

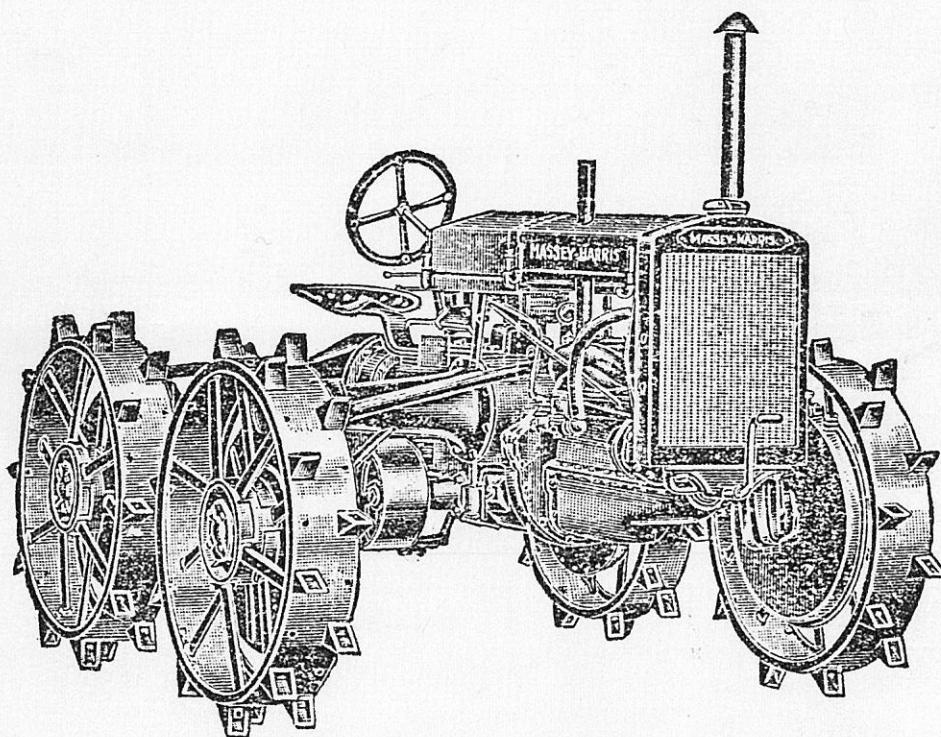
Service Manual

MASSEY-HARRIS

GENERAL PURPOSE

FOUR WHEEL DRIVE

TRACTOR



Massey-Harris Co., Ltd.

General Offices
Toronto, Canada

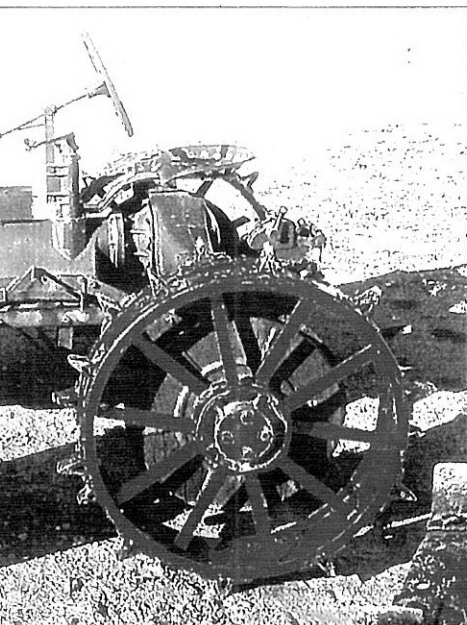
Branches and Service Stocks at Leading Trade Centers

IMPORTANT

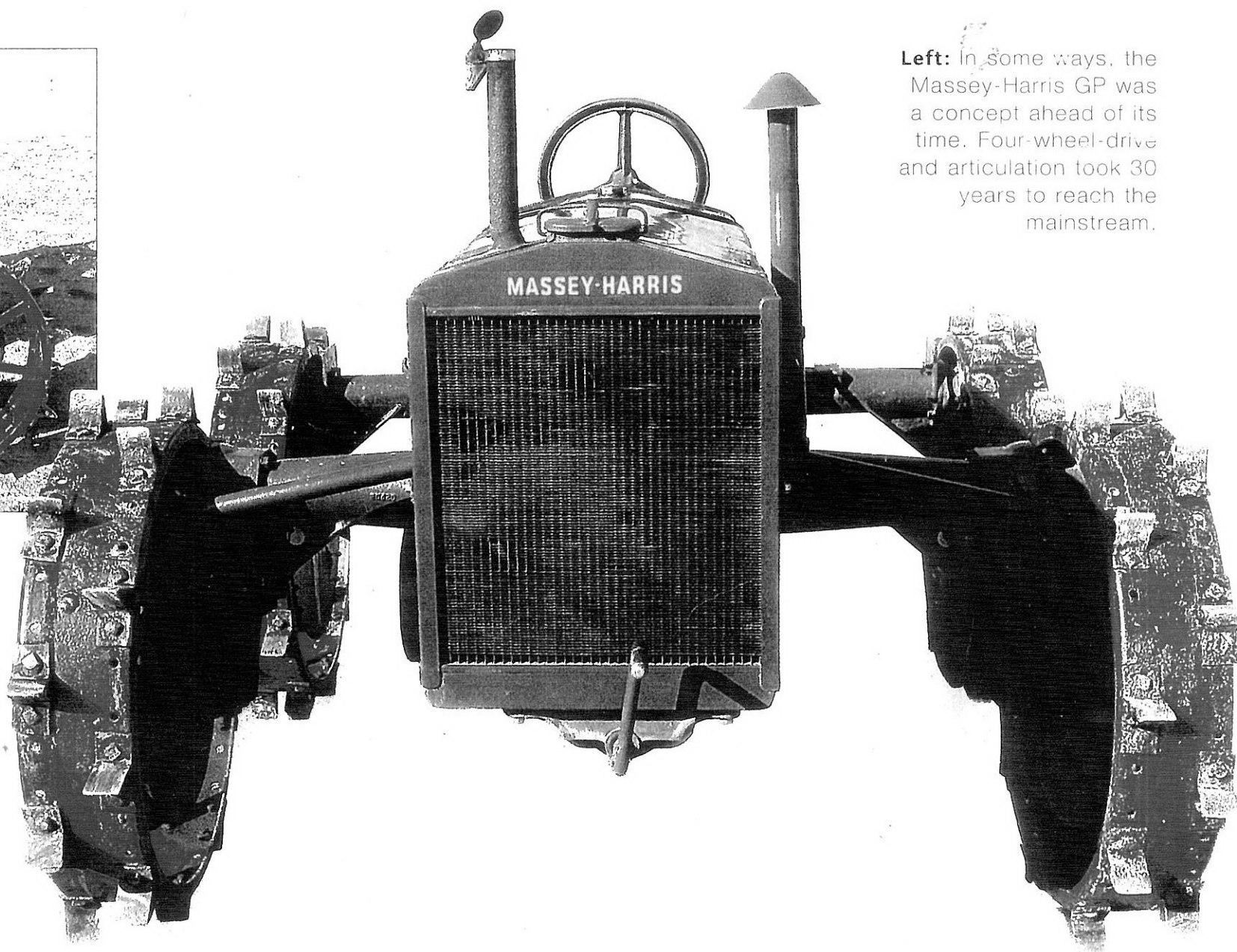
1. Read this Instruction Book Carefully.
2. The Massey-Harris General Purpose Tractor is a fine piece of machinery. No fine machine should ever be loaded to full capacity until it has been run light for a reasonable length of time.
3. ORDERING REPAIRS.
When ordering repairs, be sure to give: 1, Number of Tractor; 2, Width of Tread; and 3, Name and Number of part wanted.

1930 MASSEY-HARRIS GP

Left: In some ways, the Massey-Harris GP was a concept ahead of its time. Four-wheel-drive and articulation took 30 years to reach the mainstream.

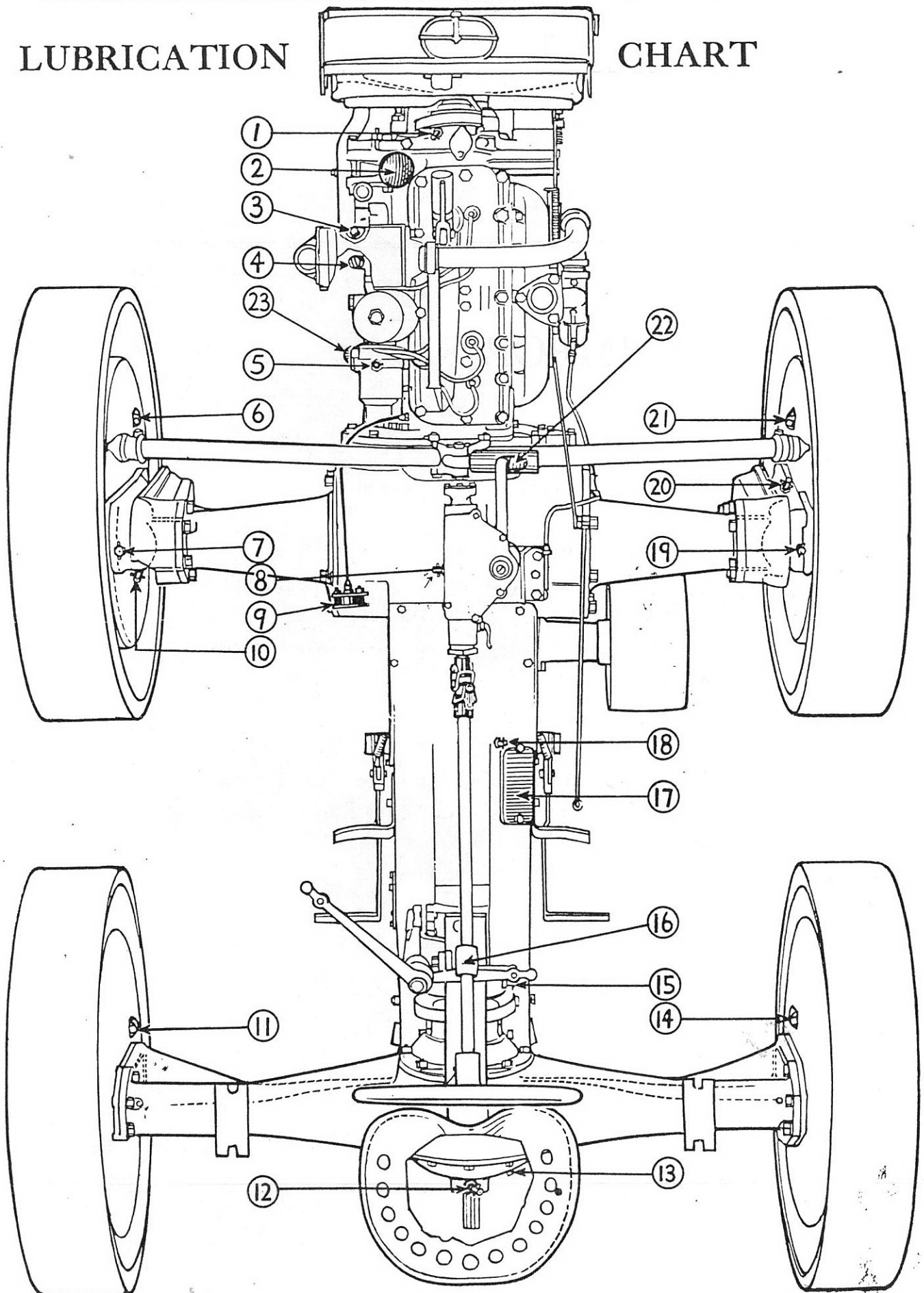


Above: The GP's forward weight bias is obvious here. Its engine was mounted ahead of the front axle, to counteract the weight of a towed implement and thus give even weight distribution over the four driven wheels.



LUBRICATION

CHART



Explanation of Lubrication Chart

DAILY LUBRICATION DUTIES

- No. 1. Fan Bearing Alemite.
- No. 23. Oil Level Gauge. Keep crank case filled to mark 4/4 on bayonet gauge.
- No. 2. Oil Filler Cap. Keep clean. Use seasonal oil. See Pages 8, 9, and 10.
- No. 3. Oil Air Cleaner Filler Plug. Fill with used crank case oil.
- No. 4. Grease Cup for Water Pump Shaft Bearing. Fill with good grade cup grease.
- No. 9. Oil Pressure Gauge. As soon as motor is started, indicator hand should read 20 to 30 lbs. (Don't fail to note this gauge.) When oil has warmed pressure should show approximately 15 lbs.
- No. 10. } Pivot Pin Bearings—Alemite.
- No. 20. }
- No. 18. } Housing Carrier and Tube Bearings—Alemite.
- No. 15. }
- No. 12. Power Take-off Shaft—Alemite.
- No. 16. Steering Shaft Bearing. Use light oil around shaft.
- No. 22. Coupling Socket for Steering Arm. Oil around spring.

15 DAYS' LUBRICATION

- No. 5. Magneto. Few drops light oil. (See special Magneto Instructions, Page 11.)
- No. 8. Steering Gear. Light transmission oil in winter and heavy transmission oil in summer. Never use graphite oil.

30 DAYS' LUBRICATION

- No. 19. } Universal Joints. Fill with 1/2 lb. of lubricant. For temperatures 20 and higher
- No. 7. } use 600W or its equivalent S.A.E. transmission No. 160. For lower, including
- No. 10. } sub-zero, temperatures use a mixture of equal parts of the above oil and S.A.E.
- No. 10 Crank Case Oil.

60 DAYS' LUBRICATION

- No. 11. } Master Gear Housing and Wheel Bearings. Fill completely. For temperatures
- No. 14. } 20 and higher use 600W or its equivalent S.A.E. transmission No. 160. For
- No. 6. } lower, including sub-zero temperatures, use a mixture of equal parts of the
- No. 21. } above oil and S.A.E. No. 10 Crank Case Oil.
- No. 17. Transmission Case Oil Filler Plate. Fill with 4 Gal. 1 Qt. (U.S.) or 3 Gal. 1 Qt. (Imp.) same grade oil used in motor. Oil should be kept to bottom of sliding gear shaft bearing retainer (1, Plate 28).
- No. 13. Differential Case, rear. Fill completely. For temperatures 20 and higher use 600W or its equivalent S.A.E. transmission No. 160. For lower, including sub-zero, temperatures use a mixture of equal parts of the above oil and S.A.E. No. 10 Crank Case Oil.

PREPARING YOUR NEW TRACTOR FOR WORK

A. INSPECTION.

Look over your tractor carefully to see that no parts have been lost or broken in shipping.

1. Make sure that all oil and grease connections are undamaged and in place. See Lubrication Chart on Page 4.
2. See that air vent hole in fuel tank filler cap is open.
3. Make sure that the clutch lever and brake pedals operate easily.

B. FUEL, WATER AND OIL.

4. Fill fuel tank with clean gasoline preferably strained through chamois to remove any water present.
5. Close water system drains (2 and 3 Plate 14) and fill radiator with clean water—soft water is best.
6. Put the proper amount of oil in the motor crank case. Should be up to the full mark $\frac{4}{4}$ on the bayonet gauge. See Lubrication Instructions, Page 5.
7. Check the oil in the oil air cleaner. See Lubrication Instructions, Page 5.
8. See that transmission is filled with oil as instructed on Page 5.
9. See that rear axle is filled with lubricant. See Instructions, Page 5.
10. Give proper attention to all grease connections. See Instructions, Page 5.

C. STARTING THE MOTOR.

11. Be sure gears are in neutral. (See Plate 2.)
12. Disengage clutch. (See Plate 2.)
13. Pull throttle rod back toward seat at least half way, to open.
14. Release ground screw on magneto by turning contact to the left. (See 16, Plate 14, Page 15.)

Note: In cases, however, when electric lights and starter are furnished, this ground contact is released by pushing in switch on the battery case, I, Plate 38. (Spark is automatically retarded for starting.)

15. Crank the motor by pulling crank upwards several one-quarter turns, holding out the choke wire at the same time. (Be careful in using choke not to hold it out so long as to flood the motor.)
16. In cold weather, before engine is warmed up, you may need to pull out the choke quickly several times in order to keep engine going until it warms up a little.

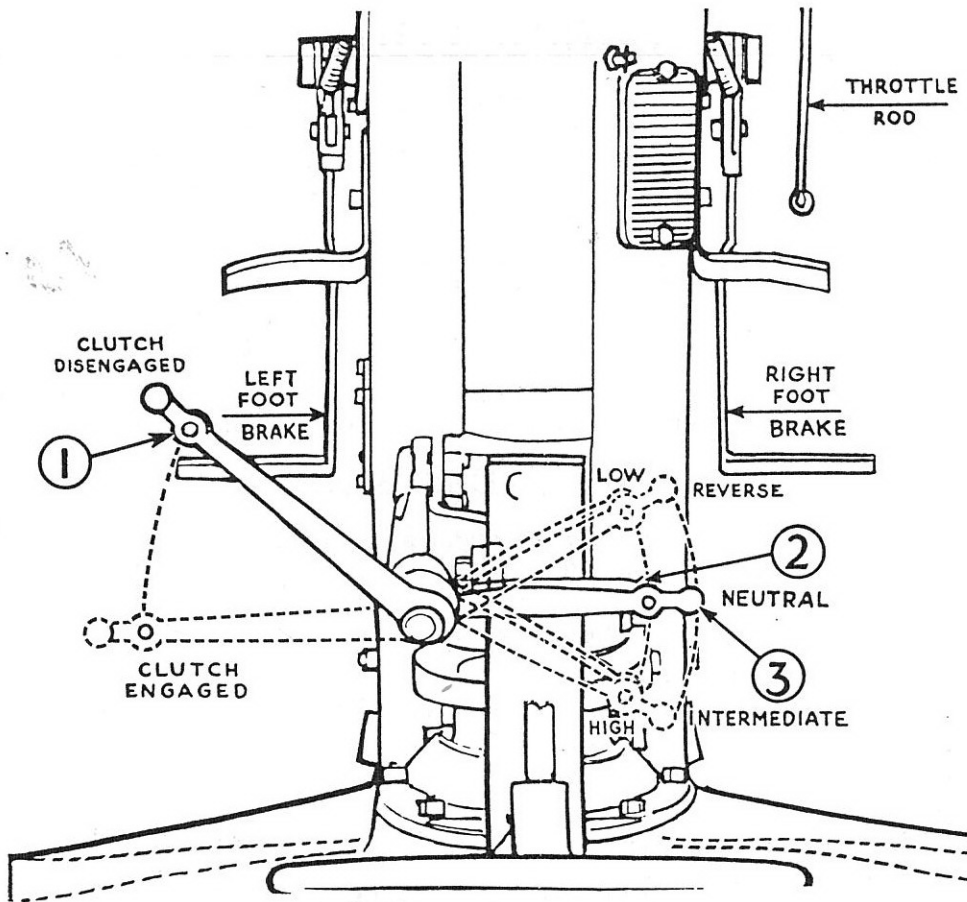


PLATE 2—Operating controls as viewed from above

D. MOVING THE TRACTOR.

17. Move gear lever to low speed as shown in Plate 2.
18. Pull back on clutch lever gradually until tractor starts moving. Then give the lever a quick, hard pull back as far as it will go.
19. To change from low to intermediate or high gear, or to reverse, disengage clutch by firmly pushing the lever forward; allow tractor to stop, at same time moving gear lever to neutral. Now select the speed you desire and move the proper lever in the direction indicated in Plate 2.
20. Again re-engage the clutch as before.

