



Wisconsin Motors, LLC

2020 Fletcher Creek Dr.

Memphis, TN 38133

Ph 901-371-0353 or 800-932-2858

Fax 901-372-2183

www.wisconsinmotors.com

**AENL, AEN
AENS**

**INSTRUCTION BOOK
AND PARTS LIST**

IMPORTANT

READ THESE INSTRUCTIONS CAREFULLY

SERVICE FACILITIES

WISCONSIN MOTORS Distributors and Service Centers, located throughout the U.S. and foreign countries, have been carefully selected to insure complete and efficient repair and inspection service to owners of WISCONSIN MOTORS Engines. These service centers, equipped and staffed for complete engine repair, also stock engine parts to facilitate immediate delivery for the complete line of WISCONSIN MOTORS Engines.

STARTING AND OPERATING OF NEW ENGINES

Careful breaking in of a new engine will greatly increase its life and result in trouble-free operation. A factory test is not sufficient to establish the polished bearing surfaces, which are so necessary to the proper performance and long life of an engine. Neither is there a quick way to force the establishment of good bearing surfaces. These can only be obtained by running a new engine carefully and under reduced speeds and loads for a short time, as follows:

First, be sure the engine is filled to the proper level with a good quality of engine oil, see "Grade of Oil" chart.

Before a new engine is put to its regular work, the engine should be operated at low idle speed (1000 to 1200 R.P.M.) for one half hour, without load. The R. P. M. should then be increased to engine operating speed, still without load, for an additional two hours.

If at all possible, operate the engine at light loads, for a period totaling about eight hours, before maximum load is applied. This will greatly increase engine life.

The various bearing surfaces in a new engine have not been glazed, as they will be with continued operation, and it is in this period of "running in," that special care must be exercised, otherwise the highly desired glaze will never be obtained. A new bearing surface that has once been damaged by carelessness will be ruined forever.

Our engine warranty is printed on the inside back cover of this manual. Read it carefully.

For your own record and for ordering purposes:

MODEL

SPECIFICATION

SERIAL NUMBER

THE ABOVE INFORMATION, WHICH WILL BE FOUND ON THE INSTRUCTION PLATE ATTACHED TO THE AIR SHROUD OF THE ENGINE, SHOULD BE FILLED IN. YOUR PROMPT ATTENTION TO THIS MATTER WILL MAKE IT CONVENIENT FOR YOU IN THE FUTURE, AS THIS INFORMATION **MUST** BE GIVEN WHEN ORDERING ENGINE REPAIR PARTS.

BOOK OF INSTRUCTIONS

WISCONSIN *Air-Cooled*

SINGLE CYLINDER ENGINES



READ THE *STARTING AND OPERATING INSTRUCTIONS* THOROUGHLY BEFORE STARTING A NEW ENGINE. BECOME ACQUAINTED WITH THE ENGINE COMPONENTS; THEIR LOCATION, MAINTENANCE AND ADJUSTMENT REQUIREMENTS.

NOTE:

MODELS AEN and AENS ARE OBSOLETE and WERE REPLACED BY MODEL AENL. ALL SERVICE REPLACEMENT PARTS FOR MODEL AENL CAN BE APPLIED TO MODELS AEN and AENS.

FLYWHEEL ALTERNATOR Instructions and Parts List are located in the rear section of this manual.

Models AENL AEN, AENS

3" Bore – 3-1/4" Stroke
23 cu. in. Displacement

ISSUE WM 20253

The AENL engine with LONG LIFE exhaust valve and seat insert has the letter 'D' suffixed to the model designation and is referred to as the Model AENLD.

INTRODUCTION

This manual has been compiled to suit the service requirements of the basic engine and accessories most commonly supplied with engines.

WISCONSIN MOTORS adapts its engines to suit individual customer requirements whenever practical. It evidently would become too involved to include all variations in one manual; therefore, should any problems arise concerning engine servicing, we advise that a Wisconsin distributor or authorized service station be contacted as they are capable of identifying all parts by the specification number stamped on the name plate of engine.

Wisconsin heavy duty air-cooled engines are of the most advanced design and are built in a modern factory, equipped with the latest machinery available. Only the best materials, most suitable for

the particular part, are used. During production every part is subjected to the most rigid inspection, as are also the completely assembled engines. After assembly, every engine is operated on its own power for several hours, and all adjustments are carefully made so that each engine will be in perfect operating condition when it leaves the factory.

Over 90 years of engineering experience back WISCONSIN MOTORS in the design of gasoline engines for every conceivable type of service. The performance of these engines is proof of the long satisfactory service you too can expect from your engine.

Like all fine machinery, the engine must be given regular care and be operated in accordance with the instructions.

SAFETY PRECAUTIONS

- Never fill fuel tank while engine is running or hot; avoid the possibility of spilled fuel causing a fire.
- Always refuel slowly to avoid spillage.
- When starting engine, maintain a safe distance from moving parts of equipment.
- Do not start engine with clutch engaged.
- Do not operate engine in a closed building unless the exhaust is piped outside. This exhaust contains carbon monoxide, a poisonous, odorless and invisible gas, which if breathed causes serious illness and possible death.
- Never run engine with governor disconnected, or operate at speeds in excess of 3600 R.P.M. load.
- Never make adjustments on machinery, while it is connected to the engine, without first removing the ignition cable from the spark plug. Turning the machinery over by hand during adjusting or cleaning might start the engine and machinery with it, causing serious injury to the operator.
- Precaution is the best insurance against accidents.

Keep this book handy at all times, familiarize yourself with the operating instructions.

INDEX

	PAGE		PAGE
Air Cleaners	9	Ignition	7
Alternator – Rear of Manual.		Ignition Switch	10
Battery Ignition – Timing	12	Illustration of Engine	4-5
Neon Lamp Timing	13	Lubrication	7
Carburetor Adjustment	9	Lubrication System	7
Carburetor Repair – See Manufacturer’s Bulletin in Rear of Manual.		Magneto – Breaker Point Adjustment	11
Clutch Take-Off	14	Magneto Ignition Spark	11
Clutch Adjustment	15	Magneto Repair – See Manufacturer’s Bulletin in Rear of Manual.	
Cooling	7	Magneto Timing	11
Compression	17	Motor-Generator Operating Instructions	13
Compression – Restoring	14	Oil – Grade of	8
Cross Section of Engine	6	Parts List Section	27
Disassembly and Reassembly	18	Reduction Gears	15
Air Shroud	19	Rotation	7
Camshaft	23	Safety Precautions	2
Carburetor and Air Cleaner	19	Service Center Directory – Rear of Manual.	
Connecting Rod and Piston	20	Spark Plug	14
Crankshaft	22	Starting and Operating Instructions	7
Cylinder	22	Starting and Operation of New Engine (See Inside of Front Cover)	
Cylinder Head	19	Starting – Rope Starter – Starting Procedure	8
Engine Base	20	Stopping Engine	9
Flywheel	18	Storage of Engine	16
Fuel Tank	18	Testing of Rebuilt Engine	18
Oil Pump	20	Troubles – Causes and Remedies	16
Piston, Ring and Rod Clearance Chart	22	Backfiring Through Carburetor	18
Piston Rings	21	Ignition	17
Starter Sheave	18	Knocking	18
Valves, Guides and Seat Inserts	22	Missing	17
Electric Wiring Circuits	13	Overheats	18
Fuel	8	Starting Difficulties	16
Fuel Pump	10	Stops	17
Fuel Strainer	10	Surging or Galloping	17
Gear Train	22	Valves – Grinding and Tolerances	22
General Design	7	Valve Tappet – Adjustment	23
Generator and Timer Maintenance	13	Warm-Up Period – Overspeeding	9
Governor Adjustment	24		
Governor – Description – Operation	23		
High Temperature Safety Switch	14		
Horsepower	7		

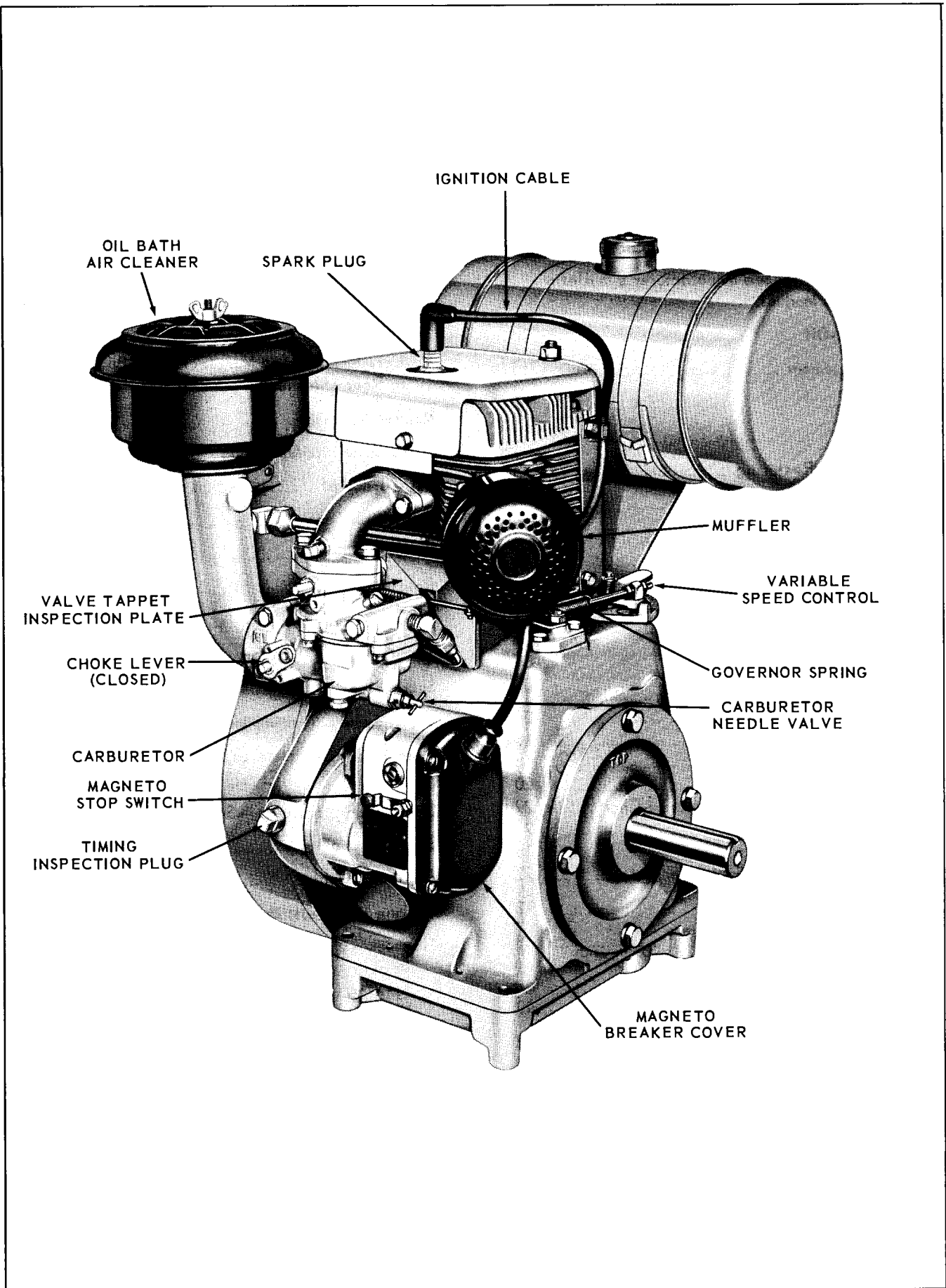


Fig. 1

287039C

CARBURETOR and MAGNETO side view of ENGINE

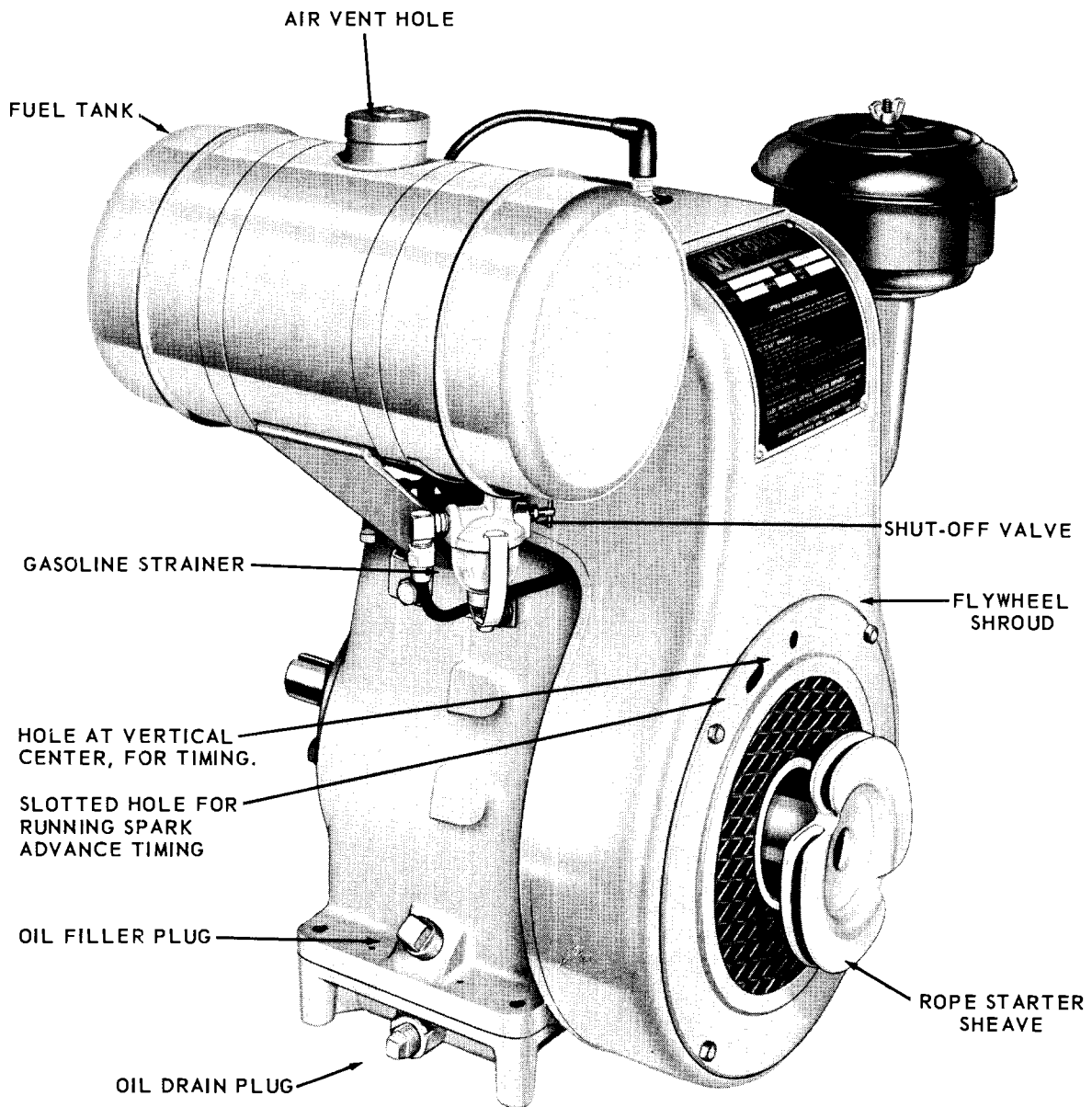


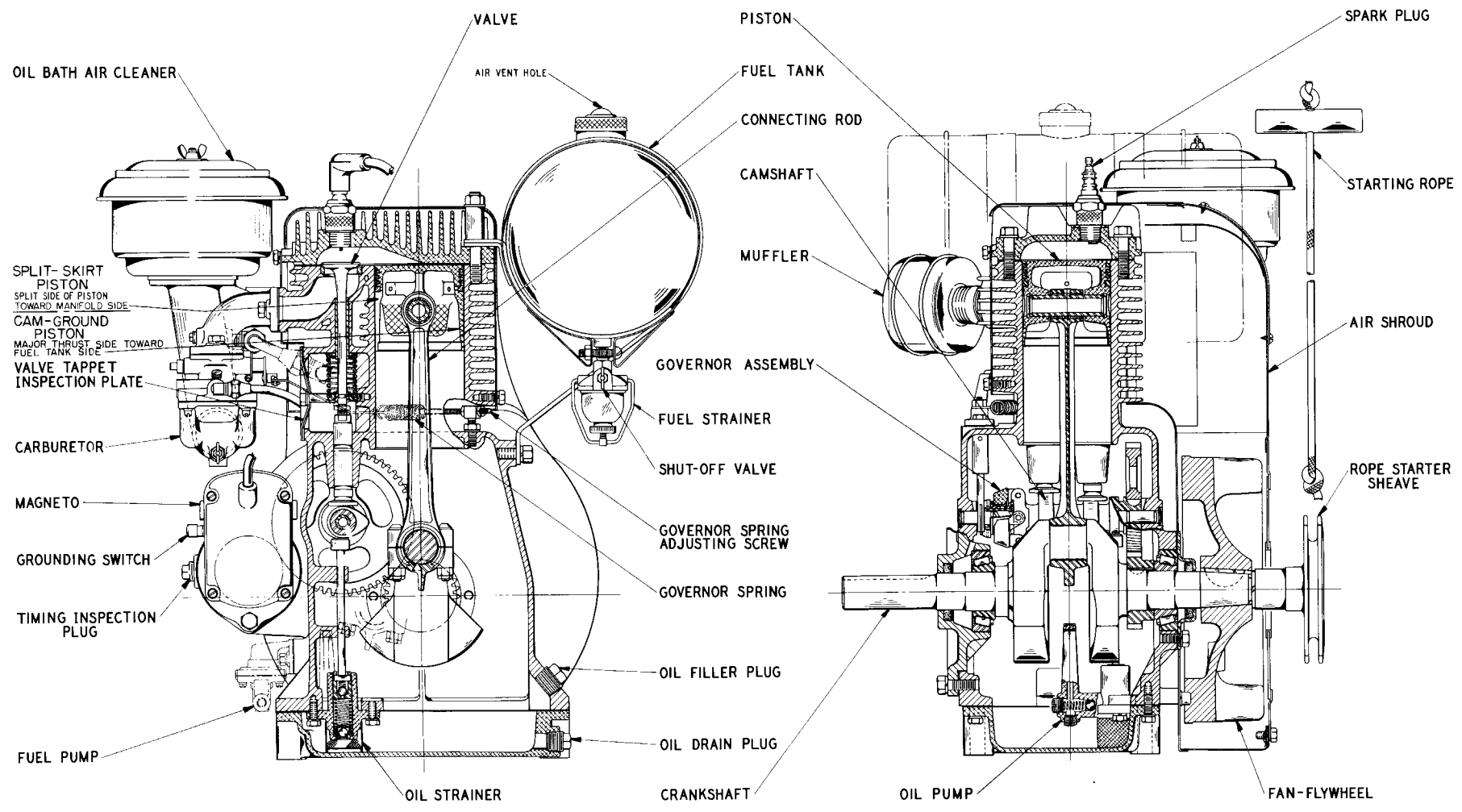
Fig. 2

287041C

FUEL TANK side of ENGINE

SECTIONAL VIEWS OF MODEL AENL ENGINE

Fig. 3



GENERAL DESIGN

Wisconsin engines are of the *four cycle* type, in which each of the four operations of *suction, compression, expansion and exhaust* constitutes a complete stroke. This produces one power stroke for each two revolutions of the crankshaft.

COOLING

Cooling is accomplished by a flow of air, circulated over the cylinder and head of the engine, by a combination fan-flywheel encased in a sheet metal shroud. The air is divided and directed by ducts and baffle plates to insure uniform cooling of all parts.

Never operate an engine with any part of the shrouding removed – this will retard air cooling.

Keep the cylinder and head fins free from dirt and chaff. Improper circulation of cooling air will cause engine to overheat.

CARBURETOR

The proper combustible mixture of gasoline and air is furnished by a balanced carburetor, giving correct fuel to air ratios for all speeds and loads.

GOVERNOR

A governor of the centrifugal flyball type controls the engine speed by varying the throttle opening to suit the load imposed upon the engine. These engines are equipped with either a *fixed speed* or *variable speed control*, to regulate the governed speed of the engine.

IGNITION

The spark for ignition of the fuel mixture is furnished by a high tension magneto driven off the timing gears at crankshaft speed. The magneto is fitted with an impulse coupling, which makes possible a powerful spark for easy starting. Also, the impulse coupling automatically retards the spark for starting, thus eliminating possible kick back from engine while cranking.

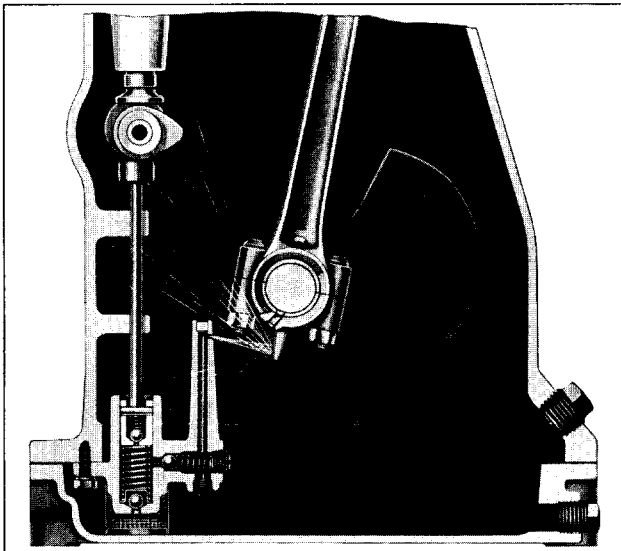


Fig. 4

141162C-1

Battery ignition (12 volt) timer, is furnished in place of magneto on engines equipped with flywheel alternator or generator.

LUBRICATION SYSTEM (Fig. 4)

A plunger type pump supplies oil to a spray nozzle which directs an oil stream against the connecting rod. Part of the oil enters the rod bearings thru holes in the rod, and the balance of oil forms a spray or mist which provides ample lubrication for all internal friction surfaces of the engine.

ROTATION

The rotation of the crankshaft is *clockwise* when viewing the flywheel or starting end of the engine. This gives *counter-clockwise* rotation when viewing the power take-off end of the crankshaft.

HORSEPOWER

R.P.M.	HORSEPOWER
1600	4.7
1800	5.4
2000	6.1
2200	6.8
2400	7.4
2600	7.9
2800	8.5
3000	8.9
3200	9.2
3400	9.2
3600	9.2

Horsepower given in the accompanying chart is for an atmospheric temperature of 60° Fahrenheit at sea level and at a Barometric pressure of 29.92 inches of mercury.

For each inch lower Barometer reading deduct 3½% from above horsepower.

For each 10° higher temperature there will be a reduction in horsepower of 1%.

For each 1000 ft. altitude above sea level, there will be a reduction in horsepower of 3½%.

The friction in new engines cannot be reduced to the ultimate minimum during the regular block test, but engines are guaranteed to develop at least 85 per cent of maximum power when shipped from the factory. The power will increase as friction is reduced during a few days of operation. The engine will develop at least 95% of maximum horsepower when friction is reduced to a minimum.

For continuous operation, allow 20% of horsepower shown, as a safety factor.

INSTRUCTIONS FOR STARTING AND OPERATING

LUBRICATION

Before starting a new engine, fill crankcase base with the proper grade of engine oil, as specified in "grade

of oil chart". Fill thru the filler plug opening, illustrated in Fig. 4, to the level of the hole. The crankcase capacity is 3 pints.

For run-in of new engines, use same oil as recommended in Grade of Oil Chart.

Use only high-grade highly refined oils, corresponding in body to the S. A. E. (Society of Automotive Engineers) Viscosity Numbers listed in Grade of Oil Chart. These will prove economical and assure long engine life.

SERVICE CLASSIFICATION OF OIL

In addition to the S.A.E. Viscosity grades, oils are also classified according to severity of engine service. Use oils classified by the American Petroleum Institute as **Service SE** or **SF**. This type of oil is for engines performing under unfavorable or severe operating conditions such as: high speeds, constant starting and stopping, operating in extreme high or low temperatures and excessive idling.

GRADE OF OIL

SEASON OR TEMPERATURE	GRADE OF OIL
Spring, Summer or Autumn + 120°F to + 40°F	SAE 30
Winter + 40°F to + 15°F + 15°F to 0°F Below Zero	SAE 20-20W SAE 10W SAE 5W-20
Use oils classified as Service SE or SF	
Crankcase Capacity	3 Pts.

Follow summer recommendations in winter if engine is housed in warm building.

Check oil level every 8 hours of operation.

The old oil should be drained and fresh oil added after every 50 hours of operation.

To drain oil, remove drain plug illustrated in Fig. 4. Oil should be drained while engine is hot, as it will then flow more freely.

FUEL

The fuel tank should be filled with a **good quality** gasoline free from dirt and water. The capacity of the tank is **1½ gallons**. Some of the poorer grades of gasoline contain gum which will deposit on valve stems, piston rings, and in the various small passages in the carburetor, causing trouble in operating, and in fact might prevent the engine from operating at all.

*Use only reputable, well known brands of gasoline of the **REGULAR GRADE**.*

The gasoline should have an octane rating of at least 90. Fuel with a low octane rating will cause detonation, and if operation is continued under this condition, severe damage will result to the engine. The

cylinder and piston will be scored, head gasket blown out, bearings will be damaged, etc.

Be sure that air vent in fuel tank cap is not plugged with dirt, as this would impede the flow of gasoline to the carburetor.

STARTING

ROPE STARTER (Fig. 5)

This engine is equipped with a rope starter, which has an advantage over a starting crank in that a pull on the rope will give two full revolutions of the crankshaft. This will result in easier starting, especially if direct connected loads are coupled to the engine, such as generators, compressors, or belted equipment, and when no clutch is used.

STARTING PROCEDURE

1. Check crankcase and air cleaner oil level, and fuel supply. Open fuel valve.
2. If applicable, open **high speed needle valve** on carburetor 1¼ turns (See "Carburetor-Adjustment").
3. Disengage clutch, if furnished.
4. Set throttle about 1/2 open if variable speed governor control is furnished. With a fixed speed governor, spring will hold throttle open for starting.
5. Close choke on carburetor and turn engine over once. Open choke half-way, turn engine over to compression with starter sheave and then turn back one-half turn. Wind rope fully on sheave and **pull briskly** to turn crankshaft over.

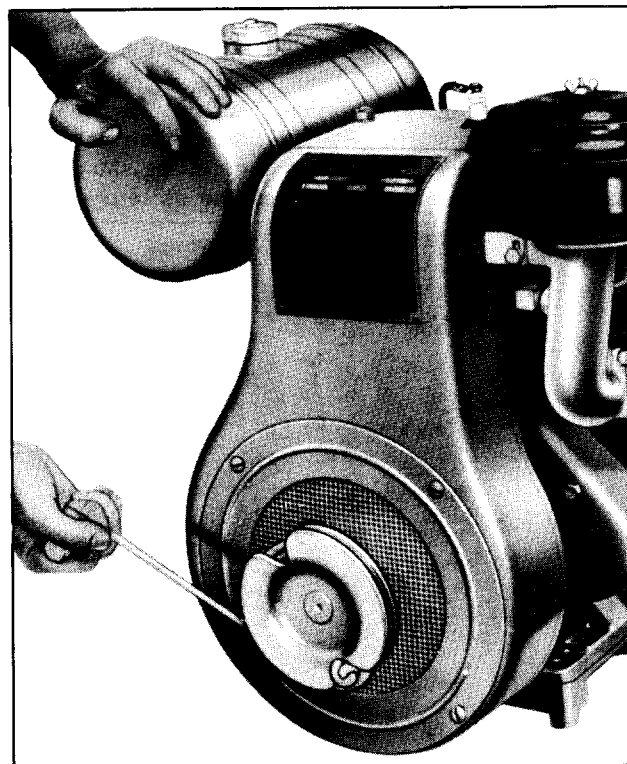


Fig. 5

140443C-1

With *starting motor*, pull out ignition switch and depress starter button.

6. After engine starts, *open choke fully*. Less choking is necessary in warm weather or when engine is warm, than when it is cold. Should flooding occur, open choke fully and continue cranking.

If all conditions are right, engine will start promptly after one or two attempts. After engine starts, allow it to warm up a few minutes, before applying load, as prescribed in 'Warm-Up Period' paragraphs.

New engines should be "run-in" gradually to insure trouble-free service. Refer to "Starting and Operation of New Engine", on the inside front cover of this manual, for correct "running-in" procedure.

CARBURETOR ADJUSTMENT (Fig. 6)

The *main metering jet* in the standard engine carburetor is of the *fixed type* and therefore no adjustment can be made.

On engines with an *adjustable jet* carburetor, the *high speed needle valve* should be opened $\frac{3}{4}$ to $1\frac{1}{4}$ turns. With the engine warmed up and running at normal operating speed, the needle valve should then be re-adjusted for best operation. This adjustment need only be made the first time the engine is started. In cold weather, starting may be facilitated by opening the needle valve slightly more, then readjusted to normal running position after engine is started.

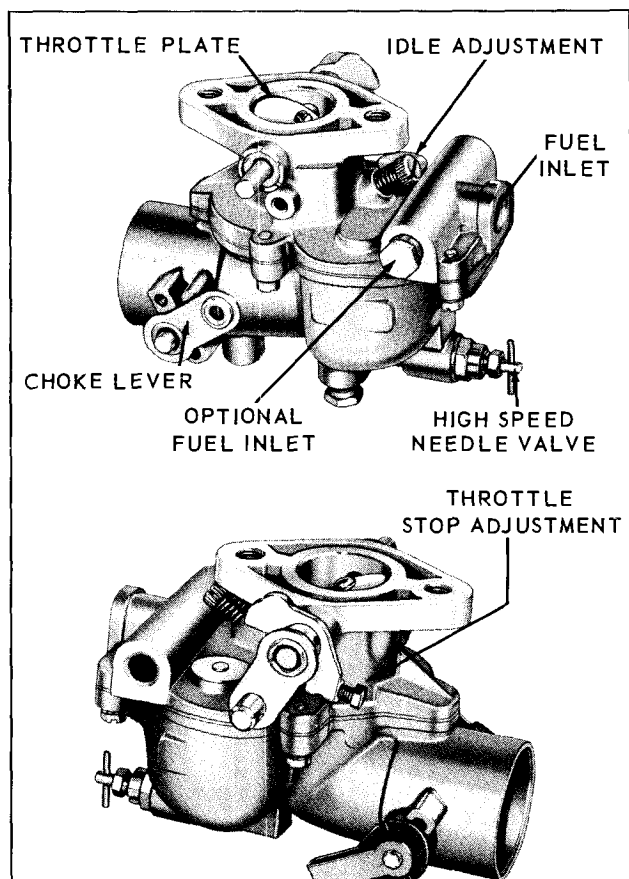


Fig. 6

289224C

The correct amount of throttle plate opening for low idle speed is obtained by means of the *throttle stop adjustment*. However, this is set at the factory so that no further adjustment is necessary. The *idle adjustment* is for smooth low speed operation and this adjustment, if necessary, must be made with the carburetor throttle lever closed.

For further information, refer to carburetor service instructions in the rear of this manual.

WARM-UP PERIOD

The engine should be allowed to warm up to operating temperature before load is applied. This requires only a few minutes of running at moderate speed. *Racing an engine or gunning it*, to hurry the warm-up period, is *very destructive* to the polished wearing surfaces on piston, rings, cylinder, bearings, etc., as the proper oil film on these various surfaces cannot be established until the oil has warmed up and become sufficiently fluid. This is especially important on new engines and in cool weather.

Racing an engine by disconnecting the governor, or by doing anything to interfere with the governor controlled engine speed, is *extremely dangerous*. The governor is provided as a means for controlling the engine speed to suit the load applied, and also as a safety measure to guard against excessive speeds, which not only overstrain all working parts, but which might cause wrecking of the engine and possible injury to bystanders.

Strict adherence to the above instructions cannot be too strongly urged, and greatly increased engine life will result as a reward for these easily applied recommendations.

STOPPING ENGINE

Engines with *magneto ignition* have a lever type ground switch on the side of the magneto. To stop, depress lever and *hold down until engine stops*. See Fig. 1. *Battery ignition* engines are furnished with an ignition switch, "To Stop Push In".

If the engine has been running hard and is hot, do not stop it abruptly from full load, but remove the load and allow engine to run idle at 1000 to 1200 R.P.M. for three to five minutes. This will reduce the internal temperature of the engine much faster, minimize valve warping, and of course the external temperature, including the manifold and carburetor will also reduce faster, due to air circulation from the flywheel.

MAINTENANCE

AIR CLEANERS

AENL engines are provided with a *dry element* type air cleaner, as illustrated in Fig. 7A, with the previously standard *oil bath* air cleaner, Fig. 7, now furnished as optional equipment.

The air cleaner must be serviced frequently, depending on the dust conditions where engine is operated. Daily attention to the air cleaner is one of the most important considerations in prolonging engine life.

OIL BATH AIR CLEANER, (Fig. 7)

Once each week; the filtering element should be thoroughly washed in a solvent. Remove oil and clean out air cleaner bowl. Add fresh oil to the *level line* indicated on bowl, using the same grade oil as is used in the crankcase.

Service daily, if engine is operating in very dusty conditions. Detailed instructions are on air cleaner.

Operating the engine under dusty conditions without oil in the air cleaner or with dirty oil, may wear out cylinder, piston, rings and bearings in a few days time, and result in costly repairs.

DRY ELEMENT AIR CLEANER, (Fig. 7A)

Service daily, if engine is operating in very dusty conditions. Remove cartridge and shake out the accumulated dirt (do not tap or strike element – it may become damaged). Wipe out dirt from inside cover.

Once each week; the filtering cartridge should be taken out and rinsed under a faucet with cold water, then wash by repeated dipping for several minutes in a solution of lukewarm water and a mild, *non-sudsing* detergent. Rinse in cold water from the inside out, and allow to dry overnight before installing. In cold weather, protect element from freezing until dry. *Excessive smoke or loss of power are good indications that the element requires cleaning.*

Do not use gasoline, kerosene or solvent for cleaning – Do not oil element.

After five washings or one year of service, replace cartridge. New cartridges are available at your *Wisconsin Motor dealer.*

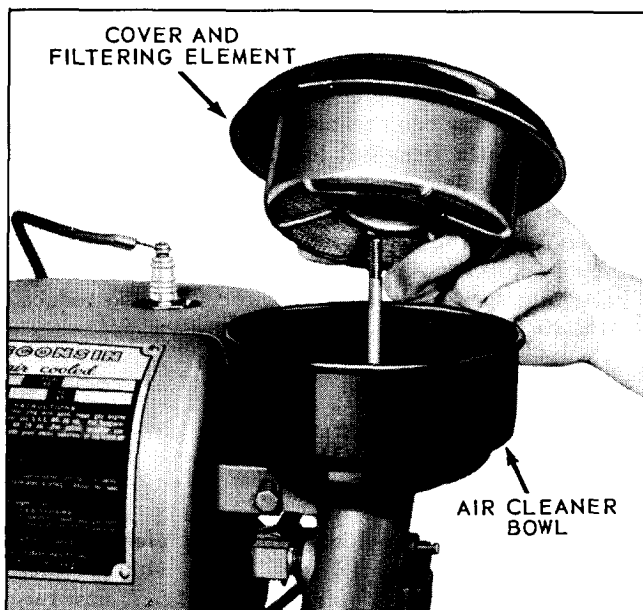


Fig. 7

208064C

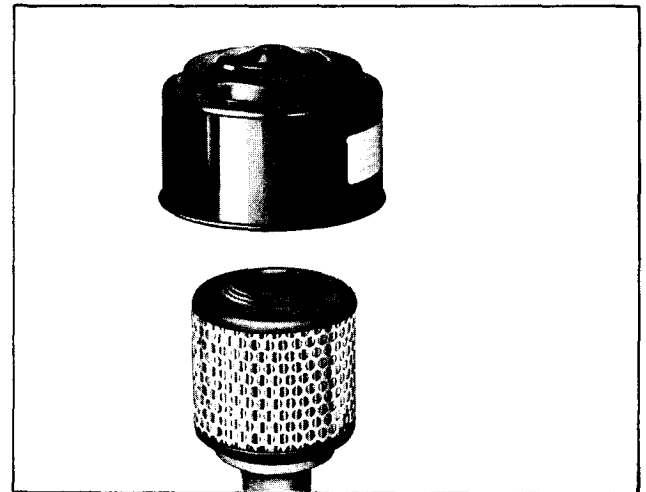


Fig. 7A

311747C

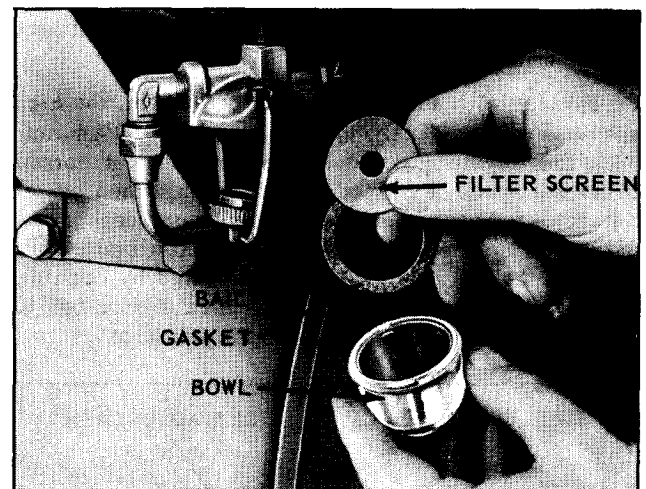


Fig. 8

208072C

FUEL STRAINER

A fuel strainer is very necessary to prevent dirt from entering the carburetor and causing trouble, or even complete stoppage of the engine.

The *strainer* is an integral part of the *shut-off valve* at the bottom of the tank. *Remove and clean periodically.*

A glass bowl *fuel filter*, Fig. 8, can be furnished in place of the shut-off valve strainer. When dirt and water accumulate the glass bowl and screen can be easily removed for cleaning. Twist bowl when removing to prevent damage to the gasket. Replace gasket if it has become damaged or hardened. *Repair kits* are available for service replacement, refer to parts list.

FUEL PUMP

Fuel pump is an optional accessory and can be furnished only upon request when engine is purchased from the factory. Instructions for fuel pump maintenance and repair are located in the back of manual.

IGNITION SWITCH

Magneto ignition is standard on these engines, with a lever type ground switch on the side of the magneto, which is always in the *on* or running position,

except when depressed for stopping the engine. See Fig. 1 for location of stop switch.

MAGNETO

BREAKER POINT ADJUSTMENT (Fig's. 9, 10)

Magnetos are properly adjusted and timed before leaving the factory. The **breaker point gap** of the Fairbanks-Morse magneto and Wico magneto should have an opening of **.015 inch** at full separation. If the spark becomes weak after continued operation, it may be necessary to readjust the breaker points. To do this first remove the end cover on the magneto. See Fig's. 9 and 10 which show the end cover removed and the breaker points of the magneto exposed. The following instructions are for the Fairbanks-Morse magneto, but can be applied to the Wico magneto as well. The crankshaft should be rotated by turning the starting rope sheave by hand (this also rotates the magneto), until the breaker points are wide open. The opening or gap should then be measured with a feeler gauge and if necessary reset as shown in Fig. 9. To readjust points, first loosen the **locking screws** on the contact plate enough so that the plate can be moved. Insert the end of a small screw driver into the **adjusting slot** at the bottom of the contact plate and open or close the contacts by moving the plate until the proper opening is obtained. After tightening the locking screws, recheck breaker point gap to make sure

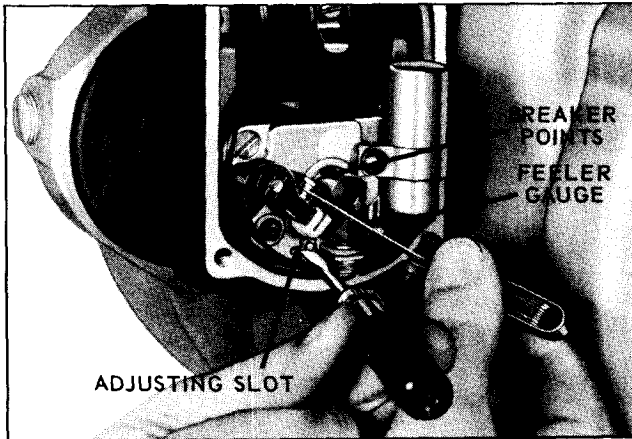
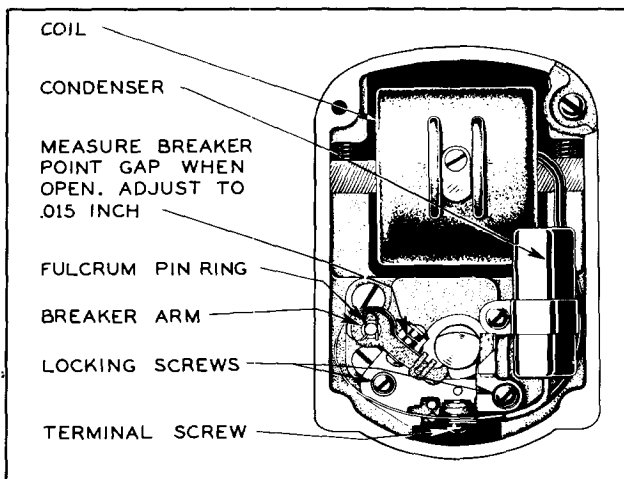


Fig. 9



END VIEW OF FAIRBANKS-MORSE MAGNETO

Fig. 10

it has not changed. If it is found that the breaker points have become rough, they should be smoothed with a breaker point file before the above adjustments are made. Replace magneto end cover and gasket carefully, so that it will seal properly. For further information see *Fairbanks-Morse or Wico Magneto Maintenance Instructions in the rear of this manual.*

MAGNETO IGNITION SPARK (Fig. 11)

If difficulty is experienced in starting the engine or if engine misses firing, the strength of the ignition spark can be tested as follows: Remove the ignition cable from the spark plug and then wedge a piece of stiff bare wire up into the terminal boot with one end of the wire extending out. With the extended wire held about 1/8 inch away from the cylinder head shroud stud, as shown in Fig. 11, turn the engine over slow-

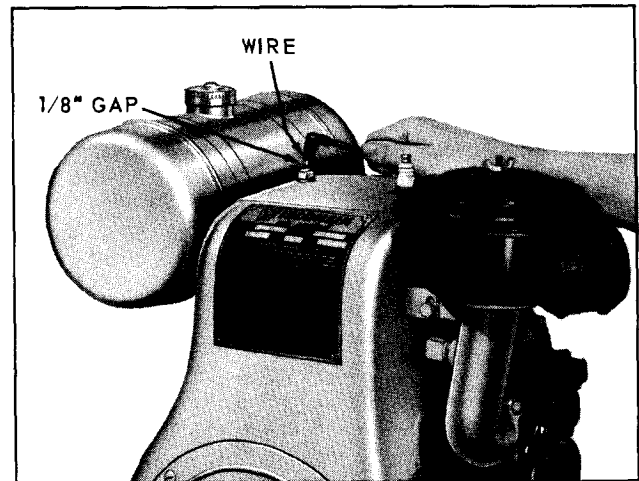


Fig. 11

140450C-2

ly by means of the rope starter sheave. When the impulse coupling in the magneto snaps, there should be a good spark at the wire to stud gap. If there is a weak spark or no spark at all, check breaker point gap as explained in the preceding paragraph. If this does not remedy the trouble, refer to magneto manufacturer's maintenance instructions in the rear section of this manual for condenser replacement and further service procedures.

MAGNETO TIMING (Fig's. 12, 13, 14)

If it becomes necessary to remove the magneto for cleaning or repairs, it is important that the magneto be reassembled properly so that it is timed correctly to the engine.

Removal of the rope sheave and air intake screen on the flywheel shroud, will expose the **timing marks** on the shroud and flywheel, as shown in Fig. 12. It is however, possible to time the magneto to the engine without removing the flywheel screen. A 3/8" dia. hole in line with the vertical center is located in the air intake screen as illustrated in Fig. 13. The marked air vane on the flywheel is visible thru this opening.

1. Remove spark plug to make cranking easier.
2. Turn engine over with the starter sheave until the edge of the **D-C** and **'X'** marked **vane on flywheel** is in line with the **mark on the vertical centerline** of

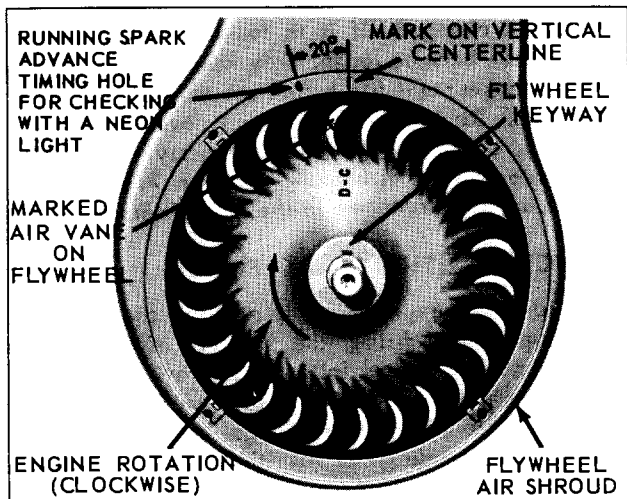


Fig. 12 208068C-1

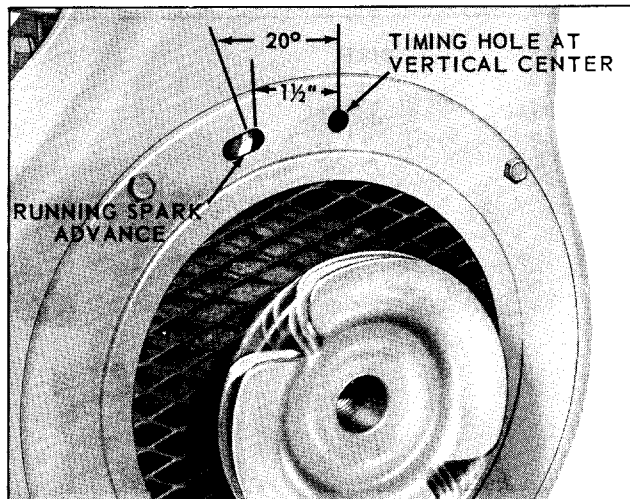


Fig. 13 287043C

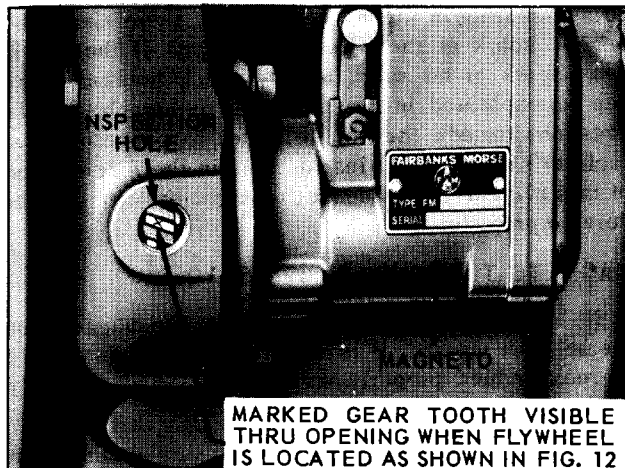


Fig. 14 208069C

the shroud as shown in Fig. 12, or in the center of the **timing hole** as illustrated in Fig. 13.

3. Leave the flywheel in this position. At this point the **keyway** for mounting the flywheel is on top.
4. Mount magneto to engine, meshing the gears so that when the magneto is in place, the 'X' marked tooth on the magneto gear will be visible in the center of the **inspection hole** of the crankcase as shown in Fig. 14.

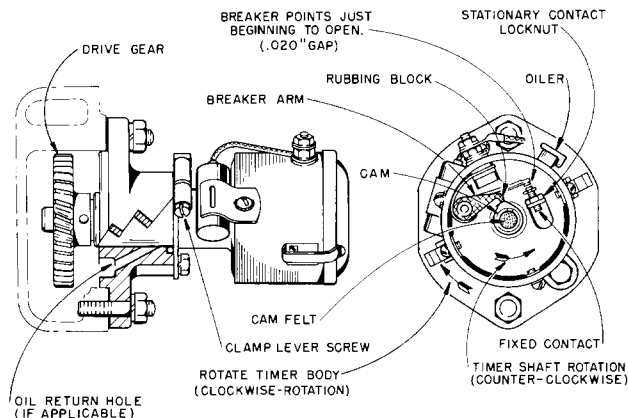


Fig. 15, IGNITION TIMER

When the magneto is properly timed, the impulse coupling will snap when the 'DC' marked vane of the flywheel, lines up with the **vertical centerline mark** on the flywheel shroud, or with the **timing hole** in air intake screen, while turning the engine over slowly with the rope starter sheave.

The **running spark advance** is 20°. For checking timing with a **neon light**, the running spark advance is indicated by a **slotted hole** on the flywheel screen rim, as shown in Fig. 13. The center of the radii of the right hand edge of the slotted hole is 20° or 1½ inches before the **vertical center** of the cylinder.

BATTERY IGNITION

TIMING (Fig's. 12, 13, 15)

Ignition timer is used in place of a magneto, when 6 or 12 volt separate **starter** and **generator** is used.

Time engine or check timing in the following manner:

The ignition timer **breaker point gap** should be .020 inch. This opening must be checked before the timer body is set, otherwise any adjustment made to the breaker point opening will change the ignition advance adjustment. To readjust the breaker point gap, turn the engine over by means of the rope starter sheave so that the ignition timer breaker arm **rubbing block** is on a high point of the **cam**. Loosen the **stationary contact locknut** and screw **fixed contact**, in or out, until correct gap of .020 inch is obtained. Tighten locknut and recheck gap. See Fig. 15.

Timing marks on the flywheel and shroud are exposed when the rope starter sheave and air intake screen are removed, as illustrated in Fig. 12. However, a 3/8" dia. hole on the **vertical center** and a **slotted hole** to the left, on the rim of the air intake screen as shown in Fig. 13, makes it possible to time the engine without removing the sheave and screen, if so desired.

1. Remove spark plug to make cranking easier.
2. Turn engine over with the starter sheave until the edge of the **D-C** and 'X' marked vane on the **flywheel** is in line with the **mark** on the **vertical centerline** of the shroud as shown in Fig. 12, or in the center of the 3/8" **timing hole** as shown in Fig. 13.

3. Leave flywheel in this position, for mounting ignition timer assembly.
4. Assuming the timer assembly is removed from the engine, turn *cam*, by means of *drive gear*, in a counter-clockwise direction until *breaker points* are just beginning to open. Mount timer assembly to engine, being sure that *oil return hole* in adapter is in the downward position, see Fig. 15.
5. Since the running spark advance of the engine is 20° , and the timer *automatic advance* is 15° , an *initial advance setting* of 5° must be obtained.
6. With the timer assembly mounted in place, loosen the *clamp lever screw*. Obtain the initial 5° advance as follows; with the *breaker points* just beginning to open, turn *timer body* in a clockwise direction through an angle of 5° , which is equal to $1/8$ inch on the outside circumference of the timer body. Tighten *clamp lever screw*.
7. Mount timer cover and connect primary wire from ignition timer to coil. See wiring diagram, Fig. 16.

If care is exercised in the above operations, the spark timing will be accurate enough for satisfactory starting, however, the running spark advance *must be checked* with a neon lamp, as described in 'Neon Lamp Timing' paragraph.

NEON LAMP TIMING FOR TIMER IGNITION

Chalk or paint the end of the 'X' marked vane on the flywheel, white. Then, with the engine operating at **1800 R.P.M.** or over, allow the flash from the neon lamp to illuminate the whitened vane. At the time of the flash, the leading edge of the vane should line up with the *running spark advance timing hole* on the flywheel shroud, shown in Fig. 12, or the corresponding 20° location in the *slotted hole* of the air intake screen rim, as shown in Fig. 13. If it does not, the *clamp lever screw*, shown in Fig. 15, should be loosened and the timer body turned slightly clockwise or counter-clockwise, as required, until the *advance timing mark* and the *white vane* coincide. Be sure *clamp lever screw* is then securely tightened.

Do not time engine below 1800 R.P.M. The automatic advance in the ignition timer will not be fully advanced and the timing would not be accurate.

GENERATOR AND TIMER MAINTENANCE

This model of engine can be equipped with either a 12 volt combination *motor-generator* or separate 6 and 12 volt *starter* and *generator*. Battery is not furnished. The generator, motor-generator, and ignition timer should be periodically lubricated and inspected for external conditions which would affect their operation. Motor-generators without oilers have *pre-lubricated* bearings. It is recommended that the generator and motor-generator oilers be given 3 to 5 drops of medium engine oil after every **50 hours** of operation.

