

F 7465 Engine 78458

In Service 4-1947

Fairmont

Lincoln *Private* *Key*

M9 Motor Car

G-1

**SERVICE INSTRUCTIONS
AND PARTS LISTS**

IMPORTANT

Before placing a motor car in service read the starting and operating instructions in this book.

Bulletins enclosed in these covers sometimes apply to more than one series of the same class of car, therefore be sure to consult the sections which refer to the car and engine being used.

When this book is received, complete the motor car record inside this front cover. Mention factory engine and car serial numbers when ordering parts or writing about the car.

FAIRMONT RAILWAY MOTORS, INC.

FAIRMONT, MINNESOTA, U. S. A.

DISTRICT SALES OFFICES:

NEW YORK CHICAGO ST. LOUIS
WASHINGTON, D. C. SAN FRANCISCO

FAIRMONT RAILWAY MOTORS, LTD.

TORONTO, ONTARIO, CANADA

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Printed in U. S. A.

INSTRUCTIONS FOR ORDERING PARTS

When this book is received complete the following motor car record from the FAIRMONT name plates on the car, and on the engine water jacket. The engine number is also stamped on top of the crankcase. Always mention these factory serial numbers when writing about the car or ordering parts. Don't give us railroad numbers.

Factory Car No. Class.....Series.....
Group.....Special.....
Factory Engine No. Type.....H.P.....
Group.....Special.....

TO INSURE PROMPT AND CORRECT SHIPMENT
of parts on orders, be sure to give us:

- (1) Quantity of each part wanted
- (2) Symbol number of part as shown in this book
- (3) Description of part as shown in this book
- (4) Factory serial numbers recorded above
- (5) Car gauge if other than 56½" standard
- (6) State whether shipment is to be by mail, express, or freight

If in doubt as to a part wanted, send full description or a sketch, or send old part to us with order.

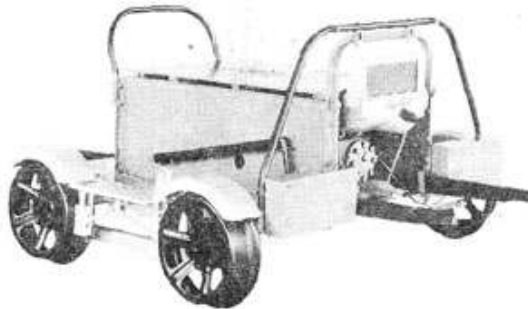
All parts are shipped f.o.b. factory, transportation charges to be paid by customer. Terms are strictly cash with order.

SERVICE INSTRUCTIONS AND PARTS LIST

Fairmont

M9 SERIES G

INSPECTION CARS



This bulletin contains complete instructions for the operation and care of standard M9 series G group 1 and later inspection cars with battery ignition and direct belt drive as illustrated above and lists all parts for them.

Before starting engine or car read pages 5 to 9.

Before ordering spare parts read page 20.

The table of contents on pages 2 and 3 permits of quickly locating any information desired. Use it and save time.

If car is magneto equipped see bulletin 202 for starting instructions and also for magneto and magneto drive parts.

Service Division

FAIRMONT RAILWAY MOTORS, INC.
FAIRMONT, MINNESOTA, U. S. A.

DISTRICT SALES OFFICES:

Chicago St. Louis Washington, D. C. San Francisco New York
 Fairmont Railway Motors, Ltd., Toronto, Canada

TO OPERATORS OF FAIRMONT M9 SERIES G MOTOR CARS

This bulletin contains instructions and spare parts for standard M9 series G group 1 and later motor cars having battery ignition and direct belt drive. Accessories, their main parts and some maintenance tools are found on pages 46 through 49. Items used on cars having figures in the space on the name plate marked "Special" and different from those used on standard cars, are listed under that special car designation, see page 50.

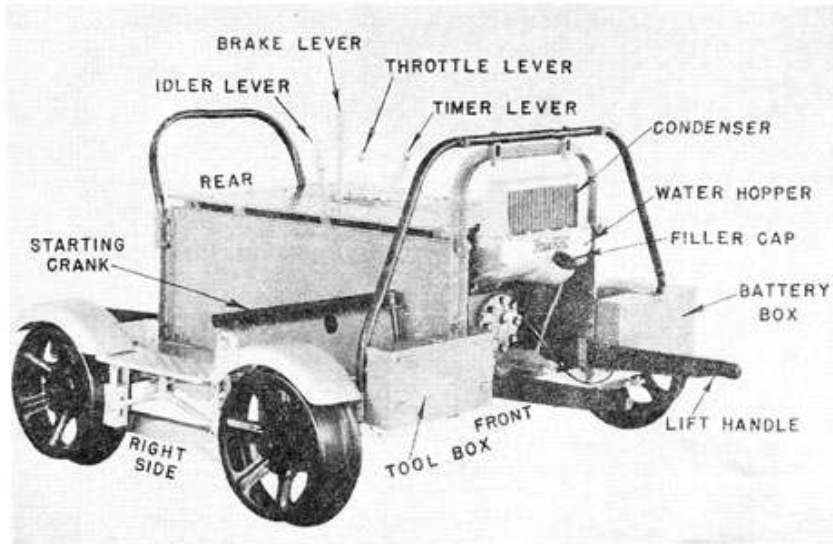
Upon receipt of this book promptly fill in the car and engine record on page 20, and always mention these factory numbers when writing about the car or ordering parts. Take good care of this book so it is available for reference when making adjustments and repairs, or ordering spare parts.

Maximum capacity of car is 500 lbs. at ordinary speeds.

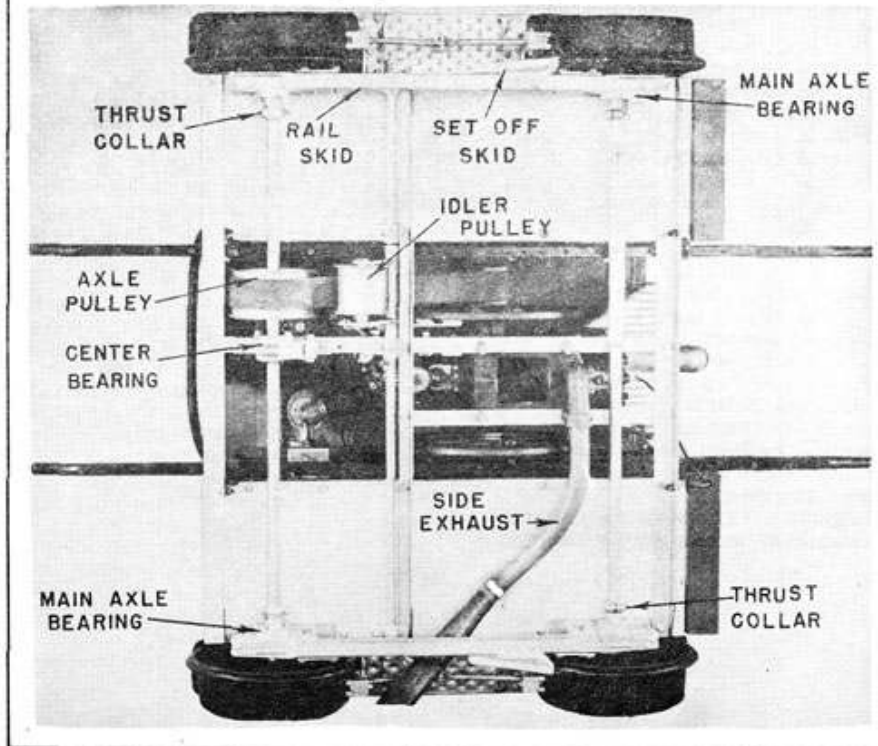
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These illustrations show a general view, and the underside of a standard M9 series G car, with the more important parts pointed out. Reference is frequently made to these parts throughout the bulletin, and the user should thoroughly familiarize himself with them and their functions before placing the car in service or making adjustment and repairs.



PREPARING CAR FOR SERVICE

Inspect everything for possible damage in transit. If in bad condition make a full report to supervising officials at once. Be sure switch button on car seat is down, then attach high tension cable to spark plug and connect the loosened wire in battery box. If not sure where to attach this wire see diagram on page 14. Examine all bolts, nuts, and electrical connections for tightness. See that all cotter pins are spread open.

Fill grease gun with a good grade of pressure gun grease, and force grease into fittings on center bearing support, brake shaft bearings, idler pulley, idler arm pivot, drive axle center bearing, and the four main axle bearings. Also force grease into fitting on differential axle till it comes out the ends of the sleeve.

Remove filler cap from water hopper and pour in clean water up to level of the filler neck. About six quarts are required.

Remove gas tank filler cap at rear of car and fill tank with oil and gasoline mixed according to instructions on this page, then replace filler cap. When filling tank, strain fuel through a fine mesh screen funnel or clean cloth free from lint. Open shutoff valve under gas tank. Open drain cock under carburetor, see that gasoline flows, then close it tight.

The spark and throttle levers stand vertically. The right hand one is the throttle, the left one the timer control. The carburetor control knob located at the left of belt plate on lever guide turns to open or close the needle valve, and pulls up to choke carburetor. Standard cars are equipped with a push-pull ignition switch located at left rear corner of lever guide. The switch is in the "on" position when the switch button is pulled up from the lever guide and in the "off" position when pushed down.

Finally set car on the track and operate the controls to become familiar with them. Release brake and idler levers, and see that car rolls freely. Be sure wheels and axles run true, and brake shoes do not drag.

MIXING OIL AND GASOLINE

S.A.E. 30 gas engine or automobile cylinder oil will give good results all year 'round in nearly any climate. We do not recommend the use of an oil heavier than S.A.E. 40. Measure 3/4 pint of oil for each gallon of gasoline (1 part oil and 11 parts gasoline by measure) and stir the mixture thoroughly. Don't use poor oil or reduce the proportions recommended. Never pour oil and gasoline in the tank separately -- they will not mix properly.

When "breaking in" new engines, add 1/4 pint more oil per gallon to the mixture during the first 500 miles of operation, so closely fitted parts wear in smoothly. If gasoline and oil are supplied mixed, add an extra 1/4 pint of oil to each gallon.

OIL RECOMMENDATIONS

Oils properly refined from either asphalt or paraffine base crudes furnish good lubrication if they do not contain acids, alkalis, and impurities in injurious quantities. In general the lower viscosity oils give cleaner results, and provide a higher factor of safety. Heavy oils have high viscosities and they form excessive carbon and do not flow freely in cold weather. Mixing heavy oil in the gasoline in smaller proportions than recommended reduces the lubricating value of the mixture and lower engine efficiency and higher maintenance costs will result.

Good lubrication is assured by using oils of suitable viscosity having a fairly low pour test. Carbon deposits are also reduced and engines start easier. S.A.E. 30 oils of approximately the following viscosity characteristics are most satisfactory for year 'round use:

- At 130° Fahrenheit 185 to 255.
- At 210° Fahrenheit 50 to 63.

Oils up to S.A.E. 40 as follows, may be used if S.A.E. 30 is not obtainable:

- At 130° Fahrenheit 255 to 450.
- At 210° Fahrenheit 62 to 75.

Practically all refiners and oil companies can supply oils conforming to these specifications, and Fairmont Railway Motors, Inc., will gladly render assistance in selecting lubricants.

STARTING BATTERY IGNITION ENGINES

These instructions apply to direct belt drive cars. The engine will run either forward or backward, but the timer control lever must be set differently for starting and operating in each direction, see instruction plate on car seat.

STARTING ENGINE FORWARD

Forward is with top of flywheels running clockwise or toward water hopper. Release idler lever, and set and lock the brake. Slip starting crank through steady bearing on right front wheel guard and over end of crankshaft. Apply oil at these points.

TO TEST IGNITION

Retard the spark by moving timer control lever *toward the rear* of car. Pull up switch button and slowly crank engine forward. The coil should buzz only while the timer contact points close. If it buzzes at any other time or does not buzz at all, there may be a short circuit or improperly connected wire, and a check should be made by following instructions on page 14. Finally open switch (push down).

TO PRIME ENGINE

See that shutoff valve at gas tank is open and fuel flows to carburetor. Partly open the throttle by moving lever toward rear of car. Open carburetor needle valve 1½ to 2 turns from the closed position by turning control knob to the left.

Be sure ignition switch is open (down), then spin the engine several times with the crank while pulling up control knob to choke carburetor. This fills the cylinder and crankcase with fresh gas. In cold weather it can also be primed by injecting some of the fuel mixture through the priming cup on throttle valve cover. Choking the carburetor or priming is usually only necessary when starting a new or cold engine.

CRANKING ENGINE

Next release choke control knob, be sure spark is retarded, close switch (pull up), and firmly holding the starting crank engaged, quickly pull it upward in a clockwise direction. If engine does not start the first time, continue these upward pulls on the crank until it does, priming again if necessary. When the engine starts, remove the starting crank. *Never spin the engine with switch on -- injury might result.*

IDLING ENGINE

As soon as engine starts move timer control lever toward the front of the car to advance the spark, and slightly close the throttle so engine runs slowly until it warms up, then set carburetor needle valve to the best running position, about ¾ to 1 turn open. Never "race" a cold engine to warm it up, nor run it at high speed when the car is standing still.

STARTING ENGINE BACKWARD	<p>Backward is with top of flywheels running anti-clockwise or away from water hopper. Retard the spark by moving timer lever toward the front of car.</p> <p>Follow the preceding instructions for testing ignition, setting throttle, priming, and starting, but crank the engine anti-clockwise or backward. As soon as it starts, move the timer lever toward the rear of the car to advance the spark, and after warming up set needle valve to proper running position.</p>
TO STOP ENGINE	<p>Open (push down) the switch. Just before engine stops turning open throttle to fill the engine with fresh gas and make starting easier.</p>
REVERSING BATTERY IGNITION ENGINES	<p>To reverse a battery engine when running, without using starting crank, the belt must be free. Open (push down) ignition switch and leave timer advanced. Open throttle, and just before flywheels stop turning, close (pull up) switch and engine will kick back and run in the opposite direction. Then reset timer lever.</p>
HANDLING THE CAR	<p>Pull out extension lift handles when setting car on and off the track. Be careful not to strike axle pulley on rails. Use care in setting off at crossings, switches, and frogs so axles are not sprung by pinching wheels in flangeways.</p>
STARTING THE CAR	<p>Always drive with the engine ahead in normal service. After starting and warming up the engine, seat passengers, operator facing ahead, and release brake. Gradually open the throttle and at the same time tighten the belt by slowly pushing idler lever ahead. This allows the belt to slip and act as a clutch.</p>
DRIVING THE CAR	<p>After car gets under way, tighten idler enough to prevent belt slippage, and latch the lever. Use throttle to regulate speed, and for average conditions the spark should be well advanced.</p> <p>Always drive a new car slowly and carefully until thoroughly familiar with the controls. A speed of 15 to 20 miles per hour for the first 500 miles is recommended.</p> <p>If the car loses speed or the engine knocks on hard pulls with open throttle, partially retard the spark, and slip the belt a little if necessary. When coasting down light grades the belt can be released and throttle closed, thereby saving fuel. In descending heavy grades the engine can be used as a brake by leaving belt tight, closing throttle, and cutting off ignition. When coasting long distances, maintain slight throttle opening to furnish lubrication for internal engine parts.</p>
STOPPING THE CAR	<p>First close the throttle, then retard the spark part way. Next release idler lever to slacken belt, and apply the brake. Shut off ignition to stop engine if car is to be removed from track.</p>
REVERSING THE CAR	<p>To reverse a battery ignition car without cranking, release belt and bring car to a full stop, allowing the engine to run slowly. Then reverse the engine as explained previously, after which the car can be driven in the other direction.</p>
LUBRICATION	<p>Always mix $\frac{3}{4}$ pint of oil with each gallon of gasoline. This mixture lubricates all internal moving parts of the engine.</p> <p>Once a week force some grease into the fittings on the main axle bearings and on the axle center bearing. Grease the differential axle each day or two.</p>

Once a month inject about an ounce of grease into the grease fitting on idler shaft. Occasionally grease the idler arm pivot and brake shaft bearings.

**GENERAL
SUGGESTIONS--
SAFETY FIRST**

Inspect the car before starting out each day, and make sure it is in good operating condition. Once a week clean the entire car thoroughly, examining gasoline joints, electrical connections, bolts, screws, etc., and tighten all loose parts.

When making inspection see that:

- (1) Wheel tires are not worn dangerously thin.
- (2) Wheels and axles run true.
- (3) Axle end nuts are secured by cotters.
- (4) Wheel hub bolts are tight.
- (5) All wheels are tight on axles.
- (6) All pulleys are aligned and belt runs true.
- (7) Brake is in first class working condition.

Maximum capacity of car is 500 lbs. at ordinary speeds. Load baggage and tools carefully to prevent their working into moving parts or falling off the car.

Drive slowly with car under full control where there is not a clear view ahead, over road crossings, through gangs of workmen, through railroad yards, and over frogs and switches. Don't drive during rain or snow storms or foggy weather unless necessary, and then only with a lineup and extra precaution. When following other motor cars or trains remain 500 feet or more behind. Adhere strictly to local railroad motor car rules.

BELT IDLER

For ordinary driving, when the idler lever is latched in the first notch in the guide plate, the belt should be just tight enough to propel the car without slipping. The coiled spring under the nut on the threaded end of idler control rod, cushions the drive and protects all parts from excessive strains. To increase belt tension screw down the nut -- to reduce tension back it off. Adjust tension so the coiled spring does not compress solidly together when idler is in operating position.

