

Operating Instructions

and

Field Maintenance

Manual

for

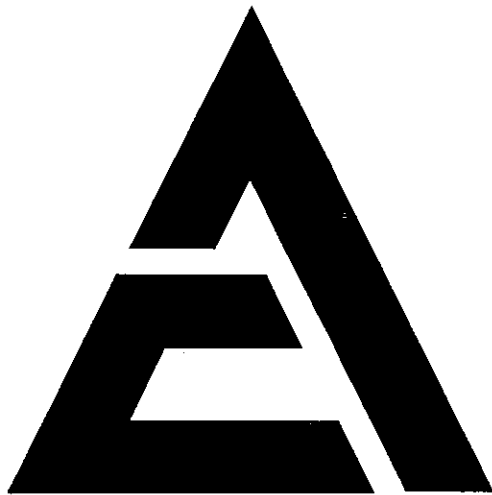
HD-6AG

and

HD-6B

(S/N 13322-UP)

CRAWLER TRACTOR



ALLIS-CHALMERS

**CONSTRUCTION MACHINERY DIVISION
SPRINGFIELD, ILLINOIS 62705**

FORM 0669126-5

AVOID ACCIDENTS

MOST ACCIDENTS, WHETHER THEY OCCUR IN INDUSTRY, ON THE FARM, AT HOME OR ON THE HIGHWAY, ARE CAUSED BY THE FAILURE OF SOME INDIVIDUAL 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 thousand serious injuries each year. That rule is:

Never attempt to clean, oil or adjust a machine while it is in motion.

NATIONAL SAFETY COUNCIL

WARNING

ON MACHINES HAVING HYDRAULICALLY, MECHANICALLY, AND/OR CABLE CONTROLLED EQUIPMENT (SUCH AS SHOVELS, LOADERS, DOZERS, SCRAPERS, etc.) BE CERTAIN THE EQUIPMENT IS LOWERED TO THE GROUND BEFORE SERVICING, ADJUSTING AND/OR REPAIRING. IF IT IS NECESSARY TO HAVE THE HYDRAULICALLY, MECHANICALLY, AND/OR CABLE CONTROLLED EQUIPMENT PARTIALLY OR FULLY RAISED TO GAIN ACCESS TO CERTAIN ITEMS, BE SURE THE EQUIPMENT IS SUITABLY SUPPORTED BY MEANS OTHER THAN THE HYDRAULIC LIFT CYLINDERS, CABLE, AND/OR MECHANICAL DEVICES USED FOR CONTROLLING THE EQUIPMENT.

FOREWORD

This manual provides essential information regarding preparation of crawler tractor for use, instructions for proper operation, routine lubrication, and minor service. Close adherence to these instructions will result in many hours of trouble-free use and longer unit life.

To assure best results and maintain original quality, always use Allis-Chalmers parts; furnish Dealer with crawler tractor serial number when ordering parts.

Many equipment owners employ Dealer's service department for all work other than routine lubrication and minor service. This practice is encouraged, as our Dealers are well informed and equipped to render factory approved service.

This manual may not be reprinted or reproduced, either in whole or in part, without written permission of Allis-Chalmers.

ADDITIONAL PUBLICATIONS AVAILABLE
FOR
MODEL HD - 6AG AND HD-6B (S/N 13322-UP)
CRAWLER TRACTORS

ORDER FROM LOCAL ALLIS-CHALMERS DEALER

DESCRIPTION	SERIAL NO.	FORM NO.			
		ENGLISH	ESPAÑOL (Spanish)	PORTUGUÊS (Portuguese)	FRANÇAIS (French)

<u>Parts Catalogs</u>					
Tractor - - - - -	All	626081	_____	_____	_____
Dozer - - - - -	All	649040	_____	_____	_____
Independent Hydraulic System - -	All	649042	_____	_____	_____
Injection Pump - - - - -	All	643833	_____	_____	_____
Ripper - - - - -	All	649043	_____	_____	_____

<u>Service Manuals</u>					
Dozer - - - - -	All	644308	647070	647071	647495
Electrical System - - - - -	All	664045	_____	_____	_____
Engine - - - - -	All	645120	650407	650408	650409
Engine Clutch - - - - -	All	650396	657932	657933	657934
Final Drive - - - - -	All	650630	656633	656634	656635
Injection Nozzles & Holders - - -	All	657397	_____	_____	_____
Injection Pump - - - - -	All	657398	_____	_____	_____
Service Tools - - - - -	All	650850	_____	_____	_____
Steering Clutches & Brakes - - -	All	648095	656639	656640	656641
Track Frames and Track--15730-UP		645550	650413	650414	650415
Prior to		626145	_____	_____	_____
15730					
Transmission, Bevel Gear, Drive Shaft U-Joint - - - - -	All	650432	656742	656743	656744

