A, AP, ARG

208250 and up

OPERATING AND MAINTENANCE MANUAL

WITH PARTS CATALOG

For Briggs & Stratton Engine

MODELS

"A" — "AP" — "ARG"

TYPE NUMBERS FROM 208250 AND UP

BRIGGS & STRATTON

MANUFACTURED BY
BRIGGS & STRATTON CORPORATION
MILWAUKEE 1, WISCONSIN, U.S.A.

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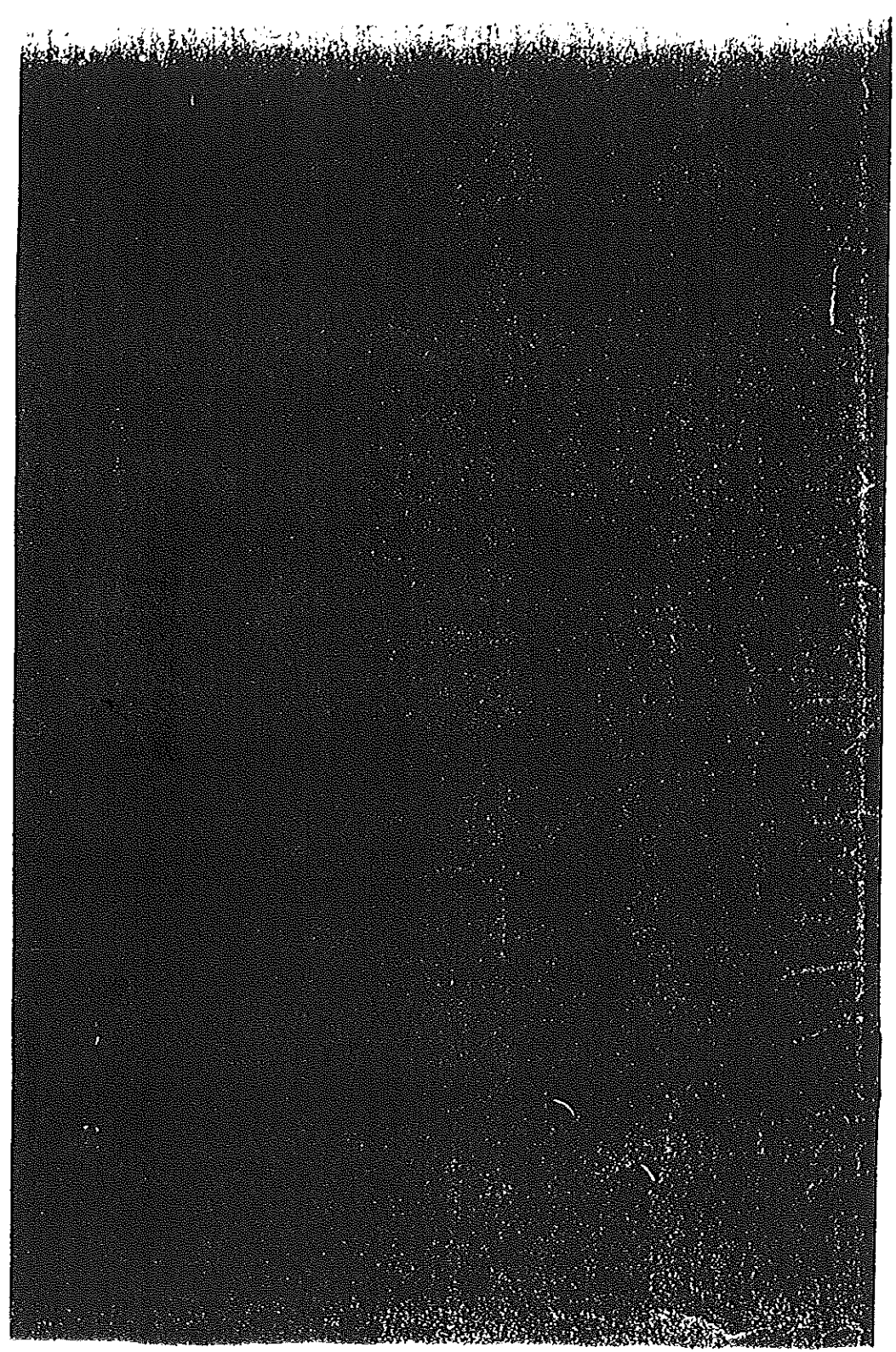

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INTRODUCTION

This book has been especially prepared to cover the Briggs & Stratton Engines listed on the cover and is published for the information and guidance of all concerned.

THERE IS A RIGHT WAY TO OPERATE THIS ENGINE. THIS BOOK TELLS YOU HOW.

Guessing how to run it may cause failure to receive the maximum in performance and dependable service originally built into this engine. Each engine has been carefully tested and adjusted at the factory before packing for shipment, and if correctly operated will perform efficiently and economically.

This book is divided into four sections, namely:

1. GENERAL, contains information that you should know regarding the principal specifications and design of the engine.
2. OPERATOR'S SECTION, contains instructions necessary for starting and operating the engine in the field.
3. MAINTENANCE SECTION, consists of instructions pertaining to actual repairs such as are conducted in the repair shop.
4. PARTS SECTION, includes exploded views of the various engine assemblies and component parts, parts list, and prices.

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CAUTION!

EXHAUST GASES CONTAIN CARBON MONOXIDE WHICH IS ODORLESS AND A DEADLY POISON. PROPER CARE MUST BE TAKEN TO PROVIDE EFFICIENT VENTILATION.

ALWAYS MAINTAIN PROPER OIL LEVEL IN CRANKCASE AND AIR CLEANER.

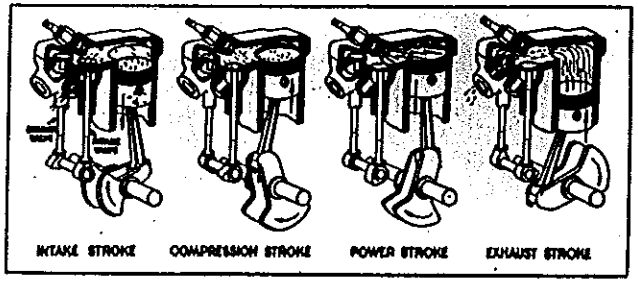
DON'T FILL THE GASOLINE TANK WHILE THE ENGINE IS RUNNING. AVOID SPILLING GASOLINE ON A HOT ENGINE —THIS MAY CAUSE AN EXPLOSION AND SERIOUS INJURY.

GENERAL INFORMATION

This engine is a single cylinder, L-Head air cooled type; bore 2¼" and stroke 2¼" having a piston displacement of 8.95 cubic inches. It is rated at 1¾ horsepower at 2,200 to 3,200 R. P. M.

It is of the same basic 4-cycle design used in automobiles, aircraft, trucks, and tractors. As the name indicates, there are four strokes to one complete power cycle:

THE 4-STROKE CYCLE
Plate No. 1



a. INTAKE STROKE: The piston goes down, creating a vacuum in the cylinder which draws gas through open intake valve into the space above the piston.

b. COMPRESSION STROKE: The piston comes up with both valves closed, highly compressing the gas into the space left between the top of the piston and cylinder head.

c. POWER STROKE: At this point the magneto sends high tension current to the spark plug, firing or exploding the compressed gas and driving the piston down.

d. EXHAUST STROKE: Exhaust valve opens and the upward stroke of the piston forces out all of the burnt gases, thus completing the power cycle.

Ignition is supplied by a high tension magneto built into the flywheel. The spark plug is 18mm.

Lubrication is supplied by a pump built into the base of the engine which furnishes positive lubrication to all moving parts. Oil reservoir capacity is three pints.

The gasoline tank holds five quarts. The carburetor is float feed, ~~gravity~~ type, adjustable.

The governor is adjustable mechanical type.

Two valves are employed: one Intake and one Exhaust.

The piston and connecting rod are made of aluminum alloy. Crankshaft is a drop forging, counterweighed to ~~eliminate~~ reduce vibration.

Air cleaner is an efficient oil bath type.

This engine has been substantially built. It is made of high grade materials by skilled workmen, in a factory fully equipped with the most modern machinery. Before it was shipped, it received many tests and careful inspections.

OPERATOR'S SECTION
STARTING AND OPERATING INSTRUCTIONS

1. PREPARATION FOR USE.

a. Before starting the engine, fill the crankcase with "Mobiloil Arctic" or other high grade oil not heavier than S. A. E. No. 30 for operating the engine in temperatures of 32° F. or above. For temperatures of 32° to 0° F. use "Mobiloil Arctic" or other high grade oil not heavier than S. A. E. No. 10. For sub-zero temperatures mix kerosene with oil as follows:

0° to — 10° No. 10 with 10% Kerosene
— 10° to — 20° No. 10 with 20% Kerosene
— 20° to — 30° No. 10 with 30% Kerosene

UNDER NO CIRCUMSTANCES SHOULD A GREATER PROPORTION OF KEROSENE BE USED THAN ABOVE SPECIFIED. No kerosene should be used for operating at temperatures above 0° F. The oil filler plug is painted blue and is located on top of engine base. See Plate 2. With the engine standing level pour oil in opening until it rises to the top of filler plug opening. The crankcase holds three pints.

b. Fill air cleaner with oil of the same viscosity as used in the crankcase and fill to the indicated oil level.

c. Fill the fuel tank with a good grade of regular, clean, fresh gasoline. The tank holds five quarts. DO NOT MIX OIL WITH GASOLINE.

2. HOW TO START ROPE STARTER.

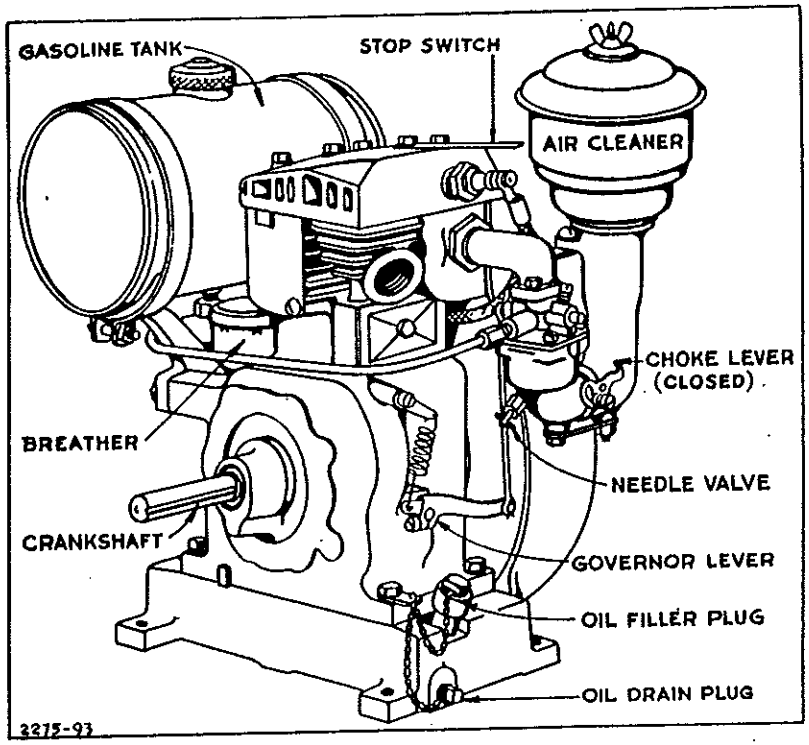
a. Open gasoline shut-off valve in gas filter by turning to left or in a counter-clockwise direction.

b. Completely close carburetor choke by moving choke lever in a clockwise direction.

c. Wind the starter rope around the starter pulley with the knot in the pulley notch. Pull the rope with a quick steady pull to spin the magneto flywheel with choke fully closed to prime the engine. Then open choke about one-eighth and repeat operation.

d. After the engine warms up, gradually open choke valve in a counter-clockwise direction until engine runs smoothly with the choke wide open. Operate the choke the same as you do on an automobile. (A warm engine does not require as much choking as a cold one.)

MODEL "A" BRIGGS & STRATTON ENGINE
Plate No. 2



FOOT PEDAL STARTER.

e. Step down on pedal quickly with choke closed to prime the engine. Then operate choke as in paragraph d.

3. FAILURE OF THE ENGINE TO START.

Cold weather causes the oil in the crankcase to become thick and the gasoline less volatile. Should you experience trouble in starting after spinning the engine several times with the choke closed, be sure to check the spark plug — see that it is clean and the points set to .025". If the engine fails to start after a reasonable number of trials, do not make any adjustments until you have studied the Engine Trouble Chart on following page.

4. HOW TO STOP.

a. Press the stop switch mounted on the cylinder head against the end of the spark plug. Hold until engine stops firing.

b. To stop engines fitted with ignition shielding — press red stop switch located on blower case.

c. Close the fuel shut-off valve so that gasoline will not spill out through carburetor when handling the engine.

5. USE CLEAN GASOLINE. A good grade of regular gasoline is recommended. Be sure the vent hole in the top of the fuel tank is open, for air must enter the tank to allow the gasoline to flow to the carburetor.

6. DO NOT MIX OIL WITH GASOLINE. This engine is provided with an efficient pump lubrication system which forces a stream of oil to all moving parts. There are no external parts which require separate oiling.

7. USE THE RIGHT KIND OF OIL. (See Paragraph 1.)

8. ADD OIL REGULARLY. After each 5 hours of operation, fill the crankcase to the top of the blue filler plug opening.

9. CHANGE OIL FREQUENTLY. After each twenty-five hours of engine operation, the oil should be completely drained from the crankcase. Do not remove engine from its mounting base. Remove the yellow oil drain plug, located at end of engine base, and let the oil flow into a pan or other receptacle you use. Do not flush out with kerosene. Replace the drain plug, refill with fresh oil, and replace the blue filler plug.

10. KEEP THE ENGINE CLEAN. It will pay you to keep the engine clean both inside and outside. See that no dirt or water enters engine when filling with oil or gasoline. As a precautionary measure always wipe off the fuel cap and oil filler plug, as well as around them before refilling. Dirt in the engine or fuel tank will cause trouble and even serious damage. Also be sure to remove any dirt or grass that may accumulate in the flywheel housing or between cylinder fins.

STORAGE INSTRUCTIONS

Engines stored any length of time should be completely drained of fuel to prevent gum deposits forming on essential parts such as the carburetor, fuel filter, fuel lines, and tank.

Such deposits may affect the operation of the engine when again used. Therefore, it is important that the following instructions be adhered to before storing the engine:

a. Remove filter bowl, open shut-off valve and drain tank completely.

b. Operate engine until it stops from exhaustion of fuel.

c. Replace filter bowl.

d. Leave shut-off valve open.

