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AC-S-HD19

MODEL HD-19 TRACTOR

DIESEL-POWERED

SERVICE

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SECTION I — DESCRIPTION AND SPECIFICATIONS

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1

1. GENERAL DESCRIPTION

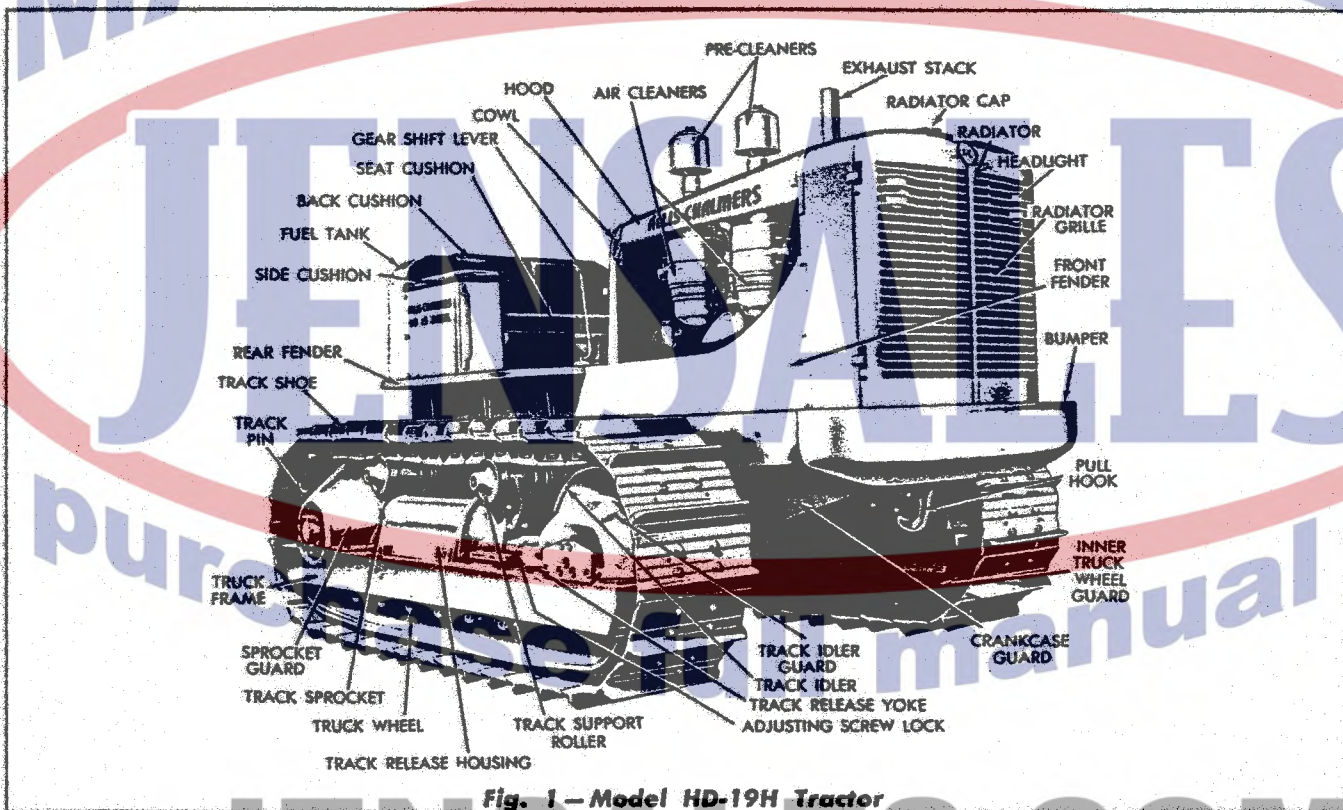


Fig. 1 — Model HD-19H Tractor

The description given herein and the information contained in this manual pertains to the Model HD-19H Tractor (Standard Model).

The Model HD-19H Tractor is a 40,000 pound track-type tractor powered with a 6 cylinder, 2 cycle Diesel Engine. Power from the engine is transmitted through a single plate, over-center type engine clutch into the Torque Converter which automatically multiplies the engine torque to meet the varying load requirements and transmits the power through a universal joint drive shaft assembly to the transmission.

From the transmission, the power is transmitted to

the bevel gear and from the bevel gear to two multiple disc steering clutches (one on each side of the bevel gear cross shaft), thence through the steering clutches to the final drives and to the track sprockets.

The transmission provides 2 forward speeds ranging from 3 M.P.H. in low gear to 7 M.P.H. in high gear and a reverse speed of 5.5 M.P.H. under full governed engine speed of 1750 R.P.M.