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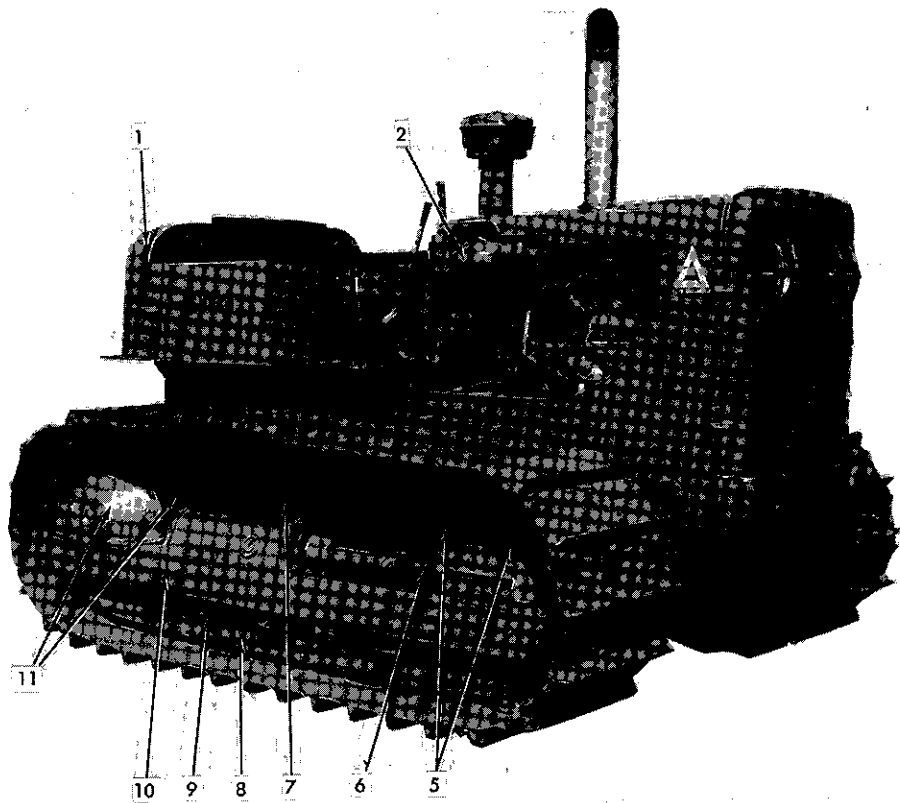
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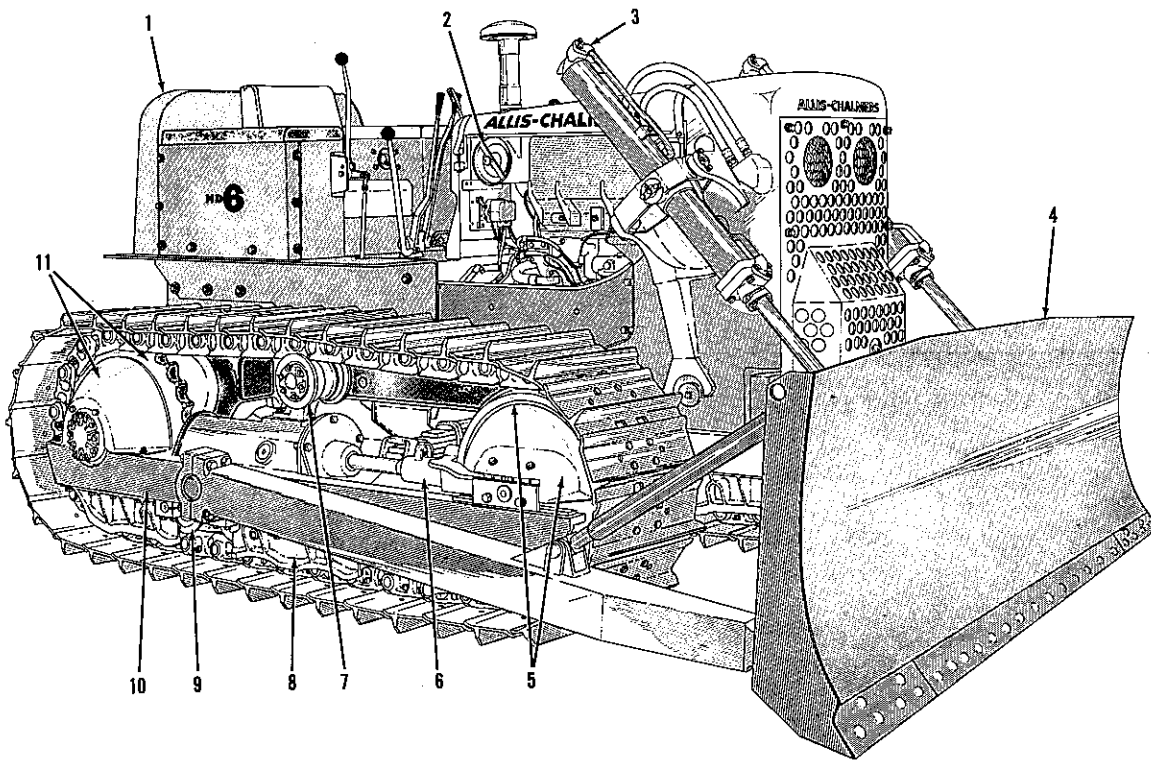
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GENERAL DESCRIPTION



HD-6A6

T-75564



HD-6B

T-73778

FIG. 1 MODEL IDENTIFICATION

Legend for Fig. 1

1. Fuel tank
2. Air cleaner
3. Dozer cylinder (special equipment)
4. Moldboard
- *5. Track idler and guard
6. Track idler yoke
7. Carrier roller
- *8. Track roller guards
9. Track roller
10. Track frame
- *11. Track sprocket and guards

* Guards are special equipment.

The Allis-Chalmers HD-6AG and HD-6B Crawler Tractors are designed to work for you efficiently at the lowest possible operating cost and with the greatest possible ease.

The HD-6AG and HD-6B are equipped with a wide operators seat to increase operators comfort and visibility as well as many other features which will aid you in more efficient and easier operation.

The HD-6AG and HD-6B are powered by an Allis-Chalmers 6000 Series Diesel engine; power from the engine is transmitted to a (standard) five speed, splash lubricated transmission. From the transmission, power is transmitted to the bevel gear and from the bevel gear through the steering clutches to the final drives and drive sprockets.

Your Allis-Chalmers machine is designed for you, the operator.

TRACTOR

DIMENSIONS AND WEIGHT

Shipping weight (approximate) (Tractor only) - - - -	12,600 lbs.	(5707 kg)
Overall length (tractor only)- - - - -	10 ft. 1.8 in.	(3.34 m)
Overall height (with exhaust stack)		
HD-6AG - - - - -	5 ft. 9.7 in.	(1.76 m)
HD-6B - - - - -	5 ft. 8.5 in.	(1.73 m)
Overall width, standard shoes- - - - -	6 ft. 6 in.	(1.98 m)
Ground Clearance		
HD-6AG - - - - -	10.9 in.	(276.8 mm)
HD-6B - - - - -	11.4 in.	(289.5 mm)
Drawbar height (from face of track shoe to center line of jaws)		
HD-6AG - - - - -	1 ft. 1.8 in.	(350.3 mm)
HD-6B - - - - -	1 ft. 7.5 in.	(495.3 mm)
Lateral movement of drawbar		
HD-6AG - - - - -	1 ft. 9 in.	(533.4 mm)
Center of gravity (ahead of sprocket center) - - - -	2 ft. 9.1 in.	(840.7 mm)
Tipping angle (tractor only) - - - - -	59°	

ENGINE

Make - - - - -	Allis-Chalmers diesel	
Model - - - - -	6000	
Type		
HD-6AG - - - - -	4 cycle turbocharged	
HD-6B - - - - -	4 cycle naturally aspirated	
Number of cylinders - - - - -	4	
Bore - - - - -	4.438 in.	(112 mm)
Stroke - - - - -	5.563 in.	(141 mm)
Crankshaft rotation (viewed from fan end)- - - - -	Clockwise	
Number of main bearings - - - - -	5	
Piston Displacement - - - - -	344 cu. in.	(5.6 lt.)
Low idle speed - - - - -	500-600 rpm	
High idle speed- - - - -	1950-1970 rpm	
Governed at full load- - - - -	1800 rpm	

ENGINE CLUTCH

DRY-TYPE

Number of friction plates - - - - -	1
Engaging action - - - - -	Mechanical, over-center

OIL-TYPE

Number of friction discs (bimetallic) - - - - -	4
Number of friction discs (steel) - - - - -	3
Engaging Action - - - - -	Mechanical, over-center