MAINTENANCE SECTION

ENGINE TROUBLE CHART

ENGINE DIFFICULT TO START

1. No fuel in tank.
2. Fuel flow obstructed.
3. Loose or defective wiring.
4. Spark plug cracked.
5. Spark plug fouled.
6. Improper choking.
7. Improper fuel mixture.
8. Throttle valve stuck or out of adjustment.
9. Throttle rod loose.
10. Valve seats bad.
11. Valves sticking.
12. Timing improper.
13. Defective magneto.
    a. Breaker points worn or pitted.
    b. Breaker points out of adjustment.
    c. High tension wire shorted.

ENGINE MISSING

1. Spark plug fouled.
2. Spark plug cracked.
3. Spark plug gap wrong.
4. Defective wiring.
5. Ignition breaker points sticking.
6. Valves warped, broken, or sticking.

ENGINE [illegible]

1. Carburetor choke valve partly closed.
2. Improper fuel mixture.
3. Piston rings sticking.
4. Improper timing.
5. Muffler clogged.
6. Governor or throttle loose.
7. Air cleaner requires cleaning.
8. Overload.

ENGINE KNOCKS

1. Carbon in cylinder.
2. Loose main bearings.
3. Loose rod bearings.
4. Worn piston and cylinder.
5. Engine overheated.
6. Tight pistons.
7. Loose flywheel.
8. Lack of oil.

FAULTY CARBURETION

1. Carburetor improperly adjusted.
2. Inlet valve leaking.
3. Shut-off valve closed.
4. ~~Using too much~~ Fuel.
5. Sediment in fuel tank.

EXCESSIVE SMOKE FROM EXHAUST

1. Carburetor needle valve open too far.
2. Carburetor float sticking or leaking.
3. Worn piston or piston rings.

EXPLOSION IN CARBURETOR

1. Gas mixture too lean.
2. Intake valve sticking.
3. Intake tappets sticking.
4. Intake valve spring weak.
5. Intake valve warped or broken.
6. Intake tappets set too close.

POOR COMPRESSION

1. Valves not seating.
2. Valves sticking.
3. Piston rings worn or weak.
4. Piston rings broken.
5. Piston rings sticking.
6. Loose spark plug.
7. Cylinder head loose.
8. Scored cylinder.
9. Worn piston and cylinder.
10. ~~Cracked spark~~ plug.

4. Cooling air stream

SERVICING REFERENCE CHART

DISASSEMBLING THE ENGINE

11. To facilitate the complete disassembly of the engine for major repairs or general overhaul, the following procedure for removing the parts is recommended:

1. Drain oil and fuel.
2. Remove air cleaner, brace, and elbow.
3. Remove muffler.
4. Disconnect fuel line at carburetor.
5. Remove fuel tank and filter.
6. Remove spark plug, using wrench supplied with engine.
7. Remove cotter pin which holds link attached to governor arm.
8. Remove screws (2) which hold carburetor to elbow and remove carburetor.
9. Remove carburetor elbow and baffle plate.
10. Remove cylinder head.
11. Remove valve cover plate and gasket.
12. Remove valve, springs, and retainer.
13. Unhook governor spring from arm.
14. Remove blower case.
15. Remove rope starter pulley.
16. Remove flywheel.
17. Remove engine base.
18. Remove oil pump.
19. Remove piston and connecting rod.
20. Remove piston pin and rings.
21. Remove magneto plate.
22. Slide crankshaft out through magneto side.
23. Drive out cam shaft and remove gear and tappets.
24. Remove governor lever from crankcase, and remove governor assembly.

Check each item as removed to determine its condition. On following pages you will find instructions covering these items including repair procedure, allowable tolerances, etc., to determine if parts are suitable for further use or must be replaced with new ones.

THE FUEL SYSTEM

12. **AVOID GUMMY GASOLINE.** If you experience trouble with a gummy, sticky substance with a sharp obnoxious odor, change to fresh gasoline. This gum comes from the gasoline and clogs the carburetor, fuel line, fuel tank, etc. You can check the gasoline by evaporating a half pint in an open dish. If a quantity of gum remains, try another kind of gasoline that is fresh and clean.

13. **YOU CAN AVOID MOST TROUBLE FROM GUM IF YOU WILL KEEP THE FUEL TANK FULL WHEN NOT USING THE ENGINE.** If you use it only occasionally, drain tank completely and refill when the engine is used again. The reason for this is that evaporation of gasoline causes most gum deposits.

14. **TO CLEAN THE FUEL LINES.**

a. Close the shut-off valve in the fuel filter by turning lever to the right.

b. Disconnect fuel line at filter.

c. Blow through fuel line to clear it.

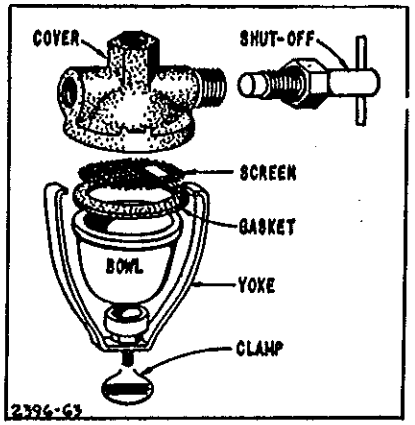
15. **TO CLEAN FUEL FILTER.** (See Plate No. 3.)

a. Loosen thumb screw below filter bowl.

b. Remove and clean filter bowl and screen.

c. Open shut-off valve to see if fuel flows freely from the tank. IMPORTANT: If you find a gummy, varnish-like substance use alcohol or acetone to dissolve it. (See Paragraphs 12 and 13.)

Fuel Filter — Plate No. 3



16. **TO CLEAN FUEL TANK CAP.** Be sure that the small vent hole in the fuel tank cap is not clogged up, for air must enter the tank to allow the gasoline to flow to the carburetor. Test by blowing through top of cap.

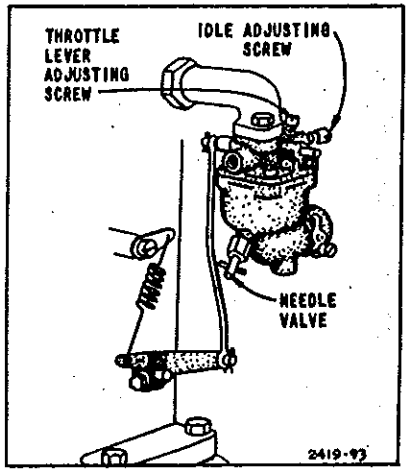
17. **CORRECT USE OF CHOKE.** The correct carburetor setting (see Paragraph 19) gives the engine the best mixture to run on when it is hot. When cold it is necessary to choke the carburetor to get a rich mixture, because cold gasoline does not vaporize readily. A warm or hot engine requires very little choking. Until you become familiar with the engine, you may make the mistake of not choking the carburetor enough or you may choke it too much. If engine fails to start after three or four attempts with the choke open, try a few times with the choke part-way open and then all the way open.

18. **THE CARBURETOR.** The carburetor on this engine is of the [illegible] type. The gasoline is regulated by a needle valve. The throttle is automatically controlled by a governor. (See Paragraphs 25-26.)

19. **TO ADJUST THE CARBURETOR.**

a. Completely close needle valve by turning to right, or in a clockwise direction, as far as possible. (See Plate No. 4.) Do not screw up too tight or use force when closing as needle valve may be damaged.

Carburetor Hook-up — Plate No. 4



b. From closed position, open needle valve one to one and one-quarter turns.

c. After the engine has been started and warmed up make a final adjustment with the choke wide open by turning the needle valve to the point at which engine operates most smoothly with full load. This setting will also take care of starting with use of the choke.

d. If it is necessary to keep choke partially closed several minutes before engine

runs smoothly, carburetor setting is too lean and needle valve should be opened a notch or two . . . turn to left. For governor adjustments see Paragraphs 25-26.

e. The idle adjustment screw setting is about a half to three-quarters of a turn open. Do not force screw against seat or you will damage both.

f. The throttle lever adjustment screw is set at the factory to permit an idling speed of about 1,200 R. P. M. If you want to idle the engine at a higher speed than 1,200 R. P. M. turn the throttle lever adjusting screw to the right or in a clockwise direction.

20. TO REMOVE AND REPLACE CARBURETOR.

a. Close shut-off valve in fuel filter.

b. Disconnect fuel line at carburetor.

c. Remove air cleaner and elbow.

d. Remove two cap screws and lockwashers from the intake elbow.

e. Remove throttle link. The carburetor is then free from all connections. TO REPLACE reverse the operations as performed above.

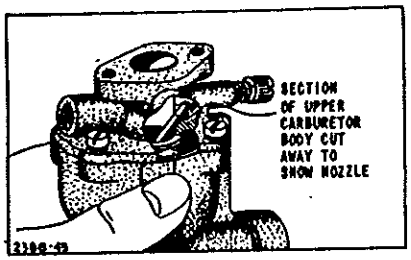
21. TO DISASSEMBLE CARBURETOR.

a. Remove needle valve, stuffing box nut, gland, and nozzle.

b. Remove screws and lockwashers from the carburetor body.

CAUTION: The upper and lower bodies are interlocked by the nozzle (see Plate No. 5) and failure to disassemble in above order will result in damaged parts.

Carburetor Nozzle — Plate No. 5



22. TO CHECK CARBURETOR INLET VALVE AND SEAT (See Plate No. 6.)

a. Pull out the brass pin that holds the carburetor float. A worn or dirty inlet valve and seat, or incorrect float level will cause the carburetor to leak.

23. TO CLEAN CARBURETOR PARTS.

a. Wash parts with alcohol or acetone to remove gum deposits and dirt.

b. Blow through all passages and openings. Do NOT use wire to clean out holes.

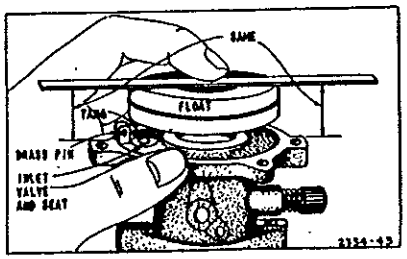
c. Replace worn or damaged parts.

24. TO REASSEMBLE. (See Plate No. 6)

a. The float should be in a horizontal position when it closes inlet valve and seat.

b. Check the float by inverting upper carburetor body and place a scale or flat, straight piece of steel across carburetor float and see that the distance from the top of float to carburetor body flange is equal on both sides. The float hinge tang can be bent to attain proper position of float.

Carburetor Float Position — Plate No. 6



c. Reassemble remaining parts in following order:

1. Upper and lower carburetor bodies.
2. Nozzle and needle valve parts.

THE GOVERNOR

25. CORRECT ENGINE SPEED. The speed of this engine is automatically maintained under varying loads by a centrifugal governor. It is operated from the cam gear. The governor was carefully adjusted at the factory and should not be readjusted unless absolutely necessary. As different types of equipment require various operating speeds for the greatest efficiency, it is suggested that you follow the recommendations of the manufacturer of the complete unit which the engine powers.

Governor Hook-up — Plate No. 7

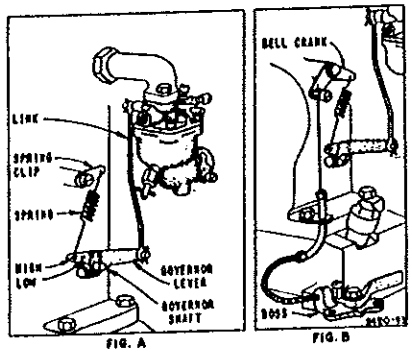


FIG. A FIG. B

26. GOVERNOR SPEED ADJUSTMENTS. (See Plate No. 7, Fig. A.) The throttle spring can be hooked to governor lever in two positions, depending upon the speed you want the engine to run:

a. If you want a speed of 2,500 R. P. M. or under, hook the throttle spring in the cotter pin marked "low speed" in the illustration.

b. If you want a speed over 2,500 R. P. M., hook it in cotter pin marked "high speed."

27. TO ADJUST GOVERNOR SPEEDS OF ENGINES WITH REMOTE CARBURETOR CONTROL. (See Plate No. 7, Fig. B) Some engines are equipped with manual or remote carburetor control.

a. To increase engine speed, move control lever away from boss on the control lever base. This adds more tension to the throttle spring allowing carburetor throttle to open wider.

b. To decrease speed, move the control lever toward the boss on the control lever base.

28. TO RESET GOVERNOR LEVER. If the governor lever has become loosened or removed from the governor shaft, reset as follows:

a. With the carburetor attached to the engine and hooked up to the governor lever with throttle link, loosen screw holding lever on the shaft.

b. Push the governor lever toward the left as far as it will go. Hold it in this position and turn the governor shaft to the right with pliers until it strikes a "stop" in the crankcase. Tighten screw that holds governor lever to the shaft until it is snug.

c. Push governor lever to the right as far as it will go and tighten screw securely.

29. TO REMOVE AND REPLACE GOVERNOR. The governor mechanism is self-oiling and seldom do any parts need replacing. However, if trouble should develop and an inspection is necessary, proceed as follows:

a. Disconnect governor spring and throttle control rod.

b. Remove governor lever by loosening screw.

c. Remove engine from base and tilt back so it rests on fuel tank.

d. Remove oil pump. See Paragraph 43.

e. Remove screw and slide out governor gear assembly. If any parts show breakage or undue wear, replace with new ones.

To replace governor, reverse above procedure.

THE IGNITION SYSTEM

30. THE IGNITION SYSTEM. The spark is produced by a high tension magneto consisting of armature, condenser, contact points, and rotating magnets cast in a flywheel. The ignition current is sent into the engine cylinder through the ignition cable and spark plug. The magneto itself as well as the cable and spark plug must all be in proper condition and adjustment to insure a good hot spark.

31. TO CHECK FOR SPARK.

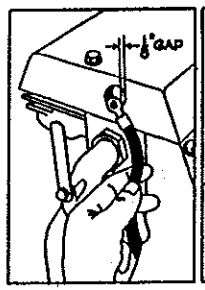
a. Remove the ignition cable from the plug. Remove plug. Hold the ignition cable terminal about ⅛" from any metal part of cylinder head. (See Plate No. 8.)

b. Turn engine and if spark jumps this gap the entire ignition system with the exception of the spark plug is O. K.

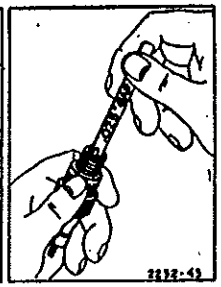
c. If no spark develops, check the cable (see Paragraph 33), and refer to magneto adjustments explained in Paragraphs 34 to 41.

32. SPARK PLUG ADJUSTMENT. The spark plug should be cleaned and the points reset to .025" after each 100 hours of operation. See Plate No. 9. Always keep a fresh plug on hand. Use Champion No. 6M (18mm) spark plug or its exact equivalent. When inserting plug place a little graphite grease on the threads. Do not get grease on points.

