

# *Operator's Manual*



**McCORMICK**  
**FARMALL**  
**Cub**

INTERNATIONAL HARVESTER COMPANY

180 North Michigan Ave.

Chicago 1, Illinois, U.S.A.

## TO THE OWNER

By selecting an International Harvester tractor as your new power partner, you have purchased a product of one of the world's foremost manufacturers of farm equipment. We feel sure you will obtain from this machine the economical and superior performance it is designed to give. It is certain that you will derive a large measure of personal satisfaction from operating it.

Years of tractor manufacturing experience and actual contact with agricultural problems in the field have been combined with advancements in engineering and metallurgical science to produce all the features and refinements built into your tractor. The liberal use of precision-type bearings, the heavy-duty crankshaft, force-feed lubrication, dependable ignition, extra-large flywheel and the efficient air, oil and fuel cleaners are some of the features that give your tractor its eager power to do all your power jobs with thoroughness, speed and economy. Properly adjusted, operated, and maintained, this tractor will respond to every reasonable demand you make upon it and give you reliable service for years to come.

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*A complete list of parts will be supplied on request.*

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It is the policy of International Harvester Company to improve its products whenever it is possible and practical to do so. We reserve the right to make changes or add improvements at any time without incurring any obligation to make such changes on tractors sold previously.

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All illustrations and descriptive matter in this publication apply to International Harvester products sold under the McCormick, McCormick-International, McCormick-Deering, or McCormick-Deering International trade name.



# DELIVERY REPORT

(This copy to be retained by owner.)

Delivered to \_\_\_\_\_  
Purchaser's Name

Address \_\_\_\_\_  
Street and No. or R.F.D. and Box No.

\_\_\_\_\_ Town \_\_\_\_\_

\_\_\_\_\_ State \_\_\_\_\_ Date \_\_\_\_\_ 19\_\_\_\_

1. Acres or hectares in crops \_\_\_\_\_ 4. Check chief source of farm income \_\_\_\_\_

2. Tractor being replaced if any: Dairy

Make \_\_\_\_\_ Age \_\_\_\_\_ (Years) Livestock

Model \_\_\_\_\_ Corn

Wheat

3. Number tractors owned, including Truck

new purchase \_\_\_\_\_ Cotton

Orchard

Other

**Farmall Cub**

Tractor Serial No. \_\_\_\_\_  
(See Illust. 2)

Engine Serial No. \_\_\_\_\_  
(See Illust. 2A)

**PREDELIVERY SERVICE**

Prior to delivery of the above tractor the following checks and tests were made and corrective action taken as necessary:

<input type="checkbox"/> Shortage in Shipment	<input type="checkbox"/> Transmission and Differential Oil Levels	<input type="checkbox"/> Generator Charging Rate
<input type="checkbox"/> Damage in Shipment	<input type="checkbox"/> Steering Housing Oil Level	<input type="checkbox"/> Lights
<input type="checkbox"/> Attachments and Special Features Checked against Purchase Order	<input type="checkbox"/> Cooling System Level	<input type="checkbox"/> Gear Shifting
<input type="checkbox"/> Tire Pressures	<input type="checkbox"/> Hydraulic System Oil Level*	<input type="checkbox"/> Clutch
<input type="checkbox"/> Engine Oil—Drain and refill with correct viscosity oil.	<input type="checkbox"/> Water Level and Gravity of Battery Checked when Installed	<input type="checkbox"/> Brakes
<input type="checkbox"/> Air Cleaner—Empty oil from cup and re-fill with correct-viscosity oil.	<input type="checkbox"/> Engine Oil Pressure	<input type="checkbox"/> Engine Operation
	<input type="checkbox"/> Cranking Motor	<input type="checkbox"/> Road Test for General Operation
		<input type="checkbox"/> Clean and Polish

**DELIVERY SERVICE**

At time of delivery the importance of the Operator's Manual was explained and, with it as a guide, instruction was given as indicated by check marks:

<input type="checkbox"/> Precautions with New Tractor	<input type="checkbox"/> Care of the Cooling System	<input type="checkbox"/> Wheel Tread Adjustment
<input type="checkbox"/> Lubricating Entire Tractor	<input type="checkbox"/> Care of Hydraulic System*	<input type="checkbox"/> Tires—Inflation, Weighting, Care
<input type="checkbox"/> Engine and Chassis Lubricant Specifications	<input type="checkbox"/> Care of Fuel System	<input type="checkbox"/> Cold Weather Operation
<input type="checkbox"/> Checking Oil Levels	<input type="checkbox"/> Fuel Specifications	<input type="checkbox"/> Storing Tractor
<input type="checkbox"/> Care of Air Cleaner	<input type="checkbox"/> Adjustment of Clutch	<input type="checkbox"/> Starting Tractor After Storage
<input type="checkbox"/> Servicing Oil Filter	<input type="checkbox"/> Care of Ignition System	<input type="checkbox"/> Caution Regarding High-Speed Operation
<input type="checkbox"/> Starting, Stopping, and General Operation	<input type="checkbox"/> Care of Generator	<input type="checkbox"/> Tightening Nuts and Bolts
<input type="checkbox"/> Drawbar Adjustment	<input type="checkbox"/> Care of Battery	<input type="checkbox"/> Keeping Tractor Clean
<input type="checkbox"/> Safe Hitching Practices	<input type="checkbox"/> Adjustment of Brakes	

\*When So Equipped.

The customer's signature below certifies that the tractor was delivered to him in a satisfactory condition and that he received instruction as to its proper operation and maintenance.

Appointment for after-delivery inspection (10 to 30 days after) was made for \_\_\_\_\_ Date \_\_\_\_\_

Signed \_\_\_\_\_ Customer Signed \_\_\_\_\_ Dealer

By \_\_\_\_\_ By \_\_\_\_\_

*A Careful Operator*

**IS THE BEST INSURANCE**

**AGAINST AN ACCIDENT**

*—National Safety Council.*

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# INTRODUCTION

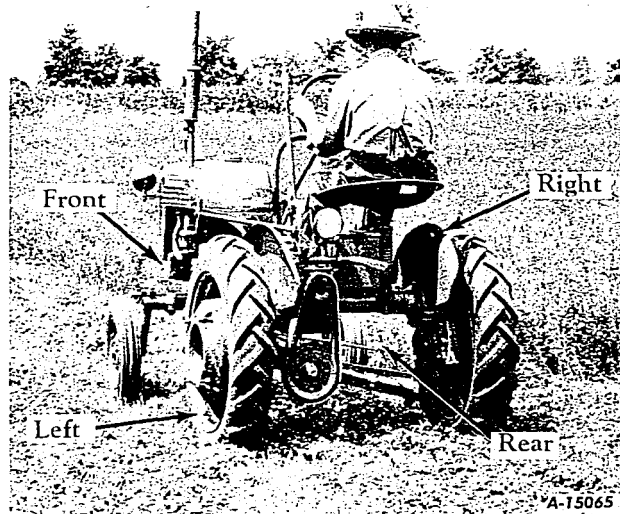
Assembled in this book are operating and maintenance instructions for the Farmall Cub. This material has been prepared in detail in the hope that it will prove helpful to you in providing a better understanding of the correct care and efficient operation of your tractor.

If you should need information not given in this manual, or require the services of a trained mechanic, get in touch with the International Harvester dealer in your locality. Dealers are kept informed on the latest methods of servicing tractors. They carry stocks of IH parts, and are backed in every case by the full facilities of a nearby International Harvester District Office.

The illustrations in this manual are numbered to correspond with the pages on which they appear; for example, *Illusts. 7 and 7A are on page 7.*

Throughout this manual the use of the terms LEFT, RIGHT, FRONT and REAR must be understood to avoid confusion when following instructions. LEFT and RIGHT indicate the left and right sides of the tractor when facing forward in the driver's seat. Reference to FRONT indicates the radiator end of the tractor, and REAR the drawbar.

When in need of parts, always specify the tractor and engine serial numbers. The tractor serial number is stamped on a name-plate attached to the steering gear housing on the right side of the tractor.

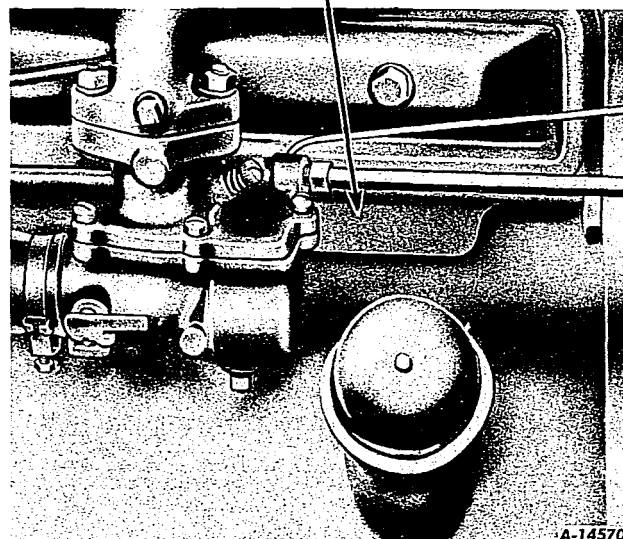
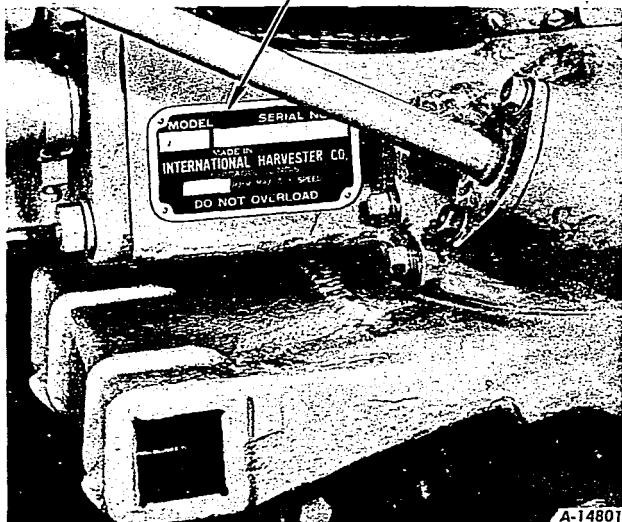


The serial number is preceded by the letters FCUB. *See Illust. 2.* The engine serial number is stamped on the left side of the engine crankcase to the right of the carburetor. This serial number is preceded by the letters FCUBM. *See Illust. 2A.*

For ready reference, we suggest that you write these serial numbers in the spaces provided below.

Tractor serial number  
FCUB 159676

Engine serial number  
FCUBM 162580



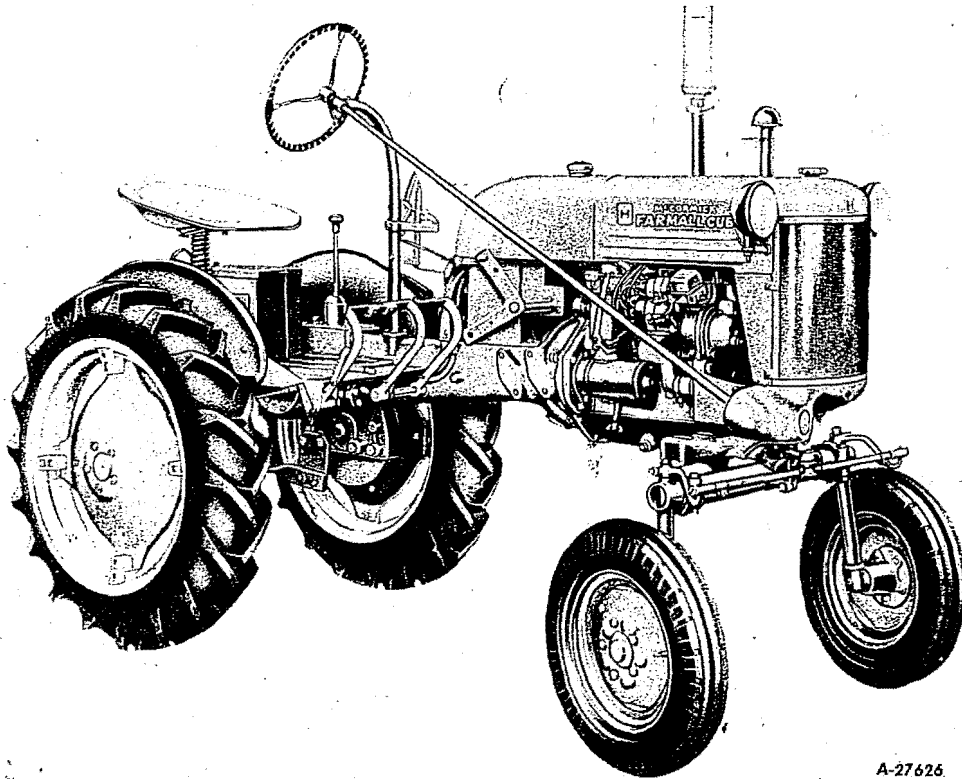
Illust. 2

Location of tractor serial number.

Illust. 2A

Location of engine serial number.

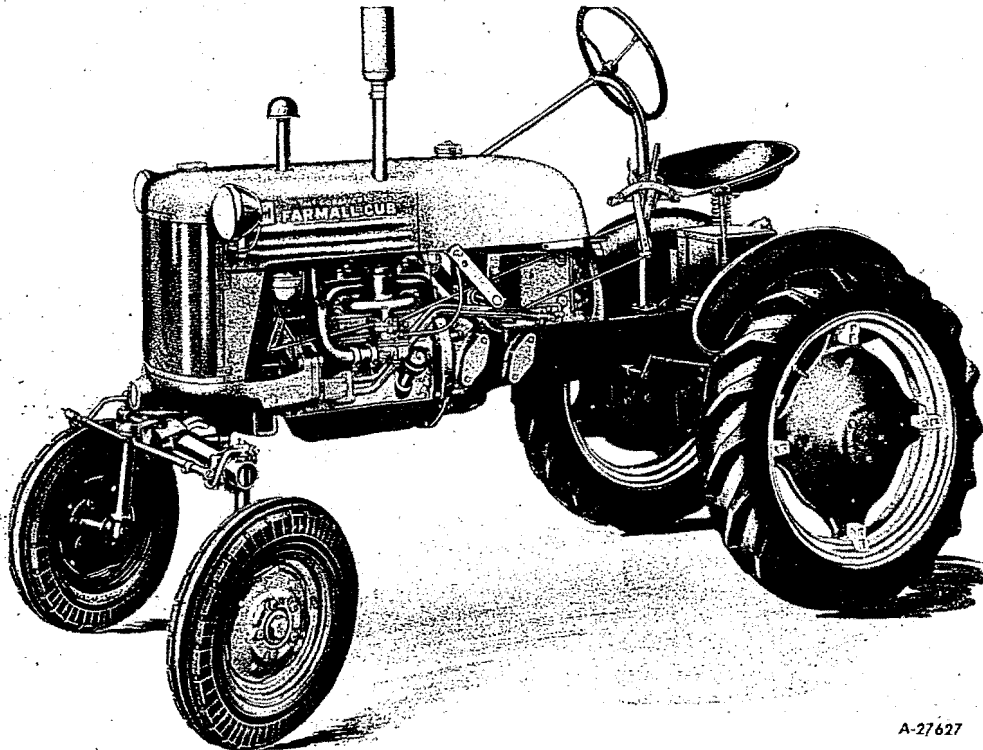
# DESCRIPTION



A-27626

Illust. 3

Right front view of the Farmall Cub. The adjustable front axle and electric starting and lighting shown in this illustration are special features.



A-27627

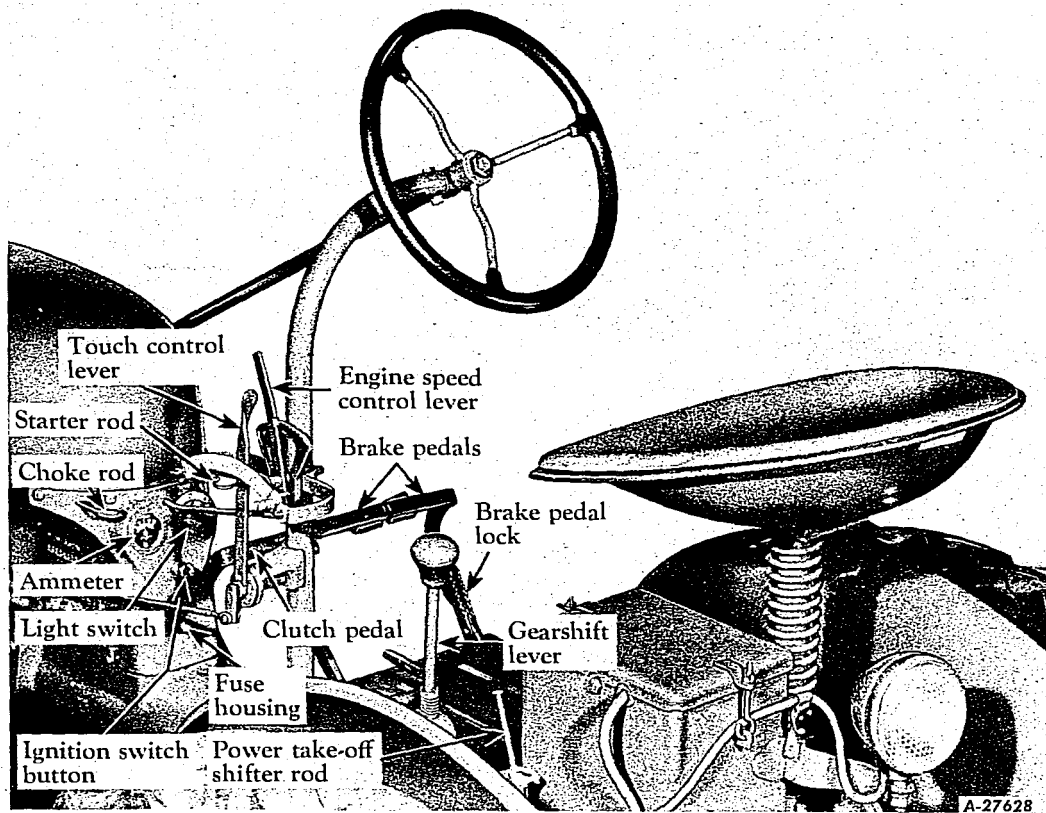
Illust. 3A

Left front view of the Farmall Cub.

## DESCRIPTION

### Instruments and Controls

A variety of special equipment is available for use with the Farmall Cub. The instructions for operating and maintaining the special equipment have been included in the instructions for operating and maintaining the tractor. Disregard the instructions for special equipment not on your tractor.



Illust. 4

Location of controls.

#### Brake Pedals

These pedals are used to stop the tractor, to hold the tractor in a stationary position, or to assist in making sharp turns as outlined below:

To stop the tractor, latch the pedals together so both brakes will operate simultaneously when the pedals are pressed down.

To hold the tractor in a stationary position, latch the pedals together, depress and lock them in this depressed position by using the brake pedal lock.

To assist in making a sharp turn, the pedals must be operated individually, de-

pressing the pedal on the side toward which the turn is to be made.

The brake pedal latch (located behind the left-hand brake pedal) is used to latch both brake pedals together, causing the brakes to operate simultaneously.

The brake pedal lock (*Illusts. 4 and 48B*) is used to lock the brake pedals in the depressed position. This prevents the tractor from moving.

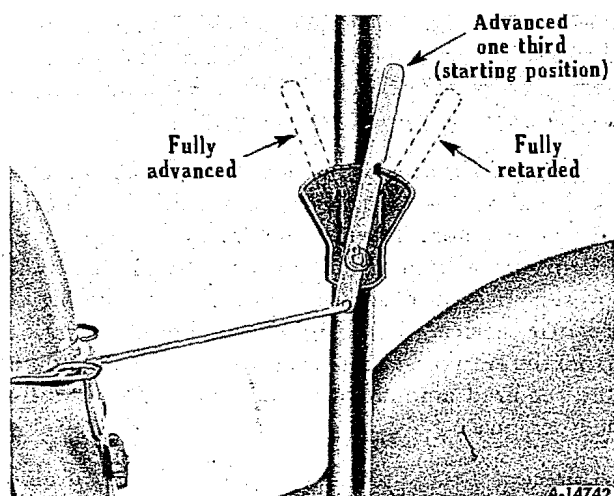
#### Clutch Pedal

This pedal, when depressed all the way, disengages the engine from the transmission.



## DESCRIPTION

### Engine Speed Control Lever



Illust. 5

Various positions of the engine speed control lever.

This lever controls the speed of the engine and, when set in a given position, will maintain a uniform engine speed even though the engine load may vary.

The rated or maximum full load governed speed is 1,600 r.p.m.; maximum idle speed is approximately 1,800 r.p.m.; minimum speed (hand throttle) is 450 to 500 r.p.m. Never operate the engine at more than the regular, governed speed. Excessive speeds are harmful.

The governor is set at the factory and should require no adjustment. Consult your International Harvester dealer if the governor does not function properly.

### Choke Rod

The choke rod is a part of the electric starting attachment, and makes possible the regulation of the carburetor choke from the driver's seat. Pulling out on the choke rod closes the carburetor choke for starting the engine; pushing it back in opens the choke.

### Carburetor Choke Lever

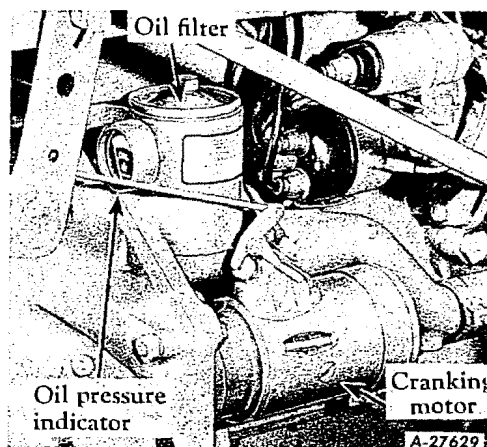
The carburetor choke lever controls the air supply to the carburetor. When the choke lever (Illusts. 8 and 9) is moved up all the way (closed position) the air supply is cut off, thereby enriching the fuel mixture for starting the engine. If your tractor is not equipped with the electric starter and choke rod, move the choke lever up all the way before cranking the engine. Moving the choke lever back down opens the choke for normal engine operation.

### Ignition Switch Button

This button closes and opens the electrical circuit for operating and stopping the engine. Pull the button out for operating and push it in to stop the engine.

**Caution:** On tractors with battery ignition, when the engine is not operating or the engine has stalled and the operator leaves the tractor, the ignition switch button must be pushed all the way in, so that the switch is in the "off" position, to prevent battery discharge.

### Oil Pressure Indicator



Illust. 5A

Location of oil pressure indicator.

This indicator (Illusts. 5A and 5B) shows whether lubricating oil is circulating through the engine. The indicator needle should be in the white area when the engine is running at approximately 100 r.p.m. above slow idle speed. See Illust. 5B. If it is not in the white area, stop the engine immediately and investigate the cause of the oil pressure failure. If you are unable to find cause, be sure to consult your International Harvester dealer before operating the engine.



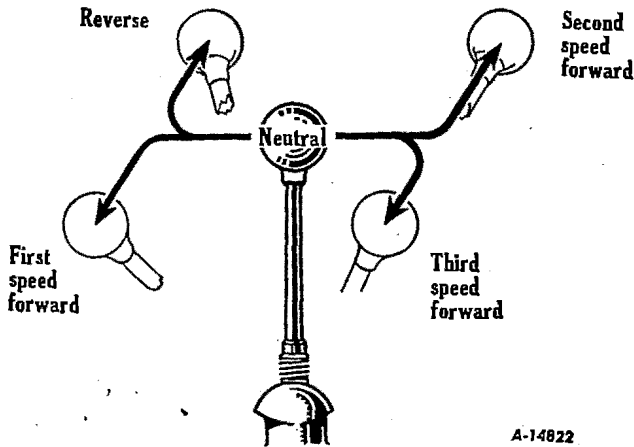
Illust. 5B

Oil pressure indicator, showing needle in correct operating position.

## DESCRIPTION

### Gearshift Lever

This lever is used to select various gear ratios provided in the transmission. There are three (3) forward speeds and one (1) reverse speed. See *Illust. 6*.



*Illust. 6*  
Gear shifting positions.

### Starter Rod

To start the engine, adjust the choke rod and pull out on the starter rod as explained on *page 8*.

### Light Switch

The light switch has three positions: "O"—off position, "D"—dim lights, and "B"—bright lights.

### Ammeter

This instrument indicates the charging rate of the generator or discharge rate of the battery. If it shows discharge continuously, investigate the cause to avoid completely discharging the battery and possible damage to the generator. Refer to *pages 29 to 46* for additional information on electrical equipment.

### Belt Pulley and Power Take-Off Shifter Rod

The shifter rod is used to engage or disengage the belt pulley or the power take-off. Refer to *page 13* for operating instructions.

## Before Starting Your New Tractor

### Lubrication

Lubricate the entire tractor, using the "*Lubrication Guide*."

Check the oil levels of the engine crankcase, air cleaner, transmission, belt pulley housing and all gear cases to see that they are filled to the correct levels with the proper grades of oil for the prevailing temperature. Refer to "*Lubrication Guide*" and the specifications of lubricants on *page 17*.

Tractors shipped to destinations in the United States of America, Canada and Mexico are filled with oil in all parts before leaving the factory. Engines are filled with a light engine oil. However, this is for preservative purposes only and is not suitable for regular service. The original oil should be drained from the crankcase and air cleaner and replaced with the required amount of fresh oil for the prevailing temperature.

Tractors packed for export have all oil drained from the engine crankcase, air cleaner and all gear cases.

Before starting the engine, for the first time, remove the spark plugs and put about one teaspoonful of crankcase oil into each cylinder; replace the spark plugs and crank the engine to distribute the oil over the cylinder walls. This assures positive lubrication of the cylinders and pistons immediately after starting and eliminates the possibility of scoring.

### Pneumatic Tires

Before moving the tractor, check the air pressure in the pneumatic tires and inflate or deflate the front tires to 20 lbs. and the rear tires to 12 lbs. Refer to the table on *page 54* for more complete information.

### Engine Cooling System

The cooling system capacity is approximately  $9\frac{3}{4}$  U.S. quarts.

Be sure the drain plug underneath the radiator is closed. See *Illust. 26*.

Fill the radiator to a level slightly below the bottom of the filler neck. Filling the radiator to this level will allow for expansion of the coolant under normal operating conditions. Use clean water; soft or rain water is recommended, as it does not contain alkali which forms scale and eventually clogs the passages.

For further information, see "*Cooling System*" on *page 26*. If the tractor is to be operated in freezing temperatures ( $+32^{\circ}\text{F}$ . or lower), refer to "*Cold Weather Precautions*" on *page 25*.

## DESCRIPTION

### Fuel System

Use a good grade of clean gasoline.

During the first 100 hours of operation, mix 1 pint of light engine oil with every 5 U.S. gallons of fuel.

### Ignition

Tractors shipped from the factory with starting and lighting equipment have the "battery to ground" cable (*Illust. 37*) disconnected and taped. Therefore, before attempting to start the engine, be sure that the "battery to ground" cable is connected to the ground.

### Instruments and Controls

Thoroughly acquaint yourself with all instruments and controls as described on pages 4 to 6.

## Preparing Your Tractor for Each Day's Work

### Fuel System

Fill the fuel tank (capacity  $7\frac{1}{2}$  gals.) with a good grade of clean gasoline, preferably at the end of each day's run. This will force out any moisture-laden air and prevent condensation in the fuel tank.

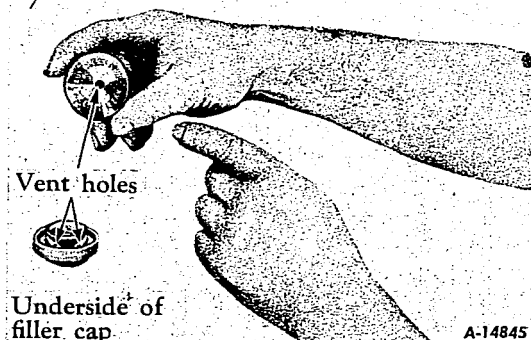
**Safety First!** Never fill the fuel tank when the engine is running or when near an open flame; do not smoke or use an oil lantern when working around inflammable fuels. When pouring fuel, keep the funnel and container in contact with the metal of the fuel tank (*Illust. 7*) to avoid the possibility of an electric spark igniting the gas. Do not light matches near gasoline, as the air within a radius of several feet is mixed with a highly explosive vapor.



Illust. 7

Filling the fuel tank.

The fuel tank filler cap has air vents. See *Illust. 7A*. Keep these vents open at all times to assure proper flow of the fuel.



Illust. 7A

Vent holes in filler cap.

### Cooling System

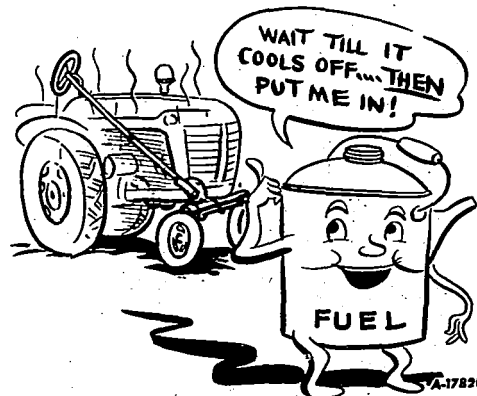
Remove the radiator filler cap and check the water level. Fill to a level slightly below the bottom of the filler neck.

### Lubrication

**Air Cleaner**—Change the oil in the air cleaner oil cup. Fill to the level mark with engine oil. Remove any dirt or chaff from the air cleaner cap.

**Engine crankcase**—Check the oil level and, if necessary, add sufficient oil to bring the level up to the "FULL" mark on the bayonet gauge. See *Illust 14*. Also refer to "Lubrication Guide."

**Grease fittings**—Refer to "Lubrication Guide" for complete daily lubrication requirements.



Never refuel tractor while engine is running or extremely hot.

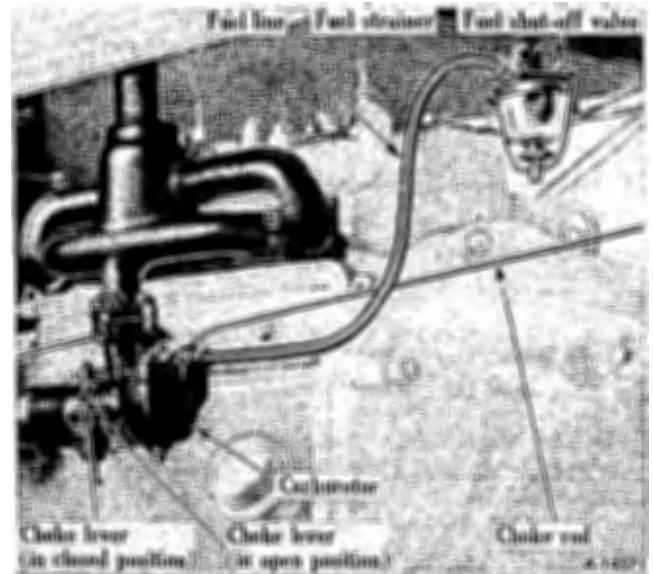
# OPERATING YOUR TRACTOR

Before attempting to start or operate the tractor, be sure that you have checked over the instructions for a new tractor and thoroughly familiarized yourself with the instruments and controls.

## Operating the Engine



When starting the engine in a barn or garage, keep the doors wide open as the exhaust gas from internal-combustion engines contains poisonous carbon monoxide which is odorless, tasteless and colorless.



Illust. 8  
Fuel system and controls.

## Fuel System

Check the fuel tank to make sure it is full; also see that the shut-off valve on the fuel strainer under the gasoline tank is open. To assure against leakage or seepage when the valve is in its full-open position, be sure to screw out the needle stem (shut-off valve) until the seat on the stem is tight against the stop.



Be sure the gearshift lever of the tractor is in neutral before starting the engine.

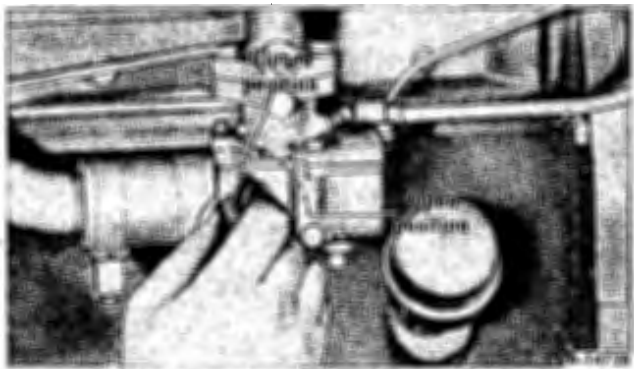
## Starting the Engine with the Cranking Motor

1. Put the gearshift lever in the neutral position. See *Illust. 6*.
2. Pull the choke rod all the way out. See *Illust. 4*.
3. Advance the engine speed control lever one third. See *Illust. 5*.
4. Pull out on the ignition switch button. See *Illust. 4*.
5. Pull out on the starter rod (*Illust. 4*) and release it as soon as the engine starts. However, do not hold the starter rod out for more than 30 seconds at any one time. If the engine does not start within this time, release the starter rod and wait a minute or two; then try again.

## Hand Cranking the Engine

1. Put the gearshift lever in the neutral position. See *Illust. 6*.
2. Close the choke by moving the carburetor choke lever all the way up. See *Illust. 9*.

## OPERATING YOUR TRACTOR



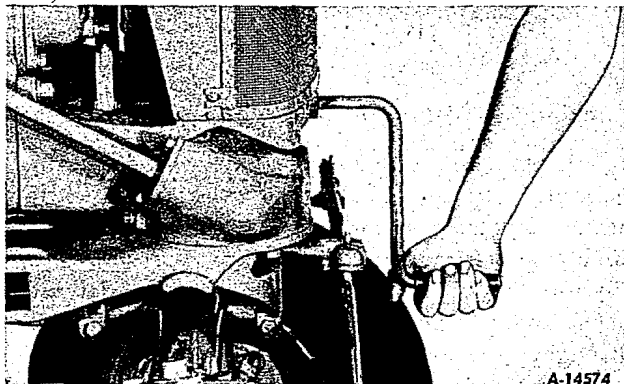
Illust. 9

Closing the carburetor choke lever.  
(Tractors without cranking motor.)

3. Advance the engine speed control lever one-third. See *Illust. 5*.
4. Pull out on the ignition switch button. See *Illust. 4*.
5. Crank the engine one or two strokes; then open the choke part way.
6. Crank the engine until it starts. See *Illust. 9A*.