TRANSMISSION

Type- - - - -	Direct drive, sliding gear
Lubrication - - - - -	Wet-sump, splash

MAXIMUM TRACTOR SPEEDS

	Standard Transmission	Optional Transmission
1st Forward - - - - -	1.5 mph (2.4 Km/h)	1.5 mph (2.4 Km/h)
2nd Forward - - - - -	2.4 mph (3.8 Km/h)	2.4 mph (3.8 Km/h)
3rd Forward - - - - -	3.2 mph (5.1 Km/h)	3.3 mph (5.3 Km/h)
4th Forward - - - - -	3.9 mph (6.2 Km/h)	5.5 mph (8.8 Km/h)

5th Forward	- - - - -	5.4 mph (8.6 Km/h)	
1st Reverse	- - - - -	1.9 mph (3.0 Km/h)	2.0 mph (3.2 Km/h)
2nd Reverse	- - - - -		4.1 mph (6.6 Km/h)

STEERING

Method	- - - - -	Clutches	
Controls	- - - - -	Mechanical	
Turning radius	- - - - -	7 ft. 2 in.	(2.18 m)

BRAKES

Method	- - - - -	Band and drum
Controls	- - - - -	Mechanical

FINAL DRIVES - - - - - Double reduction

TRACKS

Tread width (center-to-center of tracks)	- - - - -	5 ft.	(1.52 m)
Length of track on ground (center of track sprocket-to-center of track idler)	- - - - -	5 ft. 6.9 in.	(1.69 m)
Width of standard track shoe	- - - - -	1 ft. 1 in.	(330 mm)
Ground pressure (standard shoe)	- - - - -	7.2 psi	(.63 kg/cm ²)
Track pitch (center of pin-to-next pin)	- - - - -	6.5 in.	(165.1 mm)
Number of track rollers (each track)	- - - - -	4	
Number of track carrier rollers (each track)	- - - - -	1	
Ground contact (standard shoe)	- - - - -	1739 sq. in.	(11219.3 cm ²)

CAPACITIES (APPROXIMATE)

Cooling system	- - - - -	8.5 gals.	(31.2 lt)
Engine crankcase - including standard filter	- - - - -	*4 gals.	(15.14 lt)
Engine clutch (oil type)	- - - - -	2.5 gals.	(9.4 lt)
Air cleaner (oil bath)	- - - - -	.5 gals.	(1.89 lt)
Dozer hydraulic system	- - - - -	6.5 gals.	(24.6 lt)
Final drives (each)	- - - - -	3 gals.	(11 lt)
Fuel tank	- - - - -	40 gals.	(151 lt)
Transmission	- - - - -	5 gals.	(18.9 lt)
Track release housing oil-type (each)	- - - - -	1.25 gals.	(4.7 lt)

* On units having a heavy duty lubricating oil filter (special equipment) add an additional 1 gallon (3.785 lt) of oil after replacement of heavy duty oil filter element.

RIPPER

Weight (less controls)	- - - - -	1350 lbs.	(612 kg)
Overall width	- - - - -	6 ft. 5.5 in.	(1.96 m)
Overall ripping width	- - - - -	6 ft. 5 in.	(1.84 m)
Space (center-to-center of shank)	- - - - -	1 ft. 5.5 in.	(404.5 mm)
Number of shank holes in tool bar	- - - - -	5	
Number of shanks (standard equipment)	- - - - -	3	
Penetration	- - - - -	**8-13-18 in.	(203-330-457 mm)
Length extended behind tracks (raised)	- - - - -	1 ft. 7 in.	(472.6 mm)
Ground clearance under teeth (raised)	- - - - -	1 ft. 5.75 in.	(450.8 mm)

** Adjustable 3 - position shanks

DOZER

DIMENSION AND WEIGHT	6 HS	6 HA
Weight, hydraulic, dozer and tractor complete -----	15,321 lbs. (6949 kg)	15,880 lbs. (7203 kg)
Weight, dozer only - complete---	2116 lbs. (959 kg)	2675 lbs. (1213 kg)
Weight, hydraulic system-----	605 lbs. (274 kg)	605 lbs. (274 kg)
Tractor length		
Blade straight -----	13 ft. 2.25 in. (3.95m)	13 ft. 11 in. (4.24 m)
Blade angled -----	---	16 ft. 2 in. (4.92 m)
Tractor width		
Blade straight -----	8 ft. (2.43 m)	10 ft. 7.62 in. (3.24 m)
Blade angled -----	---	9 ft. 7.62 in. (2.93 m)
Height (with stack) - from face of track shoe -----	5 ft. 8.62 in. (1.74 m)	5 ft. 8.62 in. (1.74 m)
Turning radius - blade straight---	9 ft. 1.87 in. (2.79 m)	10 ft. 4.50 in. (3.162 m)
MOLDBOARD		
Weight-----	989 lbs. (447 kg)	1046 lbs. (473 kg)
Length-----	8 ft. (2.43 m)	10 ft. 7.62 in. (3.24 m)
Height-----	3 ft. 1 in. (939 mm)	2 ft. 4 in. (711 mm)
Angle of cutting edge at ground level -----	50° - 60°	55°
Max. lift above ground-----	2 ft. 8 in. (812 mm)	2 ft. 8 in. (812 mm)
Max. drop below ground-----	1 ft. (304 mm)	1 ft. 3 in. (380 mm)
Max. tilt - either end-----	10 in. (254 mm)	10 in. (254 mm)
Max. pitch adjustment-----	10°	---
Max. angle - either direction---	---	25°
Center cutting edge		
Reversible-----	Yes	Yes
Length-----	5 ft. 5.75 in. (1.66 m)	8 ft. (2.43 m)
Width-----	6 in. (152 mm)	6 in. (152 mm)
Thickness-----	.625 in. (15.9 mm)	.625 (15.9 mm)
End bits		
Length-----	1 ft. 3 in. (380 mm)	1 ft. 3.68 in. (398 mm)
Width-----	6 in. (152 mm)	6 in. (152 mm)
Thickness-----	.75 in. (19 mm)	.75 in. (19 mm)
Interchangeable-----	Yes	No
Replaceable-----	Yes	Yes

SERIAL NUMBER LOCATIONS

Illustrations indicate serial number locations of engine, crawler tractor and other equipment mounted on unit. Engine and crawler tractor serial numbers are also stamped on plate attached to front of cowl; tractor serial num-

ber is also stamped vertically on main housing on right hand side of rear edge. Always give serial numbers in all correspondence to properly identify unit, and assure obtaining correct parts and information.

