ELECTRICAL SYSTEM

Gasoline Engine Loader Tractor

The 12-volt electrical system of the gasoline loader tractor consists of a generator, voltage regulator, cranking motor, lights, lighting switch, battery, electrical instruments and a distributor and coil unit.

Use the illustrations and wiring diagrams in this section as a guide for identifying the various electrical units and for tracing the electrical cables and connections. Be sure all terminals are clean and securely fastened.

Caution! Before working on any part of the electrical system, disconnect the battery ground strap from the battery terminal. Do not reconnect it until all electrical work has been completed. This will prevent shorting and causing damage to any of the electrical units. After the ground strap has been reconnected, the electrical system must be repolarized as described **on page 53.**

SPARK PLUGS AND CABLES

Note: Remove all dirt from the base of the spark plug before removing the spark plug.

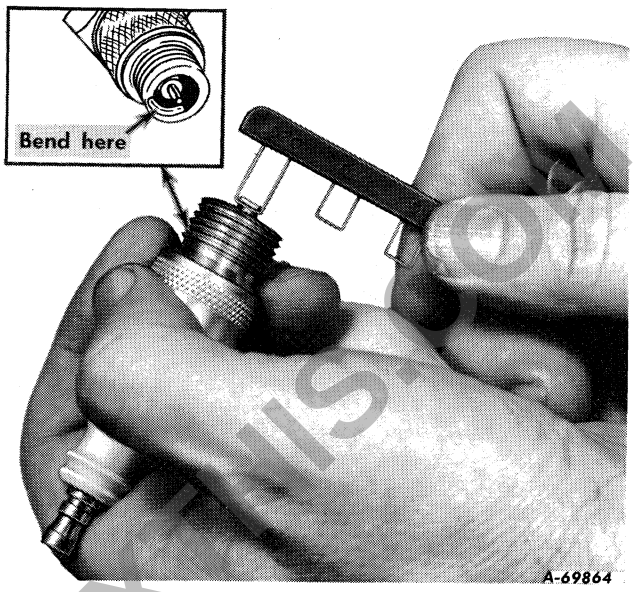
Remove the spark plugs after every 250 hours of operation for cleaning and checking the gaps between electrodes. Always use a deep socket wrench when removing or replacing plugs.

A gap of .025-inch should be maintained. If the gap between the electrodes is too great, the engine will misfire and be hard to start. Always bend the outer electrode. Never bend the center electrode as it may damage the insulator.

Cleaning Spark Plugs

Sandblasting is the recommended method of cleaning spark plugs. Never scrape or clean the insulator with anything which will scratch the porcelain.

Securely screw the spark plugs into the cylinder head, using a new copper gasket with each one. Tighten enough to compress the gasket to seal the plug and assure a good heat transfer between the plug and the cylinder head. Tighten the plug 1/2 to 3/4 turns past finger tight.



Illust. 40
Set spark plug gap at .025-inch

Replace defective plugs with new plugs. See your International Harvester dealer for various makes of replacement plugs for normal or special service.

If the spark plug cables are removed for any reason, note the position of each cable on the distributor cap as shown **in Illust. 43.**

Spark Plug Cables

Replace the cables when they become hard, cracked, shorted, or rotted. If the spark plug cables are removed note the position of each in the distributor cap.

The cable terminals must fit snugly in the distributor and coil sockets. Use rubber nipples to cover these connections. Be sure each cable is secured to a spark plug terminal.

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DIESEL ENGINE AND FUEL SYSTEM

VENTING THE FUEL SYSTEM

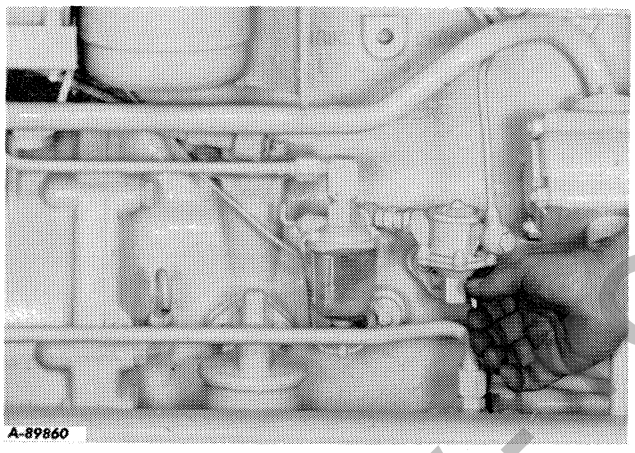
The fuel system must be vented under the following circumstances:

1. Before starting the engine for the first time.

2. When the fuel filter has been serviced or replaced.

3. When the engine, in operation, runs out of fuel.

4. When any connections between the injection pump and fuel tank have been loosened or broken for any reason.



Illust. 20
Hand priming primary pump.

