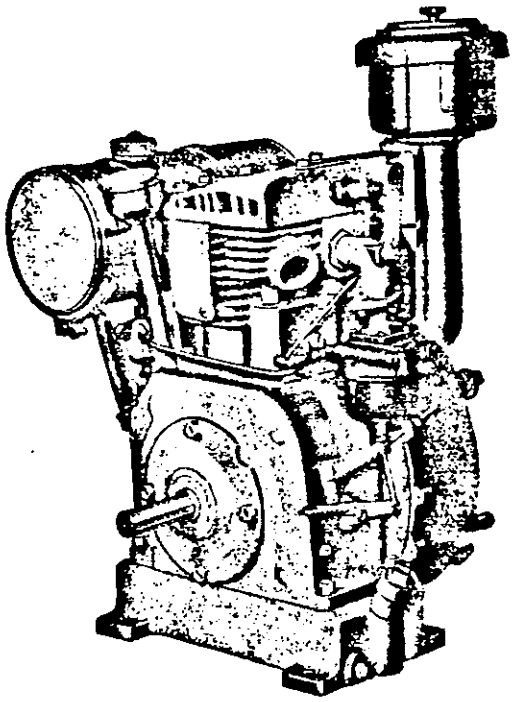
Operating Instructions

MODEL "Z"

SPECIAL MODELS
"ZH" — "ZHL" — "ZHLP" — "ZP" — "ZR"

Adjustment and Repair Information
Parts List



INDEX

	Page
Starting the "Z" Motor	3
Servicing Reference Chart	4
Instructions for Adjustment and Repair	4
Repair Parts	10
Parts List, Model "Z"	11-15
Illustrated Parts	16-17
Parts List, Models "ZH," "ZHL," "ZHLP," "ZP" and "ZR"	15-16
Guarantee	18
Nation-Wide Service Organization	18
Authorized Central Service Distributors	18

Read these instructions carefully before operating this Motor for the first time.

Guessing how to run it may cause you unnecessary inconvenience, aggravation or failure to receive the fine service that is built into it.

There is a right way to operate the "Z" Motor. This book tells you how.

Each Model "Z" Motor is carefully tested and adjusted at the factory before packing for shipment, and if correctly operated will perform beyond your expectations.

DO NOT START THIS MOTOR UNTIL YOU HAVE READ CAREFULLY "STARTING AND OPERATING THE MODEL "Z" MOTOR" ON PAGE 3

4 CYCLE
BRIGGS & STRATTON
MILWAUKEE, WIS., U.S.A.
GASOLINE MOTOR

IMPORTANT SAFETY INFORMATION AND INSTRUCTIONS FOR

ENGINE SELECTION
ENGINE INSTALLATION
ENGINE OPERATION

Keep these instructions for future reference.

In the USA and Canada,
our 24 hour hotline is:

18002333723

Briggs & Stratton Corporation
Milwaukee, Wisconsin 53201

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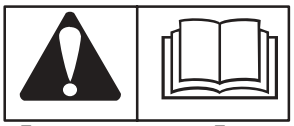


Before installing and operating this engine read and observe all warnings, cautions and instructions on both sides of this sheet, on the engine, and in the operating & maintenance instructions.

NOTE: This sheet of instructions and safety information is not meant to cover all possible conditions and situations that may occur. Read entire Operating & Maintenance Instructions for this engine AND the instructions for the equipment this engine powers. Failure to follow instructions and safety information could result in serious injury or death.

The safety alert symbol (⚠) is used to identify safety information about hazards that can result in personal injury.

A signal word (DANGER, WARNING, or CAUTION) is used with the alert symbol to indicate the likelihood and the potential severity of injury. In addition, a hazard symbol may be used to represent the type of hazard.

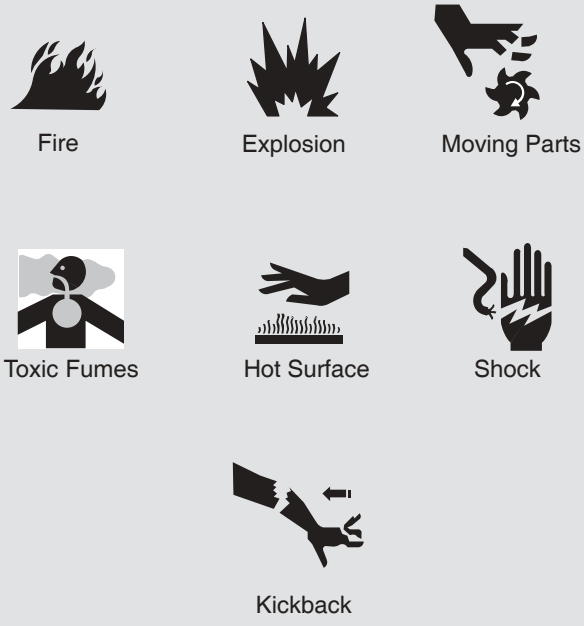
⚠ **DANGER** indicates a hazard which, if not avoided, **will result in death or serious injury.**

⚠ **WARNING** indicates a hazard which, if not avoided, **could result in death or serious injury.**

⚠ **CAUTION** indicates a hazard which, if not avoided, **might result in minor or moderate injury.**

CAUTION, when used **without** the alert symbol, indicates a situation that **could result in damage to the engine.**

HAZARD SYMBOLS AND MEANINGS



(OVER)

FORM MS-6445-01/03

ENGINE SELECTION

- Some engines are unique and designed for specific applications or types of equipment. If this engine will be used to build new equipment, contact Briggs & Stratton to ensure that the engine is appropriate for the intended use.

  Note: For all Go-karts use only a model 136200 series engine, which offers improved safety and performance.
- Replacement engines should be the same model as the original engine, or be the Briggs & Stratton designated replacement engine. Refer to the Operation & Maintenance Instructions for engine identification information.

  Note: For all Go-karts use only a model 136200 series engine, which offers improved safety and performance.
- Do not use Briggs & Stratton engines on 3-wheel All-Terrain Vehicles (ATVs), motor bikes, air craft products, or vehicles intended for use in competitive events. Briggs & Stratton does not approve of or authorize such uses.

ENGINE INSTALLATION

[1] Do not attempt to install this engine if you do not have the appropriate tools and knowledge of small engine installation procedures. Use only Briggs & Stratton parts. Contact your Authorized Service Dealer for assistance.

[2] Do not modify the engine in any way without Briggs & Stratton factory approval. Any such modification is at the owner's sole risk.

[3] If the exhaust system on the old engine was supplied by the equipment manufacturer, you must transfer the exhaust system and related components (original muffler and related pipes, brackets, clamps, and shields) to the new engine. All components must be in good condition.

[4] 

Install muffler (and muffler deflector if used) so outlet points away from operator, fuel tank, and equipment, and so muffler heat will not damage or deform engine and components.

[5] 

Ensure all fuel lines and fittings are properly assembled and do not leak. Replacement parts must be the same model as the original.

[6] 

Ensure all wiring, including safety switches and engine shut-off components are completely installed and functioning properly.

[7] Set engine speed to equipment manufacturer's specification. Refer to equipment manufacturer's manual. Do not tamper with governor springs, or other parts that will increase engine speed above specification.

[8] 

All engine parts, including fuel cap, spark plug, muffler, air cleaner, and covers and guards for drive components (gears, belts, shafts, couplings, etc.) must be in place before attempting to start engine.

[9] 

If engine is installed on walk behind lawn mower, all mower components, including cutting blade, must be correctly installed before attempting to start engine.

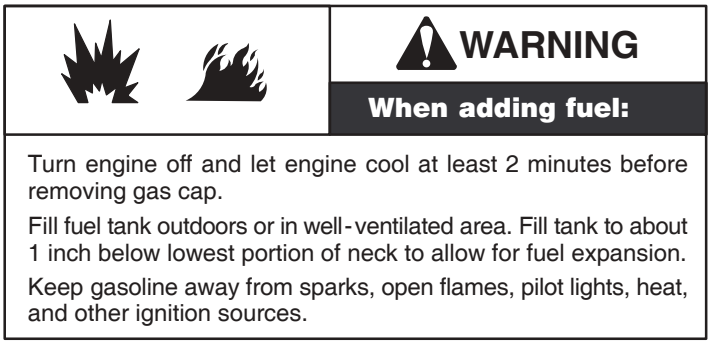
[10] 

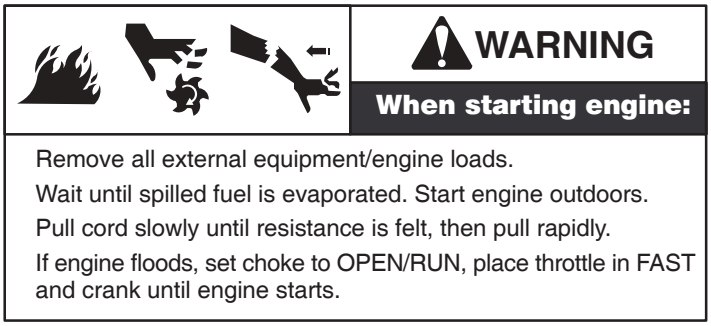
When working on the engine or equipment, remove spark plug wire from spark plug. For electric start, remove negative wire from battery.

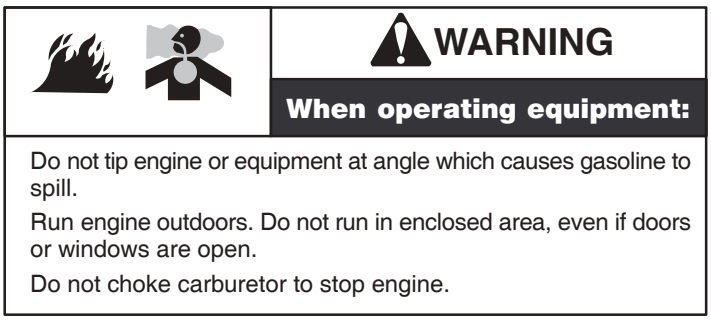
[11] 

Do not check for spark with spark plug removed. Use Briggs & Stratton spark tester #19368.

ENGINE OPERATION







Starting and Operating the Model "Z" Motor

	Paragraph
Before Starting the Motor	1
How to Start	2
Failure of Motor to Start	3
How to Stop	4
General Data	5

1. BEFORE STARTING THE MOTOR. Fill the crankcase with Mobiloil Arctic or any other high grade oil not heavier than S. A. E. No. 20. A HEAVIER OIL MUST NOT BE USED. The oil filler plug is painted blue and is located on top of motor base. With the motor level remove filler plug and pour oil in opening until it rises to the level of the filler plug opening. Crankcase holds five pints. Fill the gas tank with a good grade of **clean** regular gasoline. Tank holds five quarts. Do not mix oil and gasoline. See paragraphs 11 to 19.

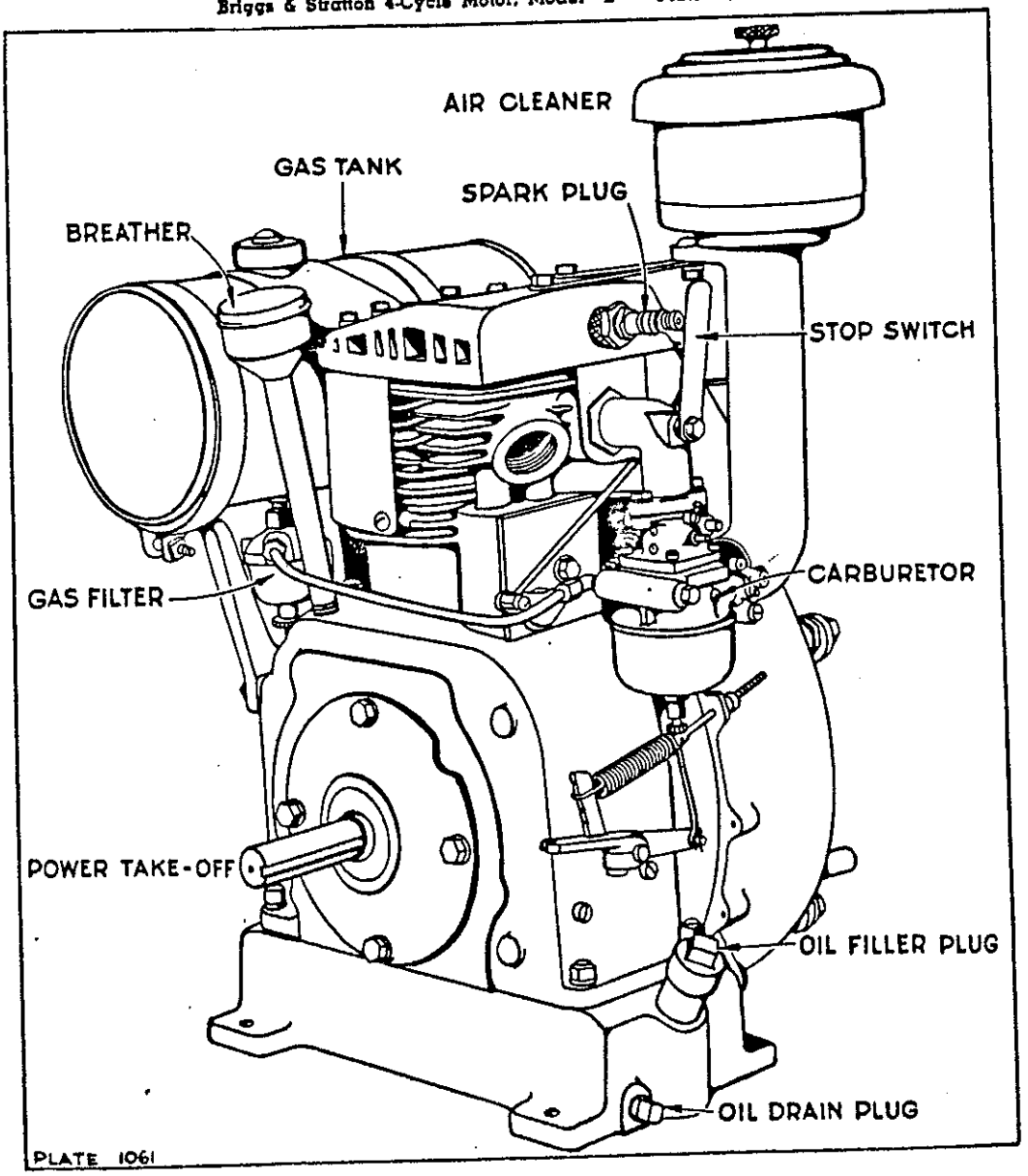
2. HOW TO START. Open gasoline shut-off valve in gas filter or gasoline tank.