E. STOPPING THE TRACTOR.

21. Push clutch lever forward to release.
22. Shift gears to neutral. (If a quick stop is necessary, press down on both the brake pedals as soon as the clutch is disengaged. These two operations can be performed simultaneously, as soon as the operator becomes familiar enough with the tractor.)
23. Push throttle rod forward to idle the motor.
24. Turn ground contact screw on magneto to right to stop engine.

Note: If your tractor has electric starter and lights, this grounding is accomplished by pulling out the push-pull switch on the battery box. (See Plate 38.)

Caution: Be sure when starting up the motor later to release this contact by turning screw in the opposite direction, or pushing in push-pull switch as case might be. If this is not done, the engine will not start again.

LUBRICATION

Lubrication is the very first and most important consideration. The object of lubrication is to prevent a metal to metal contact. The lubricant forms a film between the metal parts and prevents wear. In the engineering of Massey-Harris Tractors there has been provided sufficient clearance between the metal parts for a lubrication film. All parts on Massey-Harris tractors are closely fitted.

CLEAN LUBRICATION

Cleanliness in lubrication is as essential in a tractor as is cleanliness in a surgical operation. Every provision possible has been made to exclude dirt from the inside of the tractor that it is possible to make. But, carelessness on the part of the operator is one thing for which the manufacturer cannot be held responsible.

OIL PRESSURE

When the motor has been started, the oil pressure gauge should show a pressure of 20 to 30 pounds. The operator should watch the oil pressure. This should be approximately 15 lbs. when oil is warm.

Causes of oil pressure falling and remedy are:

Lack of oil. Fill to proper level.

Dirt covering the screen in the oil sump (3, Plate 4). Remove screen and wash.

Cracked or broken oil pipes. Replace.

Loose oilpipe connections. Tighten.

Diluted oil. Change oil.

Improper pump adjustment.

TO ADJUST OIL PRESSURE

Remove inspection plug on left side of motor, Plate 5. Then with special wrenches, as shown in Plate 5, furnished with tractor, loosen the nut 3, Plate 3, on adjusting screw, 2, on oil pump, 1, Plate 3, and turn to right to increase pressure.

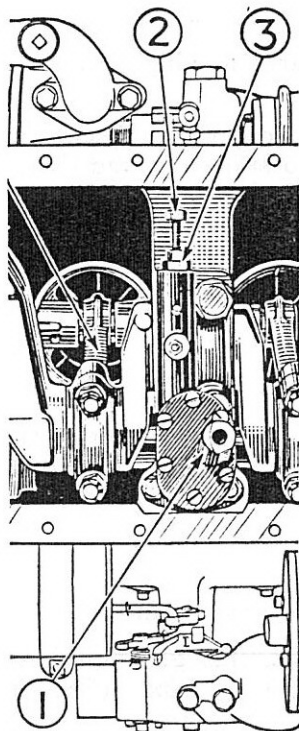


PLATE 3—Oil Pump Assembly.
(1) oil pump; (2) main adjusting screw; (3) lock nut.

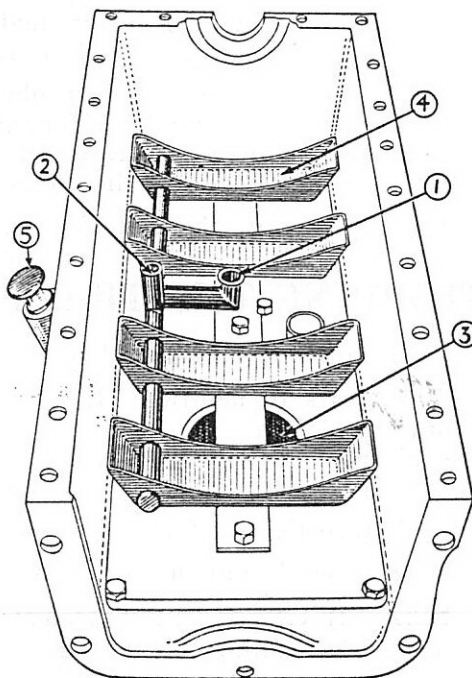


PLATE 4—Motor oil pan. (1) and (2) distributor pipe for troughs; (3) sump screen; (4) oil trough; (5) bayonet gauge.

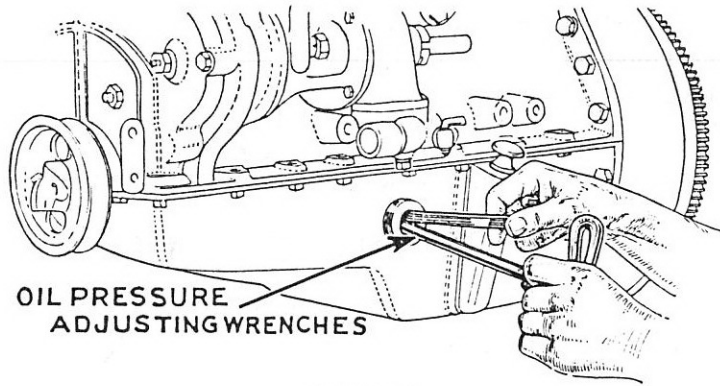
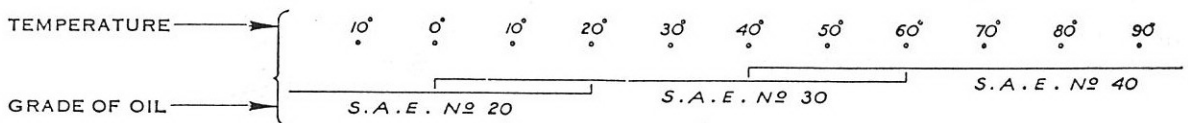


PLATE 5

OIL SPECIFICATIONS FOR MASSEY-HARRIS TRACTORS



(It is recommended that only high-grade oil of the above body specifications, manufactured by reputable oil companies and sold by reliable dealers, be used.)

The Society of Automotive Engineers, working with most of the reputable oil companies, has established a series of numbers which represent certain bodies of motor lubricating oil. These have been adopted by Massey-Harris Company.

The chart shows the various body numbers recommended and the temperatures for which they are suitable.

Please note the overlapping of temperatures on each body number. The reason for this overlapping is obvious, when it is considered that, as in the case of No. 20, the motor may be started in the morning when it is below zero, the chances are that the temperature will rise during the day.

In the case of No. 30 the same is true and No. 40 would be used in the extremely hot weather.

OIL AIR CLEANER

Tests show the Massey-Harris Oil Air Cleaner to be practically perfect, but any equipment so efficient must have some attention. This air cleaner will remove the dust from the air but it is up to the operator to remove the dirt from the cleaner.

TO FILL: Remove the filler plug (3, Plate 1) and pour in used oil drained from engine crankcase until full. IN COLD WEATHER DILUTE THE OIL WITH KEROSENE IN ORDER TO KEEP IT THIN. Examine oil each morning.

TO CLEAN: Remove drain plug from lower left hand corner and drain off dirty oil. Occasionally remove lower hand hole cover and clean out dirt. The time to do this depends on conditions. A good rule to go by is never to let more than $\frac{1}{4}$ inch of dirt collect in bottom of the cleaner.

Remove pipe plug located in the opposite lower corner and run a wire up through small hole by which oil is fed to the top screen and under which the wool is located.

The more dusty the work the oftener the cleaning should be done. Keep the cleaner clean and save upkeep expense.

Occasionally remove the upper cover to ascertain if there is any chaff, leaves, or other foreign matter on top of the screen above the wool; if so, remove it. A little practice will teach the operator how often that is necessary. And, once in a while this wool should be removed and washed out in gasoline, soaked in oil and then replaced.

CARE OF OIL FILTER

In the natural operation of the Oil Filter, the oil passes through the felt (2, Plate 6) from the outside to the delivery tube (6, Plate 6).

Every time the motor oil is changed remove the cover over filtering pads. Remove plug (5, Plate 6) let the motor run slowly so all oil will be run through the pads from the inside out; as the oil comes out, massage the pads downward with the hands, this will clean off any sediment on the outside of the pads. Clean sump (4, Plate 6) when finished. To refill crank case when this is done, pour in 4 quarts U.S. measure (3 quarts, 1 pint Imp. measure).

All water and sludge will accumulate in the sump (4, Plate 6) and drain out when plug (5) is removed.

Once every month of motor operation the felt pads (2, Plate 6) should be removed and washed.

The filter consists of a series of disc-like pads pressed together by a screw plate (1, Plate 6) and to get at them remove cap plug which will release the shell and leave the filter exposed.

Take off screw plate (1, Plate 6) and the filter pads (2, Plate 7) can then be removed complete as shown on Page 10.

Remove each disc separately and wash in gasoline as shown in (4, Plate 7). All the dirt, carbon and foreign substance can be washed out.

When replacing, be sure the sump (4, Plate 6) is clean.

Replace the cover, tighten cap nut on shell.

Caution: Do not overlook the importance of pouring oil into the crank case after washing the filter.

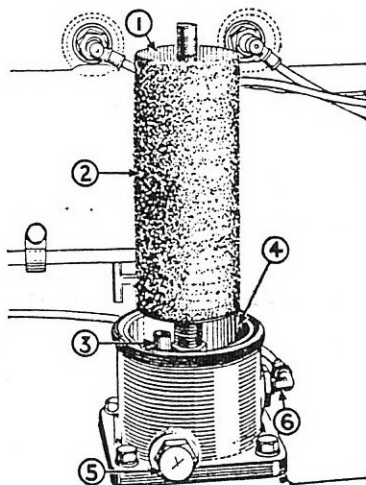


PLATE 6

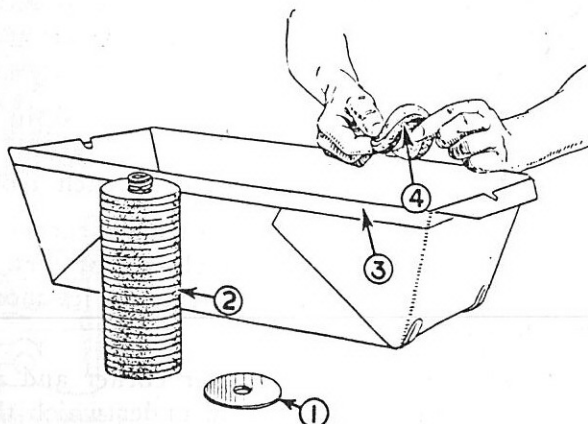


PLATE 7

CARBURETOR

(See Plate 8)

The correct jet calibration for G.P. motor carburetors is as follows:

- 1—Main Jet should be No. 19.
- 9—The Ventura should be No. 18.
- 10—The Idling Jet should be No. 10.
- 2—Compensator should be No. 21.
- 7—Idling Adjustment should operate at about $1\frac{1}{4}$ turns open. Should be adjusted on idling speed.
- 3—The metal float should be level when carburetor is turned up-side-down.

Any adjustments to obtain greater fuel economy must be made by changing the sizes of the main jet, 1, only. The smaller the opening or number of the jet the greater the economy. In warm weather a No. 18 main jet could be used but in cold weather a No. 19 jet should be used.

Note: In high altitude, above 3000 ft. main jet, 1, should be a No. 18 the year around.

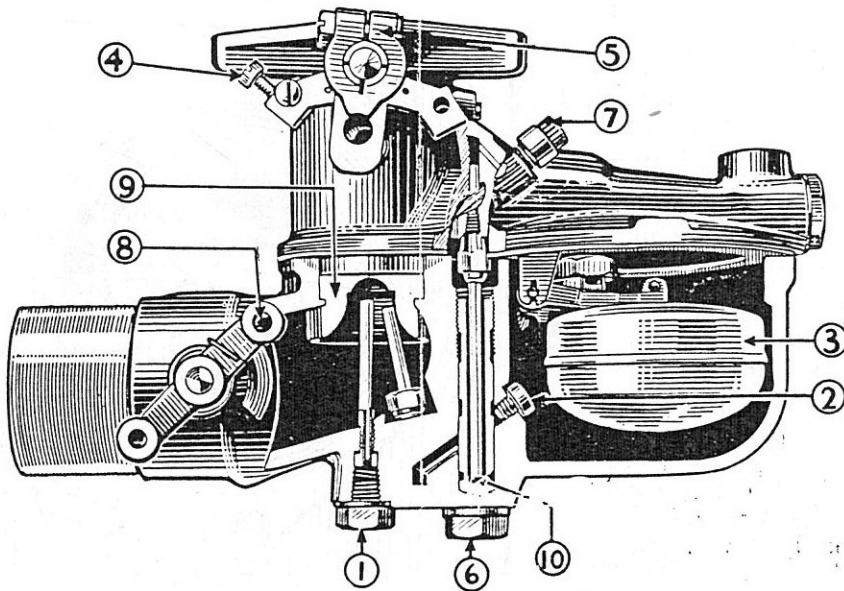


PLATE 8

MAGNETO INSTRUCTIONS CARE AND MAINTENANCE

Aside from keeping the magneto clean externally, practically the only care required is the oiling of a single plain bearing supporting the shaft of the distributor gear. This bearing should receive not more than two or three drops of oil every 100 hours' operation, applied through the oil duct located on top of the magneto. Any good, light engine oil may be used for this purpose.

The interrupter unit is intended to operate without lubrication, and as oil on the platinum interrupter contacts (2, Plate 9) will prevent good contact, cause sparking and burning, as well as misfiring, care should be exercised to prevent the entrance of oil to these parts.

Note: The Magneto is equipped with a Bosch Adjustable Impulse Coupling, this coupling should be taken apart and cleaned at a Bosch Service Station once a year. Do not oil or grease the coupling.

TROUBLE SHOOTING

Ignition difficulties may be divided into two main classes; one, the most common, due to spark plugs and cables, and the other, due to the magneto. In case of defective ignition, therefore, it must first be determined whether the fault is in the magneto or elsewhere.

In general, when only one cylinder misfires, the fault is in the spark plug (7, Plate 15) the most common plug difficulties being:

Plug Gap Too Wide: The distance between the electrodes of the spark plugs varies according to the individuality of the engine, but normally this distance should not be less than .02" or about thickness of a thin dime. On the other hand, too wide a gap increases the electrical resistance, and interferes with the proper generation of current at low speed.

Plug Short Circuited: This is usually caused by a cracked or porous insulator, or by fouling of the electrodes or insulator. Any of these conditions will cause misfiring by permitting the current to stray from its intended path.

· TROUBLE IN OTHER ELECTRICAL EQUIPMENT

Cables: Misfiring of one cylinder, either continuous or intermittent, may be due also to a chafed or broken cable or a loose cable connection. The cables should be carefully examined, special attention being paid to the insulation. The metal terminals of the cable must not come into contact with any part of the magneto except the terminals on the distributor plate and end cap or any metal parts of the engine except those designated as being correct according to the instructions given.

Irregular Firing: If the cables and plugs are in good condition, and yet the ignition is irregular, the trouble is probably with the magneto, and the interrupter should be carefully examined. It should be seen that the interrupter lever (1, Plate 9) moves freely on its pivot, that the hexagon headed fastening screw (6, Plate 9) in the center of the interrupter is properly tightened, and also that the two interrupter contacts (2, Plate 9) are properly in position.

If the interrupter lever (1, Plate 9) should not move freely on its pivot, the hole in the fibre bushing in which the lever pivots, may be slightly enlarged by means of a reamer or a good oiling; this work, however, should be carefully done as very little reaming accomplishes the desired result.

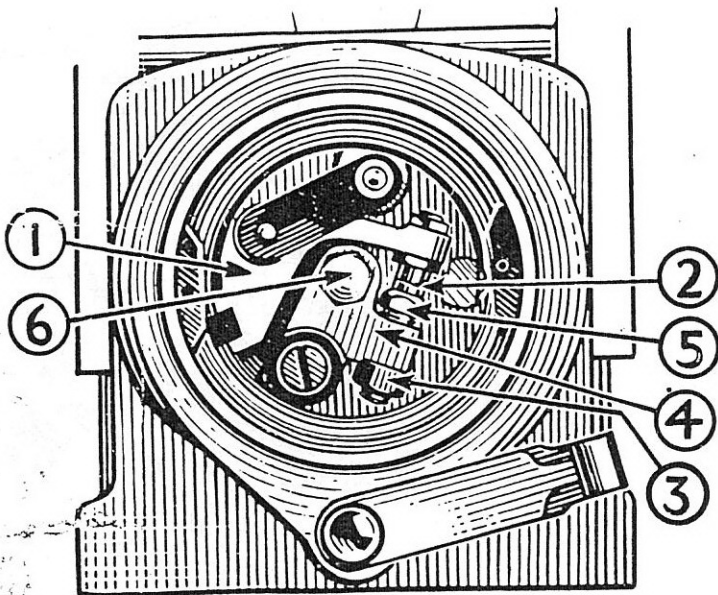


PLATE 9

Ignition Fails Suddenly: A sudden failure of ignition may indicate a short circuit in the low tension cable (only used on tractors equipped with starter), due to a defect in the cable, to a faulty connection at the switch or to the presence of dirt or moisture. A test for trouble in the switch or low tension cable can be made by removing the cable from the grounding terminal on the end cap and endeavoring to start the engine on the magneto. (This cable will be found only on tractors equipped with starter, and runs to switch on battery box.) If the engine runs with this wire disconnected, but stops when the wire is connected, it is evident the magneto is in good order and that the trouble is due to some fault in the switch or grounding wire permitting the low tension current to escape to ground.

Interrupter Contacts: The interrupter contacts (2, Plate 9) should be examined for the correct adjustment, and they should be so set that they are separated by a distance of 0.4 of a millimeter (about 1/64th inch) when the interrupter lever is resting on either of the segments in the interrupter housing. The strip of steel attached to the magneto adjusting wrench, which is furnished with each magneto, is to be used as a gauge for this distance. The adjustment of the platinum interrupter contacts may be made by loosening the lock nut of the long contact screw (3, Plate 9) which passes through the interrupter contact block (4, Plate 9) and turning the hexagon head of the screw itself (5, Plate 9) with magneto adjusting wrench. When the adjustment is made, care should be taken to tighten the lock nut, 3, firmly. The contacts of the interrupter should be clean and in proper alignment. If any oil, grease or dirt is deposited on them it can be removed by drawing a piece of cloth or paper between them while they are together or, if they are pitted too much, a cloth dampened with gasoline may be used. If the latter method is used care must be taken that the points are absolutely dry before attempting to operate the magneto.

REMOVING THE INTERRUPTER

The interrupter may be taken out as a unit by removing the interrupter housing and removing the hexagon headed fastening screw (6, Plate 9) in the center of the interrupter with the magneto adjusting wrench.

INSULATING PARTS

As it sometimes happens, brush holders and other insulating parts of the magneto are damaged through accident or carelessness. These parts should also be carefully examined for possible disarrangement or damage of the insulation which might cause leakage of current. In order to prevent leakage by the brush holders (4, Plate 10) distributor plate (1, Plate 10) or other insulating parts, it is necessary to clean them occasionally with a soft cloth saturated with gasoline. After cleaning these parts the magneto should not be operated until it is thoroughly dry.

Ready access to these parts can be had by releasing the two catch springs (1, Plate 11) holding distributor plate in place.

