

Operating Instructions

and

Field Maintenance

Manual

for

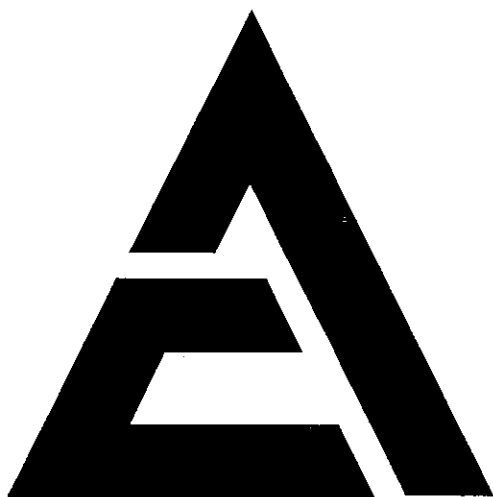
HD-6AG

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 - 6A 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 15730		626145	_____	_____	_____
Transmission, Bevel Gear, Drive Shaft U-Joint - - - - -	All	650432	656742	656743	656744

TABLE OF CONTENTS

SPECIFICATIONS

General Description	4
Serial Number Locations	9
Fuel Specifications and Storage	10
Lubricant Specifications	11
Engine Crankcase Lubricating Oil Recommendations	12

CRAWLER TRACTOR PREPARATION

Preparation for Use	14
Preparation for Storage	14

LUBRICATION

Lubrication and Service Guide	15
Lubrication and Service Instructions	16
Periodic Services and Adjustments	23

OPERATING INFORMATION

Operating Controls and Instruments	24
Operating Instructions	26
Operating Tips	30

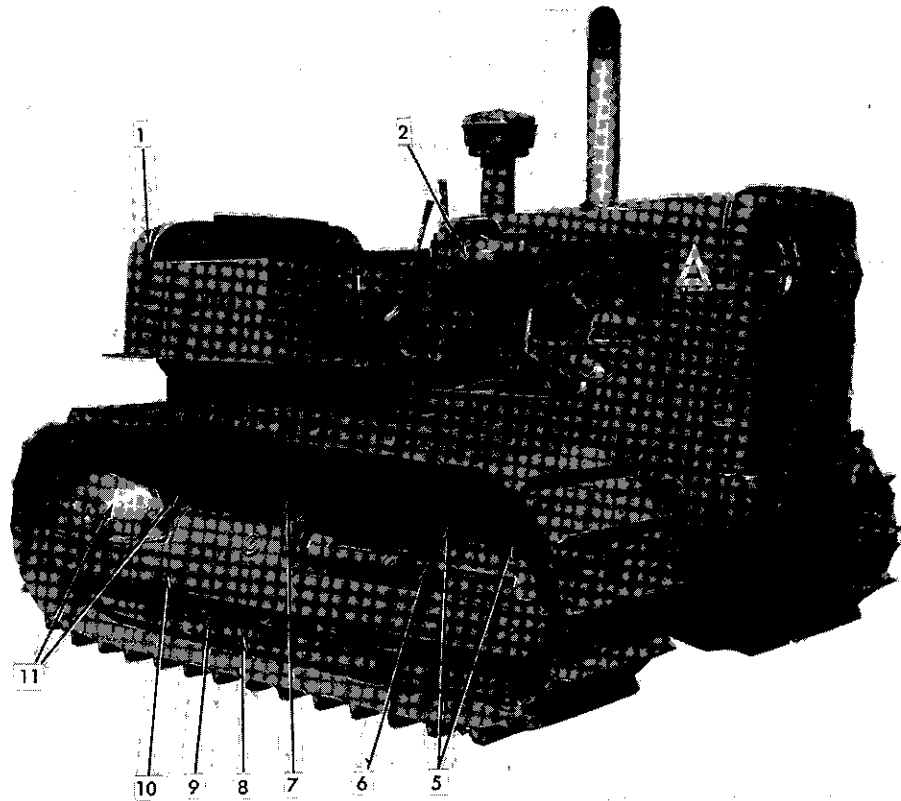
DETAILED MAINTENANCE INFORMATION

Engine Cooling System	34
Engine Lubrication System	37
Fuel System	40
Electrical System	44
Air Cleaner	45
Engine Control Linkage	52
Engine Clutch and Clutch Brake	55
Transmission	57
Steering Clutches and Brakes	58
Undercarriage	60
Dozer Hydraulic System	62

ALPHABETICAL INDEX	64
------------------------------	----

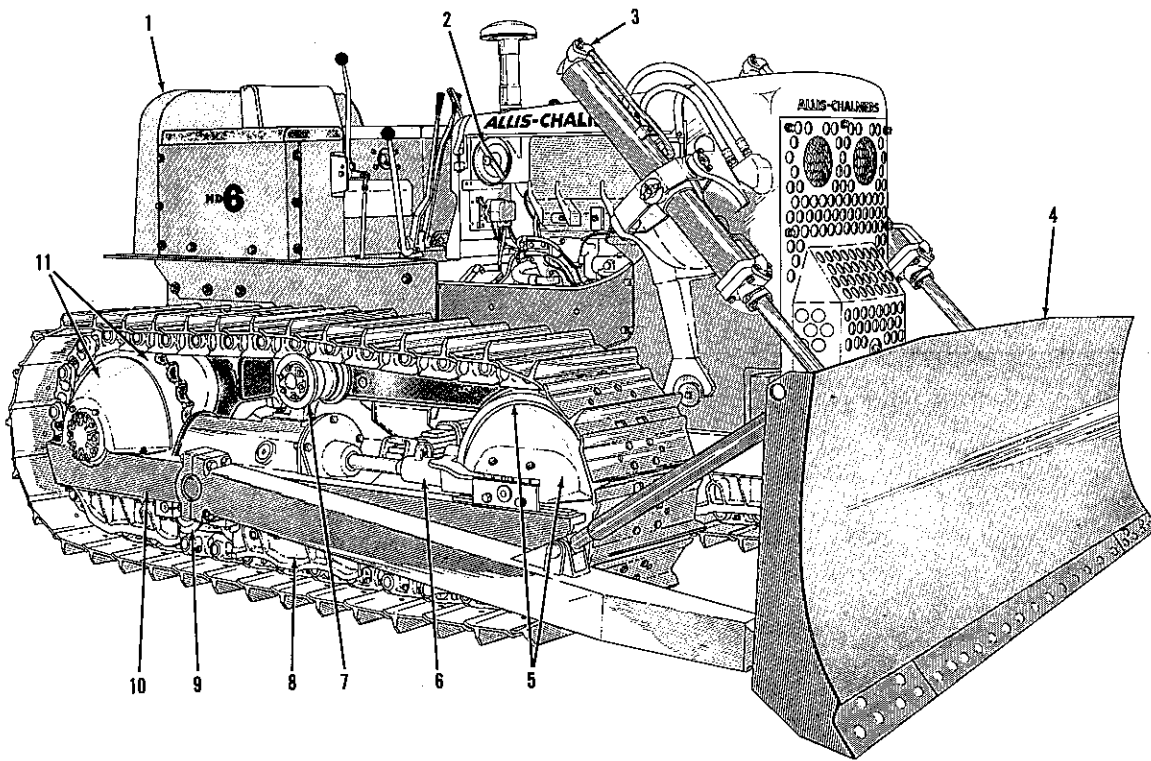
WEIGHT OF VARIOUS MATERIALS	Back Cover
---------------------------------------	---------------

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

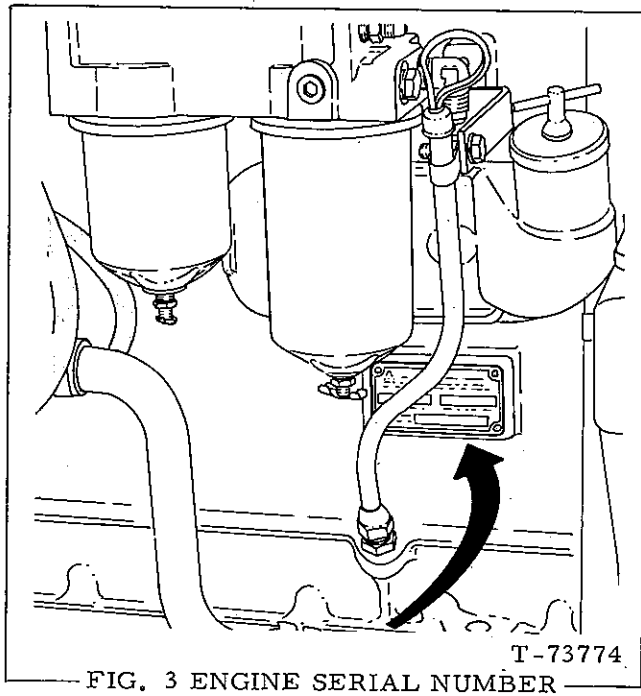
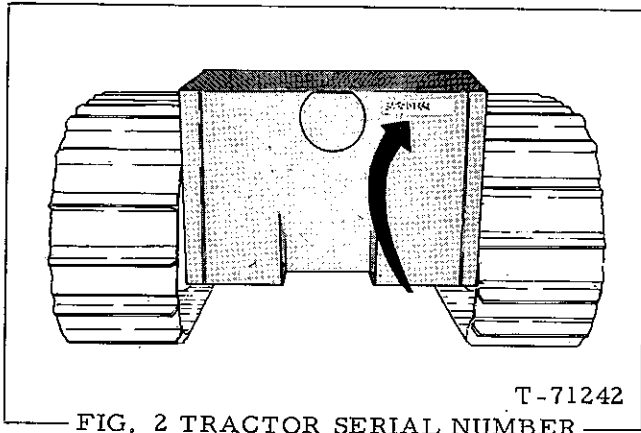
DOZER

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.

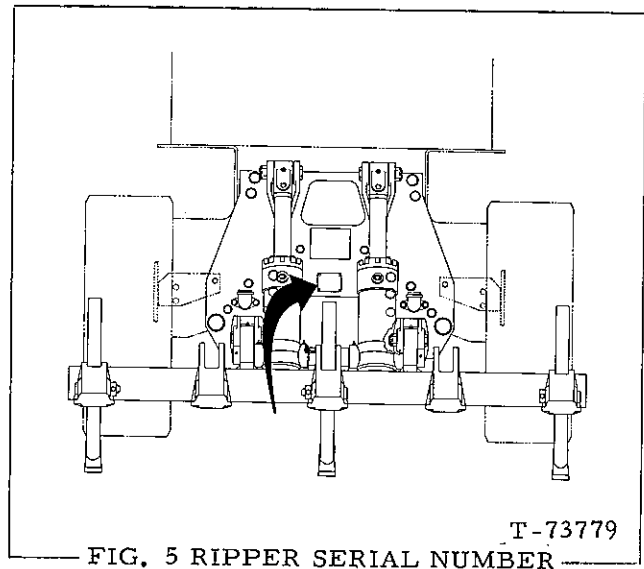
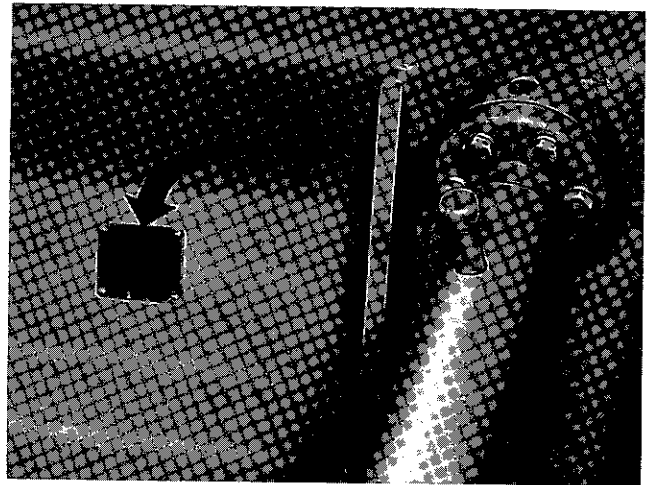


RECORD YOUR SERIAL NUMBERS BELOW

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:

- Maintain pistons, rings and other working parts in a carbon free, varnish free and clean condition.
- Maintain enough body to satisfactorily lubricate the moving parts at maximum oil temperatures.
- Prevent bearing corrosion. Counteract corrosive products of combustion and sulphur in fuel.
- 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
	30	Brake pedal levers - lubricate	2	PGL
	31	Drive shaft universal joint - lubricate	2 or 3	PGL
Each 500 Hours	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
Each 1000 Hours	36	Final drive compartments - change oil	2	RGL
	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.

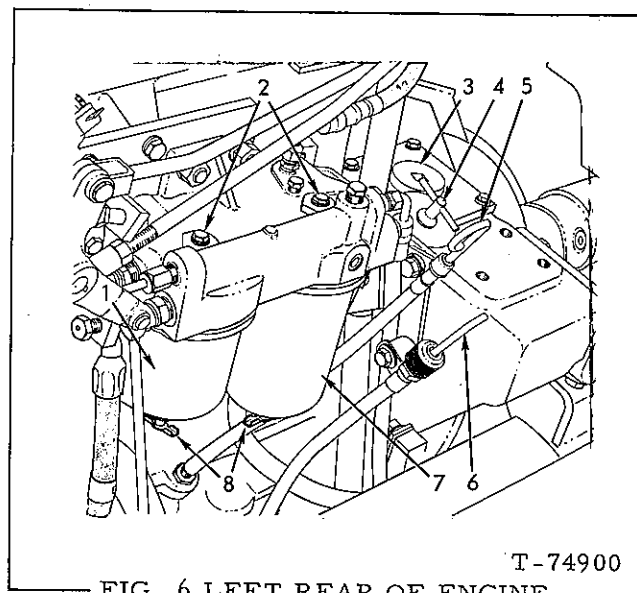


FIG. 6 LEFT REAR OF ENGINE

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

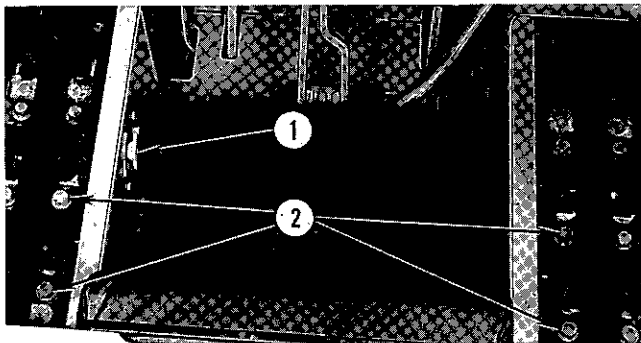
Remove radiator cap and check coolant level. Maintain coolant level approximately 1" (25.4 mm) below bottom of filler neck. Refer to ENGINE COOLING SYSTEM for additional information.

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.



T-27231

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.

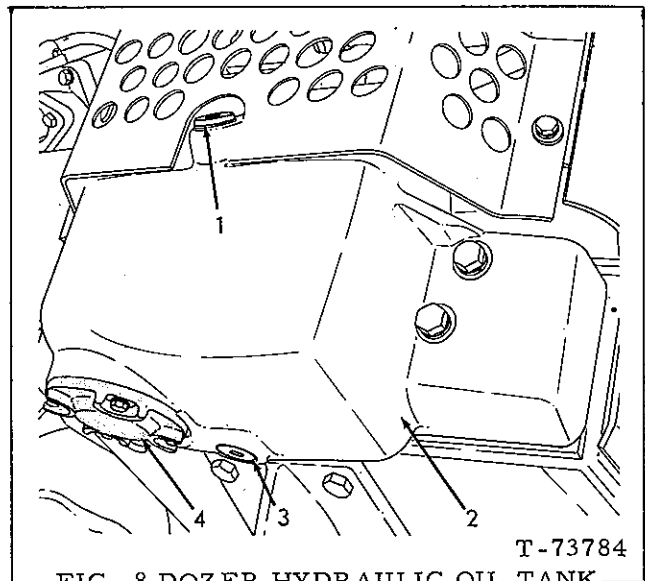


FIG. 8 DOZER HYDRAULIC OIL TANK
(late units)

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

LUBRICATE

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

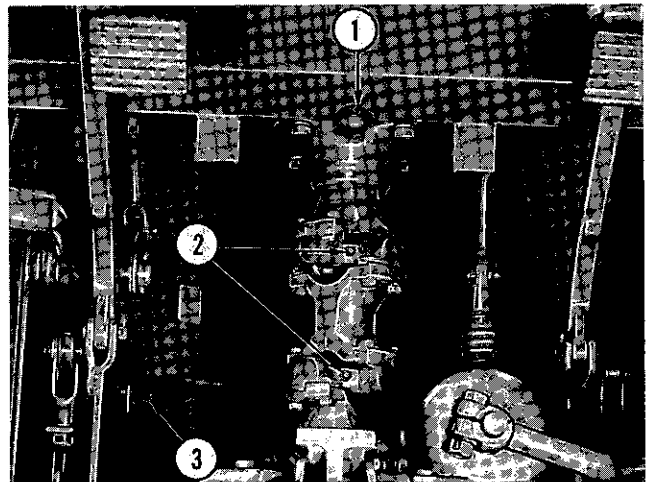
6. HYDRAULIC TRACK ADJUSTER PISTON SEAL (EARLY TYPE)

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.

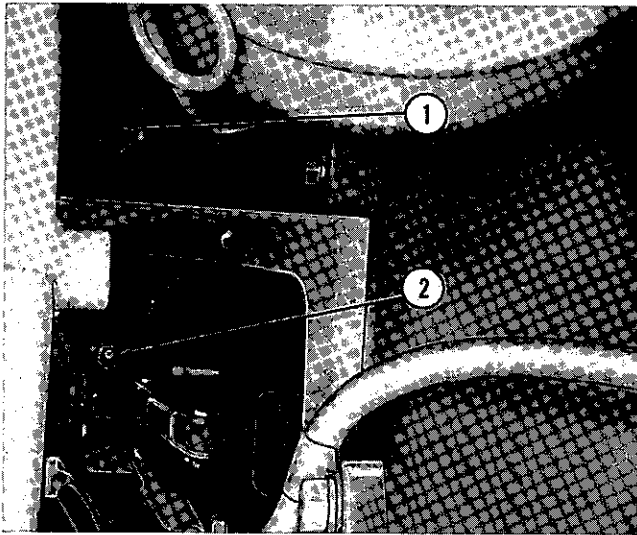


T-27245

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)

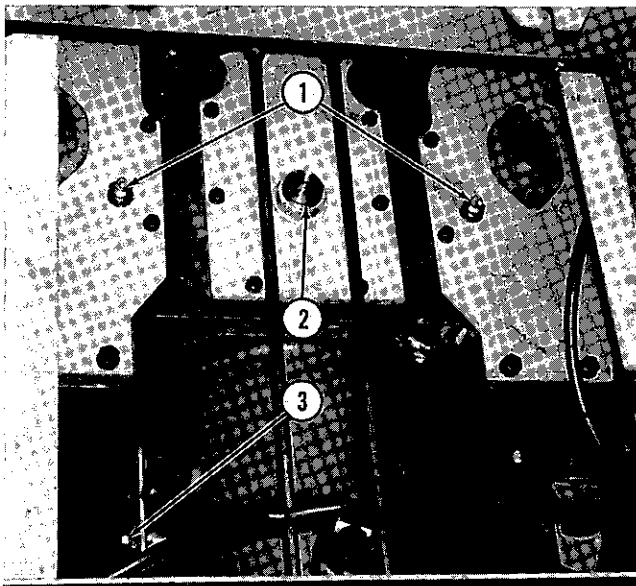
7. ENGINE CLUTCH SHIFTING SLEEVE BALL BEARING (DRY-TYPE CLUTCH)
One lube point, Fig. 10; 6 to 14 shots.



T-27244

FIG. 10 UPPER RIGHT SIDE OF CLUTCH HOUSING (DRY-TYPE)

1. Engine clutch shifting sleeve ball bearing lube fitting
 2. Engine clutch shifting sleeve lube fitting
8. STEERING CLUTCH THROWOUT BEARINGS
Two lube points, Fig. 11; 3 to 5 shots each.



T-75441

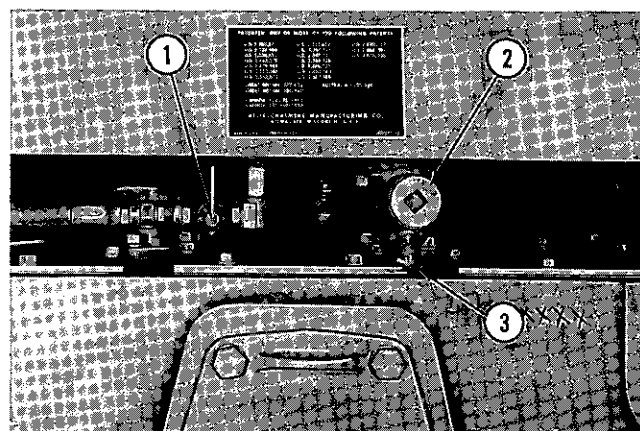
FIG. 11 TOP OF MAIN HOUSING

1. Steering clutch throwout bearings lube fittings
2. Transmission and bevel gear housing oil filler plug (Eff. S/N 21448)
3. Transmission oil level plug

9. DOZER CYLINDER PISTON ROD ASSEMBLIES
One lube point each side; 3 to 4 shots.
10. DOZER CYLINDER PISTON ROD UNIVERSAL ASSEMBLIES (EARLY MODELS)
One lube point each side; 3 to 4 shots.
11. DOZER CYLINDER YOKE ASSEMBLIES
Eight lube points; four each side; 3 to 4 shot
12. RIPPER HYDRAULIC CYLINDERS
Six lube points; three each side; 3 to 4 shots
13. RIPPER FRAME CONNECTING BOLTS
Two lube points; one each side; 3 to 4 shots.

SERVICE

14. FUEL FILTERS-DRAIN SEDIMENT
Open drain cocks, Fig. 6, in first and second stage fuel filter shells daily (or as often as conditions warrant) and allow any water or sediment to drain; close drain cocks when clean fuel runs out. Perform this service before start of day's operation in warm weather or shortly after end of day's operation in freezing weather.
15. FUEL TANK-DRAIN SEDIMENT AND FILL TANK
Open drain cock, Fig. 12, before engine is started in warm weather or shortly after end of day's operation in freezing weather and allow water and sediment to drain. Close drain cock when clean fuel runs out. Fill tank at end of each operating period to keep condensation in tank to a minimum.



T-27224

FIG. 12 FUEL TANK DRAIN COCK

1. Fuel tank shut-off cock
2. Drain plug
3. Fuel tank drain cock

100-HOUR SERVICES

Also perform 10-hour services.

CHECK

16. FINAL DRIVES

Remove oil level and filler plug, Fig. 13; oil level must be even with plug opening.

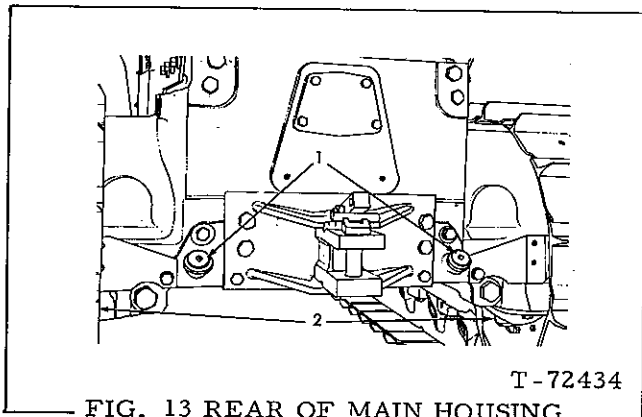


FIG. 13 REAR OF MAIN HOUSING

1. Final drive oil level and filler plugs
2. Final drive oil drain plugs

17. TRANSMISSION AND BEVEL GEAR HOUSINGS

Remove oil level plug, Fig. 14, and oil filler plug, Fig. 14 or Fig. 11; add oil through filler plug opening as necessary to raise oil level even with oil level plug opening.

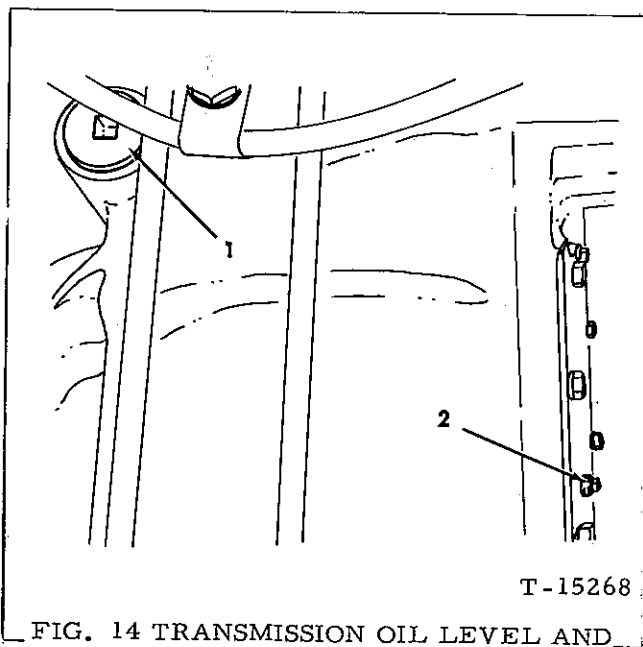


FIG. 14 TRANSMISSION OIL LEVEL AND FILLER PLUG

1. Oil filler plug (prior to S/N 21448)
2. Oil level plug.

18. ENGINE CLUTCH OIL RESERVOIR - OIL LEVEL

Remove oil level gauge rod, Fig. 6, and check oil level. Remove oil filler plug from the upper left side of engine fly-wheel housing and add oil, if necessary, to raise oil level within Operating Range on the gauge rod. DO NOT OVERFILL. Install and tighten oil filler plug.

LUBRICATE

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

18A. ENGINE CLUTCH SHIFTING SLEEVE

One lube point, Fig. 12; 8-12 shots.

NOTE: Three fittings are provided to allow lubrication without cranking engine; lubricate through one fitting only.

19. ENGINE CLUTCH HOUSING BREATHER

Remove breather Fig. 15, from clutch access cover. Wash breather in clean solvent, dry with compressed air, and reinstall.

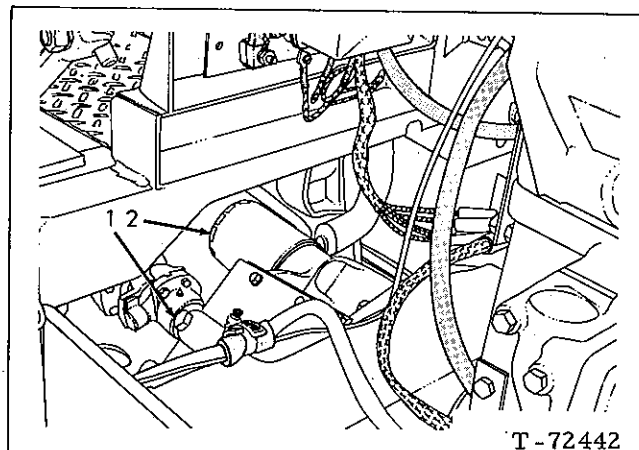


FIG. 15 ENGINE CLUTCH OIL FILTER AND BREATHER

1. Breather
2. Oil filter

20. ENGINE CRANKCASE - CHANGE OIL

Remove access cover from bottom of crankcase guard to reach crankcase oil drain plug; remove drain plug. Be certain drain plug gasket is in good condition before reinstalling drain plug; tighten drain plug securely. Fill crankcase with specified lubricant to the correct marks on oil level gauge rod, Fig. 6. Refer ENGINE LUBRICATION SYSTEM for detailed information.