A. HAND CRANK STARTER TYPE. Pull out the compression release rod as far as it will come. Press the starter shaft in, to mesh gear with pinion on crankshaft. Crank rapidly, and as soon as enough momentum is gained let go of the compression release rod and pull carburetor choke lever toward you to choke carburetor. After motor starts, gradually open the choke valve until motor runs smoothly with the choke valve wide open. (A warm motor does not require as much choking as a cold motor.)

B. ROPE STARTER TYPE. Pull carburetor choke lever toward you or to the right. Slip the knotted end of the starter rope into the notch of the starter pulley and wind the rope around it. Pull the rope with a quick steady pull to spin and start the motor. Operate choke as explained under 2-A.

3. FAILURE OF MOTOR TO START. If motor fails to start after a reasonable number of trials do not make any adjustments until you have studied the instructions referred to in the **Servicing Reference Chart** on page 4.

Briggs & Stratton 4-Cycle Motor, Model "Z" — Plate No. 1



Servicing Reference Chart

MOTOR FAILS TO START

	Paragraph
Out of Gasoline	1-16
Out of Oil	1-13-60-61
Dirt or Gum in Fuel System	16 to 19
Incorrect Use of Choke	20
Carburetor Out of Adjustment	22 to 27
Spark Plug Dirty	33-34
Ignition Cable Grounded	35
Magneto	36 to 47
Poor Compression	48 to 57
Air Cleaner Clogged	63

MOTOR STOPS

Out of Gasoline	1-16
Out of Oil	1-13-60-61
Dirt or Gum in Fuel System	16 to 19
Motor Overheated	13-60-61-62-65
Air Cleaner Clogged	63
Motor Overloaded	65

MOTOR OVERHEATS

	Paragraph
Out of Oil	1-13-60-61
Oil Needs Changing	14-15
Oil Too Heavy	14-15
Carburetor Out of Adjustment	22 to 27
Poor Spark	32 to 47
Carbon	62
Muffler Clogged	64
Overloaded	65

MOTOR LACKS POWER

Lack of Oil	1-13-60-61
Add or Change Oil	13 to 15
Carburetor Out of Adjustment	22 to 27
Motor Not Up to Speed	26 to 29
Poor Spark	26 to 31
Poor Compression	48 to 57
Carbon	62
Air Cleaner Clogged	63
Muffler Clogged	64
Overloaded	65

Instructions for Adjustment and Repair

	Paragraph
Operating Requirements	8
How a 4-Cycle Motor Operates	10
Keep the Motor Clean	11
Use the Right Kind of Oil	12
Add Oil Regularly	13
Change Oil Frequently	14
Use Clean Gasoline	16
Avoid Gummy Gasoline	17
To Clean the Fuel Lines	19
Correct Use of the Choke	20
To Prime the Motor	21
To Adjust the Carburetor	22
To Remove and Replace Carburetor	26
To Clean Carburetor	27
Governor—Correct Motor Speed	28
Resetting Governor Lever	30
The Ignition System	32
To Check for Spark	33
Spark Plug Adjustment	34
Ignition Cable	35
To Remove and Replace Flywheel	36
To Remove and Replace Magneto Assembly	38
Magneto Timing	39
To Adjust and Clean Contact Points	40
To Replace Condenser	42
To Replace Armature	44
Cylinder Head	48
Compression	49
Valve Adjustment	50
Piston	55
Piston Rings	57
Piston Pin	58
Connecting Rod	59
Oil Pump	60
Oil Leaks	61
Carbon	62
Air Cleaner	63
Muffler	64
Overload	65
Crank Starter Assembly	66
Parts	67

4. HOW TO STOP. Press the stop switch mounted on the intake elbow against the end of the spark plug. Hold it until motor stops firing. Some motors have a hinged stop switch mounted on the cylinder head. Turn the end of it over so that it rests on the spark plug terminal. Both of these methods will ground the spark.

5. GENERAL DATA. You will find your Briggs & Stratton motor 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.

6. Your motor will give you better service if you do not tinker with it. This does not mean, however, that it does not require a certain amount of attention. Give it the right kind of fuel, oil and care. Keep it clean both inside and out. You will be well repaid in trouble-free, satisfactory service.

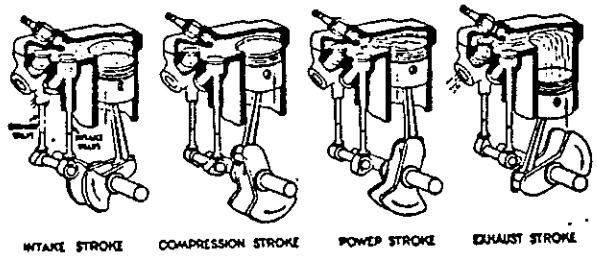
7. If you should experience any difficulty, follow the instructions referred to in the **Servicing Reference Chart** above. If you cannot easily remedy it, consult your dealer, or a nearby Briggs & Stratton Authorized Central Service Distributor. See page 18.

8. OPERATING REQUIREMENTS. A gasoline motor to operate properly must have all parts in correct adjustment to provide good ignition, carburetion, compression and cooling. And of equal importance, the oil and gasoline used must be clean and of recommended grades. The following instructions fully explain the simple adjustments and offer operating recommendations that will assure you of complete satisfaction. We urge you to carefully observe them.

9. The reliability, economy and ease of starting which characterize this motor are due in part to the fact that it is of the 4-stroke cycle design commonly called "4-cycle," the same design used in all automotive motors. As the name indicates there are four strokes to one complete power cycle.

10. HOW A 4-CYCLE MOTOR OPERATES. On the **intake stroke** the piston goes down, producing a vacuum in the cylinder, thereby drawing fuel up through the carburetor so that the space above the piston becomes filled with combustible gas. During this stroke the intake valve is open. Next the piston comes up on the **compression stroke** with both valves closed. At the top of the compression stroke a spark occurs at the spark plug, firing the highly compressed gas. This produces an explosion above the piston which forces it down on the **power stroke.** Both valves are closed. On the next upstroke of the piston, called the **exhaust stroke,** the exhaust valve is open, and the burned gases driven out. See Plate No. 2.

The 4-Stroke Cycle
Plate No. 2



11. KEEP THE MOTOR CLEAN. It will pay you to keep your motor clean both inside and outside. See that no dirt or water enters motor when filling with oil or gasoline. As a precautionary measure always wipe off the gasoline cap and oil filler plug, as well as around them before refilling. Dirt in the motor or gasoline tank will cause trouble and even serious damage.

12. USE THE RIGHT KIND OF OIL. Correct lubrication is important. We recommend the use of MOBILOIL "ARCTIC" or other high grade oil with similar characteristics having a low carbon residue and a body not heavier than S. A. E. No. 20. **A heavier oil which might be satisfactory in a tractor or for lubricating farm machinery must NOT be used.** Do not mix oil with the gasoline. This 4-cycle motor is provided with an independent efficient pump lubrication system which forces a stream of oil to all moving parts of the motor. There are no external parts which require separate oiling.

13. ADD OIL REGULARLY. A motor which is run without oil will be ruined within a few minutes. To avoid the possibility of such an occurrence and the resulting expense, always fill the oil reservoir at the blue plug to the top of the filler plug opening after each five hours of motor operation. Capacity of oil reservoir is five pints.

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

15. In the normal running of any motor, small particles of metal from the cylinder walls, pistons and bearings will gradually work into the oil. Dust particles from the air also get into the oil. If the oil is not changed regularly, these foreign particles cause increased friction and a grinding action which shortens the life of the motor. Sludge, a gummy mass, forms which clogs up the oil passages. Fresh oil also assists in cooling, for old oil gradually becomes thick and loses its cooling as well as its lubricating qualities.

16. USE CLEAN GASOLINE. A good grade of **clean, fresh** regular gasoline is recommended. Too high test gasoline may form vapor-lock in gas line when motor gets hot. This interrupts the flow of gasoline and causes motor to stop. Be sure that the small vent hole in the gasoline 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. AVOID GUMMY GASOLINE. If you experience trouble with a gummy, sticky substance with a peculiar sharp obnoxious smell, change to another grade of gasoline. This gum comes from the gasoline and clogs carburetor, gas line, gasoline tank, etc. You can check your gasoline by evaporating a half pint in an open dish. If a quantity of gum remains, try another kind that is clean and fresh.

18. You can avoid most trouble from gum if you will keep the tank full when you are not using the motor. If you use it only occasionally, drain tank completely and refill when motor is used again. The reason for this is that evaporation of stale gasoline causes most gum deposits.

19. TO CLEAN THE FUEL LINES. Disconnect the gasoline line at the carburetor and also at the gas filter. Blow through the gas line to clear it. To clean the gas filter, first close the shut-off valve and loosen thumb screw. Remove and clean glass bowl, gasket and screen. Open shut-off valve to see if gasoline flows freely from the tank. IMPORTANT: If you find a gummy varnish-like substance, alcohol or acetone will dissolve it. See paragraphs 17 and 18.

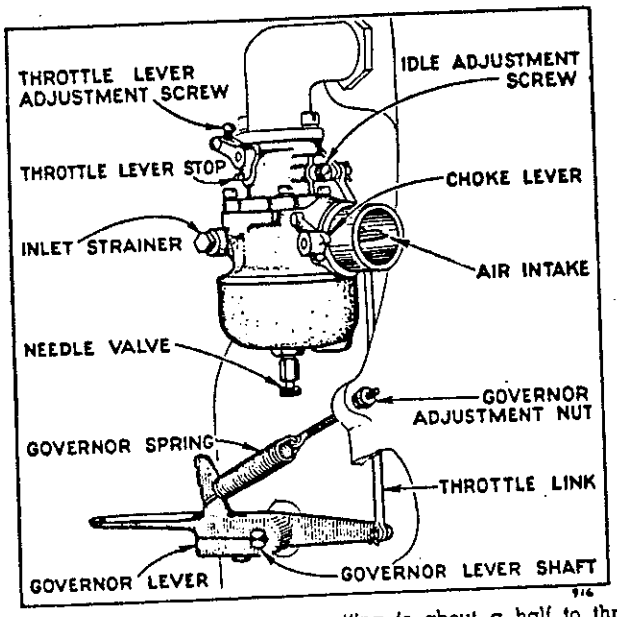
20. CORRECT USE OF THE CHOKE. The correct carburetor setting (see paragraph 23) gives the motor the best mixture to run on when it is hot. For starting, it is necessary to choke the carburetor to get a rich mixture, because cold gasoline does not vaporize readily. A warm or hot motor requires very little choking. Until you become familiar with your motor, however, you may make the mistake of not choking the carburetor enough or you may choke it too much. If motor fails to start after cranking three or four times with the choke closed, try cranking two or three times with the choke part-way down and then all the way down, or open. Use motor choke the same as you use an automobile choke.

21. TO PRIME THE MOTOR. The motor may fail to start for the reason that either the carburetor is incorrectly adjusted or dirty, or the fuel line is dirty or clogged, or you are out of gasoline. To determine the cause, prime the motor by removing the spark plug and pour a half teaspoonful of gasoline into the spark plug opening. Replace the spark plug and crank the motor. If it fires for three or four revolutions and stops, the difficulty is definitely in the fuel system. See paragraphs 19, 22 to 27. If motor will not fire at all, check the ignition system, see paragraphs 32 to 47, also compression, paragraphs 48 to 57.