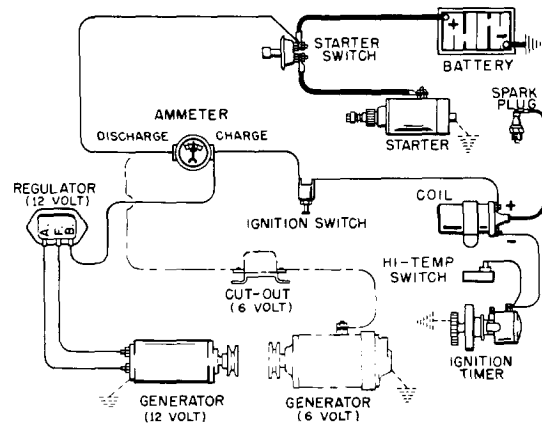


Fig. 16, STARTER AND GENERATOR WIRING

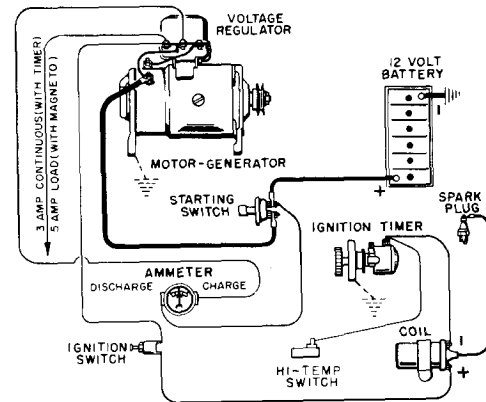


Fig. 17, COMBINATION MOTOR-GENERATOR WIRING

Inspect the brushes for wear, approximately every **200 hours** of operation. If they are worn to less than half their original length, they should be replaced.

The oiler on the ignition timer and felt wick in the cam sleeve should have 3 to 5 drops of medium engine oil every **100 hours** of operation.

ELECTRICAL WIRING CIRCUITS

NOTE: Beginning with engine serial No. 3991018, the standard wiring circuits for all **12 volt** electrical equipment is *negative ground polarity*, instead of the previously furnished positive ground. All **6 volt** systems remain positive ground.

The wiring diagrams, Fig. 16 and 17, illustrate *negative ground* circuits. If polarity of generator or motor-generator is for a positive ground circuit (engines built previous to serial No. 3991018), terminal connections at ammeter, coil and battery are just reversed from those illustrated.

Do not use positive ground generator and regulator in a negative ground circuit, or vice versa. Polarity does not affect starting motor, timer and coil.

MOTOR-GENERATOR OPERATING INSTRUCTIONS

The combination *motor-generator* functions as a cranking motor when the *starting switch* is closed. When the switch is open and the engine is running, the unit will function as a generator. The generator out-

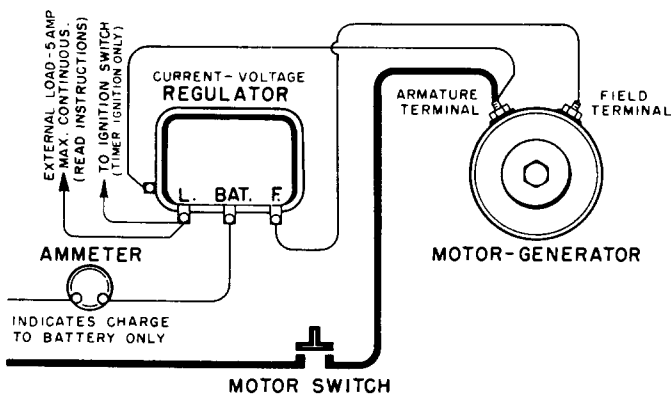


Fig. 18 MOTOR-GENERATOR REGULATOR WIRING

put and circuit voltage for the various battery and operating requirements are controlled by a **current-voltage regulator** mounted to the generator.

The total electrical output of this **12 volt** combination motor-generator is **12 amperes**. However, all of the current is not taken off of a single terminal. There are **two terminals** on the current-voltage regulator, illustrated in *Fig. 18*, for distributing the generator output. One terminal is marked '**BAT**' and a wire is connected from it to the battery, thru an **ammeter**. The other terminal marked '**L**' is for the timer ignition system, if applicable, and for operating lights or any other customer accessory. For a continuous load, not more than **5 or 6 amps** should be taken from this terminal if engine has magneto ignition. With timer ignition, maximum draw should be **3 or 4 amps**, since **2 amps** is required for the ignition system. Current from the '**L**' terminal is continuous and is not affected by the regulator windings. Whereas, the current to the '**BAT**' terminal goes thru the regulator windings and is controlled to keep the battery charged.

The ammeter in this circuit indicates only the current going into the battery to keep it charged and does not indicate the total generator output. If it is necessary to check the amount of current coming from the '**L**' terminal, it will be necessary to put a second ammeter in the circuit between the '**L**' terminal and the load. Add the two values indicated on the ammeters to get the total generator output.

To check if the generator is charging, it is only necessary to observe the ammeter that is connected in the battery circuit. If it shows a charge, the system is functioning properly. If it shows a discharge, remove the load connected to the '**L**' terminal until the battery current is restored and the ammeter does register a charge.

SPARK PLUG (Fig. 19)

The spark plug gap should be thirty thousandths (.030) of an inch, and plugs should be kept clean both inside and out. If the porcelain insulator is cracked, replace with a new plug of correct heat range, like Champion No. D-16J, AC No. C86 Commercial, or equal. The thread is 18 millimeter.

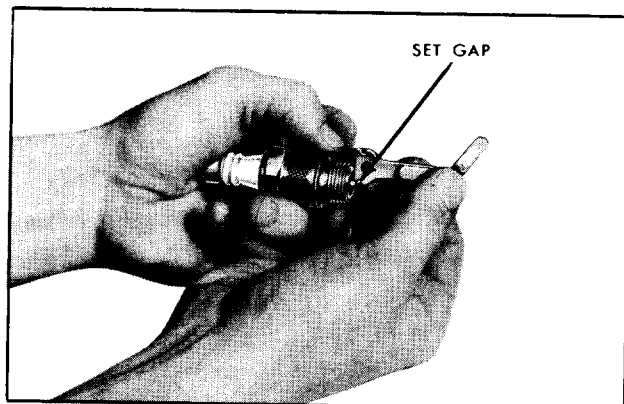


Fig. 19

104713C

Use a new gasket when mounting either old or new plug and thoroughly clean threads in cylinder head before installation. Tighten spark plug **25 to 30 ft. pounds torque** in reassembly.

RESTORING COMPRESSION

On a new engine or one which has been out of operation for some time, the oil may have drained off the cylinder so that compression will be weak. This may cause difficulty in starting. To remedy this condition, remove the spark plug and pour about a fluid ounce of crankcase oil through the spark plug hole. Turn the engine over several times with the rope starter to distribute the oil over the cylinder wall. Assemble spark plug and compression should be satisfactory.

HIGH TEMPERATURE SAFETY SWITCH

The high temperature safety switch is an accessory mounted to the cylinder head bolt at the take-off end and toward the fuel tank side. This safety switch will automatically stop the engine whenever cylinder head temperatures become critically high.

The switch is set by the manufacturer to operate at a predetermined temperature and consequently should not be tampered with. If an extreme cylinder head temperature causes the switch to automatically short out the magneto or timer and stop the engine, a waiting period of about **10 minutes** will be required before the switch has cooled off sufficiently to allow the engine to be re-started. An overheated engine will score the cylinder walls, burn out connecting rod and crankshaft bearings, also warp piston and valves. The cause of the overheating condition will have to be remedied before the engine is re-started.

CLUTCH AND REDUCTION GEARS

CLUTCH TAKE-OFF (Fig. 20)

The clutch in the take-off assembly, that can be furnished with this model of engine, is of the multiple disc type running in oil. Use the same grade of oil in the clutch housing as is used in the crankcase. The oil should be filled to the height of the oil level plug in the clutch housing. Fill through the inspection plate opening; about **1 pint** of oil is required.

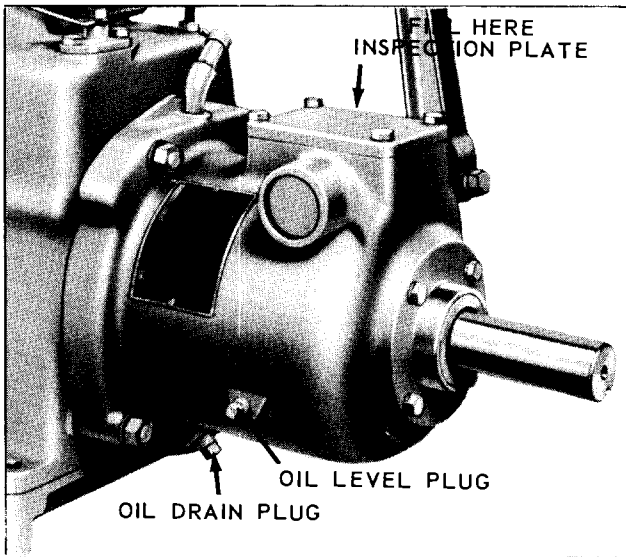


Fig. 20

140451C-1

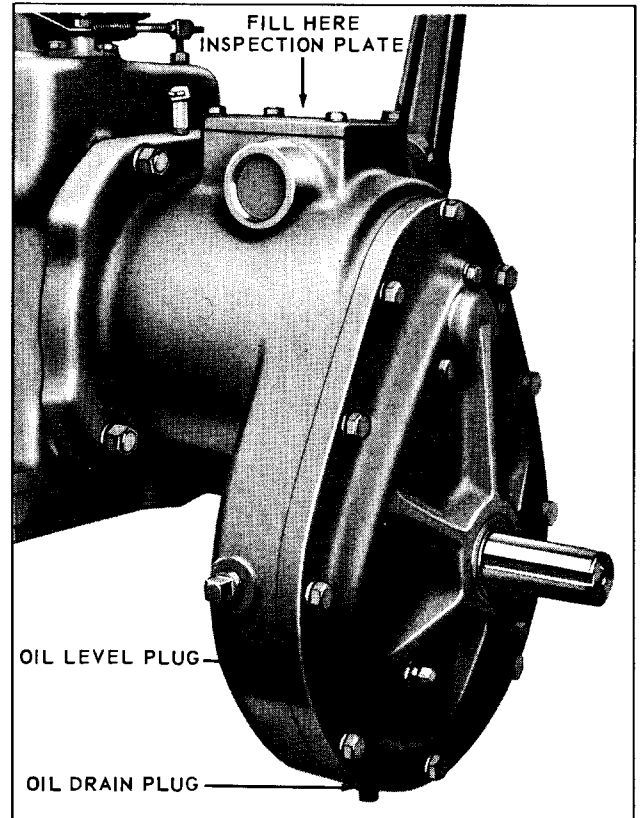


Fig. 22

140457C-1

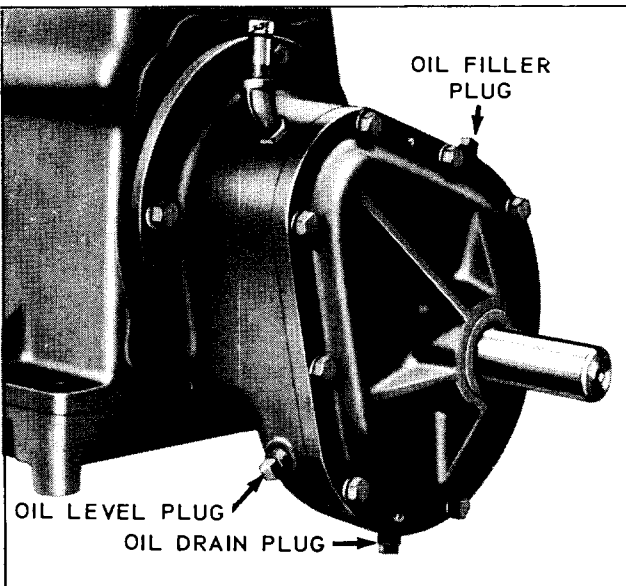


Fig. 21

140449C-1

REDUCTION GEARS (Fig. 21 and Fig. 22)

Reduction gears are furnished in several different ratios, some with spur gears, others with chains. All are of the same general design, except that some are furnished with clutches, others without.

Use same grade oil as used in engine crankcase.

For different installations these gears are assembled to the engines in various positions. Several plugs are furnished on these reduction gears so that the lubrication may be properly taken care of regardless of the position of installation. For instance, there will always be one plug on top to be used for filling oil. There will always be one plug below for draining oil, and there will be one plug on the side, slightly above the bottom, to be used as an oil level plug. The oil should always be filled when the engine is at rest. When the oil becomes dirty it should be drained while the engine is hot, and fresh oil added. The frequency at which these oil changes should be made depends entirely on the kind of service in which these gears are used, but even with light service;

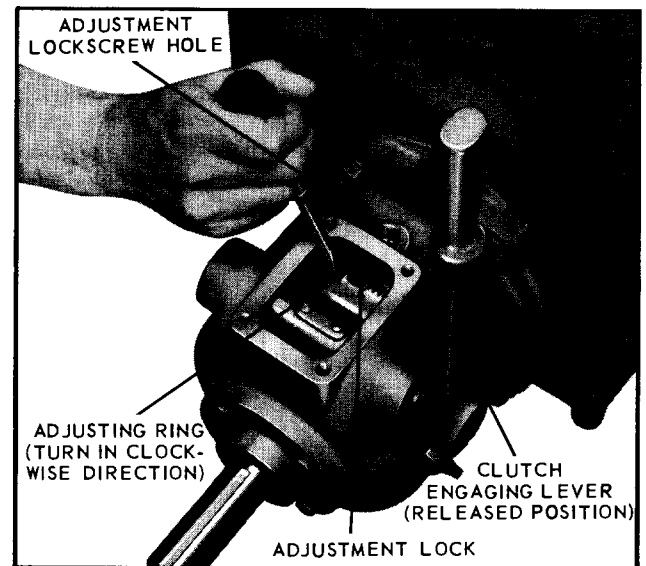


Fig. 23

244949C

Change oil at least every 500 hours of operation.

Add sufficient oil between changes to keep oil up to the oil level plug. The oil capacity for the *reduction unit* shown in Fig. 21 is $2/3$ pint, and for the *clutch reduction unit*, Fig. 22, 1 pint.

CLUTCH ADJUSTMENT (Fig. 23)

If the clutch begins to slip, it should be readjusted to prevent it from becoming overheated and damaged. The clutch in the *clutch take-off* and *clutch reduction units* is adjusted by first removing the clutch inspection plate which will expose the notched *adjusting ring*. Release the *clutch*, by pushing the *engaging lever* forward.

Turn engine over by means of the rope starter sheave, until the clutch *adjustment lock* is visible thru the inspection opening of the housing. Loosen *adjustment lock screw*, one full turn. On *take-off units*, the lock-screw is accessible thru the pipe plug hole behind the inspection opening.

Keep the clutch from turning by holding the rope starter sheave firmly in place with the left hand. Then, by means of a screw driver, turn the *adjusting ring* one notch at a time in a clockwise direction, until a definite pressure is felt on the clutch lever when the clutch is being engaged. Securely tighten adjustment lock screw. Assemble inspection plate, being sure that the gasket fits properly and is not broken.

INSTRUCTIONS FOR PROTECTING ENGINES FOR WINTER OR SHORT STORAGE PERIODS

When the work interval is completed, the following instructions should be carried out very carefully to protect the engine from the weather.

The outside of the engine, including the cooling fins on the cylinders and heads, should be thoroughly cleaned of all dirt and other deposits.

The air cleaner at the carburetor intake should be thoroughly cleaned of all oil and accumulated dust, and the sediment removed from the oil cup at the bottom of the cleaner.

To protect the cylinder, piston, rings and valves and keep them from rusting and sticking, a half and half mixture of kerosene and good engine oil, (the same kind of oil as used in the crankcase of the engine), should be injected into the pipe tap opening on the intake manifold while the engine is warm and running at moderate speed. About a quarter of a pint is necessary, or enough so that a heavy bluish smoke will appear at the exhaust. The ignition switch should then be shut off and the engine stopped. This fogging operation will give a coating of oil on the above mentioned parts, protecting them from the atmosphere. After the engine has stopped, disconnect the spark plug cable and turn engine over slowly thru the compression stroke until the flywheel key or take-off shaft keyway is up, or in the 12 o'clock position. Both valves will be closed and the piston will be on top in the cylinder bore, with the crankshaft in the described position. This will minimize rusting of the cylinder bore and help in retaining the oil fog previously injected into the engine.

All old used oil should be drained from the crankcase while the engine is warm, as the oil will then flow more freely than when cold.

Drain fuel system, including gasoline lines, carburetor, fuel pump and tank of all gasoline, to prevent lead and gum sediment interfering with future operation. Gasoline fumes from gradual evaporation is a dangerous *fire hazard*.

The air cleaner or carburetor intake, as well as the exhaust manifold opening, should be taped or other-

wise sealed off, for the duration of the storage period.

All exposed unpainted metal parts should be coated with grease or heavy oil.

Before starting the engine, after the storage period, remove crankcase drain plug so that any condensation which may have collected may be drained, before new crankcase oil is added. It is highly recommended that the engine base be removed, and scrubbed of all sediment which may have collected there. When reassembling the base, a new gasket should be used.

Be sure to fill crankcase with the correct grade of oil to the level of the filler plug hole. Do not use any oil heavier than SAE No. 30. Also be sure to put oil to the proper level in the air cleaner. (Refer to Lubrication and Air Cleaner.)

It is advisable to use a new spark plug at the beginning of the operating interval, especially if the engine has given considerable service.

Refuel engine and follow the starting instructions as shown on preceding pages of this manual.

It is suggested that machines be stored inside a building. If this is not possible, the engine should be protected from the weather by a proper covering.

TROUBLES CAUSES AND REMEDIES

Three prime requisites are essential to starting and maintaining satisfactory operation of gasoline engines. They are:

1. *A proper fuel mixture* in the cylinder.
2. *Good compression* in the cylinder.
3. *Good spark, properly timed*, to ignite the mixture.

If all three of these conditions do not exist, the engine cannot be started. There are other factors which will contribute to hard starting; such as, too heavy a load for the engine to turn over at a low starting speed, a long exhaust pipe with high back pressure, etc. These conditions may affect the starting, but do not necessarily mean that the engine is improperly adjusted.

As a guide to locating any difficulties which might arise, the following causes are listed under the three headings: *Fuel Mixture, Compression, and Ignition*. In each case the causes of trouble are given in the order in which they are most apt to occur. In many cases the remedy is apparent, and in such cases no further remedies are suggested.

STARTING DIFFICULTIES

FUEL MIXTURE

No fuel in tank or fuel shut-off valve closed.

Fuel pump diaphragm worn out, so pump does not supply carburetor with fuel.

Carburetor not choked sufficiently, especially if engine is cold. See *'Starting Procedure'*, Page 8.

Water, dirt, or gum in gasoline interfering with free flow of fuel to carburetor.

Poor grade or stale gasoline that will not vaporize sufficiently to form the proper fuel mixture.

Carburetor flooded, caused by too much choking especially if engine is hot.

Needle valve on carburetor insufficiently opened. See *'Carburetor Adjustment'*, Page 9.

Dirt or gum holding float needle valve in carburetor open. This condition would be indicated if fuel continues to drip from carburetor with engine standing idle. Often tapping the float chamber of the carburetor very lightly with the wood handle of a screw driver or similar instrument will remedy this trouble. Do not strike carburetor with any metal tools, it may be damaged. If the mixture in the cylinder, due to flooding, is not too rich to start the engine, starting should be tried, as it will usually correct the trouble. In this case the choke should be left open.

If, due to flooding, too much fuel should have entered the cylinder in attempting to start the engine, the mixture will most likely be too rich to burn. In that case the spark plug should be removed from the cylinder and the engine then turned over several times with the starting sheave, so the rich mixture will be blown out through the spark plug hole. The choke on the carburetor should of course be left open during this procedure. The plug should be dried off, assembled, starting tried again.

To test for clogged fuel line, loosen fuel line nut at carburetor slightly. If line is open, fuel should drip out at loosened nut.

COMPRESSION

If the engine has proper compression, considerable resistance will be encountered in the pull on the starting sheave. If this resistance is not encountered, compression is faulty. Following are some reasons for poor compression:

Cylinder dry due to engine having been out of use for some time. See *'Restoring Compression'*, Page 14.

Loose spark plug or broken spark plug. In this case a hissing noise will be heard in cranking engine due to escaping gas mixture on compression stroke.

Damaged cylinder head gasket or loose cylinder head. This will likewise cause hissing noise on compression stroke.

Valve stuck open due to carbon or gum on valve stem. Remove tappet inspection plate and note if valves are moving up and down as engine is turned over by hand. A stuck valve will not follow down. To clean valve stems, see *'Valves'*, Page 22.

Valve tappets adjusted with insufficient clearance under valve stems. See *'Valve Tappets'*, Page 23.

Piston rings stuck in piston due to carbon accumu-

lation. If rings are stuck very tight this will necessitate removing piston and connecting rod assembly and cleaning parts. See *'Connecting Rod and Piston'*, Page 20.

Scored cylinder. This will require reboring of the cylinder and fitting with new piston and rings. If scored too severely an entirely new cylinder crankcase may be necessary.

IGNITION

See *'Magneto Ignition Spark'*, Page 11 or *'Battery Ignition Timing'*, Page 12. No spark may also be attributed to the following:

Ignition cable disconnected from magneto, timer, coil or spark plug.

Broken ignition cables, causing short circuits.

Ignition cable wet or oil soaked.

Spark plug insulator broken.

Spark plug wet or dirty.

Spark plug point gap wrong. See Page 14.

Condensation on spark plug electrodes.

Magneto or Timer breaker points pitted or fused.

Magneto or Timer breaker arm sticking.

Magneto or Timer condenser leaking or grounded.

Spark timing wrong. See *'Magneto Timing'*, Page 11, or *'Battery Ignition Timing'*, Page 12.

ENGINE MISSES

Spark plug gap incorrect. See Page 14.

Worn and leaking ignition cable.

Weak spark. See *'Magneto Ignition Spark'*, Page 11, or *'Battery Ignition Timing'*, Page 12.

Loose connections at ignition cable.

Magneto or Timer breaker points pitted or worn.

Water in gasoline.

Poor compression. See *'Compression'*, Page 17.

ENGINE SURGES OR GALLOPS

Carburetor flooding.

Governor spring hooked into wrong hole in lever, or governor rod incorrectly adjusted. See *'Governor Adjustment'*, Page 24.

ENGINE STOPS

Fuel tank empty.

Water, dirt or gum in gasoline.

Gasoline vaporized in fuel lines due to excessive heat around engine (Vapor Lock). See *'Stopping Engine'*, Page 10.

Vapor lock in fuel lines or carburetor due to using winter gas (too volatile) in hot weather.

Air vent hole in fuel tank cap plugged. Engine scored or stuck due to lack of oil.

Ignition troubles. See 'Ignition', Page 17.

ENGINE OVERHEATS

Crankcase oil supply low. Replenish immediately.

Ignition spark timed wrong. See 'Magneto Timing', Page 11, or 'Battery Ignition Timing', Page 12.

Low grade of gasoline.

Engine overloaded.

Restricted cooling air circulation.

Part of air shroud removed from engine.

Dirt between cooling fins on cylinder and head.

Engine operated in confined space where cooling air is continually recirculated, consequently becoming too hot.

Carbon in engine.

Dirty or incorrect grade of crankcase oil.

Restricted exhaust.

Engine operated while detonating due to low octane gasoline or heavy load at low speed.

ENGINE KNOCKS

Poor grade of gasoline or of low octane rating. See 'Fuel', Page 8.

Engine operating under heavy load at low speed.

Carbon or lead deposits in cylinder head.

Spark advanced too far. See 'Magneto Timing', Page 11, or 'Battery Ignition Timing', Page 12.

Loose or burnt out connecting rod bearing.

Engine overheated due to causes under previous heading.

Worn or loose piston pin.

ENGINE BACKFIRES THROUGH CARBURETOR

Water or dirt in gasoline.

Engine cold.

Poor grade of gasoline.

Sticky inlet valve. See 'Valves', Page 22.

Overheated valves.

Spark plug too hot. See 'Spark Plug', Page 14.

Hot carbon particles in engine.

DISASSEMBLY AND REASSEMBLY OF ENGINE

Engine repairs should be made only by a mechanic who has had experience in such work. When disassembling the engine, it is advisable to have several boxes available so that parts belonging to certain groups can be kept together. Capscrews of various lengths are used in the engine, therefore great care must be

exercised in reassembly so the right screw will be used in the proper place.

Tighten the cap screws and nuts of the manifold, cylinder head, engine base, connecting rod, main bearing plate and the spark plug to the specified torque readings indicated in the paragraphs of reassembly, relative to these parts.

While the engine is partly or fully dismantled, all of the parts should be thoroughly cleaned. Use *all new gaskets* in reassembly and lubricate all bearing surfaces.

The following procedure is for complete disassembly of an engine. As disassembly progresses, the order may be altered somewhat, as will be self-evident to the mechanic. Reassembly of the engine should be made in the reverse order.

TESTING OF REBUILT ENGINE

An engine that has been completely overhauled, such as having the cylinder rebored and fitted with new piston, rings and valves, should go through a thorough "run-in" period before any load is applied to the engine.

The engine should be started and allowed to run for about one-half hour, at about 1200 to 1400 R.P.M. without load. The R.P.M. should then be increased to engine operating speed, still without load, for an additional three and one-half to four hours.

The proper "running-in" of the engine will help to establish polished bearing surfaces and proper clearances between the various operating parts and thus add years of trouble free service to the life of the engine.

ACCESSORIES

On engines furnished with clutch or reduction units, these should be removed first if the engine is to be completely overhauled. Also remove muffler, spark plug cable and electrical equipment.

FUEL TANK (Fig. 24)

Disconnect fuel line at fuel strainer. Remove capscrews mounting the fuel tank bracket to the crankcase and cylinder head. The *tank* and *bracket* assembly can be removed as a unit.

Cylinder head cover can also be removed at this time.

ROPE STARTER SHEAVE (Fig. 25)

The rope starter sheave can be loosened by a sharp blow against the handle of a wrench, fitted to the hexagon hub of the sheave, in a counter-clockwise direction. Remove *sheave* as shown in *Fig. 25*.

FLYWHEEL (Fig. 26)

Remove air intake screen by taking out the four screws which mount the screen to the shroud.

The flywheel is mounted to a taper on the crankshaft. Take a firm hold on the flywheel fins, pull outward

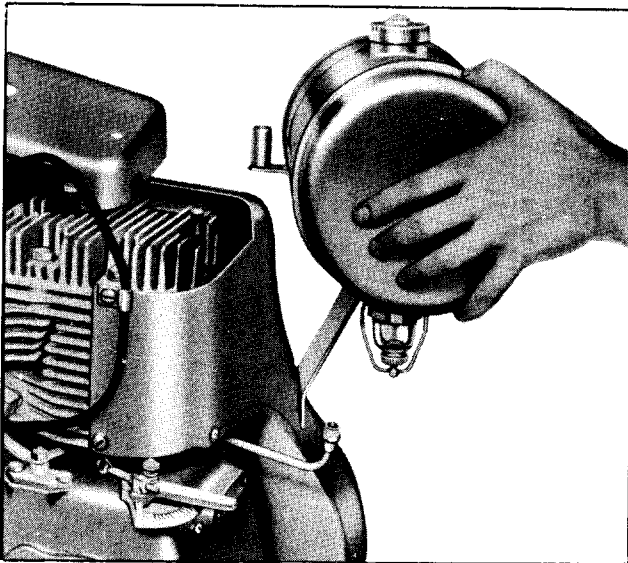


Fig. 24

140436C-1

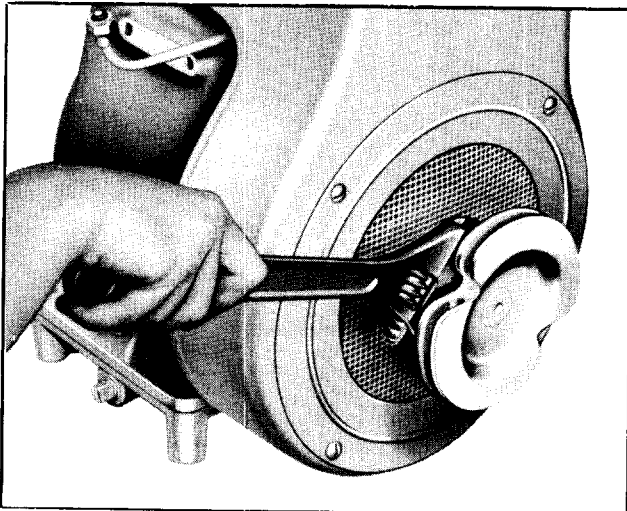


Fig. 25

140445C-1

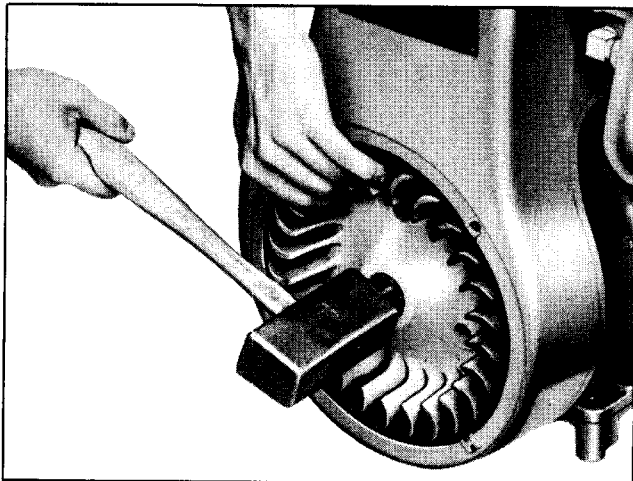


Fig. 26

140448C-1

and at the same time strike the end of the crankshaft several times with a babbitt hammer. The flywheel will slide off the taper of the crankshaft. Do not use a hard hammer as it may ruin the crankshaft and bearings. Remove Woodruff key from crankshaft.

In reassembly; be sure the Woodruff key is in position on the shaft and that the keyway in the flywheel is

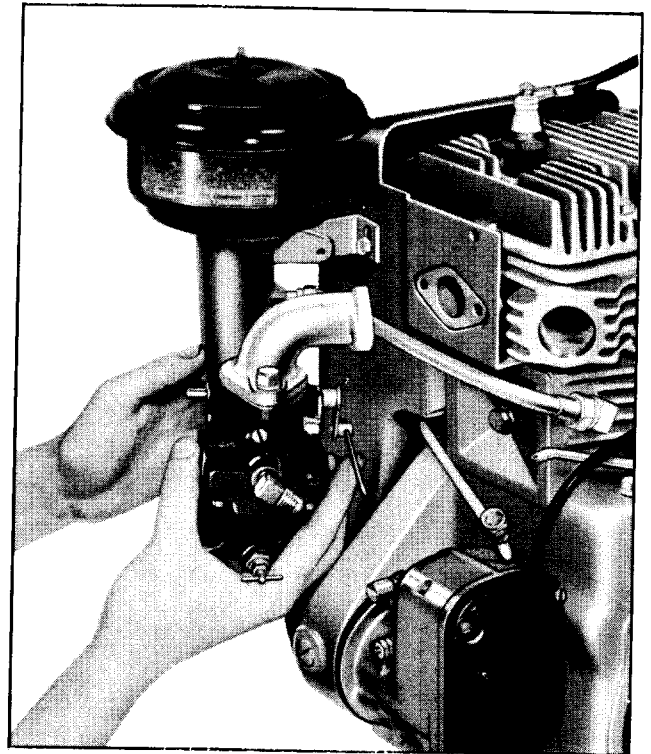


Fig. 27

140455C-1

lined up accurately with the key. After mounting; seat flywheel on crankshaft taper by slipping a piece of pipe over the end of the crankshaft and against the hub of the flywheel, and striking the end of the pipe a sharp blow with the hammer.

CARBURETOR AND AIR CLEANER (Fig. 27)

Loosen the fuel line at the carburetor and breather line at the cylinder. Then, remove the cotter pin from the governor control rod and pull the rod out of the governor lever. Loosen and remove the capscrew and lockwasher which holds the air cleaner bracket to the engine and the two capscrews and lockwashers which clamp the manifold to the cylinder. The entire assembly of the *manifold, carburetor* and *air cleaner* can then be removed as illustrated.

In reassembly; tighten the screws for mounting the manifold to **9 foot pounds torque**.

AIR SHROUD (Fig. 28)

Take out the four screws which mount the air shroud to the cylinder and cylinder head. Remove the two lower screws that fasten the shroud to lugs on the crankcase and take off the *air shroud* as shown.

CYLINDER HEAD

The cylinder head must be removed if it is necessary to regrind valves, or to work on the piston, rings or connecting rod. All of the cylinder head screws are plainly in view and can be easily removed.

Before reassembling the cylinder head, all carbon and lead deposits should be removed. It is recommended that a new cylinder head gasket be used in reassembly as the old gasket will be compressed and hard so that it may not seal properly. Use a mixture of

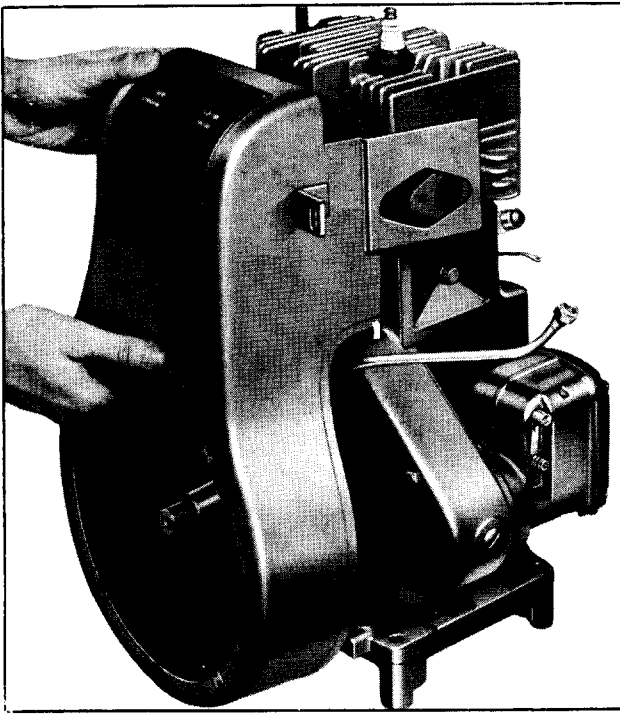


Fig. 28 140440C-1

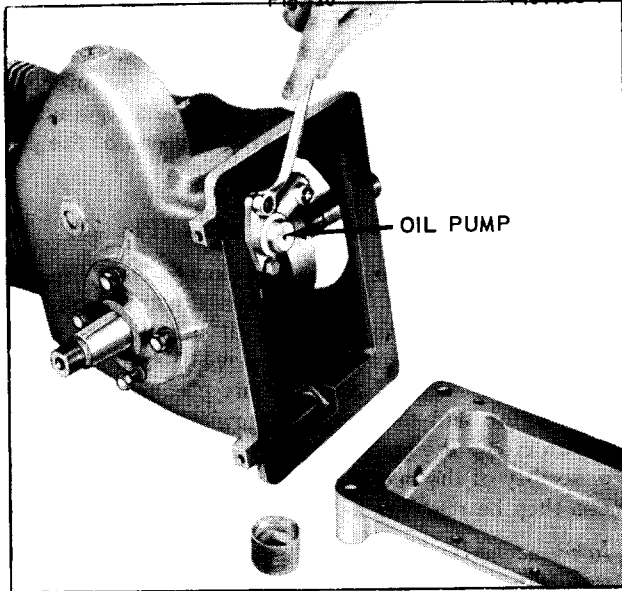


Fig. 29 140437C-1

graphite and oil on the cylinder head screws to prevent them from rusting tight in the block. **Torque** cylinder head screws to **32 foot pounds**.

ENGINE BASE and OIL PUMP (Fig's. 29 and 30)

Magneto can be removed at this time to prevent it from becoming damaged while removing engine base.

Be sure oil is drained from base – place engine on its side and remove the twelve base to crankcase capscrews and washers. **In reassembly**, use a new base gasket – tighten capscrews **7 to 9 foot pounds torque**.

Dismantle the oil pump by taking out the two capscrews which hold it to the crankcase. All parts of the pump should be thoroughly washed in solvent to remove all traces of thickened oil and sludge.

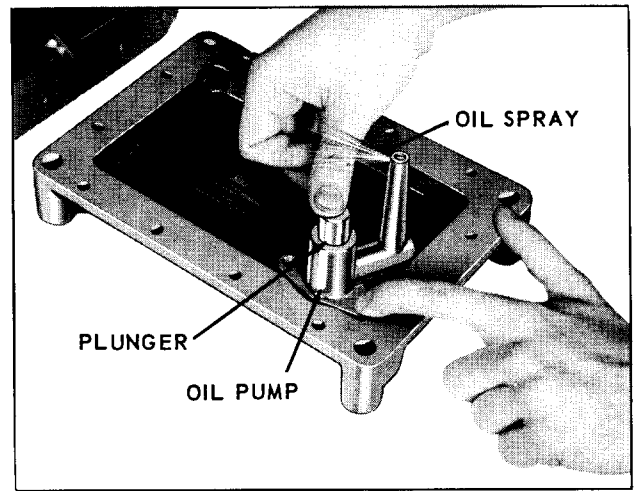


Fig. 30 140435C-2

The oil pump plunger is fitted to the bore with a clearance of **.003 to .005 inch**. If the clearance is greater than **.008 inch**, the plunger and oil pump body should be replaced. Inspect the check ball seat in the bottom of the pump cylinder. This seat must be perfectly clean, and must not be worn or pitted. The check ball should be dropped into the cylinder and tapped into the seat lightly. Insert retainer spring and plunger into bore.

Before assembling oil pump to crankcase, fill base partially with engine oil and test the operation of the pump by working the plunger up and down as shown in *Fig. 30*.

In reassembly; be sure push rod makes contact with plunger and the strainer screen is in good condition and properly mounted. See oil pump in *Fig. 32*.

CONNECTING ROD and PISTON(Fig's. 31, 32, 33, 34)

After removal of engine base and oil pump, the connecting rod will be accessible. By means of a **1/2"** socket wrench, loosen and remove hex locknuts from the rod bolts. Then, by tapping the ends of the bolts lightly, the connecting rod cap will break free from the bolts.

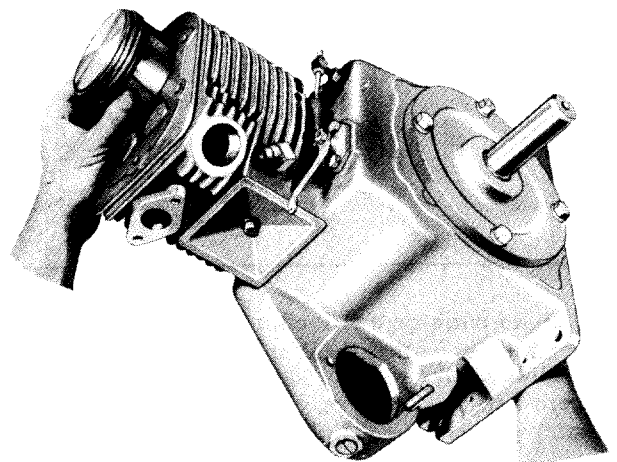


Fig. 31 140444C-1

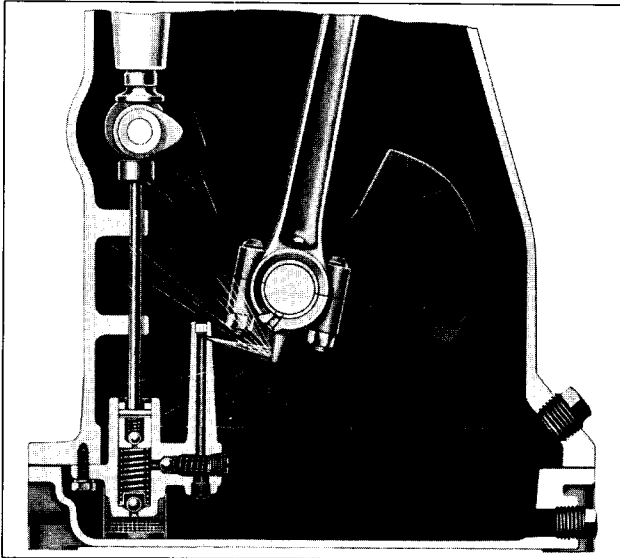


Fig. 32 141162C-1

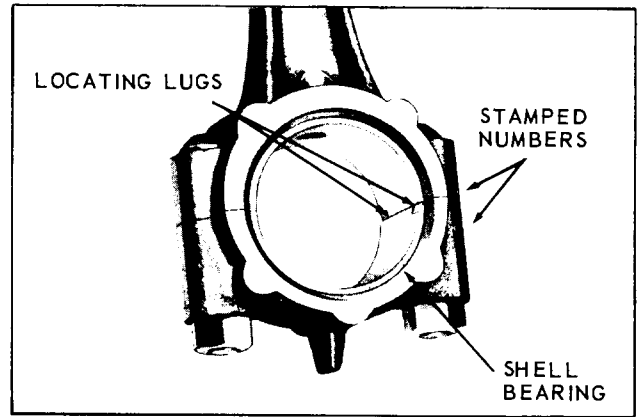


Fig. 34 316307C

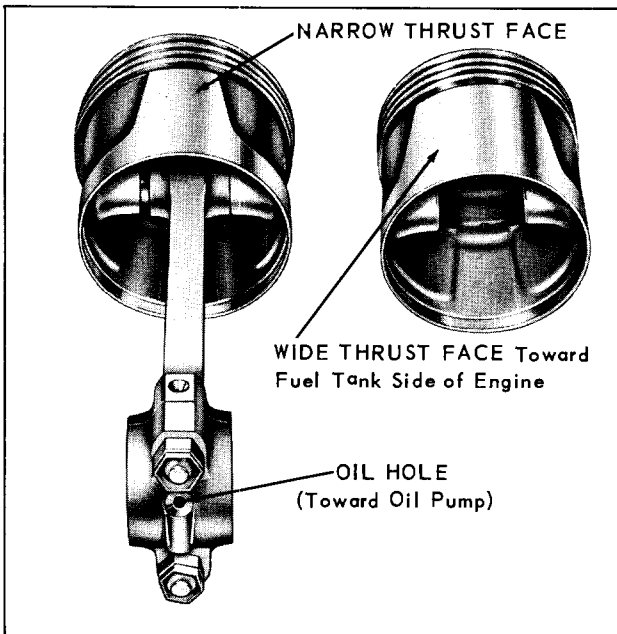


Fig. 33 287047C

Scrape off all carbon deposits that might interfere with removal of pistons from upper end of cylinder. Turn crankshaft until piston is at top, then push connecting rod and piston assembly upward and out thru top of cylinder, *Fig. 31*. Be careful not to mar the crank pin by allowing the rod bolts to strike or scrape across it.

NOTE: This model of engine was originally furnished with *babbitt cast* connecting rod bearings. *Shell bearing* rods are now being used for current production engines, and are interchangeable with babbitt bearing rods for service replacement. Care should be taken *in reassembly* to mount bearings properly. The cap should be assembled to the rod so that the *locating lug* of both bearing halves are on the same side as illustrated in *Fig. 34*. Refer to chart, *Fig. 37*, for clearance between bearing and crank pin.

Cam ground piston is mounted to the connecting rod with the *wide thrust face*, *Fig. 33*, *opposite oil hole*

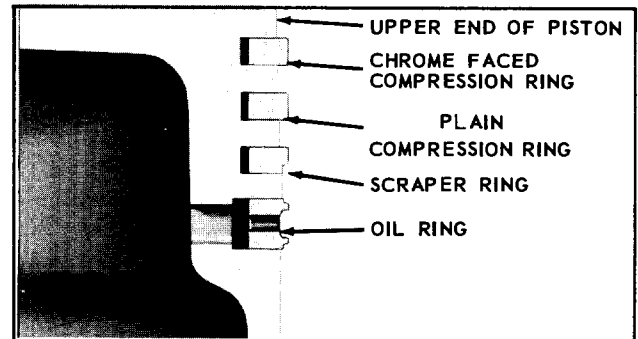


Fig. 35 92200C-1B

in rod cap. When assembling to engine, the wide section of the piston skirt is *toward the maximum thrust side*, which is the fuel tank side of engine.

The AENL engine was originally designed with a *split-skirt* piston, which has since been replaced by a *cam-ground* piston. When reassembling the *split-skirt* piston, the split should be toward the manifold side of the engine. Clearance between the piston and cylinder must be measured in the center of the thrust face at the bottom of the piston skirt. Refer to Chart, *Fig. 37* for proper skirt clearance for both *split-skirt* and *cam-ground* pistons.

In reassembly; use a suitable ring compressor and stagger the piston ring gaps 90° apart around the piston. Oil the piston rings, wrist pin, rod bearings and cylinder walls before assembly.

CAUTION: Identical numbers are stamped on the side of the rod with its corresponding cap. These numbers must be on the same side of the connecting rod when mounted in engine. Be sure that *oil hole* in connecting rod cap is facing *toward oil pump* spray, as illustrated in *Fig. 32*. *Install new nuts* on connecting rod bolts and *torque 18 to 20 foot pounds*.

PISTON RINGS (Fig. 35)

If an expander tool is not available, install rings by placing the open end of the ring on piston first. Spread ring only far enough to slip over piston and into correct groove, being careful not to distort ring. The outer diameter of the top compression ring is *chrome plated*. Assemble bottom ring first and work upward, installing top ring last. Mount scraper ring with

scraper edge down, otherwise oil pumping and excessive oil consumption will result. Refer to Fig. 35 for correct placement of rings.

CYLINDER

If cylinder is scored or worn more than .005 inch over standard size, it should be reground and fitted with oversize piston and rings. This work should be done at a Wisconsin engine service center.

If in the opinion of the service center a chrome re-ring is necessary, use *Wisconsin TriCrome* piston ring set indicated in parts list section.

VALVES and SEAT INSERTS (Fig. 38)

Remove valve tappet inspection plate and compress valve springs with a standard automotive type valve lifter as illustrated. Remove retainer locks and take out valves from top of cylinder block. Clean out carbon and gum deposits from the valves, seats, ports and guides. Replace valves that are badly burned, pitted or warped.

Valve grinding should be done by an authorized Wisconsin service center that has the experience and equipment to do a precision job. *Before grinding valves*, inspect valve guides for possible replacement. Refer to *Valve Guide* paragraph. The *valve face* is ground at 45° to the vertical center line of the valve stem and the *valve seat insert* should also be ground at a 45° angle. *After grinding*, lap valves in place until a uniform ring will show entirely around the face of the valve. Clean valves, and wash block thoroughly with a hot solution of soap and water. Wipe cylinder

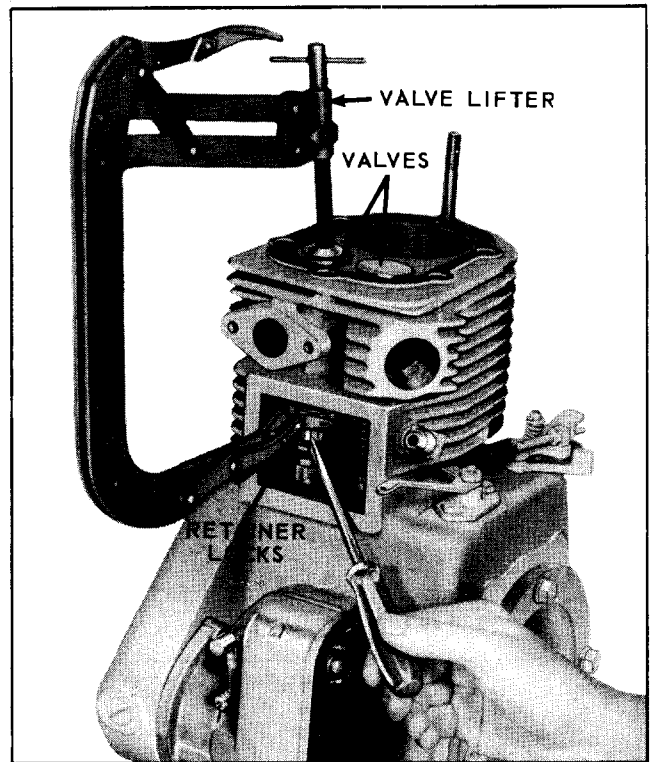


Fig. 38

140442C-1

walls with clean lint free rags and light engine oil, especially if cylinders were rebored and honed.

Long life exhaust valve and seat insert are furnished on engine model *AENLD*. This model is also equipped with a *positive* type exhaust *valve rotator*.

Valve guides in the cylinder block are replaceable. The valve stem has a clearance of .003 to .005" in the guide. When the clearance becomes .007", the guide should be driven out and a new guide pressed in place. Use Wisconsin Motor *DF-72* driver.

The inlet and exhaust *seat inserts* can be removed, when replacement becomes necessary, by means of Wisconsin Motor *DF-66-A* insert puller.

CYLINDER BORE		3.0005 to 2.9995
PISTON TO CYLINDER AT PISTON SKIRT (THRUST FACE)	CAM-GROUND	SPLIT-SKIRT
	.003 to .0035"	.0045 to .005"
PISTON RING GAP		.010 to .022"
PISTON RING SIDE CLEARANCE IN GROOVES	TOP RING	.002 to .0035"
	2nd, 3rd RING	.001 to .0025"
	OIL RING	.0025 to .004"
PISTON PIN TO CONNECTING ROD BUSHING		.0005 to .0011"
PISTON PIN TO PISTON		.0000 to .0008" tight
CONNECTING ROD TO CRANK PIN - SIDE CLEARANCE		.009 to .018"
CONNECTING ROD SHELL BEARING TO CRANK PIN DIA. (VERTICAL)		.0011 to .0030"
CONNECTING ROD BABBITT BEARING TO CRANK PIN		.0007 to .0020"
<p>Standard Crank Pin Dimensions</p>		

Fig. 37 PISTON, RING AND ROD CLEARANCES CHART

CRANKSHAFT and GEAR TRAIN (Fig's. 39, 40)

To remove the crankshaft, first remove the four cap-screws in main bearing plate. The plate can then be pried off, as illustrated in Fig. 39, and crankshaft removed from that end of crankcase. *In reassembly*; use same quantity and thickness of bearing plate gaskets as were removed, since these are necessary to provide proper end play for the tapered roller crankshaft bearings. *End play* should be .001 to .003 inch when engine is *cold*. There is practically no wear in these tapered roller bearings so that readjustment is seldom necessary when properly assembled.

Gear train, illustrated in Fig. 40, shows the *timing marks* on both the crankshaft and camshaft gears. Proper matching of the timing marks is necessary for correct valve timing and smooth engine operation.

In reassembly; mount main bearing plate correctly. The word 'TOP', cast on the outside of the plate,

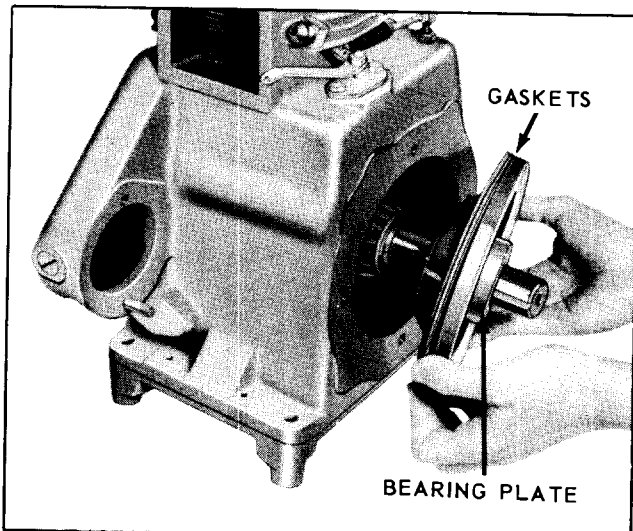


Fig. 39 140458C-1

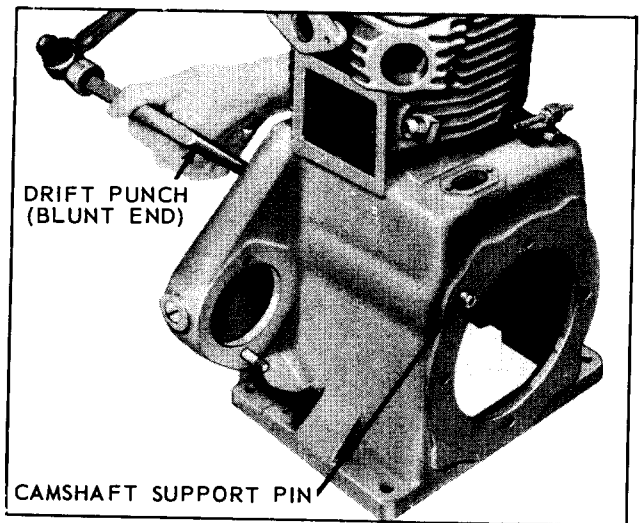


Fig. 41 140453C-1

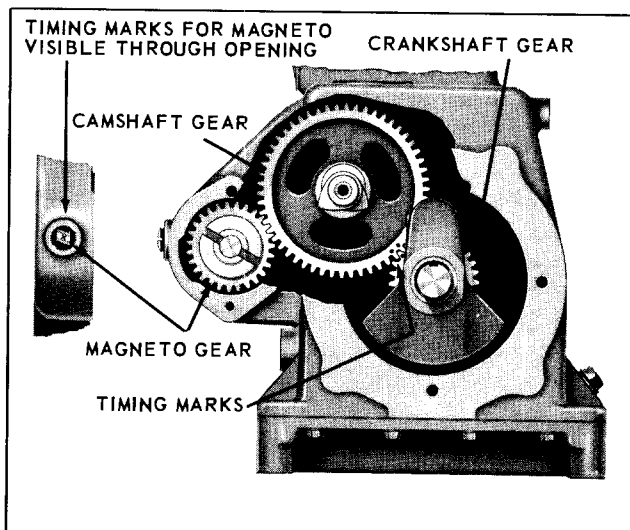


Fig. 40 141160C

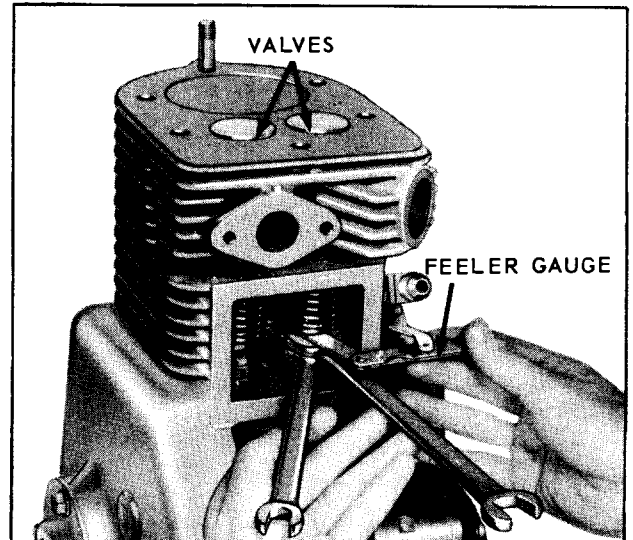


Fig. 42 140446C-1

specifies the proper mounting position. An inverted mounting would prevent the main bearing from being properly lubricated. Tighten main bearing plate cap screws, 20 to 22 foot pounds torque.