Avoid overchoking, as excessive use of the choke will flood the engine, making it hard to start. The use of the choke for starting will vary, depending on temperature and altitude.

**Caution!** When cranking the engine, be sure that the gearshift lever is in the neutral position, and always stand in a position that will eliminate any possibility of being struck by the starting crank if there is a reversal of the direction of the engine. Crank the engine by using quick up-strokes; do not spin it.



Illust. 9A

Correct method of hand-cranking.  
(Tractors without cranking motor.)



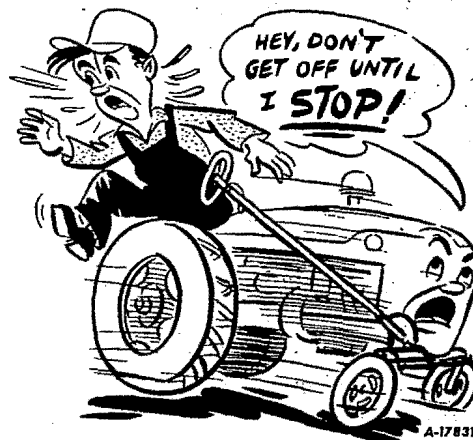
A-14821

Always engage the clutch gently, especially when going up a hill or when pulling out of a ditch.



A-14820

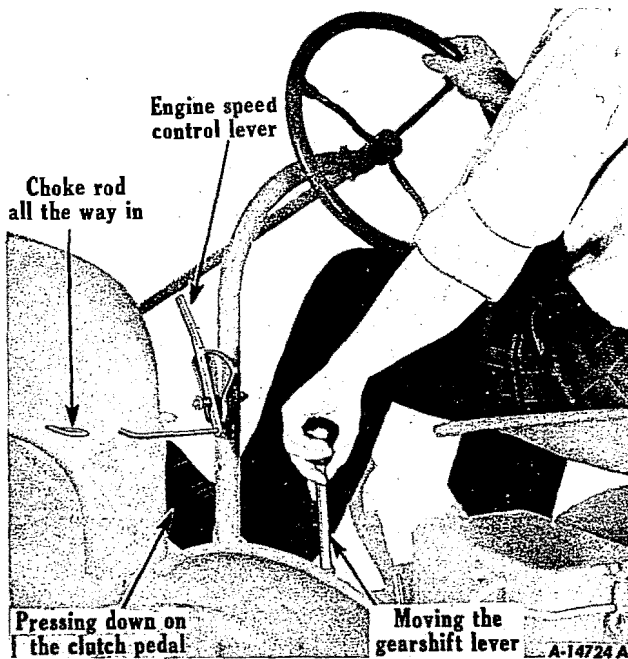
Always lock the brake pedals together when driving on the highway or when driving in high gear.  
Be sure that the brakes are properly adjusted.



A-17831

Never dismount from the tractor while it is in motion. Wait until it stops.

## OPERATING YOUR TRACTOR



Illust. 10

Shifting the gears.

### After the Engine Starts

As soon as the engine starts, adjust the choke to a point where the engine operates without missing; and as the engine warms up, open the choke by gradually pushing the choke rod all the way in, or by moving the carburetor choke lever down all the way. See *Illusts. 8 and 10*. Do not use the choke to enrich the fuel mixture, except when starting the engine.

Immediately after the engine starts, check the oil pressure indicator (*Illust. 5B*) to see whether sufficient oil is circulating through the engine. If it is not, stop the engine and inspect the oil system to find the cause of failure. If unable to find the cause, be sure to consult your International Harvester dealer before operating the engine.

### Stopping the Engine

Retard the engine speed control lever by pulling it all the way back (*Illust. 5*). Allow the engine to cool slowly from full-load operation by slowly idling the engine for a short time. Then push the ignition switch control button all the way in to stop the engine. It is advisable to close the gasoline shut-off valve if the engine is to be stopped for any length of time.

## Driving the Tractor

### Starting the Tractor

1. Advance the engine speed control lever slightly. See *Illust. 5*.
2. Disengage the clutch by pressing the clutch pedal all the way down.
3. Hold the clutch pedal in this position and move the gearshift lever to the desired speed.
4. Advance the engine speed control lever to a position where the engine operates best for the load to be handled.
5. Start the tractor in motion by slowly releasing the clutch pedal. **Note:** Do not shift gears while engine clutch is engaged or while the tractor is in motion.
6. Do not "ride" the clutch or brake pedals while driving the tractor, as this will result in excessive wear on the linings.

Always latch the brake pedals together before driving the tractor in high gear. To latch the pedals together, engage the latch "A" (located in back of the left brake pedal) in the slot in back of the right pedal. See *Illust. 48B*. When brake pedals are not latched together, the latch should rest in the slot in back of the left brake pedal. See *Illust. 48A*.

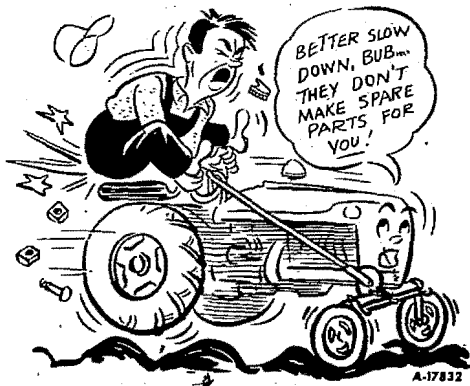
### Stopping the Tractor

Disengage the clutch by pressing down firmly on the clutch pedal, and move the gearshift lever to neutral position. Use the brakes if necessary.

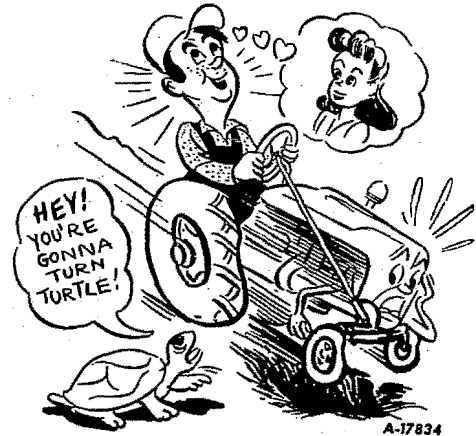
### Locking the Brakes

Always lock the brakes when the tractor is parked on a grade or when doing belt work. To lock the brakes, first latch the brake pedals together with the latch as previously described. Now press down on the foot pedals; then place the brake pedal lock in the engaged position as shown in *Illust. 48B*. To disengage the lock, press down on the foot pedals and lift the lock and place it in the disengaged position, against the right-hand brake pedal. See *Illust. 48A*.

# OPERATING YOUR TRACTOR



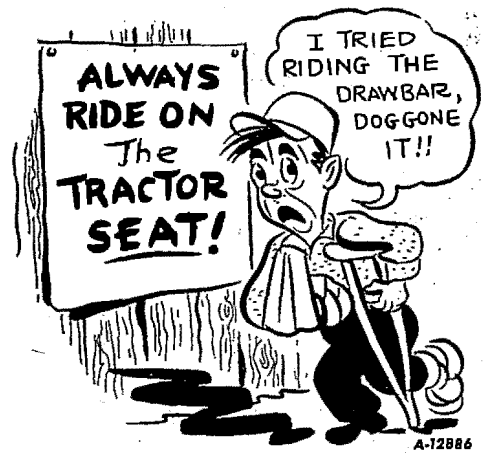
Always drive the tractor at speeds slow enough to insure safety, especially when driving over rough ground or near ditches.



Be extra careful when working on hillsides. Watch out for holes or ditches into which a wheel might drop and overturn the tractor.

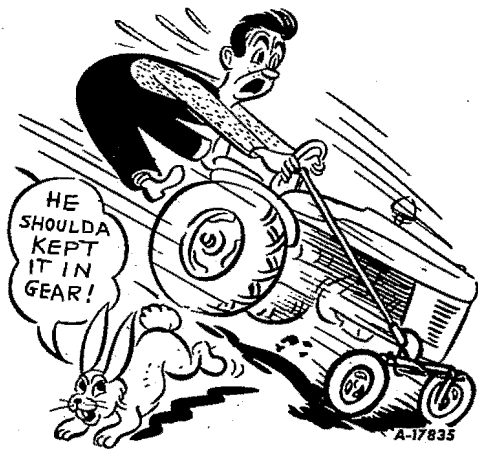


Only one person, the operator, should be permitted to ride on the tractor when it is in operation.

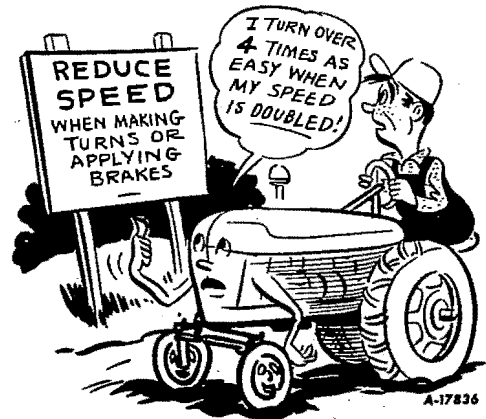


Always ride on the tractor seat when driving on the highway or to and from the fields. Never ride on the tractor drawbar or on the drawn implement.

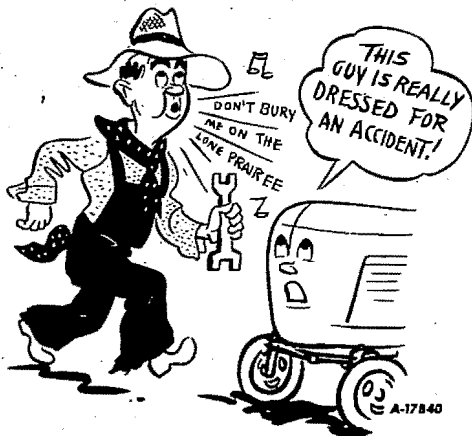
# OPERATING YOUR TRACTOR



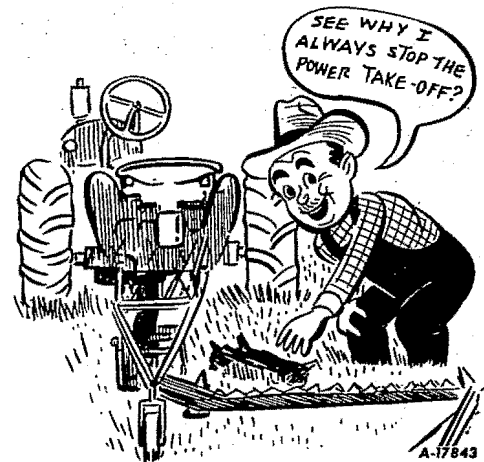
Always keep the tractor in gear when going down steep hills.



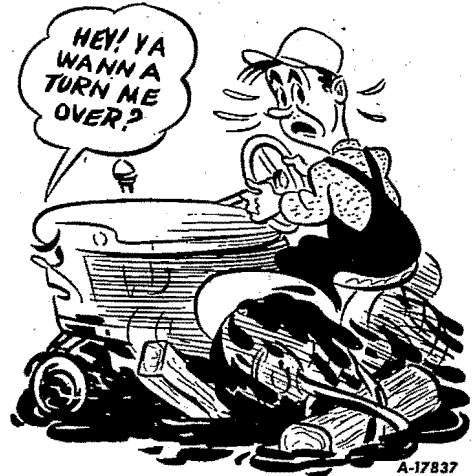
Reduce speed before making a turn or when applying the brakes. Remember, the danger of the tractor overturning increases four times when the speed is doubled.



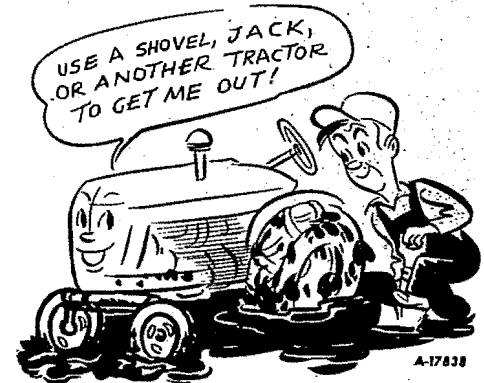
Loose or "floppy" clothing should not be worn by the operator because of the danger of it wrapping on or getting into the moving parts.



Always stop the power take-off before dismounting from the tractor.



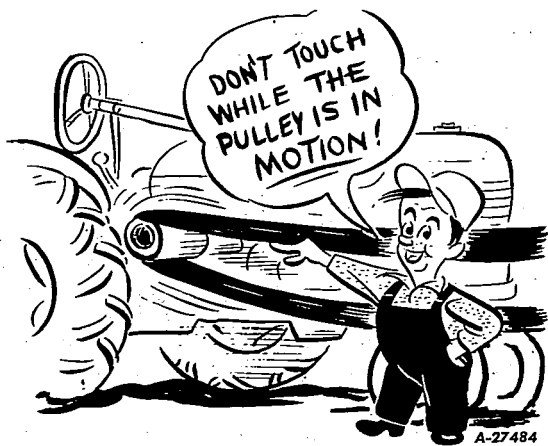
If the tractor will not move because the rear wheels have dug in or sunk deeply into the ground, don't fasten logs, posts, or anything to the rear wheels that will prevent them from rotating. This would be certain to tip the tractor over backward. Instead.....



.....dig out or jack up the rear wheels and fill in under them. Or, if another tractor is available, hitch it with a chain to the front end of the "stuck" tractor. The power of both tractors can be used, if needed, provided a heavy pull is kept on the chain all the time.



## OPERATING YOUR TRACTOR



Don't put on or remove the belt from the belt pulley while the pulley is in motion.

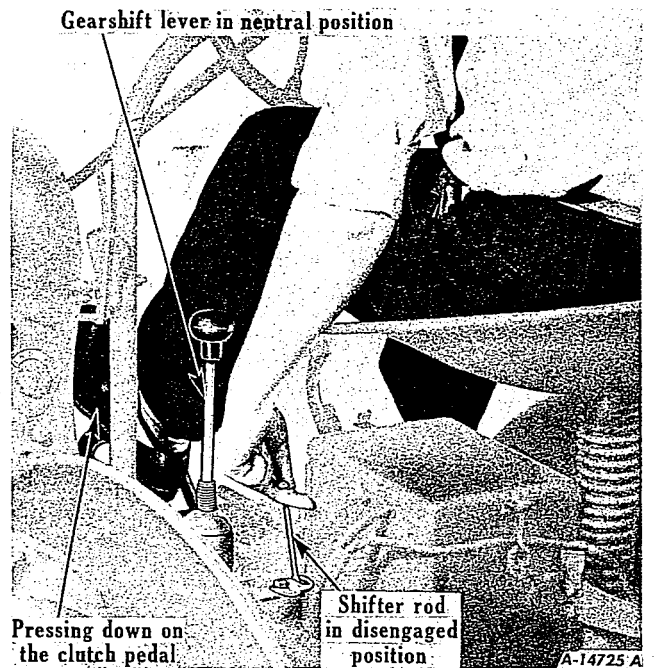
### Operating the Belt Pulley and Power Take-Off

If your tractor is equipped with a belt pulley or power take-off, the following instructions and precautions should be carefully studied and followed.

The belt pulley and power take-off are started and stopped by the same engine clutch as the tractor. Be sure to disengage the engine clutch before moving the belt pulley or power take-off shifter rod. The belt pulley is driven by the power take-off shaft; therefore, the same shifter rod is used to operate either the belt pulley or power take-off. The shifter rod should always be in the disengaged (forward) position (*Illust. 13*) when the belt pulley or power take-off is not in use.

### Operating the Belt Pulley or Power Take-Off with the Tractor Standing Still

1. The transmission gearshift lever must be in the neutral position.
2. Move the engine speed control lever back to low idle speed.
3. Depress the clutch pedal to disengage the engine clutch.
4. Press down on the shifter rod (*Illust. 13*) and move it back to the engaged position; release the shifter rod and allow it to lock in place.
5. Slowly release the clutch pedal.



*Illust. 13*

Moving the belt pulley and power take-off shifter rod to the engaged position.

### Operating the Power Take-Off with Tractor in Motion

Follow the first four steps outlined above; then release the power take-off shifter rod and allow it to lock in place. Keep your foot pressed down on the clutch pedal (in the disengaged position), advance the engine speed control lever and move the transmission gearshift lever to the speed that is desired to run the tractor. Slowly release the clutch pedal. This will start the tractor in motion with the power take-off in operation.

When the power take-off shaft is not in use, always keep it covered with the power take-off shaft guard.

For additional belt pulley and power take-off information, refer to page 62.

Careless use of the tractor and other farm machinery is the cause of most farm accidents. The safety rules shown throughout this manual are based on a careful study of thousands of farm accidents. . . . Study them carefully and follow them, and insist that they be followed by those working for you.

Remember, an accident is usually caused by someone's carelessness, neglect or oversight.

# LUBRICATION

The life of any tractor depends upon the care it is given. Proper lubrication is a very important part of that care.

## General Engine Lubrication

The engine has a pressure-feed lubrication system. A gear-type oil pump circulates the lubricating oil under pressure to the crankshaft bearings, connecting-rod bearings, camshaft bearings, valve mechanism, timing gears, and governor, thereby assuring positive lubrication of all parts.

### Oil Pump

The gear-type oil pump in the crankcase has a screen attached to the oil intake which stops large dirt particles from entering the oiling system. Clean this screen whenever the oil pan is removed.

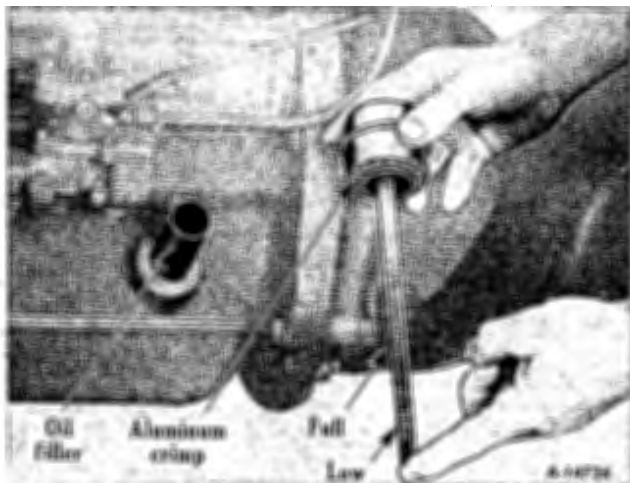
### Oil Pressure Indicator

The oil pressure indicator shows whether the oil pump is working. The oil pressure should hold the indicator in the white section of the gauge at approximately 100 r.p.m. above slow idle speed. Should the indicator not register, stop the engine at once and inspect the oil system to find the cause of failure. If unable to find the cause, consult your International Harvester dealer before operating the engine.

Always look at the oil pressure indicator immediately after starting the engine.

### Crankcase Breather

The crankcase breather and oil filler cap (Illustr. 14) has an oiled aluminum crimp filler which acts as a dust filter for crankcase ventilation. Clean and reoil this breather each time the engine oil is changed.



Illust. 14

Checking the oil level in the crankcase.

### Oil Filter

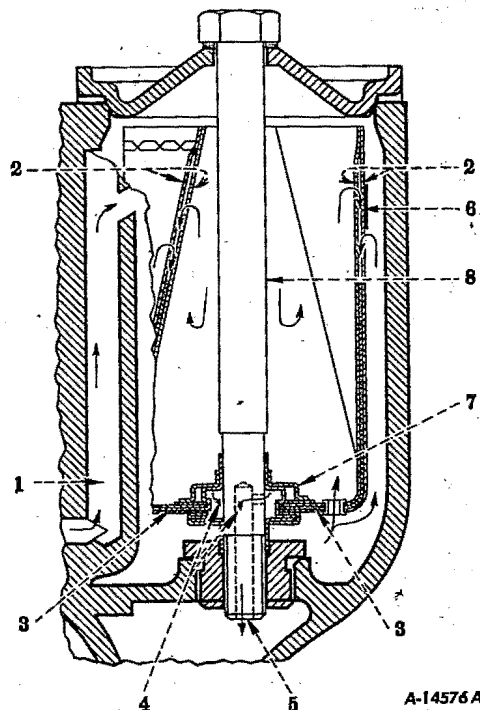
The engine is equipped with an oil filter which continually cleans the oil while the engine is running. To obtain the full benefit from the filter, replace the used element with a new one every time the oil is changed in the crankcase (after every 120 hours of operation). Cleaning the old element is not satisfactory.

Do not run the engine for any length of time with the oil level below the low mark on gauge. See Illustr. 14.

Never check the oil level while the engine is operating.

### Oil Filter

The life of your engine depends upon clean oil being circulated to all bearings. Every good tractor operator knows that dirt and other injurious materials eventually get into the crankcase of the engine, and that in the normal course of engine



Illust. 14A

Cutaway view of filter showing: (1) oil inlet; (2) replaceable filtering element; (3) mesh screen separator to provide passage for filtered oil between inner and outer layer of element; (4) outlet for filtered oil; (5) filtered oil return; (6) band holding folds of element together; (7) oil seal; (8) stud.

## LUBRICATION

operation, the lubricating oil undergoes changes which produce sludge, acids, gums, varnish, and other harmful by-products.

The purpose of the oil filter is to separate and remove the dirt and other foreign substances from the oil to prevent these injurious materials from being circulated to the engine.

This filter is so efficient it will keep the circulating oil free of harmful materials for 120 hours of operation—at which time the oil should be changed and the inexpensive filter element replaced. Refer to "Lubrication Guide" for the recommended oil to use for the prevailing temperature. By following the simple, common-sense procedure for keeping dirt and oil impurities away from precision-made engine parts, you will safeguard your tractor engine against undue wear and the operating troubles and upkeep expense which are a natural result of that condition.

### To Change the Filter Element

1. Do not change the element while the engine is running.

2. Remove the oil filter drain pipe cap (Illustr. 15) and allow the oil filter to drain completely.

3. Clean off filter cover "A" (Illustr. 15A) to prevent dirt from dropping into the filter when the cover is removed.

4. Unscrew and remove stud "B" and gasket "C" (Illustr. 15A).

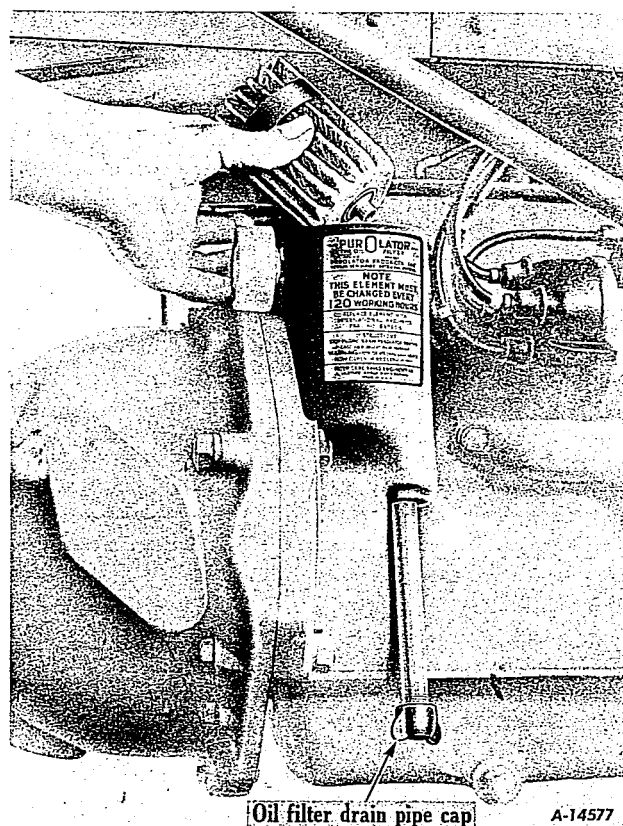
5. Lift up and remove filter cover "A" and gasket "D" (Illustr. 15A).

6. Remove the old element.

7. If the oil appears very dirty or sludgy when draining, flush out the filter with kerosene. Before flushing, however, replace the stud without the filter cover in order to prevent sludge from being flushed into the crankcase. When completely flushed and drained, replace the drain pipe cap.

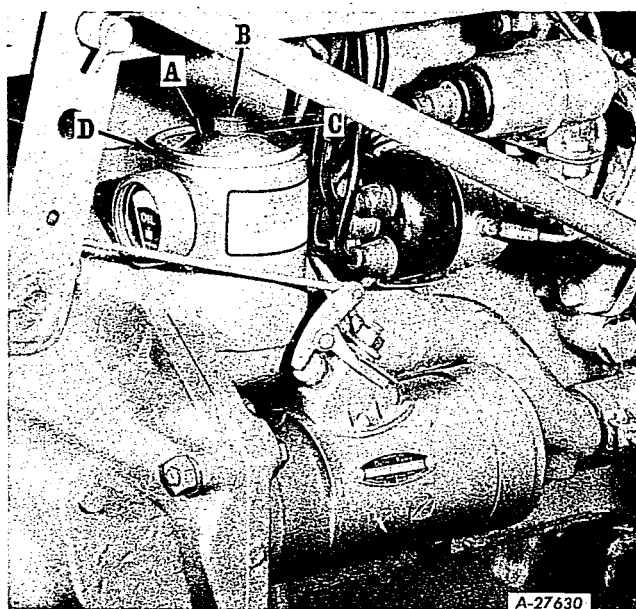
8. To install the new filter element, move gasket "C" up to the top of stud "B" and place cover "A," gasket "D" and the new element on the stud in their proper order. See Illustr. 15A. (Leave the retaining band on the element.) Then install the entire assembly and be sure that filter cover gasket "D" seats properly. Screw the stud into the filter base and tighten securely.

9. Check the oil level in the crankcase to see that the new oil is up to the proper level (see "Lubrication Guide"). Now start up the engine, check the oil pressure indicator to see whether sufficient oil is circulating through the engine, and inspect the filter for oil leaks.



Illustr. 15  
Installing the new oil filter element.

Note: To avoid delays, we recommend that you carry extra elements on hand so replacement can be made at the proper time.



Illustr. 15A  
Oil filter assembled.

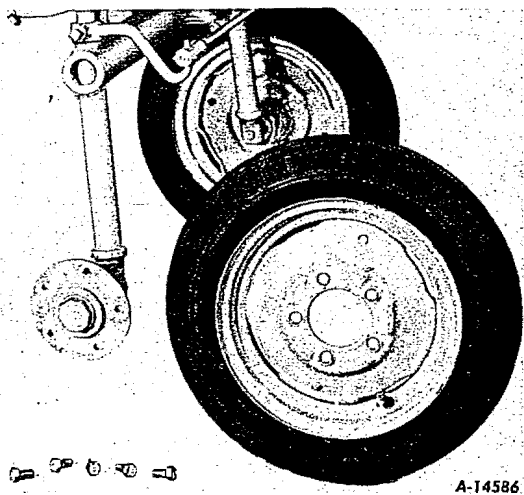
## LUBRICATION

### Greasing the Front Wheels

#### Removing and Greasing

After every six months or every 500 hours of operation, whichever occurs first, remove, clean and grease the front wheel bearings.

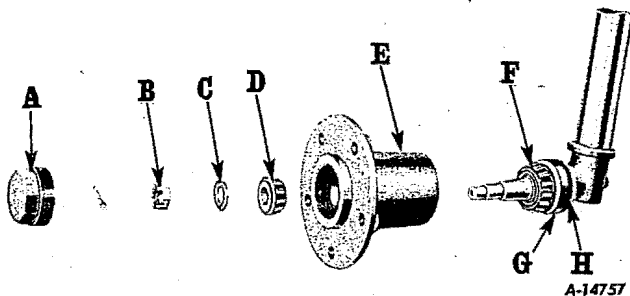
To grease the front wheels, raise the front end of the tractor until the wheel clears the ground and remove the wheel as shown in *Illust. 16*. Unscrew hub cap "A" (*Illust. 16A*), remove the cotter pin, and remove nut "B" and washer "C." Remove bearing "D" and place it in hub cap "A" or a clean container; then remove and clean the inside of hub "E."



Illust. 16

Front wheel removed from hub.

Remove the old grease from the bearings and clean them thoroughly with kerosene. Then pack the bearings with pressure-gun grease (chassis lubricant).



Illust. 16A

Front wheel hub and bearing removed for cleaning.

It is advisable to leave bearing "F" on the axle and clean it with a brush and kerosene. Apply new grease on rollers before reassembling the bearings.

Inspect oil seal "G" and felt washer "H," and if they are not in satisfactory condition, replace them with new ones.

#### Replacing and Adjusting

Reassemble the hub and wheel, tighten nut "B" until the wheel binds slightly, rotating wheel at the same time. Back the nut off one castellation from the cotter pin hole; replace cotter pin and hub cap.

*Be sure to keep all parts clean.*

### Lubricating Oil and Grease Specifications

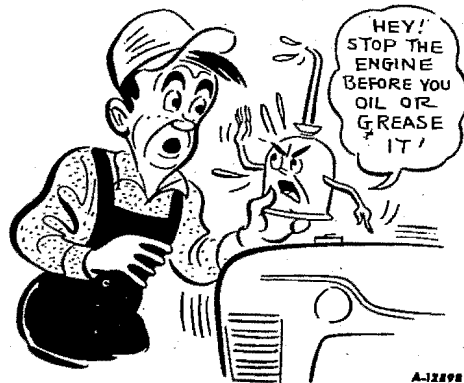
#### Engine Oil

Engine lubricating oil of regular, premium or heavy-duty grade is satisfactory for use in this engine. The oil should be well-refined petroleum oil, free from water, fatty oils and acids.

#### To Aid Starting

To aid easier starting, the selection of crankcase lubricating oils should be based on the lowest anticipated temperature for the day. It is not necessary to change the crankcase oil every time the temperature rises or falls into another temperature range during some part of the 24-hour day.

*Also refer to "Cold Weather Precautions" on page 25.*



Don't oil or grease the tractor while the engine is running.

## LUBRICATION

### Gear Lubricant

Tractors are shipped from the factory with SAE-90 oil in the transmission, steering gear, rear axle and belt pulley housings.

For all temperatures above 0°F., use SAE-90 transmission lubricant. For temperatures below 0°F., use the same transmission lubricant as for above 0°F., except to dilute with kerosene as follows: pour ½ U. S. pint of kerosene into the transmission case and ¼ U. S. pint of kerosene into each rear axle housing.

After the kerosene is put in these compartments, run the tractor until the mixture is thoroughly warm. Then drain to the level plugs. Replace the plugs.

Use a good grade of oil, free from solid materials. Use only high-quality lubricating oils and grease. For your own protection, select only oils and grease of recognized manufacture.

Keep your supply of lubricating oil absolutely clean and free from dust. Always use clean containers. Keep the lubricator clean and wipe dirt from grease fittings before applying lubricator.

### Engine and Chassis Lubricant Specifications

Point of Lubrication	Capacity	Anticipated Air Temperature		
		Above +80° F.	Above +32° F. to +80° F.	Below +32° F.
Engine Crankcase .....	3 qts.	SAE-30	SAE-20	10W
Air Cleaner Donaldson Type..... United Type.....	½ pt. ¾ pt.	SAE-30	SAE-20	10W

Point of Lubrication	Capacity	Anticipated Air Temperature		
		Above +32° F.	+32° F. to +10°	Below +10° F.
Magneto Rotor Bearing..... Impulse Coupling.....	..... ..... .....	SAE-30 *	SAE-20 *	10W *
Battery Ignition Unit (tractors so equipped) Distributor and Drive Housing..	..... .....	Chassis Lubricant	Chassis Lubricant	Chassis Lubricant
Cam Hole Felt (in distributor)...	.....	Light Engine Oil	Light Engine Oil	Light Engine Oil
Generator.....	.....	SAE-20	SAE-20	SAE-20
Cranking Motor.....	.....	None	None	None
Transmission.....	3½ pt.	SAE-90	SAE-90	SAE-90†
Rear Axle Housing.....	1¾ pt. ea.	SAE-90	SAE-90	SAE-90†
Steering Gear.....	¾ pt.	SAE-90	SAE-90	SAE-90
Belt Pulley Housing.....	½ pt.	SAE-90	SAE-90	SAE-90
Touch-Control Reservoir (refill)...	3½ pt.	IH Touch-Control Fluid	IH Touch-Control Fluid	IH Touch-Control Fluid
Grease Fittings††.....	.....	Chassis Lubricant	Chassis Lubricant	Chassis Lubricant

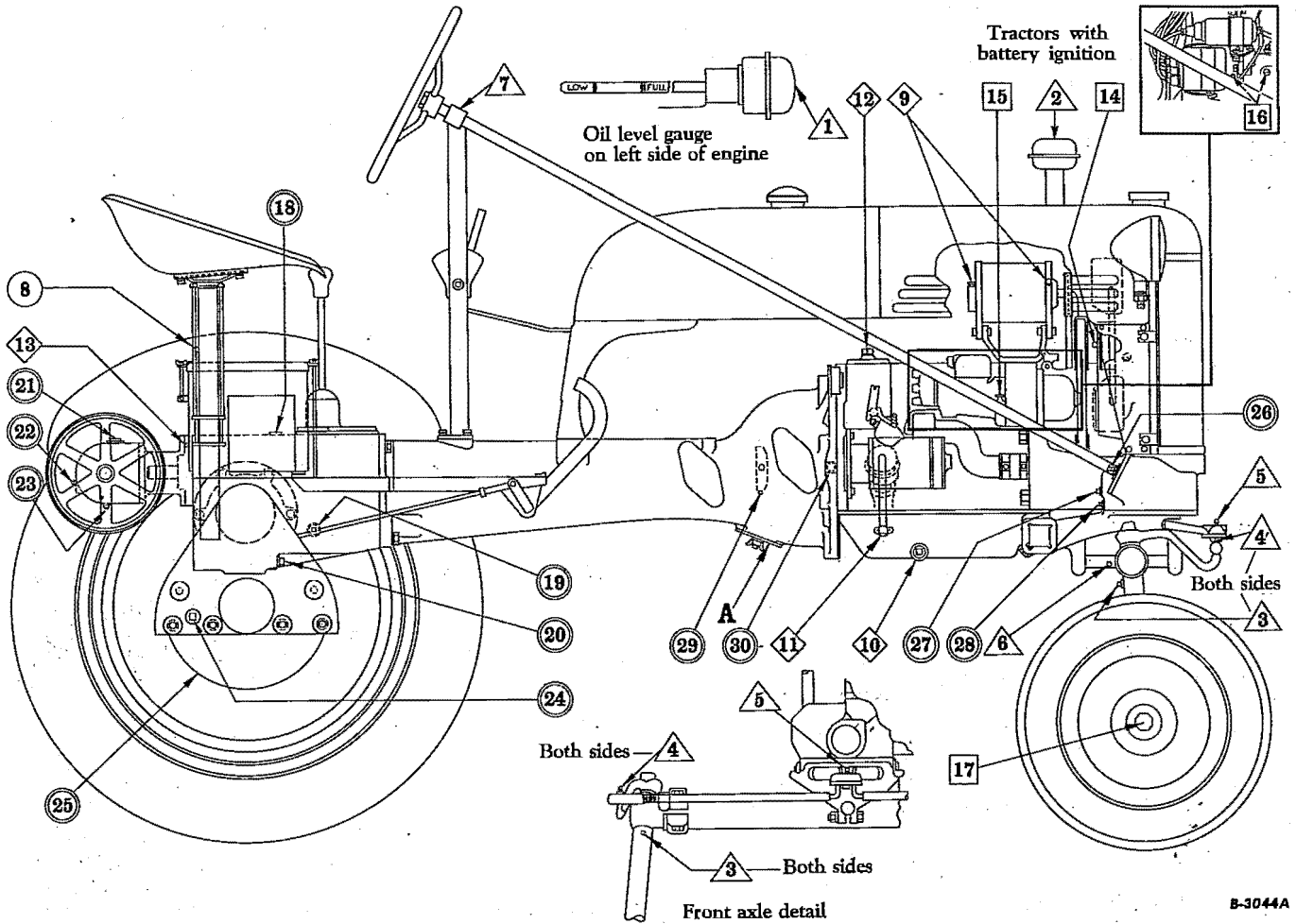
\*Impulse Coupling: Use a very light oil such as cream separator or sewing machine oil for all temperatures above +32° F. Use kerosene for temperatures below +32° F. Refer to page 31 for further information.

