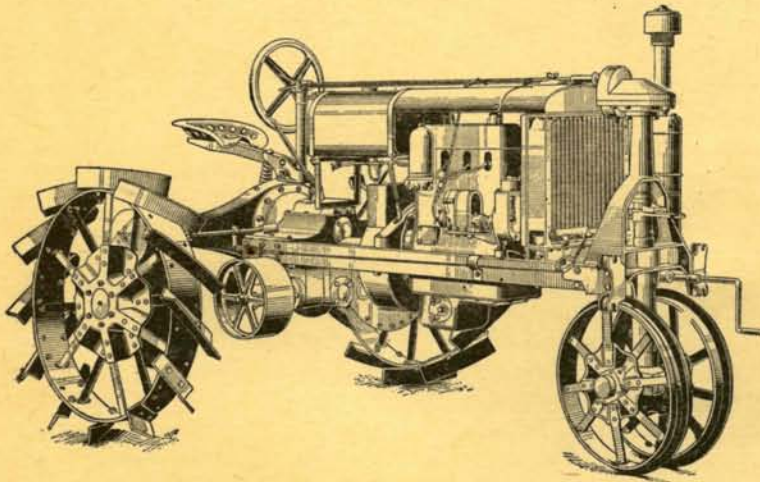


Exhibit "E"

Instruction Book

McCormick-Deering Farmall Tractor Model F-20

(Regular, Narrow Tread and Fairway)



including

Sectional Views and Parts List

MANUFACTURED BY

INTERNATIONAL HARVESTER COMPANY
(INCORPORATED)

606 SO. MICHIGAN AVE.

CHICAGO, U. S. A.

Examine the tractor carefully and see that all oil holes are cleaned of paint and dirt—if any threaded oil holes are found with no grease or pipe connections, look at the Lubrication Chart. If connection is shown, and not in place, it was lost and should be replaced before starting.

Special Precautions with a New Tractor

1. Before starting a new engine, remove the spark plugs and put about one ounce of gas engine lubricating oil into each cylinder; replace the spark plugs and crank the engine to distribute the oil over the cylinder walls.
2. When cranking an engine, the operator should take his position so as to avoid being struck by the starting crank if there is a reversal of the direction of the engine from any cause whatsoever.
3. During the first one hundred hours of operation, mix one pint of engine oil with every five gallons of fuel.
4. See that the engine has the proper amount of oil in the crankcase.
5. See that all lubrication connections are filled with lubricant approved for use in Alemite-Zerk compressor. (See "Lubrication Chart" for Specifications.)
6. See that oil in transmission is up to level of plug located in front of transmission case. (See "Lubrication Chart.")
7. See that oil in rear axle carrier is up to level of plug located on side of carrier. (See "Lubrication Chart.")
8. See that oil in steering gear case is up to level of plug located on side of case. (See "Lubrication Chart.")
9. See that oil in oil air filter is up to proper level.
10. Tractors shipped Domestic and Canada are properly filled with oil in all parts when shipped from the factory. *All oil is drained from tractors shipped Export.* However, Tractor should be checked over for proper quantities of oil before starting.
11. Complete instructions for oiling are shown on "Lubrication Chart."
12. *Do not operate a new Tractor on full load.* The Tractor should never be loaded to full capacity until it has been run light for a reasonable length of time. After oiling and lubricating, the tractor, *for the first 50 hours*, should be *run at half load or less before it is put on full load.*
13. Modern tractors travel fast, therefore due care should be exercised in getting on or off the tractor, to avoid accident or injury to the operator.
14. When starting the Tractor *always engage the clutch gradually* so the engine will pick up the load slowly. This is particularly necessary when the tractor is going up a steep hill, climbing out of ditches or when hitched to some heavy or difficult load. Never hitch a tractor to a stump or other object by means of a long chain or rope with slack so that when the tractor moves forward it will jerk into the load.
15. *Read Instruction Book carefully.*

Ordering Repairs

When ordering repairs be sure to give Serial Number and Model of Tractor and name and number of Part Ordered.

This book contains, in addition to instructions for operating, instructions and illustrations pertaining to certain simple adjustments and replacements which can readily be made. However, the owner should consult the service dealer before attempting a general overhauling or when any mechanical difficulties occur, as he has the necessary equipment for doing the work.

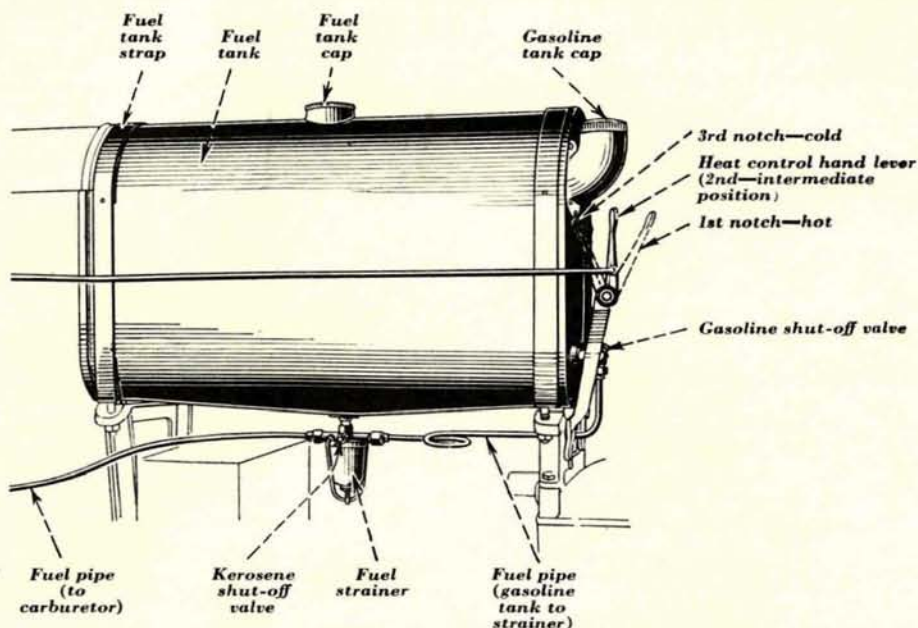


Illustration No. 1

Fuel tanks, tank connections, shut-off needle valves, fuel strainer, heat control hand lever, etc.

Preparations for Starting

Close kerosene and gasoline shut-off needle valves.

Fill fuel tank with clean kerosene (capacity 13 gallons).

Fill gasoline tank with gasoline (capacity $\frac{7}{8}$ gallon).

Carefully strain all fuel and be sure it is free from water.

Gasoline is necessary only when starting and warming up the engine.

Fill radiator with *clean* water to the level of baffle plate (inside of filler hole) and keep filled to this level. Use soft or rain water if obtainable.

Pull up radiator curtain to top of radiator. (See page 4.)

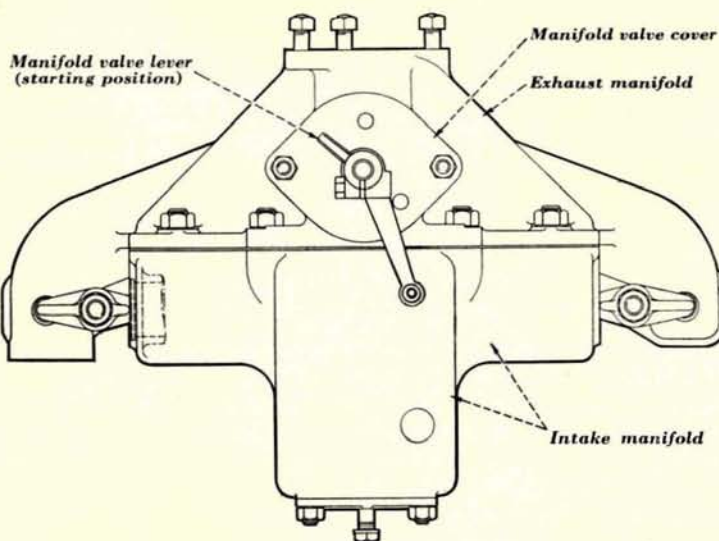


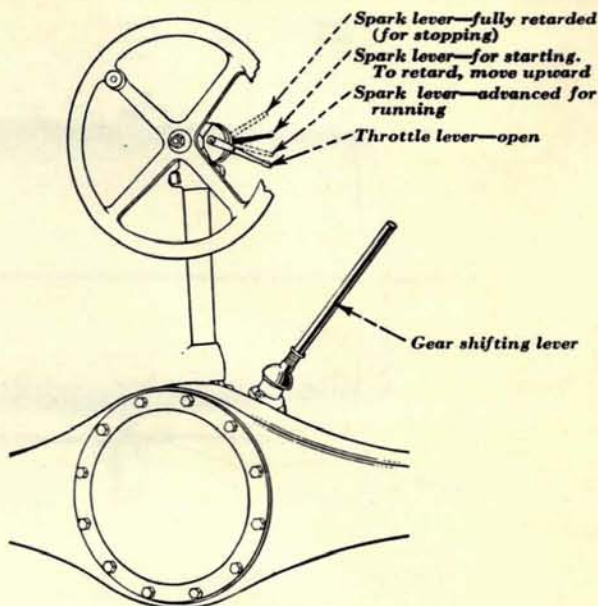
Illustration No. 2—Detail of heat control, manifolds, etc.

Before Starting Engine

Put gear shifting lever in neutral position.

Open throttle lever by moving lever down.

Open gasoline shut-off needle valve.



Heat Control Hand Lever

The heat control hand lever (located on left side of fuel tank) should be pulled out toward the operator to first notch, which is "Hot" or "No. 1" position. (See illustrations Nos. 1 and 2.)

Illustration No. 3

Spark and throttle control, gear shifter, etc.

To Start Engine

Prime cylinders with gasoline through priming cups.

With spark lever fully retarded and the choker valve completely closed, crank engine rapidly three or four revolutions. Then move spark lever to starting position, move choker valve nearly one-half open and crank engine with half up-strokes.

As soon as engine starts, the choker valve should be opened to where the engine runs without missing.

Note: Should the engine be started with the spark lever all the way down (fully advanced), there is danger of a "back-fire" or "kick" which may injure the operator.

After Engine Starts and Is Warmed Up

Engine should warm up in from five to eight minutes.

Spark and throttle control levers must be adjusted for proper advance for load to be handled.

After gasoline shut-off needle valve has been *closed tight*, quickly open kerosene shut-off needle valve, but *never have both valves open or even partly open at the same time*, otherwise kerosene will mix with gasoline, making it unsatisfactory for starting.

Set Heat Control Valve after Engine Warms Up

When operating on kerosene, the heat control hand lever should be set in "Hot" or "No. 1" position (first notch).

When operating on gasoline, start with heat control hand lever in "Hot" or "No. 1" position. After engine is thoroughly warmed up, the lever should be set at "Cold" or "No. 3" position (third notch.) In extremely cold weather or when operating under light load, the heat control hand lever should be set at "Intermediate" or "No. 2" position (second notch).

It is important that control valve be properly set to correspond with the fuel being used. (See instructions on page 3.)

To Start Tractor

Place left foot on clutch pedal and press down firmly, holding in this position; this disengages the clutch. *Clutch must always be disengaged while shifting gears.* Move gear shifting lever to desired speed.

Slightly speed up engine with hand throttle lever and at the same time gently release pressure on clutch pedal. Properly combining these movements will cause the tractor to start without jerking and straining the mechanism or stopping the engine.

To Stop Tractor

Disengage clutch by pressing down firmly on clutch pedal, then move gear shifting lever to neutral position.

To Stop Engine

Close *kerosene* shut-off needle valve and open *gasoline* needle valve just long enough to fill the strainer with gasoline. Then close the needle valve and run engine until all kerosene is used out of carburetor and fuel pipe, in order to insure having gasoline in the fuel bowl when starting up again.

The shut-off needle valves for gasoline and kerosene should always be closed when engine is stopped for more than an hour.

The automatic grounding switch on the magneto should be used only in emergencies, when the engine must be stopped quickly.

Throttle Lever

(See illustration No. 3.)

The rear lever located under the steering wheel is the throttle lever. Since the governor maintains constant engine speed under variable loads, this lever should be used only to reduce the speed of the engine below normal operating speed, at which very little load can be handled by the engine.

Operation of Heat Control

(See illustrations Nos. 1 and 2)

Built into the exhaust and intake manifold is a rotary valve which controls the exhaust gas passageway. To the front of the operator's seat and to the left of the fuel tank is a lever and a bracket containing three notches, with which the heat control valve is operated. The first notch nearest to the operator is No. 1, "**Hot**" or starting position of the lever. Second notch (No. 2) is "**Intermediate**" and third notch (No. 3) is "**Cold**" position.

Position No. 1 or "**Hot**" should *always* be used when starting the engine and during the warming-up period. *This is true whether using gasoline or kerosene.* When using gasoline all the time, it will be desirable to move this valve to Position No. 3 or "**Cold**" very shortly after starting engine, depending on the weather and load. When starting on gasoline and operating on kerosene, it will be desirable to keep the valve in Position No. 1 ("**Hot**") most of the time unless the weather is hot. In hot weather with a heavy load on the engine, good results may be obtained with this valve in Position No. 3 ("**Cold**"), but generally, better results will be secured if the intake manifold is kept hot when using kerosene. To secure this condition and not sacrifice too much power, it will be desirable to set valve at Position No. 2 ("**Intermediate**"). If not kept hot, fuel will not be properly vaporized and dilution of the crankcase lubricating oil as well as imperfect regulation of engine will result.

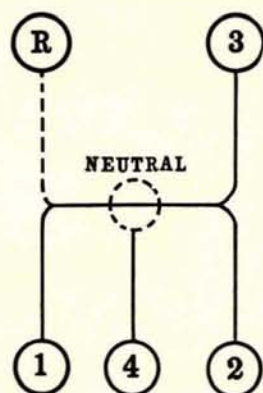


Illustration No. 4
Showing different positions of gear shifting lever.

ADJUSTING RADIATOR CURTAIN

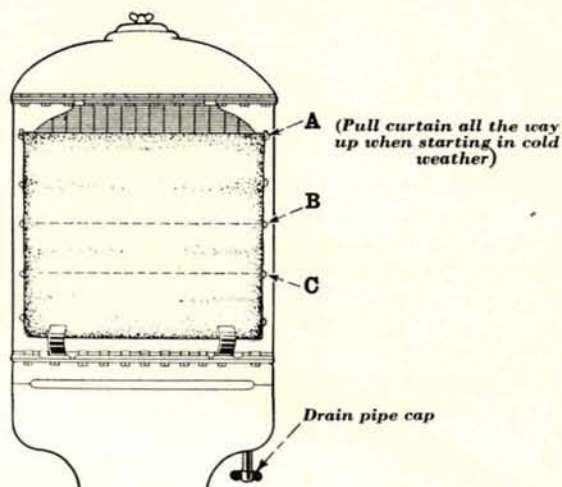


Illustration No. 5

Curtain is supplied with tractor and should be adjusted in warming up as follows:

A. When starting the engine in freezing weather, set curtain as shown in illustration, or better still, cover the radiator completely. This will assist in warming up the engine more rapidly and will prevent cold air being drawn through the radiator core and freezing the water in the cooling system.

B. In cool weather, set curtain at "B".

C. In non-freezing weather in the early morning or late evening hours, curtain should be adjusted to position "C".

After the engine is thoroughly warmed up the curtain may be lowered completely, except during cold weather.

Important! Do not start the engine in freezing weather without first covering the radiator *completely*.

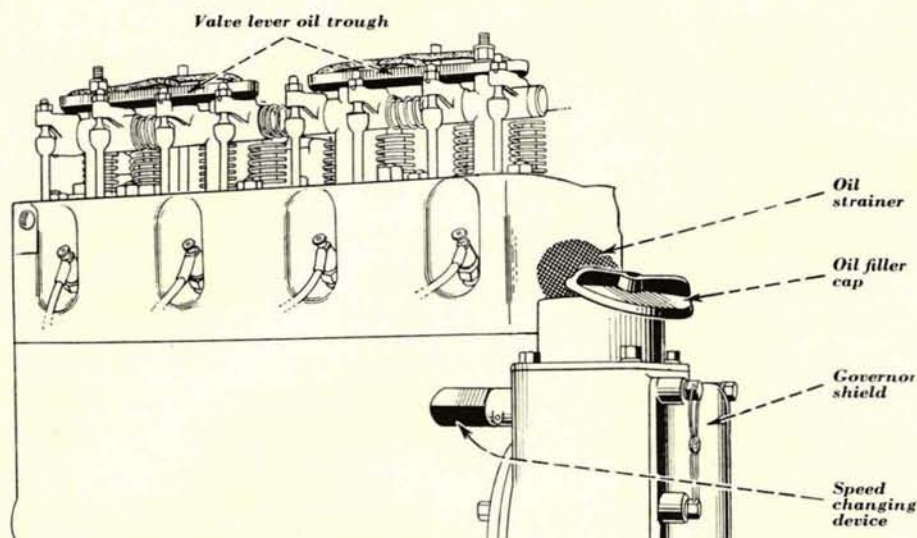


Illustration No. 6—Crankcase oil filler, governor, etc.

Remove and clean the oil strainer in governor housing occasionally.

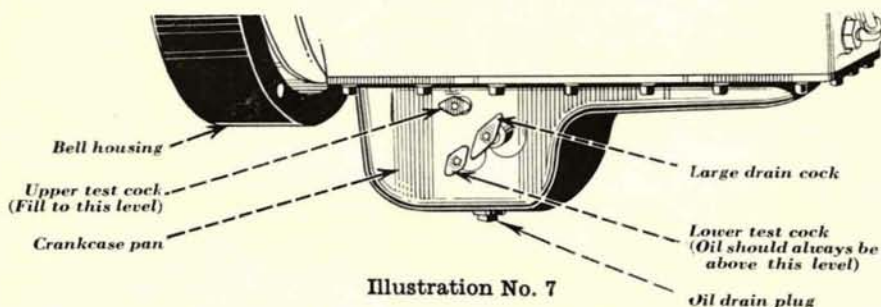


Illustration No. 7

Governor

The rated or governed speed is approximately 1200 R.P.M. for full load, which gives a no-load speed of approximately 1350 R.P.M.

The governor with the speed changing device provides for engine speed reduction of approximately 200 R.P.M.

This device is located in back of the governor housing and speed can be decreased by turning block to the left.

This device will be found useful in obtaining proper speeds readily when tractor is operating threshers and similar machines requiring close speed regulation.

Important: For all-around satisfactory operation, the engine should not be idled down to a speed below 300 to 400 R.P.M.

ALEMITE "PUSH TYPE" LUBRICATION SYSTEM

Filling the Compressor

Remove plunger assembly "B" by unscrewing cap "A" and fill barrel "C" to within $\frac{1}{2}$ " of the top with approved lubricant. (See "Lubrication Chart.") Spread the leather washer "E" and replace the plunger assembly "B." Press the nozzle "D" against some solid object and push on handle "G" with quick strokes until the lubricant starts to come out at "D". (See illustration No. 8.)

Instructions for Lubricating

Wipe all dirt from fittings and, with the compressor as nearly in a straight line with the fitting opening as possible, actuate handle "G" until lubricant starts to squeeze out of bearing. (Do not twist handle when operating the compressor.)

Warning! Lubricant container should always be covered to prevent the entry of dirt.

Because of the cupped shape of nozzle "D" and the smaller flat tip of the Alemite-Zerk type fitting, a grease or oil-tight seal is secured at all points within a twenty-five degree angle of the axis of the fitting, giving a total effective angle of fifty degrees. Approximate alignment is recommended in order to avoid exceeding the limits.

If a poor grade of lubricant is used, small particles of dirt and other foreign substances may clog up the fittings, or may keep ball from seating properly, and grease will flow out from fittings. If this should happen, remove the fitting and wash thoroughly with gasoline.

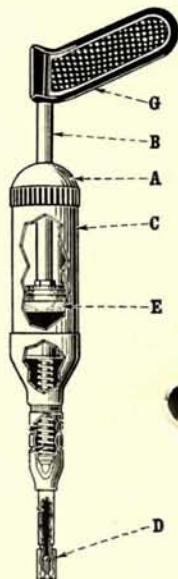


Illustration No. 8
Alemite "Push Type"
Compressor.

Engine Lubrication

The life and efficient working of the engine depends on proper lubrication; neglect in this direction may cause serious trouble, excessive wear and complete breakdown. Properly oiled working parts must always have a thin film of oil between them; the kind of oil to use under a given condition is determined by its ability to establish this film between the rubbing parts, and to resist being squeezed out under normal pressure. It must also be of proper quality to resist decomposition caused by heat. The average operator does not know that to get the maximum horse power from his tractor he must look after his lubricating oil as closely as he does his fuel. The best oil that can be obtained will wear out and become gritty in time.

Too much cannot be said about the need of good oil of the proper body. Oil which is suitable for lubrication of internal combustion engines must be *neutral*—that is, free from *acid or alkali* reaction; free from moisture, tarry or suspended matter; must have no thickeners or mineral in suspension.

Engine oiling is very important and instructions should be followed closely.

Cylinders, connecting rods, crankshaft bearings, camshaft, and all parts within the crankcase are lubricated by splash.

Engine Oil Supply

The oil must be poured into the crankcase sump through an opening for this purpose located on the governor housing at the front of the engine. (*See illustration No. 6.*) If poured in through the hand holes, governor parts will not be sufficiently lubricated. Two test cocks are located on the right side of the crankcase pan which indicate the high and low level of the oil. The oil should never be above the high level nor below the low level. (*See illustration No. 7.*)

Oil Pressure Gauge

The indicator pointer in oil pressure gauge (unless defective) should register at all times when the engine is running. Should the gauge not register, it is an indication that the oil pump is not performing properly or the oil supply needs renewing. The engine should be stopped immediately and the oil system inspected to find the cause of failure.

Transmission Lubrication

The transmission and final gears, including differential and all bearings for the transmission, are oiled automatically.

It should not be necessary to add lubricant to transmission oftener than once a season unless excessive leakage occurs somewhere, or in case of accident, causing loss of grease.

Care of Oil Filter and Element

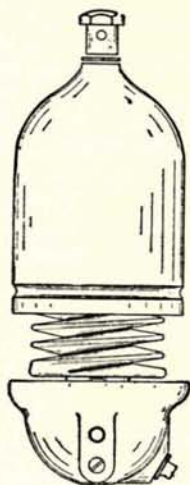


Illustration No. 9

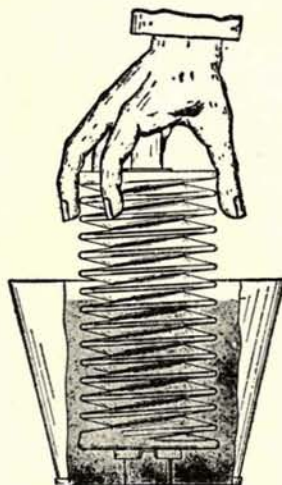


Illustration No. 10

All the oil is forced through the oil filter where the finer particles of dirt are removed from the oil before it is distributed to the working parts of the engine.

After every 60 hours of operation, the oil filter should be cleaned and once a season the filter element should be renewed.

To clean the oil filter, stop the engine and remove the drain plug. Remove the retaining nut, retaining nut gasket and the case; then lift out the filter element. (See illustration No. 9.) Wash the filter element by partially submerging it in gasoline or kerosene; placing one hand over the top of the filter element to close the opening, press the filter element together (like an accordion) until the element is clean, then allow it to drain. (See illustration No. 10.)

Inspect the filter element and if there are any breaks, it should be renewed.

Flush out the base with gasoline, being careful not to let the gasoline enter the oil inlet or oil outlet openings.

See that the case gasket is in position, then replace the drain plug, filter element, case, retaining nut gasket and retaining nut, and draw the nut up tight.

Now start up the engine, inspect the filter for oil leaks and check the oil level in crankcase.

Cleaning the Fuel Strainer

The fuel strainer should be taken apart and cleaned at least once a week when tractor is in use. This is done by first closing all shut-off needle valves for the gasoline and kerosene tanks.

To take strainer apart, loosen the lower jam nut, and swing the bail wire to one side. Fuel bowl can then be lowered, removed and cleaned.

Note condition of screen and if it is not corroded or clogged with dirt it is not necessary to remove it.

In reassembling the fuel strainer, be sure that cork gasket between the bowl and main body is in good condition and does not leak.

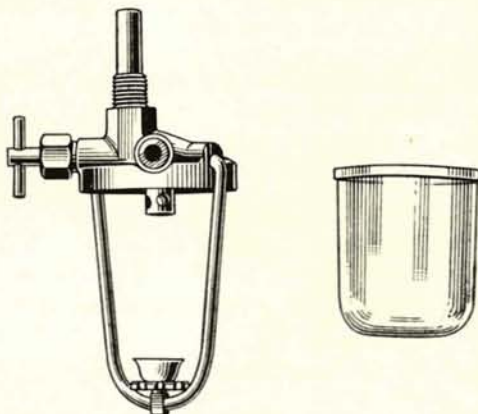


Illustration No. 11
Fuel strainer showing glass bowl removed for cleaning.

AIR FILTERING SYSTEM

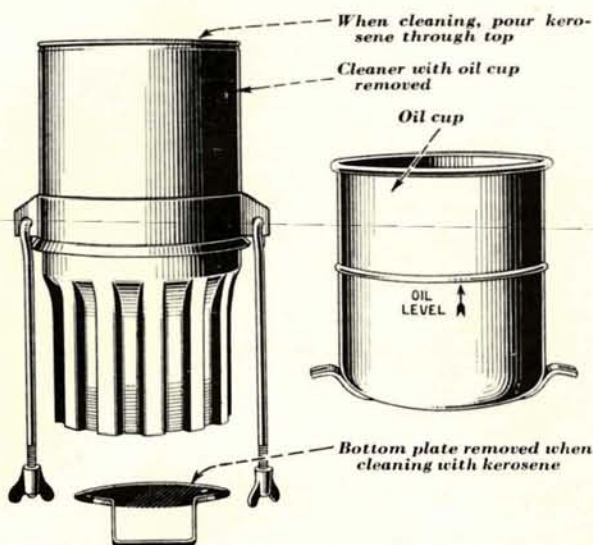


Illustration No. 12
International Oil Air Filter showing oil cup removed for cleaning.

The engine is equipped with an International Oil Air Filter.

Air Pipe Screen

The air intake pipe is provided with a screen to prevent large particles of matter from entering the air cleaner. Keep this screen clean, as water or oil on it may catch sufficient dust to restrict the air flow to the engine.

Oil Cup

The oil cup must be filled to the indicated level with a light oil before starting the engine. Drained crankcase oil is satisfactory; however, in hot weather the dilutes may be evaporated and oil should be added to keep the oil up to the indicated level.

Care of Air Filter

Remove the air filter oil cup daily and observe the oil level and refill to indicated level if there has been any evaporation. Clean out the cup and refill at least every thirty hours and when operating under very dusty conditions, clean it out and refill more often.

