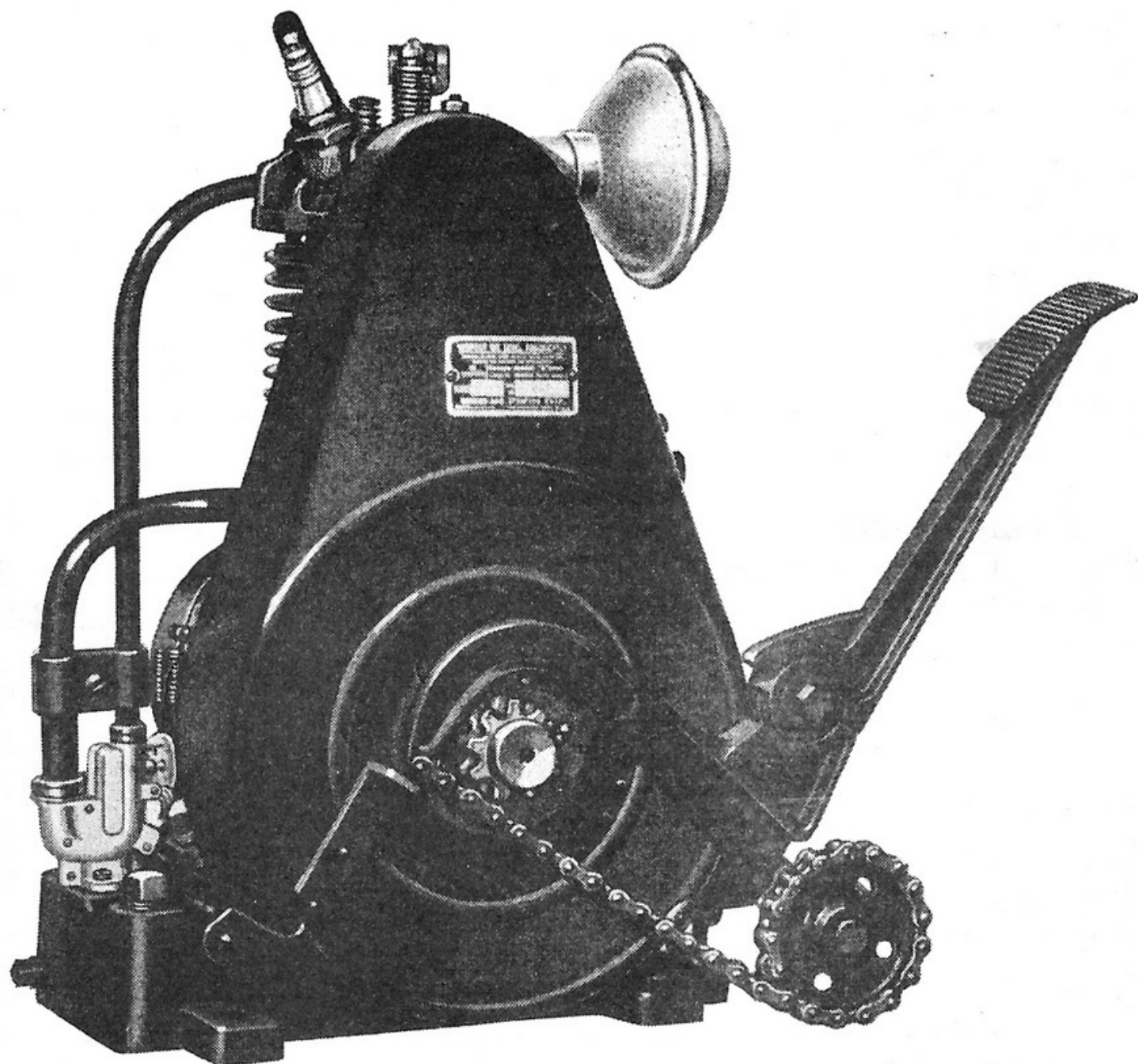


INSTRUCTIONS AND PARTS
MODEL "FH"
Briggs-Stratton Gasoline Motor



BRIGGS & STRATTON CORP.

MILWAUKEE



WISCONSIN

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Please Read This Booklet Carefully

It is important that the Starting Instruction card and the instructions in this booklet be read and followed in order to insure satisfactory operation of the motor.

IMPORTANT

Become thoroughly familiar with the following to get the best service out of your motor.

THE CORRECT OIL TO USE.

THE IMPORTANCE OF A GOOD CLEAN UNBROKEN SPARK PLUG WITH ITS POINTS PROPERLY SPACED.

THE CARBURETOR AND CHOKE ADJUSTMENTS.

THE INTAKE VALVE.

Full information is contained in this booklet or on the Starting Instruction Card.

When ordering parts or writing to us about this motor always be sure to give the number and model letter preceding the number. This number will be found on the name plate riveted to the blower case.

Guarantee

For one year from date of purchase, Briggs & Stratton Corporation will replace for the original purchaser, free of charge, any part or parts found, upon examination at our factory at Milwaukee, Wisconsin, to be defective under normal use and service, on account of defects in material or workmanship. All transportation charges on part or parts submitted for replacement under this guarantee must be borne by purchaser.

This guarantee shall not be effective if the motor has been the subject of misuse, negligence or accident, nor if the motor has been repaired or altered outside of our Milwaukee factory or authorized service station in any respects which, in our judgment, affects its condition or operation.

IMPORTANT

This guarantee does NOT cover the FREE replacement of parts or labor because of wear occasioned by use. It is solely effective to protect you against DEFECTIVE material or workmanship.

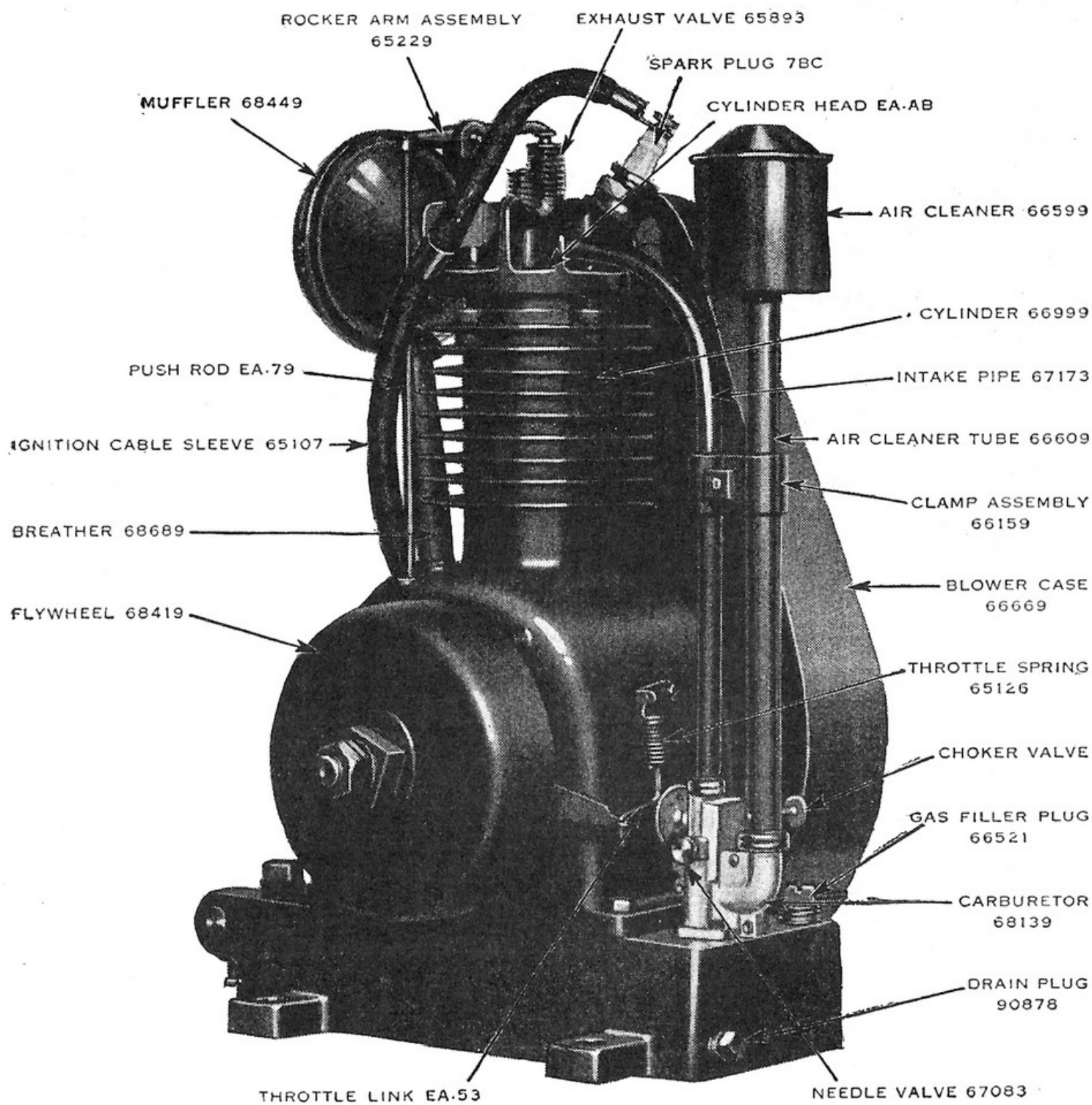


Figure 1—Model "FH" Motor

Instructions For Use of Model FH Gasoline Motor

This motor has been carefully inspected and given a thorough running test before being shipped. It should, therefore, run satisfactorily now unless something has happened to it since it left the factory, provided it is supplied with gasoline and the proper oil. It should be expected that it may still be slightly stiff the first few hours' running and that its operation will improve after a few hours use. It would undoubtedly be a good idea to allow the motor to run without a load or with a light load for an hour or two before the full load is applied.