†Refer to "Gear Lubricant" (page 17) for diluting with kerosene in cold weather.

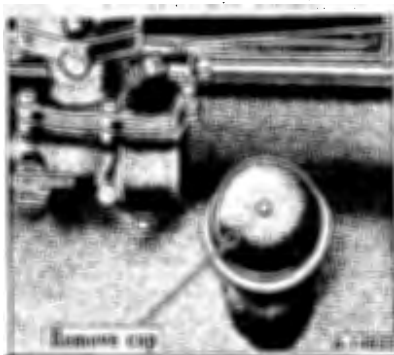
††Use pressure-gun grease (chassis lubricant) for fitting on which hand lubricator is applied, for all temperatures.

# LUBRICATION

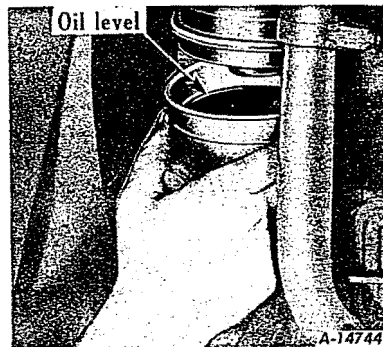
## Lubrication Guide



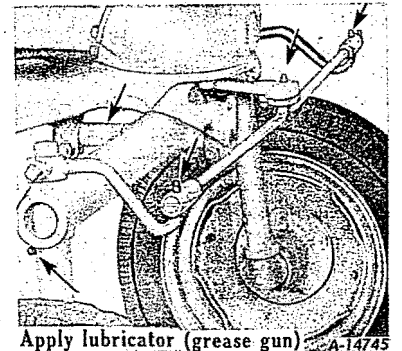
Illust. 18  
Side view of tractor.



Illust. 18A  
Crankcase oil filler.



Illust. 18B  
Air cleaner oil cup.



Illust. 18C  
Front axle.

# LUBRICATION

## Key to Lubrication Guide

The symbols shown around the reference numbers in *Illust. 18* indicate the intervals of lubrication.

Paragraph numbers on the left-hand side of the lubrication guide correspond with reference numbers in *Illust. 18*.

Detail specifications of the lubricants are listed on page 17.

### △—Daily or After Every 10 Hours of Operation

1—Crankcase oil level gauge and filler cap.

Check the oil level (with the engine stopped) and add sufficient new oil to bring to the "FULL" mark on the bayonet gauge. See *Illust. 14*. If the oil level is checked after the engine has been stopped for some time, the oil level may show slightly above the "FULL" mark on the gauge. This is a normal condition as the result of oil draining back from the filter. See *Illust. 18A*.

2—Air cleaner.

Clean out the oil cup and refill the cup to the oil level bead with the same new oil as used in the engine crankcase. See *Illust. 29*. Capacity: Donaldson type— $\frac{1}{2}$  pt. (See *Illust. 18B*); United type— $\frac{3}{8}$  pt.

3—Steering knuckle post (2).

4—Tie rod (2).

5—Tie rod ball seat.

6—Front axle pivot shaft.

7—Steering shaft support bracket.

Use pressure-gun grease (chassis lubricant) and apply 2 or 3 strokes of the lubricator or sufficient grease to flush out old grease and dirt. Lubrication points are the same for both fixed and adjustable front axles. See *Illust. 18C*.

Use an oil can and put a few drops of engine oil in the oil hole. See *Illust. 19*.

### ○—Weekly or After Every 60 Hours of Operation

8—Seat spring.

Use an oil can and put a few drops of engine oil in oil hole (8). See *Illust. 19A*.

Miscellaneous parts.

Lubricate the clutch and brake pedal connections with a few drops of engine oil.

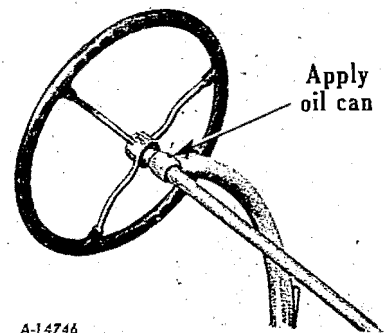
### ◇—After Every 120 Hours of Operation

9—Generator oil cups (2).

Insert the oil can spout through the holes in the hood above each oil cup. Lift up the cap on each oil cup and apply 8 to 10 drops of SAE-20 oil in each cup. See *Illust. 19B*.

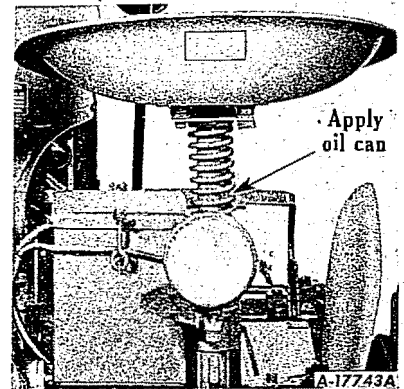
10—Crankcase oil pan.

Drain while the oil is warm. Remove drain plug (10) and drain all oil from the crankcase pan. See *Illust. 19C*. Replace the drain plug. Remove crankcase filler cap (1). Refill the crankcase pan with new oil up to the "FULL" mark on the bayonet gauge. Capacity 3 quarts.



A-14746

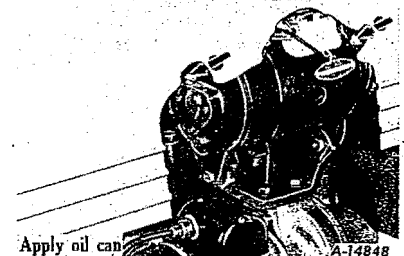
**Illust. 19**  
Steering shaft support bracket.



Apply oil can

A-17743A

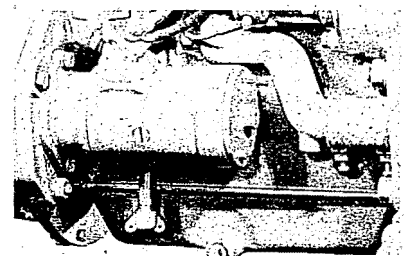
**Illust. 19A**  
Seat spring.



Apply oil can

A-14848

**Illust. 19B**  
Generator.



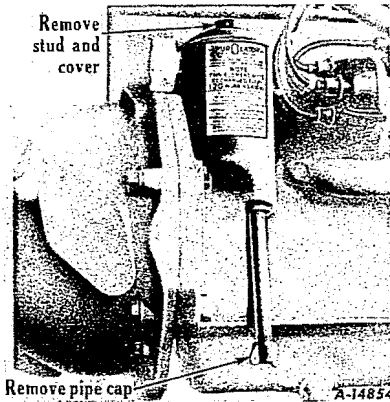
Remove plug

A-15072

**Illust. 19C**  
Crankcase drain plug.

*Continued on next page.*

# LUBRICATION



Illustr. 20  
Oil filter.

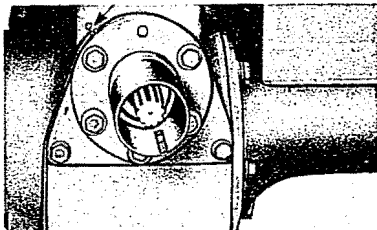
- 11—Oil filter drain.
- 12—Oil filter element.

Replace the oil filter element every time the crankcase oil is changed. See *Illustr. 20*. Remove pipe cap (11) and allow all oil to drain out. Remove oil filter stud (12) and the filter cover, and remove the used filter element. If the oil appears very dirty or sludgy when draining, flush out the filter with kerosene. Before flushing, however, replace stud (12) without the filter cover in order to prevent sludge from being flushed into the crankcase. Replace drain cap (11) and install the new filter element as instructed on page 15.

- 13—Power take-off shaft.

Use pressure-gun grease (chassis lubricant) and apply 2 or 3 strokes of the lubricator. See *Illustr. 20A*.

## □—Every Six Months or After Every 500 Hours of Operation



Apply lubricator (grease gun). A-15069A

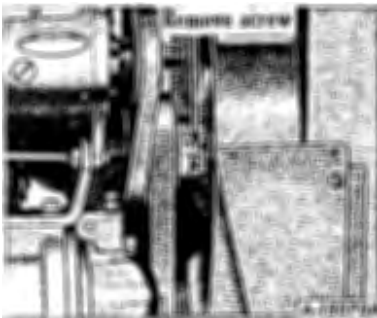
Illustr. 20A  
Power take-off.

- 14—Fan hub.

Turn the fan hub so oil retainer screw (14) is to the right-hand horizontal position. Remove the screw and fill the hub to the level of the filler hole opening with engine oil. Now turn the fan hub so the oil filler hole is on the bottom to allow excess oil to drain off. Replace the oil retainer screw. See page 28 for more information. See *Illustr. 20B*.

- 15—Magneto.

Fill the rotor bearing oil cup (15) once with the same oil as used in the engine crankcase. See *Illustr. 20C*. See page 30 for more information.



Illustr. 20B  
Fan hub.

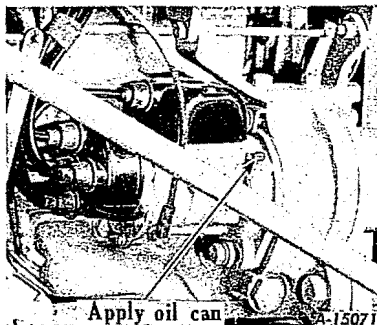
- 16—Distributor (battery ignition unit).

Remove the grease plugs and insert lubrication fittings. Apply pressure-gun grease (chassis lubricant) to the distributor fitting until a small quantity comes out of the relief hole opposite the plug. Apply several strokes of the lubricator to the drive housing fitting. See *Illustr. 20D*.

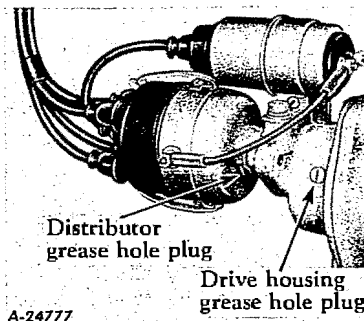
Remove the distributor cap and distributor rotor, and apply one or two drops of light engine oil to the felt in the hole at the end of the breaker cam. See pages 33 and 34 for complete information.

- 17—Front wheels.

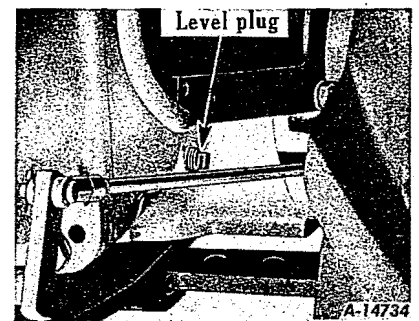
Remove, clean and repack the front wheel bearings with pressure-gun grease (chassis lubricant). See page 16 for more information.



Illustr. 20C  
Magneto.



Illustr. 20D  
Distributor.



Illustr. 20E  
Transmission oil level plug.



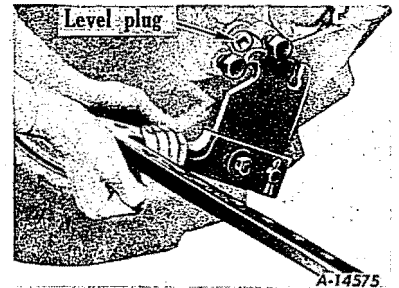
# LUBRICATION

## ○—Periodic

Check the oil level periodically. Use approved lubricant (page 17) and keep the lubricant up to level plug (19) on the left side of the transmission case. See *Illust. 20E*. Change the oil in the transmission case at least once a year. However, do not drive the tractor more than 1,000 hours without changing the oil. Remove drain plug (20) and allow all oil to drain out. See *Illust. 21*. Replace the drain plug and remove filler plug (18) and level plug (19). Refill with approved lubricant up to the level plug opening and replace the plugs. See *Illusts. 20E and 21A*. If the oil in the transmission case has been thinned with kerosene for operating in temperatures below 0°F., change the oil before operating in warm weather. Capacity 3½ pints.

### Transmission

- 18—Oil filler plug.
- 19—Oil level plug.
- 20—Oil drain plug.



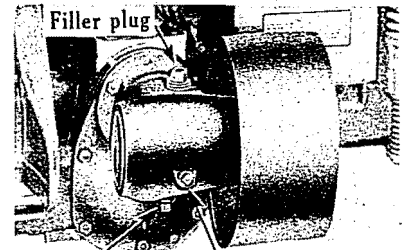
illust. 21C

Rear axle housing.

Check the oil level periodically. Use approved lubricant (page 17) and keep the lubricant up to level plug (22). Drain and refill the housing each time the oil is changed in the transmission case. To change the oil, remove drain plug (23) and allow all oil to drain out. Then replace the drain plug. Remove filler plug (21) and level plug (22). Fill up to the oil level plug opening and replace the plugs. See *Illust. 21B*. Capacity ⅓ pint.

### Belt Pulley Housing

- 21—Filler plug.
- 22—Level plug.
- 23—Drain plug.



Drain plug Level plug

A-14740

illust. 21B

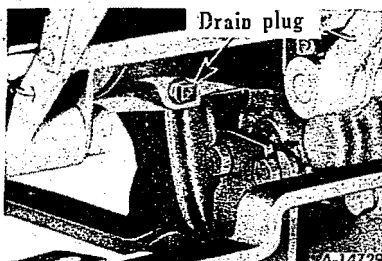
Belt pulley.

Check the oil level periodically. Use approved lubricant (page 17) and keep the lubricant up to level plug (24) in each rear axle housing. See *Illust 21C*. Remove the drawbar to get at the level plug in the left-hand housing. Change the oil at least once a year. However, do not drive the tractor more than 1,000 hours without changing the oil. To drain, remove rear axle housing pan (25). Clean the pan and replace it. Remove plug (24) and fill up to this level with approved lubricant. Replace the plug. Capacity 1¾ pints each housing.

### Rear Axle Housing

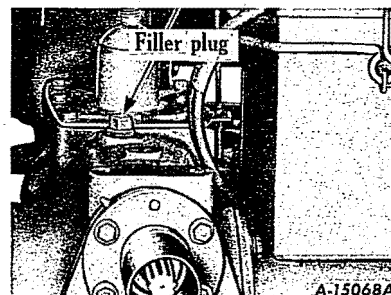
- 24—Oil filler and level plug (2).
- 25—Oil pan (2).

Continued on next page.



illust. 21

Transmission oil drain plug.



illust. 21A

Transmission filler plug.

## LUBRICATION

### Steering Gear Housing

- 26—Filler plug.
- 27—Level plug.
- 28—Drain plug.

- 29—Clutch release bearing.

- 30—Clutch pilot bearing.

### Touch-Control Reservoir

- Filler and level plug.
- Drain plug.

### Miscellaneous Parts

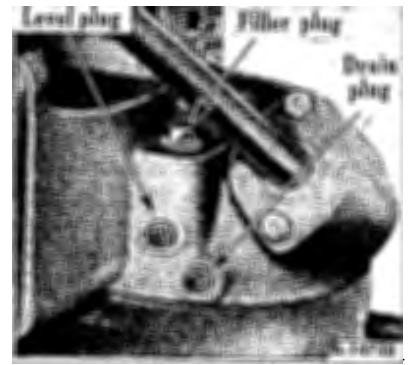
Check periodically and add sufficient approved lubricant (*page 17*) to the level of plug (27). Change the oil at least once every year. However, do not drive the tractor more than 1,000 hours without changing the oil. Drain by removing drain plug (28) and refill with new lubricant. To fill, remove filler plug (26) and level plug (27) and fill with approved lubricant to the level plug opening. Replace the plugs. *See Illust. 22.* Capacity  $\frac{3}{4}$  pint.

Use pressure-gun grease (chassis lubricant). After every 1,000 hours or at least once every year, apply a few strokes of the lubricator to clutch release bearing fitting (29) or just enough grease until it starts to come out of the bleeder hole on top of the bearing retainer. To reach the fitting, remove the clutch housing handhole cover. *See Illust. 22A. Also see Illust. 47A.*

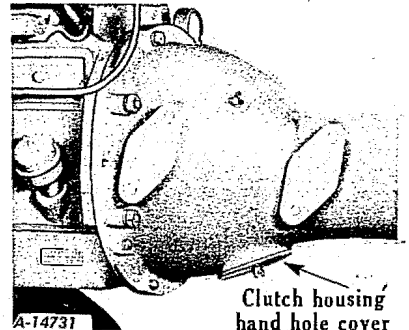
Does not require lubrication (oil-less bushing).

*Refer to page 69.*

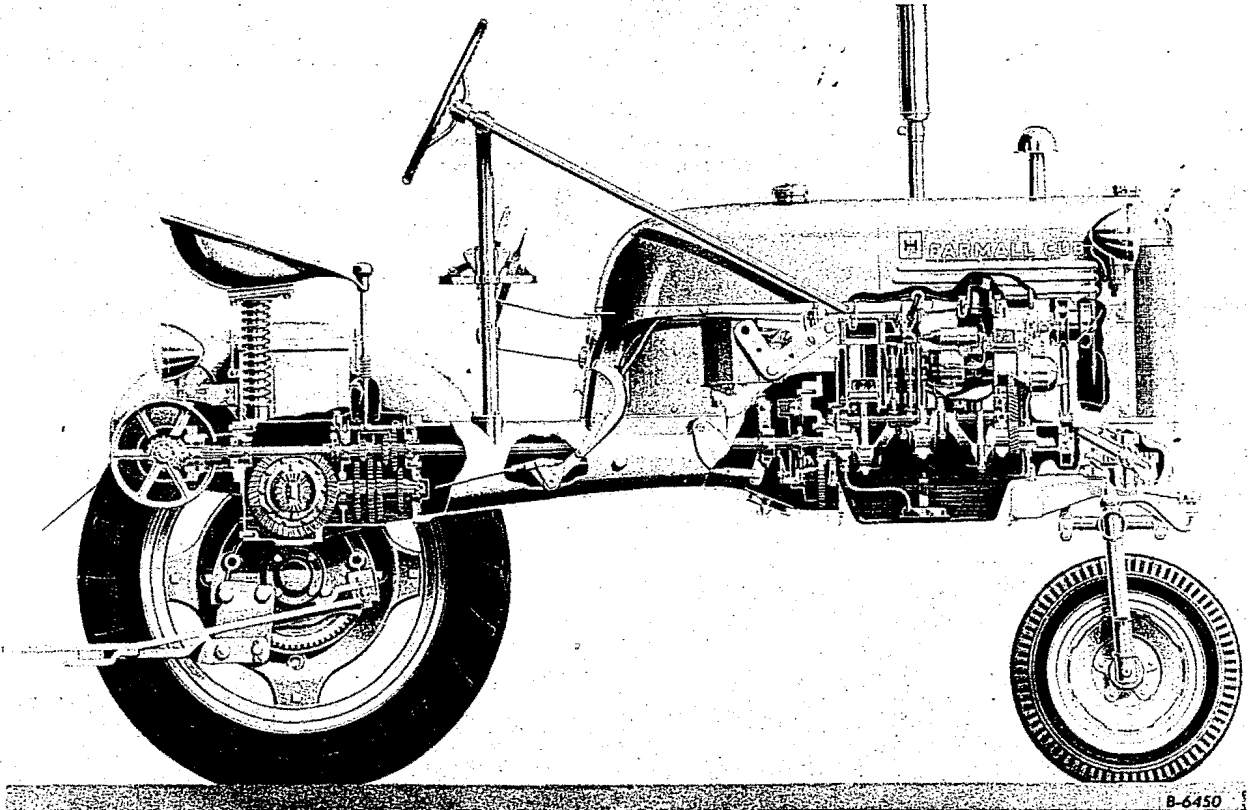
Occasionally put a few drops of engine oil on the engine control linkage, such as the engine speed control rod, governor connections, etc.



**Illust. 22**  
Steering gear housing.

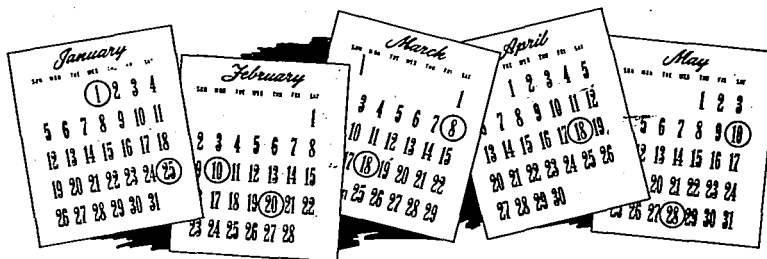


**Illust. 22A**  
Clutch release bearing.



**Illust. 22B**  
Cutaway view of the Farmall Cub, showing the internal working parts. The starting and lighting, belt pulley, power take-off, exhaust muffler and swinging drawbar are special features.

# MAINTENANCE



## Periodic Inspections

To keep your tractor performing efficiently, it is advisable to systematically inspect it at intervals as outlined below.

### After Every 10 Hours of Operation

- Air cleaner cap.....Remove any dirt or chaff. *See page 28. (When unusual dust or dirt conditions are encountered during operation it may be necessary to service these points more frequently.)*
- Air cleaner oil cup.....Remove, clean and refill. *See page 28.*
- Lubrication points.....*See "Lubrication Guide."*
- Cooling system.....Check the level of the coolant in the radiator. *See page 26.*

### After Every 60 Hours of Operation

- Air cleaner, complete.....Remove and clean. *See page 28. (When unusual dust or dirt conditions are encountered during operation it may be necessary to service these points more frequently.)*
- Flexible rubber connection between air cleaner and carburetor.....Inspect for loose fit or damage.
- Fan belt.....Check tension; replace when necessary. *See page 27.*
- Radiator fins.....Clean spaces. *See page 27.*
- Lubrication points.....*See "Lubrication Guide."*

### After Every 120 Hours of Operation

- Lubricating oil filter.....Replace the filter element. *See page 15.*
- Engine crankcase.....Drain and change the oil.
- Lubrication points.....*See "Lubrication Guide."*
- Crankcase breather cap.....Clean in kerosene.
- Storage battery.....Check the liquid level and specific gravity (*pages 43 to 46*).

### After Every 250 Hours of Operation

- Fuel strainer and sediment bowl.....Take apart and clean. *See page 25.*
- Spark plugs.....Remove and clean; check gap. *See page 29.*
- Magneto breaker points and chamber (tractors with magneto).....Clean chamber and check gap. *See pages 30 and 31.*
- Magneto drive chamber and impulse coupling (tractors with magneto).....Check and clean if necessary. *See page 31.*

### After Every 400 Hours of Operation

- Cooling system.....Clean. *See page 26.*
- Engine valves.....Check for clearance. *See page 46.*
- Clutch pedal.....Check for free movement. *See page 47.*
- Brakes.....Check for free movement and equalization. *See page 48.*
- Lubrication points (500 hours).....*See "Lubrication Guide" (Periodic).*

### Every 6 Months or After Every 500 Hours of Operation

- Front wheels.....Clean and repack with new grease. *See page 16.*
- Lubrication points (1,000 hours).....*See "Lubrication Guide" (Periodic).*
- Distributor breaker points and chamber.....Clean chamber and check points and opening. *See pages 33 and 34.*

## MAINTENANCE

### Carburetor

The presence of dirt and water in the fuel will disturb the functioning of the carburetor. Use a good grade of clean gasoline.

The fuel strainer (located under the gasoline tank) collects practically all the dirt and sediment which may enter the gas tank. Clean the fuel strainer after every 250 hours of operation.

A small strainer screen is provided in the carburetor at the fuel-line connection. This screen prevents dirt or metal chips which may have collected in the fuel line during field installation from entering the carburetor. The screen can be cleaned if necessary, when the carburetor is removed, by removing the fuel bowl cover and float valve cage assembly and forcing air through the screen in the opposite direction from the fuel flow.

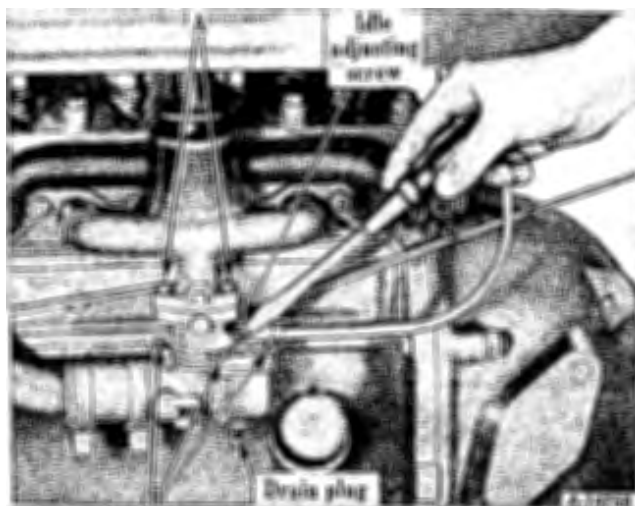
Periodically check for tightness flange nuts "A" (*Illust. 24*) which hold the carburetor to the manifold.

Occasionally check cover screws "B" (*Illust. 24*) which fasten the fuel bowl to the fuel bowl cover. They must be kept tight to avoid any air leakage past the fuel bowl cover gasket.

The engine and carburetor are correctly set when shipped from the factory. If for any reason this setting has been disturbed, the following procedure should be followed:

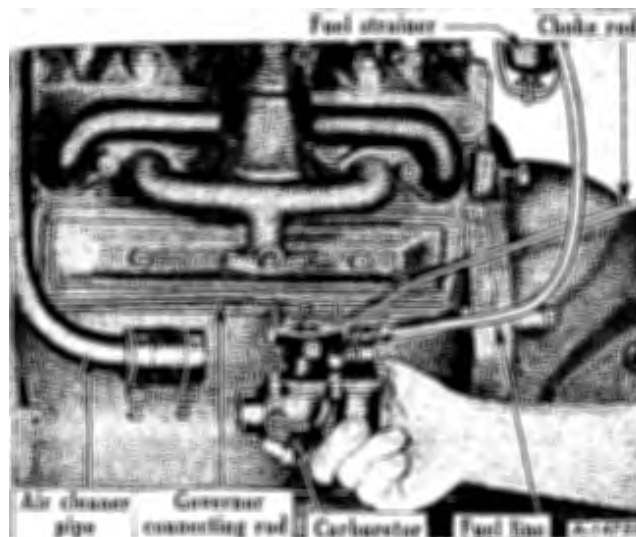
#### Adjusting the Idle Adjusting Screw

Close the idle adjusting screw to its seat by turning to the right (or in); then open one full turn. Start the engine and operate it at the fast idling speed (without any load) until thoroughly warm. (Cover the radiator if necessary.)



Illust. 24

Carburetor adjustment.



Illust. 24A

Removal of carburetor.

Close the throttle by pulling the engine speed control lever all the way back. If the engine misses or rolls, slowly turn the idle adjusting screw in or out until the engine operates smoothly. Speed up the engine for a few seconds; then recheck the idle.

#### Removing the Carburetor

1. Close the shut-off valve on the fuel strainer.
2. Drain the carburetor by removing the drain plug.
3. Disconnect the choke and governor controls.
4. Disconnect the fuel line.
5. Remove the air cleaner connections to the carburetor.
6. Remove the two nuts and lock washers holding the carburetor to the manifold, and lift off the complete carburetor. See *Illust. 24A*.

#### Installing the Carburetor

1. Install the carburetor on the engine in the reverse order of removal.
2. Always install a new gasket between the carburetor and manifold if the old one is damaged.
3. Be sure the carburetor drain plug is screwed in tight; then turn on the gasoline supply.
4. Adjust the carburetor as described previously.

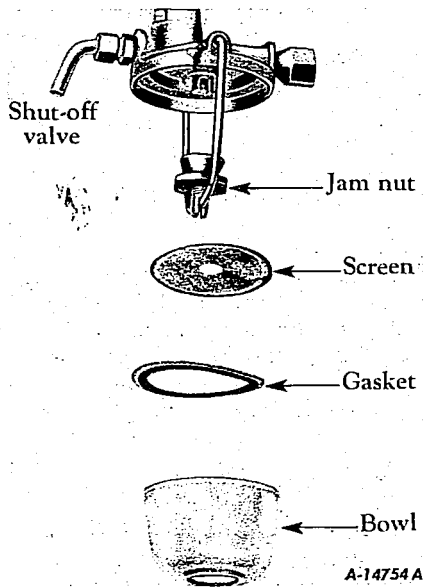
## MAINTENANCE

### Fuel Strainer

#### Cleaning the Fuel Strainer and Sediment Bowl

The fuel strainer should be cleaned after every 250 hours of operation; to do this, proceed as follows:

1. Close the shut-off valve.
2. Take the strainer apart by loosening the lower jam nut.
3. Clean out the sediment bowl and clean the screen if necessary.
4. When reassembling, be sure that the cork gasket between the bowl and main body is in good condition and does not leak. Use a new gasket if necessary.



Illust. 25

Fuel strainer showing glass bowl removed for cleaning.

### Cold Weather Precautions

When operating the tractor in temperatures of +32° F. or lower, observe the following precautions:

#### Fuel System

Use only a high-test, winter-grade gasoline, and keep your supply in a closed container so the more volatile portion does not evaporate.

Fill the fuel tank at the end of the day's run to prevent moisture from collecting in the tank.

### Lubrication

Be sure to use the correct grade of lubricant in the engine crankcase, air cleaner, magneto impulse coupling, rear axle housings, transmission, steering gear case and belt pulley housing *as specified on page 17.*

#### Magneto Impulse Coupling (Tractors with Magneto)

For satisfactory starting, it is important to keep the magneto impulse coupling oiled liberally *as specified on page 31.* The impulse coupling should be kept free of dirt and gummy rust formation.

When hand cranked, the impulse coupling should trip (click) twice for each revolution of the engine. Failure to do so may indicate the need for cleaning. *Refer to page 31 for further information.*

### Cooling System

When the temperature is likely to be +32° F. or lower, there is danger of the water freezing in the cooling system. To prevent this, either drain the water from the cooling system at the end of each run, or use one of the recommended antifreeze solutions.

#### To Drain the System

1. Remove the radiator drain plug on the bottom (left side) of the radiator. *See Illust. 26.*
2. See that the drain is not plugged and that the water drains completely.

**Important!** Before filling the radiator in freezing weather, cover the entire radiator and start the engine; then put in water immediately. This prevents water from freezing during the warming-up period. When the engine has warmed up, uncover the radiator.

1. If an antifreeze is to be used, observe the following instructions:
2. Drain and clean out the cooling system *as described on page 26.*
3. Inspect the hose connections. They must be in good condition inside and out. Then tighten all water connections.
4. Inspect the fan belt and adjust it to the proper tension *as described on page 27.* If the belt is worn or oil soaked, it is best to install a new one.

5. Before refilling the cooling system, make sure that the radiator drain is tightly closed. Then put the required amount of antifreeze into the cooling system. Fill up the radiator with clean water (use soft or rain water if possible) to a level slightly below the bottom of the filler neck.

*Continued on next page.*

## MAINTENANCE

The table below shows the amount of antifreeze to use for various temperatures.

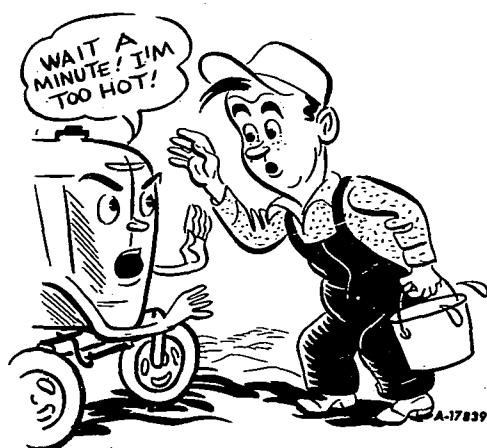
**Caution!** Use only one type of antifreeze. Do not use a mixture of solutions, as it will be difficult to determine how much protection you have against freezing.

Never use any of the following in the cooling water as an antifreeze:

Honey, salt, kerosene, diesel fuel, glucose, sugar, calcium chloride or any alkaline solution.

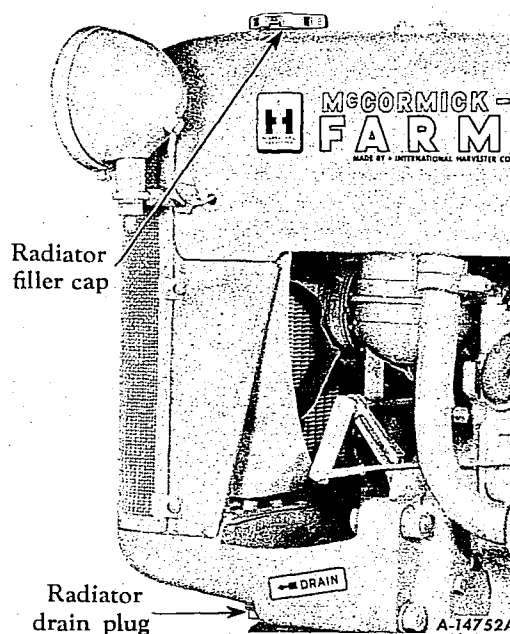
Do not use alcohol as an antifreeze if other materials are available, as denatured alcohol boils at +173° F. However, if it is necessary to use alcohol, check the solution frequently to see that you have adequate protection against freezing.