22. TO ADJUST THE CARBURETOR. The carburetor on the Model "Z" motor is of the gravity type. The gasoline supply is regulated by a needle valve. The throttle is automatically controlled by the governor, see paragraphs 28 to 31.

23. To adjust the carburetor, completely close needle valve by turning to right or clockwise as far as possible. Do not screw up too tight or use force when closing needle valve, or needle valve may be damaged. From closed position, open needle valve one to one and one-quarter turns. After the motor has been started and warmed up make final adjustment with the choke wide open by turning the needle valve to the point at which motor operates most smoothly with full load. This setting will also take care of starting with use of the choke. When starting cold motor, if it is necessary to keep choke partially closed several minutes before motor 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 28 to 31.

Carburetor and Governor Hook-Up
Plate No. 3



24. 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.

25. The throttle lever adjustment screw is set at the factory to permit an idling speed of about 800 R. P. M. We do not recommend adjusting the throttle to bring the speed lower. If you want to idle the motor at a higher speed than 800 R. P. M. turn the throttle lever adjusting screw to the right or in a clockwise direction.

26. TO REMOVE AND REPLACE CARBURETOR. Disconnect gasoline line from carburetor and gasoline shut-off valve. Remove two cap screws and lockwashers from the intake elbow. Then remove the cotter pin from the throttle shaft lever and slip the throttle link off. To replace, reverse the operations as performed above. Use a new cotter pin if necessary.

27. TO CLEAN CARBURETOR. Remove it from the motor as explained in the previous paragraph. Remove gas line connector elbow and gasoline inlet strainer. Remove the four screws and lockwashers from the upper carburetor body. Remove needle valve and stuffing box nut and packing nut gland. To check inlet valve and seat, pull out brass pin holding carburetor float. A worn or dirty inlet valve and seat or incorrect float level will cause carburetor to leak. In reassembling, float should be in a horizontal position when it closes inlet valve and seat. The float pivot can be bent to attain proper position of float. If any parts are gummy, clean them in alcohol or acetone. Blow through all passages and openings. Do not use wire to clean out small holes. Replace worn or damaged parts.

28. GOVERNOR—CORRECT MOTOR SPEED. The speed of your Model "Z" motor is automatically maintained under varying loads by a centrifugal governor. It is operated from the cam gear.

29. The governor was carefully adjusted at the factory to maintain normal speed under load. Do not re-adjust unless absolutely necessary. It can be changed by reducing or increasing the tension of the governor spring. Turn governor adjustment nut to the right or clockwise to increase motor speed. To left or anti-clockwise to reduce motor speed. Recommended motor speed (Models "Z," "ZL," "ZP," "ZR") is 2100 R. P. M. Models "ZH," "ZHL" is 2900 R. P. M.

30. RESETTING GOVERNOR LEVER. If the governor lever has been loosened or removed from the governor shaft, it is easily reset. With the carburetor attached to motor and hooked up to governor lever with throttle link, loosen cap screw holding governor lever on the governor shaft. Turn governor lever to the right or downward as far as it will go. Hold in this position and, with pliers, turn the shaft downward until it strikes a stop in the crankcase. Release the governor shaft but hold the governor lever until the cap screw is tightened. Be sure that neither governor lever nor shaft moves while tightening.

Manual and Remote Carburetor Controls

Plate No. 4

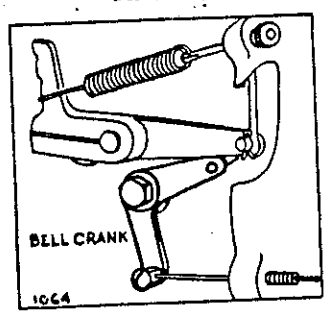


Plate No. 5

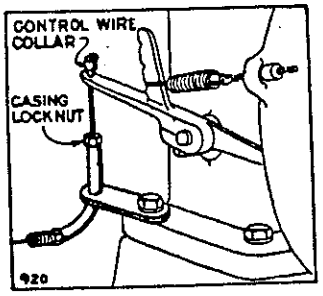


Plate No. 6

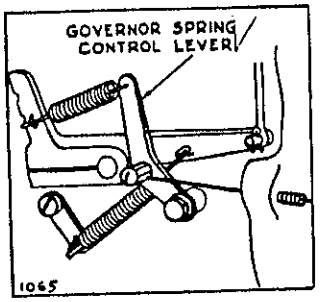
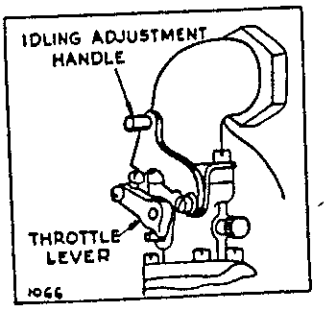


Plate No. 7



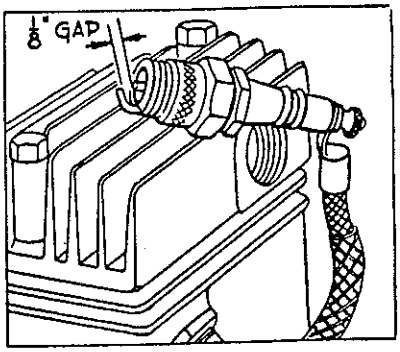
31. Some Model "Z" motors are equipped with manual or remote carburetor controls as shown in plate Nos. 4, 5, 6, and 7. To increase motor speed, move control lever away from boss on the control lever base. This adds tension to the throttle spring, allowing carburetor throttle to open wider. To reduce motor speed, return the control lever toward boss on the control lever base. Some models have a hand idling device as shown in plate No. 7. Its purpose is to keep motor idling when not in use. This eliminates changing governor hook-up on motors not equipped with a remote control. To idle motor, lower the idling adjustment lever. Raise the lever to bring motor back to normal running speed.

32. THE IGNITION SYSTEM. The spark is produced by a high tension magneto consisting of armature, condenser, contact points and rotating magnets cast in the flywheel. This is a simple self-contained system which is very reliable. It also does away with batteries. The ignition current is sent into the motor 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.

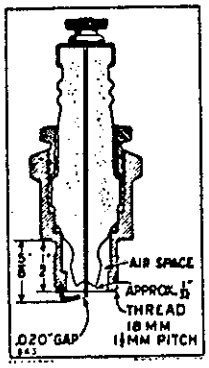
33. TO CHECK FOR SPARK. To prove that a satisfactory spark is being delivered by the magneto, remove the spark plug. Open plug point gap to about ⅛" and, with cable attached, place spark plug on the cylinder head, turn motor with starter and if the spark jumps this gap the entire ignition system is O. K. See plate No. 8. If no spark, try a new plug in the same way and if still no spark, check cable, see paragraph 35 and refer to magneto adjustments, paragraphs 36 to 47. Before replacing plug be sure to close point gap to .020 inch.

34. SPARK PLUG ADJUSTMENT. Spark plugs should be cleaned occasionally and points reset to .020". Points burn away in service. The porcelain is to prevent the spark from jumping anywhere except at the gap, and if cracked or broken it will prevent the plug firing. Water on the outside of the spark plug may permit the high voltage current to leak over the surface of the porcelain. Dirt or carbon on it will do the same thing. The spark plug can be cleaned by taking the plug apart and washing off the carbon with gasoline or kitchen scouring powder. Points should be scraped or sand-papered. When the plug has been put together again, the gap should be set at .020". See plate No. 9. Always keep a new plug on hand. We recommend the use of Champion No. 6M or its exact equivalent.

Checking Spark
Plate No. 8



Spark Plug
Plate No. 9



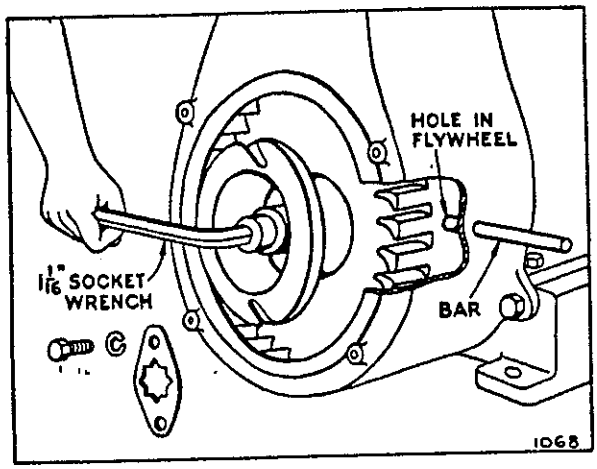
35. IGNITION CABLE. Insulation must not be broken, or soaked with oil or water, or grounded in any way where it touches the motor, or it will interfere with good ignition. Spark plug cable should be soldered to the secondary terminal (small brass plate coming out of the coil). Avoid touching coil with hot soldering iron. See plate No. 14.

36. TO REMOVE AND REPLACE FLYWHEEL. The flywheel is securely mounted to the crankshaft by means of a taper fit, a soft key, right hand threaded nut, and a nut lock on rope starter motors, or a pinion gear and lock on crank starter motors.

A. ROPE STARTER MOTORS. Remove the two cap screws that hold the nut lock and starter pulley in place. Place a rod or punch into the ⅜" hole which is in the blower housing at the gas tank side. Then turn the flywheel slowly until the rod or punch enters the corresponding hole in the flywheel. This will hold the flywheel rigid and prevent its turning as you loosen nut. Use a $1\frac{1}{16}$" socket wrench with a "T" or "L" handle. To start nut, tap end of wrench handle with hammer. Remove nut and blower housing, loosen flywheel with the flywheel puller No. 29020 furnished with the motor.

B. CRANK STARTER MOTORS. Remove compression release rod, starter gear and bracket, starter pinion lock, and starter pinion. All other operations are the same as in paragraph 36-A.

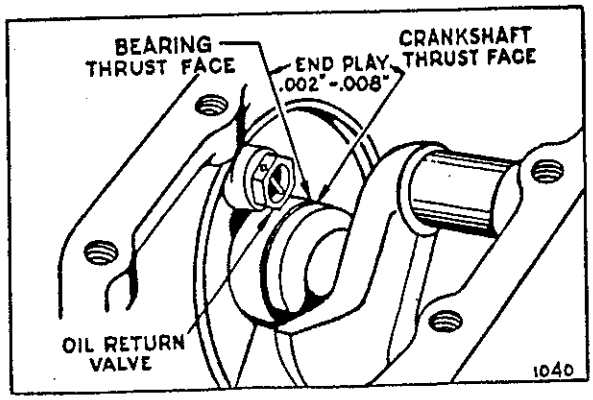
Removing Flywheel
Plate No. 10



37. To reassemble the flywheel reverse the operations in the preceding paragraphs, put a very thin coat of cup grease on the crankshaft taper and see that flywheel key is in place.

38. TO REMOVE AND REPLACE MAGNETO ASSEMBLY. After removing flywheel as explained in paragraph 36, detach the ignition cable from the spark plug and remove the back plate, flywheel key, contact point dust cover and the four magneto mounting screws. Turn the crankshaft so that the contact plunger holds the contact points open and then remove magneto assembly. To replace reverse the operations and use the old gasket between the plate and crankcase, or, if damaged, a new gasket. See part 66457, 66527, 66537 for proper thickness to get correct end play of .002" to .008" between magneto bearing and crankshaft thrust faces, as shown in plate No. 11. Use lockwashers under mounting screws.

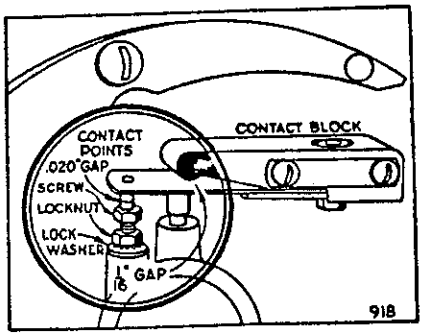
Correct End Play
Plate No. 11



39. MAGNETO TIMING. The magneto assembly is always correctly timed with the motor when the flywheel is assembled to the tapered crankshaft with a key and securely held in place with 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.

40. TO ADJUST AND CLEAN CONTACT POINTS. While magneto plate is on motor 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 file contact points — use fine sandpaper or fine grit hone to clean points.

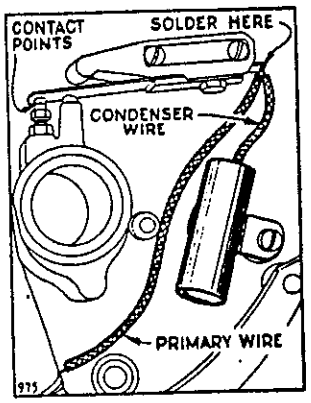
Magneto Contact Points
Plate No. 12



41. To line up contact points loosen contact spring bolt. Move contact spring assembly to line up with contact screw point. Tighten contact spring bolt. To adjust contact spring tension place 1/16" gauge between contact spring and round end of contact block, then tighten contact block screws. Turn contact screw to secure .020" gap and tighten locknut against lockwasher. See plate No. 12. If either or both points become badly pitted or burned, replace both points, part Nos. 63238 and 69754.