Loosen vent valves "A" and "B" **(Illust. 18A).** Then loosen vent valve bolt "C". Operate the pump hand lever until fuel flows from each vent, free of air bubbles. Tighten vent valve bolt "C", vent valve "B", and vent valve "A" in that order.

Loosen nut "D", operate the pump hand lever until fuel flows free of air bubbles, and tighten the nut securely.

Turn the engine over one-half revolution. Then again loosen vent valve "B", operate the pump hand lever until fuel flows free of air bubbles, and tighten the valve securely.

Try starting the engine as described elsewhere on this page. If the engine does not start, loosen one connection between the high pressure pipes and the injection nozzle. Turn the engine until fuel flows free of air bubbles. Tighten the connection securely. Repeat this for the remaining three connections.

Venting the Fuel System after Changing Filter Element

Loosen vent valve bolt "C" **(Illust. 18A),** operate the pump hand lever until fuel flows from the vent, free of air bubbles. Tighten the vent valve bolt securely.

Loosen the union at the filter end of the filter to injection pump feed pipe, and operate the pump hand lever until fuel flows, at the union, free of air bubbles. Tighten the union securely.

SAFETY STARTING SWITCH

The safety starting switch serves to prevent moving the tractor accidentally when starting the engine.

To complete the circuit to the cranking motor for starting the engine, the switch must be moved to the closed contact position. On a tractor with a regular transmission, the clutch must be depressed all the way. On a tractor with a Hydra-Shuttle transmission, the contacts are closed when both pedals are in the UP position.

STARTING THE ENGINE

1. Be sure the shut-off valve on the fuel strainer on the right side of the engine is open.

2. Put the gearshift lever, hi-lo selector lever, and forward and reverse drive lever in neutral position.

3. Push the fuel shut-off control button in all the way.

4. Advance the engine speed control lever to halfway open position.

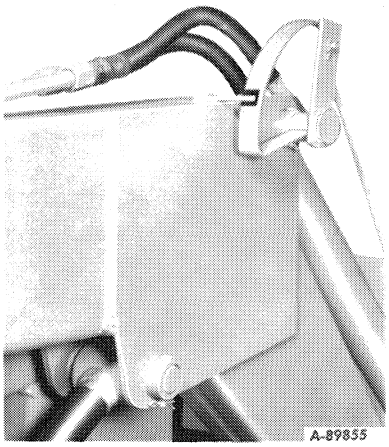
5. Turn the ignition key clockwise to the "ON" position and check the oil pressure and generator Tellites.

6. **Loader Tractor with Regular Transmission:** Disengage the engine clutch by pressing the clutch pedal down all the way.

Loader Tractor with Hydra-Shuttle Transmission: Do not press down on either of the clutch pedals when starting.

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BUCKET LEVELING - Continued



Illust. 13
Bucket level indicator.

LOADING HINTS AND PROCEDURES

Downgrade Operation

Before going downgrade, select the proper transmission gear range. In steep downhill operation, decelerate the engine and use the foot brakes if necessary to reduce the speed of the loader tractor and overspeeding the engine.