The idler pulley runs on two single row taper roller bearings packed in lubricant. Once a month inject about an ounce of grease in through fitting on idler shaft. Clean and repack bearings yearly.

To disassemble pulley, first remove it from the idler arm. Remove covers and lightly drive on one end of shaft, forcing out one outer race and both inner races. Inner races can be pressed or driven off the shaft. Reassemble in reverse order. To adjust idler bearings, remove or add shims under pulley cover. There should be .003" to .005" end play in bearings when cover is tight.

**ENDLESS CORD
BELT DRIVE**

Always leave the belt slack when car is not in use. The endless cord belt is "endless" and it must not be cut or laced. Properly cared for it will give many thousands of miles service. Never use belt dressing on the belt. If the belt glazes over and slippage cannot be overcome by increasing idler tension, scrub the inner belt face with a rag saturated in gasoline from the fuel tank. Also clean pulley faces, then dust a little tire talc or powdered soapstone on belt and pulleys.

**TO CHANGE
BELTS**

Release idler, remove right rear lift handle guide and pull out lift handle. Lift the rear end of car about a foot and securely block up under the frame. Run the belt off the axle pulley

and slip off the engine pulley. Remove right rear brake shoe wheel guard and right hand rail skid. The axle will then drop down allowing enough clearance between axle bearing and deck to slip old belt out and around wheel. Then install the new belt, using care not to damage it on sharp corners. Reassemble in reverse order, adjust idler if necessary.

PULLEYS

The engine pulley is held on the flywheel by three cap screws which should be kept tight. Be sure lock washers are used under the heads, and that screw ends do not project through the pulley lugs. The axle pulley is clamped in place and driven by a key. Keep the clamp bolts tight. In handling car over the rails be careful not to damage the axle pulley. Keep pulleys in line so belt runs true and does not rub or climb the flanges.

AXLES AND BEARINGS

The axles run on a double row taper roller bearing at each end, and a steady bearing supports the drive axle next to the pulley. When axle bearings require adjustment, it is best to remove them from the car. Unbolt and remove wheel, axle, and bearing assemblies. Take off wheels, then jar the bearing assemblies off the axles. If but one bearing requires adjustment, block up end of car and take off brake shoe and wheel adjacent to the bearing, then unbolt and remove bearing.

Take bearings apart and clean with gasoline if the lubricant is dirty or old, then repack with grease. To remove bearings from axle casing, take off the cover, and with a heavy punch drive against the inner race from the opposite end of the casing. If necessary, remove remaining outer race by jarring the casing against a heavy wood block. Reassemble in reverse order. Sufficient shims should be used under the cover to obtain .003" to .005" bearing end play with cover bolted tight.

Bushings for the axle bearing guides and steady bearing support are the self-lubricating type, stronger and longer wearing than plain bronze. They do not have holes or grooves. Grease is absorbed by them from reservoirs or passages, creeping throughout the entire bushing, and feeding to the surface as required. Do not drill holes in them, or replace them with plain bronze.

A slightly sprung axle can usually be straightened cold, but one badly bent should be replaced. Never heat axles. Two thrust collars on each axle take up end play. To adjust a thrust collar, loosen set screw and clamp bolt, then tap collar snugly against axle bearing. When correctly set, tighten clamp bolt first, then set screw, and finally apply lock wire.

DIFFERENTIAL AXLE

M9 series G cars are equipped with the FAIRMONT differential axle. It accommodates two tight insulated wheels which turn independently of each other with their respective halves of the axle.

WHEELS

Standard M9 series G cars use 14" x 4" x 3-2/8" demountable steel wheels, and are equipped with a differential axle and four insulated wheels. Insulated wheels are mounted on the tapered axle ends with fibre sleeves in the hubs and fibre washers next to the outer face to provide electrical insulation. Each group is drawn tight by the axle end nut and a steel washer.

Each wheel tire is tightly held on the hub by six heat treated bolts. Removing these bolts and swinging the brake shoe clear permits of quickly exchanging a tire without taking the

complete wheel off the axle. Insulated 14" demountable wheels are easily removed from axles by using M19888 demountable wheel puller, or M8705 shock wheel puller.

Before applying insulation smooth all burrs in the wheel hub and wipe clean. Then carefully drive the insulating bushing in until flush with outer hub face; and tighten wheel on the axle with end nut and steel washer, being sure the fiber washer is next to outer hub face. If wheels come too close together (under gauge), tough paper can be wrapped around the axle taper; if too far apart (over gauge), slightly ream the bushing with M7666 taper reamer. Be sure insulated wheels are tight on the taper and all wheels run true.

WHEEL ALIGNMENT

NOTE -- Sometimes a small difference in drive wheel circumferences causes a car to run to one side even though perfectly aligned. Again, another car will operate satisfactorily with drive wheels showing more variation. Track conditions, direction of wind, car loading, and windshield have some effect on a car, and it may tend to run to one side even when in alignment.

Careful observance of these instructions insures a safe running car. This diagram represents the running gear of any motor car, but the instructions apply to M9 series G cars with FAIRMONT 14" demountable wheels.

(1) Replace bent or sprung frame members and check frame for squareness. Measurements "G" across corners should be the same if frame is square. Tighten all frame bolts.

(2) Carefully block up under the car frame so all wheels turn freely and frame is level.

(3) Examine wheels and replace tires with badly worn flanges.

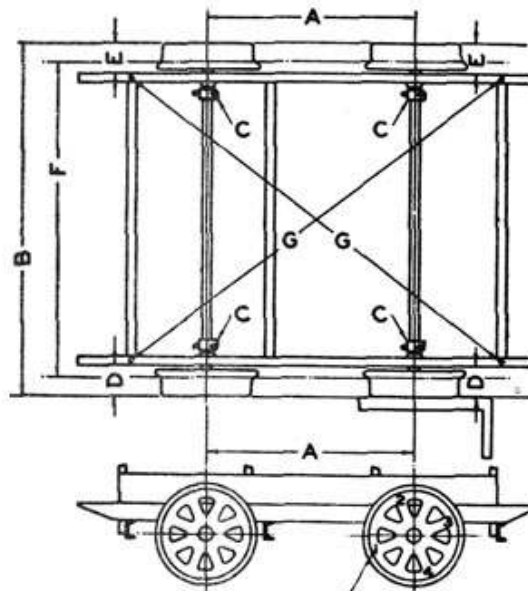
(4) Drive wheel tires must be approximately the same size. Measure them with a steel tape around the tread, being careful to keep it equidistant from the flanges at all points.

(5) (a) Rotate wheel and axle assembly, and hold a piece of chalk steady so it just touches outer face of each wheel. If wheel and axle run true chalk will mark evenly around wheel -- if wheel is sprung or axle is bent chalk will mark the high spot on wheel. Wheels or axles badly out of true usually must be replaced, though axles can sometimes be straightened. A maximum tolerance of 1/32" out of true is recommended on wheel tread, and up to 1/16" out of true on wheel face or flange.

(b) Another method of check is with a straight edge or two-foot carpenter's square across outer wheel faces (see diagram). Mark each wheel face in quarters and measure from the square to the side sill at each quarter turn of the wheel. The measurements should be the same for each wheel, if the wheel and axle run true.

(6) Axle center distance "A" should be the same on both sides of car. Axle bearing bolts can be loosened to permit shifting the wheel and axle assemblies a trifle if necessary.

(7) Cars have the wheels assembled on the axles to standard 56 1/2" gauge with a tolerance of 1/8" under gauge. The measure-



WHEEL MARKED AT EACH QUARTER
FOR TRUE RUNNING TEST (S) b

ment over outside faces of wheels at "E" is 62-13.16" when M9 series G wheels are exactly to 56½" gauge. It is preferable to have both axle assemblies drawn to the same gauge when aligning wheels.

(8) New insulating sleeves are sometimes necessary to bring wheels to gauge. Fit them carefully so wheels run true.

(9) With frame approximately centered between the four wheels, the outside faces of left wheels should be in line and parallel with axle bearing sill. Check with a straight edge, tight cord, or carpenter's square, being sure distances "E" are both the same. If necessary loosen and shift thrust collars "C."

(10) Next check right side of car where distances "D" should also be equal and approximately the same as "E".

(11) Carefully set all thrust collars "C" against bearings. First tighten clamp bolts, then set screws and lock wires.

(12) After thrust collars are set, make another check of wheels to be sure alignment has not been disturbed.

BRAKE

To bring the car to a quick stop, apply the brake with firm steady pressure, yet allowing the wheels to revolve. Go over the brake when weekly car inspection is made, and tighten bolts and adjust shoes if necessary. Be sure cotters are spread.

To adjust brake, disconnect adjustable toggles on both sides of car, unscrew the eyebolt or yoke on each toggle 2 or 3 turns, then reconnect parts. Try the brake and if necessary make further adjustment until all four shoes take hold equally. Be sure the lever can be latched in the first notch in the guide. Install replacement liners when old ones wear thin. Be sure liners and bolts holding them do not touch other metal brake parts as electric signals might be operated.

**COOLING
SYSTEM**

Use clean soft water in the cooling system if available. Check water regularly and keep it up to the level of the filler neck. Capacity is approximately six quarts. In service, steam from boiling water rises to the condenser where it is condensed to water which drains back.

A motor car operated in severe cold weather may cool too much, or the condenser may fill with frost, causing water to be forced out thru the overflow. To insure normal operation, partially or entirely cover the front of the condenser with cardboard or canvas. Cars can stand in freezing weather without harm to the engine, providing water is not carried above the proper level. If cooling system contents freeze solid, be sure engine is thoroughly warmed up before driving car.

Many operators use anti-freeze mixtures during the winter months. Automobile anti-freeze mixtures which contain mineral salts should not be used. Mixtures of alcohol and water give fair satisfaction in severe weather, providing the condenser is not covered. Equal parts of water and "Zerex," or "Prestone" make a satisfactory anti-freeze, providing the condenser is protected to prevent frost forming inside. Always use water to replenish any loss by evaporation.

After long service, lime and scale deposits from the water may cause overheating. These can be scraped off the cylinder walls after removing water hopper and cylinder head.

**FUEL
SYSTEM**

Inspect the fuel system regularly and see that the tank is securely held by the tank straps. At least once a year remove the tank from the car and thoroughly flush it out to remove sediment, water, and lint. The F3613 gas tank cap has an air vent to allow free flow of fuel to the carburetor. Never use F5115 condenser cap on the gas tank as it has no vent. Loops and bends in the fuel pipe sometimes cause "air locks" which prevent the flow of gasoline. Blowing in the tank will start the flow if fuel pipe is not clogged.

The carburetor strainer bowl should be taken off and cleaned at least once a month, oftener in winter. Be sure gaskets are in good condition when replacing bowl. This also applies to the strainer located below the fuel tank. Don't use heavy wrenches on fuel pipe couplings, float bowl, or strainer bowl.

**CAR FRAME
AND HOUSING**

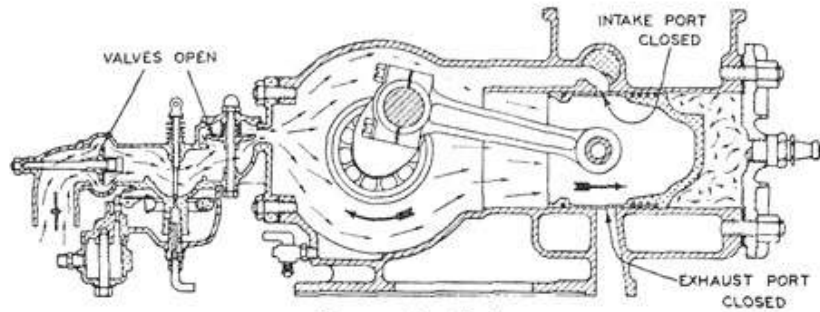
Keep all frame bolts tight. In case frame members become damaged, straighten them; or if badly out of shape, replace. Unlatching and removing the seat top permits inspections and adjustments to be quickly and easily made.

**ENGINE
MOUNTING**

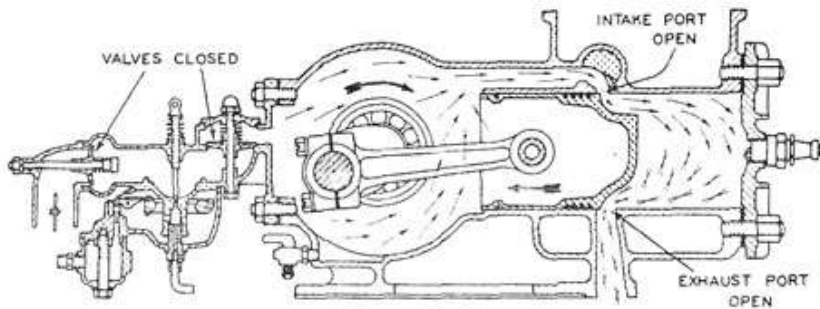
The engine is held on the bronze bushed engine sills by four, spring studs. It is very important that engines move freely in the mountings. When making field installations of new bushings, be sure the studs fit freely; if necessary, size bushings with a 7/16" reamer after pressing to place. Slightly loosen engine sill bolts, install engine, and adjust studs and springs, pry engine up and down a few times to be sure it moves freely, and finally tighten engine sill bolts. Each stud has two cotter pin holes in threaded end. The stud nuts on exhaust end of base should be turned down just enough to allow insertion of cotters in upper holes. Those on carburetor end should be turned down until cotters can be inserted in lower holes.

HOW ENGINE OPERATES

The upper illustration shows the piston passing over the exhaust and intake ports, as it moves toward the cylinder head and compresses fresh gases in the cylinder. At the same time it creates a partial vacuum in the crankcase, opening the carburetor check valve and air valve, through which fresh gases are drawn into the crankcase. When the piston reaches the end of this "compression stroke," the spark at the spark plug ignites the compressed gases, and expansion of the burning mixture forces the piston away from the cylinder head. As the piston moves away the carburetor valves close, and gases in the crankcase are compressed.



Compression Stroke



Power Stroke

The lower illustration shows the piston nearing the end of this "power stroke" where it first uncovers the exhaust ports, and burnt gases start to escape. Immediately afterward the piston also uncovers the intake ports, and fresh compressed gases from the crankcase rush through them into the cylinder. The deflector on the piston sweeps these fresh gases toward the cylinder head and spark plug, forcing the remaining burnt gases out through the exhaust ports.

As the flywheels and crankshaft turn, the piston starts back toward the cylinder head on another "compression stroke" and again covers the ports. The fresh gases are again compressed, ignited, expanded, and exhausted. This same cycle of events is repeated over and over rapidly when the engine runs.

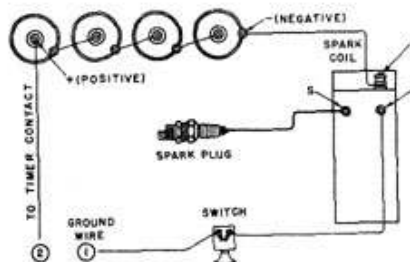
BATTERY IGNITION

The battery ignition system includes four dry cells and a coil, both carried in the battery box and wired to the timer on the engine which closes and opens the electrical circuit. A switch cuts off or turns on the ignition. This switch should always be open (down) when working on the engine or not using the car.

An engine which misses when cold and first started will usually fire regularly after being warmed up. Before changing ignition, warm up engine and try different carburetor adjustments. Then if ignition is suspected, check all wiring, switch, and connections. Tighten coil connections lightly.

New dry cells test 30 to 35 amps each and are good for several months, or until exhausted to 8 or 10 amps. Then replace entire set. Freezing reduces their efficiency, necessitating more frequent replacement in cold weather. Keep inside of battery box dry; cardboard cases on dry cells; dry cells firmly wedged in place so connections do not touch each other; and wiring free from oil, gasoline, and water.

Wiring of the Standard Car is shown in the diagram. The "ground" wire from lower timer terminal connects to the switch.



NOTE--Cars with generator and storage battery have one side of the electrical system permanently grounded. Coil, switch, and timer all connect in "live" side of circuit. This brings wire marked 1 from switch to insulated timer contact; the other side of timer is grounded by the mounting and an additional wire. Battery terminal marked 2 is then also grounded.

SPARK COIL

Always keep spark coil dry, and use only four dry cells. If system is in good condition, a $\frac{1}{4}$ " to $\frac{5}{16}$ " spark should jump from end of high tension cable to engine. If not, vibrator points may require attention or a new coil may be necessary. When rough or pitted, dress the alloy vibrator points clean and smooth with a fine file, pocket stone or emery cloth. After they wear thin, fit a complete new vibrator F4166 to the coil. See that points match and seat together evenly at all times, and that the point opening is $\frac{1}{32}$ ".

To check current draw of coil, use an accurate low reading ammeter (Fairmont F7838). Remove spark plug and lay it on some metal frame member, or disconnect high tension cable and hold it about $\frac{1}{8}$ " from engine. Close ignition switch and turn flywheels until timer points close and cause coil to buzz. Open switch, then hold ammeter leads firmly against switch binding posts. With good batteries the current draw should be .85 to .90 amps. Adjust coil draw by carefully bending the farthest end of vibrating point bridge down toward coil box to increase the current, or up to reduce the current, as required.