42. TO REPLACE CONDENSER. A leaky or weak condenser may cause the motor to start hard, to sputter, or misfire under load. If motor misfires after checking gasoline line, carburetor, spark plug, cable and contact points, install a new condenser. Slip the short insulator sleeve over the condenser wire. Solder the end of condenser wire and primary wire to contact spring. (See plate No. 13.)

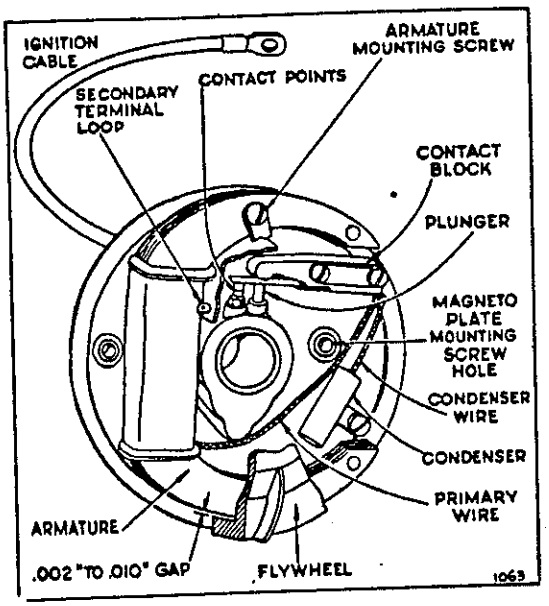
Condenser Installation
Plate No. 13



43. If after new condenser has been installed the ignition system still does not deliver a satisfactory spark, we recommend sending the complete magneto unit including the flywheel to the nearest Briggs & Stratton Central Service Distributor listed on page 18 for proper adjustment.

44. TO REPLACE ARMATURE. 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 the entire magneto assembly. Unscrew two armature mounting screws and pry armature loose with screw driver.

Complete Magneto Assembly
Plate No. 14



45. To install armature, place dust cover clip under upper mounting screw, tighten lower mounting screw. Then solder ignition cable to the terminal and fill pocket, formed with flap, with hydrolene. Solder armature lead wire to contact spring. Replace dust cover and the clip holding cover in place, tighten upper armature mounting screw. See plate No. 14.

46. 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.

47. To check armature shoes for rub, chalk edges and mount flywheel in place. Remove spark plug to release compression. Turn flywheel several revolutions by hand. Remove flywheel and examine edges of armature shoes. High spot will have the chalk rubbed off. File high spots carefully with a fine file until flywheel no longer rubs, but do not remove too much metal.

48. CYLINDER HEAD. The cylinder head is held on with six cap screws. When the cylinder head has been removed for the purpose of cleaning carbon or grinding valves, care should be used in replacing it. Use a new gasket if possible. Otherwise, clean the old one and coat both sides with cup grease. We do not recommend the use of shellac on cylinder head gaskets. Tighten each cap screw a little at a time so that the cylinder head is pulled down evenly. Screws need be only moderately tight.

49. COMPRESSION. Proper compression is obtained when valves seat properly, gaskets do not leak, and piston and rings are properly fitted. When tuning up a motor, it is always well to check compression. This is done by turning the motor over quickly by hand. If turned slowly sticky valves may not be detected. If a point of resistance is offered every other revolution, compression should be satisfactory. If motor turns over without compression resistance for a full cycle, it is possible that a worn piston or piston rings, leaky valves or leaky gaskets are present. See that spark plug has a gasket under it and is drawn up tight. Also check cylinder head gasket and tighten cylinder head bolts.

50. VALVE ADJUSTMENT. To check valve clearance, remove carburetor, paragraph No. 26, and valve cover plate on cylinder back of carburetor. The correct clearance on the exhaust is .008", and on the intake valve .006" when motor is cold. Tappet clearance is adjusted by loosening tappet locknut and turning tappet

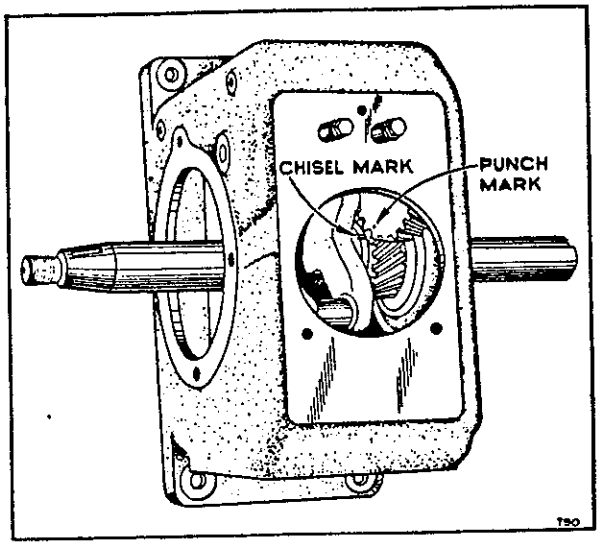
screw to desired position. Securely tighten the tappet locknut after adjusting valve clearance.

51. To remove valves, remove cylinder head, and if not dismantled, drain oil from crankcase. Invert cylinder. Compress the spring with valve spring compressor No. 69189-T3, and with the end of a screw driver push out the split collars, and release spring compressor. Tilt cylinder back far enough to allow valve to drop, permitting its stem to clear the spring. Pry spring out with end of screw driver.

52. To replace valves and valve springs, compress spring in valve spring compressor. Turn tool to inverted position with collar retainer washer on top. Drop split collar is placed in retainer washer one at a time. When first half of split collar is placed in retainer washer, push it around to the back of valve stem to allow easy placing of second half. Special valve spring compressor tool part No. 69189-T3 is available at the factory at $1.25 net.

53. To reseat valves, 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 valve ports.

Valve Timing — Plate No. 15



54. 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. 15.

55. PISTON. The piston in the model "Z" motor 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". This clearance is to compensate for the considerable expansion of aluminum when hot. 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.

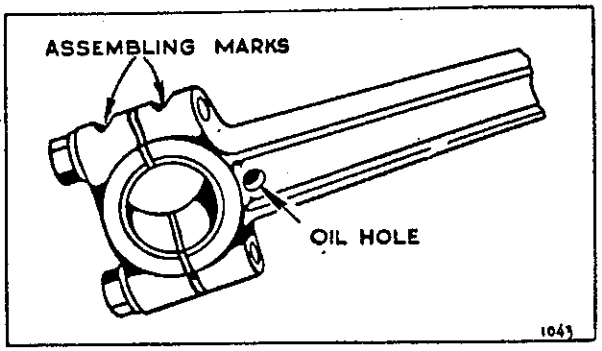
56. When fitting a new piston in the motor, assemble it with the free side pin hole with an "X" on boss, toward the magneto side. If an over-size piston is necessary, we recommend that reboring of cylinder be done by an Authorized Central Service Distributor or the factory.

57. PISTON RINGS. The piston rings when fitted in the cylinder should have a gap of .007" to .015". The rings should be fitted in the cylinder below the piston ring travel. Before assembling new rings to piston be sure that piston ring grooves are thoroughly cleaned and rings move in grooves freely.

58. PISTON PIN. The piston pin is a free fit in one side of the piston and a tight fit in the other. To remove this pin without special equipment, it is advisable to heat the piston in boiling water which causes the aluminum alloy to expand. Cut a wooden pin a little smaller than the size of the piston pin and use this and a hammer to drive the pin out. Drive the pin out through the free fit hole. This hole is toward the magneto side and is indicated with an "X" on the pin hole boss. You should, of course, drive the pin out while the piston is still hot. To easily replace the pin the piston should be heated.

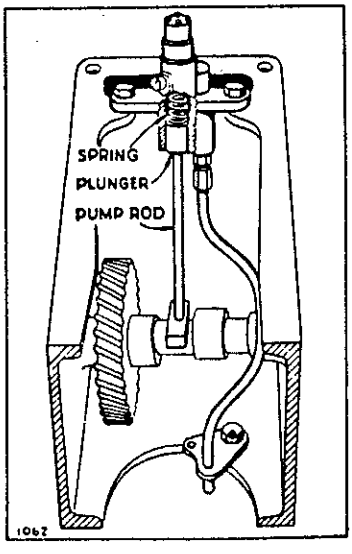
59. CONNECTING ROD. The connecting rod is also made of a special aluminum alloy which combines strength with light weight. When assembling connecting rod to crankshaft, the oil hole in the lower bearing must be toward the magneto side. See plate No. 16. The assembly marks on cap and rod must be on the same side.

Connecting Rod — Plate No. 16



60. OIL PUMP. The oil pump is assembled to the crankcase with two bolts and lockwashers and is operated from an eccentric on the cam gear. An inoperative pump will result in insufficient lubrication which may score cylinder and piston assembly. To check oil pump, remove base and the two bolts that hold pump in place. Place the pump in a pan of oil about ½" deep. Work plunger up and down. A stream of oil will be forced out of the hole in the oil tube, if the pump is in good operating 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. If the pump is still inoperative, it should be replaced. In assembling, be sure that spring and plunger are in place as shown in plate No. 17.

Oil Pump — Plate No. 17



61. OIL LEAKS. If oil leaks from either end of crankshaft bearings, remove base from motor. 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 any dirt lodged under the small disc. Replace if necessary. See plate No. 11.

62. CARBON. Excessive carbon is caused by improper grade of oil — too much oil usually the result of piston rings not seating properly or sticking — carburetor set too rich — or long service. An unusual amount of carbon is noticeable by motor knocking or loss of power. Occasionally remove carbon from valves, valve ports, piston head, piston rings and ring grooves, cylinder head and top of cylinder bore.

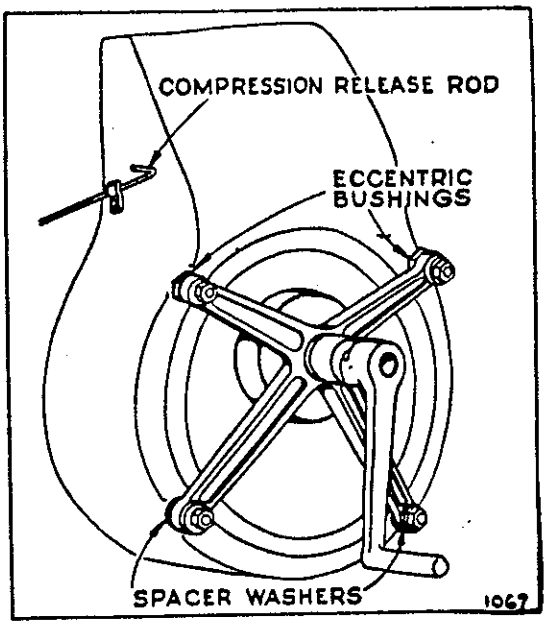
63. AIR CLEANER. The air cleaner is to protect the motor from dust and dirt. No motor can stand up under the grinding action that takes place when dust and dirt particles are drawn into the motor through the carburetor. Clean the air cleaner occasionally by removing it and washing in kerosene. Test it to see if it is clogged by blowing through it or noting if motor performs better with it off. If clogged it should be replaced. Keep the oil level up to the beading. See instructions on air cleaner label. Some motors are equipped with a felt filter type air cleaner. The felt should be removed regularly and accumulated dust and dirt brushed out and felt washed thoroughly with gasoline. Make sure felt is dry before replacing.

64. MUFFLER. After long periods of service it is possible that the muffler will become clogged to the point where it will affect the motor's power. To check the muffler unscrew it from the motor and run water into the open end of the muffler. If full streams of water come out of the 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.

65. OVERLOAD. Always be sure that the machine the motor is operating is well lubricated and running freely. If it is not, it may cause the motor to become overloaded resulting in it overheating, losing power, or even stopping entirely.

66. CRANK STARTER ASSEMBLY. The crank starter assembly shown in plate No. 18 is mounted on the blower housing on four studs and held in place by plain washers, lockwashers, and nuts. To mount starter assembly place two eccentric bushings on upper studs, and two plain washers on lower studs. Then place starter bracket gear and shaft assembly and four plain washers, lockwashers and nuts on studs. Press starter shaft toward motor and turn the two eccentric bushings until gears mesh with as little back lash as possible and without binding. Tighten nuts securely. Oil the crankgear shaft, through the oil cup, and grease the pinion gear teeth occasionally to reduce wear.

Plate No. 18



67. PARTS. All parts should be ordered from your dealer or the nearest Briggs & Stratton Service Distributor, listed on page 18.