CAMSHAFT (Fig. 41)

The camshaft rotates on a stationary pin in the crankcase and can be taken out after the crankshaft is removed. Pry out expansion plug from crankcase and *drive camshaft pin from flywheel end* out through opposite end of crankcase, *Fig. 41*.

In reassembly; the camshaft support pin must be *driven* through the case *from the take-off end* of the engine, and after tappets are assembled. Use new expansion plugs in end holes.

VALVE TAPPET - ADJUSTMENT (Fig. 42)

The valve tappets are taken out after the camshaft is removed. In reassembly, the tappets must of course be inserted in proper position in crankcase, before the camshaft is assembled.

Tappet adjustment can be made immediately after assembling the valves, springs and locks. With the tappets in their lowest position and the *engine cold*, the clearance should be:

inlet - .008 inch

exhaust - .016 inch

GOVERNOR

The governor is assembled on to the camshaft. All wearing parts of governor are hardened so replacement is very seldom necessary.

In reassembly; the spacer is slipped on to the camshaft first. The flyweights are then separated far enough so that the thrust sleeve can be slipped between. By then sliding the thrust sleeve back, the flyweights will be closed down between the two flanges of the thrust sleeve. *See Fig. 43*.

GOVERNOR OPERATION

The function of the governor is as follows: The fly-

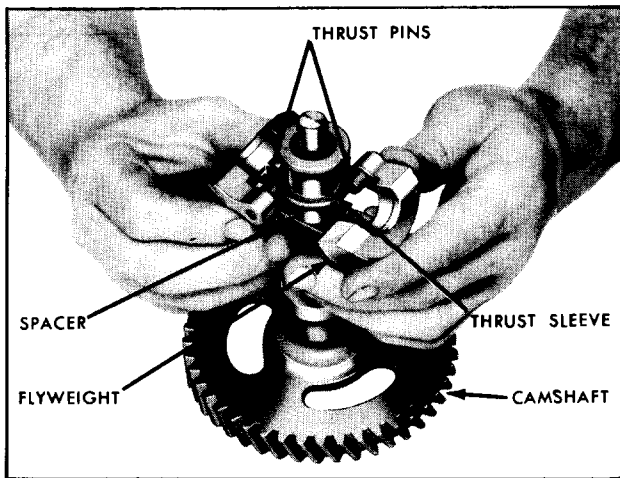


Fig. 43 79360C

weights are hinged to the end of the camshaft. Hardened pins on the flyweights bear against the flanged sliding sleeve, moving it back and forth as the flyweights move in or out. The motion of the sleeve is transmitted through a yoke connected to the governor lever, which in turn is connected to the carburetor throttle. A spring connected to the governor lever tends to hold the governor flyweights to their inner position, also to hold the carburetor throttle open. As the engine speed increases the centrifugal force in the flyweights acts against the spring and closes the throttle to a point where the engine speed will be maintained practically constant under varying load conditions. This speed can be varied to suit conditions by adjusting the governor spring tension.

GOVERNOR ADJUSTMENT

The governor rod connection to the carburetor must be very carefully adjusted for length, otherwise the governor will not function properly and may cause the engine to surge badly. Referring to Fig. 44, the governor rod should be moved as far as possible toward the carburetor, which will open the carburetor throttle wide. The governor lever should then be moved as far as possible in the same direction, all of this being done with the rod disconnected from the lever as shown. Holding both parts in the above position, the rod should be screwed in or out of the swivel block on the carburetor, until the bent end of the rod will exactly register with the hole in the lever. The rod should then be dropped into the lever and the cotter pin inserted to keep the rod in place.

The governor lever is furnished with 5 holes, as shown in Fig. 45, for attaching the governor spring. It is very important that the spring is hooked into the proper hole to suit the speed at which the engine is operated. The Governor Lever Chart shows the *full load* and *no load* speeds of the engine and the hole corresponding thereto. After the *governor spring* has been hooked into the proper hole, the spring tension must be applied by means of the *adjusting nuts*. More tension on the spring gives higher speeds and less tension, lower speeds. The *fixed speed control* and

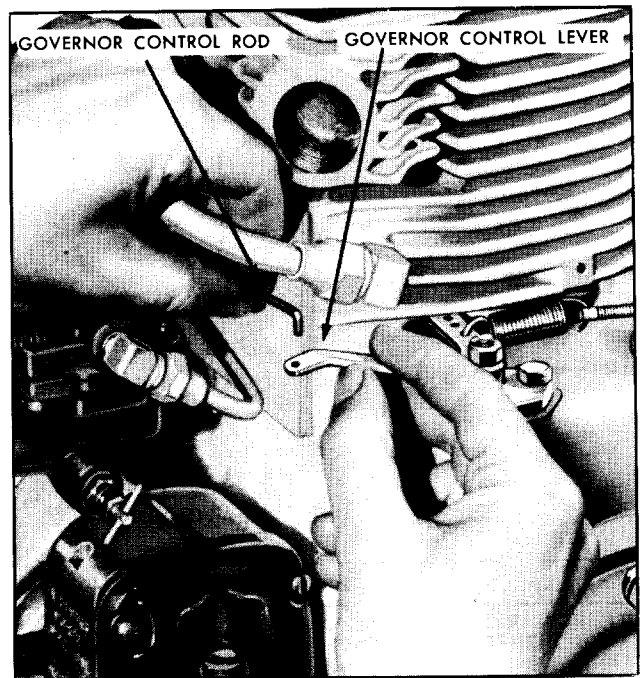


Fig. 44 141331C

the *variable speed control*, illustrated in Fig. 46, are both adjusted in the same manner.

A tachometer or revolution counter should be used against the crankshaft to check speed while adjusting the governor spring tension. The engine speed without load will vary, from 100 to 260 revolutions per minute higher than the speed with load. For instance, if the engine is to operate at 3000 R.P.M. under full

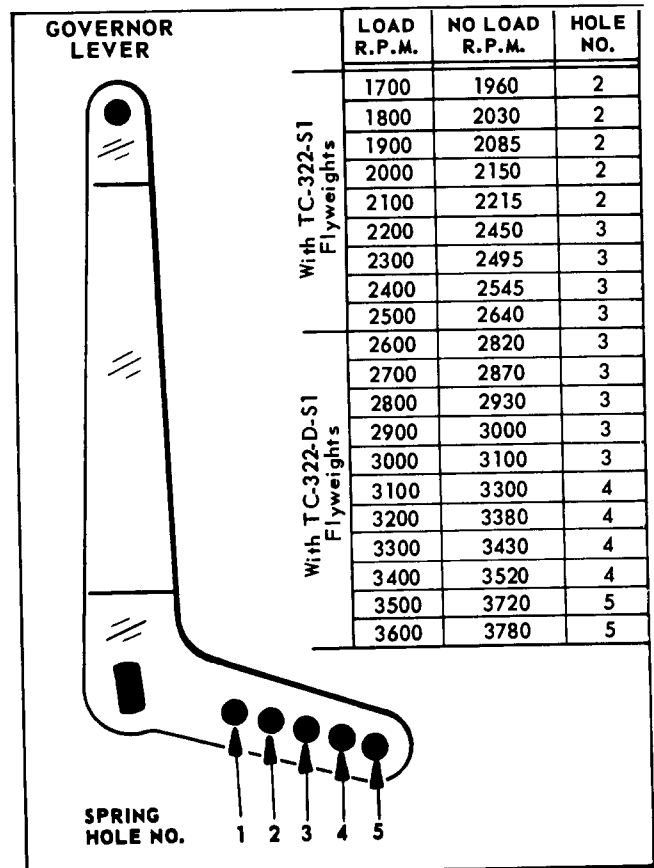


Fig. 45

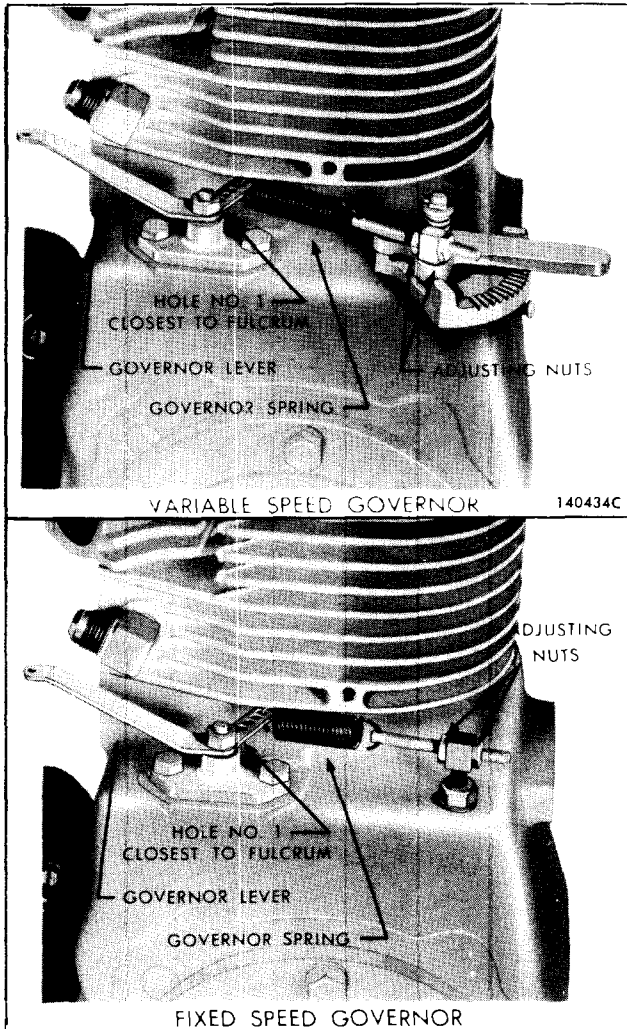


Fig. 46 140433C

load, the speed with no load will be 3100 R.P.M. and this should be kept in mind when adjusting the governor. Refer to the Governor Lever Chart, *Fig. 45*, for the exact variation between load speed and no load (high idle) speed.

REPAIR PARTS LIST

READ THESE INSTRUCTIONS BEFORE ORDERING PARTS

The **MODEL, SPECIFICATION and SERIAL NUMBERS** of your engine, shown on the name plate prominently located on the engine, **MUST BE GIVEN WHEN ORDERING PARTS.**

**COPY THE ABOVE SPECIFIED INFORMATION INTO THE SPACES PROVIDED BELOW
SO THAT IT WILL BE AVAILABLE TO YOU WHEN ORDERING PARTS.**

MODEL	<input type="text"/>	SERIAL NO.	<input type="text"/>
SIZE	<input type="text"/>	R.P.M.	<input type="text"/>
		SPEC. NO.	<input type="text"/>



**TO INSURE PROMPT AND ACCURATE SERVICE, THE FOLLOWING
INFORMATION MUST ALSO BE GIVEN.**

1. State exactly, quantity of each part and part number.
2. State definitely, whether parts are to be shipped by express, freight or parcel post.
3. State exact mailing address.

SERVICE FACILITIES

Wisconsin Engine Distributors and Service Centers, located throughout the U.S. and foreign countries, have been carefully selected in order to assure complete and efficient repairs and inspection service to owners of Wisconsin Engines. These service centers, equipped and staffed for complete engine repair, also stock parts to facilitate immediate delivery for all Wisconsin Air Cooled Engine Models. Order parts from the Wisconsin Distributor or Service Center in your locality.

PARTS LIST FOR MODEL AENL ENGINE

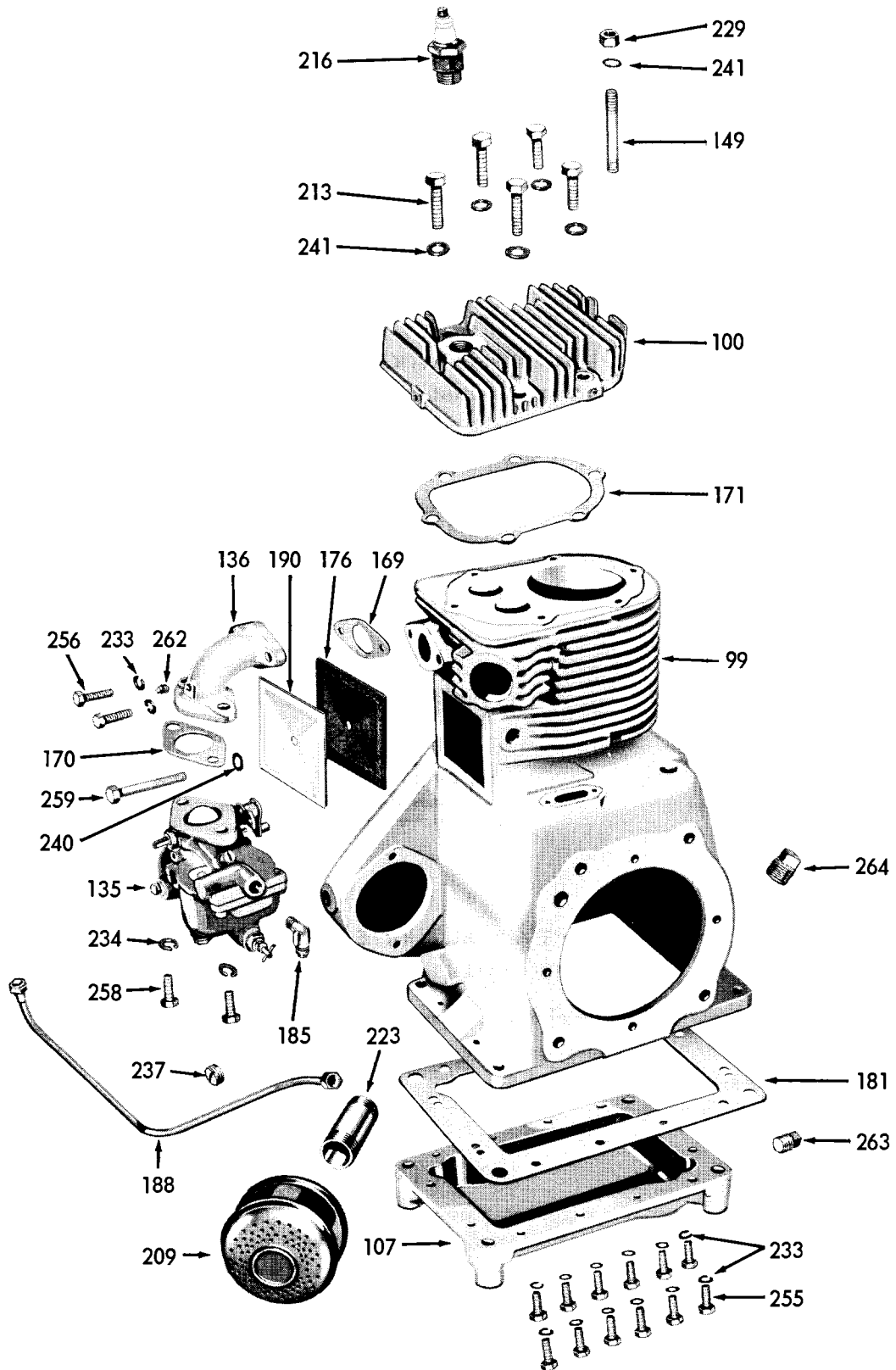


Fig. 45, CRANKCASE, BASE, HEAD AND CARBURETOR GROUP

Parts are identified by reference number. See parts list for correct part number.

141166C-2

PARTS LIST FOR MODEL AENL ENGINE

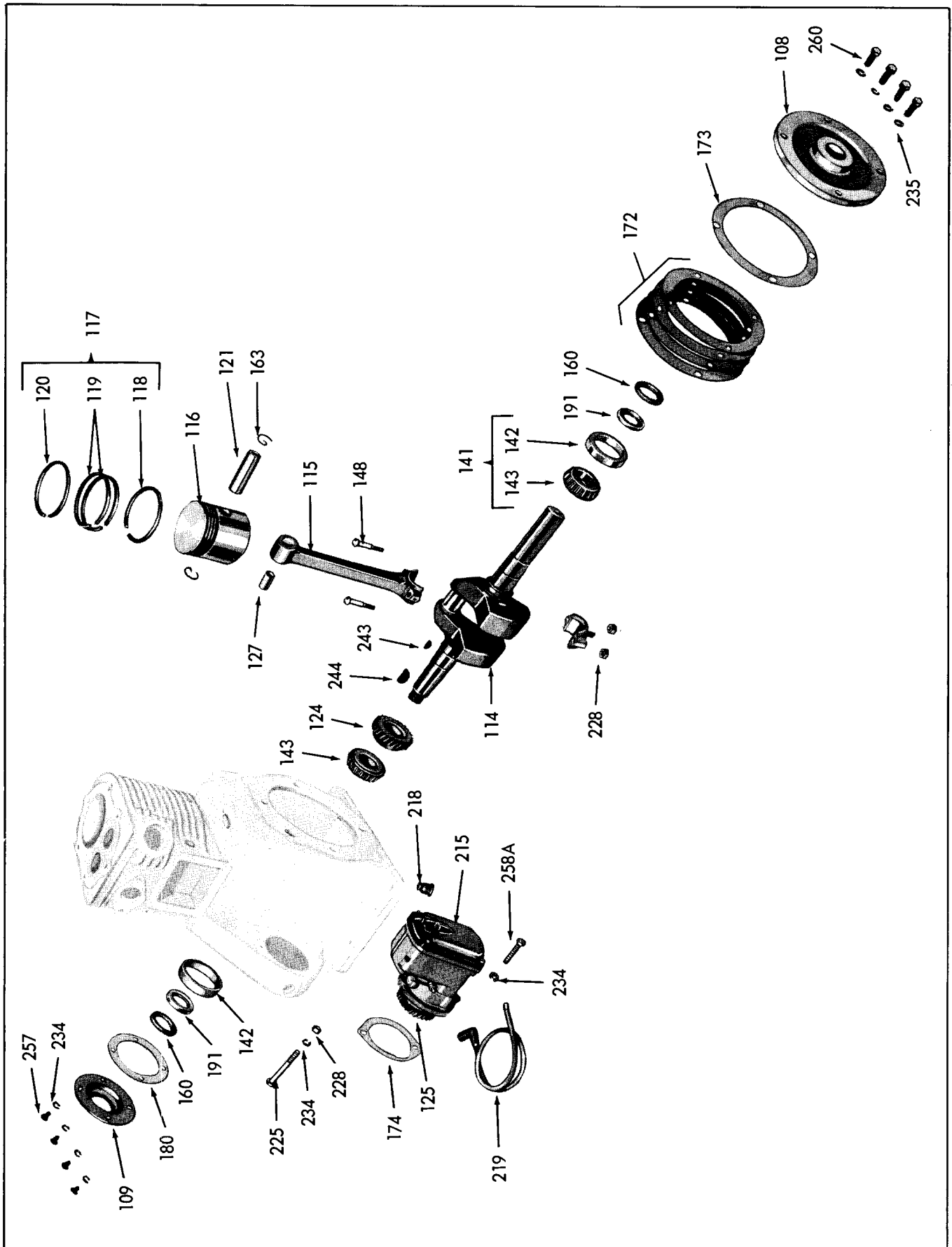


Fig. 46, BEARING PLATE, CRANKSHAFT, PISTON AND CONNECTING ROD GROUP

Parts are identified by reference number. See parts list for correct part number.

141163C-2

PARTS LIST FOR MODEL AENL ENGINE

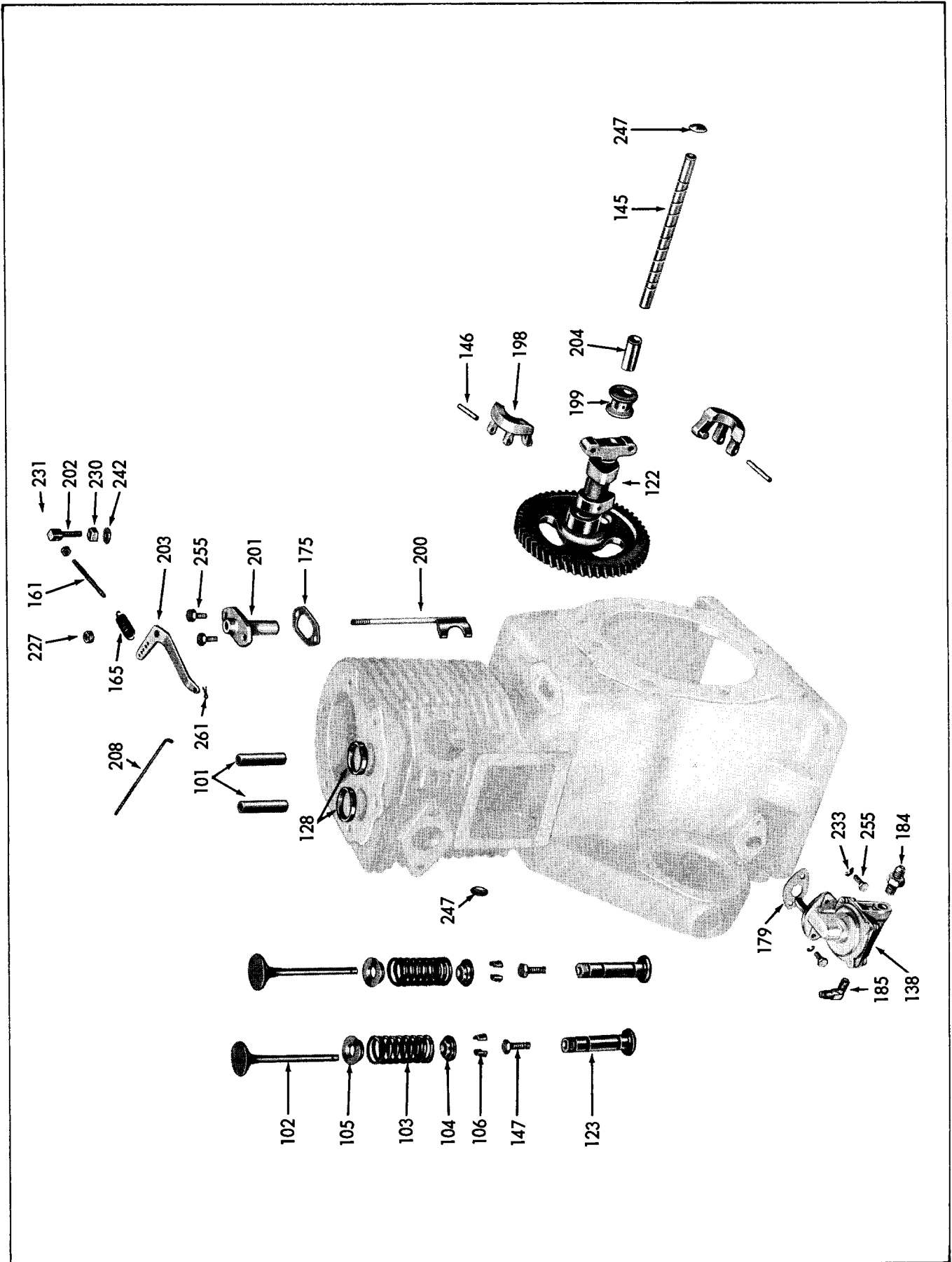


Fig. 47, VALVES, GOVERNOR, FUEL PUMP AND CAMSHAFT GROUP
 Parts are identified by reference number. See parts list for correct part numbers.

141161C-4

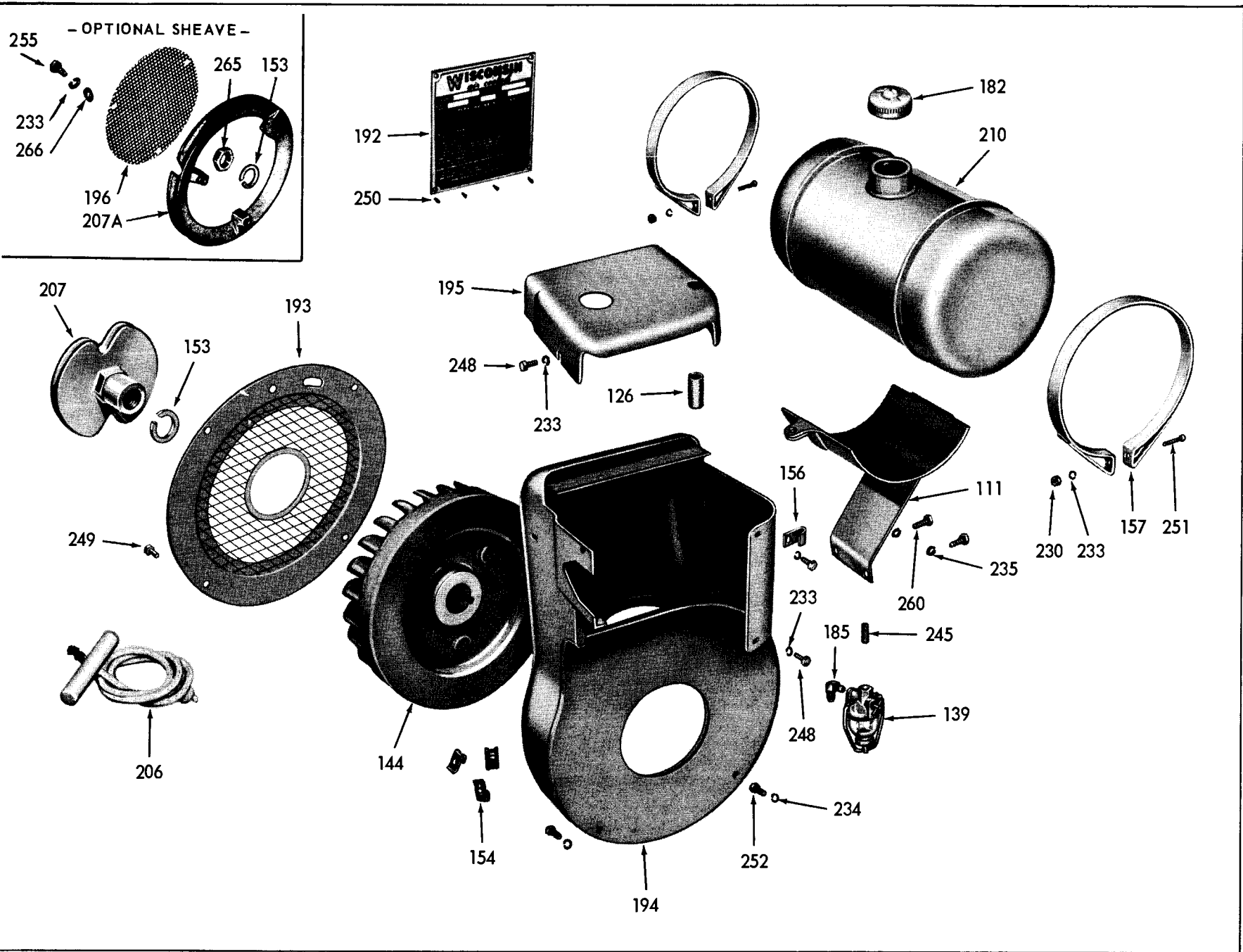
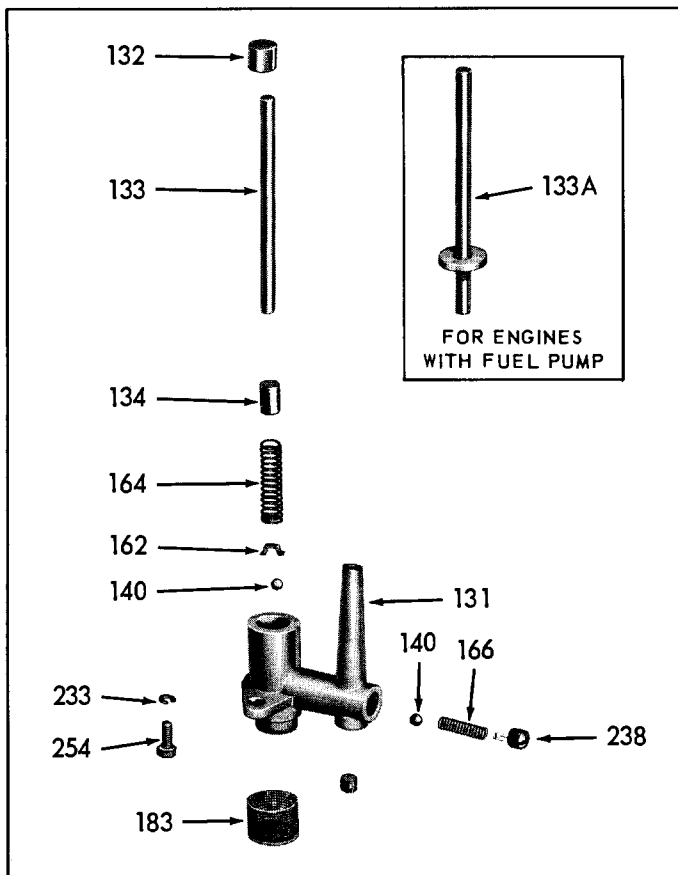


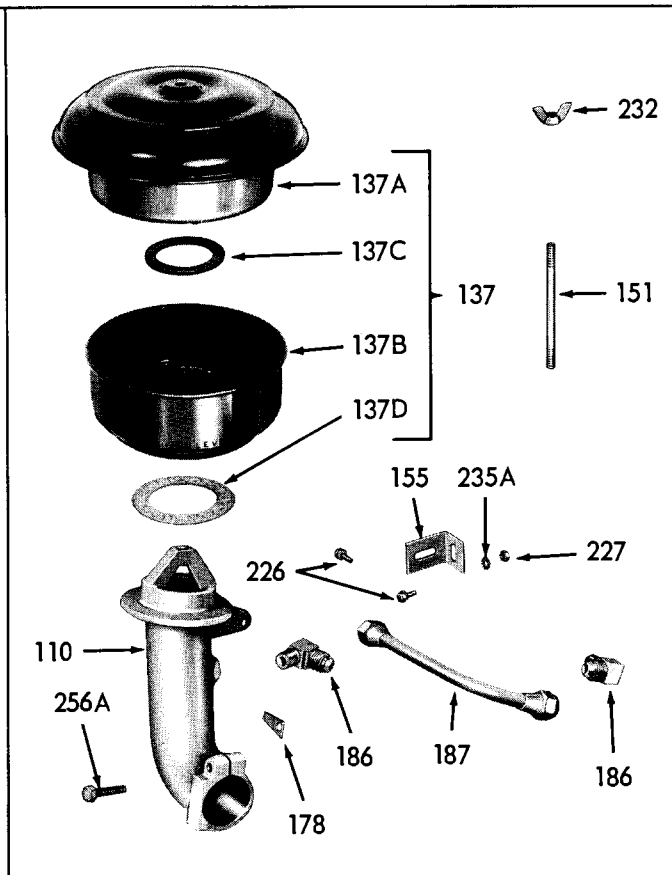
Fig. 48, FLYWHEEL, AIR SHROUD AND FUEL TANK GROUP
 Parts are identified by reference number. See parts list for correct part number.

PARTS LIST FOR MODEL AENL ENGINE



141168C-2

Fig. 49, Ref. No. 130, OIL PUMP ASSEMBLY



141164C-2

Fig. 50, AIR CLEANER ASSEMBLY

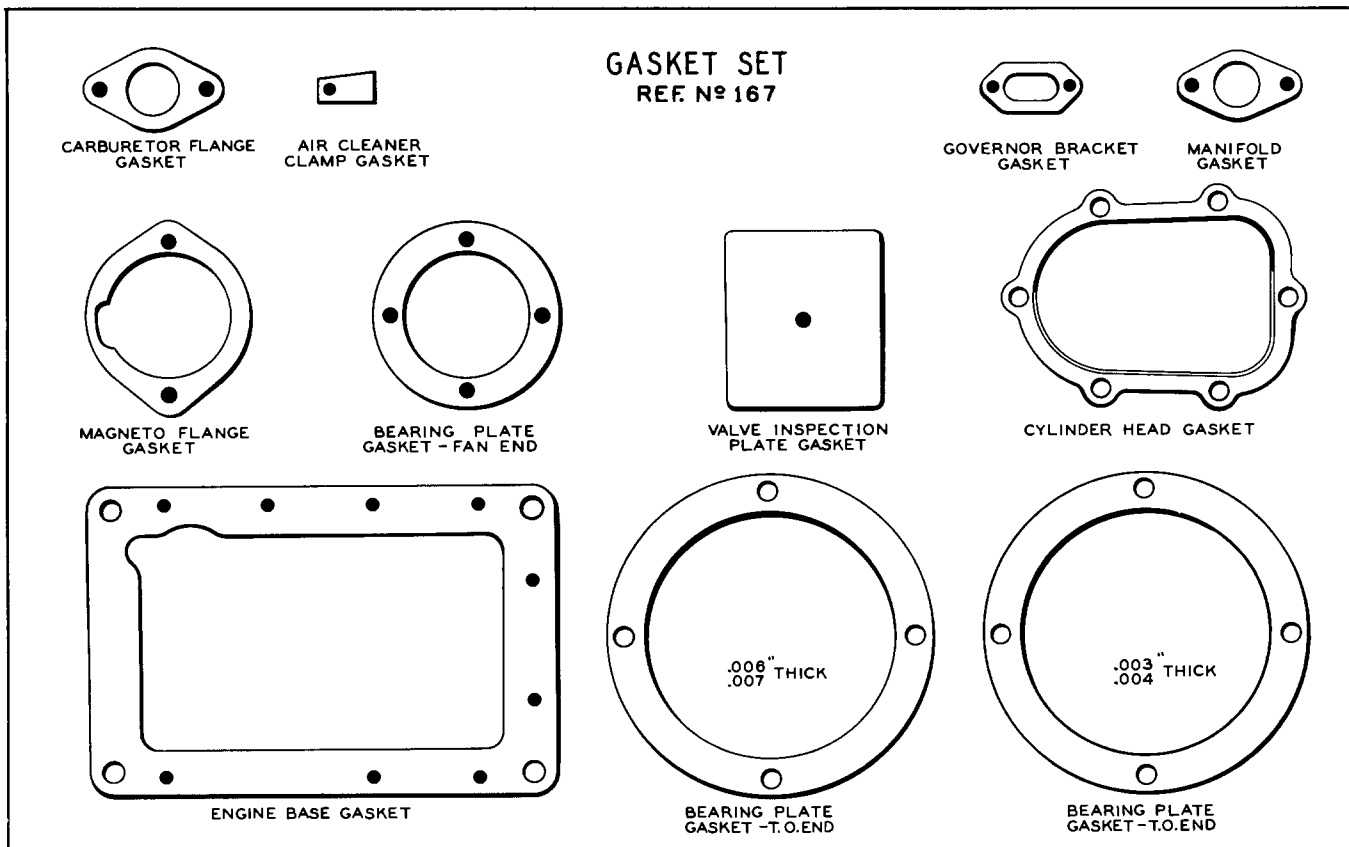


Fig. 51, Ref. No. 167, GASKET SET

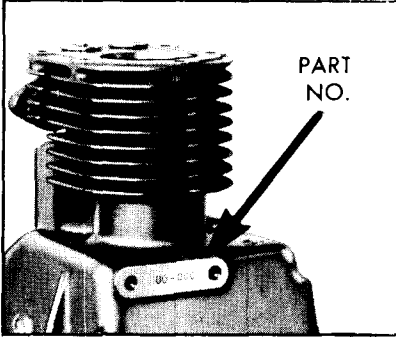
Parts are identified by reference number. See parts list for correct part numbers.

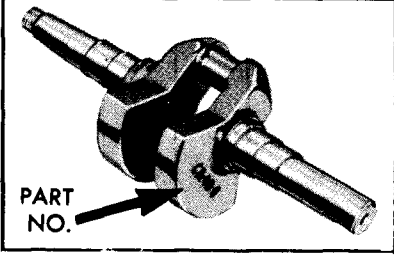
Mod I AENL Standard engine SERVICE PARTS LIST

Accessories begin on page 38. RECOIL STARTER (Form MU-8), in rear section of manual.

All parts can be applied to obsolete models AEN and AENS.

NOTE: Model AENLD has LONG LIFE exhaust valve, seat insert and VALVE ROTATOR. All other parts are identical to Model AENL

Ref. No.	Part Number	Description	No. Req.	Net Wt.	
				Lb	Oz
99	See Fig. A	CYLINDER and CRANKCASE ASSEMBLY — Complete..... Consisting of: 1 Cylinder and crankcase 2 AD-43 Guides 1 ME-59-1 Cup 2 AE-75-B Valves 1 PH-14 Washer 2 AF-49-A Springs 1 QD-612A Gasket 2 AG-26 Seats 2 SA-26 Plugs 2 AG-34-A Locators 1 SA-68 Cover 2 AH-9 Seat locks 1 XD-23 Screw 2 HG-201 Inserts	1	39	
<p>NOTE: The basic standard cylinder-crankcase part number is AA-91-A. Any special machining is indicated by a number stamped on the crankcase in the location shown in Fig. A. Add this number to AA-91-A. Order by complete number and by giving the Model, Specification and Serial Numbers of the engine.</p>					
					
Fig. A			90845C		
100	AB-101-B	CYLINDER HEAD	1	2	8
101	AD-43	VALVE STEM GUIDE	2	1	
102	AE-75-B	INLET and EXHAUST VALVE , standard	2	4	
	AE-75-D (AENLD)	EXHAUST VALVE , long life	1	4	
103	AF-49-A	VALVE SPRING , std. inlet and exh. 2-5/16" free length. Spring rated at 49 pounds when compressed to approx. 1-3/8" height.	2	2	
	AF-51	VALVE SPRING , exhaust with long life valve, less valve rotators	1	2	
	AF-54 (AENLD)	VALVE SPRING , exhaust, with long life valve and VALVE ROTATOR	1	2	
		1-13/16" free length, rated at 85 pounds, when compressed to approx. 1-1/8".			
104	AG-26	SEAT for valve spring, std.	2	1	
	AG-31 (AENLD)	VALVE ROTATOR and spring SEAT (exhaust) used with long life valve	1	1	
105	AG-34-A	VALVE SPRING LOCATOR	2	1	
106	AH-9	LOCK for valve spring seat	2 pr	1	
107	BB 128A 7	ENGINE BASE	1	2	3

Ref. No.	Part Number	Description	No. Req.	Net Wt.	
				Lb	Oz
108	BG-241-S1	MAIN BEARING PLATE ASSEMBLY Take-off end. Standard. Consisting of: 1 BG-241 Plate 1 PH-193 Seal 1 ME-59-1 Cup 1 SD-39 Retainer	1	4	12
<p>NOTE: Engines equipped with clutch or clutch reduction unit, require a special main bearing plate as specified in the rear section of this manual where these accessories are located.</p>					
109	BG-242-S1	BEARING RETAINER PLATE with oil seal, flywheel end (Standard)	1		5
	BG-344-S1	For engines equipped with flywheel alternator		2	
110	BI-291-6-S1	AIR CLEANER BRACKET ASSEMBLY For 1-5/8" O.D. carburetor air hom. Consisting of: 1 BI-291-6 Bracket 1 QD-647 Gasket 1 XD-8 Screw BI-291-S1 (for 1 1/2" O.D. carburetor air hom) replaced by BI-291-6-S1, not interchangeable unless carburetor is changed	1		14
111	BK-126 (Std.)	FUEL TANK BRACKET for WE-415 Rectangular tank. BK-126-S1 tank and bracket assembly with steel binder strapping.	1	1	
	BK-85 (Old Style)	BRACKET for WE-306-A and WE-414, Round tank	1		8
		BK-85-S1 tank-bracket assembly.			
114	See Fig. B	CRANKSHAFT ASSEMBLY	1	13	
<p>Consisting of: 1 Crankshaft 1 GA-39 Gear 2 ME-84 Bearings 1 PL-55 Key</p>					
<p>NOTE: The standard and basic engine crankshaft part number (raised letters on side of counterweight), is CA;48-D. Dash numbers are added to the basic part number to identify special machining at the take-off end. The dash (-) number will be found stamped on the cheek facing the take-off end of the shaft, as illustrated in Fig. B. Order by complete part number, (dash number added to basic number) and by giving the model, specification and serial numbers of the engine.</p>					
					
Fig. B			141332C-1		

Order parts from nearest **WISCONSIN DISTRIBUTOR** or **SERVICE CENTER**.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

Model AENL Parts List

Ref. No.	Part Number	Description	No. Req.	Net Wt.		Ref. No.	Part Number	Description	No. Req.	Net Wt.	
				Lb	Oz					Lb	Oz
115	DA-49B-S1	CONNECTING ROD - shell bearing type Assembly includes: 1 HG-133A Bushing 2 PE-148 Bolts 2 PD-246 Locknuts	1	1	6	131	KA-64A-S1	OIL PUMP BODY ASSEMBLY Consisting of: 1 KA- Body 1 PF-164 Plug 1 KF-30 Ball seat 1 PF-165 Plug 1 ME-38A Ball 1 PM-165 Spring KA-64-2-S1, repl'd by KA-64A-S1.	1		10
		NOTE: The connecting rod is furnished LESS shell bearings. Refer to following HA 139 part number for standard and under-size shell bearings available.				132	KF-19-A	CAP for pump plunger rod	1		1
		DA-49A-21-S1, 17-S1, 9-S1, DA-49A-S1 Babbitt Lined connecting rods repl'd by DA-49B-S1 and shell bearings.				133	KF-26	PLUNGER ROD for oil pump, standard	1		2
	HA 139 S	SHELL BEARING (2 halves) For connecting rod, standard size. NOTE: The following under-size shell bearings are also available. HA 139 S1 (.001" under-size) HA 139 S2 (.002" under-size) HA 139 S10 (.010" under-size) HA 139 S20 (.020" under-size) (HA 131 etc. replaced by HA 139 etc.)	1		2	133A	KF-26-C	PLUNGER ROD ASSEMBLY For engine with fuel pump. KF-26-3-S1, replaced by KF-26-C.	1		4
116	DB-209-5	PISTON , cam-ground, standard size Pistons are also furnished .010", .020" and .030" over-size. DB-209-3, -2, replaced by DB-209-5.	1		8	134	KF-23-1	PLUNGER for oil pump	1		4
117	DR-6-E	PISTON RING SET , standard size DR-6-A, replaced by DR-6-E. Consisting of:	1		4	135	L-63-K-S1 (Std.)	CARBURETOR with gasket Fixed Jet type, Zenith #12234.	1		3
118	DC-186	OIL RING	1		1		L-63-E-S1 (Optional)	CARBURETOR with Adjustable Jet , Zenith #12199			3
119	DC-163	COMPRESSION RING , 2nd groove	1		1		LQ-39	REPAIR KIT for L-63K, L-63E	1		3
	DC-163-1	SCRAPER RING , 3rd groove	1		1			NOTE: Special carburetors are identified by Part Number stamped on carburetor name plate. Refer to this number for service replacement carburetor or parts. See carburetor bulletins in back of manual for service replacement parts list.			
120	DC-163-D	COMPRESSION RING , chrome faced, top groove	1		1	136	LC-269-A	INTAKE MANIFOLD	1		12
	DR-37	TRI CROME RE-RING SET , std. size .. Piston ring sets are also furnished .010", .020" and .030" over-size.	1		6	137	LO-24 (Optional)	AIR CLEANER - Oil Bath type	1	1	12
121	DE-65	PISTON PIN , standard size	1		3		137A	Service parts: 81-179B1 Cap and filter assembly ..			
		Piston pins are also furnished .005" and .010" over-size.					137B	81-176B1K01 Oil cup			
122	EA-110B-S1	CAMSHAFT ASSEMBLY	1	2	8		137C	81-615A1 Filter gasket			
		Includes: Gear and key PA-314-1 Support pin					137D	QD-540 Base gasket			
123	F-63	VALVE TAPPET with lock screw	2		4		LO-175 (Standard)	AIR CLEANER - Dry Element type Service parts: LO-175-B Element	1		1
124	GA-39	CRANKSHAFT GEAR	1		8			LO-175-D Body	1		4
125	GD 113	GEAR , magneto drive For Y 117 FM, or Y 118 Wico magneto GD 145 gear, for obsolete FM, Y 135	1		12			SD-295 Decal	1		1
126	HF-432	SPACER for cylinder head stud	1		3	138	LP 62B S1 LQ 51	FUEL PUMP (not standard)	1		10
127	HG-133-A	PISTON PIN BUSHING	1		1			REPAIR KIT for fuel pump	1		2
128	HG 201	VALVE SEAT INSERT , standard	2		1			LP-42B-S1 replaced by LP-62B-S1. LQ-28 Repair Kit for LP-42B-S1. NOTE: Refer to fuel pump instruction sheet in back of manual for maintenance and repair			
	HG 273D (AENLD)	SEAT INSERT , exhaust - long life (HG 201D, replaced by HG 273D)	1		1	139	RG-41 (Std.)	SHUT-OFF VALVE and STRAINER	1		5
130	K-100-G	OIL PUMP ASSEMBLY (Fig. 49)	1		1			LP-43 (Optional)	1		
		Replaces K-100-E, K-100, beginning with serial #4402043, interchangeable.						LQ-31 Repair Kit (bowl, gasket, screen) NOTE: See illustration in back of parts list for service replacement parts.			
						140	ME-38-A	CHECK BALL for oil pump, 5/16" dia. ME-38, replaced by ME-38A.	1		1
						141	ME-84	MAIN BEARING ASSEMBLY	2		12
						142		Consisting of: 1 ME-59-1 Cup *			
						143		1 ME-84-1 Cone *			
								* Not sold separately.			