Operating Over an Obstruction

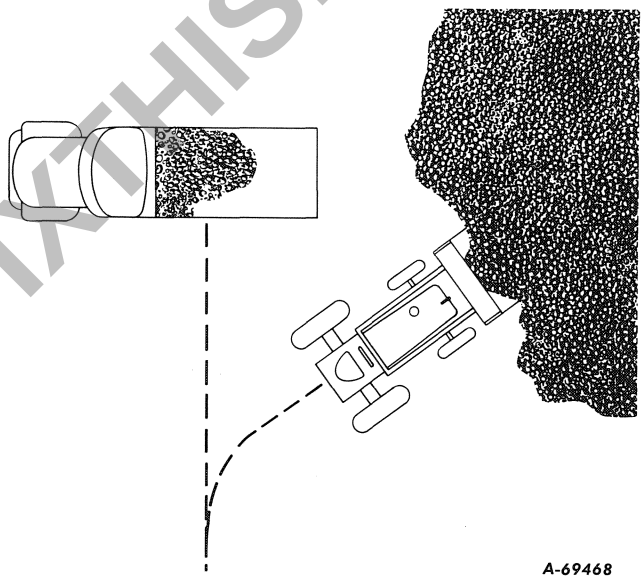
When crossing ditches or ridges, it must be done slowly and if possible, at an angle. This slows the fall, lessening the danger of upsetting the loader tractor and reduces the fall jolt which can be harmful to the operator and the loader tractor. Decelerate the engine, then gradually increase the power as the loader tractor moves forward, over, and down. If the load is light, it may also be necessary to use the foot brakes.

Loading

For efficiency in loading, for operating economy, and for minimizing turning and movements, use the V-method as shown in Illust. 13A. Keep the trucks close to the work area to minimize loader tractor travel which should be held to 15 feet maximum when possible.

Keep the working areas smooth.

Shake the bucket only to loosen dirt from within.



Illust. 13A

Raise the bucket when moving toward the truck, and lower the bucket when moving away from the truck.

Approach the stock pile with the engine running at full governed speed. Lower the bucket so the forward motion of the loader tractor will push the bucket into the material. While the bucket is being pushed forward into the stock pile, pull the boom lever. Then pull the bucket control lever, rolling the bucket back. This can easily be done by using both control levers at the same time. This action of "moving in" and rolling the bucket back simultaneously is called "crowd action".

The operator must learn to coordinate the use of the throttle, clutch, and transmission with that of the two bucket levers.

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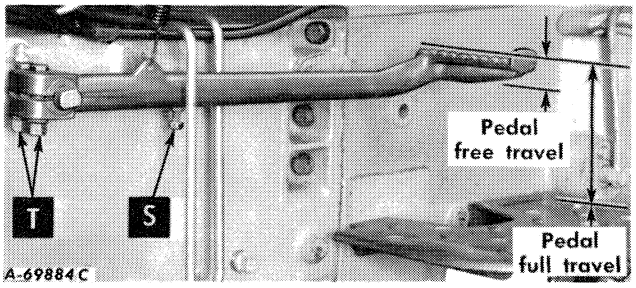
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CLUTCHES

ENGINE CLUTCH (Regular Transmission and Forward and Reverse Drive)

The engine clutch is designed to require a minimum of attention. However, it is important that the clutch pedal be checked for free movement after every 150 hours of operation, until the proper inspection interval is determined according to usage. Also, the clutch release shaft should be lubricated at the proper intervals as instructed in the "Lubrication Guide".

Adjusting the Clutch Pedal



Illust. 60
Clutch pedal adjustments.

Loader tractors equipped with a continuous running power take-off have a dual-stage clutch. The clutch pedal should be adjusted to give a full pedal travel of 6 inches, measured between the top of the pedal pad and the foot plate. With the clutch fully engaged the pedal should have a free movement of 3/4-inch. **See Illust. 60.**

Loader tractors not equipped with continuous running power take-off have a single-stage heavy duty clutch. The clutch pedal should be adjusted to give a full pedal travel of 6 inches, measured between the top of the pedal pad and the foot plate. With the clutch fully engaged the pedal should have a free movement of 3/4-inch. **See Illust. 60.**

To obtain the full pedal travel, adjust the set screw "S" **(Illust 60)** until the required measurement is obtained.

Note: Do not adjust the pedal free travel by means of the set screw.

The correct pedal free travel is obtained by loosening the pedal clamp retaining bolts "T" **(Illust. 60)** and turning the pedal and clamp assembly on the clutch release shaft until the specified pedal free travel is obtained.

Clutch Type	Pedal Full Travel	Pedal Free Travel
Dual Stage	6 inches	3/4-inch
Single Stage	6 inches	3/4-inch

HYDRA-SHUTTLE TRANSMISSION CLUTCHES

Note: If the tractor is disabled for any reason, it must be transported on a low bed trailer or other vehicle. DO NOT TOW THE TRACTOR.

The clutches in this unit are not power absorbing members and cannot be subjected to slippage under load as the control system engages the clutches prior to engine acceleration. This arrangement greatly increases the life of the clutches. The clutches are hydraulically applied and spring released.