MAGNETO REPAIRS

By carefully following the instructions, your magneto will give you effective service. Still there are conditions and accidents that will cause the magneto to become unfit for most effective service. When such conditions arise, or if the magneto should require a complete overhauling by reason of extended use, it is strongly recommended that it be given to an expert in magneto repair work; if possible a Bosch Service Station. While the complete magneto is very rugged in construction, the fact should not be overlooked that many small and delicate assemblies are contained therein which must be properly adjusted and balanced in order to procure permanent and efficient results. Special tools and testing equipment are necessary to do this work properly.

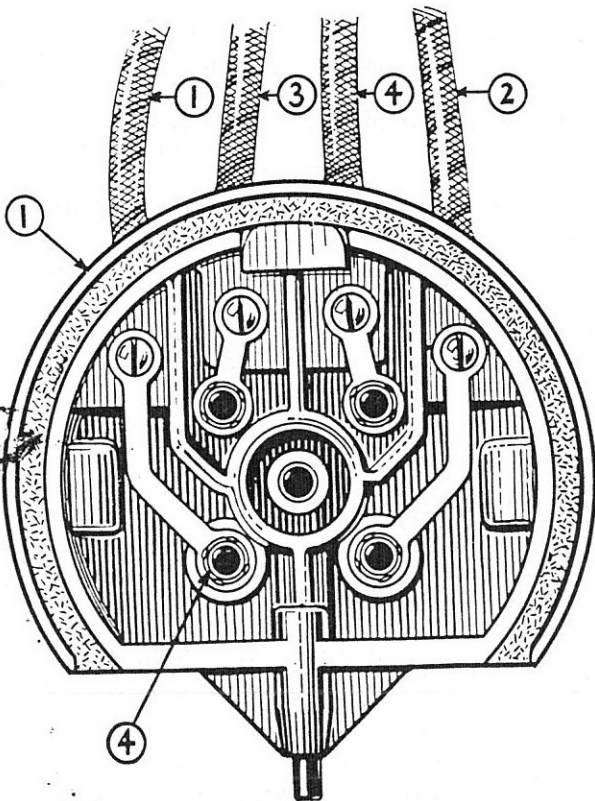


PLATE 10

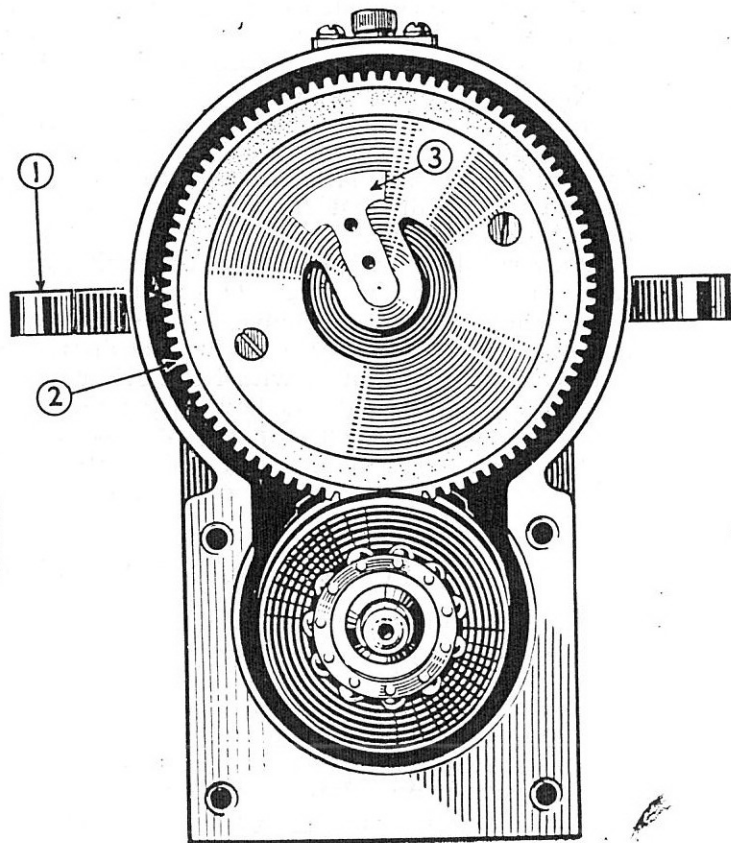


PLATE 11

TO CHECK MAGNETO TIMING

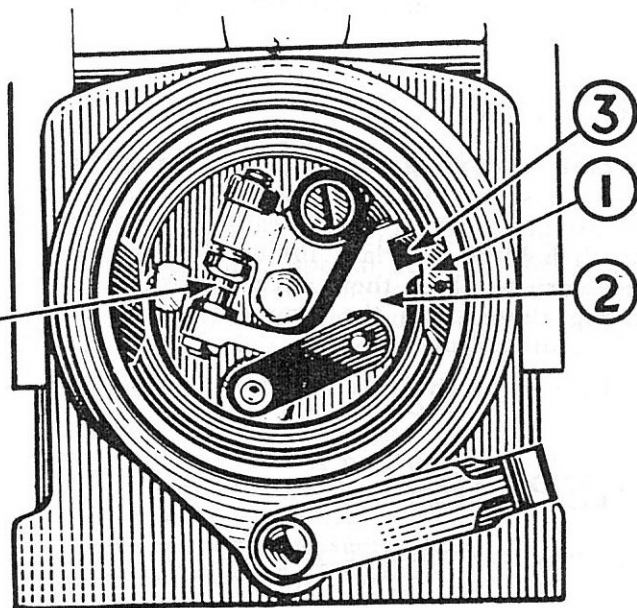


PLATE 12

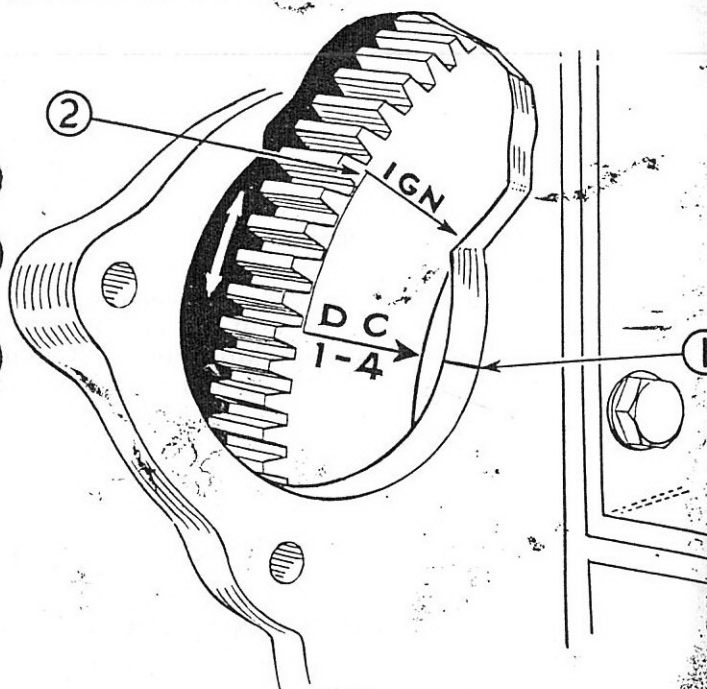


PLATE 13

First, remove the cover plate from opening on right hand, front side of motor flywheel housing, (or the electric starter motor, if your tractor has a starter). Remove the spark plug from No. 1 cylinder and hold your thumb over the hole as you turn the engine over until you can feel the pressure of the air under your thumb caused by the upward movement of the piston on compression stroke. Watch, carefully, the opening where cover plate was removed until the mark "DC-1-4" appears at opening, Plate 13. When this mark registers with the mark on motor housing, (Arrow, 1, Plate 13) you will have the piston in No. 1 cylinder at top of the compression stroke. Now continue to turn just a little more until the impulse on magneto clicks; then stop.

Next, examine the flywheel carefully and see if your motor has the letters "IGN" over an arrow stamped on it about 2 inches above the "DC-1-4" mark. (Later motors have this.) If they do not appear, then measure exactly 2-1/32 inches above the "DC-1-4" mark, along the fine dark line at bottom of the teeth, or at a point half way between the 5th and 6th tooth, and make a punch mark here with center punch. This mark will then correspond with the "IGN" mark in Plate 13, Arrow 2.

Now revolve flywheel **backwards** until this punch mark, or "IGN," is exactly opposite mark, Arrow, 1, on housing. This is the point to set magneto to fire No. 1 cylinder.

To check magneto, remove distributor cover, (1, Plate 10) by releasing the two catch springs (1, Plate 11) thus exposing the distributor gear (2, Plate 11). See if collector (3, Plate 11) comes in contact with No. 1 cylinder brush (4, Plate 10). (Firing order is 1-2-4-3, and Plate 10 clearly shows how to locate brush of No. 1 cylinder.) If distributor is in correct position, proceed with the next step.

Remove interrupter housing. The interrupter lever 2, with fibre block, (3, Plate 10) will be just coming onto the cam (1, Plate 12) as shown and the points at, 3, will be just ready to open.

TO RE-SET MAGNETO IF REMOVED

If magneto has been removed for cleaning or repairs, or if for any reason the position of its parts are not as indicated in preceding paragraphs, it will be necessary to re-set magneto. Proceed as follows:

Being careful not to turn motor from the position secured in first paragraph, loosen the impulse coupling (1, Plate 14,) and rotate magneto armature to left (anti-clock-wise) until impulse clicks; then turn backwards just enough so that the interrupter and cam are in position like Plate 12 and as described previously.

When this is done tighten couplings (1, Plate 14). Motor is now ready to start.

Note:—The impulse starter automatically retards the spark for safety in cranking. This ignition is known as the "fixed spark" type and is not advanced or retarded by any movement of the interrupter housing.

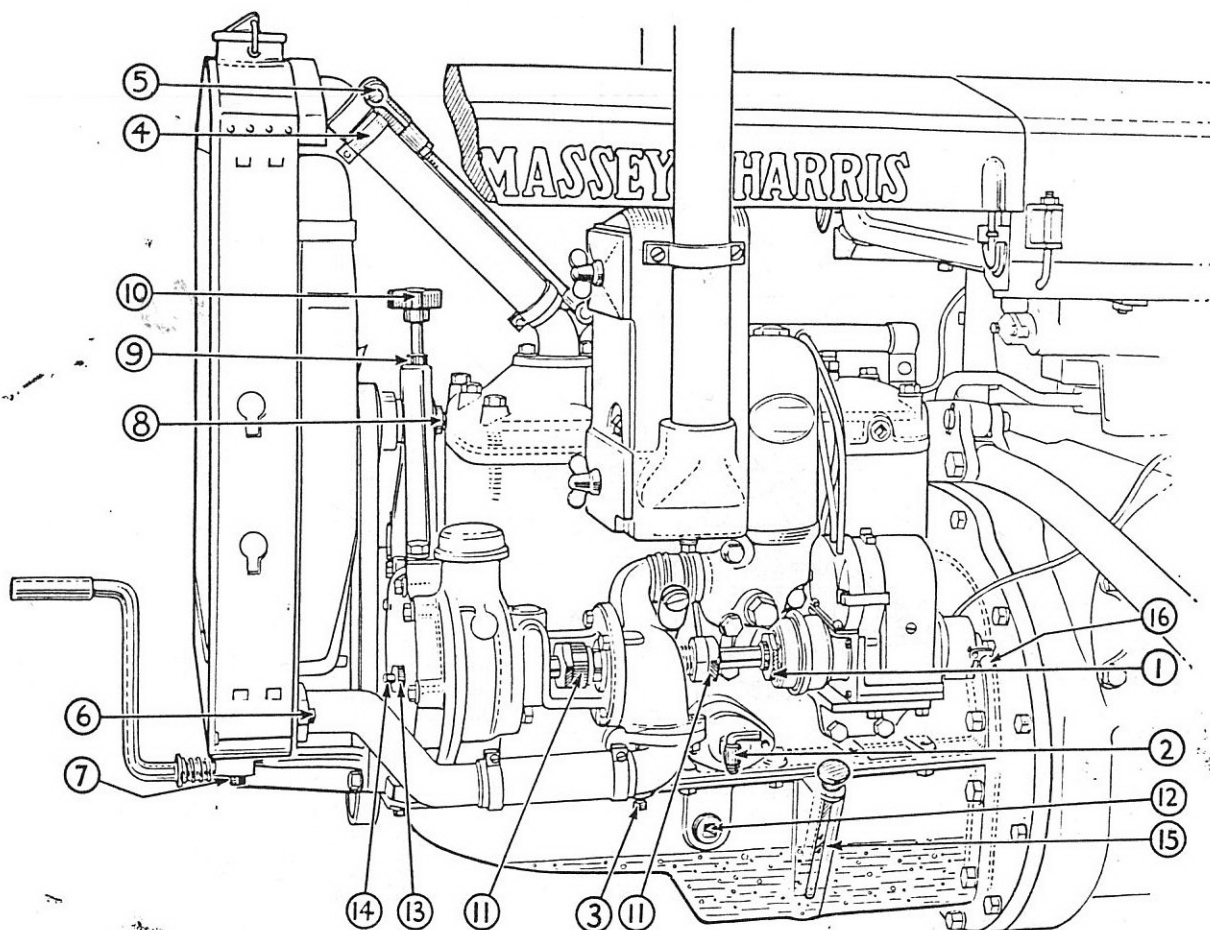


PLATE 14

CARE OF MOTOR

TO DRAIN RADIATOR AND ENTIRE COOLING SYSTEM

Open drain valve (2, Plate 14) and remove drain plug (3, Plate 14).

TO REMOVE THE RADIATOR

Remove hose clamp (4, Plate 14). Remove pin (5, Plate 14) from radiator support rod. Remove cap screws (6, Plate 14) that attach water connections. Next remove cap screws (7, Plate 14) in bottom of radiator bracket.

TO TIGHTEN FAN BELT

Loosen lock nut (8, Plate 14) on fan shaft. Loosen lock nut (9, Plate 14) on adjusting screw (10, Plate 14). Then turn adjusting screw (10, Plate 14) to the right to tighten belt. Make sure both lock nuts are tightened after adjustment is made.

TO PACK WATER PUMP

Back up packing glands (No. 11, Plate 14). Remove old or worn packing and replace with graphite asbestos.

Note: Do not use a coarse packing that will cut pumping shaft.

TO ADJUST END PLAY IN CAM SHAFT

Loosen lock nut (13, Plate 14) and with a screw driver turn adjusting screw (14, Plate 14) slightly in. Care should be used that this is not adjusted so as to make it too tight.

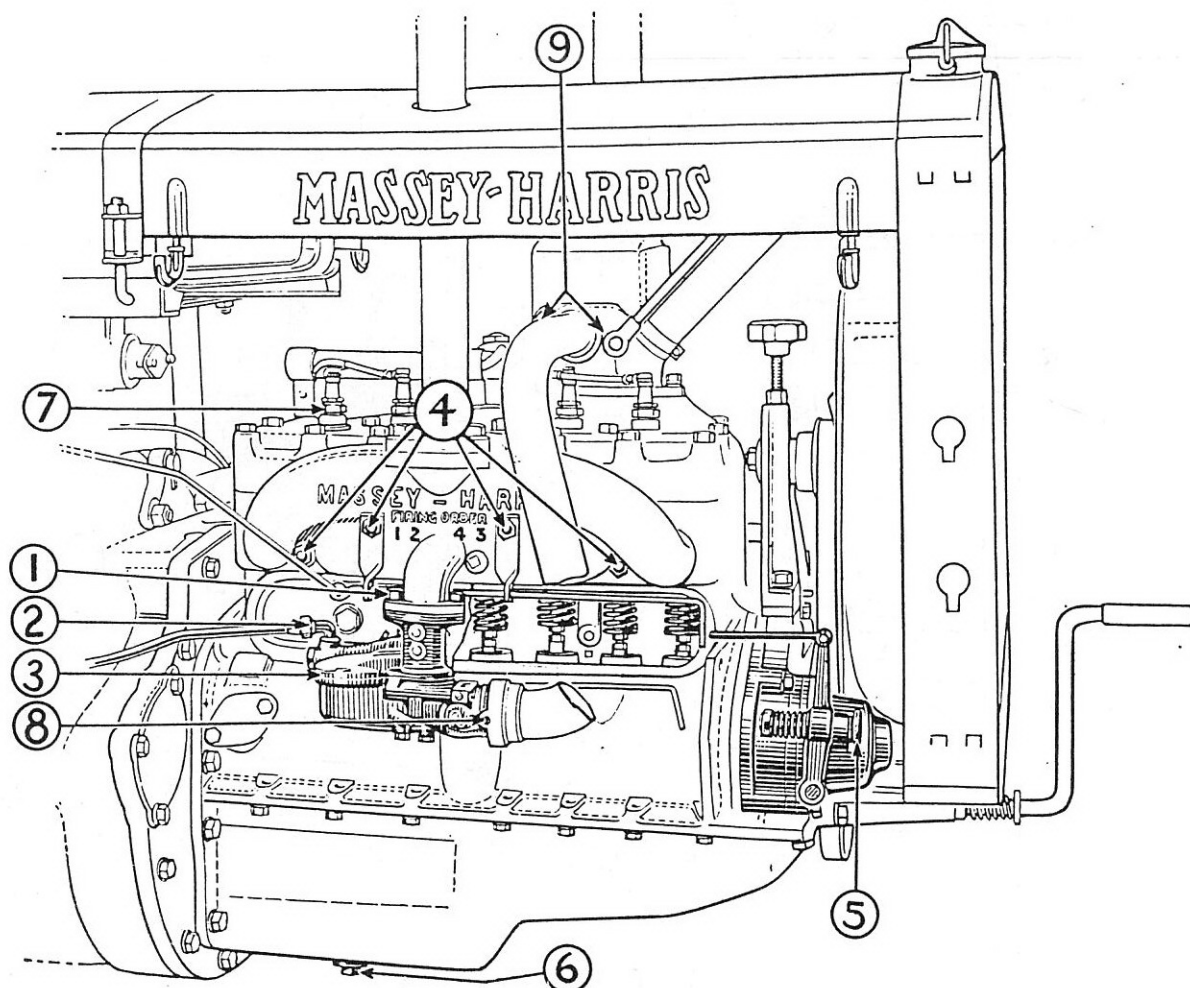


PLATE 15

REMOVING CARBURETOR

If it should ever become necessary to take off the carburetor; as for instance when adjusting valve tappets or grinding valves, disconnect the air intake pipe extending from the oil air cleaner to the carburetor by taking out cap screws (9, Plate 15) and loosening the screw, 8. Also remove the two bolts, 1, on the manifold extension and unscrew the pipe union at, 2.

REMOVING MANIFOLD

The manifold is the hot-spot type, cast in one unit and is attached to the cylinder block with four studs, (4, Plate 15). Remove the nuts from these bolts after carburetor is detached and the entire assembly can be taken off as a unit.

CRANK CASE DRAIN PLUG

The removable plug for draining oil from the engine crank case is located at (6, Plate 15).

GOVERNOR ADJUSTMENT

To decrease the speed below that at which the motor is set at the factory turn the round, knurled screw (5, Plate 15) backwards, or to the left.

To increase the speed turn this screw in the opposite direction, to the right.

