications or a straight mineral transmission oil, whichever is most convenient. Be sure your oil supplier furnishes a MIL-L-2105 oil that is filterable. If the transmission oil filter becomes plugged, damage to the transmission may result.

At temperatures above freezing use S.A.E. No. 90 oil, but when operating continuously in extremely hot temperatures, use S.A.E. No. 140 oil.

Below freezing S.A.E. No. 80 oil will be required, however, in extremely cold weather S.A.E. No. 80 oil should be diluted with sufficient kerosene to provide fluidity.

CO Crankcase Lubricating Oil

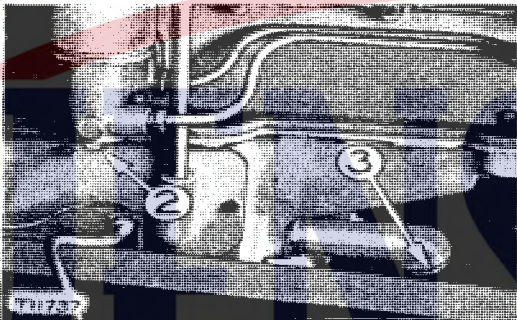


3

DIESEL ENGINE CRANKCASE

Check oil level with engine running and the motor grader level, every 10 service hours. Oil should be between the "full" and "low" marks on gauge (1). The oil level maintained at the "full" mark is more desirable, however, any level above the "low" mark is permissible.

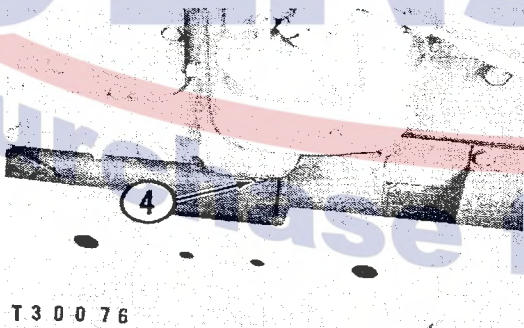
The oil level may be considerably higher than the "full" mark on the gauge if the full capacity of crankcase oil is checked after the engine has been stopped for several minutes. See the topic, "Crankcase Lubricating Oil"—Also see Note A.



3

DIESEL ENGINE CRANKCASE

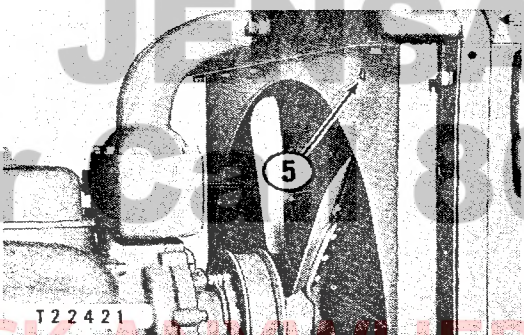
Every 250 or 500 service hours, depending on type of crankcase lubricating oil used, drain crankcase at (3) and filter at (2) with the motor grader level and while the engine is hot. Drain fuel injection pump housing at (4) each time the crankcase is drained on machines effective with 3U4798 and 81C1. See the topics, "Crankcase Lubricating Oil" and "Crankcase Lubricating Oil System". See Note A.



3

DIESEL ENGINE CRANKCASE

Open oil cooler vent valve (5) so the oil will drain more rapidly from the oil cooler each time the crankcase is drained.



NOTE A: Caterpillar Diesel Engines are built in a clean modern diesel engine factory and each crankcase is filled with a good quality of new crankcase oil. For these reasons the initial crankcase oil change period for this engine should be at the usual crankcase oil change period as given in the SUPERIOR LUBRICANTS (SERIES 3) CHANGE PERIOD CHART.

CLICK ANYWHERE FOR MORE DETAILS

LUBRICATION CHART

CATERPILLAR

**NO. 112
MOTOR GRADER**

The folded pages are arranged to serve two purposes:

First, they are a complete outline of all the information required to lubricate the motor grader.

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 lubricating and service information.