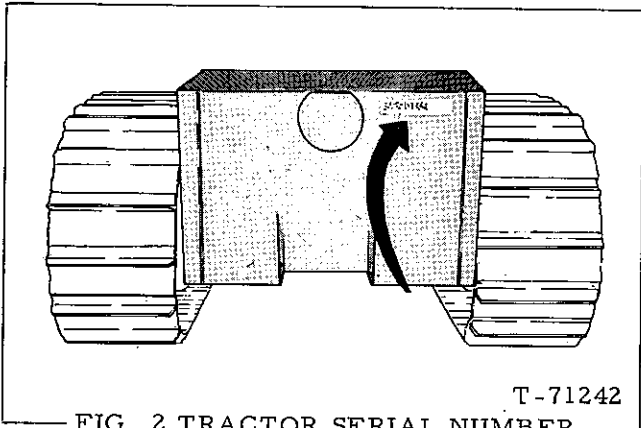


FIG. 2 TRACTOR SERIAL NUMBER

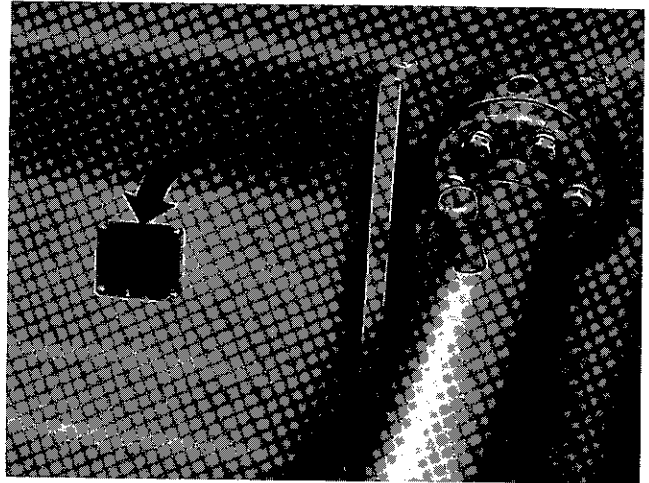


FIG. 4 DOZER SERIAL NUMBER

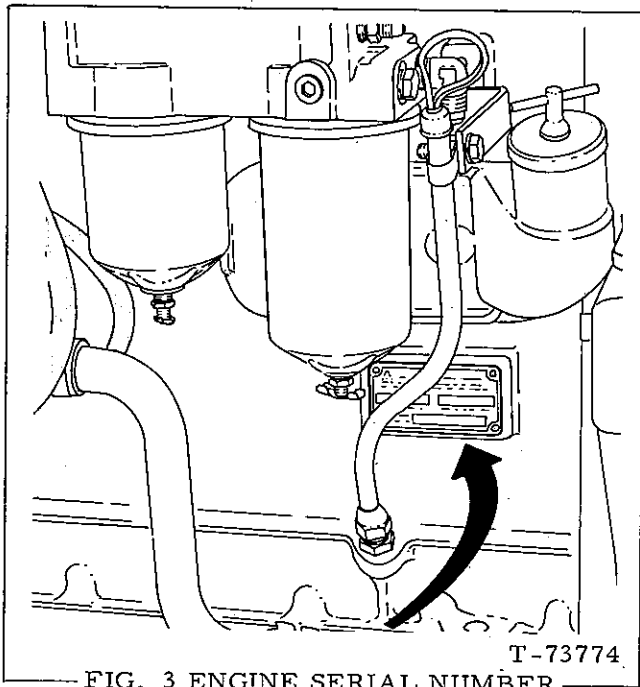


FIG. 3 ENGINE SERIAL NUMBER

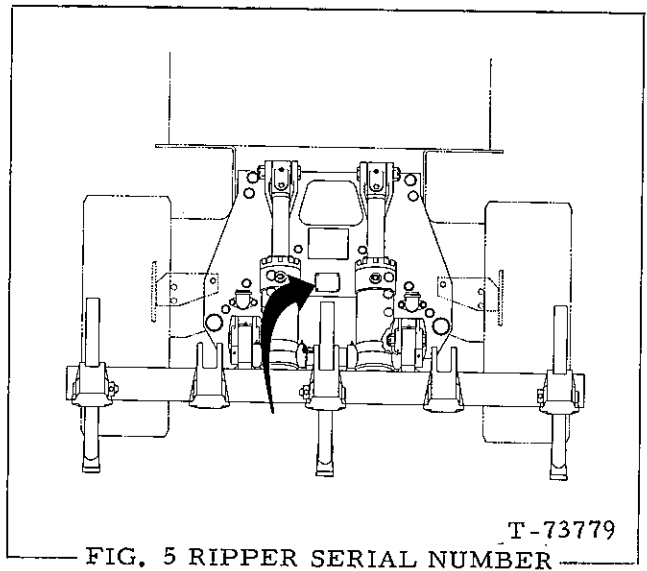


FIG. 5 RIPPER SERIAL NUMBER

RECORD YOUR SERIAL NUMBERS BELOW

TRACTOR SERIAL NO. _____

ENGINE SERIAL NO. _____

DOZER SERIAL NO. _____

RIPPER SERIAL NO. _____

FUEL SPECIFICATIONS AND STORAGE

SPECIFICATIONS

Diesel fuel should be natural distillate petroleum oil and must have certain qualities to ignite and burn at proper rate and temperature. Field experience has shown fuel best suited for this engine closely approximates following specifications:

Gravity API -----	30-35
Viscosity saybolt universal at 100°F. (37.8°C)-----	35-40
Flash point -----	150°F. (65°C)
Diesel index -----	48.5 to 65.5
Cetane number -----	46 to 60
Pour point-----	0°F. (-18°C)
Volatility 90%-----	650°F. max. (358°C)
End point 98% Summer-----	700°F. max. (385°C)
Winter-----	600°F. preferable (341°C)
Sediment and water -----	trace
Ash -----	.02 of 1% max.
Conradson carbon -----	.03 of 1% max.
Sulphur -----	.05 of 1% max.

Pour point of fuel must be at least 10°F. (-12°C) below prevailing atmospheric temperature for satisfactory fuel flow through lines and filters.

API gravity of fuel varies with its specific gravity. Low API fuels are desirable because they have high specific gravity and more heat units per gallon. However, ignition quality of fuel is better with higher API gravity.

Ignition quality of fuel is expressed as a "cetane number". Higher cetane number= higher quality of fuel. Higher cetane fuel shortens ignition delay period to facilitate starting and improve combustion. Diesel index number, which is a close approximation of cetane number, is field method to represent ignition quality.

Distillation 90% point and end point are important. High volatility is required to enable complete vaporization of fuel, clean combustion, and low residue formation.

Flash point of fuel has no quality significance, but is important with respect to safety in fuel storage and handling.

It is important fuel be within specified limits for ash, carbon, water and sediment content, etc. to prevent excessive wear and damage to engine parts.

It is also important fuel has lubricating properties so fuel injection pump and fuel injection nozzles are adequately lubricated. In instances

where fuel with inadequate lubricating properties must be used, one quart (.946 lt.) of SAE 10 engine oil must be added to every 10 gallons (37.8 lt.) of fuel to provide necessary lubrication. Contact fuel supplier and follow his recommendations as to whether or not engine oil should be added to fuel.