Checking Spark Plate No. 8



Spark Plug Plate No. 9

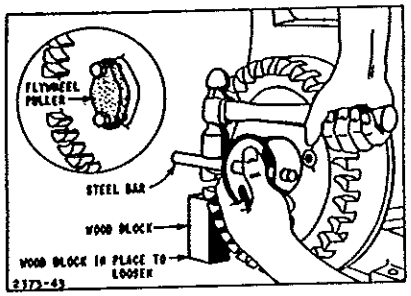


33. IGNITION CABLE. Insulation must not be broken or soaked with oil or water, or grounded in any way where it touches the engine as this will interfere with good ignition. To check the cable all the way to the magneto it is necessary to remove blower case. Be sure that the cable is securely fastened to the secondary terminal of the coil. (See Plate No. 15.)

34. TO REMOVE FLYWHEEL. The flywheel is securely mounted to the crankshaft by means of taper fit, a soft flywheel key and either a right hand thread starter pulley and lockwasher, or a nut depending

upon the type of starter used. To remove proceed as follows:

Removing Flywheel on Rope Starter Engine Plate No. 10



Rope Starter Engines. (See Plate No. 10.)

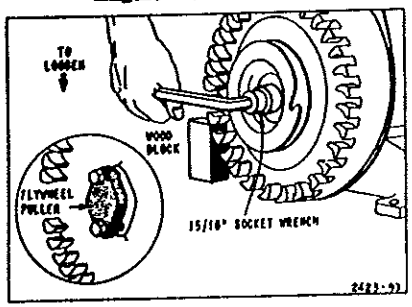
a. Place a wood block under flywheel fin on left side of flywheel to hold it rigidly and prevent turning.

b. Place a long bar or a heavy screwdriver through hole in starter pulley. To start pulley, tap end of bar lightly with hammer, to the left. Be careful not to hammer too hard or broken fin may result which will throw the flywheel out of balance.

c. After pulley has been removed unscrew two screws and two washers from flywheel.

d. Remove flywheel with flywheel puller No. 29157 provided with engine.

Removing Flywheel on Foot Starter Engine — Plate No. 11



Foot Starter Engines. (See Plate No. 11.)

a. Place a wood block under flywheel fin as explained in Paragraph 34a.

b. Use 15/16" socket wrench to remove nut. Tap end of wrench lightly to left to loosen nut. Remove two screws and washers.

c. Remove flywheel with flywheel puller No. 29157, supplied with engine.

35. TO REASSEMBLE FLYWHEEL. Reverse the operation in preceding paragraph. Place a thin coat of cup grease on the crankshaft taper and see that the flywheel key is in place. If key is damaged, use a new one, Part No. 66403.

36. TO REMOVE MAGNETO ASSEMBLY. After removing flywheel as explained in Paragraph 34, proceed as follows:

a. Detach the ignition cable from the spark plug.

b. Remove the contact point dust cover, and the four magneto mounting screws to remove magneto.

c. Turn the crankshaft so that the contact plunger holds the contact points open and then remove magneto assembly.

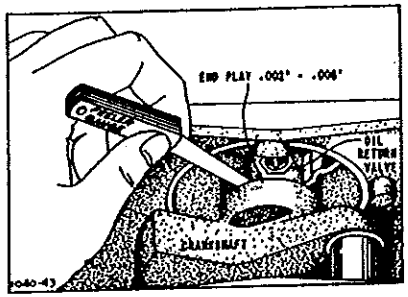
37. TO REPLACE MAGNETO ASSEMBLY. Reverse the above operations and use the old gasket between the magneto plate and crankcase, or if damaged use one of the following new gaskets for proper end play:

Part No. 66527 — .005" thick
Part No. 66537 — .009" thick
Part No. 66457 — .015" thick

The end play should be .002" to .008" between magneto bearing and crankshaft thrust faces as shown in Plate No. 12.

Use lockwashers under mounting screws.

Correct End Play — Plate No. 12



38. MAGNETO TIMING. The magneto assembly is always correctly timed with the engine when the flywheel is assembled to the tapered crankshaft with a key and securely held in place with threaded pulley or right hand threaded nut. Do not attempt to change the timing by relocating any parts or filing crankshaft timing flat. Always use soft key Part No. 66403. If steel key is used and flywheel becomes loose it will damage the keyway in the crankshaft.

39. TO ADJUST AND CLEAN CONTACT POINTS. (See Plates No. 13 and 14.)

a. While magneto plate is on engine crankcase, turn crankshaft by hand to see if contact points open and close properly. Points must be clean and line up squarely to make good electrical contact. Do not use a steel file on contact points — use a carborundum contact point file. If either or both points are badly pitted or burned, replace both points, Parts Nos. 63238 and 69754.

b. To line up contact points:

(1) Loosen contact spring bolt.

(2) Move contact spring assembly to line up with contact screw point.

(3) Tighten contact spring bolt.

c. To adjust contact spring tension:

(1) Turn crankshaft until points are in open position, then place .020" gauge between contact spring and round end of contact block and tighten contact block screws.

(2) Turn contact screw to secure .020" gap and tighten locknut against lockwasher.

Adjusting Contact Points Plate No. 13

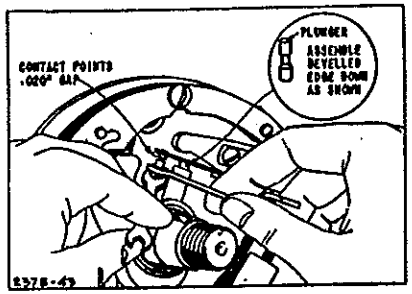
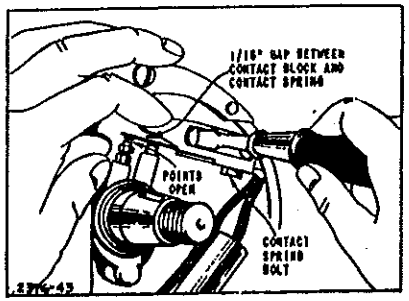


Plate No. 14

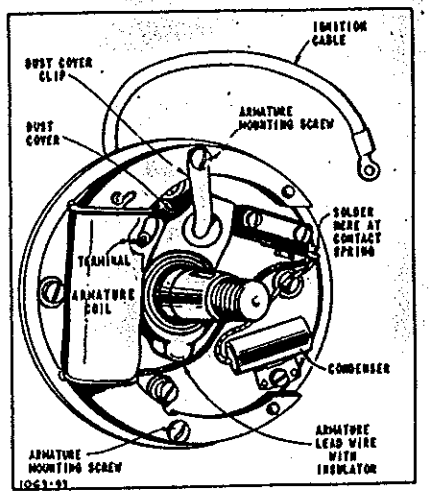


40. TO REPLACE CONDENSER. (See Plate No. 15.) A leaky or weak condenser may cause the engine to start hard, to sputter, or misfire under load. If engine misfires after checking fuel line, carburetor, spark plug, cable, and contact points, install a new condenser, Part No. 29861. Solder the end of the condenser wire and primary wire to contact spring.

41. TO REPLACE ARMATURE. (See Plate No. 15.)

a. Remove armature lead wire from contact spring, and high tension ignition cable from secondary terminal loop in the armature. Both wires are soldered. Save as much of the hydrolene as possible so that you can insulate high tension terminal when you assemble new armature. Do not use battery compound or tar as it will melt and run over entire magneto assembly.

Complete Magneto Assembly — Plate No. 15



b. Unscrew two armature mounting screws and pry armature loose with screw driver.

c. To install new armature:

(1) Place dust cover clip under upper mounting screw. Tighten lower mounting screw.

(2) Then solder ignition cable to the terminal and fill pocket formed with flap with hydrolene.

(3) Solder armature lead wire to contact spring.

(4) Replace dust cover and the clip holding cover in place, tighten upper armature mounting screw.

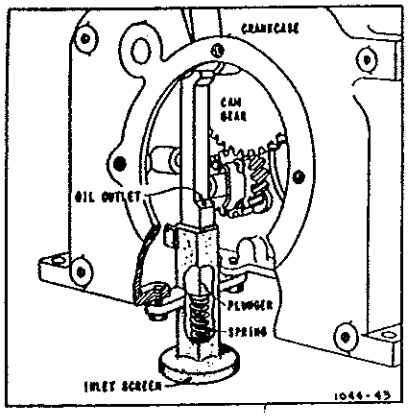
d. An air gap of .002 to .010" must be maintained between armature shoes and flywheel poles. Gap must only be sufficient to prevent rubbing, but not over .010" or poor ignition will result.

e. To check armature shoe for rub, chalk edges and mount flywheel in place. Remove spark plug to release compression. Turn flywheel several times by hand. Remove flywheel and examine edges of armature shoes. High spots will have the chalk rubbed off. File high spots carefully with a fine file until it clears, but do not remove too much metal.

LUBRICATION SYSTEM

42. THE OIL PUMP. This engine is lubricated with a plunger type of oil pump, located in crankcase and operating from an eccentric on the cam gear. It forces a steady stream of oil over all moving parts when the engine is in operation.

Oil Pump Assembly — Plate No. 16



43. TO CHECK AND CLEAN. (See Plate No. 16.)

a. Remove base from engine.

b. Tilt engine back and remove pump by removing two cap screws that hold it in place.

c. Place the pump in a pan of oil about ½" deep and work plunger up and down. A stream of oil will be forced out of the hole in the pump plunger, if the pump is in good working condition. If clogged, remove plunger and plunger spring and submerge the parts in gasoline or kerosene for three or four hours to loosen accumulated sludge or gum.

d. If pump is still inoperative, it should be replaced, Part No. 29569. In assembling be sure that spring and plunger are in place as shown.

44. OIL LEAKS. If oil leaks from either end of crankshaft bearing, remove base from engine. Oil return valves are screwed into crankcase and magneto back plate below main bearings. Remove oil return valve and clean or flush with gasoline and blow out dirt lodged under small disc. See Plate No. 12. Replace if necessary, Part No. 89807.

VALVES

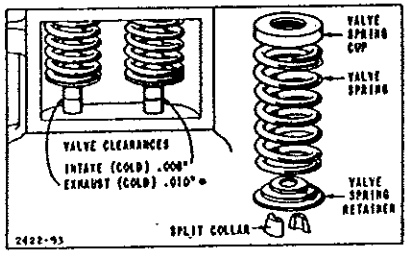
45. VALVE ADJUSTMENT. (See Plate No. 17.) To check valve clearance, remove carburetor and valve cover plate. Correct valve clearances when engine is cold are:

*Exhaust Valve ..... .010"
Intake Valve ..... .008"

**Engines with exhaust valves stamped "T. P. A." on head should be set at .015.*

Valve clearance is adjusted by grinding required amount from end of valve stem. End of stem must be square with stem proper.

Valve Adjustment — Plate No. 17

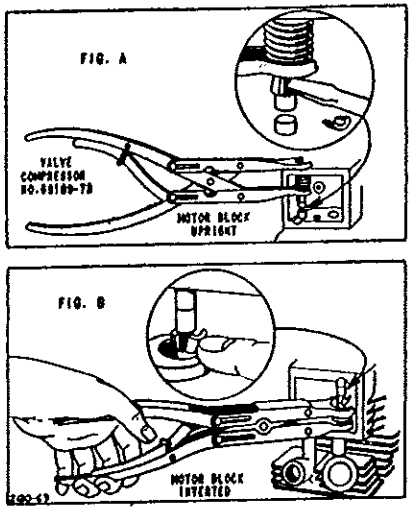


46. TO REMOVE VALVES. (See Plate No. 18, Fig. A.)

a. Remove muffler, carburetor intake elbow, and cylinder head.

b. Place valve spring compressor (Tool No. 69189-T3) on top of valve chamber and below spring retainer as illustrated. Then compress the spring and pry out split retainer collars with a screw driver.

To Remove and Replace Valves Plate No. 18



47. TO REPLACE VALVES. (See Plate No. 18, Fig. B.)

a. Invert cylinder after oil has been drained.

b. Place valve spring and retainer into compressor tool and compress as much as possible. Place tool into valve chamber and slip valve into place. Slip one-half of retainer collar into groove in valve stem and move it toward the rear of the valve chamber, then insert the other half. Release spring compressor.

48. VALVE RESEATING.

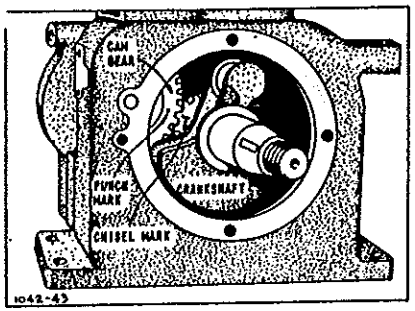
a. Grind in the same manner as automobile valves. If valves stick they may be coated with gum or carbon. To remove gum, use alcohol or acetone. Clean valve stems thoroughly with wire brush or emery cloth. Also scrape all carbon from valves.

b. If inspection shows that the valve stems are worn more than .001" undersize or the seat is too badly pitted, then replace. If not too badly pitted or worn, reface the valves in a valve facing machine set at 45° angle.

c. Should the valve seat in cylinder block show that it is worn beyond repair by regrinding, install new one.

49. VALVE TIMING. The timing of the valves is taken care of by the meshing of the cam shaft gear with the gear on the crankshaft. These gears are properly meshed when the mark on the cam shaft gear is in line with the mark on the crankshaft collar. See Plate No. 19.

Valve Timing — Plate No. 19



CYLINDER

50. CYLINDER HEAD. The cylinder head is held in place with six cap screws.

51. TO REMOVE AND CLEAN CYLINDER HEAD.

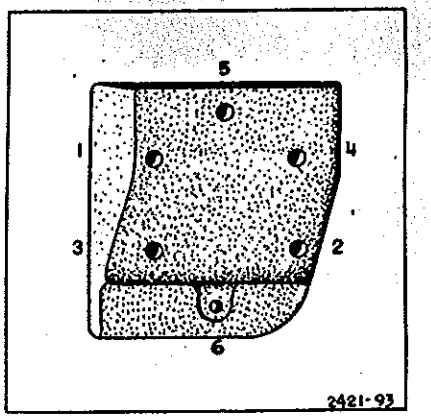
a. Remove spark plug.

b. Remove cylinder head.

c. Accumulated dirt, grease and oil should be scraped and blown out of the air passages. This is important to allow free circulation of air and prevent overheating.

d. Clean carbon deposits with wire brush or scraper and thoroughly blow out. See that spark plug hole is clean and that the threads are not stripped.

Tightening Cylinder Head — Plate No. 20



52. TO REASSEMBLE CYLINDER HEAD.

a. Use a new gasket, Part No. 69004. If not available, clean the old one and coat both sides with cup grease—**shellac is not recommended.**

b. Replace cylinder head and tighten cap screws a little at a time, while engine is cold, taking them in rotation as shown in Plate No. 20.