This little motor, although very simple and requiring very little care, nevertheless requires some attention and will give much better satisfaction if the instructions in this book are followed.

It is necessary to keep this motor as clean as possible. Wipe off any dirt or oil that accumulates on the motor and keep the motor covered when not in use.

We have developed for use outdoors or wherever there is much dirt or dust an air cleaner, which we recommend to anyone who is interested in keeping down future repair bills. This slips into the carburetor air opening and filters all the air used, preventing any particles of grit reaching the cylinder. This cleaner is not supplied with the motor unless ordered at an extra cost. You can easily determine by comparing your motor with the illustration in this booklet whether your motor is so equipped. This air cleaner can be purchased separately any time. Order 1-66599 Air Cleaner, 1-66609 Air Cleaner Tube, and 1-66159 Clamp Assembly for holding it in place.

Proper care in keeping the motor clean and following the instructions on the following pages will do much toward keeping down repair bills. We will try on the following pages to give sufficient information so that you should be able to take care of any simple troubles which may arise.

The Briggs & Stratton Motor operates on what is known as the four cycle or four-stroke principle, the same as practically all automobile and stationary motors. The four cycles can be explained as follows: It requires four strokes of the piston to produce one power stroke.

First Cycle or Suction Stroke: The piston moves down in the cylinder when exhaust valve is closed. The suction thus produced

opens the intake valve and a charge of gasoline mixed with a proper proportion of air is drawn into the cylinder. This mixture quickly forms a gas when the motor is hot. When the piston reaches the bottom of the cylinder and there is no more suction the spring on the intake valve closes it.

Second Cycle or Compression Stroke: The piston now makes the up or compression stroke. Both valves being closed, you will readily see that the charge of gas must be compressed into the small space in upper end of cylinder when the piston reaches the upper end of its stroke.

Third Cycle or Power Stroke: An instant before the piston reaches the end of its second stroke the timer breaks a contact in the ignition circuit, and this causes a spark to leap across the points of the spark plug. This ignites the compressed gas, which in burning expands so rapidly as to cause the term "explosion" to be used when describing this operation. It takes an instant for all the gas to ignite, and the spark is so timed that by the time all the gas is burning the piston has passed the upper end of the stroke and started down again. The rapid expansion of the burning gas pushes the piston down, forming the power stroke.

Fourth Cycle or Exhaust Stroke: When the piston reaches the bottom of the power stroke the exhaust valve is opened by the push rod and the piston in moving up forces all the burnt gases out of the cylinder. At the top of the exhaust stroke the exhaust valve closes and the first cycle or suction stroke takes place again, followed by the other strokes as described.

All the cycles or strokes take place more rapidly than they can be described, but we believe that this explanation of the operation of the motor will help you understand it better and thus enable you to keep it in perfect running order.

Inspection

Examine spark plug to see that it is screwed in place and is not cracked or broken. See that ignition cable terminal is securely fastened to spark plug.

Depress intake valve several times. It should snap up freely when released. If sticky, put a few drops of kerosene, not oil, on valve stem, and work valve until free.

Revolve flywheel several times and watch exhaust valve stem, rocker arm and pushrod. These should work freely once every second revolution of flywheel. When exhaust valve is seated, or up, there should be a space between the exhaust valve stem and rocker arm of about double the thickness of a piece of newspaper.

If the space between the exhaust valve stem and rocker arm is not as outlined above, the adjustment is made on the rocker arm fork or "yoke". Revolve flywheel until valve push rod and end of rocker arm are in lowest position. Loosen set screw holding rocker arm fork in place, raise rocker arm and fork and insert two thicknesses of newspaper between the valve stem and rocker arm. Lower rocker arm and fork gently until one end of rocker arm rests on paper on valve stem and other end of rocker arm is seated on valve push rod. Then securely tighten set screw holding rocker arm fork in place and your valve adjustment is properly made.

If rocker arm is removed entirely, care should be taken so that the small slug No. 65232, which is placed between the set screw and rocker arm fork, does not drop out. The purpose of this slug is to prevent the set screw from marring the rocker arm fork when same is drawn up tight.

Filling Gasoline Tank

Gasoline tank is in the base of the motor and is filled through openings in top of base after removing red gasoline filler plug. Examine filler plug to see that small vent hole is clear and fill tank with a good grade of high test gasoline. Replace plug.

Lubricating System

Lubrication of the Model FH Motor is accomplished by the well known splash system. A positive action pump actuated by the cam shaft pumps the oil from the bottom of the oil pan into a dip trough, maintaining a constant level of oil in this trough, irrespective of the amount of oil supply in pan. Into this trough, the dipper on the lower end of the connecting rod dips on each stroke of the piston, distributing the oil in the form of a fine spray throughout the cylinder walls and crank case. By this means all moving parts are kept lubricated at all times.

We recommend for washing machine motors the year round a light oil such as GARGOYLE MOBIL OIL ARCTIC. For other than

washing machine application we recommend GARGOYLE MOBIL-OIL A, except for cold weather outdoor running use GARGOYLE MOBIL-OIL ARCTIC.

Filling Oil Reservoir

The oil filler opening is on either side of the motor, one side opposite the carburetor, the other below the breather pipe. With the motor setting level pour oil in this opening until it overflows. This is the maximum oil level. Replace filler plug.

After filling the oil reservoir no further attention is necessary except to examine the oil level as indicated by the height of the oil in the filler opening and add fresh oil after every five running hours. The first few times running a new motor it is advisable to check the oil level every two hours. The oil reservoir should be as nearly full as possible at all times.

ONCE EVERY FIFTY RUNNING HOURS DRAIN THE OLD OIL OUT OF THE MOTOR BY TIPPING IT OR DRAWING IT OUT WITH AN OIL GUN. THE RESERVOIR SHOULD THEN BE REFILLED WITH FRESH OIL. THIS SHOULD BE DONE WHILE THE MOTOR IS STILL HOT, BECAUSE WHEN THE MOTOR IS COLD IT IS IMPOSSIBLE TO GET ALL THE OLD OIL OUT.

Oil Sludge

Oil Sludge is dirty oil, emulsified with water (which is a product of the combustion in the motor) and beaten up into a gummy mass in the crank case. It clogs the screen, preventing the pump from getting enough oil to keep the dip trough full and in extreme cases cuts off the flow of oil entirely.

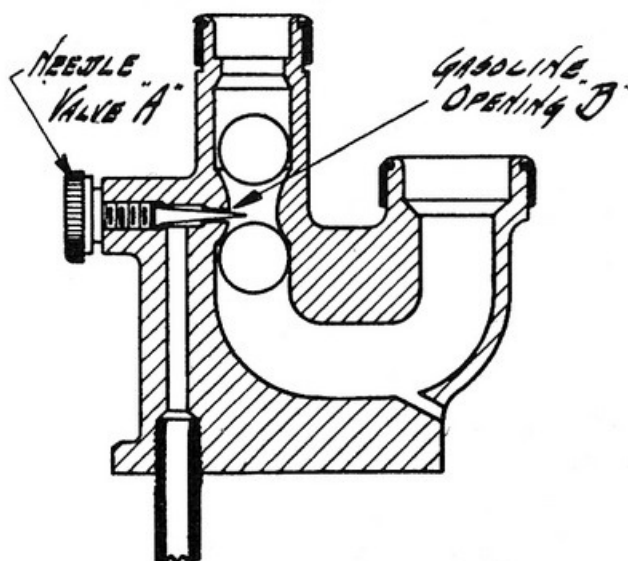
This sludge occurs largely in winter and is due to using cheap and improper lubricating oil and to neglect of draining the crank case regularly every 50 hours as directed above. As the formation of this sludge is very injurious to the motor, care should be taken in following our recommendations in regard to lubrication outlined above.

STARTING

First make sure that the oil level is correct as described above and also make sure that the gasoline tank is supplied with plenty of gasoline. Depress intake valve once or twice, making SURE it is free.

Then choke the carburetor by closing the valve at the lower end of the air cleaner (handle at right angle to pipe) if the motor is equipped with air cleaner. If motor is not equipped with air cleaner, a choke tube is provided with a shut-off valve that is to be used for choking the motor when starting. Choking the carburetor shuts off considerable of the air supply, giving a richer mixture, needed when starting a cold motor. This choke valve should be closed completely when first starting the motor and after the motor has fired a few times it should be immediately opened slightly in order to give the motor more air, and as the motor warms up it can gradually be opened to its full opening. Under no conditions should the motor operate with this valve in any other position than wide open.

The small needle valve "A" shown on section cut below, regulates the amount of gasoline the motor uses. This valve has been properly set at the factory before the motor was shipped, but in case it has been moved, the proper setting is approximately one and one-half turns open. Screwing the valve "A" in cuts off the gasoline and screwing the valve "A" out opens up the gasoline. A very slight movement of this valve in either direction will have a decided effect on the operation of the motor. When this valve is properly set, it need not be moved or adjusted again, as the proper setting for a running condition is the proper setting for starting. In order to determine whether or not the gasoline mixture is correct, the exhaust pipe can be disconnected from the motor and the exhaust flame that shows through the exhaust opening should be blue in



Section Thru Carburetor

color when the motor is running. If this exhaust shows dark red it is an indication of too much gasoline and the valve should be turned down slightly.