SPARK PLUG

To test, remove from engine and lay on some metallic part of car or engine, high tension cable attached. Close (pull up) switch and turn engine until the coil buzzes. If spark at plug gap is not steady, check high tension cable and clean the plug,

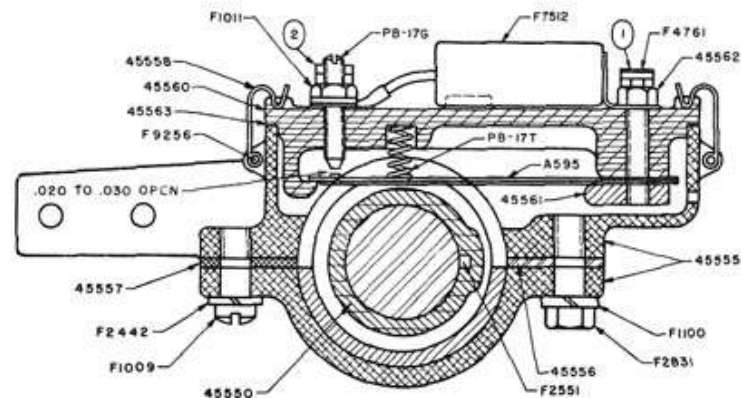
then test again. If condition of plug is doubtful, replace plug. Set points at $1/32$ " gap for battery ignition and $1/64$ " for magneto ignition. Check and reset gap whenever plug is removed. Always carry a spare plug for emergency use. Replacement plugs should duplicate the factory plug closely and be 18 mm size.

TIMER

Keep timer connections clean and tight and the contact points free from pits and scale. The timer casting should be adjusted closely on the timer support casting, yet free enough to move when the spark is "advanced" or "retarded". If the points burn or wear unevenly, dress them with a fine file, pocket stone, or fine emery cloth. Timer is equipped with an ignition condenser that is bridged across the timer points to reduce burning and scaling of points, thereby giving more efficient ignition operation. When the timer cam wears off so it will not properly close the points, remove the flywheel and the timer support casting, exposing the timer cam. Loosen the set screw, remove the cam from the crankshaft and replace with the worn section to the inside, and tighten set screw. Adjust the points and reassemble timer casting and flywheel.

Best ignition is obtained with the contact points adjusted from $.020$ " to $.030$ " opening. Following is an easy way to set them: Remove the body assembly from the mounting casting by releasing the snap springs at each end of the body assembly. Loosen the lock nut on adjusting screw PB-17G. Turn this screw down until the two points just touch, then back it out a full $\frac{1}{2}$ turn and tighten the lock nut. Reassemble body assembly on the mounting casting.

To renew a timer blade, remove the body assembly from the mounting casting by releasing the snap springs at each end of the body assembly. Loosen timer blade screw 45562 and remove clamp block 45561. Old blade can then be removed and a new one put in its place. Be careful not to lose the PB-17T spring. Replace the clamp block and tighten the screw making sure the clamp block is lined up with the blade and with the rounded end towards the points. Also be sure the two contact points match and seat together evenly. Adjust the points and reassemble body assembly on the mounting casting.



CARBURETOR

The carburetor control knob turns to open or close the needle valve and pulls up to choke the carburetor. If needle valve is opened too far the mixture will be "rich". Black smoke from the exhaust indicates a "rich" mixture. With needle valve closed too much the mixture is "lean". A "lean" mixture gives a weak explosion and causes engine to run unevenly, missing a few explosions or back firing.

The needle valve should always be set so the engine runs best with the least gasoline. The best adjustment for a warm engine is between $\frac{3}{4}$ and 1 turn open. When starting in cold weather, open needle valve at least a turn more than the regular adjustment. After engine is warmed up, needle valve can be closed to the regular adjustment. Don't close needle valve when stopping engine, nor shut it hard. Springs on check and air valves are set with correct tension at factory and should not be changed.

Sometimes a hot engine will start hard after standing a short time. This is caused by "flooding," or a very rich mixture forming in the crankcase. A "flooded" engine can be cleaned out by opening crankcase drain cock and rocking flywheels.

The small vent hole in body of carburetor should be kept open. If gasoline runs out, or constantly drips, float valve is not seating properly. To remedy, take off and clean strainer bowl and drain carburetor, then replace parts. If float valve continues to leak, shut off gasoline, remove float bowl, and inspect float valve, float lever bearing and hinge pin. New parts should be applied if these are badly worn, and float level checked.

With float lifted to its high position and float valve tight on the seat, the top surface of float should be $\frac{3}{8}$ to $\frac{7}{16}$ inch below top rim of bowl. If the distance is less than this, the float valve and seat should be renewed. The strainer bowl should be taken off and cleaned regularly.

**AIR
CLEANER**

Cars are equipped with open screen type of air cleaners as standard. Clean the screen every two to four weeks, depending on conditions. Extremes may necessitate other intervals. To clean, remove screen assembly and wash in gasoline or engine fuel mixture. Allow screen to dry thoroughly, then dip in medium engine oil, drain and replace.

**CONNECTING
ROD**

The piston pin bushing is pressed in the connecting rod, and reamed for .0015" to .002" clearance on the pin. The renewable bushings at the crankpin end wear slightly in service and need occasional adjustment. A dull rattling sound in crankcase as engine slows down usually indicates a worn or loose connecting rod bearing.

The connecting rod should be fitted .002" to .003" loose on the crankpin. To adjust a loose rod, remove carburetor. Remove lock wire, both cap screws, cap, and shims. Peel off one or more layers from each shim, according to looseness; then replace cap and shims, drawing screws tight, and test adjustment. If still loose, continue until correct. Do not file the cap or rod body. There should be very little play in this bearing. If piston rebounds from compression the bearing is not too tight. Be sure screws are tight, then lock with a new wire.

The two halves of the crank pin bushing are renewable, and should be replaced when worn to a point where all shims have been removed. The bushing half for the rod body is plain, and the one for the cap is drilled and has oil grooves.

ALUMINUM ALLOY PISTON AND RINGS

New rings should have an end opening of .011" to .018". To remove a piston pin from a piston and rod assembly, first take out lock rings, then heat piston head in boiling water, and push or carefully tap pin out. To assemble, insert one lock ring in piston. Thoroughly heat piston in boiling water, hold connecting rod in place, and quickly push in the cold pin until it stops against the lock ring. Finally install the remaining lock ring and check piston for roundness. The piston pin should not be forced into a cold piston. The holes in the piston pin bosses should not be enlarged.

To pull piston from cylinder, first remove camretor, then disconnect connecting rod. Remove cylinder head, after which piston and rod can be pulled. When replacing piston, be sure the deflector is in proper position (see cut on page 13). The piston pin and holes in the piston and connecting rod are finished to insure assembly without fitting. Always use a new pin with a new piston.

FLYWHEELS

Flywheels are located on crankshaft tapers by keys, and drawn to place by nuts. Don't try to drive flywheels off as spokes are liable to be cracked, crankshaft sprung, or bearings damaged. To remove a flywheel, pull cotter and unscrew nut. With a brass or lead hammer weighing about 3 lbs. sharply strike end of crankshaft, at same time pulling outward on flywheel rim. Flywheels which have been in place a long time may stick, and a jaw wheel puller should be used. When replacing flywheel, wipe parts clean and oil, draw nut fairly tight and insert cotter.

ROLLER BEARINGS

Roller bearing installations on FAIRMONT equipment are approved by the bearing manufacturer's engineers, and bearings have proper load capacities and clearances to insure satisfactory service. Don't strike bearings with steel hammers. Always drive them off evenly with a brass punch held against inner races only, being careful not to damage the roller retainers. A piece of clean tubing which just slips over the shaft is best to drive them back in place. Never lay bearings on work benches or heat with a torch. Wash in gasoline or hot soda bath as soon as removed, lubricate with oil, and wrap in clean paper or cloth.

CRANKSHAFT AND ROLLER BEARINGS

The crank pin, inboard roller bearings and outboard roller bearings are lubricated by oil which enters the crankcase mixed in the fuel.

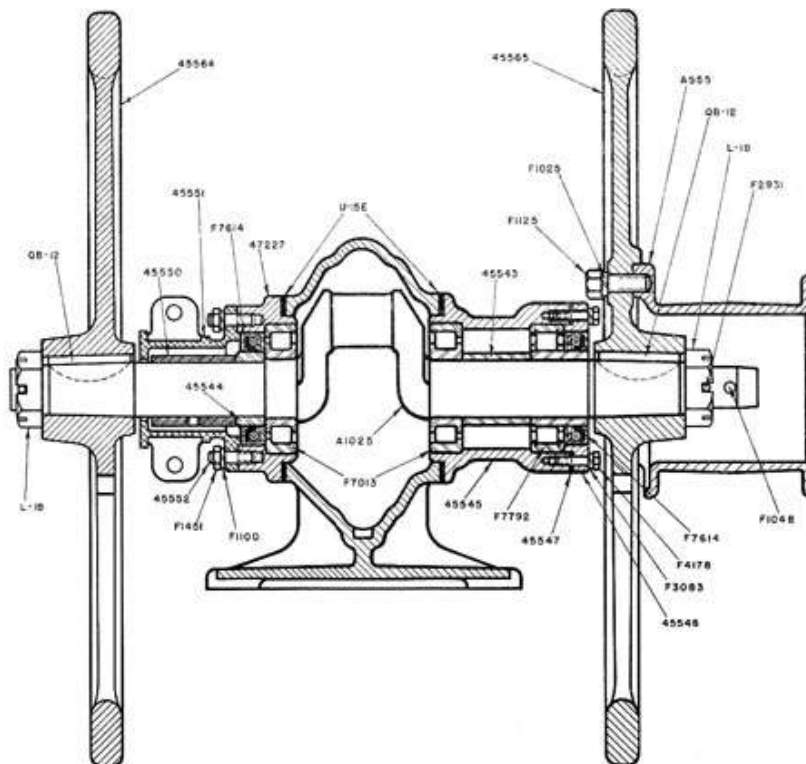
To remove crankshaft disconnect connecting rod, then push piston and rod assembly toward cylinder head. Take off flywheels and remove starting crank pin from crankshaft. Remove nuts holding side bearing casings and carefully drive them off with a block of wood. Remove timer cam and key, turn crank pin straight down in crankcase, then lift out crankshaft with bearings.

The three roller bearing races are pressed on the crankshaft, the inner two having rollers and cages assembled on them. If necessary to remove them, they should be driven off evenly, with a brass punch against inner races only. The oil seal race on timer side is forced off as the bearing race is removed. On

the belt side the outboard bearing inner race is removed first, then the spacing sleeve, and finally the inboard bearing race and rollers. Outer races of the two inboard bearings are pressed in the side bearing casings, also the outer race and rollers of the outboard bearing. Outer races may be driven from the casings with a bent punch.

Smooth all burrs and rough places on the crankshaft shoulders and fillets before reassembly, then carefully press or drive on the inner races with rollers. Also press or drive the oil seal race on the timer side against the inner bearing race with the beveled edge out. Tap belt side spacing sleeve against inner bearing race, then press or drive on the outboard bearing race. Apply timer cam and tighten set screw. Outer races for the inboard bearings must be squarely pressed and seated in the bearing casings, thrust shoulders first.

Clean gasket joints, remove timer support casting from side bearing casing, and oil bearings before reassembling. Replace crankshaft and bearings in crankcase, apply a new gasket, then start timer side casing with outer race on the rollers squarely and carefully tap to place. Be sure oil seal fits properly on the oil seal race. When applying the side bearing nuts first draw one up just snug, then tighten the opposite one equally. Set the remaining two the same way and finally tighten all four nuts evenly. Next "seat" the roller bearing in the casing by lightly tapping the opposite end of the crankshaft. Apply belt side casing with a new gasket, and tighten as instructed for timer side. Be sure this casing is drawn evenly to place and concentric with the crankshaft.



The crankshaft and bearing assembly must have 1/64" to 3/64" clearance when side bearing casings are bolted in place. Check this by tapping crankshaft on one end, then the other, and measure the amount it shifts. An extra gasket may have to be added at one or both bearing casings to secure clearance. Replace belt side casing cover, using a new gasket, and be sure oil seal is in good condition. On the timer side, using a new gasket, replace the timer support casting on the side bearing casing. Flywheels and remaining parts can then be reassembled.

THROTTLE

Leakage at the throttle stem is prevented by a packing. The stop in opposite cover limits the valve travel. The throttle arm is held in place by a clamp screw that should be kept tight. If this arm slips, the throttle may not open properly. The throttle valve can be pulled out from belt side of engine after removing valve cover.

**CARBON
DEPOSITS**

After long service the piston head, inside of cylinder head, and walls of combustion chamber become coated with carbon. Knocking or "pinging" then occur when the engine is warmed up, especially when pulling loads. Carbon can be scraped out after removing cylinder head. Clean the intake and exhaust ports; removing the muffler and throttle valve makes it easier. Carbon inside the piston head and deflector should also be removed. Wipe or blow out loose carbon before reassembling.

When replacing cylinder head be sure the gasket and joints are clean. First tighten every other cylinder head nut just snug, then set the remainder the same way. Next go over all of them, tightening to place evenly.

INSTRUCTIONS FOR ORDERING PARTS

When this bulletin is received complete the following motor car record from the FAIRMONT name plates on the car, and on the engine water hopper. The engine number is also stamped on top of the crankcase. Always mention these factory serial numbers when writing about the car or ordering parts.

Factory Car No. _____ Class _____ Series _____
 _____ Group _____ Special _____
 Factory Engine No. _____ H. P. _____ Type _____
 _____ Group _____ Special _____

TO INSURE PROMPT AND CORRECT SHIPMENT of parts always give:

- (1) Quantity of each part wanted.
- (2) Symbol number of part as shown in this book.
- (3) Description of part as shown in this book.
- (4) Factory serial numbers recorded above.
- (5) Car gauge if other than 56 $\frac{1}{2}$ " standard.
- (6) State whether shipment is to be by mail, express, or freight.

All parts are shipped f.o.b. factory, transportation charges to be paid by customer. Terms are strictly cash with order.

Parts are listed by description, symbol, and quantity, and all important items illustrated. Quantities in right hand columns show the number of parts in each assembly or group. Items printed in capitals are assemblies which include all parts listed immediately following and indented to the right. When assemblies can be used, always order them to save work of fitting separate parts. If in doubt as to any part wanted, send full description or sketch, or send old part with order.

For descriptive purposes the engine end of car is named front, and right and left are determined by looking from rear to front.

Common bolts, nuts, and washers are not listed in this bulletin, as they can be obtained from any railroad store department.

The weight and numerical part list on pages 21 through 23 contains all items shown in the parts section covering standard direct belt drive battery ignition cars. Spare parts for accessories, and parts used on special cars only, are not listed in this index.

Spare parts of accessory groups are given on pages 46 through 49. Items used only on cars having figures in the space on the name plate marked "Special" are listed according to car designation, starting on page 50.

CAR IDENTIFICATION

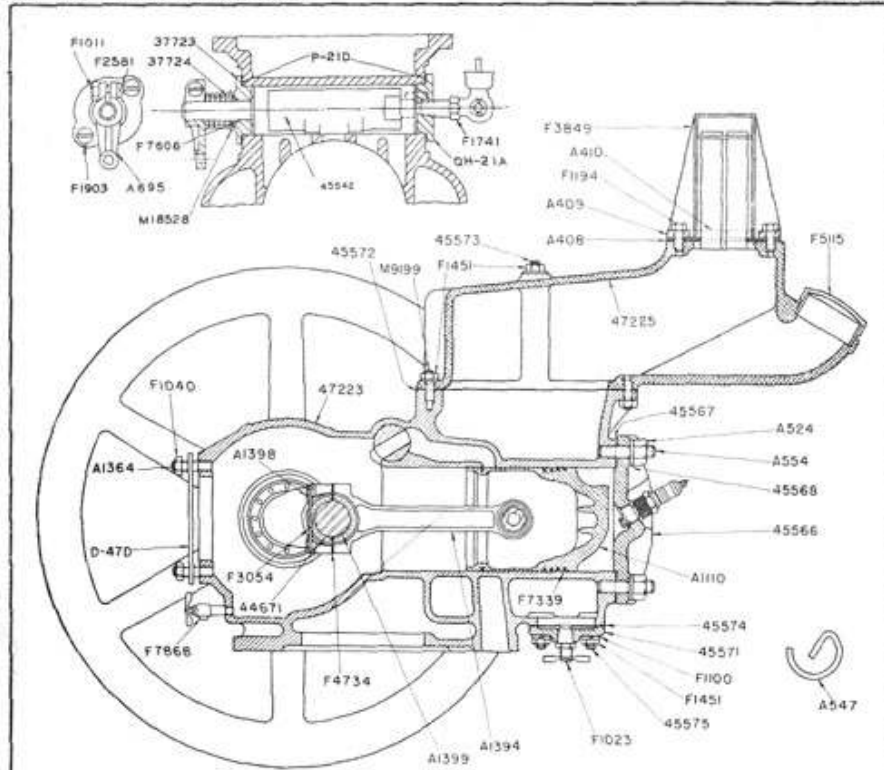
(Found on Car Name Plate)

To accurately identify cars, all units carry the designation "Class M9--Series G--Group____--Special___." The group number is always shown, and cars having changes to customers' specifications also have figures in the space marked "Special." When the letter "Z" appears in the designation, it indicates either broad or narrow gauge.