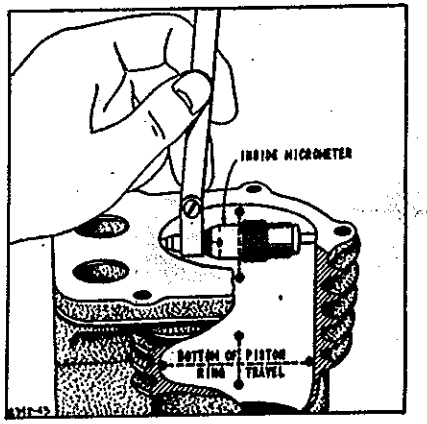
c. Continue in this manner until securely tight, but do not exert more than 200 inch pounds of pull.

d. Use a small amount of graphite grease on spark plug before replacing.

53. CHECKING THE CYLINDER.

a. Frequently cylinders that appear scored are merely out of round or oversize. In such cases use an inside micrometer to determine the condition by taking several readings from top to the bottom of the

Checking Cylinder Bore — Plate No. 21



space in which the piston operates. See Plate No. 21.

b. The standard cylinder bore is 2.2490" to 2.2500". If micrometer readings show that the standard bore is exceeded by .003", or is more than .0015" out of round, the cylinder should be rebored or replaced.

c. When reboring add .010", .020", or .030" to the standard size to allow for oversized pistons of these same sizes. See Paragraph 61. Allow .0055" to .007" for piston and cylinder clearance.

d. Rebore and hone in the same manner you would an automobile engine.

CRANKSHAFT

54. TO REMOVE CRANKSHAFT.

Different engine models have different crankshaft assemblies. Therefore, before removing determine the model of your engine by referring to the metal nameplate attached to the blower housing and proceed as follows:

MODELS A AND AR-6.

a. Drain oil from crankcase.

b. Remove blower housing.

c. Remove flywheel as explained in Paragraph No. 34.

d. Remove magneto plate as explained in Paragraph No. 36.

e. Remove engine from base.

f. Turn engine upside down.

g. Remove oil pump.

h. Disconnect connecting rod and push piston down in cylinder bore so it clears crankshaft. Do not push too far as top ring may become detached.

i. Slide crankshaft out toward the magneto side of the engine.

MODEL AP (Rope Starter).

a. Remove same as Model A. The crankshaft, however, has a ball bearing on drive side. Remove cam shaft (see Paragraph 59) and slide gear into crankcase pocket to allow ball bearing to pass cam gear.

MODEL AP (Foot Pedal Starter).

a. Remove foot pedal and clutch.

b. Remove nut, washer, oil seal and spacer on drive side of crankshaft.

c. Proceed to remove crankshaft the same as Models A and AR-6 explained above.

Note: This model has a slip fit ball bearing on drive side of crankshaft. This is fastened inside of crankcase with three cap screws and lockwashers. It is not necessary to remove unless for inspection.

55. TO REASSEMBLE CRANKSHAFT.

Reverse above procedure. Check gasket between crankshaft and magneto plate for correct end play. This should not be less than .002" or more than .008". See Paragraph No. 37.

56. TO REMOVE BALL BEARING FROM CRANKSHAFT.

a. **Model AP (Rope Starter).** The ball bearing on this engine is a tight fit. If worn or rough, replace with a new bearing, Part No. 99157. With both sides of ball bearing supported in an Arbor Press, remove as shown in Plate No. 22.

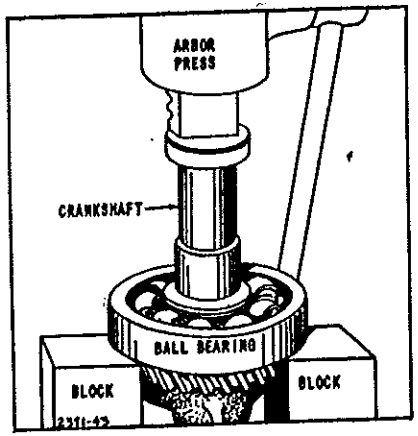
b. **Model AP (Foot Pedal Starter).** The ball bearing is a slip fit on the crankshaft and is held in cylinder by three cap screws and lockwashers. Remove these screws and lockwashers located inside of crankcase and ball bearing will drop out or can easily be forced with a screw driver. If worn or rough, replace with new one, Part No. 99157.

57. TO REPLACE BALL BEARING.

a. **Model AP (Rope Starter).** Heat ball bearing in hot oil before installing on crankshaft. When hot it will become a slip fit. Hold crankshaft in a vise and place ball bearing into place with the seal end down, allowing bearing to cool slowly—do not submerge in cold water.

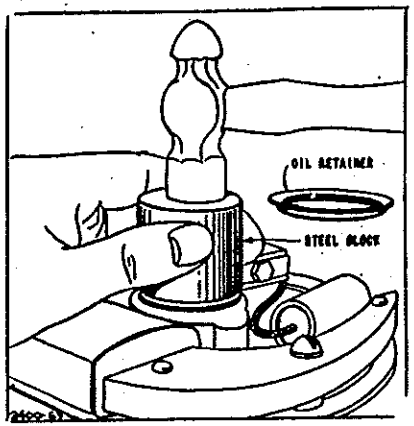
b. **Model AP (Foot Pedal Starter).** This ball bearing is a slip fit on crankshaft. Place ball bearing with sealed side toward inside of crankcase and fasten securely with three cap screws and lockwashers.

Removing Ball Bearing From Model "AP" Crankshaft — Plate No. 22



58. OIL RETAINER RING. (See Plate No. 23.) Replace oil retainer ring, using a wood block and hammer to force into position. If worn or damaged replace with a new one, Part No. 62235.

Replacing Oil Retainer Ring — Plate No. 23



CAM SHAFT AND CAM GEAR

59. TO REMOVE CAM SHAFT AND CAM GEAR proceed as follows:

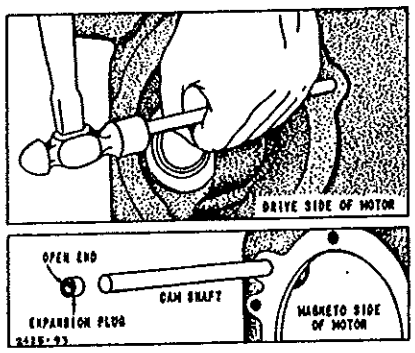
a. Use a blunt punch and force cam shaft out from drive side of the engine as shown in Plate No. 24. The cam gear will then be free for removal from crankcase.

b. Be sure not to get burrs on the end of shaft. After removal, check for wear. Standard camshaft diameters are:

.87315" Max.
.87285" Min.

If worn more than .001" undersize, replace with new shaft, Part No. 68333.

Removing Cam Shaft — Plate No. 24



60. TO REPLACE CAM SHAFT.

a. Insert cam shaft through hole on the magneto side of the engine far enough to permit sliding the cam gear into position.

b. Slide cam shaft through cam gear and press in flush with outside of crankcase on opposite side.

c. Install the expansion plug in hole on the magneto side with its open end out. Seal with "Permatex" or other liquid gasket material to prevent oil leaks.

d. When inserting the crankshaft be sure to line up timing marks on the cam shaft gear with the gear on the crankshaft. See Plate No. 19.

PISTON ASSEMBLY AND CONNECTING ROD

61. PISTON. (See Plate No. 25.)

a. The piston in this engine is made of a special aluminum alloy which is very light in weight. The standard clearance between the piston skirt and cylinder wall is .0055" to .007". The clearance is to compensate for the considerable expansion of aluminum when hot. The top and second lands of the piston are smaller than the skirt to allow for greater expansion at the piston head. When piston is removed be sure to thoroughly clean carbon from head of piston and ring grooves. If piston is out of round or scored it should be replaced.

b. If an oversize piston is necessary, we recommend reboring of cylinder to form a perfect fit. Oversize pistons and assemblies (including rings) are available as follows:

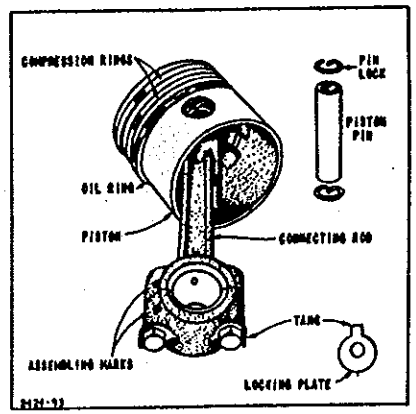
PISTONS

Part No. 99964 — .010" O.S.
Part No. 99965 — .020" O.S.
Part No. 99966 — .030" O.S.

PISTON ASSEMBLIES

Part No. 99967 — .010" O.S.
Part No. 99968 — .020" O.S.
Part No. 99969 — .030" O.S.

Piston Assembly — Plate No. 25



62. PISTON RINGS. Three rings are used: Two compression and one oil control. Before assembling new rings, thoroughly clean piston grooves so rings move freely. When

fitted in the cylinder allow a gap of .007" to .017". Check the clearance between a new ring and groove wall with a .005" feeler gauge, and if the gauge enters the space the piston should be replaced with a new one. Oversize rings are available and will be found listed in the parts section.

63. PISTON PIN.

a. The piston pin is a slip fit in the piston. To remove, first remove lock rings, then slip pin out of piston.

Standard piston pin diameters are:

.56225 Max.
.56200 Min.

b. The maximum clearance, including wear between the piston pin and the pin hole in the connecting rod is .0015".

c. If clearance exceeds .0015", the pin should be replaced with Part No. 63436, which is .005" oversize, and hole reamed to fit. If a new connecting rod is used, then a standard pin (Part No. 65863) should be used.

64. CONNECTING ROD. The connecting rod is also made of a special aluminum alloy which combines strength with light weight. When assembling connecting rod to crankshaft, the assembly marks on the cap and rod must be on the same side and toward magneto side of engine. (See Plate No. 25.) It is equipped with locking plates. The tang in this plate must fit in slot and the plate bent against the hexagon head cap screws.

CRANKCASE BREATHER

65. THE BREATHER. This engine is equipped with a crankcase breather which permits circulation of air and prevents pressure to form in the crankcase. This should be cleaned when the engine is tuned up or overhauled because, if clogged, sufficient pressure may form to force oil through bearing.

66. TO DISASSEMBLE. (See Plate No. 26.)

a. Remove cover by tapping lightly with a blunt tool as shown and remove parts.

b. Replace with new sisal. Be sure to pull apart with fingers to remove lumps and also prevent packing too tightly. If new sisal isn't available, wash old sisal thoroughly with gasoline and permit to dry. Then proceed to replace the same as new sisal.

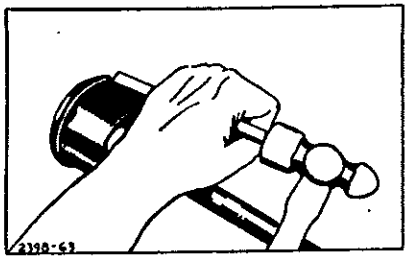
c. Wash retainers with gasoline.

67. TO REASSEMBLE. (See Plate No. 27.)

a. Replace parts in order illustrated in Fig. A.

b. Place a piece of cloth over cover and with the use of a 1½" pipe coupling placed over cloth, force into place with a hammer. See Fig. B. Do not hammer cover directly as this is liable to dent it and prevent proper fit.

Disassembling Breather — Plate No. 26



Assembling Breather Parts — Plate No. 27

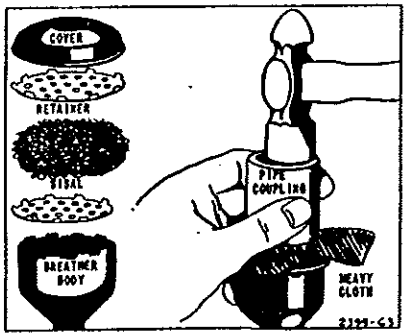


Fig. A Fig. B

AIR CLEANER

68. TO REMOVE, CLEAN, AND REPLACE. (See Plate No. 28.) The air cleaner is to protect the engine from dirt and grit. It is therefore important that it be cleaned occasionally to prevent clogging. Clean as follows:

a. Remove thumb nut and slide entire cleaner over rod.

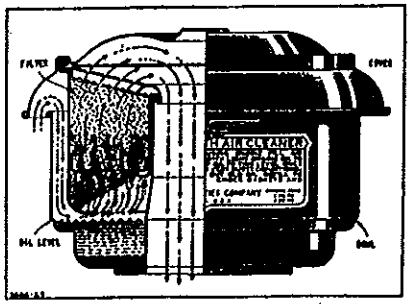
b. Remove cover and filter and pour out oil.

c. Wash the outside of the filter element with a rag or brush dipped in gasoline. **Do not submerge.**

d. Clean bowl and cover by submerging in gasoline and wipe dry.

e. Replace parts. Fill cleaner with oil of the same viscosity as used in the crankcase up to the level marked on cleaner bowl. See Instructions on air cleaner label.

Air Cleaner Assembly — Plate No. 28



MUFFLER

69. TO CLEAN. After long periods of service it is possible that the muffler will become clogged to the point where it will affect the engine's power. To check the muffler unscrew it from the engine and run water into the open end of the muffler. If full streams of water come out of small holes at the end of the muffler, you will know that it is not clogged up. If the water runs through very slowly, however, the muffler is probably clogged and should be replaced.

FOOT PEDAL STARTER

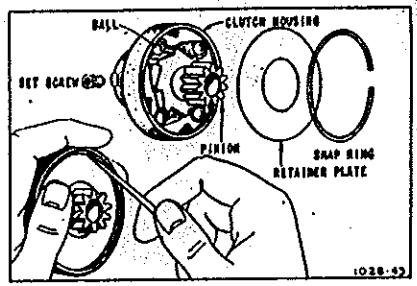
70. FOOT PEDAL STARTER. Certain types of engines are equipped with foot starter pedal and pulley clutch. Therefore, follow these instructions only if the engine to be serviced is of this type.

71. To ADJUST FOOT STARTER CLUTCH. (See Plate No. 29.) If the starter clutch slips or fails to turn the engine when stepping on the starter pedal, it is probably due to one of the following causes:

Loose set screw.
Worn clutch housing.
Worn or broken pinion.

a. Tighten the set screw to be sure clutch is tight on the crankshaft. Use $\frac{1}{16}$" Allen hexagon set screw wrench.

Foot Pedal Starter Clutch — Plate No. 29



b. If the clutch still slips, loosen set screw and remove clutch from the shaft.

c. Pry out the snap spring with a sharp tool, holding the clutch in the position shown as a precaution against the spring jumping out.

d. Check the parts carefully for wear or damage and replace those necessary.

e. To reassemble, replace the parts in the same order and slip the spring back in place. Replace pulley clutch on shaft with the set screw hole lined up with recess in crankshaft extension. Securely tighten set screw.

OVERLOAD

72. TO PREVENT. Always be sure that the machine the engine is operating is well lubricated and running freely. If it is not, it may cause the engine to be overloaded, resulting in it overheating, losing power, or stopping entirely.