If the motor is equipped with the foot starter it is only necessary to crank the motor over by stepping on this foot starter and pumping it as fast as possible with the foot in order to get as high a speed as possible on the motor. This starter is provided with an automatic clutch that releases as soon as the motor has started and there is absolutely no danger of the starter being jammed when the motor starts.

If the motor is equipped with the rope starter, the starter rope should be applied to the starting pulley by slipping the knot of the starter rope into the "V" of the starter pulley and wind all the cord on the pulley assembly, winding in a clockwise direction when facing the motor from the starter pulley side. Grasp the cord and give it a hard fast pull so as to spin the motor. The cord will become disengaged from the pulley at the end of the pull. If the motor is cold, it may be necessary to repeat this operation two or three times.

As soon as the motor starts to turn over under its own power, open the choke valve slightly and as the motor picks up, gradually open this valve until the motor is running full speed. In case the motor starts to slow down after opening this valve, close it again slightly to increase the suction of gasoline and as soon as the motor has warmed up completely, this valve should be left wide open. A little practice in the adjustment of this air valve will produce good results in starting at all times.

If Motor Fails To Start Properly

If the motor fails to start properly the following suggestions may be of value and should be followed one by one until trouble is found:

CAUSES

1. Intake valve may be stuck.
2. No gasoline in tank.
3. Water in gasoline.
4. No spark or poor spark.
5. Governor arm improperly adjusted.
6. Carburetor gas pipe plugged up.

REMEDIES

1. Depress valve several times, making sure it works freely. (Always do this when starting a cold motor.) If this does not help put a few drops of kerosene on the valve stem, depressing valve several times until it moves freely.

2. Fill tank with gasoline.

3. Drain tank (remove small plug near bottom of base) and refill.

4. Inspect and test spark plug and if not in good condition replace plug. Be sure cable is tight and breaker points are properly set. Refer to paragraph headed "Ignition" for detail ignition tests.

5. Loosen set screw, move governor arm to the right and tighten in place. See paragraph headed "Speed Regulation."

6. Loosen nut holding gas pipe to lower end of carburetor and unscrew gas pipe. Then blow out any obstructions in the small opening through the pipe. Do not clean out with pin or tool.

Troubles and Remedies

MOTOR LACKS POWER OR DOES NOT OPERATE SMOOTHLY

1. Leaky valves and motor badly carboned.
2. Compression leaks at other points.
3. Weak valve springs.
4. Clearance too great between exhaust valve and rocker arm.
5. Muffler clogged.
6. Dirty or cracked spark plug.
7. Motor overheating.
8. Worn piston rings.
9. Equipment operated by motor may be binding or otherwise working improperly.
10. Carburetor clogged up.

REMEDIES

1. Head should be removed (see paragraph on "Lack of Compression"). Carbon should be thoroughly cleaned out and exhaust valve ground to a seat.

2. Spark plug must be securely screwed into head. Be sure gasket is in place. Cylinder head gasket may leak. Test for air

leak and replace if necessary. Use only copper and asbestos gasket as supplied with motor.

3. Weak valve springs may be tested by inserting the point of a screwdriver into the coils and placing tension on the spring. If motor speeds up to normal, spring should be replaced. Head should be removed and valves removed as described in paragraph headed "Lack of Compression". Only valve springs as supplied by the factory for this purpose are to be used. The exhaust valve spring must be considerably stronger than the intake valve spring.

4. See third paragraph under "Inspection."

5. Make sure that small holes in muffler are not clogged.

6. Clean spark plug thoroughly and set points at .020" clearance. Replace plug if defective in any way. See paragraph headed "Ignition".

7. Caused by poor grade of oil or lack of oil or overloaded or tight bearings.

8. This condition will not occur until motor has had a great deal of use or has been run with poor or an insufficient quantity of oil. Replacement should be made by an authorized Briggs & Stratton service station or by the factory.

9. Disconnect motor and test equipment for freedom of movement or amount of friction. Be sure the equipment is kept well oiled and greased.

10. Same as No. 6 under "Motor fails to start properly."

Motor Knocks

1. Motor badly carboned.
2. Loose connecting rod.
3. Loose crankshaft bearing.
4. Loose flywheel.
5. Lack of oil.

REMEDIES

1. Proceed to clean out. See paragraph "Lack of Compression".
2. and 3. Have repairs effected by an authorized Briggs & Stratton service station or return to factory. This condition is caused only by poor oiling or long service.

4. Be sure flywheel nuts and pulleys are properly tightened. Replace key on crankshaft if necessary.

5. Replenish oil supply.

Carburetor

The carburetor is adjusted properly at the factory for all conditions, and if this adjustment has not been changed, the motor should start and function correctly. In case this adjustment has been changed and it becomes necessary to regulate the carburetor, this can be done by a slight movement of the needle valve "A" located in the side of the carburetor body. This needle valve should be set at approximately one and one-half of a turn open and screwing the valve down reduces the amount of gasoline taken into the motor, and screwing the valve up increases the amount of gasoline taken into the motor. When the valve is set approximately one and one-half turn open, a very small movement of the valve in either direction will give the proper mixture. The proper mixture can be determined by the sound of the motor and also by the color of the exhaust coming from the exhaust opening. This should be a light blue color slightly tinged with red. A heavy black exhaust indicates too much gasoline and the needle valve should be screwed down slightly. An intermittent popping of the motor with no signs of red in the exhaust indicates too lean a mixture and the valve should be opened slightly to increase the amount of gasoline. Be sure that there is always sufficient gas supply in the tank and that the vent hole in the gasoline filler plug is not clogged up, preventing the gas to flow freely.

For use outdoors or where there is much dirt or dust we have developed an air cleaner which slips into the carburetor air opening. This is supplied only at an extra cost when ordered and is not standard equipment on the motor. We recommend its use, however, to keep the dust and dirt out of the cylinder, thus reducing wear. The air cleaner proper can be removed from the tube by merely pulling same off. **EVERY DAY** the air cleaner should be rinsed or cleaned in kerosene to remove all dirt which may accumulate. Then dip in old crank case oil and replace.

Ignition

If the motor fails to start, remove ignition cable from spark plug and remove spark plug. See that points are clean and about .020" apart. This will be a trifle greater than 1/64". Attach ignition cable firmly to spark plug and lay spark plug on top of motor so that steel part of plug is touching motor. Grasp ignition cable by the insulation and keep plug in place as above. Revolve flywheel

smartly by hand several times. At a point during each revolution a spark should jump across the gap in the spark plug providing spark plug is laid so that steel part is touching motor. If there is no spark the probabilities are that the spark plug is cracked or porous. **Replace with a plug of reputable manufacture that you know has been tested and is O. K.**

CAUTION: Never in any case try to test for spark by removing ignition cable from spark plug, trying to hold terminal of cable close to cylinder, revolving flywheel and watching for spark between ignition cable terminal and cylinder. You run an excellent chance of completely ruining your magneto if you test in this manner.

If there is still no spark remove pulley from end of crankshaft that holds magneto flywheel in place. Pulling outward on the flywheel, tap the end of the crankshaft gently with a piece of wood, brass or lead. Do not strike end of the crankshaft with hammer or other hard substance as you will ruin the thread. This gentle tapping will loosen flywheel from its taper seat and it will come off of the crankshaft. You will then have exposed to view the breaker arm 65489. You will note that the breaker arm is pivoted in the center, with one end riding on the crankshaft. On the other end is located a tungsten point with another located opposite it. You may find that there is oil or foreign substance between these points or they may be burned. (Note: The latter only after a motor has seen considerable service.) If found to be dirty, clean well with a piece of fine sand paper. If the points are rough scrape them with a sharp knife, but under no condition use emery cloth. The points should be separated about .020, or a little more than 1/64 of an inch.

Another important matter to watch is the proper fastening of the magneto cable which reaches from the connection on the coil to the spark plug. This cable should be securely fastened at both the coil and the spark plug. Fasten the cable to the coil connection with a pair of pliers. Under no circumstances is the cable to be soldered to the coil. This heat will damage the winding. To insure the cable not coming loose at the coil, secure with the clamp just to the left of the points. This will insure a good connection even though the cable is jerked. The insulation of the coil and cable must not be cracked or oil soaked. Replace flywheel carefully and try as before. If still no spark develops there is something wrong that you cannot remedy and the motor should be returned to the factory or to an authorized Briggs & Stratton service station.

When replacing flywheel be sure that the taper end of the crank shaft and the taper hole in flywheel are absolutely clean to insure proper fit of flywheel to the shaft. Insert a bar or rod through the two holes in the starter pulley (which acts as a nut to hold the flywheel in place) and tighten securely by hitting bar with hammer. **PULLEY MUST BE DRAWN UP TIGHT.**

The key, which holds the flywheel in place, is made of aluminum so that it will shear off if the pulley becomes loose, thereby not allowing any damage to be done to the keyways in the flywheel or crankshaft.

Lack Of Compression

The mixture of gasoline from the carburetor must be compressed on the up stroke of the piston and in this condition fired by the spark jumping across the gap in the spark plug. If this compression is faulty there will be either no explosion or insufficient explosion to develop full power by the motor. To determine if you have compression revolve flywheel at a moderate speed by hand. If compression is correct, there will be a point during every second revolution where resistance will be felt. It will feel as if pull were against a spring and if the flywheel is revolved, fairly fast, up to this point of resistance and let go, it will rebound rapidly in the opposite direction. If this action does not take place there is no compression and the cause must be looked for. There are four causes of poor compression which you can easily determine and remedy.

