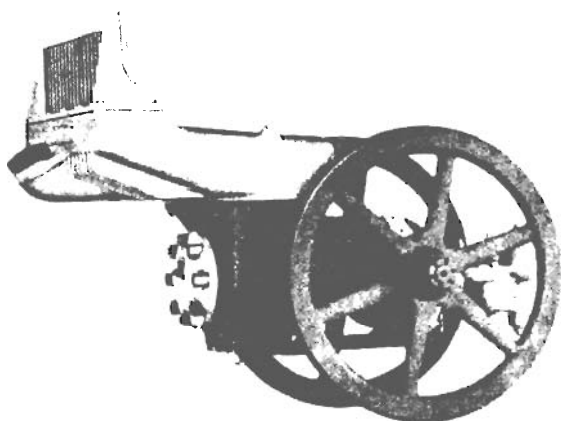


# SERVICE INSTRUCTIONS AND PARTS LIST

## *Fairmont*

### RO - C

#### 9 HP



This bulletin contains instructions for the operation and care of RO-C roller bearing engines, and lists spare parts for them. Before starting engine read pages 2 thru 4.

Before ordering spare parts read page 9.

Parts used on special engines are listed on pages 14 and higher.

Also see the following:

CARBURETOR - Instructions and parts for C5 - Bulletin 461.

TIMER - Instructions and parts for ADJUSTABLE WEATHERSEALD - Bulletin 646.  
Instructions and parts for WEATHERSEALD - Bulletin 548.

MAGNETO - Instructions and parts for magneto and drive - Bulletin 559.

## FAIRMONT RAILWAY MOTORS, Inc.

### FAIRMONT, MINNESOTA, U. S. A.

#### DISTRICT SALES OFFICES

Chicago    Philadelphia    Washington, D. C.    St. Louis    St. Paul

IN CANADA: Fairmont Railway Motors, Ltd., Toronto, Ont.

**PREPARING  
FOR SERVICE**

Inspect everything for possible damage in transit. If in bad condition make a full report to supervising official at once. Connect wires as per diagram in timer bulletin for battery ignition engines. On magneto engines connect magneto wire to spark plug.

Remove filler cap from water hopper and pour in clean water up to level of the filler neck. About six quarts are required. A small carton of rust preventative is included in the packing box with each new unit and it is recommended this be regularly used, *except do not use with permanent anti-freeze mixtures.*

Remove gas tank filler cap 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 carburetor has an adjustable needle valve and a choke. Controls for the timer and throttle depend on the installation.

**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 1/2 pint of oil for each gallon of gasoline (1 part oil and 16 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 RECOM-  
MENDATIONS**

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.

**STARTING  
BATTERY  
IGNITION  
ENGINES**

The engine will run either forward or backward, but the timer control lever must be set differently for starting and operating in each direction. The engines in two-speed gear cars run opposite to those in direct belt drive cars when propelling the car in the same direction.

**STARTING  
ENGINE  
FORWARD**

Forward is with top of flywheels running clockwise or toward water hopper. Retard the spark. Where timer control lever is mounted on car seat, retard spark by moving lever *away from* water hopper. On engines with lever attached directly to timer casting, move lever *toward* water hopper.

**TO TEST  
IGNITION**

Close switch and slowly crank the 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. Finally open switch.

**TO PRIME  
ENGINE**

See that shutoff valve at gas tank is open and fuel flows to carburetor. Partly open the throttle. Open carburetor needle valve 1 1/2 to 2 turns from the closed position by turning needle valve to the left.

Be sure ignition switch is open, then spin the engine several times with the crank while pulling up on choke. 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, be sure spark is retarded, close switch, 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 to opposite position 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 1 to 1 1/4 turns 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**

Backward is with top of flywheels running anti-clockwise or away from water hopper. Retard the spark. Where timer lever is mounted on car seat, move lever *toward* water hopper. On engines with lever attached directly to timer casting, move lever *away from* water hopper.

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 to opposite position to advance the spark, and after warming up set needle valve to proper running position.

**TO STOP  
ENGINE**

Open the switch. Just before engine stops turning open throttle to fill the engine with fresh gas and make starting easier.

**REVERSING  
BATTERY  
IGNITION  
ENGINES**

To reverse a battery engine when running, without using starting crank the belt must be free. Open ignition switch and leave timer advanced. Open throttle, and just before flywheels stop turning, close switch and engine will kick back and run in the opposite direction. Then reset timer lever.

**STARTING  
MAGNETO  
ENGINES**

Consult magneto bulletin for instructions on starting and operating magneto engines. These engines are primed and cranked the same as battery engines, but the setting of magneto is different. The magneto control arm should be in the off or mid position, or on engines so equipped the switch should be in the "off" position when priming. Do not spin engine when magneto is turned on, crank with upward pulls only. Magneto engines cannot be reversed without cranking.