It is important to remove the entire air filter occasionally and wash it thoroughly. To do so, remove the oil cup and the nuts or studs at the top of the casting, taking care not to injure the copper gasket when separating the air filter from the top casting. Remove the bottom plate (held in place by three screws) and pour gasoline or kerosene through from the top. Before replacing, be sure to replace the bottom plate and top gasket. Clean the air pipe occasionally. Keep the clamps on rubber hose leading to carburetor tight, and renew the hose connections before they have rotted out.

Oil Recommended for Air Filter

At temperature above 40° (Fahrenheit), use oil drained from crankcase.

At 40° to 10° above zero (Fahrenheit), use four parts drained crankcase oil and one part kerosene.

At 10° above zero (Fahrenheit), or colder, use one part drained crankcase oil and one part kerosene.

CARBURETOR

Ref. No.	DESCRIPTION
1	Throttle shaft.
2	Throttle plate adjusting screw.
3	Idling needle valve.
4	Main jet adjustment.
5	Drain plug.
6	Air shutter plate lever.
7	Air intake.
8	Drip plug.

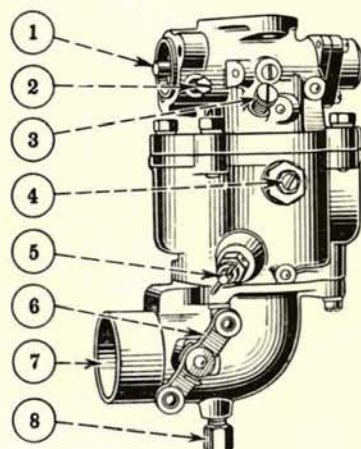


Illustration No. 13
Zenith carburetor, Model K-5 (21271DA).

Idling Adjustment

Do not expect a new engine that is too stiff to "rock" on compression when stopped, to idle well at low speed. Set stop screw on throttle lever so that engine will run sufficiently fast to keep it from stalling. Turn in or out on idling needle valve, until engine hits evenly and without rolling or skipping. Then back off on stop screw until desired engine speed is obtained.

The correct idling adjustment is usually found between 1 and 3 turns open of the idling needle valve. A good starting point is $1\frac{1}{2}$ turns from its seat.

Main Jet Adjustment

To regulate main jet adjustment, retard the spark and open the throttle to approximately $\frac{1}{4}$ open and turn the adjustment clockwise, shutting off the fuel so the R.P.M. of the engine drops because of lean mixture; then open the adjustment until the R.P.M. drops because of a rich mixture, then turn back halfway between these two points to where the R.P.M. of the engine is the highest.

Fuel Level

The fuel level on the K-5 Carburetor is measured from the top edge of the fuel bowl. The correct level should be between $\frac{13}{32}$ " and $\frac{27}{64}$ " from this edge. Fuel valve seat assemblies are interchangeable.

Note: Do not bend the float hinge to change the fuel level.

Care of Carburetor

About the only thing that can disturb the functioning of the carburetor is the presence of dirt and water. Accordingly, it should be cleaned periodically, as this will insure uninterrupted operation. The fuel screen is removed by unscrewing the filter plug.

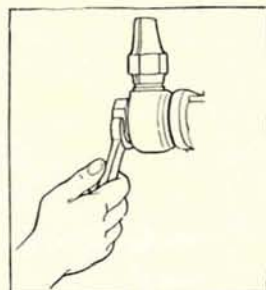


Illustration No. 14

IGNITION SYSTEM

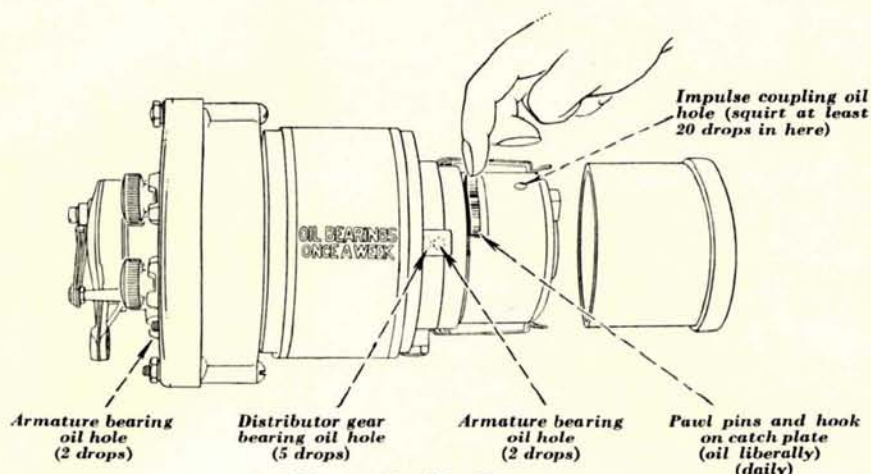


Illustration No. 15
Top view of magneto.

The engine is equipped with the International E4A Magneto and the International Automatic Impulse Starter Coupling.

Magneto and Impulse Coupling—Lubrication

Important! When the engine is first received, or when it has stood idle for more than three months, both armature and distributor gear bearing oil holes should be filled twice and the impulse coupling liberally oiled, before starting the engine.

After every fifty hours of operation, lubricate the following places with cream separator or sewing machine oil:

Armature bearings.....two drops in each cup.
Distributor gear bearing.....five drops.
(*) Impulse coupling.....twenty drops (at least
one spoonful).

(*)Squirt in forcibly at least 3 or 4 shots from a full oil can, also oil the pawl pins and hook on clutch plate. The impulse coupling cannot be over-oiled. (See illustration No. 15.)

After every 200 to 300 hours of operation, lubricate the following places with cream separator or sewing machine oil:

Ground contact.....one drop.
Breaker screw.....one drop.
Breaker cam.....two drops of oil in the small
felt under the breaker cam.
Breaker arm bearing.....one drop.

Crank the engine so that the hollow pivot bearing is at the bottom of the breaker housing, to prevent oil from dripping on the breaker points. With the fingers lift up the breaker arm clamp spring and cap which covers the hollow pivot bearing, swing it to one side, and put one drop of oil in the opening. (See illustration No. 16.)

Warning! Do not oil the magneto more than specified and do not use heavier oil than specified, as it will gum the working parts of the magneto and make the impulse coupling inoperative, which may cause the engine to "kick back" when being cranked, resulting in serious injury to the operator, if the spark is not retarded.

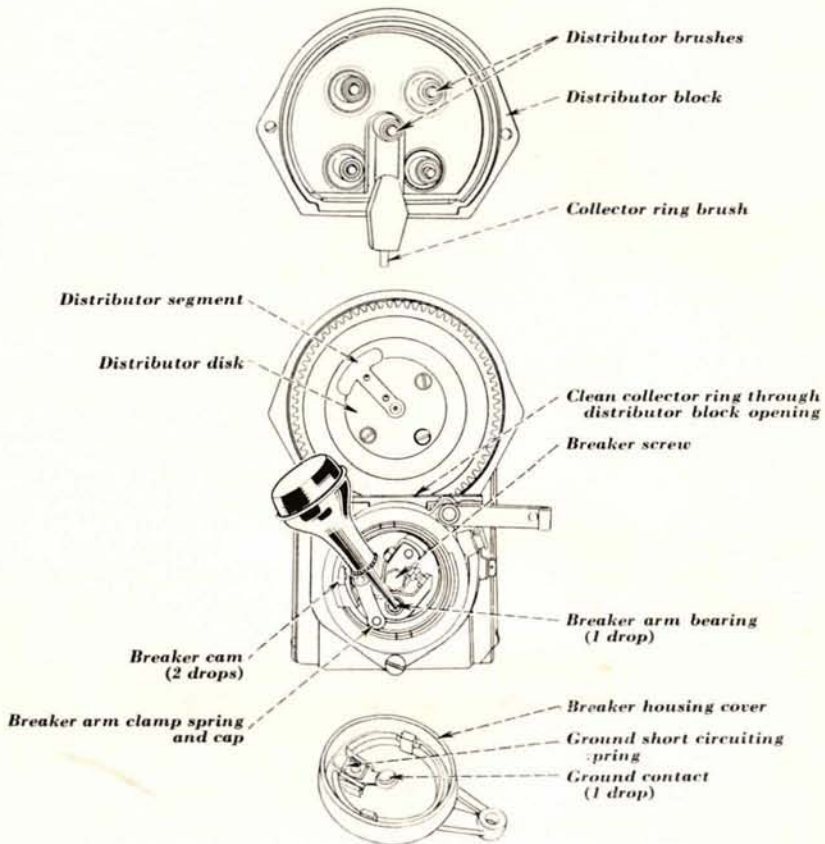


Illustration No. 16
Detail of magneto

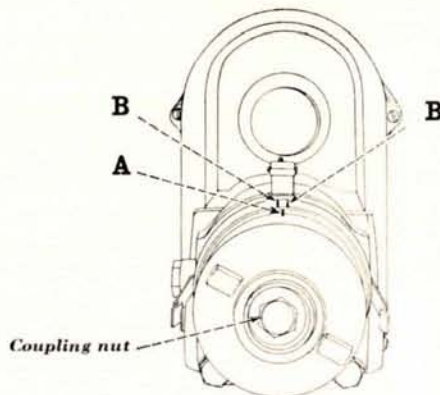


Illustration No. 17
Impulse coupling, showing timing marks.

Circuit Breaker

The breaker point opening should be from .012" to .015" when the rubbing block is on the high point of the cam. Should the breaker points need adjustment, proceed as follows:

Inspect the breaker points and if they are pitted, use a sharp magneto point file to polish the contact surfaces. One point should be slightly rounded, about .003" to .004" to insure good contact. (*See illustration No. 18.*) Loosen the fixed breaker point lock nut and adjust the fixed breaker point to the thickness of the gauge attached to the magneto wrench marked "Breaker Points." Without changing this adjustment, tighten the fixed breaker point lock nut. When making this adjustment be sure the fiber rubbing block is on the high point of the cam. (*See illustrations Nos. 19 and 20.*)

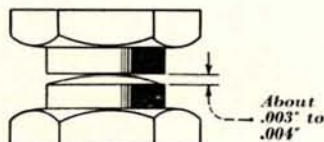


Illustration No. 18
Dressing breaker points.

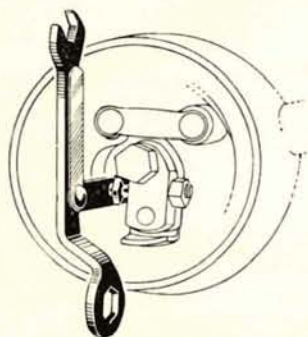


Illustration No. 19
Gauging breaker points.

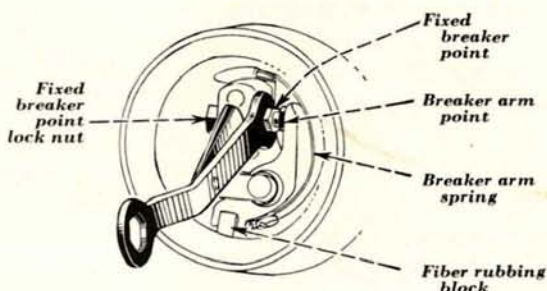


Illustration No. 20
Adjusting stationary breaker point.

The breaker arm springs should be cleaned and wiped with a piece of cloth dampened with oil at the time the breaker cam is oiled, to prevent the springs from rusting.

The rubbing surface of the cam should always be free from dust and slightly oiled to prevent excessive wear of the fiber rubbing block. (*See illustration No. 16.*)

Distributor

Remove the distributor block after every two to three hundred hours of operation and clean the inside of the block, the face of the distributor disk, and the collector ring on the armature shaft with a cloth moistened with gasoline, and then wipe dry with a clean cloth. The brushes should be inspected to see that they are in good condition and move freely in their guides. (*See illustration No. 16.*) If the brushes are allowed to stick in their guides, they will arc and form a green corrosion on the brass parts. The brush and breaker springs will also be rusted.

Remember—Overhauling and repairing are best done by an expert.

Impulse Coupling

The magneto is equipped with an automatic impulse starter coupling which makes possible the production of a spark, when cranking, equal to the spark when the engine is running.

Failure of the impulse coupling to operate may be caused by heavy oil or dirt and it should be cleaned by flushing it with gasoline while in place on the engine.

The coupling cover must always be in place to exclude water and dirt.

At least once a year the magneto, with coupling attached, should be taken to an authorized service station for a general overhauling. In case a service station is not accessible, the coupling should be removed from the magneto by unscrewing the coupling nut. The complete coupling should be washed in gasoline and allowed to dry. It should then be immersed in cream separator or sewing machine oil and re-assembled on the magneto. (*See illustration No. 17.*)

Timing the Magneto

Every engine is correctly timed at the factory and should not be tampered with. If it does not function properly, the magneto, with coupling attached, should be removed and taken to a service dealer.

If the magneto has been removed for any reason, the following instructions must be closely adhered to in replacing the magneto on the engine.

Check the breaker point opening as outlined under the heading "**Circuit Breaker.**"

Secure the magneto in place on the bracket by inserting the magneto base screws loosely in the magneto.

Note: When replacing the magneto base screws, do not use screws longer than the originals as they will damage the armature.

Crank the engine until No. 1 piston (the piston next to the starting crank) is on the upper dead center of the compression stroke. The compression stroke can be determined by removing the No. 1 spark plug and placing the thumb over the opening and cranking the engine until an outward pressure is felt. Continue cranking until the D. C. No. 1 mark on flywheel is in line with timing mark on flywheel housing. Both intake and exhaust valves should be closed at this time.

Fully retard the spark by raising the breaker housing lever as high as it will go, then carefully remove the breaker housing cover so as to avoid moving the breaker cam.

Remove the distributor block, grasp the magneto half of the adjustment coupling and rotate it clockwise (as viewed from the coupling end) until the segment in the distributor disk is under the distributor block terminal marked "No. 1", and the breaker points are just beginning to open.

The magneto is now correctly timed with the engine. Without changing this setting, replace the magneto coupling shims between the two halves of the adjustment coupling and shift the shims so the cap screws will pass through the holes in the shims and enter the holes in the tapped half of the adjustment coupling.

The coupling is so made that only two of the holes line up exactly opposite to each other and the cap screws must not be forced or the setting will be incorrect.

Replace the distributor block and breaker housing cover, exercising care not to damage the distributor block brushes.

Remember—Overhauling and repairing are best done by an expert.

Timing the Magneto—Continued

With the spark fully retarded, unhook and slide the impulse coupling cover away from the magneto and crank the engine until the breaker points are just beginning to open, with the impulse coupling disengaged and No. 1 piston coming up on the compression stroke. If the engine is timed correctly, the D. C. No. 1 mark on the flywheel will be in line with the timing mark on the flywheel housing.

The impulse coupling can be disengaged by pressing in the leading end of the top pawl while the engine is being cranked. This prevents this pawl from engaging with the catch plate. (See illustration No. 15.)

With the impulse coupling engaged, crank the engine until No. 1 piston is coming up on the compression stroke. Continue to crank the engine slowly, watching to see that mark "A" on the coupling member is between the two marks "B-B" on the impulse coupling plate when the impulse coupling trips. The impulse coupling cover should then be replaced. (See illustration No. 17.)

The D. C. No. 1 mark on the flywheel should be in line with or not more than 8° below ($\frac{25}{32}$ " on flywheel rim), and never above, the timing mark on the flywheel housing when the impulse coupling trips.

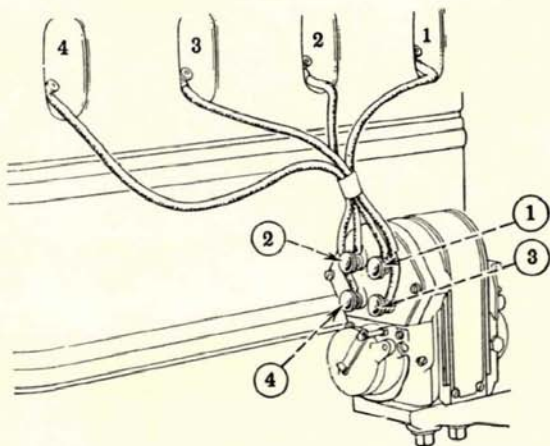



Illustration No. 21—Wiring plan (for E4A Magneto).

 Firing order is 1, 3, 4, 2, beginning at radiator end of engine.

Attach the spark plug cables to the magneto, connecting the No. 1 cable to the terminal on the distributor block marked "1." When all cables are connected to the distributor block, slip the magneto cover over the cables and before the cover is fastened in place, connect the cables to the correct spark plugs. Insert the magneto connection through the opening in the magneto cover and fasten the cover in place. (See illustration No. 21.)

The magneto is now correctly timed and wired.

Caution: Never operate the engine without the magneto cover in place.

Remember—Overhauling and repairing are best done by an expert.

Spark Plugs

The spark plug selected after careful tests as best suited for this engine is the Champion No. 20 and should be used.

A gap of .020" to .025" (or the thickness of the gauge attached to the magneto wrench marked "Spark Plug") should be maintained between the electrodes. When making this adjustment, always bend the outer electrode and never 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 the ends, the spark will jump the safety gap in the magneto, resulting in misfiring. Keep the gaps properly set to the thickness of the gauge.

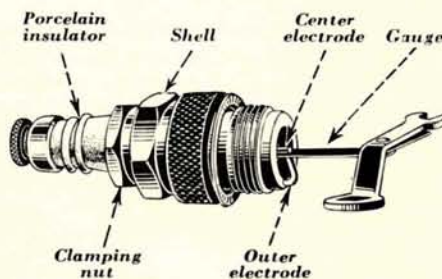


Illustration No. 22
Adjusting spark plug gap.

CLUTCH

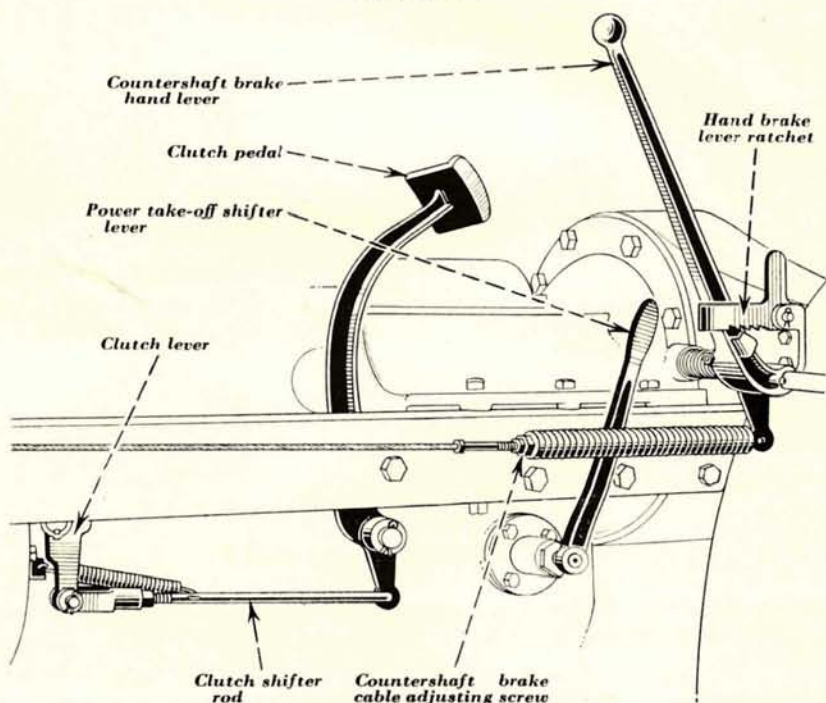


Illustration No. 23—Left side, showing clutch pedal, brake lever, etc.

Clutch Clearance

It is very important that a clearance be maintained between the clutch release bearing and the clutch release levers. (See illustration No. 57.) In order to maintain this clearance, the clutch pedal should have a free movement of 1" to 1½" from the transmission case when the clutch is fully engaged. As the clutch wears, this free movement decreases and adjustment should be made before free movement has become less than ¾". Clutch may be badly damaged unless a free movement of foot pedal is maintained. The clutch can easily be reset to the original position by lengthening the rod between foot pedal and clutch shifter lever.

WATER SYSTEM

General Information

The cooling of the engine is accomplished by the thermo-siphon system. The tank at top of radiator must be kept full to the level of baffle plate (inside of filler hole). *The water level must not be allowed to drop below the radiator inlet, otherwise the loss of water will be excessive and the engine will overheat.*

The Radiator

Keep the radiator filled with water which is free from lime, salt, gypsum, sulphur or other impurities. Soft or rain water should be used if same can be readily obtained. Never pour cold water into an empty or nearly empty water system when the engine is very hot. Wait until engine cools off.

Draining the Water System

A drain pipe with a cap located under the radiator drains the entire water system. The capacity of the water system is about 9 to 10 gallons. The water system must be drained when there is danger of freezing, as serious trouble arises if the water freezes in the engine or radiator.

Anti-Freezing Solutions

% By Volume	Distilled Glycerine			Ethylene Glycol (Prestone)		
	Freezing Point		Specific Gravity	Freezing Point		Specific Gravity
	°C	°F		°C	°F	
0%	0	32	1.000	0	32	1.000
10%	-2	29	1.029	-3	26	1.016
20%	-6	21	1.057	-9	16	1.031
30%	-11	12	1.085	-16	3	1.045
40%	-18	0	1.112	-24	-11	1.058
50%	-26	-15	1.140	-35	-31	1.070

Important!

Alcohol should not be used as an anti-freeze solution, as it will not prove satisfactory.

Do not use a solution of calcium chloride or any alkaline solution as they are injurious to the metal parts.

Cleaning the Water System

The radiator and cylinder water jackets should be cleaned occasionally. For removing grease and dirt, use a solution consisting of about three pounds of ordinary washing soda dissolved in sufficient water to fill the radiator and water jackets. Leave the radiator filler cap off and run the engine until the water gets hot, then drain out and flush with clean water.

The Fan

The fan is driven from the crankshaft by an endless belt. If radiator gives sign of overheating by excessive steaming or the motor laboring, examine the belt for slippage. Due to atmospheric conditions or prolonged use, the fan belt will stretch, and fan may hit against the upper part of fan shroud. In this case a new endless belt should be provided. A laced belt is not satisfactory.

(See illustration and instructions on page 25.)

POWER TAKE-OFF

To Operate Power Take-Off with Tractor Running

Throw out the clutch and move power take-off gear shift lever forward until gears are in mesh, shift transmission gears to the speed that is desired to run the tractor, then slowly let in clutch. (*See illustration No. 23.*) The power take-off is started and stopped by the same clutch as the tractor. Therefore, be sure to disengage clutch before moving the power take-off gear shift lever.

To Operate Power Take-Off with Tractor Standing Still

The gear shift lever must be in neutral position.

Throw out the clutch and move power take-off gear shift lever forward until gears are in mesh, then slowly let in clutch. (*See illustration No. 23.*)

COUNTERSHAFT BRAKE

(*See illustrations Nos. 23, 65, 66 and 67.*)

The brakes are of the internal expanding type. They are released when the hand lever is in the extreme forward position. To apply the brakes, it is only necessary to pull hand lever back.

BELT PULLEY

(*See illustration on title page and No. 62.*)

The belt pulley is 14 inches in diameter and $6\frac{1}{2}$ inches face. The drive is taken from the power take-off shaft through gears to the pulley shaft. These gears and the pulley shaft are mounted on ball bearings.

The gear shift lever must be in neutral position when operating the belt pulley.

Throw out the clutch and push power take-off gear shift lever forward until gears are in mesh. Then slowly let in clutch. The belt pulley is started and stopped by the same clutch as the tractor. Therefore, be sure to disengage clutch before moving the power take-off gear shift lever.

Steering

(See illustrations Nos. 63 and 64.)

The brakes take hold when the front wheels are swung to the extreme right or left, thus causing either of the rear wheels to lock, and the tractor to pivot in its course of travel. The question as to which rear wheel locks depends on the direction of steering; for example, when front wheels are turned to left, the left rear wheel locks and tractor pivots to the left.

Draw Bar and Hitch

(See illustration No. 24.)

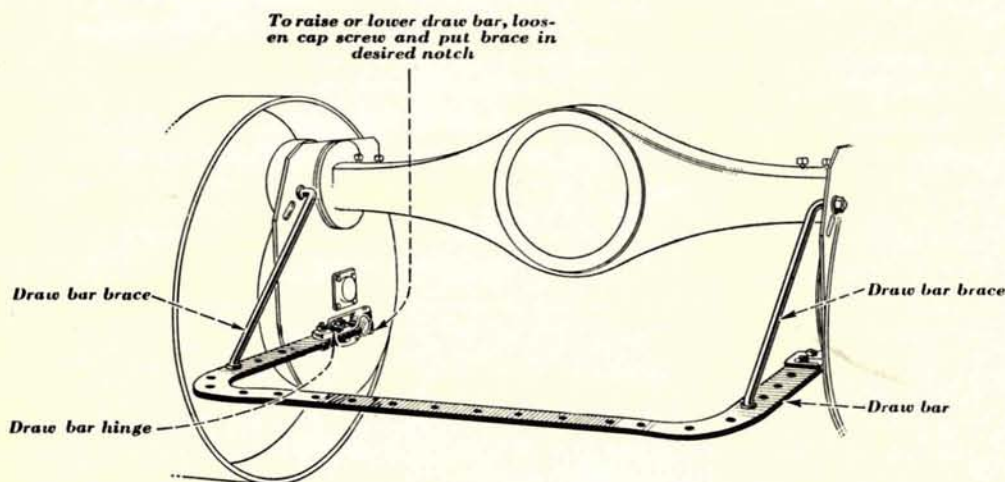



Illustration No. 24—Draw bar.

 **Always use the draw bar braces. Never use chains.**

The tractor exerts its pulling power by means of the draw bar. This is adjusted up and down to accommodate different hitches. Proper hitching will save both the tractor and the implement it is pulling from undue strains. The hitch should be made so that the center line of pull of the tractor should fall in line with, or be at least near the center line of draft of the plow or any other hitched-on implement; hitching to one side or the other of the line of draft will cause stresses and strains on both machines, frequently great enough to do permanent injury. It should be also borne in mind to make the hitch in such a way that the action of the draw bar pull will neither tend to raise the tractor rear wheels from, nor thrust them to the ground as a result of too high or too low hitching.

WARNING!

Do not hitch to the tractor at any point except to the draw bar.

Do not attempt to pull when draw bar is removed.

Always use draw bar and braces.

Instructions for Care and Operation in Cold Weather

Cold weather offers certain problems to all tractor owners. These are not much of a handicap to the experienced tractor operator, but are likely to be to the man who is wintering his tractor for the first time. In order of their importance these problems are:

1. Danger of water in cylinder jackets freezing with consequent cracking of the cylinders.
2. Faulty lubrication, due to the sluggish action of oils when cold.
3. Difficulty in starting the engine.
4. Storing the tractor for the winter months.

Danger from Freezing

One reason an engine cylinder cracks is because the water around it freezes.