VALVE GRINDING

Valve grinding consists of seating the valve in the cylinder with some suitable abrasive or grinding compound. In order to get at the valves it is necessary to remove the cylinder head and valve tappet chamber cover. Next revolve the pin holding the valve springs, and after the valves are lifted, the springs can be easily removed. Be sure the tappets are in such a position that the valves are free and resting on their seats and not riding on the tappet. By turning the engine over, this position can be found for each valve.

See Plate 16.

Place a light coil spring between the valve head and guide sufficiently strong to hold the valve off the seat. Do not use too much pressure. Rotate the valve back and forth about half a turn, lifting the valve occasionally and turning it while off its seat so as to secure a different position of the valve when starting to grind again. This will avoid cutting grooves in the seat. Repeat this operation, adding more grinding compound if necessary until a clean seat is produced on both valve and seat. If the valve is badly warped or burned, it should be replaced with a new valve; and if the seat is badly damaged, a valve seat reamer will greatly reduce the time required, as well as give a better job.

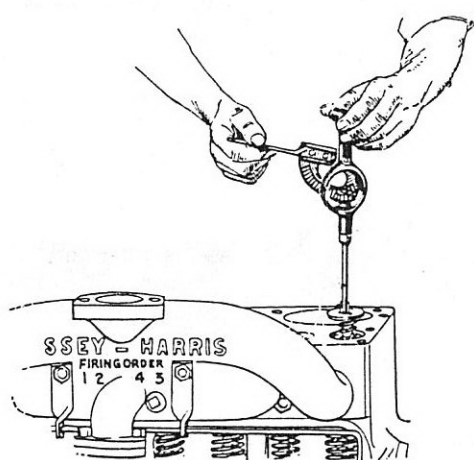


PLATE 16

Do not permit any of the compound reaching the cylinder or pistons. After grinding, adjust the clearance on the exhaust valves to .008 and on the inlet to .006. **Caution:** Do not switch the exhaust and inlet valves. The exhaust valves are stamped EXHAUST and are made of a different steel than the inlet.

When replacing the cylinder head, coat the gasket lightly with cup grease and draw the head bolts down gradually and evenly, tightening the center bolts tight just before the side bolts are given their last twist.

REMOVING AND REPLACING THE MOTOR

When general repairs are necessary for the motor it can quickly be removed from the tractor. First, disconnect the gas line to carburetor, oil lines to the pressure gauge and hand throttle control rod.

Next, have the motor blocked up or suspended from a strong hoist as in (1, Plate 17). Remove cap screws that secure motor to transmission case (2, Plate 17). Then, move motor slightly forward until clutch driving disc, 3, disengages from teeth in fly wheel.

In replacing motor, it is necessary to see that teeth on driving disc, 3, engage with teeth in fly-wheel. Examine gasket, 4, carefully to see that it is in good condition. If not, replace with a new one and shellac. Be sure that all cap screws are tightened equally.

To Repair the Clutch

When motor has been removed, pull cotter key and remove the nut on end of clutch shaft (5, Plate 17). Next slip clutch assembly forward off of clutch shaft.

To disassemble, pull out adjusting pin (1, Plate 18) and turn adjusting yoke (2, Plate 18) to the left or counter clock-wise. When yoke has been removed, plates can then be lifted off. The friction pads (3, Plate 18) are secured to the driving disc by rivets (4, Plate 18). When replacing these, care should be used to make sure the rivets are well set and are below the surface of the friction pads.

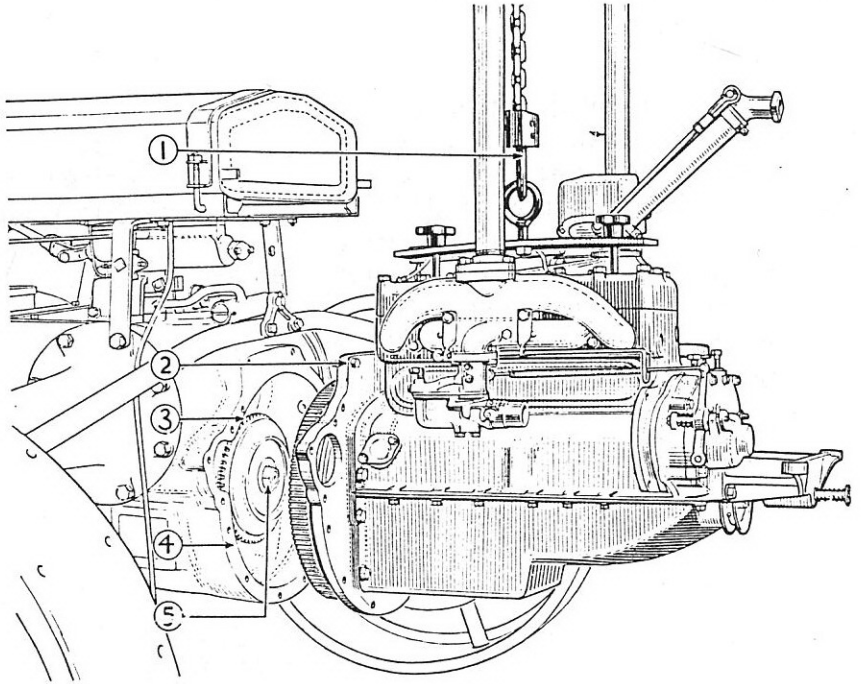


PLATE 17

In reassembling the clutch, be sure that release springs (5, Plate 18) are in place. After clutch and motor have been installed, follow instructions for adjusting clutch, Page 19.

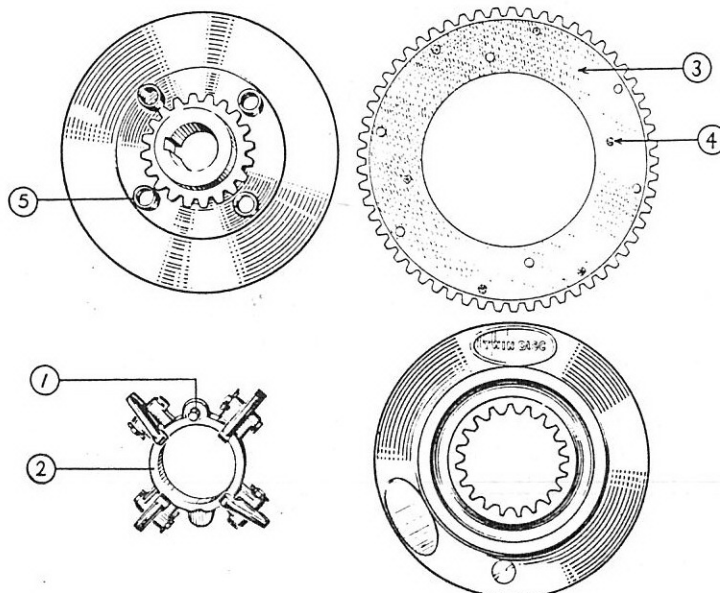


PLATE 18

REMOVING CLUTCH CONE

When clutch has been removed as in Plate 18, clutch cone and clutch shifter yoke rod can be removed as in (1, Plate 19).

In replacing this assembly, make sure that keys (2, Plate 19) are in place.

CLUTCH ADJUSTMENTS MADE WITH TRACTOR ASSEMBLED

Remove inspection plate from opening in clutch case (1, Plate 20).

Important Note: Be sure motor is stopped, while working on clutch.

Release clutch by moving clutch control lever forward. Now turn the clutch until adjusting lock pin (2, Plate 20) can be reached. Put transmission in gear so as to hold the spline shaft from turning. Pull adjusting pin (2, Plate 20) out and turn the adjusting yoke (3, Plate 20) to the right or clock-wise until the operating lever requires a good pressure to engage. The lock pin engages in the teeth of the driving disc and $1/24$ of a turn to the right will change the adjustment $2\frac{1}{2}$ thousandths. Be sure that the lock pin engages in a notch after the adjustments are made.

It is important to adjust the clutch tight enough to avoid slippage at maximum loads. If the clutch is allowed to slip at any load, the clutch plates will soon wear. The adjustment should be such that quite a little effort is required to pull the clutch control lever back into full engagement.

Clutch should always be adjusted so when engaged it will lock in and control lever will be free. Never hold the clutch in by pressure on control lever. This will put unnecessary wear on shifting yoke.

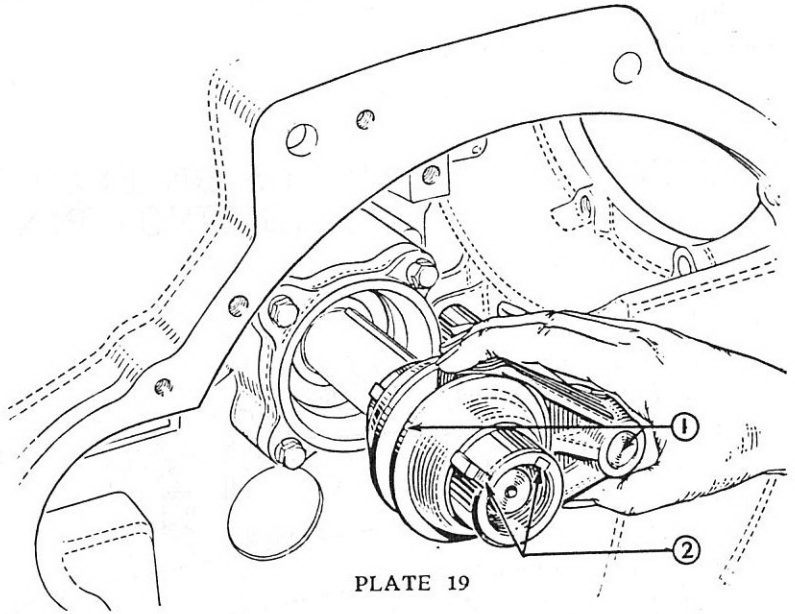


PLATE 19

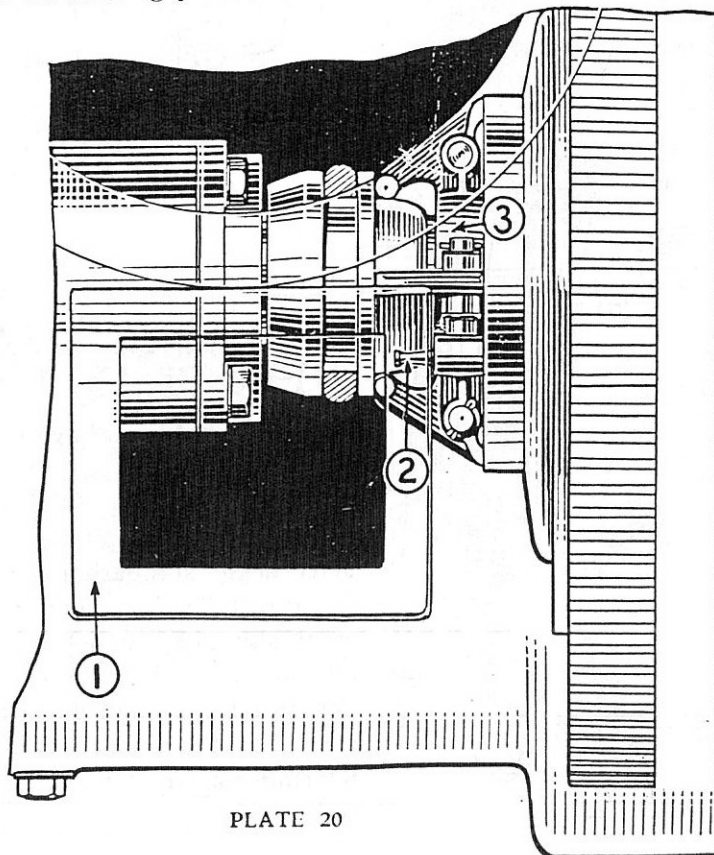


PLATE 20

REMOVING COMPLETE ASSEMBLY OF FRONT WHEEL AND UNIVERSAL JOINT

First jack up tractor (1, Plate 23). Remove cap screws attaching socket on master gear housing (1, Plate 21). Next remove cap screws (2, Plate 21) attaching front axle sleeve to bracket. Then remove wheel until spline shaft separates from the universal joint sleeve (3, Plate 21).

REMOVING BEARINGS ON FRONT AXLE SPINDLE AND PIVOT PIN

Remove cap screws (1, Plate 22) in lower cap (2, Plate 22). A hole is provided in the lower end of pivot pin (3, Plate 22) and tapped out for screwing in any standard square head $\frac{3}{8}$ " bolt (4, Plate 22) to furnish a means of withdrawing the pivot pin, 5, from the bearings, 6. The spindle bracket, 7, and bearings can thus be taken out, as shown at the left, in Plate 22. The bearings can now be removed for inspection or cleaning.

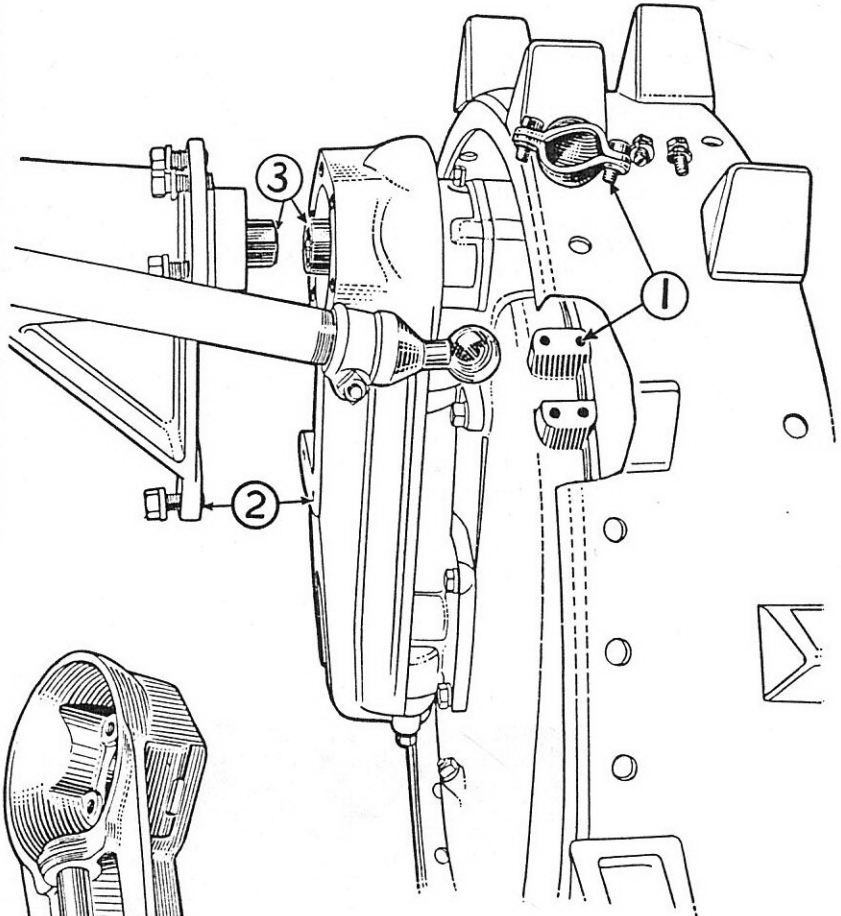


PLATE 21

REPLACING BEARINGS ON FRONT AXLE SPINDLE

When bearings have been replaced in the position as shown, see that packing (8, Plate 22) under dust cap (9, Plate 22) is in good condition. Set spindle and bearings into place in the standard and replace pivot pin, 5. To adjust Timken bearings, 6, replace sufficient shims, 10, under lower cap to take up all looseness. Use screw driver or short bar and test for up and down movement, making sure that the axle assembly turns freely on bearings after cap screws, 1, are equally tightened.

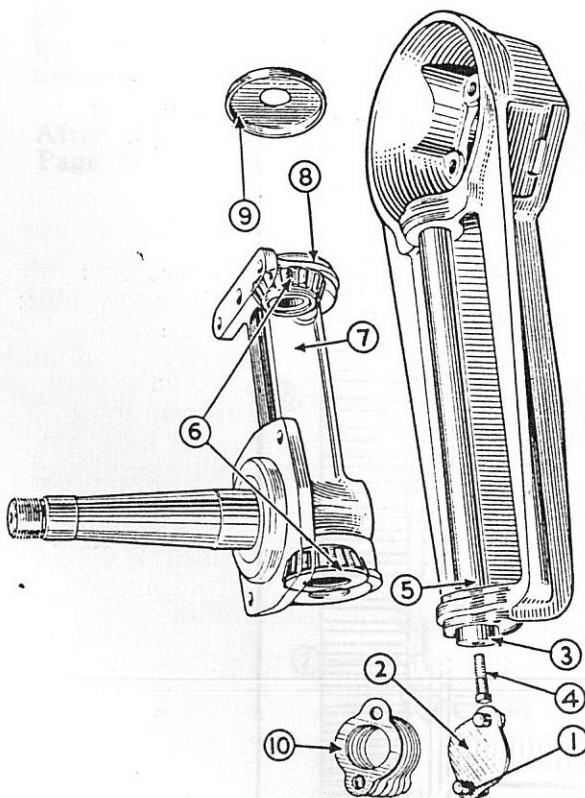


PLATE 22

AXLE SLEEVES

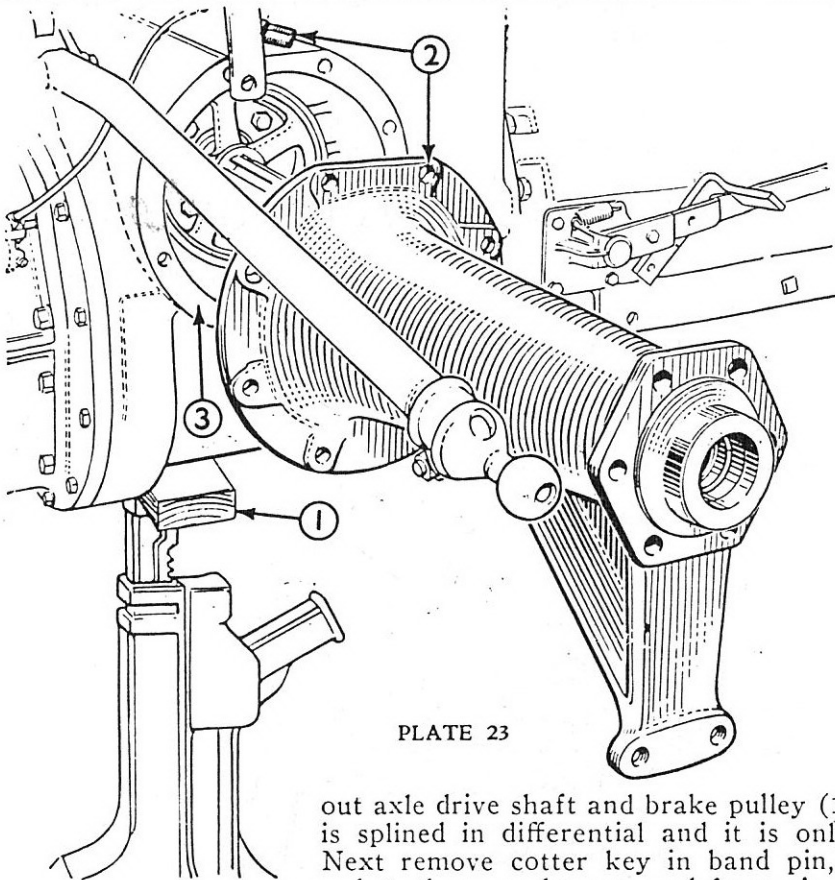


PLATE 23

out axle drive shaft and brake pulley (1, Plate 24). The axle shaft is splined in differential and it is only necessary to pull it out. Next remove cotter key in band pin, 2. Cotter key and brake rod, 3, then can be removed from pin.