1. Cylinder head loose. Can be detected by air coming through between cylinder and cylinder head and by oil oozing out at same place. Turn screws down tightly and if this does not remedy condition, use a new copper and asbestos gasket.

2. Spark plug loose. Screw down and if necessary replace gasket.

3. Exhaust valve not seating properly. First examine the exhaust valve spring and make sure it is not broken. If not broken insert the point of a screwdriver between the coils and place tension on the spring. If this makes the motor run normally the spring is weak and should be replaced. If spring is not at fault the valve may be badly carboned and need regrinding. (The latter can only occur in motors which have been running for some time and will never happen on new motors.) To replace spring or regrind valves

see paragraph on "Cylinder Head and Valves" for method of removal from motor.

4. Intake valve not seating properly. Depress the valve by hand several times. It should snap up freely. Test the spring as outlined above for exhaust valve spring. It should very seldom be necessary to replace the intake valve. See paragraph "Cylinder Head and Valves".

If none of the causes mentioned above seem to be responsible for the lack of compression see paragraph headed "Worn Rings and Scored Cylinders" for further suggestions.

Cylinder Head and Valves

To remove cylinder head, first remove ignition cable from spark plug, and the upper blower case clamp. Loosen the carburetor screws and remove intake pipe from cylinder head by tapping the pipe lightly. Then remove the four cylinder head screws whereupon the cylinder head may be easily raised up.

To regrind the exhaust valve it should not be necessary to remove the valve from the cylinder, unless the valve is in very bad condition. It should very seldom be necessary to regrind the intake valve. Secure a small amount of valve grinding compound from any garage, auto supply or motorcycle supply store and cover the seat of the exhaust valve thinly with this compound, oscillating the valve rapidly in the seat. When clean metal shows all around on both the valve and seat, and there are no pits or black spots showing, the valve is properly ground. Wash valve and seat thoroughly with gasoline before assembling.

When necessary to remove exhaust valve to regrind or to replace exhaust valve spring, the following suggestions will be found helpful. The head should be laid on a bench with some means of supporting the exhaust valve from beneath, as a block of wood, etc. Using a tube, pipe or anything else that will bear down on the collar at the upper end of the exhaust valve stem without touching the split sleeve next to the stem, drive the collar or sleeve retainer down by several taps with a hammer. The split sleeve will then drop out, enabling the valve parts to be disassembled. If no other tool is available, the flywheel nut may be used to drive down the sleeve retainer or collar as described above. Always grind in, as described above, a new valve before assembling.

After assembling adjust the rocker arm. There should be a space about double the thickness of a piece of newspaper between

the exhaust valve stem and the rocker arm, when the exhaust valve is seated or up. This adjustment can be made as outlined in the first paragraph under the heading "Inspection" on page 7.

The intake valve is spun in place on the cylinder head and we do not recommend replacement except by an authorized Briggs & Stratton service station or the factory. There should be very little occasion to replace the intake valve. In many cases when necessary to replace the intake valve it may be advisable to replace cylinder head. If necessary to replace intake valve spring, the entire cylinder head may be returned to the factory to have spring replaced and valve seats reground at a cost of \$2.00 net. This includes new valves.

All Model FH Motors are equipped with a cylinder head gasket composed of copper and asbestos. While it is possible to use this part a second time it is advisable to use a new gasket when available. Place cylinder head in proper position on cylinder, insert screws, attaching magneto cable clip and upper blower clamp and draw to seat. Tighten all screws, a half turn at a time so as to bring head down evenly on the cylinder. Then insert intake pipe into cylinder head and tighten the carburetor screws.

Worn Piston Rings or Scored Cylinders

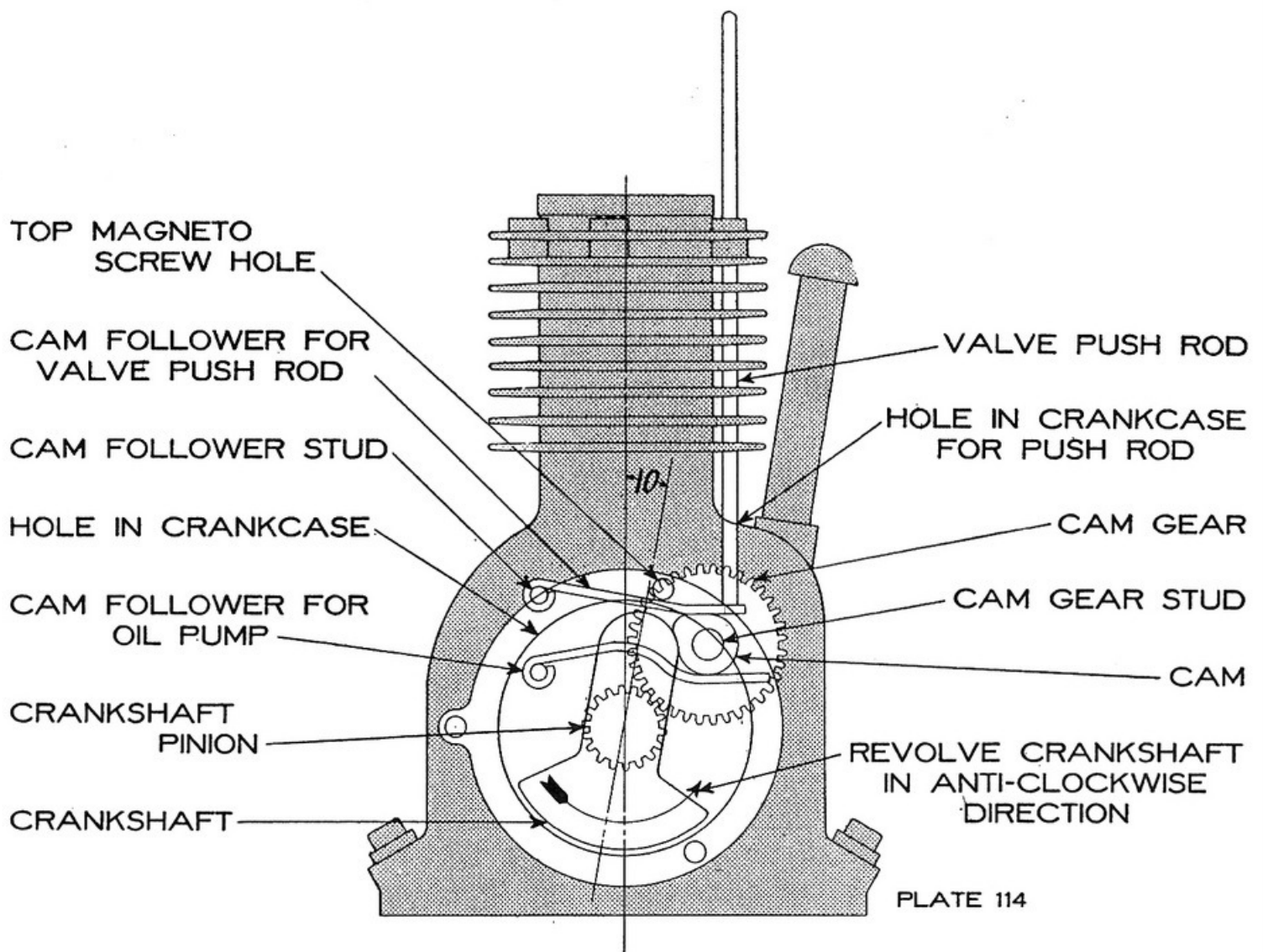
This condition can be identified by the sound of air rushing down into the crank case when point of compression is reached. This would only occur after long use of the motor unless the motor were run without sufficient oil, or with a poor grade or dirty oil or continuously overloaded.

In the condition, or whenever the motor does not perform satisfactorily and you have proper gasoline, ignition and compression at other points, we recommend that either a competent gas motor expert repair the motor, or it be returned to the factory for repairs.

If the motor is torn down, in no event use any gasket, except the copper and asbestos cylinder head gasket, a second time. Always use a new gasket.

Speed Regulation

The speed of the motor is set properly when leaving the factory, and there should be no need of adjustment unless the



VIEW LOOKING AT MAGNETO SIDE OF CRANK CASE AND CYLINDER

Figure 2—Timing Diagram

governing mechanism has been disarranged in transit. If it is necessary to change speed, proceed as follows:

Immediately in rear of carburetor will be found a double arm lever attached to a small stem entering carburetor. From one of these arms a wire extends to the governor in the flywheel. From the other arm a coil spring extends to a small bracket fastened to the crankcase by a screw. Loosen this screw and move bracket down to decrease speed, and up to increase the speed.

Timing

If the connecting rod has not been disassembled from the crank shaft, even though the motor has been otherwise disassembled, the timing gears will not be disengaged and the motor will not have to be retimed.

When taking the motor apart closely observe the relative position of the cam followers and other parts and how they are removed as this will be of great aid when again reassembling.

If the connecting rod has been disassembled from the crank shaft, the timing gears will have been disengaged, and when reassembling the motor the gears must be properly engaged, or the motor will not run. Referring to diagram, figure 2, will make timing instructions outlined in the following paragraphs, clearer.