A man may forget to drain his engine or he may not think it is going to be cold enough to freeze the water in the cylinder jackets. No matter how the water happens to be left there, the result is invariably a cracked cylinder, often followed by an extensive outlay for repairs. To avoid anything of this sort, there is one simple precaution to take in cold weather and that is to *drain the water out of the cooling system at the end of every run*. If tractor is to be left standing idle for a few hours, it should be drained.

Where a tractor operator has finished using his tractor, although at that time the weather may not be freezing, he should take care to drain his engine because, when the freezing weather does come, he may have forgotten that he left water in the cooling system.

When engine is left standing for any length of time in freezing weather, crankcase pan should be inspected for water in the oil on account of the possibility of pump freezing and causing breakage.

Engine Oiling in Cold Weather

If desired, during very cold weather, the engine oil in the crankcase pan can be completely drained each night. Do this while the oil is warm so it will drain freely.

Before refilling, warm oil thoroughly and pour into crankcase just before starting the engine as this will insure oil thin enough to pass through screen over pump suction.

Danger from Thick Transmission Lubricant

In cold weather transmission lubricant of other than approved specifications often becomes thick and heavy and *care should be taken to see that it is diluted sufficiently with a lighter oil so that it will flow readily*, otherwise it will channel and stick to the sides of the case and not flow back to the bottom of the case from where the gears can carry it over the bearings and gears.

Failure of the transmission lubricant to flow readily will soon cause the bearings to be without lubrication.

Storing and Housing

When a tractor is not to be used for a period of time, it should be stored in a dry and protected place. To leave a tractor stand in an open field or yard exposed to rain and snow, will result in materially shortening the life of the tractor.

CORRECTIVE MEASURES

Study the problem before making any changes.

If any adjustments are to be disturbed, the original setting should be noted, so this same setting may be restored in case the part changed does not remedy the trouble.

Failure to Start:

- No fuel.
- Fuel strainer needle valve closed.
- Carburetor choked too much.
- Magneto grounded.
- Throttle control lever improperly set.
- Gears engaged.
- Kerosene instead of gasoline in fuel strainer (for starting).

Irregular Speed:

- Governor sticking, out of adjustment, or worn.
- Throttle shaft bent or out of alignment.

Lack of Power:

- Governor out of adjustment.
- Exhaust pipe clogged.
- Throttle control lever improperly set.
- Clutch slipping.

Overheating:

- Spark retarded.
- Insufficient amount of water.
- Fan belt slipping.
- Excess load.
- Inside of radiator and cylinder block lined up or clogged with dirt.
- Outside of radiator or radiator screen covered with dirt or chaff.
- Excess carbon in the cylinders.
- Carburetor improperly adjusted.

Missing and Backfiring:

- Water in the fuel.
- Air leaks around the intake manifold.
- Engine not warmed up.
- Red-hot carbon deposits in cylinder.

Lack of Oil Pressure:

- Insufficient amount of oil.
- Oil diluted or not as specified.
- Oil filter clogged.
- Dirt under the oil pressure regulating valve.
- Broken oil gauge.
- Oil pump strainer clogged or pump not working.

Knocking:

- Spark too far advanced.
- Excess carbon in the cylinders.
- Sticky valve or improperly adjusted valves.
- Loose piston pin, connecting rod, camshaft, or crankshaft bearings.
- Broken piston rings or loose pistons.

Lack of Compression:

- Sticky, dirty, pitted or improperly adjusted valves.
- Stuck, worn or broken piston rings.
- Worn pistons.
- Leaky cylinder head gasket.

Excess Fuel Consumption:

- Choke out.
- Spark retarded too far.
- Air pipe screen or air filter clogged.
- Incorrect amount or improper grade of oil.
- Leaky carburetor fuel valve.

Lack of Fuel:

- Fuel low in the tank.
- Vent hole in fuel tank filler cap plugged.
- Fuel strainer needle valve closed or only partially opened.
- Clogged fuel strainer screen, fuel line or carburetor strainer.
- Idling adjusting screw not properly set.

Defective Ignition:

- Wrong kind, old, cracked, dirty or poorly set spark plugs.
- Broken, loose or improperly connected wiring.
- Dirty distributor block disk or collector ring.
- Stuck or broken brushes.
- Dirty, pitted or improperly set breaker points.
- Breaker arm not free on its bearing or the breaker arm spring weak or broken.
- Ground contact, ground contact spring insulation or spring defective.
- Magneto not timed correctly with the engine.
- Impulse coupling dirty, dry or lubricated with heavy oil.

Explosions in exhaust pipe often occur just after starting, due to first charges not firing in cylinder and passing through into exhaust pipe, where burning gases from first few explosions will ignite them.

Remember—Overhauling and repairing are best done by an expert.

ILLUSTRATIONS AND INSTRUCTIONS FOR ADJUSTMENTS AND OVERHAULING

This section contains instructions and illustrations pertaining to certain simple adjustments and replacements which can readily be made. However, the owner should consult the dealer before attempting a general overhauling or when any mechanical difficulties occur, as he has the necessary equipment for doing the work.

Remember—Overhauling and repairing are best done by an expert.

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ENGINE

Valve Adjustment

The valve levers must be kept properly adjusted, otherwise hard starting and lack of power will result. The firing order of the engine is 1-3-4-2. (See *illustration No. 21*.) If, for any reason, the valve setting has been disturbed or cam gear is to be replaced, care must be taken to restore to original setting. To facilitate this, all gears are properly marked and the marked teeth must be meshed together. Every time the nuts are tightened on cylinder head studs, the valve lever must be adjusted by means of the valve lever screws, using the valve clearance gauge so that there is a clearance of .012" between ends of valve lever and valve stem when valve is closed. This clearance is very necessary.

(See *illustration No. 25*.)

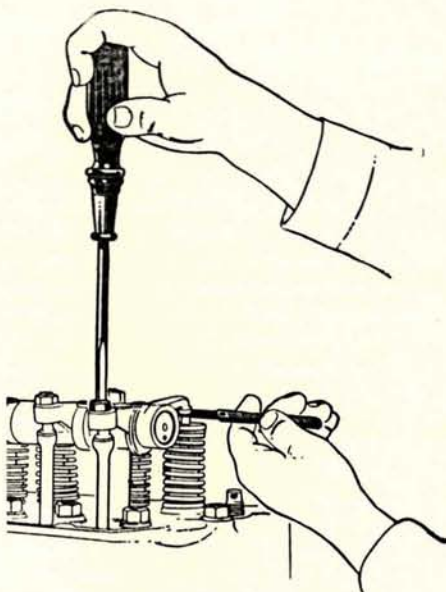


Illustration No. 25
Gauging valve levers with a "feeler" gauge.

Cylinder Head Drain Trough

Illustration No. 26 shows drain trough properly placed to deflect water collected on top of cylinder head from passing into crankcase through breather tube.

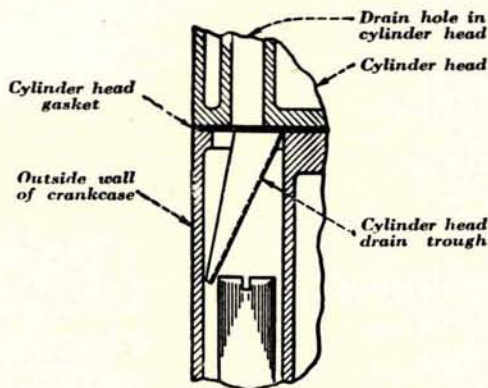


Illustration No. 26
Cylinder head drain trough.

Gaskets

Before putting on new gaskets, the surface for the joint must be thoroughly cleaned. When tightening up a joint after a new gasket has been inserted, screw up all nuts fairly snug, then tighten uniformly, 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 secure an even pressure on the gasket in this manner. *After engine has been running a few minutes, tighten the nuts again.*

CAUTION—Be sure to adjust valve tappet clearance after the last tightening of cylinder head stud nuts. (See "Valve Adjustment.")

Remember—Overhauling and repairing are best done by an expert.

Testing Compression

Compression in all cylinders should be equal. Test the compression occasionally by turning the starting crank until compression is felt in each of the four cylinders in succession, comparing the result. Loss of compression is probably due to worn cylinder sleeves, worn pistons and rings, imperfect seating of valves, too little or no clearance between ends of valve levers and stems or by carbon deposit on the valve seats.

Carbonized Cylinders

In case the engine knocks continuously and does not develop the normal amount of power, it may be that the combustion chamber walls are coated with carbon. If the cylinders are carbonized, remove the cylinder head, scrape off the carbon from the head, piston head and combustion chamber. It is also advisable to regrind the valves at this time.

When replacing cylinder head, follow the instructions on page 23 under heading "Gaskets" regarding tightening of nuts as it is important to secure an even pressure on all studs.

Grinding Valves

Valves and seats must be kept in good shape. To regrind valves, drain the cooling system, remove the cylinder head, take off the valve springs, then lift out and clean valve and seat with kerosene. Make a paste of fine emery dust and oil, or use a prepared valve grinding compound.

Apply grinding compound to seat of valve. Put the valve in place and revolve it with a screw driver, or better a carpenter's brace with a screw driver bit, turning a few turns to the right and then to the left, lifting the valve off the seat occasionally to let the grinding compound get between the valve and seat. Continue in this manner until the valve and seat show an even surface all the way around. Then wash off with gasoline or kerosene. Be sure there is no dirt or compound left on the valve seat or in parts when assembling. *After grinding valves, it will be found necessary to readjust valve levers to compensate for the wear.*

Inspecting and Testing Bearings

To determine if the connecting rod bearings are loose, remove the hand hole plates on left hand side of engine. Turn engine over until bearing to be tested is nearly at the top dead center of compression stroke. Then place a bar under nut on bearing cap and pry against it; meanwhile place the other hand on bearing and crankshaft and determine by touch what looseness is present. (See illustration No. 27.)

If excessive looseness is found, a sufficient amount of shims should be removed to leave about $3/1000''$ to $5/1000''$ play in the bearings and there should be from $10/1000''$ to $15/1000''$ side play. The main bearings are ball bearings and do not need adjustment or special attention except to *keep gril* away from same; this is best accomplished by keeping clean oil in crankcase.

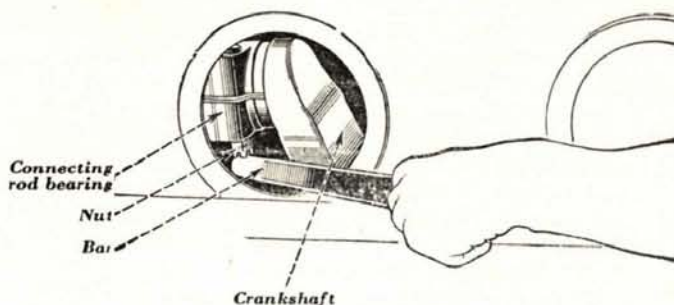


Illustration No. 27

Testing connecting rod bearings for looseness.

Remember—Overhauling and repairing are best done by an expert.

Removing or Replacing Fan Belt

Loosen the wing nut on the fan adjuster bolt, to relieve the tension of the spring on the fan bracket. Fan pulley can then be pushed down so that the fan belt will pass over the fan edge of the belt pulley. Next put the belt over the belt drive pulley. Then work the belt over the fan blades, as shown in *illustration No. 28*.

In replacing the belt, the reverse procedure should be followed. Adjust fan belt to avoid slippage.

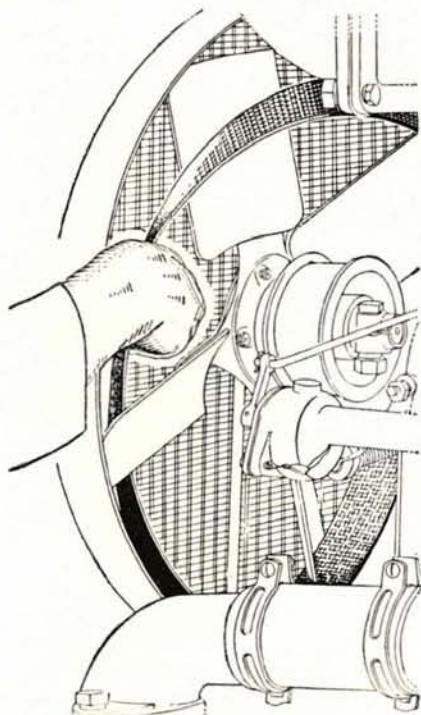


Illustration No. 28
Removing fan belt.

Adjusting Front Wheel Bearing

To adjust front wheel bearing, run the opposite wheel on a block of wood as shown in *illustration No. 29*. Remove the four cap screws and take off the hub cap. Straighten the nut lock "C" and remove the nut; take off the adjusting lock "A," and turn the adjusting nut "B" to the right until just snug, at the same time rotating the wheel several turns. Then turn the nut "B," back about one-sixteenth of a turn and reassemble by placing adjusting lock "A" so one of the holes fits over pin in the adjusting nut "B." Replace nut lock "C," locating the small projection on side opposite pin in nut "B." Replace the nut, bend the nut lock, and replace the hub cap.

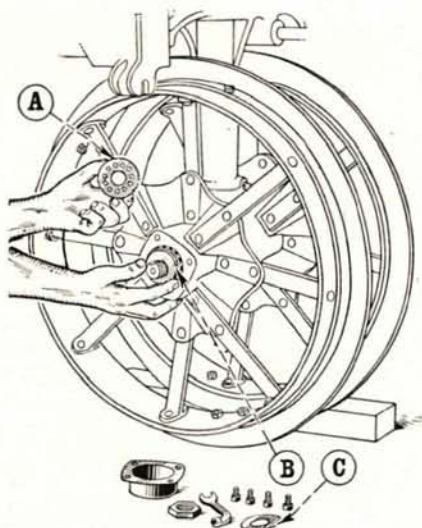


Illustration No. 29

Remember—Overhauling and repairing are best done by an expert.

Removing Front Wheel

To remove the front wheel proceed as shown in *illustration No. 29*, and in addition take off the adjusting nut. Oftentimes the wheel can be "rocked off." If this fails, use a stick of wood as shown in *illustration No. 30* and gently tap the wheel until it is loosened.

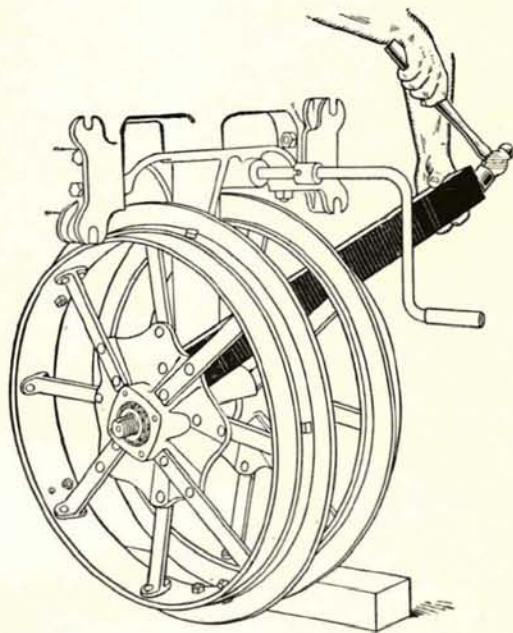


Illustration No. 30

After the front wheel has been loosened, as shown in *illustration No. 30*, hold one hand under the bearing so it will not fall in the dirt. When a bearing of this kind becomes filled with dirt and dust it is very difficult to thoroughly clean it. This precaution will save time and difficulty later. (See *illustration No. 31*.)

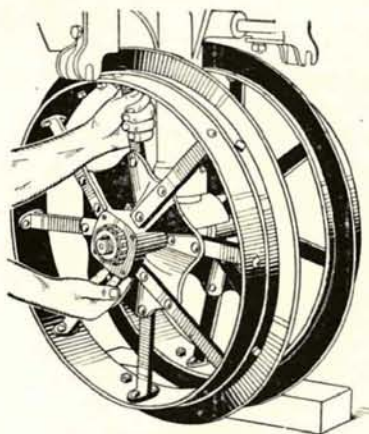


Illustration No. 31

Remember—Overhauling and repairing are best done by an expert.

Removing Outer Race of Front Wheel Bearing

When it is necessary to put new bearings in the front wheel, proceed as shown on pages 25 and 26. In removing, hold the wheel as shown in *illustration No. 32* and with a bar drive the outer race out of place. When the new race is to be put in, be very careful that it is started in straight and tap it in place by using a block of wood laid across it.

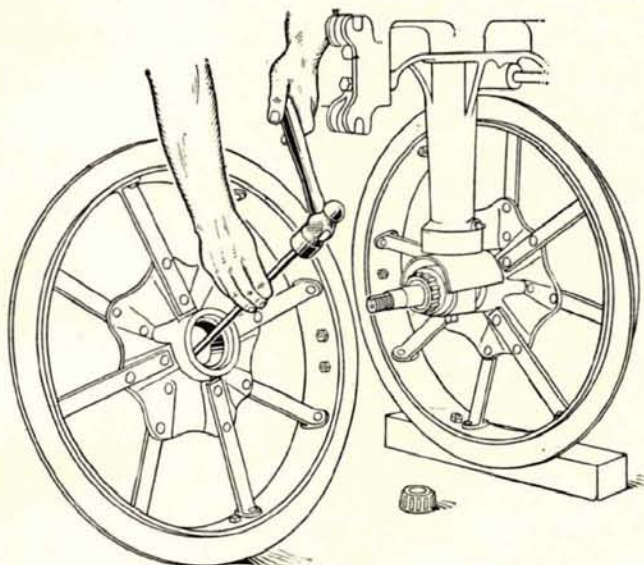


Illustration No. 32

Removing Front Wheel Bearing

After removing the wheel, the inner roller bearing and its inner race will remain on the spindle. These can be removed by prying off with a screw driver if no better tool is available. (See *illustration No. 33*.) If the felt washer is injured in this procedure, replace with a new one.

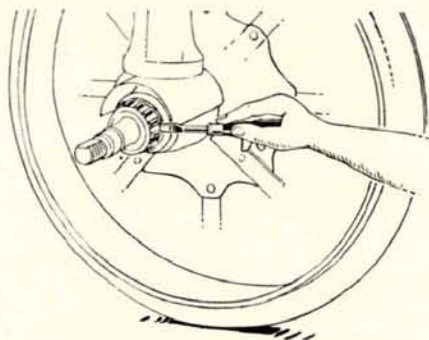


Illustration No. 33

Remember—Overhauling and repairing are best done by an expert.

Replacing Front Wheel Bearing

In replacing the front wheel and bearing, care should be exercised not to injure the bearing. Put the wheel on and see that the felt washers on the inside of the wheel are not sheared off or injured. Place the outer bearing on the end of the shaft and with a clean block of wood gently tap it into the proper position. (See illustration No. 34.)

Proceed from this point as described on page 25, which will give the proper adjustment to the bearing.

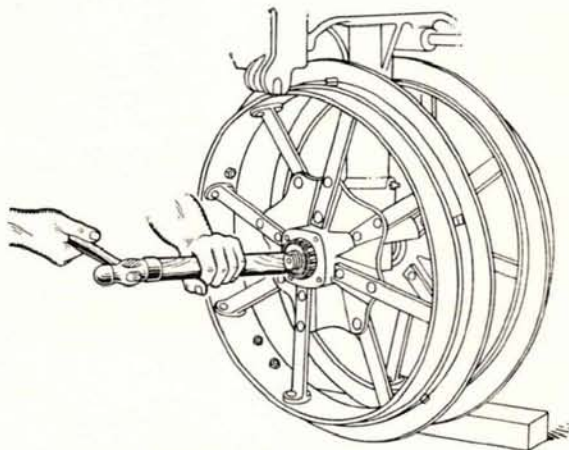


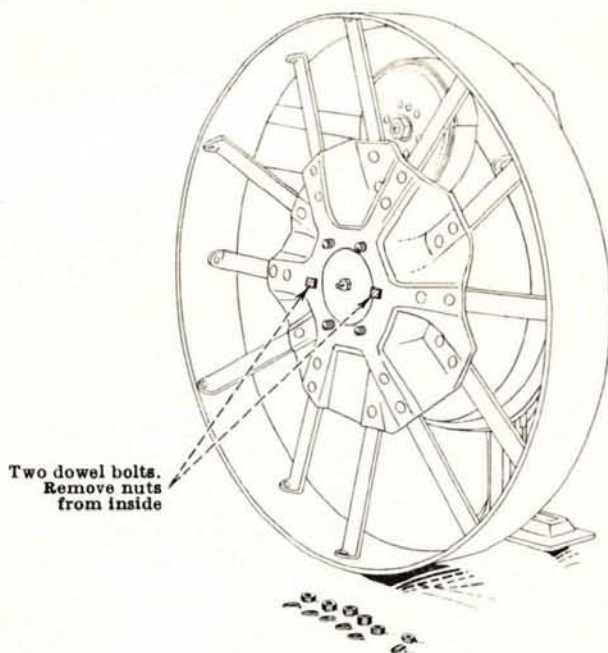
Illustration No. 34

Removing Rear Wheel

(See illustration No. 35)

Jack up the drive gear housing. Remove the nuts from the two dowel bolts (from the inside of the wheel). Then unscrew the four nuts from the outside.

The wheel can then be removed.



Two dowel bolts.
Remove nuts
from inside

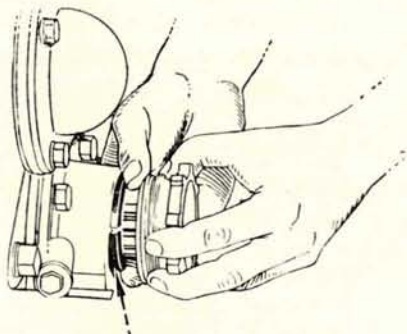
Illustration No. 35

Remember—Overhauling and repairing are best done by an expert.

Replacing Transmission Shaft Packing

To remove the transmission shaft packing, take out the four cap screws which hold the dust shield over the transmission joint. Then loosen the cap screw holding the packing gland locks. Using the spanner wrench found in the tool box, turn the packing gland as far out as possible. Remove the old packing with a large nail or hooked wire and insert new packing as shown in *illustration No. 36*.

Note: It is not necessary to remove any parts other than those mentioned.



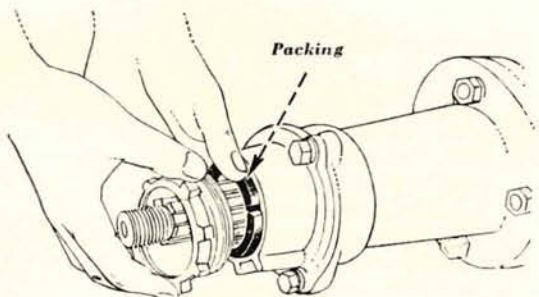
Packing

Illustration No. 36

Replacing Belt Pulley Shaft Packing

To remove the pulley shaft packing, turn the packing gland out as far as possible with the spanner wrench found in the tool box. Remove the old packing with a large nail or hooked wire and insert new packing as shown in *illustration No. 37*.

Note: It is not necessary to remove belt pulley.



Packing

Illustration No. 37

Remember—Overhauling and repairing are best done by an expert.

COUNTERSHAFT BRAKE

Brake Cable Adjustment

The brakes are adjusted by means of an eyebolt attached to the steel steering cables. The front wheels must be in line with the center line of the tractor, the cables just taut and of such length that the brake operating levers lay back against the countershaft housing, which is the released position of the brake cam. At this point there must be no tension on the springs.

Removing the Brake Drum

First take off the large nut which holds the brake drum in place. Remove the two screws located in the brake drum. This will enable a puller to be used. It may be possible to slip the drum off without using the puller.

Adjusting Brake for Wear

Some operators make the mistake of resting a foot on the brake lever which causes undue wear of the brake lining; this may also spring the brake shaft. If one finds that the brake doesn't take hold and yet doesn't show that it is worn out, it can be fixed as shown in *illustration No. 38*. Remove the wearing plate, "A," and place some shims, "B," under it. This will give the brake more braking contact. When relining brakes, the shims, "B," must be removed because the new lining is thicker.

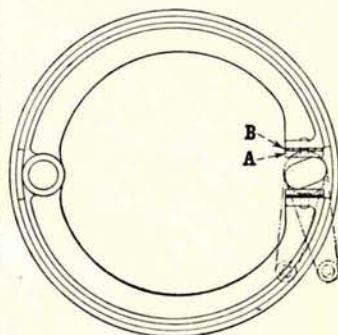


Illustration No. 38

Removing Brake Band

Should the brake lining become worn and need to be replaced, the brake band can be removed easily as shown in *illustration No. 39*. Take out the cotter pin and remove the washer. With a chisel or screw driver pry off the brake band.

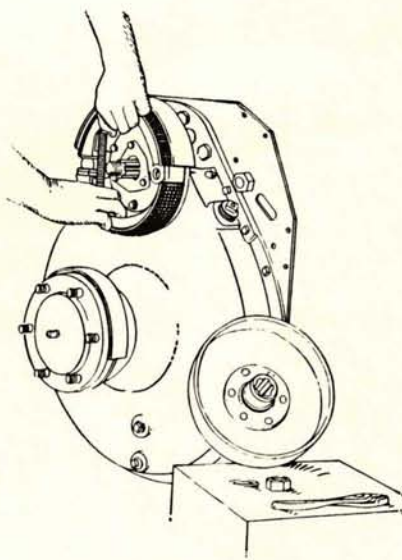


Illustration No. 39

Remember—Overhauling and repairing are best done by an expert.

List and Illustrations

Detailed illustrations of the principal units are included in this section, together with list showing the numbers and description of parts.