In replacing this brake band, see that brake adjusting rod is loose. After it is installed, follow the instructions for tightening brake band.

TO TIGHTEN BRAKE BANDS

Remove cap screws (4, Plate 24) that attach bracket for foot lever, 5. With this removed turn eye in brake rod, 7, to the right. One or two turns is generally sufficient.

In replacing foot lever bracket make sure that pivot crank, 8, engages with eye in brake rod (7, Plate 24).

REPAIRING BRAKE BANDS

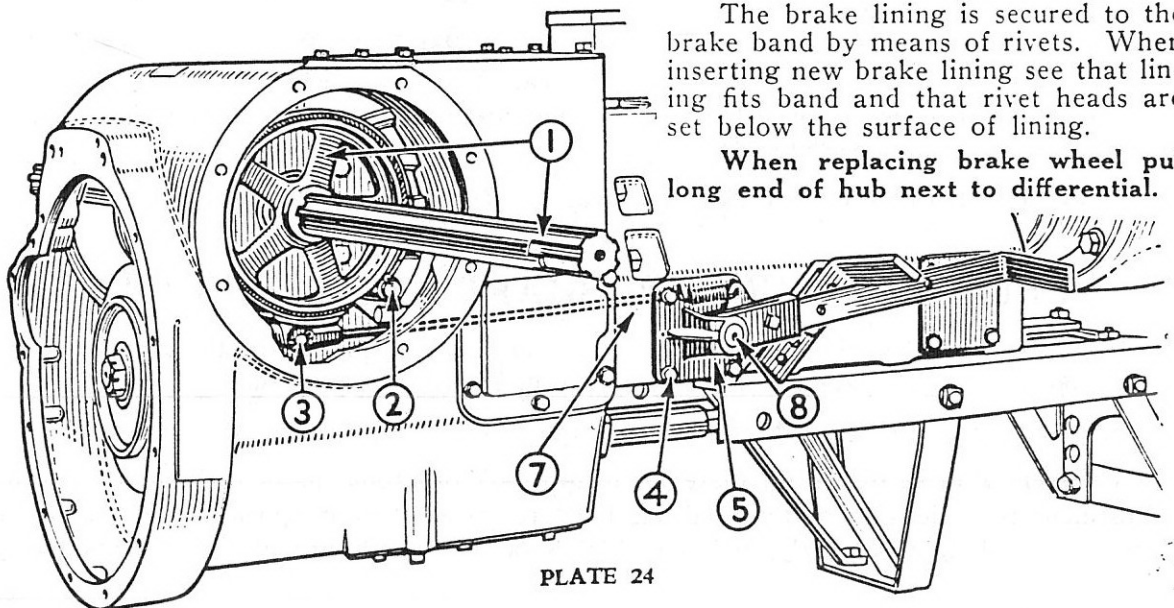


PLATE 24

Raise tractor by using lifting jack with wood block in position as shown at 1, Plate 23.

(**Caution:** Never attempt to lift tractor by placing jack under oil pan of motor as it is not strong enough to form support for load.)

Now remove cap screws (2, Plate 23) that attach axle sleeve to transmission case.

When replacing any axle sleeve assemblies make sure that gasket (3, Plate 23) is in good condition and well shel-lacked.

Be sure to tighten all cap screws equally.

REMOVING TRANSMISSION BRAKES

When axle sleeve has been removed, take

The brake lining is secured to the brake band by means of rivets. When inserting new brake lining see that lining fits band and that rivet heads are set below the surface of lining.

When replacing brake wheel put long end of hub next to differential.

REMOVING THE FRONT DIFFERENTIAL

With the motor removed as in Plate 17, remove the cap screws (1, Plate 25) that hold bearing retainer, brake brackets and adjusting shims, 2. Next remove cap screws, 3, that hold differential bearing cap, 4.

In replacing differential assembly follow instructions for adjusting rear differential, Page 30 and Plate 32. Both front and rear differentials are adjusted in the same manner.

REMOVING THROUGH SHAFT AND RING GEARS

When differential has been removed from transmission case as instructed under heading "Removing Front Differential," first remove nut (1, Plate 26) on end of through shaft. Next, use a block of wood to start through shaft from rear. The shaft can then be drawn out of transmission case with the hand as in (2, Plate 26).

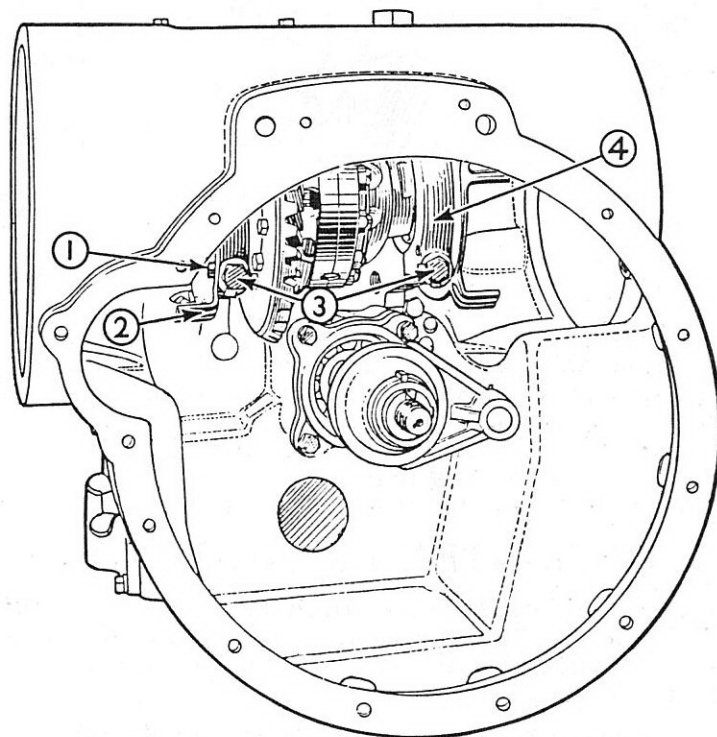


PLATE 25

Next, back up cap screws, 3, in bearing carrier (Plate 26). Bearing carrier can then be slid slightly back permitting hub for ring gears to pass bearing carrier (4, Plate 26). The gears can then be removed through opening provided in top of transmission case as the hand indicates at (5, Plate 26).

Next, bolts can be removed from ring gear hub (6, Plate 26) to release gears from the hub.

REPLACING THROUGH SHAFT AND RING GEARS

First make sure that ring gears have been again securely bolted to the ring gear hub and in position as in Plate 26. Place gear assembly down in position.

Replace through shaft, 2, Plate 26. When in position, replace nut, 1, on through shaft.

Differential drive pinion (8, Plate 26) is adjusted for proper mesh with shims, 9. This adjustment is made after differential has been re-installed as it appears in Plate 25. If gears are meshing too tightly, add one shim at a time until through shaft turns freely.

SHIFTING FORK AND SHIFTING CONE FOR RELEASING JAW CLUTCH ON POWER TAKE-OFF AND BELT PULLEY SHAFT

To examine the releasing cone (10, Plate 26) remove cap screws, 11. Releasing cone is secured to the hand lever by key, 12. When shifting cone is installed, be sure that cone is in the same position as shown at, 10.

Caution: Be sure that when cone is raised by the lever that shifting fork seats exactly in groove in cone as would be the case if the points of arrows at, 13, were brought together.

REMOVING DRIVE GEAR PINION

Remove through shaft; follow instructions pertaining to its removal, Plate 26.

Press drive gear (1, Plate 27) farther on shaft (2, Plate 27) until lock rings, 3, can be removed.

Then press shaft out of gear.

In replacing gear press on far enough so lock rings can be replaced. Then press shaft through until lock rings are held in place.

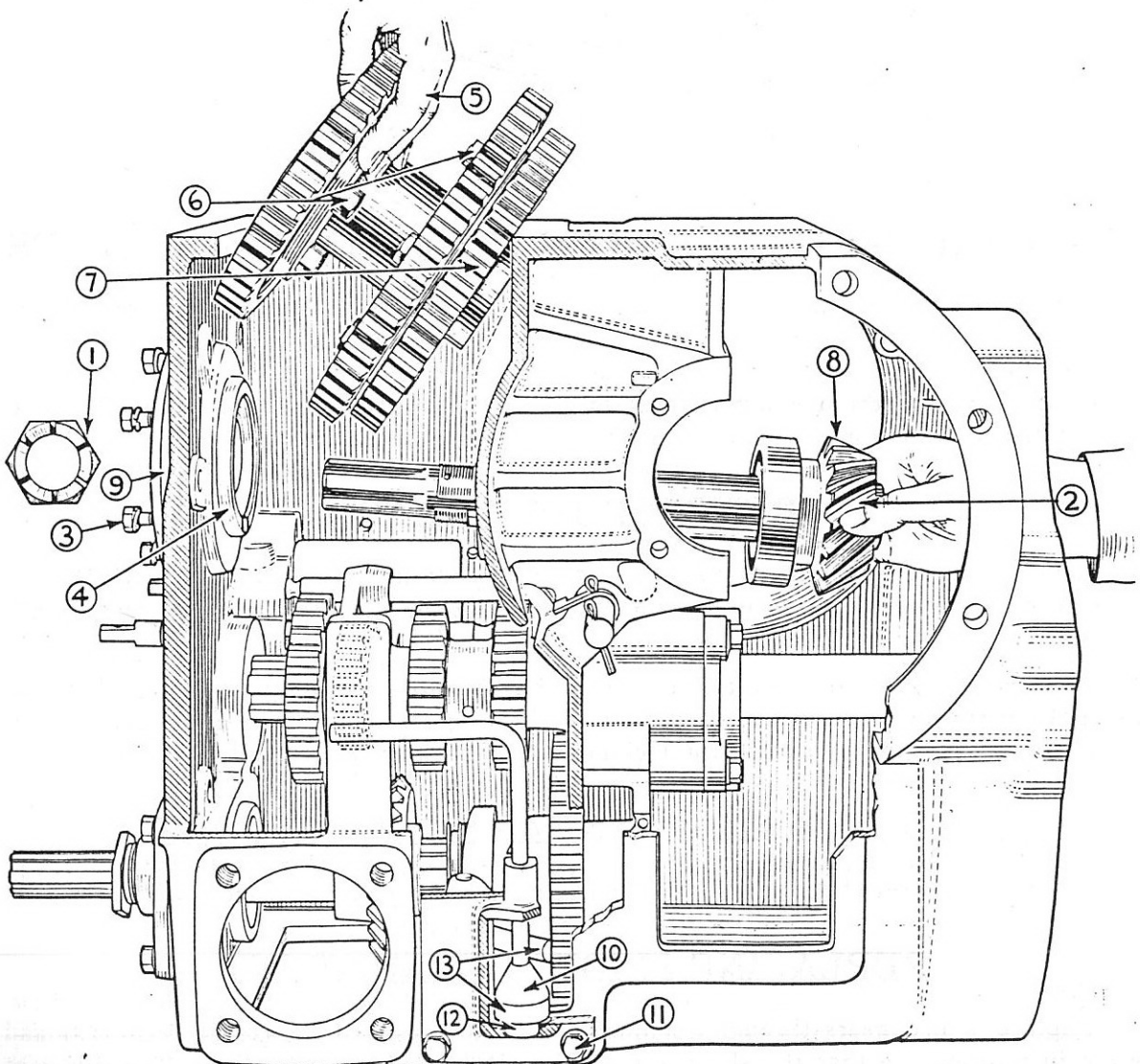


PLATE 26

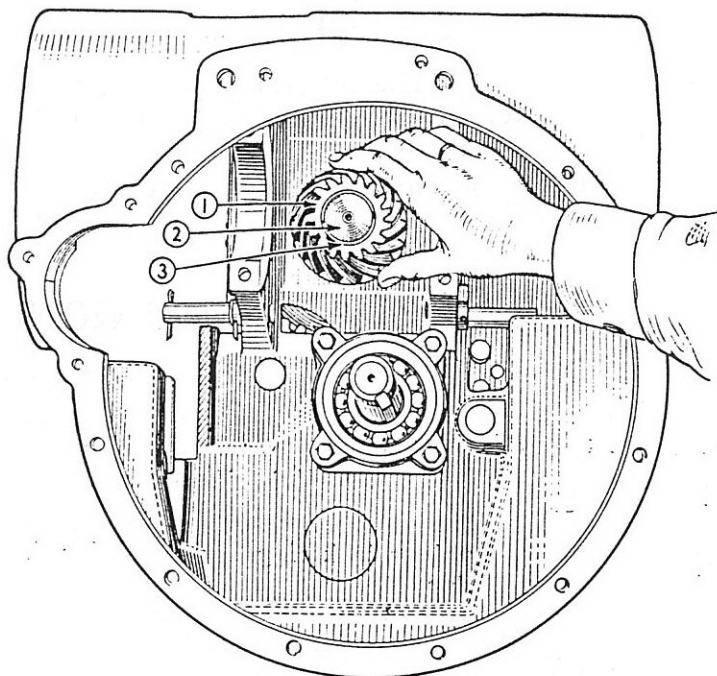


PLATE 27

REMOVING SLIDING GEAR SHAFT AND SLIDING GEARS

Remove cap screws in bearing retainer cup (1, Plate 28). Remove nut on end of sliding gear shaft, 2. Sliding gear shaft and roller bearing can then be taken out of the front of transmission case as at 3. Sliding gear pinions can then be removed like that shown at, 4, through the opening provided in top of transmission case. It is unnecessary to remove the shifting forks (5, Plate 28) in removing these gears.

REVERSE IDLE GEAR

Remove set screw (8, Plate 28). Then drive reverse idle shaft, 9, from front to rear through opening, 10, provided in transmission case. Gear then can be removed through openings in top or bottom of transmission case.

In replacing gear and shaft, make sure that countersink in reverse idle shaft (9, Plate 28) corresponds with hole in casting for locking set screw. When set screw is in place, tighten lock nut provided for locking set screw in place.

REMOVING SLIDING GEAR SHIFTING FORKS

Remove set screws (6, Plate 28). Then remove rod for shifter yoke (7, Plate 28).

REPLACING SLIDING GEAR SHAFT

Replace sliding gears through opening in top of transmission case (4, Plate 28) and when in position see that the shifting forks, 5, are in their proper place. The different diameter gears are placed in location as in (4, Plate 28). Secure bearing in place with nut, 2, and tighten securely.

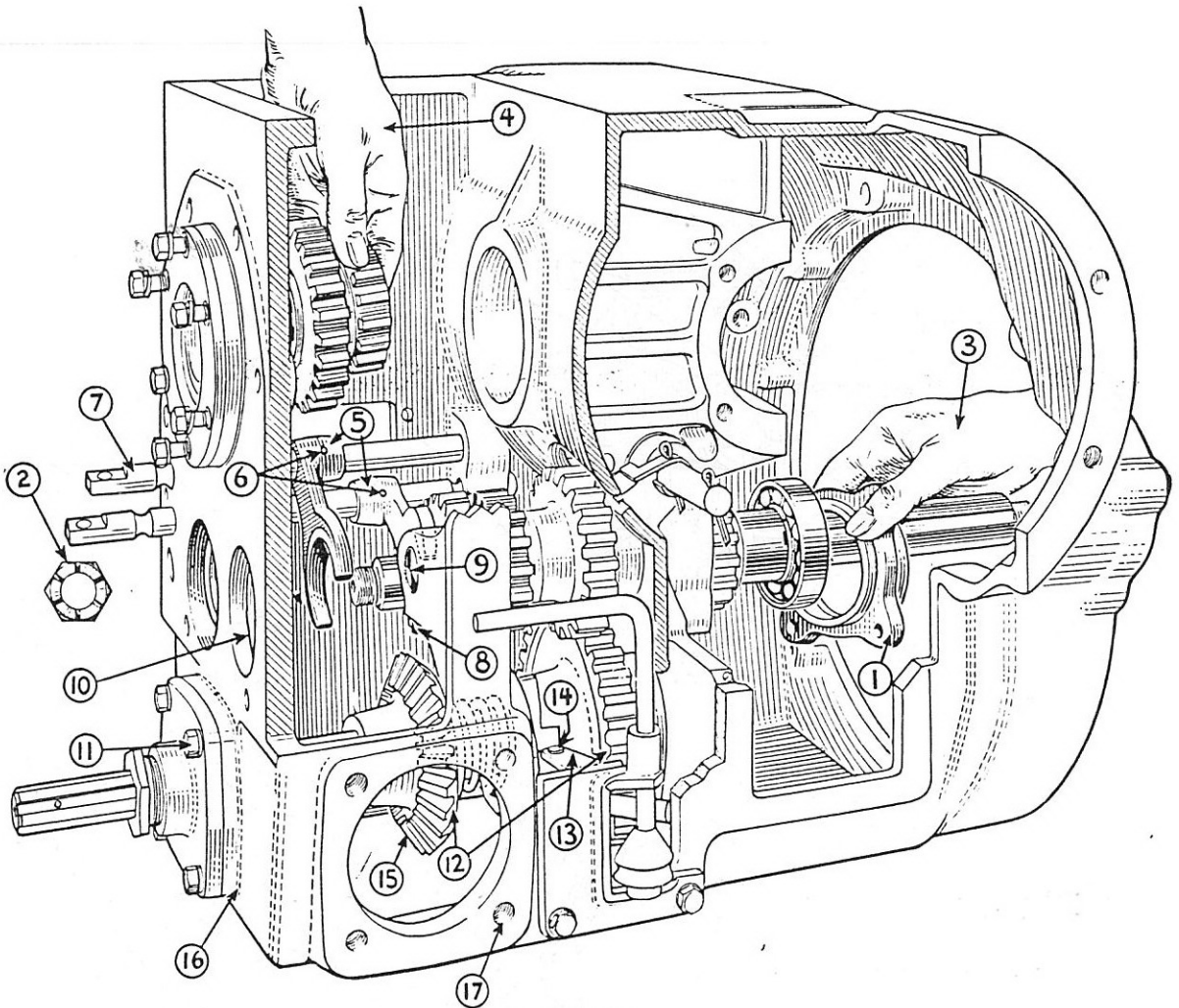


PLATE 28

POWER TAKE-OFF AND BELT PULLEY DRIVE GEAR

Remove cap screws, 11, in packing retainer, Plate 28. The shaft is then taken out through rear opening in transmission case. The gears and release jaws and release springs can be taken out through opening in bottom of transmission case.

Gears are placed in position as arrows at, 12, indicate. Shifting fork for release jaw, 13, is secured by pin, 14. Adjustment of belt pulley drive gear, 15, is made by shims, 16. This adjustment is made after belt pulley bracket and belt pulley drive gear are attached to opening (17, Plate 28).

Be sure gasket at this joint is in good order.

To attach extension spline shaft for power take-off, place splined sleeve on end of power take-off shaft (18, Plate 28). Place bearing in support for power take-off shaft (10, Plate 31).

TO INSTALL FELT PACKING IN DIFFERENTIAL SHAFT TUBE (See Plate 30)

Install No. RO-1619-A Packing Retainer (8, Plate 30) which has felt packing insert, with cup side up, on rear differential drive shaft, inside of tube. To do this, a tube which will just slide over the drive shaft should be used and the packing pushed down 23" from the top of the tube. Re-assemble.