Freezing Point (Fahrenheit)	Pints of antifreeze required		
	Ethylene Glycol	Distilled Glycerine	Denatured Alcohol
+10°	5	6½	6
0°	6½	8	7½
-10°	8	9½	8½
-20°	9	10½	10
-30°	10	11½	11½
-40°	10½	—	13
-50°	11½	—	14
-60°	12	—	15½
-70°	13	—	—



Should the motor overheat, allow the engine to cool off before removing the cap to fill the radiator. When removing the cap, be extremely careful to avoid being scalded by steam which has built up pressure in the radiator.

## Cooling System



Illust. 26

Water cooling system.

The water is circulated through the engine block, cylinder head and radiator by the thermosiphon method. As the engine warms up, the water is heated, expands and circulates back through the radiator where the water is cooled before again circulating through the engine.

### To Clean Out Dirt and Sludge

1. Drain the cooling system by removing the drain plug. See Illust. 26. Allow the system to drain; then replace the plug.
2. Fill the cooling system with a solution of 2 pounds of ordinary washing soda mixed with 9¾ U. S. quarts of water (cooling system capacity).
3. Leave off the radiator filler cap and operate the engine until the water is hot; then drain and flush with clean water.

### To Fill the Cooling System

1. The water capacity is approximately 9¾ U. S. quarts.
2. Replace the drain plug.
3. Fill the radiator to a level slightly below the bottom of the filler neck. Filling the radiator to this level will allow for expansion of the coolant under normal operating conditions.

## MAINTENANCE

**Note:** Do not pour cold water into the radiator if the engine is very hot, unless conditions make it absolutely necessary; in which case start the engine, let it idle, and slowly pour water into the radiator.

4. If the engine is to be operated in freezing temperatures, refer to "Cold Weather Precautions."

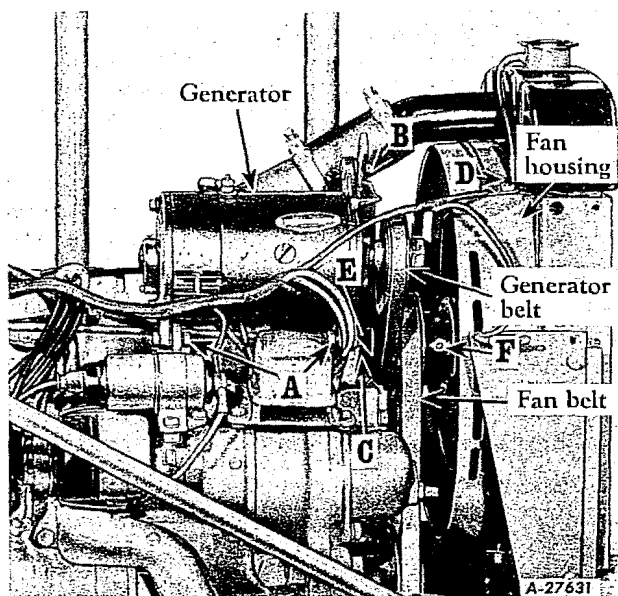
### Rust Prevention

One of the most common causes of engine overheating is a rust-clogged cooling system. Rust interferes with circulation and cooling, which causes overheating.

In localities where alkaline, acid, or saline waters are the only kind available, the addition of a rust preventive or "inhibitor" will tend to minimize the corrosive action of such water.

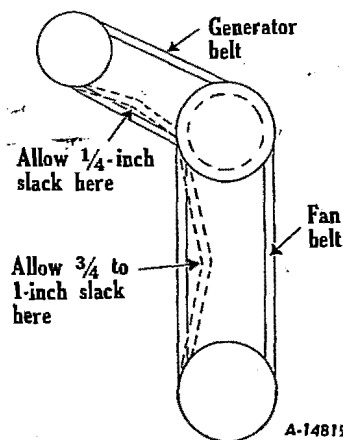
For rust prevention during winter use of the engine, a fresh filling of antifreeze containing an effective corrosion preventive should be used. In the spring, drain and discard the old antifreeze solution, as the rust preventive or "inhibitor" may be exhausted from contamination and continued use.

After draining the antifreeze, a rust preventive should be added to the cooling water to protect the cooling system during warm weather operation. This inhibitor solution should be drained and dis-



Illust. 27

Fan and generator belts.



Illust. 27A

Correct belt tension.

carded in the fall when danger of freezing again makes necessary the use of an antifreeze.

### Radiator Core

Overheating is often caused by bent or clogged radiator fins. If the spaces between the radiator fins become clogged, clean them with forced air or water. When straightening bent fins, be careful not to injure the tubes or break the bond between the fins and tubes.

### Fan Belt Tension

Check the slack of the fan belt after every 60 hours of operation to assure maintenance of the correct tension. The tension is correct when the belt can be depressed without effort by the thumb, approximately  $\frac{3}{4}$  inch to 1 inch, midway between the two pulleys. See Illust. 27A. If the slack is more than 1 inch, adjust the belt as follows:

### Adjusting the Fan Belt

When the tractor is equipped with a generator, first loosen nuts "A" and "B" before adjusting the fan belt tension. The tension of the fan belt is adjusted by loosening fan spindle "C" (Illust. 27) and moving the fan and hub assembly up or down until the correct tension is obtained. After the correct tension is obtained, tighten fan spindle "C." To adjust the generator belt, see page 28.

After a new belt has been in use approximately 60 hours, check the tension and adjust again if necessary.

## MAINTENANCE

### Removing the Fan Belt

To remove the fan belt, loosen fan spindle nut "C" (*Illust. 27*) and slide the fan and hub assembly to the bottom of the groove on the crankcase front cover. The fan belt can then be slipped over the bottom drive pulley and worked up over the fan blades.

### Replacing the Fan Belt

Replace the fan belt when it becomes soaked with grease, or when it is so badly worn that it does not drive the fan at the proper speed.

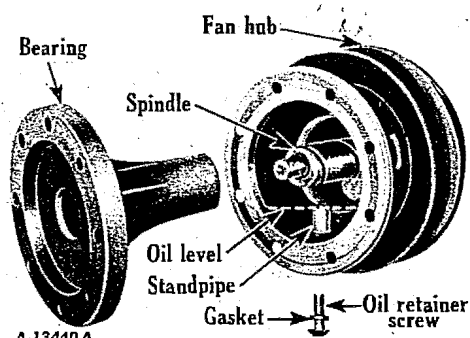
When replacing the belt, reverse the procedure outlined under "Removing Fan Belt," except that belt can be started on the lower pulley by hand, and by slowly cranking the engine, the belt will find the correct position.

### Generator Belt

After the fan belt tension has been adjusted, move the generator toward or away from the engine to get the correct generator belt tension; then tighten nuts "A" and "B." The generator belt should be tight enough as not to allow slippage, but not so tight as to cause side thrust on the generator bearing. Allow  $\frac{1}{4}$ -inch slack. See *Illust. 27A*.

### Fan Hub Lubrication

Every six months or after every 500 hours of operation, whichever occurs first, remove oil retainer screw "F" (*Illust. 27*) and turn the fan assembly so that the oil filler hole is at the right horizontal position. Add engine oil until the oil reaches the level of the hole. Now turn the assembly so that the hole is on the bottom and allow any excess oil to drain out. The oil is then up to level of the top of the stand pipe



*Illust. 28*

Fan hub partially disassembled showing oil level.

(approximately  $\frac{1}{10}$  pint). See *Illust. 28*. Replace the oil retainer screw and be sure that the retainer screw gasket is in place.

**Note:** The rubber gasket located behind the hub at "E" (*Illust. 27*) is used for shipping purposes only. It does not have to be replaced when worn out.

## Air Cleaning System

Clean air for combustion is assured by an oil-type air cleaner. A heavy screen in the air intake cap prevents large particles from entering the air cleaner. The air then passes to the oil cup where it goes through a bath of oil. As the air rises to the intake manifold, it passes through a series of oil-bathed screens and the fine dust is removed. As the oil from the screen works back down, it carries the dirt with it and settles in the oil cup. *Never allow dirt to build up in the cup more than  $\frac{1}{2}$  inch deep.*

### Oil Cup Service

Remove the oil cup by pushing the oil cup bail toward the engine. See *Illust. 29*. Clean and refill the oil cup every day, or every 10 hours of operation (more frequently when operating under dusty conditions). Refill the oil cup to the oil level bead with the same grade of oil used in the engine crankcase. The capacity of the oil cup is  $\frac{1}{2}$  U. S. pint for the Donaldson Air Cleaner and  $\frac{3}{8}$  U. S. pint for the United, whichever type is used (the name appears on the air cleaner). Do not remove the oil cup while the engine is operating. Before replacing the oil cup, clean or wipe oil or grit from the top bead of the oil cup.

### Air Intake Cap and Screen

The screen in the air intake cap prevents chaff and other coarse dirt from getting into the air cleaner. Keep this screen clean and free from all chaff, oil, dust, or paint, as clogged holes in the screen will reduce the power of the engine by restricting the flow of air.

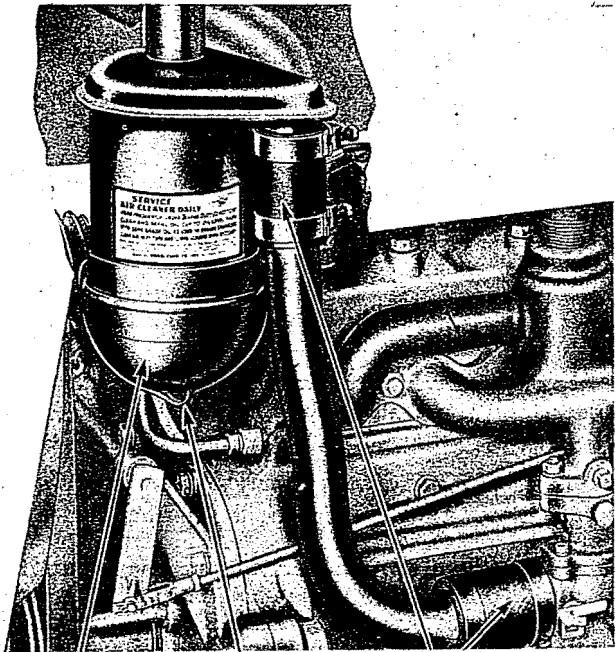
### Washing the Cleaner

After every 60 hours of operation—particularly if operating the tractor in an atmosphere heavily laden with dust, chaff or lint—remove the entire air cleaner from the tractor, disassemble it (*Illust. 29A*) and wash the parts thoroughly in kerosene. Be sure to clean out the air intake pipe.



## MAINTENANCE

After all parts have been thoroughly cleaned, replace the air cleaner body on the tractor. Make sure all joints are airtight. Replace the air intake cap. Fill the oil cup to the proper level with the specified grade of oil and replace it on the air cleaner. Be sure it is held securely in place by the oil cup bail.



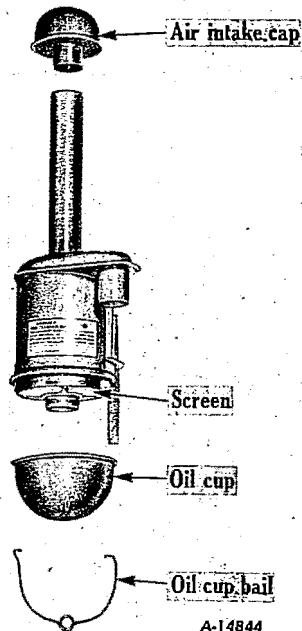
Oil cup Oil cup bail Hose connections A-14579A

Illust. 29

Servicing the oil cup.

### General Precautions

As an added precaution against dirt entering the engine, frequently inspect the flexible rubber hose connections between the carburetor and the air cleaner. If they show any sign of deterioration, replace them. To eliminate strain on the rubber hose connections, be sure the pipes line up. All joints between the air cleaner, carburetor, manifold and cylinders of the engine should be tight. All gaskets must be in good condition and the bolts should be drawn up tight.



Illust. 29A

"Exploded" view of air cleaner.

## Spark Plugs and Cables

### Spark Plugs

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

Remove the spark plugs after every 200 to 300 hours of operation for cleaning and checking the gaps between electrodes. A gap of .023 inch should be maintained. When making this adjustment, always bend the outer electrode. Never bend the center electrode, as it may damage the insulator. If the gap between the electrodes is too great, due to improper setting or burning off of the ends, the engine will misfire and be hard to start.

### Cleaning Spark Plugs

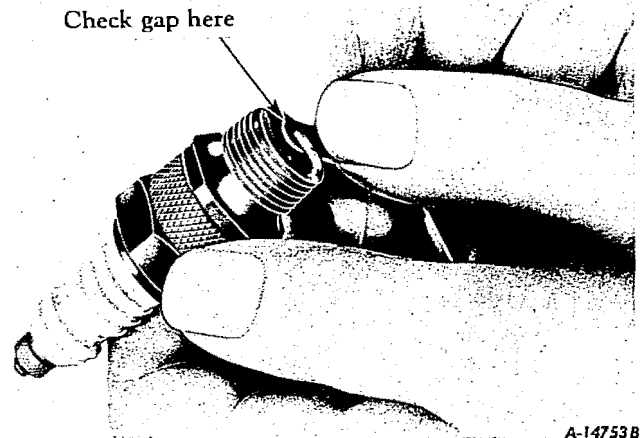
Sandblasting is the recommended method of cleaning spark plugs. Never scrape or clean the insulator with anything which will scratch the porcelain. Scratched porcelain allows carbon and dirt to accumulate much faster.

Always use a spark plug wrench when removing or replacing plugs. This helps to prevent cracking the porcelain.

When replacing spark plugs, be sure that the gaskets are in good condition, and screw the plugs in tight.

Replace defective plugs with new plugs.

See your International Harvester dealer for various makes of replacement plugs for normal or special service. These plugs have been tested and recommended as best suited for this engine.

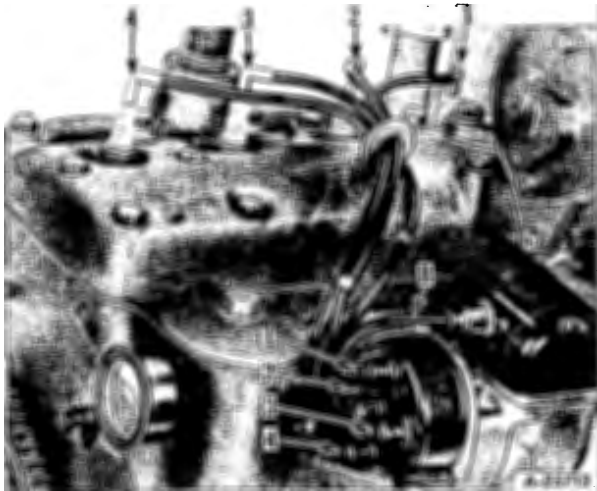


A-14753B

Illust. 29B

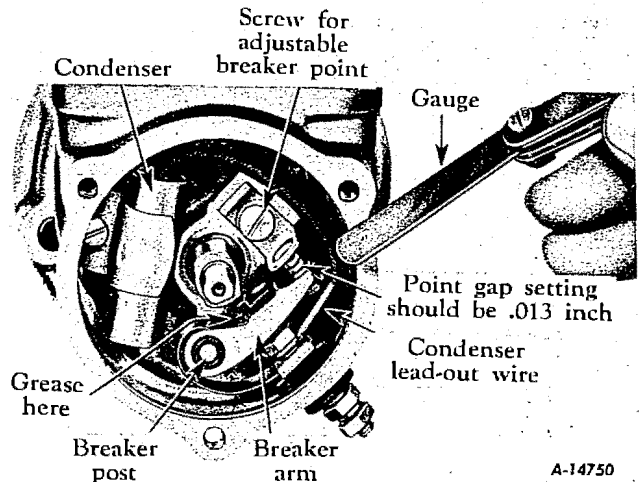
Checking the spark plug gap.  
Set gap at .023 inch.

## MAINTENANCE



Illust. 30

Spark plug wiring. Engine firing order is 1, 3, 4, 2.



A-14750

Illust. 30A

Adjusting the breaker points.

### Spark Plug Cables (Magneto Ignition)

If the spark plug cables are removed for any reason, note the position of each cable on the magneto (*Illust. 30 shows the correct wiring*).

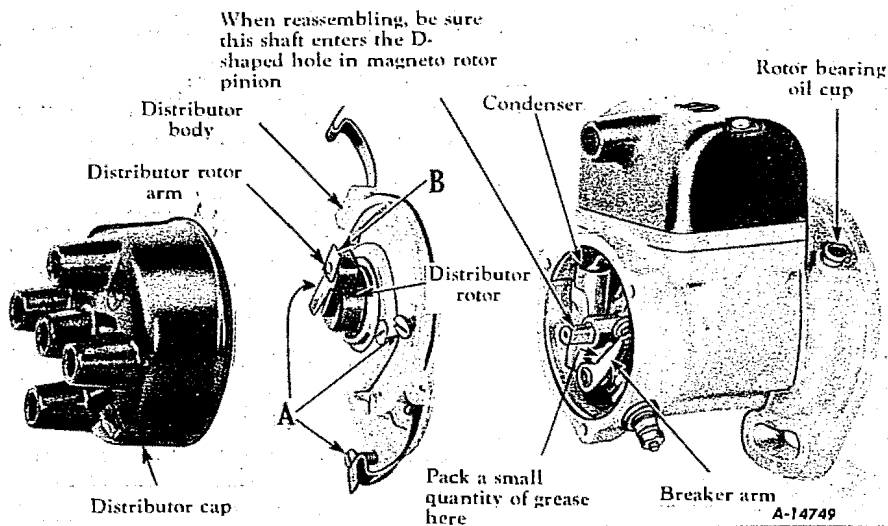
## Magneto

### Magneto Lubrication

After every 500 hours of operation, fill the magneto rotor bearing oil cup (on mounting flange) (*Illust. 32A*) once with the same oil as used in the crankcase.

### Greasing the Breaker Mechanism and Checking the Points

It is important that the breaker chamber be kept clean, as oil on the breaker points will cause rapid burning. Inspect the breaker chamber after every 250 hours of operation, to assure that it is clean. To reach the breaker mechanism, remove the distributor cap, and crank the engine slowly until end "B" of the distributor rotor arm points toward the No. 1 terminal on the distributor cap, and the impulse coupling just trips. Take off the distributor body by removing three screws "A" (*Illust. 30B*). See that the points are in good condition and have the proper clearance. If the chamber is clean, no attention is necessary other than checking the clearance of the points; but if the chamber is dirty, all parts must be thoroughly cleaned.



Illust. 30B

Magneto disassembled.

## MAINTENANCE

Do not crank the engine while distributor body is removed or it might be necessary to retime the magneto to the engine.

Remove the breaker arm from the chamber and clean all parts. Inspect the breaker points and, if necessary, dress them with a sharp, fine file. If the points are worn excessively, replace both points.

Fill the recess in the breaker post with grease and pack a small quantity of magneto grease in back of the breaker arm rubbing block (*Illusts. 30A and 30B*). See your International Harvester dealer for the proper grease to use.

Replace the breaker arm and be sure the points line up when the breaker arm is in place.

Check the opening between the breaker points (*Illust. 30A*) with a feeler gauge. The point opening should be .013 inch when the rubbing block is on the high part of the cam. If the opening is not correct, adjust it by loosening the screw holding the adjustable point (*Illust. 30A*) and moving the point up or down until the gauge slips snugly into the opening. After the proper adjustment has been made, tighten the screw.

With the engine on the top dead center of the No. 1 firing stroke, turn the distributor rotor until end "B" of the distributor rotor arm points to the No. 1 terminal on the distributor cap. Place the distributor body on the magneto and be sure the rotor shaft enters the D-shaped hole in the magneto

rotor pinion. Be sure the gasket is in place and tighten three screws "A" (*Illust. 30B*). - Replace the distributor cap.

### Greasing the Distributor Gear

After every 2,000 hours of operation or at least every year, the distributor gear and distributor gear chamber should be cleaned and repacked with IH magneto grease. We recommend this be done by your International Harvester dealer.

### Distributor Cap

Every three or four months, remove the distributor cap and examine the inside. If any dust, moisture or oil deposits are present, thoroughly clean and wipe dry. To assure long life of the distributor, care must also be taken to keep the three small ventilator holes in the bottom of the distributor cap open at all times. Also see that the distributor rotor is kept clean.

If the distributor cap terminal nipples are removed, be sure that the terminals and coil cover terminals are clean and dry.

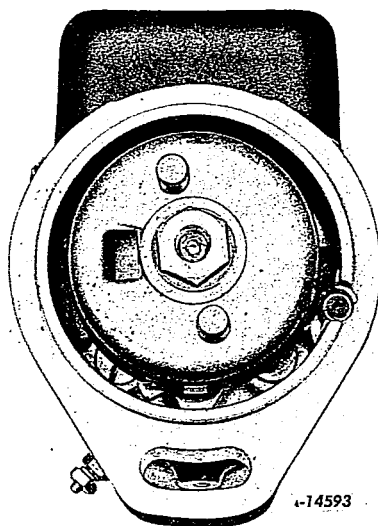
The magneto is equipped with these nipples to prevent any external electrical leakage when the tractor is operating under adverse conditions.

### Magneto Impulse Coupling and Magneto Drive Chamber

When hand cranked, the impulse coupling should trip (click) twice for each revolution of the engine. Failure to do so indicates the need of cleaning or service.

Remove the magneto as described below. Hold the magneto at an angle of approximately 45 degrees, and flush the impulse coupling and magneto drive chamber with kerosene. During warm weather, oil the impulse coupling liberally with light oil, such as cream separator or sewing machine oil. Do not use oil during cold weather (below +32° F.). Flushing with kerosene is all that is required.

If it is necessary to remove the impulse coupling from the magneto for cleaning or service, we recommend that this be done by your International Harvester dealer.

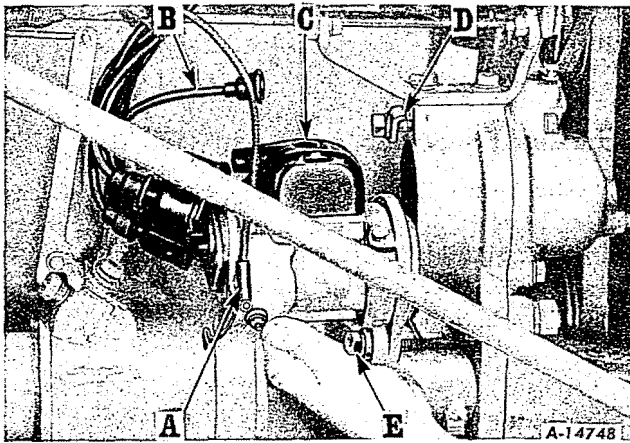


Illust. 31

Magneto removed showing impulse coupling.

## MAINTENANCE

### Removal of the Magneto



Illust. 32

Removal of the magneto.

1. Disconnect switch cable "A" (Illust. 32) by removing the nut and lock washer attaching the cable to the magneto terminal.

2. Pull out cable "B" from coil cover "C" and remove the distributor cap.

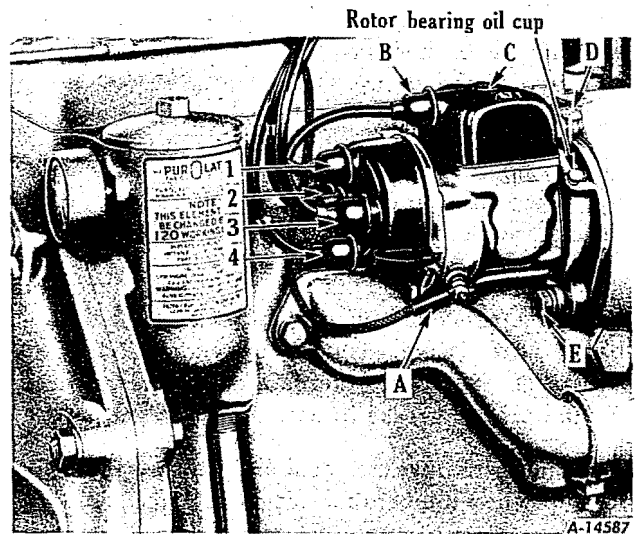
3. Loosen the nut holding magneto mounting clip "D" and remove cap screw "E." The magneto assembly can then be removed. See Illust. 32.

### Installing and Timing the Magneto to the Engine

1. Pull out cable "B" (Illusts. 32 and 32A) from the coil cover end. This will eliminate any possibility of accidental starting.

2. Crank the engine until the No. 1 piston (the piston next to the radiator) is on the upper dead center of the compression stroke. The compression stroke can be determined by removing the No. 1 spark plug, placing the thumb over the opening, and cranking the engine until an outward pressure is felt. Continue cranking slowly until the notch on the fan drive pulley (on the crankshaft) is in line with pointer on front crankcase cover. See Illust. 33. Both intake and exhaust valves will then be closed.

3. Remove the distributor cap and turn the magneto impulse coupling (Illust. 31) in a counter-clockwise direction (as viewed from the coupling end) until end "B" of the distributor rotor arm points toward the No. 1 terminal on the distributor cap. See Illust. 30B. Then replace the distributor cap.



Illust. 32A

J-4 Magneto wiring (clockwise rotation).

4. Assemble the magneto on the engine, making sure that the lugs on the impulse coupling engage in the slots on the magneto drive coupling. (Assemble the magneto so that the top is as close to the crankcase as possible.)

5. Insert magneto mounting bolt "E" loosely in the magneto flange, just enough to hold the magneto in place. Then crank the engine one complete revolution to the next top dead center. Now pull the upper part of the magneto away from the engine until the impulse coupling just trips.

6. Tighten mounting clip nut "D" and bolt "E" (Illust. 32) securely. Attach the spark plug cables to the engine and magneto. Start by connecting No. 1 cylinder spark plug to the socket marked "1" on the distributor block; connect the No. 3 socket with the No. 3 cylinder; next with the No. 4 cylinder, and next with the No. 2 cylinder. See Illusts. 30 and 32A.

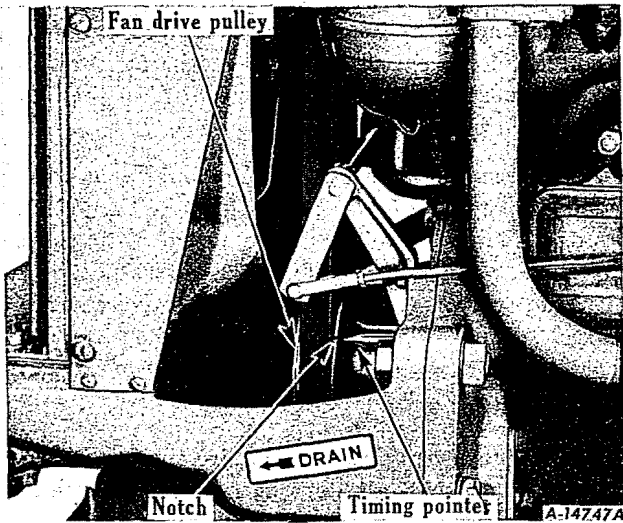
7. Connect the switch cable to the magneto terminal.

8. To check the timing, crank the engine slowly until the top dead center of No. 1 cylinder is reached; at which time the impulse coupling should just trip.

9. The magneto is now correctly wired and timed.

10. Push cable "B" back into the socket in the coil cover. See Illust. 32A.

## MAINTENANCE



Illustr. 33

Notch on fan drive pulley in line with timing pointer.

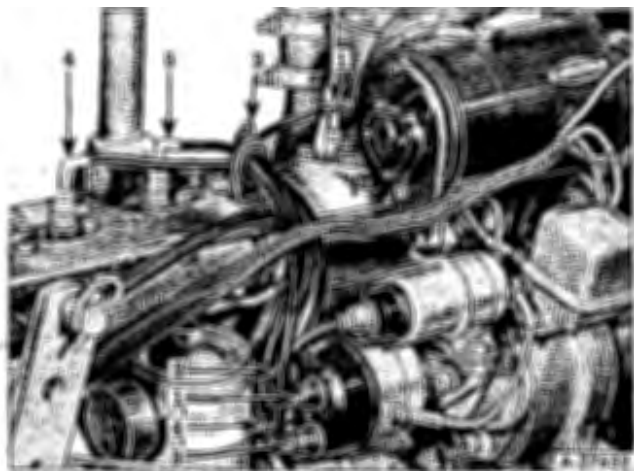
### Battery Ignition Unit

#### Spark Plug Cables (Battery Ignition)

If the spark plug cables are removed for any reason, note the position of each cable on the distributor. *Illustr. 33B* shows the correct wiring.

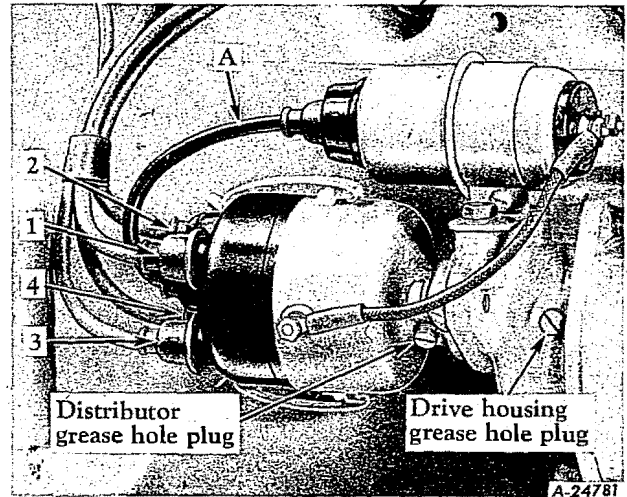
#### Lubrication

Every six months or after every 500 hours of operation, whichever occurs first, remove the grease plugs (*Illustr. 33B*) and insert lubrication fittings. Apply pressure-gun grease (chassis lubricant) to the distributor fitting until a small quantity comes out



Illustr. 33A

Spark plug wiring. Engine firing order is 1, 3, 4, 2.



Illustr. 33B

Distributor wiring and lubrication.

of the relief hole opposite the plug. Apply several strokes of the grease gun to the drive housing fitting.

Remove the distributor cap and the distributor rotor and apply one or two drops of light engine oil to the felt in the hole at the end of the breaker cam. *See Illustr. 34 and 34A.*

#### Greasing the Breaker Mechanism and Checking the Points

It is important that the breaker chamber be kept clean because oil on the breaker points will cause rapid burning. Remove the distributor cap, distributor rotor, and the breaker cover for breaker chamber inspection. *See Illustr. 34A.* Care should be taken, when removing the breaker cover, to prevent dirt from entering the breaker chamber. Be sure the chamber is clean and that the breaker points are in good condition and have the proper opening.

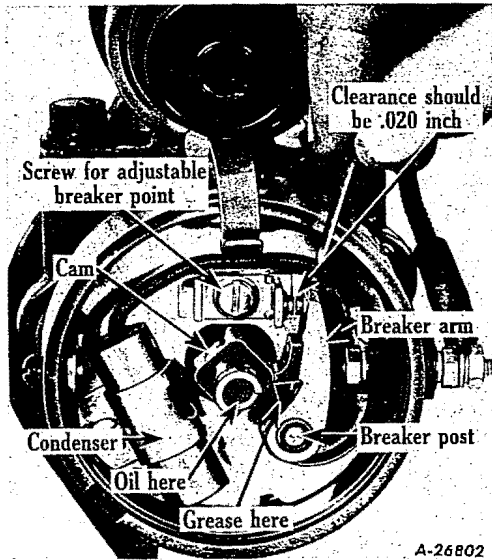
*Never use emery cloth or sandpaper to clean the points.* If the points are worn excessively, replace both points.

Fill the recess in the breaker post with grease and pack a small quantity of magneto grease in back of the breaker arm rubbing block. *See Illustr. 34 and 34A.* See your International Harvester dealer for the proper grease to use.

Check the condition of the breaker points for build-up or lip formation. If present, the points must be dressed before the point opening can be checked or set. Check the opening between the

*Continued on next page.*

## MAINTENANCE



Illust. 34

Adjusting the breaker points.

breaker points with a feeler gauge as shown in *Illust. 34*. The point opening should be .020 inch when the rubbing block is on the high part of the cam. If the opening is not correct, adjust it by loosening the screw holding the adjustable point. Then move the point toward or away from the point on the breaker arm until the gauge slips snugly into the opening. After the adjustment has been made, tighten the screw.

### Distributor Cap

Every three or four months remove the distributor cap and examine the inside. If any dust, moisture or

oil deposits are present, thoroughly clean and wipe dry. To assure long life of the distributor, care must be taken to keep the three small ventilator holes in the distributor cap open at all times. Also see that the distributor rotor is kept clean.

If the terminal nipples are removed, be sure the distributor cap terminals and coil terminal are clean and dry. The distributor is equipped with these nipples to prevent any external electrical leakage when the tractor is operating under adverse conditions.

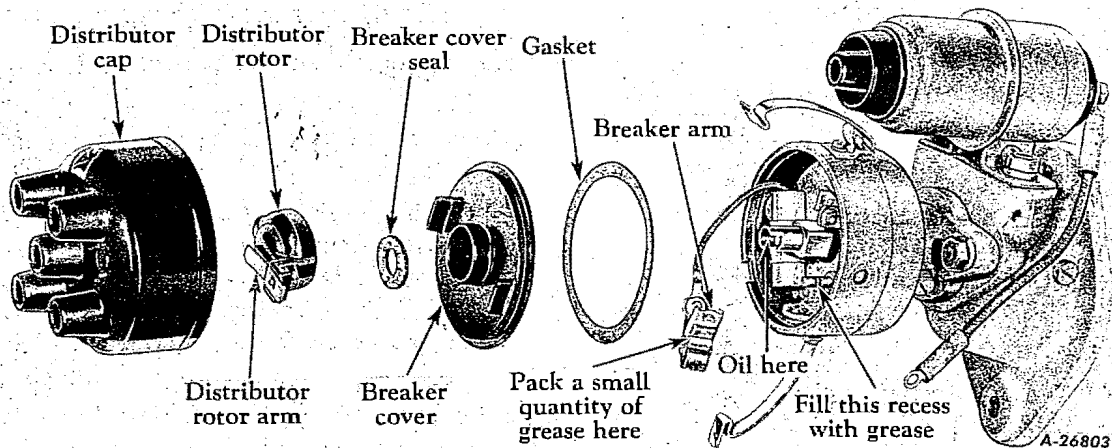
### Ignition Coil

The ignition coil does not require special service other than to keep all terminals and connections clean and tight.