21. **ENGINE OIL FILTER-REPLACE ELEMENT**
Remove old element from filter body, Fig. 16; clean body, and install new element. Refer to **ENGINE LUBRICATION SYSTEM** for detailed information.

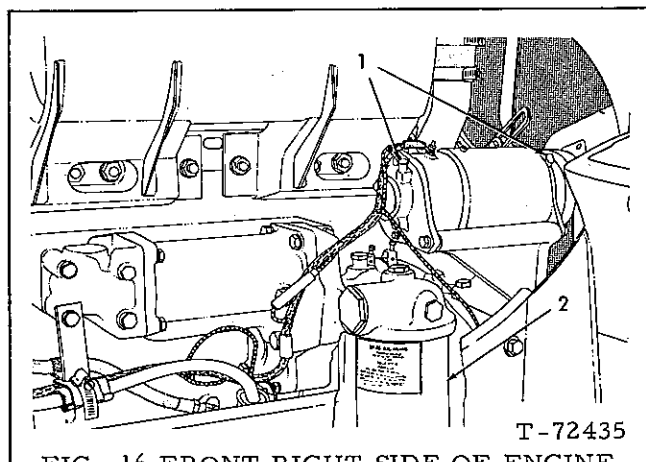


FIG. 16 FRONT RIGHT SIDE OF ENGINE

1. Generator oil cups 2. Engine oil filter

200-HOUR SERVICES

Also perform 10 and 100-hour services.

CHECK

22. **TRACK RELEASE HOUSINGS-OIL LEVEL**
Place unit on level ground. Remove plug, Fig. 17, from each housing. Check oil

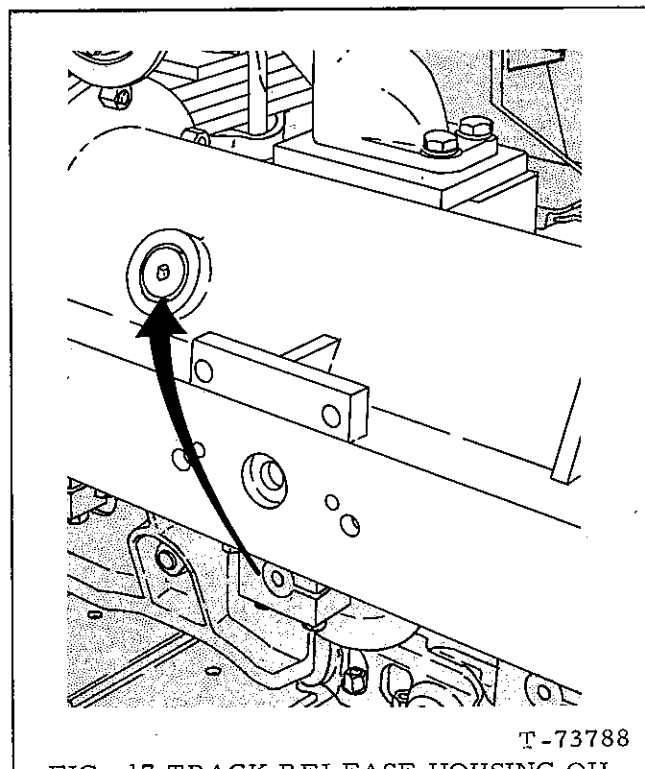


FIG. 17 TRACK RELEASE HOUSING OIL LEVEL AND FILLER PLUG

level and add oil as necessary to raise oil level to plug opening.

LUBRICATE

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

23. **FAN BEARINGS**
One lube point Fig. 18; 4 to 6 shots.
24. **FAN BELT TIGHTENER BEARING**
One lube point Fig. 18; 4 to 6 shots.
25. **GENERATOR OIL CUPS**
Two oil cups Fig. 16. Lubricate with four drops of light engine oil in each oil cup.
26. **WATER PUMP BEARINGS**
One lube point Fig. 18; 4 to 6 shots.

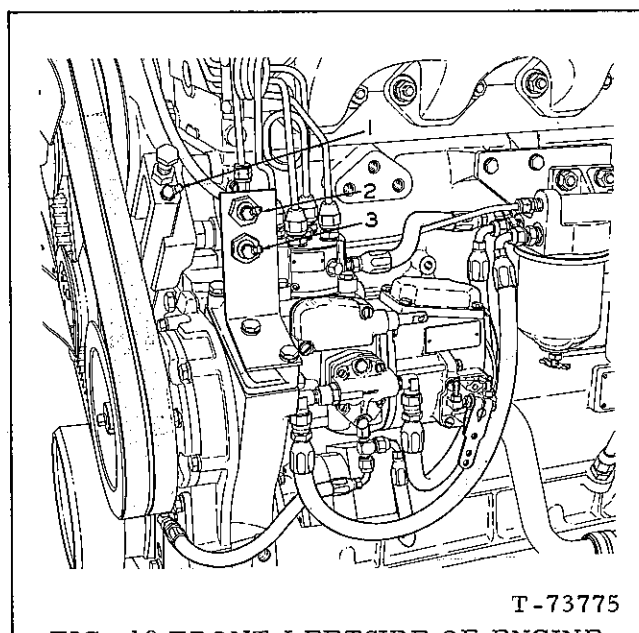


FIG. 18 FRONT LEFTSIDE OF ENGINE

1. Fan belt tightener bearing lube fitting
2. Fan bearings lube fitting
3. Water pump bearings lube fitting
27. **STRAIGHT DOZER MOLDBOARD TILT BRACES**
Four lube points; two each side; 3 to 4 shots each.
28. **STRAIGHT DOZER MOLDBOARD DIAGONAL BRACES**
Two lube points; one each side; 3 to 4 shots each.
29. **ANGLE DOZER MOLDBOARD UPPER STRUTS**
Four lube points; two each side; 3 to 4 shots each.

500-HOUR SERVICES

Also perform 10 and 100-hour services.

LUBRICATE

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

30. BRAKE PEDAL LEVERS

Two lube points; one each side Fig. 9. Remove floor plate to reach lube fittings. 3 to 5 shots each.

31. DRIVE SHAFT UNIVERSAL JOINT

Two lube points Fig. 9, one in each spider assembly. Remove floor plate to reach lube fittings. Pump grease in slowly; stop when back pressure is felt. Do not "pop" grease seals. Units equipped with oil-type engine clutch have an additional lube fitting in the front yoke; 4 to 6 shots.

32. DOZER HYDRAULIC PUMP UNIVERSAL JOINT ASSEMBLY

Universal joint is located between hydraulic tank and front of crankshaft pulley. Two lube points, one each end. Pump grease in slowly; stop when back pressure is felt. Do not "pop" grease seals.

NOTE: On late models universal joint has four lube fittings (two each end) to allow lubrication without cranking engine; lubricate through one fitting only at each end.

SERVICE

33. FIRST AND SECOND STAGE FUEL FILTERS - REPLACE ELEMENTS

Install new element in each filter, Fig. 6, after each 500 hours of operation, or when fuel pressure drops to 8 psi (0.562 kg/cm²) due to clogged filter elements. Do not attempt to clean clogged filter element. Refer to FUEL SYSTEM for detailed information.

34. DOZER HYDRAULIC SYSTEM FILTER - REPLACE ELEMENT

Refer to DOZER HYDRAULIC SYSTEM for detailed information.

35. DOZER HYDRAULIC SYSTEM - CHANGE OIL AND FLUSH

Refer to DOZER HYDRAULIC SYSTEM for detailed information.

1000-HOUR SERVICES

Also perform 10, 100, 200 and 500-hour services.

SERVICE

36. FINAL DRIVE COMPARTMENTS - CHANGE OIL

Climatic or operating conditions may require this service at shorter intervals. Remove each drain plug, Fig. 13, to drain oil; reinstall each plug and torque to 70-75 lbs. ft. (9.67-10.36 kg-m). Remove oil level and filler plugs, Fig. 13; fill each final drive with specified lubricate to plug opening.

37. TRANSMISSION AND BEVEL GEAR HOUSINGS - CHANGE OIL

Climatic or operating conditions may require this service at shorter intervals. Remove drain plug, Fig. 19, from bottom of bevel gear compartment and allow oil to drain; be certain drain plug gasket is in good condition; reinstall drain plug. Remove seat to reach transmission oil filler plug and the oil level plug, Fig. 14 or Fig. 11; fill to proper level with specified lubricant. Refer to TRANSMISSION for detailed information.

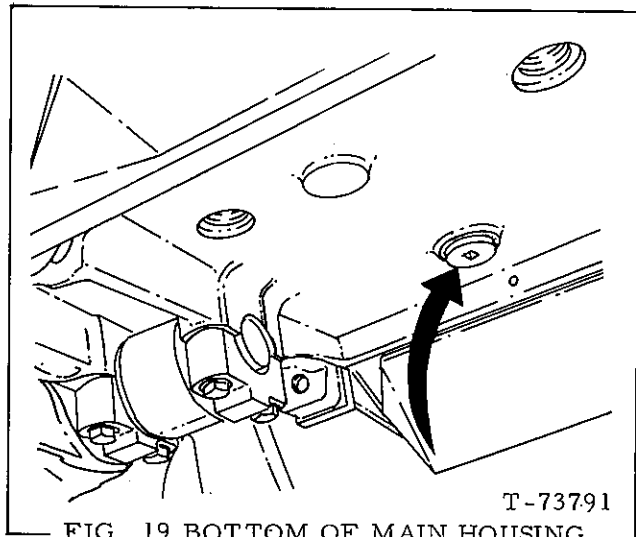


FIG. 19 BOTTOM OF MAIN HOUSING

38. ENGINE CLUTCH OIL TANK - CHANGE OIL

Remove and clean oil drain plug, Fig. 20. When oil has drained install drain plug and remove oil filler plug. Fill with specified oil until level is even with top mark of Operating Range on oil level gauge rod. Refer to ENGINE CLUTCH AND BRAKE for detailed information.

39. ENGINE CLUTCH OIL FILTER - REPLACE FILTER

Remove floor plate to reach filter. Clean oil filter base and surrounding area. Turn filter, Fig. 20, counterclockwise to remove; discard old filter. Coat new gasket of new filter with clean oil; turn new filter into base until gasket contacts the base, then tighten an additional half turn.

NOTE: Use hand pressure only to tighten filter.

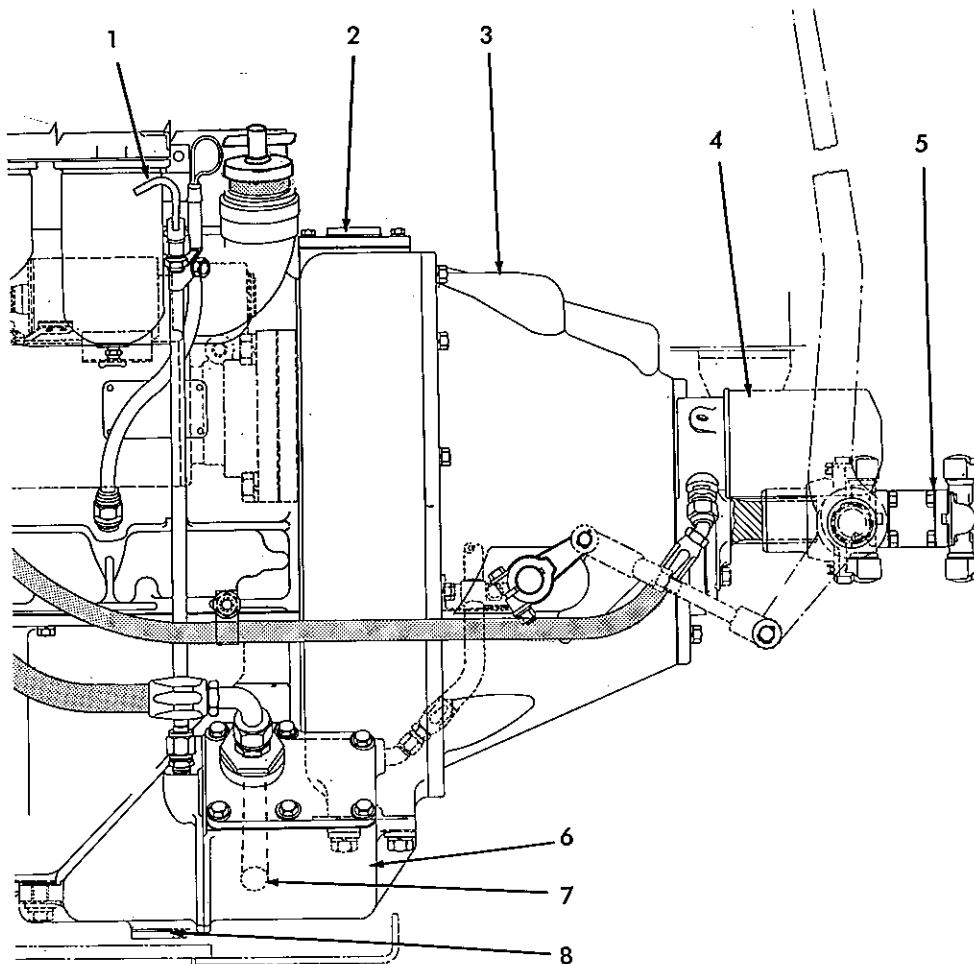


FIG. 20 ENGINE CLUTCH (OIL-TYPE)

T-30175

- 1. Oil level gauge
- 2. Oil filler plug
- 3. Clutch housing

- 4. Oil filter
- 5. Universal joint
- 6. Oil tank

- 7. Screen
- 8. Oil drain plug

40. **ENGINE CLUTCH BREATHER - CLEAN**
Remove breather from top of clutch housing and wash in clean solvent or fuel oil. Blow dry with compressed air and reinstall. Operating in extremely dusty conditions may require more frequent cleaning.

41. **ENGINE CLUTCH OIL PUMP SUCTION LINE SCREEN - CLEAN**

This screen, Fig. 20, located in the oil tank for the clutch, must be removed and cleaned after each 1000 hours of operation, and whenever major repairs are made to engine clutch. Refer to **ENGINE CLUTCH AND BRAKE** for detailed information.

PERIODIC SERVICES AND ADJUSTMENTS

SERVICES

ENGINE COOLING SYSTEM

Drain and flush periodically. Keep cooling system filled with clean soft water or rain water. In freezing weather use permanent type (glycol base) anti-freeze solution. Refer to ENGINE COOLING SYSTEM for detailed information.

ENGINE AIR INTAKE SYSTEM

Check all capscrews, hoses, clamps, etc. and tighten if necessary. Also make certain all gaskets are properly installed and are in good condition to avoid air leaks. Refer to AIR CLEANER for detailed information.

ENGINE CRANKCASE AND TRANSMISSION GUARDS

Remove any accumulation of dirt and debris from the inside of guards.

FUEL TANK

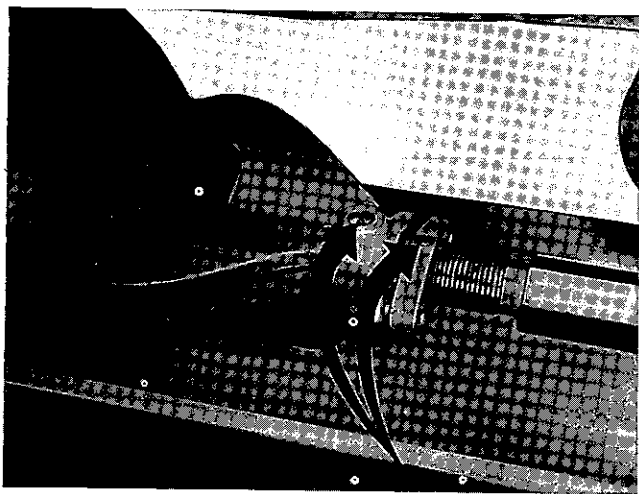
Drain and flush fuel tank if it contains a large accumulation of water, rust, or scale.

TRACK ROLLERS, TRACK IDLERS, AND TRACK CARRIER ROLLERS

Check these components periodically for signs of grease leakage. Leakage is an indication of damaged grease seals or loose or damaged bearings; component must be removed immediately for inspection and repair if leakage is evident.

TRACK ADJUSTING SCREW LUBE FITTINGS (MECHANICAL TYPE ONLY)

Two lube points, Fig. 21, each side. Lubricate



T-36866

FIG. 21 TRACK ADJUSTING SCREW LUBE FITTINGS

periodically to prevent rust and facilitate turning of adjusting screws when adjusting tracks. Refer to UNDERCARRIAGE for detailed information.

HOSES, PIPES, AND FITTINGS

Check condition and tighten if necessary.

ADJUSTMENTS

ENGINE CLUTCH (DRY-TYPE)

With engine stopped, check pull required on engine clutch lever to engage clutch. When pull on lever diminishes to 15 lbs. (6.8 kg), clutch must be adjusted. Refer to ENGINE CLUTCH AND CLUTCH BRAKE for detailed information.

ENGINE CLUTCH (OIL-TYPE)

With engine stopped, check pull required on engine clutch lever to engage clutch. When pull on lever diminishes to 20 lbs. (9.07 kg), clutch must be adjusted. Refer to ENGINE CLUTCH AND CLUTCH BRAKE for detailed information.

STEERING CLUTCH CONTROL LINKAGE

Keep clutches adjusted so each steering lever has 3" (76.2 mm) free travel. Steering clutch levers must be adjusted when free travel has decreased to 1" (25.4 mm). Refer to STEERING CLUTCHES AND BRAKES for detailed information.

BRAKES

Keep brakes adjusted so each brake pedal has 1.75" to 2" (44.45-50.8 mm) free travel before brake application begins. Refer to STEERING CLUTCHES AND BRAKES for detailed adjustment procedure.

TRACKS

Adjustment is correct when track has 1" to 1.5" (25.4-38.1 mm) sag midway between front carrier roller and track idler; refer to UNDERCARRIAGE for detailed procedures.

TRACK SHOE BOLTS

Periodically torque all track shoe bolts to 100 to 120 lbs. ft. (13.83 to 16.59 kg-m).

WATER PUMP AND GENERATOR BELT

Belt is properly adjusted when belt can be depressed by hand approximately .38 in. (9.65 mm) half-way between generator and fan pulleys. Adjust belt when slippage is evident. Refer to ENGINE COOLING SYSTEM for detailed procedure.

FAN DRIVE BELTS

Fan belts are properly adjusted when the

belts can be pressed inward by hand approximately .38 to .50 in. (9.65 to 12.7 mm) at a point half-way between fan hub and fan drive pulley. Adjust belts when slippage is evident. Refer to ENGINE COOLING SYSTEM for detailed procedure.

PACKING GLANDS OF HYDRAULIC CYLINDERS

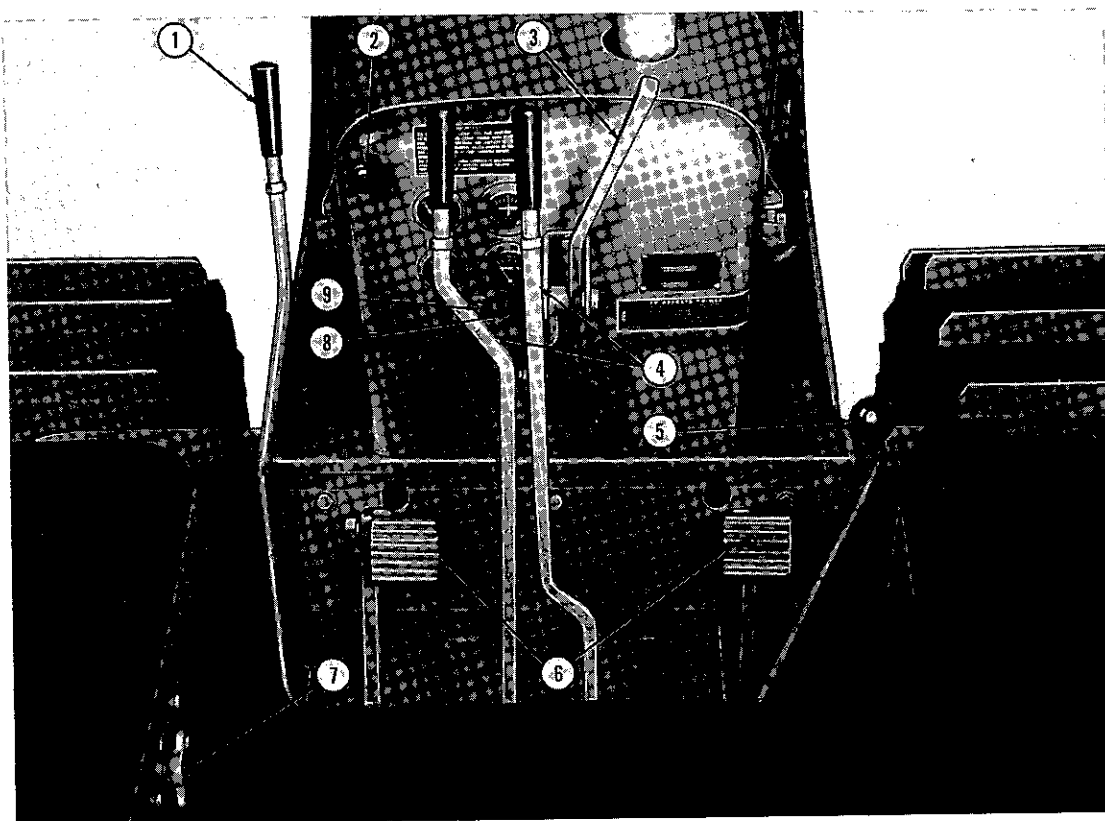
Check dozer or ripper cylinders for proper adjustment to avoid leakage. Packing glands

should be adjusted so a light film of oil is on piston rods when unit is in operation. Refer to DOZER HYDRAULIC SYSTEM for detailed procedure.

DIAGONAL AND TILT BRACES

Periodically check ball and socket adjustment of diagonal and tilt braces (and/or tilt cylinder if so equipped). Use shims to obtain .000 to .032 in. (.000-.833 mm) loose ball fit between moldboard and braces and/or tilt cylinders.

OPERATING CONTROLS AND INSTRUMENTS



T-27230

FIG. 22 OPERATING CONTROLS

- | | | |
|------------------------|----------------------------------|--------------------------|
| 1. Engine clutch lever | 4. Steering levers | 7. Master switch |
| 2. Fuel shut-off | 5. Transmission gear shift lever | 8. Starter switch button |
| 3. Throttle lever | 6. Brake pedals | 9. Light switch |

Operator must familiarize himself with the various controls and instruments. Although many of these controls are similar to those of other tractors, there are important differences; it is not wise, regardless of previous experience, to operate tractor before fully understanding purpose of each control and instrument.

OPERATING CONTROLS

If any control, Fig. 22, does not function

properly while operating tractor, determine cause and correct immediately.

1. ENGINE CLUTCH LEVER

Engine clutch lever controls the engine clutch which transmits power from engine to transmission. Push lever forward to disengage clutch; pull back to engage clutch. Push lever all the way forward to apply clutch brake.

2. FUEL SHUT-OFF

Push engine shut-off knob all the way forward to start engine. To stop engine pull shut-off knob all the way back. On HD-6AG units pull back and lock.

3. THROTTLE LEVER

Throttle lever is connected by linkage to the speed control lever of the governor. Engine will run at low idle speed with throttle lever all the way forward; pull lever back to increase engine speed as desired.

4. STEERING LEVERS

Steering levers are provided to control steering clutches. These levers are used to steer tractor by disengaging the left or right steering clutch. Pull right hand lever back to make right turn; Pull left hand lever back to make left turn; refer to OPERATING INSTRUCTIONS for detailed information.

5. TRANSMISSION GEAR SHIFT LEVER

Transmission shift lever is used to select proper transmission gear ratio for desired power or speed. Position to which lever must be moved for each forward and reverse speed is indicated on shifting instruction plate attached to cowl.

6. BRAKE PEDALS

Brake pedals are used to retard speed or to facilitate turning unit. To turn unit to right, fully disengage right steering clutch and press on right brake pedal; to turn unit to left, fully disengage left steering clutch and press on left brake pedal. After desired turn has been made, release brake pedal and return steering lever to its forward position.

CAUTION

Do not attempt to use brake pedals without first pulling corresponding steering lever back as far as possible.

7. MASTER SWITCH

Electrical system master switch is provided to connect or disconnect batteries. As safety precaution, it is recommended master switch be used to disconnect batteries from electrical system at end of operating period to prevent anyone tampering with starter or other electrical equipment.

WARNING

To prevent possibility of bodily injury, always use master switch to disconnect batteries before cleaning, repairing, disconnecting or connecting any heavy electrical cables.

8. STARTER SWITCH BUTTON

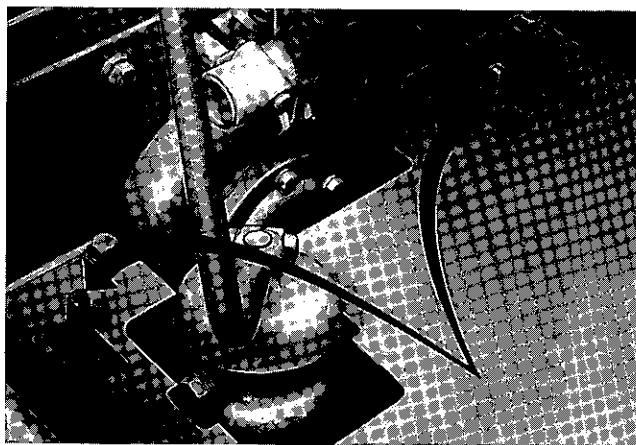
Before starter switch button can actuate starter, the electrical master switch must be turned to the ON position. Move transmission gear shift lever in NEUTRAL position and engine clutch lever in the disengaged position. Push on starter button to actuate starter solenoid and engage starter pinion with flywheel ring gear.

9. LIGHT SWITCH

Turn switch lever clockwise to turn on lights; counter-clockwise to turn off lights.

10. PARKING BRAKE LOCK LEVERS

Parking brake lock levers, Fig. 23, are provided to hold brakes in applied position when unit is to be parked. To engage parking brake lock levers, depress the brake pedals and move the lock levers forward. To release the brakes, depress further on brake pedals and move lock lever to the rear.



T-27243

FIG. 23 PARKING BRAKE LOCK LEVERS

11. DOZER CONTROL LEVER (Not illustrated)

Hydraulic dozer control lever, located on front of right batter box, is connected by linkage to control valve and has four positions: RAISE, HOLD, LOWER and FLOAT.

12. RIPPER CONTROL LEVER (Not illustrated)

Ripper control lever is connected by linkage to a control valve and has three positions: RAISE, HOLD, and LOWER.

INSTRUMENTS

If any gauge, Fig. 24, does not indicate proper reading within a few minutes after engine has been started (except engine temperature gauge) engine must be stopped immediately and cause determined and corrected.