INDEX TO UNITS

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COMPLETE TRACTOR

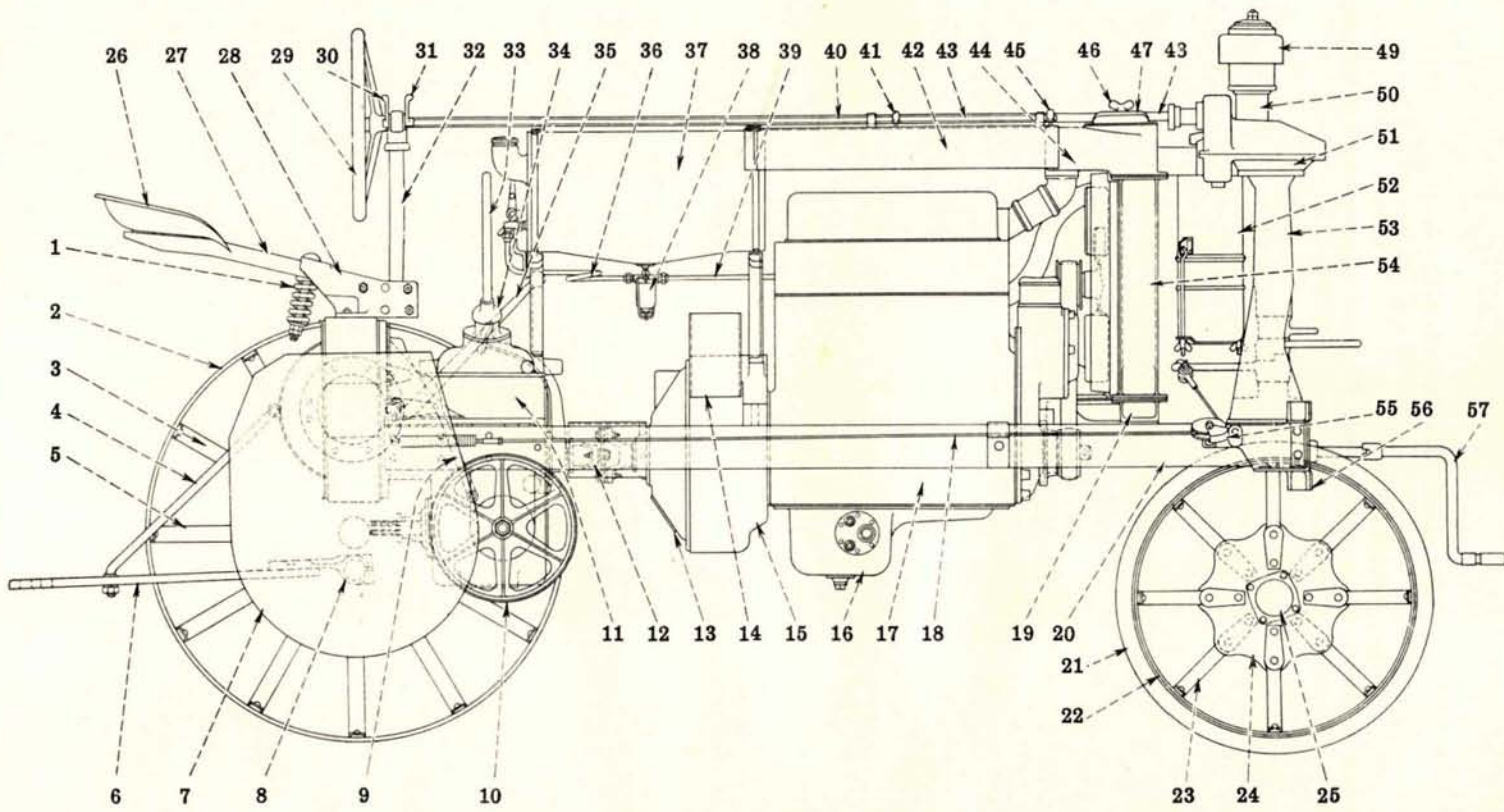


Illustration No. 40
Right side of complete Tractor.

COMPLETE TRACTOR

(See illustration No. 40)

Ref. No.	I H C Part No.	DESCRIPTION
1	10214DA	Seat support spring.
2	17254DC	Rear wheel, complete less lugs (not "Narrow Tread").
3	20556D	Rear wheel spoke, inner (not "Narrow Tread").
	20558D	Rear wheel spoke, inner ("Narrow Tread" only).
4	15085DA	Drawbar brace, L. H.
5	20556D	Rear wheel spoke, outer (not "Narrow Tread").
	20559D	Rear wheel spoke, outer ("Narrow Tread" only).
6	15141D	Drawbar (not "Narrow Tread").
	15407D	Drawbar ("Narrow Tread" only).
7	1501DC	Rear wheel carrier.
8	1539DB	Drawbar hinge, L. H.
9	1530D	Power take-off shifter lever.
10	1592DX	Pulley, 14" diam. x 6½" face.
11	2433DX	Transmission case, complete.
12	20728D	Transmission joint.
13	14006D	Clutch housing handhole cover.
14	15172DA	Tool box, less cover.
15	1565DA	Bell housing.
16	10372DX	Crankcase pan, complete.
17	423DBXb	Crankcase, complete.
18	15206DB	Countershaft brake cable, complete.
19	1408DAX	Water tank, lower, complete.
20	15190D	Main frame, L. H.
	15191D	Main frame, R. H.
21	15360DB	Front wheel tire ring.
22	20643D	Front wheel, complete (29" diam. x 5" tire).
23	20642D	Front wheel spoke.
24	1515DDX	Front wheel hub, with roller bearing cups.
25	15397D	Front wheel hub cap.
26	MB 488B	Seat.
27	17389D	Seat support channel.
28	19160D	Seat support bracket, complete.
29	1526D	Steering wheel (18" diam.).
30	1438D	Throttle rod hand lever.
31	1439D	Spark shaft hand lever.
32	20725D	Steering shaft bearing post.
33	15047DA	Gear shift lever.
34	2438D	Gear shift ball socket.
35	1809D	Countershaft brake hand lever.
36	20727DX	Fuel pipe, complete (gas tank to fuel strainer).
37	20732DX	Fuel tank, complete with caps.
38	17237D	Fuel strainer.
39	20738DX	Fuel pipe, complete (tank to carburetor).
40	15078DB	Spark tube.
41	431EB	Spark rod tube lever.
42	21242DX	Hood sheet, complete.
43	15153DB	Throttle rod.
44	1580DX	Water tank, upper, complete with drain pipe.
45	2431D	Throttle rod lever.
46	7167T	Water tank handhole cover clamp bolt.
47	4080D	Water tank handhole cover, with stop.
48	20724D	Steering shaft.
49	15736DY	Air pipe, upper, complete with 15736DX.
50	15736DX	Air pipe, upper with flange.
51	2237DAX	Steering gear case, complete.
52	16466DAX	Oil air filter, complete (International).
53	2432DX	Front bolster, complete.
54	21183D	Radiator, complete.
55	15269DA	Countershaft brake sheave shield.
56	1528DA	Cultivator pivot bracket, R. H.
57	15179DAX	Starting crank, complete.

COMPLETE TRACTOR

Miscellaneous parts not indicated in illustration No. 40.

I H C Part No.	DESCRIPTION
1527DA	Cultivator pivot bracket (L. H.).
1555DA	Hand brake ratchet fork.
2442D	Heat control lever bracket.
2595D	Exhaust pipe elbow.
2598D	Exhaust pipe.
10862D	Throttle rod spring.
11901D	Heat control hand lever spring.
13089D	Cultivator shifter lever key.
14038DA	Choke rod clip.
14177D	Throttle hand lever stop pin.
14186D	Starting crank bearing lubricator (Zerk).
15020DB	Hand brake lever ratchet.
15229D	Bell housing shim.
15230D	Front engine support shim.
15274D	Starting crank spring.
15346D	Hand brake ratchet fork pin.
15354D	Throttle rod connection.
15416D	Hand brake ratchet spring.
15540D	Spark tube connection.
19305D	Heat control rod end.
19306D	Heat control rod end pin.
19931D	Heat control hand lever pivot.
20504D	Starting crank bearing stud.
20726D	Heat control rod.
20735D	Choke rod.
21591D	Exhaust pipe gasket.
3843T	Heat control hand lever pin.
9663T	Throttle rod hand lever pin.

ENGINE

(3½ x 5)

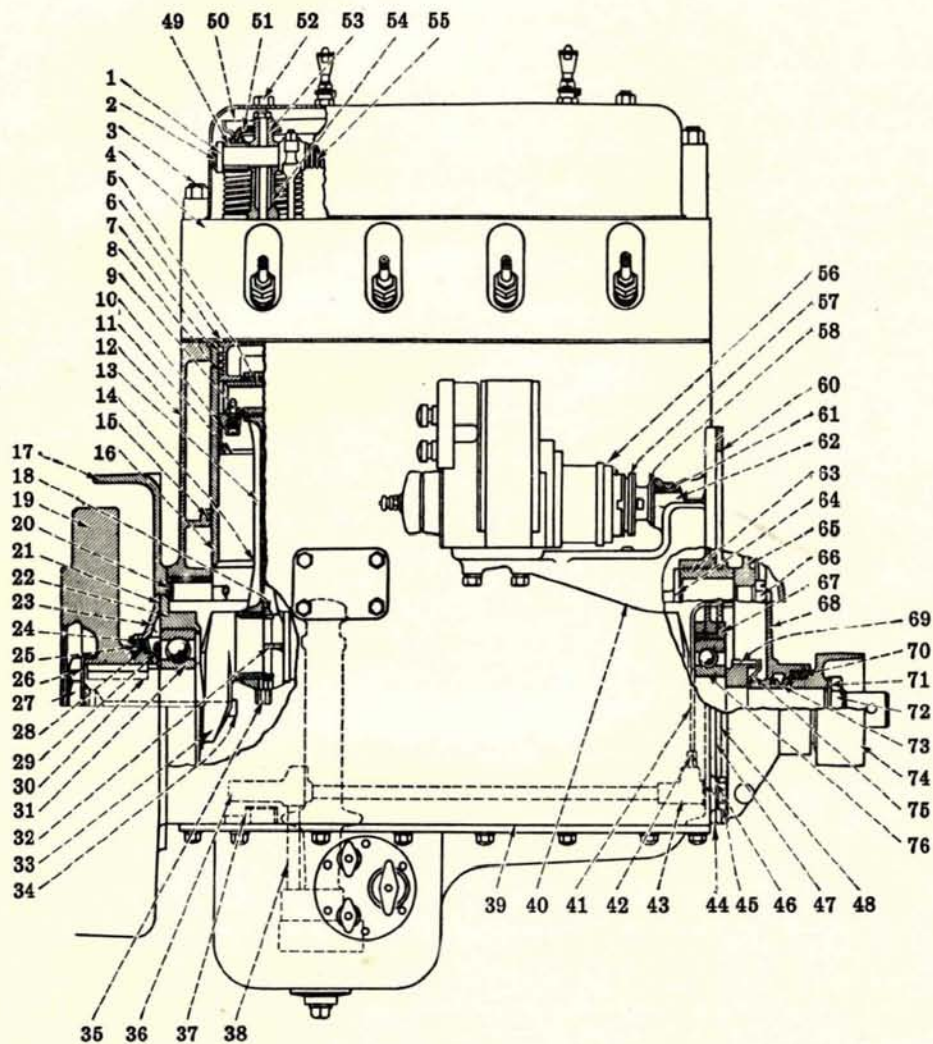


Illustration No. 41

Right side of engine (3½ x 5) (sectional view).

(For list of parts, see page 36.)

ENGINE

(See illustration No 41)

Ref. No.	I H C Part No.	DESCRIPTION	Ref. No.	I H C Part No.	DESCRIPTION
1	12207D	Valve lever pin collar.	36	15885D	Oil discharge pipe, complete.
2	10326DA	Valve lever pin, $\frac{1}{8}$ x $9\frac{1}{8}$ ".	37	.....	Crankcase pan oil trough (order 10372DX).
3	7196TA	Cylinder head stud, $\frac{1}{2}$ x $9\frac{1}{8}$ " long.	38	14413D	Oil discharge pipe, vertical $\frac{1}{2}$ " O.D. x $4\frac{1}{4}$ ".
4	414DXc	Cylinder head with studs and valve guides.	39	10417D	Crankcase pan gasket.
5	10307DA	Piston pin, $1\frac{1}{8}$ x $3\frac{1}{8}$ ".	40	1906DAX	Magneto bracket with bushing.
6	10321DB	Cylinder head gasket.	41	10411DX	Camshaft gear oil pipe, complete.
7	401DA	Piston ring.	42	13061D	Camshaft gear oil pipe connector
8	12204DA	Piston ring (perfect circle oil seal).	43	14408D	Oil discharge elbow.
9	10302D	Piston pin bushing.	44	10370D	Crankcase plate, front.
10	4787T	Piston pin set screw, $\frac{1}{8}$ x $1\frac{1}{2}$ ".	45	10493DA	Oil discharge elbow nut.
11	400DAXb	Piston with piston pin and set screw.	46	4301D	Oil discharge elbow gasket.
12	423DBX	Crankcase with stud and camshaft bearing.	47	10416D	Crankcase front plate gasket.
13	10300DAX	Connecting rod with cap and piston pin bushing.	48	10415D	Crankcase front cover gasket.
14	16738DA	Camshaft bearing, rear.	49	10325D	Valve lever bushing.
15	10369D	Cylinder sleeve packing ring (rubber).	50	10351D	Valve lever oil trough.
16	421DX	Cylinder sleeve ($3\frac{1}{4}$ ") with rubber packing ring.	51	10352D	Valve lever oil trough packing.
17	1565DA	Bell housing.	52	17619D	Valve lever pin stud, long.
18	7153TX	Connecting rod bolt with nut, $\frac{1}{2}$ x $3\frac{1}{8}$ ".	53	8010T	Valve lever pin stud, short.
19	1482D	Flywheel.	54	4319D	Valve lever pin stud spacer.
20	16740D	Crankcase gasket, rear.	55	411DA	Valve lever pin support.
21	10496D	Main bearing cover plate gasket.	56	3223T	Valve lever spring.
22	403D	Crankshaft retainer, rear.	57	12741D	Magneto coupling block spacer.
23	424DAX	Main bearing cover plate, complete.	58	12740D	Magneto coupling block, male.
24	12749D	Crankshaft felt washer retainer.	59	7882T	Magneto coupling, $2\frac{1}{2}$ x $1\frac{1}{8}$ ".
25	12750D	Main bearing cover plate washer.	60	10367D	Magneto bracket gasket.
26	10354D	Flywheel nut lock.	61	16552D	Governor and magneto shaft bushing.
27	10353D	Flywheel nut.	62	17220DX	Governor and magneto shaft with carrier.
28	12748D	Crankshaft felt washer, rear.	63	10311DB	Camshaft bearing front.
29	10355D	Main bearing oil deflector.	64	10347DA	Camshaft.
30	10318D	Flywheel key (No. 9 tapered pin $2\frac{1}{4}$ " long).	65	10371DX	Camshaft gear, 70 teeth (with shim).
31	4259D	Crankshaft ball bearing, rear.	66	4221D	Camshaft nut, $1\frac{1}{8}$ " hex. x $\frac{1}{2}$ ".
32	10 041DA	Connecting rod bearing shims (package).	67	402D	Crankshaft retainer, front.
33	10356DAX	Crankshaft with wick.	68	496D	Crankcase front cover.
34	12219D	Clutch shaft bearing wick.	69	10315D	Crankshaft pinion (35 teeth).
35	7154T	Connecting rod bolt castellated nut, $\frac{1}{2}$ " S.A.E.	70	12734D	Crankshaft felt washer, front.
			71	10374D	Crankshaft pinion nut lock.
			72	10316D	Crankshaft pinion nut.
			73	10320D	Crankshaft pinion spacer.
			74	2365D	Fan drive pulley.
			75	10317D	Crankshaft pinion washer.
			76	10349D	Crankshaft ball bearing, front.

ENGINE

(3½ x 5)

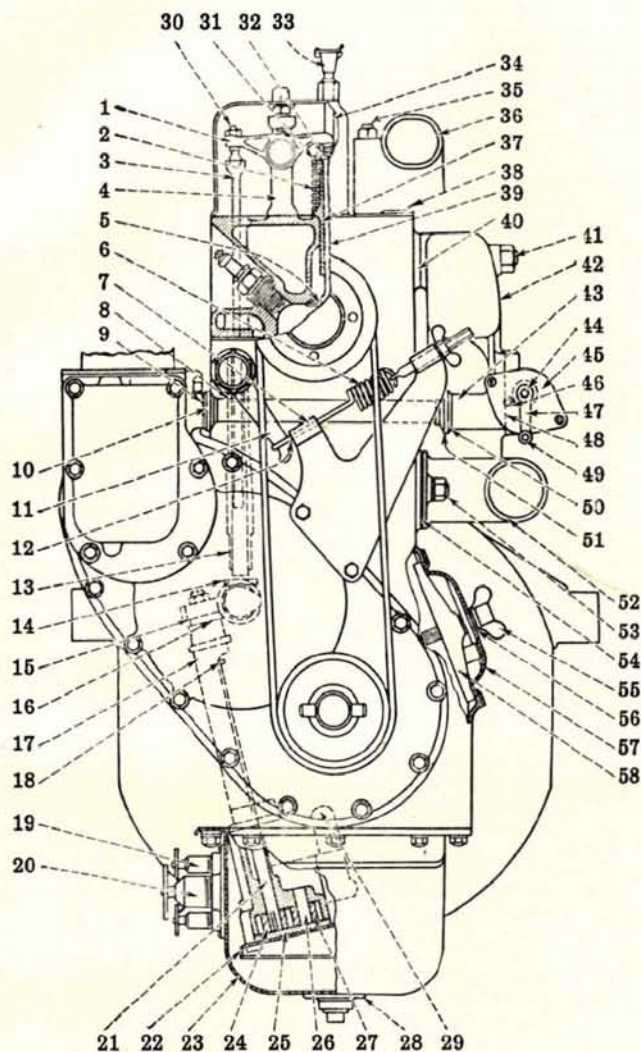


Illustration No. 42

Front view of engine (3½ x 5) (sectional view).

(For list of parts, see page 38.)

ENGINE

(See illustration No. 42)

Ref. No.	I H C Part No.	DESCRIPTION
1	{ 10949DX	Valve lever with bushing, front.
2	{ 10950DX	Valve lever with bushing, rear.
3	10333D	Valve spring.
4	10348D	Valve push rod, $\frac{5}{8}$ x 20 $\frac{1}{2}$ ".
5	411DA	Valve lever pin support.
6	18534D	Inlet and exhaust valve.
7	11585D	Fan adjuster spring.
8	14710D	Fan adjuster bracket.
9	12744D	Governor connecting rod housing.
10	12726D	Governor connecting rod housing felt washer.
11	12720D	Governor connecting rod housing felt washer retainer.
12	471DA	Fan bracket.
13	11586D	Fan adjuster bolt.
14	405D	Valve tappet guide.
15	10332D	Valve tappet.
16	10335D	Oil pump drive pinion, 10 teeth.
17	407D	Oil pump shaft bushing.
18	406DBX	Oil pump body with bushing and pin.
19	10337D	Oil pump shaft collar.
20	1998T	Oil gauge cock, $\frac{1}{8}$ ".
21	1994TA	Crankcase oil drain valve, 1" complete.
22	10345D	Oil pump shaft, $\frac{1}{2}$ x 13 $\frac{1}{8}$ ".
23	10346D	Oil pump screen holder with screen and block.
24	10372DX	Crankcase pan with trough, flange and strips.
25	10344D	Oil pump impeller gear driver, 12 teeth.
26	413D	Oil pump cover.
27	4299D	Oil pump impeller gear pin, $\frac{9}{16}$ x 1 $\frac{1}{2}$ ".
28	10336D	Oil pump impeller gear, driven, 12 teeth.
29	7061T	Crankcase pan drain flange.
30	15841D	Oil pressure valve, complete.
31	10952D	Valve lever screw check nut, $\frac{1}{2}$ " hex. x $\frac{1}{2}$ ".
32	18532D	Valve spring seat.
33	16058D	Valve spring lock.
34	13106D	Cylinder head priming cup, $\frac{1}{8}$ ".
35	10322DA	Cylinder priming tube.
36	7196TA	Cylinder head water outlet manifold stud, long, $\frac{1}{2}$ x 9 $\frac{1}{8}$ ".
37	450D	Water outlet manifold.
38	7973T	Valve guide.
39	10418D	Water outlet manifold gasket.
40	.....	Intake valve (order 18534D).
41	10378D	Exhaust and inlet manifold gasket.
42	G 2436	Exhaust and inlet manifold stud, $\frac{1}{2}$ x 4 $\frac{1}{8}$ ".
43	2559DX	Intake manifold.
44	2487DX	Governor rod support with bushing.
45	{ 20327D	Speed change lever shaft.
46	{ 18907D	Governor throttle shaft, complete.
47	2382D	Governor rod support cover.
48	12700D	Governor connecting rod pin, $\frac{1}{2}$ x 1 $\frac{3}{8}$ ".
49	1451D	Governor throttle lever.
50	21632D	Carburetor gasket.
51	2383D	Speed change lever.
52	12726D	Governor connecting rod housing felt washer.
53	12720D	Governor connecting rod housing felt washer retainer.
54	2562D	Water inlet elbow.
55	G 3243	Water inlet elbow stud, $\frac{7}{8}$ x 1 $\frac{1}{8}$ ".
56	12235D	Water inlet elbow gasket.
57	7167T	Hand hole cover clamp bolt.
58	4112D	Hand hole cover clamp bolt gasket.
	4080D	Hand hole cover, complete.
	4083D	Hand hole cover clamp, complete.

ENGINE

Miscellaneous parts not indicated in illustrations Nos. 41 and 42.

I H C Part No.	DESCRIPTION
400DAY	Piston (400DAX), complete with 4 rings.
974D	Oil discharge bracket.
1610DA	Valve seat insert.
4097DA	Cylinder head stud nut.
10303DBX	Connecting rod bearing (2 halves with shims).
10310DB	Camshaft center bearing.
10314D	Cylinder head and water outlet manifold stud, short.
10330D	Valve housing with stiffener.
10338D	Oil pump screen.
10408D	Cylinder head stud, long.
10434D	Crankcase pan oil level flange.
10498D	Crankcase breather nipple.
10644D	Motor support, front.
10647DA	Fan housing sheet.
10908DBX	Connecting rod bearing (.020" undersize).
10944D	Camshaft gear shim (.002").
10951D	Valve lever screw.
10953DA	Cylinder head drain trough.
11252D	Camshaft gear shim.
12260D	Cylinder sleeve shim.
12732DBX	Connecting rod bearing (.031" undersize).
12735D	Connecting rod bearing shim.
12768D	Connecting rod and cap, complete.
13055D	Crankshaft pinion key.
13143D	Valve lever oiler.
14415D	Oil pressure valve cover.
15840D	Oil pressure valve body gasket.
15950D	Oil pump gasket.
16207D	Oil pump, complete.
16373D	Magneto drive shaft oil flinger.
17172DX	Crankshaft (undersize $\frac{1}{32}$ ").
18533DX	Valve (oversize $\frac{1}{16}$ ").
18590D	Magneto and governor shaft, complete with 17220DX.
19367D	Cylinder head venturi.
20683D	Camshaft gear oil pipe connector nut.
20684D	Camshaft gear oil pipe connector sleeve.
20685D	Camshaft gear oil pipe connector.
G 1356	Water inlet elbow stud.
G 2864	Flywheel pointer.
G 3102	Crankcase breather nipple (street ell).
G 6193	Crankcase breather pipe.
3405H	Spark plug gasket.
H 5143	Valve lever collar pin.
4167T	Oil pump shaft key.
6220T	Oil pump shaft bushing pin.
7102½T	Handhole cover gasket.
7115T	Camshaft center bearing lock screw.
7115T	Camshaft rear bearing lock screw.
7220T	Camshaft gear key.
8000T	Cylinder head stud, short.
8029T	Oil pump shaft collar pin.

FAN

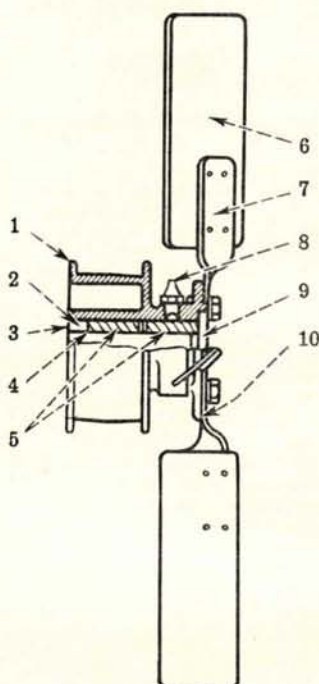


Illustration No. 43
Fan (sectional view).

Ref. No.	I H C Part No.	DESCRIPTION
1	432DA	Fan pulley, 4" dia. x $1\frac{1}{8}$ " face.
2	10387D	Fan felt washer, $1\frac{7}{16}$ " O. D., $\frac{3}{4}$ " I. D., $\frac{1}{4}$ " thick.
3	10388D	Fan felt retainer.
4	10389D	Fan felt retainer washer.
5	10392D	Fan shaft roller bearing.
6	10423D	Fan blade carrier with blades.
7	4286D	Fan blade carrier.
8	14186D	Fan bracket lubricator, $\frac{1}{8}$ ", straight (Zerk).
9	10385D	Fan shaft.
10	10386D	Fan pulley gasket.

Miscellaneous parts not indicated in illustration No. 43.

I H C Part No.	DESCRIPTION
433D	Fan pulley cap.
10343DB	Fan bracket stud.
10554D	Fan shaft roller bearing outer race.
13055D	Fan drive pulley key.
13114D	Fan bracket stud lock washer.
14186D	Fan pulley lubricator, $\frac{1}{8}$ ", straight (Zerk).
20270D	Fan belt.
F 306	Fan adjusting bolt wing nut.

RADIATOR AND WATER TANK

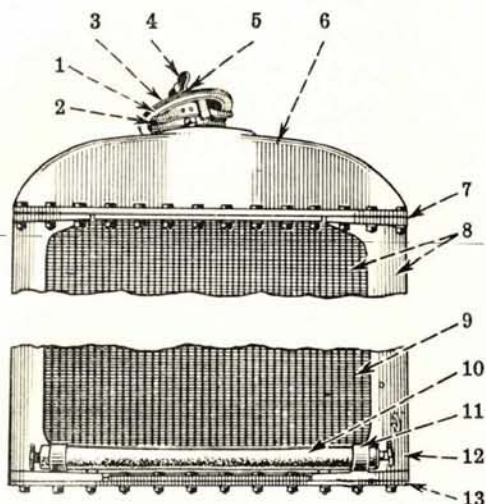


Illustration No. 44

Ref. No.	I H C Part No.	DESCRIPTION
1	4083D	Water tank hand hole cover clamp, complete.
2	10429D	Water tank hand hole cover gasket.
3	4080D	Water tank hand hole cover with clamp bolt.
4	7167T	Water tank hand hole cover clamp bolt.
5	4112D	Water tank hand hole cover clamp gasket.
6	1580DX	Water tank, upper, complete (mention name of tractor when ordering).
7	10646DA	Radiator gasket.
8	21183D	Radiator, complete (mention name of tractor when ordering).
9	20339D	Radiator core.
10	10764DX	Radiator curtain, complete.
11	10161D	Radiator curtain holder.
12	1579DB	Radiator core spacer, L. H.
	1810D	Radiator core spacer, R. H.
13	1408DAX	Water tank, lower, complete.

Miscellaneous parts not indicated in Illustration No. 44.

I H C Part No.	DESCRIPTION
1419DA	Radiator inlet elbow.
2563D	Radiator outlet elbow.
10629D	Radiator gasket plate, front.
10630D	Radiator gasket plate, rear.
10634D	Water tank lower stud.
10690D	Radiator outlet elbow gasket.
10832D	Radiator overflow pipe clip.
10833D	Radiator overflow pipe, lower, complete.
12235D	Radiator inlet elbow gasket.
13047DA	Drain pipe winged cap.
14017D	Radiator inlet and outlet hose.
14018D	Radiator overflow pipe, upper.
15355D	Radiator dust shield.
G 3277	Radiator drain pipe.