Order parts from nearest WISCONSIN DISTRIBUTOR or SERVICE CENTER.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

Model AENL Parts List

Ref. No.	Part Number	Description	No.			Net Wt.		
			Req	Lb	Oz	Req	Lb	Oz
		NOTE: Beginning with engine serial No. 5789735, the NC 215 series Recoil Start Flywheel replaces NC 143 series (Rope-Start) flywheel -- Not interchangeable - unless Shrouding is changed and engine Base/Crankcase is modified.						
144	NC 215	FLYWHEEL, standard	1	24				
		NC 143, previous to serial No. 5789735		16				
	N 108-1	FLYWHEEL with GH 48 Ring-Gear		25				
		NC 143ES1 previous to serial #5789735						
	N 108-2	FLYWHEEL with rotor and ring gear for 10 amp Flywheel Alternator. N 104-5 previous to, serial No. 5789735.		25				
	N 108-3	For 25 amp Flywheel Alternator. N 104-9 previous to serial No. 5789735.		25				
		NOTE: Order other special flywheels by Spec and Serial No's.						
145	PA-314-1	CAMSHAFT SUPPORT PIN	1	4				
146	PA-340	ROLL PIN for governor flyweights	2	1				
147	PB-169-A	ADJUSTING SCREW for valve tappet	2	1				
148	PB-148	CONNECTING ROD BOLT	2	2				
149	PC-321	STUD (3-1/16" long) for cylinder head and cover spacer	1	3				
	PC-458	STUD (3-1/4" long) for cylinder head -- when mounting ignition coil	1	3				
151	PC-372-A	STUD for oil or dry element air cleaners	1	2				
153	PE-101	LOCKWASHER, 7/8" special (pos. type) For mounting rope starter sheave. PE-38, 7/8", light Positive type -- for sheave with 'V' belt drive.	1	1				
154	PG-315	SPEED NUT for SE 6D flywheel screen	4	1				
155	PG-343-C	SUPPORT CLIP for air cleaner bracket	1	1				
156	PG-430	SUPPORT CLIP for ignition cable	1	1				
157	PG-1196	FUEL TANK STRAP for WE-415, Rectangular tank	2	4				
	PG-504	STRAP for WE-306A and WE-414, Round fuel tank		4				
		NOTE: Steel binder strapping and seal, for mounting fuel tank, on engines sent out from the factory, are not serviceable in the field. Order 2 PG- Tank Straps, 2 XA 61 Screws, 2 PD 329 Nuts.						
160	PH-193	CORK OIL SEAL for crankshaft	2	1				
161	PI-121-A	ADJUSTING SCREW for governor spring	1	1				
162	PK-50-A	RETAINER for oil pump check ball	1	1				
163	PK-52	RETAINING RING for piston pin	2	1				
164	PM-58-E	SPRING for oil pump plunger	1	1				
		PM-58, replaced by PM-58-E.						
165	PM-74	GOVERNOR SPRING	1	2				
166	PM-165	SPRING for oil pump outlet	1	1				
167	Q-22	GASKET SET	1	6				
		Consisting of:						
		1 QB-77 1 QD-487-B 1 QD-647						
		1 QC-71 1 QD-570-A 1 QD-674						
		1 QD-484 1 QD-571 1 QD-675						
		9 QD-487-A 1 QD-612-A						
169	QB-77	GASKET for intake manifold	1	1				
170	QC-71	GASKET for carburetor flange	1	1				
171	QD-484	GASKET for cylinder head	1	1				
172	QD-487-A	GASKET for bearing plate, T.O. end -- .006" thick	6	1				
		* Use as required to obtain .001 to .003" end play.						
173	QD-487-B	GASKET for bearing plate, T.O. end -- .003" thick	1	1				
174	QD-570-A	GASKET for magneto flange	1	1				
175	QD-571	GASKET for governor yoke shaft bracket	1	1				
176	QD-612-A	GASKET for valve tappet insp. plate	1	1				
178	QD-647	GASKET for slot in air cleaner bracket	1	1				
179	QD-670	GASKET for mounting fuel pump	1	1				
180	QD-674	GASKET for bearing plate, flywheel end	1	1				
	QD-833	GASKET for engine with Flywheel alternator						
181	QD-675	GASKET for engine base	1	1				
182	RC-122	CAP (screw type) for WE-414, WE-415 tanks	1	2				
	RC-123-A	CAP with gauge, available for WE-414, WE-415 fuel tanks		4				
		RC-87 cap for obsolete WE-306A bayonet neck type fuel tank		2				
183	RD-137-C	OIL STRAINER for pump	1	1				
		RD-112-2, replaced by RD-137-C.						
184	RF-269	STRAIGHT FITTING for fuel pump outlet	1	1				
185	RF-1439	ELBOW for flexible fuel line in carb. ..	1	1				
	RF-1225	ELBOW for bundyweld tubing fuel line	3	1				
	(Optional)	1-in carburetor						
		1-in fuel strainer outlet						
		1-in fuel pump inlet						
186	RF-296	ELBOW for breather line	2	1				
187	RM-494	BREATHER LINE , tubing with nuts,	1	4				
	- LK 30	HOSE CLAMP , fuel line (not illust.)	2	1				
188	LL-178-18	FLEXIBLE FUEL LINE , 18" long, 1/4" neoprene tubing	1	3				
	RM-980	FUEL LINE , 19 1/2" long, 1/4" bundy-weld tubing with nuts	1					
	(Optional)	Fuel tank to carburetor.						
	RM-197	FUEL LINE , 1/4" tubing, 12 1/2" long, with nuts, fuel pump to carburetor	1	2				
	(Optional)							

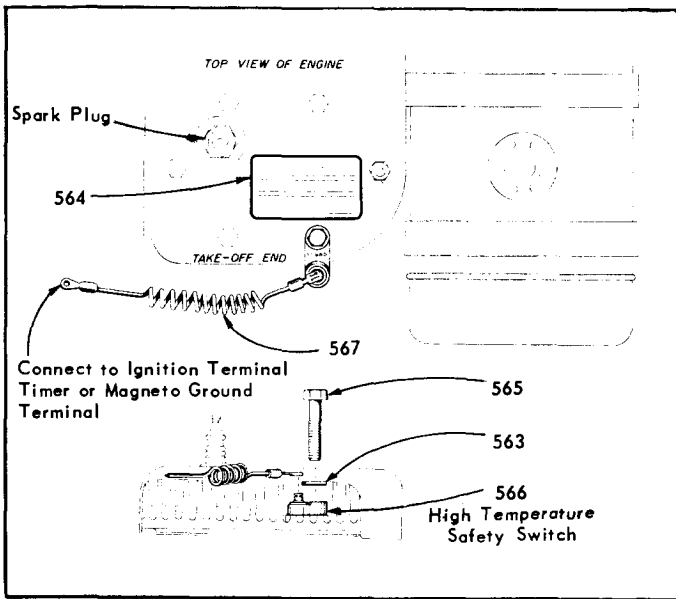
Order parts from nearest WISCONSIN DISTRIBUTOR or SERVICE CENTER.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

Model AENL Parts List

Ref. No.	Part Number	Description	No.			Net Wt.			Ref. No.	Part Number	Description	No.			Net Wt.		
			Req	Lb	Oz	Req	Lb	Oz				Req	Lb	Oz	Req	Lb	Oz
233	PE 3	LOCKWASHER , 1/4" spring lock 2-for mounting oil pump to crankcase 12-for mounting engine base 4-for air shroud to cyl. block and head 2-for SE 339 air shroud mtg. to base 2-for mounting intake manifold 2-for mounting fuel pump 3-for rope sheave mounting	27		1				252	XB 87	SCREW , 1/4"-20 x 3/4 long socket hd. For SE 339 air shroud to base	2			1		
										XA 113	SCREW , 5/16"- 18 x 1/2 long phil. hd. For obsolete SE 154 air shroud to case	2			1		
									254	XD-5	SCREW , 1/4"-20 x 5/8" long, hex. head For oil pump mounting.	2			1		
234	PE 4	LOCKWASHER , 5/16" spring lock 2-for mounting magneto 4-for main bearing plate-flywheel end 2-for SE 154 air shroud to crankcase 2-for mounting carburetor	10		1				255	XD-6	SCREW , 1/4"-20 x 3/4" long, hex. hd. 12-for mounting engine base. 2-for mounting fuel pump. 2-for governor shaft support. 3-for rope sheave mounting	19			1		
235	PE-5	LOCKWASHER , 3/8" spring lock 4-for main bearing plate-take-off end. 2-for fuel tank bracket to crankcase.	6		1				256	XD-7	SCREW , 1/4"-20 x 1" long, hex. head .. For mounting manifold.	2			1		
235A	PE-74	LOCKWASHER , 1/4" internal-external "Everlock", plated For air cleaner bracket clip.	1		1				256A	XD-8	SCREW , 1/4"-20 x 1-1/4" long, hex. hd. For air cleaner bracket clamp. XB-20, fillister hd., replaced by XD-8.	1			1		
237	XK-3	PIPE PLUG , 3/8" square head For timing inspection hole in crankcase PF-25 (slotted plug) replaced by XK-3.	1		1				257	XD-15	SCREW , 5/16"-18 x 3/4" long, hex. hd. For bearing retainerplate-flywheel end.	4			1		
238	PF-165	PIPE PLUG (special) for oil pump out let spring retainer PF-51A, replaced by PF-165.	1		1				258	XD-16	SCREW , 5/16"-18 thread x 7/8" long, hexagon head For mounting carburetor.	2			1		
									258A	XD-17	SCREW , 5/16"-18 x 1" long, hex. hd. .. For mounting magneto, lower hole. PG-362 Stud, replaced by XD-17.	1			1		
240	PH-14	WASHER , 5/16" I.D. x 19/32" O.D. x 1/16" thick, copper For valve tappet inspection plate.	1		1				259	XD-23	SCREW , 5/16"-18 x 2" long, hex. hd. .. For valve tappet inspection plate.	1			2		
241	PH-22	WASHER , 3/8" I.D. x 11/16" O.D. x 1/16" thick, plain steel For mounting cylinder head.	6		1				260	XD-27	SCREW , 3/8"-16 x 1" long, hex. head .. 4-for main bearing plate-take-off end. 2-for fuel tank bracket to crankcase.	6			1		
242	PH-30-A	WASHER , 1/4" I.D. x 7/16" O.D. x 1/16" thick, plain steel For governor adjusting screw pin.	1		1				261	XI-32	COTTER PIN , 3/64" dia. x 3/8" long For control rod to governor lever.	1			1		
243	PL-55	WOODRUFF KEY , No. 6 For mounting crankshaft gear.	1		1				262	XK-1	PIPE PLUG , 1/8" square head In inlet manifold. (optional)	1			1		
244	PL-87	WOODRUFF KEY , No. 22 For mounting flywheel.	1		1				263	XK-3	PIPE PLUG , 3/8" square head For oil drain.	1			1		
245	RF-794	NIPPLE , 1/8" x 3/4" long, close pipe For fuel strainer mounting. (optional)	1		1				264	XK-4	PIPE PLUG , 1/2" square head For oil filler.	1			2		
247	SA-26	EXPANSION PLUG , 5/8" For camshaft end holes.	2		1				265	PD 142	NUT , 7/8"-14, hex jam Flywheel mounting- with rope sheave	1			2		
248	XA-33	SCREW , 1/4"-20 thread x 3/8" long, indented hexagon head For air shroud to cylinder block.	4		1				266	PH 196	WASHER , 1/4", plain steel For rope sheave mounting	3			1		
249	XA-34	SCREW , 1/4"-20 thread x 1/2" long, indented hexagon head For flywheel screen mounting.	4		1												
250	XA-67	SCREW , Parker Kalon No. 4, Type 'A', 1/4" long, stove head, self-tapping sheet metal screw, for name plate	4		1												
251	XA-61	SCREW , 1/4"-20 x 1-3/4" long, rd. hd. For fuel tank straps.	2		1												

Order parts from nearest WISCONSIN DISTRIBUTOR or SERVICE CENTER.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

YC-66-D-S1 HIGH TEMPERATURE SAFETY SWITCH KIT

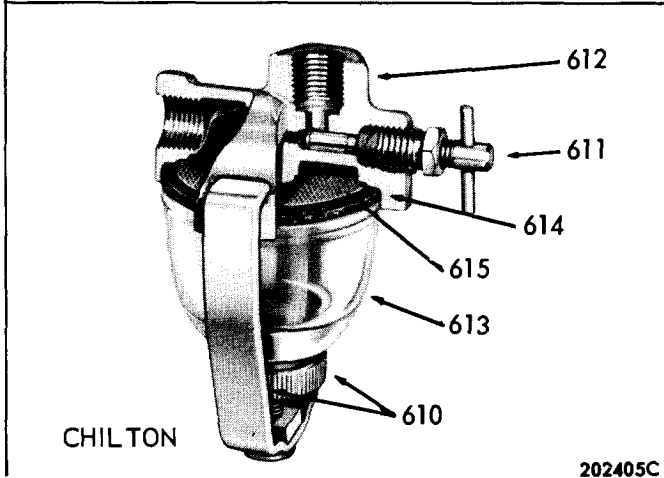
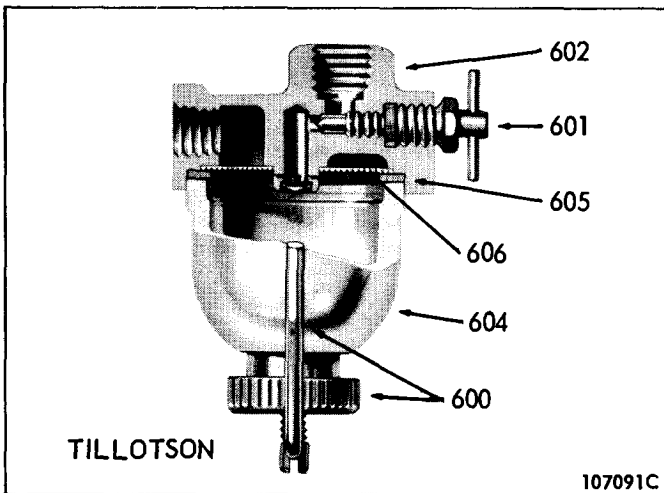


Ref. No.	Part Number	Description	No. Net Wt.		
			Req	Lb	Oz
	YC-66-D-S1	HIGH TEMPERATURE SAFETY SWITCH KIT — Complete..... Consisting of:			8
563	PH-22	WASHER , 3/8" I.D., plain steel..... For switch to cylinder head mounting.	1		1
564	SD-233	INSTRUCTION DECAL	1		1
565	XD-31	CAPSCREW , 3/8"-16 thread x 1 1/4" long, hexagon head..... For switch to cylinder head mounting.	1		1
566	YC-66-D	HIGH TEMPERATURE SAFETY SWITCH	1		3
		For replacement, order YC-66-D-S1 Kit.			
567	YL-357-42	WIRE ASSEMBLY , 42" long, with terminals. (Wire coiled to suit all models.)	1		1

LP-43 FUEL STRAINER ASSEMBLIES

The LP-43 small fuel strainer is furnished by either the TILLOTSON or CHILTON Companies. The strainers are interchangeable as complete units, but only the glass bowl, gasket and screen (LQ-31 Kit) are interchangeable as service replacement parts.

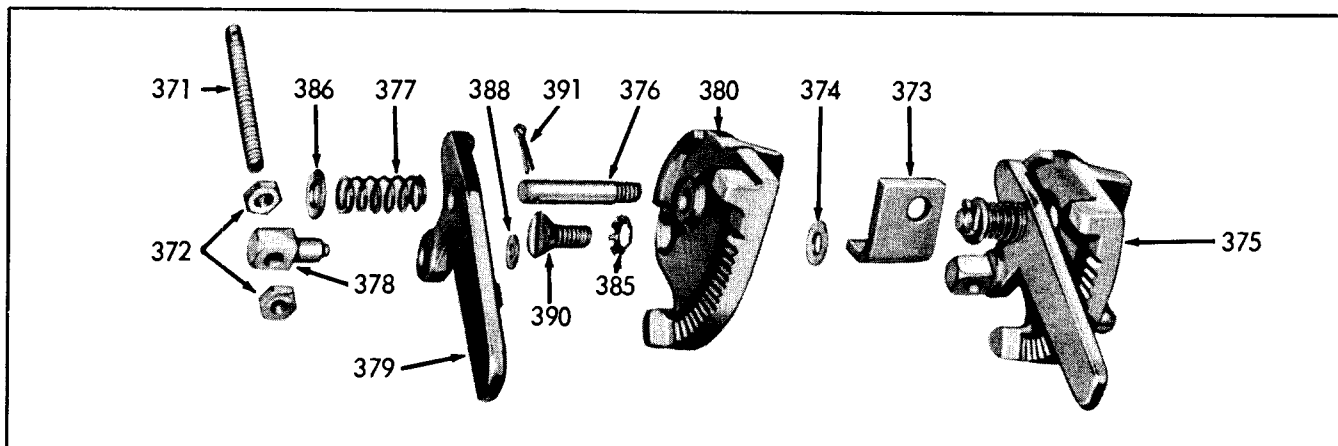
NOTE: Code number 75 or 17, prefixed to the part number, is a vendor identification. When ordering parts, please use number with code as shown.



Ref. No.	Part Number	Description	No. Net Wt.		
			Req	Lb	Oz
	OW-480-T	TILLOTSON FUEL STRAINER ASSEMBLY — Order (Wisconsin LP-43)....	1		6
600	75-07766	CLAMP WIRE and NUT ASSEMBLY	1		1
601	75-07769	NEEDLE VALVE ASSEMBLY	1		1
		Includes Packing.			
602	75-07770	COVER	1		2
	LQ-31	REPAIR PARTS KIT	1		3
		Consisting of:			
604		Glass Bowl	1		1
605		Gasket	1		1
606		Screen	1		1
		OPTIONAL			
	830	CHILTON FUEL STRAINER ASSEMBLY — Order (Wisconsin LP-43)	1		6
610	17-830-15A	BAIL ASSEMBLY	1		2
611	17-100-6-7-8-9	NEEDLE VALVE ASSEMBLY	1		1
		Includes Packing.			
612	17-830-1	COVER	1		2
	LQ-31	REPAIR PARTS KIT	1		3
		Consisting of:			
613		Glass Bowl	1		1
614		Gasket	1		1
615		Screen	1		1

Order parts from nearest **WISCONSIN DISTRIBUTOR** or **SERVICE CENTER**.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

TT-74-D VARIABLE SPEED GOVERNOR CONTROL ASSEMBLY

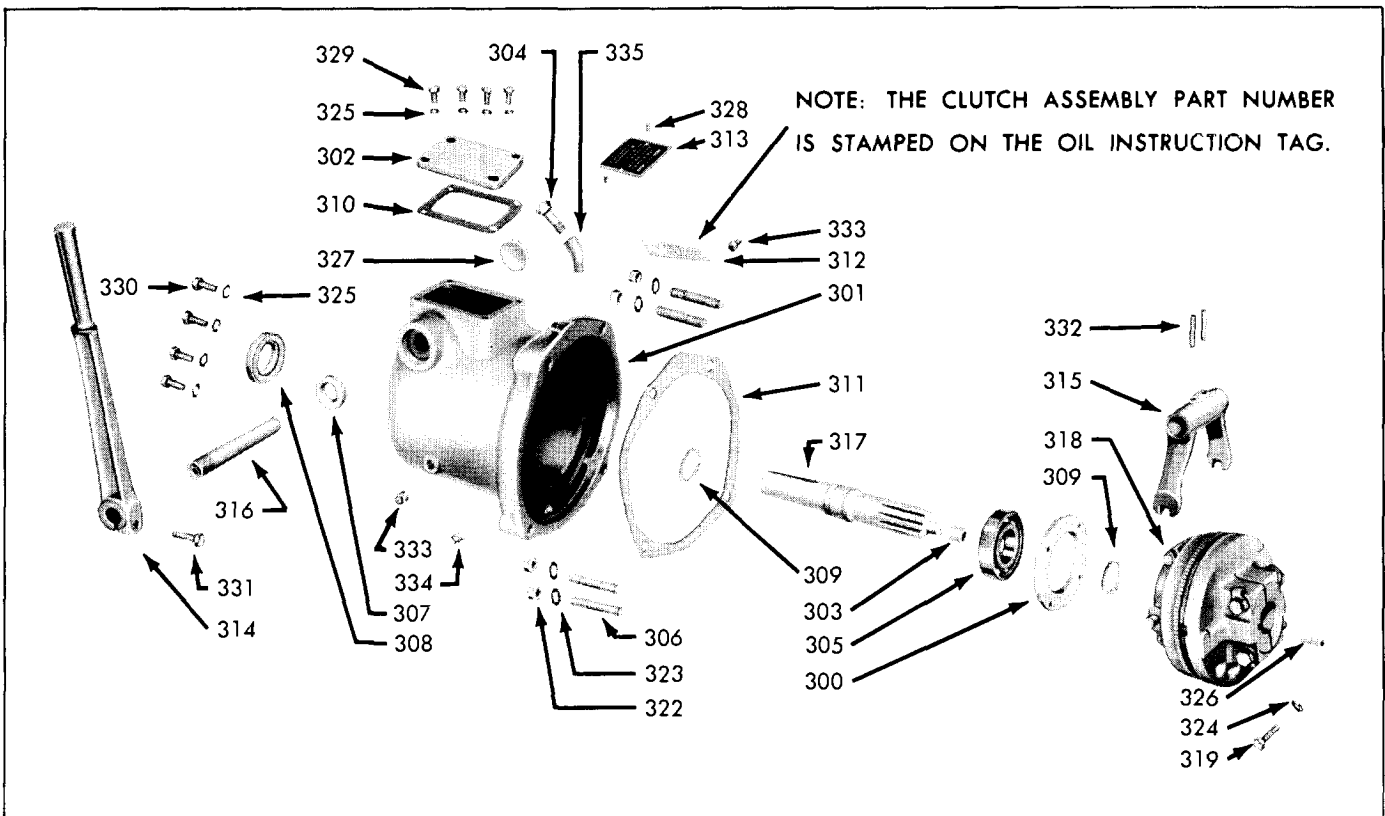


141786C-1

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT	
				LBS	OZ
	TT-74-D	CONTROL ASSEMBLY – Complete		1	2
371	PI-121-A	SCREW for governor spring adjusting	1		1
		PI-121, replaced by PI-121-A.			
372	PD-115	NUT , No. 10-32 thread, hexagon steel nut	2		1
		For adjusting screw.			
373	PG-563	BRACE for control bracket	1		1
374	QD-695	GASKET for mounting bracket to crankcase	1		1
		PH-221 Washer, replaced by QD-695.			
375	VE-584-A	CONTROL ASSEMBLY	1	1	
		Consisting of all the following parts:			
376	PC-393-2	PIN for lever support	1		1
377	PM-117	SPRING for lever support pin	1		1
378	TC-301-3	SWIVEL BLOCK for adjusting screw	1		1
379	VB-179-A	CONTROL LEVER	1		2
380	VC-35	CONTROL BRACKET	1		10
STANDARD HARDWARE					
385	PE-55	WASHER , 1/4" countersunk everlock	1		1
		For bracket support screw.			
386	PH-84	WASHER , 1/4" I.D. x 1/2" O.D. x 1/16" thick, plain steel	1		1
		For support pin spring.			
388	PH-253	WASHER , 5/32" I.D. x 3/8" O.D. x 1/32" thick, plain steel	1		1
		For swivel block.			
390	XC-14	SCREW , 1/4"-20 thread x 5/8" long, flat head	1		1
		For bracket mounting.			
391	XI-1	COTTER PIN , 1/16" dia. x 1/2" long, steel	1		1
		For support pin spring.			

Order parts from nearest **WISCONSIN DISTRIBUTOR** or **SERVICE CENTER**.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

WW-102 CLUTCH AND POWER TAKE-OFF ASSEMBLY



141165C

NOTE: Engines equipped with a clutch and power take-off assembly require a special main bearing plate assembly, crankshaft and cylinder-crankcase as follows:

- BG-241-1-S1 MAIN BEARING PLATE ASSEMBLY** (not illustrated)
 Consisting of:
 1 BG-241-1 Plate 1 ME-59-1 Bearing cup 1 PH-265 Oil seal
- CA-48D-1-S2 CRANKSHAFT ASSEMBLY** (not illustrated)
 Consisting of:
 1 CA-48D-1 Shaft 1 HG-182 Bushing 1 PL-55 Key
 1 GA-39 Gear 2 ME-84 Bearings

THE PART NUMBER OF THE CYLINDER-CRANKCASE CAN BE FOUND STAMPED ON THE FUEL TANK MOUNTING PAD ON THE CRANKCASE

Ref. No.	Part Number	Description	No.		Net Wt.		Ref. No.	Part Number	Description	No.		Net Wt.	
			Req		Lb	Oz				Req		Lb	Oz
	WW-102	CLUTCH and POWER TAKE-OFF ASSEMBLY Consisting of:	1		28								
300	BG-156	PLATE for bearing retainer	1		8		307	PH-234-A	OIL SEAL for shifter lever shaft	1			2
301	BG-230-2	CLUTCH HOUSING	1		6		308	PH-280	OIL SEAL for take-off shaft	1			3
302	BH-115-A	COVER for inspection hole (stamping) BH-115 (cast iron), replaced by BH-115A	1		2		309	PK-97	RETAINING RING for bearing.....	2			1
303	HG-182	PILOT BUSHING for crankshaft	1		1		310	QD-551	GASKET for inspection hole cover	1			1
304	LO-44	BREATHER ASSEMBLY	1		1		311	QD-650-1	GASKET for housing mounting.....	1			1
305	ME-79-A	BEARING for take-off shaft, N.D. No. 7507	1		10		312	SD-79	TAG for oil instructions	1			1
306	PC-392	STUD for mounting clutch housing	4		2		313	SD-125-A	INSTRUCTION PLATE	1			1
									For clutch adjustment. SD-132, replaced by SD-125-A.				
							314	VB-55-1	SHIFTER LEVER	1			2
							315	VB-64-A	SHIFTER YOKE	1	1		4

Order parts from nearest **WISCONSIN DISTRIBUTOR** or **SERVICE CENTER**.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

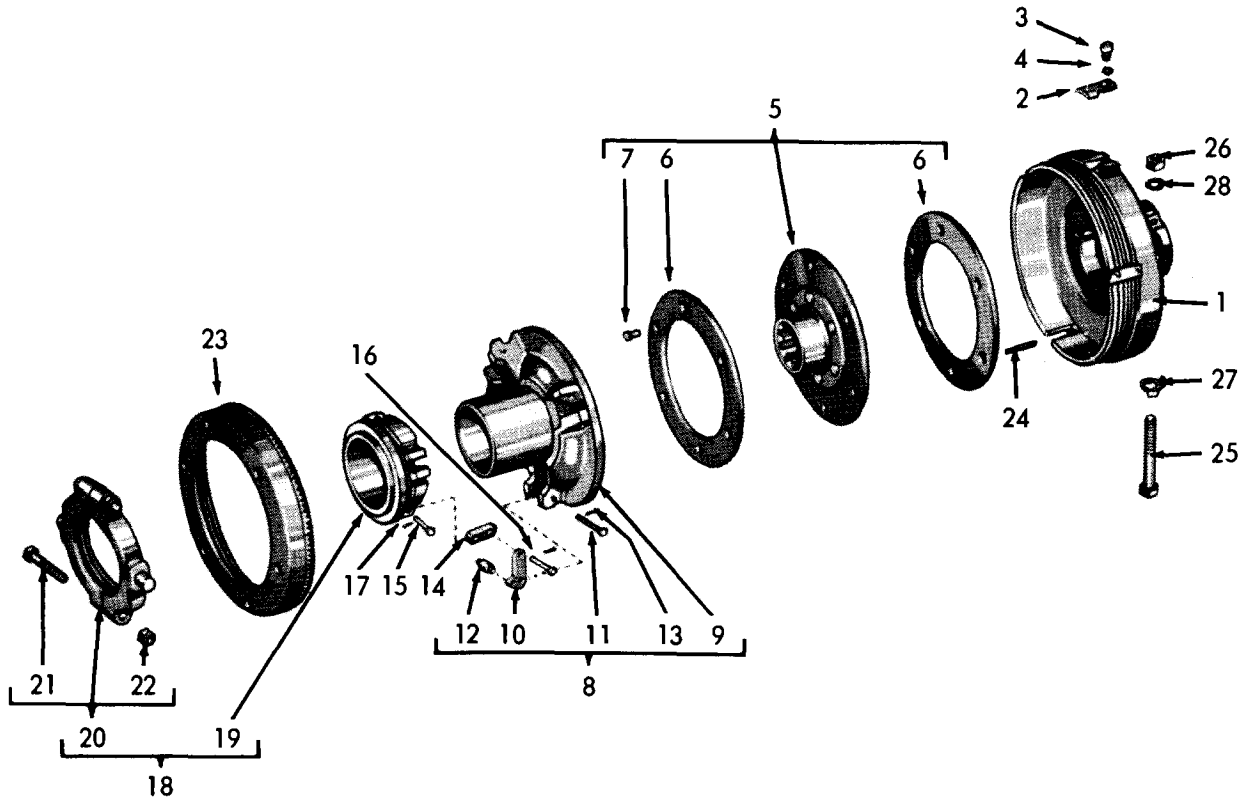
WW-102 CLUTCH AND POWER TAKE-OFF ASSEMBLY

Ref. No.	Part Number	Description	No. Req	Net Wt.	
				Lb	Oz
316	WA-61	SHAFT for shifter yoke	1	1	
317	WA-101	TAKE-OFF SHAFT	1	2	8
318	WC-280-B	CLUTCH, Rockford Model 4-1/2 LOC No. CLA-1761	1	8	6
		NOTE: See Rockford illustration and parts list for clutch parts.			
319	XD-14-2	SET SCREW for clutch drive hub	1		1
		STANDARD HARDWARE			
322	PD-12	NUT, 7/16"-20 thread, hexagon steel.... For clutch housing studs.	4		1
323	PE-6	LOCKWASHER, 7/16" Positive	4		1
		For clutch housing stud nuts.			
324	PE-46	LOCKWASHER, 5/16" External Everlock For drive hub set screw.	1		1
325	PH-30	WASHER, 1/4" I.D. x 7/16" O.D. x 1/16" thick, plain copper	8		1
		4-for inspection hole cover. 4-for bearing retainer plate.			
326	PL-86	KEY, 1/4" square x 1" long	1		1
		For clutch drive hub.			
327	SA-58	PLUG, 1-3/8" expansion	1		1
		For shifter shaft hole.			
329	XA-34	SCREW, 1/4"-20 thread x 1/2" long, round.....	4		1
		For inspection hole cover (stamping). XD-5 Hexagon head screw, 5/8" long, for cast iron cover.			
330	XD-8	SCREW, 1/4"-20 thread x 1-1/4" long, hexagon head.....	4		1
		For bearing retainer plate.			
331	XD-30	SCREW, 3/8"-16 thread x 1-1/2" long, hexagon head.....	1		1
		For shifter lever.			
332	PA-341	ROLL PIN, 1/4" dia. x 1-1/8" long	2		1
		For shifter yoke to shaft. XH-26, No. 4 x 1-3/8" long, taper pin, replaced by PA-341.			
333	XK-1	PIPE PLUG, 1/8" square head	2		1
		For oil level.			
334	XK-2	PIPE PLUG, 1/4" square head	1		1
		For oil drain.			
	XK-3	PIPE PLUG, 3/8" square head	1		1
		For clutch adjustment (not illustrated).			
335	XK-77-A	STREET ELL, 1/8" x 45°, brass	1		1
		For breather mounting. XK-77, replaced by XK-77-A.			

Order parts from nearest **WISCONSIN DISTRIBUTOR** or **SERVICE CENTER**.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

WC-280B CLUTCH ASSEMBLY

Rockford No. CLA-1761



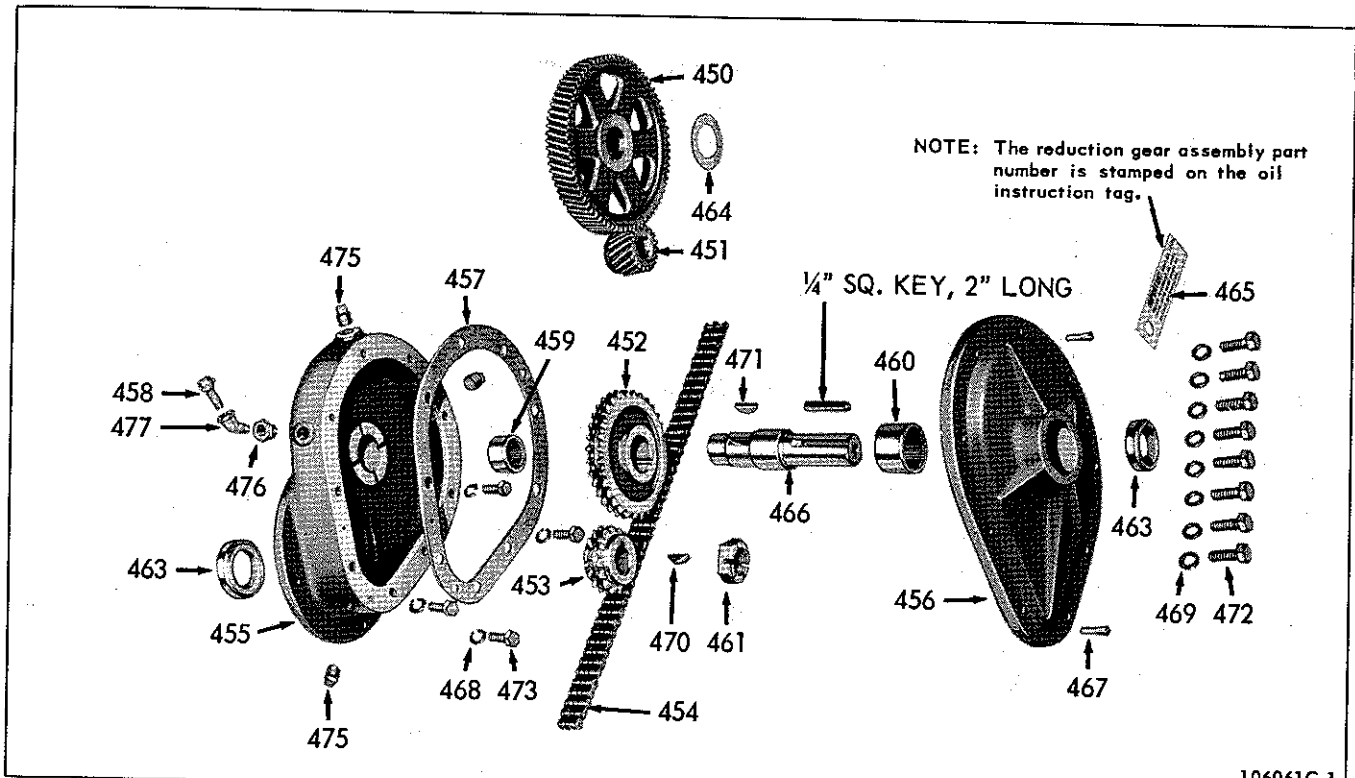
206584C-A

NOTE: Code number 63, prefixed to the part number, is a vendor identification. When ordering parts, please use number with code as shown.

Ref. No.	Part Number	Description	No. Req.	Ref. No.	Part Number	Description	No. Req.
1	63-CL-7248-1	CLUTCH HOUSING	1	18	63-UCL-7-5229	RELEASE SLAVE ASSEMBLY.....	1
2	63-CL-7012	ADJUSTMENT LOCK	1	19		Consisting of:	
3	63-CL-8807-1	SCREW for adjustment lock, 1/4"-20 thread x 3/8" long, hexagon head.....	1	20		63-CL-5229 Release sleeve	1
4	63-CL-3468	WASHER for adjustment lock, 1/4" Shakeproof	1		*	63-UCL-14-4966 Release bearing assembly	1
5	63-UCL-5230	DRIVE MEMBER ASSEMBLY	1			Consisting of:	
	*	Consisting of:		21		Release bearing (2 halves)	
		Splined center and plate assembly	1	22		63-CL-3335-1 Hex. hd. screw, 5/16"-24 thread x 1-3/4" long.....	2
6		63-CL-4096-18 Facing (Raybestos No. 500B)	2			63-CL-7356 Elastic stop nut, 5/16"-24 thread	2
7		63-CL-1011 Brass rivet	6	23	63-CL-4964	ADJUSTING RING	1
8	63-UCL-1-5228-A	PRESSURE PLATE and LEVER ASSEMBLY	1	24	63-CL-5087	SPRING	3
		Consisting of:		25	63-CL-5318	CLAMP SCREW, 3/8"-24 thread x 2-1/2" long, hexagon head	2
9		63-CL-5228 Pressure plate assembly	1	26	63-CL-5319	NUT, 3/8"-24 thread, light hexagon	2
10		63-CL-5543 Lever	6	27	63-CL-5211	SCREW LOCK	2
11		63-CL-5156 Lever pin	3	28	63-PT-353	LOCKWASHER, 3/8" Positive	2
12		63-LM-408 Roller.....	3				
		63-CL-4775 Roller and 63-CL-4971 Pin replaced by 63-LM-408.					
13		63-CL-5092 Cotter pin, 1/16" x 3/8" long	3				
14	63-CL-4776	CONNECTING LINK.....	6				
15	63-CL-5153	LINK PIN (long)	3				
16	63-CL-5152	LINK PIN (short)	3				
17	63-CL-5092	COTTER PIN for link pins, 1/16" x 3/8" ..	6				
						(*) Not serviced separately from sub-assembly it is included in.	

Order parts from nearest WISCONSIN DISTRIBUTOR or SERVICE CENTER.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

WW-64-B etc. and WW-64-E etc. REDUCTION GEAR ASSEMBLIES



106061C-1

ASSEMBLY PART NUMBER	REDUCTION RATIO	ROTATION AT TAKE-OFF SHAFT	NET WEIGHT	
			LBS	OZ
WW-64-E WW-64-B	4 to 1	Counter-Enginewise	25	
WW-64-E-1 WW-64-B-1	2:076 to 1	Counter-Enginewise	25	
WW-64-E-2 WW-64-B-2	3.4 to 1	Engine-Wise (chain drive)	24	

NOTE: Beginning with engine Serial No. 1422515, WW-64-E etc. reduction gear assemblies replace WW-64-B etc. and are interchangeable as complete units. The basic differences are in the design of the housing, cover and gasket, and these are not interchangeable unless all three parts are used together.

REF. NO.	PART NUMBER	DESCRIPTION	ASSEMBLY USED IN	NO. REQ.	NET WEIGHT	
					LBS	OZ
450	GG-119-3	DRIVEN GEAR - 64 teeth..... GG-119-1, replaced by GG-119-3 But GG-120-2 and PH-333 must also be furnished.	WW-64-E WW-64-B	1	5	2
450	GG-122-3	DRIVEN GEAR - 54 teeth.....	WW-64E-1 WW-64B-1	1	4	4
451	GG-120-2	DRIVER GEAR - 16 teeth..... GG-120-1, replaced by GG-120-2 But GG-119-3 and PH-333 must also be furnished.	WW-64-E WW-64-B	1		8
451	GG-121-2	DRIVER GEAR - 26 teeth.....	WW-64E-1 WW-64B-1	1	1	11
452	GG-122-1	DRIVEN SPROCKET - 34 teeth.....	WW-64E-2 WW-64B-2	1	3	1
453	GG-123	DRIVER SPROCKET - 10 teeth.....	WW-64E-2 WW-64B-2	1		5
454	GJ-15	CHAIN - 1/2" pitch - 40 pitches long.....	WW-64E-2 WW-64B-2	1	1	6
455	BG-244-A BG-244	MAIN HOUSING..... MAIN HOUSING.....	WW-64E, -1, -2 WW-64B, -1, -2	1 1	12 11	 8
456	BH-144-A BH-144	COVER..... COVER.....	WW-64E, -1, -2 WW-64B, -1, -2	1 1	6 5	 12
457	QD-623-A QD-623	GASKET for cover to housing..... GASKET for cover to housing.....	WW-64E, -1, -2 WW-64B, -1, -2	1 1		1 1

Order parts from nearest **WISCONSIN DISTRIBUTOR** or **SERVICE CENTER**.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

**INTERCHANGEABLE PARTS OF WW-64-B etc. and WW-64-E etc.
REDUCTION GEAR ASSEMBLIES**

NOTE: Engines equipped with reduction units require a

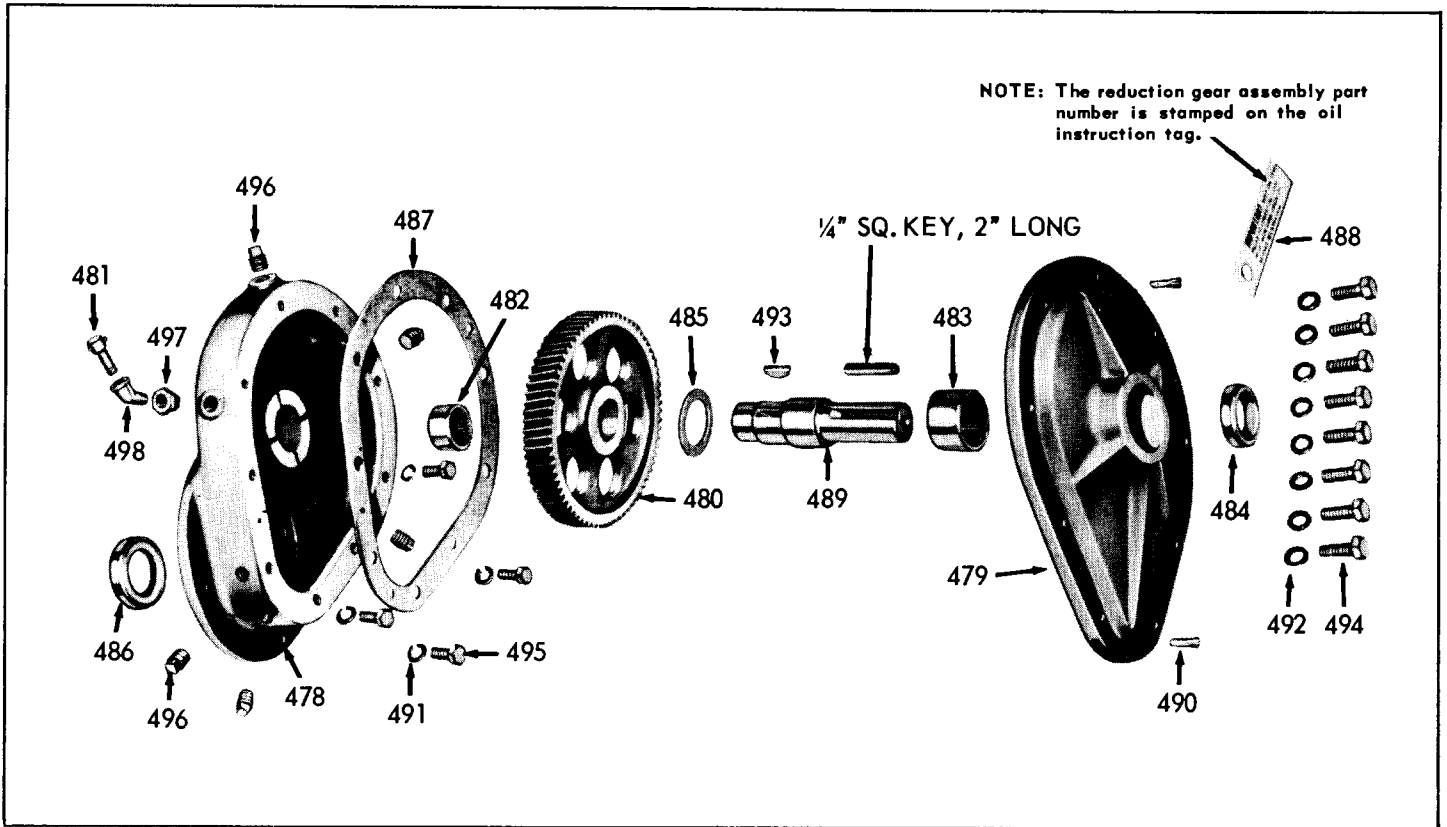
CA-48D-2-S1 CRANKSHAFT ASSEMBLY (not illustrated) consisting of:

- | | |
|-----------------------|------------------|
| 1 CA-48D-2 Crankshaft | 2 ME-84 Bearings |
| 1 GA-39 Gear | 1 PL-55 Key |

REF. NO.	PART NUMBER	DESCRIPTION	NO. REQ.	NET WEIGHT	
				LBS	OZ
458	LO-44	BREATHER	1		1
459	ME-92	NEEDLE BEARING inner, Torrington No. B-1816X	1		3
460	ME-93	NEEDLE BEARING outer, Torrington No. B-2420X	1		4
461	PD-221	LOCK-NUT , 3/4"-16 thread, for driver gear mounting	1		2
		PD-62-2 Castle nut and XI-9 Cotter pin, replaced by PD-221 Lock-nut.			
463	PH-265	OIL SEAL , Victor No. 60320	2		3
		1-for crankshaft 1-for take-off shaft			
464	PH-333-D	THRUST WASHER for WW-64-E assembly (.022" thick)	1		1
465	SD-79	TAG for oil instruction	1		1
466	WA-69	TAKE-OFF SHAFT	1	2	2
STANDARD HARDWARE					
467	PA-289	TAPER PIN , 3/16" dia. x 5/8" long, half taper	2		1
		For cover to housing mounting.			
468	PE-5	LOCKWASHER , 3/8" Positive	4		1
		For housing to crankcase mounting.			
469	PH-14	WASHER , 5/16" plain copper	8		1
		For mounting cover to housing. PE-4 Lockwasher, replaced by PH-14.			
470	PL-16	KEY , No. 11 Woodruff, for drive gear mounting.	1		1
471	PL-50	KEY , No. 16 Woodruff, for driven gear mounting	1		1
472	XD-17	SCREW , 5/16"-18 thread x 1" long, hexagon head	8		1
		For mounting cover to housing.			
473	XD-27	SCREW , 3/8"-16 thread x 1" long, hexagon head	4		1
		For housing to crankcase mounting.			
475	XK-2	PIPE PLUG , 1/4" square head	4		1
		For oil filler, drain and level holes.			
476	XK-21	REDUCER BUSHING , 1/4" to 1/8" pipe	1		1
		For breather mounting.			
477	XK-77-A	STREET ELL , 1/8" x 45°	1		1
		For breather mounting.			

Order parts from nearest **WISCONSIN DISTRIBUTOR** or **SERVICE CENTER**.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

WW-64E-6, 6.059 TO 1 REDUCTION GEAR ASSEMBLY



157740C-1

NOTE: Engines equipped with this reduction unit require...

CA-48D-112-S1 CRANKSHAFT ASSEMBLY (17 tooth spiral gear)

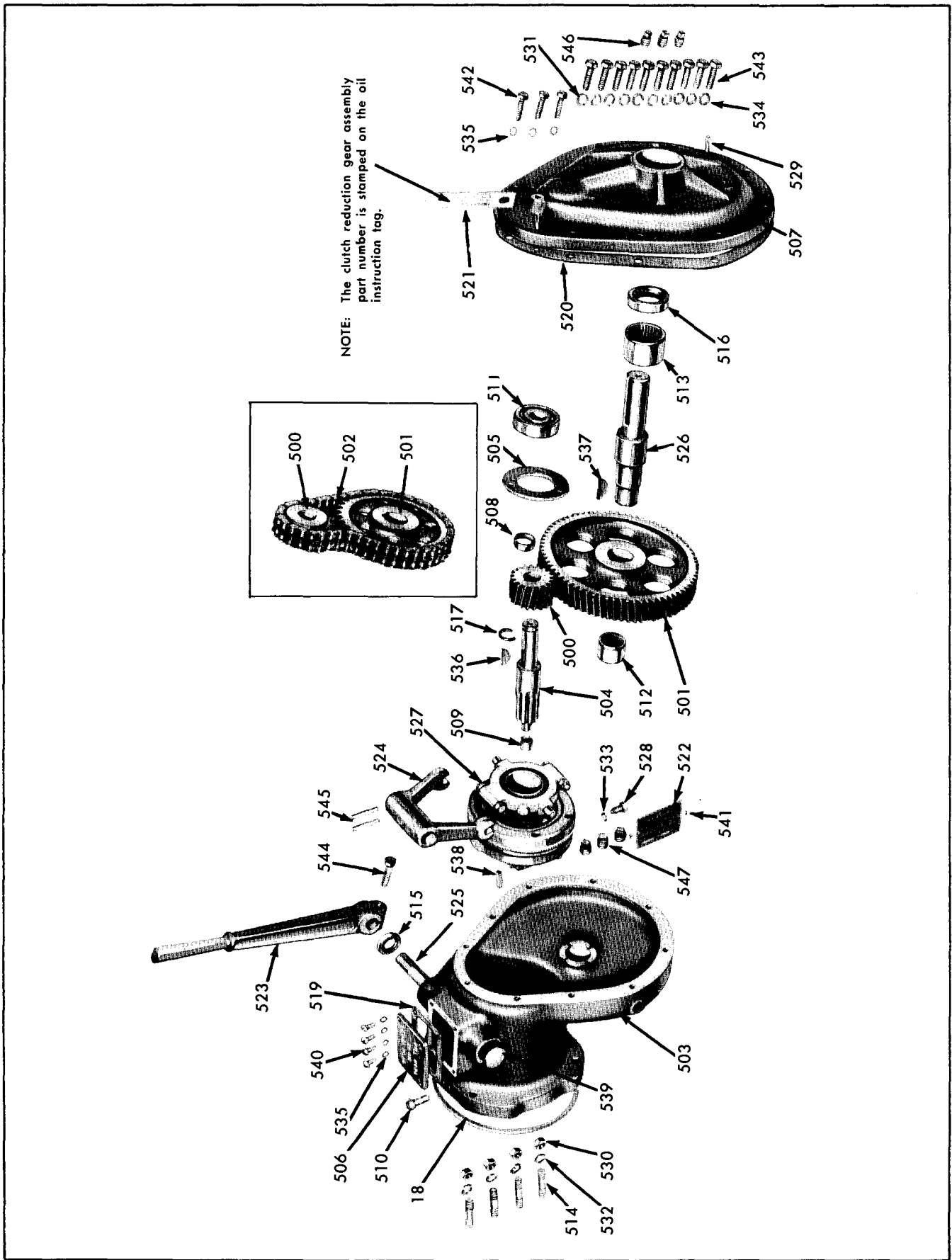
Consisting of:

1 CA-48D-112 Crankshaft 2 ME-84 Bearings
1 GA-39 Gear 1 PL-55 Key

Ref. No.	Part Number	Description	No. Req.		Net Wt.		Ref. No.	Part Number	Description	No. Req.		Net Wt.	
					Lb	Oz						Lb	Oz
	WW-64E-6	REDUCTION GEAR ASSEMBLY Counter Enginewise rotation. Consisting of:	1		27								
478	BG-244A-1	HOUSING and ENGINE BEARING PLATE	1		12		490	PA-289	TAPER PIN, 3/16" dia. x 5/8" long, half taper	2		1	
479	BH-144-A	COVER	1		6		491	PE-5	LOCKWASHER, 3/8" Positive	4		1	
480	GG-136-5	DRIVEN GEAR - 103 teeth	1		6		492	PH-14	WASHER, 5/16" plain copper	8		1	
481	LO-44	BREATHER ASSEMBLY	1		1		493	PL-50	KEY, No. 16 Woodruff	1		1	
482	ME-92	NEEDLE BEARING, inner - Torrington No. B-1816X	1		3		494	XD-17	SCREW, 5/16"-18 thread x 1" long, hexagon head	8		1	
483	ME-93	NEEDLE BEARING, outer - Torrington No. B-2420X	1		4		495	XD-27	SCREW, 3/8"-16 thread x 1" long, hexagon head	4		1	
484	PH-265	OIL SEAL for take-off shaft, Victor No. 60320	1		3		496	XK-2	PIPE PLUG, 1/4" square head	2		1	
485	PH-333-E	THRUST WASHER for driven gear (.005" thick) Replaces PH-333-A.	2		1			PF-51	PIPE PLUG, 1/4" slotted - for plugging optional drain and level holes	4		1	
486	PH-374	OIL SEAL for crankshaft, National No. 50129	1		3		497	XK-21	REDUCER BUSHING, 1/4" to 1/8" pipe For breather mounting.	1		1	
487	QD-623-A	GASKET for cover to housing	1		1		498	XK-77-A	STREET ELL, 1/8" x 45°, brass	1		1	
488	SD-79	TAG for oil instruction	1		1								
489	WA-69	TAKE-OFF SHAFT	1	2	2								

Order parts from nearest **WISCONSIN DISTRIBUTOR** or **SERVICE CENTER**.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

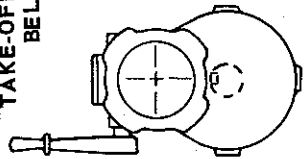
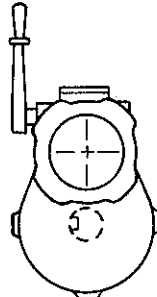
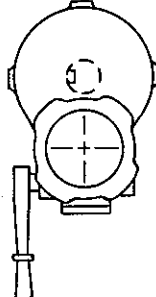
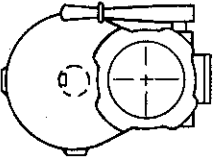
WW-79-A Etc. CLUTCH REDUCTION GEAR ASSEMBLIES



Parts are identified by reference number. See parts list for correct part number.