Symbol	Weight (Approx)	Page
RO-C.....	187 lb.	48
L-1B.....	5 oz.	27
QB-12.....	2 oz.	27
U-15E.....	1/2 oz.	27
PE-17G.....	1 oz.	38
PB-17T.....	1/2 oz.	38
QH-21A.....	3 oz.	25
P-21D.....	1/2 oz.	25
D-47D.....	1 oz.	25, 29
C-48.....	1/2 oz.	35
D-48A.....	8 oz.	35
QB-61C.....	1 oz.	48
TF-68F.....	1/2 oz.	31
PH-90P.....	1/2 oz.	31
A406.....	1 oz.	25
A408.....	4 oz.	25
A409.....	7 oz.	25
A410.....	3 oz.	25
EZ453.....	1/2 oz.	29
EZ454.....	1/2 oz.	29
EZ455.....	1 oz.	29
EZ456.....	1/2 oz.	29
EZ474.....	1/2 oz.	29
A524.....	1 1/2 oz.	25
EZ530.....	1 oz.	29
EZ540.....	1/2 oz.	29
EZ541.....	1/2 oz.	29
A547.....	1/2 oz.	24
A554.....	1 oz.	25
A555.....	3 1/2 lb.	41
A595.....	1/2 oz.	33
A646.....	1/2 oz.	29
A695.....	2 oz.	25
F1000.....	1/2 oz.	27, 41
F1007.....	1/2 oz.	37, 41
F1009.....	1/2 oz.	33
F1011.....	1/2 oz.	25, 33
F1023.....	5 oz.	25
A1025.....	8 lb.	27
F1040.....	1/2 oz.	25, 37, 39
F1048.....	1/2 oz.	27
F1075.....	1/2 oz.	39
F1081.....	2 lb.	35
A1110.....	2 1/2 lb.	24
A1111.....	2 1/2 lb.	24
F1115.....	1/2 oz.	41
F1125.....	1/2 oz.	37, 41
F1194.....	1/2 oz.	25, 37
F1222.....	1/2 oz.	39
A1241.....	1/2 oz.	27
F1291.....	1/2 oz.	37
A1318.....	3 lb.	29
A1326.....	1/2 oz.	29
A1327.....	1/2 oz.	29
A1331.....	1/2 oz.	29
A1332.....	1/2 oz.	29
A1334.....	1/2 oz.	29
A1341.....	1/2 oz.	29
A1345.....	1 oz.	31
A1347.....	1/2 oz.	29
A1349.....	1/2 oz.	29
A1350.....	1/2 oz.	29
A1351.....	1 1/2 lb.	29
A1353.....	1/2 oz.	29
A1354.....	1/2 oz.	29
A1356A.....	2 oz.	29
A1357.....	1/2 oz.	29
A1359.....	1/2 oz.	29
A1361.....	1/2 oz.	29
A1362.....	12 oz.	29
A1364.....	6 oz.	25, 27
A1366.....	1/2 oz.	29
A1367.....	1/2 oz.	29
A1368.....	1/2 oz.	29
A1369A.....	1 oz.	29
A1371.....	9 oz.	29
A1375.....	9 1/2 oz.	29
A1384.....	1/2 oz.	29
A1386.....	1 oz.	29
A1387.....	6 oz.	29
A1388.....	1 1/2 lb.	29
A1389.....	5 1/2 lb.	29
A1394.....	1 1/2 lb.	24
A1398.....	1 oz.	24
A1399.....	1 oz.	24
F1402.....	7 1/2 oz.	35
F1451.....	1/2 oz.	25, 27, 41
F1615.....	1 1/2 oz.	39
F1640.....	1/2 oz.	37, 41
F1688.....	1/2 oz.	31
F1692.....	1/2 oz.	29
F1730.....	1/2 oz.	45
F1741.....	2 oz.	25
F1742.....	1/2 oz.	45
F1864.....	1/2 oz.	39
F1903.....	1/2 oz.	25
F1969.....	1/2 oz.	29
F1971.....	1/2 oz.	29
F2035.....	1/2 oz.	31
M2314.....	1/2 oz.	35
F2442.....	1/2 oz.	33
F2447.....	1/2 oz.	27, 33
F2545.....	1/2 oz.	37
F2551.....	1/2 oz.	27, 33
F2581.....	1/2 oz.	25
F2607.....	1/2 oz.	37
F2707.....	1/2 oz.	37
F2787.....	1/2 oz.	39
F2831.....	1/2 oz.	33
F2877.....	1/2 oz.	41
F2931.....	1/2 oz.	27
F2945.....	13 oz.	35
F2946.....	7 oz.	35
F2948.....	2 oz.	35
F2958.....	1/2 oz.	ft. 35
F3006.....	1/2 oz.	ft. 25
F3011.....	1 oz.	45
F3032.....	1 oz.	33, 35
F3054.....	1/2 oz.	ft. 24, 31, 37
F3132.....	1 oz.	45
F3383.....	1/2 oz.	43
F3453.....	3 oz.	37
F3503.....	1/2 oz.	27
F3613.....	4 oz.	31
F3614.....	2 oz.	31
M3639.....	1 oz.	41
F3651.....	1 oz.	31
F3849.....	5 1/2 lb.	25
F3853.....	1/2 oz.	31
F3854.....	1 oz.	31
F3855.....	1/2 oz.	31
F4026.....	14 oz.	ft. 31
F4125.....	13 oz.	35
F4166.....	1 oz.	35
F4178.....	1/2 oz.	27
F4216.....	10 oz.	41
F4252.....	1/2 oz.	37, 41
F4413.....	7 oz.	35
F4598.....	1 1/2 lb.	41
F4734.....	1/2 oz.	24
F4761.....	1/2 oz.	33
F5115.....	4 oz.	25
F5158.....	1/2 oz.	37
F5193.....	1 oz.	31
F5519.....	1 lb.	37
F5537.....	4 oz.	37
F5603.....	2 oz.	35
M6001.....	1/2 oz.	39
M6334.....	3 oz.	39
F6470.....	1/2 oz.	29
F6471.....	1/2 oz.	31
F6537.....	1/2 oz.	31
M6738.....	1 oz.	35
M6880.....	1 1/2 oz.	39
F7018.....	1 lb.	27
F7022.....	1/2 oz.	31
F7057.....	1/2 oz.	37
F7119.....	1/2 oz.	29, 31, 43, 45
F7120.....	1/2 oz.	39, 43
F7121.....	1/2 oz.	31, 37, 43, 45
F7179.....	1/2 oz.	31
F7221.....	2 oz.	39
F7226.....	1 oz.	45
F7242.....	1/2 oz.	45
F7244.....	1/2 oz.	45
F7339.....	1/2 oz.	24
F7353.....	5 oz.	35
F7370.....	1/2 oz.	29
F7455.....	2 oz.	35
F7512.....	1 oz.	33
F7608.....	1/2 oz.	25
F7614.....	1 1/2 oz.	27
F7762.....	8 oz.	ft. 27
F7787.....	1/2 oz.	45
F7792.....	1 1/2 lb.	27
F7803.....	1 oz.	31
F7868.....	1 oz.	25
F7876.....	1 1/2 oz.	31
F7877.....	1/2 oz.	31
F7901.....	1/2 oz.	29
F7923.....	11 oz.	31
F7950.....	1/2 oz.	31
F7953.....	14 oz.	35
F7954.....	9 oz.	35
F7955.....	6 1/2 oz.	35

F7956.....3½ oz....35	M24814.....4½ lb....41	44284.....2 oz....45
F7957.....1½ oz....35	M26831.....4 oz....41	44285.....2 oz....45
F7979.....1 oz....45	M27264.....11 oz....37	44286.....2 oz....45
F7996.....2½ lb....35	M27266.....7 oz....37	44287.....2 oz....45
F8002.....4 oz....33	M28988.....2 lb....37	44288.....8 oz....45
F8037.....½ oz....31	M29206.....14½ oz....39	44289.....4 oz....45
F8039.....4 oz....31	M29207.....1 oz....39	44240.....8 oz....45
F8085.....3 oz....31	M29209.....6½ oz....39	44245.....10 oz....45
F8086.....1½ oz....31	M29210.....4 oz....39	44246.....4½ lb....45
F8260.....1 oz....41	M29213.....2½ oz....39	44250.....1½ oz....45
F8587.....4 oz....37	M29214.....6½ oz....39	44255.....1 oz....45
F9042.....4 oz....45	M29829.....1½ oz....31	44260.....4 oz....45
F9043.....4 oz....45	M30335.....4 oz....37	44261.....6½ lb....35
F9044.....4 oz....45	M30336.....4 oz....37	44262.....6 lb....35
F9045.....4 oz....45	M30337.....4 oz....37	44267.....8 oz....37
F9046.....4 oz....45	M30839.....4 oz....45	44268.....4 oz....37
F9182.....4 oz....35	M33226A.....1½ lb....27	44269.....4 oz....37
M9199.....4 oz....25	M33628A.....4 oz....37	44270.....8 lb....42
F9217.....4 oz. 37.39	M33955.....1½ lb....27	44271.....8 lb....42
F9256.....4 oz....38	M34028.....4 oz....41	44272.....6 oz....42
10069.....4 oz....35	M34410.....6 oz....31	44274.....4 lb....42
M10268.....½ oz....37	M34724N.....23 lb....37	44275.....8 lb....42
M12024.....½ oz....25	M34725A.....3½ lb....37	44276.....4 lb....42
M12335.....7 oz....35	M34727A.....2½ lb....37	44279.....1 lb....42
M12336.....1½ oz....35	M34860.....2 lb....45	44280.....1 lb....42
M13581.....3½ oz....37	M35511.....2½ oz. 27.45	44281.....3½ lb....42
M15403.....1 oz....35	M36331A.....5 oz....31	44282.....3½ lb....42
M16247.....2½ oz....37	M36899.....2½ lb....35	44283.....9 oz....42
M16420.....3½ lb....27	M36400.....10½ oz....35	44284.....1½ oz....42
M17061.....½ oz....39	M36406.....5 oz....35	44285.....3 lb....43
M17078.....4 oz....39	M36865.....2 oz....35	44288.....1½ lb....42
M17079.....11 oz....39	M36866.....8 oz....35	44290.....5 oz....42
M17080.....3 oz....39	M36867.....1 lb....35	44291.....1 lb....39
M17081.....6 oz....39	M36871.....3 oz....35	44294.....1½ lb....45
M17082.....1 oz....39	M37168.....2½ lb....42	44296.....1½ lb....45
M17513.....3 oz....42	M37169.....3½ lb....42	44298.....2½ lb....45
M17568.....1 oz....39	M37170.....3½ lb....42	44299.....3½ lb....45
M17927.....23 lb....39	37502.....1 oz....29	44300.....9 oz....45
M18043.....4 oz....41	37723.....4 oz....25	44302.....9 oz....45
M18049.....4 oz....35	37724.....1 oz....25	44305.....3½ lb....45
M18457.....6 oz....39	38762.....8½ lb....41	44671.....1 oz....24
M18518.....4 oz....37	38763.....14½ oz....41	44736.....9 oz....31
M18519A.....1 lb....37	38764.....2 lb....41	44737.....8 oz....45
M18528.....½ oz. 25.39	38765.....4 oz....41	44739.....7 oz....45
M18930.....1 oz....39	38766.....4 oz....41	44745.....2 oz....45
M18931.....4 oz....39	38767.....4 oz....41	44746.....2 oz....45
M19044.....1 oz....42	38768.....4 oz....41	44747.....3½ lb....45
M19846.....4½ lb....39	38769.....8 oz....41	44749.....1 oz....45
M19852.....1½ lb....39	38776.....5 oz....41	44954.....8½ oz....31
M19853.....1½ oz....39	38777.....2½ oz....41	45242.....3½ lb....42
M19855D.....28 lb....39	38778.....2 oz....41	45243.....3½ lb....42
M19867A.....4 oz....37	38779.....1 lb....41	45244.....1½ lb....42
M19971.....½ oz....37	38780.....8 oz....41	45245.....1½ lb....42
M20023.....3 oz....37	38783.....5 oz....41	45542.....5 oz....25
M20919.....13 oz....35	39082.....2 oz....31	45543.....7 oz....27
M21581A.....4 oz....41	41196.....4 oz....37	45544.....8 oz....27
M22500.....4 oz....39	41362.....2 oz....45	45545.....3½ lb....27
M22506.....2 oz. 27.45	42269.....3½ lb....24	45547.....4 oz....27
M22664.....4 oz....35	43008.....2 oz....41	45548.....9 oz....27
M24007.....6 lb....37	44126.....2 oz....24	45550.....6 oz. 27.38
M24008.....12½ lb....37	44199N.....19 lb....37	45551.....6 oz....27
M24009.....9 oz....37	44221.....2½ lb....39	45552.....4 oz....27
M24010.....3½ lb....37	44225.....2 lb....45	45553.....12 oz....33
M24813A.....½ oz....41	44233.....2 oz....45	45554.....8 oz....33

45556..... $\frac{1}{2}$ oz.... 33	45574..... $\frac{1}{2}$ oz.... 25	47224..... 20 lb.... 25
45557..... $\frac{1}{2}$ oz.... 38	45575..... $\frac{1}{2}$ oz.... 25	47225..... 14 $\frac{1}{2}$ lb.... 25
45558..... $\frac{1}{2}$ oz.... 33	46500..... 12 oz.... 43	47226..... 12 $\frac{1}{2}$ lb.... 27
45559..... 4 oz.... 38	46501..... 12 oz.... 43	47227..... 2 lb.... 27
45560..... 8 oz.... 38	46502..... 6 oz.... 37	47228..... 7 $\frac{1}{2}$ oz.... 24
45561..... 1 oz.... 33	46504..... 1 oz.... 37	47750..... 57 lb.... 43
45562..... $\frac{1}{2}$ oz.... 33	46525..... 4 oz.... 39	47751..... 6 $\frac{1}{2}$ lb.... 43
45563..... $\frac{1}{2}$ oz.... 33	46560..... 8 oz.... 31	47752..... 6 $\frac{1}{2}$ lb.... 43
45564..... 20 lb.... 27	46561..... 6 oz.... 31	47753..... 10 $\frac{1}{2}$ lb.... 41
45565..... 20 $\frac{1}{2}$ lb.... 27	46565..... 5 lb.... 31	47754..... 2 lb.... 41
45566..... 1 $\frac{1}{2}$ lb.... 25	46569..... 10 oz.... 31	47755..... 20 $\frac{1}{2}$ lb.... 45
45567..... 1 $\frac{1}{2}$ oz.... 25	46570..... 5 oz.... 31	47756..... 10 oz.... 45
45568..... $\frac{1}{2}$ oz.... 25	46571..... 5 oz.... 31	47757..... 10 oz.... 45
45571..... 4 oz.... 25	46573..... 2 lb.... 45	47758..... 6 lb.... 45
45572..... $\frac{1}{2}$ oz.... 25	47222..... 41 lb.... 25	47760..... 3 oz.... 31
45573..... 1 oz.... 25	47223..... 37 lb.... 25	47762..... 2 $\frac{1}{2}$ oz.... 31
		47763..... 4 oz.... 31



PISTON AND CONNECTING ROD

PISTON, RINGS, AND CONNECTING ROD (assembled)	42269	1
PISTON, RINGS, PISTON PIN, & LOCK RINGS (aluminum)	A1110	1
PISTON WITH PISTON PIN & LOCK RINGS (aluminum)	A1111	1
Lock Ring (piston pin)	A547	2
Piston Ring	F7839	5
CONNECTING ROD COMPLETE (steel)	A1394	1
Bushing (piston pin end)	44126	1
Cap Screw (cap)	A1398	2
Shim (cap)	F4734	2
Bearing Half (for rod)	A1399	1
Bearing Half (for cap)	44671	1
Lock Wire (cap screws)	F3054	9*

GASKET SET 47228

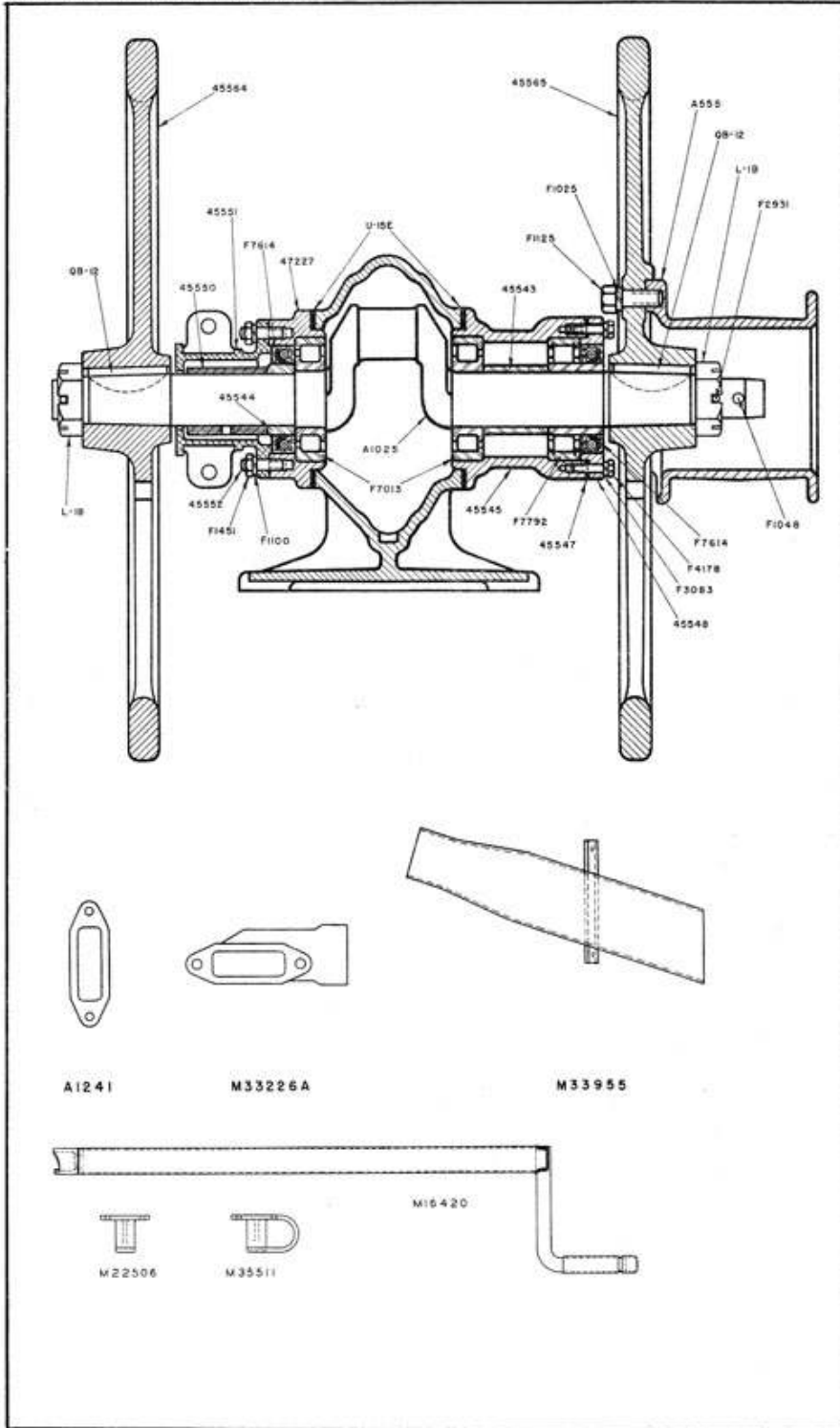
All gaskets (including condenser gasket) and the throttle valve stem packing may be obtained under one symbol by specifying 47228 gasket set. This set includes the items in this bulletin on pages 25 and 27 marked with an asterisk (*) and in the quantities shown.