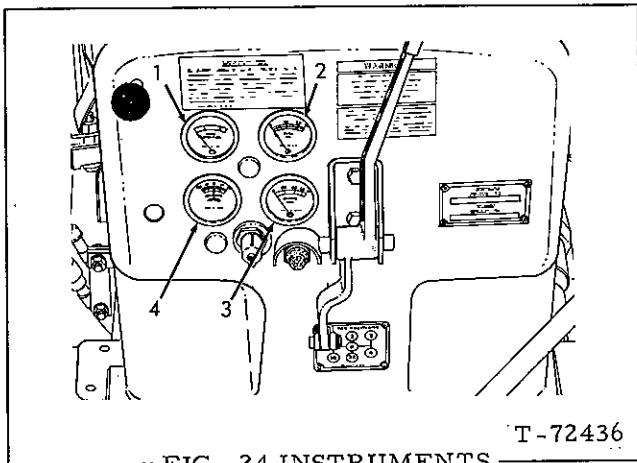


FIG. 24 INSTRUMENTS

1. Engine temperature gauge
2. Fuel pressure gauge (Special equipment HD-6B)
3. Engine oil pressure gauge
4. Ammeter

1. **ENGINE TEMPERATURE GAUGE**
Coolant operating temperature should stabilize within green area on gauge.
2. **FUEL PRESSURE GAUGE (Special equipment HD-6B)**
This gauge indicates fuel pressure; under normal conditions, with engine operating at full governed speed and full load, fuel pressure should be between 8-30 psi (.56-2.10 kg/cm²).

3. **ENGINE OIL PRESSURE GAUGE**
This gauge indicates pressure at which engine lubricating oil is circulated through engine. At full throttle, oil pressure should be between 30-55 psi. (2.10-3.86 kg/cm²) at normal engine operating temperature.

4. **AMMETER**
Ammeter indicates charging rate of generator. When batteries are in discharged condition, ammeter should indicate good rate of charge until batteries approach fully charged condition. When batteries are fully charged, ammeter will indicate nearly zero, except for short time after starter has been in use.

5. **ENGINE HOUR METER (Not illustrated)**
Engine hour meter, installed as special equipment, is direct reading type. Meter records up to 10,000 hours and repeats. Four figures of hours are read directly. Red figure indicates 10ths of an hour. Small indicator (upper left) visibly turns when meter is recording.
6. **AIR CLEANER RESTRICTION INDICATOR (Special equipment HD-6B) (Not illustrated)**
Red indicator will gradually rise until it reaches the top and locks in position. Air cleaner filter element must then be serviced immediately; refer to AIR CLEANER. Reset indicator after servicing element.

OPERATING INSTRUCTIONS

Before starting engine and/or placing tractor in motion, be certain tractor has been properly prepared for use and has been properly serviced since last operating period. Refer to PREPARATION FOR USE and LUBRICATION AND SERVICE INSTRUCTIONS for detailed information.

CAUTION

Fuel injection pump and governor, as set at factory permits operation of units without turbocharger up to 2,500 feet (762 m) above sea level; unit with turbocharger is set for 10,000 feet (3048 m) above sea level. If unit is to be operated above these limits, have Allis-Chalmers Dealer make necessary altitude adjustments.

If unit is to be operated in frigid climates, consult Dealer or write factory for information regarding availability of special cold weather equipment.

If repairs have been made since last operating period, be sure all nuts and bolts affected by repairs have been tightened and all necessary adjustments have been made.

STARTING THE ENGINE

1. Push engine clutch operating lever all the way forward and move transmission gear shift lever to neutral position. Move throttle lever to 1/4 speed.
2. Turn electrical system master switch, Fig. 22, on. Move fuel shut-off to run position and depress starter switch button to start engine.

CAUTION

If engine does not start within 30 seconds, allow starter to cool for 2 minutes before using it again.

3. As soon as engine starts, release starter switch button and pull throttle operating

hand lever back to about 1/2 throttle and allow engine to warm up. Observe all instruments for proper readings.

NOTE: Leave transmission gear shift lever in NEUTRAL position and engage engine clutch lever during warm up period.

4. In extremely cold weather when necessary to use aerosol starting fluid as an aid in starting engine, proceed as described in first 2 operations, then proceed as follows.
 - a. Press on starter switch button to actuate starter, and at same time spray starting fluid into air cleaner; be certain spray can is held far enough away from air cleaner so cleaner elements will not become saturated with fluid. Continue spraying until engine starts and runs smoothly. Always observe caution instructions printed on fluid container.
 - b. As soon as engine starts, release starter button and run engine at approximately 1/2 throttle for 10 to 15 minutes to allow oil in transmission, engine oil clutch system (if so equipped), and dozer hydraulic system to circulate and warm up before applying load to systems.
5. If engine will not start due to low batteries or inoperative starter, it is possible to start engine by pushing or towing the tractor. Use the following procedure to start engine.
 - a. Move throttle operating hand lever to high idle position; move transmission shift lever to 1st Forward or 1st Reverse. Pull engine clutch operating lever all the way back to engage clutch.

CAUTION

Speed of pushing or towing must not exceed 1.4 mph (2.2 km/h). This will prevent overspeeding the engine while pushing or towing before engine starts.

- b. Move engine fuel shut-off knob forward to RUN position to start engine.
- c. When engine starts, push forward on engine clutch lever and move transmission shift lever to NEUTRAL position; move throttle operating lever to about 1/2 throttle and allow engine to warm up.

ENGINE IDLING

Prolonged engine idling causes engine coolant operating temperature to fall below operating range. Since engine is readily started with electric starter, there should be no reason for prolonged engine idling; stop engine when prolonged idling period would occur. How-

ever, if it is necessary to keep engine running, it should be run at speed fast enough to maintain normal oil pressures. Transmission gear shift lever should be in NEUTRAL position, engine clutch lever disengaged (all the way forward), and front or rear mounted equipment lowered to the ground.

PLACING CRAWLER TRACTOR IN MOTION

1. Start engine and allow it to warm up.

CAUTION

If mud or snow collects on tracks, track rollers, or carrier rollers during operating period and is allowed to freeze solid while machine is idle, or if tracks freeze solidly to ground, apply heat to loosen frozen material or tracks. Serious damage will be caused by an attempt to break unit loose under engine power, or by moving unit with large frozen lumps of material in tracks. In freezing weather it is good practice to park unit on planks or logs so tracks will not freeze to ground.

2. Slow engine to low idle speed; push forward on engine clutch lever to disengage engine clutch and apply engine clutch brake.
3. Move gear shift lever to desired speed range and pull throttle lever back to approximately 1/2 speed position.
4. Pull back steadily on engine clutch lever until all slack is taken up between tractor and load; then pull clutch lever all the way back quickly to fully engage engine clutch.
5. After engine clutch is engaged, move throttle lever as necessary to meet operating requirements.

NOTE: Engagement of engine clutch with engine running at 1/2 throttle, and starting the load in the preceding manner will prolong clutch life and prevent shock loading of tractor.

6. To shift to another speed range after tractor is in motion, decelerate engine speed and disengage engine clutch. Push engine clutch lever all the way forward to apply engine clutch brake; clutch brake stops rotation of transmission input shaft which enables operator to shift to another speed range without clashing gears.

NOTE: It is advisable to decelerate engine and bring tractor to complete stop when reversing direction of travel.

SELECTION OF PROPER SPEED

Since, in any speed range, it is possible to travel at any speed up to maximum speed of

that range, selection of proper speed range for any particular job or working condition is influenced by several factors:

1. Difficult or rough terrain may require maximum speed of tractor be restricted to speed safe for both operator and tractor; some jobs can best be accomplished at relatively slow tractor speeds. Use of low speed (in either forward or reverse) will limit tractor speed even though throttle lever is in full speed position.
2. Where preceding factors have no influence or need not be considered because of operating conditions, governing factor in selecting proper speed range is speed at which tractor can move load. Speed range should be used which will give fastest travel speed.

STEERING TRACTOR

Tractor is steered by disengaging steering clutch on side of tractor toward which turn is to be made. This is done by using steering levers located directly in front of operator. To make right turn, pull back right hand steering lever; to make left turn, pull back left hand steering lever. If short turn is to be made, pull steering lever back on side toward which turn is to be made and press down on corresponding brake pedal; this will stop that track completely. Always pull steering lever all the way back before applying brake. When tractor has turned as desired, release brake pedal and return steering lever immediately to its forward position. Steering clutches can be partially disengaged for "inching" control of tractor by pulling steering lever(s) part way back.

When steering tractor down steep grades, use of steering levers is opposite to when tractor is pulling load. In this case, left-hand lever is used to make right turn and right-hand lever to make left turn. Disengaging either steering clutch will allow track on that side to travel faster, since braking power of engine is released from it, while other steering clutch remaining engaged will act as brake.

GENERAL DOZING INSTRUCTIONS

WARNING

Always lower moldboard to ground as a safety precaution when tractor and dozer are not in use and when making repairs, adjustment, or servicing unit.

Recommended position of moldboard for normal dozing conditions is with back of moldboard perpendicular to ground and/or cutting edge angle at approximately 52° to ground.

Some conditions may require a greater draft angle; obtain greater draft angle by adjusting

moldboard to move top of moldboard to rear. For less draft angle, move top of moldboard forward.

Some operations, such as leveling or slope control may require moldboard to be tilted one way or other.

Normally, first cut should be heavy enough to maintain a full blade. This will make it easier for operator to maintain proper grade level on subsequent cuts; in addition, operator will have sufficient material in front of moldboard to make any light fills necessary on first cut.

To obtain a smoother finish after dozing, it may be necessary to backdrag the surface. This is accomplished by placing dozer control lever in FLOAT position while traveling in reverse. This will eliminate track marks, windrows, and smooth out slight variations in surface.

CAUTION

Never hold control lever in extreme raise or lower position after moldboard has reached its maximum travel.

GENERAL RIPPING INSTRUCTIONS

WARNING

Always lower ripper to ground as safety precaution when not in use and when making repairs, adjustments, or servicing unit.

Ripper control lever, controls movement of ripper. Control lever is connected by linkage to control valve. Control lever has three positions "RAISE", "HOLD", AND "LOWER".

Raise ripper by pulling lever toward operator; lower ripper by pushing lever away from operator. Return lever to HOLD position when ripper reaches desired height.

CAUTION

Never hold control lever in extreme RAISE or LOWER position after ripper has reached its maximum travel.

Three teeth may be used; however, in some materials, it will be necessary to remove teeth to obtain desirable results. Select number of teeth that will accomplish ripping operation in one pass if possible, to avoid operating machine over ripped material. If one tooth is used, install it in middle of tool bar; if two teeth are used, install one at each end of tool bar.

STOPPING CRAWLER TRACTOR

To stop tractor, push throttle lever forward,

disengage engine clutch, apply the brakes, and move transmission gear shift lever to neutral position.

Allow engine to idle 3 or 4 minutes so engine and turbocharger (if so equipped) may cool gradually and uniformly, then pull engine fuel shut-off knob all the way back to stop the engine.

If tractor is parked on a grade where there is possibility of its rolling, lock both brakes in

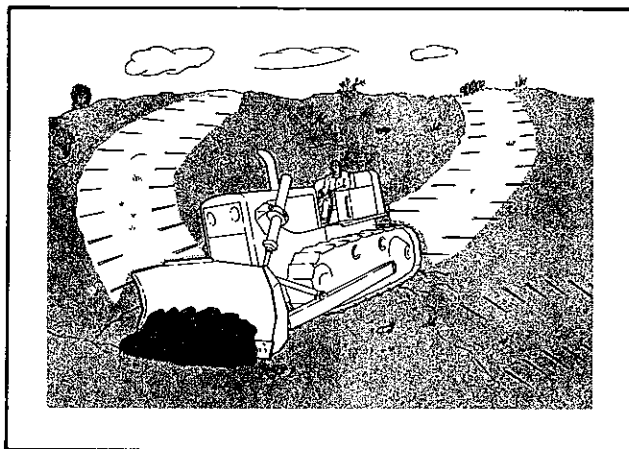
applied position by use of parking brake lock levers.

IMPORTANT: When stopping tractor at end of an operating period, it is a good practice to disconnect batteries from electrical system by means of master switch, Fig. 22, to prevent starting of engine while tractor is parked. In freezing weather it is good practice to park machine on planks or logs so tracks will not freeze to ground.

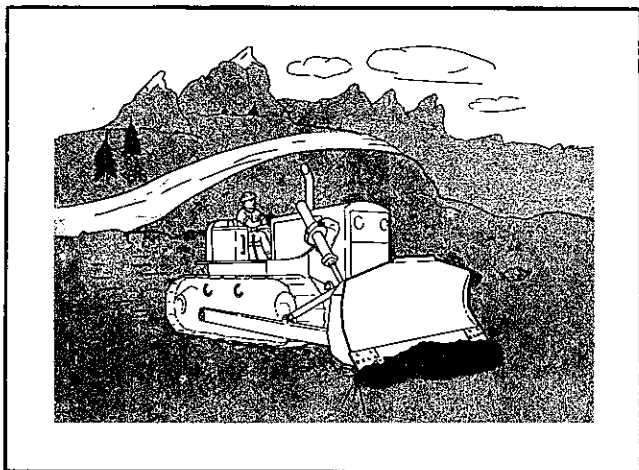
OPERATING TIPS

EFFICIENT DOZING

The operator must first know his machine and its capabilities, then he can proceed with his project. Size up the project first. Don't wander around aimlessly wasting valuable time.



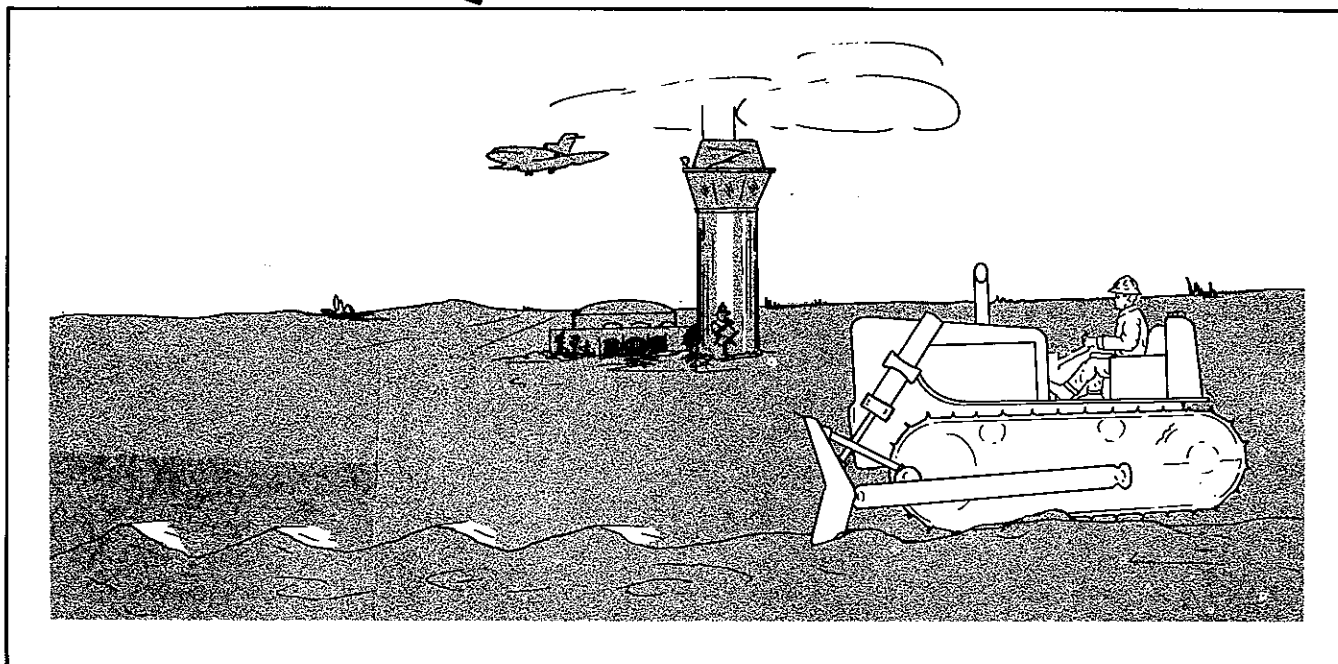
T-75117



T-75118

If a "washboard" is started, it will become progressively worse as cut progresses. Level out the cut at first indication that a "washboard" is developing. The easiest way to accomplish this is to accumulate a full blade of dirt with tractor level, then make a cut over "washboard" keeping blade full of dirt and operating tractor at reduced speed.

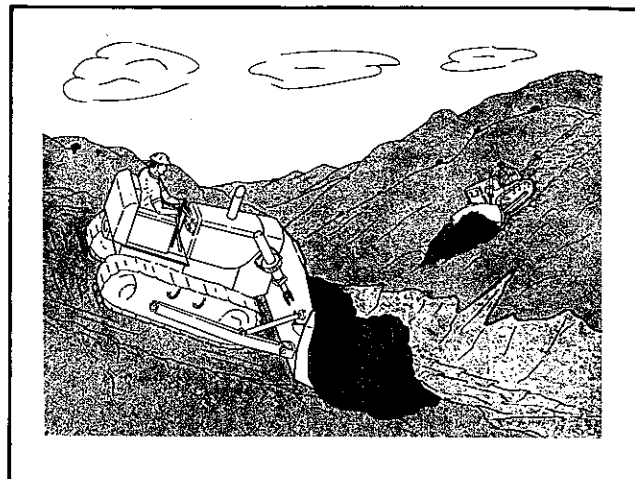
The most common error of a new or inexperienced dozer operator is over controlling or attempting to cut too deep when first lowering the blade. Approach the work from a relatively level area to prevent "teetering" of the tractor over uneven ground and always lower the blade into the ground slowly. Cut only as much as the tractor can handle with the working gear. After cut is started, keep in mind that a full blade of dirt handles easier.



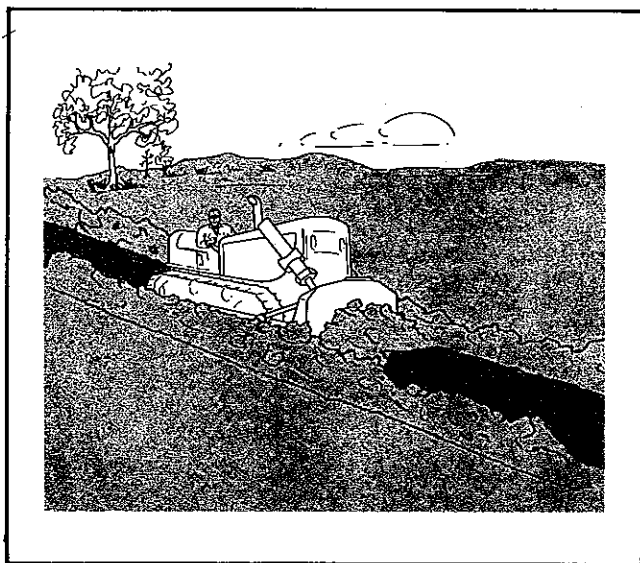
T-75119

INCREASE PRODUCTION

When working downhill, move one blade full of material into the start of the haul. Then back up and push in another load before you travel to the fill thus doubling the amount of material moved each complete trip. This method is also used when working on level ground and the material is too hard to allow the operator to get a full load in a single pass.



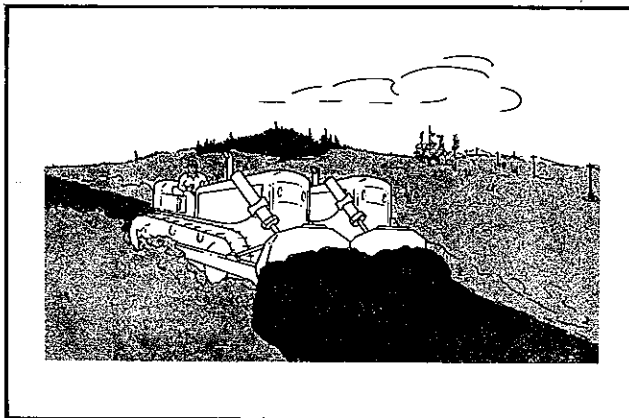
T-75120



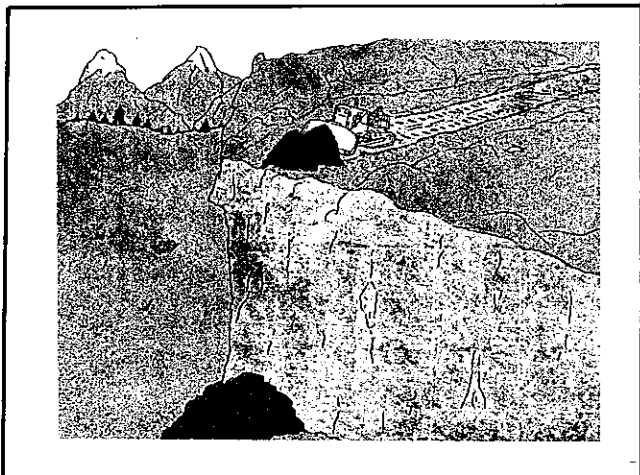
T-75121

Extra yardage can be moved by using the "buddy" system.

When possible, follow the same path on successive trips so that material spilling from the ends of the blade will form a windrow on both sides. This practice increases the amount of material that stays ahead of the blade.



T-75122

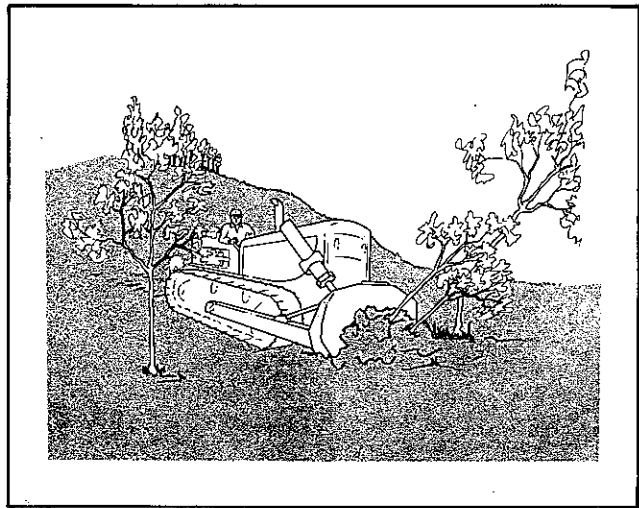


T-75123

Dozing off a steep wall or cliff can create a potentially dangerous situation as the edge could break off. Instead of dozing one load at a time over the edge, doze up a single load and then push it over with the second load. This will keep the tractor back on more stable ground, and increase production due to faster cycle times.

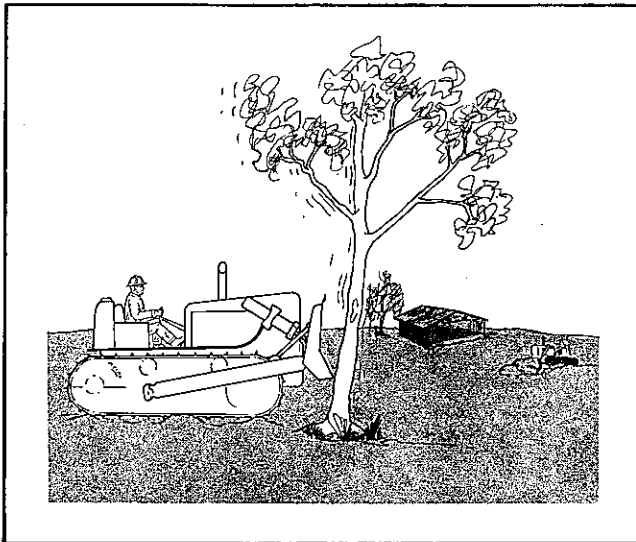
CLEARING

In land clearing of brush and small trees, clearing can be accomplished in one pass, with the blade cutting slightly below the ground. This will allow the blade to shear the roots. It may be necessary to back up occasionally to clear the roots from the cutting edge. Roots under the edge cause the blade to ride up and waste machine power.



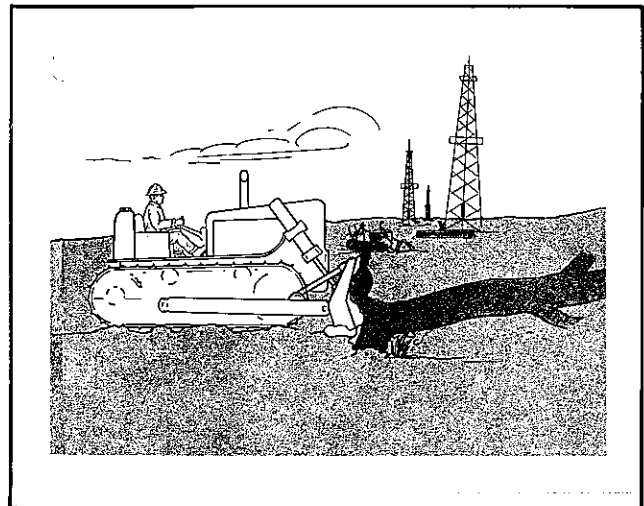
T-75124

When removing small trees make gradual contact with blade. Keep the blade raised high to gain the maximum leverage to push over the tree.



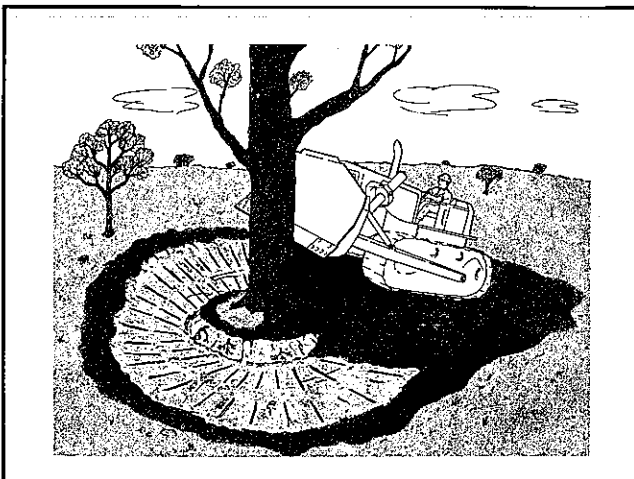
T-75125

Doze the roots and stump clear of the ground. Felled trees can be pushed more easily lengthwise from the stump end.



T-75126

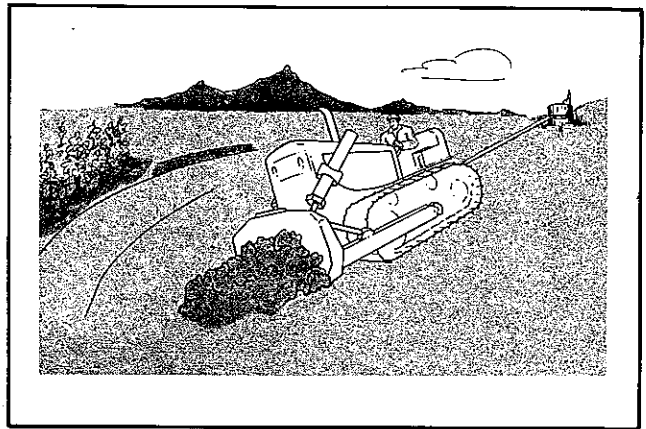
Larger trees may require a few passes to cut some of the outlying root structure. This should be done around entire circumference of the tree as close to the trunk as possible. Build up an earth ramp opposite the direction the tree is to be felled. This, with the blade raised high, will increase the leverage and make pushing easier. Remember, never ram the tree as the shock load may damage the tractor. It may also cause dead limbs to fall, bringing serious injury to an operator.