99747C

**WW-79-A Etc. CLUTCH REDUCTION GEAR ASSEMBLIES
FOR AEN ENGINE**

Position of Take-Off Shaft is Determined When Viewed From Cranking End of Engine	Assembly Part Number	Reduction Ratio	Rotation of Take-off Shaft	Ref. No. 500	Ref. No. 501	Ref. No. 502	Ref. No. 503	Ref. No. 504
				Driver Gear Part No.	Driven Gear Part No.	Chain Part No.	Housing Part No.	Clutch Shaft Part No.
TAKE-OFF SHAFT BELOW 	WW-79-A	2.12 to 1	Engine-Wise	GG-138	GG-137	GJ-19	BG-232	WA-95
	WW-79A-1	3.08 to 1	Engine-Wise	GG-133	GG-132	GJ-20	BG-232	WA-95
	WW-79A-2	4.00 to 1	Engine-Wise	GG-123	GG-132	GJ-19	BG-232	WA-95
	WW-79A-3	2.03 to 1	Counter Engine-Wise	GG-139	GG-119-2	.....	BG-232	WA-95
	WW-79A-4	2.96 to 1	Counter Engine-Wise	GG-140	GG-136	.....	BG-232	WA-95
	WW-79A-5	4.06 to 1	Counter Engine-Wise	GG-141	GG-135	.....	BG-232	WA-95
	WW-79A-6	5.06 to 1	Counter Engine-Wise	GG-142	GG-134-1	.....	BG-232	WA-95
WW-79A-7	6.00 to 1	Counter Engine-Wise	On Shaft	GG-134	.....	BG-232	WA-95-A	
TAKE-OFF SHAFT ON LEFT HAND SIDE as viewed from cranking end 	WW-79A-8	2.12 to 1	Engine-Wise	GG-138	GG-137	GJ-19	BG-232-1	WA-95
	WW-79A-9	3.08 to 1	Engine-Wise	GG-133	GG-132	GJ-20	BG-232-1	WA-95
	WW-79A-10	4.00 to 1	Engine-Wise	GG-123	GG-132	GJ-19	BG-232-1	WA-95
	WW-79A-11	2.03 to 1	Counter Engine-Wise	GG-139	GG-119-2	.....	BG-232-1	WA-95
	WW-79A-12	2.96 to 1	Counter Engine-Wise	GG-140	GG-136	.....	BG-232-1	WA-95
	WW-79A-13	4.06 to 1	Counter Engine-Wise	GG-141	GG-135	.....	BG-232-1	WA-95
	WW-79A-14	5.06 to 1	Counter Engine-Wise	GG-142	GG-134-1	.....	BG-232-1	WA-95
WW-79A-15	6.00 to 1	Counter Engine-Wise	On Shaft	GG-134	.....	BG-232-1	WA-95-A	
TAKE-OFF SHAFT ON RIGHT HAND SIDE as viewed from cranking end 	WW-79A-16	2.12 to 1	Engine-Wise	GG-138	GG-137	GJ-19	BG-232-2	WA-95
	WW-79A-17	3.08 to 1	Engine-Wise	GG-133	GG-132	GJ-20	BG-232-2	WA-95
	WW-79A-18	4.00 to 1	Engine-Wise	GG-123	GG-132	GJ-19	BG-232-2	WA-95
	WW-79A-19	2.03 to 1	Counter Engine-Wise	GG-139	GG-119-2	.....	BG-232-2	WA-95
	WW-79A-20	2.96 to 1	Counter Engine-Wise	GG-140	GG-136	.....	BG-232-2	WA-95
	WW-79A-21	4.06 to 1	Counter Engine-Wise	GG-141	GG-135	.....	BG-232-2	WA-95
	WW-79A-22	5.06 to 1	Counter Engine-Wise	GG-142	GG-134-1	.....	BG-232-2	WA-95
WW-79A-23	6.00 to 1	Counter Engine-Wise	On Shaft	GG-134	.....	BG-232-2	WA-95-A	
TAKE-OFF SHAFT ON TOP 	WW-79A-24	2.12 to 1	Engine-Wise	GG-138	GG-137	GJ-19	BG-232-3	WA-95
	WW-79A-25	3.08 to 1	Engine-Wise	GG-133	GG-132	GJ-20	BG-232-3	WA-95
	WW-79A-26	4.00 to 1	Engine-Wise	GG-123	GG-132	GJ-19	BG-232-3	WA-95
	WW-79A-27	2.03 to 1	Counter Engine-Wise	GG-139	GG-119-2	.....	BG-232-3	WA-95
	WW-79A-28	2.96 to 1	Counter Engine-Wise	GG-140	GG-136	.....	BG-232-3	WA-95
	WW-79A-29	4.06 to 1	Counter Engine-Wise	GG-141	GG-135	.....	BG-232-3	WA-95
	WW-79A-30	5.06 to 1	Counter Engine-Wise	GG-142	GG-134-1	.....	BG-232-3	WA-95
WW-79A-31	6.00 to 1	Counter Engine-Wise	On Shaft	GG-134	.....	BG-232-3	WA-95-A	

See following page for weights and description

WW-79-A Etc. CLUTCH REDUCTION GEAR ASSEMBLIES

WEIGHTS OF PARTS SHOWN ON PRECEDING PAGE

PART NUMBER	NET WT.		PART NUMBER	NET WT.		PART NUMBER	NET WT.	
	LBS	OZ		LBS	OZ		LBS	OZ
BG-232	20		GJ-19 (23" long)	1	9	WW-79A-14	54	8
BG-232-1	20		GJ-20 (23½" long)	1	10	WW-79A-15	54	8
BG-232-2	20		WA-95	1	3	WW-79A-16	53	8
BG-232-3	20		WA-95-A	1	8	WW-79A-17	53	8
GG-119-2 (61 teeth)	4	14	WW-79-A	53	8	WW-79A-18	53	
GG-123 (10 teeth)		5	WW-79A-1	53	8	WW-79A-19	54	
GG-132 (40 teeth)	3	13	WW-79A-2	53		WW-79A-20	55	
GG-133 (13 teeth)		11	WW-79A-3	54		WW-79A-21	54	8
GG-134 (78 teeth)	7	1	WW-79A-4	55		WW-79A-22	54	8
GG-134-1 (76 teeth)	6	12	WW-79A-5	54	8	WW-79A-23	54	8
GG-135 (73 teeth)	6	8	WW-79A-6	54	8	WW-79A-24	53	8
GG-136 (68 teeth)	6	4	WW-79A-7	54	8	WW-79A-25	53	8
GG-137 (36 teeth)	3	8	WW-79A-8	53	8	WW-79A-26	53	
GG-138 (17 teeth)	1	5	WW-79A-9	53	8	WW-79A-27	54	
GG-139 (30 teeth)	1	15	WW-79A-10	53		WW-79A-28	55	
GG-140 (23 teeth)	1	8	WW-79A-11	54		WW-79A-29	54	8
GG-141 (18 teeth)		12	WW-79A-12	55		WW-79A-30	54	8
GG-142 (15 teeth)		5	WW-79A-13	54	8	WW-79A-31	54	8

INTERCHANGEABLE PARTS OF WW-79-A Etc. CLUTCH REDUCTION GEAR ASSEMBLIES

NOTE: Engines equipped with a clutch reduction gear assembly require a special main bearing plate, crankshaft and cylinder-crankcase as follows:

BG-241-1-S1 MAIN BEARING PLATE ASSEMBLY (not illustrated) consisting of:
 1 BG-241-1 Bearing Plate 1 ME-59-1 Bearing Cup 1 PH-265 Oil Seal

CA-48D-1-S2 CRANKSHAFT ASSEMBLY (not illustrated) consisting of:
 1 CA-48D-1 Crankshaft 1 HG-182 Bushing 1 PL-55 Key
 1 GA-39 Gear 2 ME-84 Bearings

**THE PART NUMBER OF THE CYLINDER-CRANKCASE CAN BE FOUND
 STAMPED ON THE FUEL TANK MOUNTING PAD OF THE CRANKCASE.**

Ref. No.	Part Number	Description	No. Net Wt.			Ref. No.	Part Number	Description	No. Net Wt.		
			Reg	Lb	Oz				Reg	Lb	Oz
505	BG-233	PLATE for bearing retainer	1		4	518	QD-650-1	GASKET for housing to crankcase mounting	1		1
506	BH-115-A	COVER for inspection hole (stamping) .. BH-115 (cast iron), replaced by BH-115A	1		2	519	QD-551	GASKET for inspection hole cover	1		1
507	BH-157	COVER for housing	1	9		520	QD-651	GASKET for cover to housing	1		1
508	HF-230	SPACER for clutch shaft bearing	1		1	521	SD-79	TAG for oil instruction	1		1
509	HG-182	BUSHING for clutch shaft pilot	1		1	522	SD-125-A	INSTRUCTION PLATE For clutch adjustment. SD-132, replaced by SD-125-A.	1		1
510	LO-44	BREATHER	1		1	523	VB-55-1	SHIFTER LEVER	1	2	
511	ME-10	BEARING for clutch shaft	1		6	524	VB-64-A	SHIFTER YOKE	1	1	4
512	ME-92	NEEDLE BEARING inner, Torrington No. B-1816X	1		3	525	WA-61	SHIFTER SHAFT	1		1
513	ME-93	NEEDLE BEARING outer, Torrington No. B-2420X	1		4	526	WA-69	TAKE-OFF SHAFT	1	2	2
514	PC-392	STUD for housing to crankcase mounting	4		2	527	WC-280-B	CLUTCH, Rockford Model 4½ LOC, No. CLA-1761. NOTE: See Rockford illustration and parts list for clutch parts. Page 42.	1	8	6
515	PH-234-A	OIL SEAL for shifter lever shaft	1		2	528	XD-14-2	SET SCREW for clutch drive hub	1		1
516	PH-265	OIL SEAL for take-off shaft	1		3						
517	PK-76	RETAINING RING for clutch shaft mtg.	1		1						

Order parts from nearest **WISCONSIN DISTRIBUTOR** or **SERVICE CENTER**.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

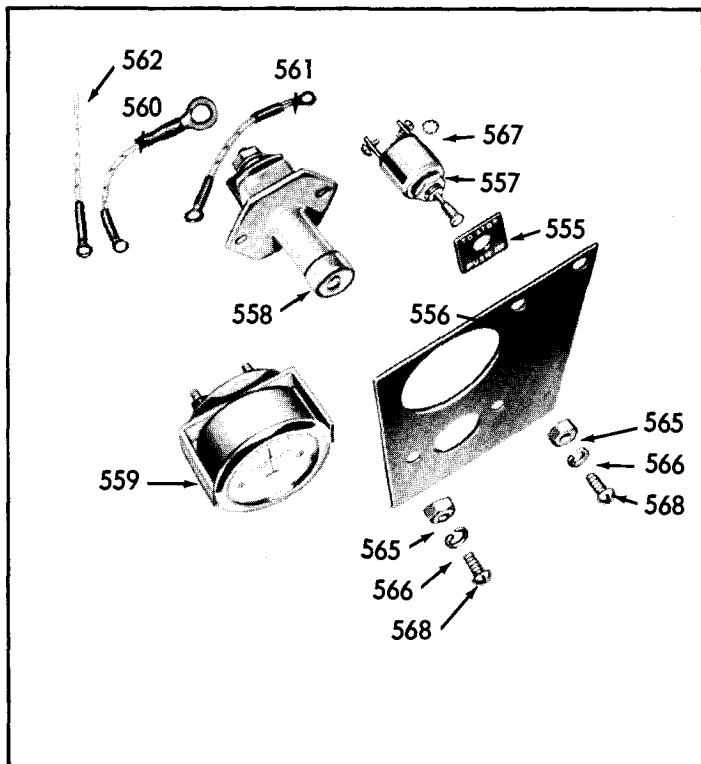
INTERCHANGEABLE PARTS OF WW-79-A Etc. CLUTCH REDUCTION GEAR ASSEMBLIES

Ref. No.	Part Number	Description	No. Req	Net Wt.	
				Lb	Oz
STANDARD HARDWARE					
529	PA-289	TAPER PIN , 3/16" dia. x 5/8" long, half taper For cover to housing mounting.	2		1
530	PD-12	NUT , 7/16"-20 thread, hexagon For housing to crankcase studs.	4		1
531	PE-4	LOCKWASHER , 5/16" Positive For cover to housing—above oil level.	7		1
532	PE-6	LOCKWASHER , 7/16" Positive For housing to crankcase studs.	4		1
533	PE-46	LOCKWASHER , 5/16" external Everlock For drive hub set screw.	1		1
534	PH-14	WASHER , 5/16" I.D. x 19/32" O.D. x 1/16" thick, plain copper For cover to housing—below oil level.	3		1
535	PH-30	WASHER , 1/4" I.D. x 7/16" O.D. x 1/16" thick, plain copper..... 4-for inspection hole cover. 3-for bearing retainer plate.	7		1
536	PL-16	KEY , No. 11 Woodruff For driver gear mounting.	1		1
537	PL-50	KEY , No. 16 Woodruff..... For driven gear mounting.	1		1
538	PL-86	KEY , 1/4" square x 1" long For drive hub mounting.	1		1
539	SA-58	PLUG , 1-3/8" expansion For shifter shaft hole.	1		1
540	XA-34	SCREW , 1/4"-20 thread x 1/2" long, round head For inspection hole cover (stamping). XA-35, 5/8" long, for cast iron cover.	4		1
542	XD-7	SCREW , 1/4"-20 thread x 1" long, hexagon head For bearing retainer plate.	3		1
543	XD-17	SCREW , 5/16"-18 thread x 1" long, hexagon head For cover to housing mounting.	10		1
544	XD-30	SCREW , 3/8"-16 thread x 1-1/2" long, hexagon head For clamping shifter lever.	1		1
545	PA-341	ROLL PIN , 1/4" dia. x 1-1/8" long..... For shifter yoke to shaft. XH-26, No. 4 x 1-3/8" long, taper pin, replaced by PA-341.	2		1
546	XK-1	PLUG , 1/8" square head, pipe For oil level holes.	3		1
547	XK-3	PLUG , 3/8" square head, pipe For oil drain holes.	3		1

Order parts from nearest **WISCONSIN DISTRIBUTOR** or **SERVICE CENTER**.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

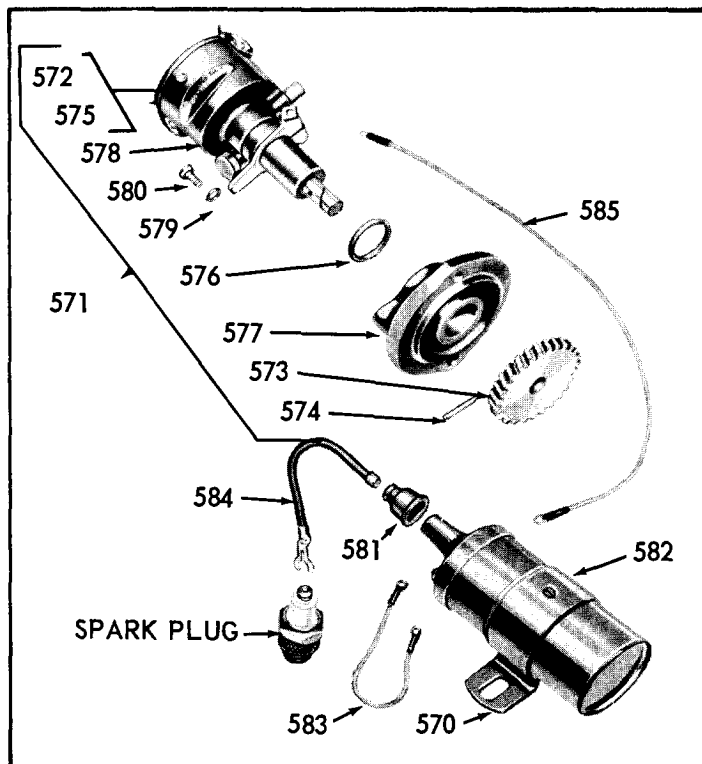
ELECTRICAL EQUIPMENT FOR MODEL AENL ENGINE

CONTROL PANEL



236522C

IGNITION TIMER



236523C

Ref. No.	Part Number	Description	No. Req.	Net Wt.	
				Lb	Oz
555	SD-109	TAG for ignition switch	1	1	
556	VE-262-2	CONTROL PANEL	1	4	
557	YC-9-B	IGNITION SWITCH	1	2	
558	YC-10-C	STARTING SWITCH	1	4	
		YC-10, replaced by YC-10-C.			
559	YE-2	AMMETER	1	6	
560	YL-353-6	IGNITION WIRE ASSEMBLY, starter switch to ammeter	1	1	
561	YL-352-4	IGNITION WIRE ASSEMBLY, ammeter to ignition switch	1	1	
562	YL-352-19	IGNITION WIRE ASSEMBLY, circuit breaker to ammeter	1	2	
STANDARD HARDWARE					
565	PD-77	NUT, 1/4"-20 thread, hexagon steel... 2-for control panel 2-for starting switch	4	1	
566	PE-3	LOCKWASHER, 1/4" Positive	4	1	
		2-for control panel 2-for starting switch			
567	PE-72	LOCKWASHER for ignition switch terminal	2	1	
568	XA-34	SCREW, 1/4"-20 thread x 1/2" long, indented hexagon head	2	1	
		For control panel.			
	XA-36	SCREW, 1/4"-20 thread x 3/4" long, indented hexagon head	2	1	
		For starting switch.			

Ref. No.	Part Number	Description	No. Req.	Net Wt.	
				Lb	Oz
570	PG-556-2	BRACKET for mounting coil	1	4	
		PG-556, replaced by PG-556-2.			
571	TF-105	IGNITION TIMER ASSEMBLY	1	4	8
		Consisting of:			
572	BH-151B	Cover (stamping) replaces cast iron cover BH-151 and QD-711 gasket	1	2	
573	GD-114A	Drive gear.....	1	8	
		GD-114, replaced by GD-114A.			
574	PA-313	Pin for gear	1	1	
575	QD-711	Gasket for BH-151 cast iron cover 1	1	1	
576	JK-59	'O' ring seal for adapter	1	1	
577	TB-116-1	Adapter	1	1	6
578	YF-8-C	Timer, Prestolite No.IGW-4408 (less cover) - replaces YF-8A, IGW-4405 and IGW-4179	1	2	3
		(YF-8C-51 Timer Assembly with cover)			
		NOTE: See Prestolite illustration and parts list for Timer service parts.			
579	PE-3	Lockwasher for advance arm	1	1	
580	XD-4	Screw for advance arm	1	1	
581	YD-20-A	RUBBER NIPPLE for coil terminal	1	1	
582	YF-11	IGNITION COIL (6 volt)	1	1	12
	YF-5-B	IGNITION COIL (12 volt)	1	1	12
583	YL-352-11	IGNITION WIRE ASSEMBLY, coil to ignition switch.....	1	1	
584	YL-339-6	IGNITION CABLE, coil to spark plug... YL-166, replaced by YL-339-6.	1	1	
585	YL-352-21	IGNITION WIRE ASSEMBLY, coil to timer.....	1	2	

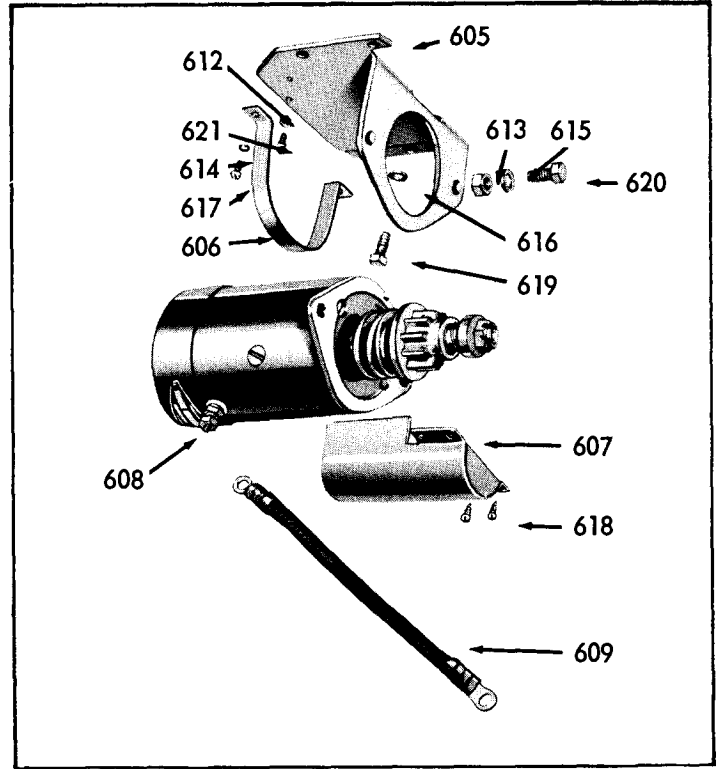
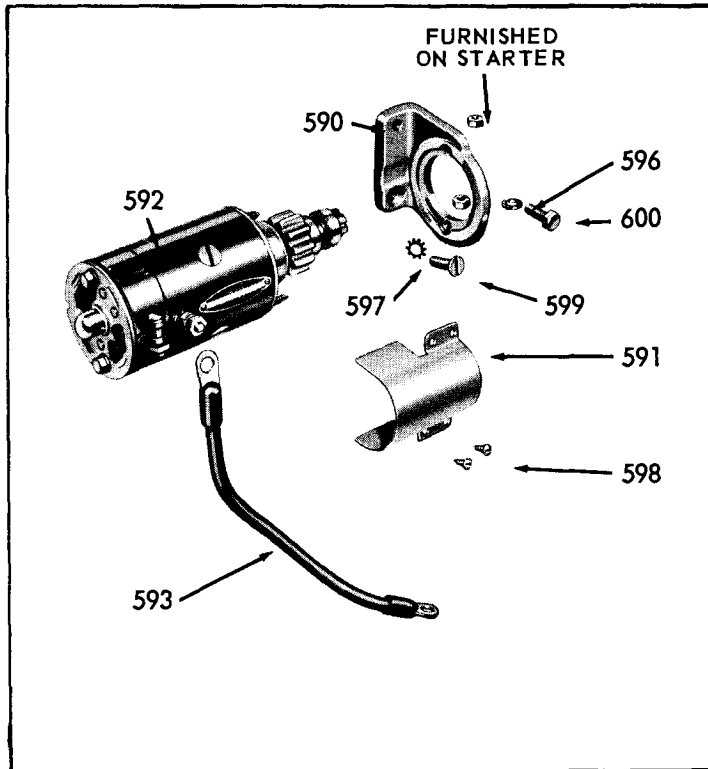
Order parts from nearest WISCONSIN DISTRIBUTOR or SERVICE CENTER.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

ELECTRIC STARTING MOTOR

For Model AENL

3" Diameter, 6 and 12 Volt (EEA-105)

3-5/8" Diameter, 6 Volt (obsolete)



250735C

251438C

Ref. No.	Part Number	Description	No. Req.	Net Wt.	
				Lb	Oz
590	BI-370 (See pg. 54a)	BRACKET for YA-50 (12 volt) starter.... Beginning with engine Serial No. 5,000,100	1	1	8
	BI-347-2	Previous to Serial No. 5,000,100		1	8
	BI-347	BRACKET for YA-29 (6 volt) starter.....	1	1	8
591	SE-165-A	COVER for starter Bendix	1		3
592	YA-50 (Repl'd by YA63) (See pg. 54a)	STARTING MOTOR (12 volt) MGD-4102A. Used in conjunction with either BI-370 or BI-347-2 Brackets. YA-27 (MDO-4102M) repl'd. by YA-50.	1		8
	(Alternate) YA-58	STARTING MOTOR (12 volt) with in- tegral mounting bracket. Available on engines beg. with Serial No. 5,000,100.	1	9	8
	YA-29	STARTING MOTOR (6 volt) MDH-4001M. Used with BI-347 bracket. NOTE: For starting motor service parts, refer to separate illustration.	1		6
593	YL-356-11	STARTER CABLE starter to switch	1		5
		STANDARD HARDWARE			
596	PE-4	LOCKWASHER, 5/16", spring lock	1	1	
	PE-5	For BI-347 type starter bracket mtg. 3/8" for BI-370 and YA-58 mounting.			
597	PE-49	LOCKWASHER, 5/16", counter-sunk	1	1	
		For BI-347 type starter bracket mtg.			
598	XA-73	SCREW No. 7 x 3/8" long, self-tapping For starter Bendix cover.	4		1
599	XC-64	SCREW, 5/16"-18 thread x 1" long, flat hd. For BI-347 type starter bracket mtg.	1		1
600	XD-16	SCREW 5/16"-18 x 7/8" long, hex. hd. For BI-347 type starter bracket mtg.	1		1
	XD-27	SCREW, 3/8"-16 x 1" long, hex. hd. For BI-370 and YA-58 mounting.	2		1

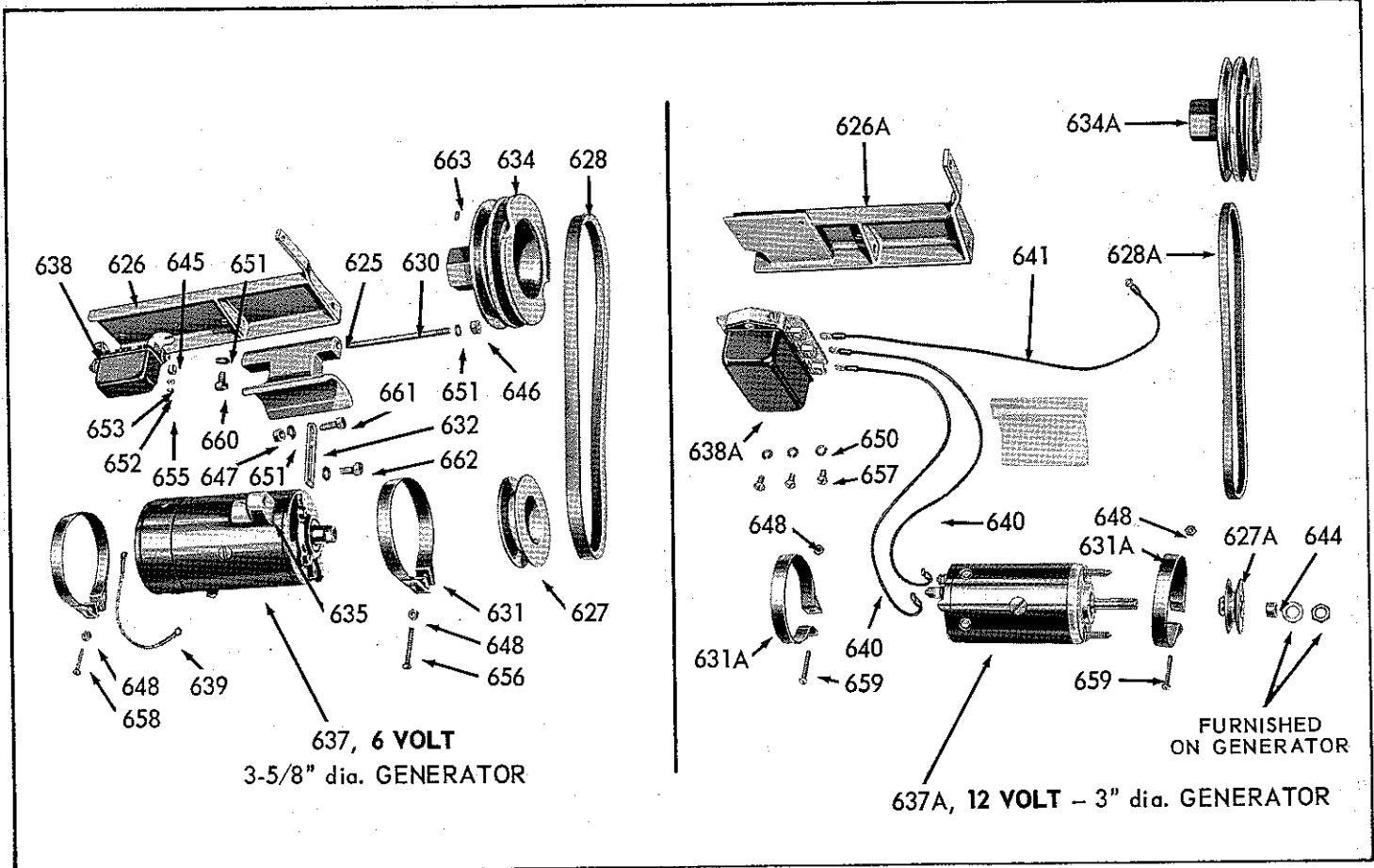
Ref. No.	Part Number	Description	No. Req.	Net Wt.	
				Lb	Oz
605	BI-294-2	BRACKET for mounting starter.....	1	2	
606	PG-657	STARTER SUPPORT STRAP	1		2
607	SE-165	COVER for starter Bendix	1		4
608	YA-5-B	STARTING MOTOR (6 volt) MAK-4008 .. NOTE: For starting motor service parts, refer to separate illustration.	1	10	12
609	YL-356-11	STARTER CABLE, starter to switch	1		5
		STANDARD HARDWARE			
612	PD-77-1	NUT, 1/4"-20, hexagon steel (Jam nut) For starter bracket support screw.	1		1
613	PD-79	NUT, 3/8"-16 thread, hexagon steel	2		1
614	PE-3	LOCKWASHER, 1/4" Positive.....	2		1
		For starter support strap.			
615	PE-5	LOCKWASHER, 3/8" Positive	2		1
		For mounting starter.			
616	PH-14	PLAIN WASHER, 5/16" 1.D. copper	2		1
		For starter bracket mounting.			
617	XA-33	SCREW, 1/4"-20 x 3/8" long, round hd. For starter support strap.	2		1
618	XA-73	SCREW, No. 7 x 3/8" long, self-tapping, round head. For starter Bendix cover....	4		1
619	XD-13	SCREW, 5/16"-18 x 1/2" long, hex. hd. For starter bracket mounting.	2		1
620	XD-25	SCREW, 3/8"-16 x 3/4" long, hex. hd. For mounting starter.	2		1
621	XE-36	SET SCREW, 1/4"-20 x 1/2" long, sq. hd. For starter bracket support.	1		1

Order parts from nearest **WISCONSIN DISTRIBUTOR** or **SERVICE CENTER**.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

GENERATOR MOUNTING FOR MODEL AENL ENGINE

6 VOLT

12 VOLT



NOTE: The cradle, stud and miscellaneous parts for mounting generator to support bracket are identical for both 6 and 12 volt generators, except where noted.

250734C

Ref. No.	Part Number	Description	No. Req.	Net Wt.	
				Lb	Oz
625	BI-295	CRADLE for mounting generator	1	1	8
626	BI-313	BRACKET for mounting 6 volt generator	1	2	12
626A	BI-313-B	BRACKET for mounting 12 volt generator	1	3	
627	MD-333	PULLEY for 6 volt generator	1		14
627A	MD-370-1	PULLEY for 12 volt generator	1		8
628	MH-142	BELT for 6 volt generator, Gates #2300	1		5
628A	MH-173	BELT for 12 volt generator, 3/8" wide x 29" long endless, industrial.	1		5
630	PC-454	STUD for mounting generator cradle	1		2
631	PG-117	STRAP for mounting 6 volt generator ..	2		2
631A	PG-851	STRAP for mounting 12 volt generator	2		2
632	PG-661	STRAP for generator belt adjustment ..	1		2
634	UC-133	SHEAVE for 6 volt generator drive	1	3	8
634A	UC-133-12	SHEAVE for 12 volt generator drive	1	3	8
635	VC-34	SUPPORT for generator adjusting strap	1		3
637	YB-6-A	GENERATOR (6 volt - 3-5/8" dia.) Prestolite No. GAS-4103-1 (pos. grd.) ..	1		11

Ref. No.	Part Number	Description	No. Req.	Net Wt.	
				Lb	Oz
637A	YB-47-C	GENERATOR (12 volt-3" dia.-neg. grd.) PRESTOLITE No. GJG-4010M, for engines beginning with serial No. 3991018. YB-47-A (12 volt - positive ground) Prestolite No. GJG-4001MP, for engines to and incl. serial No. 3991017. For replacement use YB-47-C neg. grd. generator and YJ-33-K neg. grd. regulator. NOTE: See Prestolite illustrations and parts list for Generator service parts.	1		8
638	YJ-5	CIRCUIT BREAKER (6 volt) Prestolite No. CB-4008	1		6
638A	YJ-33-K	CURRENT-VOLTAGE REGULATOR .. (12 volt - negative ground). PRESTOLITE No. VBO-4201-Y1, used with YB-47-C Generator. YJ-33-J (positive ground) Prestolite No. VBO-4201-Z1, used with YB-47-A Generator. YJ-33-B, replaced by YJ-33-J.	1		2
639	YL-352-11	IGNITION WIRE ASSEMBLY, circuit breaker to generator	1		1

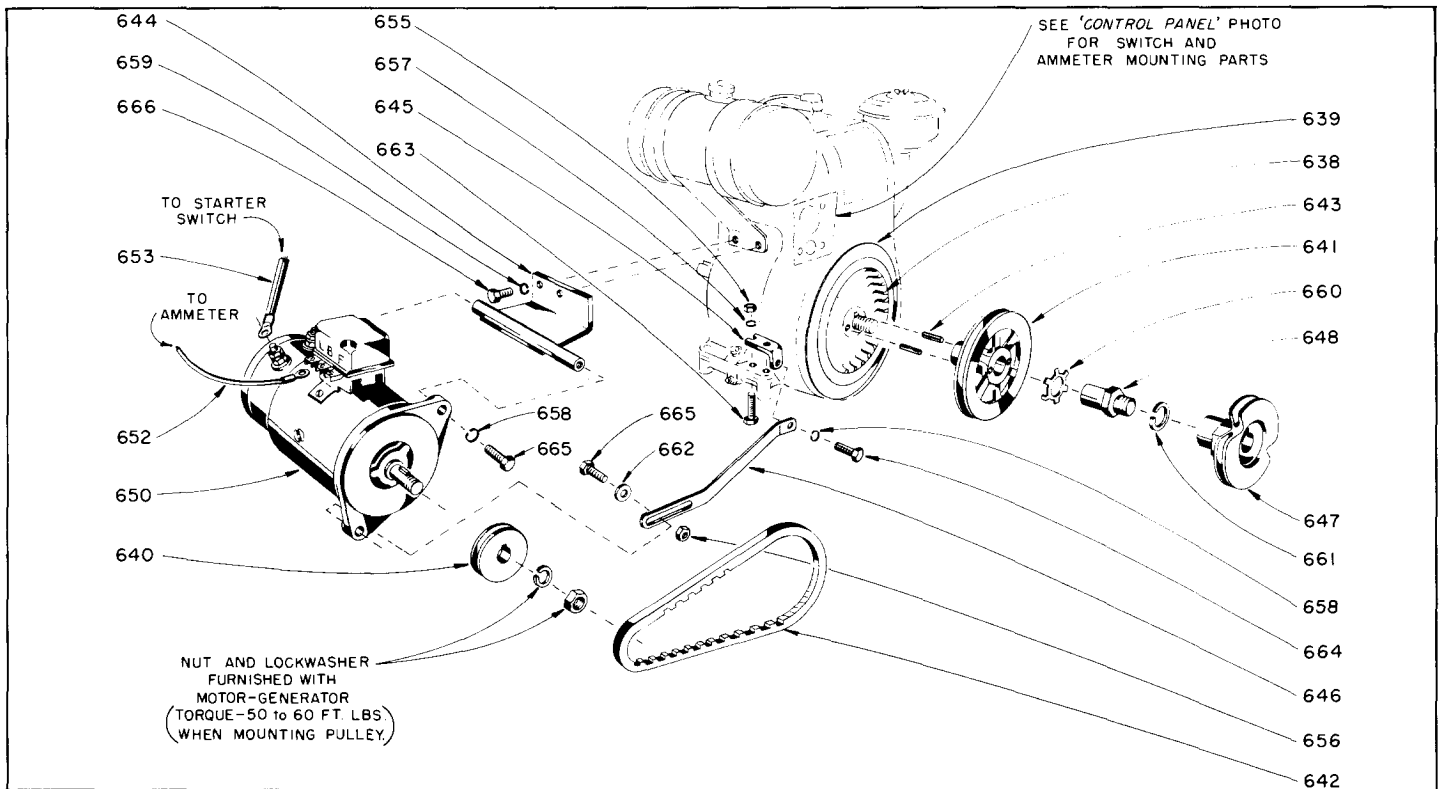
Order parts from nearest WISCONSIN DISTRIBUTOR or SERVICE CENTER.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

6 VOLT AND 12 VOLT GENERATOR MOUNTING FOR MODEL AENL ENGINE

Ref. No.	Part Number	Description	No.			Net Wt.			Ref. No.	Part Number	Description	No.			Net Wt.		
			Req	Lb	Oz	Req	Lb	Oz				Req	Lb	Oz	Req	Lb	Oz
640	YL-352-4	IGNITION WIRE ASSEMBLY 1-for generator to regulator (FLD). 1-for generator to regulator (ARM).	2		1				660	XD-15	SCREW, 5/16"-18 thread x 3/4" long, hexagon head For generator bracket.	2		1			
641	YL-352-19	IGNITION WIRE ASSEMBLY For regulator to ammeter.	1		2				661	XD-15-2	SCREW, 5/16"-18 thread x 3/4" long, 5/32" thick, hexagon head For generator adjusting strap, at bracket.	1		1			
	YL-355-10	IGNITION WIRE ASSEMBLY (not illust.) Voltage regulator ground terminal to generator frame bolt.	1		1				662	XD-16	SCREW, 5/16"-18 thread x 7/8" long, hexagon head For generator adjusting strap, at generator.	1		1			
STANDARD HARDWARE																	
644	HF-430	SPACER for 12 volt generator pulley, 15/32" I.D. x 9/16" O.D. x 5/16" long, steel	1		1				663	XE-55	SET SCREW, 5/16"-18 thread x 3/8" long, Allen head For generator drive sheave.	1		1			
645	HF-481	SPACER, 3/16" I.D. x 7/16" O.D. x 1/4" long, steel	2		1												
		For mounting circuit breaker.															
646	PD-10	NUT, 5/16"-24 thread, hexagon steel .. For generator cradle stud.	2		1												
647	PD-78	NUT, 5/16"-18 thread, hexagon steel . For generator adjusting strap.	1		1												
648	PD-115	NUT, No. 10-32 thread, hexagon steel For generator straps.	2		1												
650	PE-3	LOCKWASHER, 1/4" Positive For mounting voltage regulator.	3		1												
651	PE-4	LOCKWASHER, 5/16" Positive 2-for generator cradle stud. 2-for generator bracket. 2-for generator adjusting strap.	6		1												
652	PE-89	LOCKWASHER, No. 8 Positive For mounting circuit breaker.	2		1												
653	PH-86-B	PLAIN WASHER, 3/16" I.D. x 3/8" O.D. x 1/32" thick, steel	2		1												
		For mounting circuit breaker.															
655	XA-5	SCREW, No. 8-32 thread x 1/2" long, round head	2		1												
		For mounting circuit breaker.															
656	XA-11	SCREW, No. 10-32 thread x 1-1/2" long, round head	1		1												
		For 6 volt generator strap.															
657	XA-34	SCREW, 1/4"-20 thread x 1/2" long, indented hex. head	3		1												
		For mounting voltage regulator.															
658	XA-53	SCREW, No. 10-32 thread x 1" long, round head	1		1												
		For 6 volt generator strap.															
659	XA-56	SCREW, No. 10-32 thread x 1-1/4" long, round head	1		1												
	XA-11	SCREW, No. 10-32 thread x 1-1/2" long For 12 volt generator straps.	1		1												

Order parts from nearest **WISCONSIN DISTRIBUTOR** or **SERVICE CENTER**.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

12 VOLT MOTOR-GENERATOR EQUIPMENT FOR AENL ENGINE



Ref. No.	Part Number	Description	No. Req.	Net Wt.		Ref. No.	Part Number	Description	No. Req.	Net Wt.	
				Lb	Oz					Lb	Oz
638	NC-143-6	FLYWHEEL — replaces standard	1	15	12	652	YL-352-11	IGNITION WIRE ASSEMBLY, ammeter to motor-generator, current-voltage reg. .	1		1
639	SE-6-E	RIM — replaces standard screen	1		12	653	YL-356-11	STARTER CABLE ASSEMBLY	1		4
640	MD-367-B	DRIVEN PULLEY on motor-generator. Included with YB-37U-S1.	1		4	STANDARD HARDWARE					
641	MD-375E-1	DRIVE PULLEY	1	2	3	655	PD-77	NUT, 1/4"-20 thread, hexagon steel ... For adjusting strap bracket.	1		1
		MD-375, MD-375-1, replaced by MD-375E-1.				656	PD-78	NUT, hexagon steel, 5/16"-18 thread .. For adjusting strap at motor-generator.	1		1
642	MH-179	GENERATOR BELT	1		7	657	PE-3	LOCKWASHER, 1/4" Positive	1		1
643	PA-341	MH-169, replaced by MH-179.				658	PE-4	LOCKWASHER, 5/16" Positive	3		1
644	PG-856	ROLL PIN, 1/4" dia. x 1-1/8" long For generator drive pulley.	2		1	659	PE-5	LOCKWASHER, 3/8" Positive	2		1
645	PG-858-A	SUPPORT BRACKET for motor-generator	1	3	2	660	PE-100	LOCKWASHER, 1-1/8" Star	1		1
646	PG-859-A	BRACKET for adjusting strap	1		6	661	PE-101	LOCKWASHER, 7/8" for sheave	1		1
647	UC-103-F-S1	PG-858, replaced by PG-858-A.				662	PH-209B	PLAIN WASHER, 5/16" I.D. For adjusting strap to generator.	1		1
648	UC-173-E	ADJUSTING STRAP	1		12	663	XD-10-1	CAPSCREW, 1/4"-20 thread x 1-3/4" long, hexagon head (full length thread) .. For adjusting strap bracket.	1		1
		PG-859, replaced by PG-859-A.				664	XD-14-A	CAPSCREW, 5/16"-18 thread x 5/8" long, hexagon head (heat treated)	1		1
650	YB-37U-S1	ROPE STARTER SHEAVE with PE-101 lockwasher (standard engine parts)	1	1	6	665	XD-17-B	CAPSCREW, 5/16"-18 thread x 1" long, hexagon head (heat treated)	3		1
		UC-173 ext. nut — replaced by UC-173-E and UC-103-F-S1.			9	666	XD-29	CAPSCREW, 3/8"-16 thread x 1 1/4" long, hex. head. For motor-generator bracket.	2		1
		MOTOR-GENERATOR, 12 volt-12 amp. DelcoRemy No. 1101872 (neg. ground), beginning with engine No. 3991018. (Was No. 1101999 with 1118984 reg.)	1		25						
		YB-37B-S1 (positive ground), Delco-Remy No. 1101969 replaced by YB-37U-S1, but wire negative ground.									
		NOTE: Motor generators have been replaced by Bendix Starter plus fly-wheel alternator on production engines.									
		NOTE: See Delco-Remy illustration for motor-generator service parts.									

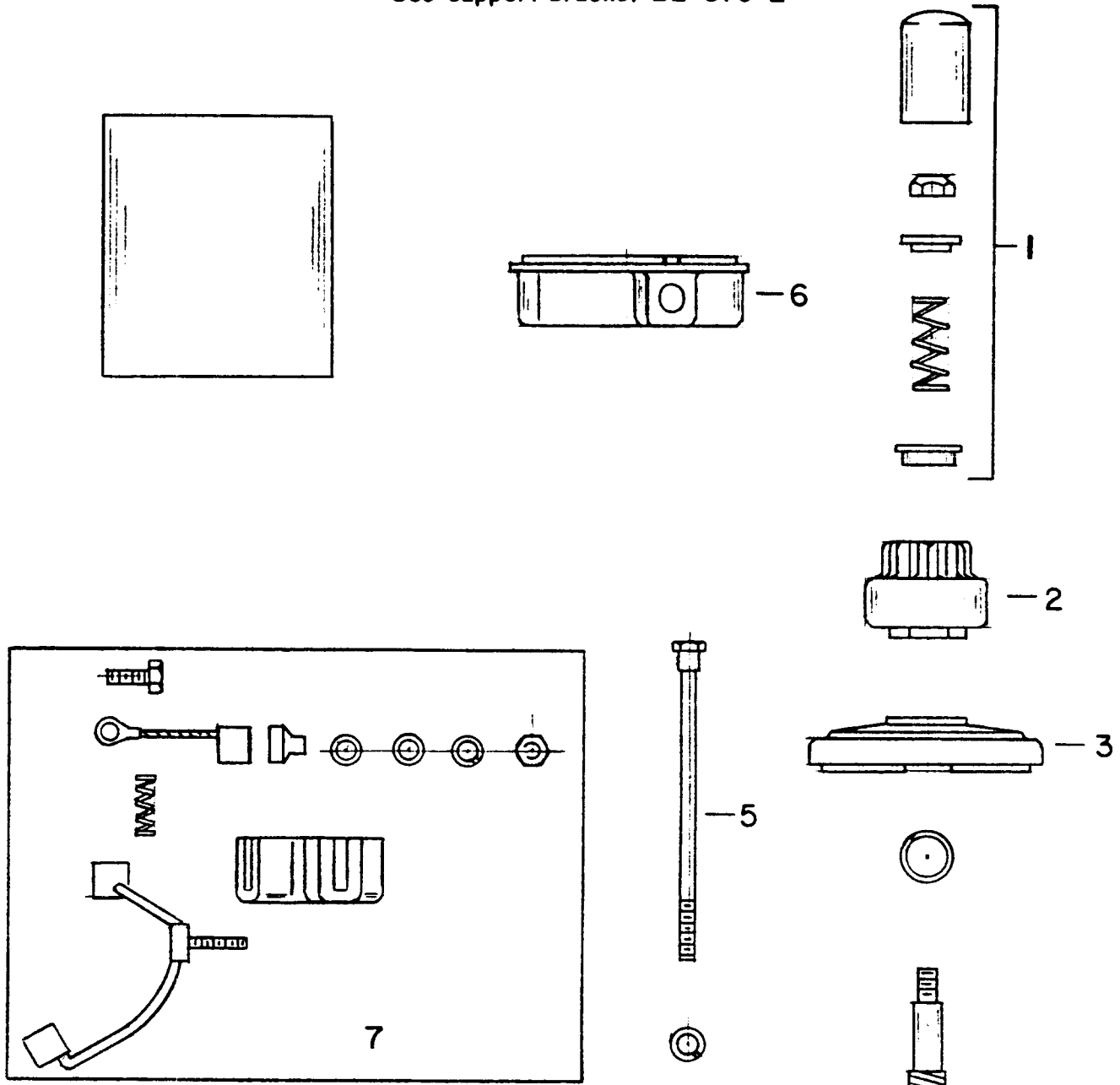
**Order parts from nearest WISCONSIN DISTRIBUTOR or SERVICE CENTER.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.**

YA63 STARTING MOTOR

American Bosch part number 02556-25-M030SM

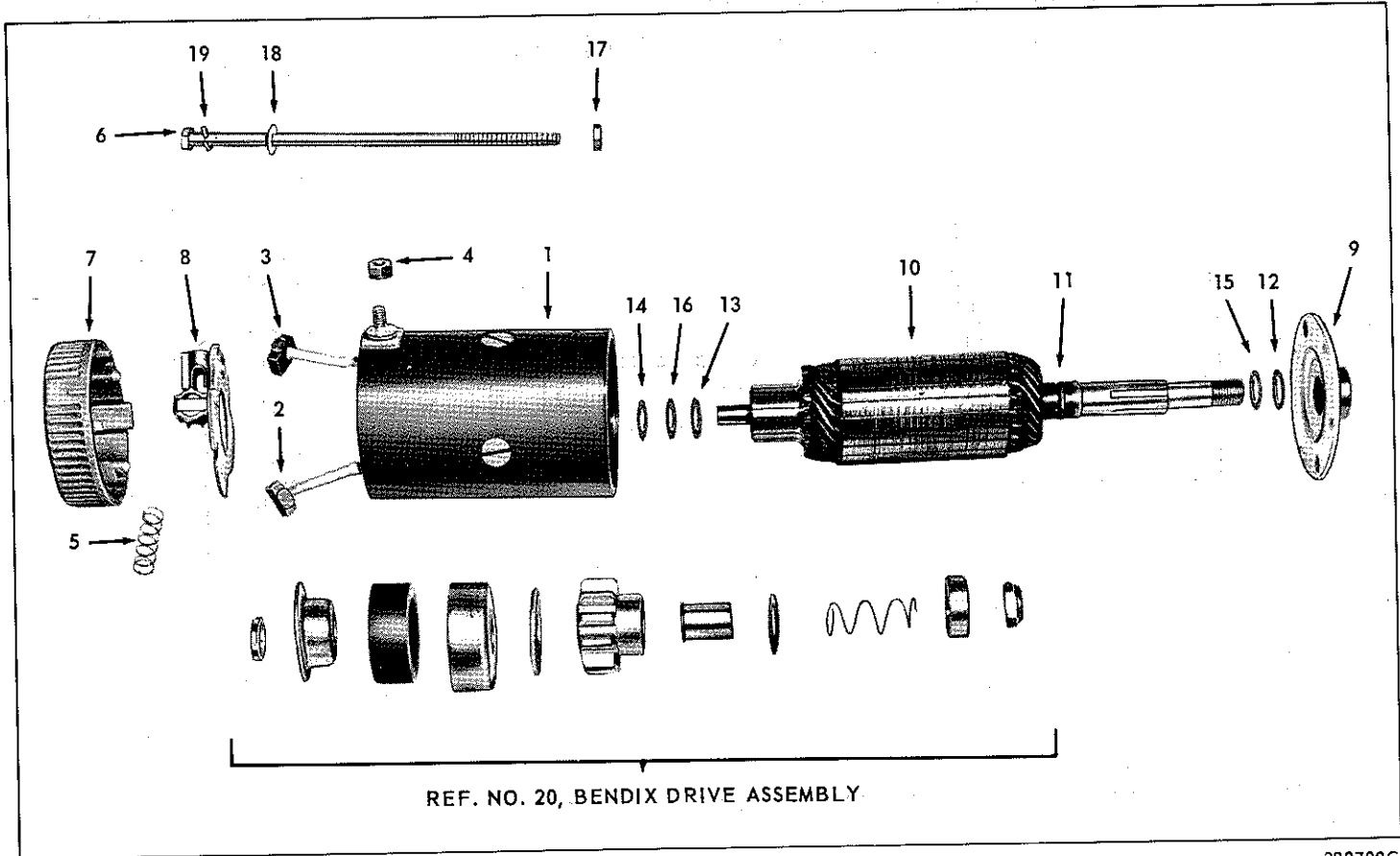
Replaces YA50 Prestolite starting motor beginning with serial number 6073082

Use support bracket BI-370-2



Ref. No.	Part Number	Description	No. Req.
1	9 KT 18939	DRIVE KIT	1
2	9 DV 16375	DRIVE PINION ASS'Y	1
3	9 CP 01447	CAP, DRIVE END	1
4	9 AT 13890	ARMATURE ASS'Y	1
5	9 SC 02620	THRU BOLT	2
6	9 CP 551353AS	CAP, COMMUTATOR END	1
7	9 KT 10900	BRUSH AND SPRING KIT	1

YA-50 STARTING MOTOR - 12 Volt, 3-1/16" Diameter
Prestolite MGD-4102A (was MGD-4002A)
(Replaced by YA63 beginning with engine serial number 6073082)

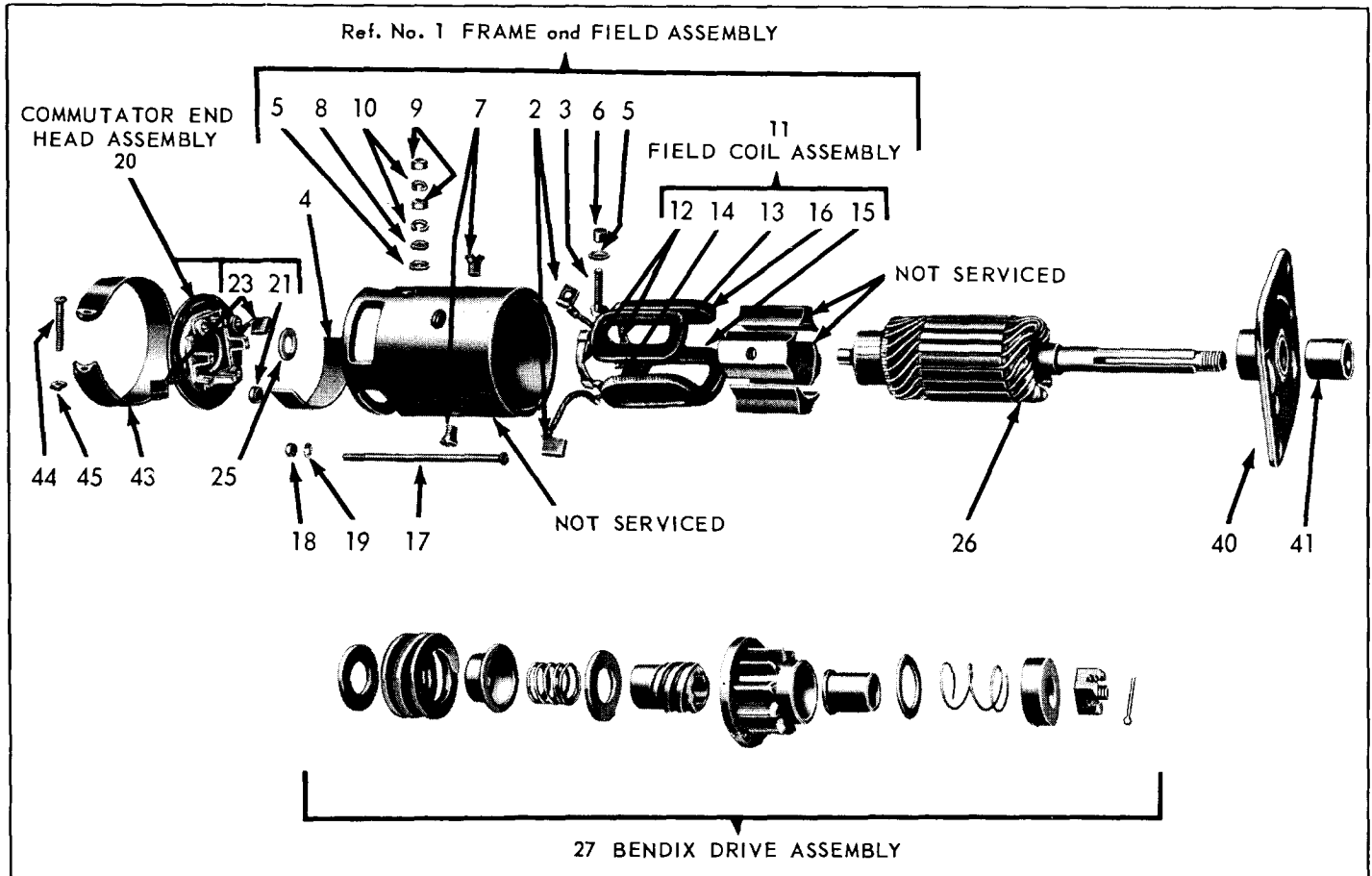


289709C

Ref. No.	Part Number	Description	No. Req.	Ref. No.	Part Number	Description	No. Req.
1	28-MGD-2101S-2	FRAME and FIELD ASSEMBLY, complete 28-MGD-2101, replaced by 28-MGD-2101S-2 Includes:	1	15	**	THRUST WASHER, D.E., .045" thick	1
2	*	BRUSH	1	16	**	THRUST WASHER, C.E., .023" thick	1
3	*	BRUSH and TERMINAL ASSEMBLY.....	1	17		NUT, 1/4"-20 hex., for thru bolt	2
4	*	NUT, 1/4"-20 hex. lock, for terminal	1	18		WASHER, 1/4" plain, for thru bolt.....	2
5	28-MGD-18S	SPRING SET for brushes	1	19		LOCKWASHER, 1/4" Skpf., for thru bolt ..	2
6	28-MGD-120S	THRU BOLT PACKAGE	1	20	28-480175	BENDIX DRIVE ASSEMBLY	1
7	28-MGD-1002	HEAD ASSEMBLY, commutator end	1			Replaces MGD-1161 and DRF-3002S, inter- changeable and serviced as a unit only.	
8	28-MGD-1033B	BRUSH PLATE and HOLDER ASSEMBLY 28-MGD-1033, replaced by 28-MGD-1033B	1	*		28-MGD-2032S BRUSH SET for SERVICE	
9	28-MGD-1103	HEAD ASSEMBLY, drive end	1	**		P90-259 ARMATURE THRUST WASHER PACKAGE	
10	28-MGD-2106	ARMATURE	1			NOTE: Parts less part number are not serviced separately.	
11	28-XA-1221	'O' RING SEAL for armature, 11/16" O.D. 28-HI-226, replaced by 28-XA-1221	1				
12	**	THRUST WASHER, D.E., 1/32" thick	1				
13	**	THRUST WASHER, C.E., .045" thick	1				
14	**	THRUST WASHER, C.E., 1/32" thick	1				
		(when required)					

STARTING MOTOR (Obsolete) – 6 VOLT, 3-5/8" DIAMETER

WISCONSIN No. YA-5-B – PRESTOLITE No. MAK-4008



179860C

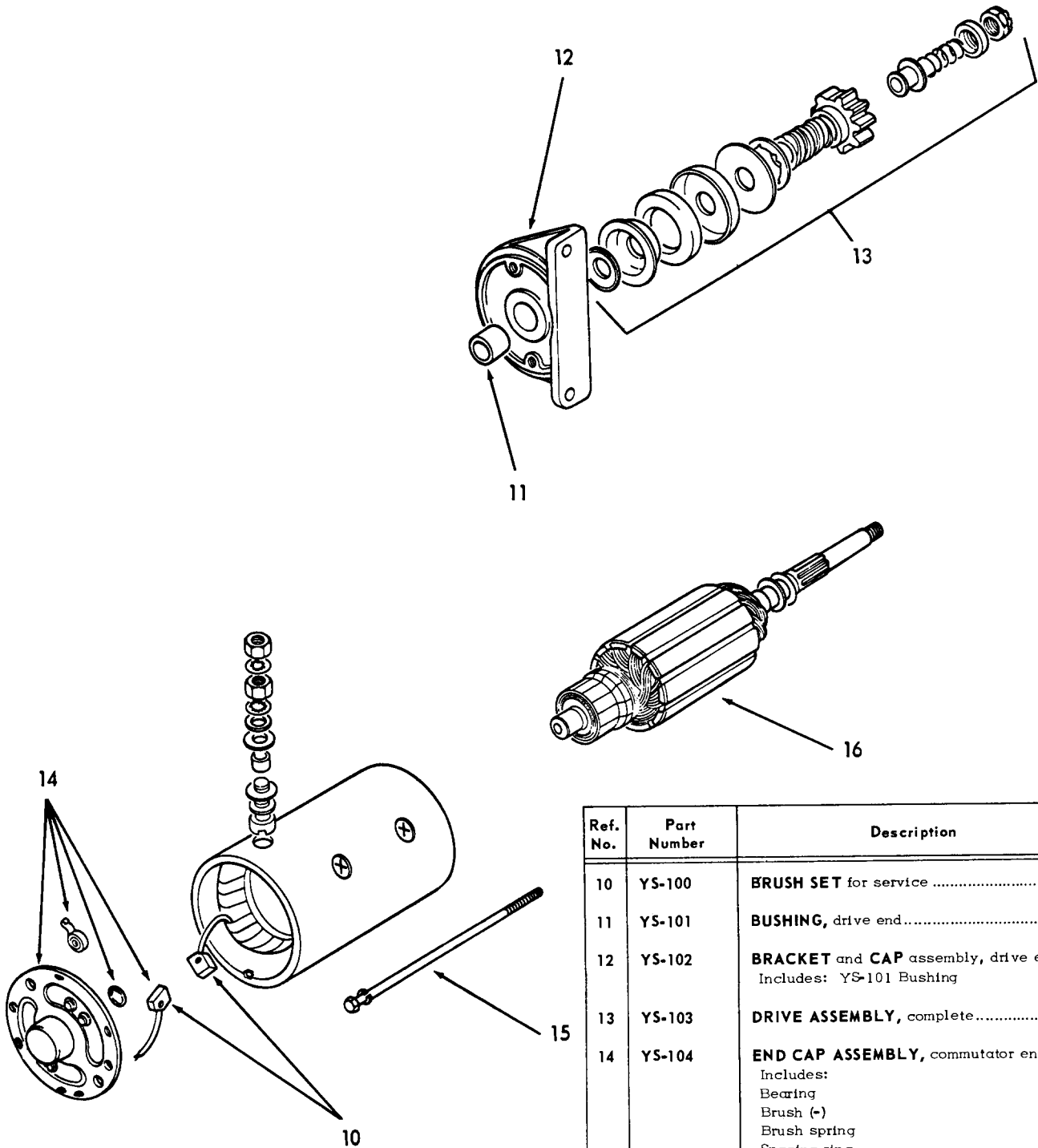
NOTE: Code number 28, prefixed to the part number, is a vendor identification. When ordering parts, please use number with code as shown.