CYLINDER AND CRANKCASE

CYLINDER AND CRANKCASE WITH STUDS THROTTLE VALVE AND COVER	47222	1
Throttle Valve	45542	1
Guide (throttle valve)	37723	1
Cover (throttle valve - with stop)	QH-21A	1
Screw (throttle guide and cover)	F1903	4
*Gasket (throttle guide and cover)	P-21D	2
*Packing (throttle stem)	F7608	1
Washer (packing pressure)	M18528	1
Spring (packing pressure)	37724	1
THROTTLE ARM, SCREW AND NUT	A695	1
Screw (throttle valve arm)	F2581	1
Nut (throttle valve arm screw)	F1011	1
CYLINDER AND CRANKCASE WITH STUDS AND COVER	47223	1
Stud (side bearing and carburetor - 1-3/8")	A1364	10
Stud (cylinder head)	A554	8
Stud 5/16 x 5/4 (water hopper)	45573	2
Stud 5/16 x 1-1/8 (water hopper)	M9199	1
Cover (water jacket bottom)	45571	1
*Gasket (cover)	45574	1
Stud (cover)	45575	4
Hex Nut 5/16" (use F1100 L.W.)	F1451	4
Priming Cup	F1741	1
Drain Cock (crankcase)	F7868	1
Drain Cock (water jacket)	F1023	1
Cylinder Head	45566	1
*Gasket (cylinder head)	45567	1
Nut (cylinder head stud)	A524	8
Washer (cylinder head stud)	45568	8
*Gasket (carburetor to crankcase)	D-47D	1
Nut (carburetor stud)	F1040	2

WATER HOPPER - COOLING SYSTEM

WATER HOPPER WITH CONDENSER, STUDS AND FILLER CAP	47224	1
Cooling Condenser	F3849	1
WATER HOPPER WITH STUDS (cap included)	47225	1
Stud 5/16 x 1-1/8 (water hopper)	M9199	6
Stud 5/16 x 5-1/4 (water hopper)	45573	2
FILLER CAP (water hopper)	F5116	1
Gasket (filler cap)	A406	1
*Gasket (condenser to hopper)	A408	1
Clamp Bar (short, for end of condenser)	A410	2
Clamp Bar (long, for side of condenser)	A409	2
Cap Screw (hex head - condenser to hopper)	F1194	14
*Gasket (hopper to cylinder)	45572	1
Nut (water hopper stud)	F1451	8
Overflow Hose (not ill.)	F3006	21"
Fiber Clip (overflow hose - not ill.)	M12024	1



FLYWHEELS - CRANKSHAFT - SIDE BEARINGS

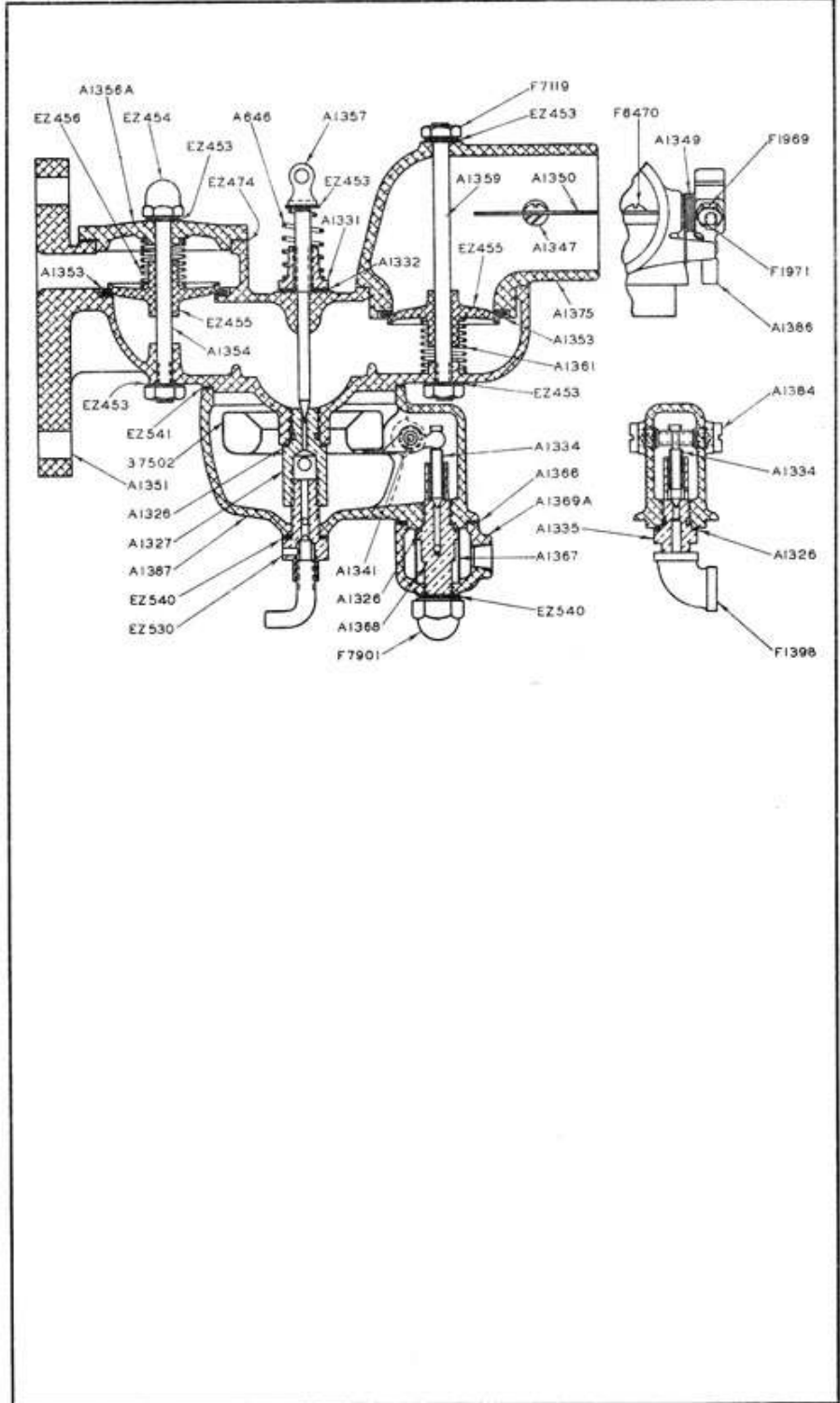
Flywheel (timer or magneto side)	45564	1
Flywheel (belt side)	45565	1
Key (flywheel)	QB-12	2
Nut (flywheel)	L-1B	2
Center 5/32 x 1 1/4"	F2931	2
Pin (starting crank)	F1048	1
CRANKSHAFT with BEARINGS, SLEEVE AND OIL SEAL RACE	47226	1
Crankshaft only	A1025	1
Bearing with Races (inboard)	F7013	2
Bearing with Races (outboard)	F7792	1
Spacer (belt side)	45543	1
Oil Seal Race (timer side)	45544	1
*Gasket (bearing casing)	U-15E	2
Stud (Bearing Casing)	A1364	8
Nut (bearing casing stud)	F1000	8
BEARING CASING WITH STUDS (timer side)	47227	1
Stud 5/16" x 1-1/16"	45552	4
Hex Nut 5/16" (use F1100 L.W.)	F1451	4
Oil Seal (timer side)	F7614	1
Support Casting (timer)	45551	1
COVER WITH OIL SEAL (bearing casing belt side)	45548	1
Oil Seal only	F7614	1
*Gasket (cover)	45547	1
Screw (cover - 1/4 x 7/8 - use F3083 L.W.)	F4178	4
Bearing Casing (belt side)	45545	1
Timer Cam	45550	1
Key (timer cam)	F2551	1
Set Screw (hollow head)	F2447	1

SIDE EXHAUST PARTS

Exhaust Elbow (on engine - left hand outlet)	M83226A	1
Exhaust Tubing (specify length)	F7762	23"
Exhaust Outlet (on left hand rail skid)	M88955	1
Gasket (elbow to engine)	A1241	1
Center 3/16 x 3-1/2"	F3503	1

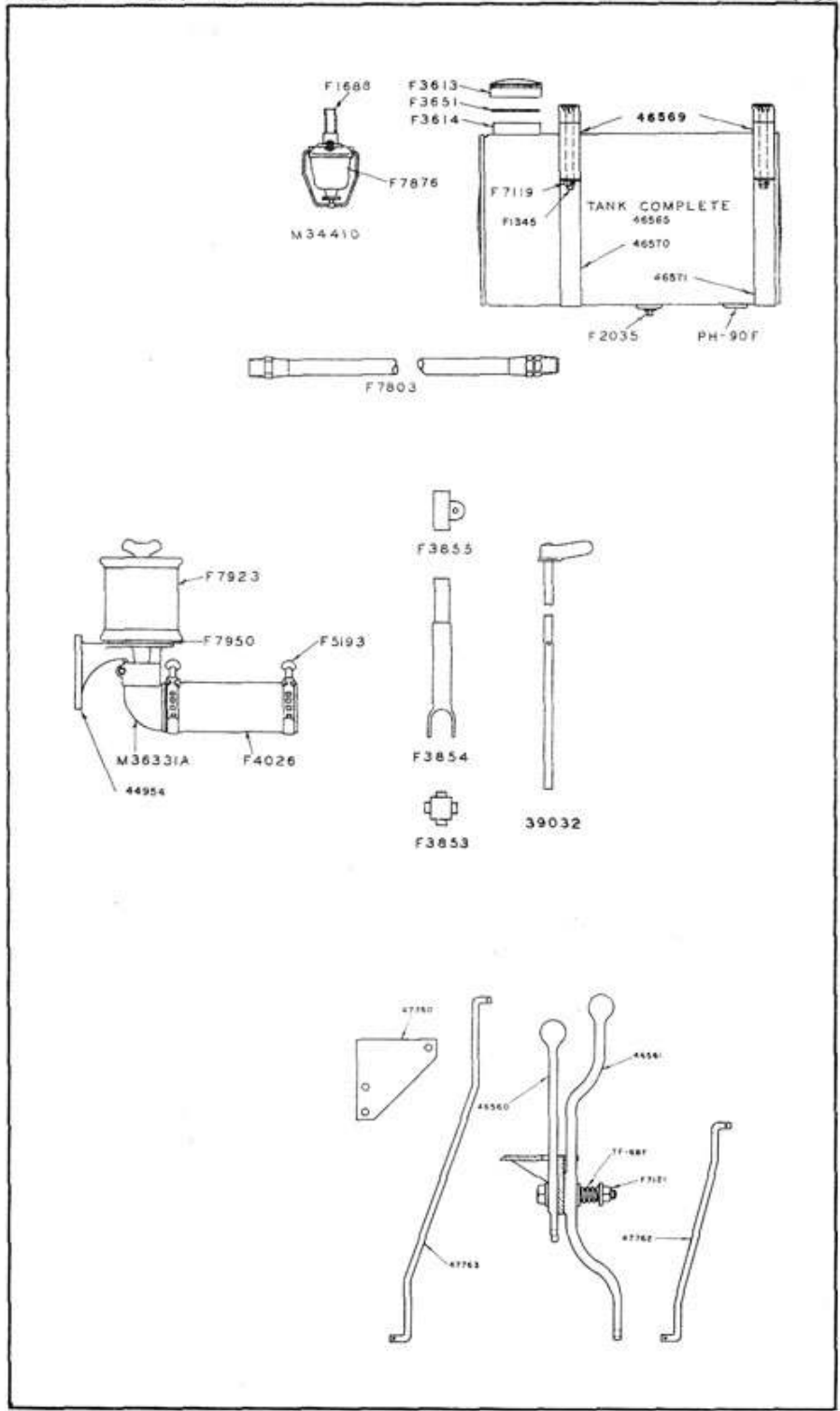
STARTING CRANK

Starting Crank	M16420	1
Starting Crank Holder (plain)	M22506	1
Starting Crank Holder (with loop)	M35511	1



C5 CARBURETOR

Gasket (carburetor to crankcase - inc. in gasket set)	D-47D	1
Gasket Set (complete for C5 carburetor)	A1389	1
PHIRMONT C5 CARBURETOR Complete	A1318	1
CARBURETOR BODY Complete (with needle valve guide, needle valve seat, and check valve seat)	A1388	1
CARBURETOR BODY (with check valve seat)	A1351	1
Valve Seat (for either check or air valve)	A1353	1
Guide (needle valve)	A1331	1
Gasket (needle valve guide)	A1332	1
Cap Screw 4 x 1/2" (needle valve guide)	F7370	2
Seat (needle valve)	A1327	1
Gasket (needle valve seat)	A1326	1
Needle Valve (yoke type - length 3 1/2")	A1357	1
Washer (or gasket - needle valve friction)	EZ453	2
Lock Spring (under needle valve)	A646	1
Check Valve (same as air valve)	EZ455	1
Check Valve Stem (with lower nut - length 2-5/8")	A1354	1
Spring (check valve - 1-5/16" free length)	EZ456	1
Cover (check valve)	A1356A	1
Gasket (check valve cover)	EZ474	1
Cap Nut (check valve stem upper)	EZ454	1
Gasket (or washer - valve stem nuts)	EZ453	2
FLOAT BOWL Complete (with float and strainer)	A1371	1
FLOAT BOWL (with float valve seat)	A1387	1
Seat (float valve)	A1368	1
Gasket (float valve seat)	A1326	1
Float with Lever (metal - replaces A1336)	37502	1
Hinge Pin (float lever)	A1341	1
Bearing Screw (hinge pin)	A1384	2
Float Valve	A1334	1
Strainer Bowl only	A1369A	1
Screens (strainer)	A1367	1
Gasket (strainer bowl upper)	A1366	1
Cap Nut (strainer bowl)	F7901	1
Gasket (cap nut - strainer bowl lower)	EZ540	1
Gasket (float bowl to carburetor body)	EZ541	1
Drain Cock complete (float bowl)	EZ530	1
Gasket (drain cock)	EZ540	1
AIR VALVE CAGE (with choke but less air valve)	A1362	1
AIR VALVE CAGE (with valve seat)	A1375	1
Valve Seat (for either check or air valves)	A1353	1
Choke Shaft	A1347	1
Choke Disc	A1350	1
Screw (choke disc - self tapping)	F6470	2
CHOKE ARM (with clamp screw)	A1386	1
Machine Screw (choke arm clamp)	F1971	1
Hex Nut (clamp screw)	F1969	1
Lock Washer 3/16"	F1692	1
Spring (choke arm)	A1349	1
Air Valve Stem (with lower nut - length 3 1/2")	A1359	1
Air Valve (same as check valve)	EZ455	1
Spring (air valve - 1" free length)	A1361	1
Hex Nut (air valve stem upper)	F7119	1
Gasket (or washer - valve stem nuts)	EZ453	1