Each clutch has six friction plates which have sintered bronze facings, and six reaction plates of polished steel. Since the clutches are hydraulically controlled, compensation is automatic for normal wear, therefore, no adjustment is necessary.

Control Valve Linkage Adjustment

With the Hydra-Shuttle forward and reverse pedals in the uppermost (neutral) position, adjust the control valve linkage as follows:

1. Adjust the tension of spring "H" **(Illust 61)** to approximately 8 inches.

2. Disconnect rods "A" and "B" at the control pedals (clevis ends).

3. Adjust the length of rod "C" until stud "E" is centered in slot "F".

4. Reconnect rods "A" and "B", adjusting the length so the clevis pins fit freely.

5. Disconnect rods "A" and "B" and shorten both rods three complete turns of the clevis.

6. Reconnect rods "A" and "B". Clearance between the stud and end of the wobble plate (dimension "D") should be approximately 1/4 inch. If the clearance is not 1/4 inch, repeat steps "4" and "5".

7. Adjust rod "G" so that the control pedal pads just touch the throttle linkage after the forward and reverse control valve is completely shifted.

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— After Every 100 Hours of Operation

11. Crankcase breather cap.	Remove the breather cap and wash it in solvent. Blow it out with compressed air. Under extremely dusty conditions, it may be necessary to clean the breather cap more frequently.
12. Engine crankcase oil.	Remove the crankcase and oil filter drain plugs and drain all the oil while the engine is warm; then replace the plugs and refill with new oil to the "FULL" mark on the oil level gauge. Refer to the "Lubrication Table".

— After Every 200 Hours of Operation

12A. Clutch release bearing	Use IH 251H EP grease or equivalent #2 multi-purpose lithium grease and apply one or two strokes of the lubricator. To reach the clutch release bearing (12A) remove the clutch compartment bottom cover "A".
13. Engine oil filter element.	Replace the oil filter element as instructed on pages 74 and 75.
14. Air cleaner.	Remove the entire air cleaner and service it as instructed under "Washing the Air Cleaner"; then fill the oil cup with new oil of the correct viscosity as instructed in the "Lubrication Table".

— After Every 250 Hours of Operation

15. Distributor (gasoline engine).	Apply 4 to 5 drops of engine oil to the hole in the shaft. Apply a light coat of IH high temperature grease (21372-D) on the cam lobes and flats, and fill the recess in the breaker post. Pack a small quantity of grease in back of the breaker arm rubbing block. See Illust. 41.
16. Transmission and hydraulic system.	Remove the dipstick on the right front side of the transmission cover and check the fluid level. If necessary, add sufficient IH Hy-Tran® fluid through the transmission breather hole to bring level up to the "FULL" mark on the dipstick.
17. Hydraulic fluid filter.	Replace the filter element as instructed on page 76.
18. Hydra-Shuttle transmission.	Replace the filter as instructed on page 77.