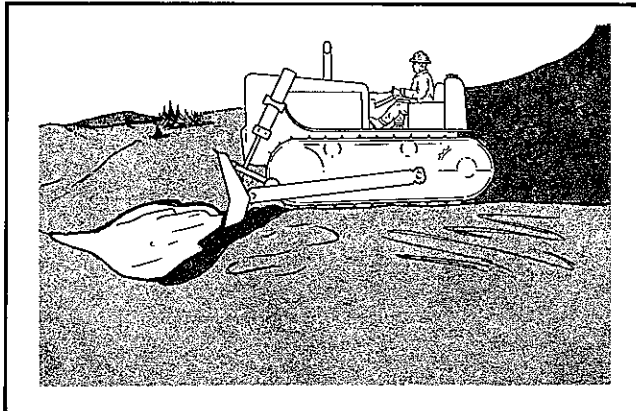
T-75127

PIONEERING AND ROUGH WORK

When pioneering cuts on steep side slopes in extremely rough terrain, it may be advantageous to equip the tractor with a winch. With another tractor above, or anchoring on a tree, the dozing tractor can "Yo-Yo" up and down the hill.



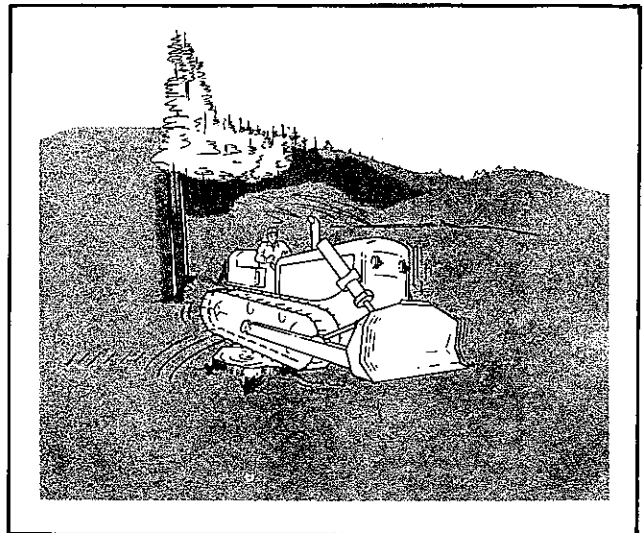
T-75128



T-75129

When cleaning an area of rock, remove all small or loose rocks before working on the large ones.

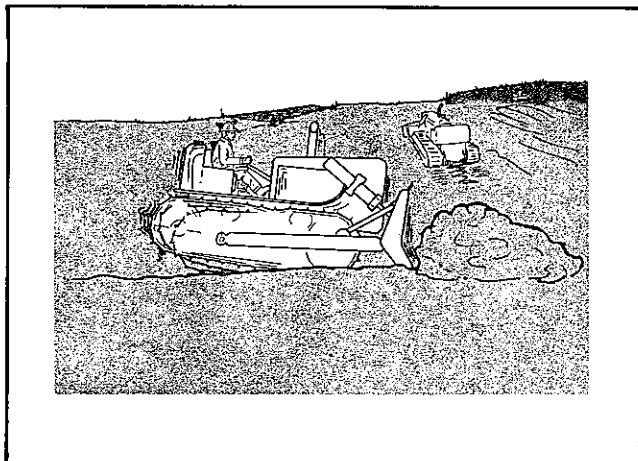
Often times rock is found in layers and positioned at an angle. The dirt can be cut away from the outcrop, and the rock worked away in layers as nature left it.



T-75130

OPERATING IN SOFT TERRAIN

Turning in soft conditions can many times bog down the inside track. A good operator will look for a firm support such as a tree stump, root, or log to pivot his track on.



T-75131

When operating in soft fill material and backing away from the load, do not raise the blade immediately. The extra load and weight will cause the tractor to mire at the front idlers. Let the blade float back a few feet. This will remove the weight of material from the front of dozer blade.

ENGINE COOLING SYSTEM

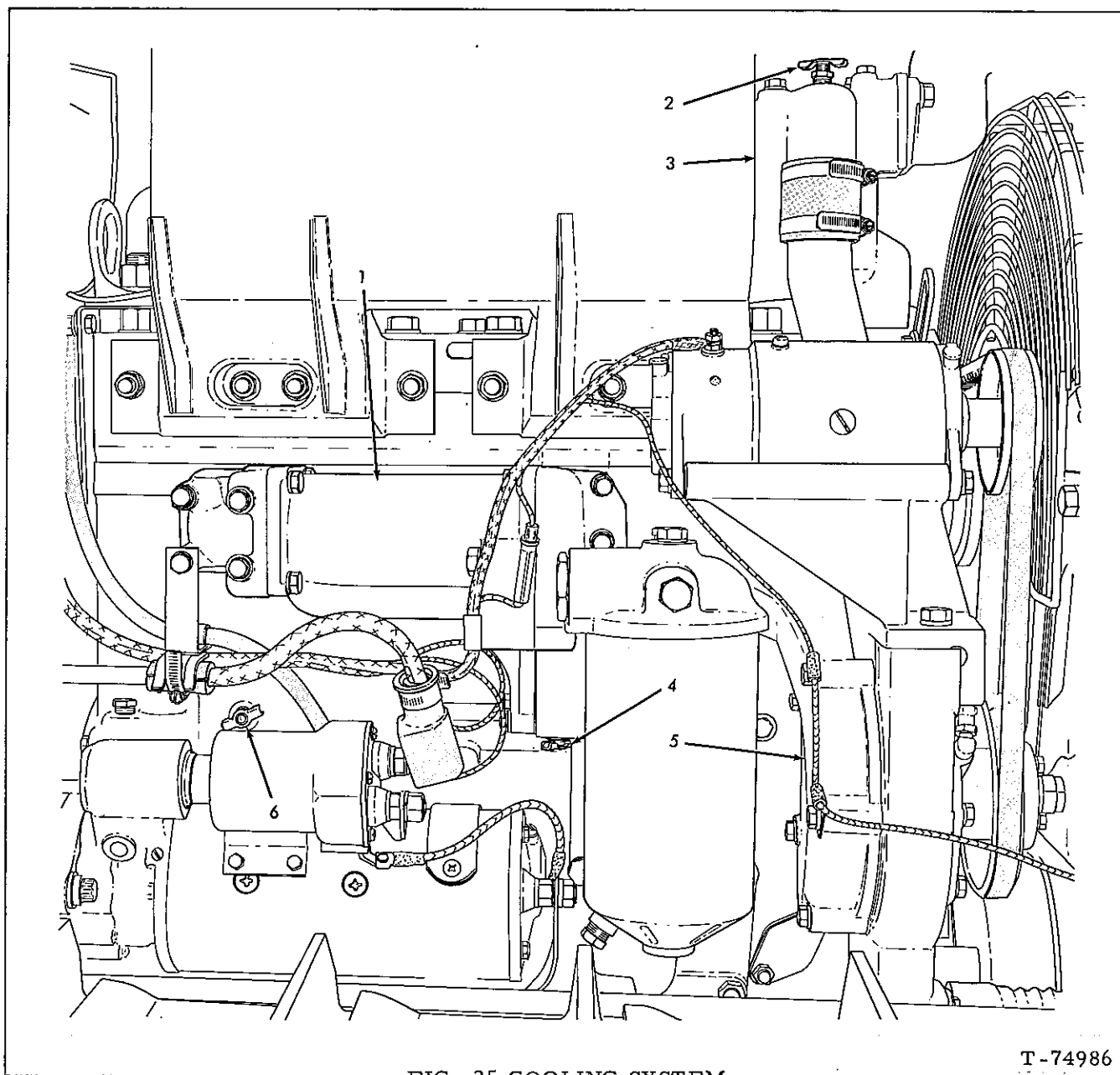


FIG. 25 COOLING SYSTEM

T-74986

1. Oil cooler
2. Vent cock

3. Thermostat housing
4. Oil cooler drain cock

5. Water pump
6. Cylinder block drain cock

DESCRIPTION

Engine cooling system includes water pump, radiator, oil cooler, thermostat, water outlet manifold, engine temperature gauge, cooling fan, and water passages in cylinder block and cylinder head.

Thermostat, located in engine water outlet

manifold, operates automatically to maintain minimum coolant operating temperature of approximately 180°F. (82°C).

Engine cooling system is a pressure system; therefore, it is necessary to keep radiator cap tight.

WARNING

Do not remove pressure type radiator cap while coolant temperature gauge indicates temperature in upper portion of "Operating Range" or above, as coolant will break into boil and may cause injury to person removing cap.

GENERAL MAINTENANCE

In warm weather, keep cooling system filled with clean soft water or rain water whenever possible.

If soft water is not available and hard water must be used, hard water should first be treated with water softener. A commercially reliable rust inhibitor should be added to cooling system for warm weather operation. If cooling system contains anti-freeze, be certain rust inhibitor is compatible with anti-freeze.

CAUTION

Do not use rust inhibitor if cooling system has a filter. Rust inhibitor is not only unnecessary but will also clog cooling system filter.

In cold weather, drain, flush, and refill cooling system with "Permanent-Type" (glycol base) anti-freeze and clean water solution. Use anti-freeze in accordance with anti-freeze manufacturer's directions.

Keep radiator air passages free of any material which will restrict flow of air through radiator.

All leaks in cooling system must be corrected as soon as evident. Fan drive belts and water pump and generator drive belt must be kept properly adjusted.

COOLING SYSTEM FILTER - SPECIAL EQUIPMENT

The filter (if so equipped), Fig. 25A, is connected to engine cooling system with by-pass hose connections. Coolant from outlet side of water pump passes through filter and is returned to suction side of water pump. Purpose of the filter is to extend engine life by establishing and maintaining a cooling system free of rust, scale, or corrosion. The filter element should be changed after every 500 hours of operation.

NOTE: The cooling system filter contains a Borate type filter element which is suitable for use in cooling systems containing permanent type anti-freeze or plain water. However, for most efficient results, when only plain water is used in cooling system, it is recommended that Borate type element be replaced by Chromate type element (contact ALLIS-

CHALMERS Dealer). When cooling system is changed from one element formula to the other, the system must be drained and flushed.

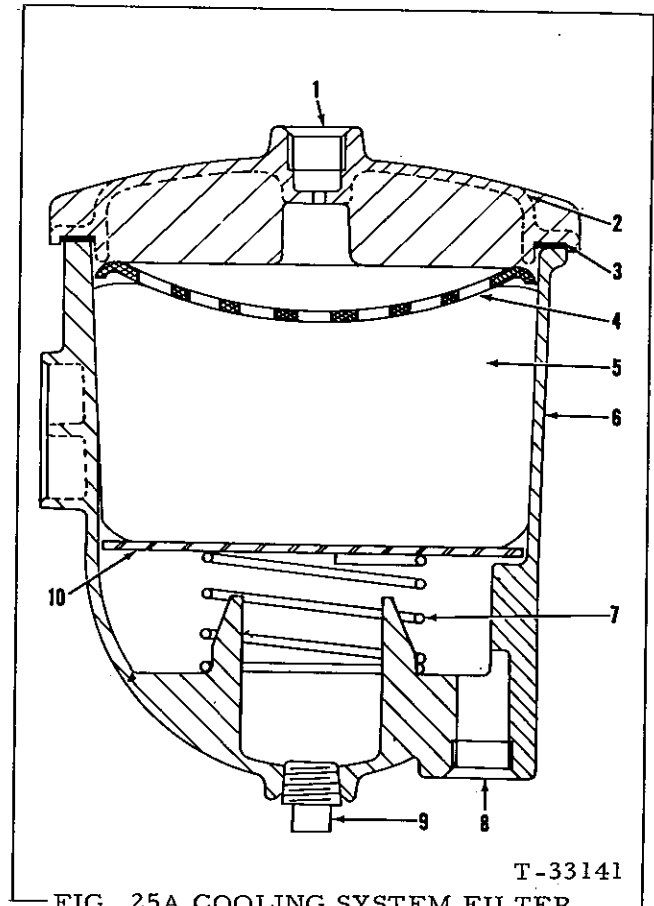


FIG. 25A COOLING SYSTEM FILTER - SPECIAL EQUIPMENT

- | | |
|------------------|------------------------------|
| 1. Filter outlet | 6. Body |
| 2. Cover | 7. Spring |
| 3. Gasket | 8. Filter inlet |
| 4. Upper plate | 9. Drain plug |
| 5. Element | 10. Corrosion resistor plate |

FILTER ELEMENT REPLACEMENT

1. Clean filter body and surrounding area.
2. Close valves, located in outlet and inlet hoses to cooling system filter.
3. Remove drain plug, Fig. 25A, from bottom of filter body and allow coolant to drain. Install drain plug; remove capscrews attaching filter cover to filter body and remove cover.
4. Lift upper plate and filter element, Fig. 25A, out of filter body. Discard old filter element. Remove corrosion resistor plate (lower) and spring from filter body.
5. Clean spring and interior of filter body.

Install spring and corrosion plate in filter body; refer to Fig. 25A and install new filter element and upper plate in filter body.

NOTE: Corrosion resistor plate, Fig. 25A, should be replaced each time filter element is replaced. If replacement is not possible, buff plate to a bright finish with wire brush or wheel. When plate becomes thin and pliable, or develops large jagged holes, it **MUST** be replaced.

6. Place new gasket in cover, then install cover with attaching capscrews. Open inlet and outlet shut-off valves.
7. Operate engine until normal operating temperature has been reached. Remove radiator cap and check level of coolant. Add coolant if necessary.
8. Check cooling system for leaks and correct any leaks found.

DRAINING AND FILLING OF COOLING SYSTEM

Park unit on level surface. Remove radiator cap; insert extension tool through hole in lower right front corner of main frame and open radiator drain cock. Refer to Fig. 25, open thermostat housing vent cock, oil cooler drain cock and cylinder block drain cock.

CAUTION

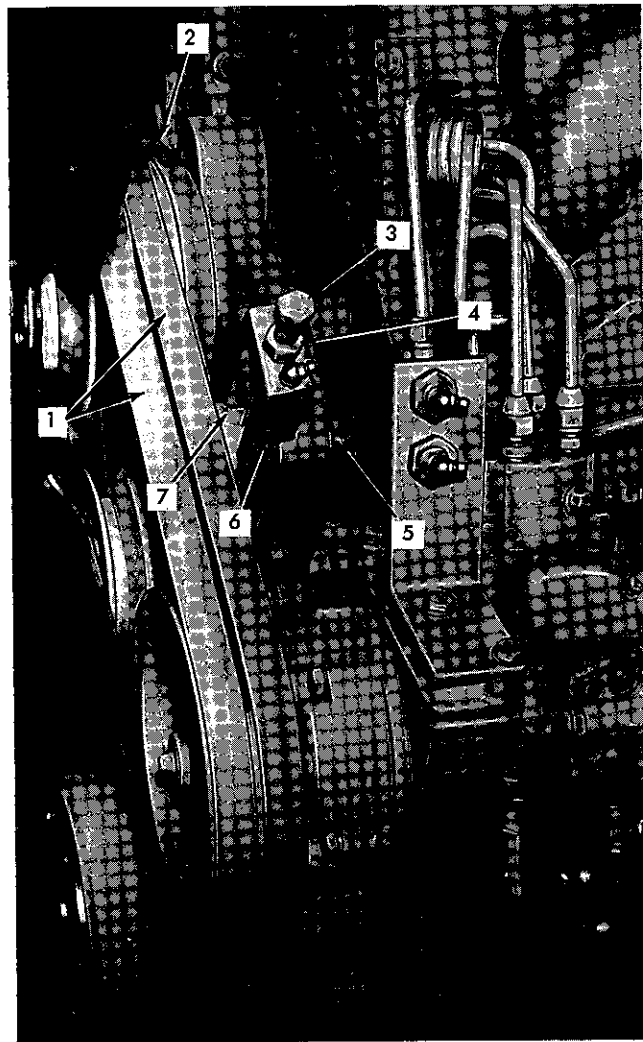
When draining cooling system in freezing weather be certain that coolant flows freely from drain cocks and system drains completely.

Close cylinder block and oil cooler drain cocks, Fig. 25, and radiator drain cock. Fill cooling system through radiator filler pipe until coolant flows from vent cock in thermostat housing, then close vent cock. Continue filling until coolant level is 1 inch (25.4 mm) below bottom of filler neck.

FAN DRIVE BELT ADJUSTMENT

Fan drive belts are properly adjusted when belts can be pressed inward by hand approximately .38 in. to .50 in. (9.65 mm to 12.7 mm) at a point half-way between fan hub and fan drive pulley. Refer to Fig. 26 and adjust belts as follows:

1. Loosen large nut on rear of slide clamping bolt.
2. Hold fan belt adjustment screw; turn adjustment screw jam nut clockwise to tighten belts, or counterclockwise to loosen belts.
3. When belts are properly adjusted, tighten large nut on rear of slide clamping bolt and lock adjustment screw jam nut against slide.



T-72482

FIG. 26 FAN DRIVE BELTS ADJUSTMENT

1. Fan drive belts
2. Water pump and generator drive belt
3. Adjustment screw
4. Jam nut
5. Slide clamping bolt nut
6. Fan belt tightener slide
7. Slide clamping bolt

WATER PUMP AND GENERATOR DRIVE BELT ADJUSTMENT

Water pump and generator drive belt is properly adjusted when belt can be pressed inward by hand approximately .38" (9.65 mm) at a point half-way between generator pulley and fan pulley. To adjust belt, refer to FIG. 27 and loosen brace attaching capscrew; loosen belt adjustment capscrew and two generator mounting capscrews. Move generator in or out to obtain proper belt tension; tighten belt adjustment capscrew, brace attaching capscrew and generator mounting capscrews.

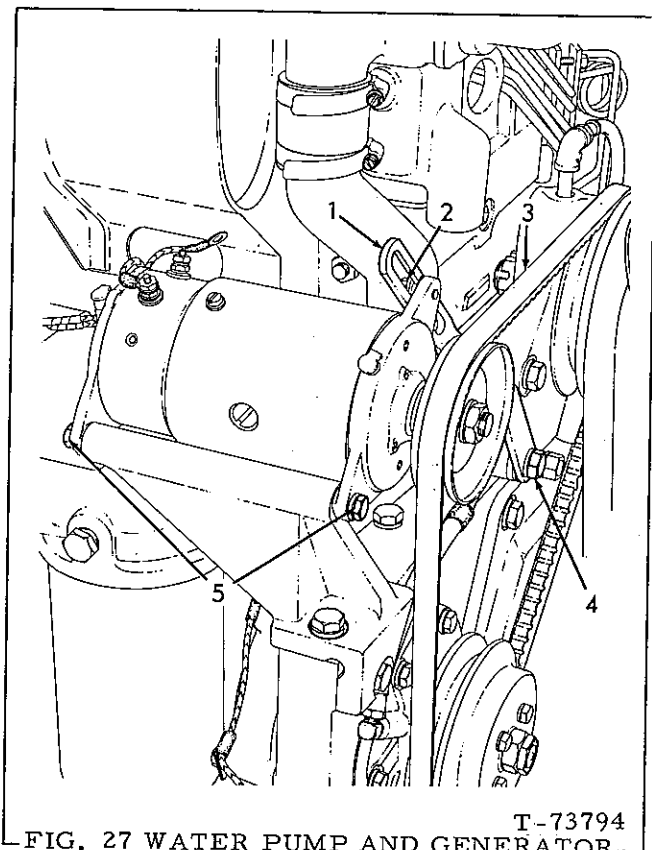


FIG. 27 WATER PUMP AND GENERATOR
DRIVE BELT ADJUSTMENT

1. Belt adjustment brace
2. Belt adjustment cap screw
3. Belt
4. Brace attaching cap screw
5. Generator mounting cap screws

ENGINE LUBRICATION SYSTEM

DESCRIPTION

Engine is pressure lubricated by gear type lubricating oil pump, driven by oil pump driving gear in mesh with crankshaft gear. Engine lubricating oil filter, located on right side of engine, is full-flow type and contains replaceable element. Drain plug in filter body permits draining filter when replacing filter element.

OIL CHANGE AND FILTER ELEMENT REPLACEMENT

Engine crankcase lubricant must be drained and refilled to proper level with specified

lubricant and new element installed in engine lubricating oil filter after each 100 hours of operation, or more often if conditions warrant. Engine should be at operating temperature when draining lubricant.

1. Remove drain access plate from bottom of crankcase guard and remove drain plug from oil pan.
2. After oil has drained completely, install and tighten drain plug; be certain drain plug gasket is in good condition. Install drain access plate in position on bottom of crankcase guard.

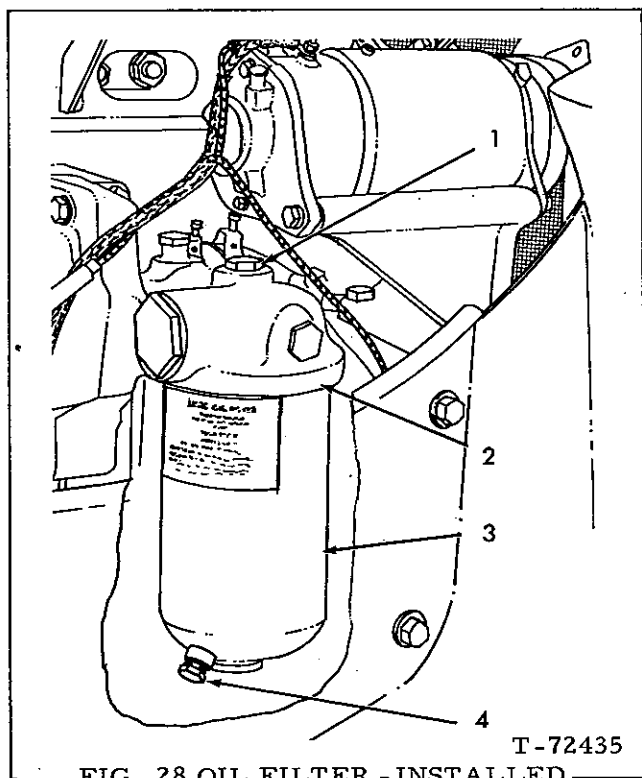


FIG. 28 OIL FILTER - INSTALLED

- | | |
|----------------------------|---------------|
| 1. Body retaining capscrew | 3. Body |
| 2. Filter head | 4. Drain plug |

3. Service engine lubricating oil filter, Fig. 28 and 29, as follows:

- Clean filter head, filter body and surrounding area. Remove oil drain plug from oil filter body and allow oil to drain.
 - Remove body retaining capscrew; remove filter body and filter element assembly from oil filter head.
 - Remove filter element from filter body and discard element. Remove and discard body gasket.
 - Wash and dry interior of filter body. Install new element in filter body.
 - Install filter body assembly with new gasket, on filter head. Torque body capscrew to 45 to 50 lbs. ft. (6.22-6.91 kg-m). Install filter oil drain plug and tighten securely.
4. Fill engine crankcase, through crankcase oil filler pipe, with specified lubricant.
- Be certain engine shut-off knob is pulled back (stop position); crank engine with starter for 15 seconds. This will pump lubricant to engine components and assure filling of filter before engine is started. Operate

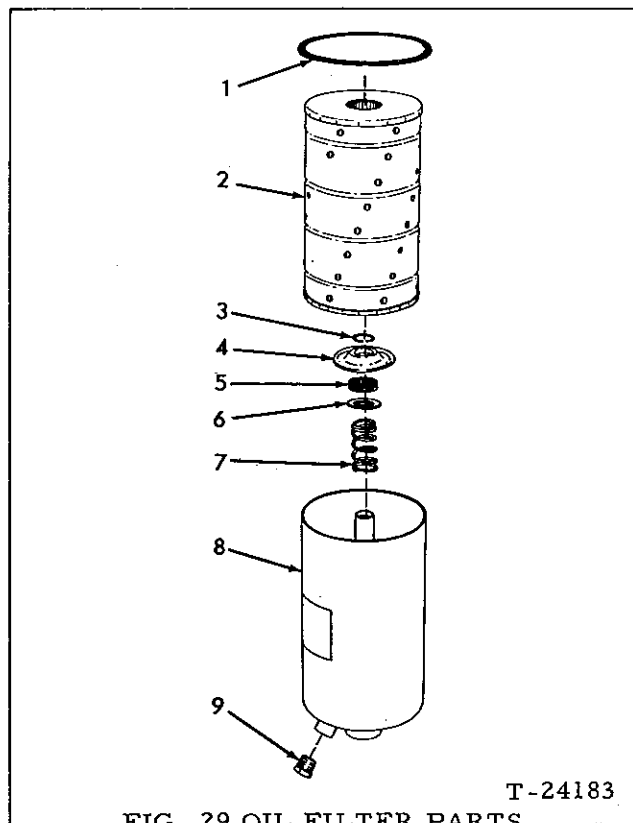


FIG. 29 OIL FILTER PARTS

- | | | |
|--------------|------------|---------------|
| 1. Gasket | 4. Adapter | 7. Spring |
| 2. Element | 5. Seal | 8. Body |
| 3. Snap ring | 6. Washer | 9. Drain plug |

engine at 1/4 throttle for about 5 minutes.

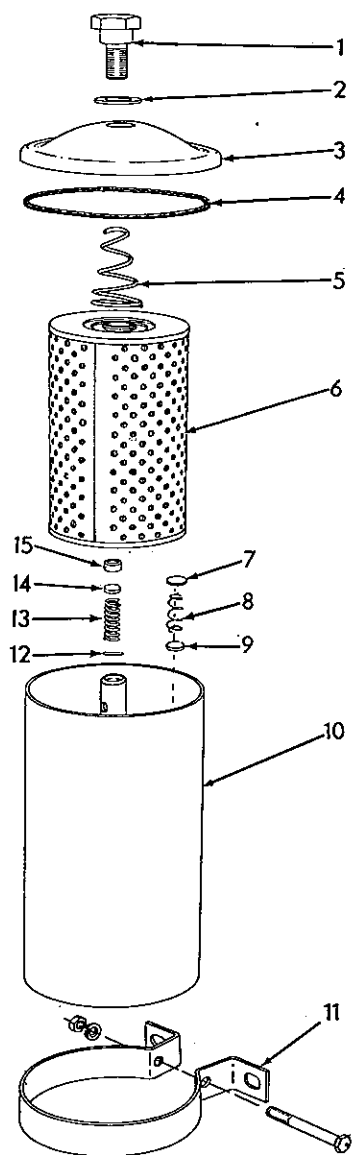
- Stop engine and check oil level; be certain level is not above FULL or below ADD on gauge rod.
- Observe engine lubricating oil filter for oil leakage; correct any leaks.

HEAVY-DUTY FILTER ELEMENT REPLACEMENT EARLY TYPE "WALKER" (Special Equipment)

On units equipped with heavy-duty lubricating oil filter, filter element must be changed at each crankcase oil change. Refer to Fig. 30 and replace oil filter element as follows:

- Clean exterior of oil filter. Open drain cock in bottom of filter and allow oil to drain.
- After oil has drained completely, loosen cover retaining bolt until free of center tube and remove cover (with retaining bolt, gasket, and spring).
- Withdraw filter element and discard. Clean interior of filter shell and tighten drain cock.