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KEY LUBRICANTS

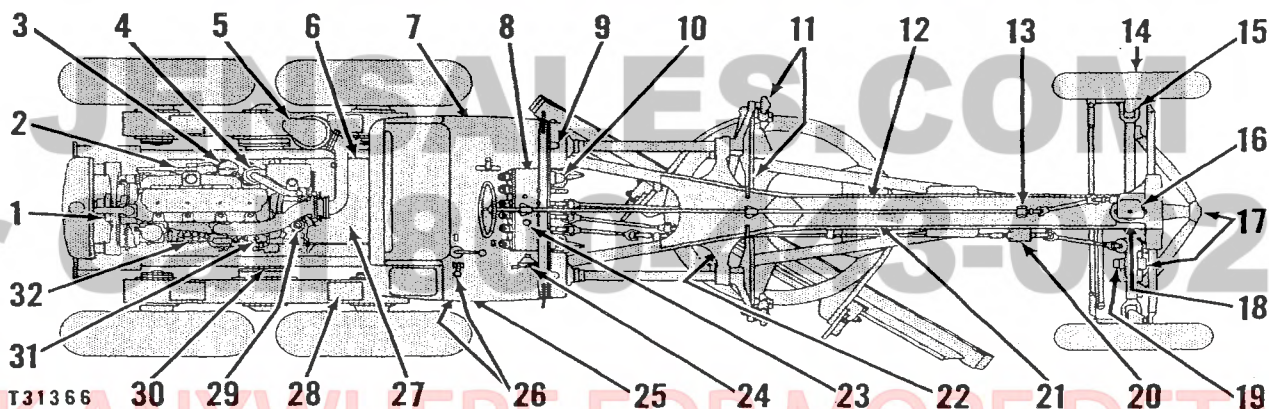
CO Crankcase Oil

BR Ball and Roller Bearing Lubricant

TO Transmission Oil

Point and Identification	Lubri- cant	SERVICE HOURS					
		10	50	125	250	500	1000
1 Fan Bearings	BR				X		
2 Transmission and Rear Axle Housing	TO			X			
3 Diesel Engine Crankcase and Fuel Injection Pump Housing	CO				*X	*X	
4 Starting Engine Air Cleaner	CO		††X				
5 Diesel Engine Air Cleaner	CO	‡X	X				
6 Flywheel Clutch Pilot Bearings and Hand Brake Crank Bearings	BR				X		
7 Brake Control Shaft, Engine Mounting Bearing and Power Control Shaft Spline	BR	X					
8 Power Control Shaft Worm and Gear Housing	TO			X			X
9 Blade Lift Control Housing	TO			X			X
10 Blade Lift Control Shaft and Drive Pinion Bearings	BR	X					
11 Ball and Socket Joints, Blade Lift Arm Shaft, Center Shift Housing and Worm Shaft Bearings	BR	X					
12 Circle Reverse Control Housing and Shaft Bearings	BR	X					
13 Steering Control Shaft Bearings	BR	X					
14 Front Wheel Bearings	BR	X					
15 Drag Link, Tie Rod, Spindle Pin and Front Wheel Lean Pin	BR	X					
16 Steering Gear Housing	TO			X			
17 Front Wheel Lean Rack and Axle Pivot Pin Bearings	BR	X					
18 Steering Gear Shaft, Circle Draft Ball Joint, Steering Arm, Steering Arm Block and Tie Rod Ends	BR	X					
19 Front Wheel Lean Control Housing	TO			X			
20 Front Wheel Lean Shaft	BR	X					
21 Circle Reverse Control Housing and Transfer Gear Housing	TO	X					
22 Center Shift Control Housing	TO			X			
23 Power Control Housing	TO			X			
24 Governor Control Lever	CO	X					
25 Governor Control Lever Shaft Bearing	BR	X					
26 High Speed Shifter Lever and Gear Shifter Rod Assembly	BR	X					
27 Flywheel Clutch Release Bearing	BR	X					
28 Tandem Drive Housing	TO			X			
29 Starting Engine Crankcase	CO	††X					
30 Rear Axle Housing Bracket Cap	BR	X					
31 Starting Engine Clutch	CO			††X			
32 Fuel Injection Pump Housing (Earlier Models)	CO			X	X		

Location of Points of Lubrication



*See the Diesel Engine Crankcase Lubricating Oil Change Period Chart.

‡Only when operating in extremely dusty conditions.

††When equipped with starting engine.