CAUTION

Sulphur content of diesel fuel should be as low as possible; fuel should not contain sulphur content of more than one-half of 1%.

Generally speaking, No. 2 diesel fuel purchased from a reputable oil company will meet above specifications.

STORAGE

Importance of proper fuel storage cannot be too strongly stressed. Storage tanks, drums, or service tanks must be free of rust, scale, sediment or any other foreign matter which will contaminate fuel. Contaminated fuel will clog engine fuel filters and eventually damage fuel injection pump and fuel injection nozzles.

Portable storage tanks provide best method for storing fuel on job. In such tanks, sediment and water can easily be drained and fuel can be pumped into fuel tank with minimum handling. Consult Allis-Chalmers Dealer for details about this type of storage tank. Since condensation will occur in storage tank, it is very important a sediment sump be provided in bottom of tank so water and sediment can be drained daily.

Fuel should be allowed to settle at least 48 hours in storage container before being added to fuel tank. It is advisable to use a pump, and draw fuel from storage tank or barrel rather than drain it from bottom of fuel container. Where conditions are such that drums must be used to supply fuel, it is advisable to have enough drums to allow sufficient time for fuel to settle. Fuel thus left in a number of drums can be collected into one drum and used after usual time allowed for settling. In this manner, sediment and foreign matter will be disposed of and no fuel will be wasted. Drums which are used for fuel storage should be covered or placed under shelter so fuel will not become contaminated by water, which will enter through filler plugs when it rains even though plugs are tight.

Fuel tank of unit should be filled at end of day's run rather than at start; this will reduce water content, as a full tank is less subject to condensation.

LUBRICANT SPECIFICATIONS

IMPORTANT: The lubricant distributors and/or suppliers are to be held responsible for the results obtained from their products. Procure lubricants from distributors and/or suppliers of unquestioned integrity, supplying known and tested products. Do not jeopardize your equipment with inferior lubricants. No specific brands of oil are recommended. Use only products qualified under the following oil viscosity specifications and classification and recommended by reputable oil companies.

ENGINE CRANKCASE (SYMBOL EO)

Only "Series 3" or "Service DS" oils as classified by the American Petroleum Institute (API) or oils meeting Military Specification "MIL-L-45199A", are specified for use in the engine crankcase. Use oils with a high ash content rather than ashless or half-ashless oils (refer to ENGINE CRANKCASE LUBRICATING OIL RECOMMENDATIONS).

Use oils of the following viscosities:

ATMOSPHERIC TEMPERATURE	VISCOSITY
32°F. (0°C) and above	Use SAE 30
0°F. to 32°F. (-18°C to 0°C)	Use SAE 20W
*0°F. (-18°C) and below	Use SAE 10W

*Below minus 20°F. (-28°C), a means of warming the engine and batteries is recommended to obtain satisfactory starting and to prevent damage to the engine.

DOZER AND RIPPER HYDRAULIC SYSTEM (SYMBOL HO)

Oil for use in the hydraulic system must meet the following specifications:

1. American Petroleum Institute (API) Classification "SERVICE MS" meeting or exceeding the five engine test sequences.
2. Military Specifications "MIL-L-2104B".

ATMOSPHERIC TEMPERATURE	VISCOSITY
100°F. (37°C) and below	Use SAE 10W
100°F. (37°C) and above	Use SAE 20-20W

Oils used in hydraulic system perform the dual function of lubrication and transmission of power. Oil must be selected with care and with the assistance of a reputable supplier.

Crankcase oils meeting or exceeding the "Five Engine Test Sequence" for evaluating oils for API (American Petroleum Institute) service MS (Maximum Severity) best serve the needs of the hydraulic system. These engine sequence tests are adopted by the Society of Automotive Engineers, American Society for Testing Materials and automotive engine builders. The MS classification is the key to selection of oils containing the type of compounding that will extend the operating life of the hydraulic system by providing additional resistance to wear, scuffing, corrosion and rusting. Oils in "Service DG through DS" classifications, may or may not have the type of compounding required for MS classification and desired for high performance hydraulic systems.

ENGINE CLUTCH OIL-TYPE; TRANSMISSION AND BEVEL GEAR SYSTEM (SYMBOL TF)

Specified oil is SAE 10W crankcase oil meeting the following specifications:

1. Transmission Fluid "Type C-1".
2. American Petroleum Institute (API) classification "Service MS".
3. Military Specification "MIL-L-2104A" or "MIL-L-2104B" Grade 10W.

Automatic Transmission Fluid "Type A - Suffix A" may be used if desired.

API classification "Service DS" or "Series 3" oil is not recommended.

When atmospheric temperature is below -10°F. (-23°C), Automatic Transmission Fluid "Type A-Suffix A" or a lubricating oil meeting Military Specification "MIL-L-10295A OES" MUST be used.

CAUTION

Do not use "MIL-L-10295A OES" if atmospheric temperature remains consistently above -10°F. (-23°C).

FINAL DRIVE HOUSING; TRACK RELEASE HOUSING OIL-TYPE (SYMBOL RGL)

Use a good quality Regular Gear Oil.

CAUTION

Do not use Extreme Pressure (EP) Gear Oil.

Use oils of following viscosities:

ATMOSPHERIC TEMPERATURE	VISCOSITY
Above 32°F. (0°C)	SAE 90 Gear Oil
32°F. (0°C) and below	SAE 80 Gear Oil

TRACK ROLLERS, TRACK IDLERS, AND TRACK CARRIER ROLLERS (SYMBOL TRL)

Track rollers, track idlers, and track carrier rollers contain positive type seals. These

assemblies are filled with lubricant at time of assembly and do not require additional servicing unless removed for rebuild. If any above assemblies are removed for disassembly and rebuild, they must be lubricated (when reassembled) with NLGI#0 calcium soap base grease. Refer to Service Manual Form 645550 for detailed information.

PRESSURE GUN LUBRICANT (SYMBOL PGL)

Use ball and roller bearing lubricant with minimum melting point of 300°F. (149°C). Lubricant should have a viscosity range to assure easy handling in lubricating gun at prevailing atmospheric temperature and **MUST** be waterproof. Use this pressure gun lubricant whenever pressure type lubricating fittings are provided.

ENGINE CRANKCASE LUBRICATING OIL RECOMMENDATIONS

1. GENERAL

Major oil companies recognize the importance of the lubricant quality required for satisfactory performance in present day high - output diesel engines. They are co-operating fully to assure the use of only those oils which will fill the following requirements:

- a. Maintain pistons, rings and other working parts in a carbon free, varnish free and clean condition.
- b. Maintain enough body to satisfactorily lubricate the moving parts at maximum oil temperatures.
- c. Prevent bearing corrosion. Counteract corrosive products of combustion and sulphur in fuel.
- d. Promote general cleanliness within the engine.