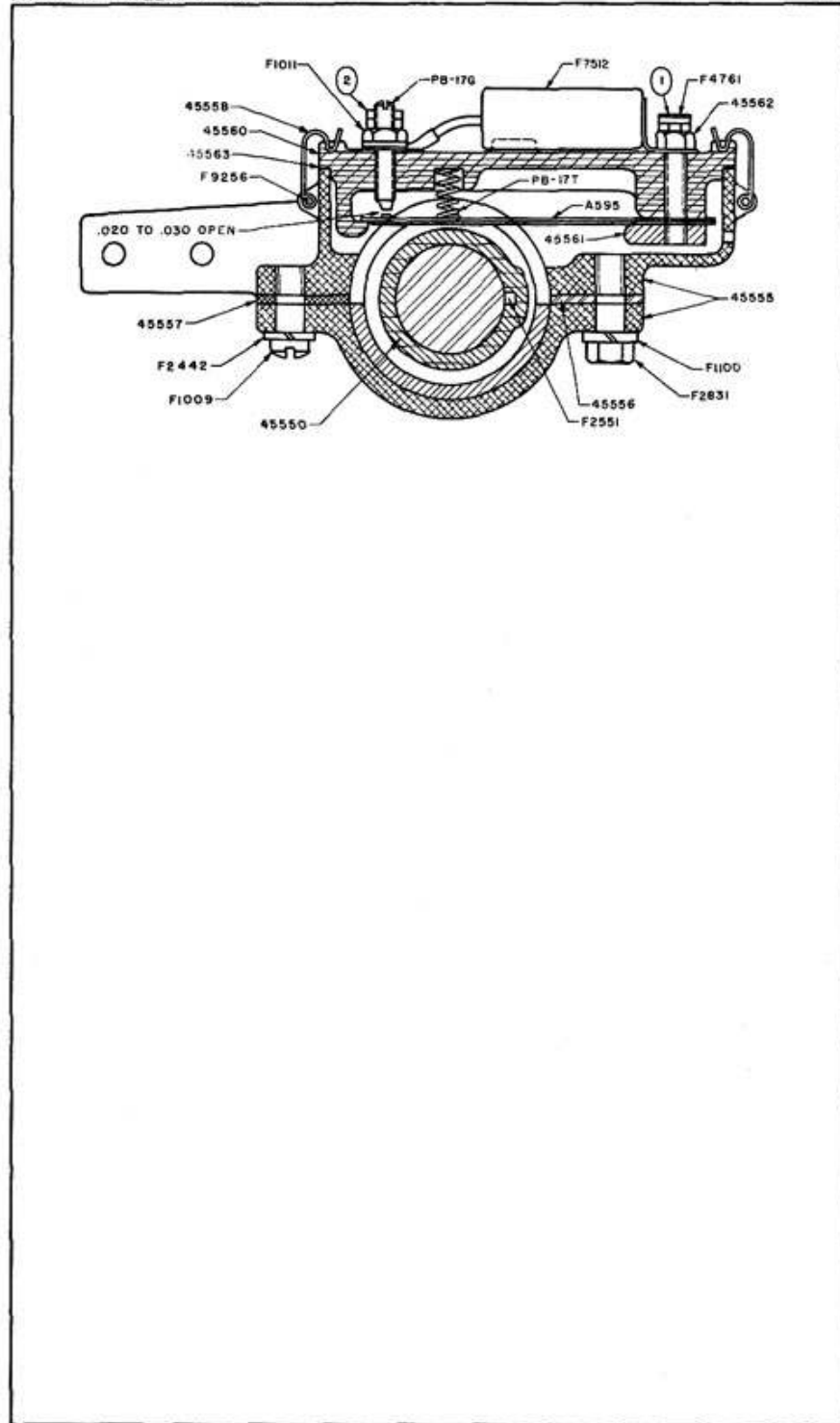


FUEL SYSTEM - AIR CLEANER

FUEL TANK (with cap)	46565	1
Threaded Bushing (solders in tank)	MH-90F	2
Bayonet Catch (neck for F3613)	F3614	1
FILLER CAP (bayonet type - with gasket)	F3613	1
Gasket (filler cap)	F3651	1
Pipe Plug	F2035	1
Saddle (fuel tank)	46569	2
Strap (fuel tank front)	46571	1
Strap (fuel tank rear)	46570	1
Bolt 1/4 x 4" (tank straps)	F1345	4
Hex Nut 1/4" self-locking	F7119	4
FUEL STRAINER WITH NIPPLE	M34410	1
Nipple 1/8 x 3/4" brass	F1688	1
Bowl (glass - strainer)	F7876	1
Gasket (strainer bowl)	F7877	1
PERMISSIBLE FUEL LINE - 18" (with fittings)	F7803	1
Half Union (fuel line)	F7179	1
AIR CLEANER ASSEMBLY (screen with cover, stem, and nut)	F7923	1
Top only (cover)	F8085	1
Wing Nut only	F8037	1
Stem only (threaded)	F8086	1
Name Plate only (washer)	F8039	1
Mounting Bracket (screen assembly)	44954	1
Gasket (screen to bracket)	F7950	1
Support Plate (mounting bracket)	44736	1
Elbow (below cleaner)	M36331A	1
Clamp Bolt (elbow)	F6471	1
Hex Nut 1/4" (clamp bolt)	F7022	1
Hose - 2" diameter (specify length required)	F4026	9"
Clamp (hose)	F5193	2

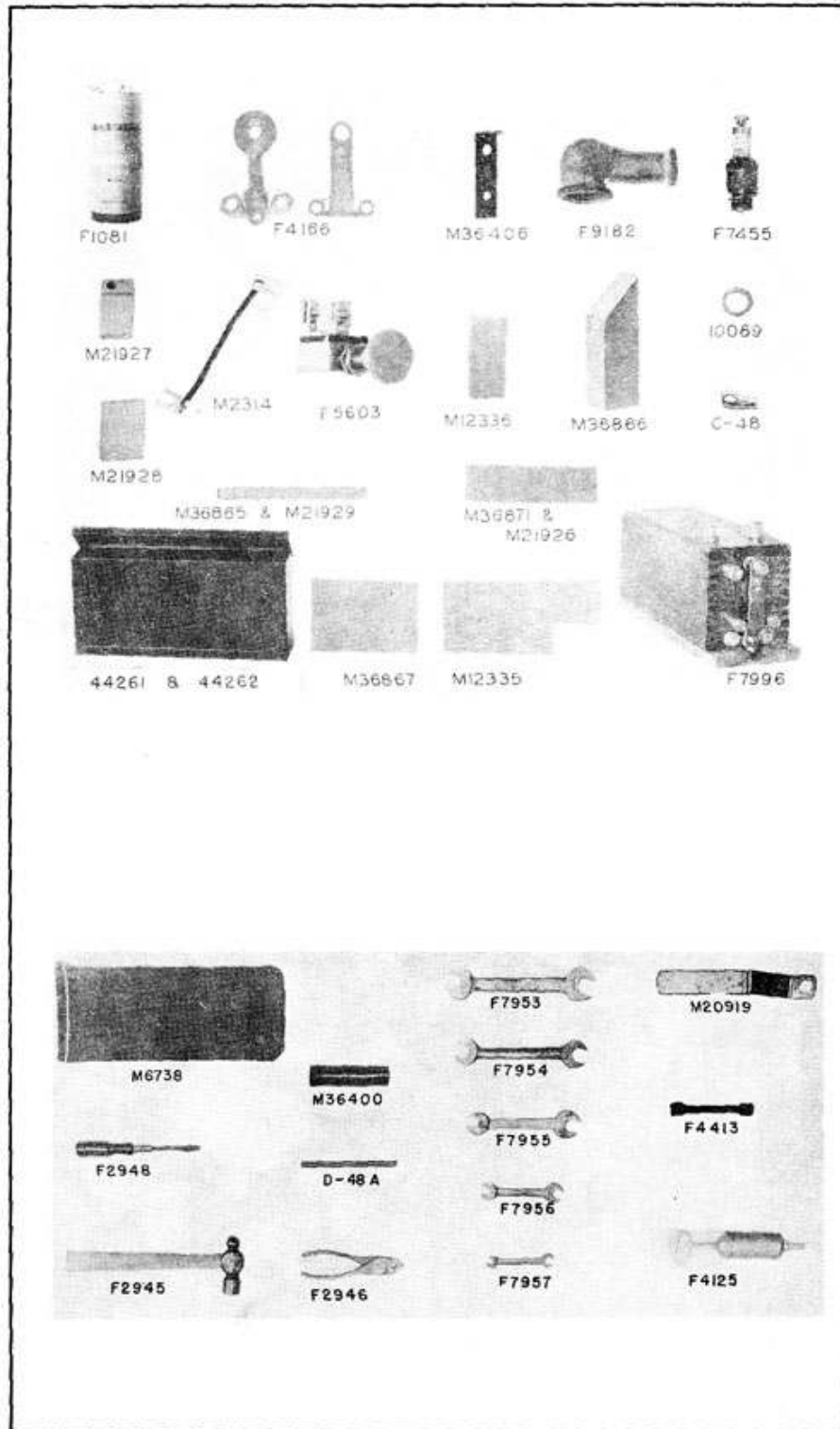
CONTROLS

Throttle Lever	46560	1
Timer Control Lever	46561	1
Spring (throttle lever friction)	TF-68F	1
Hex Nut 3/8" self-locking	F7121	1
Throttle Rod	47768	1
Timer Rod	47762	1
Extension (timer)	47760	1
CONTROL SERVICE GROUP (carburetor)	M29829	1
Universal Spider (carburetor control)	F8853	1
Sleeve (adjusting rod - lower end)	F8854	1
Sleeve (choke wire connecting)	F8855	1
Adjusting Rod (with knob)	M18670	1
Wire (choke - specify length)	F8054	9"
Wash Washer (choke sleeve)	F6537	1



WEATHERSEALD TIMER

WEATHERSEALD TIMER COMPLETE (assembled)	45553	1
MOUNTING CASTING (complete - halves not sold separately)	45554	1
Spacer Steel (lower - casting halves)	45556	1
Spacer Cork (upper - casting halves)	45557	1
Cap Screw 5/16" x 7/8" hex head	F2831	1
Lock Washer 5/16"	F1100	1
Clamp Screw 5/16" x 3/4"	F1009	1
Lock Washer 5/16" Special	F2442	1
Spring Clip	45558	2
Pins	F9256	2
Stop Pin	F8002	1
Gasket (timer body to mounting casting)	45563	1
TIMER BODY COMPLETE (with blade, points and condenser).	45559	1
Body only	45560	1
Timer blade (with point)	A595	1
Spring (timer blade - spiral)	PB-17T	1
Screw (timer blade clamp)	45562	1
Clamp Nut (timer blade)	45561	1
Connector	F4761	2
Adjusting Screw (with point)	PB-17G	1
Wet (timer adjusting screw)	F1011	1
Ignition Condenser Complete	F7512	1
Timer Cam	45550	1
Key (timer cam)	F2551	1
Set Screw (hollow head)	F2447	1
Wrench (set screw)	F3032	1

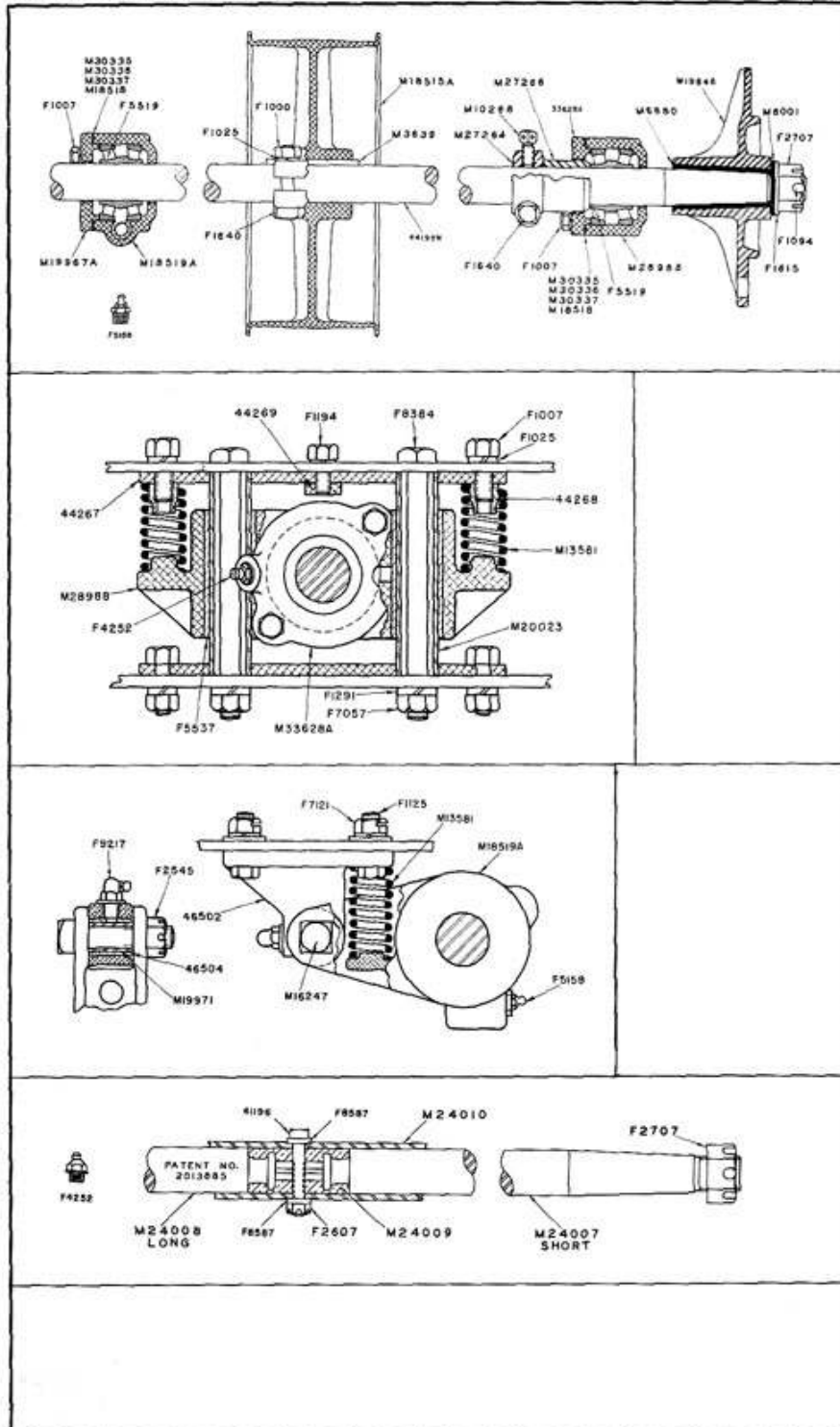


BATTERY IGNITION EQUIPMENT

Battery Box	44262	1
Spacer Sleeve (box mounting)	M18049	2
Insulating Liner (side - battery box)	M12335	1
Insulating Liner (end - battery box)	M12336	1
Insulating Liner (bottom - short - 10-1/4")	M36871	1
Insulating Liner (side - short - 10-1/4")	M36867	1
Rubber Bushing (protects wires)	10069	1
Spark Coil	F7996	1
Spacer Block (coil)	M36866	1
Spacer (above batteries)	M36865	1
Dry Cell	F1081	4
Vibrator (both points included)	F4166	1
Connector (battery)	M2314	3
Spark Plug - 18 mm	F7455	1
Rubber Cap (high tension terminal - coil)	F9132	1
Wire (spark plug with terminals)	M15403	1
Switch	P5603	1
Wiring Assembly (in braided covering)	F7353	1
Wire (coil to battery - 11")	M22664	1
Support Clip (timer wires)	M36406	1
Cable Clip (fibre)	C-48	7
Hi Tension Wire (plain, no terminals - specify length req.)	F1402	
Primary Wire (plain, no terminals - specify length req.)	F2958	

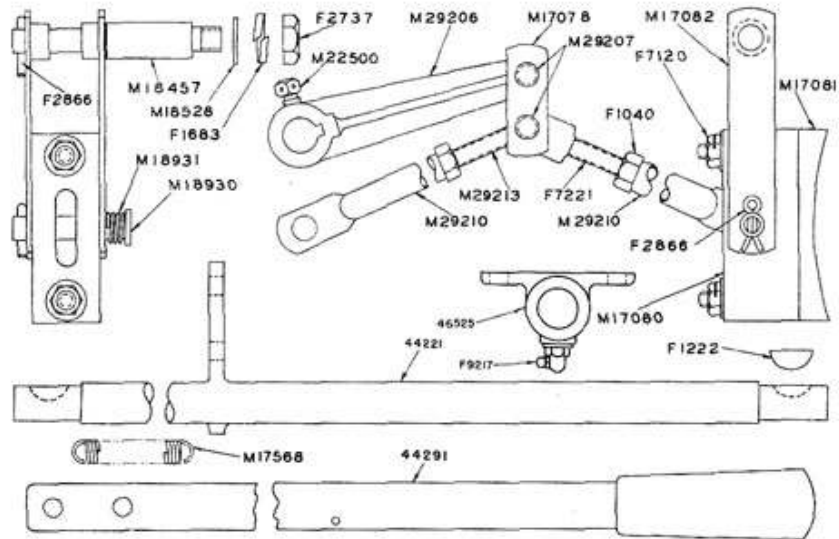
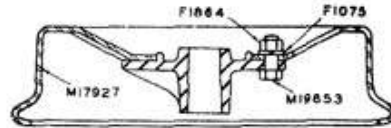
TOOL BOX AND TOOLS

Tool Box	44261	1
Spacer Sleeve (tool box mounting)	M18049	2
Grease Gun	F4125	1
Wrench (spark plug)	M36400	1
Handle (spark plug wrench)	D-48A	1
Demountable Wheel Wrench	M20919	1
Wrench (hollow head set screw - timer cam)	F3032	1
TOOL KIT (in bag)	M36399	1
Draw String Bag	M6738	1
Ball Pein Hammer	P2945	1
Pliers - 6"	F2946	1
Screw Driver - 3"	F2948	1
Connecting Rod Socket Wrench	F4413	1
End Wrench 7/16 & 3/8" openings	F7957	1
End Wrench 9/16 & 1/2" openings	F7956	1
End Wrench 3/4 & 5/8" openings	F7955	1
End Wrench 7/8 & 13/16" openings	F7954	1
End Wrench 15/16 & 1" openings	F7953	1