Hydraulic steering clutch controls, mechanical self energizing brakes, adjustable and wide operator's seat, and unobstructed vision of the front of both tracks assure easy operation of the tractor.

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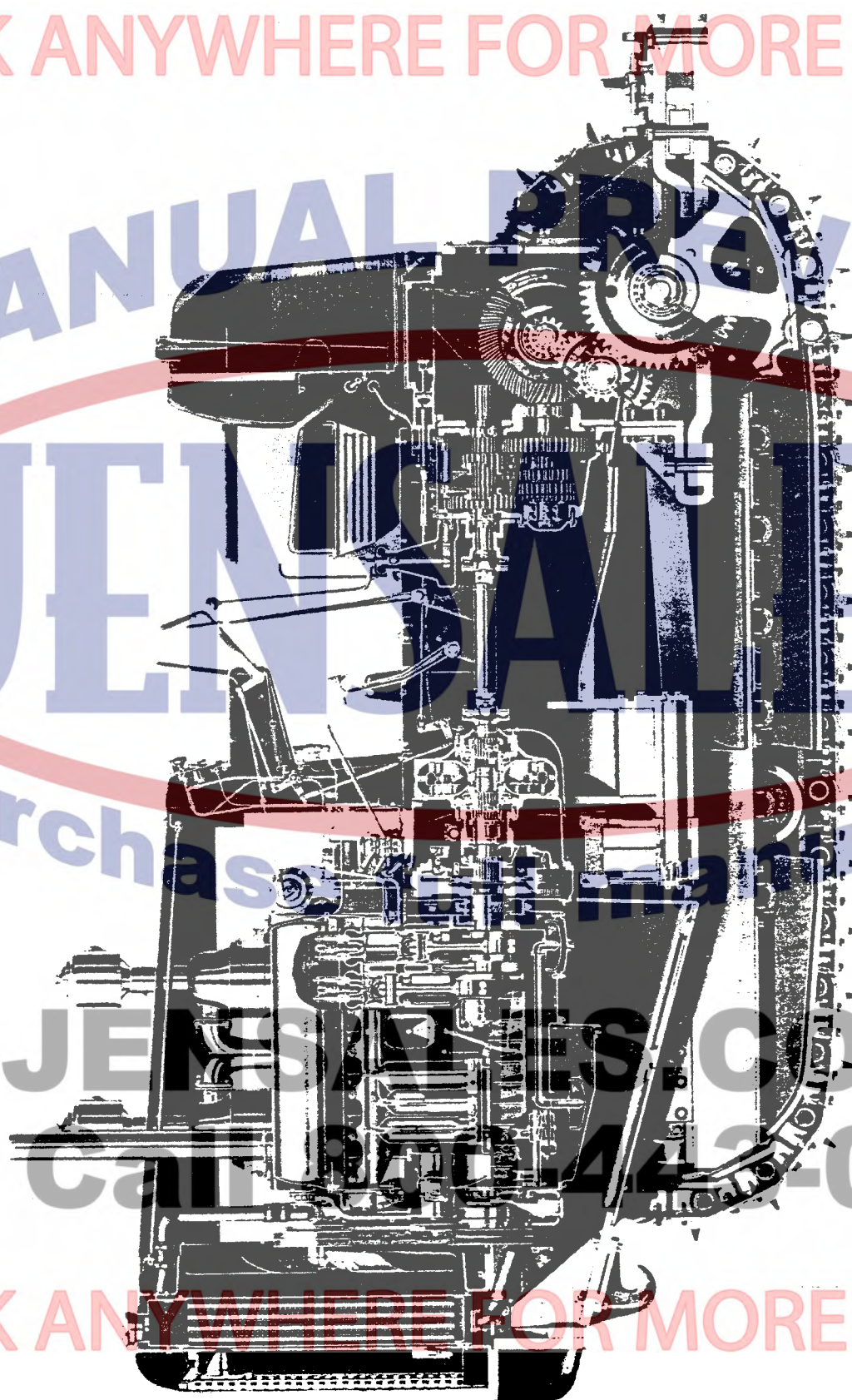


Fig. 2—Cutaway View of HD-19H Tractor

2. GENERAL SPECIFICATIONS

GENERAL SPECIFICATIONS:

Overall Length	15 ft. 10 $\frac{1}{4}$ in.
Overall Height (without stacks)	7 ft. 10 $\frac{1}{4}$ in.
Overall Width	9 ft. 1 $\frac{1}{4}$ in.
Turning Radius	10 ft. 2 $\frac{1}{4}$ in.
Ground Clearance	16 $\frac{1}{2}$ in.
Drawbar Height (center line of jaw)	19 $\frac{1}{2}$ in.
Lateral Drawbar Movement	44 in.
Shipping Weight (approximate)	40,000 lbs.
Length of Track on Ground	8 ft. 10 $\frac{1}{2}$ in.
Width of Standard Track Shoes	24 in.
Maximum Width Track Shoes	34 in.
Maximum Width Track Shoes Available	28 in.
Ground Contact Area (Standard Shoes)	5118 sq. in.
Number of Track Shoes per Track	37
Ground Pressure per Sq. In. (Standard Shoes)	7.8 lb.
Tread Width (center-to-center of tracks)	84 in.

MAXIMUM TRACTOR SPEEDS:

GEAR RANGE	SPEED
Low	3.0 M.P.H.
High	7.0 M.P.H.
Reverse	5.5 M.P.H.
Make	General Motors Diesel
Type	Two Cycle
Number of Cylinders	6
Bore	4 $\frac{1}{4}$ in.
Stroke	5 in.
Piston Displacement	426 cu. in.
Engine Speed (governed at full load)	1750 R.P.M.
Maximum Net Torque	558 ft. lbs. @ 1200 R.P.M.
Lubrication	Forced Feed
Fuel Used	No. 1 or No. 2 Diesel Fuel Oil
Fuel Supplied by	70 cu. mm. Unit Injectors

TORQUE CONVERTER:

Make	Twin Disc
Type	Three Stage
Torque Ratio Increase	4.4 to 1
Fluid Used	Diesel Fuel
Fluid Supplied	Directly From Engine Fuel Return Manifold Under Pressure

CAPACITIES (U. S. Standard Measure):

	Approximate
Cooling System	
Tractors Prior to HD-19H 1802	11 Gallons
Tractors HD-19H 1802 and Above	13 Gallons
Crankcase and Filters	5 Gallons
Transmission Case	9 $\frac{1}{2}$ Gallons
Final Drives (Each)	7 $\frac{1}{2}$ Gallons
Fuel Tank and Converter System	
Tractors Prior to HD-19H 1123	109 Gallons
Useable Fuel Tank Capacity	99 Gallons
Tractors HD-19H 1123 and Above	130 Gallons
Useable Fuel Tank Capacity	120 Gallons
Track Release Housing (Each)	5 $\frac{1}{2}$ Gallons
Air Cleaner (Each)	1 Gallon
Hydraulic Steering System	2 $\frac{3}{4}$ Gallons

The Allis-Chalmers Manufacturing Company reserves the right to make changes in the above specifications or to add improvements at any time without notice or obligation.

3. SPECIFICATIONS OF LUBRICANTS

A. Engine Crankcase Lubricant.

USE NON-CORROSIVE DIESEL ENGINE LUBRICATING OIL CONTAINING ADDITIVES WHICH WILL PREVENT SLUDGE OR GUM DEPOSITS. UNDER NO CIRCUMSTANCES SHOULD A CORROSIVE DIESEL ENGINE LUBRICATING OIL EVER BE USED.

Use oils with the following viscosity:

Atmospheric Temperature	Viscosity
Above 32° F.	Use SAE 30
0° F. to 32° F.	Use SAE 20
0° F. and below	Use SAE 10

Manufacturers of lubricants recognize the importance of the qualities required for use in our equipment and they are co-operating fully to insure the use of only those oils which fulfill these requirements. The oil distributor and oil manufacturer are to be held responsible for the results obtained from their products.

The outstanding lubricating requirements for efficient operation of this engine are: The maintaining of piston rings in a clean, free condition; absence of hard carbon and "varnish" deposits on or within engine parts; the prevention of bearing corrosion and the promotion of general cleanliness within the engine.

Proper operation and maintenance of the engine is necessary to obtain the desired results from the lubricating oil. Operating and maintenance factors can be effectively controlled by the engine user.

B. Transmission, Final Drive and Track Release Housing Lubricant.

Lubricate these assemblies with a good grade of motor oil purchased from a reputable oil company.

Use oils with the following viscosity:

Atmospheric Temperature	Viscosity
Above 32° F.	Use SAE 50
32° F. and below	Use SAE 30

C. Truck Wheel, Track Idler and Track Support Roller Lubricant.

Lubricate these assemblies with a grease that has been tested and found satisfactory by Allis-Chalmers Manufacturing Company.