4. Install new element on center tube, using care to prevent damage to seals located at each end of element.



T-24009

FIG. 30 HEAVY-DUTY OIL FILTER PARTS-
(Early type "WALKER")

1. Bolt
2. Gasket
3. Cover
4. Gasket
5. Spring
6. Element
7. Plug
8. Inlet check valve spring
9. Inlet check valve
10. Shell
11. Mounting bracket
12. Spring retaining pin
13. Outlet check valve spring
14. Outlet check valve
15. Outlet check valve sleeve

CAUTION

Use only recommended filter element available from Allis-Chalmers Dealer.

5. Install new gasket in cover; install cover and tighten cover retaining bolt securely.
6. Fill engine crankcase with specified lubricant to top of Operating Range on gauge rod.
 - a. Be certain engine shut-off is in stop position; crank engine with starter for 15 seconds. This will pump lubricant to engine components and assure filling of filter before engine is started. Operate engine at 1/4 throttle for about 5 minutes.
 - b. Stop engine and check oil level; be certain level is not above FULL or below ADD on gauge rod.
 - c. Observe filter for oil leaks; correct any leaks found.

HEAVY-DUTY FILTER ELEMENT REPLACEMENT LATE TYPE "BRIGGS" (Special Equipment)

On units equipped with heavy-duty lubricating oil filter, filter element must be changed at each engine oil change. Refer to Fig. 31 and replace oil filter element as follows:

1. Clean filter cover and surrounding area. Open drain cock in bottom of filter tank and allow oil to drain.
2. After oil has drained completely, loosen cover retaining valve assembly until free of tank center tube and remove cover (with cover retaining valve assembly, gasket, washer, spring, element retaining plate and nut).
3. Withdraw element from tank and discard. Clean tank interior and tighten drain cock.
4. Install new element on tank center tube; use care to prevent damage to seals located at each end of element.

CAUTION

Use only recommended filter element available from Allis-Chalmers Dealer.

5. Install new cover gasket in cover. Install cover on filter tank; tighten cover retaining valve assembly securely.
6. Fill engine crankcase with specified lubricant to top of operating range on gauge rod.
 - a. Be certain engine shut-off knob is in stop position; crank engine with starter

for 15 seconds. This will pump lubricant to engine components and assure filling of filter before engine is started. Operate engine at 1/4 throttle for 5 minutes.

b. Stop engine and check oil level; be certain

level is not above FULL or below ADD on gauge rod.

c. Observe filter for oil leaks; correct any leaks found.

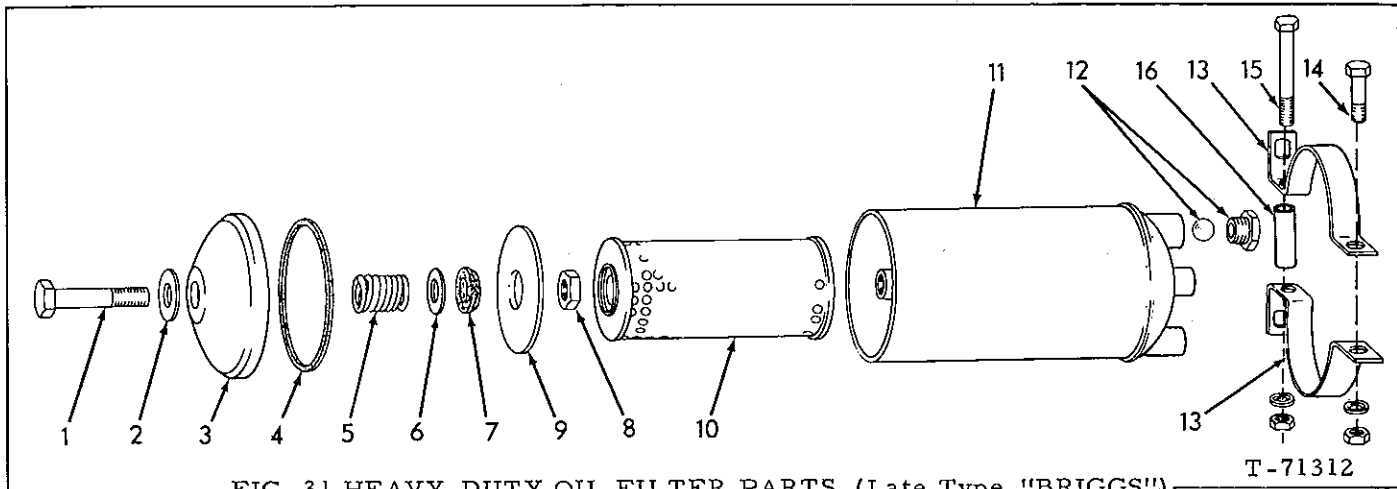


FIG. 31 HEAVY-DUTY OIL FILTER PARTS (Late Type "BRIGGS")

1. Cover retaining valve assembly
2. Washer
3. Cover
4. Gasket
5. Spring
6. Washer (steel)
7. Washer (cork)
8. Nut

9. Element retaining plate
10. Element
11. Tank
12. Oil inlet check ball and bushing
13. Mounting strap
14. Capscrew
15. Capscrew
16. Spacer pipe

FUEL SYSTEM

DESCRIPTION

Fuel system consists of tank, first stage fuel filter, fuel transfer pump, second stage fuel filter, fuel injection pump, fuel injection nozzles, fuel pressure relief valve, fuel shut-off cock in fuel supply line and the necessary lines and hoses.

FUEL TANK AND DRAIN COCK

Drain cock located in bottom of fuel tank, provides means for draining tank when flushing and also acts as sediment sump. Open drain cock before engine is started at beginning of day's operation in warm weather, or shortly after end of day's operation in freezing weather, and allow any water and sediment to drain; close drain cock when clean fuel runs out. Drain and flush fuel tank when a large accumulation of rust and scale is evident. To drain tank, remove drain cock.

FIRST AND SECOND STAGE FUEL FILTERS

1. DESCRIPTION

The first and second stage fuel filter each contain a replaceable type element. Dirt and sediment is collected by first stage fuel filter and prevented from entering fuel transfer pump. Any dirt or sediment passing through first stage fuel filter and fuel transfer pump is collected by second stage fuel filter and prevented from entering fuel injection pump. A drain cock is provided in bottom of each fuel filter shell for draining any water or sediment collected.

2. SERVICE

Open drain cock Fig. 32, in bottom of each fuel filter shell daily, before start of day's operation in warm weather or shortly after end of day's operation in freezing weather, and allow any water or sediment to drain. Close drain cocks as soon as clean fuel

runs out. Install a new element in each filter after each 500 hours of operation (more often if conditions warrant) or when fuel pressure drops below 8 psi (0.562 kg/cm²) as indicated by fuel pressure gauge (if so equipped) with engine running at high idle. Clogged filter elements are usually indicated by irregular engine performance.

3. REPLACEMENT OF FIRST STAGE FUEL FILTER ELEMENT (Fig. 32)

NOTE: The first stage fuel filter does not contain an element when tractor is equipped with heavy-duty fuel filter (special equipment).

- a. Close fuel shut-off cock located at bottom of tank. Clean all dirt from around filter head and shell. Loosen vent screw in top of shell retaining nut, and drain cock in bottom of filter shell; allow fuel to drain.
- b. Loosen shell retaining nut in filter head until it is free from shell center-bolt; remove filter shell from head.
- c. Remove and discard filter element and shell gasket. Wash and dry interior of filter shell.
- d. Install new filter element and push it down firmly so up-turned edge of seat plate (attached to bottom of shell center-bolt) is firmly impressed into bottom of filter element.
- e. Install new gasket in lip of filter shell. Hold filter shell in position under filter head and engage threads of shell retaining nut with shell center-bolt; tighten retaining nut securely.
- f. Close filter drain cock. Open fuel shut-off cock and allow filter to fill with fuel by gravity. Tighten filter vent screw when fuel (free of bubbles) flows from around vent screw.

4. REPLACEMENT OF SECOND STAGE FUEL FILTER ELEMENT (Fig. 32)

- a. Clean fuel filter head and surrounding area. Loosen vent screw in shell retaining nut and drain cock in bottom of filter shell; allow fuel to drain.
- b. Loosen shell retaining nut in filter head until it is free from shell center-bolt; remove filter shell (with its components) from filter head.
- c. Remove and discard filter element. Remove centering guide, element seating plate, seating plate gasket, metal washer, and element spring from shell center-bolt. Discard seating plate gasket, metal

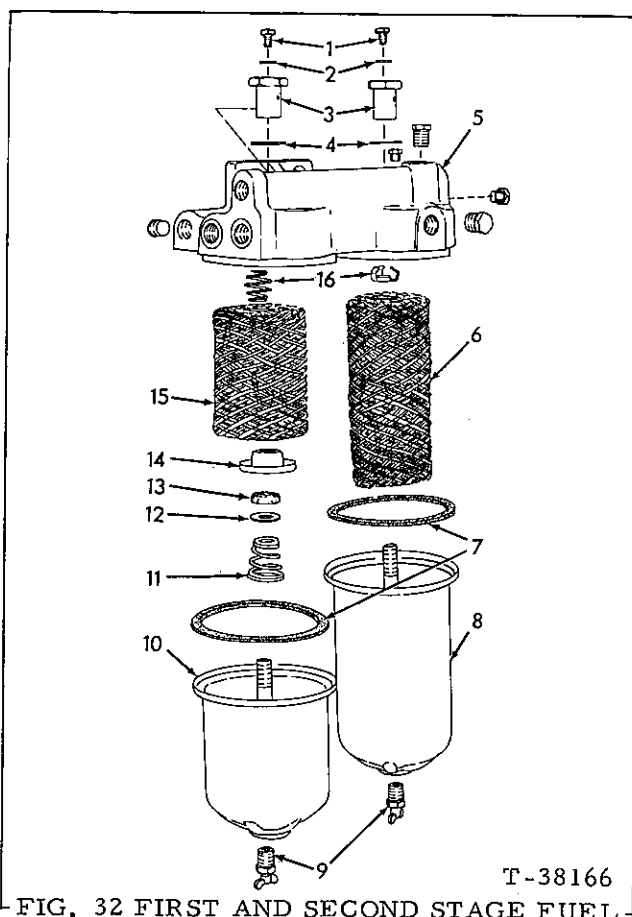


FIG. 32 FIRST AND SECOND STAGE FUEL FILTER PARTS

1. Vent screws
2. Washers
3. Shell retaining nuts
4. Gaskets
5. Head
6. Element (first stage)
7. Gaskets
8. Shell (first stage)
9. Drain cocks
10. Shell (second stage)
11. Element spring
12. Washer
13. Seating plate gaskets
14. Element seating plate
15. Element (second stage)
16. Element centering guide

washer, and shell gasket.

- d. Wash and dry interior of filter shell. Close and tighten drain cock located in bottom of filter shell.
- e. Place element spring (large end downward) on shell center-bolt and install new metal washer over shell center-bolt and down onto element spring.
- f. Install new seating plate gasket in position in element seating plate; install gasket and element seating plate on shell center-bolt.

NOTE: Install element seating plate and gasket on shell center-bolt so gasket contacts metal washer.

- g. Install centering guide in position on shell center-bolt, and install new filter element in position in filter shell. Install new gasket in lip of filter shell.
- h. Fill filter shell with fuel. Hold filter shell in position under filter head, install shell retaining nut and retaining nut gasket; tighten retaining nut securely.
- i. Crank engine with starter until full stream of fuel (free of bubbles) flows from around loosened vent screw; tighten vent screw while continuing to crank engine.
- j. Start engine, observe for fuel leaks; correct any leaks found.

HEAVY-DUTY FUEL FILTER (Special Equipment)

1. SERVICE

Open drain cock, located in bottom of fuel filter shell (tank), before engine is started at beginning of day's operation in warm weather or shortly after end of day's operation in freezing weather, and allow water or sediment to drain. Close drain cock when clean fuel runs out. Remove and discard oil filter element and install new one after every 500 hours of operation, or when fuel pressure drops to 8 psi (0.562 kg/cm²) on pressure gauge (if so equipped) with engine running at high idle.

2. REPLACEMENT OF HEAVY-DUTY FUEL FILTER ELEMENT (Fig. 33) EARLY TYPE "WALKER"

- a. Close fuel tank shut-off cock; open drain cock located in bottom of fuel filter and allow fuel to drain; clean exterior of fuel filter.
- b. Loosen cover retaining bolt until free of center tube and remove cover (with retaining bolt, gasket, and spring) from filter.
- c. Withdraw filter element from shell and discard element. Clean interior of filter and tighten drain cock.

- d. Install new filter element in position in filter and on center tube, using care to prevent damage to seal located at each end of element.

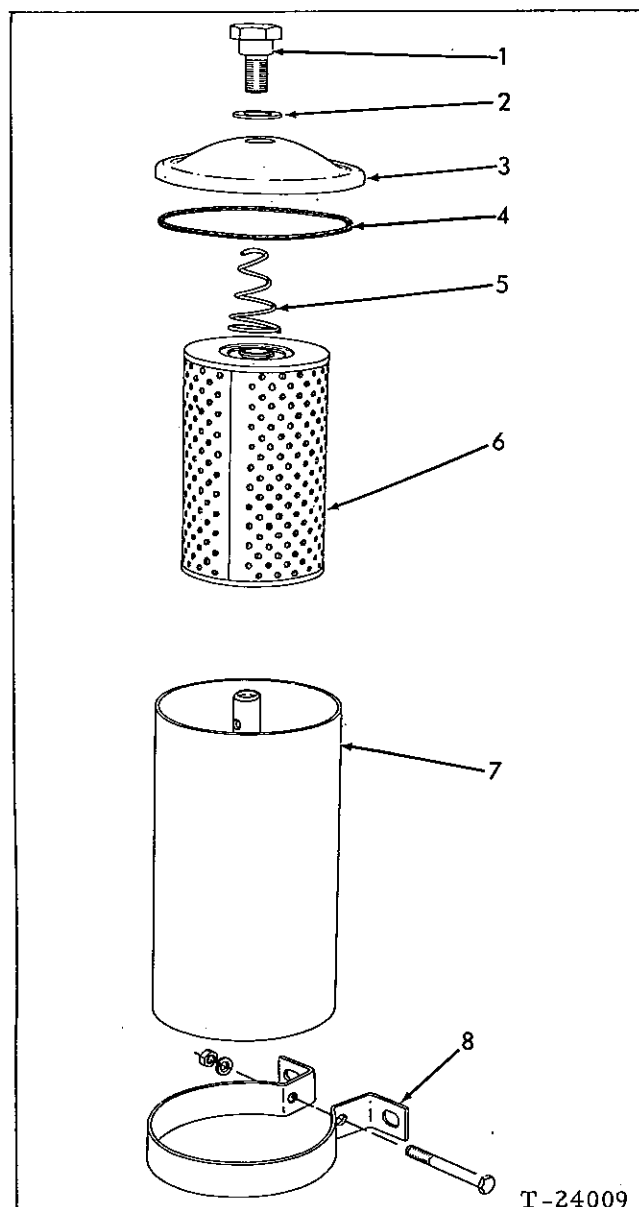


FIG. 33 HEAVY-DUTY FUEL FILTER PARTS
(Early Type "WALKER")

- | | |
|-----------------|---------------------|
| 1. Bolt | 5. Spring |
| 2. Gasket | 6. Element |
| 3. Cover | 7. Shell |
| 4. Cover gasket | 8. Mounting bracket |

CAUTION

Use only recommended filter element available from Allis-Chalmers Dealer.

- e. Install new cover gasket in cover. Install cover but do not tighten retaining bolt at this time.
 - f. Fill fuel tank with fuel so fuel level is high enough to fill fuel filter by gravity. Open fuel tank shut-off cock. Observe fuel filter; when fuel flows from around cover, tighten cover retaining bolt securely.
3. REPLACEMENT OF HEAVY-DUTY FUEL FILTER ELEMENT (Fig. 34). LATE TYPE "BRIGGS"

- a. Close fuel tank shut-off cock; open drain cock located in bottom of filter tank and allow fuel to drain; clean exterior of fuel filter.
- b. Loosen cover retaining capscrew until free of tank center tube and remove cover (with retaining capscrew, gasket,

washer, spring, element retaining plate and nut).

- c. Withdraw filter element from tank and discard element. Clean interior of filter tank and tighten drain cock.
- d. Install new filter element in position in filter tank (on tank center tube) using care to prevent damage to seals located at each end of element.

CAUTION

Use only recommended filter element available from Allis-Chalmers Dealer.

- e. Install new cover gasket in cover; install cover on filter tank but do not tighten cover retaining capscrew at this time.
- f. Fill fuel tank with fuel so fuel level will be high enough to fill fuel filter by gravity. Open fuel tank shut-off cock. Observe fuel filter; when fuel flows from around cover tighten cover retaining capscrew securely.

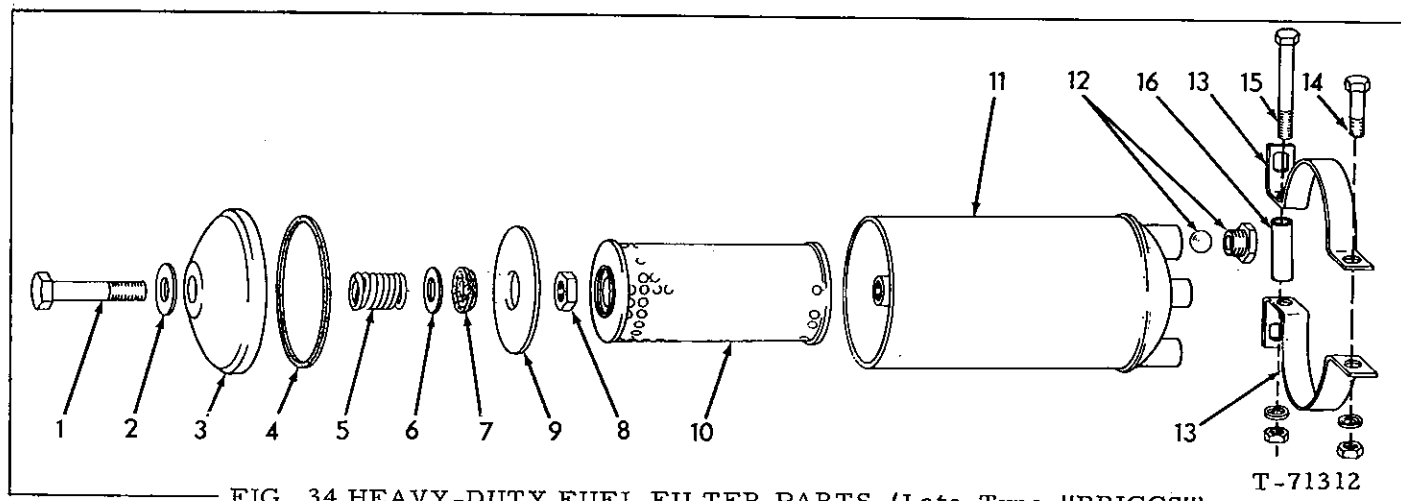


FIG. 34 HEAVY-DUTY FUEL FILTER PARTS (Late Type "BRIGGS")

- | | |
|-----------------------------|--|
| 1. Cover retaining capscrew | 9. Element retaining plate |
| 2. Washer | 10. Element |
| 3. Cover | 11. Tank |
| 4. Gasket | 12. Oil inlet bushing and check ball
(used on lube filter only) |
| 5. Spring | 13. Mounting strap |
| 6. Washer (steel) | 14. Capscrew |
| 7. Washer (cork) | 15. Capscrew |
| 8. Nut | 16. Spacer pipe |

ELECTRICAL SYSTEM

DESCRIPTION

The electrical system, which includes the starter, generator, generator regulator, ammeter, two batteries, master switch, and wiring, is a 24-volt system through out. Two 12-volt wet cell storage batteries, located in compartments at the ends of the seat, are used to supply current for the system.

BATTERIES

Check level of electrolyte in batteries after every 10 hours of operation, or as often as operating conditions prove necessary. Maintain level of solution .38" (9.65mm) above plates of batteries by addition of clean distilled water. Keep battery and cable terminals tight and clean. Filler caps must be kept tight at all times.

WARNING

To prevent possibility of bodily injury, always turn electrical system master switch, Fig. 7, OFF before cleaning, repairing, disconnecting or connecting any heavy electrical cables.

BATTERY STORAGE

If unit is not expected to be used for two or more weeks, the batteries should be removed and stored in a cool dry place. During extended storage they should be checked periodically and recharged as necessary.

CAUTION

Do not store batteries on concrete or steel.

An undercharged battery is susceptible to freezing when standing idle and exposed to cold weather. The electrolyte of the battery in various stages of discharge will start to freeze at following temperatures:

Specific Gravity Corrected to 80°F. (26.7°C)	State Of Charge	Freezing Temperature	
		°F.	°C.
1.110	Discharged	15	9.44
1.190	Half charged	-10	-23.3
1.270	Fully charged	-80	-62.2

Refer to Service Manual #664045 for detailed procedure.

GENERATOR AND GENERATOR REGULATOR

Generator and generator regulator are set to keep batteries fully charged under normal conditions. Ammeter should indicate good rate of charge for short time after starting engine or until generator replaces energy drained from batteries during cranking; then it will show little or no charge. It is important generator and generator regulator be maintained in good condition so batteries will be kept charged.

Testing and adjustment of generator and generator regulator should not be attempted without dependable testing equipment, therefore, it is recommended these units be taken to dependable electrical repair shop when service is required.

CAUTION

Whenever generator has been removed for repairs or replacement, or when generator leads have been disconnected and reconnected, the generator must be polarized BEFORE engine is started. Polarizing causes current to flow in normal direction through field coils and will prevent vibration, arcing, burning and sticking of regulator points.

Polarize generator as follows:

1. Turn electrical master switch ON.
2. Using a short jumper lead, momentarily touch jumper lead to "BAT." (Battery) terminal and at same time to "GEN." (Generator) terminal of generator regulator.

CAUTION

Do not run or test generator on an open circuit. If it should become necessary to operate generator without it being connected to batteries, it should be short circuited. This can be done by disconnecting lead connected to "GEN" terminal of regulator and connecting end of lead to convenient ground.

WATER PUMP AND GENERATOR DRIVE BELT ADJUSTMENT

Water pump and generator drive belt is properly adjusted when belt can be pressed inward by hand approximately .38" (9.65mm) half-way between generator pulley and fan pulley. To adjust belt, refer to Fig. 27 and loosen

belt adjustment brace attaching capscrew; loosen belt adjustment capscrew and generator mounting capscrews. Move generator in or out to obtain proper belt tension; tighten belt adjustment capscrew, brace attaching capscrew and generator mounting capscrews.

ELECTRICAL CABLES

Inspect electrical cables frequently to detect any loose connections or frayed insulation. Tighten connections and wrap any frayed spots with friction tape to prevent short circuits.

WARNING

To prevent possibility of bodily injury, always turn electrical system master switch, Fig. 7, OFF before cleaning, repairing, disconnecting or connecting any heavy electrical cables.

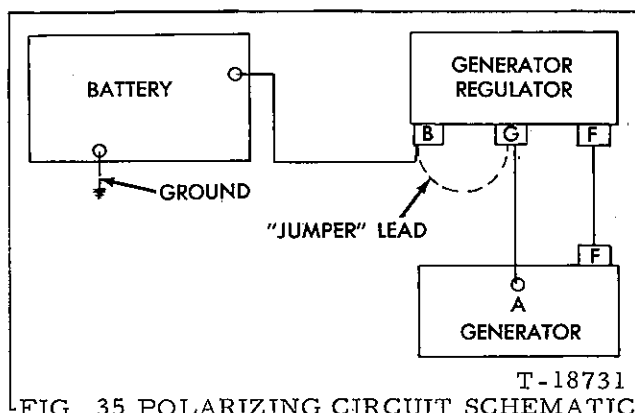


FIG. 35 POLARIZING CIRCUIT SCHEMATIC

AIR CLEANER

DESCRIPTION AND PURPOSE

Purpose of air cleaner is to remove dust and other foreign matter from air used by engine. Life of engine depends largely upon efficiency of air cleaner. Fast wear on cylinder sleeves, pistons, and rings may result if air cleaner is not kept in good condition and properly serviced.

A damaged hose, loose hose clamp, damaged gasket or leak of any kind allowing air to enter engine cylinders without first passing through air cleaner will defeat purpose of cleaner; therefore, extreme care should be taken to prevent leaks. Periodic inspection of above parts and of air cleaner housing for dents, cracks, etc., should be made frequently. If any of above mentioned conditions are found, they MUST be corrected immediately.

1. DRY TYPE

HD-6B. Air for engine is drawn into air cleaner through air stack. Air cleaner is designed to impart rotary motion to intake air which causes heavy particles of dust in air to strike interior of air cleaner body thus slowing velocity of dust particles and allowing them to fall into automatic dust unloader at bottom of air cleaner.

NOTE: On early models, dry-type air cleaner was equipped with a dust jar instead of automatic dust unloader. Partially cleaned air is drawn through air cleaner filter element which removes any dust particles still remaining in air. Clean filtered air leaves filter element through air outlet elbow and enters intake

manifold for delivery to engine cylinders.

HD-6AG. Air for engine is drawn through air pre-cleaner mounted on top of air inlet tube. Pre-cleaner is designed to impart rotary motion to air; this causes heavy particles of dust to be thrown to outside of pre-cleaner sediment bowl and retained in the bowl. A large percentage of dust in air drawn through pre-cleaner is thus removed. After passing through air pre-cleaner, air enters air cleaner. Design of air cleaner imparts rotary motion to air; any remaining dirt enters sediment cup through slot in top of baffle; dirt is then expelled through automatic dust unloader. Partially cleaned air is drawn through air cleaner filter elements which remove any dust particles still remaining in air. Clean filtered air leaves filter element through air outlet elbow and enters turbocharger and intake manifold for delivery to engine cylinders.

The capacity of the air cleaner is greater than the demand; therefore, some foreign deposits on the paper element actually increase the effectiveness of the unit by reducing the size of the openings in the element and restricting an even greater amount of dust particles. However, neglect of proper servicing of the air cleaner will result in too much restriction, causing loss of power and excessive fuel consumption.

2. OIL TYPE

Air for engine enters through air pre-cleaner mounted on top of air cleaner pipe. Pre-

cleaner is designed to impart rotary motion to air; this causes heavy particles of dust to be thrown to outside of pre-cleaner shell and deposited therein. A large percentage of dust in air drawn through pre-cleaner is thus removed.

After passing through air pre-cleaner, air enters air cleaner through pipe that extends down through center of air cleaner body. An oil cup filled to specified level with engine oil is suspended on lower end of air cleaner body. As air is drawn through air cleaner, portion of this oil is drawn up onto screen mats in main body of cleaner.

Dust still remaining in air is collected by these oily mats as air passes through them. Oil, dripping back into oil cup, carries this dust with it and deposits it in cup. Thus, only clean air enters cylinders.

AIR CLEANER SERVICE

1. DRY TYPE HD-6B

Air cleaner contains a cleanable element; replace element after six cleanings, or after one year of use regardless of number of cleanings.

