



International Harvester

Operator's Manual

UD-9A

Power Unit

JENSALES.COM

or Call 800-443-0625

JENSALES

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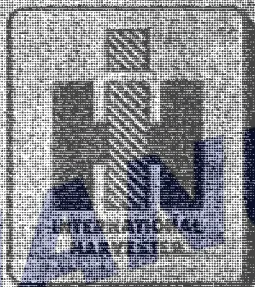
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IH-O-UD9A

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SPECIFICATIONS

ENGINE

Type Diesel, 4-cycle, valve-in-head
Cylinders 4, in line
Bore 4.4 in.
Stroke 5.5 in.
Engine speed
(Full load governed) 1600±10 r.p.m.
Engine speed
(High idle) 1775±30 r.p.m.
Engine speed
(Minimum idle) 450 to 550 r.p.m.
Magneto IH Type H-4
Spark plug gap 0.020 to 0.025 in.
Valve clearance (engine hot) 0.017 in.
Valve clearance (engine cold) 0.019 in.
Carburetor IH Model F-8
Fuel injection pump IH or Bosch
Air cleaner Donaldson, 8 in.
Clutch Over-center type, 12 in.

CAPACITIES (U.S. Measure) (Approximate)

Cooling system 13 gal.
Gasoline tank (starting) 2/3 gal.
Crankcase oil pan 11 qt.
Air cleaner oil cup 3-3/4 pt.
Injection pump housing (IH) . . 1/2 pt. or 8 oz.
Injection pump housing
(Bosch) 3/8 pt. or 6 oz.
Air and water trap
(on engine with IH pump) 5-1/8 qt.
Auxiliary fuel tank
(on engine with Bosch pump) . . . 4-3/4 qt.

DIMENSIONS (Approximate)

Length
(over-all, less starting crank) . . 67-3/4 in.
Width (over-all) 27 in.
Height (over-all) 52 in.

DIESEL FUEL SPECIFICATIONS

The best guide to follow when selecting fuel for use in the International diesel engines is the set of fuel specifications prepared and recommended by the builder.

Most refiners now market fuel oil designated as diesel fuel to distinguish it from burner fuel. Although similar to burner fuel, the diesel fuel is usually made from the straight run distillates, while the burner fuel may contain sufficient quantities of the lower ignition, catalytic cracked distillates to make it unsatisfactory for use in the International diesel engine.

Some refiners are marketing one grade of fuel for use in both diesel and burner applications. This fuel, when within the specifications shown below, can be safely used. However, maintaining the quality and suitability of these fuels for International diesel engines is definitely the responsibility of the supplier.

Diesel fuel for high speed diesel engines is now obtainable in the U.S.A. in two grades, namely No. 1-D (light fuel) and No. 2-D (heavy fuel).

No. 2-D fuel gives the most satisfactory performance in International diesel engines when the physical properties are within the limits of the following specifications:

Gravity - Minimum 30 API
Flash point - Minimum 125° F. Minimum
or legal
Pour point - 10° lower than minimum anticipated temperature

Cloud point - Preferable no more than 10° higher than pour point
Water and Sediment None
Carbon Residue (10% Residuum) 0.25% Maximum
Ash (by weight) 0.02% Maximum
Distillation
Initial Boiling Point Minimum 325° F.
50% Boiling Point Minimum 475° F.
End Boiling Point Minimum 610° F.
End Boiling Point Maximum 725° F.
Sulphur by weight 0.5% Maximum
Cetane number 40 Minimum
Copper strip corrosion 3 Hours at 212° F.
Color 3 NPA Maximum

When No. 2-D fuel conforming to the above specifications is not available, the No. 1-D (light) fuel may be used. However, this lighter fuel has a lower heat content and lower viscosity. Its use may result in loss of power and/or increased fuel consumption and shortened injection pump life. However, No. 1-D fuel may be required in sub-zero weather in order for the pump to maintain an adequate flow of fuel.

Fuels lighter than kerosene will not give satisfactory performance in International diesel engines. Although some fuels meet the No. 2-D specifications, their composition may be such that unsatisfactory engine wear and excessive deposits may result unless high additive lubricating oil is used. Knowledge of the fuels in your area and the types of crankcase oils required for satisfactory performance with these fuels will avoid service problems. When in doubt, see your International Industrial Power distributor or dealer.