PARTS SECTION

INDEX

• • •

73. HOW TO FIND THE CORRECT NUMBER OF THE PART YOU NEED

a. Make a note of your engine TYPE NUMBER (Not the Serial Number) that appears on the metal nameplate attached to blower case.

b. Refer to pages illustrating parts and locate the Master Part Number by comparing your old part with illustrations. Assemblies include all part numbers shown in frames in illustration. All parts shown in assembly frames on which part numbers are given can be purchased separately.

c. After the Master Part Number has been identified, refer to the following Parts List where these Master Part numbers are listed in numerical order.

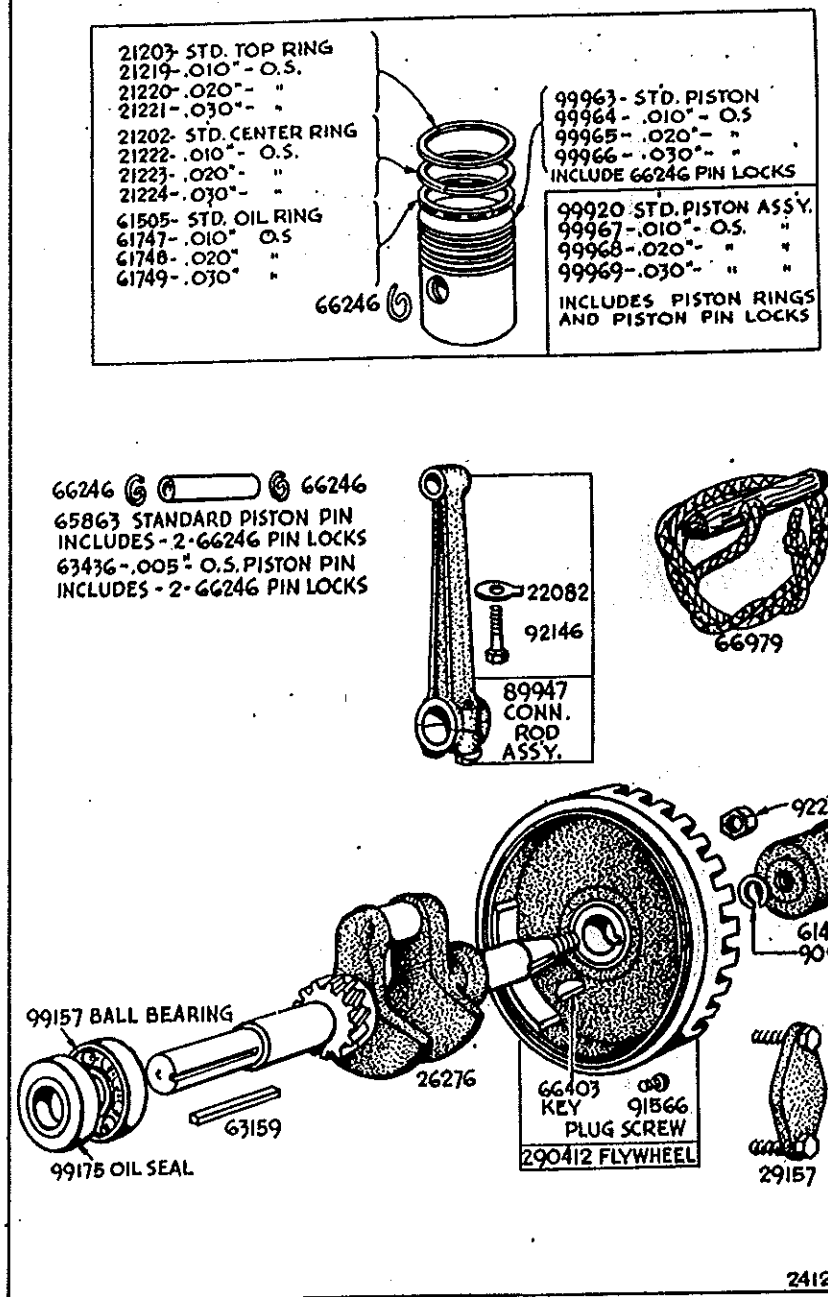
THE MASTER PART IS USED ON ALL TYPES OF ENGINES EXCEPT THOSE TYPES LISTED UNDER "NOTE."

d. If a "Note" appears below the Master Part Number, this means that this part is made different from the Master Part for certain types, and if your type is listed under "Note" order the part referred to.

e. If your Engine Type Number does not appear after any part number listed under "Note," order the Master Part Number.

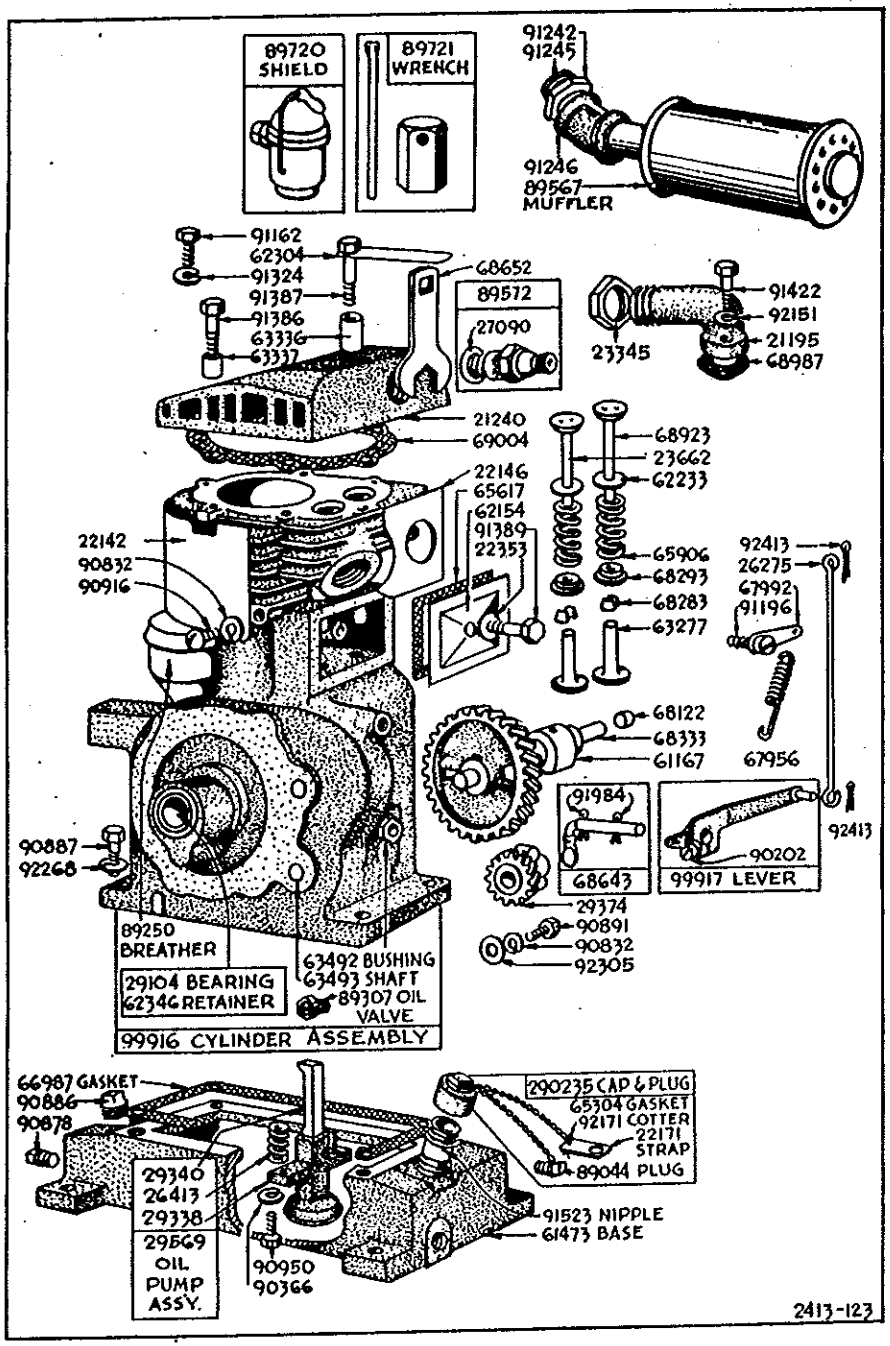
f. When ordering parts — or writing for service information — always specify the MODEL LETTER — TYPE NUMBER — and SERIAL NUMBER of your engine.

74. PRICES: All prices in this book are subject to change without notice. In case of change of prices, orders will be filled at current prices. All prices are for United States only; F. O. B. Milwaukee, Wis., or nearest Authorized Central Service Distributors. Prices outside of the U. S. A. are subject to local import duties, taxes, etc. The above conditions apply to all orders except those placed directly by the Government's armed forces where specific quotations and conditions of sale have been otherwise specified.