The unloader valve located on the bottom of the air cleaner must be kept free from debris. Check the lips periodically and keep them clean; lips should be open only when the engine is at low idle or stopped. If the lips of the valve have been sucked into the air cleaner, check for a plugged air cleaner inlet. Malfunction of the valve will reduce the element service interval because of backward air flow through the valve but will not alter the air cleaner effectiveness.

An air cleaner restriction indicator (special equipment) is used to indicate condition of air cleaner element. Indicator (if so equipped) is located on front of cowl. As dirt is trapped in the air cleaner element, the volume of air flowing through the air cleaner is reduced and the pressure drop across the air cleaner-to-engine circuit increases. At a predetermined point the signal in the indicator begins to rise. When the signal reaches top of window and locks in position (maximum allowable restriction), servicing of the air cleaner is required.

On units without air cleaner restriction indicator, element must be removed and cleaned every 100 hours of operations or more often in abnormal conditions. Excessive smoke and loss of power are good indications cleaner element should be cleaned regardless of time interval since last cleaning.

NOTE: On earlier models, dry-type air cleaner was equipped with a dust jar; dust jar must be removed and cleaned when dust reaches dust

level mark on jar. Never allow dust level to build up past level mark.

Service air cleaner Fig. 36 and 37 as follows:

- a. Check rain cap located on top of air inlet tube and clean screen if necessary.
- b. With engine stopped, clean element end of air cleaner and surrounding area.
- c. Loosen element retaining screw and remove element retaining bar. Carefully withdraw element from air cleaner body.
- d. The filter element may be cleaned with compressed air or washed. If contaminant on element is mostly dust, either method works well; if contaminant contains a large amount of soot or oil fumes, washing is the better method.

WARNING

Never use gasoline or solvent to clean element.

- e. To clean element with compressed air, direct dry, clean air up and down the pleats on clean air side of element until all dust is removed.

CAUTION

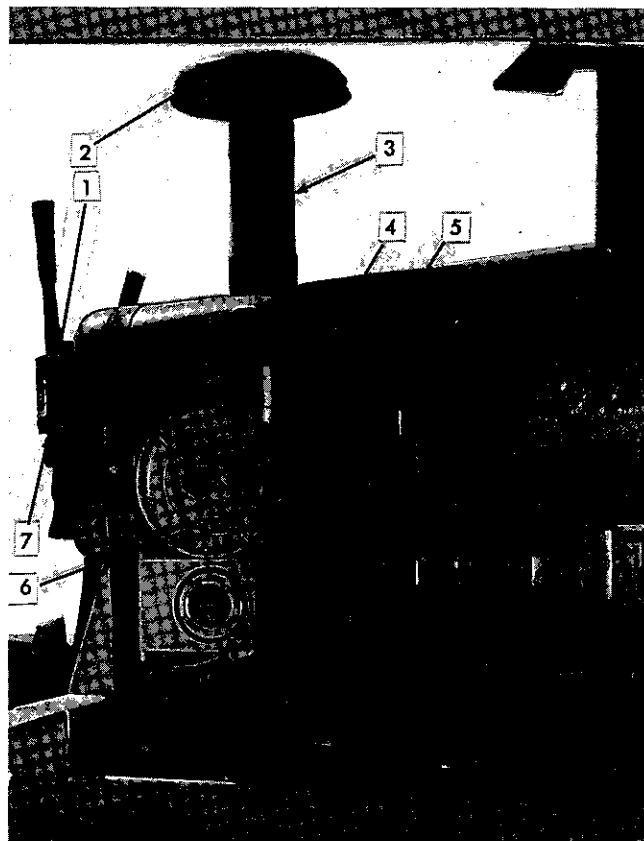
Air pressure must not exceed 100 psi (7.03 kg/cm²). Maintain a reasonable distance between nozzle and filter element.

- f. Wash element in a solution of two ounces (57 grams) low detergent soap or filter cleaner in one gallon (3.78 liters) of water. For best mixing results, dissolve detergent or cleaner in a small amount of cool water, then add warm water - approximately 100°F. (37.7°C) - to obtain proper proportion.
- g. Soak element in solution for at least fifteen minutes, then agitate element for about two minutes to loosen dirt. Rinse element with water from hose or faucet until clean; water pressure must not exceed 40 psi (2.81 kg/cm²).
- h. Air dry element for 24 hours before using. Mechanized drying methods may be used but heated air - 180°F. (42°C) maximum - must be circulated. Do not use light bulbs to dry element.
NOTE: Keep spare elements on hand to reduce downtime.
- i. After element has been cleaned and dried, it must be inspected for rupture or holes. Place bright light inside element and inspect element from outside; light will

shine through any holes or tears making them visible. If any holes are evident, new element must be installed.

j. Inspect gasket on end of element. If gasket is damaged in any way which may permit an air leak, element must be replaced.

k. Clean inside of air cleaner body before reinstalling element. Insert element (with open end first) into position in air cleaner body; install element retaining bar assembly, and tighten element retaining screw.



T-75404

FIG. 36 HD-6B AIR CLEANER INSTALLED

1. Air restriction indicator (Special equipment)
2. Rain cap
3. Air inlet tube
4. Element
5. Air cleaner housing
6. Element retaining bar
7. Reset button

2. DRY TYPE HD-6 AG

The air pre-cleaner mounted on top of air cleaner air inlet tube has a cleanable type dust bowl; dust bowl must be removed and cleaned when dust reaches dust level mark

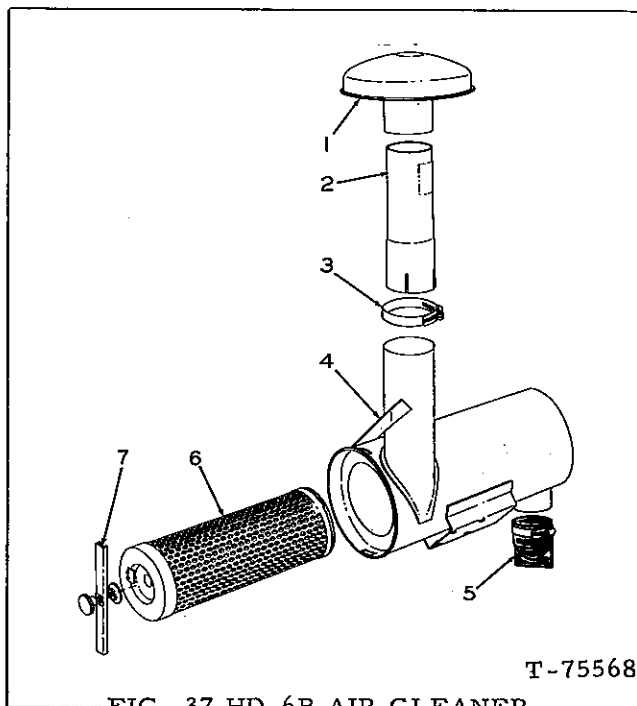


FIG. 37 HD-6B AIR CLEANER

1. Rain cap
2. Air inlet tube
3. Clamp
4. Air cleaner
- *5. Unloader valve
6. Element
7. Element retaining bar

*Dust jar and bail used on early units

on bowl. Never allow dust level to build up past level mark.

Air cleaner contains outer and inner filter elements. Outer element is cleanable; replace outer element after six cleanings, or after one year of use regardless of number of cleanings. Inner element is not cleanable; replace inner element after one year of use or if restriction is indicated after outer element has been serviced.

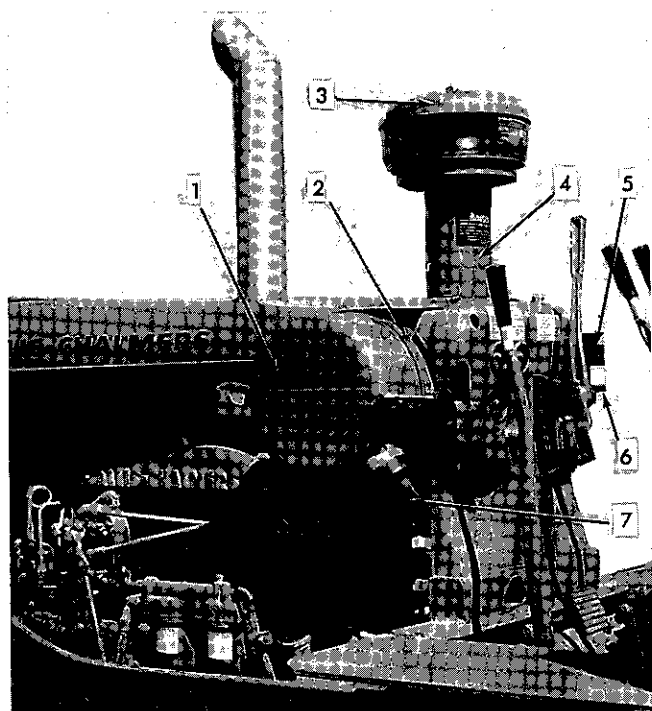
The unloader valve located on the bottom of the air cleaner must be kept free from debris. Check the lips periodically and keep them clean; lips should be open only when the engine is at low idle or stopped. If the lips of the valve have been sucked into the air cleaner, check for a plugged air cleaner inlet. Malfunction of the valve will reduce the element service interval because of backward air flow through the valve but will not alter the air cleaner effectiveness.

Air cleaner restriction indicator is used to indicate condition of air cleaner element. As dirt is trapped in the air cleaner elements, the volume of air flowing through the air cleaner is reduced and the pressure drop across the air cleaner-to-engine circuit increases. At a predetermined point the signal in the indicator begins to rise. When the signal

reaches top of window and locks in position (maximum allowable restriction), servicing of the air cleaner is required.

Service air pre-cleaner Fig. 38 and air cleaner Fig. 39 as follows:

- a. Unscrew wing nut; remove cover from dust bowl. Lift dust bowl from pre-cleaner sleeve assembly.
- b. Clean the dust bowl. Be certain fins in sleeve assembly are not bent, damaged, or clogged.
- c. Wipe cover and reassemble pre-cleaner. Tighten wing nut with fingers. **DO NOT USE WRENCH.**



T-75405

FIG. 38 HD-6 AG AIR CLEANER INSTALLED

1. Sediment cup
 2. Air cleaner body
 3. Air pre-cleaner assembly
 4. Air inlet tube
 5. Air restriction indicator
 6. Reset button
 7. Unloading valve
- d. Clean air cleaner assembly and surrounding area.
 - e. Loosen cup retaining nuts attaching sediment cup to air cleaner body; remove sediment cup and baffle.
 - f. Remove outer element retaining wing

nut and gasket; rotate outer element 180° and pull it from air cleaner body. **DO NOT REMOVE INNER ELEMENT.**

- g. The filter element may be cleaned with compressed air or washed. If contaminant on element is mostly dust, either method works well; if contaminant contains a large amount of soot or oil fumes, washing is the better method. Clean plastic sleeve and fins with a stiff fiber brush; do not remove them from element.

WARNING

Never use gasoline or solvent to clean element.

- h. To clean element with compressed air, direct dry, clean air up and down the pleats on clean air side of element until all dust is removed.

CAUTION

Air pressure must not exceed 100 psi (7.03 kg/cm²). Maintain a reasonable distance between nozzle and filter element.

- i. Wash element in a solution of two ounces (57 grams) low detergent soap or filter cleaner in one gallon (3.78 liters) of water. For best mixing results, dissolve detergent or cleaner in a small amount of cool water, then add warm water (approximately 100°F.) (37.7°C) to obtain proper proportion.
- j. Soak element in the solution for at least fifteen minutes, then agitate element for about two minutes to loosen dirt. Rinse element with water from hose or faucet until clean; water pressure must not exceed 40 psi (2.81 kg/cm²).
- k. Air dry element for 24 hours before using. Mechanized drying methods may be used but heated air (180°F. (42°C) maximum) must be circulated. Do not use light bulbs to dry element.
NOTE: Keep clean spare elements on hand to reduce downtime.
- l. After element has been cleaned and dried, it must be inspected for rupture or holes. Place bright light inside element and inspect element from outside; light will shine through any holes or tears making them plainly visible. If any holes are evident, new element must be installed.

Inspect element retaining wing nut gasket and element seating gasket; replace wing nut and/or element if damage is apparent.

Clean inside of air cleaner body and sediment cup before reinstalling element. Insert element in air cleaner body and tighten retaining wing nut securely.

Be certain sediment cup o-ring is in good condition and install o-ring in groove in cleaner body; install sediment cup (unloader

valve at bottom) and tighten cup retaining nuts securely.

Start engine; observe air cleaner restriction indicator with engine running at high idle. If restriction is indicated, air cleaner inner element must be replaced.

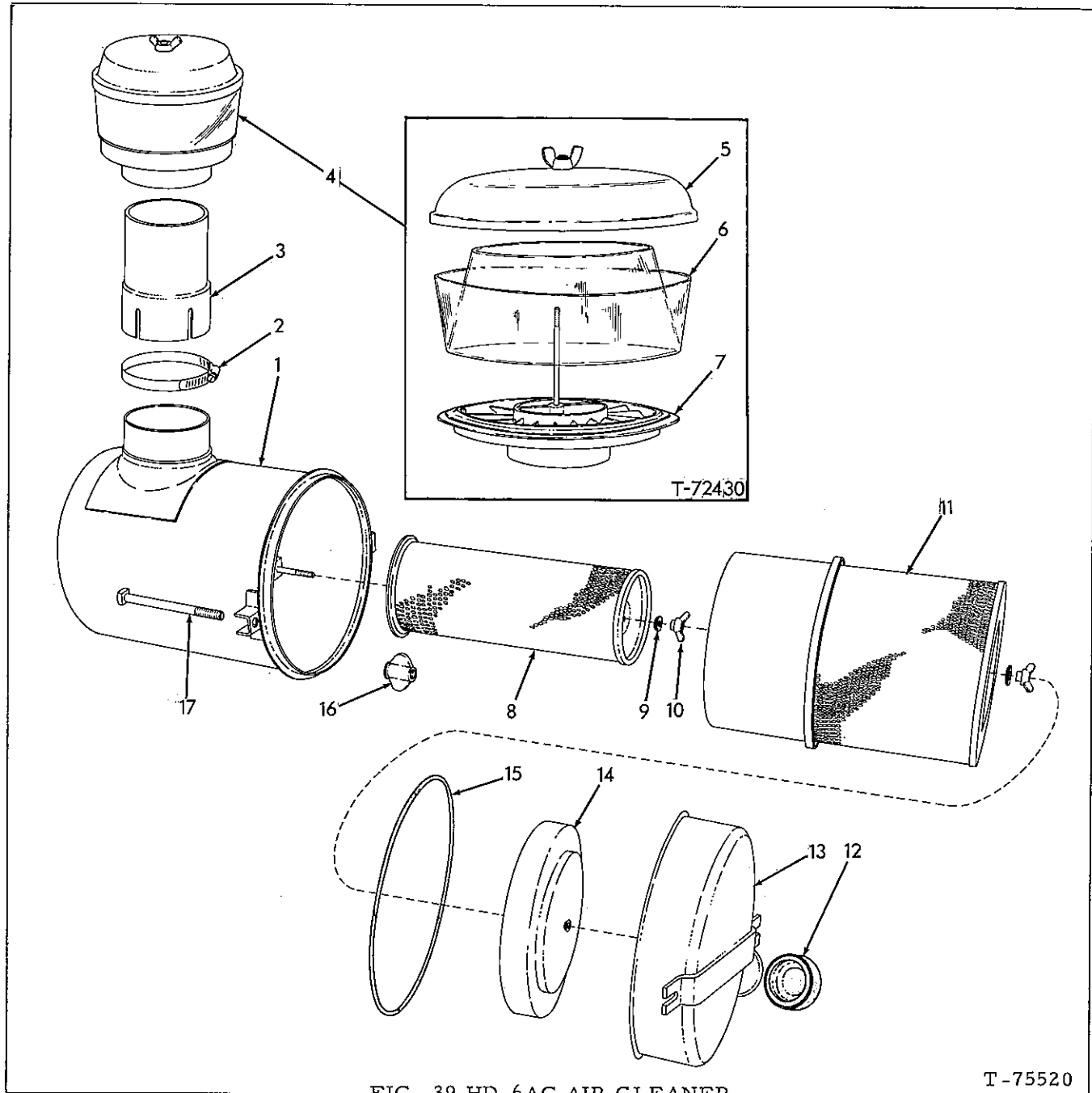


FIG. 39 HD-6AG AIR CLEANER

T-75520

1. Air cleaner body
2. Clamp
3. Air inlet tube
4. Air pre-cleaner assembly
5. Air pre-cleaner cover
6. Sediment bowl

7. Sleeve Assembly
8. Inner element
9. Retaining nut gasket
10. Retaining nut
11. Outer element
12. Unloading valve

13. Sediment cup
14. Baffle assembly
15. Cup sealing O-ring
16. Cup retaining nut
17. Cup retaining bolt

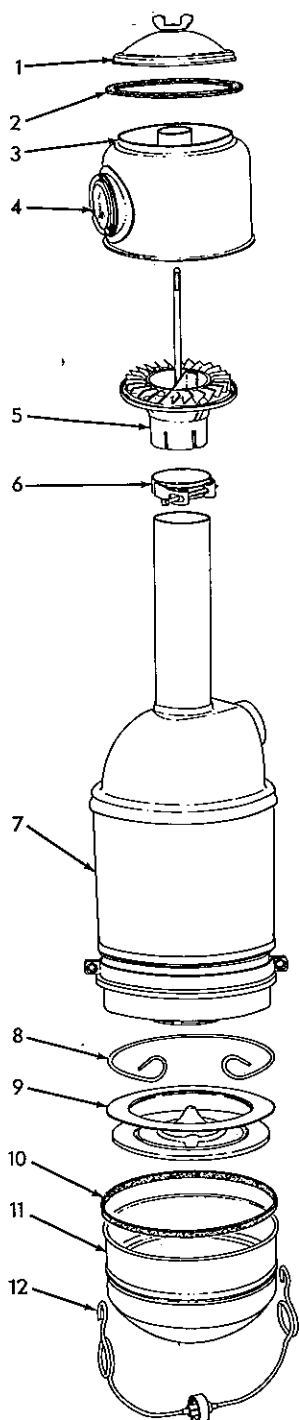
3. OIL TYPE

Remove air pre-cleaner assembly whenever

dust level reaches half-way up in dust bowl.
Remove and clean as follows:

a. Remove cover from pre-cleaner assembly.

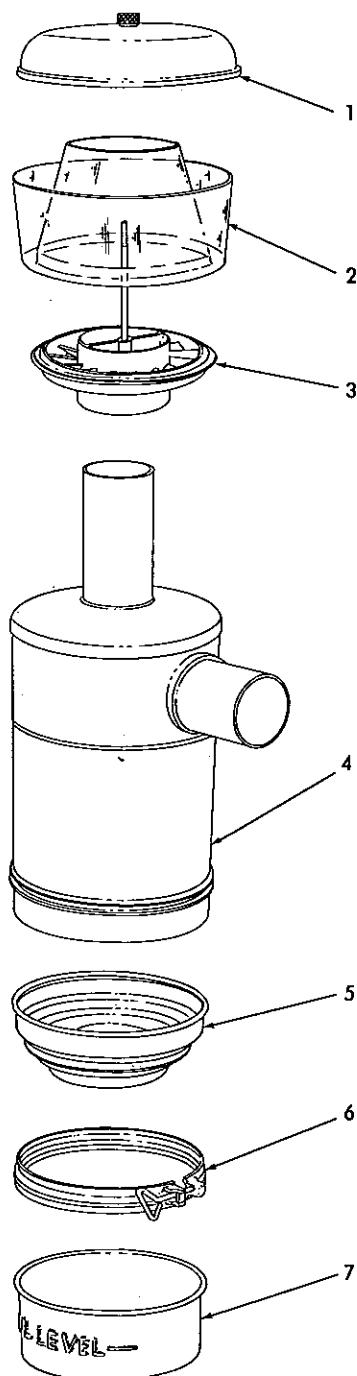
b. Clean inside of pre-cleaner assembly.



T-73806

FIG. 40 OIL TYPE AIR CLEANER (EARLY MODELS)

- | | |
|---------------------|---------------------|
| 1. Cover | 7. Air cleaner body |
| 2. Gasket | 8. Ring |
| 3. Dust bowl | 9. Baffle |
| 4. Inspection glass | 10. Gasket |
| 5. Pre-cleaner body | 11. Oil cup |
| 6. Clamp | 12. Bail |



T-73807

FIG. 41 OIL TYPE AIR CLEANER (LATE MODELS)

- | | |
|---------------------|--------------|
| 1. Cover | 5. Inner cup |
| 2. Dust bowl | 6. Clamp |
| 3. Pre-cleaner body | 7. Oil cup |
| 4. Air cleaner body | |

Be certain fins in pre-cleaner body are not bent, damaged, or clogged.

c. Wipe dust off cover and reassemble pre-cleaner. Replace gasket if not in good condition. Do not use wrench to tighten nut.

d. Remove oil cup from bottom of air cleaner body.

(1) Early models, Fig. 40, remove air baffle retaining ring and air baffle from oil cup. Empty oil from cup.

(2) Wash oil cup and air baffle with clean solvent or fuel. Install air baffle and retaining ring in oil cup and fill cup to proper level with clean specified engine oil.

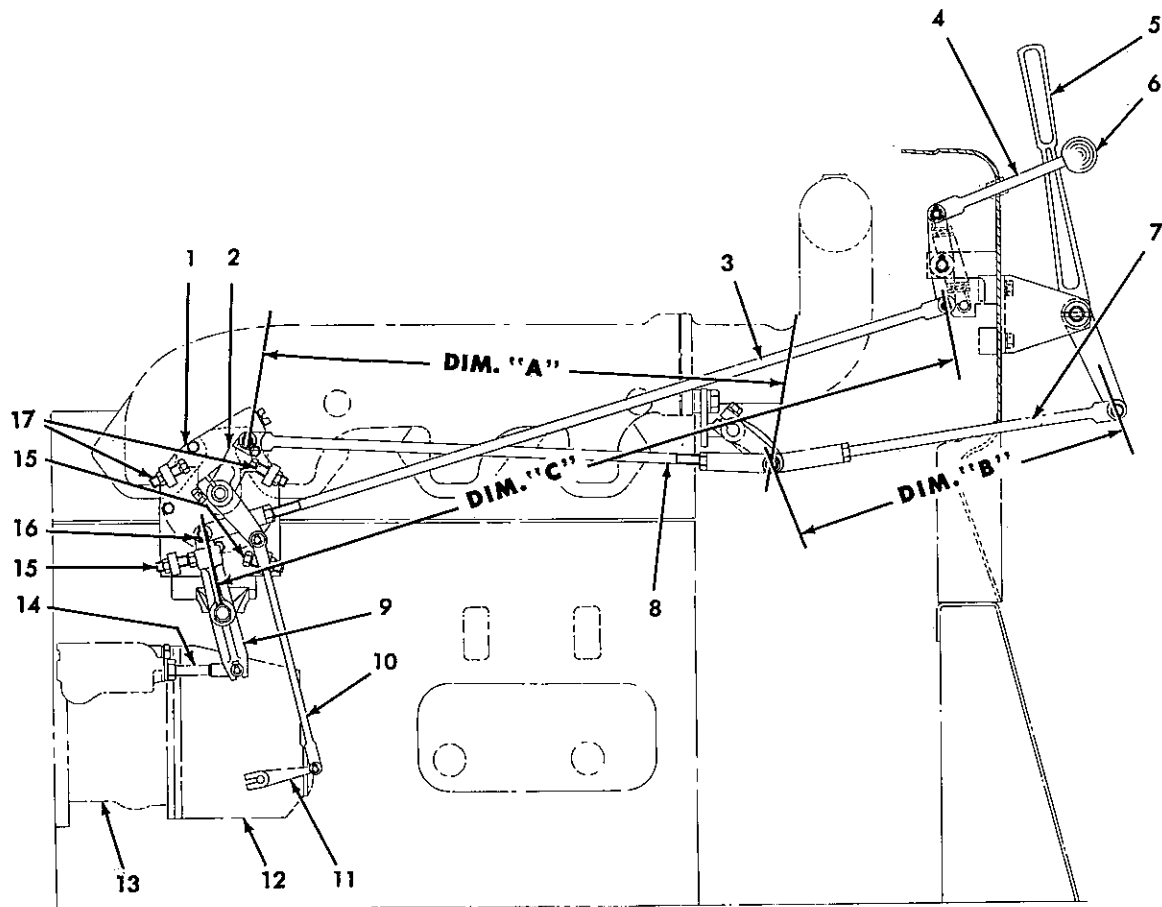
(3) Late models, Fig. 41, remove inner cup then empty oil from oil cup.

(4) Wash oil cup and inner cup with clean solvent or fuel. Place inner cup in oil cup and fill to proper level with clean specified engine oil.

Be certain oil cup gasket is in good condition, then install oil cup in position on bottom of air cleaner body.

Once or twice a year, remove air cleaner from its mounting. Remove oil cup and immerse cleaner in clean fuel, or non-combustible cleaning solvent and rinse dirt from air cleaner matting. Allow sufficient time for fuel or solvent to drain from matting before reinstalling air cleaner.

ENGINE CONTROL LINKAGE



T-27284

FIG. 42 HD-6B ENGINE CONTROL LINKAGE

1. Throttle assembly
2. Throttle control bellcrank
3. Fuel shut-off front rod
4. Fuel shut-off rear rod
5. Throttle lever
6. Fuel shut-off knob
7. Throttle control rear rod
8. Throttle control front rod
9. Fuel shut-off bellcrank
10. Throttle control vertical rod

11. Speed control lever
 12. Governor
 13. Fuel injection pump
 14. Fuel shut-off plunger
 15. Fuel shut-off stop screws
 16. Yoke pin
 17. Throttle control stop screws
- Dim. "A" - 20.44 in. (519 mm)
 Dim. "B" - 14.75 in. (375 mm)
 Dim. "C" - 30.75 in. (781 mm)

DESCRIPTION

Engine fuel shut-off knob is connected by linkage to the fuel shut-off plunger of fuel injection pump. When shut-off knob is moved all the way forward, fuel shut-off plunger moves forward to run position. When shut-off knob is pulled all the way back, fuel shut-off plunger moves rearwards to stop position. Knob can be locked in off position on HD-6AG.

Improper adjustment of engine shut-off linkage may result in loss of engine speed or power, failure of engine to start with shut-off knob in RUN position, or failure of engine to stop when shut-off knob is pulled all the way back or locked in STOP position.

The throttle lever is connected by linkage to speed control lever of engine governor. Engine will run at low idle speed with throttle

lever all the way forward; pull back on lever to increase engine speed as desired. Improper adjustment of throttle linkage may result in loss of engine speed.

The engine governor is adjusted at the factory to provide maximum horsepower along with high operating efficiency. Should adjustment of governor become necessary, contact Allis-Chalmers Dealer.