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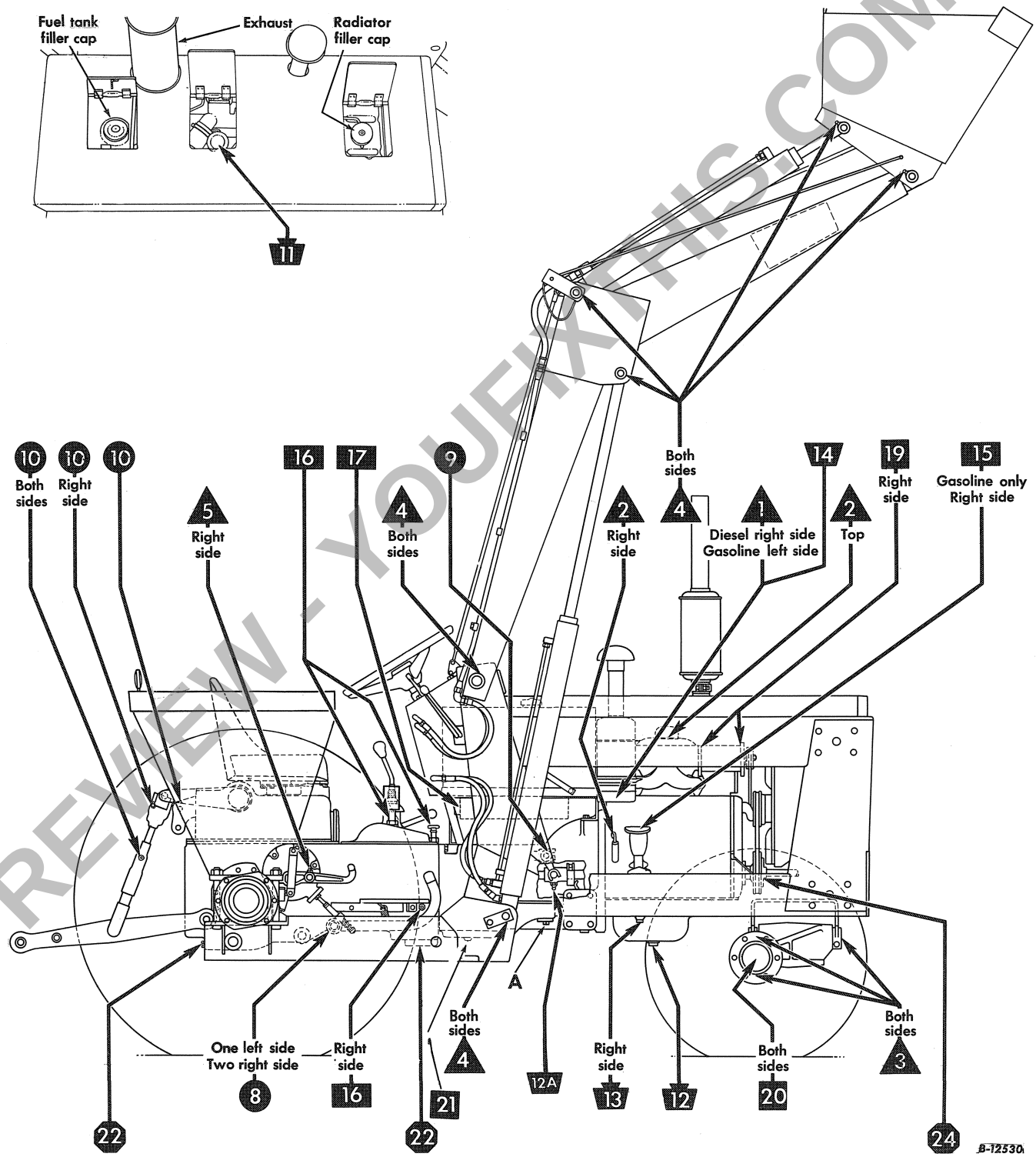
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LUBRICATION GUIDE

The symbols around the reference numbers indicate the intervals of lubrication.

—10 hours — 50 hours —100 hours —200 hours

—250 hours —500 hours —Periodic



Illust. 79 — Right side view.

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DRIVING

STEERING - Continued

sharp or pivot turn, press the right or left brake pedal, depending on the direction in which the turn is to be made. The brake pedals must be unlatched so they can be operated individually.

Caution! Reduce speed before making turns or when applying the brakes. The danger of any driven machine overturning increases four times when the speed is doubled.

STARTING AND STOPPING THE MACHINE

Regular Transmission and Forward and Reverse Drive

During cold weather, warm the hydraulic fluid by running the engine at idling speed and holding the valve down, to permit the hydraulic fluid to by-pass through the relief valve, until the tube becomes warm.

1. Advance the engine speed control lever slightly.

2. Disengage the clutch.

3. With the engine running and the clutch in the disengaged position, select the desired gear and speed range by moving the gearshift lever and the hi-lo shifter lever to their appropriate positions **(Illust. 2).**

The hi-lo shifter lever should be in the forward position for low range operation or in the rearward position for high range operation **(Illust. 2).**

If the loader tractor is equipped with the forward and reverse drive transmission, the shifter lever should be in the forward position for forward operation or in the rearward position for reverse operation **(Illust. 7).**

4. Release the brakes by pressing the brake pedals further down and moving the brake pedal lock lever forward past the retainer plate **(Illust. 2).**

5. Start the loader tractor in motion by slowly engaging the clutch and advancing the engine speed control lever to a position where the engine operates best for the load to be handled.

Note: Do not shift gears while the engine clutch is engaged or while the loader tractor is in motion.

6. Do not "ride" the clutch or brake pedals by resting the feet on the pedals while driving the loader tractor because this will result in excessive wear on the friction material.