In re-assembling this unit, when the tube is nearly in place, it is necessary to revolve one wheel slightly until splines on rear differential drive shaft will engage with coupling.

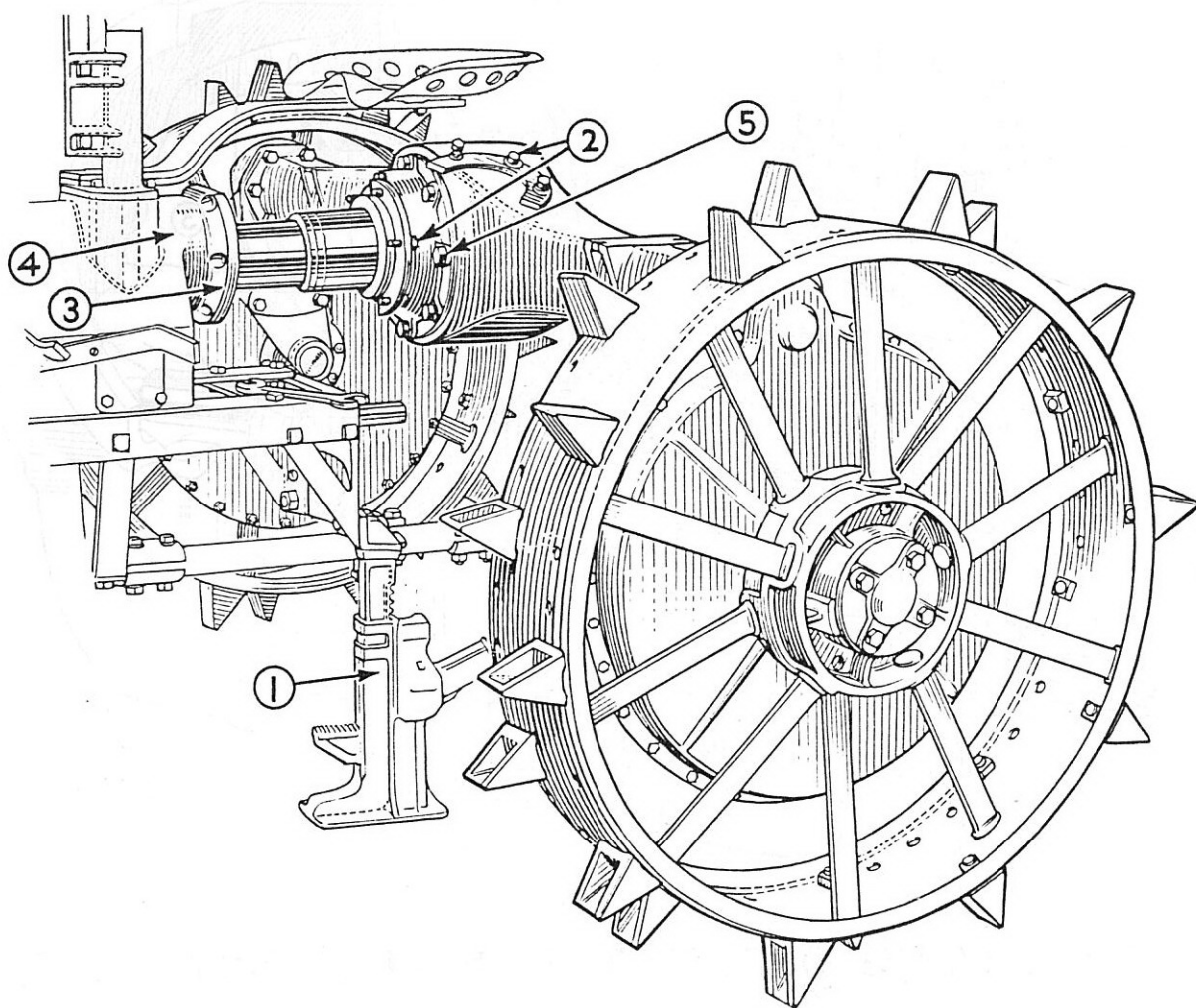


PLATE 29

REMOVING REAR AXLE AND TUBE AS AN ASSEMBLY

Place jack under drawbar (1, Plate 29). Make sure that wheels clear the ground slightly. Next remove the cap screws, 2, that hold differential housing carrier and tube assembly to housing (3, Plate 29). When these have been removed, axle and tube can then be backed out of pivot bracket and control housing (4, Plate 29).

REMOVING PIVOT BRACKET AND CONTROL HOUSING

When rear axle assembly has been removed as in Plate 29, remove cap screws, Plate 30, that attach foot brake bracket, 1, to pivot bracket. Remove cotter keys in control rods, 2, and disconnect rods. Remove cap screws, 3, that attach pivot bracket to transmission case. In replacing bracket be sure gasket is in good shape, also that shifting rods (2, Plate 30) are in the same position as shown.

If it is only necessary to remove or replace these rods, remove, 1, Plate 30 and inspection plate, 4.

No. 5 is the clutch lever. Complete instructions for the use of it are given on Pages 6 and 7.

No. 6 is the gear shifting lever for intermediate and reverse speeds. (See Pages 6 and 7.)

No. 7 is the gear shifting lever for low and high speeds. (See Pages 6 and 7.)

At (8, Plate 30) is a felt packing around rear differential shaft and inside of tube. This is pressed in the tube from the forward end. Its correct position is 23" from front end of tube. (See instructions titled "To Install Felt Packing," just preceding.)

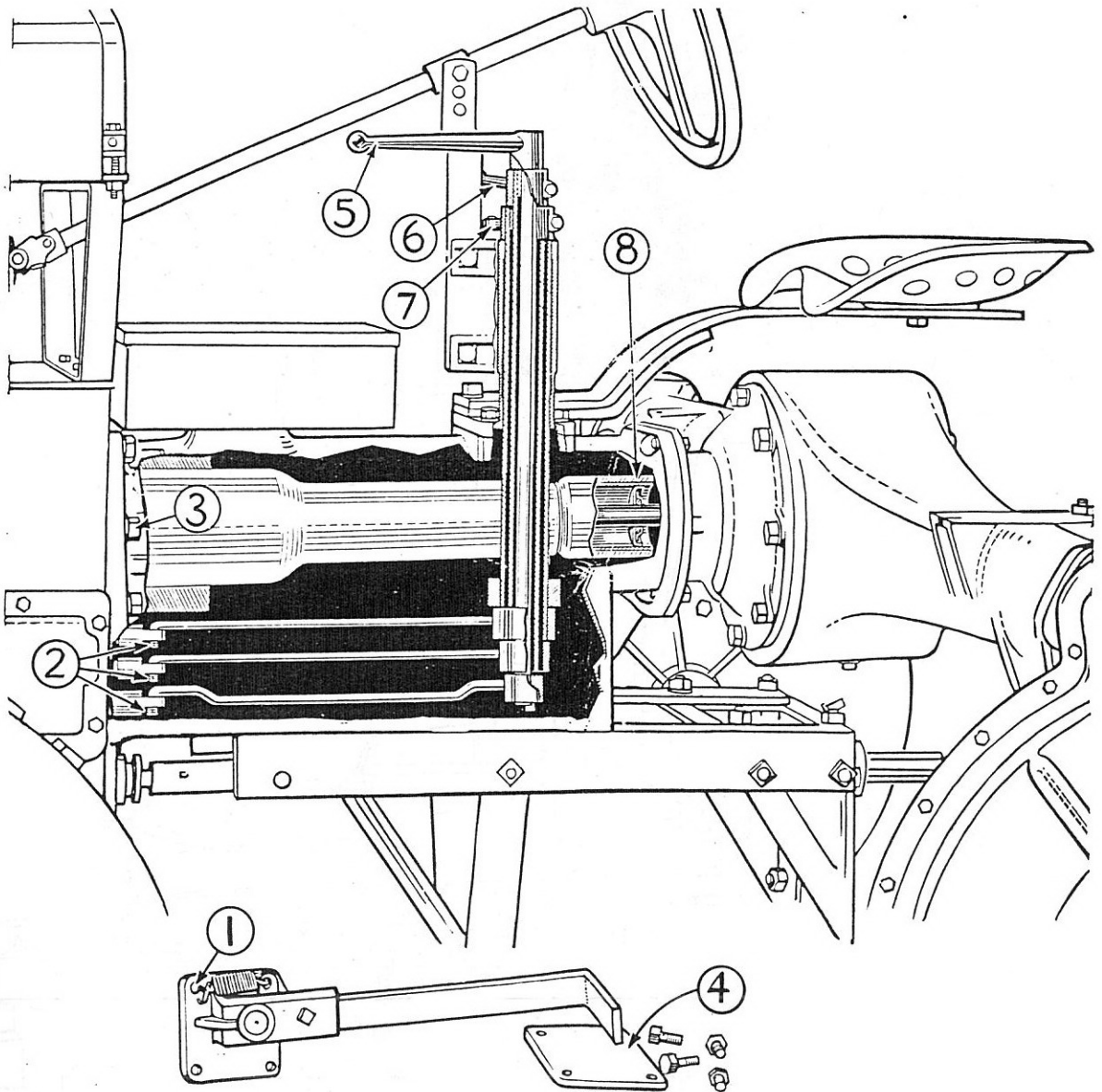
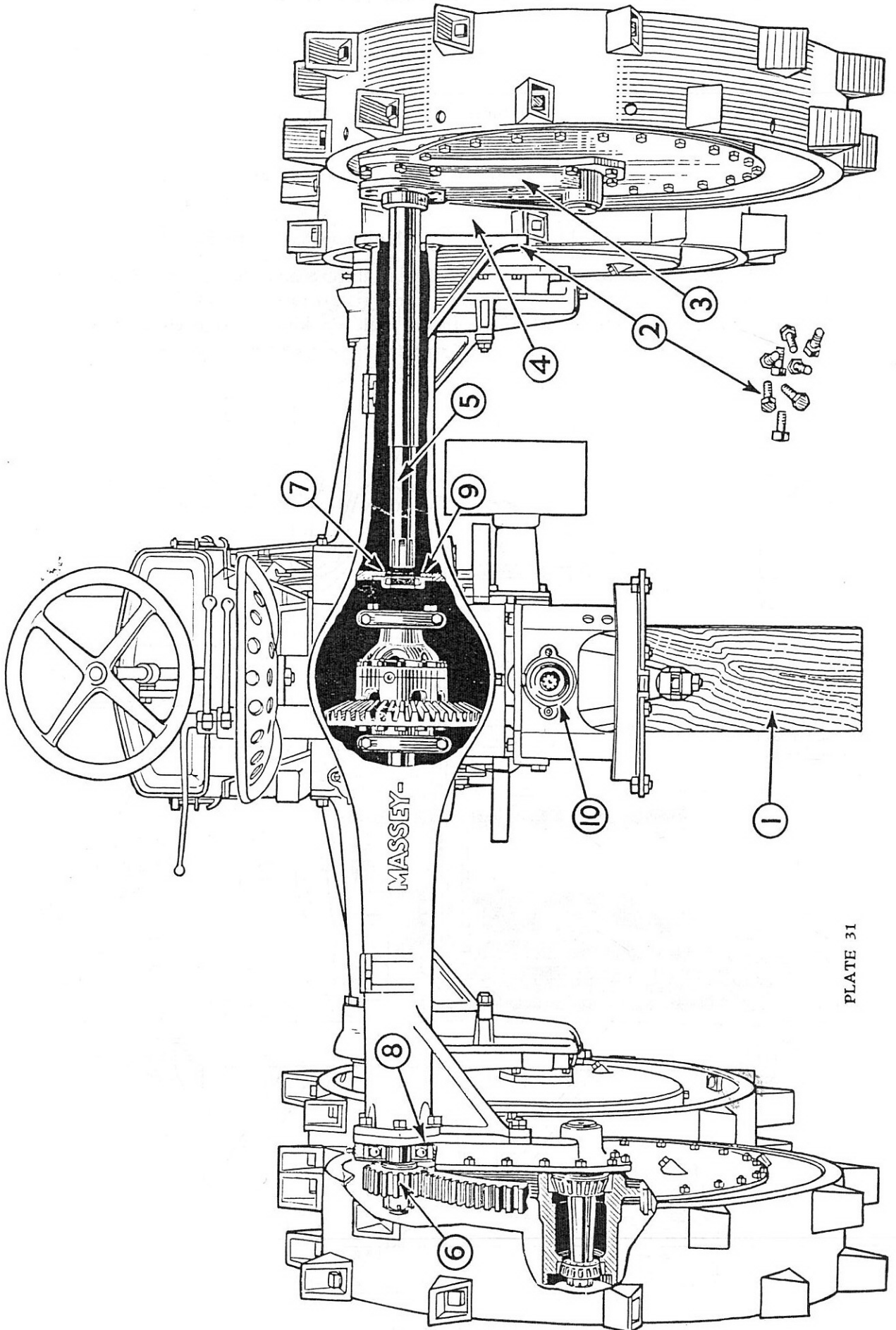


PLATE 30



REMOVING COMPLETE ASSEMBLY OF REAR WHEELS AND SPLINE SHAFTS

First block up tractor under drawbar frame (1, Plate 31). Remove cap screws, 2, that attach bracket for rear axle housing, 3. Wheel and master gear housing can then be removed from tractor as in, 4. Spline shaft, 5, will come out with wheel and axle bracket.

Assuming you have now removed the right wheel assembly repeat this operation for the left rear wheel assembly.

TO EXAMINE CONDITION OF FELT OIL RETAINER FOR REAR AXLE SPLINE SHAFT

At (7, Plate 31) is a felt packing to retain the differential grease. When spline shaft has been removed, examine packing. See that it is in good condition.

The steel felt-retainers (9, Plate 31) are welded to the web and cannot be removed.

If inspection shows that these two felt rings, 7, one on either side of differential, need replacing because of wear they can easily be removed and new ones inserted as follows:

Remove the cap screws (5, Plate 29) around the rear differential case where it joins the rear axle housing and pull the rear axle housing away from the tractor. (This is done after the two rear wheels and spline drive shafts are removed.) The felt rings can easily be reached now from the front and rear openings.

In putting in new felt rings press felt well out into the groove.

Caution: When re-assembling the differential assembly in the rear axle housing, the large bevel gear must be on the left hand side of the assembly when standing back of the rear axle housing looking toward the radiator.

REPLACING REAR WHEELS AND SPLINE SHAFT ASSEMBLY

First replace spline shaft (5, Plate 31) with drive gear, nut and cotter key in place, 6. Make sure that felt packing, 7, stays in place. When ball bearing, 8, is in carrier, replace wheel and axle bracket, 3. The teeth in drive gear pinion, 6, will go through openings provided in axle brackets. Make sure that cap screws are equally tight.

ADJUSTING THE REAR DIFFERENTIAL

After spline shafts (6, Plate 32) have been removed, remove cap screws, 4, that hold bearing retainer, 8, in place. Next remove cap screws (1, Plate 32). Remove adjusting shims (3, Plate 32) as required. The differential bearings should be adjusted so there is no end play. Make sure that ring gear, 7, turns freely after cap screws, 1, have been equally tightened.

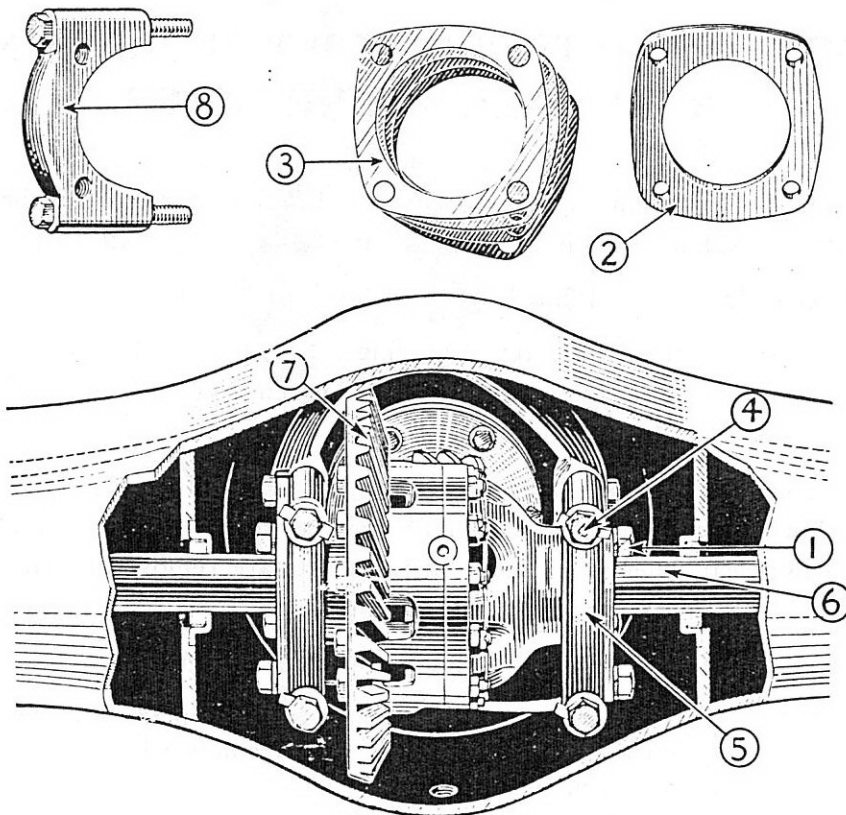


PLATE 32

REMOVING THE REAR DIFFERENTIAL

When rear axle housing has been removed from Tractor, as instructed in Plate 29, remove cap screws (5, Plate 29). Differential housing carrier and tube assembly are then removed from axle housing.

Next remove cap screws (1, Plate 32) that attach bearing retainer (2, Plate 32) and adjusting shims (3, Plate 29). Next remove cap screws (4, Plate 32) and bearing cap (5, Plate 32).

TO INSTALL NEW OIL RETAINING RING IN WHEELS

Remove wheel, Plate 34. Remove shield over the gears. Remove present oil retaining ring and discard cork gasket. Install the new oil retaining ring as shown in Plate 33. Drain (1, Plate 33) must be at the bottom. Cork gasket, 2, is between the metal and the felt retainer ring, 4, and the felt ring, 3, in place. Then, pull bolts up tight. The same bolts are used in this replacement as were formerly used.

Complete set of cork gaskets are included in package for master gear housings, and should be installed in re-assembly.