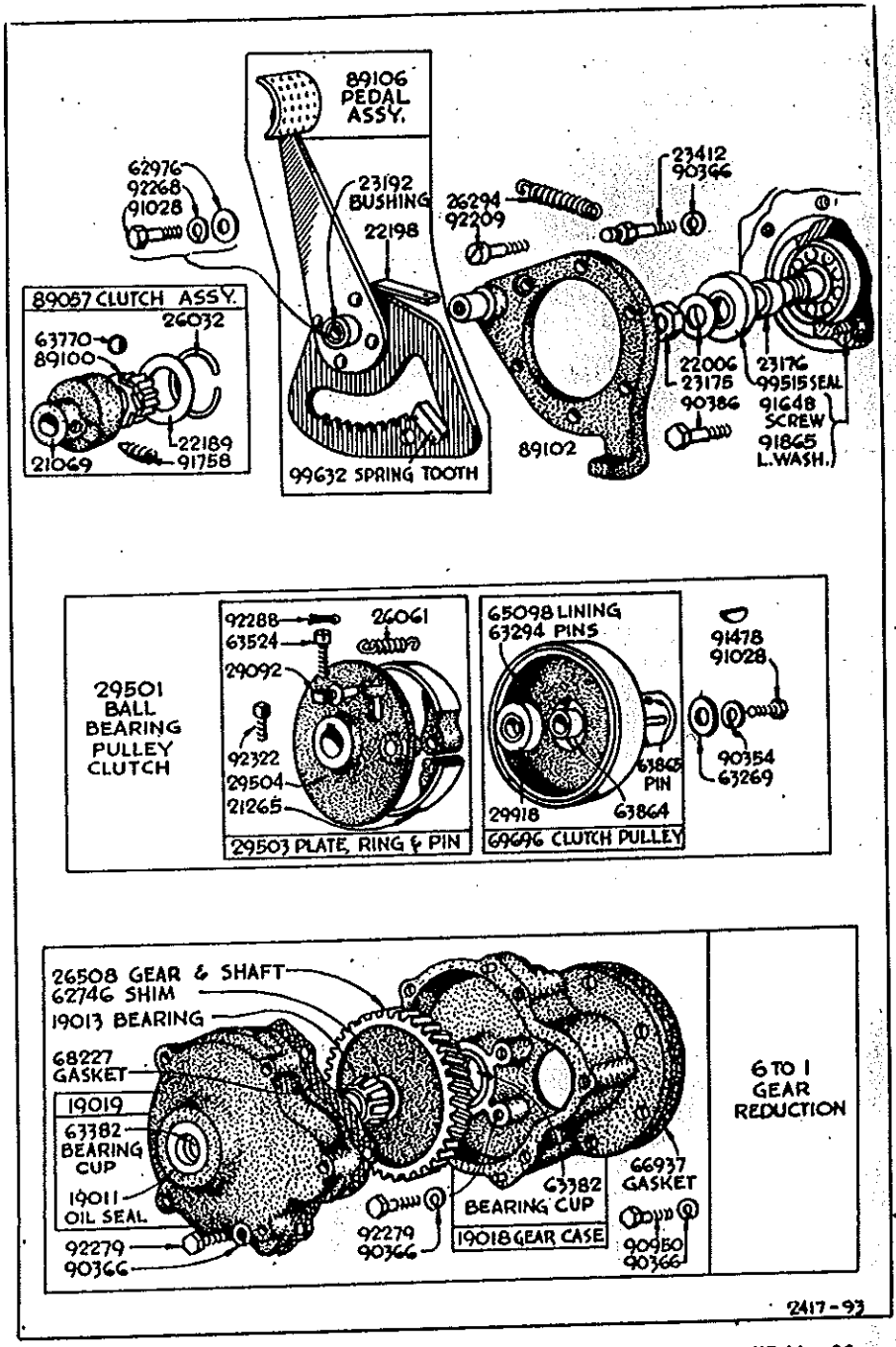
PISTON, CONNECTING ROD, CRANKSHAFT, FLYWHEEL — PLATE No. 30

ASSEMBLIES INCLUDE ALL PARTS SHOWN IN FRAMES



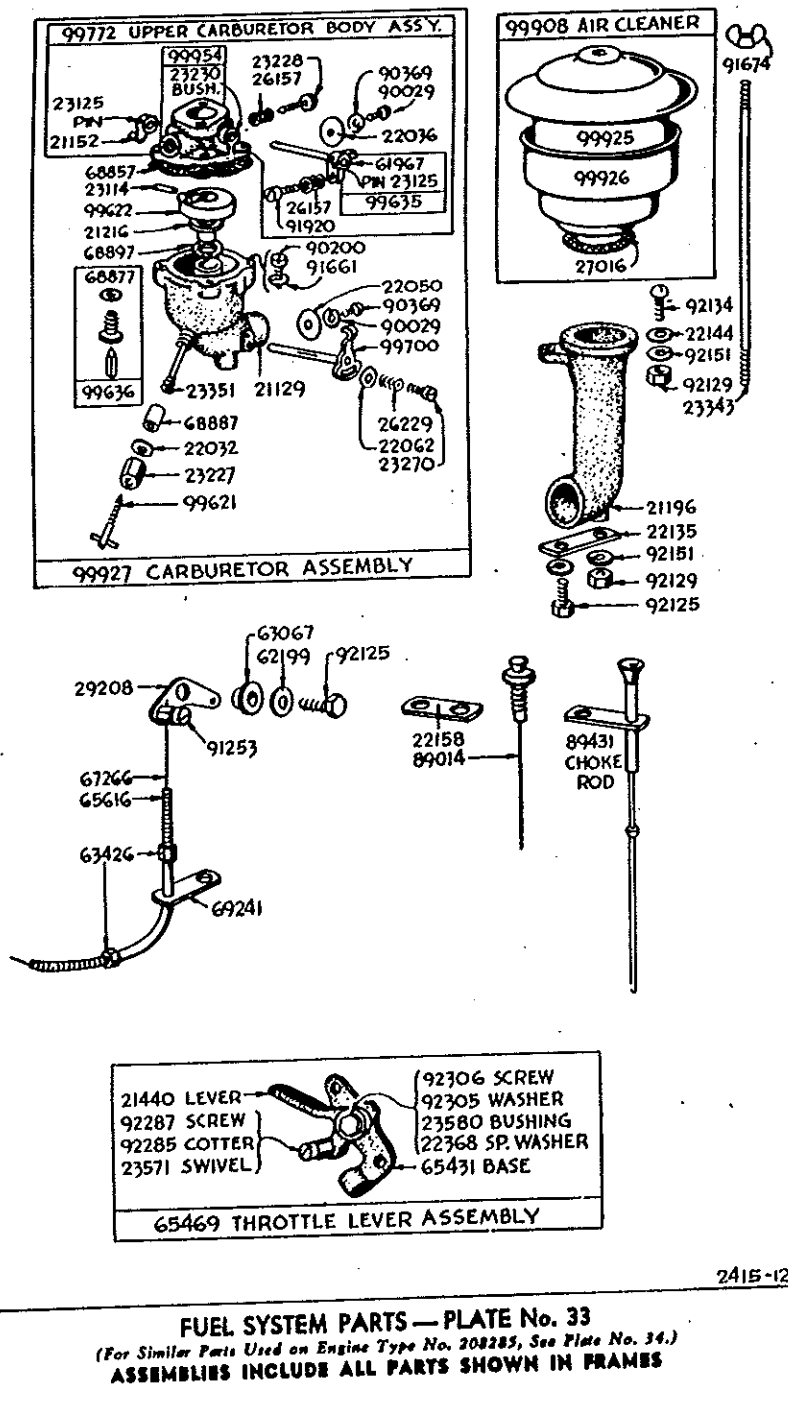
CYLINDER AND BASE PARTS — PLATE No. 31

ASSEMBLIES INCLUDE ALL PARTS SHOWN IN FRAMES



FOOT PEDAL, CLUTCH, AND GEAR REDUCTION PARTS — PLATE No. 32

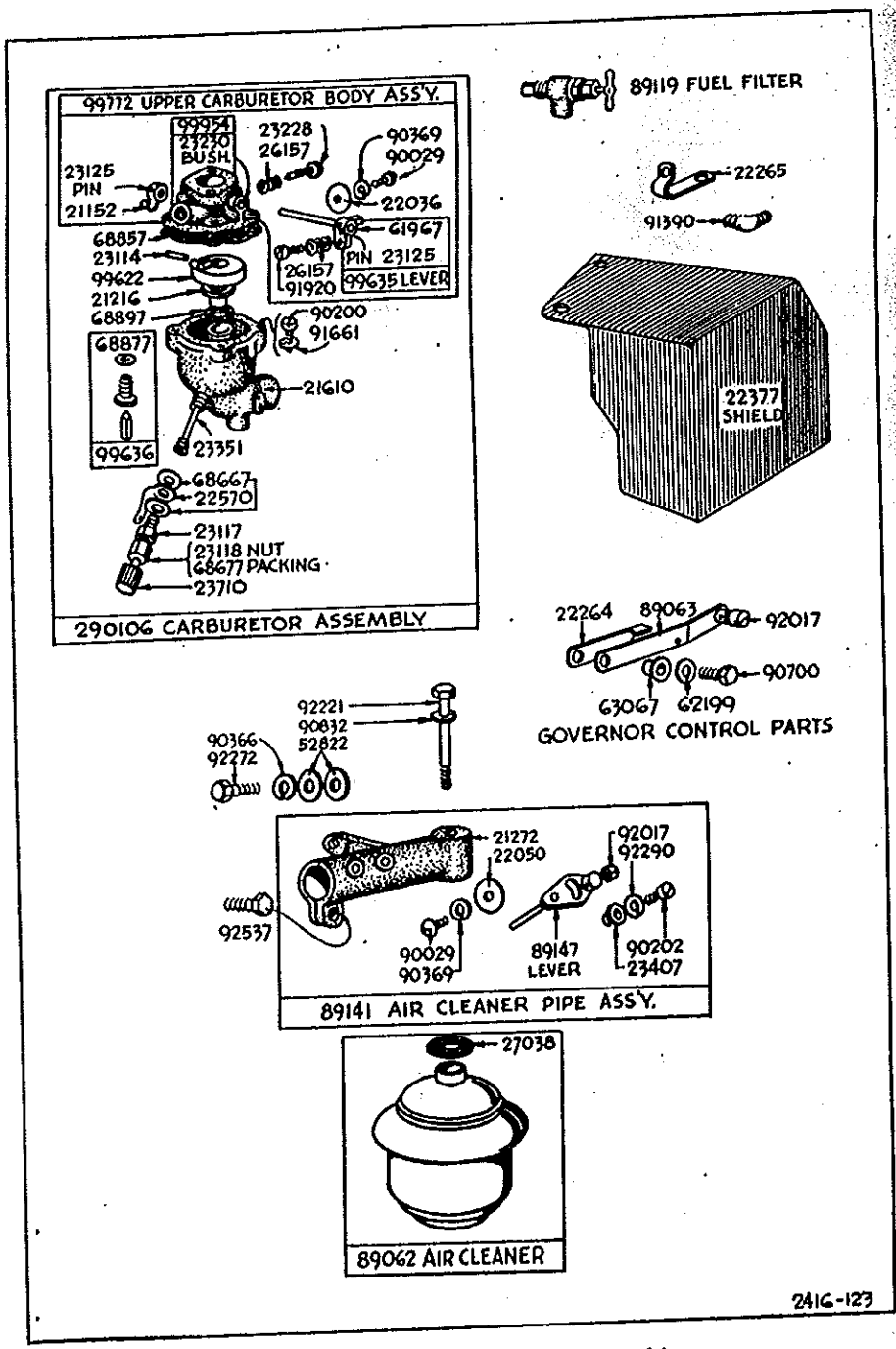
ASSEMBLIES INCLUDE ALL PARTS SHOWN IN FRAMES



FUEL SYSTEM PARTS — PLATE No. 33

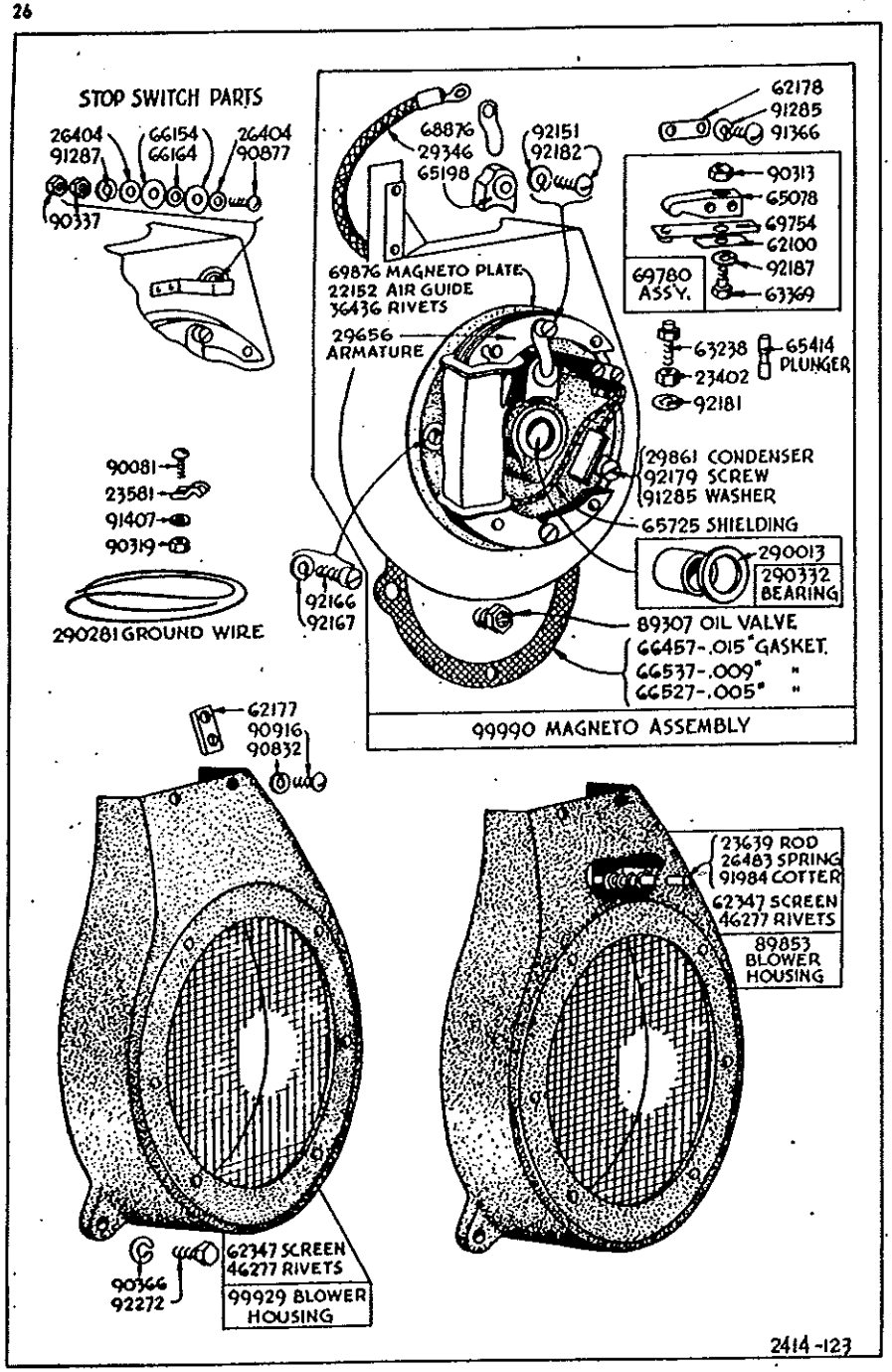
(For Similar Parts Used on Engine Type No. 208285, See Plate No. 34.)

ASSEMBLIES INCLUDE ALL PARTS SHOWN IN FRAMES



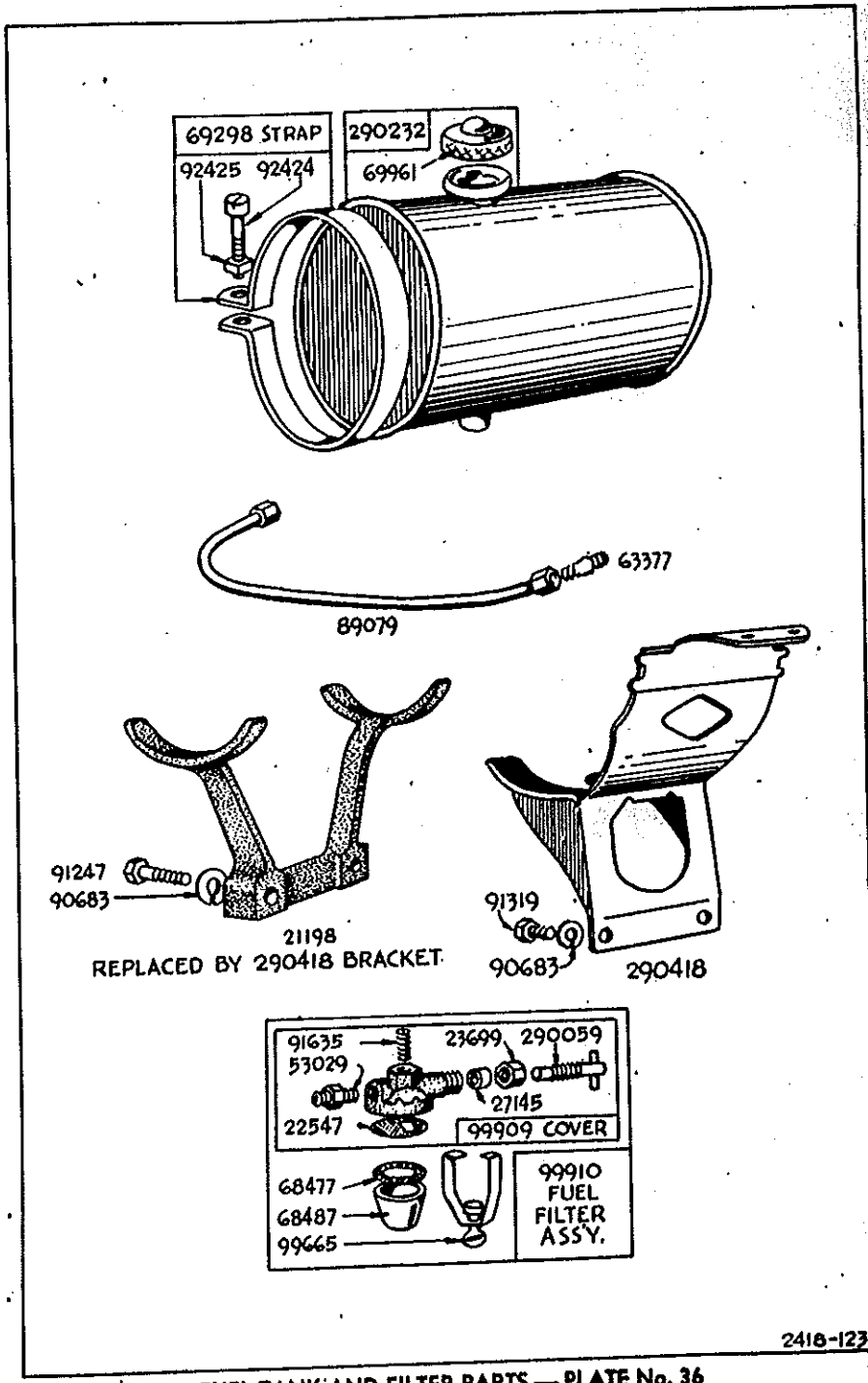
FUEL SYSTEM PARTS — PLATE No. 34

(These Parts Used Only on Engine Type No. 208285, See Plate No. 33 for Others.)