After the connecting rod has been properly assembled to the piston by means of the piston pin, this pin being locked by the piston pin lock, the piston and connecting rod is inserted into the cylinder from the large opening in the crank case, from which the magneto was removed, meshing the pinion (small gear) on the crank shaft with the cam gear. This cam gear should be on its stud with the cam part of the gear toward the wall of the crank case. The cam followers should be on their studs, secured in place by cotter pins, with the free ends of the cam followers riding on the cam of the cam gear.

The cam follower for the valve push rod, or the shorter one of the two, is mounted on the upper stud. Care should be taken to mount same correctly. The free end should point upwards and rest on the upper side of the cam. The cam follower for the oil pump, or the long bent one, should be mounted on the lower stud and rest on the lower side of the cam.

Insert valve push rod through small hole in top of crank case, lower end of rod resting on cam follower. Revolve crank shaft to the left or anti-clockwise, at the same time holding push rod down on cam follower until the push rod just begins to rise. It will be best to do this several times so the exact spot may be determined. You will readily feel when the cam begins to push the cam follower and push rod up. If you have the timing gears properly meshed, the crank pin of the crank shaft, or, in other words, the part of the

crank shaft to which the connecting rod will be fastened, will be nearly in its topmost position. It will be to the right of its topmost position about 10° and will be pointing, nearly directly, towards the top one of the three screw holes in the crank case, in which the screws fit that fasten the magneto to the crank case.

If, when the push rod is just beginning to rise, the crank shaft is not in the correct position, pull it straight out toward you, disengaging the timing gears. Revolve it until it assumes the correct position described above, then push it straight in, engaging the timing gears. During this operation, be sure that the cam gear has not moved. If you should engage the gears incorrectly, even so little as one tooth, the position of the crank shaft, when the push rod begins to rise, will be so far wrong that it will be readily apparent.

After the gears have been meshed properly, assemble the connecting rod to the crank shaft, being sure that the screws holding the connecting rod cap in place are drawn down tightly and have lock-washers under each head.

New gaskets should be used when reassembling the motor.

To Stop Motor

Motor can be stopped in several ways. Intake valve can be held down, governor throttle can be moved to extreme left and when motor is equipped with a short circuiting switch the switch should be closed and held closed until the motor stops. Be sure short circuiting switch is open when attempting to start motor. It is very poor practice to stop the motor by choking the carburetor as this practice has a tendency to flood the motor with raw gasoline which washes the oil out of the piston and rings tending to make hard starting.

Operation And Care

Always use a good grade of high test gasoline and be sure there is a sufficient amount in the tank. Use the very best grade of cylinder oil of medium weight. Be sure oil is up to proper level.

Inspect spark plug frequently and keep points free from carbon. Set points with a gap of .020, or a little more than 1/64 of an inch.

Repairs

KEEP YOUR MOTOR CLEAN. THIS PROLONGS LIFE OF MOTOR AND INSURES SATISFACTORY OPERATION AT ALL TIMES.

We have attempted to describe in this booklet only those repair operations which might well be undertaken by the average man, with a slight mechanical skill. If it is necessary to undertake any serious repairs to the magneto, replace piston, piston rings, bearings or regrind cylinder, we recommend that the motor either be sent to an authorized Briggs & Stratton service station or to our factory for repairs. This should not be necessary until the motor has seen considerable service.

Ordering Parts

In order to avoid delay and unnecessary correspondence, the INSTRUCTIONS BELOW MUST BE CAREFULLY OBSERVED IN ORDERING PARTS. Do not order parts in the same letter you write on any other subject. Be sure to write plainly and legibly.

ALWAYS GIVE BOTH PART NUMBER AND DESCRIPTION OF PARTS, AND ALSO THE MODEL LETTER AND NUMBER OF THE MOTOR ON YOUR ORDER. Service orders cannot be filled unless these numbers are given. Motor number will be found on the name plate riveted to the Blower Case and is preceded by the model letter.

Description Of Parts

Select the part numbers by referring to both the list of parts and the illustrations of parts. Always refer to both the description and the illustration to make sure the proper part number is selected. If unable to determine the proper number of the part wanted describe it as fully as possible. Do not depend on the numbers cast on parts as being correct as they may only cover part of what you want if it is an assembly.

Shipping Instructions

Always specify on the order whether shipment is desired by parcel post, express or freight. In absence of specific instructions we will ship the cheapest way.

Remittance

SAVE TIME AND C. O. D. EXPENSES BY HAVING PROPER REMITTANCE ACCOMPANY EACH PARTS ORDER.

We will not ship any parts C. O. D. unless a deposit of more than twice the transportation charge has been made. Remittance must include sufficient to cover postage charge if to be shipped by mail as well as ten cents (\$0.10) to cover insurance. Any excess remittance will be refunded. **MINIMUM CHARGE FOR PARTS IS 25 CENTS PLUS POSTAGE AND INSURANCE.**

Remit either postoffice or express money order. Postage stamps will be accepted in amounts of less than one dollar (\$1.00) only.

Prices

All prices in this book are subject to change without notice. In case of changes in price, orders will be filled at current prices. All prices shown are F. O. B. our factory in Milwaukee, Wis. Prices higher in Canada.

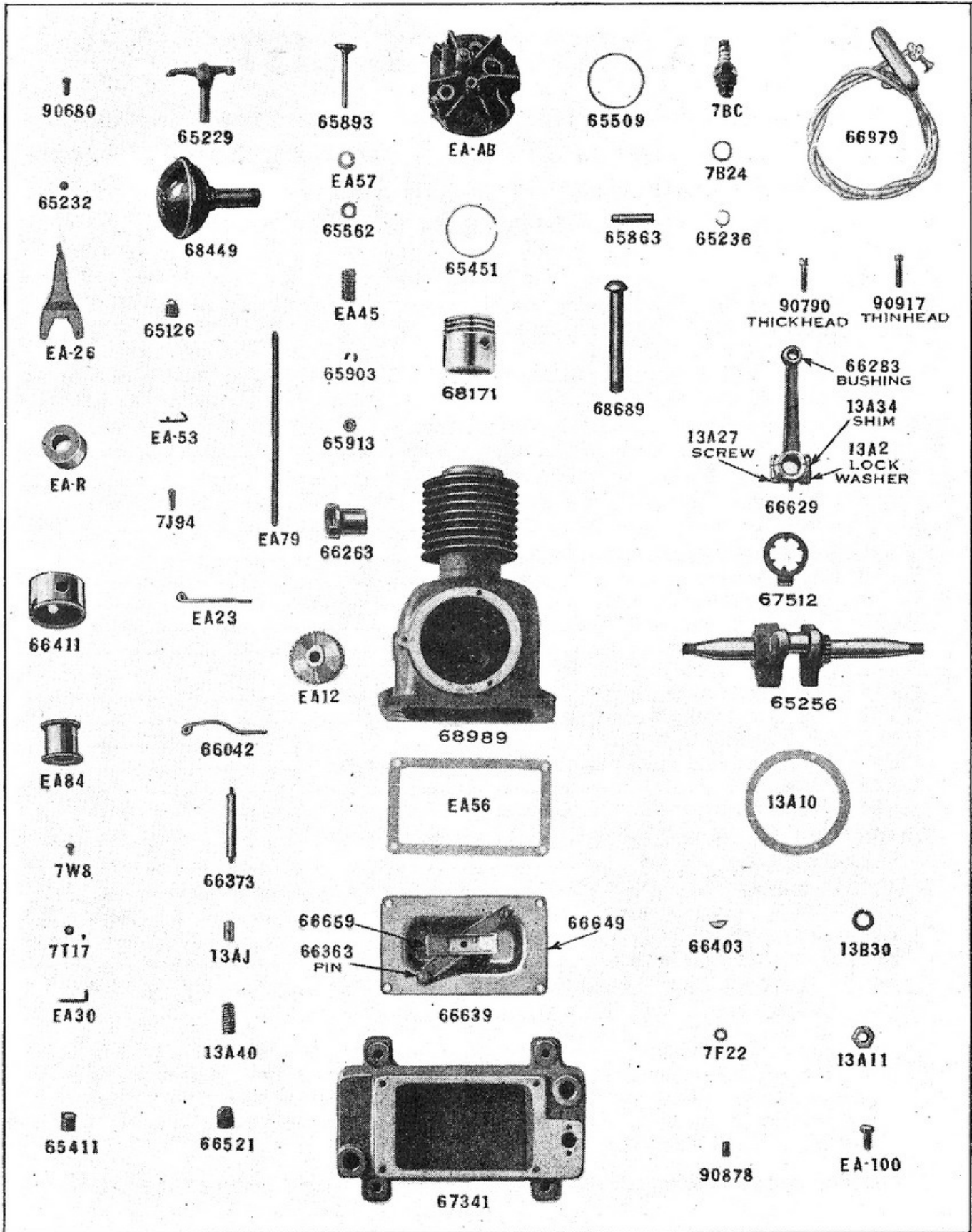
Instructions On Return Material

Never return any material to the factory without first receiving permission from us to do so, except incorrect shipment of parts, defective material returned for replacement or material returned for repairs at your expense.

Never return material to us without writing us a letter explaining what parts are being returned, the **motor number** and the reason for return. Mark the shipment both outside and by tag on the parts with your name and address. Do not include any instructions in package, however. All instructions must be sent by mail to insure prompt attention.

NO RETURN SHIPMENTS WILL BE ACCEPTED UNLESS RETURN TRANSPORTATION CHARGES ARE PREPAID. SEE GUARANTEE, PAGE 3.