Ref. No.	Part Number	Description	No. Req.	Ref. No.	Part Number	Description	No. Req.
1		FRAME and FIELD ASSEMBLY	1	24	**	THRUST WASHER for armature, drive end .. (not illustrated)	1
2	*	Consisting of: BRUSH	2	25	**	THRUST WASHER for armature, com. end ..	1
3	***	TERMINAL STUD	1	26	28-MAK-2006	ARMATURE	1
4	***	INSULATING WASHER for terminal stud ..	1	27	28-480099	BENDIX DRIVE ASSEMBLY, replaces 28-A1535 and 28-EBA-10	1
5	***	INSULATING BUSHING for terminal stud ..	2	40	28-MAK-1048	DRIVE END HEAD ASSEMBLY – includes:	1
6	***	INSULATING BUSHING for terminal stud ..	1	41	28-MAK-39	BRONZE BEARING	1
7		SCREW for pole shoe	4	42	28-X-386	OILER for bronze bearing (not illustrated) ..	1
8	***	PLAIN WASHER for terminal stud	2	43	28-GAS-1024F	COVER BAND	1
9		NUT for terminal stud 1/4"-20 thread, hex. ..	2	44		SCREW for cover band	1
10		LOCKWASHER for terminal stud, 1/4"	2	45		NUT for cover band	1
11	28-MAK-30055	FIELD COIL PACKAGE	1		*	28-MAK-2012AS BRUSH SET	
12		Consisting of: CONNECTOR for field coil	2		**	28-P90-294 THRUST WASHER PACKAGE	
13		FIELD COIL, U.R.	1		***	28-P90-459 TERMINAL STUD PACKAGE	
14		FIELD COIL, L.R.	1			NOTE: Parts less part number are not serviced separately.	
15		FIELD COIL, L.L.	1				
16		FIELD COIL, U.L.	1				
17	28-MAK-205	THRU BOLT PACKAGE – includes	2				
18		NUT for thru bolt, No. 10-32 thread, hex. ..	2				
19		LOCKWASHER for thru bolt, No. 10	2				
20	28-MAK-3002	COMMUTATOR END HEAD ASSEMBLY	1				
21	28-MAK-195	Includes: BRUSH SPRING SET	1				
22		FELT (not illustrated)	1				
23	*	GROUNDING BRUSH	2				

Order parts from nearest **WISCONSIN DISTRIBUTOR** or **SERVICE CENTER**.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

YA-58 (12 Volt) STARTING MOTOR ASSEMBLY

With integral mounting bracket

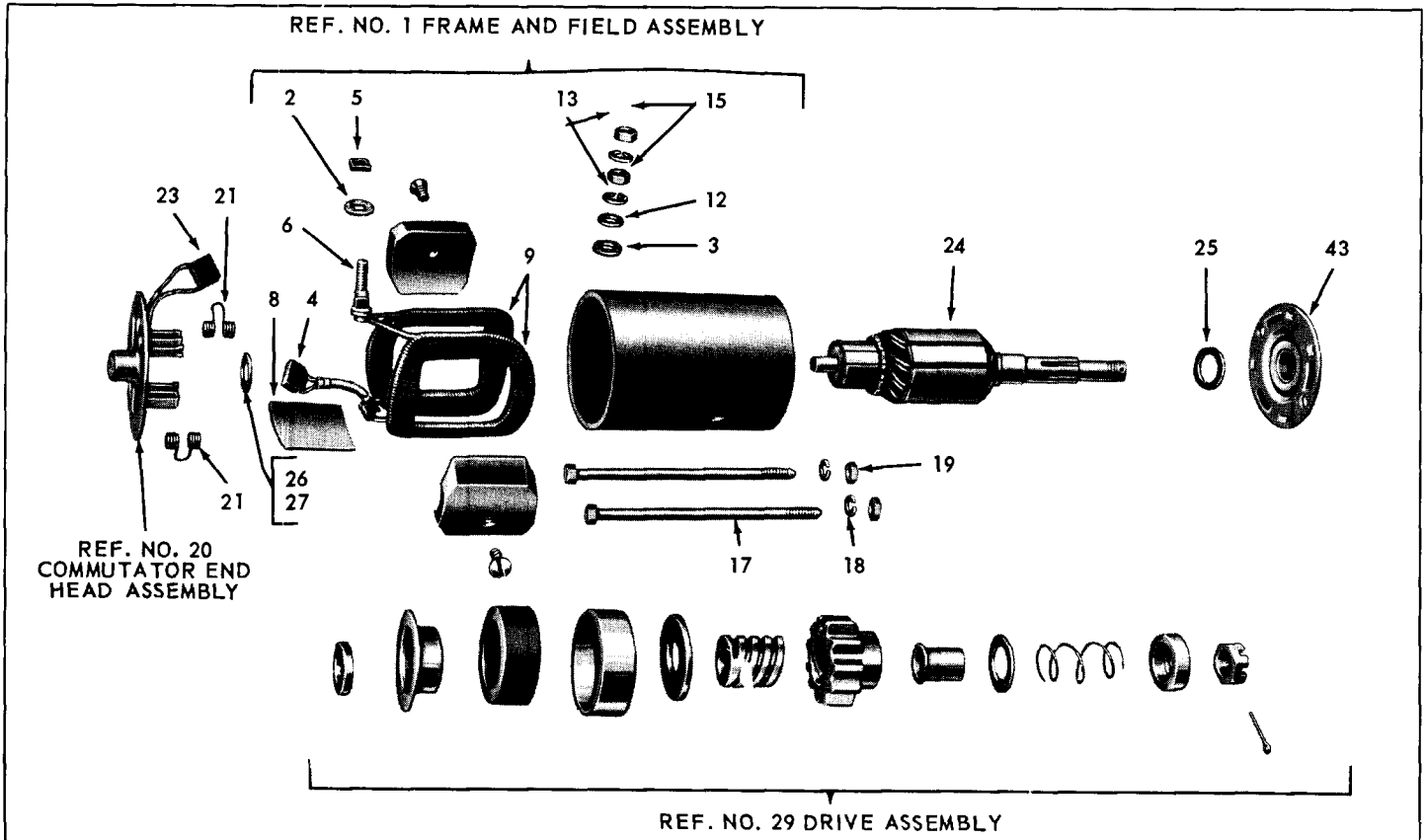


Ref. No.	Part Number	Description	No. Req.
10	YS-100	BRUSH SET for service	1
11	YS-101	BUSHING, drive end.....	1
12	YS-102	BRACKET and CAP assembly, drive end.. Includes: YS-101 Bushing	1
13	YS-103	DRIVE ASSEMBLY, complete.....	1
14	YS-104	END CAP ASSEMBLY, commutator end Includes: Bearing Brush (-) Brush spring Spacing ring	1
15	YS-105	THRU BOLT ASSEMBLY	2
16	YS-106	ARMATURE ASSEMBLY	1
		Includes: Spacing washers	

Order parts from nearest **WISCONSIN DISTRIBUTOR** or **SERVICE CENTER**.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

STARTING MOTORS
(Obsolete - 3" Diameter)

YA-27 (12 Volt) - Prestolite MDO-4102M (was MDO-4002M)
YA-29 (6 Volt) - Prestolite MDH-4001M



235805C

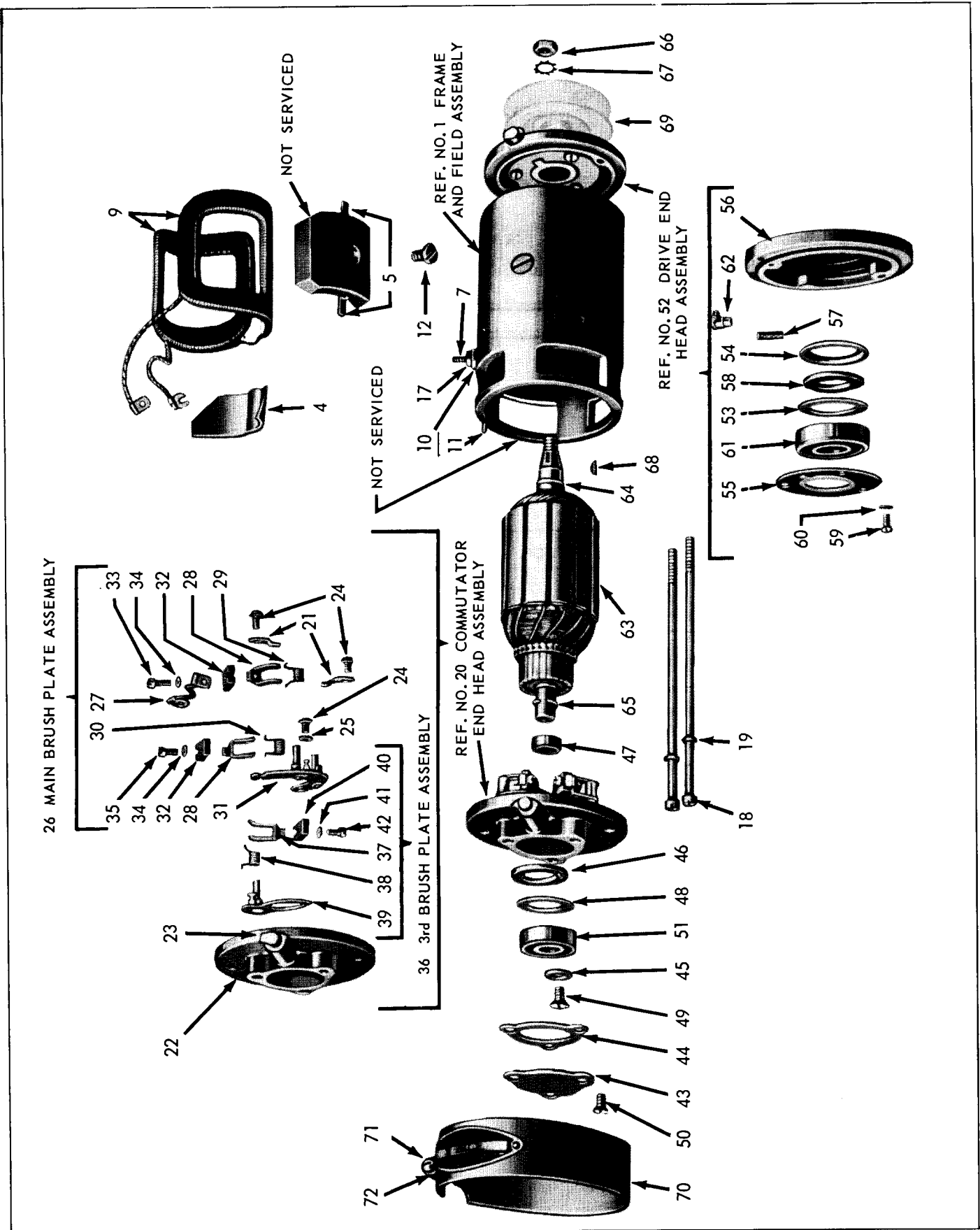
OTE: Code number 28, prefixed to the part number, is a vendor identification. When ordering parts, please use number with code as shown.

Ref. No.	Part Number		Description	No. Req.	Ref. No.	Part Number		Description	No. Req.
	YA-27 (12 Volt)	YA-29 (6 Volt)				YA-27 (12 Volt)	YA-29 (6 Volt)		
1	28-MDO-2001	28-MDH-3001	FRAME & FIELD ASSEMBLY	1	29		28-A3656	BENDIX DRIVE ASSEMBLY Was EBB-47A & 28-MDH-1061.	1
2		***	WASHER for term. stud, inner	1		28-480175		BENDIX DRIVE ASSEMBLY Rep'l. MGD-1161A, MGD-1061, & EBB-56A, interchangeable and serviced as unit only.	1
3		***	WASHER for term. stud, outer	1					
4	28-MDO-2012AS	28-MDH-2012S	BRUSH SET	1	43	28-MGD-1003	28-MDH-1003	DRIVE END ASSEMBLY	1
5		***	BUSHING for terminal stud	2				NOT ILLUSTRATED	
6		***	TERMINAL STUD	1			28-MDH-1024	COVER BAND	1
8			INSULATION for field conn.	1				SCREW for cover band, No. 10-32 x 1", round hd.	1
9			FIELD COIL ASSEMBLY ..	1				NUT for cover band, No. 10-32, square hd.	1
12		***	WASHER for terminal stud..	1					
13			LOCKWASHER 1/4" term. stud	2					
15			NUT for terminal stud, 1/4"-20 thread, hex.	2					
17	28-MDO-205	28-MDH-205	THRU BOLT PACKAGE	1					
18			Includes: WASHER, 1/4", for thru bolt	2					
19			NUT for thru bolt, 1/4"-20 thread, hexagon	2					
20	28-MDW-1002	28-MDH-3002	COMMUTATOR END HEAD ASSEMBLY	1					
21	28-MDH-185	28-MDH-185	Includes: BRUSH SPRING SET	2					
22			FELT (not illustrated)	1					
23	(Ref. 4)	(Ref. 4)	GROUNDING BRUSH	2					
24	28-MDO-2206	28-MDH-2006	ARMATURE ASSEMBLY	1			** 28-P90-259	THRUST WASHER PACKAGE	
25	**	**	THRUST WASHER D.E. 1/32"	1			*** 28-P90-460	TERMINAL STUD PACKAGE	
26	**	**	THRUST WASHER C.E. .045"	1					
27	**	**	THRUST WASHER C.E. 1/32"	1					

NOTE: Parts less part number are not serviced separately.

Order parts from nearest **WISCONSIN DISTRIBUTOR** or **SERVICE CENTER**.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

PRESTOLITE GAS-4103-1 (6 V 1½) GENERATOR PARTS LIST
WISCONSIN MOTOR PART NUMBER YB-6-A



Parts are identified by reference number. See parts list for correct part number.

179861C

12 VOLT MOTOR-GENERATOR WITH REGULATOR

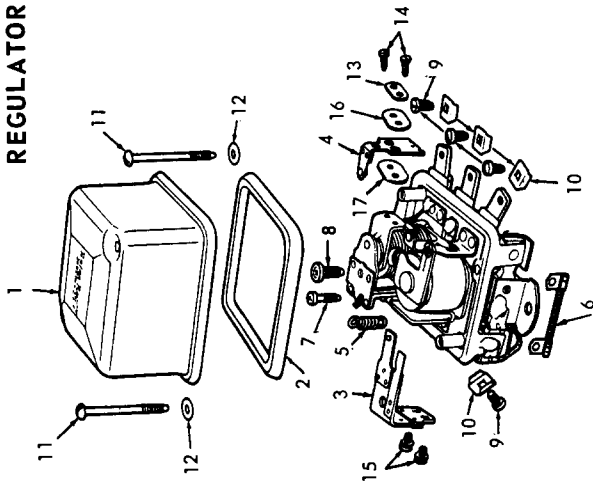
YB-37U-S1 (Negative Ground)

Delco-Remy No. 1101872 (was 1101999)

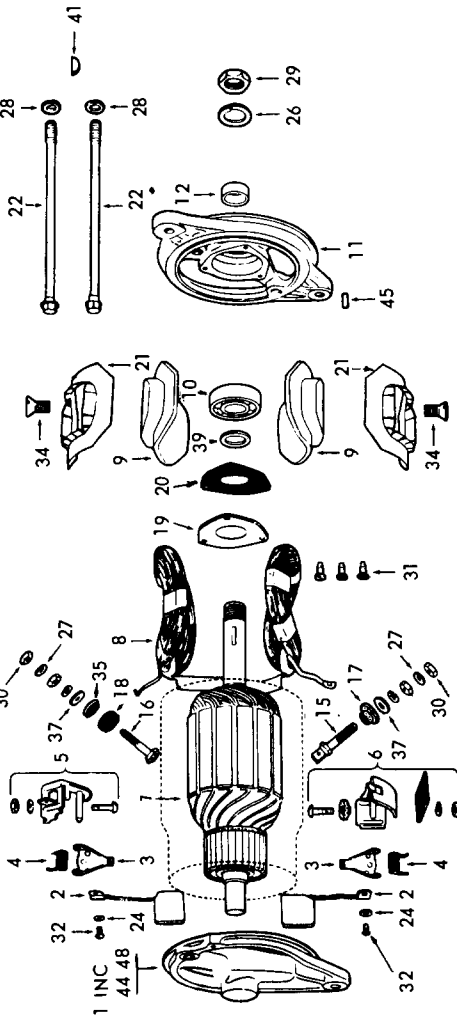
YB-37B-S1 (Positive Ground)

Delco-Remy No. 1101969

REGULATOR



MOTOR-GENERATOR



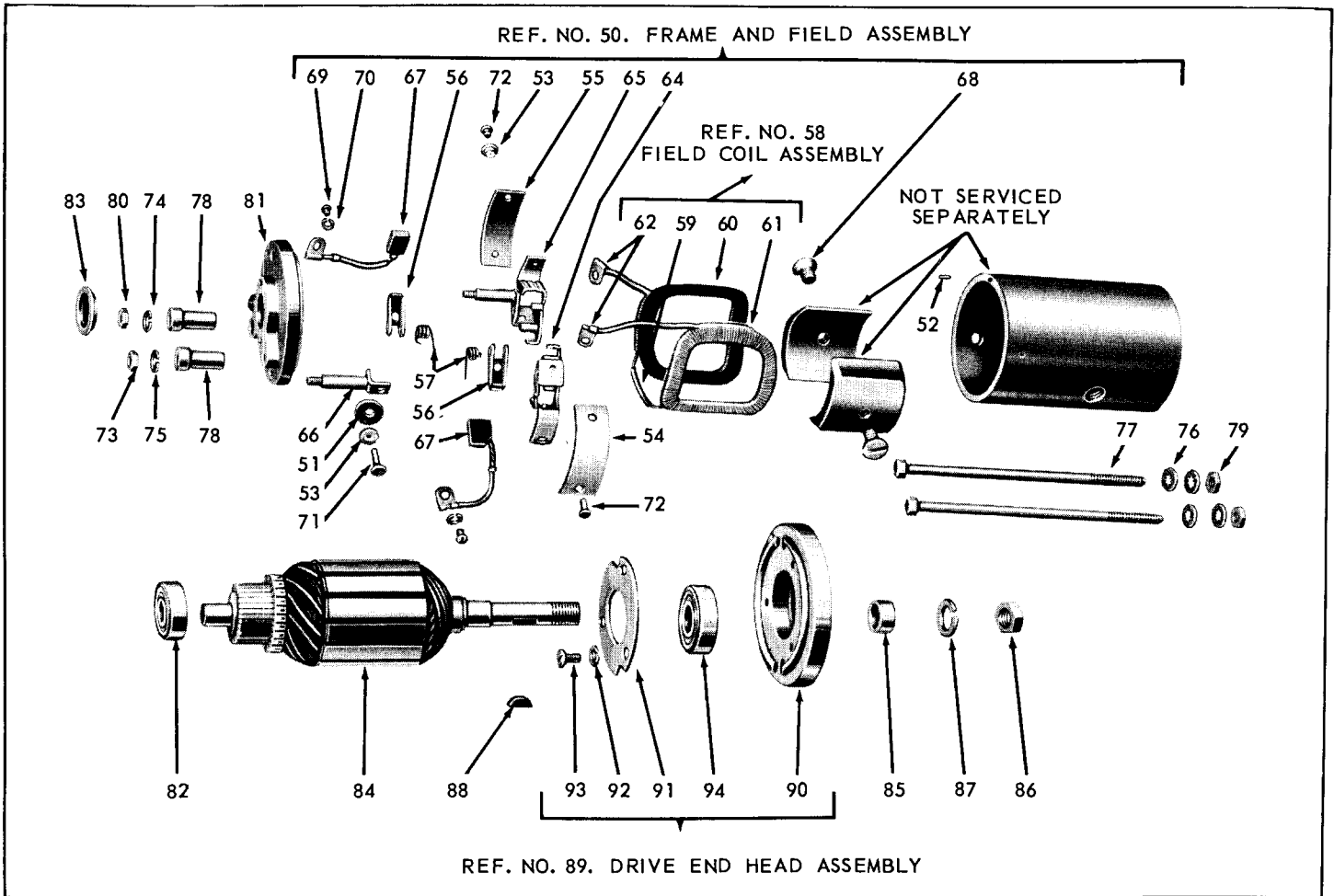
NOTE: Parts are interchangeable for both units, except where identified by motor-generator number. Code number 18, prefixed to the part number, is a vendor identification. When ordering parts, please use number with code as shown.

Ref. No.	Part Number	Description	No. Req.
1	18-1962414	FRAME, commutator end, includes: 44, 48 and 18-1948326 brg. plug.	1
2	18-1946427	BRUSH	2
3	18-1944373	BRUSH ARM	2
4	18-1908829	BRUSH SPRING (For 1101969, 1101999).	2
5	18-1916324	BRUSH SPRING (For 1101872)	1
6	18-1940421	GROUND BRUSH PACKAGE	1
7	18-1939904	INSULATED BRUSH PACKAGE	1
8	18-1939889	ARMATURE	1
9	18-1939890	FIELD COIL, R.H. shunt	1
10	18-1939902	FIELD COIL, L.H.	1
11	18-1911961	POLE SHOE (notched end)	2
12	18-954378	POLE SHOE (For 1101969)	1
13	18-1962417	BALL BEARING, D.E.	1
14	18-1959991	COLLAR, D.E.	1
15	18-1858749	STUD, armature terminal	1
16	18-1858749	STUD, field terminal	1
17	18-1921362	BUSHING, armature terminal	1
18	18-1939894	BUSHING, arm. term., inside (not ill.)	1
19	18-1955494	BUSHING, field term. (incl. with stud)	1
20	18-1912008	GASKET, bearing retainer plate	1
21	18-1912073	INSULATION, field coil	2
22	18-809763	THRU BOLT	2
24	18-1914816	LOCKWASHER, brush lead screw	2
26	18-1915265	LOCKWASHER, shaft nut, D.E.	1
27	18-1914579	LOCKWASHER, terminal stud	4
28	18-9421424	LOCKWASHER, thru bolt	2
29	18-1915172	NUT, shaft, D.E.	1
30	18-121743	NUT, terminal stud	4
31	18-1914580	SCREW, bearing retainer plate	3
32	18-454329	SCREW, brush lead (6-32 x 5/16)	2
34	18-1913960	SCREW, pole shoe	2
35	18-1858753	WASHER, insulating, field term. stud	1
37	18-826319	WASHER, plain, terminal stud	2
39	18-1861591	WASHER, spacer, D.E., inside	1
41	18-124545	WOODRUFF KEY, D.E.	1
44	18-809062	DOWEL PIN, C.E.	1
45	18-809593	DOWEL PIN, D.E.	1
47	18-904751	BALL BEARING, C.E. (not ill.)	1
48	18-1929959	BEARING CLAMP, C.E. (not ill.)	1
1	18-1914185	LEAD WIRE, arm. to regulator	1
2	18-1917571	LEAD WIRE, field to regulator	1
3	18-1947344	SLINGER, grease, D.E.	1
18-1118983		REGULATOR (neg.grd.) for YB-37U-S1 (repl. 1118984 for 1101999 motor-gen.)	1
18-1118985		REGULATOR (pos.grd.) for YB-37B-S1 For service repl. use 18-1118791.	1
18-1927980		COVER	1
18-1953902		COVER GASKET	1
*18-1878780		ARMATURE, relay	1
18-1878493		CONTACT, regulator (For 1118983)	1
18-1878517		CONTACT (For 1118985 reg.)	1
18-1912176		SPRING, regulator armature	1
18-1910174		RESISTOR, "F" term. to ground	1
18-1944590		ADJUSTING SCREW, regulator arm.	1
18-1912159		ADJUSTING SCREW, relay armature	1
18-453418		TERMINAL SCREW	4
18-1868137		TERMINAL CLAMP	4
18-1927982		SCREW, cover mounting	2
18-1935031		WASHER, ins., cover mounting	2
18-1878505		LOCKWASHER, reg. contact mt'g.	1
18-1878516		SCREW, regulator contact mounting	2
18-1924764		SCREW, (with L.W.), armature relay	2
18-1922599		WASHER, insulating (with bushing) For regulator contact mounting.	2
18-1878507		WASHER, ins., reg. contact mt'g.	1
18-178451		SCREW, regulator mounting	2
18-138479		LOCKWASHER, regulator mounting	2
18-1856056		PLAIN WASHER, regulator mounting	2

YB-47-C (Negative Ground - 12 Volt) GENERATOR
Obsolete YB-47-A (Positive Ground - 12 Volt)

Prestolite No. GJG-4010M
GJG-4007MP

NOTE: Component parts are identical, except for Drive End Head, as noted in parts list, and polarity.

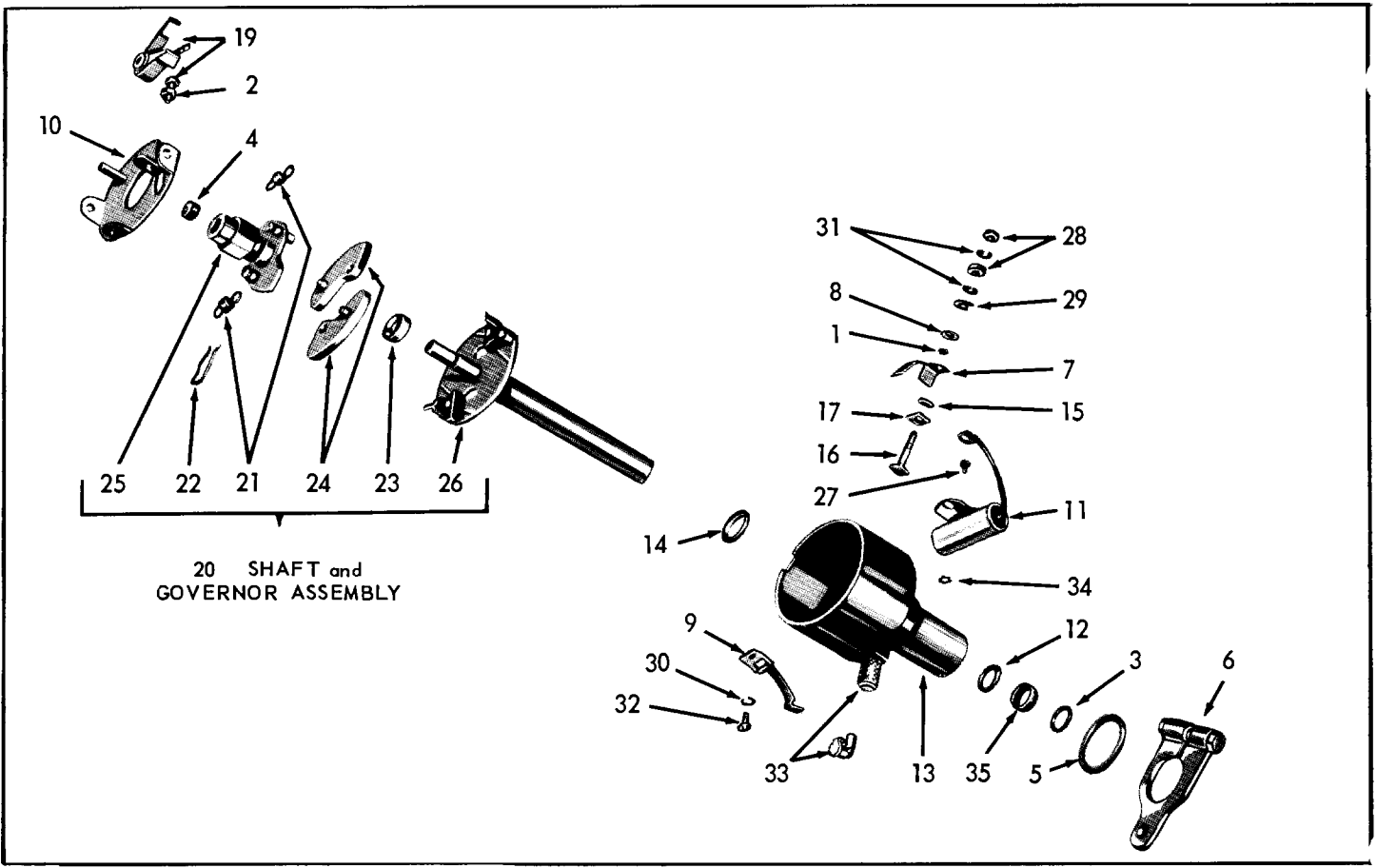


235806C

Code number 28, prefixed to the part number, is a vendor identification. When ordering parts, please use number with code as shown.

Ref. No.	Part Number	Description	No. Req.	Ref. No.	Part Number	Description	No. Req.
50	28-GJG-2101	FRAME and FIELD ASSEMBLY consisting of:	1	76		WASHER for thru bolt, 1/4" Shakeproof	4
51		INSULATING WASHER for field terminal	1	77	28-GJG-205	THRU BOLT PACKAGE	2
52		DOWEL PIN	2	78	28-GJG-26	INSULATING BUSHING for terminal stud	2
53	**	INSULATING BUSHING for field terminal and insulated brush holder	3	79		NUT for terminal stud, 1/4"-20 thread, hexagon	2
54		SPACER for ground brush holder	1	80		NUT for armature terminal, #10-32 thread	2
55	**	INSULATION for brush holder	1	81	28-GJG-2	COMMUTATOR END HEAD	1
56	***	BRUSH ARM	2	82	28-GJG-45	BALL BEARING for commutator end head	
57	***	BRUSH SPRING	2	83	28-GAL-40C	BEARING COVER for commutator end head ..	1
58		FIELD COIL ASSEMBLY - ORDER COMPLETE FRAME AND FIELD ASSEMBLY.	1	84	28-GJG-23065	ARMATURE ASSEMBLY	1
59		INSULATING TUBE	1	85	28-GJG-27	SPACER for armature shaft	1
60		FIELD COIL, left	1	86	28-P90-673	NUT, WASHER PKG. for armature shaft	1
61		FIELD COIL, right	1	87		LOCKWASHER for armature shaft, drive end ..	1
62		TERMINAL	2	88		KEY for driven pulley, #2 Woodruff	1
64	*	HOLDER for ground brush	1	89	28-GJG-1003	DRIVE END HEAD ASSEMBLY (For YB-47-A)	1
65	**	INSULATED HOLDER for brush and arm term	1		28-GJG-1103	DRIVE END HEAD ASSEMBLY (For YB-47-C)	1
66	28-GJG-1038	FIELD TERMINAL	1			Consisting of:	
67	28-GJG-20125	BRUSH SET for service	1	90		DRIVE END HEAD	1
68		POLE SHOE SCREW	2	91		BEARING RETAINER	1
69		SCREW, brush lead, #6-32 x 3/16" rd. hd.	2	92		LOCKWASHER for retainer screw, #10	3
70		LOCKWASHER for lead screw, No. 6	2	93		SCREW, brq. retainer, #10-32 x 5/16" bdg. hd.	
71		FIELD TERMINAL RIVET	1	94	28-GJG-44	BEARING for drive end head	1
72	*	BRUSH HOLDER SCREW, #4-40 x 1/2"	4				
73		NUT for field terminal, #8-32 thread, hex.	2				
74		PLAIN WASHER for armature terminal, #10 ..	1				
75		PLAIN WASHER for field terminal, #8	1				
						* 28-P90-251 Gr. Brush Holder & Parts Package	
						** 28-P90-252 Ins. Brush Holder & Ports Package	
						*** 28-P90-253 Brush Arm & Spring Package	
						NOTE: Parts less part number are not serviced.	

YF-8-C-S1 IGNITION TIMER – Prestolite No. IGW-4408
YF-8-A-S1 (Obsolete Timer) – Prestolite No's. IGW-4405 and IGW-4179



NOTE: YF-8-C-S1 Ignition Timer (Prestolite No. IGW-4408) replaces YF-8-A-S1 (Prestolite No's. IGW-4405 and IGW-4179). Primary change is the addition of an oil seal in the base replacing oil grooves in the drive shaft. Timers are interchangeable as a unit, as are most of the internal parts, with the exceptions being where the Prestolite Timer No's. are specified. 179858C-1

Code number 28, prefixed to the part number, is a vendor identification. When ordering parts, please use number with code as shown.

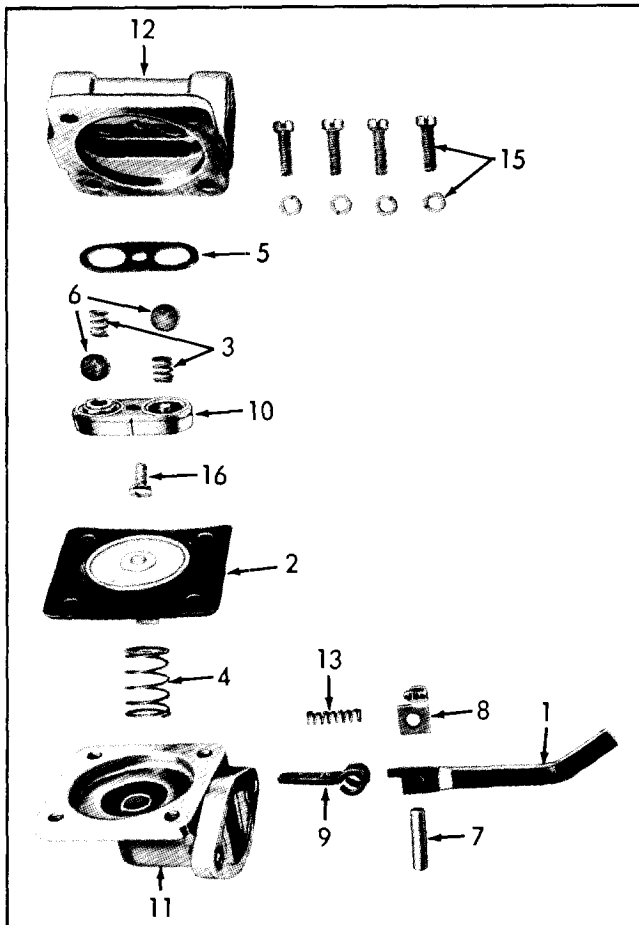
Ref. No.	Part Number	Description	No. Req.	Ref. No.	Part Number	Description	No. Req.
1	**	INSULATING BUSHING for terminal stud..	1	20		SHAFT and GOVERNOR ASSEMBLY	1
3	*	THRUST WASHER for drive shaft	1	21	28-IGB-3185	SPRING SET for governor weights	1
4	28-IG-495	FELT WICK for cam sleeve	1	22	*	CAM RETAINING SPRING	1
5	28-IG-816A	THRUST WASHER for advance arm	1	23	*	CAM SPACER	1
6	28-IG-1860A-6	ADVANCE ARM	1	24	28-IGW-1014LBS	GOVERNOR WEIGHT SET	1
7	**	INSULATION for terminal stud	1	25	28-IGW-2100LAG	CAM and STOP PLATE	1
8	**	INSULATING WASHER for terminal stud ..	1	26	28-IGW-2113LA	DRIVE SHAFT (for IGW-4408L	1
9	28-IGB-10075	CLAMP SPRING and HINGE PACKAGE	1		28-IGW-2103L	(For IGW-4405 and IGW-4179).	
10	28-IGB-1010	BREAKER PLATE	1	27		SCREW for condenser mounting	1
11	28-IAT-3076-ES	CONDENSER PACKAGE	1			No. 8-32 thread x 3/16" long, round head.	
12	*	WASHER for shaft seal (IGW-4408)	1	28		NUT for terminal stud	2
13		BASE ASSEMBLY	1			No. 10-32 thread, hexagon.	
		Base Assembly Includes:		29		WASHER for terminal stud, No. 10 plain ..	1
	*	BRONZE BEARING (not illustrated).....	2	30		LOCKWASHER for breaker plate, No. 8 ...	3
14	*	THRUST WASHER for drive shaft, upper ..	1	31		LOCKWASHER for terminal stud, No. 10 ..	2
15	**	INSULATING WASHER for terminal stud ..	1	32		SCREW for breaker plate mounting	3
16	**	TERMINAL STUD	1			No. 8-32 thread x 5/16" long, round head.	
17	**	WASHER for terminal stud.....	1	33	28-X-2961	OILER (right angle)	1
18	28-IGW-188	FELT WICK for oiler (not illustrated)	1	34		WASHER for condenser mounting	1
19	28-IGW-3028YS	BREAKER CONTACT SET	1			Shakeproof No. 8.	
				35	*	SHAFT OIL SEAL (for IGW-4408)	1
						* 28-P90-713 Dist. Shaft Bearing & Parts Pkg.	
						** 28-P90-330 Terminal Stud & Parts Package	
						NOTE: Parts less part number are not serviced separately.	

INSTRUCTIONS FOR MAINTENANCE AND REPAIR OF FUEL PUMP

PART NO.	ENGINE USED ON	PART NO.	ENGINE USED ON
LP-42-A	TF, TH, THD	LP-42-M	S-10D, S-12D
LP-42-B	ACN, BKN, AENL	LP-42-N	S-8D, HS-8D, TR-10D
LP-42-G	AGND		
LP-42-L	S-7D, HS-7D		

The efficiency of the fuel pump will gradually decrease any time after 500 hours of operation. This will be dictated by the engines faltering at high speeds or when heavy loads are suddenly applied. The pump can easily be restored to its normal efficiency by the installation of a Wisconsin Motor No. LQ-28 repair kit.

1. Remove the fuel lines and the two mounting bolts which hold the pump to the engine. Take the pump to a work bench or suitable place.
2. With file, make an indicating mark across a point at the union of castings (11 and 12). This is a positive location of the fuel line positions when reassembling. Remove four assembly screws (15) and remove fuel head.
3. Turn head (12) over and remove one screw (16). Remove (10, 3, 6 and 5) valve assemblies, noting their positions. Discard the above parts (3, 6 and 5).
4. Clean fuel head thoroughly with gasoline and a fine wire brush.
5. Holding fuel head, (12) with diaphragm surface (containing four clearance holes) up, reassemble the valve spring (3) and valve (6) into the cavity from which they were removed. Now place new gasket (5) in position and reassemble the valve retainer (10) into position and lock it by inserting and tightening the fuel pump valve retainer screw (16).



176824C

6. Place this fuel head assembly in a clean place and we are ready to rebuild the lower diaphragm section.
7. Using a screw driver, inserted into the coils of rocker arm spring (13), remove this spring and save.
8. Holding the mounting bracket (11) in the left hand with the rocker arm toward the body and the thumb nail on the end of the link (9) with the heel of the right hand on the diaphragm (2) compress the diaphragm spring (4) at the same time, turning in a clockwise position 90°. This will unhook the diaphragm from the link (9) so it can be removed.
9. Clean the mounting bracket (11) with gasoline and fine wire brush.
10. Replace the new diaphragm operating spring (4), standing it into casting (11). Repeat in reverse step eight, using the new diaphragm. Replace rocker arm spring removed in step seven.
11. Mount this assembly back on the engine in the position from which it was removed, using the new mounting gasket which is the last piece of the repair kit.
12. Crank the engine over to a position where the diaphragm (2) is laying flat on the mounting bracket (11). Place the fuel head (12) back in position so that the indicating marks of step one are in line, and start the four assembly screws approximately three turns. Again, crank the engine over to a position where the diaphragm (2) is pulled down into (11) mounting bracket and tighten the four assembly screws (15) tightly.
13. Connect the fuel lines and you have a completely rebuilt fuel pump.

NOTE: The LQ-28 Repair Kit and the parts included therein, which are identified by an asterisk (*), are the only parts of the fuel pump available for service.

Ref No	Description	No Req
1	ROCKER ARM	1
* 2	DIAPHRAGM	1
* 3	VALVE SPRING	2
* 4	DIAPHRAGM SPRING	1
* 5	VALVE GASKET	1
* 6	VALVE	2
7	ROCKER ARM PIN	1
8	SPRING CLIP for rocker arm	1
9	LINKAGE	1
10	VALVE PLATE and SEATS	1
11	MOUNTING BRACKET	1
12	HEAD	1
13	ROCKER ARM SPRING	1
15	ASSEM. SCREW and LOCKWASHER	4
16	VALVE PLATE SCREW and LOCKWASHER	1
*	MOUNTING FLANGE GASKET (not illustrated) ..	1

Order parts from nearest **WISCONSIN DISTRIBUTOR** or **SERVICE CENTER**.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

REWIND (Recoil) STARTER

For Wisconsin Engine Model AENL Beginning with Serial No. 5789735

RWS 109
RWS 110
RWS 111

Operating Instructions — Repair — Parts List

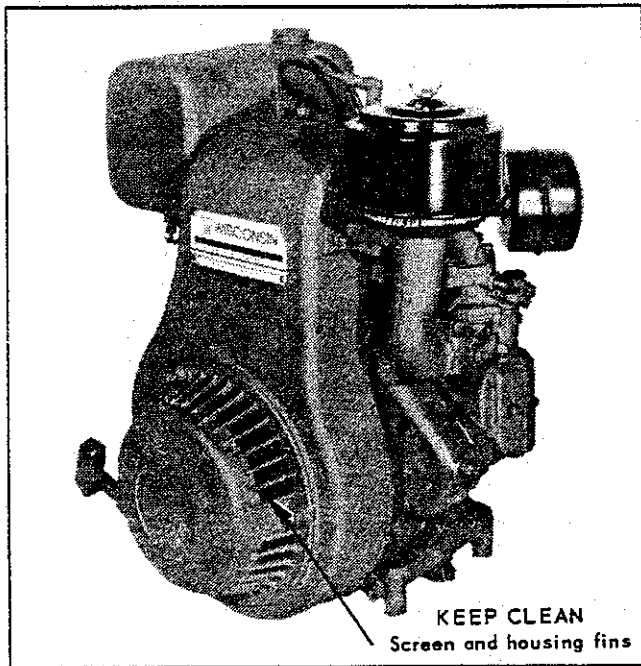


FIG. 1

PRINCIPLES OF OPERATION

A recoil spring, connecting the pulley to the housing, provides tension for actuating the starter, and it rewinds the rope on to the pulley whether the engine starts or not.

Three dogs (pawls) are mounted in a cluster to the starting pulley, around a dog cam attached to a shaft in the housing. As the rope handle is pulled to start the engine, the dogs are forced outward as they act against the contour of the stationary mounted cam. In this outward action the dogs engage with teeth in a flywheel mounted drive hub to turn the engine over.

When the engine starts and the 'T' handle returns, the dogs back out of the drive hub teeth, as the pulley rewinds in the opposite direction, and they revert back to an inactive position by means of the cam and individual dog return springs.

'T' HANDLE LOCATION, Fig. 2

The starting handle can be located in any of three locations. The standard location is toward the left side of the engine, pulling from an approximate 10 o'clock position.

Either of the two optional locations can be obtained by simply removing the three mounting nuts and rotating the housing 120° in either direction. *Caution:* Before

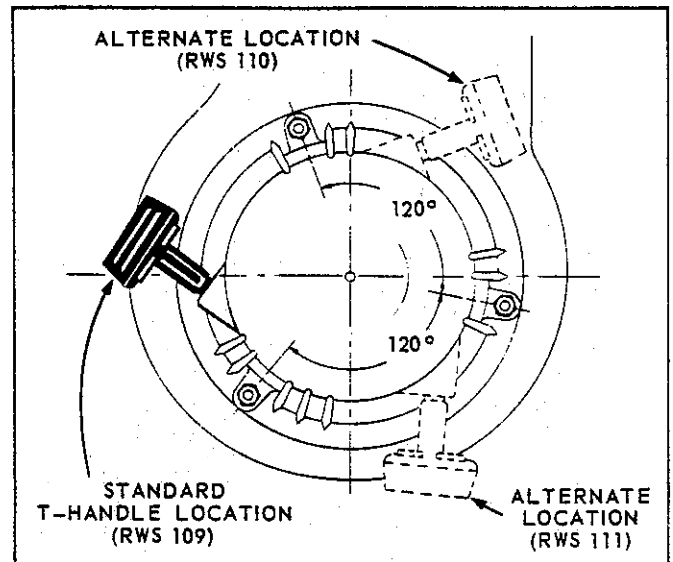


FIG. 2

tightening the mounting nuts the starter will have to be centered with the drive hub per Fig. 7, paragraph H on page 3.

OPERATING INSTRUCTIONS

1. To start engine; open fuel valve, close carburetor choke, set throttle about ½ open, disengage clutch if furnished. Pull engine over against compression and then let rope slowly rewind into starter. Pull firmly and rapidly to start engine. (Repeat procedure if necessary). After engine starts, open choke fully.
2. Always maintain your hold on the starter handle and allow it to return slowly.
3. Pull the starter handle so that the rope remains in a straight line through the handle and guide.
4. Do not jerk the cord out to its very end in an unnecessary rough manner. Use a smooth but forceful pull.
5. Do not let go of starter handle allowing it to snap back against the starter.
6. Do not attempt to pre-load starter spring unnecessarily. Units are properly adjusted at the factory so that the outward pull of the starter is stopped by the end of the cable not the spring.

MAINTENANCE AND REPAIR

Oil and dirt, if allowed to accumulate in and around the the starter, will cause wear and eventual failure of not only the starter parts, but engine parts as well.

Do not allow internal rotating screen and housing fins to become "clogged up" with dirt. Brush clean to allow proper air flow to reach the engine.

Inspect rope for wear — replace before it breaks at a critical time.

If engine does not turn over as rope is pulled out, starter dogs are not engaging with drive hub teeth.

If rope does not rewind; rope or pulley may be binding — insufficient spring tension — spring disengaged or broken.

To overhaul the rewind starter, follow the disassembly and assembly procedures in the following 'Repair Instructions'. Rope replacement can be accomplished without completely disassembling the starter. See paragraph D.

REPAIR INSTRUCTIONS

In order to do any repair work on the rewind starter, it is advisable to secure the starter housing either in a vise, or to a work bench by means of a 'C' clamp.

DISASSEMBLY

A. REMOVE HANDLE and ROPE, Fig. 3

Pull rope out about two feet and tie knot to prevent rope from rewinding into pulley. Extract metal handle reinforcement (129) from handle (128) and untie or cut off end knot. Remove handle and reinforcement from rope, and untie knot that kept the rope from rewinding into the pulley. PULL rope all the way out (about 6 feet) and at the same time hold the starter housing (127), with thumb pressing against pulley assembly (137) to prevent rewinding. Pull the rope knot (visible thru square opening in pulley) and the rope will slide out through rope bushing in housing and hole in the pulley.

Carefully release thumb pressure and the pulley will completely unwind. At this point the main recoil spring is in a relaxed position.

B. REMOVE PULLEY and SPRING, Fig. 3

Remove cam center screw (130), dog cam (135), brake spring (134) and washer (125).

Prevent recoil spring from escaping from housing by carefully lifting pulley about 1/2 inch and then detaching inside spring hook from pulley, with a screw driver. Note: If spring should escape, it can easily be replaced into cover by coiling in the turns. See Fig. 6, for proper direction of spring coiling. If it is necessary to remove spring, start with the inside loop and carefully pull out one loop at a time while holding back rest of turns. When replacing spring, note the position of spring hooks in Fig. 6. Engine rotation is clockwise, viewed from starter end.

C. REMOVAL of DOGS, Fig. 3

Remove dog retainer clips (133) using a screw driver or other pointed tool. The dogs (132) and springs (131) can then be lifted off the axis pins.

Dogs and springs can be removed and replaced without removing rope, recoil spring or cam retainer screw.

D. ROPE REPLACEMENT, Fig. 3, 4, 5

If it is only necessary to replace the rope, the starter need not be completely disassembled.

Assuming the rope has broken, remove what ever remains of the rope from the starter. Tie knot at end of new rope. To obtain the required amount of tension on the recoil spring, turn the pulley in starter counter clockwise until it stops (about 6-7 turns). Allow the pulley to rotate slightly in the opposite direction (clockwise) until the hole in the pulley is in line with the rope bushing in the housing. Lock sheave in this position by placing a screw driver between two of the housing support ribs and wedging the end of the screw driver under the dog cam and against the dog, see Fig. 4. Thread rope through hole in pulley and through rope bushing in housing. Pull rope completely through until the knot in end of rope (previously tied) can be

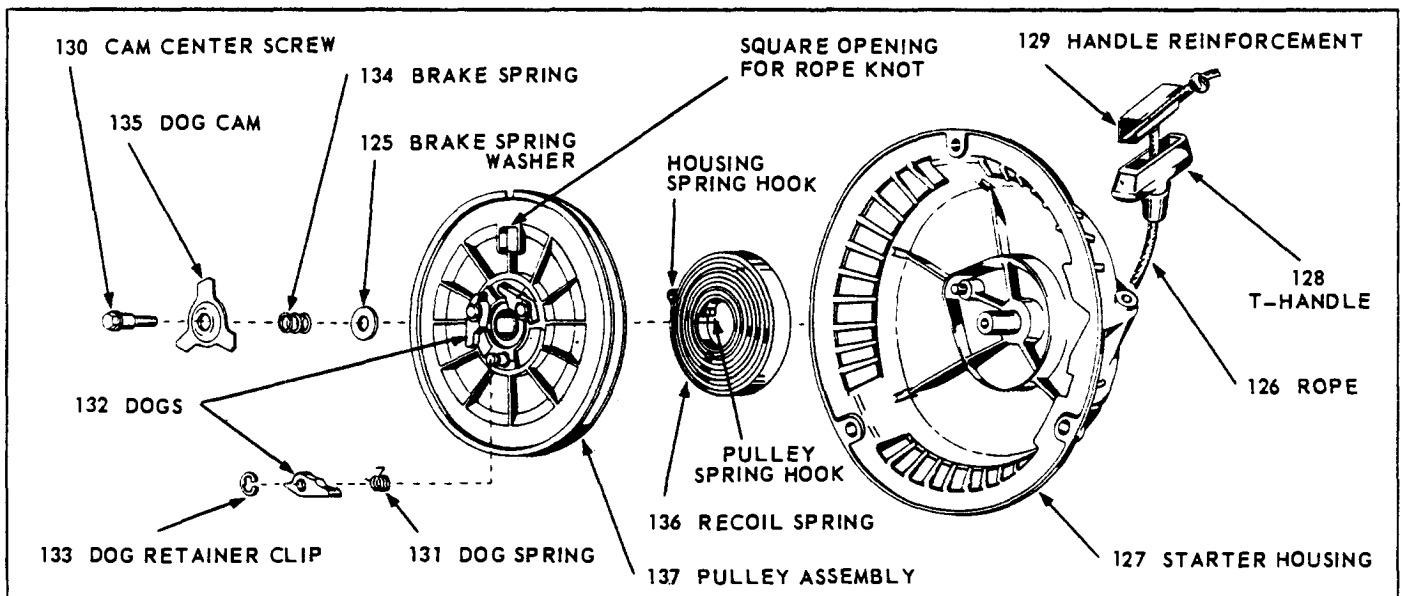


FIG. 3

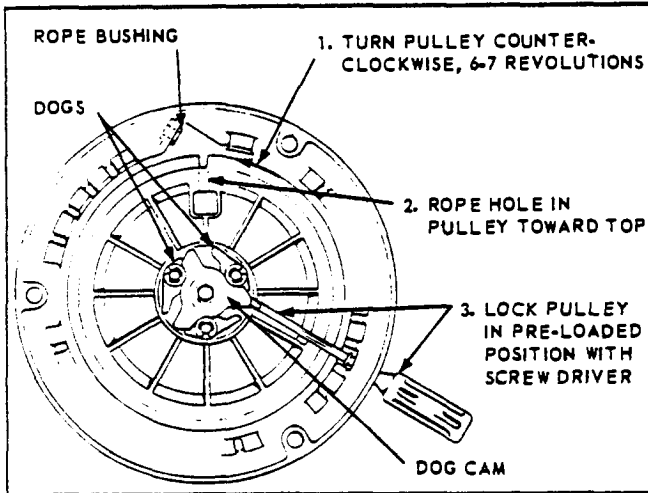


FIG. 4

tucked into the *square pocket* in the pulley, see Fig. 5. Allow the rope to recoil into the pulley about 2 feet, then tie a *retaining knot* in the rope to prevent it from being completely rewound into the pulley. Install the 'T' handle (128) on the rope, then the handle insert (129). Tie a knot at end of rope and tuck it into the handle insert, then assemble insert into the rubber 'T' handle. Remove the retaining knot and allow the rope to recoil completely.