MAGNETO AND BLOWER HOUSING PARTS — PLATE No. 35

ASSEMBLIES INCLUDE ALL PARTS SHOWN IN FRAMES



FUEL TANK AND FILTER PARTS — PLATE No. 36

ASSEMBLIES INCLUDE ALL PARTS SHOWN IN FRAMES

NUMERICAL PARTS LIST

MODELS "A"—"AP"—"AR6"

TYPE NUMBERS FROM 208250 AND UP

REF. PLATE NO.	MASTER PART NO.	NAME	UNITS REQ.	SELLING PRICE EACH
32	19011	Oil Seal	1	$ 1.25
32	19013	Roller Bearing Cone	1	1.65
32	19018	Gear Case Assembly	1	8.00
32	19019	Gear Case Cover Assembly	1	4.25
32	21069	Clutch Case	1	1.50
33	21129	Carburetor Body	1	2.50
		Note: No. 21393 Carburetor Body Used on type No. 208255.	1	2.50
33-34	21152	Throttle Lever	1	.20
31	21195	Intake Elbow	1	.75
33	21196	Air Cleaner Tube	1	1.85
36	21198	Gas Tank Bracket (Replaced by No. 290418).		
30	21202	Center Compression Ring—Standard	1	.40
30	21203	Top Compression Ring—Standard	1	.40
33-34	21216	Carburetor Venturi	1	.15
30	21219	Top Compression Ring—.010" Oversize	1	.40
30	21220	Top Compression Ring—.020" Oversize	1	.40
30	21221	Top Compression Ring—.030" Oversize	1	.40
30	21222	Center Compression Ring—.010" Oversize	1	.40
30	21223	Center Compression Ring—.020" Oversize	1	.40
30	21224	Center Compression Ring—.030" Oversize	1	.40
31	21240	Cylinder Head	1	5.25
34	21272	Air Cleaner Pipe	1	4.00
33	21440	Control Lever	1	.50
34	21610	Lower Carburetor Body	1	2.50
32	22004	Bearing Sleeve Washer	1	.05
33	22032	Needle Valve Packing Washer	1	.05
33	22034	Carburetor Throttle Valve	1	.10
33	22050	Choke Valve	1	.10
33	22062	Choke Lever Washer	1	.05
30	22062	Connecting Rod Screw Head Lock	2	.05
33	22135	Air Cleaner Elbow Brace	1	.10
31	22142	Cylinder Shield	1	.35
33	22144	Washer	1	.05
31	22148	Front Air Guide	1	.45
35	22152	Magneto Air Guide	1	.60
		Note: No. 89846 Air Guide and Switch Used on type Nos. 208255, 208257, 208258, 208267.	1	1.25
		No. 290125 Air Guide Used on type No. 208285.	1	.75
32	22158	Governor Control Bracket	1	.15
31	22171	Filler Cap Strap	1	.05
32	22189	Clutch Retainer Plate	1	.05
32	22196	Starter Spring Clip	1	.15
34	22264	Control Lever Stop	1	.20
34	22265	Gas Line Clamp	1	.05
31	22353	Valve Cover Plate Washer	1	3 0 .05
33	22368	Control Lever Spring Washer	1	.10
34	22377	Carburetor Shield	1	1.50
36	22547	Gas Filter Screen	1	.15
34	22570	Needle Valve Adjusting Spring	1	.10
33-34	23114	Float Hinge Pin	1	.10
34	23117	Needle Valve Retainer	1	.25
34	23118	Needle Packing Nut	1	.20
33-34	23125	Throttle Stop and Lever Pin	2	.05
32	23175	Crankshaft Locknut	1	.10

REF. PLATE NO.	MASTER PART NO.	NAME	UNITS REQ.	SELLING PRICE EACH
32	23176	Crankshaft Bearing Sleeve	1	.60
32	23192	Starter Lever Bushing	1	.10
33	23227	Needle Valve Packing Nut	1	.10
33-34	23228	Idler Needle Valve	1	.25
33-34	23250	Throttle Shaft Bushing	2	.10
33	23270	Choke Lever Screw	1	.05
33	23343	Air Cleaner Stud	1	.20
31	23345	Intake Elbow Locknut	1	.25
33-34	23351	Carburetor Nozzle	1	.50
35	23402	Contact Locknut	1	.10
34	23407	Choke Shaft Bushing	1	.05
32	23412	Starter Spring Anchor	1	.30
33	23571	Control Lever Swivel	1	.20
33	23580	Control Lever Bushing	1	.10
35	23591	Cable Clamp	1	.05
35	23639	Push Rod	1	.30
31	23662	Exhaust Valve	1	1.50
		Note: No. 26521 Stellite Valve Used on type No. 208267.	1	6.75
36	23699	Shut-off Lever Nut	1	.15
34	23710	Needle Valve	1	.40
32	26032	Clutch Retainer Spring	1	.05
32	26041	Clutch Extension Spring	1	.30
33-34	26157	Idler and Throttle Spring	2	.05
33	26226	Choke Lever Spring	1	.05
31	26275	Throttle Link	1	.30
30	26276	Crankshaft	1	6.00
		Note: No. 26060 Crankshaft Used on type No. 208274.	1	7.00
		No. 26076 Crankshaft Used on type Nos. 208252, 208259, 208262.	1	9.00
		No. 26203 Crankshaft Used on type No. 208285.	1	9.00
		No. 26277 Crankshaft Used on type Nos. 208251, 208261.	1	8.00
		No. 26291 Crankshaft Used on type Nos. 208255, 208257, 208258, 208267, 208272, 208284.	1	9.00
		No. 26314 Crankshaft Used on type Nos. 208268, 208275, 208276, 208279.	1	7.00
32	26294	Starter Return Spring	1	.20
35	26404	Steel Washer	2	.05
31	26412	Oil Pump Spring	1	.10
35	26483	Push Rod Spring	1	.15
32	26506	Drive Shaft and Gear	1	7.50
33	27016	Air Cleaner Gasket	1	.15
34	27038	Air Cleaner Gasket	1	.25
31	27090	Spark Plug Gasket	1	.05
36	27145	Shut-off Lever Packing	1	.10
32	29002	Spring Stud	1	.15
31	29104	Crankshaft Bearing Includes: No. 62340 Oil Retainer Ring	1	.60
			1	.05
30	29157	Flywheel Puller	1	.50
33	29206	Bell Crank Assembly	1	.25
		Note: No. 89671 Bell Crank Assembly Used on type Nos. 208259, 208275, 208280, 208281.	1	1.25
31	29338	Oil Pump Body	1	.65
31	29340	Oil Pump Plunger	1	.30
35	29346	Ignition Cable	1	1.50
		Note: No. 89762 Ignition Cable Used on type Nos. 208257, 208267.	1	2.50
		No. 290403 Cable and Suppressor Used on type Nos 208255, 208258, 208285.		

REF. PLATE NO.	MASTER PART NO.	NAME	UNITS REQ.	SELLING PRICE EACH
31	28374	Governor Gear	1	1.50
32	28501	Automatic Pulley Clutch Assembly	1	28.50
32	28502	Clutch Plate Assembly	1	10.50
32	28504	Clutch Plate and Pin	1	6.75
31	28509	Oil Pump Assembly	1	1.90
35	28656	Armature	1	4.60
35	28661	Condenser	1	.45
32	28918	Clutch Bearing	1	2.00
35	30436	Rivet	2	5 @ .05
35	46277	Rivet	6	5 @ .05
34	52832	Spacer	2	.05
36	53029	Gas Filter Connector	1	.20
31	61107	Cam Gear	1	3.00
32	61305	Clutch Ring	1	2.75
31	61473	Base	1	6.00
		Note: No. 21064 Base	1	6.00
		Used on type No. 208285.		
		No. 21553 Base	1	6.00
		Used on type Nos. 208255, 208258.		
30	61492	Rope Starter Pulley	1	1.15
		Note: No. 61644 Starter Pulley	1	2.75
		Used on type No. 208285.		
		No. 290424 Starter Pulley	1	1.15
		Used on type No. 208288.		
		Includes: No. 91363 Set Screw	1	.05
30	61505	Oil Ring—Standard	1	.60
30	61747	Oil Ring—.010" Oversize	1	.60
30	61748	Oil Ring—.020" Oversize	1	.60
30	61749	Oil Ring—.030" Oversize	1	.60
33-34	61907	Throttle Stop	1	.20
35	62100	Contact Spring Stop	1	.15
31	62154	Valve Cover Plate	1	.20
35	62177	Blower Mounting Bracket	2	.25
35	62178	Contact Block Connector Plate	1	.05
34	62190	Bell Crank Washer	1	.05
31	62233	Valve Spring Cup	1	2 @ .05
31	62304	Stop Switch	1	.10
31	62346	Oil Retainer Ring	1	.10
35	62347	Blower Housing Screen	1	.35
32	62746	Shim	1	.10
33	62976	Washer	1	.15
33-34	63067	Bell Crank Bushing	1	.05
30	63150	Pulley Key	1	.10
35	63228	Contact Point Screw	1	.40
32	63269	Clutch Washer	1	.15
31	63277	Valve Tappet	2	.35
32	63294	Brake Lining Pin	1	.05
31	63336	Cylinder Head Spacer (Long)	3	.30
31	63337	Cylinder Head Spacer (Short)	2	.25
35	63369	Contact Block Screw	1	.05
36	63377	Carburetor Connector Elbow	1	.35
32	63382	Roller Bearing Cup	2	.45
33	63426	Control Casing Locknut	1	.05
30	63436	Piston Pin—.005" Oversize	1	.40
31	63492	Governor Crank Bushing	1	.15
31	63493	Governor Shaft	1	.20
32	63524	Clutch Adjusting Screw	1	.05
32	63770	Clutch Ball	4	2 @ .05
32	63844	Bearing Spacer	1	.30
33	63845	Bearing Retainer Pin	1	.05
35	65078	Contact Spring Block	1	.40
32	65098	Clutch Lining	1	1.50
35	65198	Magneto Point Dust Cover	1	.25

REF. PLATE NO.	MASTER PART NO.	NAME	UNITS REQ.	SELLING PRICE EACH
31	65304	Oil Filler Cap Gasket	1	.05
		Note: No. 65938 Filler Cap Gasket	1	.05
		Used on type Nos 208255, 208258, 208285.		
35	65414	Magneto Point Plunger	1	.30
33	65431	Control Lever Base	1	.45
33	65469	Control Lever Assembly	1	1.25
33	65616	Control Wire Casing—72" long	1	.55
		Note: If longer casing is needed, specify length by inches; if shorter casing is needed order No. 65616 and cut to required length.		
31	65617	Valve Cover Plate Gasket	1	.10
35	65725	Armature Lead Insulator	1	.05
30	65863	Piston Pin—Standard	1	.30
31	65906	Exhaust and Intake Valve Spring	2	.15
35	66154	Washer	2	.10
35	66164	Washer	1	.10
30	66246	Piston Pin Lock	2	2 @ .05
30	66403	Flywheel Key	1	.05
35	66457	Magneto Plate Gasket—.015" thick	1	.05
35	66527	Magneto Plate Gasket—.005" thick	1	.05
35	66537	Magneto Plate Gasket—.009" thick	1	.05
32	66937	Gear Case Gasket	1	.30
30	66979	Starter Rope	1	.50
		Note: No. 66932 Starter Rope	1	.60
		Used on type Nos. 208285.		
31	66987	Base Gasket	1	.25
33	67266	Control Wire—72" long	1	.30
		Note: If longer wire is needed, specify length in inches; if shorter wire is needed order No. 67266 and cut to required length.		
31	67956	Throttle Spring	1	.20
31	67962	Throttle Spring Clip	1	.05
31	68122	Cam Shaft Plug	1	.05
32	68227	Gear Cover Gasket	1	.20
31	68283	Valve Spring Retainer Collar	2	.10
31	68293	Valve Spring Retainer Washer	1	.10
31	68333	Cam Gear Shaft	1	.40
36	68477	Gas Filter Gasket	1	.05
36	68487	Gas Filter Bowl	1	.15
31	68643	Governor Crank	1	.30
31	68652	Spark Plug Wrench	1	.30
34	68667	Fibre Washer	1	.05
34	68677	Needle Packing	1	.05
33-34	68857	Carburetor Body Gasket	1	.10
35	68876	Dust Cover Clip	1	.10
33-34	68877	Inlet Valve Seat Gasket	1	.10
33	68887	Needle Valve Packing	1	.05
33-34	68897	Venturi Gasket	1	.05
31	69023	Intake Valve	1	.55
		Note: No. 26521 Stellite Valve	1	9.75
		Used on type No. 208267.		
31	68987	Carburetor Mounting Gasket	1	.05
31	69004	Cylinder Head Gasket	1	.20
33	69241	Control Casing Tube	1	.50
36	69298	Gas Tank Strap	2	.25
32	69696	Pulley Hub	1	18.00
35	69754	Contact Spring and Point	1	.30
35	69790	Contact Block Assembly	1	.65
35	69976	Magneto Plate Assembly	1	3.00
		Note: No. 69058 Magneto Plate	1	4.00
		Used on type No. 208285.		

REF. PLATE NO.	MASTER PART NO.	NAME	UNITS REQ.		SELLING PRICE EACH
36	89961	Gas Tank Cap	1		.35
33	89014	Governor Control Assembly	1		.85
31	89044	Oil Drain Plug	1		.20
32	89057	Starter Clutch Assembly	1		3.50
34	89062	Air Cleaner Assembly	1		6.00
34	89063	Governor Spring Lever	1		.50
36	89079	Gasoline Line	1		.45
		No. 89120 Gasoline Line—13¼" long	1		1.25
		Used on type No. 208286.			
32	89100	Starter Clutch Pinion	1		1.85
32	89102	Starter Bracket	1		4.00
32	89106	Starter Pedal Assembly	1		1.25
34	89119	Gas Filter	1		3.00
34	89141	Air Cleaner Tube	1		4.50
34	89147	Choke Lever Shaft	1		1.00
31	89250	Breather Assembly	1		1.25
31-35	89307	Oil Return Valve	1		.15
33	89431	Choke Rod	1		1.50
31	89567	Muffler	1		2.00
		Note: No. 89953 Muffler	1		3.00
		Used on type Nos. 208255, 208258.			
31	89572	Spark Plug with Gasket	1		.65
31	89720	Spark Plug Shield	1		2.50
31	89721	Spark Plug Wrench	1		1.00
35	89953	Blower Housing and Stop Switch Assembly	1		4.50
		Note: No. 89994 Blower Housing Assembly	1		4.50
		Used on type Nos. 208257, 208267, 208284.			
		No. 290356 Blower Housing Assembly	1		4.50
		Used on type No. 208258.			
30	89947	Connecting Rod Assembly	1		2.50
33-34	90029	Screw—4-36x¼" Rd. Hd.	2		.05
35	90061	Screw—10-32x½" Rd. Hd.	1		.05
33-34	90200	Carburetor Screw	4		.05
31-34	90202	Screw—10-32x½" Fill. Hd.	1		.05
35	90313	Contact Block Nut	1		.05
35	90319	Cable Clamp Nut	1		.05
35	90337	Stop Switch Nut	2		.05
32	90354	Lockwasher	1	4 @	.05
31-32-34-35	90366	Lockwasher	4	4 @	.05
33-34	90369	Lockwasher	1	4 @	.05
32	90386	Screw—¼-24x1" Hex. Hd.	4		.05
36	90393	Tank Bracket Lockwasher	2	2 @	.05
34	90700	Screw—¼-20x½" Hex. Hd.	1		.05
31-34-35	90832	Lockwasher	8	4 @	.05
35	90977	Stop Switch Screw	1		.05
31	90978	Oil Drain Plug	1		.10
31	90986	Oil Filler Pipe Plug	1		.10
31	90997	Base Screw	4		.05
31	90991	Screw—¼-20x½" Hex. Hd.	1		.05
31-35	90916	Screw—¼-20x½" Rd. Hd.	5		.05
31-32	90950	Screw—⅛-24x⅝" Hex. Hd.	2		.05
30	90969	Crankshaft Lockwasher	1		.05
		Note: No. 91521 Washer	1		.05
		Used with No. 90969 on type No. 208283.			
32	91028	Screw—⅜-24x⅝" Hex. Hd.	1		.05
31	91162	Screw—⅛-18x1½" Hex. Hd.	2		.05
		Note: No. 23409 Stud	2		.15
		Used on type No. 208285.			
		Uses No. 91206 Nut	2		.05
31	91196	Screw—¼-20x⅝" Fill. Hd.	1		.05
31	91242	Muffler Elbow Locknut	1		.05
31	91245	Muffler Nipple	1		.15