FIGURE 3—Model "FH" Motor Parts



PARTS PRICE LIST

This list includes only parts used on standard Model FH Motors and should not be used to order parts for other Models. Always refer to the illustrations as well as this list.

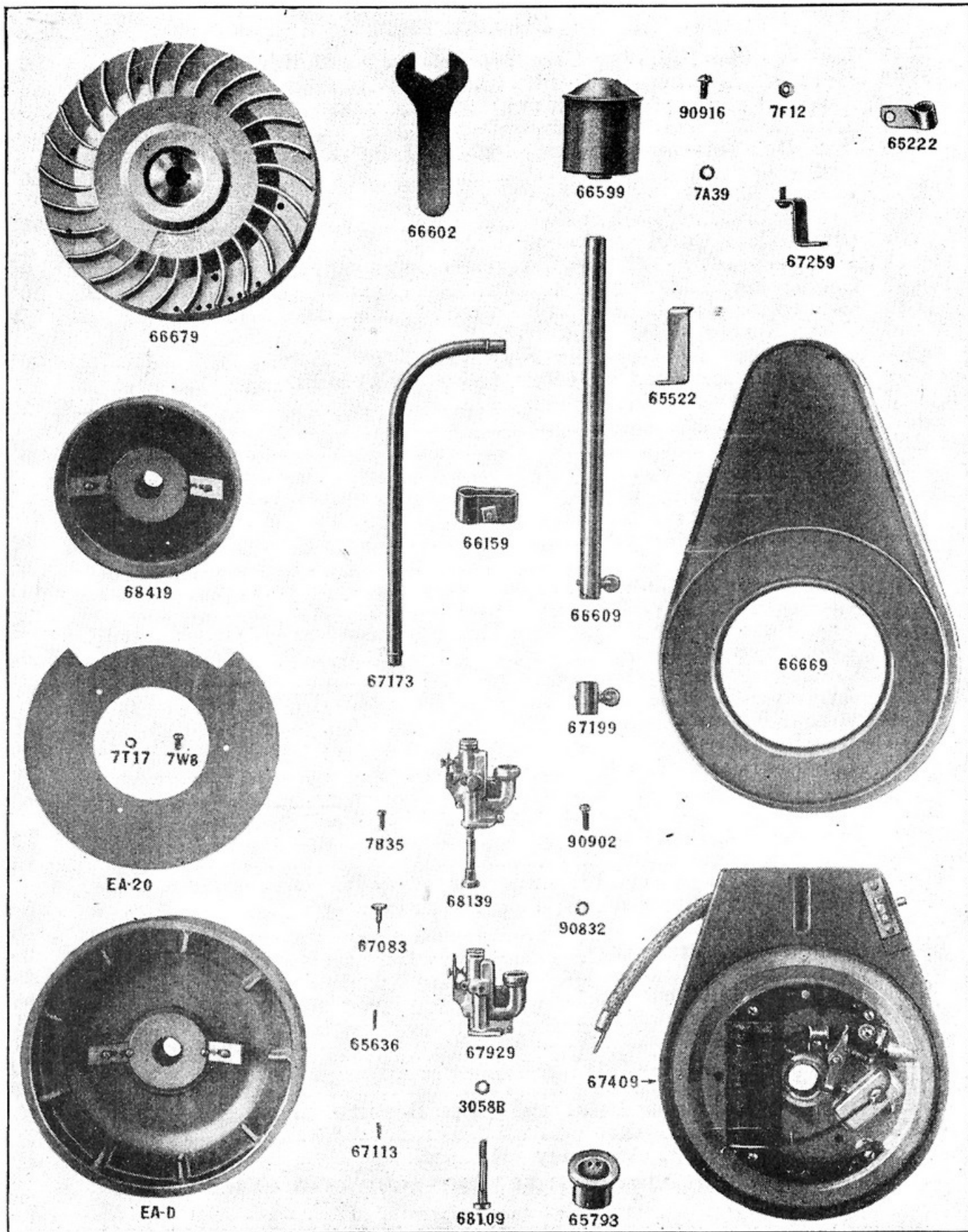
PRICES HIGHER IN CANADA

Part No.	DESCRIPTION	Price
EAAB †	Cylinder Head Assembly, consisting of EA2 Cylinder Head, EA15 Intake Valve, EA46 Intake Valve Spring, EA86 Intake Valve Collar, EA45 Exhaust Valve Spring, EA57 Valve Spring Gasket, 65562 Valve Spring Washer, 65893 Exhaust Valve, 65903 Exhaust Valve Sleeve, 65913 Exhaust Valve Sleeve Retainer.....	\$ 6.00
65299	Cylinder Head Assembly, consisting of EAAB Cylinder Head, 65229 Rocker Arm, 65232 Slug, 90680 Set Screw.....	7.60
EAD	Governor Flywheel Assembly, cast iron, consisting of EA4 Governor Flywheel, EA24 Weights, EA27 Washer, 90831 Escutcheon Pins	4.00
EAR	Governor Spool Assembly .....	.79
EA12	Cam Gear	1.50
EA20	Air Deflector .....	.20
EA23	Cam Follower for Valve Push Rod.....	.45
EA26	Governor Arm .....	.10
EA30	Throttle Spring Clip, Replaced by 68182.....	.10
EA45	Exhaust Valve Spring .....	.15
EA53	Throttle Link, Replaced by 65796 .....	.10
EA56	Oil Pan Gasket .....	.05
EA57	Valve Spring Gasket .....	.05
EA79	Push Rod .....	.10
EA84	Drive Pulley, 1¼" Diameter x 1⅛" Face Flanged Flat Belt	1.60
EA100	Cylinder Screw 5/16"—18 U. S. F. Thread x 1" lg. Hexagon Head Cap Screw .....	.05
EA117	Gasoline Filler Pipe Plug, ⅜". If ½" plug required Order 66521	.10
7A39	Blower Case Clamp Lockwasher .....	.01
7BC	Spark Plug with 7B24 Gasket .....	.75
7B24	Spark Plug Gasket .....	.05
7B35	Fill. Head Cap Screw No. 10-32 U. S. F. Thread x ½" lg. for Carburetor .	.01

†Cylinder Head only furnished complete with both valves. Intake Valve should not be ordered separately unless customer has facilities for spinning or riveting same to head. If valves are ordered separately they must be ground in the head before being used. See paragraph headed "Cylinder Head and Valves".

MOTOR SERIAL NUMBER MUST BE MENTIONED WHEN ORDERING PARTS.