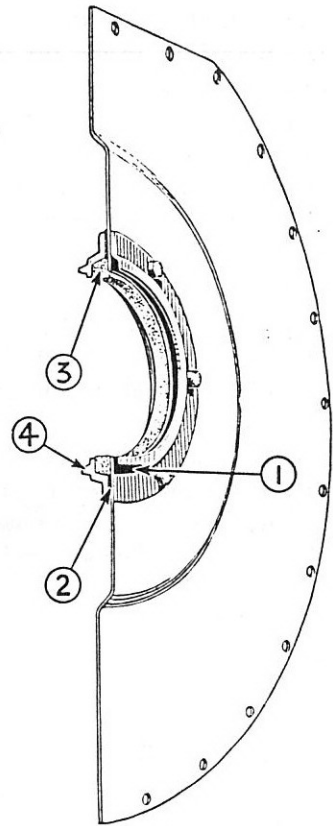


PLATE 33

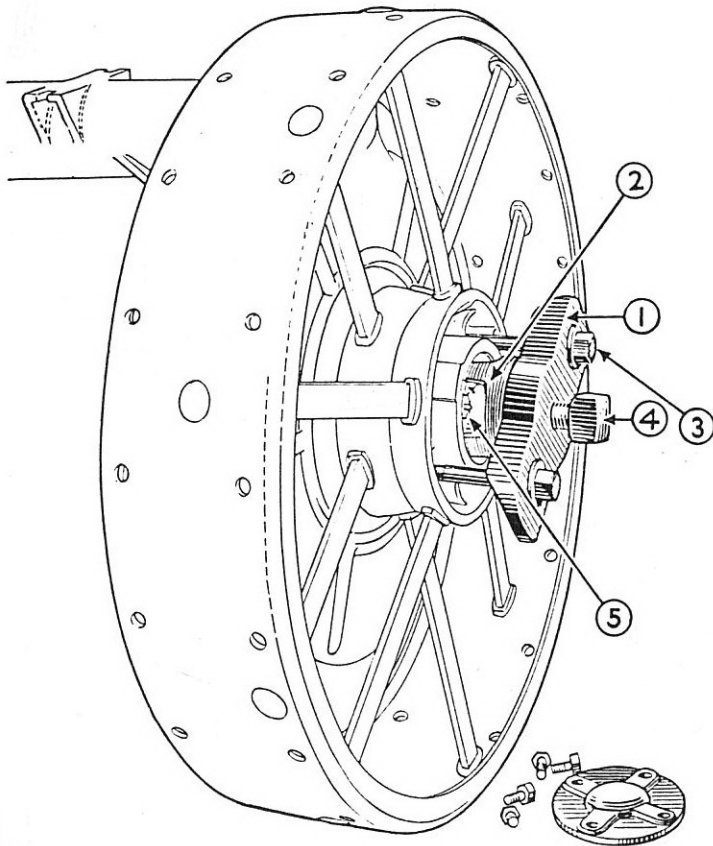


PLATE 34

THE USE OF WHEEL PULLER

This special wheel puller which can be secured on order from The Massey-Harris Co. is shown in place on one of the wheels of the General Purpose Tractor, Plate 34.

Attach the puller block, 1, and hub block, 2, as shown in Plate 34 by first removing the hub plate and fastening the block to the wheel hub with the two bolts, 3. A wrench applied to large bolt, 4, and turned in the right-hand direction will enable the puller to remove the wheel.

VALVE GUIDE RENEWAL

A badly worn inlet guide will permit enough air leakage to prevent the engine running evenly at low throttle or idling speed. Valve guides can be easily changed as follows: (See Plate 35.)

Remove cylinder head and valve chamber covers, valves and springs, and take the manifold off the engine.

Through the port in the cylinder leading into the manifold, break off the large head of the guide or take a cold chisel and cut off the head. These guides are made of cast iron and can be easily broken. Next break off that part of the guide projecting into the valve chamber. Take a round punch or drift of $9/16$ " diameter with $11/32$ " pilot with $3/4$ " long, and drive the remainder of the old guide into the valve chamber. The new guide is driven into place through the valve opening in the same manner as the portion of the old guide was driven out. After it is in place it must be reamed to size for the valve stem, due to the closing in or reduction in size caused by driving into place. A long shank $3/8$ " reamer performs this operation satisfactorily.

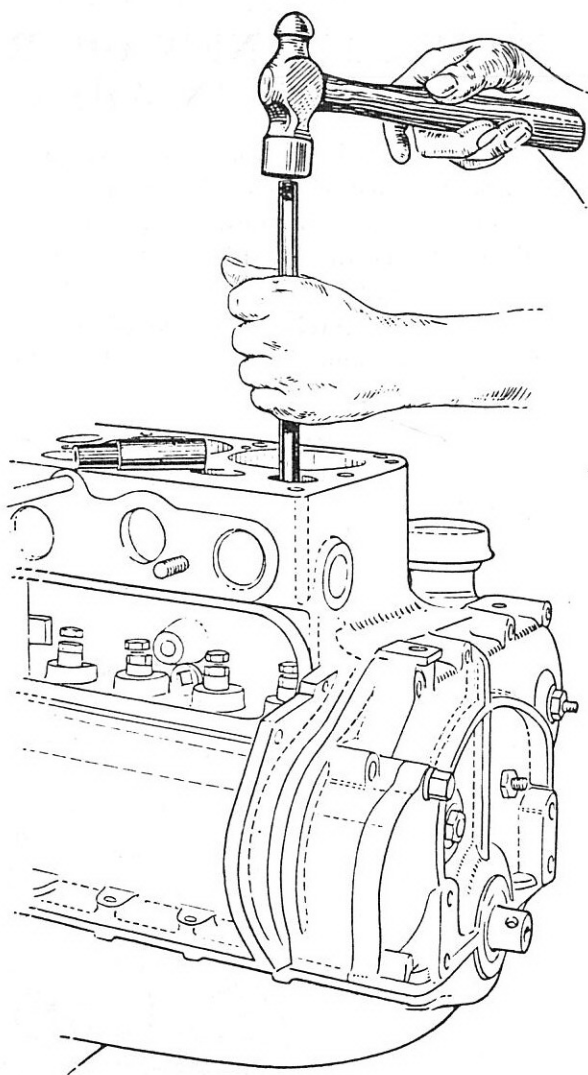


PLATE 35

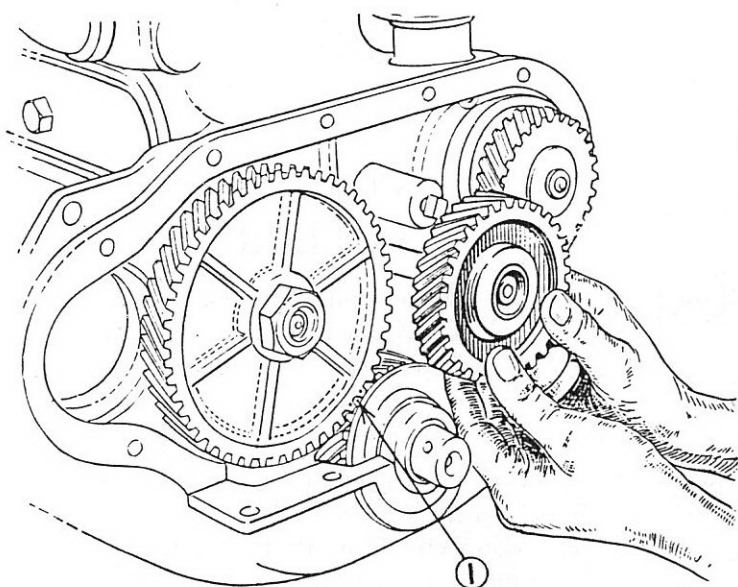


PLATE 36—Replacing camshaft gear; have the three punch marks on teeth as shown at (1) above.

BEARING ADJUSTMENTS

Proper draining and cleaning out of the oil pan, will greatly lengthen the life of all bearings and wearing surfaces. After the oil pan is removed, all bearings can readily be inspected. There is one thing to bear in mind, however, and that is that the bearings must never be too tight, i.e., must never be tightened so that it is difficult to turn the engine over. Until you have become experienced in making these adjustments, the best method is to take out sufficient shims to cause the engine to feel tight, offering considerable resistance to turning over, then remove the cap and insert a .003 shim on each side of the main bearings and from .002 to .003 to each side of the connecting rod bearings, which were formerly adjusted until they were snug. In other words, the pressure system

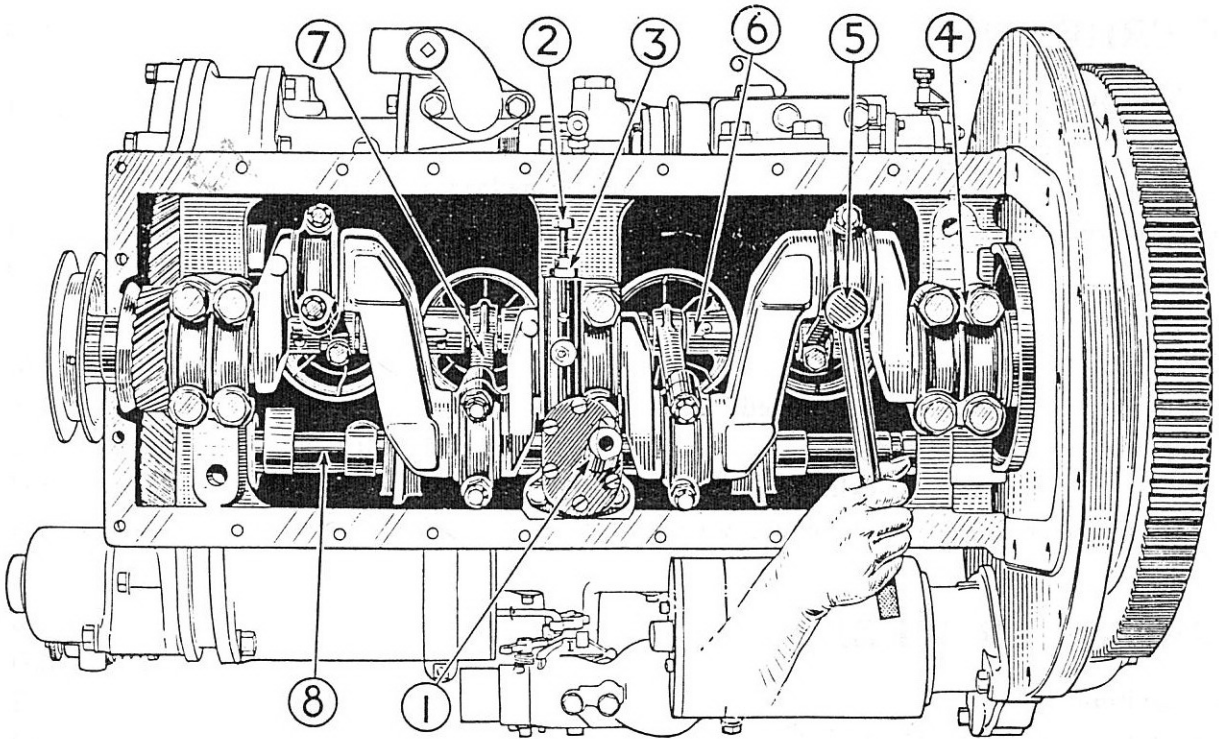


PLATE 37—Bottom of motor. (1) oil pump; (2) pressure adjusting screw; (3) lock nut; (4) main bearing; (5) adjusting connecting rod bearing; (6) piston; (7) connecting rod; (8) cam shaft.

on this engine requires a certain clearance for the oil film, and while this may not be the same practice which you have been using on other engines; you will find from experience that it will give you much longer bearing life on this engine.

Never use more than .018 shim thickness between bearing and cap; too much gap will permit oil escaping and consequent loss of pressure.

Again we wish to caution you not to draw the bearings too tight (5, Plate 37). After all bearings have been adjusted, you still should be able to crank the engine.

REPLACING CONNECTING ROD AND MAIN BEARING

The bearing metal in the connecting rod caps (5, Plate 37) and main bearings cap, 4, is poured directly into the steel parts after they have been tinned. These come to you for replacement, fly cut to size, so that practically no scraping should be necessary unless the shaft has become worn or tapered. The upper half of the main bearings are removable shells and are used in this location due to service difficulties if any other construction is used and because cast iron cannot be tinned to secure a bond for the babbitt. When replacing these parts, care must be taken to see that proper clearance is left for the oil film, as directed under bearing adjustments. Leave a side clearance of about .005 at big end of rod. Be sure connecting rod lines up properly so that piston pin is parallel to crank shaft.

The old rods and caps can be returned to us and an allowance will be made providing they are in condition so that they can be rebabbitted and reused.

CAUSES OF COMMON TROUBLES

OVERHEATING:

Ignition

Spark too late, or very weak.

Fuel

Mixture too rich.

Engine

Insufficient lubrication.

Insufficient cooling water.

Circulation of cooling water impeded.

Pump not working properly.

Heavy carbon deposits in cylinder.

Water chamber coated from impure water.

IRREGULAR SPEED:

Ignition

Loose connections, or partly broken wire.

Breaker points pitted, or poorly adjusted.

Fuel

Supply to carburetor irregular.

Dirt on needle valve.

Engine

Governor gummy, sticky, out of adjustment or badly worn.

Valves sticky.

SMOKE:

Black smoke in exhaust indicates too rich a mixture.

Bluish smoke indicates too much lubricating oil.

Smoke from the crank case or open end of cylinder indicates leak past the piston.

Look for worn rings, rings stuck in grooves, or scoring on cylinder walls.

ENGINE USES TOO MUCH FUEL:

Spark too late.

Leaky valves.

Cooling jacket water too cold.

Engine not properly lubricated.

Engine running below speed.

LOSS OF POWER:

Ignition

Spark occurring too late.
Dirty spark plugs.
Poor connections; also dirty connections.
Dirty timer.
Spark weak because of poor or broken wiring.
Breaker points worn, oily, or out of adjustment.
Commutator brush dirty or oily.

Fuel

Mixture too lean or too rich.
Supply pipe partly clogged.
Inlet valve not opening sufficiently.
Water in fuel.
Leaks around intake manifold.

Engine

Overheating in cylinders or bearings.
Gummy, inferior or insufficient oil.
Exhaust pipe partially clogged.
Governor out of adjustment.
Lack of compression, which may be due to worn, stuck, or broken piston rings.
Scored cylinder walls.
Leaks through and around cylinder head joints.
Valves sticking, worn, pitted, or not seating properly because of dirt.
In cold weather, engine and cooling water too cold.

MISFIRING:

Ignition

Poor connections.
Dirty timer.
Breaker points pitted, dirty or poorly adjusted.
Dirty or cracked spark plugs; points of plugs not properly spaced.
Breaker points not touching properly.

Fuel

Mixture too lean or too rich.
Fuel passage partly clogged.
Water in fuel.

Engine

Lack of compression.
Valves sticky or not working properly.

EXPLOSIONS IN EXHAUST PIPE:

Ignition

Irregular ignition.

Poor spark, or very late spark.

Fuel

Mixture too lean or too rich.

POUNDING:

Ignition

Spark too early.

Engine

Red-hot carbon deposit.

Loose bearings.

Tight piston, due to lack of oil or lack of cooling water.

Loose flywheel or loose key.

Very loose piston (piston slap.)

BACKFIRING:

Ignition

Spark too late. (If engine backfires and stops, spark may be too far advanced.)

Short circuit on primary wire.

Wires to wrong spark plugs.

Fuel

Weak mixture.

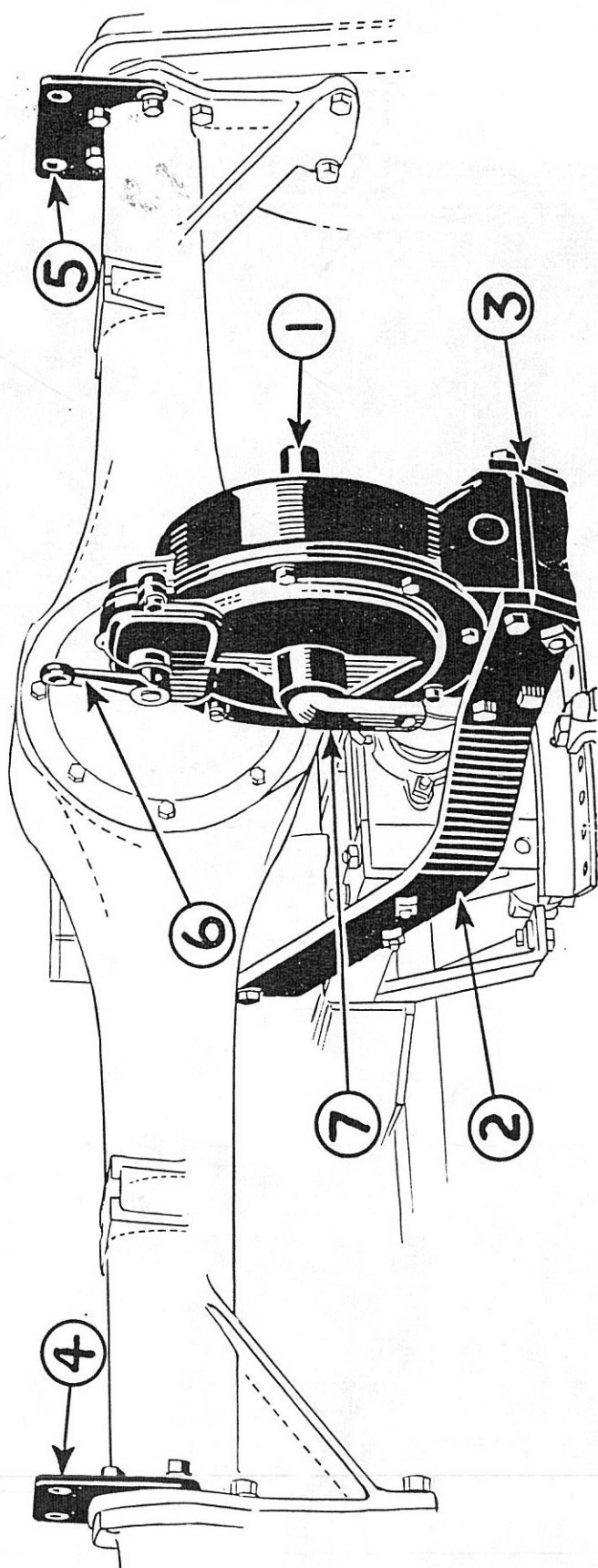
Occasionally too rich mixture.

Engine

Leaky or stuck intake valve.

Red-hot carbon deposits.

Leaky manifold or carburetor gasket.



ASSEMBLING POWER LIFT ON TRACTOR

The shipping bundle containing the power lift also includes the bracket for attaching to the tractor and the two cast steel plates, to be attached to ends of rear axle, to mount supporting equipment for all attachments operated by power lift.

After unpacking the crate, take side bracket, 2, and bolt into position as shown in Illustration 00 left. Do not, however, draw nuts up tightly on bolts at this time.

Bolt brace, 3, into place on opposite side.

Place power lift, 1, between these braces and bolt up as shown. Now tighten all bolts equally.

Now bolt side supporting plates 4 and 5 in place on tractor axle, using bolts provided in the burlap bag attached.

Lever, 6, is the trip lever which can be operated by hand or by attaching rope for convenience.

Crank, 7, is for attaching connecting rod to lift shaft of tools.

INSTALLING AND OPERATING ELECTRIC STARTER AND LIGHTS

1. Remove the tool box on the tractor.
2. Place the battery and tool box plate in position as shown in Plate 38.
3. Install electric starter "G" as shown in Plate 39.
4. Also install generator "H" as in Plate 39.
5. Put on headlight brackets and lights "A" and "B" as shown in Plates 39 and 41.
6. Now check up the wiring attached to the terminals in the battery box to make sure none have become disconnected or broken in transit.
7. Attach outer ends of wires No. 1, No. 2, No. 8 and No. 10 and cable No. 7, to their respective terminals on the lamps, generator, magneto and starter—Plates 39 and 41.