**LUBRICATION**

The same grade of oil that is mixed in the gasoline is satisfactory for general lubrication of the unit. Always mix 3/4 pint of oil with each gallon of gasoline. This mixture lubricates all internal moving parts of the engine.

**COOLING  
SYSTEM**

Use clean soft water in the cooling system if available. It is recommended that the rust preventative furnished be regularly used, *except do not use with a permanent anti-freeze*. Keep water up to the level of 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 hopper, 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 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.

**HOW ENGINE OPERATES**

As the piston passes over the exhaust and intake ports and moves toward the cylinder head, it 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.

When the piston nears the end of this "power stroke", 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 when working on the engine or not using the unit.

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.

**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 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 18mm size.

**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 1 and 1 1/4 turns 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.

**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 carburetor, 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 10). 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. 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, 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 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.

Factory Engine No. \_\_\_\_\_ H. P. \_\_\_\_\_ Type \_\_\_\_\_

Group \_\_\_\_\_ Special \_\_\_\_\_

**TO INSURE PROMPT AND CORRECT SHIPMENT** of parts always give:

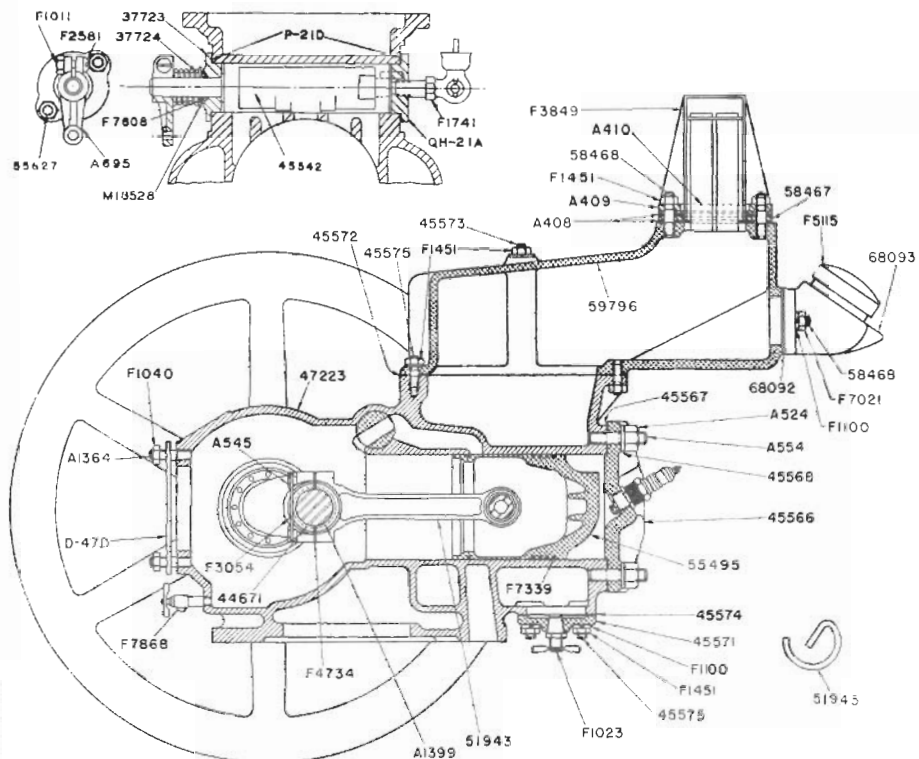
- (1) Quantity of each part wanted.
- (2) Symbol number of part as shown in this book.
- (3) Description of part as shown in this book.
- (4) Factory serial numbers recorded above.
- (5) Car gauge if other than 56 $\frac{1}{2}$ " standard.
- (6) State whether shipment is to be by mail, express, or freight.

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. Items printed in capitals are assemblies which include all parts listed immediately following and indented to the right. Always order assemblies to save work of fitting separate parts.