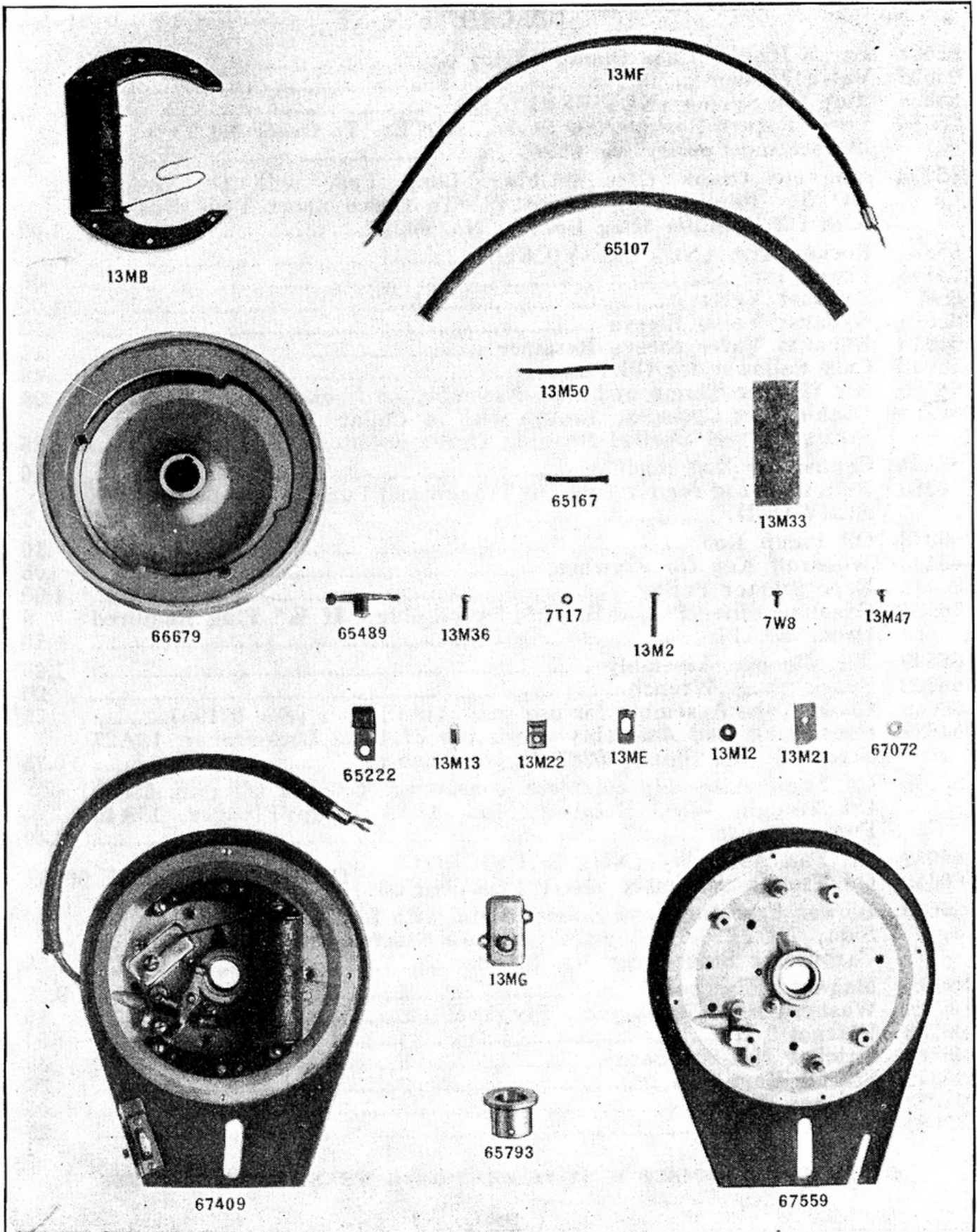
FIGURE 4—Model "FH" Motor Parts



Part No.	DESCRIPTION	Price
7F12	Nut for upper Blower Case Bracket— $\frac{1}{4}$ "—20 Hex Nut.....	.05
7F22	Cylinder Lockwasher, $\frac{5}{16}$ " Hole .....	.01
7J94	Cotter Pin for Cam Follower .....	.01
7T17	Lockwasher, $\frac{3}{16}$ " for Air Deflector .....	.01
7W8	Fill. Head Machine Screw No. 10-32 U. S. Thread x $\frac{3}{8}$ " lg. for Air Deflector .....	.05
13AJ	Pump Plunger (NOT SERVICED)	
13A2	Connecting Rod Lockwasher .....	.01
13A10	Crank Case Cover Gasket .....	.10
13A11	Flywheel Nut $\frac{9}{16}$ "—18 Thread Hexagon Nut.....	.20
13A27	Connecting Rod Screw .....	.05
13A34	Connecting Rod Shim .....	.10
13A40	Pump Spring (NOT SERVICED)	
13B30	Lockwasher for Governor Flywheel— $\frac{9}{16}$ " Hole .....	.05
13MB	Armature Replaced by 69020 (NOT SERVICED) See Page 29.....	
13ME	Contact Bracket with Point .....	.50
13MF	Ignition Cable .....	.50
13MG	Condenser	1.50
13M2	Armature Core Screw (NOT SERVICED)	
13M12	Bracket Bushing Replaced by 65194 Bakelite Washer and 796E Fiber Washer	
13M13	Breaker Arm Spring .....	.05
13M21	Bracket Shim .....	.05
13M22	Ignition Cable Clamp .....	.05
13M33	Coil Insulator (NOT SERVICED)	
13M36	Fill. Head Screw No. 10-32 U. S. F. Thread x $\frac{5}{8}$ " lg. for 13ME Contact Bracket .....	.05
13M47	Condenser Screw (NOT SERVICED)	
13M50	Armature Lead Insulator 3" lg. (NOT SERVICED)	
796E	Round Fibre Washer .....	.05
3058B	Gasoline Pipe Nut .....	.05
65107	Ignition Cable Sleeve .....	.10
65126	Throttle Spring .....	.15
65167	Condenser Lead Insulator $1\frac{3}{4}$ " lg. (NOT SERVICED).....	
65194	Square Bakelite Washer .....	.05
65222	Ignition Cable Clamp .....	.15
65229	Rocker Arm Assembly consisting of 65861 Rocker Arm, 65281 Rocker Arm Fork, 65303 Rocker Arm Pin.....	1.50
65232	Slug for 90680 Set Screw .....	.02
65236	Piston Pin Lock Ring .....	.05
65256	Crankshaft	8.00
65281	Rocker Arm Fork .....	.90
65303	Rocker Arm Pin .....	.10
65367	Felt Washer .....	.01
65411	Oil Filler Pipe Plug $\frac{3}{8}$" .....	.10
65451	Piston Ring .....	.55
65489	Breaker Arm with Point and Fibre Bushing .....	.75
65509	Cylinder Head Gasket .....	.10
65516	Spring for Pawl Assembly .....	.10

MOTOR SERIAL NUMBER MUST BE MENTIONED WHEN ORDERING PARTS.

FIGURE 5—Model "FH" Magneto Parts



Part No.	DESCRIPTION	Price
65522	Large Blower Case Clamp (Side) .....	.15
65562	Valve Washer .....	.05
65636	Stop Pin Spring (NOT SERVICED)	
65736	Lever Return Spring New Style. NOTE: To Order old Type, not illustrated Specify No. 65586 .....	.35
65793	Magneto Crank Case Bushing, Long Type with Oil Groove. NOTE: Replaced by No. 68243. To Order Short Type Bushing with Oil Retainer Ring Specify No. 69282.....	1.00
65861	Rocker Arm (NOT SERVICED)	
65863	Piston Pin .....	.60
65893	Exhaust Valve	1.00
65903	Exhaust Valve Sleeve .....	.10
65913	Exhaust Valve Sleeve Retainer .....	.15
66042	Cam Follower for Oil Pump .....	.45
66159	Air Cleaner Clamp and Bolt Assembly or Choke Tube Clamp.....	.20
66263	Bushing for Cylinder. Bronze with $\frac{3}{4}$ Collar. NOTE: To Replace Straight Steel Shelled Bushing Order 68453.....	1.25
66283	Connecting Rod Bushing .....	.40
66363	Retainer Stud for riveting Oil Trough and Pump Assemblies (NOT SERVICED)	
66373	Oil Pump Rod .....	.10
66403	Woodruff Key for Flywheel .....	.05
66411	Rope Starter Pulley	1.00
66521	Gasoline Filler Plug-drilled, $\frac{1}{2}$ " pipe plug. If $\frac{3}{8}$ " Plug Required Order EA117 .....	.10
66599	Air Cleaner Assembly	1.25
66602	Spark Plug Wrench .....	.20
66609	Choke Tube Assembly for use with Air Cleaner (See 67199).....	.75
66629	Connecting Rod Assembly consisting of 13A2 Lockwasher, 13A27 Screw, 13A34 Shim, 66283 Upper Bushing	3.75
66639	Oil Pump Assembly complete, consisting of 66649 Oil Pan, 66659 Oil Trough, 66363 Retainer Stud, 13AJ Pump Plunger, 13A40 Pump Spring	2.40
66649	Oil Pan Assembly (NOT SERVICED) } ORDER COMPLETE 66639	
66659	Oil Trough Assembly (NOT SERVICED) }	
66669	Blower Case for Rope Starter Type with Stop Switch on Exhaust Side. NOTE: To Replace for Rope Starter with Stop Switch on Carburetor Side Order No. 69083.....	1.35
66679	Magneto Flywheel	9.20
66753	Washer for 66679 Magneto Flywheel .....	.10
66733	Ratchet .....	.60
66743	Ratchet Nut-Standard .....	.30
66979	Starter Rope .....	.30
67072	Bracket Washer .....	.05
67083	Needle Valve .....	.25

MOTOR SERIAL NUMBER MUST BE MENTIONED WHEN ORDERING PARTS.

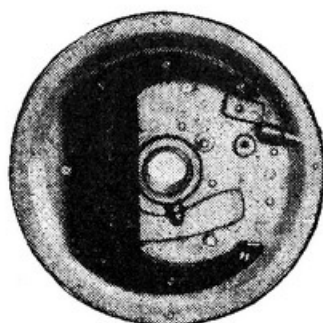
Due to some difficulty experienced in the field by users attempting to install the 13MB or 69020 armature, we can no longer furnish this part separate. If it is necessary to replace the 13MB or 69020 armature, the complete magneto assembly should be returned to our plant for repair or you can purchase a 69053 armature and magneto plate assembly.

If you purchase a 69053 armature and magneto plate assembly rivets are furnished with the assembly so that you can install the blower back plate to the magneto plate. Take particular notice of the position in which the blower back plate is riveted to the magneto plate so that no trouble will be encountered in riveting the back plate to the replacement part correctly. If the blower back plate is equipped with a stop button it will be necessary to disconnect the wire from the contact bracket. When resoldering the wire be sure it is put in the same position as before, otherwise there is a possible chance of making a short circuit which will prevent the motor from starting.

One thick and two thin 13A10 magneto crankcase gaskets are also furnished to enable you to install the magneto properly and allow the correct amount of end play of the crankshaft. The end play should be .004 to .008 of an inch.