A revised list of approved greases is issued periodically. Ask your nearest "Allis-Chalmers" authorized Dealer for the latest list.

D. Hydraulic Steering System.

Use a good grade of engine lubricating oil of the same viscosity as is used in the engine; the viscosity of the oil is to be determined by the prevailing atmospheric temperature. "DIESEL" engine oil may be used provided it does not foam. When operating in extremely low temperatures when SAE 10W oil is too heavy to function properly, the oil may be thinned by the addition of kerosene or "DIESEL" fuel. Contact your local "Allis-Chalmers" Dealer for further information.

E. Pressure Gun Lubricant.

Use a ball and roller bearing lubricant with a minimum melting point of 300° F. This lubricant should have a viscosity range so as to assure easy handling in the lubricating gun at the prevailing atmospheric temperature, and MUST be waterproof.

F. Air Cleaners.

Use the same viscosity oil in the air cleaners as used in the engine crankcase. CAUTION: Do not use an oil that foams.

4. SPECIFICATIONS OF FUEL OIL

Use No. 1 "Diesel" Fuel purchased from a reputable oil company. In warm weather, No. 2 "Diesel" Fuel may be used. This fuel must be within the classification limits as established by the American Society for Testing Material, Tentative Diesel Fuel Oil Specifications (ASTM — D975).

For commercially satisfactory engine life and performance, fuel requirements must comply with four basic qualifications:

1. Physical cleanliness.
2. Absence of chemical contamination.
3. Proper burning characteristics.
4. Cold starting ability.

Physical cleanliness means freedom from water, dirt, and other incombustible ingredients. Since all present day high speed "Diesel" fuels are completely distilled, they leave the refinery in clean condition. Transport and subsequent storage account for the addition of most foreign matter found in the fuel.

The most objectionable chemical contaminations are free sulphur and gum, which, even in small

quantities are largely responsible for harmful internal engine deposits. The fuel must also be free from alkali and mineral acids.

Proper burning characteristics are dependent upon ignition quality and volatility.

All fuels meeting the requirements of the No. 1-D and the lighter types of fuel in the No. 2-D grade of the ASTM D-975 Diesel Fuel Oil Specifications are satisfactory. The more volatile grade (ASTM No. 1-D) is recommended for all types of service where frequent speed and load changes occur, while fuels in the heavier grade (ASTM No. 2-D) may be used with sustained high loads. However, prolonged use of fuel oils combining low ignition quality (less than 45 Cetane Number) with high boiling temperature (more than 675° F. end point) should be avoided, particularly in cold weather.

CAUTION: The sulphur content of "Diesel" fuel should be as low as possible. For warm temperature conditions, the fuel oil should contain less than ½ of 1% sulphur. For cold weather operation, fuel oils with less than 3/10 of 1% sulphur are preferable.

5. FUEL STORAGE



Fig. 3 — Fuel Storage Tank

The importance of proper storage of fuel cannot be too strongly stressed. Storage tanks, drums or service tanks must be free from rust, scale, sediment or any other foreign matter which will contaminate the fuel, clog the filters and will eventually damage the fuel pump and injectors.

A portable storage tank provides the best method for storing fuel on the job. In a tank, the sediment and water can easily be drained and the fuel can be pumped into the tractor fuel tank with a minimum of handling. Consult your local "Allis-Chalmers" Dealer for details about this type of storage tank. Since condensation will occur in the tank, it is very important that a sediment sump be provided in the bottom of the storage tank where the water and settlings can be drained daily.

Fuel should be allowed to settle at least 48 hours in the storage container before it is put in the fuel tank of the tractor. It is advisable to use a pump and draw the fuel from the tank or barrel rather than from the bottom of the container by means of a faucet or through the bung hole.

Where conditions are such that drums must be used to supply fuel, it is advisable to have enough drums to allow sufficient time for the fuel to settle. The fuel should be used only to within about three inches from the bottom. The fuel thus left in a number of drums can be collected into one drum and used after the usual time allowed for settling. In this manner, the sediment and foreign matter will be disposed of and no fuel will be wasted. Whenever drums are used for storage, they should be covered or placed under shelter to avoid the fuel becoming contaminated by water which will enter through the filler plugs when it rains, even though the plugs are tight.

The fuel tank of the tractor should be filled at the end of the day's run rather than in the morning. This will reduce the water content, as a full tank is less subject to condensation. The fuel tank is provided with a drain elbow and drain cock. Sediment will settle into this elbow and can be drained.