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Water and sediment will tend to clog the filters. If water passes through them it will corrode the pump plungers and other highly finished parts in the pump and nozzles, thus greatly shortening their lives. The fuel must be free from water, sediment and residue.

Buy clean fuel and keep it clean.

Store fuel in tanks equipped with hose and nozzle because the fuel is less likely to become contaminated.

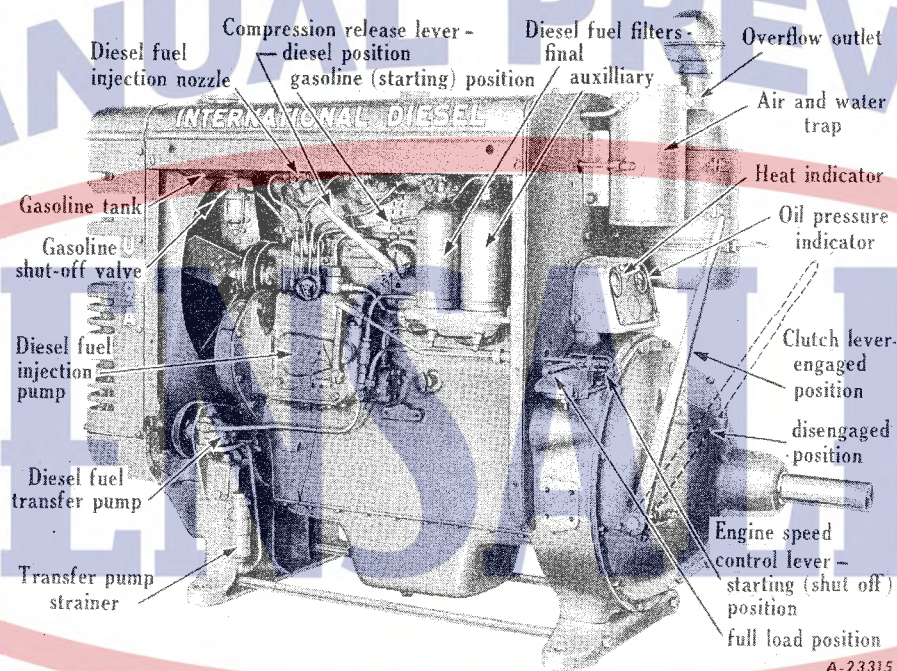
Do not use funnels, cans and drums because they are difficult to keep clean.

Handle the fuel as little as possible.

Always fill the engine fuel tank at the end of each day to reduce condensation.

Drain the water trap daily.

INSTRUMENTS AND CONTROLS



Illustr. 1 - Left Side of Power Unit Showing Instruments and Controls and Principal Components of the Fuel System.

The operator of this power unit should thoroughly familiarize himself with the instruments and controls provided for operation. There are important differences between various engines; therefore, regardless of previous experience with other machines, the operator should fully understand what each control is for, and how to use it, before starting to operate this power unit.

ENGINE SPEED CONTROL LEVER

This lever controls the speed of the engine. When set in a given position it maintains a uniform engine speed under variable loads. Move the lever forward to increase the speed.

CLUTCH LEVER

This lever is used to engage or disengage the engine from the load. Push forward to engage the clutch until a definite over-center action is felt, if using the over-center type clutch. (Pushing forward will disengage the spring-loaded type clutch. The spring loaded clutch

remains engaged unless the lever is latched in the forward position.)