### Removing the Battery Ignition Unit

If it is necessary to remove the battery ignition unit for any reason, proceed as follows:

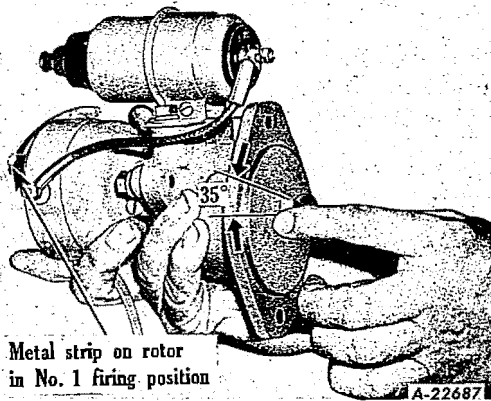
1. Disconnect ignition switch cable "C" (*Illust. 35A*) from the ignition coil.
2. Pull secondary cable "A" (*Illust. 35B*) out of the center socket on the distributor cap and remove the cap.
3. Crank the engine slowly until the distributor rotor arm is in the No. 1 firing position. See *Illust. 35A*.
4. Remove the two cap screws and the mounting clip from the distributor drive housing flange and remove the complete unit.



Illust. 34A

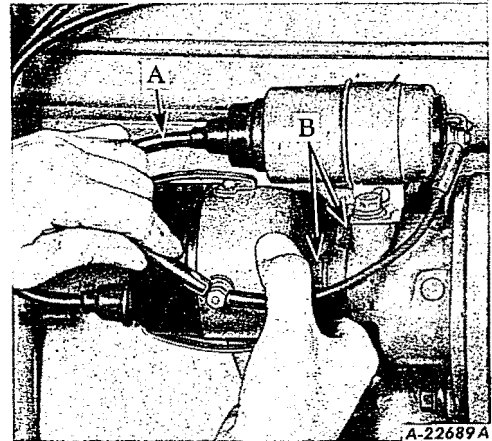
Distributor partially disassembled for servicing.

## MAINTENANCE



Illust. 35

Adjusting the distributor rotor and drive shaft lugs for timing the distributor.



Illust. 35B

Advancing the distributor while holding the secondary cable  $\frac{1}{16}$ " to  $\frac{1}{8}$ " from the primary terminal.

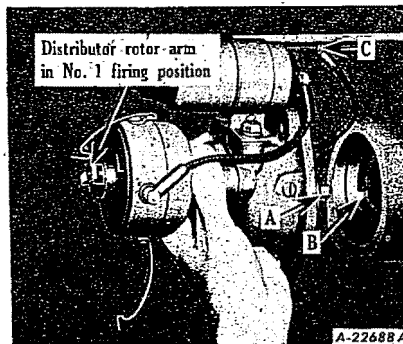
### Installing the Battery Ignition Unit

1. Place the battery ignition unit in one hand and, with the fingers of the other hand, turn the drive lugs in a clockwise direction until the rotor arm is approximately in the No. 1 firing position. See *Illust. 35*. Then continue to turn slowly and lightly until a slight resistance is felt.

2. Pull out the drive shaft to disengage the gears; then turn the shaft clockwise so drive shaft lugs "A" are approximately  $35^\circ$  past horizontal or approximately in the same position as drive shaft slots "B". See *Illust. 35A*. Engage the gears and press the drive shaft in with the palm of the hand.

3. Assemble the battery ignition unit and gasket and fasten with the mounting bolts and washers, using the mounting clip in front of the lock washer on the top bolt. Assemble the distributor cap.

4. Connect switch cable "C" (*Illust. 35A*) to the negative (—) terminal on the ignition coil.

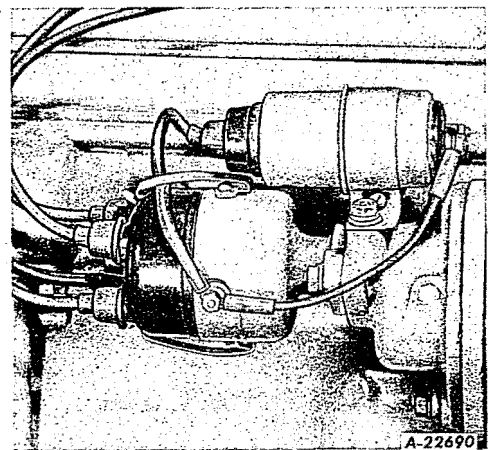


Illust. 35A

Assembling the battery ignition unit.

### Timing the Distributor to the Engine

Loosen distributor mounting bolts "B." See *Illust. 35B*. Set the engine on the No. 1 T.D.C. (top dead center) firing stroke. The secondary cable should be assembled properly in the coil terminal. Pull out the knob of the ignition switch and note if the ammeter shows discharge. If the ammeter shows discharge, the points are closed and the retarding of the distributor is not necessary. If the ammeter does not show discharge, retard the distributor by turning the body about  $30^\circ$  in the same direction as the cam rotation. Pull secondary cable "A" (*Illust. 35B*) out of the center socket on the distributor cap and hold the free end of the cable within  $\frac{1}{16}$ " to  $\frac{1}{8}$ " from the distributor primary terminal, as shown in *Illust. 35B*. Advance the distributor by turning the distributor body slowly in a direction opposite to the cam rotation until a spark occurs.



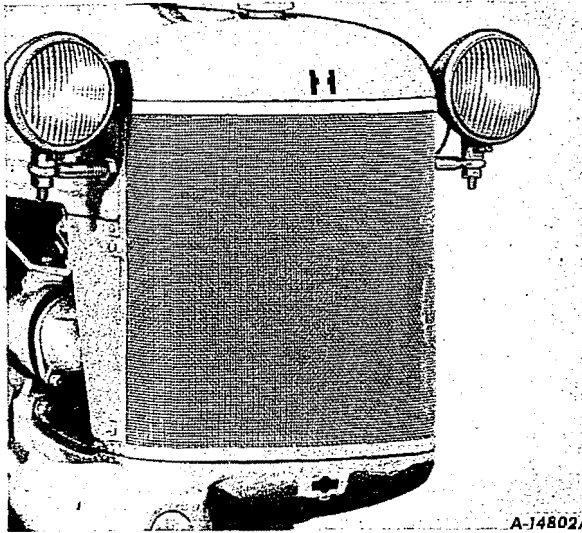
Illust. 35C

Showing the secondary cable held under the distributor cap spring for final check of timing.

# MAINTENANCE

## Starting and Lighting Equipment

(Tractors with Magneto and Voltage Regulation)

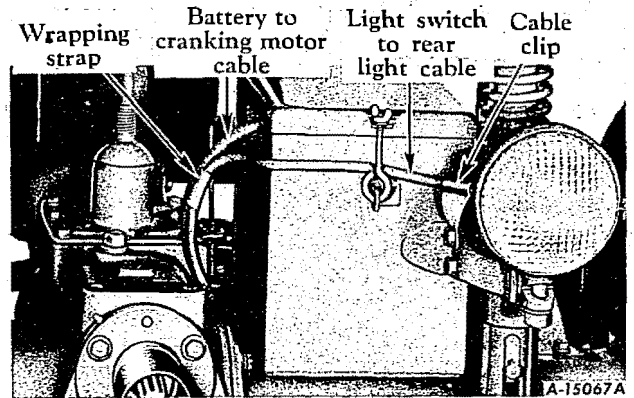


Illust. 36

Headlights and connections.

### Description

The electrical system of the tractor is a 6-volt type and consists of a generator, voltage regulator, cranking motor, lights, light switch and a 6-volt battery. The system is a single-wire type with a ground return to the battery. The cables are contained in a harness of non-metallic oil and waterproof woven braid.



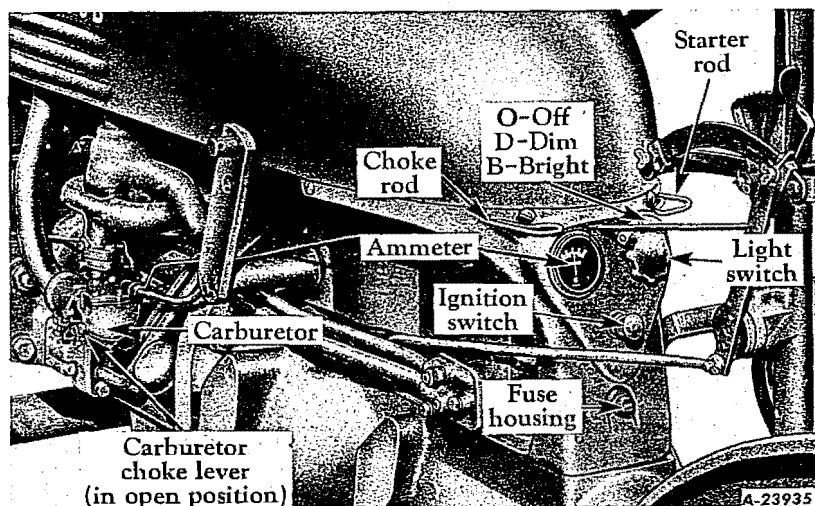
Illust. 36A

Rear light and battery box.

Use the illustrations on pages 36, 37 and 38, and the wiring diagram on page 45 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.

### Light Switch

The light switch has three positions: "O"—off position, "D"—dim lights, and "B"—bright lights.



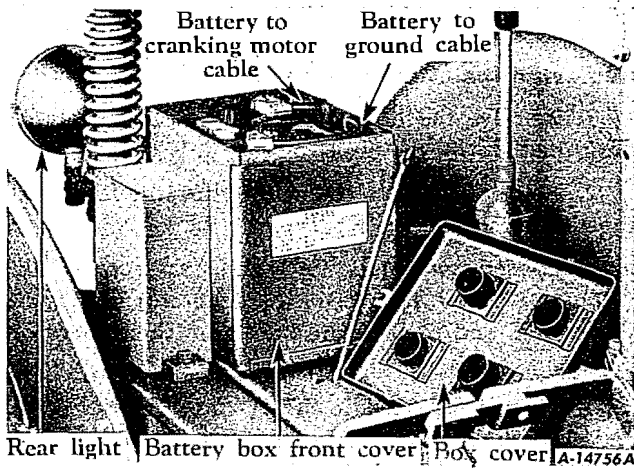
Illust. 36B

Light switch, ammeter, etc.



## MAINTENANCE

### Battery and Cables



Illust. 37

Battery and cables.

When the electrical equipment is installed at the factory, the battery ground cable (Illust. 37) is disconnected and taped. Before attempting to start the tractor, make certain that the ground cable is connected.

Before working on any part of the electrical system, disconnect the battery ground cable. See Illust. 37. Do not reconnect this cable until all electrical work has been completed. This will prevent shorting and causing damage to any of the electrical units.

### Generator and Regulator

The generator supplies current to keep the battery in a charged condition, and to replace the energy consumed by the cranking motor and lights. The generator on your tractor is sealed to prevent the entrance of dirt and moisture. It is hinge-mounted on the right side of the engine crankcase and is driven by a V-belt from the fan pulley. The generator, as received from the factory, has a fixed third brush which is set to give the maximum generator output.

The generator charging rate is controlled by a voltage regulator which controls the generator output, thereby maintaining a satisfactory charging rate, and prevents the battery from overcharging under varying temperatures and operating conditions. It should not require adjustment or attention. If the regulator fails to operate correctly, replace it with a new one or see your International Harvester dealer.

**Caution:** Do not at any time place a jumper lead between or accidentally bridge the battery terminal and the field terminal on the regulator. Serious damage to the regulator may result.

### Polarizing the Generator

If the generator or the regulator has been removed or the leads disconnected, the generator should be repolarized. After the leads have been reconnected, but before the engine is started, proceed as follows:

After making certain that the grounded battery terminal is the positive (+) one, momentarily connect a jumper lead between the "BAT" terminal of the regulator and the "A" terminal of the generator. This allows a momentary surge of current to flow through the generator which correctly polarizes it. Reversed polarity may result in vibration, arcing and burning of the relay contact points.

**Important!** Do not touch the jumper lead to the "F" terminal on the generator, as this will damage the regulator.

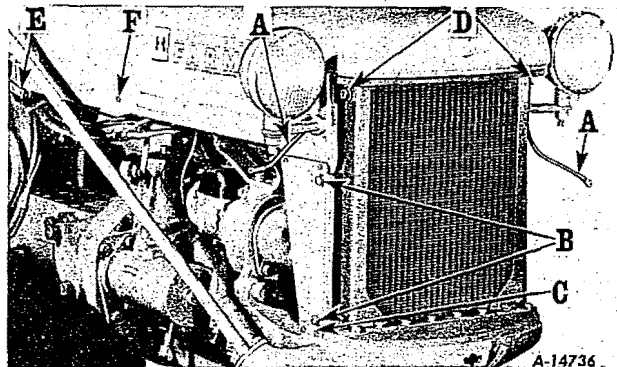
### Servicing the Generator

To service the generator other than lubrication, it is necessary to remove the hood and fuel tank assembly as described below:

### Removal of Hood and Fuel Tank

1. Remove the radiator cap, air cleaner cap and exhaust muffler (if so equipped). Disconnect each headlight cable "A" (Illust. 37A), and pull the cables through the holes in the hood.

*Continued on next page.*



Illust. 37A

Removing the hood and fuel tank.

## MAINTENANCE

2. Close the fuel strainer shut-off valve underneath the gasoline tank (*Illust. 8*) and disconnect the fuel line at the fuel strainer.

3. Remove the radiator screen by unscrewing screws "B" (*Illust. 37A*) on each side of the radiator screen. Remove screws "C" and cap screws "D" on each side of the radiator. Remove the four screws at the hood and fuel tank support "E." Remove screw "F" and allow the electrical cables to drop free from the hood.

4. Lift the hood and fuel tank assembly up and over the air cleaner pipe and exhaust pipe. Carefully place the assembly on the floor and block up the fuel tank end so as not to damage the fuel strainer or gasoline tank.

### Generator Belt Tension

Check the slack of the generator belt after every 60 hours of operation to assure maintenance of the correct tension. The belt should never be loose enough to allow slippage but should not be so tight as to cause excessive side-thrust on the generator bearing. Allow approximately  $\frac{1}{4}$ -inch slack. See *Illust. 27A*.

### Adjusting the Generator Belt

Loosen two nuts "A" and cap screw "B" (*Illusts. 38 and 38A*) and move the generator toward or away

from the engine. After getting the correct tension, tighten nuts "A" and cap screw "B."

### Removing the Generator Belt

1. Remove the hood and fuel tank assembly as described above.

2. Remove the four screws holding the fan housing to the radiator.

3. Loosen two nuts "A" and cap screw "B" (*Illusts. 38 and 38A*). Move the generator in toward the engine and remove the belt from the generator pulley.

4. Loosen fan spindle "C" (*Illusts. 38 and 38A*) and slide the fan and hub assembly to the bottom of the groove on the crankcase front cover. Remove the fan belt from the bottom drive pulley.

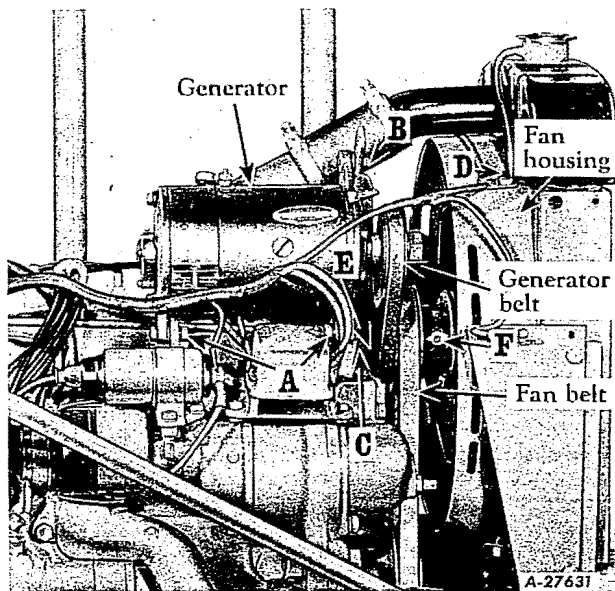
5. Set one of the fan blades in recess "D" in the fan housing (*Illust. 38*) in such a position that the fan blade will pass by the recess when raised.

6. Slide the fan and hub assembly up and out of the groove and remove the generator belt.

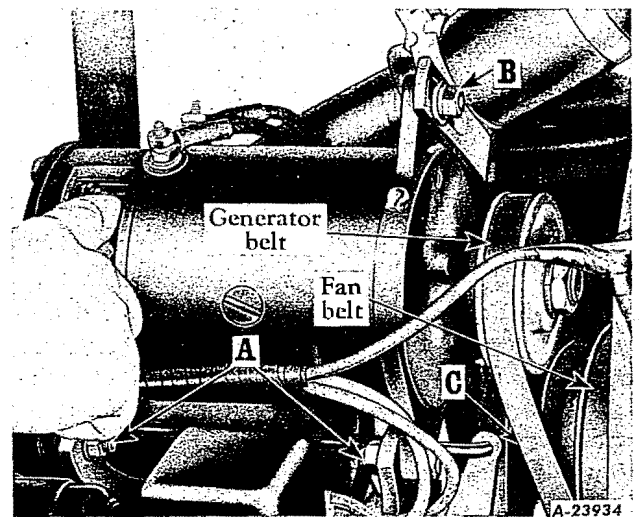
### Replacing the Generator Belt

Replace the generator belt when it becomes soaked with grease or badly worn.

When replacing the belt, reverse the procedure outlined under "Removing the Generator Belt." Before replacing the hood and fuel tank assembly, adjust the fan belt and generator belt as described on pages 27 and 28.



**Illust. 38**  
Generator belt, etc.



**Illust. 38A**  
Cleaning the generator commutator.

## MAINTENANCE

### Cleaning the Generator Commutator

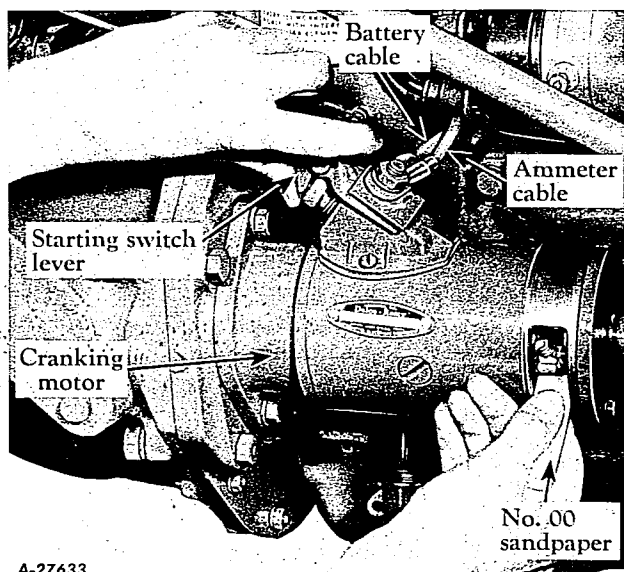
If the commutator is dirty or slightly grooved, it can be polished by placing a piece of No. 00 sandpaper on the commutator while the armature is slowly revolving. See *Illust. 38A*. Never use emery or carborundum cloth. Blow all dust from the commutator after the polishing operation is finished.

If the commutator is badly worn, rough or out-of-round it is advisable to take the unit to your International Harvester dealer, and have the commutator reconditioned.

### Generator Lubrication (2 Cups)

Follow the lubricating instructions for the generator as outlined in the "Lubrication Guide." Do not lubricate excessively, since excessive oiling may cause the oil and grease to gum on the commutator, and will result in a reduction of the generator output and increased commutator and brush wear.

*Never oil the commutator or lubricate the generator while it is in operation.*



Illust. 39

Cleaning the cranking motor commutator.

### Cranking Motor

The cranking motor is mounted on the right side of the clutch housing.

At regular intervals, remove the cranking motor commutator cover and inspect the commutator.

To clean the commutator, pull out cable "B" (*Illust. 32A*) from the magneto coil cover. Remove the cranking motor cover band. Depress the starter switch by pulling back on the starter switch lever and, with the cranking motor operating, insert a piece of No. 00 sandpaper over the commutator to clean off dirt and discoloration. See *Illust. 39*. Never use emery or carborundum cloth. Always blow out the commutator compartment after cleaning.

### Cranking Motor Lubrication

The cranking motor has oil-less type bushings at both the commutator and drive ends and requires no lubrication except when the cranking motor is removed for service repairs.

At this time it is recommended that a few drops of light engine oil be applied to both bushings.

### Removing the Cranking Motor

1. Disconnect the ground cable from the battery.
2. Remove the battery cable and the ammeter cable from the terminal on the cranking motor switch. See *Illust. 39*.
3. Remove the two cap screws which hold the cranking motor to the crankcase and lift the complete cranking motor forward and away from the engine.

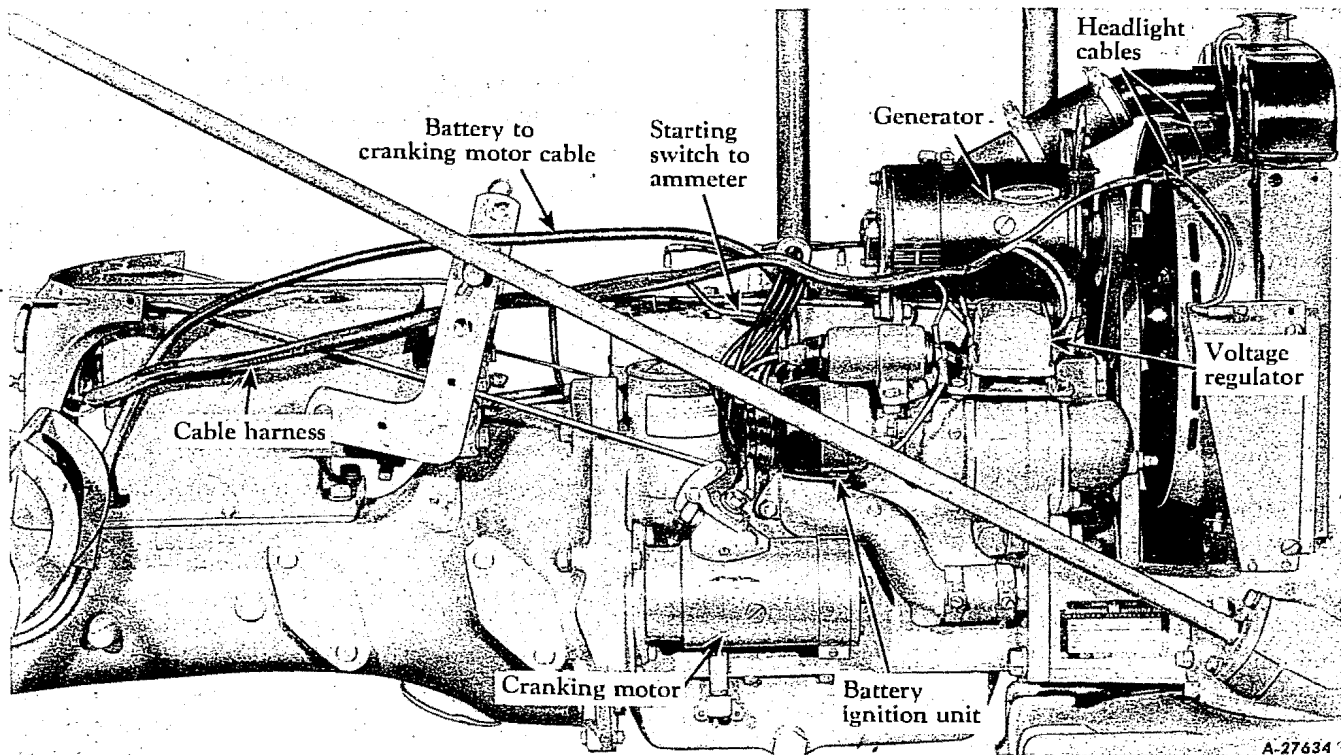
### Installing the Cranking Motor

To install the cranking motor, reverse the removal procedures.

## MAINTENANCE

### Starting and Lighting Equipment

(Tractors with Battery Ignition and Voltage Regulation)



Illust. 40

Cranking motor, generator, voltage regulator, cables, etc.

#### Description

The electrical system of the tractor is a 6-volt type and consists of a generator, voltage regulator, cranking motor, lights, light switch and a battery ignition unit with a 6-volt battery. The system is a single-wire type with a ground return to the battery.

Use *Illust. 40* and the wiring diagram on page 45 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.

When the electrical equipment is installed at the factory, the battery ground cable (*Illust. 37*) is disconnected and taped. Before attempting to start the tractor, make certain that the ground cable is connected.

#### Light Switch

The light switch has three positions: "O"—off position, "D"—dim lights, and "B"—bright lights. See *Illust. 36B*.

#### Generator and Regulator

The generator supplies current to keep the battery in a charged condition, replacing the energy consumed by the starting motor and lights. The generator on your tractor is sealed to prevent the entrance of dirt and moisture. It is hinge-mounted on the right side of the engine crankcase and is driven by a V-belt from the fan pulley. The generator, as received from the factory, has a fixed third brush which is set to give the maximum generator output.

The generator charging rate is controlled by a voltage regulator which controls the generator output, thereby maintaining a satisfactory charging rate, and prevents the battery from overcharging under varying temperatures and operating conditions. It should not require adjustment or attention. If the regulator fails to operate correctly, replace it with a new one or see your International Harvester dealer.

**Caution:** Do not at any time place a jumper lead between or accidentally bridge the battery terminal and the field terminal on the regulator. Serious damage to the regulator may result.

## MAINTENANCE

### Polarizing the Generator

If the generator or the regulator has been removed or the leads disconnected, the generator should be repolarized. After the leads have been reconnected, but before the engine is started, proceed as follows:

After making certain that the grounded battery terminal is the positive (+) one, momentarily connect a jumper lead between the "BAT" terminal of the regulator and the "A" terminal of the generator. This allows a momentary surge of current to flow through the generator which correctly polarizes it. Reversed polarity may result in vibration, arcing and burning of the relay contact points.

Important! Do not touch the jumper lead to the "F" terminal on the generator as this will damage the regulator.

### Servicing the Generator

To service the generator other than lubrication, it is necessary to remove the hood and fuel tank assembly as described below:

#### Removal of Hood and Fuel Tank

1. Remove the radiator cap, air cleaner cap and exhaust muffler (if so equipped). Disconnect each headlight cable "A" (*Illustr. 37A*) and pull the cables through the holes in the hood.

2. Close the fuel strainer shut-off valve, underneath the gasoline tank (*Illustr. 8*) and disconnect the fuel line at the fuel strainer.

3. Remove the radiator screen by unscrewing screws "B" (*Illustr. 37A*) on each side of the radiator screen. Remove the screws at "C" and cap screws "D" on each side of the radiator. Remove the four screws at the hood and fuel tank support "E." Remove screw "F" and allow the electrical cables to drop free from the hood.

4. Lift the hood and fuel tank assembly up and over the air cleaner pipe and exhaust pipe. Carefully place the assembly on the floor and block up the fuel tank end so as not to damage the fuel strainer or gasoline tank.

### Generator Belt Tension

Check the slack of the generator belt after every 60 hours of operation to assure maintenance of the correct tension. The belt should never be loose enough to allow slippage but should not be so tight as to cause excessive side-thrust on the generator bearing. Allow approximately  $\frac{1}{4}$ -inch slack. See *Illustr. 27A*.

### Adjusting the Generator Belt

Loosen two nuts "A," and cap screw "B" (*Illustr. 38*), and move the generator toward or away from the engine. After getting the correct tension, tighten nuts "A" and cap screw "B."

### Removing the Generator Belt

1. Remove the hood and fuel tank assembly as described above.

2. Remove the four screws holding the fan housing to the radiator.

3. Loosen two nuts "A" and cap screw "B" (*Illustrs. 38 and 38A*). Move the generator in toward the engine and remove the belt from the generator pulley.

4. Loosen fan spindle "C" (*Illustrs. 38 and 38A*) and slide the fan and hub assembly to the bottom of the groove on the crankcase front cover. Remove the fan belt from the bottom drive pulley.

5. Set one of the fan blades in the recess "D" in the fan housing (*Illustr. 38*) in such a position that the fan blade will pass by the recess when raised.

6. Slide the fan and hub assembly up and out of the groove and remove the generator belt.

### Replacing the Generator Belt

Replace the generator belt when it becomes soaked with grease or badly worn.

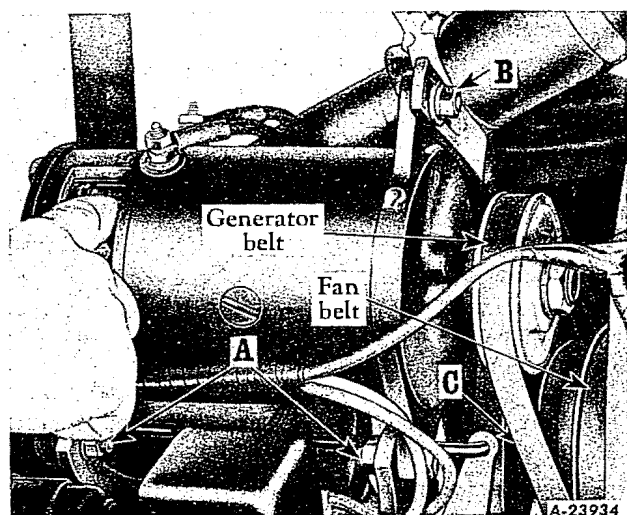
When replacing the belt, reverse the procedure outlined under "Removing the Generator Belt." Before replacing the hood and fuel tank assembly, adjust the fan belt and generator belt as described on pages 27 and 28.

## MAINTENANCE

### Cleaning the Generator Commutator

If the commutator is dirty or slightly grooved, it can be polished by placing a piece of No. 00 sandpaper on the commutator while the armature is slowly revolving. See *Illust. 42*. Never use emery or carborundum cloth. Blow all dust from the commutator after the polishing operation is finished.

If the commutator is badly worn, rough or out-of-round, it is advisable to take the unit to your International Harvester dealer and have the commutator reconditioned.



Illust. 42

Cleaning the generator commutator.

### Generator Lubrication

Follow the lubricating instructions for the generator as outlined in the "Lubrication Guide." Do not lubricate excessively, since excessive oiling may cause the oil and grease to gum on the commutator, and will result in a reduction of the generator output and increased commutator and brush wear.

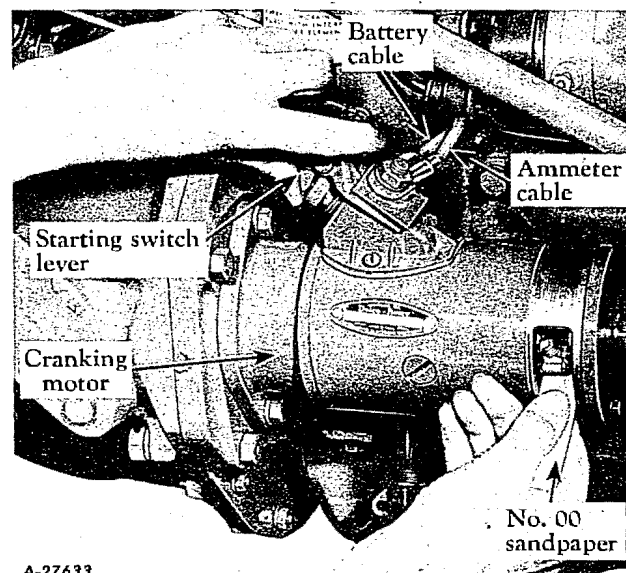
*Never oil the commutator and do not lubricate the generator while it is in operation.*

### Cranking Motor

The cranking motor is mounted on the right side of the engine crankcase, in front of the clutch housing.

At regular intervals, remove the cranking motor cover band and inspect the commutator.

### Cleaning the Cranking Motor Commutator



Illust. 42A

Cleaning the cranking motor commutator.

To clean the commutator, pull out cable "A" (*Illust. 33B*) from the center socket on the distributor cap. Remove the starting motor cover band. Depress the starter switch by pulling back on the starter switch lever and, with the starting motor operating, insert a piece of No. 00 sandpaper over the commutator to clean off dirt and discoloration. See *Illust. 42A*. Never use emery or carborundum cloth. Always blow all dust from the commutator compartment after cleaning.

### Cranking Motor Lubrication

The cranking motor has oil-less type bushings at both the commutator and drive ends, and requires no lubrication except when the cranking motor is removed for service repairs.

At this time it is recommended that a few drops of light engine oil be applied to both bushings.

### Removing the Cranking Motor

1. Disconnect the ground cable from the battery.
2. Remove the battery cable and the ammeter cable from the terminal on the cranking motor switch. See *Illust. 42A*.
3. Remove the two cap screws which hold the cranking motor to the crankcase and remove the complete cranking motor.

To install the cranking motor, reverse the removal procedures.

# MAINTENANCE

## The Fuse

A cartridge-type SFE-20 fuse is located in the housing near the bottom of the instrument panel (*Illust. 36B*). It is important to use the same capacity fuse for replacement. If the lights fail, check the fuse. If the fuse continually burns out, check the electrical wiring for short circuits.

## Lamps

Tractor lights require 6-8 volt, 32 candlepower single-contact type lamps, No. 142 309 (Trade No. 1133).

## Storage Battery

Electrical energy, obtained through chemical action, is stored in the battery to be used for starting the engine and for furnishing electric lighting. It is not the source of electricity but only a storage reservoir for use when the generator is not running. In starting, for instance, the battery supplies the energy but as soon as the engine starts, the generator output begins to replace the electricity taken from the battery.

You will receive maximum satisfactory service from your battery by closely following a few simple precautions and service operations.

A registration card is furnished with the battery. The purchaser of a new battery should take the card to the nearest authorized battery service station for registration.

Complete instructions for moist, uncharged batteries (used for export) are included with the battery.

**Cleaning and Servicing the Battery**—Battery cable terminals must be kept clean and tight. Use hot water for cleaning the top of the battery. Brighten the terminal contact surface with wire wool, and reassemble. Be sure the terminals are clamped tightly and that the battery is fastened securely in the battery box. Replace unserviceable cables. Keep the vent holes in the battery filler caps open.

**Liquid Level**—The electrolyte (acid and water) in each cell should be at star level at all times to prevent battery failure. When the electrolyte is below this level, pure, distilled water should be added. If your battery is equipped with automatic liquid leveling devices, follow the directions furnished with the battery or consult your International Harvester dealer. Never use hydrant water or any

water which has been in a metal container. Keep pure, distilled water on hand in a glass jar for battery use only. Use a clean syringe when adding water and be careful not to allow dirt or corrosive salts to enter the cells.