AXLES - AXLE BEARINGS - THRUST COLLARS

DRIVE AXLE 1-3/16" (inc. nuts and cotters)	44199N	1
Axle End Nut (use F1094 cotter)	F2707	2
DIFFERENTIAL AXLE 1-3/16" (inc. nuts and cotters)	M34724N	1
Axle Half (short)	M24007	1
Axle Half (long)	M24008	1
Split Bushing (halves not sold)	M24009	1
Sleeve (axle)	M24010	1
Grease Fitting	F4252	1
Center Bolt (axle sleeve) 5/16 x 1-3/4"	41196	1
Packing Wire (center bolt - 6" per axle - specify length)	F8587	6"
Slotted Nut 5/16" hex	F2607	1
Axle End Nut (use F1094 cotter)	F2707	2
Guide (axle bearing)	M20023	8
Plate (positions guide)	44267	8
Nut (positions upper end of spring)	44268	8
Stop Clip (bearing)	44269	4
Cap Screw 3/8 x 1"	F1007	16
Cap Screw 5/16 x 3/4"	F1194	4
Bolt (guide) 7/16 x 5 1/2"	F3453	8
Hex Nut 7/16"	F7057	8
Lock Washer 7/16"	F1291	8
Spring (axle bearing)	M13581	8
AXLE BEARING 1-3/16" (assembled)	M34725A	4
CASING WITH BUSHINGS	M28988	4
Bushing (bearing casing - Oilite)	F5537	8
Bearing with Races	F5519	4
Cover (bearing casing)	M33628A	4
Cover Shim (.005 paper)	M18518	4
Cover Shim (.010 steel)	M30335	4
Cover Shim (.007 steel)	M30336	8
Cover Shim (.005 steel)	M30337	8
Cap Screw (cover)	F1007	8
Grease Fitting	F4262	4
CENTER BEARING 1-3/16" (assembled)	M34727A	1
Casing only	M18519A	1
Bearing with Races	F5519	1
Cover (bearing casing)	M19967A	1
Cover Shim (.005 paper)	M18518	1
Cover Shim (.010 steel)	M30335	1
Cover Shim (.007 steel)	M30336	2
Cover Shim (.005 steel)	M30337	2
Cap Screw (cover)	F1007	2
Grease Fitting	F5158	1
SUPPORT (center bearing - with bushing)	46502	1
Bushing (Oilite - no hole required)	46504	1
Grease Fitting	F9217	1
Cap Screw 3/8 x 1-1/4" hex head	F1125	2
Hex Nut 3/8" self-locking	F7121	2
Spring (axle bearing)	M13581	1
Spacer Tube (hinge bolt)	M19971	1
Bolt (center bearing hinge)	M16247	1
Hex Slotted Nut 1/2"	F2545	1
THRUST COLLAR 1-3/16" (complete)	M27264	4
Clamp Bolt Thrust collar	F1640	4
Hex Half Nut (clamp bolt)	F1040	4
Set Screw (thrust collar)	M10268	4
Lock Wire (specify length)	F3054	24"
Sleeve (thrust collar to bearing)	M27266	4

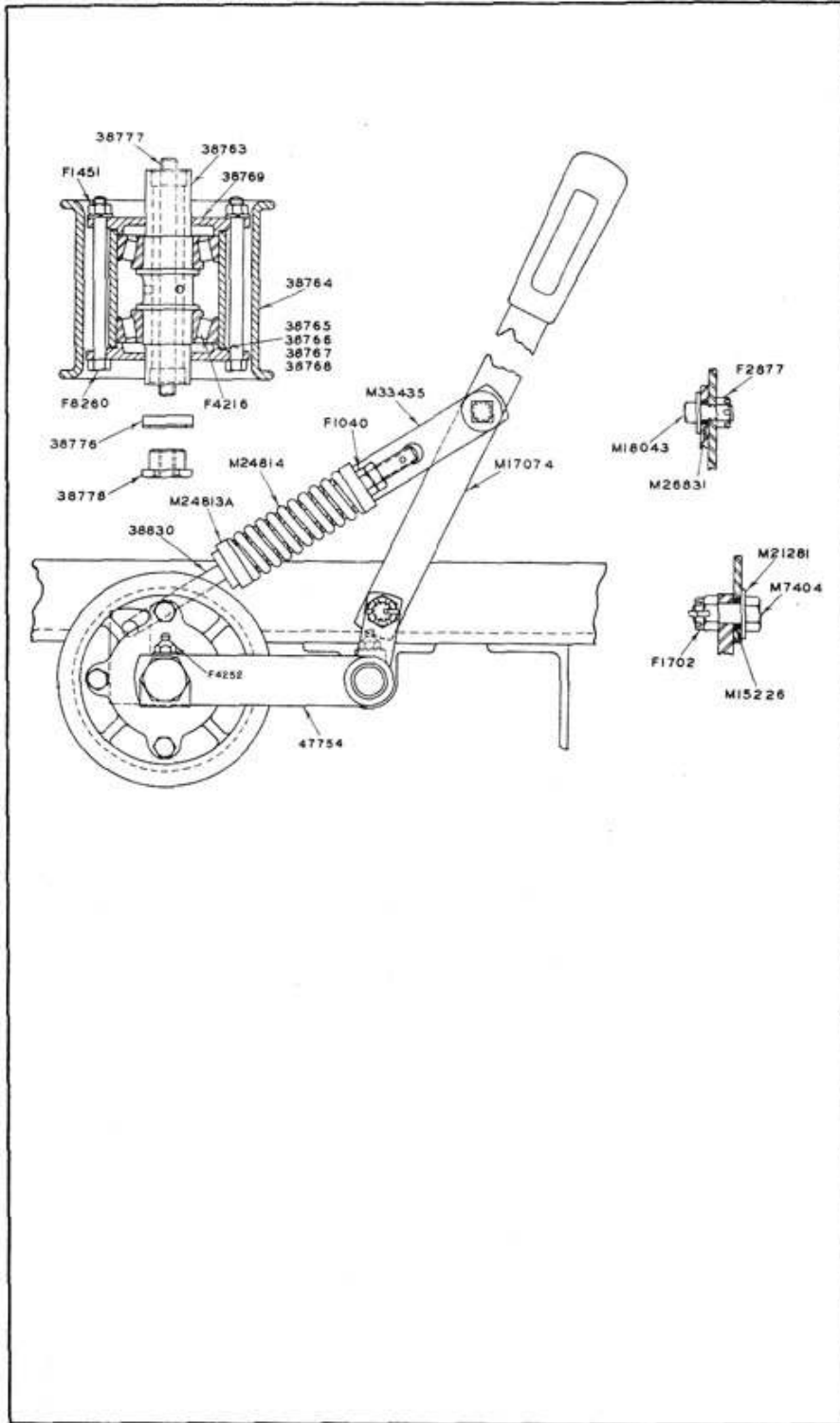


WHEELS - INSULATION

14" x 4" x 3-3/8" DEMOUNTABLE WHEEL (taper bored for ins.)	M19855D	4
Hub only (taper bore)	M19846	4
14" x 4" x 3-3/8" Demountable Tire only	M17927	4
BOLT SET (6 each hub bolt, nut, and lock washer)	M19852	4
Tire Bolt (heat treated steel) SAE	M19853	24
Lock Washer 1/2"	F1075	24
Hex Nut 1/2" SAE	F1864	24
INSULATION SET 1-3.16" (complete)	M6834	4
Insulating Sleeve	M6880	4
Insulating Washer	M6001	4
Steel Washer	F1615	4

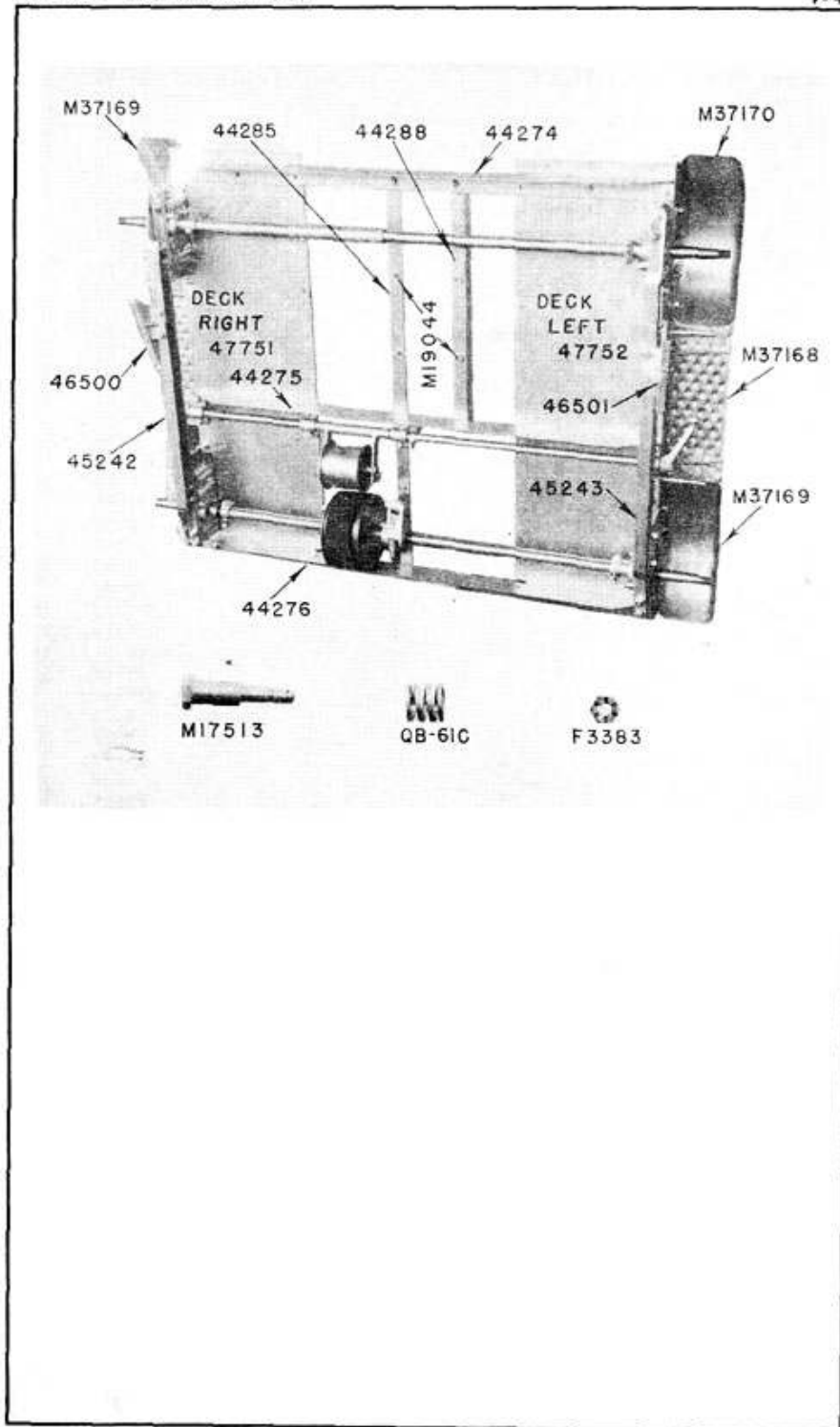
BRAKE

Brake Shaft	44221	1
BEARING with grease fitting (brake shaft)	46525	4
Grease Fitting	F9217	4
Spacer (brake shaft bearing)	M17061	4
Brake Lever	44291	1
Release Spring (brake)	M17568	1
End Arm (brake shaft)	M29206	2
Key (end arm)	F1222	2
Set Screw (end arm - use 16" of F3054 lock wire)	M22500	2
Toggle Link	M17078	4
Pin (toggle link)	M29207	4
BRAKE SHOE WITH LINER (assembled)	M17079	4
Brake Shoe (block only)	M17080	4
Liner	M17081	4
Hex Nut 5/16" self-locking	F7120	8
Pivot Stud	M18457	4
Washer (pivot stud)	M18528	4
Hex Half Nut 1/2" (use F1863 lock washer)	F2737	4
TOGGLE ARM (with eye bolt)	M29209	2
Body only (toggle arm)	M29210	2
Eye Bolt (toggle arm)	M29213	2
Hex Half Nut 3/8"	F1040	2
TOGGLE ARM (with yoke)	M29214	2
Body only (toggle arm)	M29210	2
Yoke (toggle arm)	F7221	2
Hex Half Nut 3/8"	F1040	2
Hanger (brake shoe)	M17082	8
Pin (hanger to shoe)	M18930	4
Spring (hanger pin)	M18931	4



BELT - PULLEYS - IDLER

Endless Cord Belt 3 x 64-1/8"	F4598	1
Engine Pulley - 4"	A555	1
Cap Screw 3/8 x 1-1/4" (use lock washer F1025)	F1125	8
AXLE PULLEY (with bolts - 7-5/8")	M21581A	1
Clamp Bolt (hub - use F1000 nut)	F1640	4
Drive Key (axle pulley)	M3689	1
IDLER PULLEY AND ARM (assembled)	47758	1
Idler Arm only	47754	1
Stud (pulley to arm)	38777	1
Nut (pulley stud)	38778	2
Lock Plate (nut)	38776	2
Grease Fitting	F4252	1
IDLER PULLEY AND SHAFT (assembled)	38762	1
Shaft (idler pulley)	38768	1
Bearing with Races	F4216	2
Idler Pulley only	38764	1
Cover Shim (.005 paper)	38765	2
Cover Shim (.010 steel)	38766	1
Cover Shim (.007 steel)	38767	2
Cover Shim (.005 steel)	38768	2
Cover (pulley)	38769	2
Cap Screw 5/16 x 4" hex head (use F1451 nut)	F8280	4
Spacer Sleeve (idler arm - on brake shaft)	43008	1
Pull Rod - 10-3/4"	38788	1
Hex Nut 3/8"	F1000	1
Hex Half Nut 3/8"	F1040	1
Spring (pull rod - 3-1/4")	M24814	1
Seat (spring)	M24818A	2
Strap (pull rod to spring)	38780	1
Spacer (strap bolt)	M26881	1
Bolt (strap)	M18048	1
Hex Slotted Nut	F2877	1
Idler Lever (offset)	38779	1
Spacer (idler lever cap screw)	M34028	1
Cap Screw (idler lever)	F1007	1
Washer (cap screw)	F1115	1



COMPLETE CAR LESS ENGINE

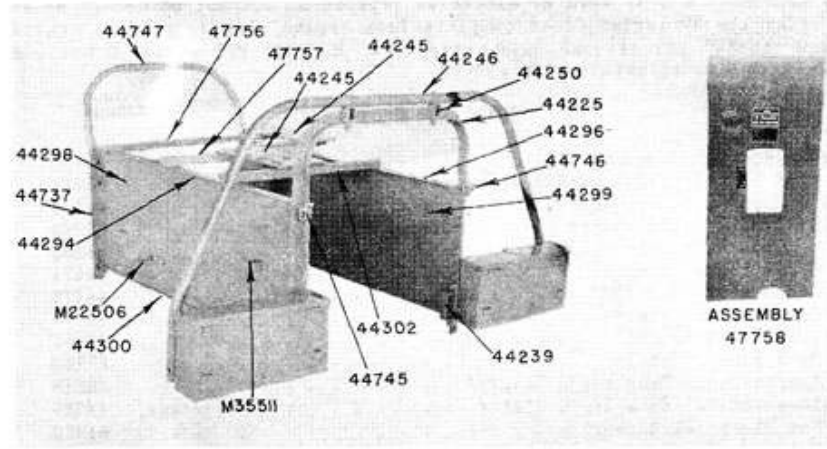
For cars that are in need of extensive repairs on account of damage or wear we offer the M9 series G car complete less engine, engine pulley, starting crank, tools, air cleaner, and batteries. Specify MF9 series G motor car frame complete to obtain this group.