6. TRACTOR AND ENGINE SERIAL NUMBERS



Fig. 4—Tractor Serial Number



Fig. 5—Engine Serial Number

SECTION II — ENGINE FUEL SYSTEM

Topic Title	Topic No.
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Fuel Tank and Drain Elbow	3
Fuel Filters	4
Fuel Pump	5
Fuel Injectors	6
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Fuel Manifolds	8

1. DESCRIPTION OF SYSTEM

The engine fuel system consists of the fuel tank, first stage fuel filter, fuel pump, second stage fuel filter, injectors, fuel lines, and fuel pressure gauge. The fuel is drawn from the bottom of the fuel tank and through the first stage fuel filter by the fuel pump. The pump then circulates the fuel under pressure through the second stage fuel filter, inlet fuel manifold on the right side of the cylinder head, and then through the injectors. As the fuel enters each injector, it passes through a small porous metal filter in the injector body. The amount of fuel required by the engine is injected into the cylinders by the injectors. Surplus fuel not required for combustion leaves each injector through another porous metal filter and enters the return fuel manifold.

From the return fuel manifold, the fuel passes through the torque converter. The fuel then circulates through a cooling radiator (for the torque converter fluid), and is returned to the fuel tank. A filter and restrictor assembly, connected in the fuel return line and located on the lower left side of the radiator, filters the returning fuel and maintains a pressure of 30 to 55 pounds within the system.

The continuous circulation of fuel through the injectors helps to cool them and also eliminates the possibility of air pockets in the converter and engine fuel supply system.

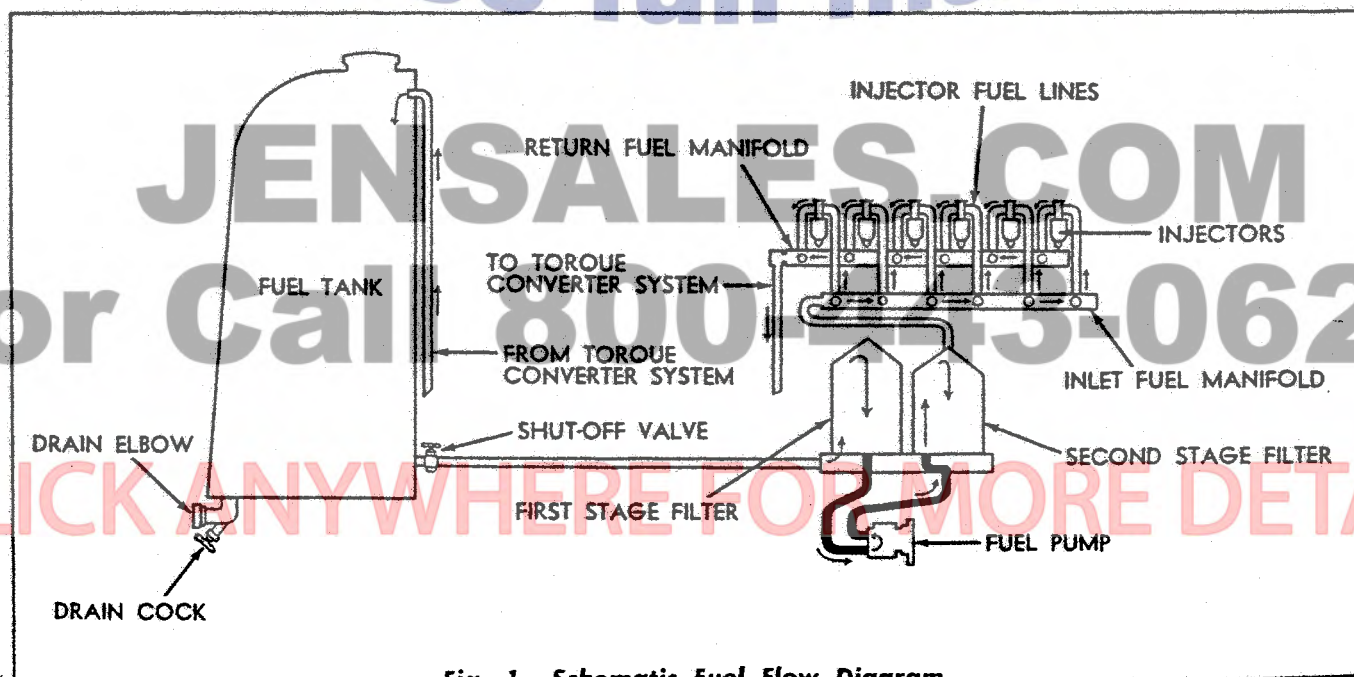


Fig. 1 — Schematic Fuel Flow Diagram