Repair Parts

	Paragraph
Always Give Type, Model and Serial Number	69
How to Make Out Parts Orders	71
Prices	75

	Page
Parts List	11-16
Parts Illustrations	16-17

68. To assure continued satisfactory performance, do not attempt to use substitute repair parts when overhauling or repairing the Briggs & Stratton Motor. Insist that all repair parts be original Briggs & Stratton parts.

69. ALWAYS GIVE TYPE, MODEL AND SERIAL NUMBERS. Briggs & Stratton motors are identified by a type number, model letter and a serial number. This information is stamped on a metal plate attached to the blower housing.

70. When writing to the factory or to a Central Service Distributor for service information, or when ordering new parts, be sure to specify the type number, the model, and the serial number of the unit to be serviced. This will assure prompt and efficient service without unnecessary correspondence.

71. HOW TO MAKE OUT PARTS ORDERS. Print your name and address plainly and correctly. Do not abbreviate name of town or state. Specify on the order how shipment to you is to be made. This will assist in giving prompt and efficient service.

72. Give part number and name of parts wanted. (Do not use number cast on parts.) You will find the part numbers, names and prices on pages 11 to 16, and parts illustrations on pages 16 and 17.

73. After you have made out order, check back to see that you have followed all instructions and have accurately listed what you want.

74. Shipments will be made C. O. D. or send remittance with order to cover parts and add what you think will be sufficient for postage. Send postal or express money order, bank draft or certified check for this amount. Do not send currency in a letter. It is not safe.

75. PRICES. All prices in this book are subject to change without notice. In case of change in prices, orders will be filled at current prices. All prices shown are F. O. B. Factory at Milwaukee, Wis., or nearest Authorized Central Service Distributor. Prices higher in Canada.

Model "Z" Parts List

PART NUMBER	NAME	PRICE EACH
EA101	Blower Housing Mounting Screw	$ 0.05
7A61	Lockwasher	.01
7BC	Spark Plug with Gasket	.85
7B24	Spark Plug Gasket	.05
7B35	Control Casing Clamp Screw	.01
7K23	Control Lever Cotter Pin	.01
7K26	Governor Lever Cotter Pin	.01
7K33	Swivel Screw	.05
7K41	Swivel	.20
7K47	Governor Crank Cotter Pin	.01
7K68	Control Lever Spring Washer	.10
7T17	Lockwasher	.01
7T45	Mounting Nut	.05
13A40	Oil Pump Plunger Spring	.10
13K3	Governor Gear Washer	.05
13K4	Control Lever Bushing	.10
13K5	Control Lever	.50
13K9	Control Casing Clamp	.05
13K10	Control Lever Screw	.05
13KE	Control Lever Assembly	4.30
13M47	Condenser Mounting Screw	.01
1363B	Choke Lever Washer	.05
26008	Crankshaft	14.00
29005	Oil Pump Screen	.75
29020	Flywheel Puller	.95
29021	Oil Pump Assembly	3.00
29036	Automatic Pulley Clutch Assembly	25.00

Includes:
- 7K47 Cotter Pin
- 29092 Spring Stud
- 29154 Pulley and Bushing
- 29403 Clutch Plate
- 61265 Clutch Ring
- 62342 Clutch Cover
- 63294 Brake Lining Pin
- 63523 Bushing
- 63524 Adjusting Screw
- 63654 Key
- 65098 Brake Lining
- 90832 Cover Lockwasher
- 91195 Cover Screw
- 91518 Set Screw

NOTE: No. 29110 used on types 60235, 60514, 60650. No. 29683 used on type 69767. No. 69691 used on types 60640, 60641, 60550, 60709.

29089	Crankstarter Assembly	17.50

Includes:
- 7A61 Lockwasher
- 7T45 Mounting Nut
- 61374 Crank
- 62254 Spring Cover
- 62363 Pinion Lock
- 63199 Pin
- 63456 Mounting Stud
- 63457 Pinion
- 63458 Eccentric Bushing
- 63460 Spacer
- 68156 Spring
- 69949 Gear and Shaft
- 69953 Gear Bracket
- 90699 Lockwasher
- 91439 Screw

29092	Spring Stud	.15
29096	Oil Pump Assembly	2.25
29103	Piston Pin (.005 oversize)	.55
29110	Pulley Clutch Assembly	26.00
29115	Gas Tank Strap	.85
29118	Carburetor Assembly (Friction choke)	15.00

Includes:
- 1363B Choke Lever Washer
- 29526 Lower Carburetor Body
- 29527 Choke Lever
- 62246 Choke Butterfly
- 63540 Choke Lever Handle
- 67626 Choke Lever Spring
- 90136 Handle Screw
- 90877 Spring Screw
- 91443 Butterfly Screw

All other parts same as in No.69729.

PART NUMBER	NAME	PRICE EACH
29119	Gasoline Tank	$ 9.75
29131	Spark Plug Shield	1.25
29136	Gas Tank Cap	.25
29137	Lower Carburetor Body	5.00
29154	Clutch Pulley with Bushing	20.00
29161	Carburetor Control Bell Crank	.75
29187	Gasoline Line	.35
29212	Carburetor Idling Device	1.75
29216	Magneto Plate Assembly	12.00
29230	Carburetor Nozzle	.60

NOTE: No. 69909—old type nozzle and flange used on carburetor body No. 69907.

29231	Upper Carburetor Body	3.50

Includes:
- 29380 Throttle Shaft
- 29574 Upper Body
- 62428 Butterfly
- 90369 Lockwasher
- 91443 Screw

29284	Blower Housing	16.50
29372	Stop Switch Assembly	.25
29375	Gasoline Tank	9.00
29380	Throttle Shaft Assembly	.70
29403	Clutch Plate	5.25
29417	Gasoline Filter	2.25

Includes:
- 29536 Shut Off Valve
- 29602 Clamp Wire
- 61685 Gas Filter Cover
- 62477 Gas Filter Screen
- 62505 Gas Filter Cup
- 63722 Gas Filter Thumb Nut
- 67257 Gas Filter Bowl
- 67267 Gas Filter Gasket

29429	Governor Lever Assembly	1.25
29440	Control Casing Tube	.50
29447	Air Cleaner Assembly	10.00

Includes:
- 29679 Cover
- 29680 Bowl
- 29681 Filter
- 63733 Stem
- 67247 Cork Gasket
- 91674 Wing Nut

29464	Gasoline Line	.75

NOTE: No. 69844 used models without gas filter.

29526	Lower Carburetor Body	5.00
29527	Carburetor Choke Lever	.75
29536	Gas Filter Shut Off Valve	.40
29543	Carburetor Choke Wire	.40
29550	Blower Housing	16.50
29555	Intake Elbow Baffle Plate	.35
29571	Lower Carburetor Body	5.00
29574	Upper Carburetor Body	2.00

NOTE: Order No. 29231 for body with throttle shaft assembled.

29575	Gasoline Tank	9.50
29579	Gasoline Tank	9.50
29602	Gas Filter Clamp Wire	.30
29652	Condenser	1.50
29656	Armature	6.00
29679	Air Cleaner Cover	1.50
29680	Air Cleaner Filter	6.00
29681	Air Cleaner Bowl	2.50
29683	Automatic Pulley Clutch Assembly	30.00
53029	Gas Filter Connector	.20
61029	Flat Belt Pulley	4.50
61265	Clutch Ring	5.25
61267	Base	7.00
61286	Cylinder Head	10.00
61287	Base (Cast Iron)	10.00

NOTE: No. 61267 used on type 60747, No. 61543 used on type 60490.

61289	Gasoline Tank Bracket	2.25
61292	Oil Control Ring (Standard)	.75

NOTE: For oversizes see 61335—.010, 61336—.020, 61337—.030.

PART NUMBER	NAME	PRICE EACH
61293	Compression Ring (Standard)	.50
	NOTE: For oversizes see 61338 — .010, 61339 — .020, 61340 — .030.	
61297	Crankcase Cover (Aluminum)	7.50
61312	Carburetor Intake Elbow	1.75
61327	Rope Starter Pulley	3.25
	NOTE: No. 61714 used on type 60131.	
61331	Air Cleaner Elbow	2.50
61335	Oil Control Ring .010 O.S.	1.25
61336	Oil Control Ring .020 O.S.	1.25
61337	Oil Control Ring .030 O.S.	1.25
61338	Compression Ring .010 O.S.	.75
61339	Compression Ring .020 O.S.	.75
61340	Compression Ring .030 O.S.	.75
61346	Base (Aluminum)	15.00
61347	Crankcase Cover (Cast Iron)	5.00
61361	Throttle Shaft Lever	.35
61365	Crankcase Cover (Aluminum)	7.50
	NOTE: No. 61297 used on motors before serial No. 276.	
61366	Crankcase Cover (Cast Iron)	5.00
	NOTE: No. 61347 used on motors before serial No. 276.	
61371	Air Cleaner Elbow	2.50
61374	Starter Crank	1.50
61380	Gasoline Tank Bracket	2.25
	NOTE: No. 61496 used on type 60315-60383.	
61454	Cam Gear	6.00
61496	Gas Tank Bracket	2.25
61543	Base	7.50
61666	Air Cleaner Pipe	3.00
61685	Gas Filter Cover	.75
61714	Rope Starter Pulley	3.25
62041	Air Cleaner Shell	1.00
62042	Air Cleaner Washer	.05
62081	Oil Tube Bracket	.25
62082	Oil Screen Washer	.15
62100	Contact Spring Stop	.15
62165	Clutch Ring	5.25
62167	Blower Housing Mounting Bracket	.25
62178	Contact Block Connector Plate	.05
62185	Cylinder Shield	.45
62196	Stop Switch	.10
62199	Bell Crank Washer	.05
62201	Blower Housing Air Guide	2.50
62222	Valve Spring Cup	.05
62244	Carburetor Bowl	1.00
62245	Throttle Butterfly	.15
62246	Choke Butterfly	.15
62252	Valve Tappet Washer	.05
62254	Starter Spring Cover	.90
62255	Starter Spacing Washer	.05
62319	Control Casing Clip	.30
62342	Clutch Cover	.50
62363	Starter Pinion Locking Plate	.45
62400	Control Casing Clip	.10
62428	Throttle Butterfly	.25
	NOTE: No. 62245 used with No. 69904 body.	
62449	Air Cleaner Mounting Strap	.15
62465	Oil Bowl	.75
62466	Oil Bowl Clamp	.15
62450	Air Cleaner Mounting Strap	.15
62477	Gas Filter Screen	.25
62505	Gas Filter Cup	.05
63055	Machine Key	.15
63067	Bell Crank Bushing	.05
63199	Starter Shaft Pin	.01
63207	Oil Pump Plunger	.15
63217	Oil Tube Connector Nut	.10
63238	Contact Point Screw	.40
63239	Contact Point Screw Locknut	.02
63294	Brake Lining Pin	.05
63334	Governor Spring Rod	.50
63335	Governor Plunger	.35
63336	Cylinder Head Spacer (Long)	.30
63337	Cylinder Head Spacer (Short)	.25
63341	Governor Crank Bushing	.75
63355	Bell Crank Bushing ⅜" Dia.	.35
63369	Contact Block Screw	.10
63374	Control Lever Bushing	.15
63377	Carburetor Connector Elbow	.35
63403	Carburetor Needle Valve	.50

PART NUMBER	NAME	PRICE EACH
63404	Idling Adjustment Valve	.45
63405	Carburetor Stuffing Box Nut	.10
63406	Throttle Lever Pin	.01
63407	Carburetor Venturi	.75
63408	Idling Valve Spring Cup	.05
63409	Carburetor Inlet Valve	.40
63410	Carburetor Inlet Valve Seat	.35
63411	Float Lever Pin	.05
63416	Gas Line Check Nut	.15
63420	Compression Release Rod Spacer	.10
63456	Starter Bracket Stud	.15
63457	Starter Pinion	2.50
63458	Starter Bracket Bushing	.25
63460	Starter Bracket Bushing and Spacer	.10
63474	Bell Crank Bushing	.10
63520	Governor Spring Rod Nut	.05
63523	Clutch Bushing	1.25
63524	Adjusting Screw	.05
63527	Pulley Clutch Set Collar	1.00
63540	Choke Lever Handle	.10
63557	Base Mounting Stud	.05
63585	Carburetor Nozzle Flange	.15
63605	Starter Shaft Bushing	.50
63609	Compression Release Rod	.30
63657	Control Wire Collar	.05
63676	Throttle Shaft Bushing	.05
63722	Gas Filter Thumb Nut	.10
63733	Air Cleaner Holding Stem	.35
64209	Crankcase (Aluminum)	35.00
64219	Crankcase Assembly (Aluminum)	46.75
	Includes: 64209 Crankcase All other parts—same as No.	
64229	—Crankcase Assembly	49.75
	Includes: 64239 Crankcase All other parts same as No.	
64239	Crankcase	38.00
64589	Gasoline Tank (5 quart)	9.00
	NOTE: No. 29119 — 2 gallon, large red cap — used on types 60315, 60383. No. 29375—5 quart copper used on type 60533. No. 29575—2 gallon, black. No. 29579 — 2 gallon, black — used on types 60292, 60655, 60705, 60706. No. 69912 — 5 quart, black, combination gas and kerosene—used on types 60145, 60613, 60691. No. 69943—2 gallon, black—used on type 60144. No. 69944 — 2 gallon, red — used on types 60141, 60143, 60152.	
64789	Carburetor Idling Device	1.75
65078	Contact Spring Block	.20
65084	Valve Cover Plate Washer	.05
65098	Brake Lining	1.50
65126	Governor Spring	.15
65198	Magneto Point Dust Cover	.25
65237	Valve Cover Plate Gasket	.10
65247	Base Gasket	.45
65414	Magneto Point Plunger	.30
65431	Control Lever Base	.45
65469	Control Lever Assembly	1.50
	NOTE: No. 13KE used on type 60661. No. 65589 like 65469 except left hand control.	
65499	Gas Tank Cap and Gasket	.60
	NOTE: Used with 69912 Tank.	
65589	Control Lever Assembly	1.50
65604	Check Valve Plug	.05
65616	Control Wire Casing (72" long)	.55
	NOTE: Specify other lengths in inches.	
65631	Control Lever Base	.45
65647	Intake Elbow Gasket	.10
65717	Gas Tank Cap Gasket	.05
	NOTE: Used only with No. 65499.	
65725	Armature Lead Insulator	.05
65735	Condenser Lead Insulator	.05
65776	Piston Pin Lock	.05
65852	Connecting Rod Shim	.05
65906	Valve Springs	.15
65932	Cam Shaft Plug	.05
65942	Valve Cover Plate	.25
	NOTE: No. 69951 used on crank starter motors.	