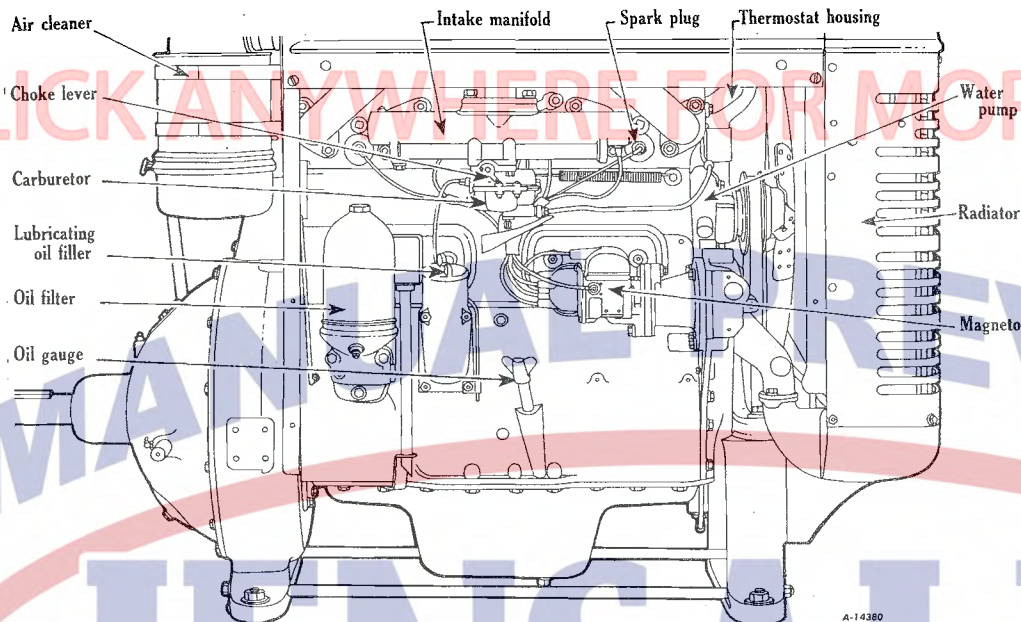
COMPRESSION RELEASE LEVER

Pulling back (toward the flywheel) on the compression release lever converts the diesel engine into a gasoline engine for starting. Reduced compression, spark plug ignition, and carbureted gasoline fuel provide for starting as a gasoline engine. After operating on gasoline a minute (two or three minutes in cold weather) switch the engine to diesel operation by pushing the compression release lever all the way forward. See page 11 for changing back to gasoline operation before stopping. After the engine is stopped place the compression release lever in diesel position to allow the starting valves to cool on their seats.

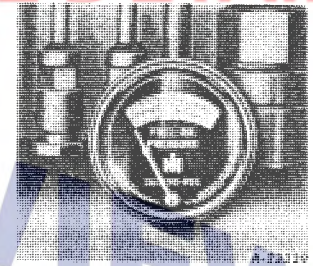
OIL PRESSURE INDICATOR

The oil pressure indicator shows whether lubricating oil is circulating through the engine. The indicator should be in the white area (Continued on next page)

INSTRUMENTS AND CONTROLS - Continued



Illustr. 2 - Right Side of Power Unit Showing Principal Components.



Illustr. 3

Fuel Oil
Pressure Indicator.

when the engine is operating. If the indicator is not in the white area stop the engine immediately and investigate the cause of the oil pressure failure.

HEAT INDICATOR

The heat indicator registers the temperature of the liquid in the cooling system. The indicator should be in the high side of the "RUN" range for normal operation.

CHOKE LEVER (ON CARBURETOR)

The choke aids in starting the engine when it is cold. Closing the choke (turning the choke lever clockwise) shuts off the air to the carburetor, giving a rich mixture. After the first few revolutions of the engine, open the choke (turn the choke lever counterclockwise) to a point where the engine operates steadily. After the engine has operated a short time, open the choke (turn the choke lever counterclockwise) all the way.

STARTING SWITCH (IF USED)

Pressing the starting switch button completes the electrical circuit between the battery and the starting motor, causing the starting motor to crank the engine. Release the pressure on this button as soon as the engine starts. Never operate the starting motor more than 30 seconds at a time; allow the starting motor to cool two or three minutes and repeat the starting operations.

FUEL OIL PRESSURE INDICATOR

This indicator located on the injection pump registers the pressure of the fuel oil from the

primary pump through the final fuel filter to the injection pump. With the engine running (either on gasoline or diesel cycle) the hand of the indicator should be in the white area or "OPERATING RANGE". If the hand remains in the red or "CHANGE FILTER" area the auxiliary or final fuel filter element needs replacement. Also see page 40.

AMMETER (IF USED)

This instrument indicates the charging rate of the generator or the rate at which the battery is being discharged. The ammeter should show charge whenever the engine is operating at a speed faster than low idle speed. If it shows discharge continuously while the engine is operating at this speed the cause should be investigated to avoid completely discharging the battery and possible damage to the generator.