Caution! Always latch the brake pedals together before driving the loader tractor in the two highest gears (HI-3 and HI-4). **See Illust. 2.** Be sure the brakes are adjusted properly.

To stop the loader tractor, disengage the clutch by pressing down firmly on the clutch pedal and moving the gearshift lever to the neutral position. Use the brakes, if necessary. Depress both pedals at the same time.

Hydra-Shuttle Transmission

The Hydra-Shuttle transmission provides fast shuttle operation without gear shifting, through a torque converter drive with hydraulically-operated forward and reverse clutches. Depressing either the forward or the reverse foot pedal, on the left side **(Illust. 6),** first actuates the control valve to engage the desired clutch, and then becomes a foot accelerator to control the engine speed. When both pedals are depressed together, they act only as a foot accelerator, without actuating either clutch.

The torque converter provides a smooth and shock-free hydraulic drive, with a range of automatic torque multiplication. When tractive loads are light, the converter transmits the engine power directly to the transmission, without torque multiplication, at almost engine speed. As higher tractive loads are encountered, there is an automatic multiplication of engine torque, with a corresponding speed reduction, which prevents engine stalling and eliminates gear shifting in a given operation. A three-speed transmission with hi-lo range provides speed selections for different types of operations and for transport.

During cold weather, warm the hydraulic fluid by running the engine at idling speed and holding the valve down, to permit the hydraulic fluid to by-pass through the relief valve, until the tube becomes warm.

The hydraulic fluid is directed through a cooler that is mounted in front of the radiator to prevent the fluid from overheating.

With the engine speed control lever in the low idle position, and with the gearshift lever and the hi-lo selector lever in the desired gear and speed range positions, slowly depress the inside pedal "F" to obtain the desired forward speed or the outside pedal "R" to obtain the desired reverse speed. To stop the loader tractor, release the forward or the reverse operating pedal. Use the brakes if necessary. Depress both pedals together for faster loader action, when no loader tractor movement is desired.

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PREVENTIVE MAINTENANCE GUIDE

After Every 150 Hours of Operation

Brake pedal	Check for free movement. See page 59.
Engine clutch pedal	Check for free movement. See page 60.

After Every 200 Hours of Operation

Air cleaner, complete	Remove and clean. See page 38.
Engine oil filter	Replace the filter element. See page 74.

After Every 250 Hours of Operation

Hydraulic fluid filter	Replace the element. See page 76.
Hydra-Shuttle transmission	Replace the filter. See page 77.
Spark plugs (gasoline engine)	Remove and clean; check gap. See page 40.

After Every 500 Hours of Operation

Distributor breaker points and chamber (gasoline engine)	Clean chamber; check breaker points and breaker point opening; retime. See pages 41 to 43.
Engine valves	Check for clearance. See page 57.
Front wheels	Clean and repack with new grease (spring and fall). See page 77.
Fuel filter (diesel engine)	Change filter. See page 23.
Hydra-Shuttle transmission	Change the hydraulic fluid. See page 76.
Lubrication points	See "Lubrication Guide".

Periodic

Battery	Check liquid level. See page 56.
Cooling system	Drain, flush, and fill (spring and fall). See pages 35 and 36.
Transmission and hydraulic system	Drain and clean. See page 75.
Lubrication points	See "Lubrication Guide".

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THIS SAFETY ALERT SYMBOL INDICATES IMPORTANT SAFETY MESSAGES IN THIS MANUAL. WHEN YOU SEE THIS SYMBOL, CAREFULLY READ THE MESSAGE THAT FOLLOWS AND BE ALERT TO THE POSSIBILITY OF PERSONAL INJURY OR DEATH.

M171B

If Safety Decals on this machine use the words **Danger, Warning or Caution,** which are defined as follows:

- **DANGER:** Indicates an immediate hazardous situation which if not avoided, will result in death or serious injury. The color associated with Danger is RED.
- **WARNING:** Indicates an potentially hazardous situation which if not avoided, will result in serious injury. The color associated with Warning is ORANGE.
- **CAUTION:** Indicates an potentially hazardous situation which if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. The color associated with Caution is YELLOW.

If Safety Decals on this machine are ISO two panel Pictorial, decals are defined as follows:

- The first panel indicates the nature of the hazard.
- The second panel indicates the appropriate avoidance of the hazard.
- Background color is YELLOW.
- Prohibition symbols such as  and  if used, are RED.