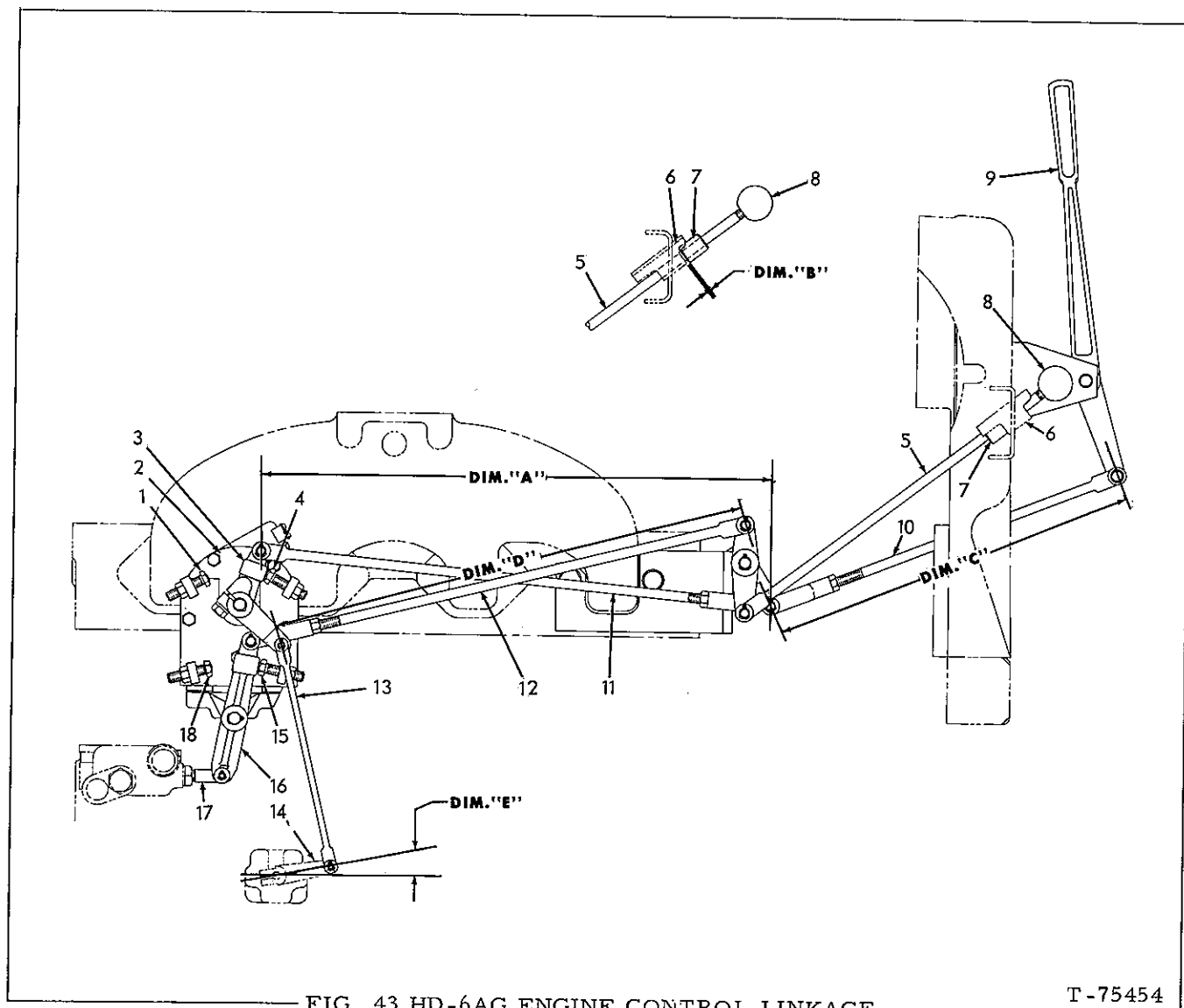


FIG. 43 HD-6AG ENGINE CONTROL LINKAGE

T-75454

- | | |
|---------------------------------|-----------------------------------|
| 1. High idle stop screw | 13. Throttle control vertical rod |
| 2. Throttle assembly | 14. Speed control lever |
| 3. Throttle control bellcrank | 15. Run position stop screw |
| 4. Low idle stop screw | 16. Fuel shut-off bellcrank |
| 5. Fuel shut-off rear rod | 17. Fuel shut-off plunger |
| 6. Locking guide | 18. Off position stop screw |
| 7. Fuel shut-off locking sleeve | |
| 8. Fuel shut-off knob | |
| 9. Throttle lever | |
| 10. Throttle control rear rod | |
| 11. Throttle control front rod | |
| 12. Fuel shut-off front rod | |

DIM. "A" - 20.44" (519 mm)
 DIM. "B" - .03" to .09" (.076-2.28 mm)
 DIM. "C" - 14.75" (375 mm)
 DIM. "D" - 20.25" (514.3 mm)
 DIM. "E" - 10°

CAUTION

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, have Allis-Chalmers Dealer make necessary high altitude adjustments.

Engine speed should be checked at crankshaft pulley or fan drive pulley with stroboscopic type tachometer; allow engine to warm-up to normal operating temperature before making rpm check. Refer to GENERAL DESCRIPTION for specified engine speeds.

ADJUSTMENT OF ENGINE SHUT-OFF CONTROL LINKAGE HD-6B (FIG. 42)

If engine fuel shut-off control fails to operate properly, first be certain the condition is not due to binding in linkage or a broken spring. Refer to Fig. 42 and adjust engine shut-off linkage as follows:

NOTE: If fuel shut-off control rods are removed or if new control rods are used, adjust them to proper length, Fig. 42, before installing.

1. Loosen jam nut on stop screws (15) and turn screws clockwise several turns. Remove yoke pin (16) from fuel shut-off bellcrank (9).
2. Adjust rear stop screw (15) so head of screw just contacts bellcrank (9) when fuel shut-off plunger (14) is .03" (.76 mm) rearward of its extreme forward position; tighten jam nut.
3. Adjust front stop screw (15) so head of screw just contacts bellcrank (9) when fuel shut-off plunger is .06" (1.52 mm) forward of its extreme rear position; tighten jam nut.
4. With shut-off knob (6) in run position and bellcrank (9) against rear stop screw (15) adjust length of control rod (3) so yoke pin (16) is easy slip fit through yoke and bellcrank.

ADJUSTMENT OF ENGINE SHUT-OFF CONTROL LINKAGE HD-6AG (FIG. 43)

If engine fuel shut-off control fails to operate properly, first be certain the condition is not due to binding or broken linkage. Refer to Fig. 43; adjust engine shut-off linkage as follows:

NOTE: If fuel shut-off control rods are re-

moved or if new control rods are used, adjust them to proper length, Fig. 43, before installing.

1. Loosen jam nut on run position stop screw (15) and shut-off position stop screw (18); turn stop screws in several turns. Remove yoke pin attaching rod (12) to bellcrank (16).
2. Adjust shut-off stop screw (18) so head of screw just contacts bellcrank (16) when fuel shut-off plunger (17) is .06" (1.52 mm) forward of its extreme rear position; tighten jam nut.
3. Adjust run position stop screw (15) so head of screw just contacts bellcrank (16) when fuel shut-off plunger (17) is .03" (.76 mm) rearward of its extreme forward position.
4. With fuel shut-off knob (8) in off position and bellcrank (16) against shut-off stop screw (15) adjust shut-off rod (12) to obtain .03" to .09" (.076-.228 mm) gap, DIM. "B", between locking guide (6) and locking sleeve (7). Adjust yoke on rod (12) so yoke pin is easy slip fit through yoke and bellcrank; secure with cotter pin.

ADJUSTMENT OF THROTTLE CONTROL LINKAGE HD-6B (FIG. 42)

If throttle control fails to operate properly be certain condition is not due to binding linkage. Refer to Fig. 42; adjust linkage as follows:

NOTE: If throttle control rods are removed or if new control rods are used, adjust them to proper length, Fig. 42, before installing.

1. Loosen jam nut on stop screws (17), and turn stop screws in several turns.
2. Start engine and move throttle lever (5) as necessary to obtain specified low idle speed. Turn rear stop screw out until head of screw just contacts rear of throttle control bellcrank (2); tighten jam nut.
3. Move throttle lever to obtain specified high idle speed. Turn front stop screw out until head of screw just contacts front of throttle control bellcrank; tighten jam nut.

ADJUSTMENT OF THROTTLE CONTROL LINKAGE HD-6AG (FIG. 43)

If throttle control fails to operate properly be certain condition is not due to binding linkage. Refer to Fig. 43; adjust linkage as follows:

NOTE: If throttle control rods are removed

or if new control rods are used, adjust them to proper length, Fig. 43, before installing.

1. Loosen jam nut on low idle stop screw (4) and high idle stop screw (1); turn stops screws in several turns. Remove yoke pin attaching front control rod (11) to bellcrank (3).
2. Check position of governor speed control lever, Fig. 43 (14); centerline of hole in lever must be 10° DIM. "E", above horizontal. Re-position lever on shaft if necessary.
3. Move shut-off knob (8) forward to the run position. Start engine and allow it to warm up. Move bellcrank (3) rearward until engine runs at specified low idle speed, hold bellcrank in this position and turn low idle stop screw (4) in until head of stop screw just contacts lug on bellcrank; tighten jam nut.
4. With lug on bellcrank (3) against low idle stop screw (4) connect front control rod (11) yoke to bellcrank (3); if necessary adjust front control rod (11) yoke so pin is easy slip fit through yoke and bellcrank (3). Secure with cotter pin.

5. Pull throttle lever (9) back slowly until specified high idle is obtained. Turn high idle stop screw (1) in until it just contacts lug on bellcrank (3); tighten stop screw jam nut.

ADJUSTMENT OF THROTTLE ASSEMBLY

A throttle assembly, Fig. 42 or 43, mounted on left side of engine, contains a friction band for the purpose of holding the throttle lever in any speed position between low and high idle speed position. If throttle lever will not remain stationary when moved to the desired speed position, adjustment of the throttle assembly is necessary. To adjust the throttle assembly, proceed as follows:

1. Remove the cotter pin from the throttle assembly adjusting capscrew.
2. Place a spring scale at top of throttle lever hand grip (with lever all the way back in high idle position) and turn throttle assembly adjusting screws as necessary until a pull of 13 to 17 lbs. (5.9 - 7.7 kgs) is required to return lever to low idle position. Install cotter pin in throttle assembly adjusting capscrew.

ENGINE CLUTCH AND CLUTCH BRAKE

DESCRIPTION

1. DRY TYPE

The dry-type engine clutch is a single plate clutch with an over-center engaging action. A shifting sleeve and bearing mechanism, carried on the clutch shaft and connected by linkage to the clutch actuating lever, is operated by the clutch operating lever to engage and disengage the clutch. An adjusting ring provides a means of maintaining the necessary adjustment to compensate for normal wear on the friction discs of the clutch plate.

A clutch brake assembly, consisting of a stationary lined plate attached to the clutch shifting sleeve bearing carrier and a plain disc bolted to the clutch shaft, is provided for stopping the rotation of transmission input shaft when shifting. The clutch brake is applied by pushing forward on the clutch operating lever after disengaging the clutch.

2. OIL TYPE

The oil-type engine clutch assembly is a multiple disc clutch which is mechanically actuated manually by means of a engine clutch lever.

A clutch brake located inside of clutch housing is provided for stopping rotation of clutch and transmission input shaft when shifting to various speed ranges. The clutch brake is applied by pushing forward on clutch lever after disengaging engine clutch.

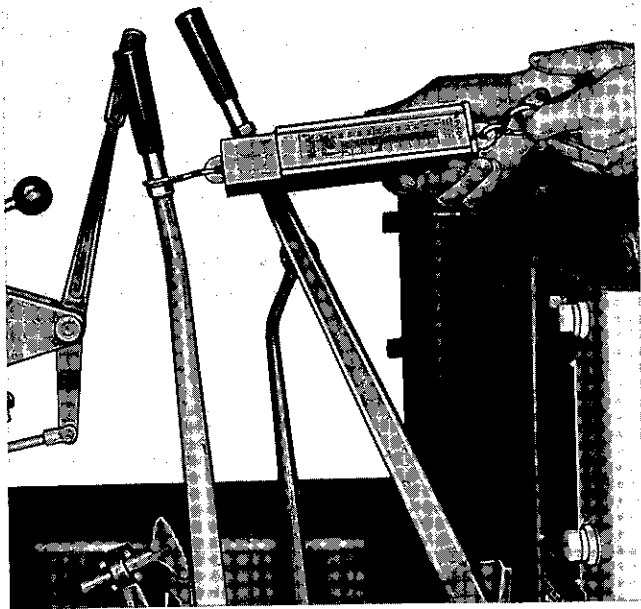
The engine clutch oiling system consists of an oil reservoir located below engine fly-wheel housing, a gear type oil circulating pump mounted at rear of timing gear housing, full-flow oil filter located at left rear side of clutch housing, and the necessary circulating lines. The pump draws oil from reservoir through a suction line screen and forces it under pressure through oil filter. The outlet end of filter is connected to drilled passages in rear bearing retainer, rear seal retainer and engine clutch shaft; oil is distributed under pressure to clutch shaft rear bearing, throwout carrier bearing, shifting sleeve bushings and through splined clutch plate center by centrifugal force to clutch discs. Oil cools clutch discs for longer and efficient clutch life.

ENGINE CLUTCH ADJUSTMENT

As the friction discs of the clutch wear, the pull required on clutch lever, Fig. 44, to engage the clutch decreases. When pull on the clutch lever diminishes on dry-type clutches to 15 pounds (6.8 kg) and an oil-type clutches to 20 pounds (9.07 kgs) with engine stopped, an adjustment is necessary. Do not operate tractor when a clutch adjustment is necessary.

IMPORTANT: Since most clutch failures are a result of improper maintenance, it is very important that the clutch be kept properly adjusted at all times as recommended. Do not slip clutch excessively when engaging.

To check the engine clutch lever pull, refer to Fig. 44 and attach a spring scale to engine clutch lever (attach scale just below lever hand grip) and note the pull required to engage clutch. When clutch is properly adjusted a pull of 15 to 30 pounds (6.79 to 13.59 kg) on dry-type clutches and a pull of 25 to 35 pounds (11.34 to 15.88 kg) on oil-type clutches is required on clutch lever for its engagement (engine stopped). The clutch should engage with a distinct over-center snap.



T-27221

FIG. 44 CHECKING ENGINE CLUTCH LEVER PULL

NOTE: Before checking the pull required to engage clutch, be certain on dry-type clutch the clutch components are properly lubricated and the clutch control linkage on either type of clutch is not binding or a false reading will be obtained.

If a clutch adjustment for either clutch is required, refer to Service Manual Form

650396 for detailed procedure.

CLUTCH BRAKE ADJUSTMENT

After each engine clutch adjustment, the clutch brake adjustment must be checked. Proper adjustment of the clutch brake must be maintained for ease of transmission shifting. Inspect clutch brake lining periodically and replace lining when it is badly worn. Refer to Service Manual 650396 for detailed procedure.

SHIFTING LOCK ADJUSTMENT

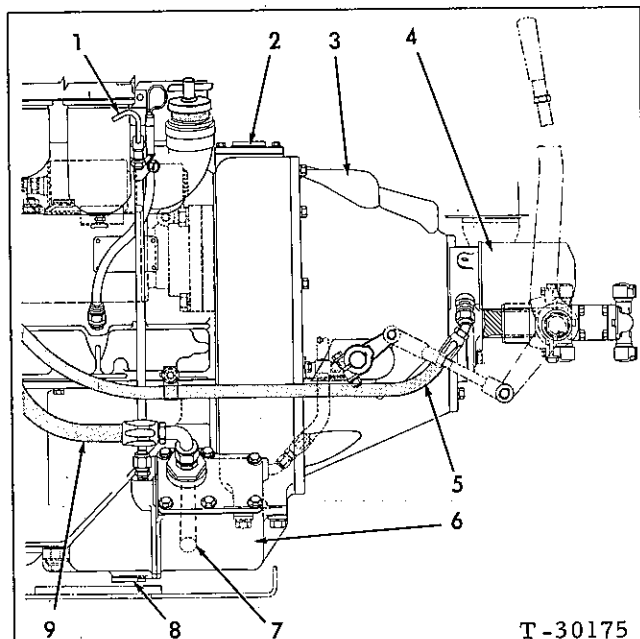
Adjustment of shifting lock plunger should not be attempted without detailed service information; refer to Service Manual Form 650396.

WASHING ENGINE CLUTCH - DRY-TYPE

Oil leaks or over-lubrication of clutch components may cause clutch disc and pressure plate to become coated with grease. This will cause clutch to slip even though it is properly adjusted, also cause it to drag and transmission gears will be hard to shift smoothly. In this event, clutch must be washed. Refer to Service Manual Form 650396 for detailed procedure.

SERVICE - OIL TYPE CLUTCH

Regular service consists of changing oil,



T-30175

FIG. 45 ENGINE CLUTCH OILING SYSTEM

1. Oil level gauge
2. Oil filler plug
3. Clutch housing
4. Filter
5. Pump-to-filter hose
6. Oil reservoir
7. Suction line screen
8. Drain plug
9. Reservoir-to-pump hose

changing filter (throw-away type), cleaning clutch housing breather and pump suction line screen. On new units, or after major repairs to engine clutch, change filter after first 50 hours of operation; thereafter at regular intervals.

1. CHANGE OIL FILTER

Remove floor plate to reach oil filter. Clean filter base, Fig. 45, and surrounding area. Turn filter counterclockwise and remove, then discard filter. Coat new filter gasket with clean oil. Turn filter into base until gasket contacts base, then tighten filter an additional half turn.

CAUTION

Use hand pressure only when tightening the filter to the base.

2. CHANGE ENGINE CLUTCH OIL

The oil should be changed after 1000 hours of operation or more often if necessary. Oil should be at normal operating temperature when draining.

Remove oil drain plug, Fig. 45, from bottom of oil tank to drain the oil. Clean drain plug before reinstalling; torque drain plug to 70-75 lbs. ft. (9.67 - 10.36 kg-m). Remove oil filler plug Fig. 45 (2) and fill with

specified lubricant to uppermost mark on of Operating Range on gauge. Install and torque filler plug (2) to 70-75 lbs. ft. (9.67 - 10.36 kg-m).

CAUTION

Over-tightening of plug gaskets could extrude gasket from under plug flange and result in leakage.

3. WASH BREATHER

Remove breather from top of engine clutch housing access cover every 1000 hours of operation or more often if necessary. Wash in clean fuel or solvent and blow dry, then reinstall.

4. CLEAN ENGINE CLUTCH OIL PUMP SUCTION LINE SCREEN

NOTE: Suction line screen should be removed and cleaned, when oil tank has been drained.

Refer to Fig. 45; disconnect tank-to-pump hose (9) from oil tank adapter. Remove the adapter from the tank cover. Remove the suction line screen from the oil tank and wash in clean fuel or solvent. Install the screen and adapter in oil tank and tighten adapter; connect tank-to-pump hose to the adapter and tighten securely.

TRANSMISSION

DESCRIPTION

The transmission used in HD-6AG and HD-6B crawler tractors is a conventional straight tooth, direct drive, splash lubricated, speed reduction unit designed to provide proper gear ratios for required speed or power during operation of tractor.

The transmission has a shifting lock mechanism actuated by engine clutch lever. The shifting lock mechanism is designed so the transmission can be shifted ONLY when engine clutch is DISENGAGED.

NOTE: Adjustment of the transmission shifting components should not be attempted without detailed service information; refer to service Manual Form 650432.

SERVICE

Regular service of transmission and bevel gear system consists of changing oil. Refer

to SERVICE AND LUBRICATION GUIDE for service intervals.

Oil should be at normal operating temperature before draining. Drain transmission and bevel gear housing as follows:

1. Remove drain plug, Fig. 19, from bottom of bevel gear compartment and allow oil to drain.
2. Be certain drain plug gasket is in good condition; reinstall drain plug and torque to 70-75 lbs. ft. (9.67-10.36 kg-m).
3. Remove seat to reach transmission oil filler plug and the oil level plug, Fig. 14 or Fig. 11. Fill with specified lubricant to a level even with oil level plug opening; reinstall oil level plug and oil filler plug. Torque oil filler plug to 70-75 lbs. ft. (9.67-10.36 kg-m).

STEERING CLUTCHES AND BRAKES

DESCRIPTION

1. STEERING CLUTCHES

Two spring loaded, multiple disc, steering clutch assemblies, one located at each end of bevel gear shaft, are provided for steering the tractor. Each clutch assembly is enclosed in a brake drum; each brake drum is bolted to a brake drum hub which is connected to the corresponding final drive pinion shaft.

Steering is accomplished by actuating the steering levers. When either lever is pulled back, linkage moves steering clutch throwout mechanism inward and disengages the steering clutch. When steering lever is released the clutch springs return and hold the clutch in

engaged position.

2. BRAKES

Brakes consist of a two section band and lining assembly, drum, band adjuster, band support screw, and operating linkage. The brakes are foot operated. The brake bands are assembled around brake drums which enclose the steering clutches. The brakes serve in conjunction with steering clutches to steer the tractor. When a steering clutch has been disengaged and operator applies corresponding brake, the brake tightens around brake drum and stops drum from turning, which in turn stops rotation of the corresponding final drive gears and track drive sprocket.

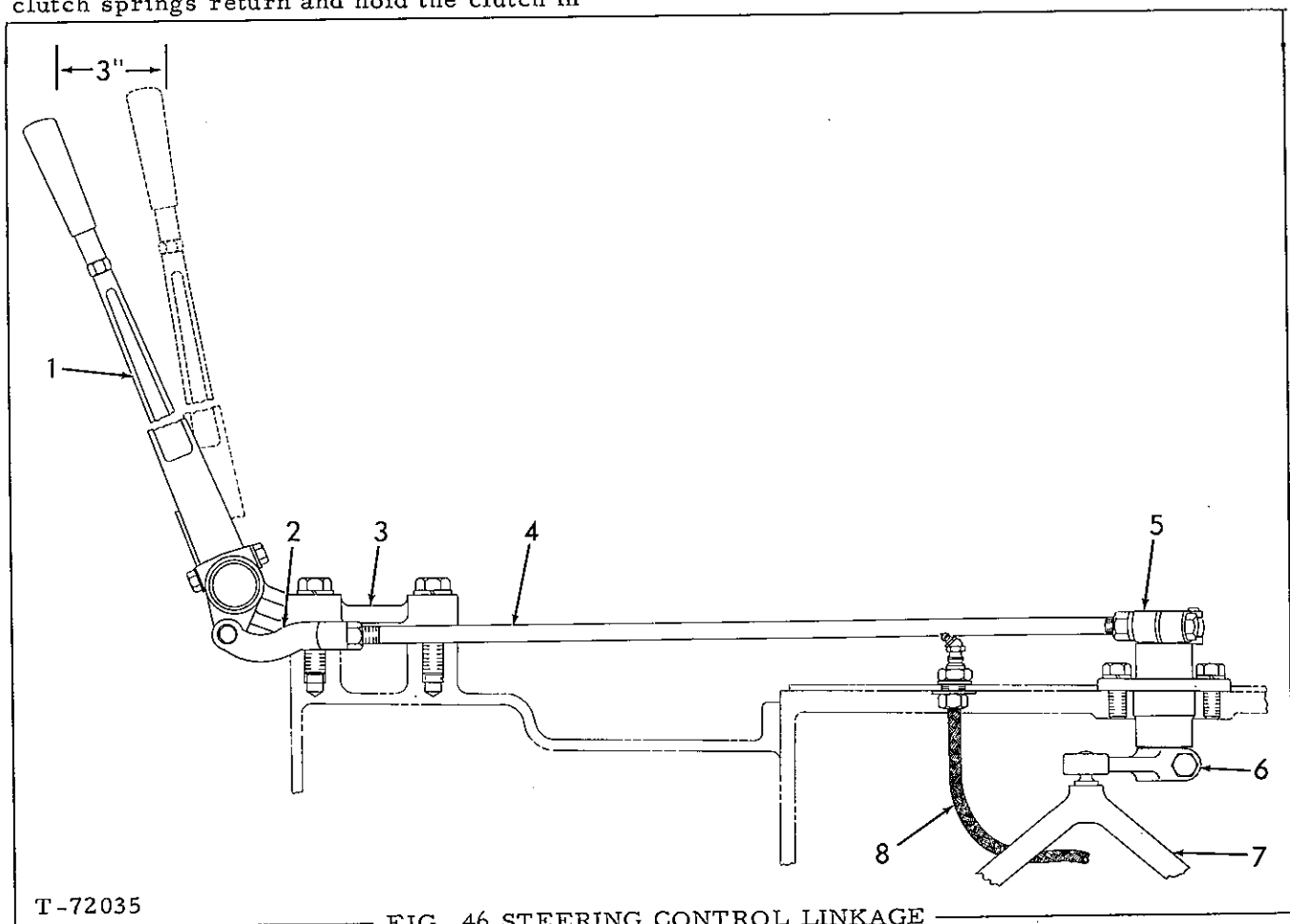


FIG. 46 STEERING CONTROL LINKAGE

- 1. Steering lever
- 2. Front yoke

- 3. Mounting bracket
- 4. Control rod

- 5. Upper actuating lever
- 6. Lower actuating lever

- 7. Throwout yoke
- 8. Lubricating hose

STEERING CONTROL LINKAGE ADJUSTMENT

Steering control linkage is properly adjusted when each steering lever has 3" (76.2 mm) of free travel, Fig. 46, measured at tops of the levers. Due to normal clutch disc wear the

free travel becomes less; when the free travel has decreased to less than 1" (25.4 mm) an adjustment is necessary.

To measure free travel, refer to Fig. 47.

Place a scale or ruler against rear hood strap or cowl. With the levers all the way forward, measure the distance from hood strap or cowl to the top of steering levers.

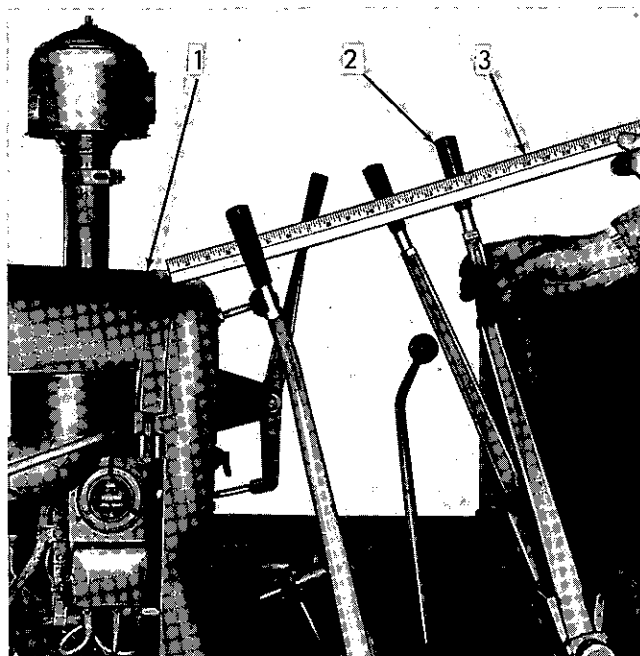
Pull steering lever back until pressure is felt, which is a point where disengagement of the clutch begins. Measure the distance between hood strap or cowl and the top of the lever. The difference between the two measurements is the free travel of the lever. If free travel is less than 1" (25.4 mm) or more than specified 3" (76.2 mm), adjustment of steering control linkage is necessary. Refer to Service Manual Form 650433 for complete adjustment information.