Oils represented as "Service DS" or "Series 3" from the various oil distributors and/or suppliers may or may not provide equal levels of performance in the various models and applications of diesel engines.

Some "Service DS" and "Series 3" oils may have a performance level in our engines in some applications that will require more frequent oil and filter change periods, or possibly a change to another brand of oil to acquire the desired performance level.

2. ASHLESS OR HALF ASHLESS OILS

Some major oil companies have developed

so-called ashless or half ashless "Service DS" or "Series 3" diesel engine lubricating oils to help decrease valve face and seat deposits. Such oils may be useful in diesel engines that are susceptible to premature valve failures due to this condition. However, Allis-Chalmers diesel engines in general are not particularly sensitive to valve face and seat deposits and benefit most from the use of lubricants that have been found to resist ring sticking and liner scuffing. In this connection, laboratory tests on our engines indicate that "Service DS" and "Series 3" lubricants containing metallic additives provide considerably more resistance to piston ring sticking and liner scuffing than do the so-called ashless or half ashless oils. For this reason, it is recommended that oils with high ash content, rather than the ashless or half-ashless oil, be used in our diesel engines.

3. OIL IN ENGINE SHIPPED FROM FACTORY

All diesel engines manufactured by Allis-Chalmers are tested on the dynamometer with SAE 20 engine crankcase lubricant meeting American Petroleum Institute (API) Diesel Classification "Service DS" or "Series 3" (with metallic additives only). This oil remains in the crankcase when shipped from the factory and need not be changed until the first regular oil change under normal ambient temperature conditions. Any make up oil required should be of the same type and viscosity. However, it is not necessary to use oil from the same oil company for make up oil prior to first oil change.

4. POINTS TO HELP LENGTHEN LUBRICATING OIL LIFE

- a. Use quality fuels meeting our published specifications particularly sulphur content.
- b. Adequate combustion chamber cooling by idling engines 3 to 4 minutes before shut-down.
- c. Maintaining proper oil level. Avoid over-filling as well as low level.
- d. Proper attention to air cleaner service and prevention of leaks in air intake system.
- e. Engine adjustment:
 - (1) Correct fuel settings.
 - (2) Fuel injection pump timing.
 - (3) Valve clearance settings.
- f. Cleanliness with lubricating oil, oil containers, oil storage facilities, and oil filler caps and pipes on engine.
- g. Proper attention to entire cooling system including removal of anti-freeze and thorough flushing of system with suitable flushing compound for summer operation. Maintaining fan belts and water pump drive belts in correct adjustment and keeping radiator surfaces free of debris.

5. CRANKCASE LUBRICATING OIL CHANGE INTERVAL

We recommend 100 hour oil and filter change periods with the following qualifications:

The quality of the oil, the additive compounds used, and the additive quantity in various brands of lubricating oils affect their performance levels. Under severe operating conditions, with engines in poor mechanical condition or when using high sulphur fuels, lubricating oils will deteriorate at a faster rate. For these reasons oil change periods can vary.

The condition of the lubricating oil at any given time is the only true measure of whether or not it should be replaced. Actual laboratory analysis

of the used crankcase oil in any particular engine application at 10 to 20 hour intervals after 100 hours use will determine the condition of the oil and will dictate whether the oil change periods should be extended or reduced.

Most major lubricant suppliers provide this oil testing service on a gratis basis. We recommend that our users take advantage of this service, not only for the protection of our engines, but also to realize maximum safe use from the lubricating oils.

6. OIL TESTING PROCEDURE

It is most important that crankcase oil samples for laboratory testing be correctly taken from the engines to ensure an accurate analysis.

Any oil sample should be taken with the engine oil at normal operating temperature.

The sample preferably should be taken from oil circulating within the oil passages in the engine. If the sample is drawn from the oil pan, it should never be drained from the bottom of the pan. It can be sucked out of the pan through the dipstick hole with a suitable hand pump equipped with a small enough suction tube to enter the dipstick hole. If taken in this manner, be sure the engine is running and the suction tube is not inserted into the pan below the low level oil mark on the dipstick.

Do not take an oil sample from an engine immediately after adding make-up oil to the crankcase. Either delay until the make-up is thoroughly mixed with the old crankcase oil or take the sample prior to adding the make-up oil.

Be sure the containers, pump, etc. are absolutely clean when taking the oil samples and be sure the container is properly sealed after the sample is taken. A sample that is contaminated by dirty containers or equipment will give a false laboratory analysis.

Generally, a one quart/liter sample is all that is required, but check with the oil company or laboratory making the analysis to determine the exact quantity they require.

PREPARATION FOR USE

New units shipped from factory have fuel tank cap breather taped closed to retain rust preventive vapor placed in tank at factory for shipping purposes only. This tape must be removed and discarded before fuel tank is filled and unit is placed in service. It is not necessary to drain this fuel mixture before filling fuel tank.

Fill fuel tank with specified fuel. Use care to prevent entrance of dirt or foreign matter while filling tank. Fuel injection pump and governor, as set at factory permits operation of units with naturally aspirated engines at altitudes up to 2,500 feet (762 m) above sea level; units with turbocharger are set for 10,000 feet (3048 m) above sea level. If unit is to be operated above these limits, contact Allis-Chalmers Dealer and have necessary high altitude adjustments made.

Be certain engine crankcase; transmission and bevel gear system; final drives; oil-type track release housing; and all hydraulic systems are filled to proper level with specified lubricants. Lubricate all points where lube fittings are provided. Refer to LUBRICATION AND SERVICE INSTRUCTIONS for detailed information.

Start engine and observe all instruments and gauges for proper pressures.

Operate controls and check for proper operation.

Stop engine and check hoses, lines, and fittings for oil leakage; tighten connections if necessary.

Cooling system of unit is filled at factory with a 50/50 mixture of water and Permanent-Type (glycol-base) anti-freeze for protection to -30°F . (-34°C); it is not necessary to drain this solution before placing unit in service.

NOTE: Before placing unit in service, always test cooling system solution and add Permanent-Type antifreeze to provide additional protection (if necessary) for prevailing or anticipated temperature.

Operate unit with light load for first 60 hours. Efficient engine operation is obtained with engine coolant temperature held within normal operating range. Operating engine with coolant temperature below this range will result in incomplete combustion of fuel, higher fuel consumption with less power, and will cause harmful gummy deposits within engine.

Inspect entire machine after first 10 hours of operation. Tighten all loose bolts and check adjustment of all controls, brakes and tracks. Torque all track shoe bolts to 100 to 120 lbs. ft. (13.83 to 16.59 kg-m); tightening these bolts at this time and again at end of 60 hours will minimize possibility of their becoming loose.