FRAME AND DECK

FRAME AND DECK (assembled)	47750	1
SIDE SILL (right - with plates, nuts, & clips on page 37)	45244	1
Side Sill only (right)	44281	1
SIDE SILL (left - with plates, nuts, & clips on page 37)	45245	1
Side Sill only (left)	44282	1
Cross Angle (front)	44274	1
Cross Angle (center)	44275	1
Cross Angle (rear)	44276	1
Deck Board (right)	47751	1
Deck Board (left)	47752	1
Longitudinal Deck Angle (right)	44279	1
Longitudinal Deck Angle (left)	44280	1
End Block (deck rear)	44288	2
Strap (end block)	44284	2
ENGINE SILL (right - assembled)	44285	1
ENGINE SILL (left - assembled)	44288	1
Base Strip (left or right)	44290	2
Bushing (engine sill)	M19044	4
Wheel Guard (left front & right rear)	M87170	2
Wheel Guard (left rear & right front)	M87169	2
Step Plate	M87168	2
Hex Nut 3/8" self-locking	F7121	
Hex Nut 5/16" self-locking	F7120	
Hex Nut 1/4" self-locking	F7119	
RAIL SKID (right - with plates 44267)	45242	1
Rail Skid only (right)	44270	1
RAIL SKID (left - with plates 44267)	45243	1
Rail Skid only (left)	44271	1
Gusset (rail skid to frame)	44272	4
Set Off Skid (right front)	46500	1
Set Off Skid (left front)	46501	1

ENGINE - MOUNTING

ENGINE Complete (battery ignition)	RO-C	1
Stud (engine base)	M17513	4
Spring (base stud)	QB-61C	4
Castle Nut 7/16" (base stud)	F8888	4



HOUSING - LIFT HANDLES		
EXTENSION LIFT HANDLE Complete	44805	2
Reinforcing Strip (bottom - steel)	M84860	2
Wood Screw No. 14 x 1 1/4" recessed head	F7242	86
Cap Screw (flat head)	F7226	4
Stop Nut	44260	4
Safety Rail (front)	44246	1
Saddle (front safety rail)	44250	2
HOUSING Only (less seat, lift handles & front safety rail)	47755	1
Post Holder (windshield - right)	44745	1
Post Holder (windshield - left)	44746	1
Safety Rail (rear)	44747	1
Support (front)	44225	1
Support Angle (right rear)	44737	1
Support Angle (left rear)	44739	1
TOP SIDE RAIL (right - with fastener springs)	44294	1
TOP SIDE RAIL (left - with fastener springs)	44296	1
Spring Unit (fastener)	F9042	4
Rivet (spring unit)	F9043	8
Side Board (right)	44298	1
Side Board (left)	44299	1
Bolting Strip	44300	2
Speed Nut 3/16"	F7787	18
Stove Bolt 3/16 x 1/2"	F1742	18
Gusset (right front)	44233	1
Gusset (left front)	44234	1
Gusset (right rear)	44235	1
Gusset (left rear)	44236	1
Guide (lift handle)	44239	4
Strap (guide)	44238	4
Spacer (guide)	44240	4
Clip (battery and tool boxes)	44237	4
Support Cleat (side seat)	47756	1
Support Cleat (lever guide rear)	47757	1
Support Cleat (lever guide front)	44302	1
Side Seat Board	44245	1
Angle Clip (rear lower)	44255	2
Lever Guide	46573	1
Speed Nut 3/16"	F7787	22
Stove Bolt 3/16 x 1/2"	F1730	22
Hex Nut 1/2" self-locking	F7119	
Hex Nut 5/16" self-locking	F7120	
Hex Nut 3/8" self-locking	F7121	
REMOVABLE SEAT BOARD (assembled)	47758	1
Angle Clip	44749	3
Spacer Washer	M30839	4
Fastener Stud (less cross pin)	F9045	4
Grommet (fastener stud)	F9044	4
Cross Pin (fastener stud)	F9046	4
Holder (with loop - starting crank)	M35511	1
Holder (plain - starting crank)	M22506	1
Instruction Plate	F3011	1
Name Plate	F7244	1
Safety First Plate	F3132	1
Timer Lever Indicating Plate	F7979	1
Identification Plate (belt)	41362	1

ACCESSORIES

The following standard accessories may be applied to M9 series G cars. When ordering for field installations, be sure to give factory car and engine serial numbers. Also shown are some tools that will simplify maintenance work.

WIDE WINDOW WINDSHIELD 44711

Adequate bad weather protection. Deflects wind away from operator. Windows allow full vision; easily applied in field.

- Curtain (with windows) 44957
- Window (specify 9 x 12") F4899
- Window (specify 9 x 20") F4899
- Top Cross Bar M31681
- Top Socket M16415
- Vertical Post 44958
- Bottom Cross Bar M30510

WIDE PLAIN WINDSHIELD 44713

Full width of car, protects riders at minimum cost. Easily applied in field. Strong materials, withstands wintry gales. Same as above except no windows.

- Curtain 44959
- Top Cross Bar M31681
- Top Socket M16415
- Vertical Post 44960
- Bottom Cross Bar M30510

AUTOMOTIVE MUFFLER 44731

This muffler makes the engine exceptionally quiet, very little reduction in horse power. Can be applied at factory or in the field.

- Exhaust Elbow M26777A
- Flex. Tubing - 19" F7762
- Muffler only F6625
- Bracket M36583
- U-Bolt M22862
- Sleeve M32070
- Tail Pipe M32380

BLADE TYPE AXLE PULLEY M35242

Replaces standard drive axle pulley, for use particularly where deep snow and tall weeds are prevalent. Construction is such as to give a positive grip with the belt, yet in no way shorten belt life.

- Blade Axle Pulley 40252
- Pulley Hub 39772
- Cap Screw 5/16 x 3/4 F8410

NARROW WINDOW WINDSHIELD 44715

This windshield soon pays for itself by reason of keeping men alert and on the job.

- Curtain (with window) 44961
- Window (specify 9 x 20") F4899
- Top Cross Bar 44962
- Top Socket M16415
- Vertical Post 44958
- Bottom Cross Bar M30510

NARROW PLAIN WINDSHIELD 44717

Same as above except the curtain does not have a window opening. Low cost protection. Easily applied in the field. Strong materials throughout.

- Curtain 44963
- Top Cross Bar 44962
- Top Socket M16415
- Vertical Post 44960
- Bottom Cross Bar M30512

ADJUSTABLE WINDGUARD 44719

Waterproof fabric front and side sections supported on a metal frame. Top section is adjustable and may be raised or lowered to suit operator's height. The side sections give the operator's legs and lower body exceptionally good protection, especially against side winds.

- Curtain only 44965
- Cross Angle 44968
- Side Pipe - R. 44972
- Side Pipe - L. 44974
- Side Rod - diagonal M31981
- Side Rod - horizontal M31980
- Tie Rod M31978
- Side Rod - vertical M31979
- Adjusting Link M31982

DRY CELL HEADLIGHT 48200

Cast aluminum case, uses two dry cell batteries. Supplied complete with mounting bracket.

RAIL SWEEPS 45468 PADDLE TYPE

Heavy duty type, hinged. All parts are steel except blade proper. Adjustable for rail clearance. Gives full protection due to blade width. Long lived. Blade easily renewed.

Angle Bracket - R.	45869
Angle Bracket - L.	45870
Arm & Support - R.	45863
Arm & Support - L.	45867
Blade only	M23956
Clamp Strip	M23957
Hinge Bolt	45879
Spring	QB-61C
Spring Seat	M30435A

HAND GONG - 10 INCH 44724

Loud, durable warning signal. Mounted away from tools. Operated by pull wire.

Gong only - 10"	1337
Pull Wire	M27209
Support Strap	M34981
Reinforcing Strip	44347

HAND GONG - 6 INCH 44722

Meets minimum requirements. Safe mounting.

Gong only - 6"	F3444
Support	45001
Pull Wire	M17341
Reinforcing Strip	45002

FOOT GONG - 8 INCH M11504

Loud warning signal operated by foot, leaves both hands free. Mounted out of way of tools, etc.

Gong only - 8"	F3626
Mounting Board	M25628

SIDE SEATS

Side seat support angles are not listed, symbol is for the side seat only.

Side Seat - Spring Seat - Stationary Back - Right or Left	F8608
Side Seat - Spring Seat - Folding Back - Right or Left	F8422

CANVAS COVER M8763

Cars that are kept out-of-doors need this protection. 12 oz. Duck, 6 x 9 feet. Eyelets for tying.

RAIL SWEEPS 45470 HOSE TYPE

Late air hose type. Hinged to clear rail when car is set on or off the track. A good serviceable sweep for all conditions.

Support Angle (right)	45863
Support Angle (left)	45867
Angle Clip (right)	45869
Angle Clip (left)	49870
Support Strap (right)	45881
Support Strap (left)	45883
Filler Block (hose)	M23345
Bolt (hinge)	45879
Spring (hinge)	QB-61C
Seat (spring)	M30435A

GENERATOR OUTFIT

The generator, generator mounting, head and tail light parts for light groups 47214, 47215 and 47216 are listed in the generator bulletin. Following are special parts used on these groups:

Support Angle Front (battery)	45125
Support Angle Rear (battery)	45127
Spacer	45126
Battery Support	45128
Clamp Angle (battery)	45129
Clamp Strap (battery)	37866

AIR CLEANER M36340

Oil bath type for group 1 and later cars. Includes filter unit complete with shell ready to be fitted on mounting bracket in place of open screen type of cleaner standard on these cars.

AIR CLEANER ASSEMBLY	F7658
Wing Nut only	F8037
Stem (threaded)	F8090
Name Plate (washer)	F8039

ELECTRIC HORN 47820

Horn only	F9284
Button	F6311

SEAT CUSHION F7359

Fits driver's cross seat, can be strapped on any corner. Sponge rubber, covered with heavy, water proof duck.

CAB TOP 47213

Shields operator and passengers from sun, wind, rain, cold. Safety glass windows mounted in rubber. Flap covered screened openings for ventilation.

Axle Bearing Spring (heavy)	M88650
Top Side Rail (right)	47788
Top Side Rail (left)	47792
Side Frame Support (right)	43769
Side Frame Support (left)	43770
Cab Support (right)	45092
Cab Support (left)	45093
CAB ASSEMBLED	47800
Side Frame - R.	46808
Side Frame - L.	46809
Front End Frame	47801
Corner Tie Casting	M33644A
Roof Unit	46819
Rear Post - R.	46830
Rear Post - L.	46832
Windshield Frame	46835
Windshield Frame Tie	46838
Glazing Strip - Vertical	M38722A
Glazing Strip - Cross	M33723A
Side Glazing Strip - Vt.	M38727
Side Glazing Strip - Vt. with lift dot fast.	M83725
Side Glazing Strip-Cross	M33728
Ventilator Flap	M83981
Window Front 22" x 26"	F8405
Window Side 8" x 20"	F8406
Glazing Rubber-Spec. Lng.	F7416
Speed Nuts 3/16"	F7787
Common Sense Fastener	F6749
Hex Nut #10-32	F3678
Lock Washer	F1692
Safety Rail - Rear	45116
Rear Brace	41554
Removable Housing Seat	45118
Battery Box	M23809
Tool Box	M24615

SIDE AND REAR CURTAINS

SIDE CURTAINS R AND L	44726
Slide Rod	43765
Side Curtain - R.	43766
Side Curtain - L.	43767
REAR CURTAIN WITH WINDOW	46606
Glass 8" x 18"	F7859
Glass 8" x 16"	F9240
Glazing Strip - Horizontal	45697
Glazing Strip - Horizontal	45698
Glazing Strip - Vertical	45699
Rear Curtain	46735
Curtain Strip	45702
Lift Dot Fasteners	F7799
Bottom Bar	M30088

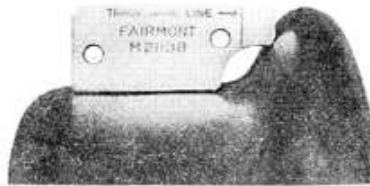
FLANGE BRAKES M36965

Brake Shaft Arm - Right	M82786
Brake Shaft Arm - Left	M82786
Toggle Arm Link	M82737
Pivot Stud	M82789
BRAKE SHOE COMPLETE	M82741
Brake Shoe only	M82742
Liner	M82743
Stud 5/16" x 1-7/8"	M82744
Stud 5/16" x 2-1/8"	M82745
Yoke	M82746
Rod End	M82752
Hex Half Nut 3/8"	F1040
TOGGLE ARM R.F. & L.R.	M82747
Toggle Arm End	M82748
Nut	M82749
TOGGLE ARM R.R. & L.F.	M82750
Toggle Arm End	M82751
Nut	M82749
Pin (brake shoe)	M82753
Spring	M83094

RUBBER CUSHION WHEELS

Rubber cushion wheels require a flange type brake, which has a grooved brake shoe liner that fits and bears against the wheel flange. Flange brake parts are listed above.

14" RUBBER CUSHION WHEEL WITH	
HUB - taper bore	M82731D
Hub only - taper bore	M19846
14" RUBBER CUSHION WHEEL	M82437
Flange and spoke disc	M82488
14" Rubber Tired Tread	M82439
Tread Bolt	M82446
Hex Nut 3/8"	F5467
Lock Washer 3/8"	F1025
BOLT SET (6 each, bolt, nut & lock washer)	M19852
Bolt 1/2"	M19853
Hex Nut 1/2"	F1864
Lock Washer 1/2"	F1075



TAPER HAND REAMER

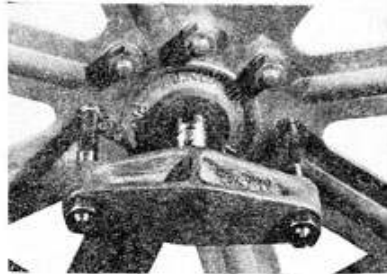
Wheel reamers save time and provide an accurate means of bringing wheel and axle assemblies to gauge, and in removing burrs, paint, or rust from the bores. Listed at the right under the illustration are four reamers with the axle size each is to be used with. Check axle size before ordering.

POCKET WHEEL GAUGE M21138

This gauge provides a dependable method of checking motor car and trailer wheel gauges. Locate line of one wheel, hold tape or other accurate measure in position, then shift gauge to other wheel.



- Reamer (1-3/16 axle) M7666
- Reamer (1-5/16 axle) M34728
- Reamer (1-7/16 axle) M7667
- Reamer (1-11/16 axle) M7668



AMMETER F7838

WHEEL PULLER M19888

Very effective, yet light weight and easy to use, this puller makes it a simple matter to remove demountable wheels or hubs with complete safety. Consists of a cross bar and two long bolts with nuts and washers. Draw nuts evenly, and when tight a hammer blow on center of cross bar frees the wheel.

Low reading ammeter is desirable when checking ignition systems to determine coil draw. Scale reads from 0 to 3 amps.

AMMETER 1230

Used to check condition of dry cell batteries. Good ignition means easy starting.



F7838



1230

PARTS USED ON SPECIAL CARS ONLY

Listed on this and following pages, in numerical order according to car designation, are spare parts used only on cars with figures in the space on the name plate marked "Special."

The symbols at left side of page are for standard car parts as listed on pages 24 through 45, and symbols for corresponding parts as used on the special cars are shown at the right-hand side of page. When selecting material for special cars, first locate items in standard parts section pages 24 through 45 and note symbol number. Then under the part of this section covering the car for which parts are being ordered, determine whether or not the symbol is changed for such cars. Items for which there are no corresponding parts in the standard parts section are shown as additional items under the car designation to which they apply.

M9-G-1-1

45242	Rail Skid - Right	Should read	45830
45243	Rail Skid - Left	" "	45829
Add:	2 Spacer (rail skid - front)		M13312
	2 Spacer (rail skid - rear)		46846
	1 Front End Pipe Skid		44755

M9-G-1-2

M16420	Starting Crank	Should read-one way . . .	M35519
F7979	Instruction Plate	Omit	
Add:	1 Instruction Plate - Start		M35802
	1 Instruction Plate - Run		M35803

M9-G-1-3

44274	Cross Angle - front	Should read	45584
44276	Cross Angle - rear	" "	45585
44225	Support Frame - front	" "	45586
M6001	Insulating Washer	Omit	
Add:	1 Steel Washer		F1615
	2 Corner Lift Handles - Front		45863
	2 Corner Lift Handles - rear		45860
	1 Support Angle - right (fusee box)		45587
	1 Support Angle - left (fusee box)		45588
	1 Fusee Box		F4715

M9-G-1-4

M16420	Starting Crank	Should read-Starting Wheel .	M25620
M22506	Holder (starting crank)	Omit	
M35511	Retainer (starting crank)	Omit	
44289	Guide (lift handle)	Should read	44348
44299	Side Panel - left	" "	45857
44305	EXTENSION LIFT HANDLE	Omit	
M34860	Reinforcing Strip	Omit	
F7242	Wood Screw	Omit	
F7226	Cap Screw	Omit	
44260	Stop Nut	Omit	
44287	Clip (battery box)	Omit	
46573	Lever Guide	Should read	M34831
47763	Throttle Control Rod	" "	47764
47762	Timer Control Rod	" "	47765
44261	Tool Box	" "	M23826
M18049	Spacer (tool box)	" "	M37006
Add:	1 Deck End Block		45858
	1 Strap (deck end block)		45854
	1 Holder (starting wheel)		45855
	2 Lock Chain (lift handle)		44351

OIL—WATER—FUEL

Satisfactory performance of a motor car depends to a great extent on these three essentials. A FAIRMONT motor car or engine of the two-cycle type must never be run without water in the water jacket and lubricating oil thoroughly mixed with the gasoline.

OIL is of vital importance in protecting a motor car and engine against rapid wear. The proper amount and grade of oil must be mixed in the fuel, and bearings and other moving parts must be lubricated regularly.

Some oils are unsatisfactory for use in FAIRMONT engines. SAE 30 (medium bodied) gas engine or automobile oil of good quality gives good results all year 'round in nearly any climate. We do not recommend using oil heavier than SAE 40. Don't use poor oil or reduce the proportions recommended.

WATER in the jacket should be kept at the correct level to insure proper engine cooling. The jacket will not be damaged by freezing of the water if cooling system instructions in car and engine bulletins are carefully followed. The simple FAIRMONT cooling system keeps the engine at the most efficient temperature, which insures economical operation.

FUEL can be any standard grade of gasoline. It must be mixed with the correct amount of oil to properly lubricate and operate the FAIRMONT two-cycle engine.

Fairmont

Inspection Motor Cars

Section Motor Cars

B & B and Extra Gang Cars

Push Cars and Trailers

Motor Car Engines

Roller Axle Bearings

Wheels and Axles

Weed Mowers

Ballast Drainage Cars

Weed Burners

Extinguisher Cars

Derrick Cars

Oil Spray Cars

Track Equipment