WARNING

IMPROPER OPERATION OF THIS MACHINE CAN CAUSE INJURY OR DEATH. BEFORE USING THIS MACHINE, MAKE CERTAIN THAT EVERY OPERATOR:

- Is instructed in safe and proper use of the machine.
- Reads and understands the Manual(s) pertaining to the machine.
- Reads and understands ALL Safety Decals on the machine.
- Clears the area of other persons.
- Learns and practices safe use of machine controls in a safe, clear area before operating this machine on a job site.

It is your responsibility to observe pertinent laws and regulations and follow Case Corporation instructions on machine operation and maintenance.

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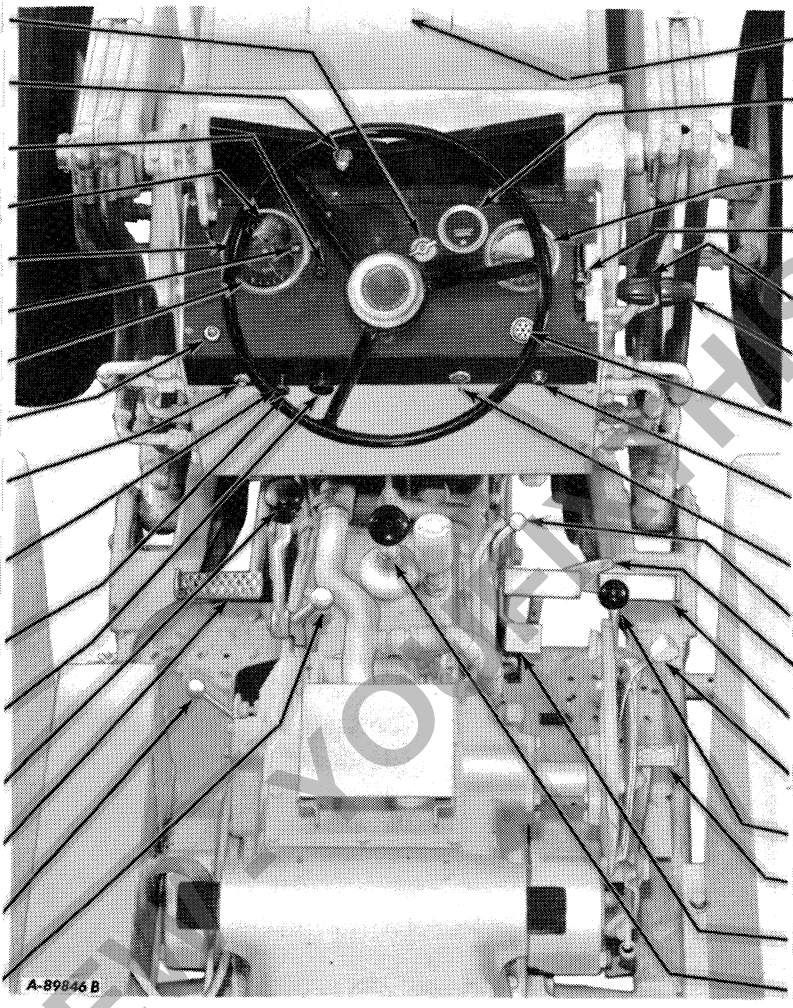
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INSTRUMENTS AND CONTROLS

Before attempting to start or operate the loader tractor, be sure to review all of the instructions for the new machine and thoroughly familiarize yourself with the instruments and controls.



Lighting switch
Instrument panel cover lock
Fuse housing
Fuel gauge
Oil pressure Tellite
Generator Tellite
Temperature gauge
Horn button
Push button starting switch
Choke control button (Gasoline engine)
Fuel shut-off control rod (Diesel engine)
Cigarette lighter
Forward and reverse drive lever
Clutch pedal
Power take-off control lever
Hi-lo selector lever

Hood latch locks
Hour meter
Odometer-tachometer
Engine speed control lever
Boom control lever
Bucket control lever
Glow plug indicator (Diesel engine)
Glow plug switch button (Diesel engine)
Key switch
Brake lock lever
Brake pedal latch
Brake pedals
Draft control lever
Position control lever
Differential lock pedal
Accelerator pedal
Gearshift lever

Illust. 2
Instruments and controls.