E. RECOIL SPRING REPLACEMENT, Fig. 6

Spring holders furnished with replacement springs simplify the assembly procedure. Place *recoil spring* in proper position as shown in Fig. 6, with the outside loop hooked around the *anchor post*. Then press spring into *housing cavity* thus releasing the spring holder. A few drops of SAE 20 or 30 oil should be applied to spring and light grease on housing shaft.

REASSEMBLY

F. ASSEMBLY of PULLEY, Fig. 6

After recoil spring has been installed in housing, mount pulley. Push housing and pulley together with a twisting motion so that the *hook* on end of spring engages the *notch* in pulley. When this occurs, the pulley will seat properly in the housing.

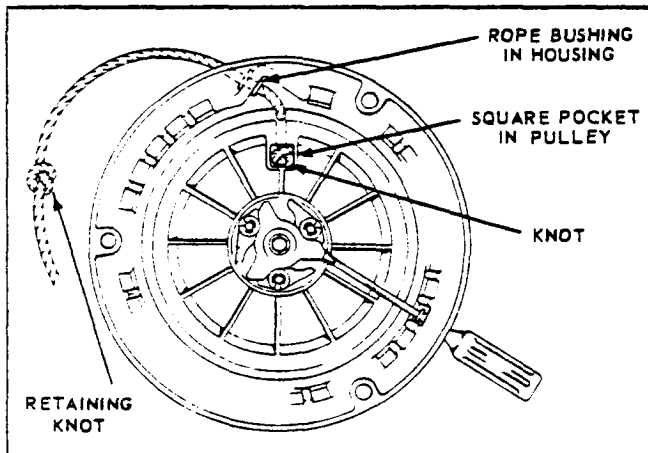


FIG. 5

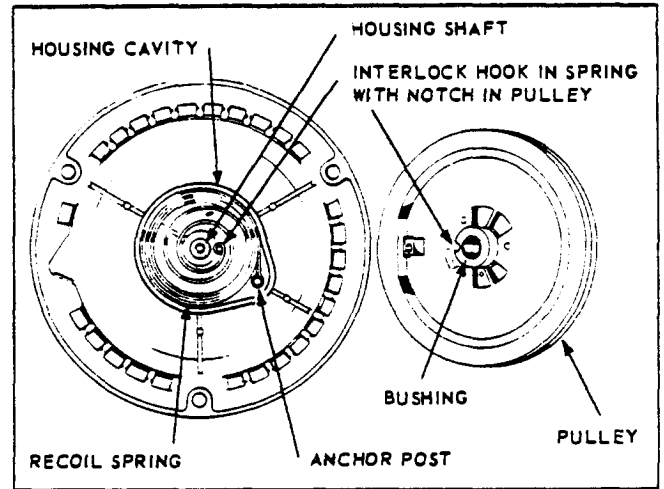


FIG. 6

G. ASSEMBLY of DOG GROUP, Fig. 3

Assemble brake washer (125), brake spring (134), dog cam (135), cam and center screw (130). Torque center screw 115-130 inch pounds. Install three dog springs (131) over the axis pins on the pulley and seat in the pockets. Mount the three dogs (132) on the same pins on pulley. Make sure that the *dog springs* are actuated as the dogs are positioned - to insure that the dogs are held in against the cam plate (135). Install three *new dog retainers* (133). *Note:* Be sure there is sufficient *recoil spring tension* before mounting unit to engine. See 'Rope Replacement', paragraph D, page 2.

H. REWIND STARTER ALIGNMENT, Fig. 7

Mount rewind starter to support ring studs with 'T' handle in required starting position. Place the three plain washers, lockwashers and nuts on studs and *hand tighten only* - for alignment purposes.

Proper *alignment* of the starter is obtained by pulling out the 'T' handle until a substantial resistance, indicating starter engagement, is obtained. This automatically centers the starter to the *drive hub*. Hold starter in this position and *securely tighten* the three mounting nuts. *The starter will become damaged if it is not centered properly.* The engine is now ready to start.

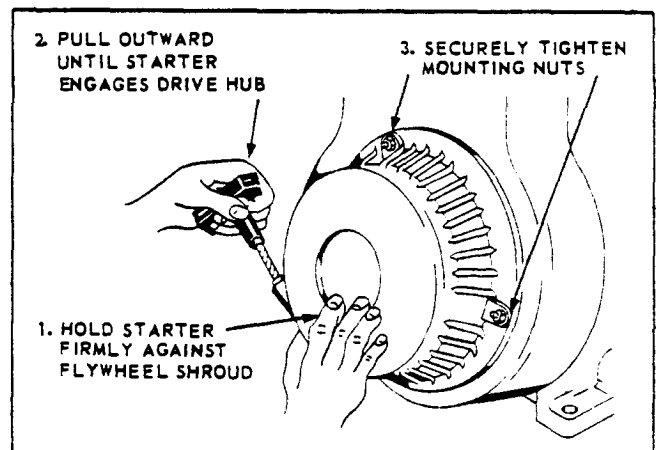
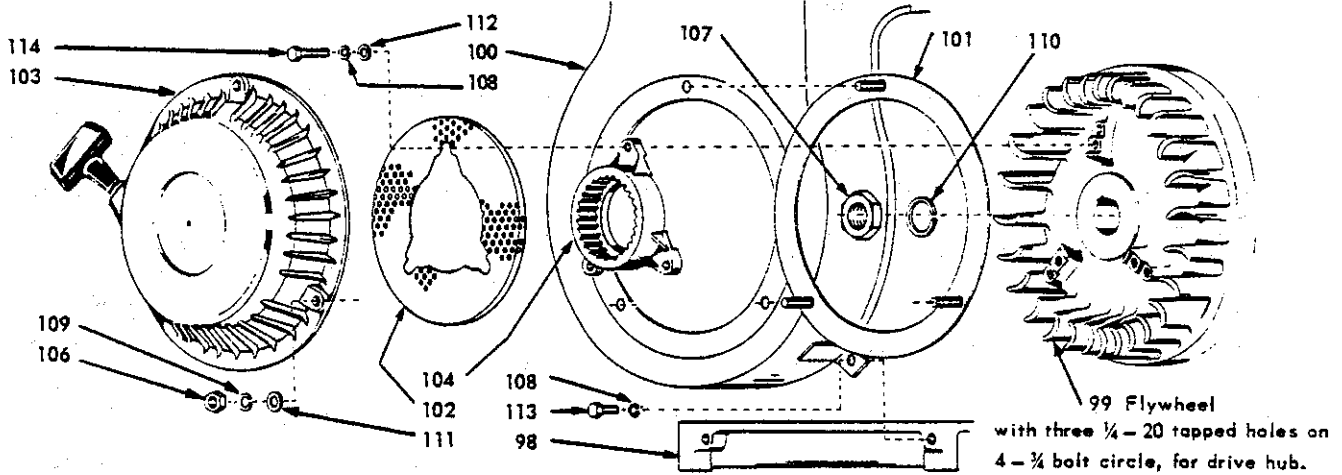


FIG. 7

RWS 109 REWIND STARTER ASSEMBLY – SERVICE PARTS LIST

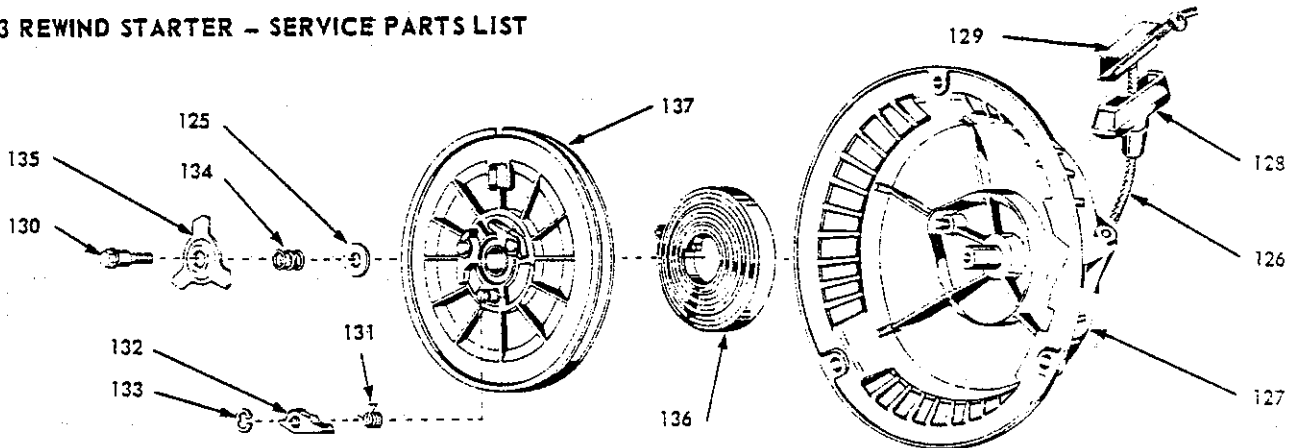
RWS 110, RWS 111 Same as RWS 109 except T – Handle in alternate locations, see Fig. 2.



Ref. No.	Part Number	Description	No. Req.
The following STANDARD PARTS as of Serial No. S789735.			
98	BB 128 A 5	ENGINE BASE	1
99	NC 215	FLYWHEEL	1
100	SE 339	SHROUD, flywheel	1
R 109, R 110, R 111 Assemblies consists of the following:			
101	PG 1300	SUPPORT RING	1
102	SE 334	SCREEN, rotating	1
103	U 283	REWIND STARTER ASSEMBLY	1
104	UC 204	DRIVE HUB	1
STANDARD HARDWARE			
106	PD 78	NUT, 5/16-18 thread, hexagon steel	3
		For rewind starter mounting.	
107	PD 142	NUT, 7/8-14 thread, 1 1/4" hexagon jam	1
		For flywheel mounting.	

Ref. No.	Part Number	Description	No. Req.
108	PE 3	LOCKWASHER, 1/4" spring lock	5
		3- For drive hub to flywheel mounting.	
		2- For flywheel shroud to case mounting.	
109	PE 4	LOCKWASHER, 5/16" spring lock	3
		For rewind starter mounting.	
110	PE 38	LOCKWASHER, 7/8" spring lock (light)	1
		For flywheel mounting.	
111	PH 14 D	WASHER, 5/16" x 19/32" O.D., plain steel.	3
		For rewind starter mounting.	
112	PH 196	WASHER, 1/4" x 5/8" O.D., plain steel	3
		For drive hub to flywheel mounting.	
113	XD 5	SCREW, 1/4"- 20 x 1/2" long, hexagon head.	2
		For flywheel shroud to case mounting.	
114	XD 7	SCREW, 1/4"- 20 x 1" long, hexagon head	3
		For drive hub to flywheel mounting.	

U 283 REWIND STARTER – SERVICE PARTS LIST



Ref. No.	Part Number	Description	No. Req.
125	27-504-015-0	WASHER, brake spring	1
126	27-504-022-0	ROPE, No. 6 x 74" long	1
127	27-504-116-0	HOUSING ASSEMBLY	1
128	27-508-008-0	T HANDLE	1
129	27-508-009-0	REINFORCEMENT, T handle	1
130	27-525-003-0	SCREW, cam center	1
131	27-525-007-0	DOG SPRING	3

Ref. No.	Part Number	Description	No. Req.
132	27-525-008-0	DOG	3
133	27-525-012-0	DOG RETAINER CLIP	3
134	27-525-013-0	BRAKE SPRING	1
135	27-526-001-0	DOG CAM	1
136	27-526-003-0	RECOIL SPRING	1
137	27-526-504-0	PULLEY and BEARING assembly ..	1

LP-62 series FUEL PUMP

REPAIR INSTRUCTIONS

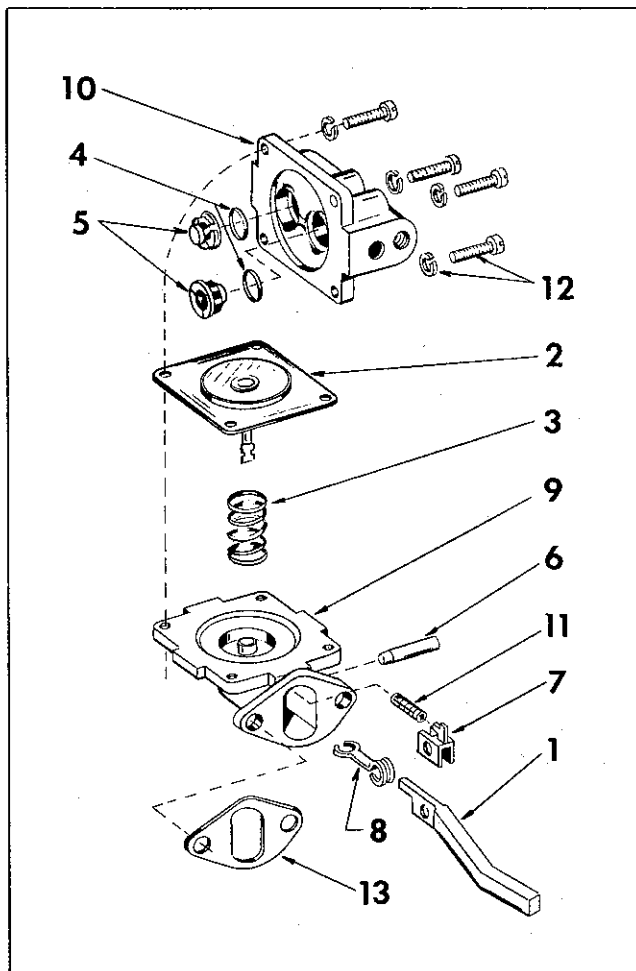
For single and two cylinder engine models

PART NO.	ENGINE USED ON
LP-62-A	THD, TJD
LP-62-B	ACN, BKN, AENL
LP-62-C	MTHD
LP-62-D	AGND
LP-62-E	S-7D
LP-62-F	S-10D, S-12D, S-14D
LP-62-G	S-8D, TRA-10D, TRA-12D

The fuel pump, like all other parts of the engine, is subject to wear and you will find that any time after 500 hours of use, its efficiency will gradually decrease. This is indicated by the engines faltering at high speeds or when heavy loads are suddenly applied. The pump can easily be restored to its normal efficiency by the installation of a Wisconsin LQ-51 Diaphragm Kit.

1. Disconnect fuel lines from pump and remove fuel strainer if mounted to pump. Remove fuel pump from engine housing by taking out the two mounting screws.
2. File a groove across a point at the union of castings (9 and 10). This is a positive location of the fuel INLET and OUTLET positions when reassembling. Remove four head to bracket screws (12) and remove fuel head (10).
3. Turn fuel head (10) over, remove and discard both valve assemblies, noting their positions.
4. Clean fuel head thoroughly with kerosene or diesel fuel and a fine wire brush.

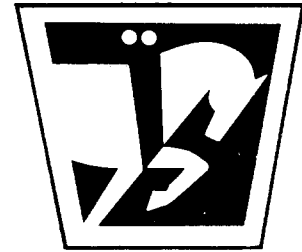
5. Hold fuel head (10), with diaphragm surface up, place two valve gaskets (4) into cavities where valves were removed. Press valve assemblies (5) in evenly without distortion, and stake in place.
6. Set fuel head assembly aside and proceed to rebuild lower diaphragm section.
7. Insert the end of a small screw driver into the coils of rocker arm spring (11), remove and save.
8. Hold mounting bracket (9) in the left hand, with the rocker arm toward your body and the thumb nail on the end of link (8). With the heel of right hand on diaphragm (2), compress the diaphragm spring (3), and at the same time turn in a clockwise direction 90°. This will unhook the diaphragm from link (8) so it can be removed.
9. Clean the mounting bracket (9) with kerosene or diesel fuel and a fine wire brush.
10. Place the new diaphragm operating spring (3) into bracket (9). Repeat in reverse order paragraph eight, using the new diaphragm. Replace rocker arm spring (11) removed in paragraph seven.
11. Mount this assembly back on the engine in the position from which it was removed, using the new flange gasket (13), which is the last piece of the repair kit.
12. Crank the engine over to a position where the diaphragm (2) is laying flat on the mounting bracket (9). Place the fuel head (10) back in position so that the indicating marks of step one are in line, and start the four head screws approximately three turns. Again, crank the engine over to a position where diaphragm (2) is pulled down into mounting bracket (9) to its lowest position. Securely tighten the four head screws (12).
13. Mount fuel strainer to fuel pump, if applicable, and connect fuel lines.



NOTE: The LQ-51 Diaphragm Kit and the parts included therein, which are identified by an asterisk (*), are the only parts of the fuel pump available for service.

Ref. No.	Description	No. Req.
1	ROCKER ARM	1
* 2	DIAPHRAGM ASSEMBLY	1
* 3	DIAPHRAGM SPRING	1
* 4	VALVE GASKETS	2
* 5	VALVE and CAGE ASSEMBLY	2
6	PIN for rocker arm	1
7	SPRING CLIP for rocker arm	1
8	LINK for diaphragm spring	1
9	MOUNTING BRACKET	1
10	FUEL HEAD	1
11	SPRING for rocker arm	1
12	SCREW and WASHER for head mounting	4
*13	GASKET for mounting flange	1

FLYWHEEL ALTERNATOR



with solid state regulation

12 Volt - 10 amp and 25 amp Systems For
WISCONSIN Single, Two and Four Cylinder Engine Models

DESCRIPTION of Change

Beginning with engine serial No. 5188288, a new *two module* flywheel alternator system replaces the previously furnished three module system, that included an isolation diode module, and the two unit system without the isolation diode.

The *isolation diode* module was incorporated into the old system to eliminate battery discharge problems during shut down, cranking and idling.

INTERCHANGEABILITY

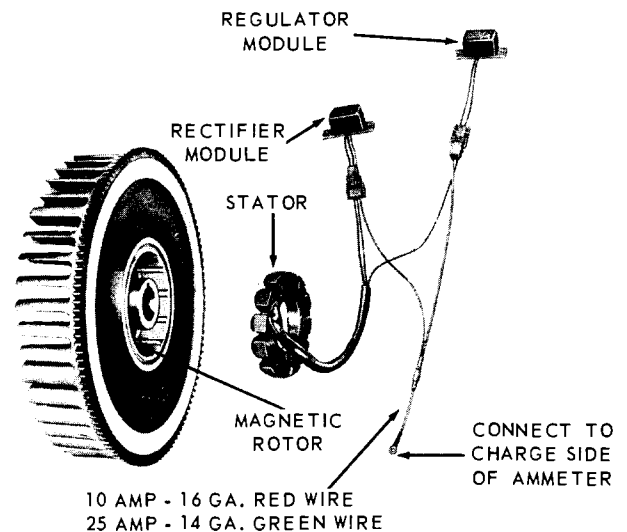
The *Regulator module* was not changed and is completely interchangeable between the new and old systems. The *Rectifier module* and *Stator assembly* have been modified to incorporate the advantages of an isolation diode without adding a third module. These new parts are *not* interchangeable with the old unless both rectifier and stator are replaced simultaneously. The new system has a *three prong* plug connector between the rectifier and stator - the old system has a two prong connector.

DESCRIPTION and OPERATION

This flywheel alternator is of the permanent magnet type and has *no brushes, commutator, belts or adjustments*. A series of coils (stator) is mounted to the engine gear cover, and the magnetic flux is provided by a permanent magnet in the flywheel which rotates around these stationary coils. Only four components make up this light weight space saving system; a *flywheel* with magnetic rotor, *stator*, *rectifier* module and *regulator* module.

The *center-tap* rectifier arrangement prevents damage to the alternator system when arc welding, because the winding acts as a choke and its inductance prevents the transient voltage from damaging the diodes.

Since the physical appearance of both 10 amp and 25 amp alternator systems are very similar, the *25 amp*



319423C-1

unit can be distinguished from the *10 amp unit* by the ammeter calibrations, and by a *14 gage green wire* in place of a *16 gage red wire*, from the ammeter to the stator-regulator connector.

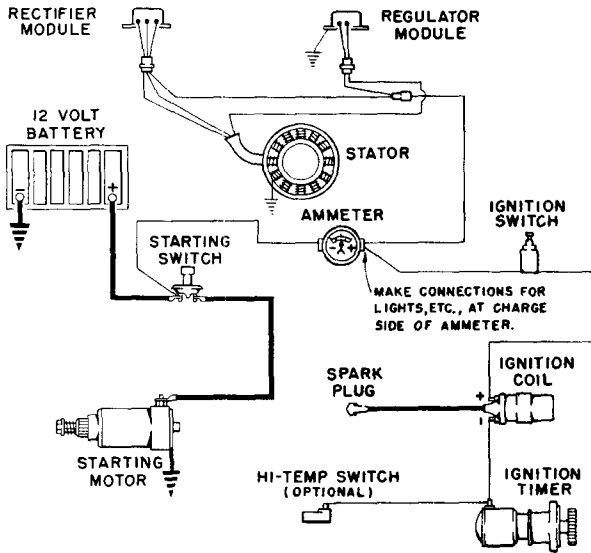
PRECAUTIONS to be exercised in the use of this flywheel alternator:

1. **Do Not** reverse battery connections. This is for a *negative ground* system only.
2. Connect booster batteries properly - positive to positive and negative to negative.
3. **Do Not** polarize the alternator.
4. **Do Not** ground any wires from stator or modules which terminate at connectors.
5. **Do Not** operate engine with battery disconnected from system.
6. Disconnect at least one battery lead if a battery charger is used.

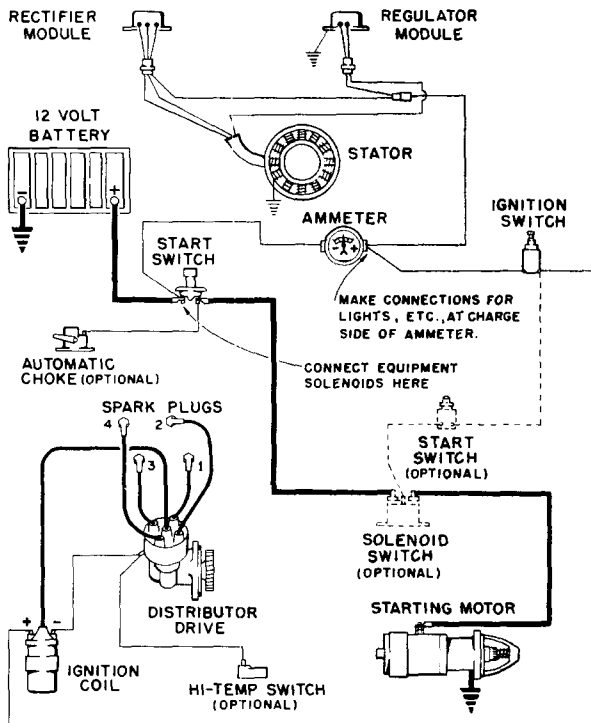
WIRING CIRCUIT

The *fool-proof* type connectors used prevent incorrect wiring from the stator to the rectifier and regulator modules. To disconnect plugs, squeeze outer ends of receptical and pull apart.

The rectifier is insulated from ground, but the stator and regulator module are grounded to the engine thru their mounting surface. The regulator module therefore should not be removed and mounted at some remote location. This is a *negative ground circuit*. Connect ground strap from negative post of battery to starting motor flange, or good clean grounding surface on engine.



WIRING DIAGRAM
For Single Cylinder Models



WIRING DIAGRAM
For Two and Four Cylinder Models

SERVICE PROCEDURE:

Prior to electrical testing, a thorough visual inspection should be made to eliminate conditions that may be interpreted as a defected alternator. Examine leads for broken or loose connections, and make sure modules are securely mounted. The *regulator module* must be mounted to a metal surface for grounding purposes, while the *rectifier module*, although insulated from ground, should be securely mounted for heat dissipation. The mounting surfaces must be clean and free of contaminants, oil, grease, etc. When assured that the problem is with the alternator, follow the tests outlined in 'Trouble Shooting'.

TROUBLE SHOOTING

10 and 25 amp Flywheel Alternator

Problem: Battery Overcharge	Possible Cause & Remedy
Test 1.0 With engine running at full RPM, check battery voltage w/ DC Voltmeter.	
1.1 If voltage is over 15.0	1.1 Regulator not functioning properly. Replace module.
1.2 If voltage is under 15	1.2 Alternator functioning properly. Check battery condition.

Problem: Low/No Charge	Possible Cause & Remedy
Test 1.0 With engine running at full RPM, check battery voltage w/ DC meter. If voltage is greater than 14 volts, place * load on battery to reduce voltage below 14 volts.	
1.1 If the charge rate increases -	1.1 Alternator functioning properly. Battery was fully charged.
1.2 If the charge rate does not increase -	1.2 Proceed with Test 2.0.

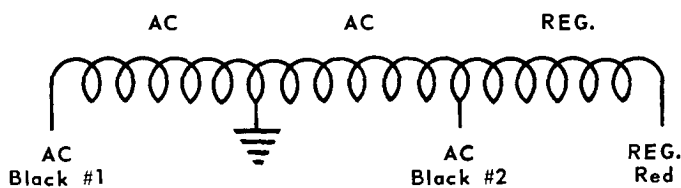
* Place as many 12 volt light bulbs across battery as required to reduce voltage below 14 volts. A carbon pile resistor may be used in place of bulbs.

Problem: Low/No Charge	Possible Cause & Remedy
Test 2.0 Conditions and procedure the same as Test 1.0 except the regulator module is disconnected. 2.1 If the charge rate increases – 2.2 If the charge rate does not increase–	2.1 Regulator was at fault. Replace regulator module. 2.2 Regulator is not at fault. Continue with Test 3.0.
Test 3.0 Test conditions and procedure the same as 1.0 except with new rectifier module plugged in. 3.1 If the charge rate increases – 3.2 If the charge rate does not increase–	3.1 Rectifier module at fault. Permanently install new rectifier module. 3.2 Continue with Test 4.0.
Test 4.0 With engine stopped, unplug all connectors between modules and stator. Start engine and run at 2400 RPM. With AC voltmeter check voltage between each of the black stator leads and ground. 4.1 If one of the two voltages is zero or they are over 10% apart –	4.1 The stator is faulty and should be replaced.

Further testing can be done on the component level with the engine stopped, and the stator and module connections including output lead uncoupled.

TO CHECK STATOR

Use an ohmmeter and check continuity as follows:



NOTE: Wire numbers indicated for probe connections are for convenience only and are not indicated on the connectors.

For 10 amp unit STATOR

METER PROBE CONNECTIONS	METER VALUE	REPLACE STATOR
+	-	
Black #1 to Black #2	APPROX. 2.0 ohms 1.0 ohm 1.0 ohm 3.0 ohms 1.0 ohm	0 Indicates Short Circuit. ∞ Indicates Open Circuit.
Black #1 to Eng. Gnd.		
Black #2 to Eng. Gnd.		
Black #1 to Red		
Black #2 to Red		

For 25 amp unit STATOR

METER PROBE CONNECTIONS	METER VALUE	REPLACE STATOR
+	-	
Black #1 to Black #2	APPROX. 0.40 ohm 0.20 ohm 0.20 ohm 3.20 ohms 2.80 ohms	∞ Indicates Open Circuit.
Black #1 to Eng. Gnd.		
Black #2 to Eng. Gnd.		
Black #1 to Red		
Black #2 to Red		

STATOR IDENTIFICATION:

10 amp – 3/8" wide flange 25 amp – 5/8" wide flange

TO CHECK RECTIFIER MODULE, Part No. YJ-68

The same module is used for both the 10 amp and 25 amp systems. It can be distinguished from the regulator by the three lead wires instead of two and the identification decal. Use an ohmmeter and *static check* continuity as follows:

METER PROBE CONNECTIONS	METER INDICATION
+	-
White lead to Black #1	No Continuity
Black #1 to White lead	Continuity
White lead to Black #2	No Continuity
Black #2 to White lead	Continuity

Note: Continuity shall be in one direction only. If readings are not as indicated, replace module.

TO CHECK REGULATOR MODULE, Part No. YJ-60

The same Regulator module is used for both the 10 amp and 25 amp systems. Use an Ohmmeter and *static check* as follows:

METER PROBE CONNECTIONS	METER INDICATION	REPLACE MODULE
+	-	
Red to Eng. Gnd.	No Continuity	Continuity
Eng. Gnd. to Red	↓	↓
Red to Black		
Black to Red		
Black to Eng. Gnd.		
Eng. Gnd. to Black		
	Continuity	No Continuity

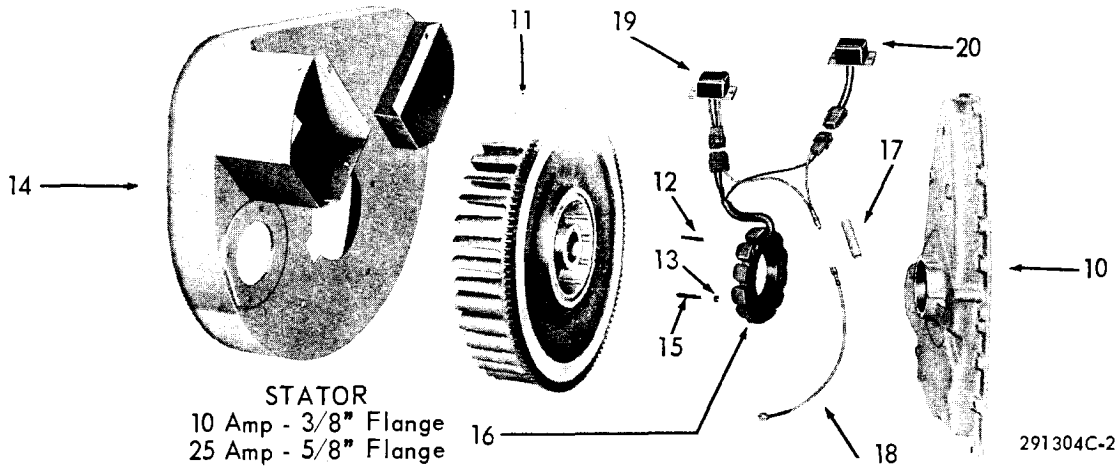
AMP OUTPUT regulated by engine speed

MODEL	MAXIMUM ENGINE SPEED	10 AMP SYSTEM	25 AMP SYSTEM
S-12D, S-14D	3600 RPM	10 amps	25 amps
AENL, TJD			
AGND	3200 RPM	10 amps	23 amps
VH4D	2800 RPM	9 amps	20 amps
VG4D	2400 RPM	8 amps	17 amps

FLYWHEEL ALTERNATOR 12 VOLT - 10 AMP and 25 AMP Systems

For Engines beginning with Serial Number 5188288

SERVICE PARTS LIST: The following items are in addition to, or replace similar parts found in the parts manual of each specific engine model. The parts illustration is for the **VG4D** engine, but can be applied to all models.



STATOR
10 Amp - 3/8" Flange
25 Amp - 5/8" Flange

REF. NO.	DESCRIPTION	NO. REQ.	PART NUMBER PER ENGINE MODEL					
			AENL	AGND	S-10D, S-12D, S-14D	THD, TJD	VF4D, VH4D	VG4D
10	GEAR COVER ASSEMBLY BEARING RETAINER PLATE - flywheel end	1 1	BG-344-S1	BG-343-S1	BG-350A-S1	BD-103J-S1	BD-100K-4-S1	BD-101B-S1
* 11	FLYWHEEL with rotor and ring gear For 10 amp alternator circuit For 25 amp. alternator circuit	1 1	N-104-5 N-104-9	N-103-5 N-103-9	N-105-2 N-105A-3	N-102-5 N-102-9	N-101-6 N-101-10	N-100-5 N-100-9
12	ROLL PIN - For 10 amp stator For 25 amp stator	2 2	PA-336 PA-362	PA-340 PA-340		PA-368 PA-340	PA-368 PA-340	PA-368 PA-340
13	LOCKWASHER , No. 10, for stator mt'g.	4	PE-14	PE-14	PE-14	PE-14	PE-14	PE-14
* 14	FLYWHEEL SHROUD	1	SE-154-A	SE-217-H	SE-289-A w/ SE-301B-1 PI.	SE-135-AT	SE-74-YA	SE-124-AM
15	SCREW - For 10 amp stator mt'g. For 25 amp stator mt'g.	4 4	XB-114 XB-110	XB-113 XB-106	XB-113 XB-106	XB-113 XB-106	XB-113 XB-106	XB-113 XB-106
16	STATOR ASSEMBLY - For 10 amp circuit For 25 amp circuit	1 1	YB-81 YB-82	YB-81 YB-82	YB-81 YB-82	YB-81 YB-82	YB-81 YB-82	YB-81 YB-82
17	INSULATOR - ammeter wire connector	1	YD-350	YD-350	YD-350	YD-350	YD-350	YD-350
18	WIRE ASSEMBLY - stator plug to ammeter For 10 amp stator For 25 amp stator	1 1	YL-381-6 YL-380-6	YL-381-6 YL-380-6	YL-381-18 YL-380-18	YL-381-14 YL-380-14	YL-381-18 YL-380-18	YL-381-22 YL-380-22
19	RECTIFIER MODULE - For 10 and 25 amp	1	YJ-68	YJ-68	YJ-68	YJ-68	YJ-68	YJ-68
20	REGULATOR MODULE - For 10 amp and 25 amp circuit	1	YJ-60	YJ-60	YJ-60	YJ-60	YJ-60	YJ-60

PARTS REQUIRED - NOT ILLUSTRATED

* CRANKCASE	1	AA-91B-10	BA-54-20					
ENGINE BASE	1	BB-128A-5						
CLIP for stator wires	1	PG-630-1	PG-430					
GROMMET for stator wires	1			PH-198B-1				
GASKET for bearing retainer plate	1	QD-833						
NUT , #10-32, for mounting modules	4	PD-115	PD-115	PD-115	PD-115	PD-115	PD-115	PD-115
LOCKWASHER , #10 I.E.T., for mounting modules	4	PE-78-A	PE-78-A	PE-78-A	PE-78-A	PE-78-A	PE-78-A	PE-78-A
SCREW , #10-32, for mounting modules	4	XA-7	XA-7	XA-7	XA-8	XA-8	XA-8	XA-8

* **NOTE:** Because of the available variations in Flywheels, Flywheel Shrouds and Crankcases - give Engine Model, Specification and Serial Numbers when ordering.

CARBURETOR

ZENITH MODEL 68-7

WISCONSIN L-63 SERIES

The Zenith 68-7 Series carburetor is of an up-draft single venturi design with a 1" S.A.E. barrel size and a 7/8" S.A.E. flange. The carburetors are made with selective fuel inlet, and with or without a main jet adjustment. These carburetors are "balanced" and "sealed", and the semi-concentric fuel bowl allows operation to quite extreme angles without flooding or starving.

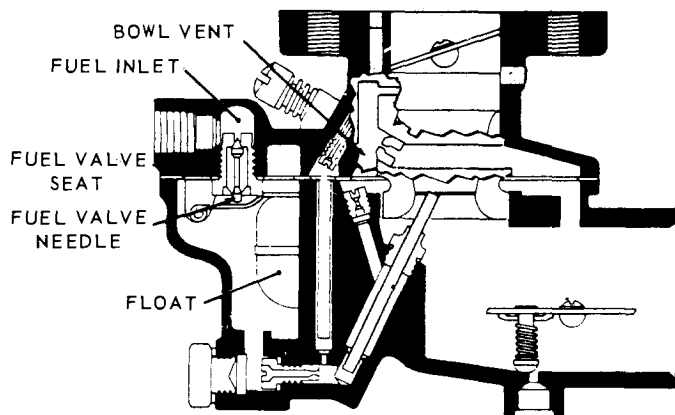


Fig. 1

Fuel supply system, Fig. 1, is made up of a threaded fuel inlet, fuel valve seat, fuel valve needle, float and fuel bowl. Fuel travels through the fuel valve seat and passes around the fuel valve and into the fuel bowl. The level of the fuel in the fuel chamber is regulated by the float through its control of the fuel valve. The fuel valve does not open and close alternately but assumes an opening, regulated by the float, sufficient to maintain a proper level in the fuel chamber equal to the demand of the engine according to its speed and load.

The inside bowl vent as illustrated by the passage originating in the air intake and continuing through to the fuel bowl, is a method of venting the fuel bowl to maintain proper air fuel mixtures even though the air cleaner may become restricted. This balancing is frequently referred to as an "inside bowl vent".

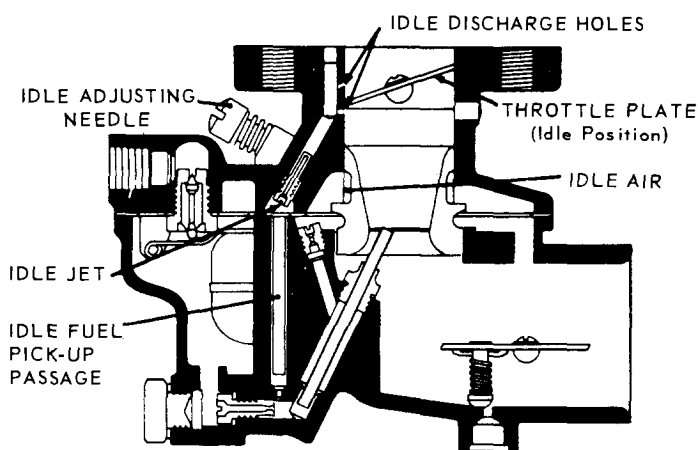


Fig. 2

Idle system, Fig. 2, consists of two idle discharge holes, idle air passage, idle adjusting needle, idle jet, and fuel pick-up passage. The fuel for idle is supplied through the main jet to a well directly below the main discharge jet. The pick-up passage is connected to this well by a restricted drilling at the bottom of this passage. The fuel travels through this channel to the idle jet calibration. The air for the idle mixture originates back of (or from behind) the main venturi. The position of the idle adjusting

needle in this passage controls the suction on the idle jet and thereby the idle mixture. Turning the needle in closer to its seat results in a greater suction with a smaller amount of air and therefore a richer mixture. Turning the needle out away from its seat increases the amount of air and reduces the suction, and a leaner mixture is delivered. The fuel is atomized and mixed with the air in the passage leading to the discharge holes and enters the air stream at this point.

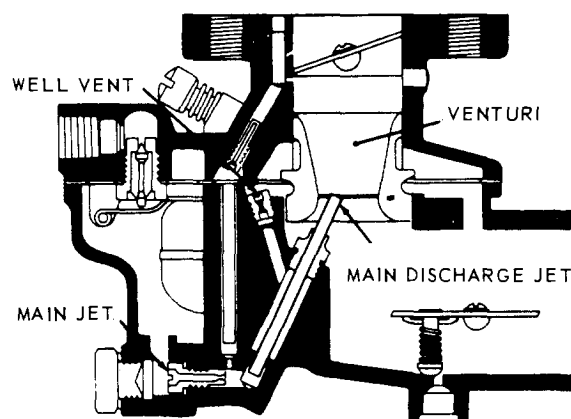


Fig. 3

High speed system, Fig. 3, controls the fuel mixture at part throttle speeds and at wide open throttle. This system consists of a venturi, controlling the maximum volume of air admitted into the engine; the main jet, which regulates the flow of fuel from the float chamber to the main discharge jet; the well vent, which maintains uniform mixture ratio under changing suction and engine speeds; and a main discharge jet, which delivers the fuel into the air stream.

The main jet controls the fuel delivery during part throttle range from about one-quarter to full throttle opening. To maintain a proper mixture, a small amount of air is admitted through the well vent into the discharge jet through air bleed holes in the discharge jet at a point below the level of fuel in the metering well.

The passage of fuel through the high speed system is not a complicated process. The fuel flows from the fuel chamber through the main jet and into the main discharge jet where it is mixed with air admitted by the well vent, and the air-fuel mixture is then discharged into the air stream of the carburetor.

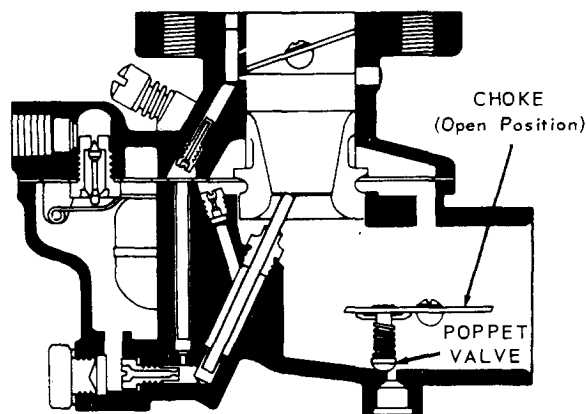


Fig. 4

Choke system, Fig. 4, consists of a valve mounted on a shaft located in the air entrance and operated externally by a lever mounted on the shaft. The choke valve is used to restrict the air entering the carburetor. This increases the suction on the jets

when starting the engine. The choke valve is of a "semi-automatic" type, having a poppet valve incorporated in its design, which is controlled by a spring. The poppet valve opens automatically when the engine starts and admits air to avoid over-choking or flooding of the engine. The mixture required for starting is considerably richer than that needed to develop power at normal temperatures. As the engine fires and speed and suction are increased, the mixture ratio must be rapidly reduced. This change is accomplished through adjustment of the choke valve and the automatic opening of the poppet valve to admit more air when the engine fires.

FLOAT SETTING, Fig. 5

If float position is not to the dimension shown, use a long nose pliers and bend lever close to float body, to obtain correct float setting.

FUEL LEVEL

The liquid level in float chamber is 17/32 to 19/32 inch below top of float bowl. This level was established with a #35 fuel valve seat at 1½ p.s.i. and a sight tube approximately 1/4 to 9/32 inch i.d.

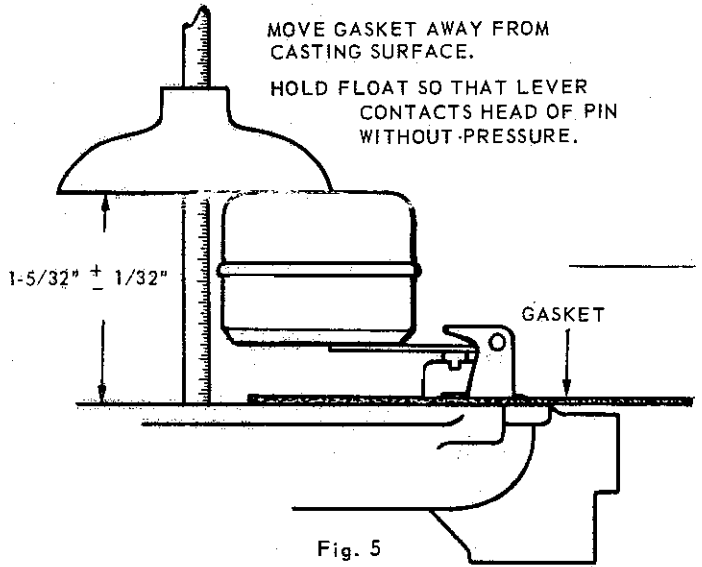
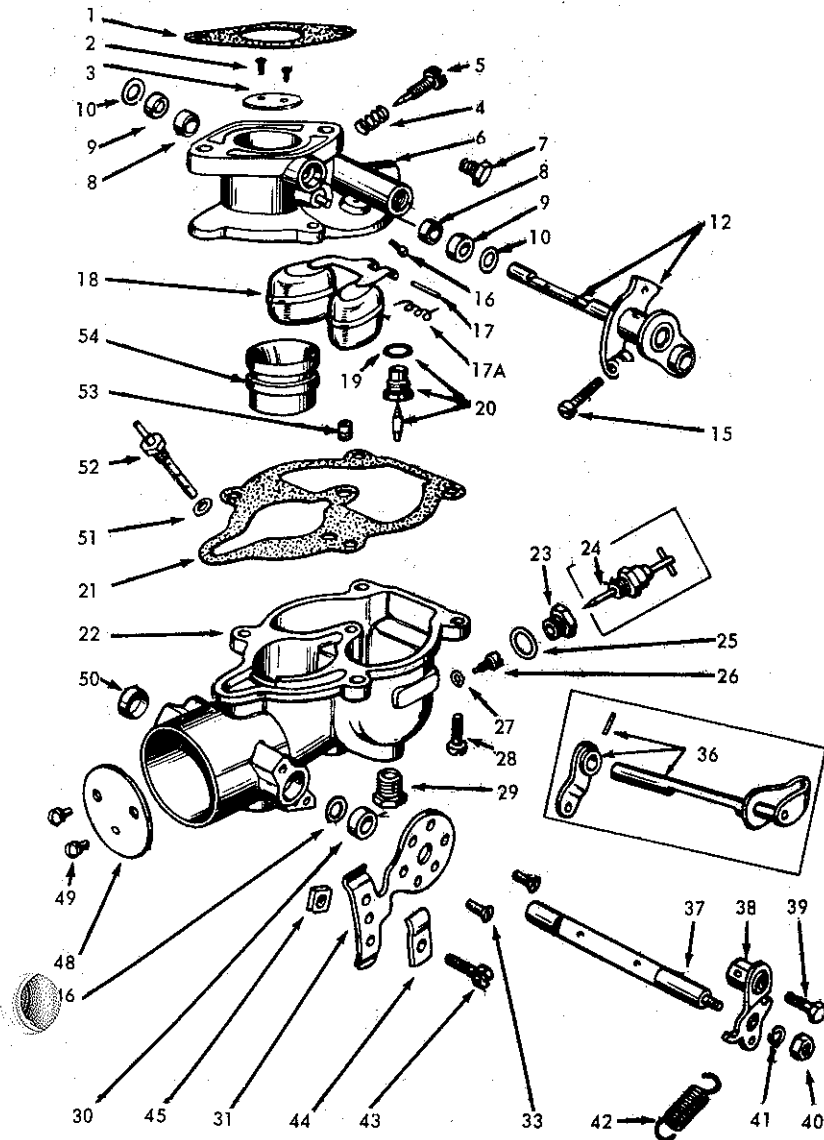


Fig. 5

SERVICE PARTS LIST

Parts are identified by reference number. See parts list for correct part number.



CARB. REF.	ZENITH NO.	WISCONSIN NO.
1	12098A ●	L-63
2	12188G ●	L-63-A
3	12158D ●	L-63-C
4	12325	L-63-D
5	12199E ●	L-63-E
6	12205A ●	L-63-F
7	12235E ●	L-63-G
8	12236	L-63-H
9	12239C ●	L-63-J
10	12234F ●	L-63-K
11	12288C ●	L-63-L
12	12300	L-63-M
13	12599D ●	L-63-N
14	12375D ●	L-63-R
15	12448D ●	L-63-U
16	12449D ●	L-63-V
17	12545C ●	L-63-W
18	12543C ●	L-63-Y
19	12546	L-63-Z
20	12647	L-63-AA
21	12253A ●	LZ-63-2
22	12229D ●	LZ-63-C
23	12238D ●	LZ-63C-2
24	12744B ●	L-63-AF
25	12982B ●	L-63-AN
26	13201A ●	L-63-AP
27	13238A ●	L-63-AQ
28	13405A ●	L-63-AV
29	13420A ●	L-63-BC
30	13449A ●	L-63-BD
31	13694	L-63-BL

NOTE: Beginning with this letter designation ● bushings (Ref. 8) were discontinued.