MANIFOLD ASSEMBLY

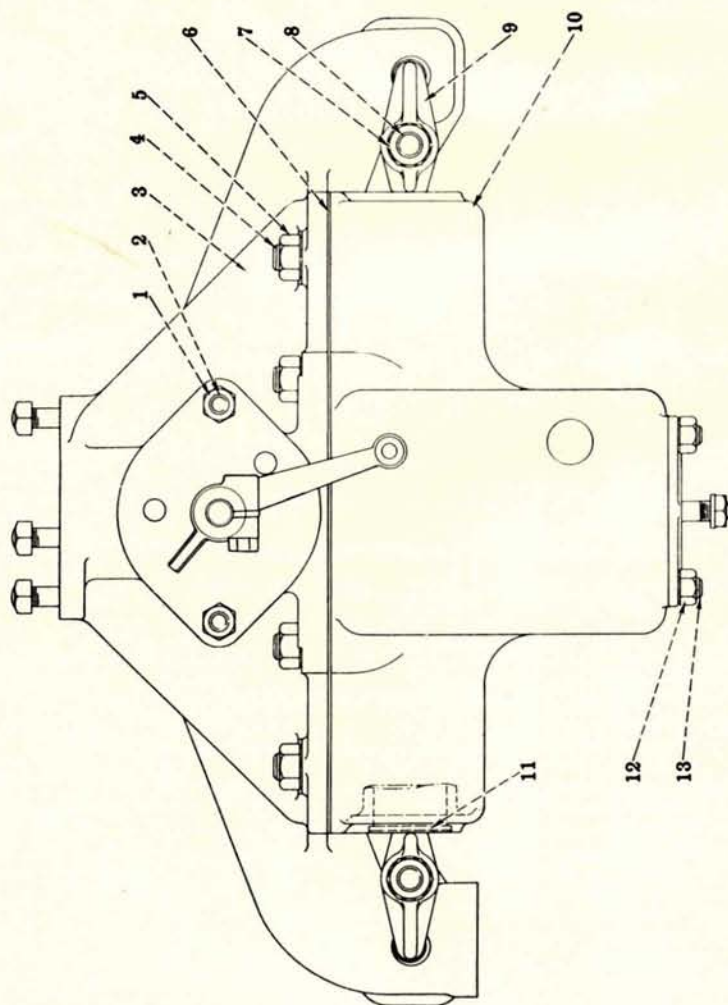
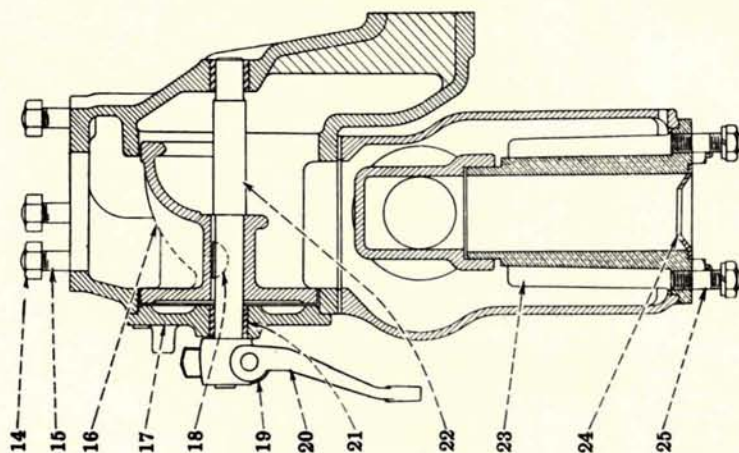


Illustration No. 45
Manifold assembly (sectional view).

MANIFOLD ASSEMBLY

(See illustration No. 45)

Ref. No.	I H C Part No.	DESCRIPTION
1	20229D	Manifold valve cover nut.
2	11422D	Manifold valve cover stud.
3	2560DX	Exhaust manifold, complete.
4	G 2436	Intake and exhaust manifold stud.
5	19962D	Manifold stud nut.
6	21250D	Exhaust to intake manifold gasket.
7	19962D	Manifold stud nut.
8	G 8058	Manifold to cylinder head stud, long.
9	21253D	Intake and exhaust manifold clamp.
10	2559DX	Intake manifold, complete.
11	13001D	Intake manifold expansion plug.
12	20229D	Intake manifold riser stud nut.
13	11422D	Intake manifold riser stud.
14	20229D	Exhaust pipe stud nut.
15	G 3314	Exhaust pipe stud.
16	2564D	Manifold heat control valve.
17	2205DBX	Manifold valve cover, complete.
18	.....	Key (Woodruff No. 7).
19	18761D	Manifold valve lever key.
20	21252DA	Manifold valve lever.
21	18741D	Exhaust manifold valve bushing.
22	19911DA	Manifold valve shaft.
23	2669DX	Manifold intake riser, complete.
24	21951D	Manifold intake riser choke.
25	12215D	Carburetor stud.

Miscellaneous parts not indicated in illustration No. 45.

I H C Part No.	DESCRIPTION
13085D	Manifold heat control valve key.
14865D	Manifold to cylinder head stud, short.
18741D	Exhaust manifold valve shaft bushing.
20324D	Intake to cylinder head washer.

GOVERNOR

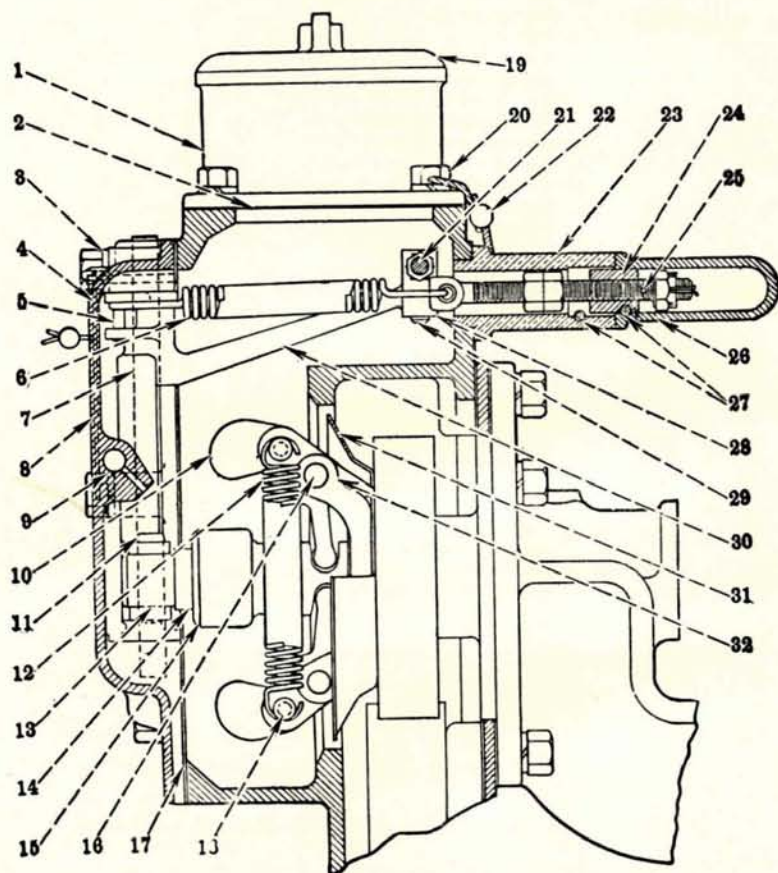


Illustration No. 46

Enclosed governor.

GOVERNOR

(See illustration No. 46)

Ref. No.	I H C Part No.	DESCRIPTION
1	495D	Oil filler.
2	12727D	Oil filler gasket.
3	4084D	Governor shield cap screw.
4	.....	Governor seal.
5	9863T	Governor throttle spring pin.
6	14136D	Governor throttle spring.
7	12710D	Governor rock shaft.
8	582DX	Governor shield with pin.
9	4084D	Governor shield cap screw.
10	12716DX	Governor ball with pin.
11	12711D	Governor shoe pin.
12	12755D	Governor spring.
13	14134D	Governor shoe.
14	.....	Governor shoe contact plate (order 1401DDX).
15	1401DDX	Governor sleeve with contact plate.
16	12214D	Governor ball pin.
17	12728D	Governor shield gasket.
18	.....	Governor spring pin.
19	101D	Oil filler cap.
20	15208D	Oil filler cap screw.
21	18748D	Governor connecting rod.
22	.....	Governor seal.
23	1454D	Governor throttle spring support.
24	14137D	Governor throttle spring adjuster nut.
25	14133D	Governor throttle spring eyebolt.
26	12712DA	Governor throttle spring adjuster.
27	.....	Oval head rivet, $\frac{1}{2} \times 1\frac{1}{2}$.
28	12719D	Governor connecting rod fork.
29	12715D	Governor fork pivot.
30	12718DX	Governor rock shaft lever, complete.
31	12212D	Governor shield, rear.
32	17220DX	Governor and magneto shaft with carrier, 7173TA.

Miscellaneous parts not indicated in illustration No. 46.

I H C Part No.	DESCRIPTION
409D	Governor gear (35 teeth).
1242DA	Oil filler strainer.
2113D	Governor rod support bracket.
2487DX	Governor rod support with bushing.
4098D	Oil filler stud.
11425D	Oil filler screen.
11659D	Governor oil pipe clip.
11662D	Governor oil pipe cushion.
12215D	Governor rod support cover stud.
12724D	Governor rod support bushing.
16715D	Governor oil pipe coupling nut.
16716D	Governor oil pipe coupling nipple.
17632D	Governor oil pipe elbow (in governor shield).
20000D	Governor rod support cover screw.
20328D	Speed change lever pin.
20329D	Governor rod support cover packing.
20347DX	Governor oil pipe, complete.
G 1256	Rockshaft lever pivot pin.
3895T	Governor throttle shaft pin.
3895T	Governor throttle lever pin.
7225T	Governor gear key.

OIL AIR FILTER (International)

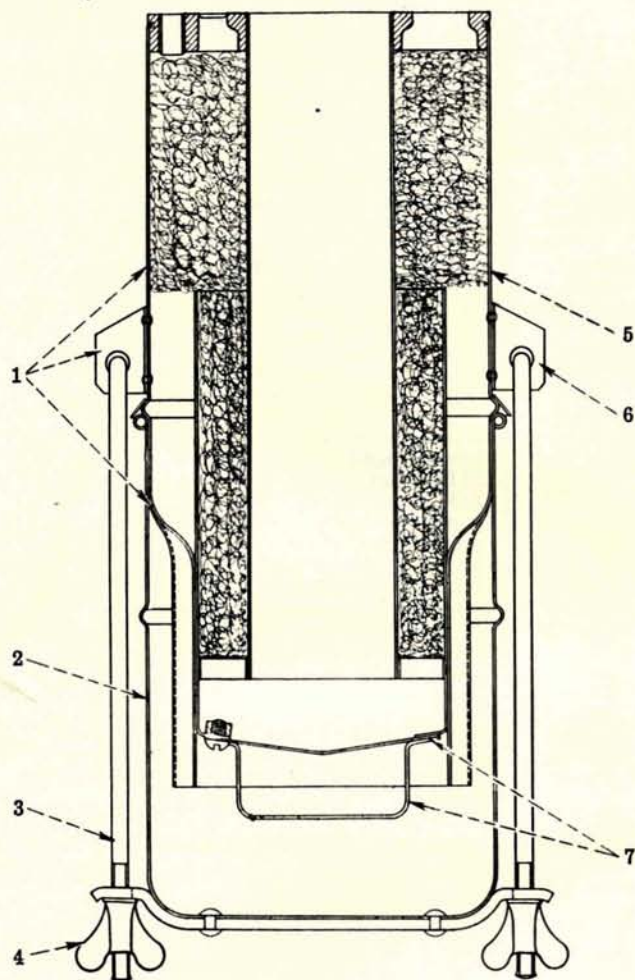


Illustration No. 47—Oil air filter (sectional view).

Ref. No.	I H C Part No.	DESCRIPTION
1	{ 16466DA	Oil air filter less studs and gasket.
2	{ 16466DAX	Oil air filter with studs and gasket.
3	16478D	Filter oil cup.
4	17975DX	Oil cup clamp rod with nut.
5	11916D	Oil cup wing nut.
6	16476D	Filter body with strainer.
7	22969DX	Filter lug ring, complete.
	16477D	Filter tube cover.

OIL AIR FILTER PIPES AND CONNECTIONS

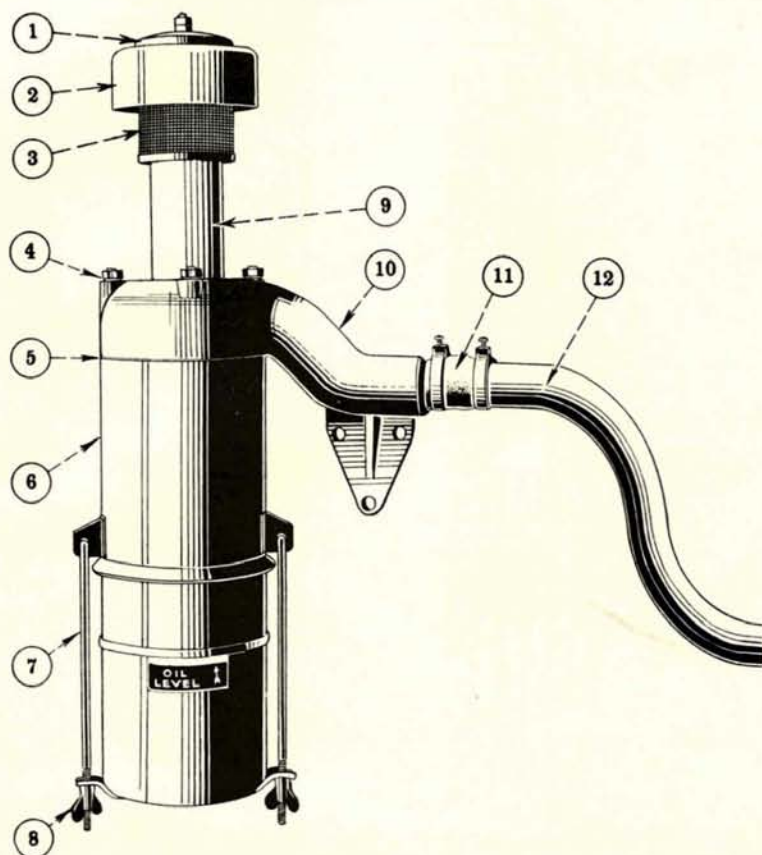
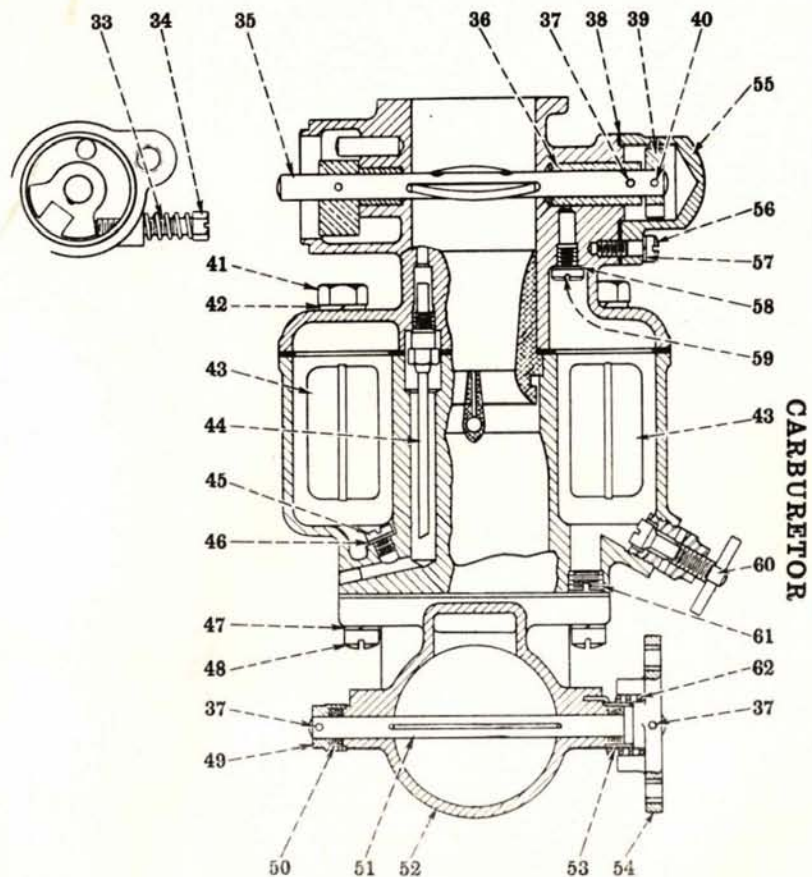
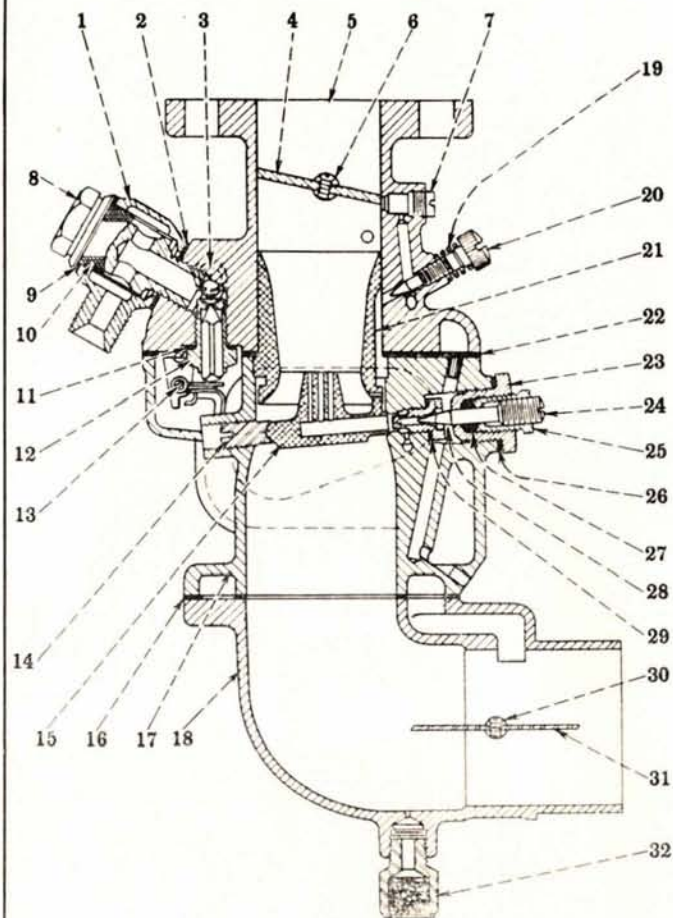


Illustration No. 48

Ref. No.	I H C Part No.	DESCRIPTION
1	17190D	Air pipe top screen reinforcing plate.
2	11196D	Air strainer top.
3	M11948	Air pipe screen.
4	11974D	Air filter top studs.
5	16479D	Air filter body gasket.
6	16466DAX	Oil air filter, complete.
7	17975DX	Oil cup clamp rod (with nut).
8	11916D	Oil cup wing nut.
9	15736DX	Air pipe, upper (with flange).
	15736DY	Air pipe, upper (with 15736DX and strainer).
10	2445DX	Air filter top.
11	11337D	Carburetor connection hose.
12	20736D	Carburetor connection.
..	20035D	Air filter pipe extension.



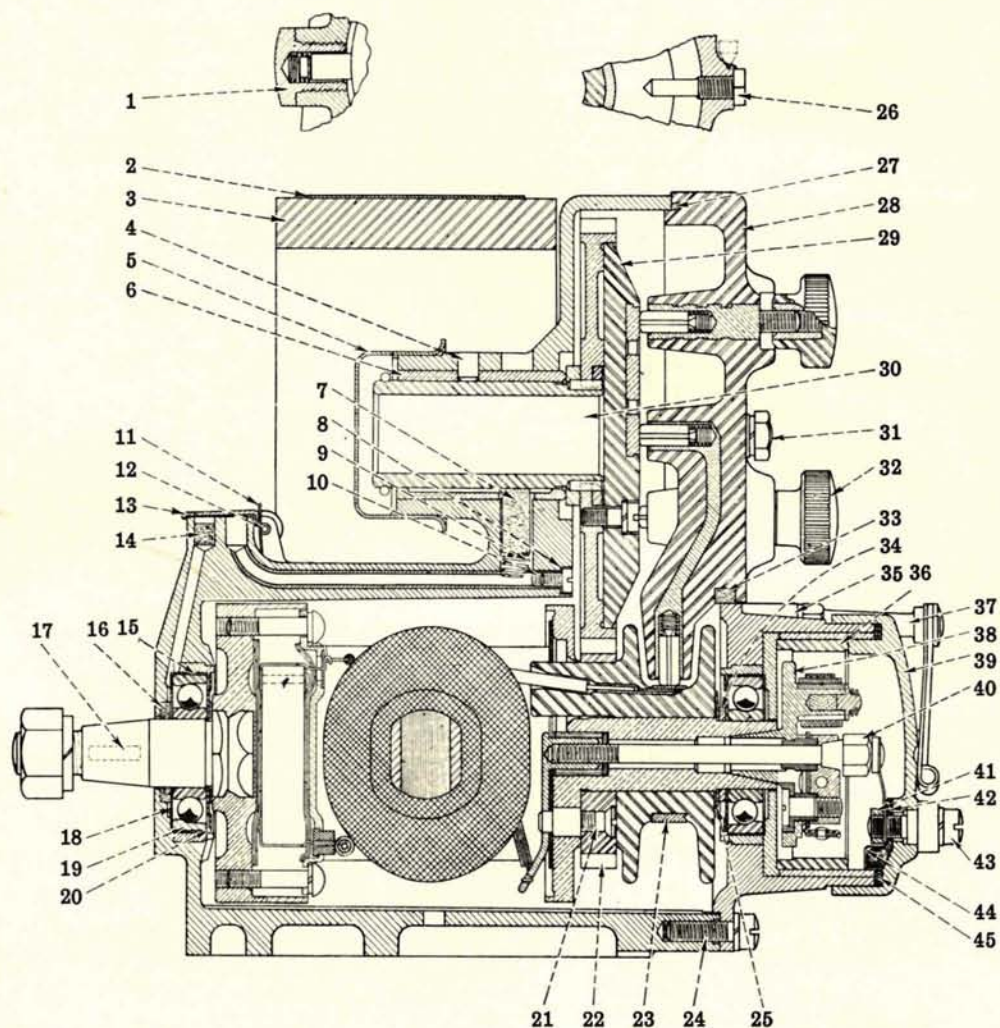
CARBURETOR

Illustration No. 49
Carburetor, 21271DA (Zenith Model K-5) (sectional view).

CARBURETOR

(See illustration No. 49)

Ref. No.	I H C Part No.	Mfr's. No.	DESCRIPTION
1	20060D	D-6774	Union body.
2	13891D	C-71x33	Fiber washer.
3	13861D	C-102	Channel screw.
4	21217D	D-6995	Throttle plate.
5	21201DA	A-1194x1	Upper body assembly.
6	12420D	D-3493	Butterfly set screw.
7	20053D	D-6204	Priming hole screw.
8	13870D	D-2422	Union body plug.
9	13892D	C-71x7	Fiber washer.
10	20044D	C-116	Filter screen.
11	12433D	C-71x23	Fiber washer.
12	20058DX	D-6560	Fuel valve assembly, complete.
13	21211D	D-5046	Float axle.
14	21229D	D-7174	Nozzle set screw.
15	21220D	D-7137	Nozzle.
16	21228D	D-7152	Intake gasket.
17	21200D	A-1193x1	Bowl assembly.
18	21202D	B-1635	Air intake only.
19	12472D	D-1882	Idle adjustment spring.
20	13873D	D-2566	Idle adjustment needle.
21	21148D	C-4518	Venturi No. 17.
22	21206D	C-4540	Assembly gasket.
23	21222D	D-7139	Packing retainer nut.
24	21223D	D-7140	Adjusting needle.
25	21221D	D-7138	Packing nut.
26	21204D	C-71x6	Fiber washer.
27	21215D	D-6924	Packing.
28	21149D	D-7000	Main jet No. 21.
29	13895D	C-71x12	Fiber washer.
30	13738D	30142	Air shutter screw.
31	16852D	D-5104	Air shutter.
32	21216D	D-6926	Drip plug assembly.
33	12848D	D-4104	Butterfly clamp spring.
34	20203D	D-6892	Butterfly stop screw.
35	21226D	D-7146	Butterfly lever assembly.
36	21225D	D-7144	Economizer valve.
37	12428D	C-42x2	Taper pin.
38	21236D	D-7262	Economizer cap gasket.
39	21235D	D-7261	Throttle driver.
40	21203D	C-42x3	Taper pin.
41	21208D	D-1147	Assembly screw.
42	13876D	D-894	Lockwasher.
43	21170D	D-7323	Float assembly.
44	21214D	D-6371	Idle jet No. 14.
45	16839D	D-1015	Compensator No. 22.
46	12435D	C-71x24	Fiber washer.
47	12459D	D-702	Intake screw lockwasher.
48	21207D	D-449	Intake assembly screw.
49	21232D	D-7258	Packing cap.
50	21210D	D-2204	Packing washer.
51	21212D	D-5744	Air shutter shaft.
52	21213D	6319-M	Intake, complete assembly.
53	12487D	D-2435	Packing ring.
54	21233D	D-7259	Air shutter lever assembly.
55	21224D	D-7143	Economizer cap.
56	12455D	D-453	Cap retaining screw.
57	12404D	D-1197	Lockwasher.
58	12431D	C-71x5	Fiber washer.
59	21209D	D-1561	Economizer No. 12.
60	21231D	D-7256	Drain plug assembly.
61	21234D	D-7260	Pipe plug.
62	20242D	D-4795	Air shutter spring.
..	21168D	D-7283	Adjustment assembly.
..	21169D	D-7311	Air shutter lever assembly.
..	22287D	6392-M	Intake assembly.

MAGNETO**Illustration No. 50**

Side view of E4A magneto assembly (sectional).