PREPARATION FOR STORAGE

If unit is to be stored during winter or slack season, make complete inspection of unit for loose, worn, or damaged parts; make necessary repairs before unit is stored. Drain engine crankcase and all other oil compartments and refill with new oil. To protect fuel injection system, drain fuel tank, then pour about 15 gallons (56.7 lts.) of a mixture of 40% mineral oil and 60% of best grade kerosene in fuel tank; run engine 15 minutes to circulate mixture through fuel system. This will leave fuel system filled with the mixture and prevent corrosion or gumming of working parts. Major oil companies can supply this storage fuel mixture.

After unit has been stored, fill fuel tank with

specified diesel fuel to minimize condensation in tank.

Storage fuel need not be drained when unit is again placed in service.

Clean and oil dozer moldboard and ripper teeth.

Remove and clean batteries; store in cool dry place. Test batteries once a month and recharge if necessary to prevent freezing (refer to ELECTRICAL SYSTEM).

Drain cooling system, or fill with an anti-freeze solution that will withstand lowest anticipated temperature. Cover exhaust pipe.

LUBRICATION AND SERVICE GUIDE

Service Interval	*Service Point	Description of Service	No. of Points	Type of Lubricant
Each 10 Hours	1	Engine Crankcase - Check oil level	1	EO
	2	Air Cleaner - Check restriction indicator or pre-cleaner	1	
	3	Radiator - check coolant level	1	
	4	Batteries - check electrolyte level	12	
	5	Dozer hydraulic tank - check oil level	1	
	6	Hydraulic track adjuster piston seal (early type) - lubricate	1	PGL
	6A	Engine clutch shaft rear bearing (dry-type) - lubricate	1	PGL
	7	Engine clutch shifting sleeve ball bearing (dry-type) - lubricate	1	PGL
	8	Steering clutch throwout bearings - lubricate	2	PGL
	9	Dozer cylinder piston rod assemblies -lubricate	2	PGL
	10	Dozer cylinder piston rod universal assemblies (early models) - lubricate	2	PGL
	11	Dozer cylinder yoke assemblies - lubricate	8	PGL
	12	Ripper hydraulic cylinders - lubricate	6	PGL
	13	Ripper frame connecting bolts - lubricate	2	PGL
	14	Fuel filters - drain sediment	2	
15	Fuel tank - drain sediment and fill tank	2		
Each 100 Hours	16	Final drives - check oil level	2	RGL
	17	Transmission and bevel gear housings - check oil level	1	TF
	18	Engine clutch oil tank - check oil level	1	TF
	18A	Engine clutch shifting sleeve - lubricate	1	PGL
	19	Engine clutch housing breather (dry-type) - clean	1	
	20	Engine crankcase - change oil	1	EO
21	Engine oil filter - replace element	1		
Each 200 Hours	22	Track release housing - check oil level	2	RGL
	23	Fan bearings - lubricate	1	PGL
	24	Fan belt tightener bearing - lubricate	1	PGL
	25	Generator oil cups - lubricate	2	EO
	26	Water pump bearings - lubricate	1	PGL
	27	Straight dozer moldboard tilt braces - lubricate	4	PGL
	28	Straight dozer moldboard diagonal braces - lubricate	2	PGL
	29	Angle dozer moldboard upper struts - lubricate	4	PGL
Each 500 Hours	30	Brake pedal levers - lubricate	2	PGL
	31	Drive shaft universal joint - lubricate	2 or 3	PGL
	32	Dozer hydraulic pump universal joint assembly - lubricate	2	PGL
	33	First and second stage fuel filters - replace elements	2	
	34	Dozer hydraulic system filter - replace element	1	
	35	Dozer hydraulic system - change oil and flush	1	HO
	36	Final drive compartments - change oil	2	RGL
Each 1000 Hours	37	Transmission and bevel gear housings - change oil	1	TF
	38	Engine clutch oil tank - change oil	1	TF
	**39	Engine clutch oil filter - replace	1	
	40	Engine clutch housing breather (oil-type)-clean	1	
	41	Engine clutch oil pump suction line screen-clean	1	

*Numbers do not conform to similar numbers on the Service and Lubrication guide attached to unit.

**Initial change at 50 hours

Lubricant Key - Refer to LUBRICANT SPECIFICATIONS

EO-Engine Crankcase Oil

HO-Hydraulic Oil

RGL-Regular Gear Oil

TF-Transmission Fluid

PGL-Pressure gun lubricant

LUBRICATION AND SERVICE INSTRUCTIONS

GENERAL INFORMATION

WARNING

Always lower moldboard or ripper to ground as a safety precaution when making adjustments or servicing unit.

Lubrication is an essential part of preventive maintenance, controlling to a great extent the useful life of the unit. Different lubricants are needed and some components in the unit require more frequent lubrication than others. Therefore, it is important that the instructions regarding types of lubricants and the frequency of their applications be explicitly followed. Periodic lubrication of the moving parts reduces to a minimum the possibility of mechanical failures.

To prevent minor irregularities from developing into serious conditions that might involve shutdown and major repair, several other services or checks are recommended for the same intervals as the periodic lubrication. The purpose of these services or checks, which require only a few minutes, is to assure the uninterrupted operation of the unit by revealing the need for adjustment caused by normal wear.

Thoroughly clean all fittings, caps, plugs, etc. before servicing to prevent dirt from entering while performing the service.

Lubricants should be at operating temperature when draining for oil changes.

Oil systems equipped with an oil level gauge rod having "Operating Range" marks, are safe to operate when oil level is anywhere within "Operating Range".

After refilling systems at oil change intervals, the oil level should be checked. Run engine at low idle speed for a few minutes to insure that oil cooler, filter, lines, etc. are fully charged before oil level check is made.

Units equipped with oil-type engine clutch, change engine clutch filter after first 50 hours of operations on new unit or after major repairs to applicable components.

NOTE: Oil levels will raise higher within "Operating Range" on oil level gauge rods (due to expansion of oil) after unit has been placed in service and operating temperatures have stabilized.

The various hour intervals are based on normal operation; perform the services more often as necessary when operating under severe or abnormal conditions.

10-HOUR SERVICES

CHECK

1. **ENGINE CRANKCASE - OIL LEVEL**
With engine stopped, remove crankcase oil level gauge rod, Fig. 6, and check oil level. Add oil, through crankcase oil filler pipe if necessary, until oil is even with FULL mark on gauge rod. Engines S/N 6-25469 - Up may be checked with engine running or stopped. Be certain correct side of oil level gauge rod is read when making check. Do not operate engine if oil level is below ADD mark or above FULL mark.