CARBURETOR PARTS LIST
ZENITH MODEL 68-7 **WISCONSIN L-63 Series**

Item No.	Part Number	Description	No. Req.	Item No.	Part Number	Description	No. Req.
1	QC-71-A *	GASKET - flange, (Zenith No. C141-4-5)	1		93-C81-50-35 *	VALVE & SEAT, fuel (spring type) for 2, 3, 7, 9, 11, 12, 14, 15, 22, 23, 24, 26	1
2	93-T31555-4	SCREW & WASHER - throttle plate	2		93-C81-50-25 *	For 17 and 19	1
	93-T315B5-4	SCREW & WASHER - throttle plate, for 30	2	21	93-C142-74 † *	GASKET - BOWL TO BODY	1
3	93-C21-176	PLATE - throttle, for all except 5, 7, 8, 10, 12, 14, 18	1	22	93-B3-121B-1	BOWL - FUEL, for 1, 6, 20, 21	1
	93-C21-205	PLATE - throttle, for 5, 7, 8, 10, 12, 14, 18	1		93-B3-121A-3	BOWL - FUEL, for 2, 5, 10, 12, 18	1
4	93-C111-17	SPRING - idle needle	1		93-B3-121A-1	BOWL - FUEL, for 3, 7, 8, 9, 11, 14, 17, 19, 22, 24, 29, 31	1
5	93-C46-6 *	NEEDLE - idle adjusting	1		93-B3-121B-2	BOWL - FUEL, for 4	1
6		BODY - throttle, (Not available for service)			93-B3-121A-2	BOWL - FUEL, for 13	1
7	93-T91-3	1/8" PLUG - fuel inlet R.H.	1		93-B3-121E-1	BOWL - FUEL, for 15, 23, 30	1
8	93-C9-75	BUSHING - throttle shaft (See Note)	2		93-B3-121F-1	BOWL - FUEL, for 16	1
9	93-T48-9 *	SEAL - throttle shaft	2		93-B3-121D-6	BOWL - FUEL, for 25	1
10	93-T52-57 *	RETAINER - shaft seal (1 used for 28)	2		93-B3-121A-7	BOWL - FUEL, for 26	1
	93-C131-38	CUP PLUG, for 28	1	23	93-C138-24	PLUG - MAIN JET PASSAGE, for 1, 3, 4, 8, 10, 15, 16, 19, 20, 21, 22, 23, 24, 26, 28, 29, 30, 31	1
12	93-C29-491	SHAFT & STOP LEVER - throttle, for 1, 3, 6, 9, 11, 17, 19, 20, 21, 22, 23, 29, 31	1	24	93-C71-21	ADJUSTMENT - MAIN JET, for 2, 5, 6, 7, 9, 11, 12, 13, 14, 17, 18, 25, 27	1
	93-C29-1301	SHAFT & STOP LEVER - throttle, for 4	1	25	93-T56-23 † *	WASHER (fiber) - PLUG & ADJUSTMENT ..	1
	93-C29-926	SHAFT & STOP LEVER - throttle, for 5, 7, 8, 10, 14, 18	1	26	93-C52-7-22	JET - MAIN, for 1, 4, 16, 20, 21, 28, 29, 30 ...	1
	93-C29-1418	SHAFT & STOP LEVER - throttle, for 25, 27	1		93-C52-7-33	JET - MAIN, for 2, 13, 25, 27	1
	93-C29-1476	SHAFT & STOP LEVER - throttle, for 15, 16, 30	1		93-C52-7-26	JET - MAIN, for 5, 7, 11, 12, 14, 17, 18	1
	93-C29-858	SHAFT & STOP LEVER - throttle, for 2, 13, 24	1		93-C52-7-25	JET - MAIN, for 6	1
	93-C29-1475	SHAFT & STOP LEVER - throttle, for 12	1		93-C52-7-19	JET - MAIN, for 8	1
	93-C29-1584	SHAFT & STOP LEVER - throttle, for 26	1		93-C52-7-30	JET - MAIN, for 9	1
	93-C29-1607	SHAFT & STOP LEVER - throttle, for 28	1		93-C52-7-21	JET - MAIN, for 10	1
15	93-T858-12-NP	SCREW - THROTTLE STOP, for all except 25, 27, 30	1		93-C52-7-23	JET - MAIN, for 3, 15, 19, 22, 23, 24, 26	1
	93-T858-10-NP	SCREW - THROTTLE STOP, for 25, 27, 30	1		93-C52-7-24	JET - MAIN, for 31	1
16	93-C55-6-12	JET - IDLE, for all except 25, 27, 29, 30	1	27	93-T56-24 † *	WASHER (fiber) - MAIN JET	1
	93-C55-6-10	JET - IDLE, for 29, 30	1	28	93-T301510-10	SCREWS - BOWL TO BODY ASSEMBLY	4
	93-C55-22-11	JET - IDLE, for 25, 27	1	29	93-T91-3	PLUG - BOWL DPAIN	1
17	93-C120-4 *	AXLE - FLOAT	1	30	93-C131-4X2 *	RETAINER - CHOKE SHAFT SEAL, for 1 thru 25, 27, 29, 30, 31	1
17A	93-C117-79	SPRING - FLOAT, for all except 1, 6, 16, 21, 28	1		93-T52-53 *	RETAINER - CHOKE SHAFT SEAL, for 26, 28 ..	1
18	93-C85-103	FLOAT and HINGE ASSEMBLY	1	31	93-C109-60C	BRACKET - CHOKE, for 1, 3, 6, 7, 8, 9, 11, 14, 15, 16, 17, 19, 20, 21, 23, 24, 26, 29, 30, 31	1
19	93-T56-20 † *	WASHER (.040" thick fiber) for 93-C81-17 Solid type fuel valve and seat.	1		93-C109-60C-2	BRACKET - CHOKE, for 4, 13, 27	1
	93-T56-70 † *	WASHER (.020" thick fiber) for 93-C81-50 Spring type fuel valve and seat.	1		93-C109-60C-1	BRACKET - CHOKE, for 22	1
20	93-C81-17-35 *	VALVE & SEAT, fuel (solid type) for 1, 4, 5, 6, 8, 10, 13, 16, 21, 25, 27, 28, 29, 30, 31 ...	1		93-C109-60E-1	BRACKET - CHOKE, for 28	1
	93-C81-17-25 *	For 18 and 20	1	33	93-C140-58	SCREWS - CHOKE BRACKET ASSEMBLY .. For all except 2, 5, 10, 12, 18, 25.	2
				36	93-C108-280	SHAFT & FRICTION LEVER - CHOKE, for 2	1
					93-C108-279	SHAFT & FRICTION LEVER - CHOKE, for 5, 10, 12, 18	1
					93-C108-277	SHAFT & FRICTION LEVER - CHOKE, for 25	1
				37	93-C105-286	SHAFT - CHOKE, for all except 2, 5, 10, 12, 18, 25	1
				38	93-C106-2	LEVER - CHOKE, for all except 2, 5, 10, 12, 18, 25	1
				39	93-T858-7	SCREW - CHOKE LEVER SWIVEL, for all except 2, 5, 10, 12, 18, 25	1
				40	93-T2258	NUT - CHOKE SHAFT, for all except 2, 5, 10, 12, 18, 25	1

(Continued)

Order parts from nearest **WISCONSIN DISTRIBUTOR** or **SERVICE CENTER**.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

CARBURETOR PARTS LIST
ZENITH MODEL 68-7

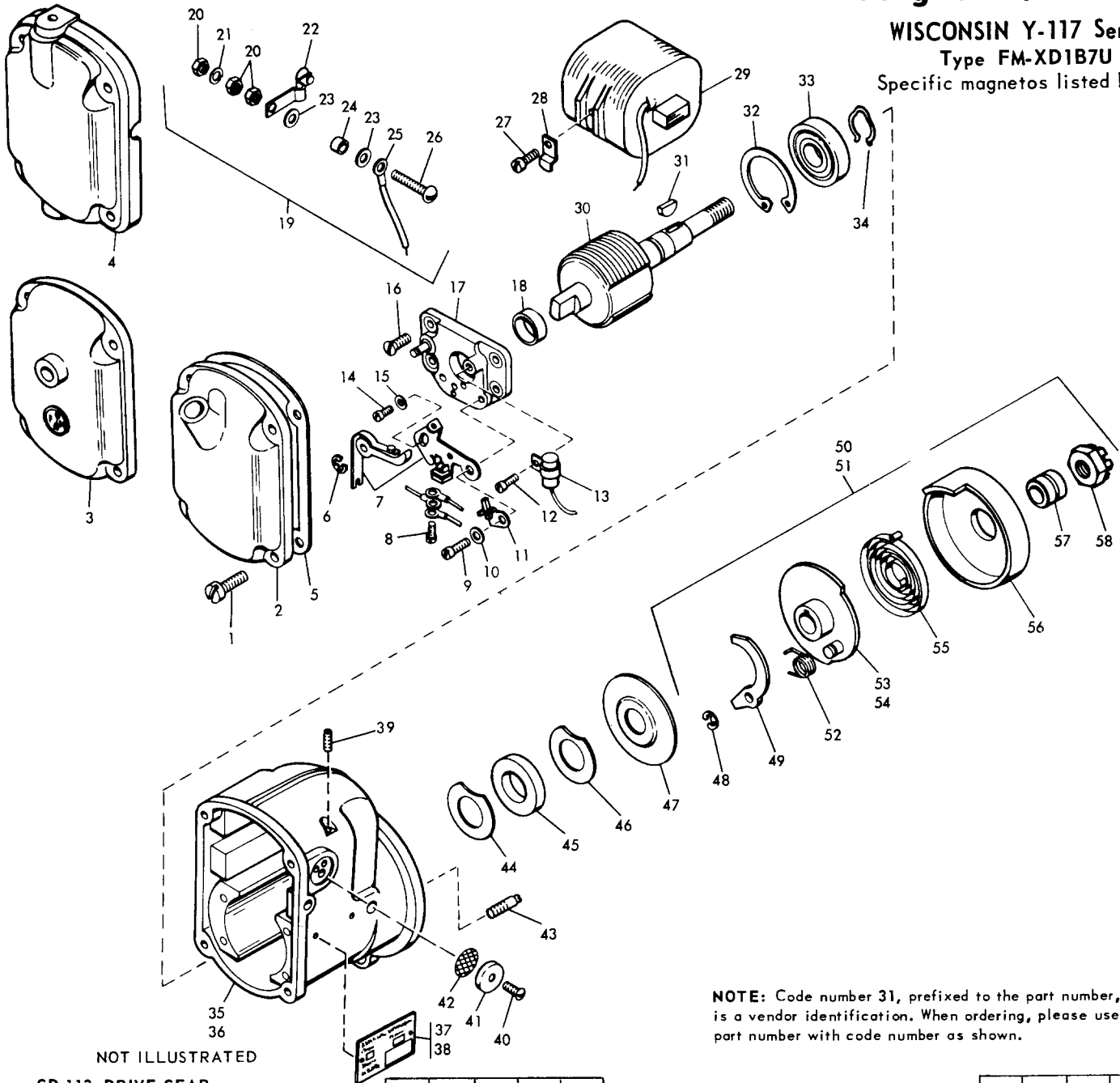
WISCONSIN L-63 Series

Item No.	Part Number	Description	No. Req.
41	93-T41-10	LOCKWASHER – CHOKE SHAFT NUT, for all except 2, 5, 10, 12, 18, 25	1
42	93-C112-6	SPRING – CHOKE LEVER RETURN, for all except 2, 5, 10, 12, 18, 25	1
43	93-T858-8	SCREW – BRACKET CLIP, for all except 2, 5, 10, 12, 18, 25	1
44	93-C110-7	CLIP – BRACKET TUBE, for all except 2, 5, 10, 12, 18, 25	1
45	93-T2158	NUT – CLAMP SCREW, for all except 2, 5, 10, 12, 18, 25	1
46	93-T57-4	* SEAL – CHOKE SHAFT, for all except 26, 28	1
	93-T48-9	* SEAL – CHOKE SHAFT, for 26, 28	1
48	93-C101-80	PLATE – CHOKE, for all except 2,13,25,27	1
	93-C101-85	PLATE – CHOKE, for 2, 13, 25, 27	1
49	93-T31555-4	SCREW & WASHER CHOKE PLATE, for all except 30	2
	93-T315B5-4	SCREW & WASHER CHOKE PLATE, for 30 ..	2
50	93-CR37-1X1 *	PLUG – CHOKE SHAFT HOLE, for all except 2, 5, 10, 12, 18	1
51	93-T56-48 †*	WASHER (fiber) – DISCHARGE JET	1
52	93-C66-114-60	JET – DISCHARGE, for 1, 4, 6, 16, 20, 21, 28	1
	93-C66-114-45	JET – DISCHARGE, for 2, 13, 25, 27	1
	93-C66-114-50	JET – DISCHARGE, for 3, 9, 11, 15, 17, 19, 22, 23, 24, 26, 29, 30, 31	1
	93-C66-114-40	JET – DISCHARGE, for 5, 7, 8, 10, 12, 14, 18	1
53	93-C77-18-12	JET – WELL VENT, for 1, 4, 6, 16, 20, 21, 28	1
	93-C77-18-13	JET – WELL VENT, for 2, 13, 25, 27	1
	93-C77-18-22	JET – WELL VENT, for 3, 9, 11, 15, 17, 19, 22, 23, 24, 26, 29, 30, 31	1
	93-C77-18-17	JET – WELL VENT, for 5, 7, 8, 10, 12, 14, 18	1
54	93-B38-74-18	VENTURI, for 1, 3, 4, 6, 9, 11, 15, 16, 17, 19, 20, 21, 22, 23, 24, 26, 28	1
	93-B38-74-19	VENTURI, for 2, 13, 25, 27, 29, 30, 31	1
	93-B38-74-17	VENTURI, for 5, 7, 8, 10, 12, 14, 18	1
Not Illust.	93-C2454AD1X2	LEVER – THROTTLE CLAMP, for 15,16,30	1
	93-T8B10-9	SCREW – LEVER CLAMP, for 15, 16, 30	1
	93-T8B8-10	SCREW – LEVER SWIVEL, for 15, 16, 30	1
	93-C181-329	GASKET KIT	1
	LQ-33	REPAIR PARTS KIT (with spring type fuel valve and seat) for 2, 3, 7, 9, 11, 12, 14, 15, 22, 23, 24, 26	1
	LQ-39	REPAIR PARTS KIT (with solid type fuel valve and seat) for 1, 4, 5, 6, 8, 10, 13, 16, 21, 25, 27, 28, 29, 30, 31	1
	93-K-2130	REPAIR PARTS KIT, for 17, 19	1
	93/K-**	REPAIR PARTS KIT, for 18, 20	1
		* Parts in Repair Kit	
		† Parts in Gasket Set	
	** Specify Zenith Carburetor Number		

Order parts from nearest **WISCONSIN DISTRIBUTOR** or **SERVICE CENTER**.
IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.

Magnet Parts List

WISCONSIN Y-117 Series
Type FM-XD1B7U
Specific magnetos listed below



NOTE: Code number 31, prefixed to the part number, is a vendor identification. When ordering, please use part number with code number as shown.

NOT ILLUSTRATED

GD-113 DRIVE GEAR
YQ-8 KIT, Points and Condenser
YQ-9 KIT, Overhaul

Ref. No.	Part Number	Description	Y-117 Series					Y-117D Series				
			FMXD1B7U	FMXD1B7U-1	FMXD1B7U-2	FMXD1B7U-3	FMXD1B7U-4	FMXD1B7U	FMXD1B7U-1	FMXD1B7U-2	FMXD1B7U-3	FMXD1B7U-4
1	31-10S12D	SCREW, end cap	4	4	4	4	4					
2	31-BZ2430	END CAP	1	1	-	-	1					
3	31-SX2430	END CAP	-	-	1	1	-					
4	31-WX2430	END CAP	-	-	-	1	-					
5	31-H2498	GASKET, end cap	1	1	1	1	1					
6	31-C1498G	SNAP RING, fulcrum pin	1	1	1	1	1					
7	31-A2437A	POINT SET	1	1	1	1	1					
8	31-6S6Z	TERMINAL SCREW	1	1	1	1	1					
9	31-8S6U	SUPPORT SCREW	1	1	1	1	1					
10	31-B5969	WASHER, support screw	1	1	1	1	1					
11	31-G2788	CAM WICK	1	1	1	1	1					
12	31-8S5NA	SCREW, condenser	1	1	1	1	1					
13	31-AMXR2433	CONDENSER	1	1	1	1	1					
14	31-6S6U	SCREW, support	1	1	1	1	1					
15	31-D2458	WASHER, support screw	1	1	1	1	1					
16	31-8S6G	SCREW, support	4	4	4	4	4					
17	31-V4631	SUPPORT, bearing	1	1	1	1	1					
18	31-A5950A	BEARING, cam end	1	1	1	1	1					
19	31-N2514C	SWITCH, assembly	1	1	1	1	1					
20	31-8N1	NUT, switch screw	3	3	3	3	3					
21	31-8LW5	LOCKWASHER, switch	1	1	1	1	1					
22	31-M2514	LEVER, insulated	1	1	1	1	1					
23	31-C6018	WASHER, insulating	2	2	2	2	2					
24	31-K2457A	BUSHING, insulating	1	1	1	1	1					
25	31-J2499A	WIRE, assembly	1	1	1	1	1					
26	31-8S14N	SCREW, switch	1	1	1	1	1					
27	31-6S4U	SCREW, clip	1	1	1	1	1					
28	31-B6120	COIL CLIP	1	1	1	1	1					
29	31-T2477C	COIL	1	1	1	1	1					
30	31-DW2480	ROTOR	1	1	1	1	1					
31	31-3K1	KEY, No. 3 Woodruff	1	1	1	1	1					

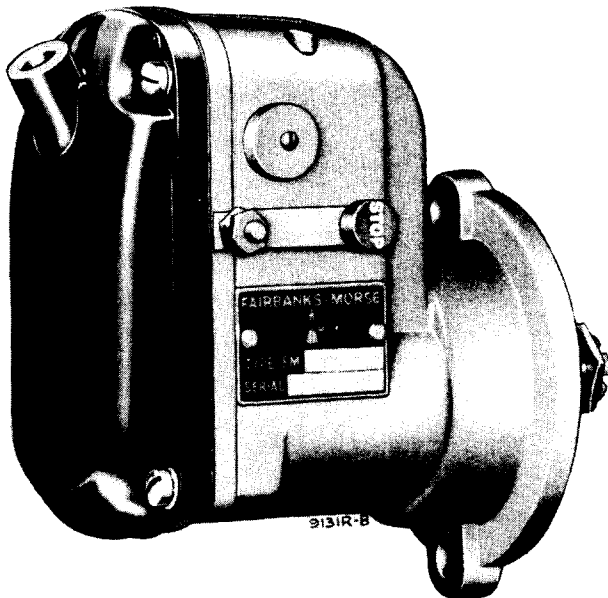
Y-117 Series
Type FM-XD1B7U

Ref. No.	Part Number	Description	Y-117-S1	Y-117A-S1	Y-117B-S1	Y-117C-S1	Y-117D-S1
			FMXD1B7U	FMXD1B7U-1	FMXD1B7U-2	FMXD1B7U-3	FMXD1B7U-4
32	31-B1498B	SNAP RING, bearing	1	1	1	1	1
33	31-C5949	BEARING, drive end.....	1	1	1	1	1
34	31-B1498D	SNAP RING, shaft.....	1	1	1	1	1
35	31-KV2425	HOUSING	-	-	-	-	1
36	31-RX2425	HOUSING	1	1	1	1	-
37	31-N195	NAME PLATE	1	-	1	1	1
38	31-A195	NAME PLATE	-	1	-	-	-
39	31-315S14A	SETSCREW, coil	2	2	2	2	2
40	31-6S4U	SCREW, cover	2	2	2	2	2
41	31-B6030A	VENT COVER	2	2	2	2	2
42	31-C6032B	VENT SCREEN	2	2	2	2	2
43	31-S2568	PIN, pawl stop	1	1	1	1	1
44	31-A2492C	WASHER, seal (inner)....	1	1	1	1	1

* Specify 20° log angle

Ref. No.	Part Number	Description	Y-117-S1	Y-117A-S1	Y-117B-S1	Y-117C-S1	Y-117D-S1
			FMXD1B7U	FMXD1B7U-1	FMXD1B7U-2	FMXD1B7U-3	FMXD1B7U-4
45	31-G3861	SEAL, shaft	1	1	1	1	1
46	31-A2492A	WASHER, seal (outer)....	1	1	1	1	1
47	31-E2303	OIL SLINGER	1	1	1	1	1
48	31-29-45	SNAP RING, pawl	1	1	1	1	1
49	31-H2566	COUPLING PAWL	1	1	1	1	1
50	31-SV2563C*	COUPLING, complete....	1	-	1	1	1
51	31-LV2563C*	COUPLING, complete....	-	1	-	-	-
52	31-S5963	PAWL SPRING	1	-	1	1	1
53	31-SZ2563 *	HUB, assembly	1	-	1	1	1
54	31-ZX2563 *	HUB, assembly	-	1	-	-	-
55	31-D2565	SPRING, coupling	1	1	1	1	1
56	31-ZX5957	SHELL, coupling	1	1	1	1	1
57	31-F2572	BUSHING, gear	1	1	1	1	1
58	31-M2570	NUT, coupling	1	1	1	1	1

FIELD SERVICE AND ADJUSTMENT



TYPICAL FMXD1B7U MAGNETO, EXCEPT GROUND SWITCH ON OPPOSITE SIDE

GENERAL DESCRIPTION

The magneto gear rotates clockwise, when viewed from the drive end, and is fitted with a dependable single pawl impulse coupling, which facilitates starting by providing an intensified and retarded ignition spark at low engine speeds.

SERVICE PROCEDURE

Improper functioning of the magneto is often believed to be the cause of engine trouble arising from other sources. A brief engine inspection will often locate the trouble before the magneto is reached and prevent maladjustment of magneto parts in good condition. It is suggested that the magneto be opened only when it is certain that the ignition spark produced is unsatisfactory. This condition may be determined by an ignition spark test. See engine INSTRUCTION MANUAL.

SERVICING BREAKER POINTS

Remove the magneto end cap and inspect the breaker points for evidence of pitting or pyramiding. A small tungsten file or fine stone may be used to resurface the points. Badly worn or pitted points should be replaced. If it is necessary to resurface or replace the breaker points, it will also be necessary to adjust them to their proper clearance, which is 0.015 inch at full separation. Refer to engine INSTRUCTION MANUAL for breaker point adjustment procedure.

SEALING MAGNETO

Opening the magneto for breaker point adjustment or other service, necessitates resealing the magneto upon reassembly. The surfaces between the magneto frame and the end cap should be thoroughly cleaned and a new gasket provided. Remove the vent hoods and clean the vent screens of all foreign material.

FURTHER FIELD SERVICE NOT RECOMMENDED

The cam felt wick, if dry or hard, should be replaced by a new factory-impregnated wick. Other than this, these magnetos do not require field lubrication and any attempt to oil or grease the bearings is inadvisable. The lubricants should be renewed only during a complete overhaul of the magneto by a Factory-Authorized Service Station. Coil and condenser replacements are not recommended, unless test equipment is available.

DRIVE GEAR

To engage the slotted drive gear correctly with the drive lugs of the coupling, the magneto rotor should be turned by hand until the coupling pawl engages the stop pin in the flange. The coupling drive lugs will then be in the position shown by **A** of Fig. 1. Mount drive gear to coupling shell so that the 'X' mark on the outer edge of the gear tooth is located as shown in view **B**.

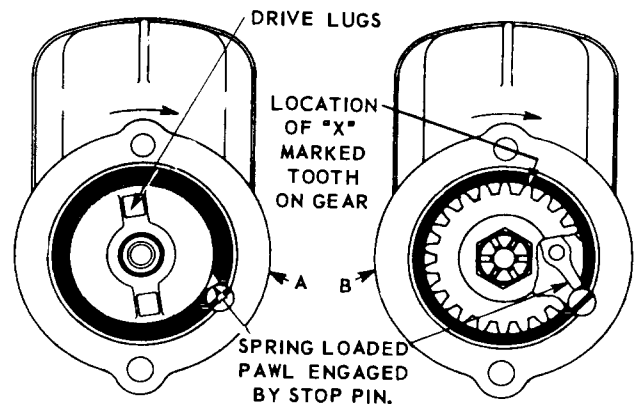


Fig. 1 DRIVE GEAR TIMING MARK ASSEMBLY

TIMING MAGNETO TO ENGINE

Refer to Magneto Timing instructions in the front section of ENGINE INSTRUCTION MANUAL, for proper mounting of magneto to crankcase, in order to obtain correct ignition timing.

WICO MODEL XH-1 FLANGE MOUNTED MAGNETO

Wico Spec. No. XH-2504, Wisconsin Motor Part No. Y-118 for Engine Model AENL
Wico Spec. No. XH-2523B, Wisconsin Motor Part No. Y-108B for Engine Model AGN
(Wico XH-2523, Y-108A replaced by Wico XH-2523B, Y-108B for Engine Model AGN)

INSTRUCTIONS

Y-108, 118 Series

TIMING

The magneto is properly timed to the engine at the factory. If it becomes necessary to retime the magneto to the engine, refer to the diagram and instructions in the engine instruction book.

LUBRICATION

The only lubricating point in the magneto is the cam wiper felt, (Ref. No. 19). This felt, which lubricates the breaker arm at point of contact with the cam, should be replaced whenever it is necessary to replace the breaker contacts.

IMPORTANT

Incorrectly adjusted spark plug gaps cause magneto failure more frequently than any other condition.

Spark plugs should be inspected at frequent intervals, the size of the gap should be carefully checked and adjusted and the plugs thoroughly cleaned.

All oil, grease, and dirt should frequently be wiped off the magneto, lead wires, and spark plug insulators. Keeping these parts clean and the spark plugs properly adjusted will improve the engine performance and at the same time will prolong the life of the magneto.

MAGNETO COVER

The magneto cover, (Ref. No. 50), can be removed by loosening the four screws (Ref. No. 36) which hold it in place. When replacing the cover be sure that the cover gasket (Ref. No. 35) is in its proper place.

BREAKER CONTACTS - REPLACEMENT AND ADJUSTMENT

The breaker contacts should be adjusted to .015" when fully opened. To adjust the contacts, loosen the two clamp screws (Ref. No. 40) enough so that the contact plate can be moved.

Insert the end of a small screw driver in the adjusting slot and open or close the contacts by moving the plate until the opening is .015", measuring with a feeler gauge of that thickness, tighten the two clamp screws.

To replace the contacts remove the breaker spring clamp screw (Ref. No. 43), the breaker arm lock and

washer (Ref. No. 18) and (Ref. No. 14), then lift the breaker arm from its pivot. Remove the aligning washer, 5717, and the two fixed contact clamp screws (Ref. No. 40). The breaker plate can then be removed.

If the contacts need replacing it is recommended that both the fixed contact and the breaker arm be replaced at the same time, using replacement breaker set X5996 (Ref. No. 42).

After assembly the contacts should be adjusted as described above. The contacts should be kept clean at all times. Lacquer thinner is an ideal cleaner for this purpose. Use WICO tool S-5449, to adjust the alignment of the contacts so that both surfaces meet squarely.

CONDENSER

To remove the condenser (Ref. No. 34), first disconnect the condenser lead by removing the breaker arm spring screw (Ref. No. 43), then remove the two condenser clamp screws (Ref. No. 22) and the condenser clamp (Ref. No. 30). When replacing the condenser make sure it is properly placed and that the clamp screws are securely tightened.

COIL AND COIL CORE

The coil and coil core must be removed from the magneto housing as a unit. Disconnect the primary wire from the breaker arm spring terminal by removing screw (Ref. No. 43), take out the two coil core clamp screws (Ref. No. 21) and remove the clamps (Ref. No. 38). The coil and core can then be pulled from the housing. When replacing this group make sure that the bare primary wire is connected under the core clamp screw and that the insulated wire is connected to the breaker arm spring terminal.

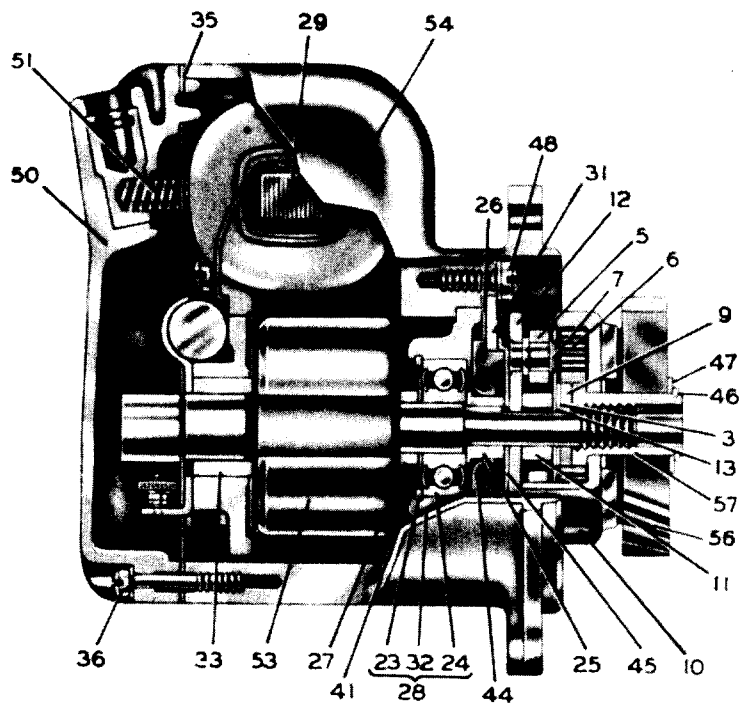
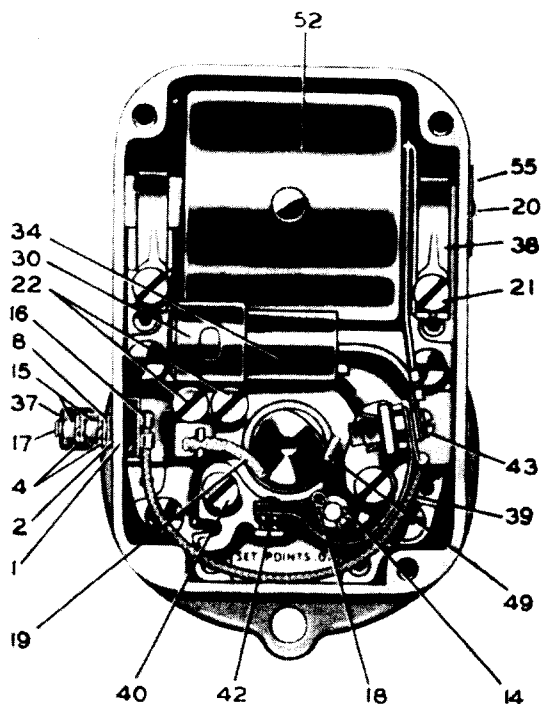
REMOVAL OF COIL FROM CORE

The coil (Ref. No. 52), is held tight on the core (Ref. No. 29) by two wedges, 10383. It will be necessary to press against the coil core with considerable force to remove it from the coil. The coil should be supported in such a way that there is no danger of the primary of the coil being pushed out of the secondary.

When replacing the coil on the coil core, slide it on then press in the two coil wedges, one on each end, until they are flush with the primary of the coil.

Magneto Parts List

Y-118 For Engine Model AENL Wico Spec. No. XH-2504
 Y-108-B For Engine Model AGND Wico Spec. No. XH-2523B
 (Y-108-A, Wico XH-2523, replaced by Y-108-B for Engine Model AGN)

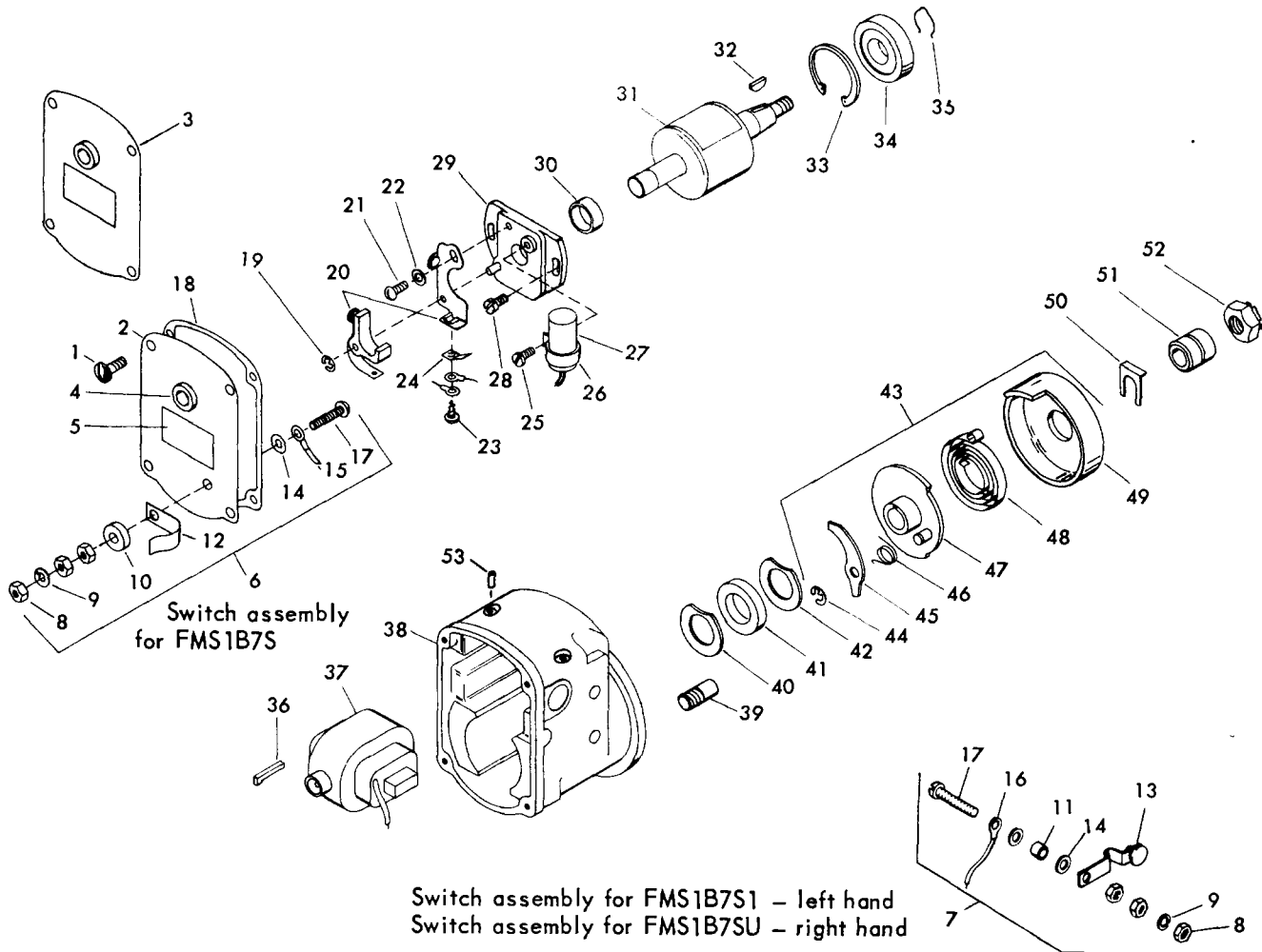


Ref. No.	Part Number	Description	No. Req.	Ref. No.	Part Number	Description	No. Req.
2	YD-316	INSULATOR for ground stud.....	1	35	90-5618	COVER GASKET	1
3	90-M-42XA	SPACING WASHER for driven flange	1	36	90-5622	SCREW for distributor cap (Sems).....	4
4	90-M-55XA	LOCKWASHER for ground stud.....	2	37	90-X5632	STOP BUTTON GROUP	1
5	90-11312	TRIP ARM for Y-118	1	38	90-5633	COIL CORE GROUP	2
	90-A-179X	TRIP ARM for Y-108A, Y-108B	1	39	90-X5757	GROUND LEAD GROUP	1
6	90-15-186	DRIVE SPRING	1	**	90-X5750	GROUND CONNECTION UNIT	1
7	90-6585	TRIP ARM SPRING for Y-118	1			(Incl. Ref. Nos. 2, 4, 8, 15, 16, 17 & 39).	
	90-6587	TRIP ARM SPRING for Y-108A, Y-108B	1	**	90-5717	ALIGNING WASHER for breaker point.....	1
8	90-IXA-256	WASHER for ground stud (steel).....	1	40	90-5900	CLAMP SCREW for fixed contact	2
9	90-IVA-583	SPACING WASHER for drive cup	1	41	90-5926	BALL BEARING SHIELD	1
10	90-11472	DRIVE CUP for Y-118	1	42	90-X5996	BREAKER CONTACT SET	1
	90-11641	DRIVE CUP for Y-108A, Y-108B	1	43	90-5431	CLAMP SCREW for breaker spring	1
11	90-2122	DRIVEN FLANGE SPACER	1	44	90-6199	OIL SEAL	1
12	90-X6586	DRIVEN FLANGE GROUP for Y-118	1	45	90-6204	OIL SLINGER	1
	90-X6588	DRIVEN FLANGE GROUP for Y-108A, Y-108B ..	1	46	90-6424	IMPULSE LOCK RING	1
13	90-2288	RETAINER for drive spring	1	47	90-6425	THRUST WASHER.....	1
14	90-3219	PIVOT WASHER for breaker arm	1	**	90-X11473	IMPULSE COUPLING UNIT (Incl. Ref. Nos. 3, 5, 6, 7, 9, 10, 11, 12, 13, 46, 47 & 57) for Y-118 ...	1
15	90-3230	NUT for ground stud	2			IMPULSE COUPLING UNIT for Y-108A, Y-108B ..	1
16	YD-324	INSULATING WASHER for ground stud.....	2	48	90-X11572	CLAMP SCREW for impulse stop (Sems)	4
17	90-3945	GROUND STUD.....	1	49	90-6468	BREAKER ARM FELT.....	1
18	90-4210	BREAKER ARM LOCK	1	50	90-X6533	COVER UNIT	1
19	90-5077	CAM WIPER FELT.....	1	51	90-6732	COIL CONTACT SPRING	1
20	90-5250	SCREW for name plate	2	52	90-X5700C	COIL GROUP (Replaced X6762—Interchangeable)	1
21	90-5411	CLAMP SCREW for coil core (Sems).....	2	**	90-10383	COIL WEDGE.....	2
22	90-5411	CLAMP SCREW for condenser (Sems)	2	53	90-Y7569	ROTOR for Y-118	1
23	90-5516	RETAINING RING for rotor bearing	1			ROTOR for Y-108A, Y-108B	1
24	90-5517	ROTOR BEARING	1	54	90-X7265	MAIN HOUSING GROUP for Y-118	1
25	90-5518	IMPULSE SPACER.....	1			MAIN HOUSING GROUP for Y-108A, Y-108B	1
26	90-5519	GASKET for impulse stop	1	55	90-5543	NAME PLATE for Y-118	1
27	90-5520	SPACER for bearing cage group	1			NAME PLATE for Y-108A, Y-108B	1
28	90-X5521	BEARING CAGE GROUP	1	**	90-10407	BREAKER POINT ALIGNING WASHER (thin)	1
29	90-X5524	COIL CORE GROUP	1	56	GD-113	DRIVE GEAR, for Y-118	1
30	90-6924	CONDENSER CLAMP	1			DRIVE GEAR, for Y-108A, Y-108B	1
31	90-X5549	IMPULSE STOP GROUP	1	57	90-6412	IMPULSE LOCK NUT.....	1
32	90-5567	BEARING CAGE	1			** (Not Illustrated)	
33	90-5610	BUSHING for breaker plate	1				
34	90-X6916	CONDENSER ASSEMBLY	1				

MAGNETO PARTS LIST

WISCONSIN Y-135 Series
Type FM-S1B7
Specific magnetos listed below

Rotation CW
Impulse Coupling UC
Lag Angle 13°



Y-135-S1 (FMS1B7S), replaced by Y-135A-S1 (FMS1B7S1) for Std. ACN, BKN Engines – with GD-87-C Drive Gear.
 Y-135-S5 (FMS1B7S), replaced by Y-135A-S3 (FMS1B7S1) for 28° spark adv. ACN, BKN Engines – with GD-87-B Drive Gear.
 Y-135-S3 (FMS1B7S), replaced by Y-135B-S1 (FMS1B7SU) for AENL Engines – with GD-145 Drive Gear.

NOTE: Parts less part number are not sold separately.
Component parts are the same for all magnetos, except where noted.

YQ-19 Points and Condenser Kit
* Parts included in Kit

YQ-20 Repair Kit
† Parts included in Kit

Ref. No.	Part Number	Description	Qty.
1	†	SCREW, end cap	4
2		END CAP for FMS1B7S	1
3		END CAP for FMS1B7S1, FMS1B7SU	1
4	PH-597	GROMMET, ignition wire	1
5		NAMEPLATE	1
6		SWITCH ASSEMBLY for FMS1B7S	1
7		SWITCH ASSEMBLY for FMS1B7S1, SU ..	1
8		NUT, hex, 8-32	3
9		LOCKWASHER, No. 8	1
10		INSULATING BUSHING for FMS1B7S	1
11		INSUL. BUSHING for FMS1B7S1, SU	1
12		GROUND SPRING for FMS1B7S	1
13		INSULATED LEVER for FMS1B7S1, SU ..	1
14		INSULATING WASHER 1-used for FMS1B7S 2-used for FMS1B7S1, FMS1B7SU	

Ref. No.	Part Number	Description	Qty.
15		WIRE ASSEMBLY, ground for FMS1B7S ..	1
16		WIRE ASSEMBLY, grd. for FMS1B7S1, SU	1
17		SCREW, ground switch, 8-32 x 7/8	1
18	QD-852	† GASKET, end cap	1
19		† SNAP RING, fulcrum pin	1
20		† * POINT SET	1
21		† SUPPORT SCREW	1
22		WASHER, support plate	1
23		† * TERMINAL SCREW	1
24		TAB, terminal screw for FMS1B7S	1
25		CONDENSER SCREW, 8-32 x 3/8	1
26		† * CONDENSER CLAMP	1
27		† * CONDENSER	1
28		SCREW, bearing support 8-32 x 1/2 long	2
29		BEARING SUPPORT assembly	1

Y-135 Series
Type FM-S1B7

Ref. No.	Part Number	Description	Qty.
30	†	BEARING, cam end	1
31	YM-4	ROTOR assembly	1
32	PL-21	KEY, woodruff	1
33	†	SNAP RING, bearing	1
34	ME-221	BEARING, drive end	1
35	†	SNAP RING, shaft	1
36		COIL WEDGE for FMS1B7S	2
37	YM-5	COIL	1
38		HOUSING	1
39		STOP PIN	1
40		WASHER, (inner) drive end	1
41	PH-598	SEAL, drive end	1

Ref. No.	Part Number	Description	Qty.
42		WASHER, (outer) drive end	1
43	YM-6	COUPLING assembly (13° lag angle) ...	1
44		SNAP RING	1
45		PAWL, impulse coupling	1
46		SPRING, impulse pawl	1
47		HUB assembly (13° lag angle)	1
48		IMPULSE SPRING	1
49		IMPULSE SHELL	1
50		WASHER, coupling plate	1
51		COUPLING BUSHING	1
52		IMPULSE NUT	1
53		SCREW, coil bridge for FMS1B7S1, SU ..	2

Service and Adjustment

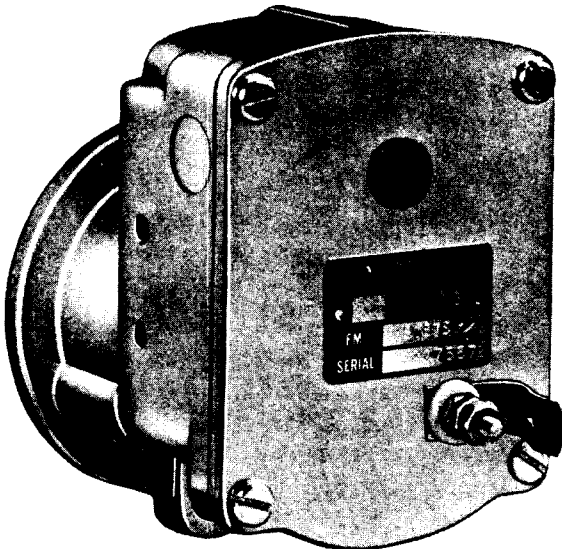


Fig. 1

GENERAL DESCRIPTION

This one-cylinder magneto, built specifically for application on Wisconsin single cylinder engines, has a two-pole magnetic rotor and a single lobe cam, producing one ignition spark per revolution. It is fitted with a dependable, single-pawl impulse coupling which facilitates starting by providing an intensified and retarded ignition spark at low engine speeds.

SERVICE PROCEDURE

Improper functioning of the magneto is often believed to be the cause of much engine trouble arising from other sources, such as a flooded carburetor, an obstructed air intake, defective ignition connections, or corroded spark plug points. Since a brief engine inspection will often locate the trouble before the magneto is reached, it prevents maladjustment of magneto parts in good condition. It is suggested that the magneto be opened only when it is certain that the ignition spark produced is unsatisfactory. This condition may be determined by simple tests which are easily made in the field.

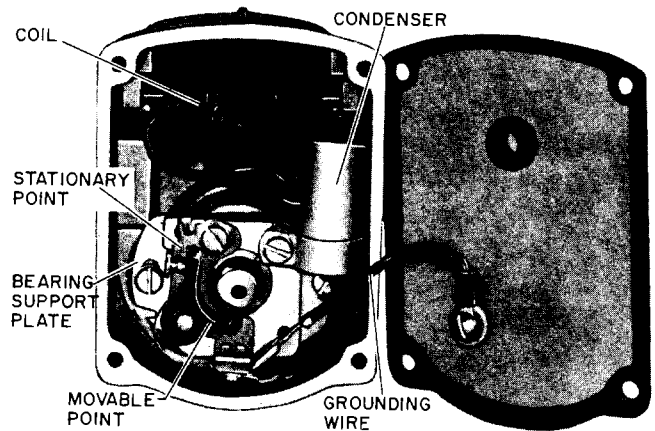


Fig. 2

TESTING THE IGNITION SPARK

With a properly adjusted spark plug in good condition, the ignition spark should be strong enough to bridge a short gap in addition to the actual spark plug discharge. This may be determined by holding the end of the ignition cable not more than 1/16 in. away from the spark plug terminal. The engine should not misfire when this is done. Ignition tests made while any part of the system is wet are useless.

TESTING THE MAGNETO SPARK

Remove the ignition cable from the end cap socket and insert a short piece of stiff wire. Bend this wire to within 1/8 in. of the engine block. Turn the engine over slowly and watch carefully for the spark which should occur at the instant the impulse coupling releases. If a strong spark is observed, it is recommended that the magneto be eliminated as the source of the difficulty and that the cable, terminals, and spark plug be thoroughly inspected.

DISASSEMBLY

END CAP

Remove the magneto end cap. The ground wire is attached to the end cap and the breaker points. Move the end cap to the side to gain access to the wire assembly at the points. This wire assembly has a

push-on type connector and may be pulled apart to disconnect the ground wire. Remove the terminal screw, releasing the coil ground contact (the coil wire on the condenser side of the magneto), the condenser lead, the grounding wire tab, and the breaker arm spring. Pull the connectors, not the wires, to prevent damage. See Fig. 2

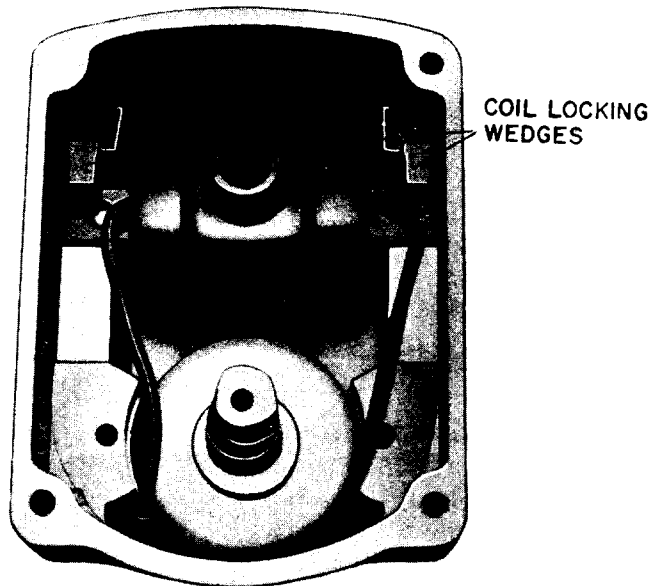


Fig. 3

CONDENSER

Remove the condenser screw, which will also release the coil wire. Lift out the condenser and test for leakage, high resistance and correct capacity.

BEARING SUPPORT

Scribe a line to mark position of bearing plate in housing. The bearing support is the mounting plate for the breaker points and the condenser. Remove the two bearing support mounting screws and lift out the bearing support plate. Inspect the bearing for excessive wear.

COIL (Fig. 3)

With the bearing support removed, take out the two coil locking wedges with a blade type screw driver. Lift out the coil assembly. Test the coil for resistance in the primary and shorted secondary windings.

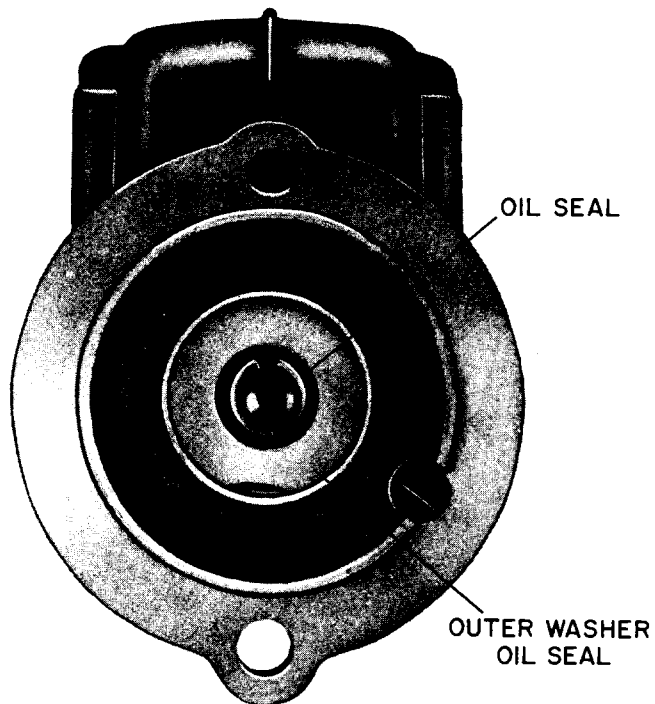


Fig. 5

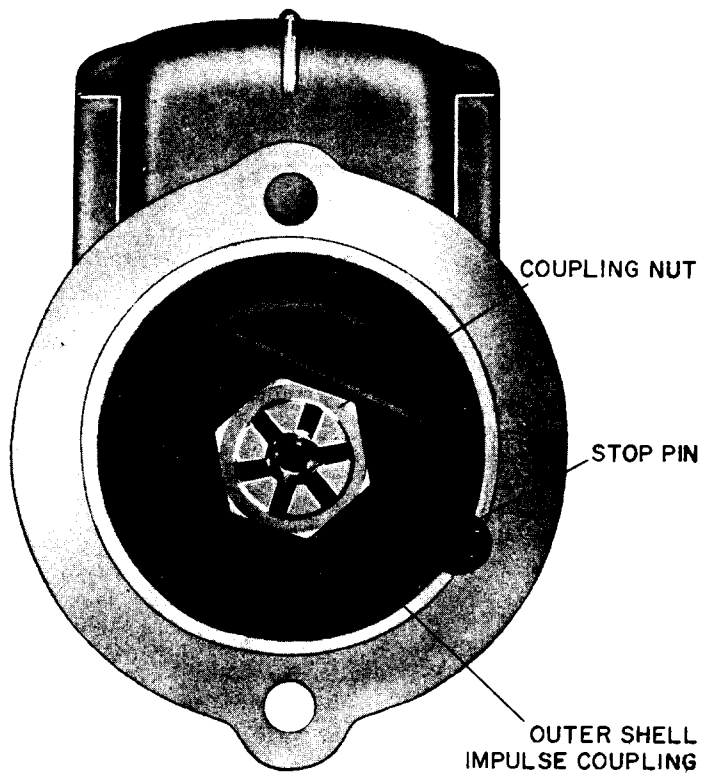


Fig. 4

BREAKER POINTS

Remove the fulcrum pin snap ring; lift the point set from the bearing plate. Inspect the points for pitting, oxidation or shorting. If the points are badly worn they should be replaced.

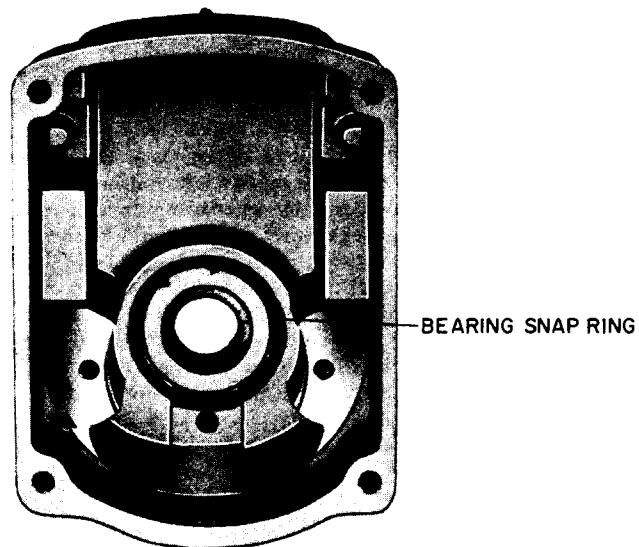


Fig. 6

IMPULSE COUPLING (Fig. 4)

Remove the coupling nut, bushing, plate washer, outer shell and spring assembly. Remove the coupling hub with a suitable puller. Inspect coupling pawls for excessive wear. Replace if necessary. Also remove stop pin with screwdriver and inspect for wear. Replace if necessary.

MAGNETIC ROTOR (Fig. 5)

Using a narrow screwdriver, remove the outer washer, oil seal, inner washer, and the shaft snap ring. Press the rotor out of the housing. Remove staking ridges from housing.

BEARING - DRIVE END (Fig. 6)

Remove the bearing snap ring. Using a socket or other suitable tool, press out the bearing; inspect the bearing for wear and rough operation. Replace if necessary.

BEARING SUPPORT ASSEMBLY BEARING

Place the bearing support assembly on the open jaws of a vise. Be sure the vise jaws are open only as far as is needed to allow the bearing to pass through. Using a flat punch, drive out the bearing.

REASSEMBLY

Before reassembly clean and inspect all parts. Replace all worn or defective parts.

BEARING - DRIVE END

If original bearing is being reused, pack bearing with IC9 bearing grease.

Using a socket or other suitable tool press the bearing into the housing until the bearing seats against the shoulder in the housing. Install the bearing snap ring.

BEARING SUPPORT ASSEMBLY BEARING

Place the bearing support assembly on a firm flat surface. Using a socket for support, press the cam end bearing, carefully centered, into the support plate.

MAGNETIC ROTOR

The rotor magnets used in this magneto are made of a stable alnico material which retains its charge for long periods of time under normal conditions; therefore recharging should not be required.

Press the rotor into the drive end bearing until it seats against the bearing. Install shaft snap ring,

new inner washer, new oil seal and new outer washer. Stake in place.

IMPULSE COUPLING

Key the coupling assembly onto the rotor shaft. Replace the plate washer, bushing and coupling nut.

COIL

Position the coil in the housing with the coil leads and hi-tension connector outward. Install the coil wedges and seat by lightly tapping into place with a lightweight hammer.

BEARING SUPPORT PLATE

Position the bearing support plate, matching the lines which were scribed at disassembly. Tighten screws.

CONDENSER

Install the condenser with the ground wire from the coil; tighten the screw securely.

BREAKER POINTS

Connect the coil ground contact, condenser lead, shutdown wire, and the breaker arm spring to the stationary point with the terminal screw. Do not tighten at this time. Install the stationary and movable points over the fulcrum pin and onto the bearing support plate. Be sure the stationary point is correctly positioned to lay flat on the bearing support plate. Install the support screw into the bearing support plate. Install the fulcrum pin snap ring. Do not lubricate the fulcrum pin. Position the coil wire, condenser lead, shutdown wire tab and the breaker arm spring so they do not contact any metal parts, and tighten the terminal screw.

To adjust the points for correct clearance turn the rotor so that the highest point of the cam is under the rubbing block and the points are being held at their widest opening. Adjust this opening by moving the stationary point until a clearance of .015 is obtained. Tighten all screws securely. Rotate the cam several revolutions and recheck point opening. Lubricate the cam with a very light film of IC9 bearing grease. Avoid excessive greasing.

END CAP

Connect shutdown wire from end cap to tab at point assembly. Be sure not to contact any metal parts. The end cap gasket is all the seal required on this magneto. Install end cap and tighten the four screws.

Check operation of magneto on a magneto test bench following manufacturer's procedure.