PART NUMBER	NAME	PRICE EACH
66193	Valve Tappet	1.50
66203	Cam Gear Shaft	.50
66403	Flywheel Key	.05
66457	Magneto Plate Gasket .015" thick	.05
66477	Cylinder Gasket	.15
66487	Crankcase Cover Gasket	.25
66527	Magneto Plate Gasket .005" thick	.05
66537	Magneto Plate Gasket .009" thick	.05
66647	Needle Valve Packing	.05
66657	Carburetor Bowl Gasket	.10
66667	Nozzle Gasket	.10
66677	Carburetor Body Gasket	.10
66687	Inlet Valve Gasket	.05
66717	Crankcase Cover Gasket	.25
	NOTE: No. 66487 used before serial No. 276.	
66739	Oil Pump Rod	.40
67197	Carburetor Nozzle Gasket	.05
67247	Air Cleaner Gasket	.10
67257	Gas Filter Bowl	.50
67266	Control Wire (79" long)	.30
	NOTE: Specify other lengths in inches.	
67267	Gas Filter Gasket	.05
67316	Governor Spring	.20
67406	Crankshaft	14.00
	NOTE: No. 26008 used on types 60235, 60514, 60650 and 60716. No. 67966 used on type 60193-ZP. No. 68586 used on types 60640, 60641, 60550 and 60709. No. 68916 used on type 60621.	
67416	Throttle Link	.50
67502	Connecting Rod Washer	.05
67546	Governor Spring	.15
67616	Idling Valve Spring	.10
67626	Choke Lever Friction Spring	.10
67632	Stop Switch Washer	.05
67666	Compression Release Spring	.25
67966	Crankshaft	14.50
68156	Starter Crank Spring	.30
68196	Choke Lever Spring	.10
68283	Valve Spring Retainer Collars	.10
68293	Valve Spring Retainer Washer	.10
68346	Choke Lever Spring	.10
68553	Exhaust Valve	2.00
68563	Intake Valve	1.00
68586	Crankshaft	14.00
68652	Spark Plug Wrench	.20
68752	Bell Crank Mounting Washer	.05
68876	Dust Cover Clip	.10
68916	Crankshaft	14.50
69120	Oil Pump Screen	.50
	NOTE: No. 29005 used with No. 29021 Oil Pump, type Nos. 60141, 60187, 60635.	
69134	Exhaust Muffler	3.00
	NOTE: No. 69431 used on type 60533.	
69298	Gas Tank Straps	.60
	NOTE: No. 29115 used with Tank No. 29119 on types 60315 and 60383.	
69314	Breather Tube	.80
69431	Exhaust Muffler	3.50
69447	Air Filter	2.50
69450	Stem and Wing Nut	.50
69547	Oil Pump Assembly	2.50
69691	Pulley Clutch (ball bearing)	30.00
69642	Connecting Rod	7.50
69689	Oil Filler Cap	.40
69729	Carburetor Assembly (spring return choke)	15.00
	Includes:	
	7T17 Lockwasher	
	29230 Nozzle	
	29571 Lower Carburetor Body	
	29574 Upper Carburetor Body	
	61361 Throttle Lever	
	62244 Bowl	
	62246 Choke Butterfly	
	62428 Throttle Butterfly	
	63403 Needle Valve	
	63404 Idling Valve	
	63405 Packing Valve	
	63406 Throttle Lever Pin	
	63407 Venturi	
	63408 Spring Cup	
	63409 Inlet Valve	
	63410 Inlet Valve Seat	
	63411 Float Lever Pin	
	63585 Nozzle Flange	
	66647 Needle Valve Packing	
	66657 Bowl Gasket	
	66667 Nozzle Gasket	
	66677 Body Gasket	
	66687 Inlet Valve Gasket	
	67197 Nozzle Gasket	
	67617 Idling Valve Spring	
	68346 Choke Lever Spring	
	69905 Carburetor Screen	
	69906 Carburetor Float	
	69908 Choke Shaft	
	90100 Throttle Lever Screw	
	90217 Body Screw	
	90369 Butterfly Lockwashers	
	91379 Throttle Lever Screw	
	91443 Butterfly Screws	
	91444 Venturi Screw	
	91604 Upper Body Screw	
	NOTE: No. 29118 used on crank starter motors.	
69737	Cylinder Head Gasket	.35
69738	Piston Assembly (Standard)	7.50
	Includes:	
	61292 Oil Control Ring	
	61293 Compression Ring	
	65776 Piston Pin Lock	
	69921 Piston	
	NOTE: For Oversizes see 69841 — .010", 69842 — .020", 69843 — .030".	
69739	Ball Bearing	5.50
69740	Bearing Oil Seal	2.75
69754	Contact Spring and Point	.40
69780	Contact Block Assembly	.75
	Includes:	
	7T17 Lockwasher	
	62100 Contact Spring Stop	
	62178 Contact Connector Plate	
	63369 Contact Block Screw	
	65078 Contact Block	
	69754 Contact Point	
	90313 Contact Block Nut	
	91406 Contact Block Screw	
69794	Blower Housing (full screen)	16.50
69798	Control Bell Crank	.85
69799	Oil Filler Cap	.30
69808	Flywheel	21.50
69817	Oil Return Valve	.20
69829	Cylinder	34.00
69830	Cylinder Assembly	37.50
	Includes:	
	62222 Valve Spring Cup	
	65906 Valve Spring	
	68283 Valve Spring Collar	
	68293 Valve Spring Retainer	
	68553 Exhaust Valve	
	68563 Intake Valve	
	69829 Cylinder	
69834	Crankcase Assembly (cast iron)	42.50
	Includes:	
	69853 Crankcase	
	All other parts same as in No. 69934.	
69835	Magneto Plate Assembly	12.00
	Includes:	
	7T17 Lockwasher	
	13M47 Condenser Screw	
	29652 Condenser	
	29656 Armature	
	62178 Connector Plate	
	63238 Contact Point Screw	
	63239 Contact Point Locknut	
	65198 Dust Cover	
	65414 Magneto Point Plunger	
	65725 Armature Lead Insulator	
	65735 Condenser Lead Insulator	
	68876 Dust Cover Clip	
	69780 Contact Block Assembly	
	69854 Ignition Cable	

PART NUMBER	NAME	PRICE EACH
	69876 Magneto Plate and Bearing	
	69911 Magneto Bearing	
	90832 Lockwasher	
	91122 Shakeproof Lockwasher	
	91270 Armature Mounting Screw	
	NOTE: No. 29216 with 36" ground wire. No. 69979 with shielded cable.	
69836	Gasoline Shut Off Valve	1.00
69838	Oil Pump Assembly	3.00
	NOTE: No. 29021 used on types 60141, 60187, 60635. No. 29096 used on type 60747. No. 69547 used on type 60490.	
69839	Governor Gear	7.00
69844	Gasoline Line	.75
69851	Air Cleaner Assembly	6.50
	Includes:	
	61331 Elbow	
	62041 Cover	
	62042 Washer	
	69447 Filter	
	69450 Stem and Nut	
	91256 Elbow Screw	
69853	Crankcase (Cast Iron)	32.50
69854	Ignition Cable	.50
69856	Governor Control Lever	.10
69861	Crankcase (Aluminum)	35.00
69864	Crankcase Assembly (Aluminum)	49.75
	Includes:	
	69861 Crankcase	
	All other parts same as in No. 69934.	
69872	Governor Control Lever	1.25
69876	Magneto Plate and Gearing	3.00
69901	Magneto Plate with Armature and Cable	9.00
69904	Upper Carburetor Body	2.00
	NOTE: Order No. 29231 for Body with Throttle Shaft assembled.	
69905	Carburetor Screen	.75
69906	Carburetor Float	.80
69907	Lower Carburetor Body	5.00
69908	Carburetor Choke Shaft	.75
69909	Carburetor Nozzle	.75
69910	Throttle Shaft	.70
69911	Crankshaft Bearing	1.00
69912	Gas and Kerosene Tank	9.00
	NOTE: The following parts used with No. 69912 Tank:	
	29187 Gas Line	
	63416 Check Nut	
	65604 Check Valve Plug	
	69836 Shut Off Valve	
	69914 Gas Line	
	69915 T Elbow	
	69916 Gas Line	
69914	Gas Line	.35
69915	T Elbow	.50
69915	Gas Line T Elbow	.50
69916	Gas Line	.80
69921	Piston (Standard)	6.00
	NOTE: For Oversizes see Nos. 69922 — .010", 69923 — .020", 69924 — .030".	
69922	Piston — .010" Oversize	7.50
69923	Piston — .020" Oversize	7.50
69924	Piston — .030" Oversize	7.50
69925	Piston Pin (Standard)	.55
	NOTE: For Oversize see No. 29103 — .005" Over size.	
69926	Governor Crank	1.25
69932	Starter Rope	.60
69934	Crankcase Assembly (Cast Iron)	
	Includes:	
	61454 Cam Gear	
	62252 Tappet Washer	
	65932 Cam Shaft Plug	
	66193 Valve Tappets	
	66203 Cam Shaft	
	69935 Crankcase	
	90847 Tappet Nut	
	90890 Tappet Screw	
	NOTE: No. 69834 used previous to serial No. 276.	

PART NUMBER	NAME	PRICE EACH
69935	Crankcase (Cast Iron)	32.50
	NOTE: No. 69853 used previous to serial No. 276.	
69939	Crankcase Assembly (Aluminum)	46.75
	Includes:	
	61454 Cam Gear	
	62252 Tappet Washer	
	65932 Camshaft Plug	
	66193 Valve Tappet	
	66203 Camshaft	
	69941 Crankcase	
	90847 Tappet Nut	
	90890 Tappet Screw	
	NOTE: No. 69864 used previous to serial No. 276. No. 64209 used on type No. 60168. No. 64229 used on type No. 60179.	
69941	Crankcase (Aluminum)	35.00
	NOTE: No. 69861 used previous to serial No. 276. No. 64219 used on type No. 60168. No. 64239 used on type No. 60179.	
69943	Gasoline Tank	8.00
69944	Gasoline Tank	9.00
69947	Air Cleaner	7.50
	Includes:	
	61371 Elbow	
	62465 Oil Bowl	
	62466 Oil Bowl Clamp	
	69948 Air Cleaner Body	
	• 91256 Elbow Set Screw	
	91458 Elbow Mounting Screw	
69948	Air Cleaner Body	5.00
69949	Starter Gear and Shaft	4.75
69950	Compression Release Valve Cover Plate Assembly.	4.50
	Includes:	
	7K47 Cotter Pin	
	67666 Release Spring	
	69951 Valve Cover Plate	
	69952 Shaft and Bell Crank	
	90010 Swivel Screw	
69951	Valve Cover Plate	2.25
	NOTE: No. 65942 used on rope starter motors.	
69952	Release Shaft and Bell Crank	2.00
69953	Crank Gear Bracket	7.75
69954	Crank Gear Bracket Assembly	13.50
	Includes:	
	7A61 Lockwasher	
	7T45 Mounting Nut	
	62254 Spring Cover	
	63199 Pin	
	63456 Mounting Stud	
	63458 Eccentric Bushing	
	63460 Spacer	
	63461 Mounting Stud	
	68156 Spring	
	69949 Gear and Shaft	
	69953 Gear Bracket	
69961	Gas Tank Cap	.25
	NOTE: No. 29136 used on Tank No. 29119 on types 60315 and 60383.	
69968	Carburetor Idling Device	1.75
	NOTE: No. 29212 used on type No. 60398. No. 64789 used on type No. 60355.	
69979	Magneto Plate Assembly	13.00
90010	Swivel Screw	.05
90100	Throttle Lever Screw	.05
90136	Choke Lever Handle Screw	.05
90217	Carburetor Body Screw	.05
90290	Casing Clip Nut	.02
90313	Contact Block Nut	.05
90366	Lockwasher	.01
90367	Contact Block Lockwasher	.01
90369	Butterfly Lockwashers	.05
90597	Casing Clamp Screw	.05
90683	Tank Bracket Lockwasher	.01
90686	Flywheel Nut Lock Screw	.05
90699	Pinion Lockwasher	.01
90700	Hexagon Head Cap Screw	.05
90832	Lockwasher	.01
90877	Friction Choke Screw	.05
90887	Mounting Cap Screw	.05
90890	Valve Tappet Screw	.05