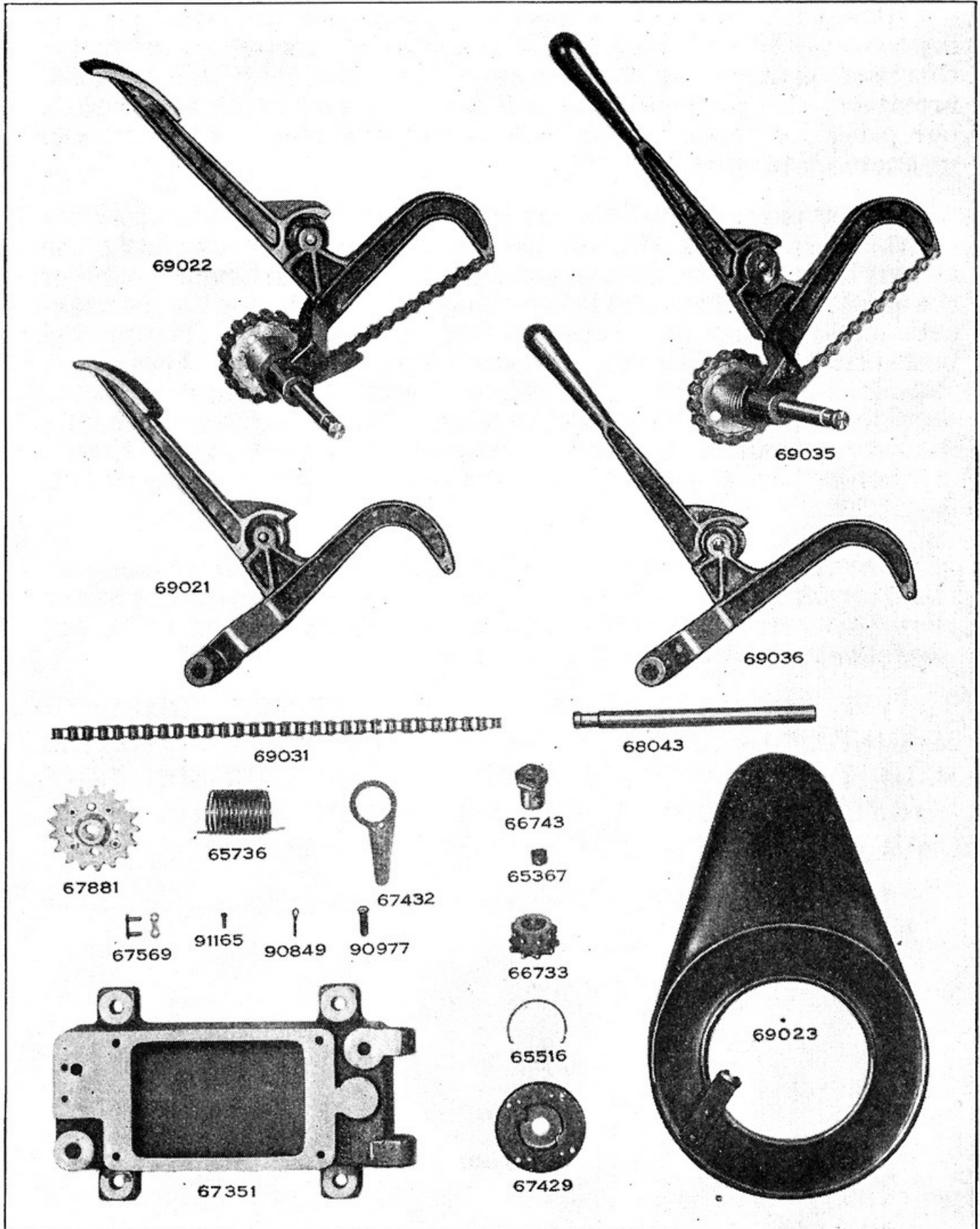
WE RECOMMEND THAT YOU RETURN COMPLETE MAGNETO ASSEMBLY WITH FLYWHEEL TO US FOR REPAIR SO THAT WE CAN MAKE TEST OF YOUR COMPLETE MAGNETO ASSEMBLY. WE GIVE PROMPT SERVICE ON REPAIR WORK SENT TO OUR PLANT.

69053 Armature and Magneto Plate Assembly.....\$7.40



69053

FIGURE 6—Model "FH" Starter Parts



Part No.	DESCRIPTION	Price
67113	Stop Pin (NOT SERVICED)	
67159	Choke Tube—Standard	1.00
67173	Intake Pipe .....	.75
67199	Short Choke Tube Assembly. NOTE: To order long bent Choke Tube Assembly which extends around Cylinder thru to Exhaust side, Specify 67159. To Order Short Bent Choke Tube Assembly Specify 67579 .....	.65
67259	Upper Blower Case Bracket with Screw. NOTE: If Bracket and Screws Separat Order Bracket 65542 with Screw 90916 and lock-washer 7A39 .....	.15
67341	Gasoline Base—Standard (For Rope Starter Type Motor).....	6.00
67351	Gasoline Base—Standard (For Hand Lever or Foot Starter Type Motor)	6.00
	NOTE: For long type, one gallon base (uses 68499 carburetor) Order 67531	9.00
	Specify 67541 for square type one gallon base with pockets on side for flywheels (uses 68509 carburetor).....	8.00
67409	Magneto Assembly, complete with Air Guide and Stop Switch on Exhaust Side. NOTE: To replace with switch on carburetor side order 68379	12.00
67429	Pawl Assembly with 65516 Spring. NOTE: If Pawl Assembly is required with Stud on face, Specify "67429 WITH STUD".....	.70
67432	Spring Lock .....	.10
67512	Crankshaft Thrust Washer .....	.05
67559	Crank Case Cover with Air Guide and Stop Switch (NOT SERVICED)	
67569	Chain Connecting Link .....	.02
67881	Sprocket . .....	.15
67929	Carburetor Sub-Assembly, consisting of Carburetor Body riveted together, 67083 Needle Valve, 67113 Stop Pin, 65636 Spring.....	2.00
68043	Starter Shaft .....	.35
68109	Gasoline Pipe—For use with 67341 and 67351 Base.....	.45
68139	Carburetor for use with Standard 67341, and 67351 Base, including 68109 Gasoline Pipe, 3058B Nut and 67929 Sub-Assembly.....	2.50
	NOTE: For one gallon base 67531 order carburetor 68499 with 3 1/8" gasoline pipe. Otherwise same as 68139.....	2.50
	Specify 68509 carburetor with 3 5/8" gasoline pipe for 67541 one gallon gasoline base	2.50
68161	Oil Regulating Ring .....	.55
68171	Piston with 2-65236 Piston Pin Locks.....	2.50
68419	Governor Flywheel Housing, Stamped Steel.....	1.25
68449	Muffler Assembly	2.50
68689	Breather Tube	1.90
68989	Cylinder assembly, consisting of 67901 cylinder, 66263 bushing, EA62 Cam Follower Studs, EA63 Cam Gear Stud, EA118 Taper Pin and 67023 Bushing Retainer Pin. NOTE: Replaced by 69093 (Has Screw Holes for EA20 Air Deflector).....	12.75
	NOTE: Same Assembly without Screw Holes is 69097.....(Continued on Page 32).....	12.75

MOTOR SERIAL NUMBER MUST BE MENTIONED WHEN ORDERING PARTS.

Part No.	DESCRIPTION	Price
69093	cylinder assembly with new style 68689 breather tube is	
69279	.....	13.50
69097	cylinder assembly with new style 68689 breather tube is	
69280	.....	13.50
69021	*Foot Pedal and Lever Assembly-Standard-Consisting of 67851 Starter Lever, 66851 Starter Pedal, 66492 Washer, 90354 Lock Washer, 91176 Cap Screw and 7T45 Nut (See Note at Bottom of Page)	1.75
69022	*Foot Pedal Starter Unit Assembly-Standard-Consisting of 69021 pedal and lever assembly, 67569 master link, 67881 starter sprocket, 68043 starter shaft, 90849 cotter pin, 69031 chain, 67432 spring lock, 65736 lever return spring and 91165 round head iron rivet. (See Note at Bottom of Page).....	4.15
69023	Blower case assembly for foot or hand lever starter type motor with stop switch on exhaust side. NOTE: To replace for Foot or hand lever starter with Stop Switch on Carburetor side order 69066	1.10
69031	Chain . .....	.90
69035	Hand lever starter unit assembly consisting of 69036 handle and lever assembly, 67569 master link, 67881 sprocket, 68043 starter shaft, 90849 cotter pin, 69031 chain, 67432 spring lock, 65736 lever return spring and 91165 round head iron rivet.....	4.15
69036	Starter handle and lever assembly consisting of 67851 lever, 67731 starter handle, 66492 washer, 90354 lockwasher, 91176 cap screw and 7T45 nut	1.75
69052	Piston Assembly consisting of 68171 Piston, 2-65451 Rings, 1-68161 Oil Regulator Ring and 2-65236 Piston Pin Lock Rings.....	4.15
	NOTE: For .010 Oversize order 69160; For .020 Oversize order 69163; For .030 Oversize order 69164.....	4.15
69053	Armature and Magneto Plate Assembly.....	7.40
90680	Rocker Arm Set Screw .....	.05
90699	1/4" Lockwasher for Throttle Spring Clip.....	.01
90790	Cylinder Head Screw 5/16"—U. S. F. Thread x 1 1/4" lg., Fill. Head (Thick Head) .....	.05
90832	Lockwasher for Magneto Crank Case Cover Plate.....	.01
90849	3/32" Dia. x 3/4" lg. Steel Cotter Pin.....	.01
90878	Drain Pipe Plug, 1/4" .....	.05
90902	Fill. Head Machine Screw, 1/4"—20 x 5/8" lg. for Crank Case Cover	.05
90916	Round Head Machine Screw, 1/4"—20x1/2" lg., Blower Case Clamp	.05
90917	Cylinder Head Screw, 5/16"—18 U. S. F. Thread x 1 1/4" lg. Fill. Head Cap Screw (Thin Head) .....	.05
90977	5/16"—18 x 3/4" lg. Square Head Cup Point Set Screw.....	.05
91083	Gasoline Filler Plug—1/2" Pipe Plug.....	.10
91165	Round head iron rivet .....	.01
91196	1/4" 20 U. S. F. Thread. Fill. Head Machine Screw for Throttle Spring Clip. ....	.05

MOTOR SERIAL NUMBER MUST BE MENTIONED WHEN ORDERING PARTS.

*If foot pedal on your motor is not straight as illustrated under 69021—69022, when ordering, specify in addition to 69021—69022, whichever required, the number cast on side of foot pedal. Also be sure to specify your motor number for further identification.