Accelerator pedal (page 5).
Brake pedals (page 6).
Brake pedal latch (page 6).
Brake lock lever (page 6).
Boom and Bucket control levers (page 12).
Choke control button (gasoline engine) (page 16).
Cigarette lighter.
Clutch pedal (page 5).
Differential lock pedal (page 6).
Draft control lever (page 30).
Engine speed control lever (page 7).
Forward and reverse drive lever (page 7).
Fuel gauge (page 7).
Fuel shut-off control button (diesel engine) (page 20).
Fuse (page 55).
Flow control (page 30).
Gearshift lever (page 5).
Generator Tellite (page 55).
Glow plug indicator (diesel engine) (page 52).
Glow plug switch button (diesel engine) (page 52).
Hi-lo selector lever (page 7).
Horn button.
Hour meter (page 7).
Instrument panel cover and hood latch anti-vandalism locks (page 7).
Key switch (page 53).
Lighting switch (page 54).
Oil pressure Tellite (page 55).
Position control lever (page 29).
Power take-off control lever (page 34).
Push button starting switch (pages 16 and 21).
Odometer-tachometer (page 7).
Temperature gauge (page 35).

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International 3444 Loader Tractor

Operator's Manual

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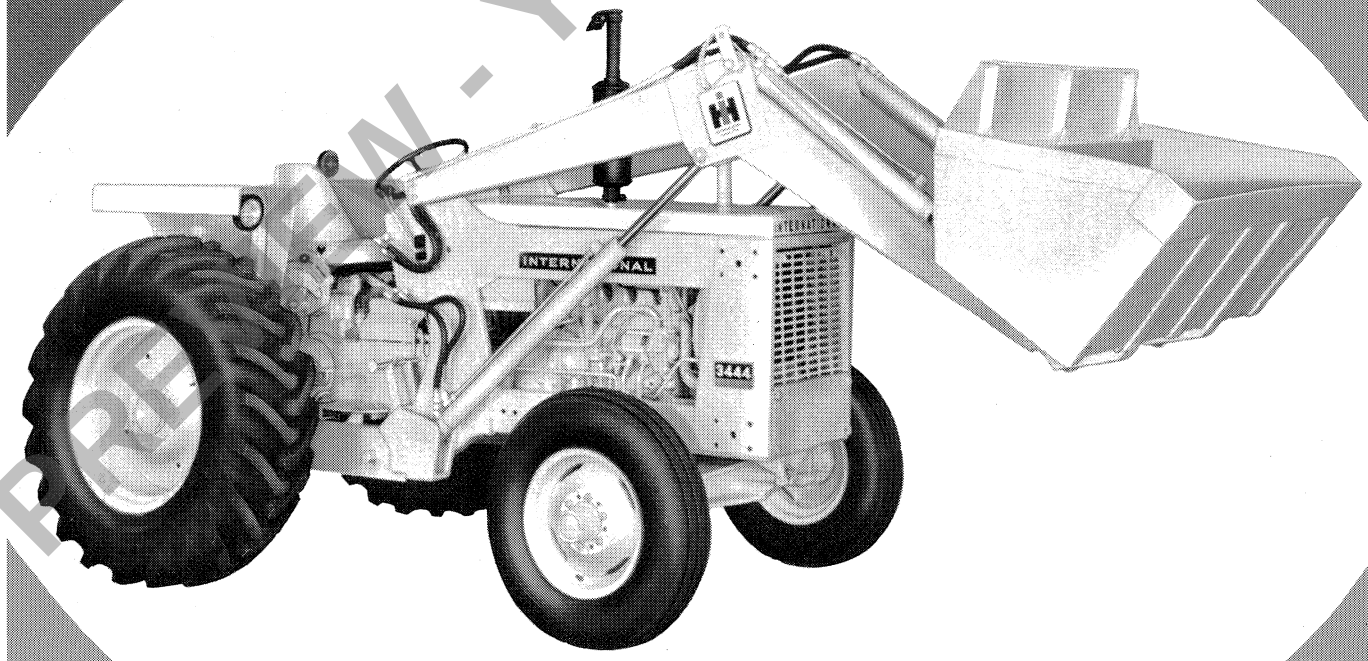
OPERATOR'S MANUAL

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OPERATION
MAINTENANCE
LUBRICATION

Loader Tractor



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