PART NUMBER	NAME	PRICE EACH
90891	Hexagon Head Cap Screw	.05
90895	Gas Tank Bracket Screw	.05
90916	Machine Screw	.05
90950	Oil Pump Mounting Screw	.05
91028	Crankcase Cover Screw	.05
91062	Bell Crank Screw	.10
91084	Oil Drain Plug	.01
91122	Contact Point Screw Lockwasher	.01
91124	Plain Lockwasher	.05
91162	Cylinder and Connecting Rod Screw	.05
91168	Stop Switch Mounting Nut	.05
91195	Flywheel Screw	.05
91208	Air Cleaner Mounting Nut	.10
91229	Gas Tank Bracket Screw	.05
91255	Governor Spring Clip Screw	.05
91256	Air Cleaner Elbow Screw	.05
91270	Armature Mounting Screw	.10
91310	Muffler Nipple Locknut	.05
91324	Plain Lockwasher	.05
91363	Pulley Set Screw	.20
91371	Pipe Nipple (2" long)	.05
91379	Throttle Lever Screw	.05
91385	Magneto Plate Mounting Screw	.10
91386	Cylinder Head Screw	.10
91387	Cylinder Head Screw	.01
91388	Magneto Plate Lockwasher	.25
91396	Carburetor Elbow Locknut	.05
91398	Gas Tank Bracket Screw	.20
91400	Flywheel Nut	.05
91406	Contact Block Mounting Screw	.45
91415	Muffler Elbow (45°)	.20
91416	Muffler Close Nipple	.05
91439	Pinion Lock Screw	.10
91442	Valve Cover Plate Screw	.05
91443	Butterfly Screw	.05
91444	Venturi Screw	.01
91458	Elbow Mounting Screw	.05
91478	Set Collar Key	.05
91482	Set Collar Screw	.05
91518	Pulley Clutch Set Screw	.10
91568	Tank Strap Nut and Bolt	.05
91604	Upper Carburetor Screw	.15
91635	Gas Tank Connector	.05
91674	Air Cleaner Wing Nut	.05

Special Models "ZH" — "ZHL" — "ZHLP" — "ZP" — "ZR"

The following list of parts are special on these models. All motor parts not listed below are standard "Z" parts and are listed on the preceding pages.

Model "ZH"
Types 60410, 60644, 60930

Model "ZHL"
Types 60239, 60514, 60532, 60638
60767, 60769, 60792, 60825

Model "ZHLP"
Type 60453

26008 Crankshaft — Types 60514, 60767 ..... $14.00
26030 Valve Springs — Type 60638 ..... .20
29218 Throttle Shaft ..... .70
29221 Upper Carburetor Body 3.50
29506 Carburetor (Friction Choke) 15.00
Includes:
29218 Throttle Shaft
29573 Lower Carburetor Body
62380 Throttle Butterfly
63574 Venturi
64669 Upper Carburetor Body
All other parts same as No. 29118—See main list.
29572 Lower Carburetor Body 5.00
29573 Lower Carburetor Body 5.00
29577 Carburetor Baffle Plate ..... .35
NOTE: No. 29579 used on type 60644.
29579 Carburetor Baffle Plate — Type 60644 ..... .35
29752 Crankcase Assembly — Type 60638 ..... 37.50
Includes:
61702 Cam Gear
All other parts same as No. 69939—see main list.
29757 Cylinder Assembly — Type 60638 ..... 34.00
Includes:
26030 Valve Springs
All other parts same as No. 64279.
61365 Crankshaft Cover 7.50
NOTE: No. 61586 used on Type 60453.
61404 Carburetor Elbow 1.75
61405 Cylinder Head 10.00
61586 Crankcase Cover — Type 60453 ..... 6.00
61702 Cam Gear — Type 60638 ..... 6.00
62380 Throttle Butterfly ..... .25
63445 Carburetor Elbow Locknut ..... .25
63574 Venturi ..... .75
64279 Cylinder Assembly 37.50
Includes:
64309 Cylinder
65906 Valve Springs
68283 Valve Collar
68293 Valve Collar Retainer
68553 Exhaust Valve
68563 Intake Valve
NOTE: See main list for prices except No. 64309. No. 29757 used on Type 60638.

64289 Carburetor (Spring Return Choke) 15.00
Includes:
29218 Throttle Shaft
29572 Lower Carburetor Body
62380 Throttle Butterfly
63574 Venturi
64669 Upper Carburetor Body
64309 Cylinder 34.00
64669 Upper Carburetor Body 2.00
NOTE: No. 29221 includes Throttle Shaft, Lower and Upper Carburetor Body, and Throttle Butterfly, assembled in one unit.
66817 Carburetor Elbow Gasket ..... .15
67406 Crankshaft 14.00
NOTE: No. 26008 used on Types 60514, 60767. No. 68516 used on Type 60453.
69939 Crankcase Assembly 46.75
NOTE: See main list for prices. No. 29752 used on Type 60638.
69941 Crankcase 35.00
90807 Carburetor Mounting Screw ..... .05

Model "ZP"
Types 60193, 60337, 60621

61431 Crankcase Cover — Type 60193 ..... $ 6.00
64739 Crankcase Assembly — Type 60193 ..... 44.50
Includes:
No. 64749 Crankcase.
All other parts same as No. 69934—see main list.
64749 Crankcase — Type 60193 ..... 34.50
67406 Crankshaft — Type 60337 ..... 14.00
67966 Crankshaft — Type 60193 ..... 14.50
68916 Crankshaft — Type 60621 ..... 14.50

Model "ZR"
Types 60130, 60132, 60143, 60145, 60152, 60153, 60156, 60226, 60249, 60380, 60398, 60441, 60490, 60665, 60685, 60692, 60747, 60898

7A61 Gear Case Lockwasher ..... $ 0.05
29254 Crankcase — Types 60398, 60490, 60794 ..... 35.00
29255 Crankcase Assembly — Types 60398, 60490, 60794 .. 45.00
Includes:
29254 Crankcase
All other parts same as No. 69938.
29560 Crankcase Assembly — Type 60685 ..... 46.75
Includes:
29561 Crankcase
All other parts same as No. 69938.
29561 Crankcase — Type 60685 ..... 36.75
29897 Drive Shaft and Gear 7.50
66627 Gear Case Gasket ..... .25
66637 Gear Case Cover Gasket ..... .25
66727 Gear Case Gasket ..... .25
NOTE: No. 66627 used on Nos. 69862, 69863 previous to serial No. 276.

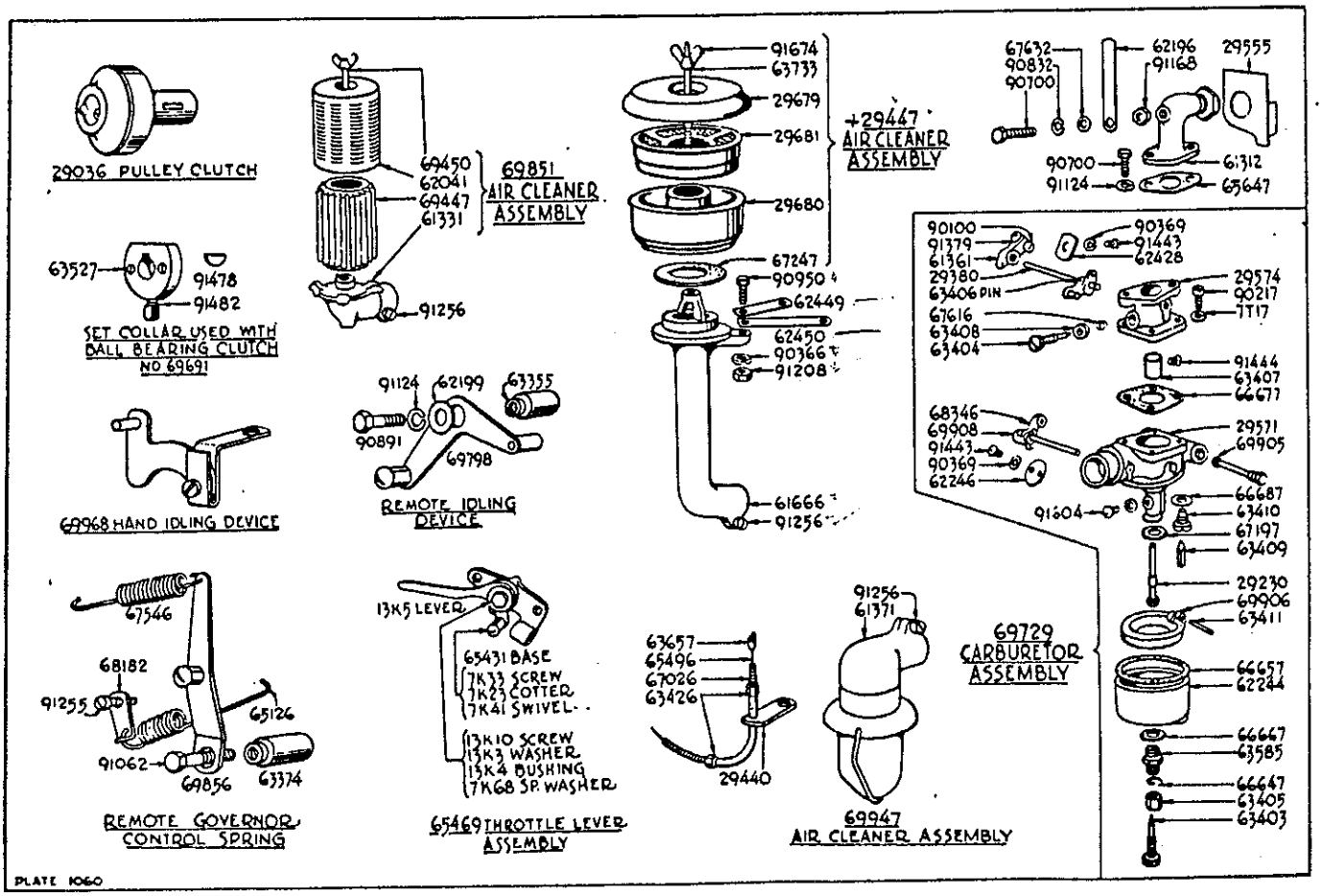
PART NUMBER	NAME	PRICE EACH
68496	Crankshaft	18.50
69858	Gear Case Oil Seal	1.25
69859	Gear Case Cover	5.50
69860	Gear Case	12.50
69862	Crankcase	35.00
69863	Crankcase Assembly	45.00
	Includes:	
	69862 Crankcase	
	All other parts same as No. 69938.	
69866	Gear Case Bearing	1.65
69867	Gear Case Cover Bearing	2.50
69938	Crankcase Assembly	45.00
	Includes:	
	61454 Cam Gear	
	62252 Valve Tappet Washer	
	65932 Cam Shaft Plug	
	66193 Valve Tappet	
	66203 Cam Gear Shaft	
	69940 Crankcase	
	90847 Valve Tappet Nut	
	90890 Valve Tappet Screw	
	See main list for prices.	
	NOTE: No. 29255 used on Types 60398, 60490, 60794. No. 29560 used on Type 60685. No. 69863 used previous to serial No. 276.	
69940	Crankcase	35.00
	NOTE: No. 29254 used on Types 60398, 60490, 60794. No. 29561 used on Type 60685. No. 69862 used previous to serial No. 276.	
69942	Gear Case	12.50
	NOTE: No. 69860 used previous to serial No. 276.	
90689	Gear Case Cover Cap Screw	.10
91028	Gear Case Cap Screw	.05