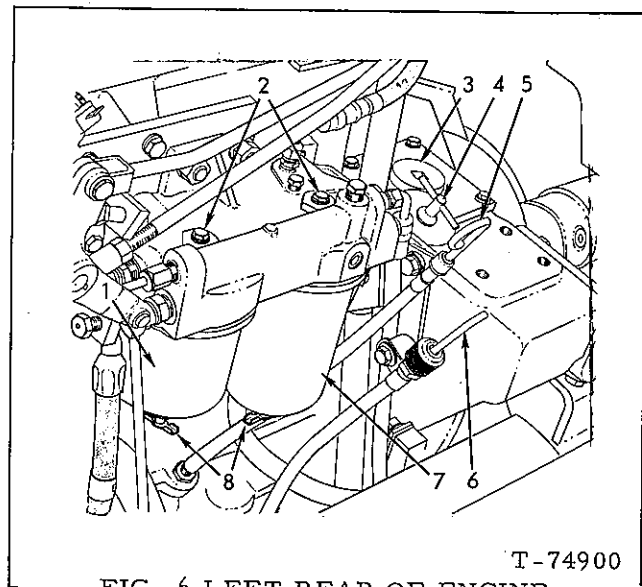


FIG. 6 LEFT REAR OF ENGINE

1. Second stage fuel filter
 2. Vent screws
 3. Engine clutch oil filler plug
 4. Crankcase oil filler closure assembly
 5. Engine crankcase oil level gauge rod
 6. Engine clutch oil level gauge rod
 7. First stage fuel filter
 8. Drain cocks
2. **AIR CLEANER RESTRICTION INDICATOR**
On units equipped with dry-type air cleaner and air cleaner restriction indicator located on cowl, service element immediately when red indicator reaches top and locks in posi-

tion. Reset indicator after servicing element. Units with dry-type air cleaner and no air restriction indicator, service element after every 100 hours of operation or more often if poor, erratic engine performance or smoking condition indicates clogged element. Units equipped with oil bath air cleaner, check pre-cleaner dust level and oil cup. Refer to AIR CLEANER for complete service information.

3. RADIATOR -COOLANT LEVEL

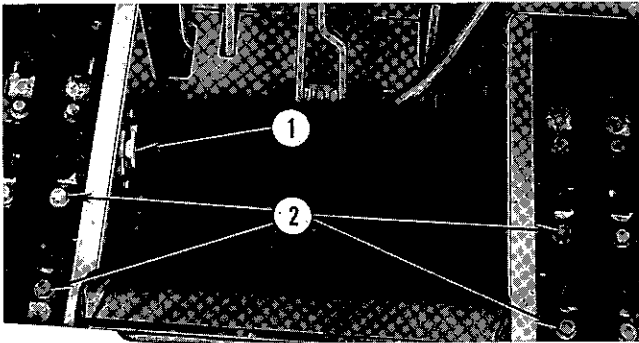
Remove radiator cap and check coolant level. Maintain coolant level approximately 1" (25.4 mm) below bottom of filler neck. Refer to ENGINE COOLING SYSTEM for additional information.

WARNING

Do not remove pressure type radiator cap when engine temperature gauge hand is in upper portion of gauge as coolant will break into boil and splash on person removing cap.

4. BATTERIES-ELECTROLYTE LEVEL

Batteries are located one on each side of seat. Remove filler caps, Fig. 7, and inspect electrolyte level. Add clean distilled water to keep the level .38" (9.65 mm) above plates. Keep tops of batteries clean and terminals free from corrosion. Test the batteries with a hydrometer periodically; refer to ELECTRICAL SYSTEM for detailed information.



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FIG. 7 BATTERIES INSTALLED

1. Master switch
2. Filler caps

5. DOZER HYDRAULIC TANK - OIL LEVEL

Remove oil level and filler plug, Fig. 8; check oil level. Add oil, if necessary to raise oil level even with plug opening.

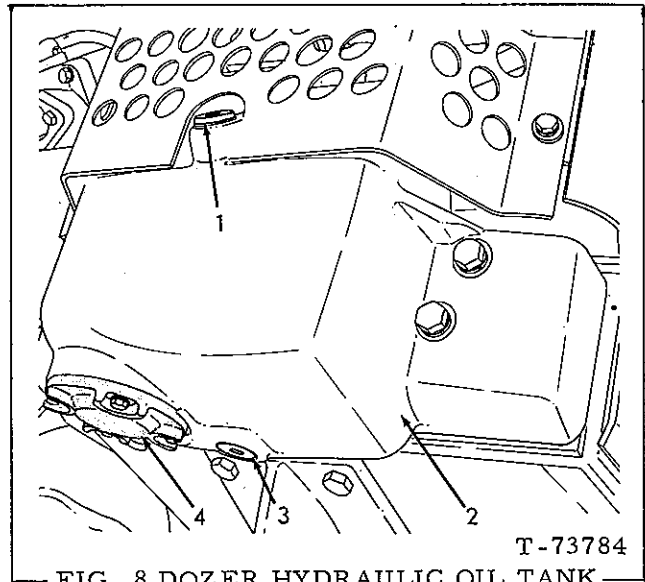


FIG. 8 DOZER HYDRAULIC OIL TANK
(late units)

- | | |
|------------------------------|---------------|
| 1. Oil level and filler plug | 3. Drain plug |
| 2. Tank | 4. Filter cap |

LUBRICATE

IMPORTANT: Unless specifically stated otherwise, use pressure gun lubricant and a hand type lubricating gun.

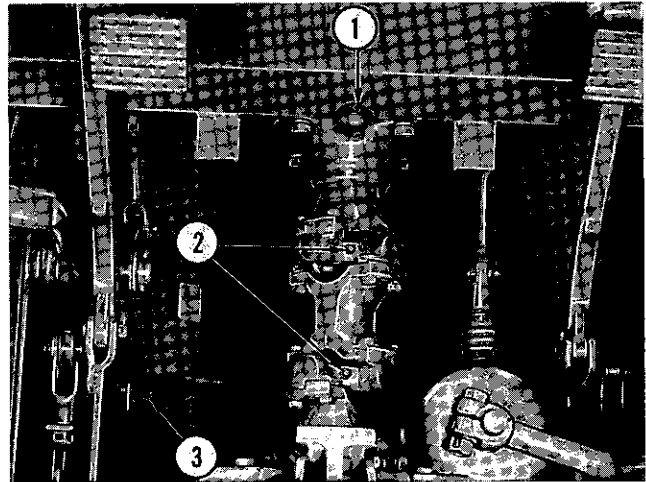
6. HYDRAULIC TRACK ADJUSTER PISTON SEAL (EARLY TYPE)

One lube point, Fig. 52; 2 to 4 shots.

Refer to "UNDERCARRIAGE" for detailed information.

6A. ENGINE CLUTCH SHAFT REAR BEARING (DRY-TYPE CLUTCH)

One lube point, Fig. 9; 6 to 14 shots.



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FIG. 9 DRIVE SHAFT UNIVERSAL JOINT

1. Engine clutch shaft rear bearing lube fitting
2. Universal joint lube fittings
3. Brake lever lube fitting (one each side)