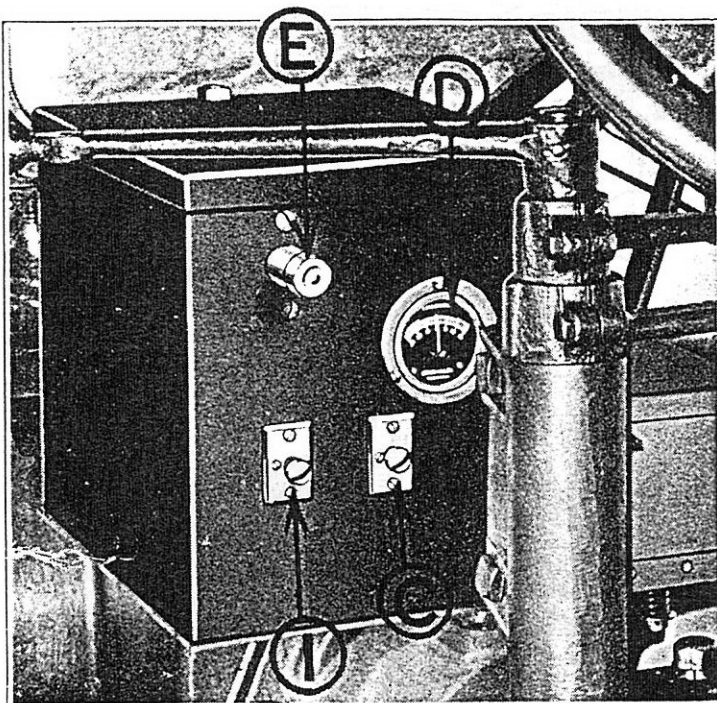


PLATE 38

To start motor: (Refer to Plate 38).

Push the ground switch "I" towards the box as far as it will go.

Push in on starter switch "E" which causes starter to crank the motor.

TO TURN LIGHTS ON OR OFF

Pull out on switch "C" which turns both headlights on. (Push this switch in to turn them off.)

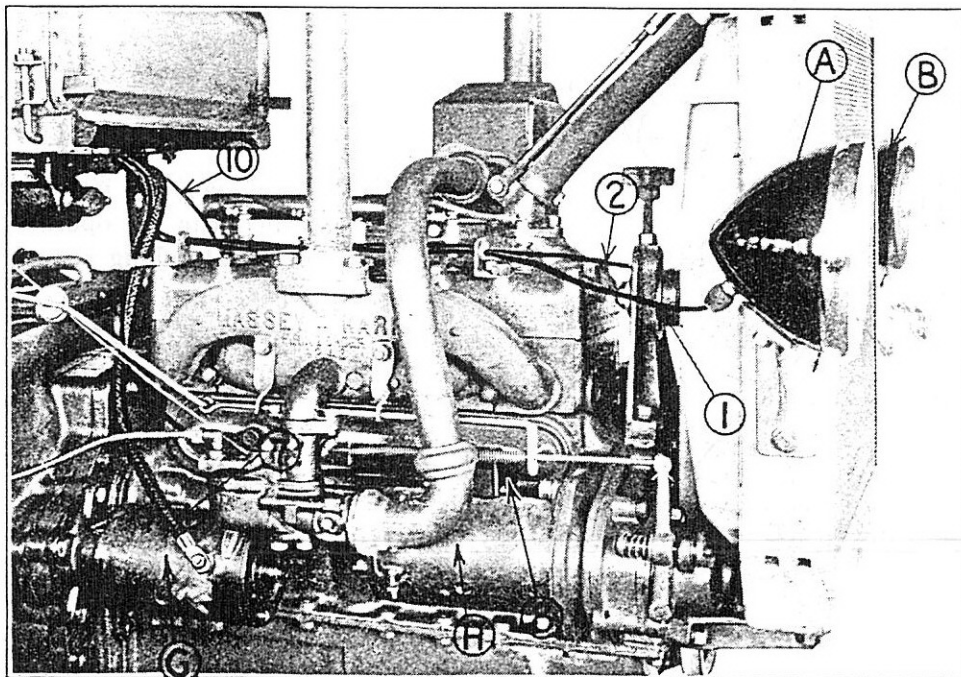


PLATE 39

TO STOP MOTOR

Pull ground switch "I" out as far as it will go.

CARE OF THE SYSTEM

Examine battery every 7 days when in use to make sure that solution is above the tops of the plates. If solution drops down to tops of plates, refill those cells with pure distilled water so that it will be about $\frac{1}{4}$ " or so above the plates. **Caution:** In excep-

tionally not or dry weather, or when tractor is operated day and night on hard work, the battery should be inspected and tested oftener. Inspect water level and test solution with hydrometer every 14 days when not in use. If the hydrometer reading ever drops to 1150 or below, it should be recharged either by running tractor motor at normal speed for several hours or removing battery from box and having it charged at service station.

Keep all connections tight.

Do not leave light switch on when motor is not running.

Turn lights on frequently when doing day work only, to keep battery from overcharging.

This starting and lighting system is as accurately and carefully made as that of most automobiles and should have the same care and consideration.

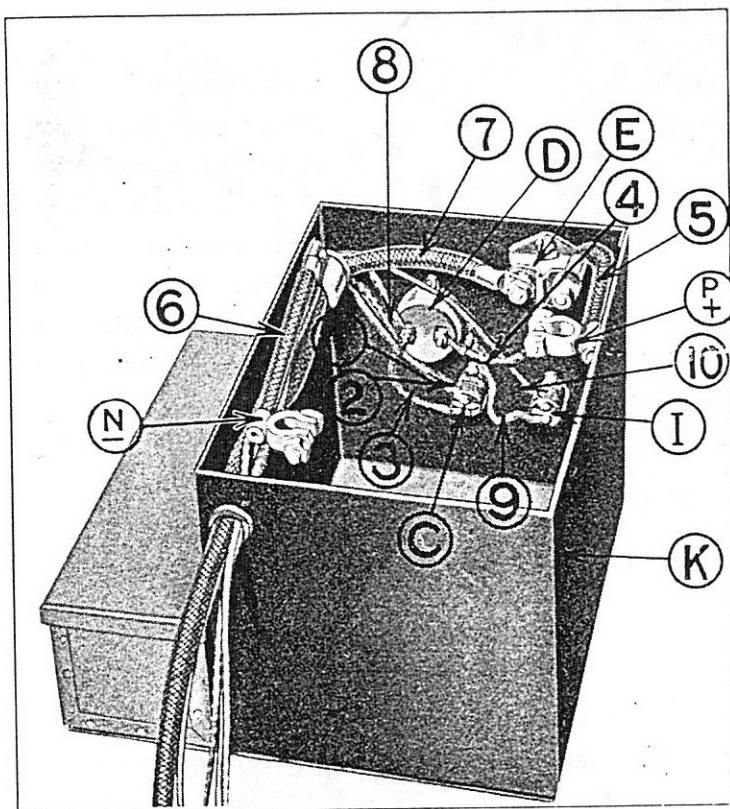


PLATE 40

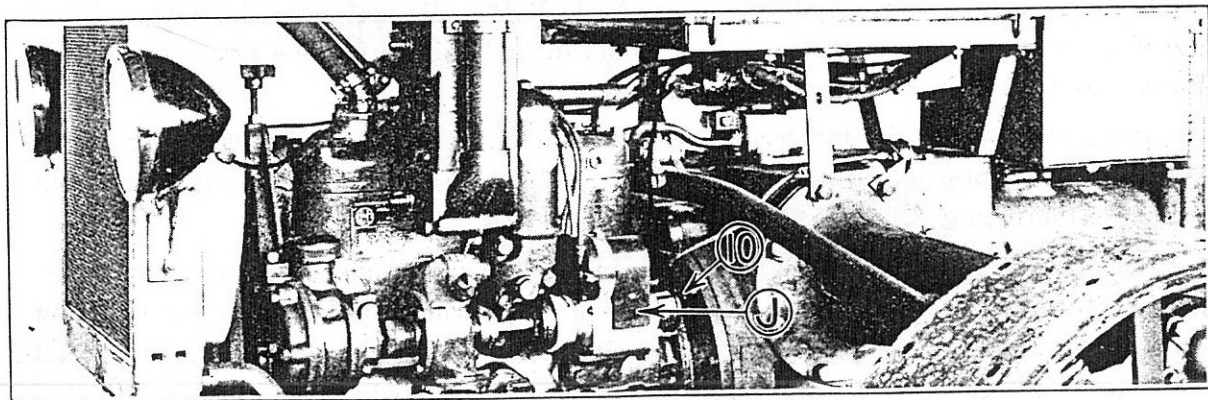


PLATE 41

TO CLEAN RADIATOR

Take a half can of lye to the radiator full of water. Have water as near boiling point as possible. Let this solution stand all night; then, flush out thoroughly with clean water.

DRAIN YOUR RADIATOR in COLD WEATHER, when not in actual use, and leave drain open. If you use your tractor in severely cold weather, the following table of mixtures, alcohol and water, will be helpful:

95%	5%	25 degrees above zero
90%	10%	18 degrees above zero
85%	15%	11 degrees above zero
80%	20%	5 degrees above zero
75%	25%	2 degrees above zero
70%	30%	9 degrees below zero
65%	35%	15 degrees below zero
60%	40%	23 degrees below zero

As the alcohol evaporates it will, of course, be necessary to replenish it from time to time.

AT THE END OF THE SEASON

Get your TRACTOR ready to put away for the winter. Give it a thorough overhauling—it will be money well spent.

Check it over carefully and replace any necessary parts giving inside of motor and all working parts thorough cleaning. Take up bearings where they need it; grind the valves; see that wrist pins, nuts and bolts are tight and in place.

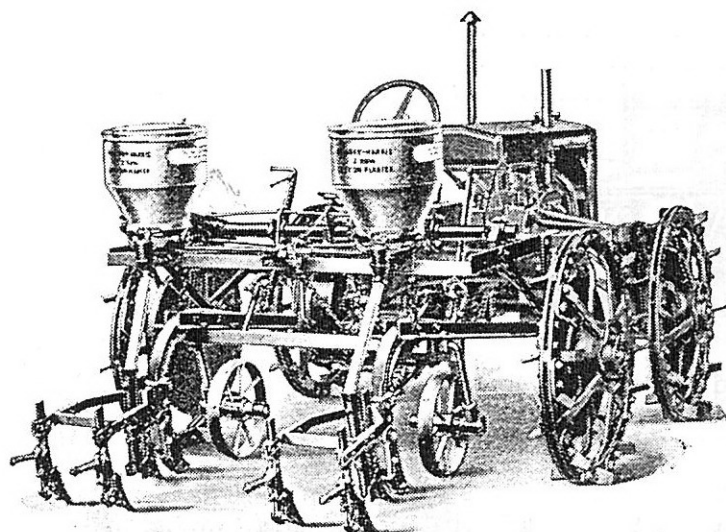
Read the instructions again.

When you have finished overhauling, refill with new oil and let motor run idle for several hours, or a day if possible—starting at low speed and increasing as the motor becomes free. This speed should not exceed 500 RPM. Do not race the motor. This run will properly bed the bearings. Leave doors of building open while motor is running—motor gas is dangerous under certain conditions.

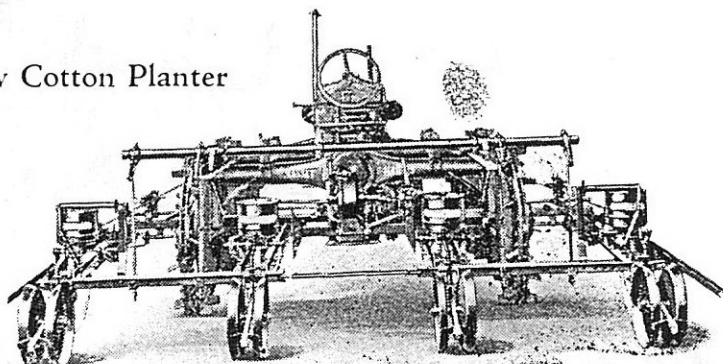
After you have run the motor in, idle it until it is thoroughly warm, draining off all the water while motor is still running. This not only forces out all water but it dries out the system thoroughly.

When empty, short-circuit the magneto, and as the motor dies down the oil will be spread all thru the motor and form a surface film, which will keep rust from accumulating thru the winter months—as an extra precaution, take out spark plugs, and squirt half pint of oil into each cylinder, then turn motor over once or twice by hand.

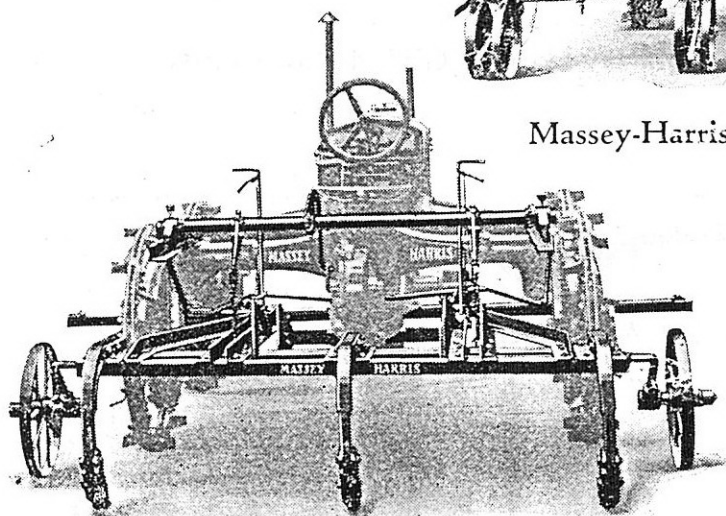
"GP" ATTACHMENTS



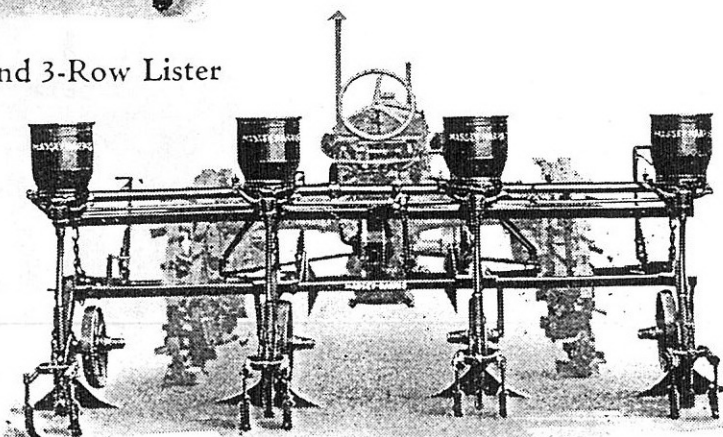
Massey-Harris "GP" 2-Row Cotton Planter



Massey-Harris "GP" 4-Row Corn Planter

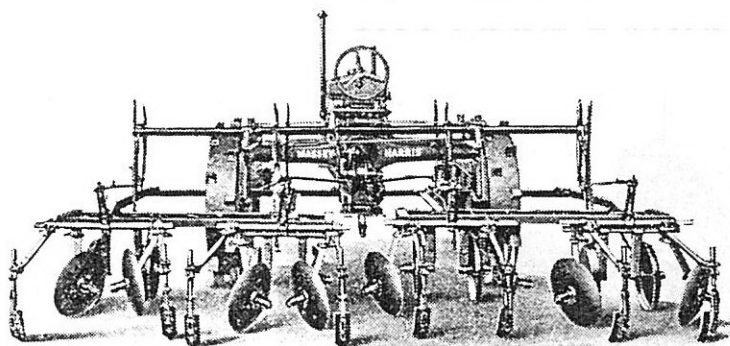


Massey-Harris "GP" 2 and 3-Row Lister

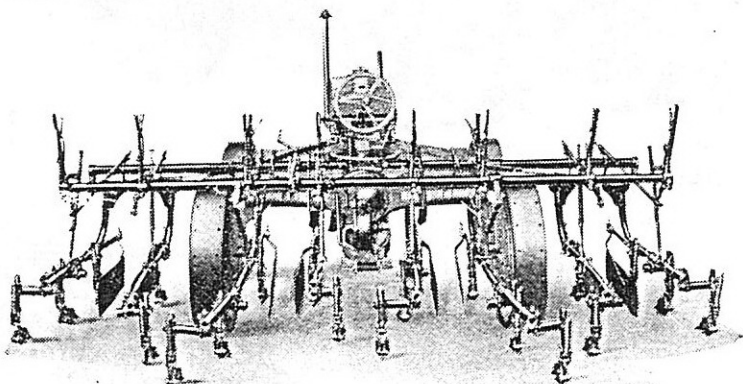


Massey-Harris "GP" 4-Row Cotton Planter

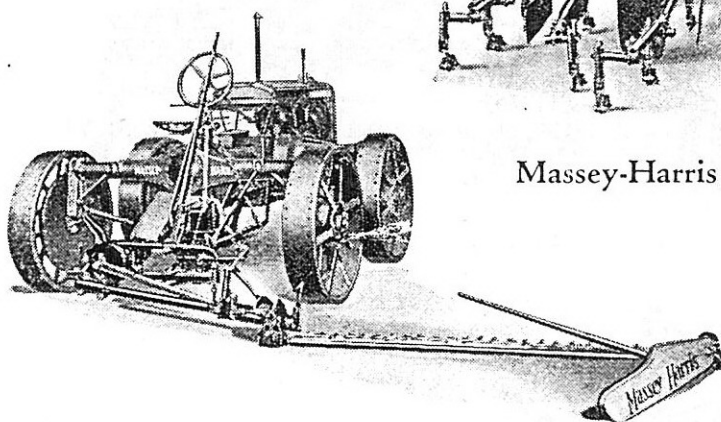
"GP" ATTACHMENTS



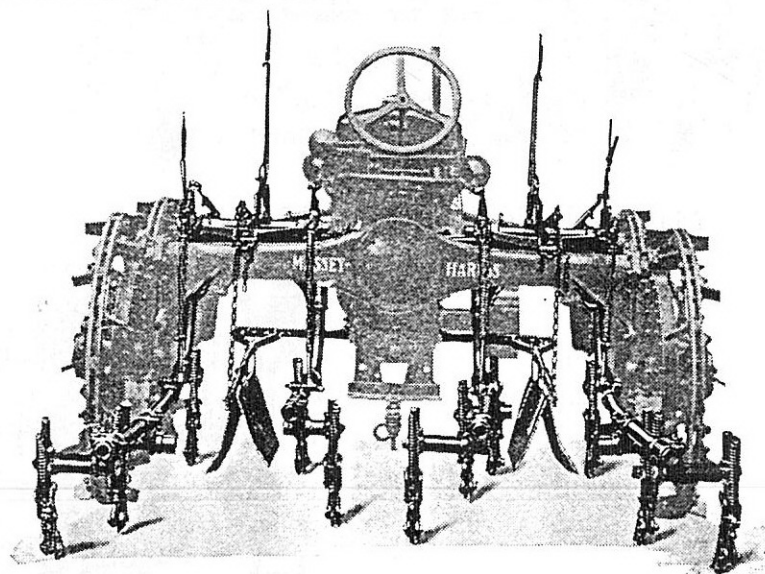
Massey-Harris "GP" 4-Row Listed Corn Cultivator



Massey-Harris "GP" 4-Row Cultivator



Massey-Harris "GP" 7-foot Mower Attachment



Massey-Harris "GP" 2-Row Cultivator

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Secure genuine Massey - Harris Tractor repair parts from your local Massey-Harris dealer or get him to order them for you. Should you require further information about operation and maintenance of this tractor write to:

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