Acid or electrolyte should never be added except by a skilled battery man. Under no circumstances add any special battery "dopes," solutions or powders.

**Caution!** Electric storage batteries give off highly inflammable hydrogen gas when charging and continue to do so for some time after receiving a steady charge.

Do not under any circumstances allow an electric spark or an open flame near the battery. Do not lay tools across battery terminals as this may result in a spark or short circuit which may cause an explosion. Be careful to avoid spilling any electrolyte on hands or clothing.

The specific gravity of the electrolyte indicates the relative condition of the battery charge and warns when it may be necessary to recharge the battery.

Inspect the battery once every two weeks to maintain the correct specific gravity. The specific gravity of a fully charged battery is 1.255 to 1.280 corrected to +80° F. (liquid temperature). A specific gravity reading of at least 1.230 corrected to +80° F. should be maintained. Never allow the battery to fall below 1.230.

The specific gravity reading will vary with the temperature of the electrolyte. For readings taken at any temperature other than +80° F., a temperature correction must be applied. This is done by adding .004 specific gravity for every 10° above +80° F., and by subtracting .004 specific gravity for every 10° below +80° F.

### Example No. 1

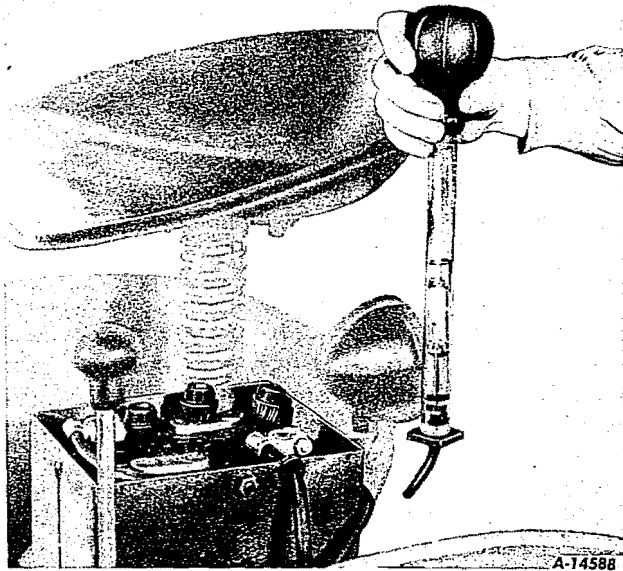
Hydrometer reading.....	1.270
Electrolyte temperature.....	+20°F.
Subtract .024 Sp. Gr.....	(.004 x 6)
Corrected Sp. Gr. is.....	1.246

### Example No. 2

Hydrometer reading.....	1.255
Electrolyte temperature.....	+100°F.
Add .008 Sp. Gr.....	(.004 x 2)
Corrected Sp. Gr. is.....	1.263

*Continued on next page.*

## MAINTENANCE



Illustr. 44

Taking a hydrometer reading of electrolyte in the battery.

Use an accurate hydrometer when testing for specific gravity. Readings should not be taken immediately after adding water. All cells should show approximately the same specific gravity reading. Wide variations indicate something is wrong.

See your International Harvester dealer or authorized battery service station.

**Battery Voltage**—With the battery fully charged and on charge at the normal rate, the average cell voltage at +80° F. ranges between 2.5 and 2.7 volts; at +100° F. between 2.4 and 2.6 volts.

**Cold Weather Operation**—It is especially important to keep the battery close to full charge for cold weather operation. Add water to the battery in freezing temperatures only when the tractor is to operate for several hours, to thoroughly mix the water and electrolyte, or damage to the battery will result from the water freezing.

The electrolyte of a battery in various stages of charge will start to freeze at temperatures indicated below:

Specific Gravity (Corrected to 80° F.)	Freezing Temperature Degrees Fahrenheit
1.230— <sup>3</sup> / <sub>4</sub> charge.....	62° F. Below zero
1.180.....	16° F. Below zero
1.130.....	5° F. Above zero
1.080.....	19° F. Above zero

The above temperatures indicate the approximate points at which the first ice crystals begin to appear in the solution. The solution does not freeze solid until a lower temperature is reached.

*Continued on page 46.*

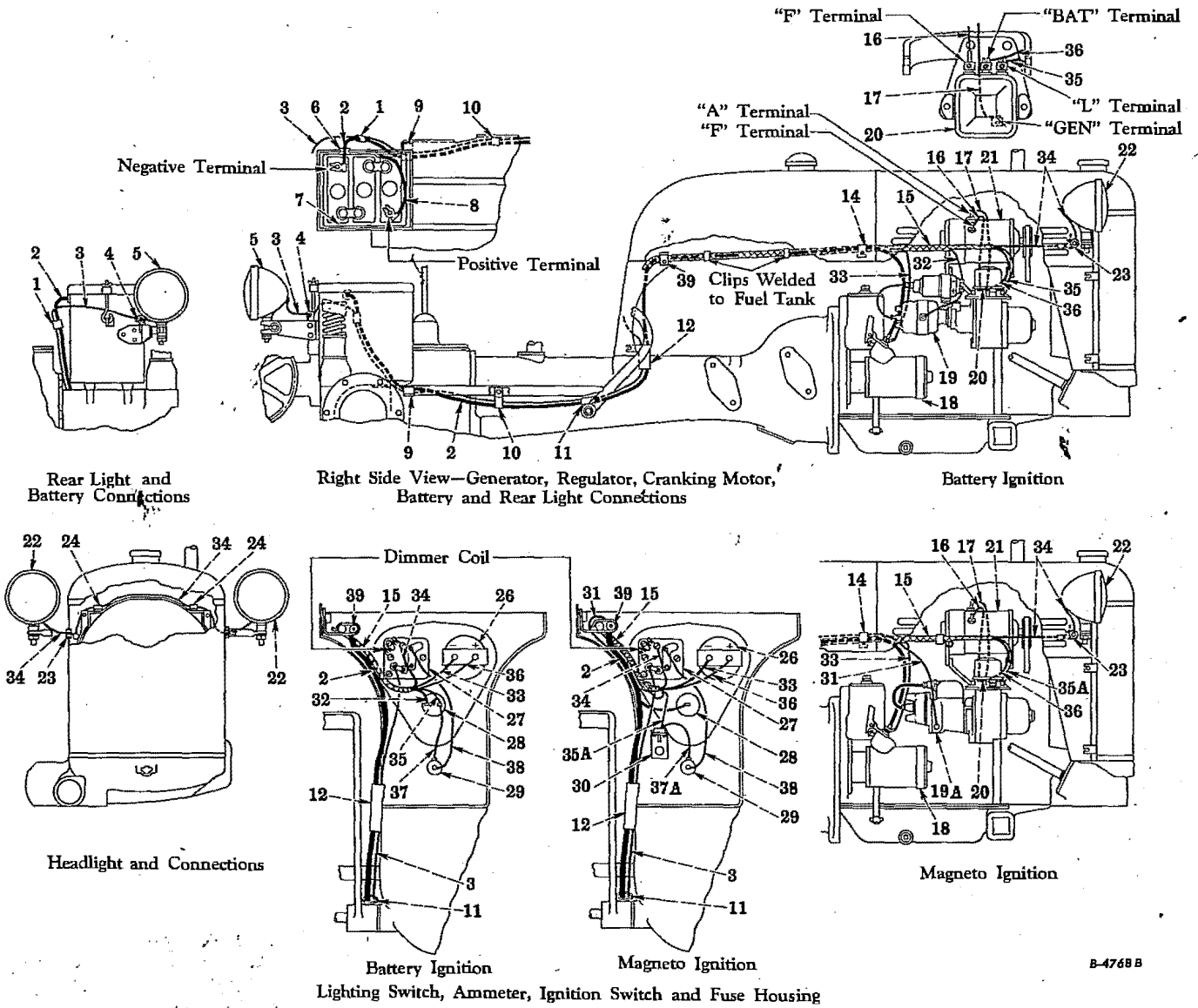
## Wiring Diagram

Index to Reference Numbers shown in illustration on opposite page.

Ref. No.	Description	Ref. No.	Description
1	Wrapping strap.	22	Headlight.
2	Cable—battery to cranking motor.	23	Grommet (in hood).
3	Cable—lighting switch to rear light.	24	Clip on upper right hand and left hand of fan housing.
4	Clip on rear light mounting bracket (upper bolt).	26	Ammeter.
5	Rear light.	27	Lighting switch.
6	Grommet—battery box.	28	Battery ignition switch.
7	Battery.	28A	Magneto ignition switch.
8	Cable—battery to ground.	29	Fuse housing.
9	Clip on rear bolt (underneath platform).	30	Junction block.
10	Clip on third bolt from rear (underneath platform).	31	Cable—magneto ignition switch to magneto.
11	Wrapping strap—between pedal and clutch housing.	32	Cable—battery ignition switch to coil (black with green tracers).
12	Clip on inside right side fuel tank support.	33	Cable—ammeter to starting switch (black).
14	Clip on inside of hood (right-hand side).	34	Cable—switch to headlight.
15	Cable harness.	35	Cable—regulator "L" terminal to switch (natural with green cross tracers).
16	Cable—generator "F" terminal to regulator "F" terminal.	35A	Cable—regulator "L" terminal to junction block.
17	Cable—generator "A" terminal to regulator "GEN" terminal.	36	Cable—regulator "BAT" terminal to ammeter (natural with black and red cross tracers).
18	Cranking motor.	37	Cable—fuse housing to ignition switch.
19	Battery ignition unit.	37A	Cable—fuse housing to junction block.
19A	Magneto.	38	Cable—fuse housing to lighting switch.
20	Voltage regulator.	39	Clip on inside edge of hood support (right-hand side).
21	Generator.		



# MAINTENANCE



B-4768 B

**Illust. 45**  
Wiring diagram for starting and lighting.

## MAINTENANCE

A battery three-fourths charged is in no danger of damage from freezing. Therefore keep the battery better than three-fourths charged, especially during winter weather.

If your tractor is not to be operated for some time during the winter months, it is advisable to remove the battery and store it in a cool dry place above freezing (+32° F.). Place the battery on a rack or bench.

Check the battery at least once a month for water level and specific gravity. If the battery shows need of charging it should be given immediate attention. Keeping the battery fully charged not only adds to its life but makes it available for instant use when needed.

When replacing a battery, make certain that the ground cable is connected to the positive (+) terminal on the battery.

Before working on any part of the electrical system, disconnect the battery ground cable. See *Illust. 37*. Do not reconnect this cable until all electrical work has been completed. This will prevent shorting and causing damage to any of the electrical units.

### Valve Clearance Adjustment

Check the valve clearance after every 400 hours of operation and adjust the clearance if necessary. A clearance of .013 inch, measured when the valves are closed and the engine is cold, is necessary between the end of the valve levers and the valve stems.

1. To safeguard against accidentally starting the engine when checking the valve clearance, remove cable "B" from the coil cover on the magneto (see *Illust. 32A*), or remove distributor to coil cable "A" from the socket on the coil of the battery ignition unit. See *Illust. 33B*.

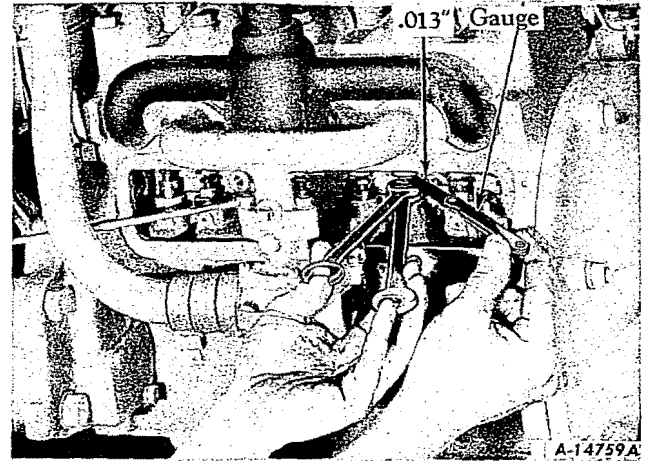
2. Remove the valve cover from the left side of the crankcase.

3. Remove the spark plug from the No. 1 cylinder (the cylinder next to the radiator).

4. Place your thumb over the spark plug opening and slowly crank the engine until an outward pressure is felt. (Pressure indicates that the No. 1 piston is moving toward the upper dead center of the compression stroke.) Continue cranking slowly until the notch on the fan drive pulley (on the crankshaft) is in line with the timing pointer in the front crankcase cover. See *Illust. 33*. Both valves are now closed on the compression stroke of the No. 1 cylinder.

5. Use two thin wrenches when adjusting the valve clearance. See *Illust. 46*. Use the lower wrench to hold the tappet and the upper wrench to raise or lower the tappet adjusting screw. A gauge of .013-in. thickness should slip snugly between the valve stem and the tappet adjusting screw.

6. Crank the engine one-half revolution at a time and check the clearance of each cylinder's



*Illust. 46*

Adjusting and checking valve clearance.

valves and adjust if necessary. Do this on each set of cylinder valves in succession according to the firing order of the engine, which is 1, 3, 4, 2.

7. Replace the valve cover. Check to see that the valve cover gasket makes an oiltight seal with the crankcase. Replace the gasket if necessary.

8. Replace magneto cable "B" (*Illust. 32A*) or distributor to coil cable "A" (*Illust. 33B*) into the socket from which it was removed.

**Important!** Be accurate—use a feeler gauge for checking the valve clearance.

### Minor Engine Service Operations

#### Cylinder Head Gasket

For most satisfactory results in tightening the cylinder head after installing a cylinder head gasket, tighten down all nuts fairly snug, starting with the row in the center, then going to the others. Retighten in the same order, giving each nut a small part of a turn at a time. Continue this until all nuts are tight. Do not screw one nut down perfectly tight and then go to the next, as you will not obtain an even pressure on the gasket in this manner.

After replacing the cylinder head, it is necessary to insure against leaks by retightening the stud nuts after engine has been operating and the water jacket has become thoroughly heated.

#### Crankshaft Bearings, Pistons and Rings

We cannot impress too strongly the necessity of having your International Harvester dealer do the work on replacement of connecting-rod bearings, crankshaft bearings, pistons and rings, and grinding valves.

# MAINTENANCE

## Engine Clutch

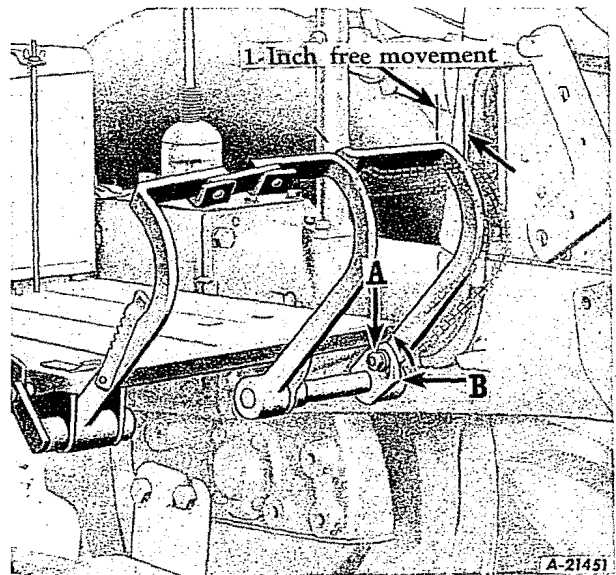
The engine is equipped with either a "Rockford" or "Atwood" clutch; both clutches are of the spring-loaded type, with  $6\frac{1}{2}$ -inch diameter single plate, and dry disc. You can determine which type is in your tractor by counting the number of pressure springs. The "Rockford" clutch has 6 pressure springs while the "Atwood" has 3 springs.

### Care of the Engine Clutch

The clutch is so designed that it requires a minimum of attention. Lubricate the clutch release bearing after every 1,000 hours of operation or at least once a year as instructed in the "Lubrication Guide" on page 22.

### Clutch Clearance

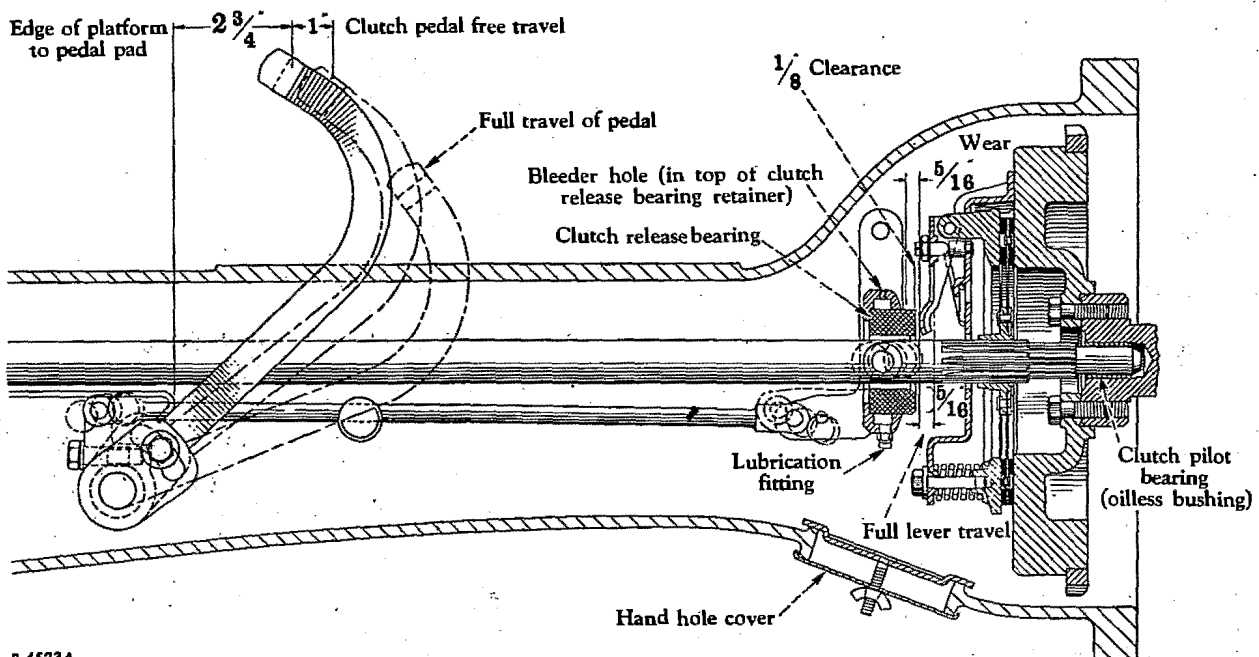
It is very important that the clutch pedal have a free movement of 1 inch (see *Illusts. 47 and 47A*), which will maintain a clearance of  $\frac{1}{8}$  inch between the clutch release bearing and the clutch release levers. As the clutch wears, this free movement decreases and adjustment should be made. The clutch may be badly damaged unless a free movement of the foot pedal is maintained.



Illust. 47

Clutch pedal adjustment.

The correct free movement can be maintained by loosening cap screw "A" (*Illust. 47*) on the outside of the clutch pedal, and rotating the slotted lever at "B" counterclockwise to a position which will give the 1-inch free pedal travel; then retighten the cap screw.

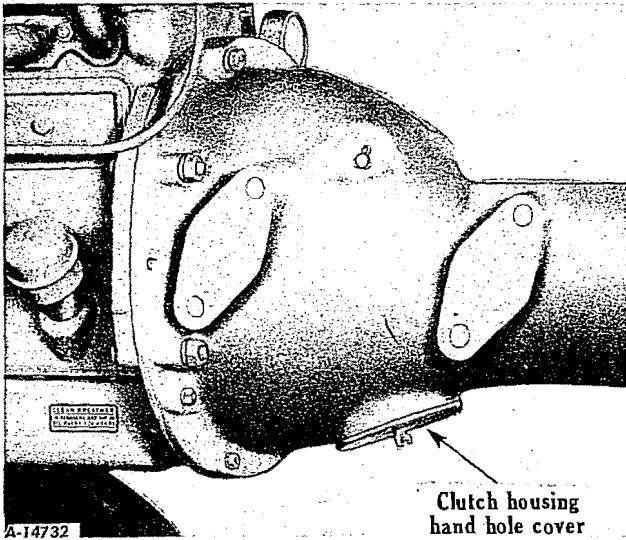


Illust. 47A

Clutch and connections.

# MAINTENANCE

## Brakes



Illust. 48

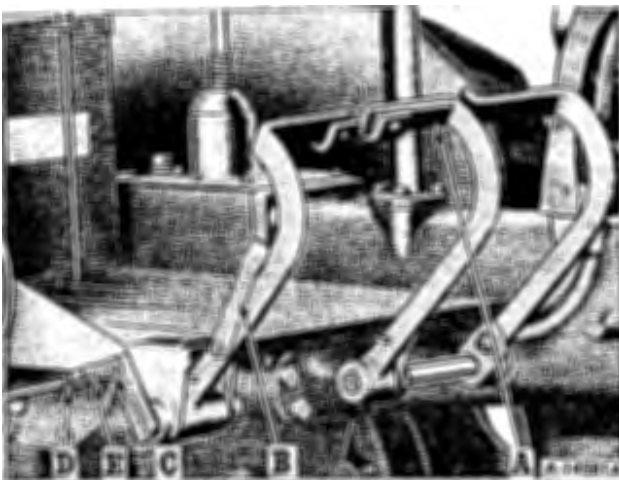
Location of clutch hand hole cover.

The brakes consist of external bands that contract on drums. The brakes are controlled by foot pedals which can be operated individually or simultaneously when locked together.

Always lock the brake pedals together with latch "A" (Illust. 48A) when traveling in high gear.

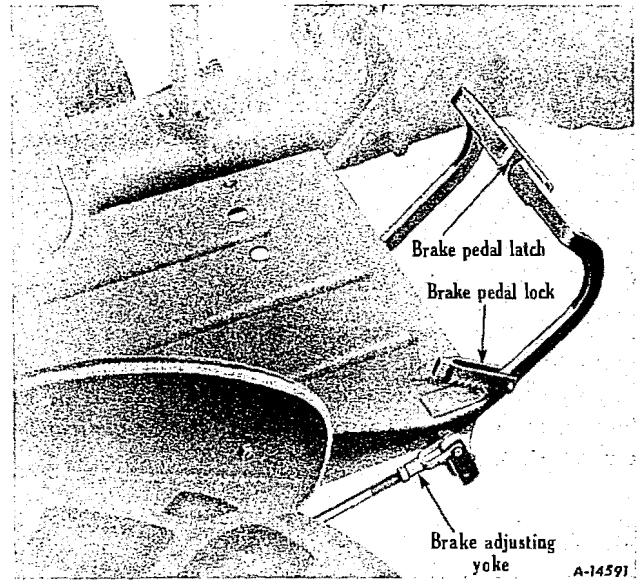
### Adjustment

To adjust the brakes, jack up the rear end of the tractor; remove pin "C" and loosen lock nut "D." Turn adjusting yoke "E" until each wheel drags slightly. See Illusts. 48A and 48B. Replace pin "C" and tighten lock nut "D" after the adjustment has been completed.



Illust. 48A

Brake pedals unlatched to assist in turning.



Illust. 48B

Brake pedals latched together and lock engaged to hold tractor in a stationary position.

It is very important that both brake pedals have the same amount of free movement to obtain brake equalization. A definite way to check equalization of brakes is to jack up both rear wheels so they will turn freely. Block the tractor securely and latch the brake pedals together; then start the engine. Operate it either in second or third speed. Application of the brakes should slow down both wheels at the same time and also tend to reduce the speed of the engine. If, when brakes are applied, one wheel stops and the other one continues to revolve, loosen the adjustment on the wheel that stops until both wheels stop simultaneously when the brakes are applied.



When tractor is pulling power equipment, be sure that all power line shielding is in place and in good order.

## MAINTENANCE

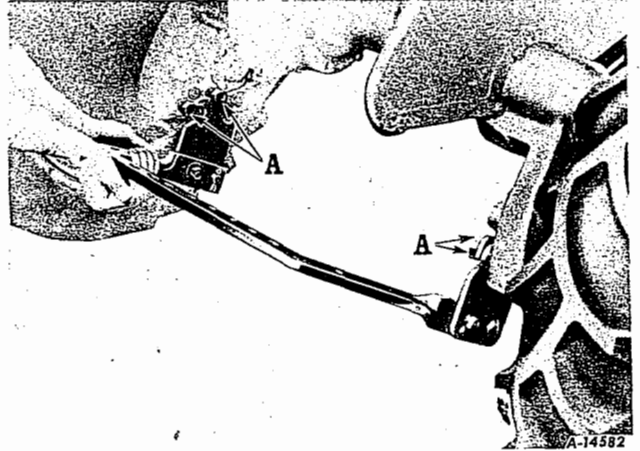
### Drawbar and Hitch

Do not attempt to pull when the drawbar is removed.  
Drawbar bolts must be kept tight.  
All hitches for trailing implements must be attached to the drawbar.

The tractor exerts its pulling power on pull-behind implements by means of the drawbar which is adjustable up and down to accommodate different hitches. Proper hitching will save both the tractor and the implement it is pulling from undue strains. Make the hitch so that the center line of pull of the tractor will fall in line with, or at least near, the center line of draft of the hitched-on implement. Hitching to one side or the other of the line of draft will cause stresses and strains on both the tractor and the implement being pulled, frequently great enough to do permanent damage. Incorrect hitching will also tend to make the tractor difficult to steer and will result in unsatisfactory work by the implement being pulled.

When using a long chain to hitch the tractor to the load, drive the tractor forward slowly until all slack is taken out of the chain.

The quick-attachable drawbar can be easily removed, or reversed and placed in the forward position. To remove the drawbar, loosen bolts "A" (Illustr. 49) and unhook the complete drawbar.



Illust. 49  
Removing the drawbar.

### Adjustment of the Drawbar

The drawbar can be set at three different heights to obtain the proper hitch position.

*Continued on next page.*



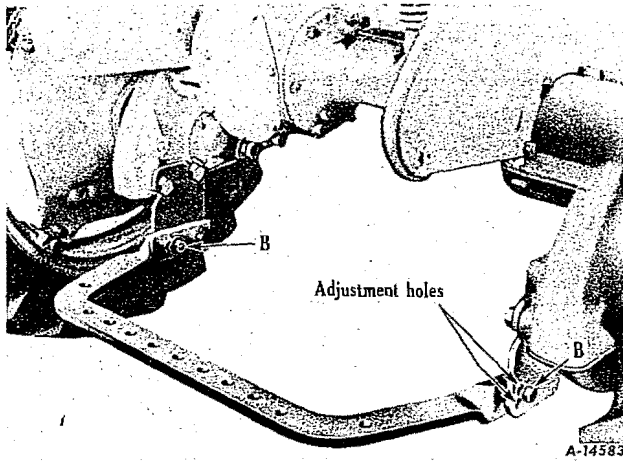
Always hitch to the tractor drawbar, and when pulling a heavy load, pull stumps, rocks, or fence posts—don't take up the slack of the chain with a jerk.



Never stand between the tractor and the drawn implement when hitching.

## MAINTENANCE

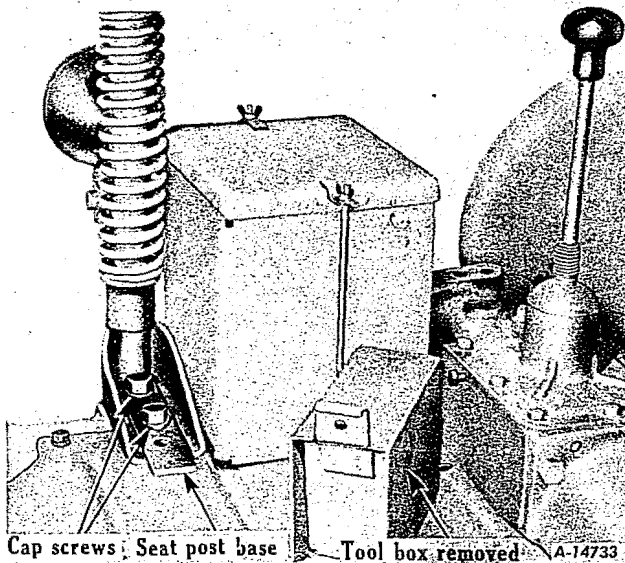
To raise or lower the drawbar, remove bolts "B" (*Illust. 50*), and raise or lower the drawbar to the upper or lower hole in the drawbar bracket. Replace bolts "B" and tighten securely.



**Illust. 50**  
Drawbar adjustment.

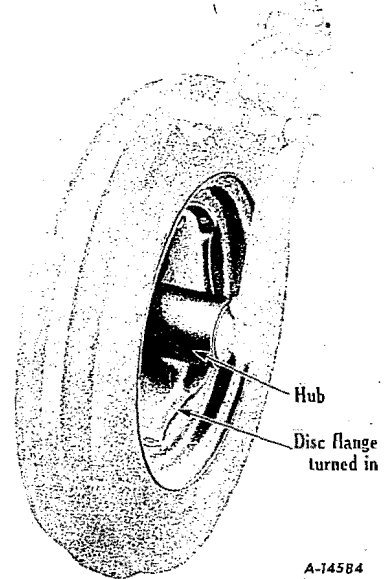
### Seat

The tractor seat can be set in either of two positions by removing the tool box and changing the position of the two cap screws in the seat post base (*Illust. 50A*), giving a total adjustment of 1½ inches. Tighten the cap screws securely when reassembling and replace the tool box.



**Illust. 50A**  
Seat set in forward position.

## Wheels

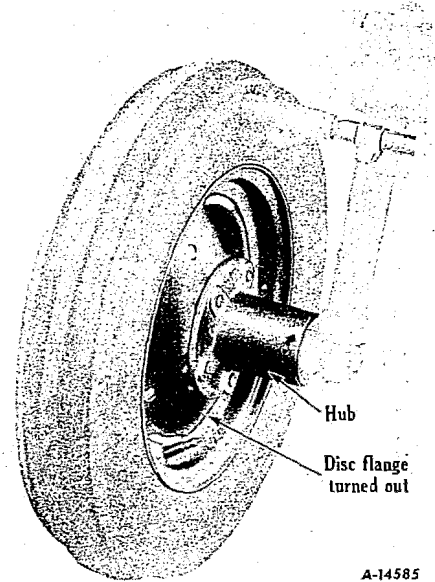


**Illust. 50B**  
Front wheel with disc flange turned in.

### Front Wheels

The front wheels are steel disc wheels with attached rims for 3.00-12 or 4.00-12 (2-ply and 4-ply) and 4.00-15 (4-ply) tractor-type tires.

Each wheel is mounted on the hub with five special bolts and may be mounted with the disc flange turned in or out to obtain different treads as described on page 51.



**Illust. 50C**  
Front wheel with disc flange turned out.

## MAINTENANCE

The hubs rotate on tapered roller bearings. An oil seal and felt washer are used at the inner end of the hubs.

**Adjusting and greasing**—The front wheels can be adjusted to treads of  $40\frac{5}{8}$  inches or  $46\frac{3}{8}$  inches. The wheels are in the  $40\frac{5}{8}$ -inch tread position when the disc flanges are turned in. See *Illust. 50B*. To obtain the  $46\frac{3}{8}$ -inch tread, reverse the wheels on the hubs so that the disc flanges are turned out. See *Illust. 50C*.

### Rear Wheels

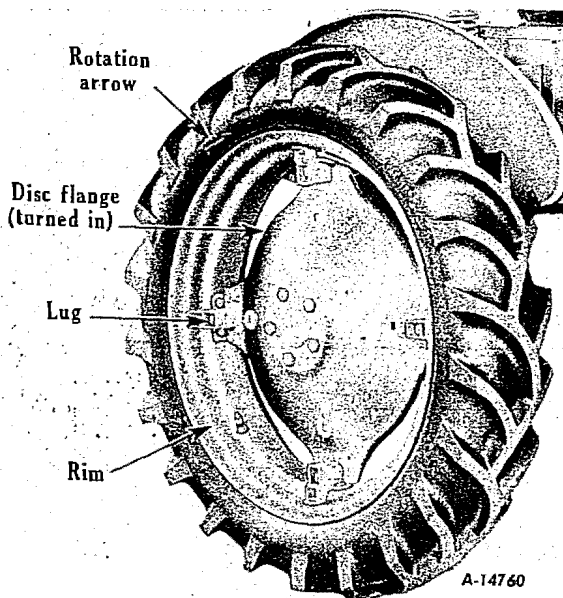
The rear wheels are steel disc wheels with demountable rims for tractor type agricultural tread tires.

**Rims**—The following rear wheel rims are available:

Rear wheel rim W5-24 for use with 6-24 (2-ply) pneumatic tires.

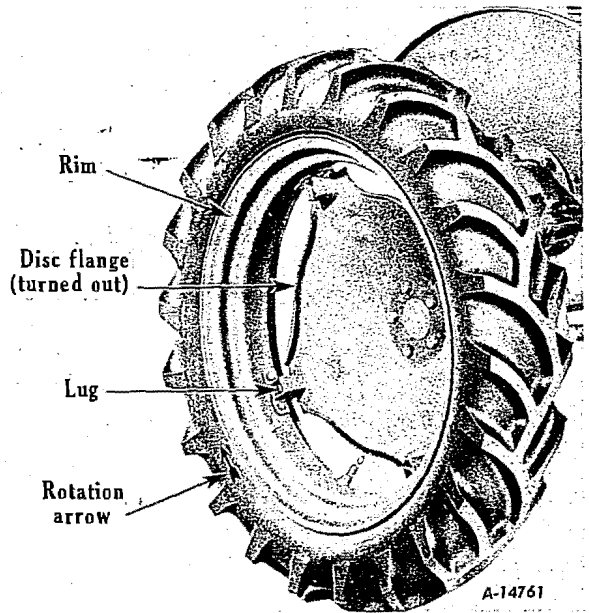
Rear wheel rim W5-30 for use with 6-30 (2-ply) and 7-30 (4-ply) pneumatic tires.

Rear wheel rim W7-24 for use with 7-24 (2-ply), 8-24 (2-ply and 4-ply) and 9-24 (4-ply) pneumatic tires.



Illust. 51

Rear wheel with disc flange turned in.



Illust. 51A

Rear wheel with disc flange turned out.

The W5-30 and W7-24 rims are furnished with the tractor when ordered.

Each wheel is mounted on the axle flange with five special bolts and may be mounted with the disc flange turned in or out to obtain, with the different rim positions, the various wheel treads as described below.

Both front and rear wheels are provided with mounting holes for the addition of cast-iron wheel weights.