BRAKE LINKAGE ADJUSTMENT

Control linkage for each brake is properly adjusted at the factory and no further adjustment should be necessary. Brake pedals should have specified 1.75" to 2" (44.4 to 50.8 mm) free travel

BRAKE BAND ADJUSTMENT

As linings wear, it will become necessary to adjust brake bands. Due to variable operating conditions, specific time intervals for brake band adjustment are not given. Brake bands require adjustment when free travel becomes excessive for convenient and safe operations. Refer to Fig. 48 and adjust brake bands as follows:

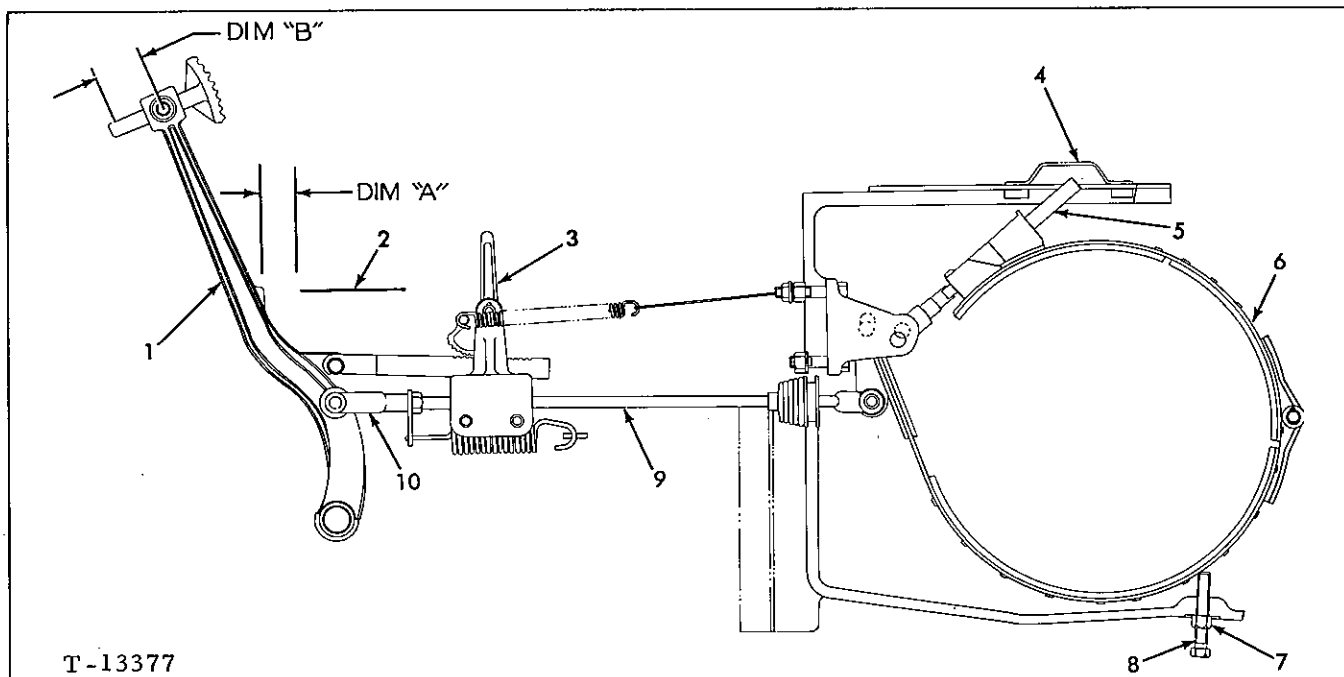


T-27220

FIG. 47 MEASURING STEERING LEVER FREE TRAVEL

1. Hood strap 2. Steering lever 3. Scale

1. Remove brake adjuster hole cover (4) from steering clutch compartment cover.



T-13377

FIG. 48 BRAKE CONTROL LINKAGE

1. Brake pedal lever
2. Floor plate
3. Parking brake lever
4. Adjuster hole cover
5. Brake band adjuster
6. Brake band assembly

7. Jam nut
 8. Support screw
 9. Control rod
 10. Adjusting yoke
- DIM. "A" - .062" to .250" (1.58 to 6.35 mm)
 DIM. "B" - 1.75" to 2" (44.4 to 50.8 mm)

2. Turn the brake adjuster (5) clockwise until brake pedal has 1.75" to 2" (44.4 to 50.8 mm) free travel.

NOTE: When adjusting the brakes, it is necessary to turn the brake adjuster in 1/2 turn increments so the roll pin of the adjuster will center in the grooves of the spring loaded locking block.

3. With the brake pedal in the released position (all the way back), loosen the jam nut (7) on the brake band supporting screw (8). Turn the screw (8) into the housing until the bottom of the brake band (6) is against the brake drum; then back the supporting screw (8) out 1/2 turn to allow clearance between the brake band and the drum. Tighten jam nut (7) securely. Install brake adjusting hole cover (4).

WASHING STEERING CLUTCHES AND BRAKES

If steering clutches or brakes slip due to oil or grease on clutch plates or brake linings, wash clutches and brake with solvent.

Install a drain plug in the drain plug hole, Fig. 19, in bottom of each steering clutch compartment.

Remove brake band adjuster cover Fig. 48 from top of each steering clutch compartment and pour approximately 2 gallons (7.57 lt.) of solvent in each clutch compartment; drive tractor back and forth in a straight line for five minutes. Leave steering clutch engaged. Oil on exterior of clutch assemblies and brakes will be washed off in this operation.

Drain compartments and refill with another 2 gallons (7.57 lt.) of clean solvent; drive tractor back and forth for another five minutes continually disengaging one clutch and the other. Oil on friction surfaces will be washed off during this operation.

Drain compartments and allow clutches and brake linings to dry (over-night); install brake adjuster covers. Adjust steering and brakes if necessary. Operate tractor in low gear with light load until clutches and brakes are completely dry.

UNDERCARRIAGE

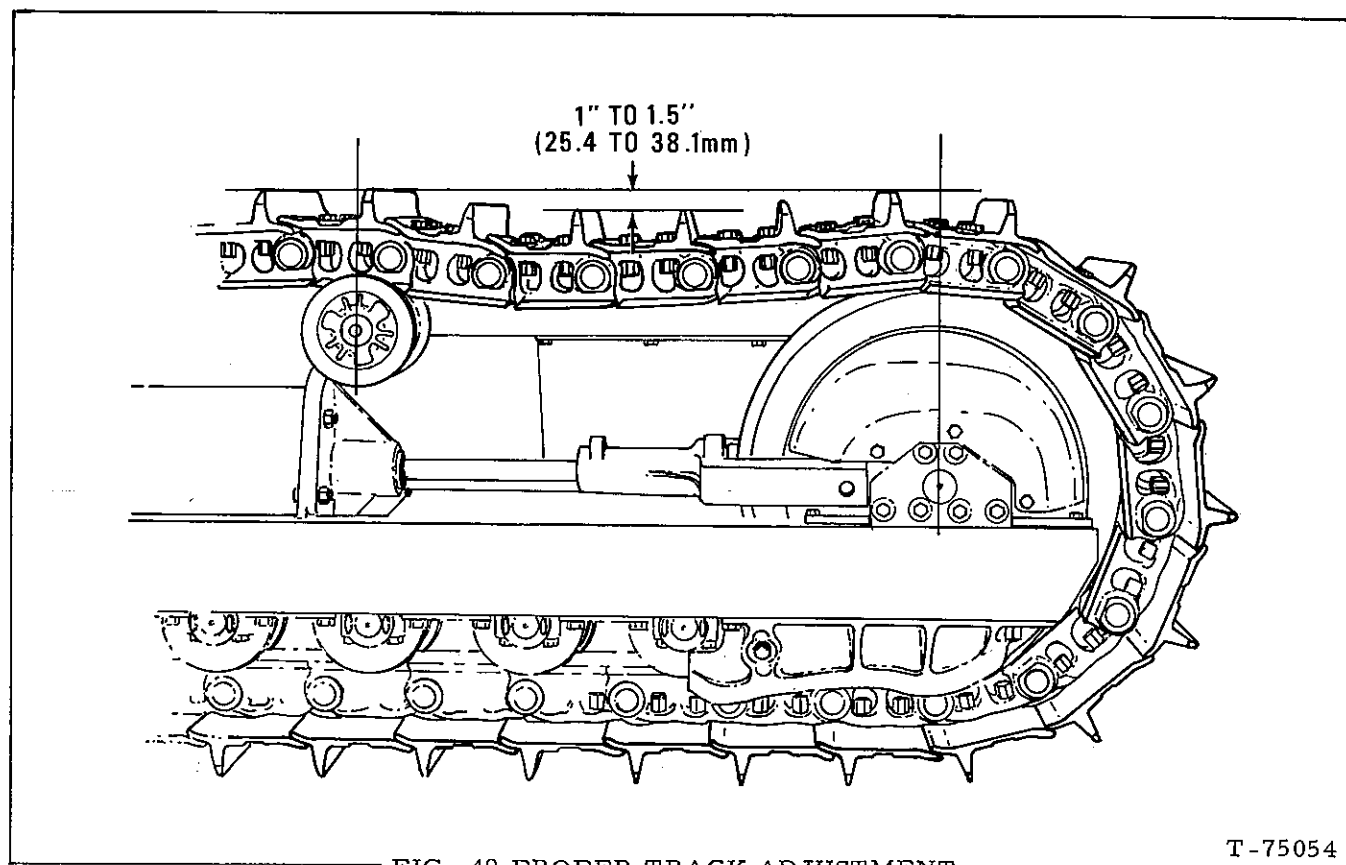


FIG. 49 PROPER TRACK ADJUSTMENT

T-75054

INSPECTION

Visually inspect track idler, track links, track rollers and all other wear surfaces. Each track idler is properly adjusted when an even contact (wear pattern) is noted on each side of track guiding flange; light contact will be apparent on inner sides of track links and on both flanges of track rollers. If any undercarriage components show signs of excessive, rapid, or abnormal wear, refer to Service Manual Form 645550 and make necessary undercarriage alignment checks.

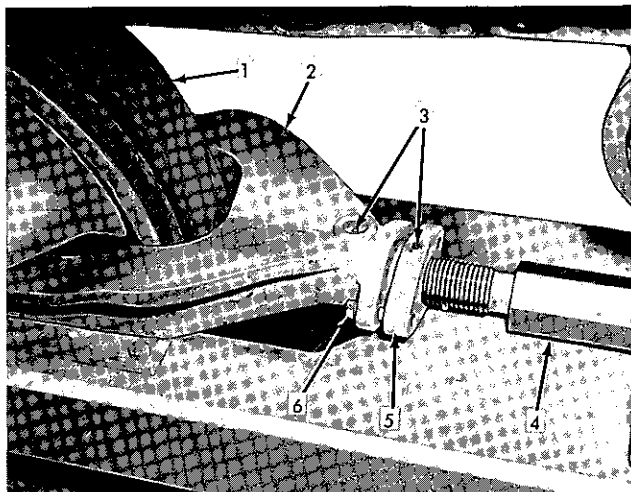
TRACK ADJUSTMENT

Each track is properly adjusted when the track has 1" to 1.5" (25.4 to 38.1 mm) sag at a point midway between carrier roller and track idler, Fig. 49. Proper adjustment is important as rapid wear will occur on tracks and related parts if tracks are too tight or too loose.

MECHANICAL ADJUSTER

Remove any accumulation of dirt and debris from around track idler yoke and track adjustment screw. Two lube fittings, Fig. 50, are provided to lubricate track adjusting screw; lubricate adjusting screw with pressure gun lubricant to facilitate turning of screw.

Loosen adjusting screw lock capscrews; turn adjusting screw out of track idler yoke as necessary to tighten track; turn adjusting screw into yoke as necessary to loosen track. Drive machine forward and backward a few times, then check track adjustment; when



T-36866

FIG. 50 MECHANICAL TRACK ADJUSTER

- | | |
|------------------|-------------------------|
| 1. Track idler | 4. Adjusting screw |
| 2. Idler yoke | 5. Adjusting screw lock |
| 3. Lube fittings | 6. Lock capscrew |

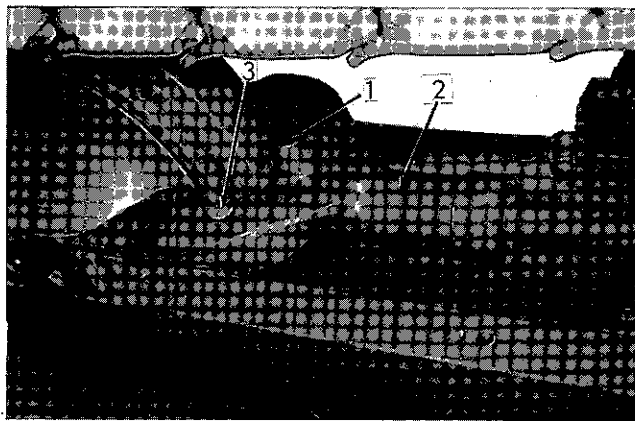
correct track adjustment is obtained, tighten capscrews in adjusting screw lock.

HYDRAULIC TRACK ADJUSTER

Remove any accumulation of dirt or debris from top of track idler yoke. To tighten track, add pressure gun lubricant through fitting in top portion of valve assembly, Fig. 51, 52 (1) until correct track adjustment is obtained.

NOTE: Late units, valve assembly is under plug, Fig. 51 (3).

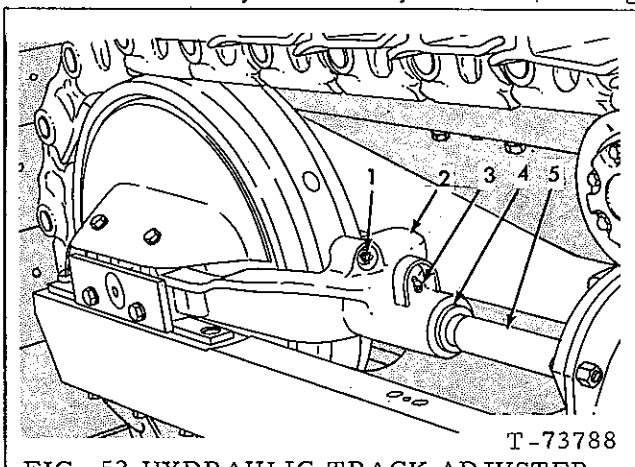
To loosen track, use suitable wrench on hex portion of valve assembly and back valve assembly out of track idler yoke as necessary to allow lubricant to escape; when correct track adjustment is obtained, tighten valve



T-75538

FIG. 51 HYDRAULIC TRACK ADJUSTER - LATE UNITS

1. Valve assembly 2. Idler yoke 3. Plug



T-73788

FIG. 52 HYDRAULIC TRACK ADJUSTER - EARLY UNITS

- | |
|------------------------------------|
| 1. Track adjustment valve assembly |
| 2. Idler yoke |
| 3. Piston seal lube fitting |
| 4. Piston |
| 5. Push bar |

assembly. Late units, install plug over valve assembly.

Early units, add 2 to 4 shots of pressure gun

lubricant daily to lube fitting, Fig. 52 (3). Lubricant acts as a seal to prevent water and dirt from entering between yoke bore and adjusting piston.

DOZER HYDRAULIC SYSTEM

DESCRIPTION

Dozer hydraulic system consists of a hydraulic tank, oil filter, pump, control valve, double-acting hydraulic cylinders and necessary lines.

The hydraulic pump, mounted in hydraulic tank, driven from front of engine crankshaft, supplies hydraulic power to the dozer system.

The dozer is controlled by a valve located on top of hydraulic tank.

INSPECTIONS

1. CHECK PISTON ROD WIPER SEALS

Wiper seals installed in rod packing retainer of cylinders serve to wipe off dirt from piston rod surfaces. Seals should be replaced when not wiping rod surfaces properly.

2. CHECK ROD PACKING

Piston rod packing in each cylinder head is properly adjusted to allow a light film of oil on piston rods when unit is in operation. Adjust piston rod packing if excessive oil is observed.

Packing glands are adjusted by tightening or loosening capscrews attaching gland end plates, Fig. 53. Turn capscrews evenly; use slight pressure only when tightening. After completing adjustment, lock capscrews with wire.

IMPORTANT: Rapid wear on packing glands and severe wiping of piston rod will result if packing gland is adjusted too tightly. If packing gland leaks oil after being adjusted properly, it is an indication the packing rings are worn and should be replaced; refer to Service Manual Form 644308 for complete procedure.

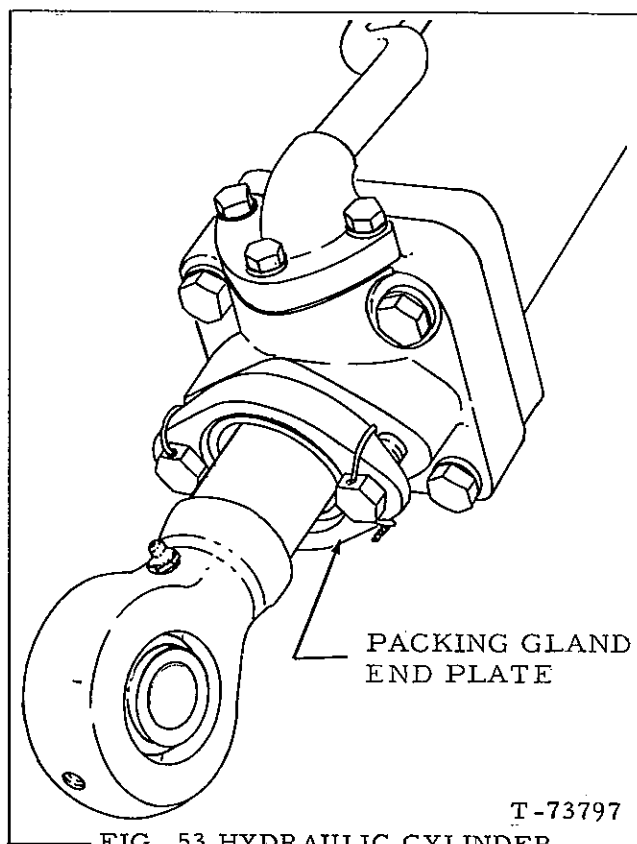
3. CHECK CONNECTIONS AND CLAMPS

a. Keep tube fittings and hose connections tight to prevent oil leaks.

b. Keep hose clamps tight to avoid hose chafing.

4. CHECK FOR PROPER OPERATIONS

Trouble shooting dozer hydraulic system should not be attempted without detailed service information. If for any reason, dozer hydraulic system does not function



properly, refer to Service Manual Form 644308 for complete information.

SERVICE

Regular service of hydraulic system consists of draining hydraulic oil system, flushing system, change filter element and refilling oil system. Refer to SERVICE AND LUBRICATION GUIDE for service intervals.

1. DRAIN AND FLUSH SYSTEM

When draining system, oil should be at operating temperature. Drain and flush system as follows:

a. Start engine, position tractor about 25 inches (635 mm) above ground level; raise dozer (and ripper if so equipped) to full height. Stop engine.

b. Remove drain plug, Fig. 8, to drain oil from hydraulic tank. Move dozer and ripper control levers to down position;

moldboard and ripper will lower and force oil from hydraulic cylinder into tank and out through oil drain hole. Clean drain plug and reinstall.

c. On late units oil filter is located at bottom of hydraulic tank, Fig. 8, remove filter cap and discard element; replace filter cap. On early units oil filter is located on side of hydraulic tank, Fig. 54, remove filter cover and discard element; replace filter cover.

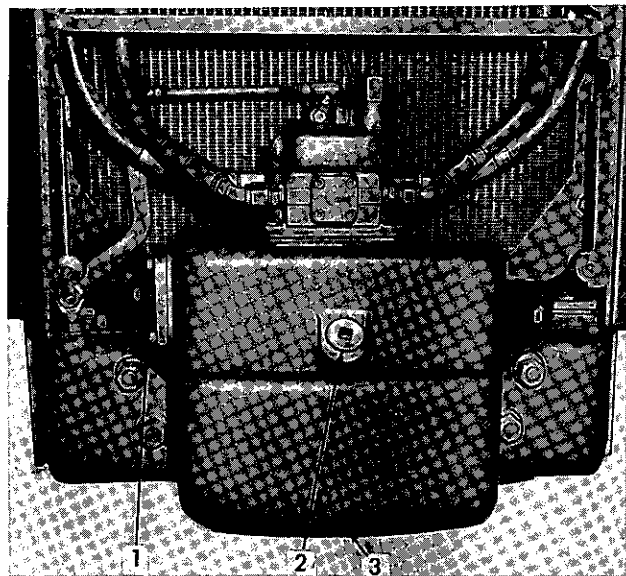
d. Completely fill hydraulic tank with clean diesel fuel or kerosene. Start engine and circulate fuel oil or kerosene through system by operating dozer control lever four or five times so cylinders will fill and empty several times (also operate ripper is so equipped). Repeat steps a. and b. to drain flushing fluid.

2. REPLACE FILTER ELEMENT AND REFILL SYSTEM

a. Remove filter cap, Fig. 8, late units, clean interior of filter housing; install a new element in filter housing; place a new O-ring in groove on filter cap and install filter cap on hydraulic tank. On early units remove filter cover, Fig. 54, clean interior of filter housing; install a new element in filter housing; position washer, spring and new gasket in filter cover and install cover securely.

NOTE: Late units contain a full-flow filter. Early units contain a by-pass filter.

b. Fill oil tank with specified lubricant. Install filler plug. Start engine and



T-27319

FIG. 54 DOZER HYDRAULIC OIL TANK (EARLY UNITS)

1. Oil filter cover
2. Oil level and filler plug
3. Drain plug

operate at half speed. Fully raise and lower moldboard (and ripper if so equipped) several times so cylinders will fill with oil.

c. Move unit to level ground and lower moldboard (also ripper if so equipped) to ground. Stop engine and recheck oil level in hydraulic tank; add oil as necessary to raise oil level even with oil level and filler plug opening.

ALPHABETICAL INDEX

SUBJECT	PAGE
Additional publications available-----	2
Adjustments, periodic -----	23
Air cleaner -----	45
Dry-type services -----	46
Oil-type services -----	50
Ammeter -----	26
Batteries -----	44
Battery storage-----	44
Brakes -----	7, 58
Adjustment, brake linkage -----	59
Adjustment, brake band-----	59
Parking brake lock levers -----	25
Washing brakes-----	60
Capacities -----	7
Dozer -----	8
Dimension and weight -----	8
Dozer hydraulic system -----	62
Inspections-----	62
Oil-drain and flush system -----	62
Service filters and refill system-----	63
Electrical master switch -----	25
Electrical system-----	44
Electrical cables -----	45
Engine -----	6
Engine control linkage-----	52
Engine shut-off linkage adjustments -----	54
Cooling filter element replacement -----	35
Cooling system filter-----	35
Cooling system -----	34
Crankcase lubricating oil recommendations-----	12
Crankcase oil and oil level-----	16
Heavy-duty oil filter element replacement -----	38, 39
Hour meter -----	26
Idling-----	27
Lubrication system -----	37
Oil change and filter element replacement -----	37
Oil pressure gauge-----	26
Starting-----	26
Stopping-----	28
Temperature gauge -----	26
Engine clutch-----	6
Dry-type-----	6
Oil-type-----	6
Engine clutch and clutch brake -----	55
Adjustment, clutch-----	56
Adjustment, clutch brake -----	56
Breather-----	22, 57
Services -----	56
Washing clutch and clutch brake -----	56
Fan drive belt adjustments-----	36
Fuel -----	10
Filters - replace elements-----	40
Gauge -----	26
Heavy-duty fuel filter element replacement -----	42

SUBJECT	PAGE
Fuel (Continued)	
Service -----	40
Specifications-----	10
Storage -----	10
System-----	40
Tank and drain cock-----	40
General description -----	4
General dozing instructions -----	28
General ripping instructions -----	28
Generator -----	44
Drive belt adjustment -----	36, 44
Regulator -----	44
Instruments -----	25
Lubricant specifications -----	11
Lubrication and service guide -----	15
Lubrication and service instructions -----	16
Moldboard -----	8
Operating -----	24
Controls -----	24
Instructions -----	26
Tips-----	30
Periodic services-----	23
Placing crawler tractor in motion -----	27
Preparation for storage -----	14
Preparation for use -----	14
Pressure gun lubricant -----	12
Radiator, draining and filling of cooling system- - - - -	36
Ripper -----	7
Serial number locations -----	9
Steering clutches -----	58
Adjustment, steering control linkage-----	58
Washing steering clutches -----	60
Speeds (engine) -----	6
Maximum tractor speeds-----	6
Selection of proper speeds -----	27
Transmission gear shift -----	25
Starter switch -----	25
Steering tractor -----	28
Throttle assembly adjustment -----	55
Throttle control linkage adjustment -----	54
Track adjustment -----	61
Tracks -----	7
Track inspection-----	61
Track shoe bolts - torque-----	23
Transmission -----	6, 57
Drain oil and refill -----	57
Oil change -----	57
Oil level (check points) -----	19
Undercarriage -----	60
Universal joints -----	21
Water pump belt adjustment -----	36, 44
Weather - cold operation -----	27



C

C

C

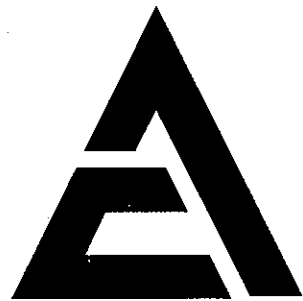


C



WEIGHT OF VARIOUS MATERIALS

Material	Approximate Weight		Material	Approximate Weight	
	lbs./cu.yd.	kgs/m ³		lbs./cu.yd.	kgs/m ³
Ashes	1080	640	Gravel		
Asphalt			Loose	2700	1601
Crushed	2250	1335	Gravel and Sand	3000	1779
Basalt			Gravel, Sand and Clay		
Broken	3300	1957	(stabilized)		
Solid	5076	3010	Loose	2700	1601
Bauxite			Compacted	4050	2400
Crushed	4250	2521	Gypsum		
Piled	2150	1275	Crushed	2700	1601
Borax			Hematite		
Powder	2925	1735	Broken	5430	3220
Piled	1425	845	Ice		
Caliche	2430	1440	Solid	1550	920
Cement			Limestone		
Portland	2700	1601	Crushed	2625	1556
Cinders	810	479	Limonite		
Clay			Broken	4159	2466
Dry lumps	1822	1079	Magnetite		
Wet lumps	2700	1601	Broken	5528	3278
Coal			Mud		
Anthracite, broken	1857	1100	Fluid	2916	1669
Bituminous, broken	1413	836	Packed	3200	1898
Earth			Phosphate Rock		
Dry, loose	1890	1120	Broken	2970	1760
Dry, rammed	2430	1440	Rip-Rap		
Dry, shaken	2214	1312	Limestone	2160	1280
Damp, loose	2106	1248	Sandstone	2430	1440
Damp, packed	2592	1537	Shale		
Earth and Gravel			Broken	2430	1440
Dry, loose	2700	1601	Slag		
Dry, rammed	3240	1921	Broken	2970	1760
Wet	3240	1921	Stone		
Earth and Sand			Crushed	2700	1601
Dry, loose	2700	1601	Taconite	4725	2803
Dry, rammed	3240	1921	Trap Rock		
Wet	3240	1921	Broken	2950	1750
Granite					
Crushed	2778	1647			



ALLIS-CHALMERS

**MASTER
MAINTENANCE**

TECHNICAL PUBLICATIONS

**CONSTRUCTION MACHINERY
DIVISION**