REF. PLATE NO.	MASTER PART NO.	NAME	UNITS REQ.		SELLING PRICE EACH
31	91246	Muffler Elbow	1		.40
		Note: No. 91205 Elbow	1		.35
		Used on type Nos. 208255, 208258.			
36	91247	Screw—½-20x2" Hex. Hd.	2		.15
33	91253	Screw—6-32x⅜" Fill. Hd.	1	2 @	.05
35	91285	Magneto Washer	3	2 @	.05
35	91287	Stop Switch Lockwasher	1		.05
36	91319	Screw—½-20x1" Hex. Hd.	2		.05
31	91324	Cylinder Head Spacer	2	2 @	.05
35	91366	Contact Connector Screw	2		.10
31	91386	Cylinder Head Screw (Short)	2		.10
		Note: No. 23410 Stud	2		.15
		Used on type No. 208285.			
		Uses No. 91206 Nut	2		.05
31	91387	Cylinder Head Screw (Long)	3		.10
		Note: No. 23411 Stud	3		.15
		Used on type No. 208285.			
		Uses No. 91206 Nut	3		.05
31	91389	Valve Cover Screw	1		.05
34	91390	Elbow Adapter	1		.20
35	91407	Lockwasher	1		.05
31	91423	Screw—¼-20x⅝" Hex. Hd.	2		.05
		Note: No. 91419 Screw	2		.05
		Used on type No. 208285.			
32	91478	Key	1		.05
31	91523	Oil Filler Nipple	1		.20
		Note: No. 89116 Oil Filler Nipple	1		.40
		Used on type No. 208285.			
		No. 89859 Oil Filler Nipple	1		.30
		Used on type Nos. 208255, 208258.			
30	91566	Pinion Lock Screw	2		.05
		Used on Rope Starter Engines and on Engines without Starters on Flywheel Side.			
36	91635	Gas Tank Nipple	1		.15
32	91648	Screw—⅛-24x½" Hex. Hd.	3		.05
33-34	91661	Lockwasher—No. 8	4	3 @	.05
33	91674	Air Cleaner Wing Nut	1		.05
32	91758	Clutch Pulley Set Screw	1		.10
32	91865	Bearing Retainer Lockwasher	3		.05
33-34	91920	Carburetor Throttle Screw	1		.05
31-35	91984	Cotter Pin	2	2 @	.05
34	92017	Screw—8-32x⅛" Fill. Hd.	1		.05
33	92125	Screw—¼-20x½" Hex. Hd.	2		.05
33	92129	Locknut	3		.05
33	92134	Air Cleaner Pipe Screw	1		.05
30	92146	Connecting Rod Screw	2		.05
31-33-35	92151	Lockwasher	7	2 @	.05
		Note: No. 92507 Lockwasher—Shakeproof	2		.05
		Used on type Nos. 208255, 208258, 208285 to mount armature.			
35	92166	Magneto Mounting Screw	4		.10
35	92167	Magneto Mounting Lockwasher	4		.05
31	92171	Cotter Pin	1	4 @	.05
35	92179	Condenser Mounting Screw	1		.10
35	92181	Contact Lockwasher	1		.05
35	92182	Armature Mounting Screw	2		.10
35	92187	Contact Block Lockwasher	1		.05
32	92209	Screw—⅛-24x¾" Fill. Hd.	1		.10

REF. PLATE NO.	MASTER PART NO.	NAME	UNITS REQ.	SELLING PRICE EACH
34	92221	Air Cleaner Pipe Screw	1	.05
31-32	92268	Lockwasher	4 @	.05
34-35	92272	Blower Mounting Screw	2	.05
32	92279	Screw—$\frac{1}{4}$-24x-1$\frac{1}{4}$" Hex. Hd.	2	.05
30	92284	Flywheel Nut	1	.05
33	92285	Control Lever Cotter Pin	1 4 @	.05
33	92287	Control Lever Swivel Screw	1 2 @	.05
32	92288	Cotter Pin	1 4 @	.05
34	92290	Lockwasher	1 3 @	.05
31-33	92305	Control Lever Washer	1	.05
33	92306	Control Lever Screw	1	.05
32	92322	Set Screw	1	.05
31	92418	Cotter Pin	2 2 @	.05
36	92424	Tank Strap Screw	2	.10
36	92425	Tank Strap Washer	2	.05
34	92537	Screw—¼-20x1" Hex. Hd.	1	.10
30	99157	Ball Bearing	1	2.75
30	99175	Oil Seal	1	1.25
32	99515	Oil Seal	1	1.75
33	99621	Needle Valve	1	.50
33-34	99632	Carburetor Float	1	.35
32	99633	Spring Tooth Assembly	1	.35
33-34	99635	Throttle Shaft Assembly	1	.45
33-34	99636	Inlet Valve and Seat	1	.50
36	99665	Gas Filter Yoke	1	.50
33	99700	Choke Shaft and Lever	1	.50
33-34	99772	Upper Carburetor Body Assembly	1	3.50
33	99966	Air Cleaner Assembly	1	5.00
36	99999	Gas Filter Cover Assembly	1	1.25
36	99919	Gas Filter Assembly	1	1.75
31	99916	Cylinder Assembly	1	17.00
		Note: No. 89055 Cylinder. Used on type No. 208285.	1	18.00
		No. 89066 Cylinder. Used on type Nos. 208252, 208259, 208262.	1	18.00
		No. 89423 Cylinder. Used on type Nos. 208255, 208258.	1	18.00
		Uses No. 23537 Studs	6	.15
		No. 99923 Cylinder. Used on type Nos. 208251, 208257, 208261, 208263, 208272, 208275, 208276, 208279, 208284.	1	18.00
		Uses No. 23537 Studs	6	.15
		No. 290254 Cylinder. Used on type No. 208267.	1	28.75
31	99917	Governor Lever	1	.55
30	99920	Piston Assembly—Standard	1	3.65
33	99925	Air Cleaner Cover and Filter Assembly	1	2.75
33	99926	Air Cleaner Bowl Assembly	1	2.25
33	99927	Carburetor Assembly	1	7.50
		Note: No. 89430 Carburetor Assembly. Used on type Nos. 208255, 208258.	1	7.50
35	99929	Blower Housing	1	4.00
		Note: No. 21065 Blower Housing. Used on type No. 208286.	1	3.50
		No. 21699 Blower Housing. Used on type No. 208285.	1	3.50
33-34	99954	Upper Carburetor Body	1	2.00
30	99963	Piston—Standard	1	2.25
30	99964	Piston—.010" Oversize	1	3.00
30	99965	Piston—.020" Oversize	1	3.00
30	99966	Piston—.030" Oversize	1	3.00

REF. PLATE NO.	MASTER PART NO.	NAME	UNITS REQ.	SELLING PRICE EACH
30	99967	Piston Assembly—.010" Oversize	1	4.40
30	99968	Piston Assembly—.020" Oversize	1	4.40
30	99969	Piston Assembly—.030" Oversize	1	4.40
35	99990	Magneto Assembly	1	10.00
		Note: No. 89015 Magneto Assembly. Used on type Nos. 208256, 208263, 208266, 208272, 208273, 208274, 208287.	1	10.00
		Includes: No. 66165 Ground Wire	1	.25
		No. 89096 Magneto Assembly. Used on type Nos. 208257, 208267, 208284.	1	12.50
		Includes: No. 89850 Armored Ground Wire	1	.50
		No. 290420 Magneto Assembly. Used on type Nos. 208255, 208258.	1	12.50
		Includes: No. 89850 Armored Ground Wire	1	.50
		No 290428 Magneto Assembly. Used on type No. 208285.	1	13.00
		Includes: No. 66005 Ground Wire	1	.40
35	290018	Magneto Oil Seal. Used on engines after Serial No. 103752.	1	.40
		No. 62235 Oil Retainer Ring. Used on engines before Serial No. 103752.	1	.05
36	290059	Shut-off Lever—⅛" Dia., "T" Shaped	1	.50
34	290106	Carburetor Assembly	1	7.75
36	290232	Gas Tank Assembly	1	4.00
31	290235	Filler Cap and Drain Assembly	1	.65
		Note: No. 89187 Filler Cap Assembly. Used on type No. 208285.	1	.60
		No. 290002 Filler Cap Assembly. Used on type Nos. 208255, 208258.	1	.50
35	290281	Ground Wire—37" long	1	.25
35	290332	Magneto Bearing and Oil Seal. Used on engines after Serial No. 103752.	1	1.00
		No. 99911 Bearing and Oil Ring. Used on engines before Serial No. 103752.	1	.70
30	290412	Flywheel Assembly (Supersedes, and is interchangeable with No. 61451.)	1	10.00
36	290418	Gas Tank Bracket (Stamped Steel). Replaces No. 21198 Tank Bracket.	1	1.50

NATION-WIDE SERVICE ORGANIZATION

To provide prompt and efficient service on Briggs & Stratton engines, Authorized Central Service Distributors and Engine Service Stations are located in the principal cities of the United States and Canada.

Each Authorized Service Organization carries a stock of original Briggs & Stratton repair parts. Each is equipped with special factory service tools and factory-trained mechanics, assuring expert repair service on all Briggs & Stratton engines.

Genuine Briggs & Stratton service will assure continuous engine satisfaction. Our long experience in engine maintenance prompts us to urge that all service work for civilian needs be done by an Authorized Service Organization or at our factory. Mechanics unfamiliar with Briggs & Stratton products, or without proper tools, should not be permitted to make major repairs.

Parts and repair work for civilian needs are F. O. B. Factory or any Authorized Briggs & Stratton Central Service Distributor or Engine Service Station. The Central Service Distributor nearest you (see list below) will be glad to give you the name of our Engine Service Station in your locality. Space does not permit listing here.

Authorized Central Service Distributors

STATE	CITY	NAME	LOCATION
Alabama	Birmingham 3	Birmingham Electric Battery Co.	Ave. B. at 23rd St.
Arizona	Phoenix	Motor Supply Co.	815 N. Central Ave.
California	Los Angeles 15	Electric Equipment Company	1611 S. Hope St.
California	San Francisco 9	Automotive Service Co.	1414 Van Ness Ave.
Colorado	Denver 1	Spitzer Electrical Company	48 W. 9th Ave.
Florida	Jacksonville 1	Spencer Electric, Inc.	40 W. Beaver St.
Florida	Miami 32	Electrical Equipment Co.	42-58 N. W. 4th St.
Florida	Tampa 1	Spencer Auto Electric, Inc.	607-11 E. Cass St.
Georgia	Atlanta 3	Auto Electric & Magneto Co.	477 Spring St., N. W.
Illinois	Chicago 16	Mid-States Auto Electric Co.	1905 S. Michigan Ave.
Indiana	Indianapolis 1	Gulling Auto Electric Co.	450 N. Capitol Ave.
Iowa	Des Moines 9	Magneto Carburetor & Electric Co., Inc.	1808 Grand Ave.
Kansas	Wichita 2	The E. S. Cowle Electric Co.	230 S. Topeka Ave.
Kentucky	Lexington 34	Kentucky Ignition Co., Incorporated	Rose and Vine Sts.
Louisiana	New Orleans 1	A. C. Suhren Co.	1319 St. Charles Ave.
Louisiana	Shreveport (A)	Chain Battery & Automotive Supply, Inc.	Marshall at Cotton Sts.
Massachusetts	Boston 15	Wm. H. Flaherty Co.	48-52 Cummington St.
Michigan	Detroit 1	Auto Electric & Service Corporation	90 Selden Ave.
Minnesota	Minneapolis 2	Reinhard Brothers Co., Inc.	11 S. Ninth St.
Missouri	Kansas City 8	The E. S. Cowle Electric Co.	1819 Wyandotte St.
Missouri	St. Louis 3	Medart Auto Electric Co., Inc.	3184 Washington Blvd.
Montana	Billings	Pasley & Spitzer Co.	20 N. 33rd St.
Nebraska	Lincoln	Carl A. Anderson, Inc.	1637 P Street
Nebraska	Omaha 2	Carl A. Anderson, Inc.	16th and Jones St.
New York	Buffalo 14	The Battery & Starter Co., Inc.	2505 Main St.
New York	New York 23	The Durham Co., Inc.	17 W. 60th St.
New York	Syracuse 4	The Durham Co., Inc.	601 W. Genesee St.
North Carolina	Charlotte 1	Carolina Rim & Wheel Co.	312 N. Graham St.
North Dakota	Fargo	Reinhard Brothers, Inc.	109 Roberts St.
Ohio	Toledo 2	The Electric Power Maintenance Co.	26-30 Seventeenth St.
Oklahoma	Oklahoma City 2	American Electric Ignition Co.	725 N. Broadway
Oregon	Portland 9	Tracey & Co., Inc.	N. W. 10th and Glisan
Pennsylvania	Philadelphia 30	Auto Equipment & Service Co., Inc.	1522-24 Fairmount Ave.
Pennsylvania	Pittsburgh 24	Pitt Auto Electric Company	5135 Baum Blvd.
South Dakota	Aberdeen	Reinhard Brothers Co., Inc.	317 S. Lincoln St.
Tennessee	Knoxville 7	R. T. Clapp Company	401-7 N. Broadway
Tennessee	Memphis 4	Automotive Electric Service Co.	1095 Union Ave.
Texas	Amarillo	The E. S. Cowle Electric Co.	700 Van Buren St.
Texas	Dallas 1	Beard & Stone Electric Co., Inc.	2101 Bryan St.
Texas	El Paso	Motor Supply Co.	308 Chihuahua St.
Texas	Houston 1	Beard & Stone Electric Company, Inc.	Milam at Polk Ave.
Texas	San Antonio 6	S. X. Callahan	425 N. Flores St.
Utah	Salt Lake 13	Motor Equipment Company	305-309 So. State St.
Washington	Seattle 14	Sunset Electric Co.	300 Westlake North
Wisconsin	Milwaukee 2	Wisconsin Magneto Co.	918 N. Broadway
		DOMINION OF CANADA	
Manitoba	Winnipeg	Beattie Auto Electric Limited	176 Fort St.
Ontario	Toronto 5	Auto Electric Service Company, Limited	1009 Bay St.

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