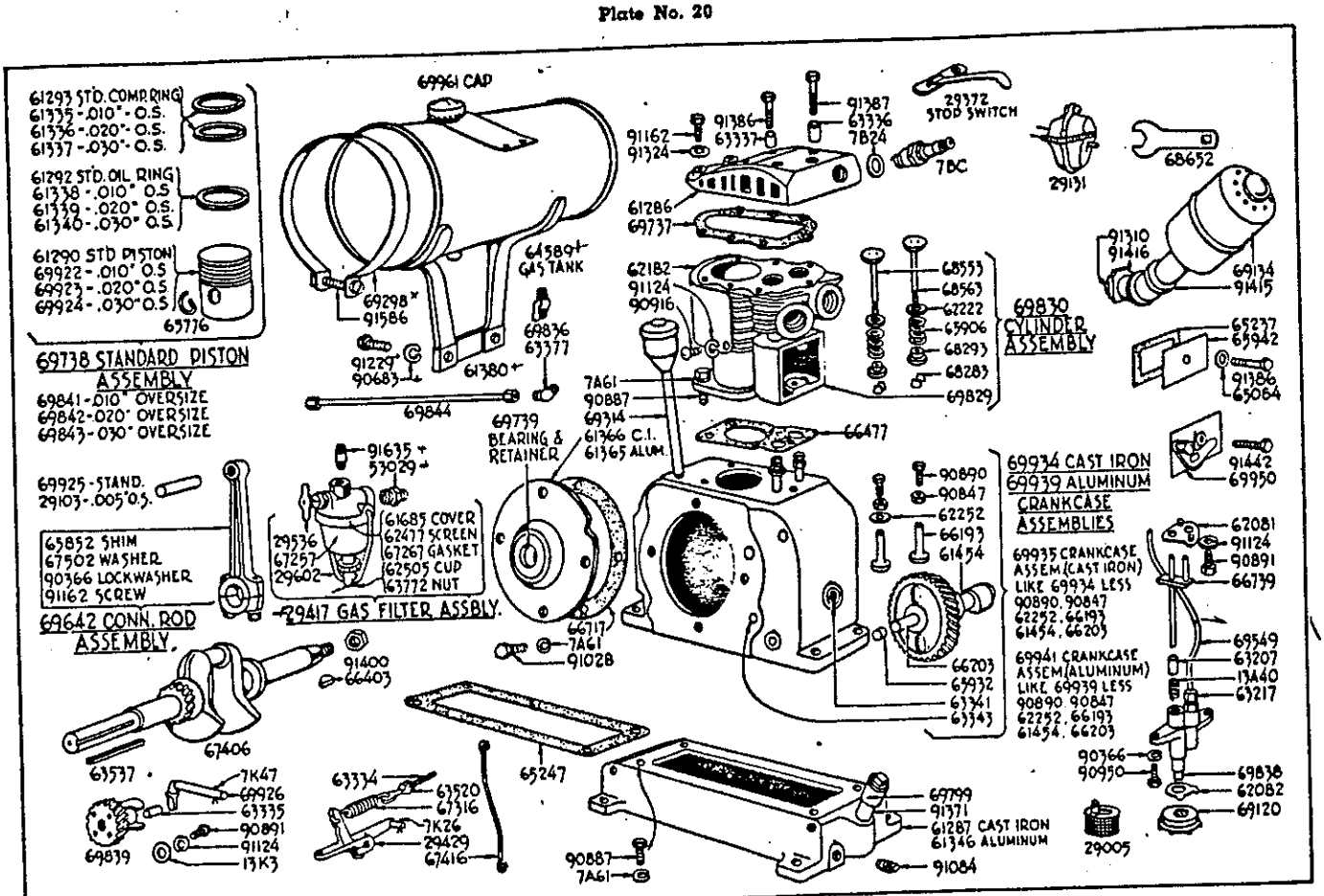
THE GUARANTEE — For Ninety Days from purchase date, Briggs & Stratton Corporation will replace for the original purchaser, FREE OF CHARGE, any part or parts found, upon examination at our factory at Milwaukee, Wisconsin, or at any Authorized Central Service Distributor's place of business, to be defective under normal use and service, on account of defects in material or workmanship.

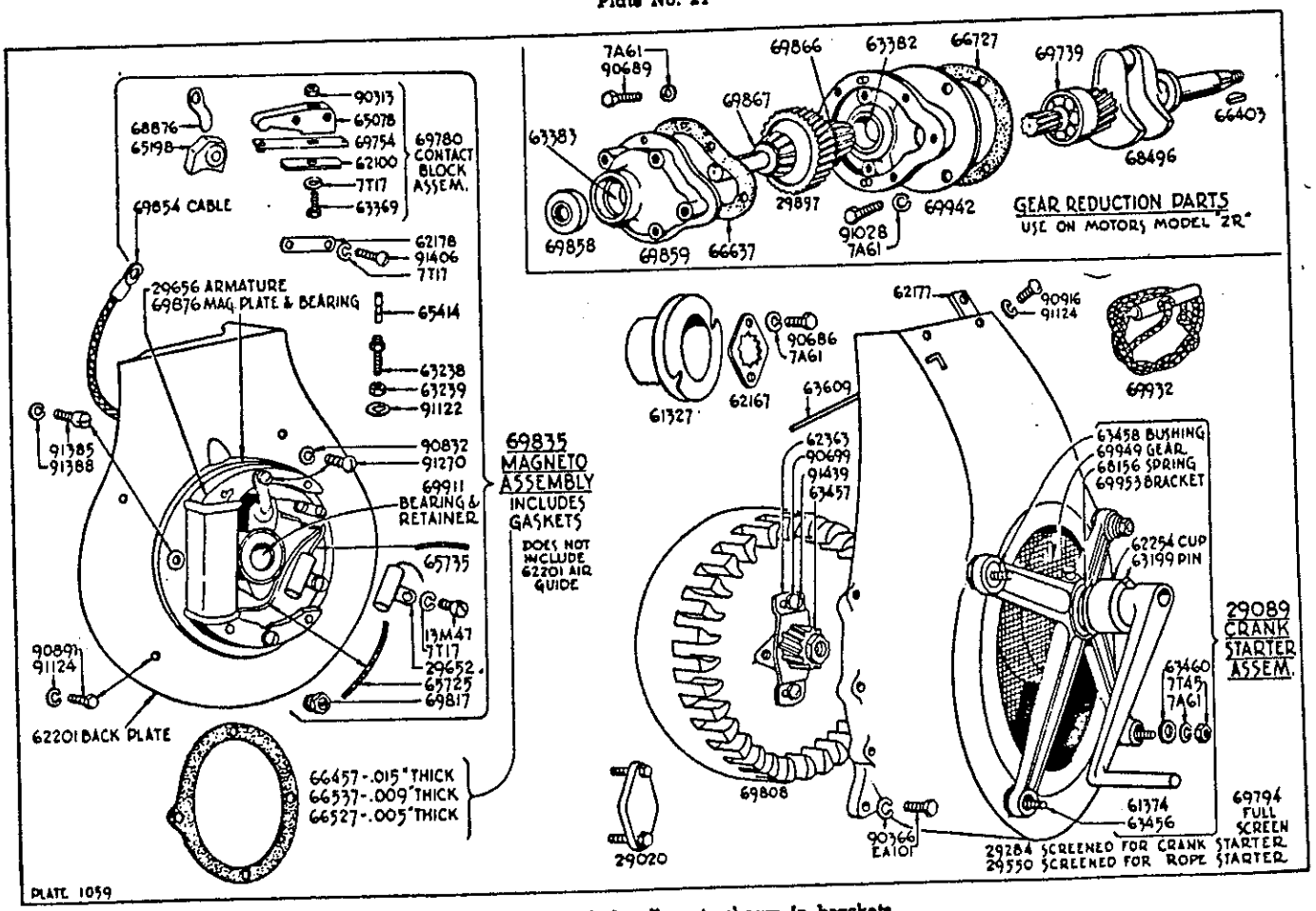
All transportation charges on part or parts, submitted for replacement under this guarantee must be borne by purchaser.

WHAT THIS GUARANTEE DOES NOT INCLUDE — This guaranty does not cover the free replacement of parts inoperative because of wear occasioned by use. It does not cover the labor cost of replacing parts, neither is it effective if the motor has been the subject of misuse, negligence or accident, nor if it has been repaired or altered outside of our Milwaukee Factory or any Authorized Central Service Distributor in any way which, in our judgment, affects its condition or operation.

Plate No. 18







Assemblies include all parts shown in brackets

Nation-Wide Service Organization

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

77. Each Authorized Central Service Distributor listed on this page carries a complete stock of original Briggs & Stratton repair parts. Each Distributor is equipped with special factory service tools and factory-trained mechanics, assuring expert repair service on all Briggs & Stratton motors.

78. All Authorized Central Service Distributors are instructed by the factory to replace free of charge all parts found to be defective in either material or workmanship, according to the conditions of the Briggs & Stratton Guarantee. See page 16.

79. All gratis work done under the guarantee is the responsibility of the Central Service Distributor until all the material involved and supporting facts are submitted to and approved by the factory. In a difference of opinion regarding a Central Service Distributors' decision, their terms should be accepted and either through them or direct, have all materials and supporting facts submitted to the factory for review.

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

81. Parts and repair work are F. O. B. Factory or any Authorized Briggs & Stratton Central Service Distributor.

Authorized Central Service Distributors

STATE	CITY	NAME	LOCATION
Arizona	Phoenix	Motor Supply Co.	315 N. Central Ave.
California	Los Angeles	Electric Equipment Co., Inc.	1240 S. Hope St.
California	San Francisco	Automotive Service, Inc.	950 Van Ness Ave.
Colorado	Denver	Spitzer Electrical Co.	43 W. 9th Ave.
Florida	Miami	Electrical Equipment Co.	42 N. W. 4th St.
Florida	Tampa	Spencer Auto Electric Co.	607 E. Cass St.
Georgia	Atlanta	Auto Electric & Magneto Co.	477 Spring St., N. W.
Illinois	Chicago	Mid-States Auto Electric Co.	2446 Indiana Ave.
Indiana	Indianapolis	Gulling Auto Electric Co.	450 N. Capitol Ave.
Iowa	Des Moines	Magneto Carburetor & Electric Co.	1216 Grand Ave.
Kansas	Wichita	The E. S. Cowie Electric Co.	230 S. Topeka Ave.
Kentucky	Lexington	Kentucky Ignition Co., Inc.	Rose and Vine Sts.
Louisiana	New Orleans	Suhren, Inc.	1319 St. Charles Ave.
Louisiana	Shreveport	Chain Battery & Automotive Supply Co.	Marshall & Cotton Sts.
Massachusetts	Boston	Wm. H. Flaherty Co.	48-52 Cummington St.
Michigan	Detroit	Auto Electric & Service Corp.	90 Selden Ave.
Minnesota	Minneapolis	Reinhard Bros. Co., Inc.	11 S. Ninth St.
Missouri	Kansas City	The E. S. Cowie Electric Co.	1819 Wyandotte St.
Missouri	St. Louis	Medart Auto Electric Co.	3134 Washington Blvd.
Nebraska	Omaha	Carl A. Anderson, Inc.	1514 Jones St.
New York	Buffalo	The Battery & Starter Co., Inc.	681 Main St.
New York	New York	The Durham Co., Inc.	17 W. 60th St.
New York	Syracuse	The Durham Co., Inc.	601 W. Genesee St.
North Carolina	Charlotte	Carolina Rim & Wheel Co.	312 N. Graham St.
North Dakota	Minot	Reinhard Bros. Co., Inc.	14-16 First St., S. E.
Ohio	Toledo	The Electric Power Maintenance Co.	26-30 Seventeenth St.
Oklahoma	Oklahoma City	American Electric Ignition Co.	725 N. Broadway
Oregon	Portland	Sunset Electric Co.	9th and Glisan Sts.
Pennsylvania	Philadelphia	Auto Equipment & Service Co., Inc.	1522 Fairmount Ave.
Pennsylvania	Pittsburgh	Pitt Auto Electric Co.	4951 Center Ave.
South Dakota	Aberdeen	Reinhard Bros. Co., Inc.	317 S. Lincoln St.
Tennessee	Knoxville	R. T. Clapp Co.	401-07 N. Broadway
Tennessee	Memphis	Automotive Electric Service Co.	1095 Union Ave.
Texas	Amarillo	The E. S. Cowie Electric Co.	7th & Van Buren Sts.
Texas	Dallas	Beard & Stone Electric Co., Inc.	Bryan and Olive Sts.
Texas	El Paso	Motor Supply Co.	308 Chihuahua St.
Texas	Houston	Beard & Stone Electric Co., Inc.	Milam St. and Polk Ave.
Texas	San Antonio	S. X. Callahan	425 N. Flores St.
Utah	Salt Lake	Motor Equipment Co.	601 S. State
Washington	Seattle	Sunset Electric Co.	1530 11th Ave.
Wisconsin	Milwaukee	Wisconsin Magneto Co.	918 N. Broadway
DOMINION OF CANADA			
Manitoba	Winnipeg	Beattie Auto Electric, Ltd.	176 Fort St.
Ontario	Toronto-5	Auto Electric Service Co., Ltd.	15 Breadalbane St.