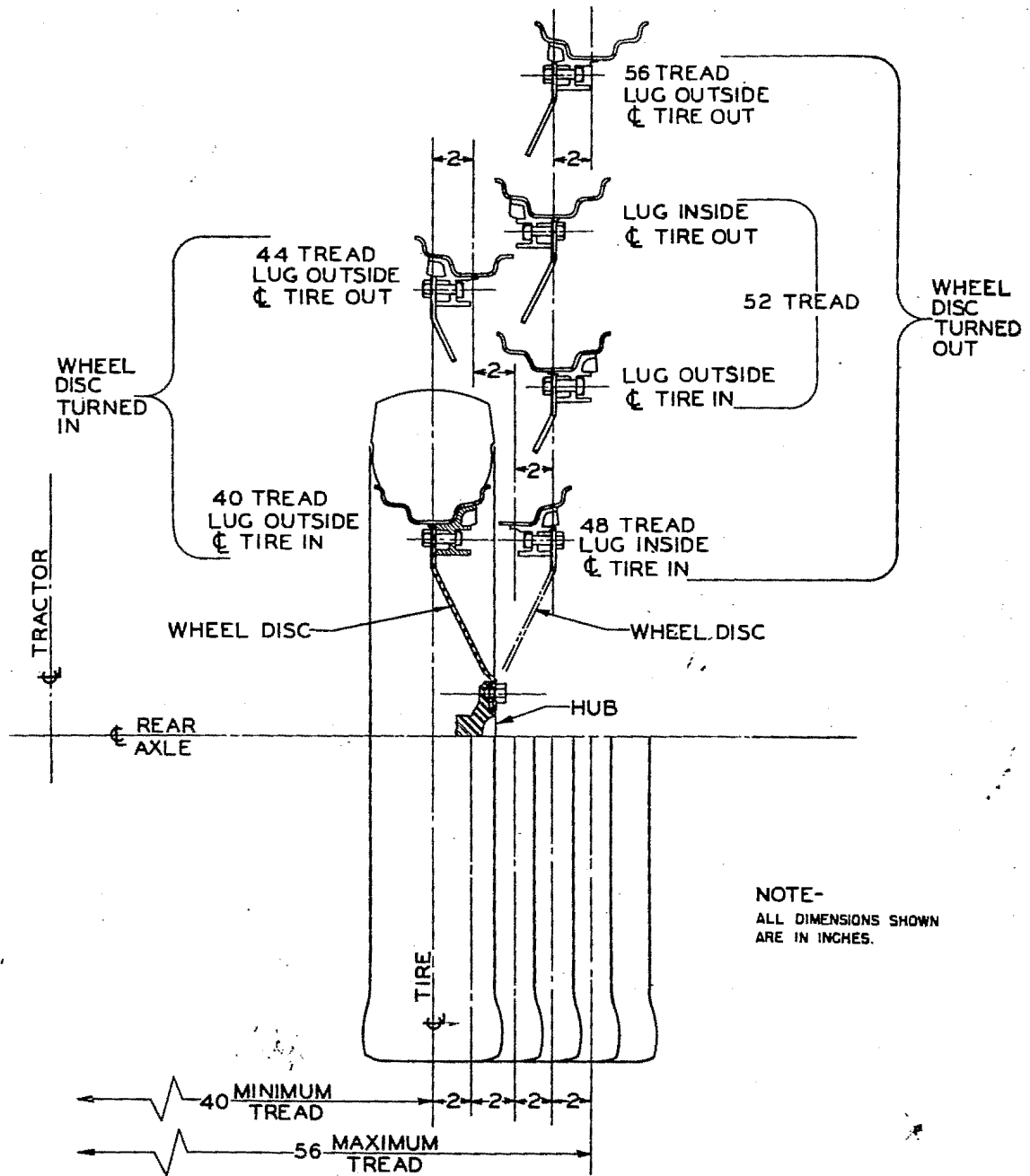
**Tread adjustment**—The rear wheels can be set in five different tread positions of 40, 44, 48, 52 or 56 inches to suit various crop spacings.

The desired tread position can be obtained by reversing the rear wheel discs and by attaching the rims to the discs in different positions as shown in *Illusts. 51, 51A and 52*.

**Note:** When the rear wheel discs or rims are reversed, make sure that the tire tread will rotate in the correct direction as shown by the arrow on the side of the tires. See *Illusts. 51 and 51A*.

When assembling discs or rims, tighten all bolts securely.

# MAINTENANCE



Illustr. 52  
Rear wheel tread positions.



## Adjustable Front Axle

If your tractor is equipped with an adjustable front axle, the front wheels can be set at treads of  $40\frac{5}{8}$ ,  $44\frac{5}{8}$ ,  $48\frac{5}{8}$ ,  $52\frac{5}{8}$  and  $56\frac{5}{8}$  inches to track with respective rear wheel tread positions.

### To Adjust the Tread Widths

1. Raise the front end of the tractor.
2. Loosen the bolts holding axle extension clamps "A."
3. Pull out the cotter pins and remove axle extension clamp pins "B." Remove the bolts from tie rod clamps "C."
4. Pull the axle extensions out an equal distance on both sides to the desired tread position and move tie rods "D" to correspond.
5. Replace axle extension clamp pins "B" in the holes selected and tighten the clamps. Also replace and tighten the bolts in the tie rod clamps.

Front wheels should have  $\frac{1}{8}$ -inch to  $\frac{1}{4}$ -inch "toe-in" ( $\frac{1}{8}$  inch closer in front than rear), measurements being taken from the inside of the front wheels at "F" and "G" respectively. See *Illust. 53*.

To adjust the "toe-in," disconnect steering knuckle arms "E" at "D," loosen the lock nuts and turn tie rod ends "D" in or out as required.

Be sure to make the arm adjustments equal.

## Pneumatic Tires

Follow the instructions and recommendations shown below in order to secure maximum life and efficient service from the pneumatic tires.

### Inflation

Keep the pneumatic tires properly inflated to the pressures shown in the chart below. Underinflation will damage the tire cord body and may cause the tire to slip on the rim and tear out the tube valve stem. Overinflation results in excessive slippage, causing rapid tire wear.

Check the air pressure once a week with an accurate low-pressure gauge having one-pound graduations. Do not allow the air pressure to drop below the recommendations.

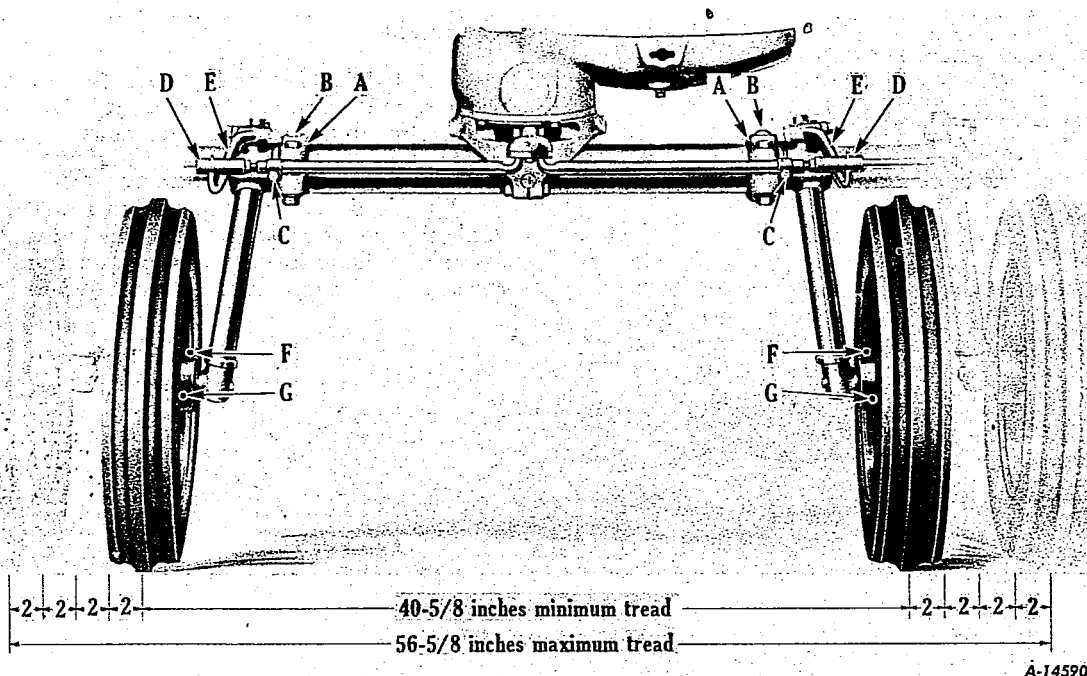
Tires can be inflated with a pressure pump, hand pump, or a spark plug pump. Spark plug pumps can be purchased from International Harvester dealers.

Always see that tire valve caps are in place and screwed tightly. The caps prevent the loss of air through the valve core, and also prevent loose soil, mud, gravel, snow, and ice from entering and damaging the valve core and air chamber in the tires.

### Shipping Tractors Equipped with Pneumatic Tires

When tractors are transported on a carrier, such as railroad cars or trailers, inflation pressures should

*Continued on next page.*



A-14590

Illust. 53

Adjustable front axle showing variable wheel treads.

## MAINTENANCE

be as follows to make possible rigid blocking and to prevent bouncing:

- All 2-ply front tires . . . . . 20 lbs.
- All 2-ply rear tires . . . . . 20 lbs.
- All 4-ply rear tires . . . . . 30 lbs.

**Important:** Deflate the rear tires to the correct operating pressure and check the front tires before the tractor is transported under its own power, towed, put into service, or placed in storage for any length of time; otherwise, the rubber will check or crack.

When towing tractors, do not exceed a speed of 20 miles per hour.

### Operating Pressure for Low-Pressure Tractor Tires

**Caution!** Adjust air pressure in tires as indicated below immediately upon receiving your tractor.

FRONT AND REAR TIRES	Lbs. Per Sq. In.	KG CM <sup>2</sup>
<b>FRONT</b>		
2-ply tires . . . . .	20	1.40
<b>REAR</b>		
2-ply tires . . . . .	12	.84
4-ply tires . . . . .	12	.84
When plowing, increase the pressure in tire on furrow wheel only to . . . . .	16	1.12
When wheel weights are used, or implements are carried on the tractor, inflation pressure must be increased; see tire and rim association schedule or contact your International Harvester dealer.		

### Mounting Tires on the Rim

After mounting a new or old tire on rim, inflate all 2-ply tires to 20 lb. and all 4-ply tires to 30 lb. pressure to seat the tire bead on the rim flange and to prevent the tire from creeping and shearing off the valve. Then deflate or inflate the tire to the correct operating pressure.

### Traction and Weights

The recommended air pressures are shown above. The tractor should not be operated with tires improperly inflated. To insure maximum hours of service, watch the tread lugs. If they wear down too fast, immediately add more weight to reduce slippage. Check for high air pressure.

See your International Harvester dealer for information.

### Wheel Weights

The drawbar pull of a tractor can be increased by the addition of weight to the driving wheels, either by adding cast-iron weights to the wheels, or by the use of liquid in the tire tube.

The amount of the increase in drawbar pull by the addition of certain definite weights varies with the type of soil. When very heavy weight is required, both liquid and cast-iron weights can be used.

### Overloading

Do not load tires beyond their rated capacity. When adding weights, consideration must be given so as not to exceed the load capacity of the tire.

After adding weight to the rear wheel it may be necessary to readjust the height of drawbar to get the correct alignment.

### Liquid Weight

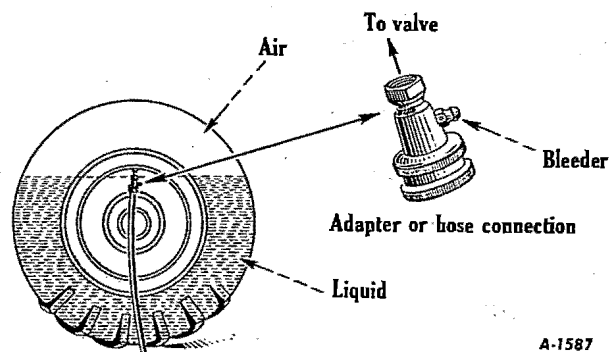
Tractor tire tubes can be filled  $\frac{3}{4}$  full with liquid, using clean water for temperatures above freezing (+32° F.). A calcium chloride solution (CaCl<sub>2</sub>) is recommended when operating in freezing temperatures.

### Methods of Putting Liquid into the Tube

Purchase an adapter (*Illust. 54*) from your International Harvester dealer. The adapter is provided with a bleeder for letting out the air displaced by the liquid.

Jack up the tractor and revolve the tire until the valve stem is on top. Remove the valve core housing and screw on the adapter; then attach a water hose to adapter.

The liquid can be injected into the tube from a tank placed at least five feet higher than the tire, by using a hand force pump or by using compressed air and a pressure tank filled with liquid.



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**Illust. 54**  
Tire three-quarters full of liquid.

## MAINTENANCE

Remove the hose and adapter; then replace the valve core housing, and inflate the tire to the correct operating pressure.

### Liquid Weight for Freezing Temperatures

Calcium chloride solution, using a 25% mixture, which is approximately 20 lb. of flaked calcium chloride to 10 U. S. gallons of water, is recommended when freezing temperatures prevail.

The strength of the solution can be checked with a battery hydrometer. A 25% solution measures approximately 1.225 specific gravity and has a freezing point of 25° F. below zero.

**Caution!** Some calcium chloride flakes have an acid reaction. It is advisable to add 1 pound of lime to each 100 pounds of calcium chloride used.

When preparing calcium chloride solution, always pour the water into the container first; then add the correct amount of calcium chloride crystals, stirring the mixture thoroughly. Never pour the water on the calcium chloride flakes. After the solution is mixed, allow it to cool before using.

### Valve Stem Mounting Cones or Nuts

Valve stem mounting cones or nuts are furnished with all rear wheel tire tubes having a valve stem for inserting liquids, and are mounted on the valve stem at the factory.

The purpose of the cone (or nut) is to hold the valve stem in the valve hole when mounting the tire, particularly when liquid is used in the tire. If the tire is mounted or the liquid inserted without the cone (or nut), the valve stem is very apt to be pulled into the rim and will require much extra work to get it through the valve hole.

### Care of Tires

Avoid stumps, stones, deep ruts and other hazards. Cuts in tires should be repaired immediately as neglect decreases the tire life.

Keep tires free from oil and grease as both destroy rubber.

After using the tractor for spraying—insect control work—wash off with water any chemicals that may be on the tires.

### Tire Protection During Storage

When not in use store the tractor so that the tires

are protected from the light. Before storing the tractor, clean the tires thoroughly. Jack up the tractor so that the load is off the tires, when it is to be out of service for a long period. If it is not jacked up, inflate the tires at regular intervals. Before putting the tractor in service, always inflate the tires to the correct operating pressures.

### Tire Chains

For wet grass or ground conditions, use lug-type chains. The flexing of the tire and creeping of chains will break the mud loose as the wheel rotates.

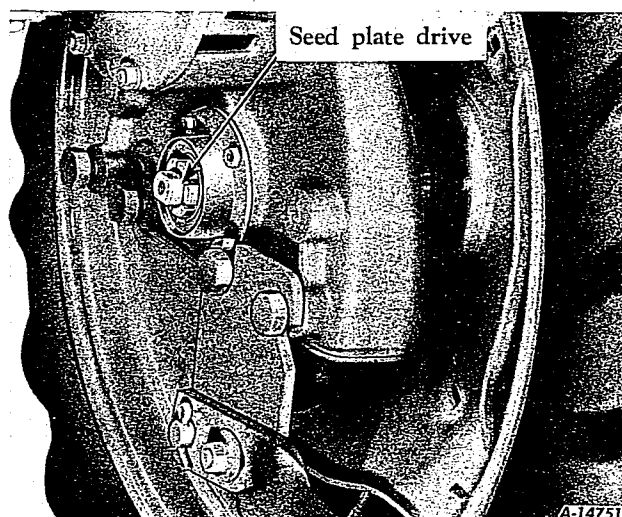
*There is a possibility of the tire slipping within the chain; to prevent this, the use of spring-type chain fasteners is recommended.*

### Static Electricity in Tractors Equipped with Pneumatic Tires Doing Belt Work

Static electricity generated by belt work can be discharged harmlessly by attaching a chain to the tractor and letting it touch the ground.

### Seed Plate Drive

The seed plate drive, located on the inner side of the right rear axle (*Illust. 55*) furnishes the power for seed planting attachments, and for sowing fertilizer. Refer to your implement book for complete instructions.



Illust. 55

Location of seed plate drive.

# MAINTENANCE

## Trouble Shooting

### Possible Cause

### Possible Remedy

#### Hard to Start

No gasoline in fuel tank or carburetor.....	Fill tank with new gasoline, open fuel shut-off valve. Check fuel lines, fuel strainer and carburetor.
Gasoline strainer or fuel lines clogged.....	Clean fuel strainer, check fuel lines and carburetor.
Impulse coupling inoperative (tractors with magneto).....	Flush with kerosene; refer to page 31.
Water in gasoline.....	Drain fuel tank and carburetor. Use new fuel and dry spark plugs; or see your dealer.
Water in cylinders.....	Check cylinder head gasket or look for clogged drain hole in exhaust manifold or muffler.
Choked improperly. Flooded engine.....	Follow starting instructions. See page 8.
Defective ignition or loose wiring.....	Check wiring, plugs, magneto, battery ignition unit, etc.; refer to pages 29 to 35.
Defective battery or cranking motor.....	Check and service; refer to page 37 or 40 or replace.
Spark plugs dirty or improper gap.....	Clean, adjust gap to .023 inch, or replace plugs.
Magneto grounded (tractors with magneto).....	Pull out on ignition switch. Check for other possible ground; also refer to "Magneto" on page 30.
Engine speed control not advanced.....	Advance lever $\frac{1}{8}$ for starting.
Lack of compression.....	See your dealer.
Flywheel ring gear teeth broken.....	See your dealer.
Too heavy grade of lubricating oil.....	Drain and refill with proper lubricant. Refer to the lubricant specifications on page 17.
Gears engaged.....	Put gearshift in neutral.
Internal seizure.....	See your dealer.

#### Engine Operates Irregular or Knocks

Engine incorrectly timed.....	Retime. See page 32 or page 35.
Spark plugs dirty; wrong gap or wrong type.....	Clean; reset gap to .023 inch or replace.
Poor or weak spark.....	Check magneto or battery ignition unit if spark is good from coil. Check distributor points and gap; spark plugs, and wiring; see page 29 or 34.
Carburetor setting incorrect.....	Adjust; see "Carburetor" on page 24.
Poor grade fuel or water in fuel.....	Drain and use a good grade of clean fuel.
Engine overheating.....	Check cooling system and fan belt; see "Engine Overheats" on page 57.
Engine valves at fault.....	Check valve clearance; or see your dealer.
Air leaks around intake manifold.....	Check gasket and tighten nuts.
Engine smokes.....	Check air cleaner oil level. Check fuel delivery at carburetor. Check for worn piston and rings; or see your dealer.
Excessive carbon in engine.....	See your dealer.
Loose piston pin or bearings.....	See your dealer.
Broken rings or loose pistons.....	See your dealer.
Worn connecting rod and main bearings.....	See your dealer.
Governor sticking or needs adjustment.....	See your dealer.

#### Lack of Power

Engine speed control lever not advanced.....	Advance engine speed control lever.
Engine cold or overheated.....	Run engine until it warms up before putting under load. Check cooling system; or see your dealer.
Engine overloaded.....	Reduce load.
Engine knocks excessively.....	Use good fuel; also check timing; or see your dealer.

## MAINTENANCE

Possible Cause	Possible Remedy
Governor not working properly.....	See your dealer.
Poor compression.....	Service valves and piston rings; or see your dealer.
Poor fuel or too lean a mixture.....	See "Carburetor" on page 24.
Fuel lines or strainer obstructed.....	Clean. See page 25.
Fuel tank air vent closed.....	Open vent in cap.
Exhaust pipe clogged.....	Clean out.
Air cleaner clogged or air leakage between carburetor and engine.....	Clean air cleaner as instructed on page 28. Tighten carburetor and manifold mounting nuts.
Too heavy oil in crankcase or air cleaner.....	Drain and refill with proper lubricant. Refer to the lubricant specifications on page 17.
Incorrect timing or faulty ignition.....	See "Magneto" (page 32) or "Battery Ignition Unit" (page 33).
Clutch slipping.....	Adjust pedal free travel (page 47); or see your dealer.
Brakes drag.....	Adjust brakes; see page 48.
Carburetor intake manifold or cylinder head intake ports restricted by carbon.....	Clean; or see your dealer.

### Engine Overheats

Cooling system clogged or limed.....	Clean system; refer to page 26; or see your dealer.
Fan belt slipping.....	Adjust or replace belt; refer to page 27.
Insufficient water in cooling system.....	Fill radiator to proper level; refer to page 26.
Radiator cores clogged.....	Remove all chaff or dirt from the radiator grille, clean with a hose if available.
Wrong kind of fuel.....	Change to a good grade of gasoline.
Carburetor improperly set.....	See "Carburetor" on page 24.
Timing incorrect.....	See "Magneto" on page 32 or "Battery Ignition Unit" on page 33.
Breaker point gap incorrect.....	Adjust gap; see "Magneto" on page 30 or "Battery Ignition Unit" on page 33.
Excess load.....	Reduce load.
Excess carbon in engine.....	See your dealer.

### No Oil Pressure, Too High or Too Low

Defective oil gauge.....	Replace; or see your dealer.
Wrong grade, diluted or insufficient oil.....	Refer to lubricant specifications on page 17. Check oil level; if diluted, replace with fresh oil, refer to operating instructions.
Broken, loose or plugged oil lines.....	Clean and tighten; or see your dealer.
Low oil level in crankcase.....	Add oil; refer to "Lubrication Guide." Check for oil leak.
Defective or dirty oil pressure regulating valve.....	See your dealer.
Oil pump strainer clogged or pump not working.....	Clean as instructed on page 14; or see your dealer.
Worn bearings.....	See your dealer.

### Oil Dilution or Uses Too Much Oil

Incorrect grade of oil.....	Refer to lubricant specifications on page 17.
Leaks in oil lines or filter, or oil pan plug or gasket.....	Check and tighten; or see your dealer.
Worn piston or oil rings.....	See your dealer.
Loose connecting rod bearings.....	See your dealer.
Long engine idling.....	Stop engine.
Engine overheating or too cold.....	Refer to "Lack of Power" and "Engine Overheats" on pages 56 and 57.
Engine speed too high.....	See your dealer.
Crankcase breather clogged.....	Clean screen in top of oil level gauge; see page 14.

## MAINTENANCE

### Possible Cause

### Possible Remedy

#### Using Too Much Fuel

Fuel mixture too rich. Carburetor out of adjustment...	Check choke <i>and see "Carburetor" on page 24.</i>
Fuel leaks.....	Tighten or replace fuel lines or fuel strainer gasket.
Poor grade of fuel.....	Use a good grade of gasoline.
Choke closed.....	Investigate for choke not operating.
Engine overloaded.....	Reduce load or shift to lower speed.
Poor compression.....	See your dealer.
Faulty ignition.....	<i>Refer to pages 29 to 45.</i>
Engine not operating at proper temperature.....	Check cooling system. Check lubricating oil; or see your dealer.
Air cleaner clogged.....	Service air cleaner; <i>see page 28.</i>
Incorrect grade or amount of lubricating oil.....	<i>Refer to the lubricant specifications on page 17; keep the oil up to the proper level.</i>

#### No Fuel at Carburetor

Fuel low in tank.....	Fill fuel tank and check fuel lines.
Air vent hole in fuel tank cap plugged up.....	Clean out vent hole.
Fuel valve closed or partly open.....	Open valve; <i>see the starting instructions on page 8.</i>
Dirty or clogged fuel strainer screen or line.....	Clean <i>as instructed on page 25.</i>

#### Ignition and Electrical

Wrong kind, old, cracked, dirty, or poorly set spark plugs.....	Clean and set gap to .023 inch, or replace with new one.
Loose wiring or improper connections.....	Check wiring to see that all connections are clean and tight. <i>See pages 29 to 45.</i>
Magneto or battery ignition unit not timed correctly...	Retime <i>as instructed on page 32 or 35.</i>
Distributor cap or rotor or breaker chamber dirty....	Clean <i>as instructed on page 31 or 34.</i>
Distributor brush broken.....	Replace brush; or see your dealer.
Breaker points dirty, pitted or improperly set.....	Clean and reset gap or replace with new. <i>See page 30 or 33.</i>
Breaker arm stuck, weak or broken spring.....	Check and replace. <i>See page 30 or 33.</i>
Impulse coupling dirty (tractors with magneto).....	Clean and lubricate <i>as instructed on page 31.</i>
Battery defective, low charge or loose connections....	Recharge, clean and tighten cable lugs or replace with new, check ground cable; <i>see pages 43 to 45.</i>
Cranking motor failure.....	Replace; or see your dealer.
Generator inoperative.....	Check commutator, check brushes ( <i>page 39 or 42</i> ); or see your dealer.
Generator relay or voltage regulator.....	See your dealer.
Ammeter inoperative.....	Replace ammeter; or see your dealer.
Lights will not burn.....	Check battery ground cable. Turn on switch, replace lamps, replace fuse, recharge battery, check wiring and generator; or see your dealer.
Lights burn dim.....	Turn switch to bright. Recharge battery, tighten cable terminals, check lamps, clean contacts.

#### Brakes

Do not hold.....	Adjust brakes ( <i>page 48</i> ) or new lining needed; or see your dealer.
Drag or uneven.....	Adjust brakes. <i>See page 48.</i>
Grease on lining.....	Replace lining; or see your dealer.
Return spring broken.....	Replace.
Do not release.....	Release brake lock. Be sure that the left-hand brake cross shaft is free to turn.

## MAINTENANCE

Possible Cause

Possible Remedy

### Transmission, Belt Pulley and Power Take-Off

Hard to shift gears.....	Use correct grade of lubricant. <i>See page 17.</i>
Shifter fork or lever defective.....	Replace; or see your dealer.
Engine clutch drags.....	Refer under "Lack of Power."
Gears clashing.....	Stop tractor and disengage clutch before shifting gears.
Gears slipping out of mesh.....	See your dealer.
Noisy.....	Check oil level, use proper grade lubricant; or see your dealer.
Damaged parts.....	See your dealer.

### Rear Wheels

Do not turn.....	Release brake lock. Transmission, differential or clutch faulty. Refer to "Transmission, Belt Pulley and Power Take-Off"; or see your dealer.
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### Front Wheels

Too tight or too loose.....	Check lubricant in bearings, check bearing adjustment; <i>see page 16.</i>
Lubricant leakage.....	Check oil seal; or see your dealer.

### Steering

Faulty.....	Check steering worm and gear, check front axle adjustment. <i>See page 53.</i> Check lubricant in front wheel. Check tire inflation; or see your dealer.
Defective front axle.....	Inspect linkage, check and replace faulty parts; or see your dealer.
Tractor turns to one side.....	Check and adjust brakes evenly. <i>See page 50.</i> Check pneumatic tire air pressures. Check front axle adjustment; <i>see page 53.</i>

### Pneumatic Tires

Excessive or uneven wear.....	Check for toe-in. <i>See page 53.</i> Check air pressure and check load on tires. <i>See page 54.</i>
Slippage, rear tire.....	Add more weight, and check for high pressure. <i>See page 54.</i> If tread is badly worn tires may slip more readily. Replace with new tires or use lug-type chains.

### Farmall Touch Control System

*See detailed instructions on pages 69 to 71; or see your dealer.*

# STORING AND HOUSING YOUR TRACTOR

## Storing and Housing Your Tractor

When your tractor is not to be used for a period of time, it should be stored in a dry and protected place. To leave equipment outdoors, exposed to the elements, will result in materially shortening the life of the machine.

Follow the procedure outlined below when your tractor is placed in storage, and repeat the lubrication precautions every six months thereafter. We also recommend caution to be practiced in starting an engine that has been in storage.

1. Wash or clean and completely lubricate the tractor (*refer to "Lubrication Guide"*).
2. Drain and flush the cooling system.
3. Tractors with magneto: Oil the magneto impulse coupling liberally with kerosene.
4. After the engine has cooled off, remove the spark plugs and pour one tablespoon of SAE-50 lubricating oil of a good grade into each cylinder. Crank the engine 2 or 3 times to distribute oil over the cylinder walls.
5. Remove valve cover; flush valves and push rods with SAE-50 oil. (If any evidence of rust is found, remove it before lubricating.) Replace the valve cover.
6. Plug up the end of the exhaust pipe.
7. Remove the oil filter element. (If any evidence of rust is found on the center stud, clean it thoroughly.) Replace the old filter element with a new one and flush out any sludge from filter base *as instructed on page 15*.
8. Drain the fuel from the fuel tank and carburetor, and clean out the fuel strainer glass bowl.

**Caution:** Gum will eventually form in tanks, lines and carburetor if unit is not used. Gum in carburetor jets and passages affects engine starting. Gum can be dissolved with acetone or a 50-50 mixture of alcohol and benzol.

9. If the tractor is equipped with a storage battery, remove the battery and place it on a rack in a cool room and check the battery at least once a month for water level and specific gravity. *See page 43.*

## Starting Engines That Have Been in Storage

1. Remove the spark plugs and pour a mixture of one-half gasoline and one-half light lubricating oil into each cylinder (2 tablespoonfuls per cylinder is enough).
2. Remove the valve cover, and flush the valve and valve operating mechanism with the same mixture.
3. Crank the engine rapidly until excess oil has been blown out of the spark plug holes. This operation will loosen any tight piston rings and wash old gummy oil from valves and pistons.
4. Tractors with magneto: Flush out the impulse coupling with kerosene and lubricate as specified.
5. Drain the crankcase and flush out with kerosene or flushing oil and fill with the specified lubricating oil. *See "Lubrication Guide."*
6. Be sure the lubricating oil filter has a new element before starting the engine.
7. Remove the exhaust pipe plug.
8. Install the spark plugs after cleaning and setting gaps.
9. Fill the water cooling system.
10. Fill the fuel tank.
11. Install a fully charged battery (if used) and be sure the proper connections are made.
12. Clean the air cleaner and refill the oil cup.
13. Start the engine and let it run slowly; observe if any valves are sticking. If so, pour a small quantity of kerosene on the valve stem until loose.
14. Assemble the valve cover.

**Caution!** Do not accelerate the engine rapidly or operate at high speed immediately after starting.



# SPECIAL EQUIPMENT

The Farmall Cub tractor is used for so many different types of work and is called on to operate under so many different conditions that a considerable variety of special equipment is necessary to adapt it to the varied requirements of the user.

The tractor, as regularly supplied, is equipped to perform straight drawbar work. Beyond that the special equipment requirements are so diverse that it is impractical to include any such equipment regularly on the tractor. In many cases you would be paying for equipment you do not need or want.

These special attachments can be installed on the tractor at any time, and once installed become a permanent part of your tractor.

Below is an index of the special equipment available. The instructions for operating and maintaining these attachments have been incorporated into the instructions for operating and maintaining the tractor. Supplemental information will be found in the following pages. You are urged to read and study this information in order to assure satisfactory service.

Special equipment must not be ordered from this manual. To order attachments, consult your International Harvester dealer, giving the tractor and engine serial numbers.

TYPES OF EQUIPMENT	ATTACHMENT NUMBER	PAGE NO.
Belt Pulley and Power Take-Off.....	351 233 R91	62, 63
Belt Pulley (tractors equipped with power take-off attachment).....	351 441 R91	62
Combination Rear Light and Tail Light.....	355 914 R91	66
De Luxe Upholstered Seat .....	357 544 R91	67
Detachable Seat Pad.....	351 440 R92	67
Electric Starting and Lighting.....	351 301 R93	66
Engine Hour Meter (tractors equipped with starting and lighting).....	356 735 R91	66
Exhaust Muffler.....	351 435 R92	65
Front Axle, Adjustable.....	351 389 R91	65
Front Wheel Weight, First.....	351 368 R91	63
Front Wheel Weight, Second.....	351 369 R91	63
High Clearance Attachment (tractors equipped with adjustable front axle).....	355 062 R91	66
Power Take-Off.....	351 234 R91	62
Rear Wheel Weight, First.....	351 372 R91	63, 64
Rear Wheel Weight, Second.....	351 373 R91	63, 64
Spark Arrester.....	351 642 R92	65
Swinging Drawbar.....	351 429 R91	65
Tire Pump (Enginair) for Pneumatic Tires.....	39 604 DA	64
Tire Pump (Schrader) for Pneumatic Tires.....	39 622 D	64
Tire Pump Kit (Schrader) for Pneumatic Tires.....	350 342 R91	64
Touch-Control System.....	354 396 R93	68, 69
Upholstered Seat.....	351 960 R93	67

## Belt Pulley and Power Take-Off

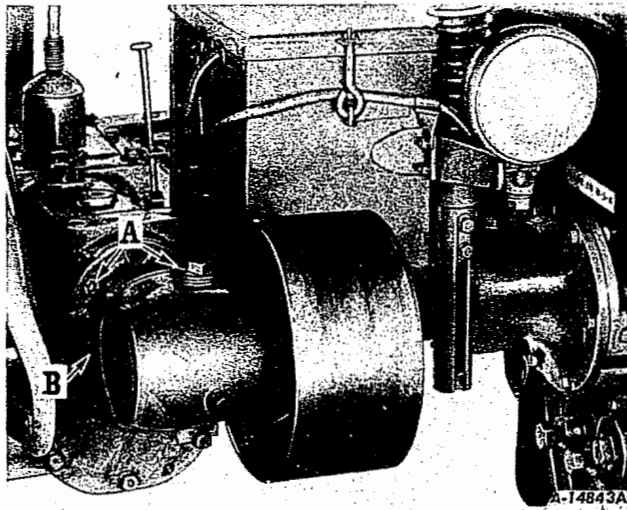
The power take-off attachment, mounted on the back of the transmission case, extends the power of the engine to the rear of the tractor for operating the mower mechanism or the mechanism of other power-driven implements that will fit the Farmall Cub. The power take-off shaft projects through the rear of the differential housing, and is driven by the transmission drive shaft. The power take-off shifter lever engages and disengages the power take-off shaft from the transmission drive shaft; the engine clutch should always be disengaged before moving this shifter lever. The power take-off has a speed of 1,600 r.p.m.

The belt pulley attachment, mounted on the power take-off, increases Cub utility by making the power of the tractor engine available for the operation of belt-driven machines such as corn shellers, feed grinders and hammer mills. The belt pulley is driven by the power take-off shaft.