MAGNETO

(See illustration No. 50)

Ref. No.	I H C Part No.	DESCRIPTION	Ref. No.	I H C Part No.	DESCRIPTION
1	E4 -218	Ground brush holder.	28	E4A-270AX	Distributor block with 2 felts (less thumb nuts).
2	E4A-28A	Name plate and magneto band.		E4A-270AY	Distributor block, complete with thumb nuts.
3	E4 -1	Magnet.	29	E4A-265X	Distributor disk with screws and lockwashers.
4	E4A-473	Dowel pin for distributor gear shaft bushing.	30	E4A-318AX	Distributor gear with shaft and disk.
5	E4A-233B	Distributor gear shaft cover.	31	E4A-366X	Distributor block screw, complete (specify magneto number when ordering).
6	E4A-231	Distributor gear shaft bushing.	32	E4A-320A	Distributor block thumb nut.
7	E4A-217	Distributor gear shaft oil wick.	33	E4A-476	Distributor block felt, lower.
8	E4A-321	Magneto distributor shaft oil pipe screw gasket.	34	E4A-325	Oil flinger spacer.
9	E4A-247	Distributor gear shaft oil wick spring.	35	E4A-5AX	Magneto end plate and breaker housing.
10	E4A-322	Magneto distributor shaft oil pipe screw.	36	E4A-471AX	Breaker cam, complete (specify magneto number when ordering).
11	E4 -245	Magneto frame oil well cover spring.	37	E4A-314A	Breaker housing cover spring post, complete (specify magneto number when ordering).
12	E4 -225	Magneto frame oil well cover pin.	38	E4A-304A	Breaker, complete with breaker points.
13	E4 -224	Magneto frame oil well cover.	39	E4A-284AY	Breaker housing cover, complete.
14	E4 -216	Ball bearing oil well felt.	40	E4 -229A	Breaker screw for holding breaker in place.
15	E4 -261	Bearing insulation, outer.	41	E4A-499	Short-circuiting terminal inside nut.
16	E4 -226	Magneto bearing felt.	42	E4A-307A	Short-circuiting terminal insulation.
17	4167T	Key for armature driving end.	43	E4A-358	Short - circuiting terminal screw, short.
18	E4A-263	Bearing insulation, rear.	44	E4A-275A	Short-circuiting spring, outer.
19	E4 -294	Magneto shaft ball bearing, complete.	45	E4A-302	Breaker housing cover packing.
20	E4A-324	Oil flinger.			
21	E4A-461	Armature pinion screw.			
22	E4 -207	Armature pinion, 37 teeth.			
23	E4A-522	Collector ring.			
24	E4A-358	Magneto end plate and breaker housing screw, plain.			
25	E4A-303A	Collector ring lockwasher.			
26	E4 -244	Safety spark gap screw.			
27	E4A-477	Distributor block felt, upper.			

Miscellaneous parts not indicated in illustration No. 50.

I H C Part No.	DESCRIPTION	I H C Part No.	DESCRIPTION
15453D	Magneto cover, complete.	E4A-347A	Magneto, complete with automatic impulse coupling.
E4A-76X	Distributor brush, complete with spring.	E4A-351	Inner race for magneto shaft ball bearing.
E4A-105	Magneto frame, complete.	E4A-352	Outer race for magneto shaft ball bearing.
E4A-150A	Armature assembly, complete with winding and condenser.	E4A-353	Retainer (with balls) for magneto shaft ball bearing.
E4A-200	Magneto, complete (less impulse coupling).	E4A-559	Breaker, complete (less breaker points) (specify magneto number when ordering).
E4 -214	Breaker cam felt.	O 37	Magneto band screw.
E4A-284A	Breaker housing cover.		
E4A-289X	Magneto wrench with gauges.		
E4 -295	Oiler for armature shaft.		
E4A-333AX	Short-circuiting spring, inner, complete.		

BREAKER ASSEMBLY

(for E4A Magneto)

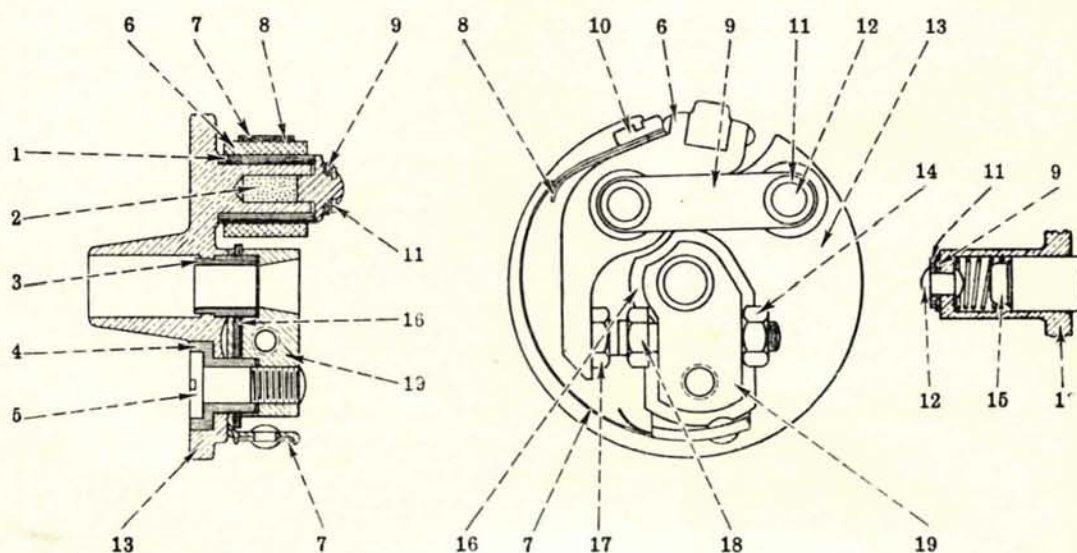


Illustration No. 51

Breaker assembly (E4A-304A) (Pivoted Arm Type).

(for E4A Magneto)

Ref. No.	I H C Part No.	DESCRIPTION
1	E4A-536	Breaker arm bushing.
2	E4A-539	Breaker arm post felt.
3	E4A-551	Breaker center bushing.
4	E4A-550	Stationary point support bushing.
5	E4A-549	Stationary point support screw.
6	E4A-558X	Breaker arm with bushing.
7	E4A-558Y	Breaker arm with point and bushing.
8	E4A-543X	Breaker arm spring post with spring.
9	E4A-555	Breaker arm reinforcing spring.
10	E4A-541X	Breaker arm cap spring with cap.
11	E4A-546	Breaker spring screw.
12	E4A-542	Breaker arm cap spring washer.
13	E4A-570	Breaker arm cap spring rivet.
14	E4A-557X	Breaker carrier with spring and cap.
15	E4A-262	Fixed breaker point lock nut.
16	E4A-554X	Ground brush with spring.
17	E4A-548	Stationary point support insulation.
18	E4A-552X	Breaker arm point.
19	E4A-258	Fixed breaker point.
	E4A-258Y	Fixed breaker point with lock nut.
	E4A-547	Stationary point support.

INTERNATIONAL AUTOMATIC IMPULSE COUPLING (E4A-500)

(for E4A Magneto)

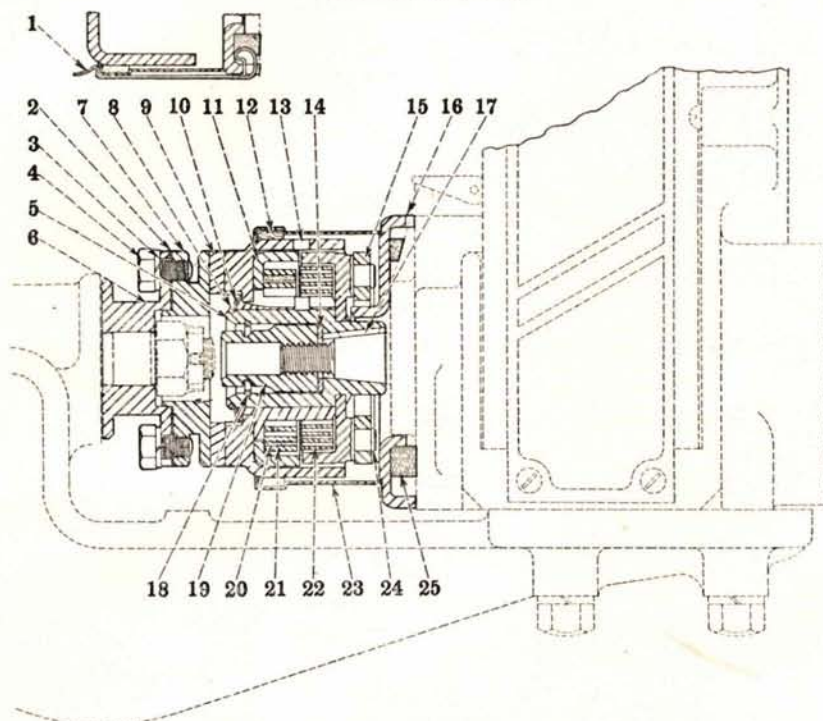


Illustration No. 52

Automatic impulse coupling (E4A-500) (for E4A Magneto).

Ref. No.	I H C Part No.	DESCRIPTION
1	E4A-439	Cover spring.
2	{ 10481D 10482D 10553D	Magneto coupling shim, medium. Magneto coupling shim, heavy. Magneto coupling shim, light.
3	.....	Lockwasher, $\frac{1}{4}$ ".
4	.....	Cap screw, $\frac{1}{4}$ x $\frac{3}{8}$ ".
5	E4A-451B	Magneto member, complete.
6	7882T	Magneto coupling.
7	12740D	Magneto coupling block, male.
8	E4A-453	Magneto member shaft snap ring, outer.
9	12741D	Magneto coupling block spacer.
10	E4A-452	Magneto member shaft outer snap ring washer.
11	E4A-456	Coupling member stop ring.
12	E4A-437	Cover felt.
13	E4A-447C	Coupling member, complete.
14	.....	Lockwasher, $\frac{7}{16}$ " (special light).
15	E4A-440	Pawl.
16	E4A-434	Coupling plate.
17	4167T	Key for magneto member.
18	E4A-454	Magneto member shaft snap ring, inner.
19	E4A-455	Coupling nut.
20	E4A-572	Snubber spring felt.
21	E4A-460	Snubber spring.
22	E4A-459	Drive spring.
23	E4A-438	Coupling cover, complete.
24	E4A-442	Pawl pin snap ring.
25	E4A-457	Coupling plate felt.
.....	E4A-500	Automatic impulse coupling, complete.
.....	E4A-583	Impulse coupling rotating unit, complete.

SPARK PLUG CABLE ASSEMBLY

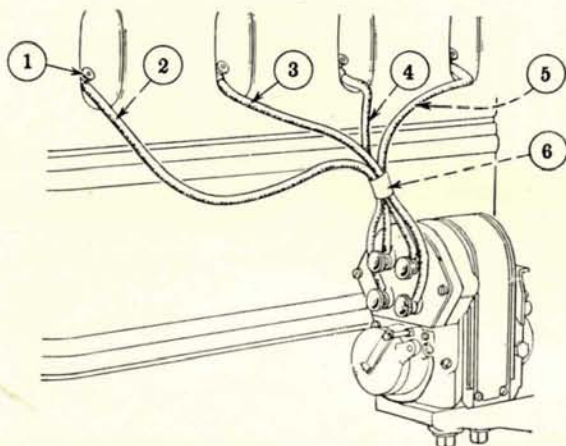


Illustration No. 53
Spark plug cable assembly.

Ref. No.	I H C Part No.	DESCRIPTION
1	13173D	Spark plug, $\frac{1}{4}$ " (Champion No. 20).
2	14042D	No. 4 spark plug cable.
3	4674D	No. 3 spark plug cable.
4	4674D	No. 2 spark plug cable.
5	14042D	No. 1 spark plug cable.
6	17464D	Spark plug cable assembly.

FUEL TANK AND VALVE CONNECTIONS

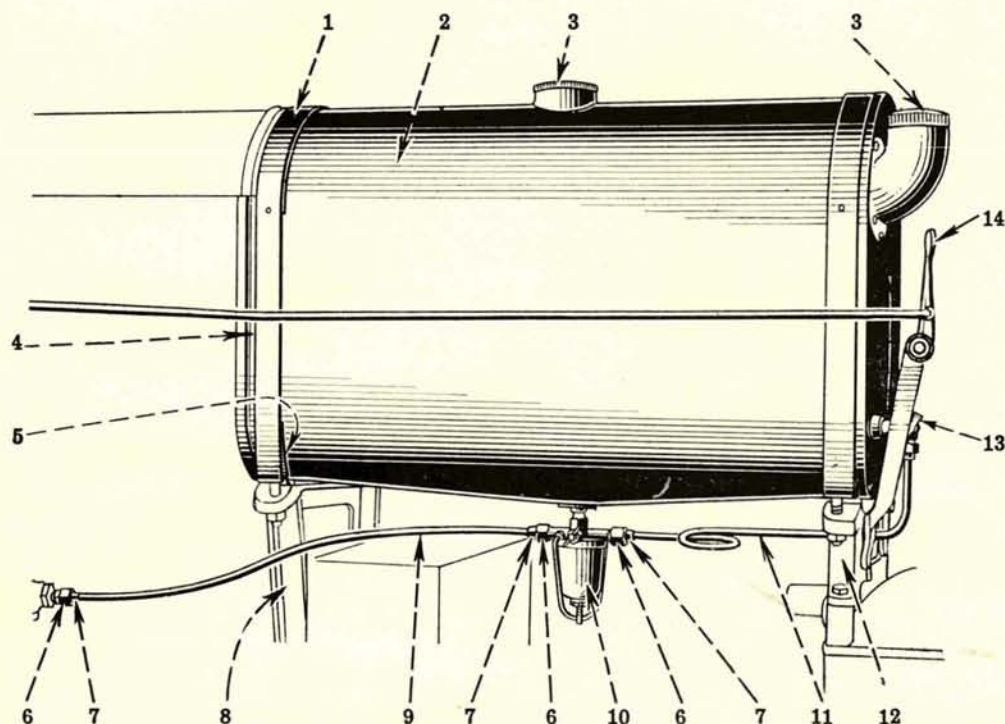


Illustration No. 54

Fuel tank and valve connections.

Ref. No.	I H C Part No.	DESCRIPTION
1	20733D	Fuel tank strap, complete.
2	20732DX	Fuel and gas tank, complete with caps.
3	11446D	Fuel and gas tank filler cap assembly.
4	15123DA	Fuel tank pad.
5	21258D	Fuel tank strap lining.
6	16718D	Fuel pipe coupling nuts.
7	16719D	Fuel pipe coupling nipples.
8	2443D	Fuel pipe bracket, front.
9	20738DX	Fuel pipe to carburetor, complete with nuts.
10	17237D	Fuel strainer assembly.
11	20727DX	Fuel pipe to gas tank, complete with nuts.
12	2444D	Fuel tank bracket, rear.
13	17228D	Shut-off needle valve.
14	2317D	Heat control hand lever.
..	11662D	Fuel pipe cushion.

OIL FILTER

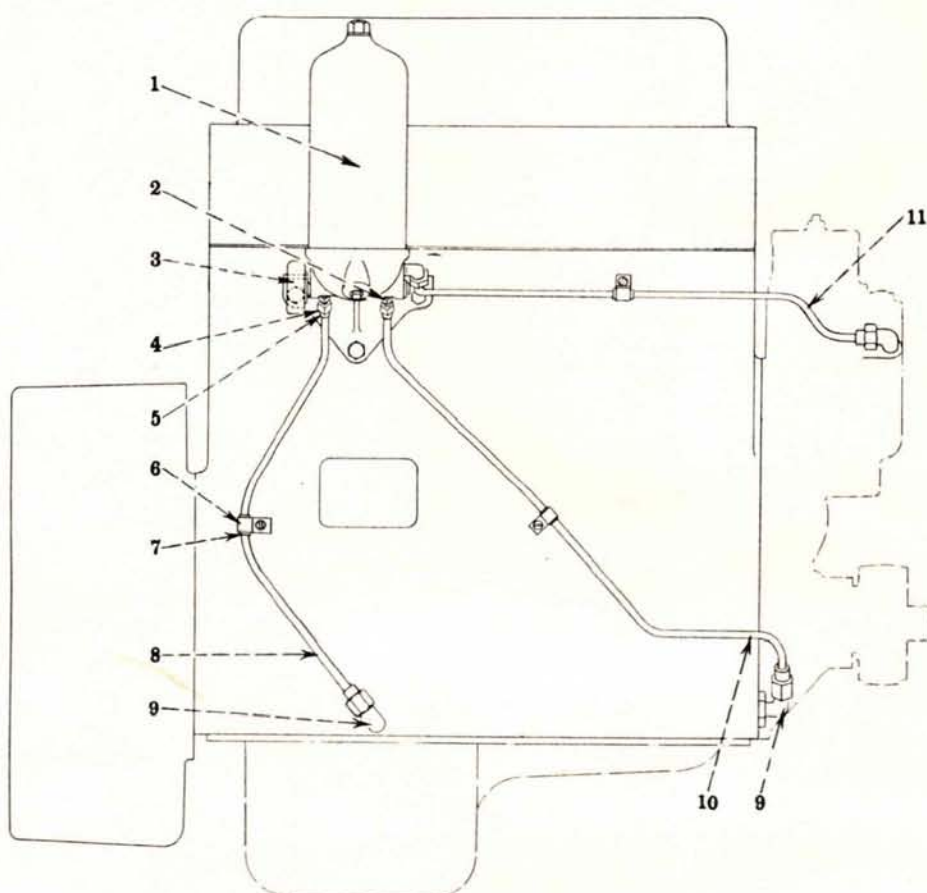


Illustration No. 55

Detail—Oil filter and connections.

Ref. No.	I H C Part No.	DESCRIPTION
1	13148DAX	Oil filter, complete.
2	17241D	Inlet or out'et pipe half union.
3	18113D	Oil pressure gauge.
4	16719D	Coupling nipple.
5	16718D	Coupling nut.
6	11659D	Inlet and outlet pipe clip
7	11662D	Inlet and outlet pipe clip felt.
8	15993DCX	Inlet pipe, complete with nuts.
9	17216D	Oil filter pipe elbow.
10	19315DX	Outlet pipe, complete.
11	20347DX	Governor oil pipe, complete.

OIL FILTER

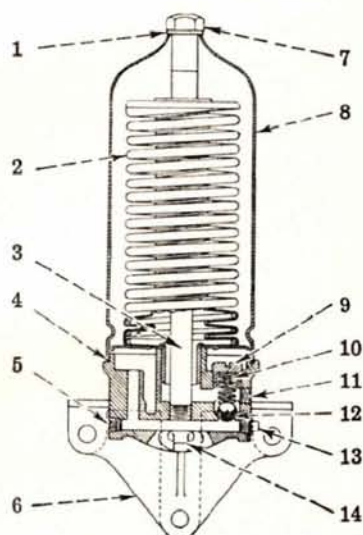


Illustration No. 56—Oil filter (sectional view).

Ref No.	I H C Part No.	DESCRIPTION
1	13727D	Retaining nut gasket, small.
2	13731DA	Element assembly.
3	13721D	Case retaining stud.
4	13728DA	Case gasket, large.
5	.....	Inlet.
6	{ 13602DAX 13730DAX	Base. Base assembly.
7	13726D	Retaining nut.
8	13729D	Case.
9	13720D	Blow-off cover screw.
10	13719D	Blow-off spring.
11	.....	Outlet.
12	13722D	Blow-off ball ($\frac{1}{4}$ " dia.).
13	.....	Pipe plug.
14	13638D	Drain plug.

CLUTCH

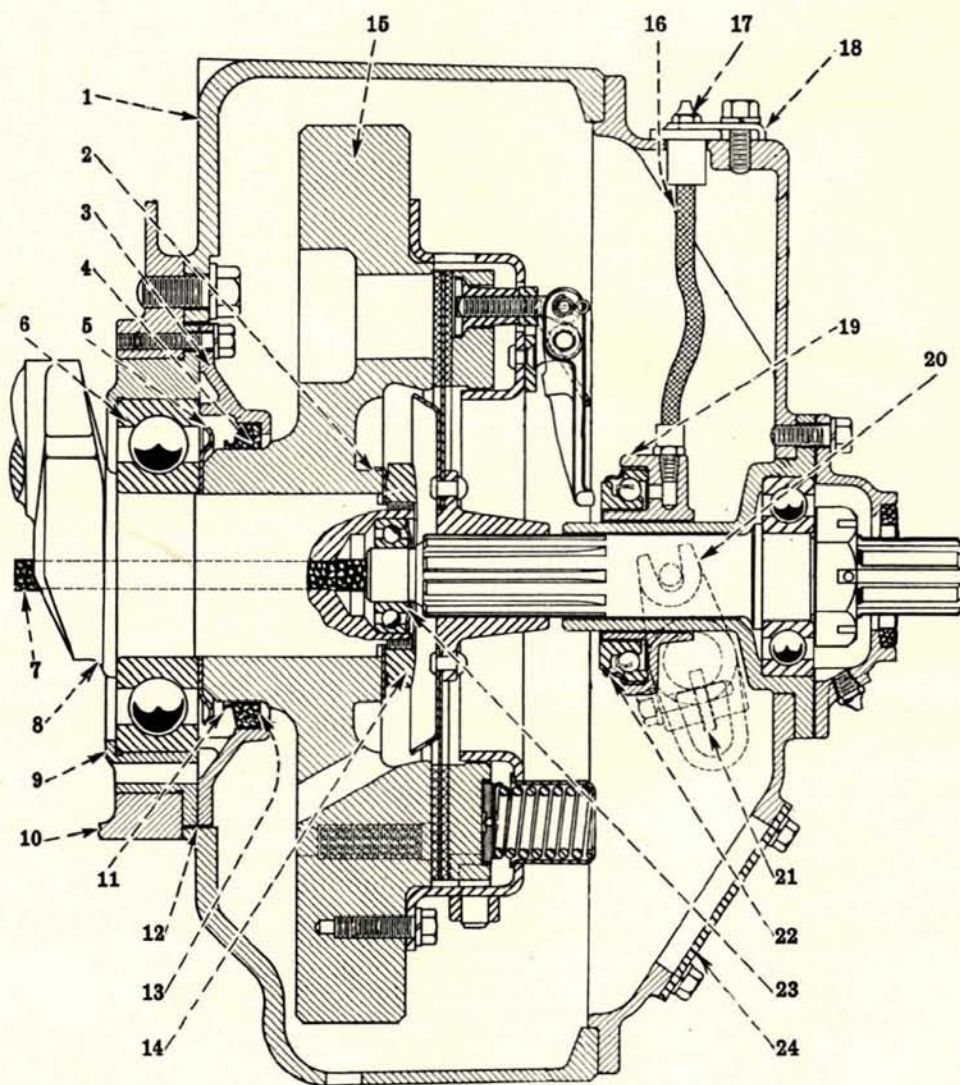


Illustration No. 57—Single plate clutch (sectional view).

CLUTCH

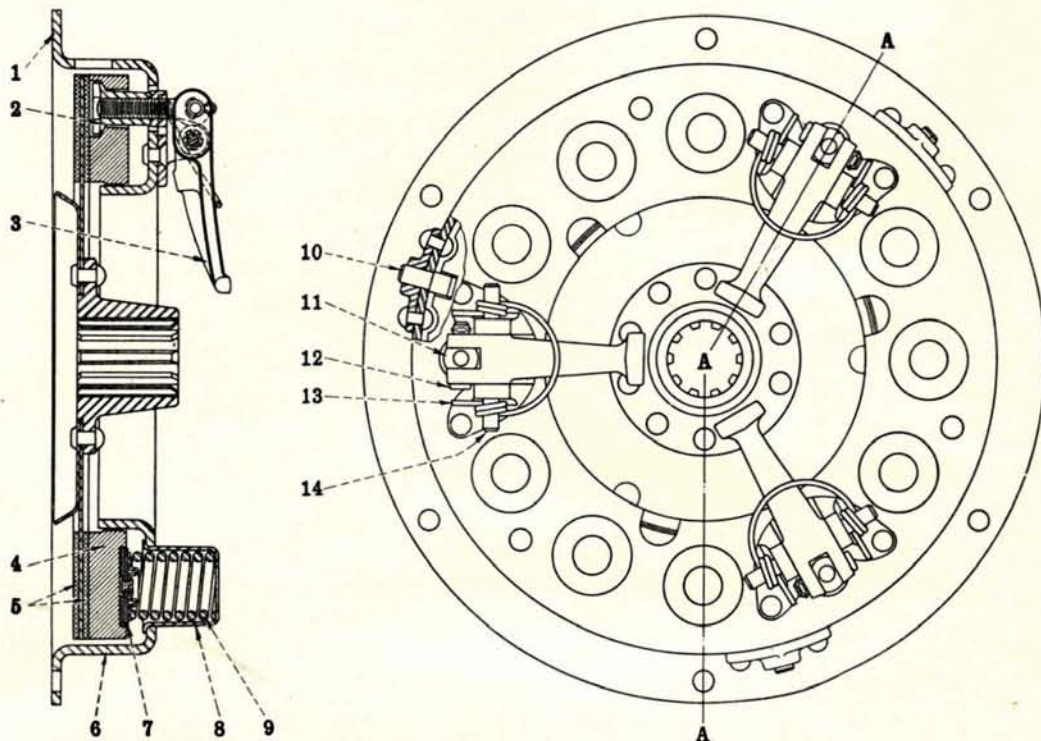
(See illustration No. 57)

Ref. No.	I H C Part No.	DESCRIPTION
1	1565DA	Bell housing.
2	10354D	Flywheel nut lock.
3	424DAX	Main bearing cover plate.
4	12748D	Crankshaft felt washer, rear.
5	10355D	Main bearing oil deflector.
6	4259D	Main bearing, rear.
7	12219D	Clutch shaft bearing wick.
8	10356DAX	Crankshaft.
9	403D	Main bearing retainer, rear.
10	423DBXb	Crankcase, complete.
11	12749D	Crankshaft felt washer retainer.
12	10496D	Main bearing cover plate gasket.
13	12750D	Main bearing cover plate washer.
14	10353D	Flywheel nut.
15	1482D	Flywheel.
16	14751DX	Clutch grease tube, complete.
17	14186D	Lubricator, $\frac{1}{8}$ ", straight (Zerk).
18	14008D	Clutch grease tube clamp.
19	1443DX	Release sleeve.
20	1444D	Clutch shifter fork.
21	14026D	Clutch shifter shaft key.
22	13157D	Clutch release bearing.
23	10701DA	Clutch shaft ball bearing, front.
24	14006D	Clutch housing handhole cover.

Miscellaneous parts not indicated in illustration No. 57.

I H C Part No.	DESCRIPTION
1533DB	Clutch lever
1558DB	Clutch pedal.
11537D	Clutch pedal spring.
12366D	Clutch shifter rod fork.
13088D	Clutch lever key (Woodruff No. 18).
13129D	Clutch shaft lubricator, $\frac{1}{8}$ ", 67 $\frac{1}{2}$ ° elbow (Zerk).
13129D	Clutch pedal shaft lubricator, $\frac{1}{8}$ ", 67 $\frac{1}{2}$ ° elbow (Zerk).
14186D	Clutch shifter collar bearing lubricator, $\frac{1}{8}$ ", straight (Zerk).
14736D	Clutch driven disk and facing, complete.
14752D	Clutch shifter shaft, short.
14772D	Clutch shifter shaft, long.
15156DA	Clutch shifter rod.
15157DA	Clutch pedal shaft.
15817D	Clutch pedal spring holder.
21238D	Release lever eyebolt nut.
2015T	Clutch shifter rod fork pin.

CLUTCH



Section through "A-A"

Illustration No. 58

11" Single plate clutch (14737D) (sectional view).