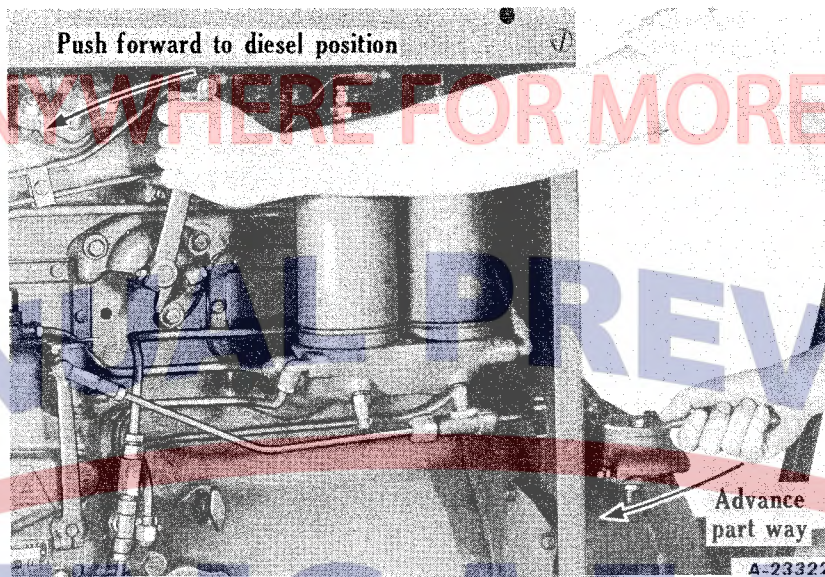
RADIATOR SHUTTER CONTROL CRANK (IF USED)

This control crank is used to open and close the radiator shutter, to control the engine temperature. Turn the crank counterclockwise to close the shutter.

ORIENTATION

The use of the terms "left" and "right," and "front" and "rear," must be understood to avoid confusion when following instructions. In this manual LEFT and RIGHT indicate the left and right sides of the power unit when facing the power unit from the clutch end. The FRONT of the power unit is the radiator end. The REAR is the clutch end.

OPERATING THE DIESEL ENGINE - Continued



Illustr. 6 - Changing from Gasoline to Diesel Operation

(6) **CHOKING AND CRANKING.** Excessive choking will flood the engine with gasoline and make it hard to start. Choke and crank the engine as follows:

(a) During warm weather; or
During cold weather when engine is warm;
 Set the choke in the fully choked position (turn the choke lever clockwise) and make one or two up-strokes of the crank. Then set the choke 1/4 to 1/3 open and crank the engine until it starts. (Crank the engine with quick up-strokes making only half a turn--do not attempt to make a full turn or to spin the engine.)

(b) During cold weather when engine is cold;
 Set the choke in the fully choked position and make three or four up-strokes of the crank. Then set choke 1/4 to 1/3 open and crank the engine until it starts.

(7) If your power unit is equipped with an electric starter set the choke part way open and press the starter button. **NOTE:** Never operate the starting motor more than 30 seconds at a time; allow the starting motor to cool two or three minutes and repeat the starting operations.

(8) As soon as the engine starts the choke should be adjusted to where the engine operates steadily. As the engine warms up set the choke all the way open.

(9) Check the oil pressure indicator to see if oil is circulating through the engine. If not, stop the engine immediately and determine the cause of the oil pressure failure.

(10) The engine should be operated on the gasoline cycle about one minute (two or three

minutes in cold weather) before switching to the diesel cycle.

CHANGING TO DIESEL OPERATION

(1) After starting the engine, before switching to the diesel cycle, operate it on gasoline with the choke wide open until the exhaust becomes clear. This will clean the spark plugs for the next starting.

(2) For severe cold conditions the engine should be run two or three minutes on gasoline before switching to diesel fuel.

(3) Push the compression release lever forward to the diesel position, then immediately advance the engine speed control lever part way and the engine will operate on diesel fuel as a diesel engine.

(4) The carburetor is automatically cut out when on diesel operation and is ready for use again when stopping on gasoline.

(5) The magneto is timed with the engine and is permanently connected. The ignition (cut-out) switch is operated automatically by the starting mechanism.

(6) The engine may start noisily when diesel operation begins but the noise will be eliminated as the engine warms up.

OPERATING THE POWER UNIT

(1) Advance the engine speed control lever to the desired speed.

(2) Engage the clutch gradually by pushing the lever forward, if using over-center type clutch, until positive over-center action is felt. (If using spring-loaded type clutch, release the lever to the rear to engage the clutch.)