The regular pulley has a 9-inch diameter with a  $4\frac{1}{2}$ -inch face. Shaft speed is 1,322 r.p.m. under full load, which gives a belt speed of 3,114 feet per minute. The low idle speed is 392 r.p.m. and the fast idle speed is 1,487 r.p.m. (no load). Two other pulleys are available if desired. See specifications on page 63.

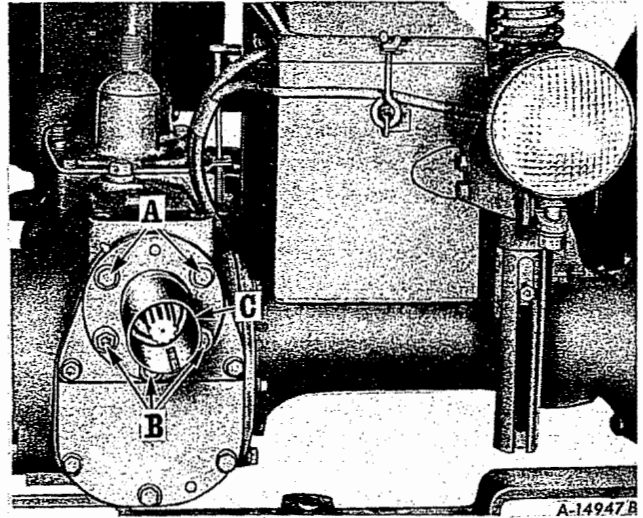
The belt pulley and power take-off is available as a unit or the power take-off is available separately. The belt pulley attachment is also supplied separately for tractors that are already equipped with a power take-off attachment.

The instructions for operating the belt pulley and power take-off attachments are on page 13. For lubrication see pages 20 and 21.



Illust. 62

Belt pulley and power take-off assembled on tractor.



Illust. 62A

Power take-off assembled on tractor.

### To Change from Belt Pulley Work to Power Take-Off Work

Remove two  $\frac{3}{8}$  N.C. x  $1\frac{1}{8}$ -inch cap screws "A" (Illust. 62) and three  $\frac{3}{8}$  N.C. x  $1\frac{1}{8}$ -inch cap screws "B" and remove the belt pulley and housing, complete. Set the belt pulley and cap screws aside for future use.

Replace the removed cap screws with the extra cap screws supplied with the belt pulley and power take-off attachment. Use the two  $\frac{3}{8}$  N.C. x  $1\frac{1}{8}$ -inch cap screws at "A" (Illust. 62A) and the three  $\frac{3}{8}$  N.C. x  $1\frac{1}{8}$ -inch cap screws at "B." Use the flat washers and lock washers provided with the cap screws and tighten securely.

Always cover the power take-off exposed shaft with the guard "C" (Illust. 62A) when the power take-off is not being used.

The power take-off shaft speed is 1,600 r.p.m. (counterclockwise rotation).

### To Change from Power Take-Off Work to Belt Pulley Work

Remove two  $\frac{3}{8}$  N.C. x  $1\frac{1}{8}$ -inch cap screws "A" (Illust. 62A) and the three  $\frac{3}{8}$  N.C. x  $1\frac{1}{8}$ -inch cap screws at "B." Apply a light coating of grease to the power take-off shaft and female spline in the belt pulley housing. Then slide the belt pulley and housing complete on to the power take-off splined shaft.

## SPECIAL EQUIPMENT

Insert the two  $\frac{3}{8}$  N.C. x  $1\frac{5}{8}$ -inch cap screws with lock washers at "A" (Illustr. 62) and the three  $\frac{3}{8}$  N.C. x  $1\frac{3}{8}$ -inch cap screws with lock washers at "B" and tighten all cap screws securely.

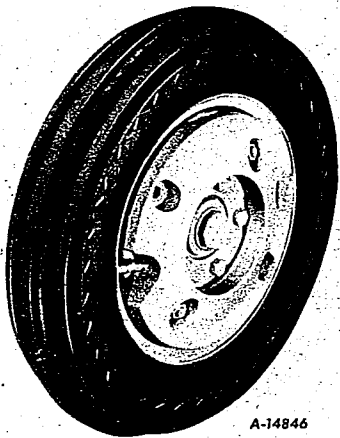
Check the lubricant in the belt pulley housing as instructed in "Lubrication Guide" on page 21.

Static electricity in tractors equipped with pneumatic tires doing belt work — The static electricity generated by belt work can be discharged harmlessly by attaching a chain to the tractor and letting it touch the ground.

### Belt Pulley Specifications

Diameter (Inches)	Face Width (Inches)	Pulley Speed (R.P.M.)	Belt Speed (Feet per Minute)
*9	4 $\frac{1}{2}$	1,322	3,114
7 $\frac{5}{8}$	4 $\frac{1}{2}$	1,322	2,638
6	4 $\frac{1}{2}$	1,322	2,050

\*Regularly supplied with belt pulley attachment.



Illustr. 63

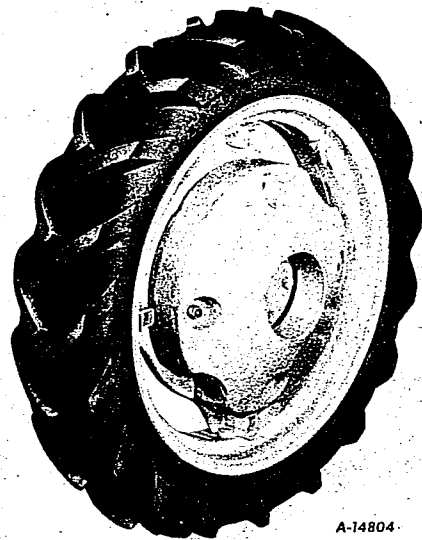
First front wheel weight mounted on wheel.

### Front Wheel Weights

The front wheel weights weigh approximately 30 pounds each, and either one or two can be attached to each front wheel. To increase steerability, front wheel weights are recommended for use as a front end counterbalance whenever heavy loads are superimposed on the drawbar, or when heavy equipment is to be mounted on the rear end of the tractor. The front wheel weight attachment includes a set of two weights and the necessary attaching bolts, nuts and lock washers. If additional weight is desired, a second set of weights is available for attaching to the first weights.

### Rear Wheel Weights

Rear wheel weights, weighing approximately 150 pounds each, can be attached to each drive wheel to reduce slippage and increase drawbar pull. Either one or two weights can be attached to each drive wheel. The increase in drawbar pull, with the proportionate reduction of slippage, varies with the type of soil. The rear wheel weight attachment includes a set of two weights with the necessary attaching bolts, nuts and lock washers. If additional weight is desired, a second set of weights is available for attaching to the first weights.



Illustr. 63A

First rear wheel weight mounted on wheel.

## SPECIAL EQUIPMENT

Before attaching the second rear wheel weights, it is necessary to remove two bolts from each first weight and replace them with the longer bolts provided with the second weights.

If the second weights are removed, replace the two shorter bolts in each first weight.



Illust. 64

First and second rear wheel weights mounted on wheel.

## Pneumatic Tire Pumps

### Enginair or Schrader

These tire pumps are useful where air service is not easily obtained. They may be used for inflating tractor, truck, or automobile tires.

**Note:** These tire pumps may be used with any carbureted type engine, but they cannot be used on diesel engines. The tire pumps also are available for various spark plug thread sizes. Specify the size of spark plug thread when ordering.

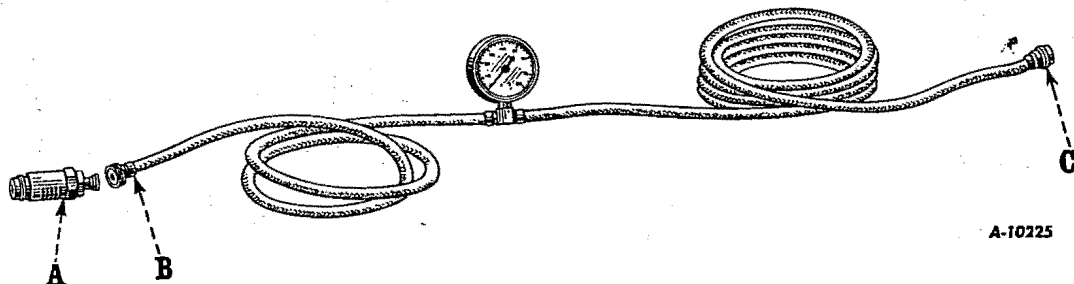
If these pumps are to be used for inflating tires on a diesel-powered tractor, a carbureted engine of another unit must be used as the source of power.

**To Use**—Remove one of the spark plugs from the tractor engine, or any carbureted engine having the correct spark plug thread size, and replace with pumping element "A" (see *Illust. 64A*). Attach one end of pump hose "B" to the pumping element and the other end "C" to the valve stem of the tire to be inflated. Start the engine and run it at slow speed for maximum efficiency.

**Schrader spark plug tire pump kit**—This kit consists of items which are necessary for proper care of the tire valve and maintenance of proper air pressure. With this kit you can maintain tire pressure on all tractors, trucks and passenger cars by changing adapters on the tire pump to suit the spark plug thread size.

The following items are packed in a serviceable metal box:

- One tire pump with 16 feet of hose and an air gauge for registering pressure up to 100 pounds.
- Five adapters for spark plug thread sizes 10 mm., 14 mm., 18 mm.,  $\frac{1}{8}$ -18 and  $\frac{1}{2}$  inch.
- Five valve cores and five valve caps which fit all standard tire valves (packed in small metal boxes).
- One valve repair tool and one valve fishing tool.
- One air-water tire valve and one air-water adapter.
- One tire pressure gauge for air-water tractor tires.



Illust. 64A

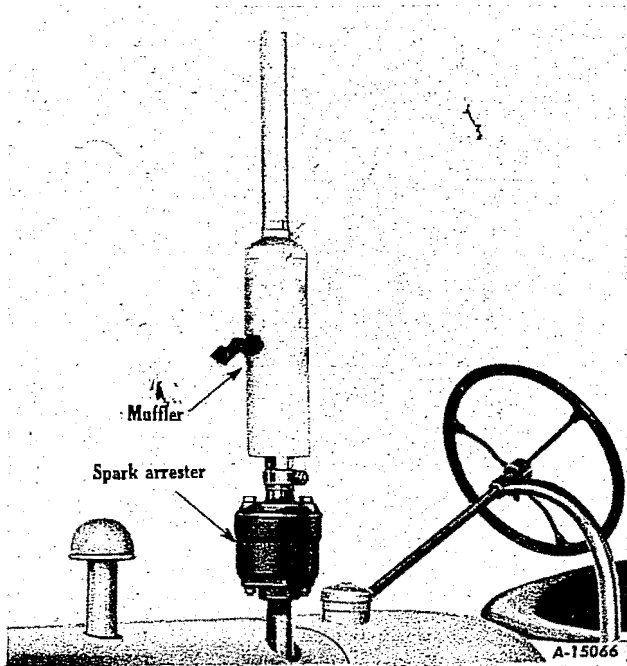
Enginair tire pump with 16-ft. hose and air gauge.

## SPECIAL EQUIPMENT

### Exhaust Muffler

The exhaust muffler can be supplied for owners who desire quieter operation of their tractors. It reduces the sound of the exhaust to a quiet purr.

The muffler attaches easily to the exhaust pipe and may be attached to the spark arrester attachment in the same manner as it is attached to the exhaust pipe.



Illust. 65

Exhaust muffler and spark arrester assembled on tractor.

### Spark Arrester

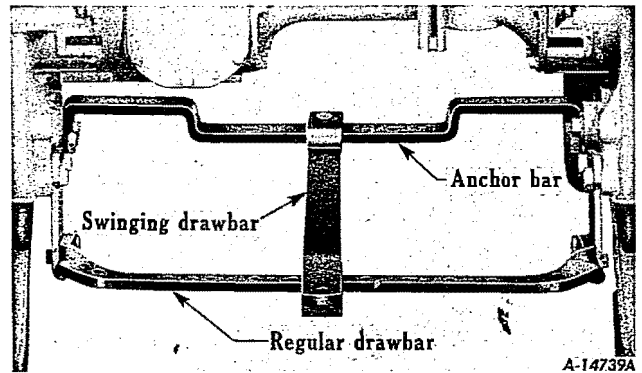
The spark arrester smothers and extinguishes any sparks that may be thrown off in the exhaust. It reduces the fire hazard when operating the tractor near inflammable material. The arrester attaches readily to the exhaust pipe. The muffler is attached to the spark arrester in the same manner it is attached to the exhaust pipe.

### Cleaning

Remove the spark arrester once a month for cleaning. To clean, turn the spark arrester upside down and shake it until the loose particles are removed.

### Swinging Drawbar

The swinging drawbar is free to swing the full width of the regular drawbar, making it easier to turn the tractor under load when pulling trail-behind implements such as disk harrows. It also facilitates steering on the straightaway when the tractor is pulling a heavy load. The load exerts less sidewise pull on the tractor and therefore interferes less with the steering. This attachment is especially desirable when working in small, irregularly shaped fields.



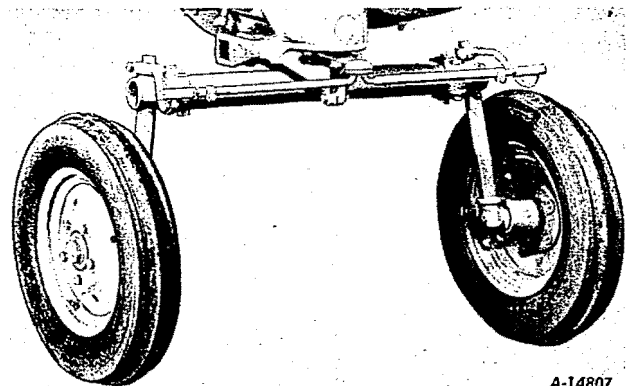
Illust. 65A

Swinging drawbar assembled on tractor.

### Adjustable Front Axle

The adjustable front axle attachment replaces the regular, fixed front axle. The variable treads of  $40\frac{5}{8}$ ,  $44\frac{5}{8}$ ,  $48\frac{5}{8}$ ,  $52\frac{5}{8}$  and  $56\frac{5}{8}$  inches permit adjustment to fit most any row crop ranging from narrow rows of vegetables to wide rows such as cotton and corn.

For instructions on adjusting the tread widths, see page 53.



Illust. 65B

Adjustable front axle.

## SPECIAL EQUIPMENT

### High Clearance Attachment

For tractors equipped with adjustable front axle attachment.

**Note:** This attachment can also be applied on tractors equipped with a fixed front axle with the addition of a few extra parts. See your International Harvester dealer for further details.

This attachment can be used for many vegetable operations where a 64-inch tread is required to straddle four rows. It also provides additional clearance when the wheels are run in furrows between the beds.

### Electric Starting and Lighting

Electric starting is more than a mere convenience to the tractor operator; it eliminates the hand-cranking problem for smaller members of the family who are otherwise entirely competent operators, and is also a fuel saver. It removes the temptation to idle the engine during "times out" to avoid using the hand crank when work is resumed.

The headlights and rear light greatly extend tractor usefulness. With strong, steady, electric light the tractor can be used after dark and, if necessary, all night, to make up for time lost because of bad weather. It can be used at night to take quick advantage of favorable weather and soil conditions, or to prevent loss of crops overdue for harvest.

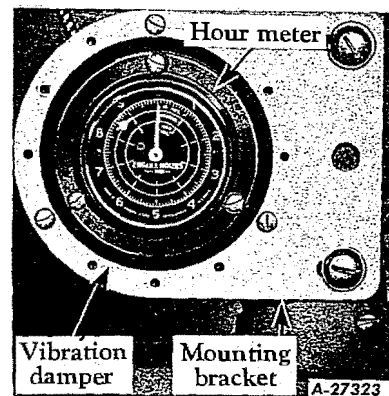
*See pages 36 to 45 for operating and maintenance instructions.*

### Combination Rear Light and Tail Light

This attachment is interchangeable with the regular rear light and contains both a white and a red lamp for field and highway operation respectively.

A switch, located on top of the body, enables the operator to select the proper light.

### Engine Hour Meter



Illust. 66  
Engine hour meter.

For tractors equipped with starting and/or lighting.

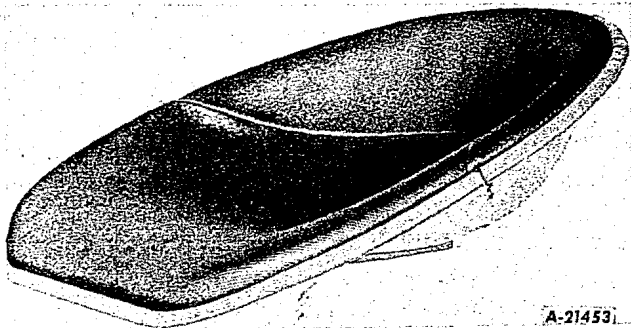
This meter records engine hours of operation and is valuable to owners who keep records of tractor cost and maintenance.

## SPECIAL EQUIPMENT

### De Luxe Upholstered Seat

The de luxe upholstered seat is used to replace the regular seat when the maximum in riding comfort is desired. It consists of foam rubber padding covered with Silver Shade "Koroseal" upholstery which has excellent water-repellent and wear-resisting qualities.

Since the Silver Shade finish has a tendency to reflect rather than absorb the sun's rays, the seat will remain cooler, thereby adding to the operator's comfort for hot weather operation.



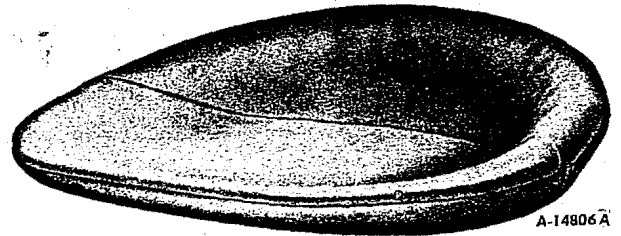
Illust. 67  
Upholstered seat.

### Upholstered Seat

The upholstered seat has the same Silver Shade "Koroseal" upholstery as the de luxe seat, except the upholstered seat contains jute felt padding in place of foam rubber.

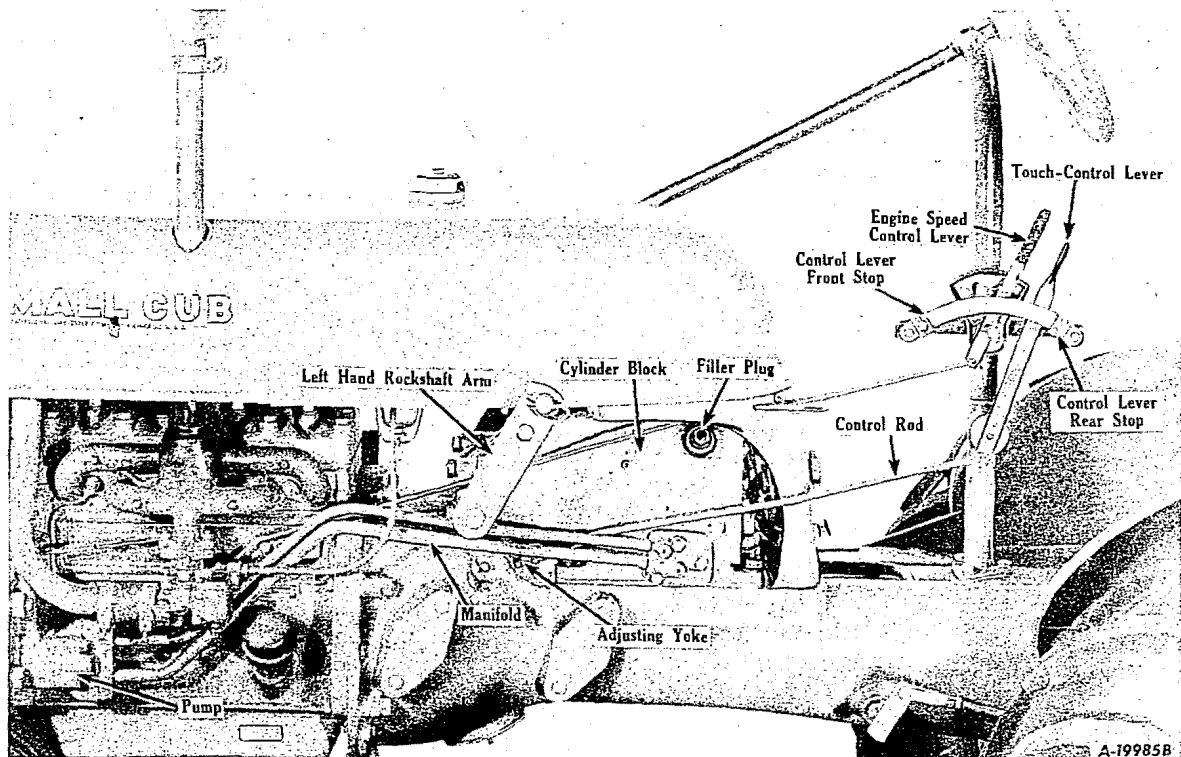
### Detachable Seat Pad

The detachable seat pad fits over the regular metal seat and is secured in place with drawstrings. It also can be used to recover the upholstered seat in the same manner. The seat pad, like the de luxe upholstered seat, also has the foam rubber padding and Silver Shade "Koroseal" upholstery.



Illust. 67A  
Detachable seat pad.

## Farmall Touch-Control System



Illust. 67B  
Showing Touch-Control attachment assembly on Farmall Cub Tractor.

## SPECIAL EQUIPMENT

### Farmall Touch-Control System

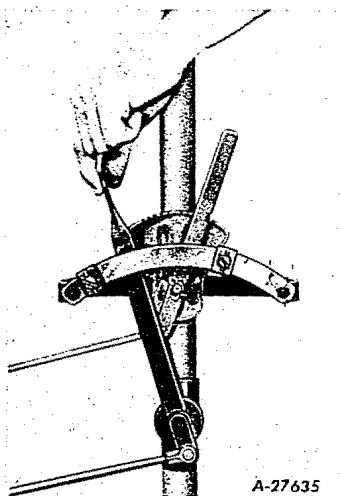
The Farmall Touch-Control system provides hydraulic power with convenient fingertip control for raising, lowering and adjusting the working depth of various implements used with the tractor. Implements can be regulated and adjusted without stopping work while the tractor is in motion or while standing still.

The control lever (*Illust. 68*) gives the operator complete, instantaneous and effortless control of all the direct-connected implement operating adjustments. The use of the lever will depend on the type of implement mounted on or pulled by the tractor. Complete instructions for operating the lever are included in the Owner's or Operator's Manual furnished with the implement. General instructions for operating the lever are given below.

The control lever quadrant is provided with a pair of adjustable Touch-Control lever stops.

The front stop when set in a given position will limit the travel of the control lever and prevent the implement from being raised above the desired height.

The rear stop is used to point out the position where the control lever should be each time the implement is lowered to maintain a uniform working depth.



*Illust. 68*

Operating the Farmall Touch-Control system.

#### To Operate the Touch-Control System

To lower the implement, move the control lever back until the implement has reached the desired

working depth; then move the rear stop to this position and tighten in place.

The working depth will be maintained by moving the lever back to the stop each time the implement is lowered.

After attaching the implement to the tractor, the Touch-Control lever front stop must be properly set if there is a possibility of the implement not clearing the underside of the tractor. Once the stop is set, the implement can be raised quickly by a flick forward on the control lever.

To set the Touch-Control stop, slowly move the control lever forward to raise the implement and stop it before the implement hits any part of the underside of the tractor. Then move the stop up against the control lever and tighten it in this position. This will prevent the control lever from being moved past the point of the desired lifting height.

**Note:** If the implement hits the underside of the tractor, in addition to doing possible damage to the tractor or implement, the Touch-Control system will not have completed its cycle and this will cause the pump unit to operate at maximum high pressure and heat the IH Touch-Control fluid excessively, thereby causing possible internal damage to the pump. This condition can be quickly detected by a noticeable loading of the engine.

If this condition should occur, immediately move the control lever back and set the control lever stop at a point where the raised implement will not hit the underside of the tractor.

The Touch-Control system is ready to operate whenever the engine is running. You will receive the maximum of satisfactory service by closely adhering to the following simple precautions and service operations.

The importance of keeping the system free from all dirt, grit and other foreign matter cannot be stressed too strongly. Keep the IH Touch-Control fluid reservoir, pipe lines and pump as clean as possible at all times. As an added precaution against the entry of dirt into the system, the reservoir is constructed without an air vent. Sufficient air space is allowed above the fluid level to compensate for the pressure changes occurring during the operation of the system. As a result a small amount of pressure may be found in the reservoir upon removing the filler plug when checking the fluid level.



## SPECIAL EQUIPMENT

### Fluid Level

When the Touch-Control system is filled to the proper level with IH Touch-Control fluid, it should not require servicing, unless for some reason the system has been disturbed.

The correct fluid level is to the bottom of the filler opening. If it is necessary to add fluid, use IH Touch-Control fluid. It is essential that the fluid be absolutely clean and free from water and all foreign matter when placed in the system. Cloudiness may indicate the presence of moisture.

If the Touch-Control system should fail to operate in a satisfactory manner or if there are any noticeable leaks in the system, check the fluid level in the reservoir or see your International Harvester dealer.

Never operate the tractor without having sufficient fluid in the reservoir. Insufficient fluid may cause damage to the Touch-Control system.

Before removing the filler plug (*Illust. 67B*) for inspection, thoroughly clean the plug and surrounding area of all dirt and grit.

### Draining and Filling the Reservoir

When it is necessary to drain and refill the reservoir for any reason, proceed as follows:

1. Wipe off all dirt and grit from the reservoir and filler plug.

2. Remove the filler plug (*Illust. 67B*) and the drain plug (*Illust. 69*) and place them in a clean container.

When the fluid has stopped draining, run the engine very briefly to drain the fluid from the pump and connecting pipes.

The refill capacity of the Touch-Control system when drained as instructed above is  $3\frac{1}{2}$  pints.

**Note:** If it is necessary to flush the system, use IH Touch-Control fluid so that the necessary lubrication of the pump and control system is maintained without adulteration. Never use kerosene or any other oil.

3. After the system has drained completely, replace the drain plug and fill the reservoir to the filler opening with IH Touch-Control fluid.

4. Start the tractor engine and operate it at a moderate idle speed. With the filler plug removed, move the Touch-Control lever back and forth 10 to 12 times through its full range of travel. This quickly frees the system of trapped air. Then place the control lever in the rearward position (toward tractor seat) and stop the engine.

5. Add sufficient clean fluid to the reservoir to bring the fluid level to the bottom of the filler opening. Replace and tighten the filler plug.

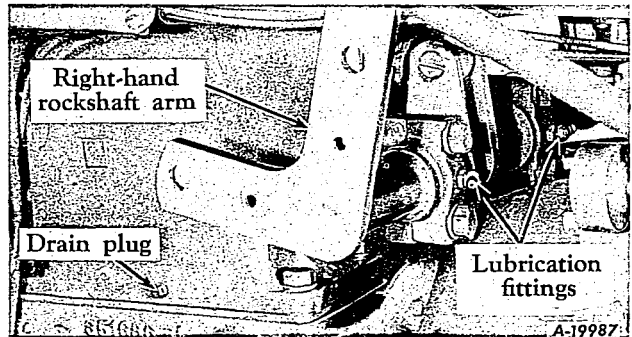
The refill capacity for the Touch-Control system when drained as instructed in paragraph 2 is  $3\frac{1}{2}$  pints.

The capacity of a completely dry unit (when a new or rebuilt unit is installed) is  $4\frac{1}{4}$  pints.

### Lubrication

Daily or after every 10 hours of operation, lubricate the rockshaft arm and bearings through lubricator fittings. See *Illust. 69*. Use pressure-gun grease (chassis lubricant) and apply 2 or 3 strokes of lubricator, or sufficient grease to flush out the old grease and dirt.

**Note:** Always keep the Touch-Control lever in the rearward position (toward tractor seat) when the tractor or the Touch-Control system is not being actively used. This places the piston in the retracted position, preventing exposure to any moisture which may have condensed in the leather dust boot.



*Illust. 69*

Showing lubrication points.

### Air in the System

Make certain that all connections and openings are well sealed. The entire system must be kept tightly sealed at all times, not only to prevent loss of fluid but also to avoid entrance of air in the inlet end of the system. Air entering the system interferes with proper lubrication of moving parts. It causes an increased amount of vibration and an unsteady pressure. Presence of air in the system will be noticed by a noise in the pump or by the pump laboring when operating under high pressure. Proper filling of the reservoir and working the system during the filling process, as previously described, will work the air out of the system.

# SPECIFICATIONS

## Capacities

Fuel tank.....	7½ gal.
Water cooling system.....	9¾ qt.
Crankcase pan.....	3 qt.
Transmission case.....	3½ pt.
Rear axle drive housing (each).....	1¾ pt.
Steering gear housing.....	¾ pt.
Air cleaner oil cup (Donaldson).....	½ pt.
Air cleaner oil cup (United).....	¾ pt.
Belt pulley housing.....	1⅓ pt.
*Touch-Control system.....	4¼ pt.

## Engine

Cylinders.....	4
Bore.....	2⅝ in.
Stroke.....	2¾ in.
Engine speed (governed)	
Minimum speed.....	450-500 r.p.m.
Maximum idle speed (no load).....	1800 r.p.m.
Maximum (full load).....	1600 r.p.m.
Magneto (clockwise rotation).....	I. H., Type J-4
Spark plug.....	Gap .023 in.
Valve clearance (engine cold).....	.013 in.
Carburetor.....	I. H., ¾-in. updraft
*Battery ignition unit (when so equipped) (clockwise rotation, 16° advance).....	I. H.

## Clutch

Single-plate, dry-disc, spring-loaded.....	6½ in.
--	--------

## Belt Pulley and Power Take-Off

*Pulley speed	
Low idle (no load).....	392 r.p.m.
Fast idle (no load).....	1487 r.p.m.
Maximum (full load).....	1322 r.p.m.
*Belt speed (with 9-in. pulley).....	3114 ft. per min.
*Pulley diameter.....	9 in.
*Pulley face.....	4½ in.
*Power take-off shaft speed (counterclockwise rotation)	
Low idle (no load).....	475 r.p.m.
Fast idle (no load).....	1800 r.p.m.
Maximum (full load).....	1600 r.p.m.

## \*Fuse and Headlight Lamps

Fuse (cartridge-type).....	No. 106 653.....	SFE—20 amperes
Headlight lamps.....	No. 142 309 (Trade No. 1133).....	{ 6-8 volt 32 candlepower

\*Furnished when ordered.

## Foot Brakes

External contracting on drums.

## SPECIFICATIONS

### Transmission (three speeds)

(Speeds based on 8-~~4~~ pneumatic tire size.)

Speed (miles per hour):	1st.....	2 $\frac{1}{8}$
	2nd.....	3 $\frac{1}{8}$
	3rd.....	6 $\frac{1}{2}$
	Reverse.....	2 $\frac{3}{8}$

### Wheels and Tread

Front wheels, pneumatic tire size.....	†4.00—12
Rear wheels, pneumatic tire size.....	†8—24
Wheelbase.....	69 $\frac{1}{4}$ in.
Tread, front (standard—fixed axle with reversible wheels).....	40 $\frac{5}{8}$ and 46 $\frac{3}{8}$ in.
Tread, front (adjustable front axle, 4-in. intervals).....	40 $\frac{5}{8}$ to 56 $\frac{5}{8}$ in.
Tread, rear (adjustable—reversible wheels and rims, 4-in. intervals).....	40 to 56 in.

†Other pneumatic tire sizes available.

### General

Belt horsepower.....	*9.76
Drawbar horsepower.....	*8.89
Length, over all.....	99 $\frac{3}{8}$ in.
Width, over all—minimum treads.....	48 $\frac{1}{4}$ in.
Width, over all—maximum treads.....	64 $\frac{1}{4}$ in.
Height, over all (to top of steering wheel).....	62 $\frac{3}{4}$ in.
Height, over all (to top of muffler).....	76 $\frac{1}{4}$ in.
Ground clearance for crops: Under front axle.....	20 $\frac{3}{8}$ in.
Under rear axle.....	20 $\frac{3}{4}$ in.
Drawbar (adjustable): Normal height.....	14 $\frac{3}{8}$ in.
High and low positions.....	12 $\frac{3}{8}$ and 16 in.
Lateral adjustment.....	11 $\frac{1}{16}$ in. on each side of center hole
Minimum turning radius with minimum treads:	
Without brake applied.....	9 $\frac{1}{4}$ ft.
With brake applied.....	8 $\frac{1}{4}$ ft.

\*Corrected to sea level barometric pressure (29.92 in. Hg) and +60° F. air temperature, according to A.S.A.E. and S.A.E. test codes.

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# Farm Accidents can be prevented with your help

No accident-prevention program can be successful without the wholehearted co-operation of the person who is directly responsible for the operation of equipment.

To read accident reports from all over the country is to be convinced that a large number of accidents can be prevented only by the operator anticipating the result before the accident is caused and doing something about it. No power-driven equipment, whether it be transportation or processing, whether it be on the highway, in the harvest field or in the

industrial plant, can be safer than the man who is at the controls. If farm accidents are to be prevented—and they can be prevented—it will be done by the operators who accept a full measure of their responsibility.

It is true that the designer, the manufacturer, the safety engineer can help; and they will help, but their combined efforts can be wiped out by a single careless act of the operator.

It is said that "*the best kind of a safety device is a careful operator.*" We ask you to be that kind of an operator.

NATIONAL SAFETY COUNCIL

*Play Safe . . . . .*

**INSIST ON  PARTS**

**WHEN** you bought your International Harvester tractor or machine, you made a good choice—you have a machine that deserves good care and good service. When wear and tear make new parts necessary, remember why you bought an International Harvester *Quality Product*. You bought quality to be sure of performance. Don't handicap your equipment by careless selection of replacement parts.

**PLAY SAFE!** Go to the International Harvester dealer for IH parts. The IH trademark is your guarantee of quality, your best assurance that your International Harvester equipment will continue to give you top-grade performance, no matter what you ask of it.



*For Your Protection*

## Always Use Parts

The finest engineering skill and the most advanced manufacturing methods go into all International Harvester products. Each part is built to our own high manufacturing standards. These are important things to remember when wear and tear make new parts necessary.

IH parts retain and continue the original performance you get when you choose International Harvester quality products. When replacing parts, don't handicap your equipment. For your

protection, be sure to use IH SERVICE PARTS.

International Harvester dealers' bins are well stocked with IH parts. These parts departments are well-equipped service stations staffed by factory-trained servicemen. Dealers are backed in every case by the full facilities of a nearby International Harvester District Office.

When selecting new farm operating equipment, keep in mind the protective service rendered by the International Harvester dealer in your community.