Ref. No.	I H C Part No.	DESCRIPTION
1	14737D	Clutch, 11", complete.
2	14616D	Release lever eye-bolt sleeve.
3	14731DA	Release lever.
4	1478D	Clutch pressure plate.
5	14733DA	Clutch friction facing.
6	14725DX	Clutch cover plate.
7	14603DB	Clutch pressure spring insulating cup.
8	12981D	Clutch pressure plate spring cup.
9	14908D	Clutch pressure spring.
10	14728D	Clutch pressure plate driving pin.
11	14617D	Release lever eye-bolt.
12	16880D	Release lever eye-bolt pin.
13	16885D	Release lever.
14	16884D	Release lever pin.

CLUTCH AND TRANSMISSION COUPLING

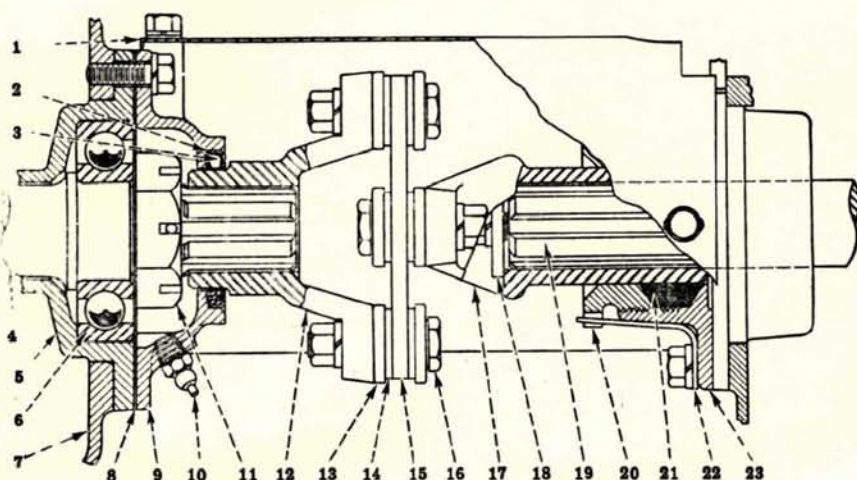


Illustration No. 59
Clutch and transmission coupling.
(Sectional view).

Ref. No.	I H C Part No.	DESCRIPTION
1	15570DA	Clutch joint shield.
2	14012D	Felt washer retainer.
3	14011D	Clutch housing felt washer.
4	14738DA	Clutch shaft.
5	1481DA	Clutch shaft retainer.
6	19110D	Clutch shaft ball bearing, rear.
7	1479D	Clutch housing.
8	14010D	Clutch housing cap gasket.
9	1588D	Clutch housing cap.
10	13129D	Clutch shifter ball bearing lubricator, $\frac{1}{8}$ " 67 $\frac{1}{2}$ ° elbow (Zerk).
11	10551D	Clutch shaft nut.
12	15023D	Clutch shaft joint.
13	7579T	Clutch joint rubber washer retainer.
14	6161H	Clutch joint rubber washer.
15	6160H	Clutch joint ring.
16	15393DX	Clutch joint screw.
17	20728D	Transmission joint.
18	15578D	Transmission joint washer.
19	20695DX	Transmission shaft.
20	1514DA	Transmission shaft packing gland.
21	15221DA	Transmission shaft packing.
22	15004D	Transmission shaft packing gland lock.
23	1507DA	Transmission shaft stuffing box.

TRANSMISSION ASSEMBLY

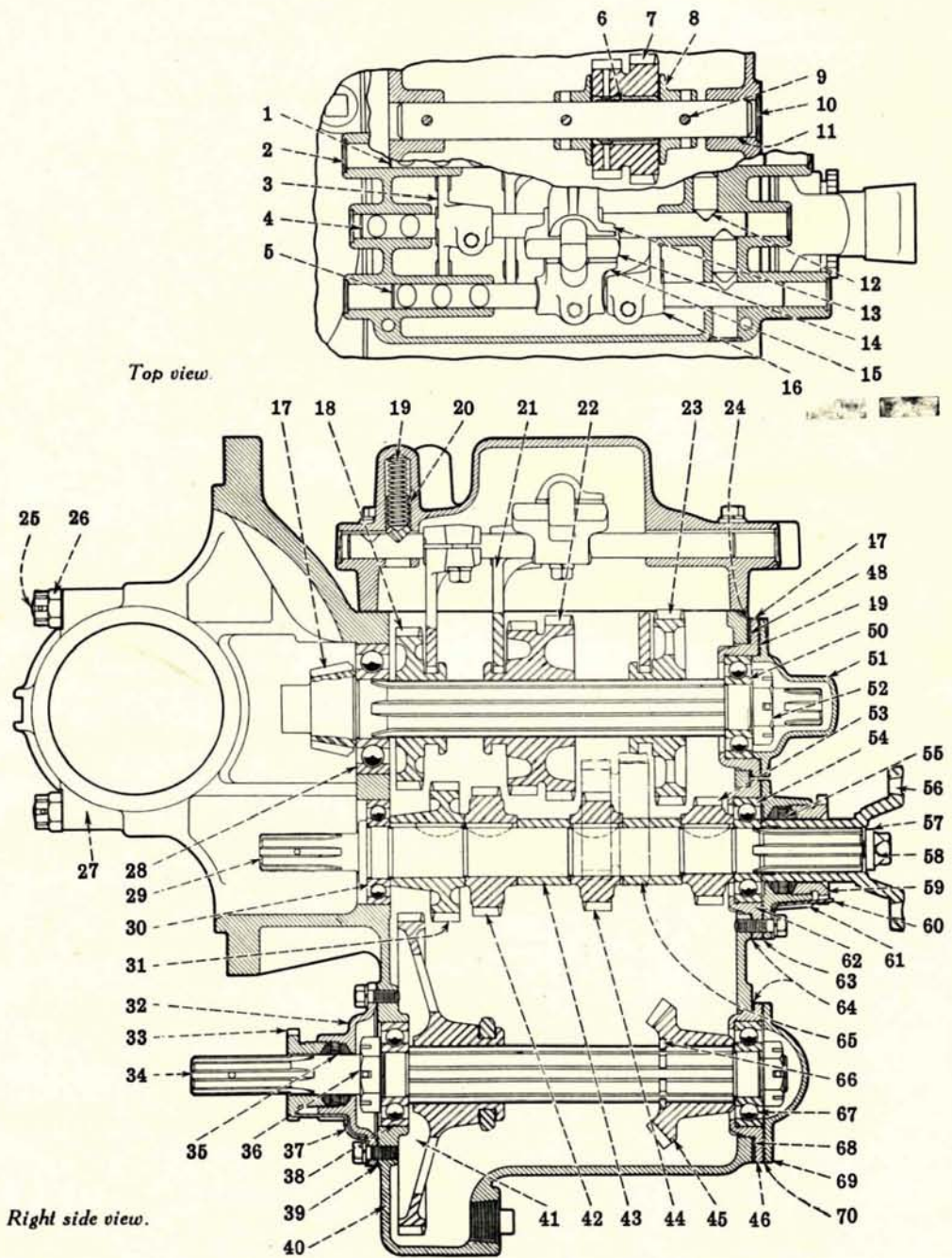


Illustration No. 60

Transmission assembly (sectional view).

TRANSMISSION ASSEMBLY

(See illustration No. 60)

Ref. No.	I H C Part No.	DESCRIPTION
1	20707D	Shifter shaft, 2nd and 3rd speed.
2	17562D	Transmission case cover expansion plug (1").
3	20710D	Shifter fork, 4th speed.
4	20708D	Shifter shaft, 4th speed.
5	20706D	Shifter shaft, 1st and reverse speed.
6	15498D	Reverse gear bushing.
7	20704DX	Reverse gear (20 teeth), complete.
8	1525DA	Reverse gear thrust collar.
9	15396DA	Reverse shaft bolt.
10	13053D	Transmission case expansion plug (1 1/8" diam.).
11	20705DX	Reverse shaft, complete.
12	19826D	Shifter shaft interlocking plug.
13	20712D	Shifter socket (2nd and 3rd speeds).
14	20713D	Shifter socket (4th speed).
15	20711D	Shifter socket (1st and reverse).
16	20709D	Shifter fork.
17	20696D	Transmission spline shaft and bevel pinion (13 teeth).
18	20702D	High speed sliding gear (28 teeth).
19	10862D	Transmission shifter rod poppet spring.
20	9222H	Transmission shifter rod poppet.
21	20709D	Shifter fork.
22	20697D	Second and third speed sliding gear (30 and 32 teeth).
23	20703D	Low speed sliding gear (34 teeth).
24	15075D	Transmission shaft bearing retainer gasket.
25	15074D	Transmission case stud.
26	15483D	Transmission case stud nut.
27	1542DB	Differential bearing cap.
28	14225H	Transmission spline shaft bevel pinion bearing, rear.
29	20695DX	Transmission shaft, complete.
30	18575H	Transmission shaft bearing, rear.
31	20701D	Fourth speed gear (24 teeth).
32	1541D	Power take-off bearing cup.
33	1545D	Power take-off shaft packing gland.
34	20716D	Power take-off shaft.
35	15220DA	Power take-off shaft packing.
36	4647D	Power take-off shaft nut, rear.
37	15192D	Power take-off packing gland lock.
38	10691V	Power take-off shaft bearing, rear.
39	15212D	Power take-off bearing cap gasket.
40	2433DX	Transmission case, complete.
41	20715D	Power take-off gear (57 teeth).
42	20700D	Third speed gear (22 teeth).
43	20694D	Transmission shaft gear spacer, rear.
44	20699D	Second speed gear (20 teeth).
45	20714D	Power take-off shaft bevel gear (22 teeth).
46	2439D	Power take-off shaft bearing retainer.
47	2437D	Transmission spline shaft bearing retainer.
48	15071D	Transmission spline shaft bearing retainer shim, light.
49	20718D	Power take-off shaft bearing retainer shim, light.
50	10691V	Transmission spline shaft bearing retainer cap gasket.
51	2436D	Transmission spline shaft bearing, front.
52	4647D	Transmission spline shaft bearing cap.
53	20698D	Transmission spline shaft nut.
54	10691V	Low speed gear (18 teeth).
55	15221DA	Transmission shaft bearing, front.
56	20728D	Transmission shaft packing.
57	15578D	Transmission joint.
58	20274D	Transmission joint washer.
59	1514DA	Transmission joint lock plate.
		Transmission shaft packing gland.

(Continued on next page)

TRANSMISSION ASSEMBLY

(See illustration No. 60)

Ref. No.	I H C Part No.	DESCRIPTION
60	15004D	Transmission shaft packing gland lock.
61	1507DA	Transmission shaft stuffing box.
62	2435D	Transmission shaft bearing retainer.
63	15076D	Transmission stuffing box gasket.
64	15075D	Transmission shaft bearing retainer gasket.
65	20693D	Transmission shaft gear spacer, front.
66	15038D	Power take-off shaft split collar.
67	10691V	Power take-off shaft bearing, front.
68	15072D	Transmission spline shaft bearing retainer shim, heavy.
69	1509D	Power take-off shaft bearing retainer shim, heavy.
70	15076D	Power take-off shaft bearing retainer cap, front.
		Power take-off shaft cap gasket.

TRANSMISSION AND DIFFERENTIAL

Miscellaneous parts not indicated in illustrations Nos. 60 and 61.

I H C Part No.	DESCRIPTION
1599D	Differential ball bearing retainer.
13070D	Transmission shaft gear key.
13090D	Transmission case expansion plug ($\frac{1}{8}$ " diam.).
15063DC	Differential bevel gear oil wiper.
15075D	Power take-off shaft bearing retainer gasket.
15075D	Spline shaft bearing retainer gasket.
15094D	Reverse gear bushing.
15103DA	Bevel ring gear (63 teeth).
15195D	Differential ball bearing.
15234D	Differential bevel gear thrust washer.
15236D	Differential bevel gear thrust washer dowel pin.
15291DA	Differential bevel gear (24 teeth).
15341DX	Differential case bolt, complete.
15350D	Differential pinion (13 teeth).
15396DA	Reverse gear thrust collar bolt.
15523D	Differential ball bearing retainer lock screw.
15524D	Differential ball bearing retainer adjusting nut lock.
15525D	Differential ball bearing retainer adjusting nut.
15527D	Differential ball bearing retainer screw lock.
20168D	Gear shift ball socket cap bushing.
20544D	Transmission bolt lock.
20721D	Transmission case flange stud.
20729D	Differential case (left hand).
20730D	Differential case (right hand).
20730DX	Differential case, complete.
20731D	Differential spider.
21237D	Transmission case flange bolt.
7699TM	Power take-off shifter lever key.

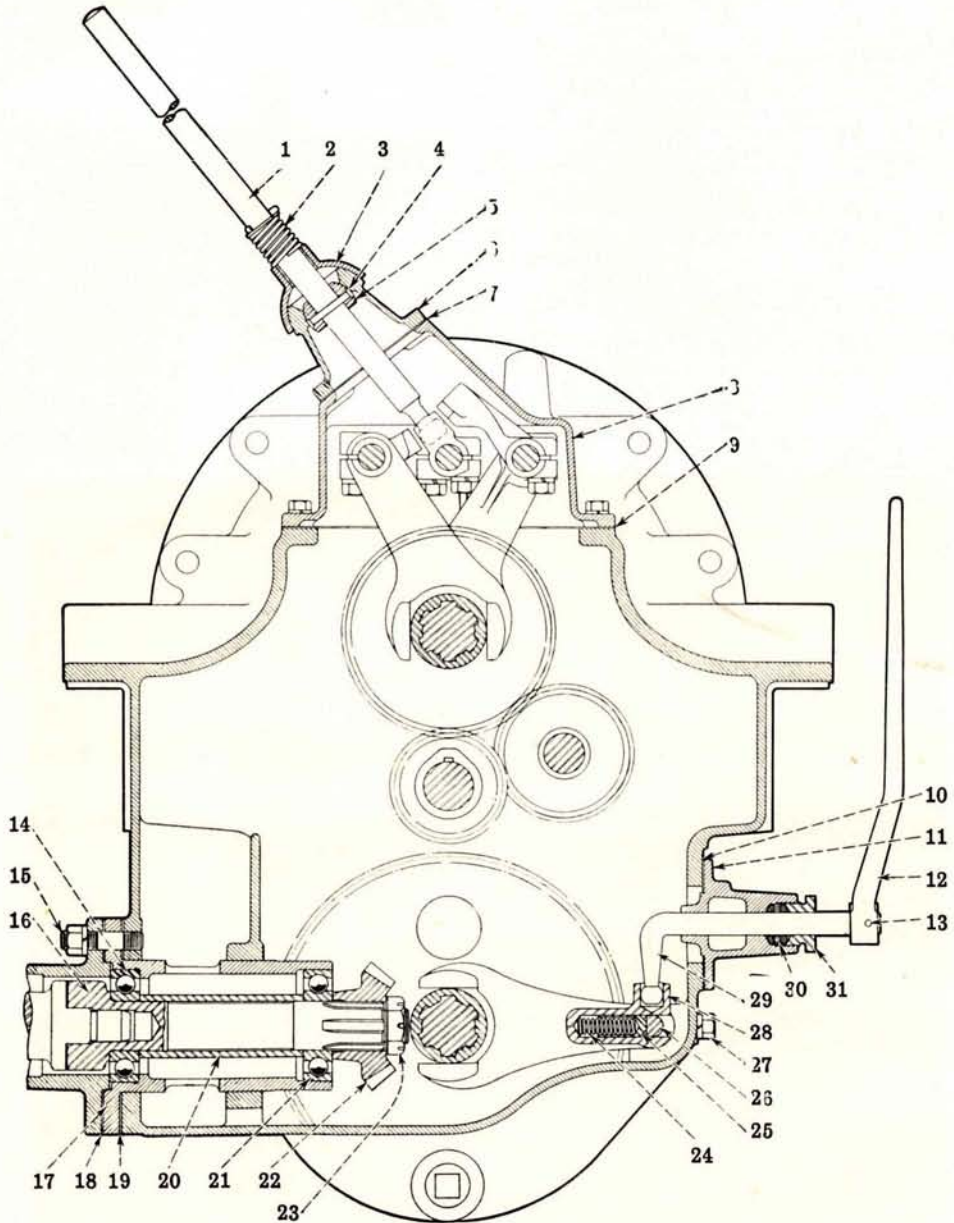
TRANSMISSION ASSEMBLY

Illustration No. 61
Transmission assembly (sectional view).

(For list of parts, see page 66.)

TRANSMISSION ASSEMBLY

(See illustration No. 61)

Ref. No.	I H C Part No.	DESCRIPTION
1	15047DA	Gear shift lever.
2	15278D	Gear shift lever spring.
3	1518DCX	Gear shift ball socket cap, complete.
4	G 9210	Gear shift lever ball pin.
5	15021D	Gear shift lever ball.
6	2438D	Gear shift lever ball socket.
7	20717D	Gear shift ball socket gasket.
8	2434DX	Transmission case cover, complete.
9	20719D	Transmission case cover gasket.
10	15068D	Power take-off shifter fork bearing gasket.
11	1529D	Power take-off shifter fork lever bearing.
12	1530D	Power take-off shifter lever.
13	G 1119	Power take-off shifter lever pin.
14	10691V	Belt pulley shaft bearing, center.
15	15816D	Belt pulley carrier stud.
16	15521D	Belt pulley shaft, inner.
17	2440D	Belt pulley carrier, inner.
18	15147D	Belt pulley carrier gasket.
19	{ 15166D	Belt pulley carrier shim, light.
	{ 15167D	Belt pulley carrier shim, heavy.
20	20720D	Belt pulley bearing spacer, inner.
21	10691V	Belt pulley shaft bearing, inner.
22	15041D	Belt pulley shaft bevel gear (17 teeth).
23	4221D	Belt pulley nut.
24	15198D	Power take-off shifter poppet spring.
25	15005D	Power take-off shifter poppet.
26	15016D	Power take-off shifter shaft.
27	15039D	Power take-off shifter shaft locking screw.
28	15092D	Power take-off shifter fork.
29	15067DA	Power take-off shifter fork lever, complete.
30	15219D	Power take-off shifter packing.
31	15069D	Power take-off shifter packing gland.

BELT PULLEY AND CARRIER ASSEMBLY

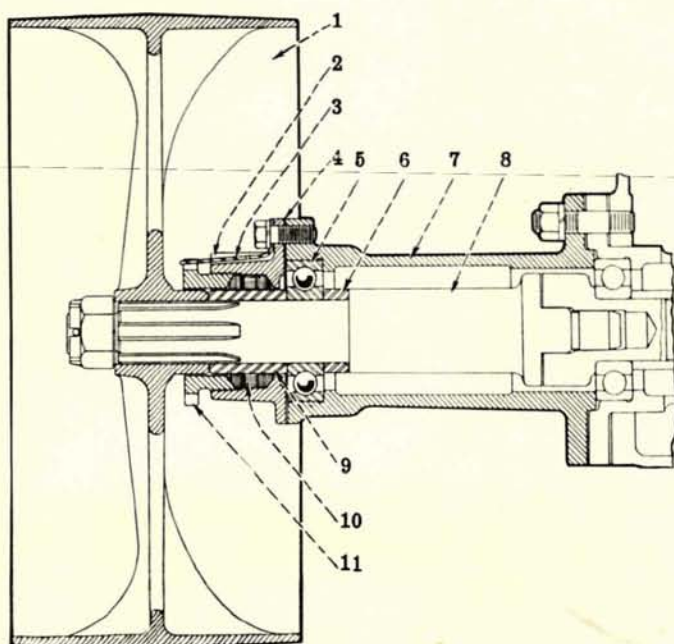


Illustration No. 62
Belt pulley and carrier assembly
(sectional view).

Ref. No.	I H C Part No.	DESCRIPTION
1	1592DX	Belt pulley with weights (14" diam. x 6½" face).
2	1571D	Belt pulley stuffing box.
3	15322D	Belt pulley shaft packing gland lock.
4	15129DA	Belt pulley bearing cap gasket.
5	10691V	Belt pulley shaft bearing, outer.
6	20739D	Belt pulley bearing spacer, outer.
7	2441D	Belt pulley carrier, outer.
8	15522D	Belt pulley shaft, outer.
9	15282D	Belt pulley spacer.
10	15221DA	Belt pulley shaft packing.
11	1514DA	Belt pulley shaft packing gland.
..	1593D	Belt pulley bearing cap.
..	15195D	Belt pulley shaft packing.
Special Belt Pulleys		
..	2049DX	Belt pulley, complete (17⅝" diam. x 6½" face) (special).
..	2219DX	Belt pulley, complete (8½" diam. x 6½" face) (special).
..	2320DX	Belt pulley, complete (11⅝" diam. x 6½" face) (special).

FRONT AXLE, SHAFT, STEERING GEAR AND STARTING CRANK

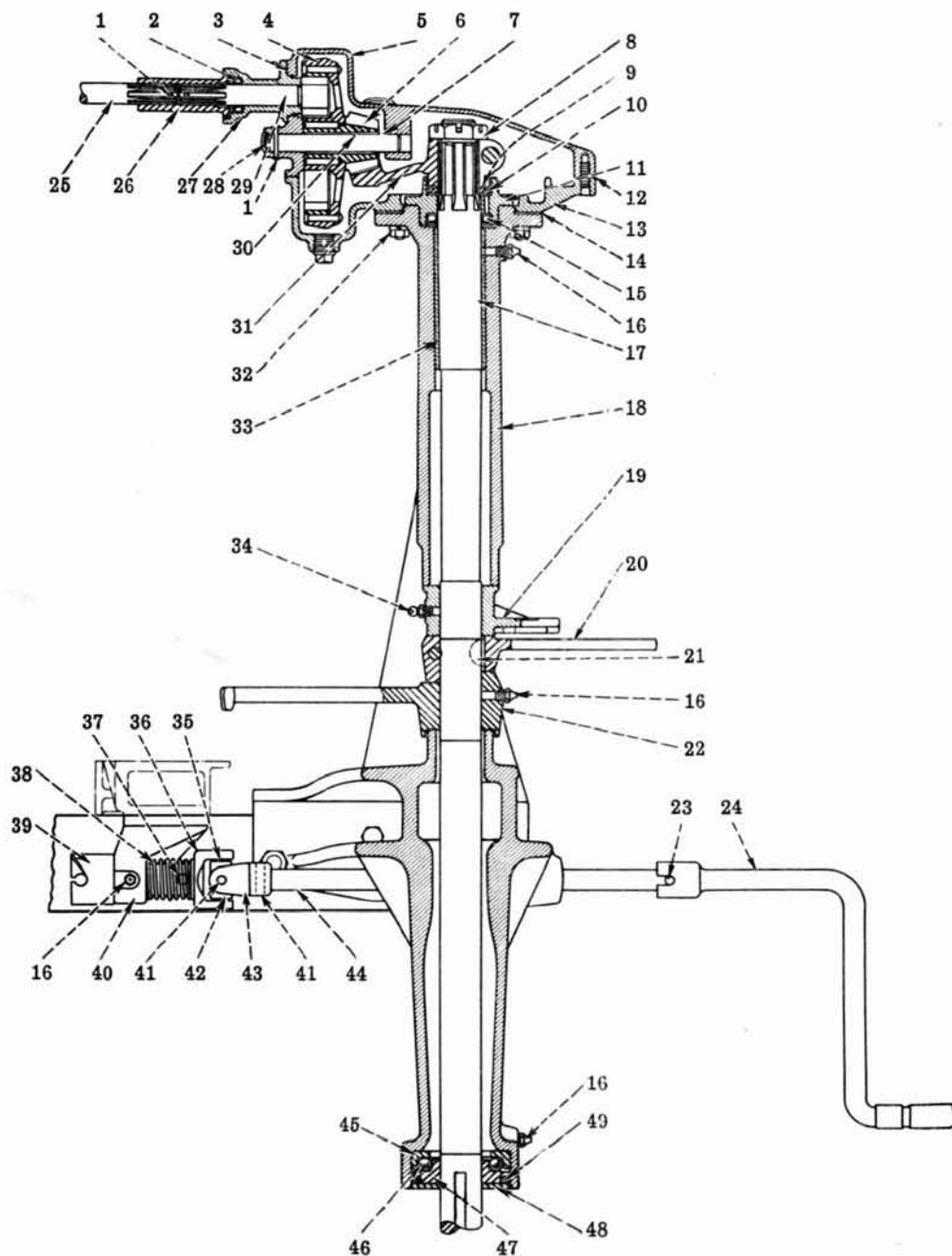


Illustration No. 63

Front axle, shaft, steering gear and starting crank (sectional view).

FRONT AXLE, SHAFT, STEERING GEAR AND STARTING CRANK

(See illustration No. 63)

Ref. No.	I H C Part No.	DESCRIPTION	Ref. No.	I H C Part No.	DESCRIPTION
1	G 2894	Steering bevel pinion shaft pin.	25	20724D	Steering shaft.
2	19707D	Steering shaft oil seal.	26	19704D	Steering shaft coupling.
3	19705D	Steering spur pinion bearing gasket.	27	2238DX	Steering spur pinion bearing.
4	20106DX	Steering gear hub with gear and pinion, complete.	28	13090D	Steering gear case cover expansion plug.
5	2236DAX	Steering gear case cover, complete.	29	19696D	Steering spur pinion (10 teeth)
6	19695DX	Steering bevel pinion (9 teeth), complete.	30	19701D	Steering bevel pinion bushing.
7	19697D	Steering bevel pinion shaft.	31	19694D	Steering sector (16 teeth).
8	4647D	Front axle shaft nut.	32	20154D	Steering gear case stud.
9	15096D	Steering sector shim, light (.007").	33	15139D	Front axle shaft support bushing.
9	15097D	Steering sector shim, heavy (.0156").	34	14186D	Front axle shaft spacer cap lubricator (Zerk).
10	20284D	Steering sector thrust washer.	35	15272D	Starting crank knuckle gimbal pin, large.
11	2367DX	Front axle shaft oil seal retainer, complete.	36	1573D	Starting crank knuckle, rear.
12	19699D	Steering gear case cover gasket.	37	G 3754	Starting crank knuckle pin ($\frac{5}{16} \times 1\frac{1}{2}$ ").
13	2237DAX	Steering gear case, complete.	38	15274D	Starting crank spring.
14	19706D	Steering gear case gasket.	39	15273D	Starting crank ratchet.
15	19702D	Front axle shaft oil seal.	40	1582D	Starting crank bearing.
16	14186D	Lubricator fitting (Zerk).	41	2709T	Starting crank gimbal pin, small.
17	20722D	Front axle, complete with shaft.	42	1574D	Starting crank knuckle gimbal.
18	2432DX	Front bolster, complete.	43	1572D	Starting crank knuckle, front.
19	1553DAX	Front axle shaft spacer, complete.	44	15162DB	Starting crankshaft.
20	15107D	Cultivator shifter lever.	45	15054D	Front axle shaft bearing outer race.
21	13089D	Cultivator shifter lever key.	46	13087D	Front axle shaft bearing ball.
22	15108DC	Countershaft brake cable lever.	47	15305D	Front axle shaft bearing inner race and felt retainer.
23	15204D	Starting crank pin.	48	15057D	Front axle shaft felt washer retainer washer.
24	15179DAX	Starting crank, complete.	49	15055D	Front axle shaft felt washer.

STEERING MECHANISM, FRONT WHEELS AND AXLE

Miscellaneous parts not indicated in illustrations Nos. 63 and 64.

I H C Part No.	DESCRIPTION
1598D	Steering shaft bearing.
13063D	Steering shaft key.
13201D	Front wheel roller bearing cup.
13205DA	Front wheel roller bearing cone, complete.
13207D	Front wheel roller bearing cup.
13211DA	Front wheel roller bearing cone, complete.
14186D	Front axle shaft ball bearing lubricator (Zerk).
14187D	Steering shaft bearing lubricator, rear (Zerk).
14187D	Steering spur pinion bearing lubricator (Zerk).
15077D	Front axle shaft key.
15545D	Steering shaft bearing pin.
19700D	Steering gear pin.
19703D	Steering gear case dowel pin.
20283D	Front axle shaft oil seal retainer gasket.
20725D	Steering shaft bearing post.

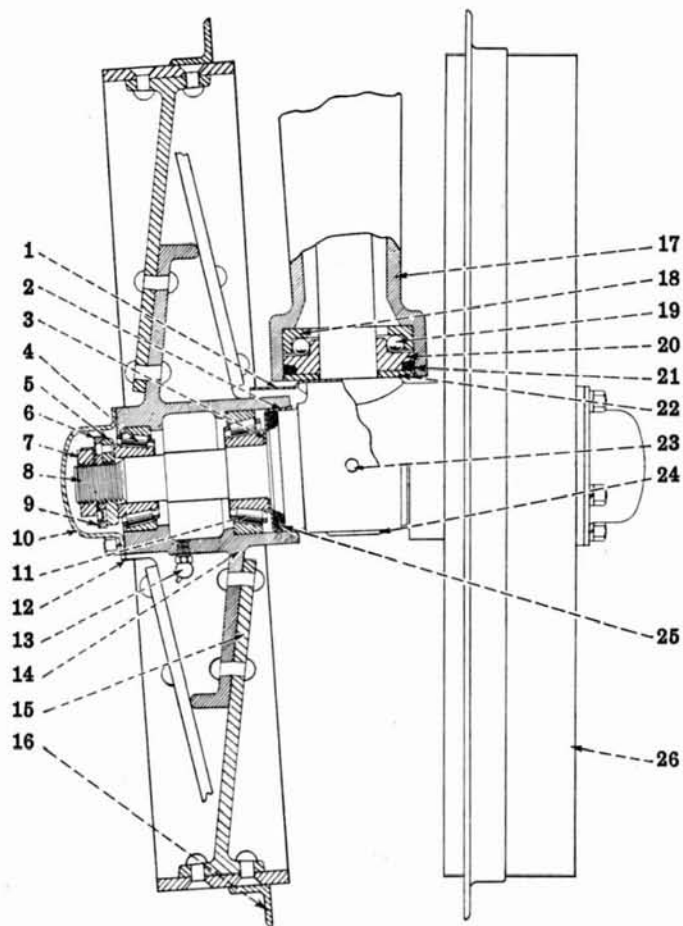


Illustration No. 64—Front axle and wheels.

FRONT AXLE AND WHEELS

Ref. No.	I H C Part No.	DESCRIPTION
1	15399D	Front wheel dust shield.
2	12302D	Front wheel felt washer retainer, outer.
3	12301D	Front wheel felt washer retainer, inner.
4	13200DA	Roller bearing, outer, complete.
5	12305DX	Front axle nut, complete.
6	12308D	Front axle adjusting lock.
7	12311D	Front axle locking nut.
8	20722D	Front axle, complete with shaft.
9	12307D	Front axle nut lock.
10	15397D	Front wheel hub cap.
11	13206DA	Roller bearing, inner, complete.
12	15398D	Front wheel hub cap gasket.
13	14187D	Front wheel bearing lubricator, $\frac{1}{8}$ ", 30° elbow (Zerk).
14	1515DDX	Front wheel hub, complete.
15	20642D	Front wheel spoke (not "Fairway").
15	15379DA	Front wheel spoke ("Fairway" only).
16	15360DB	Front wheel tire ring.
17	2432DX	Front bolster, complete.
18	15054D	Front axle shaft bearing outer race.
19	13087D	Front axle shaft bearing balls.
20	15305D	Front axle shaft bearing inner race and felt retainer.
21	15055D	Front axle shaft felt washer.
22	15057D	Front axle shaft felt washer retainer.
23	15201D	Front axle pin.
24	.....	Front axle shaft (order 20722D).
25	12300D	Front wheel felt washer.
26	20643D	Front wheel, complete, 25" dia., 4" face (2" skid ring) (for tapered roller bearing).

SPECIAL FRONT WHEELS

Ref. No.	I H C Part No.	DESCRIPTION
..	15378DC	Front wheel, complete, 24" dia., 8" face (tapered roller bearing) ("Fairway" only).
..	20681D	Front wheel, complete, with slip-over tire (tapered roller bearing) (London only).

COUNTERSHAFT BRAKE

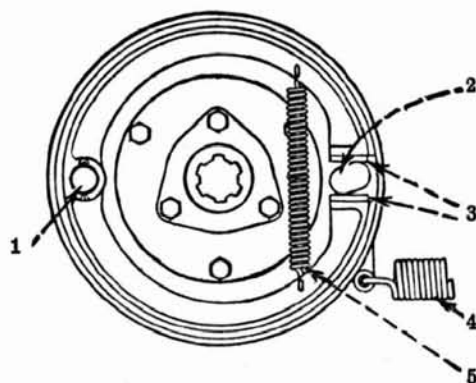


Illustration No. 65—Countershaft brake.

Ref. No.	I H C Part No.	DESCRIPTION
1	15018DA	Shoe pin.
2	{ 15029DC 15406DA	Camshaft (not "Narrow Tread"). Camshaft ("Narrow Tread" only).
3	15049DA	Shoe wearing plate.
4	15200D	Cable spring.
5	15199D	Shoe spring.

COUNTERSHAFT BRAKE DRUM

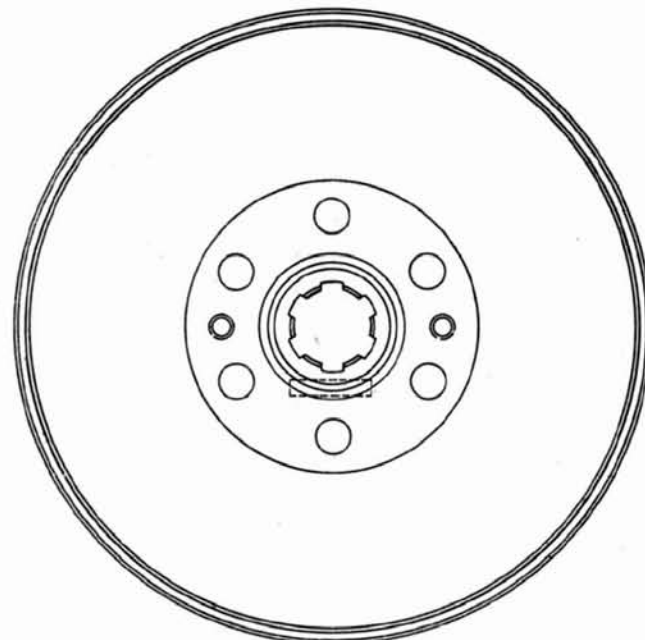
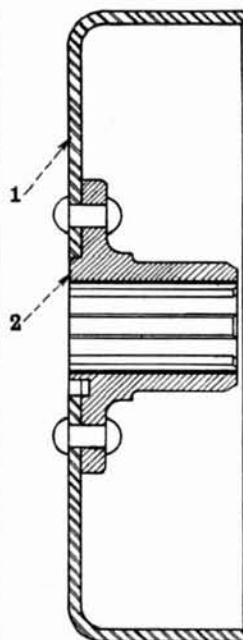
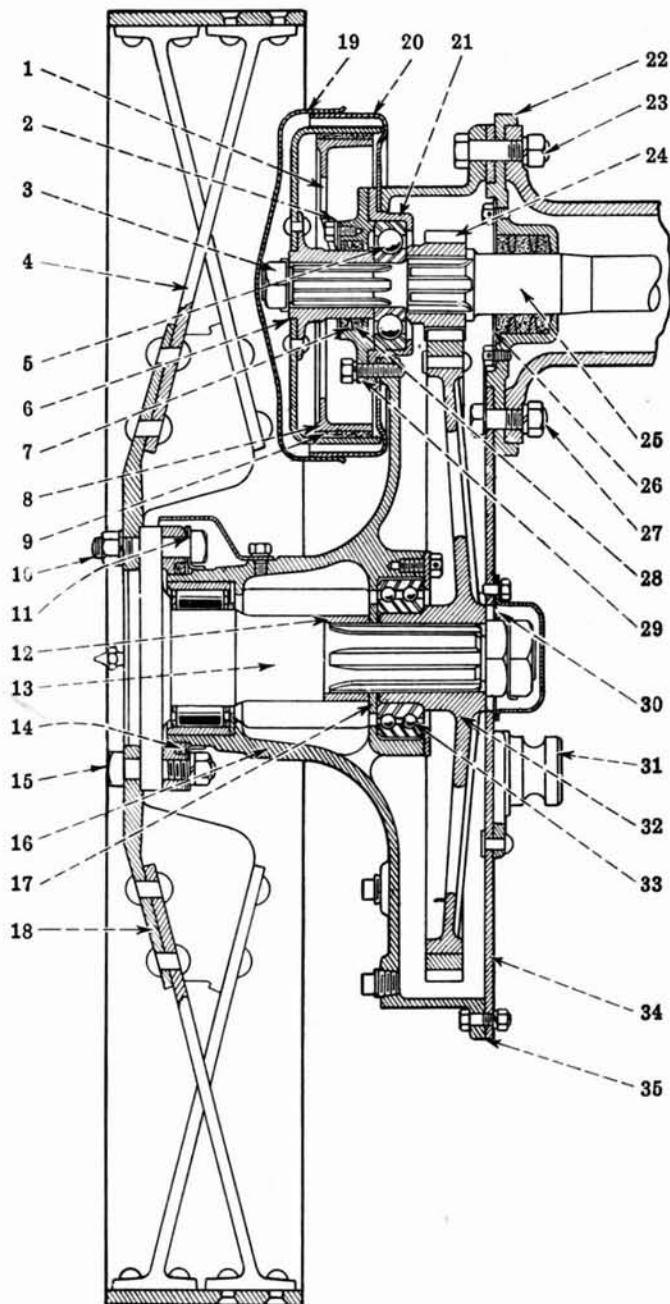


Illustration No. 66
Countershaft brake drum, complete (18013DA).

Ref. No.	I H C Part No.	DESCRIPTION
1	15014D	Countershaft brake drum (order 18013DA).
2	{ 1516DB 1516DBX	Countershaft brake drum hub (order 1516DBX).
..	18013DA	Countershaft brake drum, complete.

REAR WHEEL AND COUNTERSHAFT BRAKE**Illustration No. 67****Detail of countershaft brake and rear wheel.**

REAR WHEEL AND COUNTERSHAFT BRAKE

(See illustration No. 67)

Ref. No.	I H C Part No.	DESCRIPTION
1	1534DBX	Brake shoe, inner, complete.
2	15015D	Felt washer retainer.
3	15347D	Countershaft nut.
4	{ 20556D	Rear wheel spoke (Regular Tread).
	{ 15383D	Rear wheel spoke ("Fairway" only).
5	12798H	Countershaft ball bearing.
6	1516DBX	Brake drum hub, complete.
7	15034D	Felt washer spacer.
8	1535DBX	Brake shoe, outer, complete.
9	15102DA	Brake shoe lining (outer shoe).
10	{ 15365DAX	Rear wheel hub bolt with nut and lockwasher.
	{ 17465DX	Rear wheel dowel bolt.
11	15013DA	Rear wheel felt washer retainer.
12	15217D	Rear axle spacer.
13	17224D	Rear axle.
14	15142D	Rear wheel felt washer.
15	{ 15365DAX	Rear wheel hub bolt with nut and lockwasher.
	{ 17465DX	Rear wheel dowel bolt.
16	1501DC	Rear wheel carrier.
17	15031DA	Rear wheel ball-bearing washer.
18	17226DAX	Rear wheel hub, complete (Regular Tread).
19	22961DAX	Countershaft brake drum mud shield, outer, complete.
20	22960DX	Countershaft brake drum mud shield, inner, complete.
21	1513D	Ball-bearing retainer.
22	1524DB	Countershaft housing end.
23	15546D	Rear wheel carrier dowel bolt.
24	15007D	Drive pinion, 12 teeth.
25	{ 20310D	Countershaft (Regular Tread).
	{ 20311D	Countershaft (Narrow Tread).
26	15050D	Housing felt washer retainer.
27	15271D	Housing bolt.
28	15017D	Ball-bearing felt washer.
29	1511D	Ball-bearing retainer cap.
30	15059D	Rear axle hub cap gasket.
31	15109D	Drawbar pivot pin.
32	2309DX	Drive gear hub and gear (80 teeth), complete.
33	15196D	Rear axle ball bearing.
34	{ 15336DBX	Rear axle carrier plate, L. H.
	{ 15337DBX	Rear axle carrier plate, R. H.
35	15110DA	Rear wheel carrier gasket.

COUNTERSHAFT AND BRAKE MECHANISM

Miscellaneous parts not indicated in illustrations Nos. 65, 66 and 67.

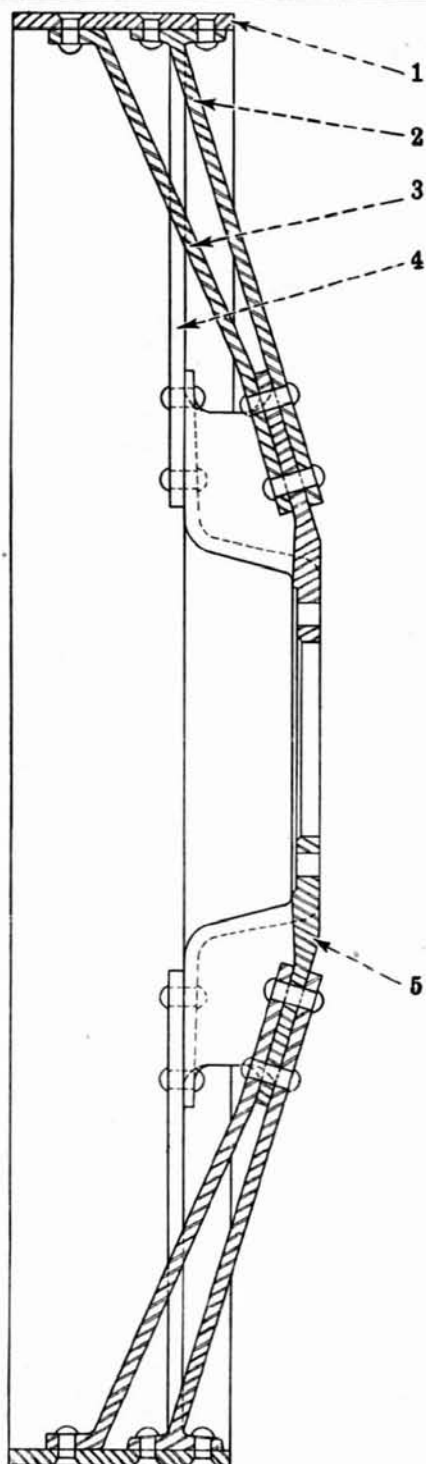
I H C Part No.	DESCRIPTION	I H C Part No.	DESCRIPTION
1521D	Countershaft brake lever.	15216DB	Countershaft housing bolt lock.
1550DB	Countershaft housing cover.	15268DB	Countershaft brake shoe, inner and outer.
1551DA	Countershaft brake sheave.	15296D	Countershaft housing cover ring.
2416DX	Countershaft housing, complete ("Narrow Tread" only).	15320D	Countershaft housing end gasket.
2554DX	Countershaft housing, complete (not "Narrow Tread").	15349D	Countershaft housing cover gasket.
13110D	Countershaft brake cable shackle.	15352DA	Countershaft brake cable guide.
13737D	Countershaft brake lever key.	15426D	Countershaft brake lever spring, left.
14186D	Countershaft brake sheave shaft lubricator (Zerk).	15427D	Countershaft brake lever spring, right.
14186D	Countershaft cable lever lubricator (Zerk).	15433D	Countershaft brake shoe wearing plate shim.
15051D	Countershaft housing felt washer spacer.	15585D	Countershaft brake shoe pin wick.
15062D	Countershaft housing felt washer.	15588D	Countershaft brake shoe pin assembly.
15101DA	Countershaft brake shoe lining inner shoe.	18012D	Countershaft nut lock.
15108DC	Countershaft brake cable lever.	20525D	Countershaft housing gasket.
15134DB	Countershaft brake sheave shaft.	20723D	Countershaft housing flange stud.
15136DB	Countershaft brake sheave spacer.	23124D	Countershaft felt washer retainer cap screw lock.
15206DB	Countershaft brake cable.	G 1119	Countershaft brake sheave bracket pin.

REAR AXLE, REAR WHEELS, AND LUGS

Miscellaneous parts not indicated in illustration No. 67.

I H C Part No.	DESCRIPTION	I H C Part No.	DESCRIPTION
1502DA	Rear wheel collar.	15944D	Rear wheel hub bolt nut.
11095DA	Spade lug, 5" (special).	15944D	Rear wheel dowel bolt nut.
12124D	Spade lug, 4", with 2 machine bolts ($\frac{3}{8}$ x $1\frac{1}{2}$ "), nuts and lockwashers (special).	16493D	Single rim rear wheel angle lug "U" bolt (special).
15008DA	Rear wheel ball-bearing retainer.	16494D	Single rim rear wheel angle lug, L. H. (special).
15012DA	Rear wheel dust cap.	16495D	Single rim rear wheel angle lug, R. H. (special).
15025D	Rear wheel roller bearing, complete (less inner race).	16510D	Single rim rear wheel angle lug extension (special).
15058DA	Rear axle hub cap.	17254DC	Rear wheel, complete less lugs, 40 x 6" (Regular Tread).
15060D	Rear wheel roller bearing retainer washer.	17259DA	Rear wheel, complete less lugs, 42 x 12" (special).
15115D	Rear wheel angle lug, R. H., with 2 machine bolts ($\frac{3}{8}$ x $1\frac{1}{2}$ "), nuts and lockwashers.	17262DA	Open rear wheel, L. H., complete less lugs, 42 x 8" (special).
15116D	Rear wheel angle lug, L. H., with 2 machine bolts ($\frac{3}{8}$ x $1\frac{1}{2}$ "), nuts and lockwashers.	17263DA	Open rear wheel, R. H., complete less lugs, 42 x 8" (special).
15173D	Rear wheel carrier dowel.	17264DA	Rear wheel, complete less lugs, 40 x 16" ("Fairway" only).
15210D	Rear wheel ball-bearing retainer cap screw.	17269D	Single rim rear wheel, complete, less lugs (42") (special).
15276D	Rear wheel carrier dirt cover.	17382D	Rear axle bearing lubricator, $\frac{1}{4}$ ", straight, $\frac{3}{16}$ " long (Zerk).
15343D	Rear axle nut.	379TM	Rear wheel spud lug, 2 $\frac{1}{4}$ " (special).
15344D	Rear axle nut lock.		
15386DA	Rear wheel lug, with nut and lock-washer ("Fairway" only).		

REAR WHEEL ASSEMBLY (Narrow Tread Only)



Ref. No.	I H C Part No.	DESCRIPTION
1	17253DC	Rear wheel, complete less lugs, 40x6".
2	20559D	Rear wheel spoke, outer.
3	20560D	Rear wheel tire brace.
4	20558D	Rear wheel spoke, inner.
5	17227DAX	Rear wheel hub, complete.

Illustration No. 68

**Rear wheel assembly
(Narrow Tread only).**

SEAT SUPPORT

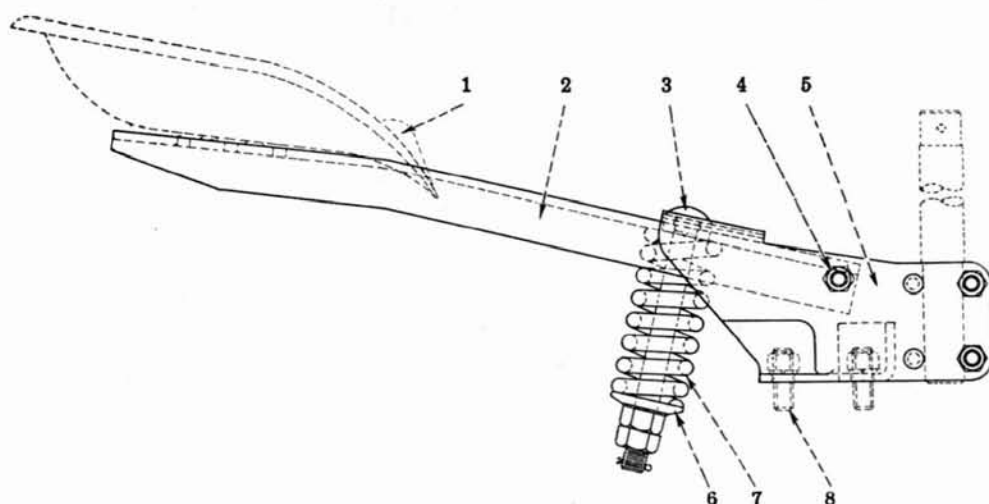


Illustration No. 69
Seat support assembly.

Ref. No.	I H C Part No.	DESCRIPTION	Ref. No.	I H C Part No.	DESCRIPTION
1	MB488B	Seat.	5	19160D	Seat support bracket.
2	17389D	Seat support (3", 5-lb. channel).	6	10027DA	Seat spring washer.
3	10026DA	Seat support bolt ($\frac{3}{4}$ x $7\frac{1}{2}$ ").	7	10214DA	Spring.
4	17387D	Seat support bracket bolt ($\frac{1}{2}$ x $4\frac{1}{2}$ ").	8	17388D	Seat support stud ($\frac{5}{8}$ x 2").

DRAW BAR

I H C Part No.	DESCRIPTION	I H C Part No.	DESCRIPTION
1538DB	Draw bar hinge, R. H.	15141D	Draw bar (Regular Tread).
1539DB	Draw bar hinge, L. H.	15407D	Draw bar (Narrow Tread only).
15085DA	Draw bar brace, L. H.	4558TM	Draw bar guide pin, $\frac{3}{4}$ x 4" (drilled).
15086DA	Draw bar brace, R. H.	6740TMA	Draw bar clevis.
15109D	Draw bar pivot pin.		

TOOL BOX AND TOOLS

I H C Part No.	DESCRIPTION	I H C Part No.	DESCRIPTION
4725D	Socket wrench, for $\frac{1}{2}$ " and $\frac{9}{16}$ " nuts.	G 3525	"S" wrench, 15° (for $\frac{5}{8}$ " and $\frac{3}{4}$ " set screws and $\frac{3}{8}$ ", $\frac{7}{16}$ " and $\frac{1}{2}$ " nuts).
12254D	Valve clearance gauge.	G 3526	"S" wrench for $\frac{5}{8}$ " nuts.
12335D	"S" wrench.	G 8899	Punch.
12737D	"S" wrench.	H 156	Oil can.
13071D	Adjustable wrench, 12".	H 758M	Cold chisel.
15172DA	Tool box (less cover).	H 59599	Compressor (Zerk Model Z3A).
15226D	Packing gland wrench.	2587T	Gas pliers, 8".
21264D	Wrench (for manifold stud nuts).	2588T	Screw driver, 5".
G 3173	"S" wrench, 15° (for $\frac{1}{4}$ " U.S.S. nuts, $\frac{5}{16}$ " cap screws and $\frac{3}{8}$ ", $\frac{3}{16}$ " and $\frac{1}{2}$ " set screws).	13095V	Spark plug wrench.

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IMPORTANT

The owner will aid in rendering prompt and efficient service, by a careful observance of the following:

- 1—When ordering parts, give the Tractor Serial Number.
- 2—Write the part number wanted exactly as shown in parts list.
- 3—All orders should be sent to the Dealer or the Branch House in charge of territory.
- 4—Give definite shipping instructions. When ordering by telegraph, prepay, and give correct address.

So that you may have it before you, write both the Tractor and Engine Serial numbers here:

Tractor Serial No. _____
(Stamped on name plate on tool box)

Engine No. _____
(Stamped on Engine name plate)

Do not omit prefix or suffix letters appearing with numbers.

Please fill in this form and mail to nearest branch house, International Harvester Company of America.

Tractor Serial No. _____ Model _____ Engine No. _____

Purchased from _____ Date _____ 19 _____

Address _____ State _____

Name of Owner _____

Address _____ State _____

Other Tractors in Service _____

POST CARD

STAMP
HERE

INTERNATIONAL HARVESTER COMPANY
OF AMERICA
(INCORPORATED)

(Street Address)

(City)

(State)

SPECIFICATIONS

Engine

Bore.....	3 $\frac{3}{4}$ "
Stroke.....	5"
Engine speed (approximate).....	1200 r. p. m.
Pulley speed.....	654 r. p. m.
Belt speed.....	2395 ft. p. m.
Power take-off shaft speed.....	505 r. p. m.
Pulley diameter.....	14"
Pulley face.....	6 $\frac{1}{2}$ "
Kerosene tank.....	13 gals.
Gas tank.....	$\frac{7}{8}$ gal.
Water cooling system—capacity.....	Approx. 10 gals.

Clutch

Single plate dry disc.....	11 in.
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Transmission (Four Speeds)

Forward speed, miles per hour.....	2 $\frac{1}{4}$, 2 $\frac{3}{4}$, 3 $\frac{1}{4}$ and 3 $\frac{3}{4}$
Reverse speed, miles per hour.....	2 $\frac{3}{4}$

Wheels

Front wheel.....	4 x 25 in.
Drive wheel.....	6 x 40 in.
Tread, front.....	8 $\frac{1}{2}$ in.
Tread, rear ("Regular").....	74 in.
Tread, rear ("Narrow" and "Fairway").....	57 in.
Wheelbase.....	85 in.

General

Length (over all).....	140 in.
Width (over all).....	86 in.
Total height—steering wheel.....	67 in.
Total height—radiator.....	58 in.
Turning radius.....	8 ft.

Order Genuine Parts for Replacements

Satisfactory and efficient service is endangered by purchasing imitation repairs, as cheap parts invariably mean short life and high cost.

Spare parts supplied for IHC Tractors are identical with those used in building the Tractor, and accurate workmanship and manufacturing equipment of the latest type insure interchangeability and proper fit.

If parts could be manufactured at a lower cost and sold at lower prices without sacrificing International quality, this would be done. The right material for the purpose and the knowledge acquired through more than twenty years of Tractor building enables International to produce quality that will not be found in the imitation repairs.

Remember that International Harvester Tractors deserve genuine International parts.