### WEIGHT AND NUMERICAL PART INDEX

Symbol	Weight (Approx)	Page	Symbol	Weight	Page	Symbol	Weight	Page
L-1B.....	5 oz.....	13	F1451.....	4 oz.....	10	45547.....	4 oz.....	13
QB-12.....	2 oz.....	13	F1741.....	2 oz.....	11	45548.....	9 oz.....	13
U-15E.....	4 oz.....	13	F1903.....	4 oz.....	11	45550.....	6 oz.....	13
QH-21A.....	3 oz.....	11	F2551.....	4 oz.....	13	45551.....	6 oz.....	13
P-21D.....	4 oz.....	11	F2581.....	4 oz.....	11	45553.....	12 oz.....	13
D-47D.....	1 oz.....	11	F2931.....	4 oz.....	13	45564.....	20 lb.....	13
D-48A.....	3 oz.....	13	F3006.....	4 oz.....	11	45565.....	20 $\frac{1}{2}$ lb.....	13
A-406.....	1 oz.....	11	F3032.....	1 oz.....	13	45566.....	1 $\frac{1}{2}$ lb.....	11
A-408.....	4 oz.....	11	F3054.....	4 oz. ft.	10	45567.....	1 $\frac{1}{2}$ oz.....	11
A-409.....	7 oz.....	11	F3849.....	5 $\frac{1}{2}$ lb.....	11	45568.....	4 oz.....	11
A-410.....	3 oz.....	11	F4178.....	4 oz.....	13	45571.....	4 oz.....	11
A-524.....	1 $\frac{1}{2}$ oz.....	11	F4413.....	7 oz.....	13	45572.....	4 oz.....	11
A-544.....	4 oz.....	10	F4734.....	4 oz.....	10	45573.....	1 oz.....	11
A-545.....	1 oz.....	10	F5115.....	4 oz.....	11	45574.....	4 oz.....	11
A-554.....	1 oz.....	11	F7013.....	1 lb.....	13	45575.....	4 oz.....	11, 13
A-555.....	3 $\frac{1}{2}$ lb.....	13	F7339.....	4 oz.....	10	47222.....	41 lb.....	11
A-692.....	3 $\frac{1}{2}$ lb.....	13	F7455.....	2 oz.....	11	47223.....	37 lb.....	11
A-695.....	2 oz.....	11	F7608.....	4 oz.....	11	47226.....	12 $\frac{1}{2}$ lb.....	13
A-696.....	5 lb.....	13	F7614.....	4 oz.....	11	47227.....	2 lb.....	13
F1000.....	4 oz.....	13	F7792.....	1 $\frac{1}{2}$ lb.....	13	47228.....	7 $\frac{1}{2}$ oz.....	11
F1011.....	4 oz.....	11	F7868.....	1 oz.....	11	51937.....	3 $\frac{1}{2}$ lb.....	10
F1023.....	5 oz.....	11	M12024.....	4 oz.....	11	51943.....	1 lb.....	10
A1025.....	8 lb.....	13	M17647.....	6 oz. 11, 13		51944.....	2 oz.....	10
F1033.....	4 oz.....	11	M18528.....	4 oz.....	11	51945.....	4 oz.....	10
F1040.....	4 oz.....	11	M36400.....	10 $\frac{1}{2}$ oz.....	13	55494.....	2 $\frac{1}{2}$ lb.....	10
F1048.....	4 oz.....	13	37723.....	4 oz.....	11	55495.....	2 $\frac{1}{2}$ lb.....	10
F1100.....	4 oz.....	13	37724.....	1 oz.....	11	55627.....	4 oz.....	11
F1125.....	4 oz.....	13	41039.....	9 oz.....	11	58467.....	1 $\frac{1}{2}$ lb.....	11
A1318.....	3 lb.....	11	44671.....	1 oz.....	10	58468.....	4 oz.....	11
A1364.....	6 oz. 11, 13		45542.....	5 oz.....	11	59793.....	21 lb.....	11
A1399.....	1 oz.....	10	45548.....	7 oz.....	13	59796.....	14 $\frac{1}{2}$ lb.....	11
			45544.....	8 oz.....	13			
			45545.....	3 $\frac{1}{2}$ lb.....	13			



**PISTONS AND CONNECTING RODS**

NOTE--Standard engines numbered 84025 and higher have aluminum pistons and aluminum rods with 1-1/16" (1.0625) piston pins. Items marked with an asterisk (\*) fit all pistons and rods listed on this page.

PISTON, RINGS AND CONNECTING ROD (assem. - replaces 42269) . . . . .	51937	1
PISTON, RINGS, PISTON PIN & LOCK RINGS (aluminum) . . . . .	55495	1
PISTON WITH PISTON PIN & LOCK RINGS (aluminum) . . . . .	55494	1
Lock Ring (1-1/16" piston pin) . . . . .	51945	2
* Piston Ring . . . . .	F7339	5
CONNECTING ROD COMPLETE (aluminum for 1-1/16" pin) . . . . .	51943	1
Bushing (1-1/16" piston pin end - aluminum rod) . . . . .	51944	1
Cap Screw (cap - aluminum rod) . . . . .	A545	2
Washer (cap screw - aluminum rod) . . . . .	A544	2
* Shim (cap) . . . . .	F4734	2
* Bearing Half (for rod - do not file) . . . . .	A1399	1
* Bearing Half (for cap - do not file) . . . . .	44671	1
* Lock Wire (cap screws) . . . . .	F3054	7

Engines below number 84025 had 7/8" (.8750) piston pins, parts listed below.

PISTON, RINGS, PISTON PIN & LOCK RINGS (aluminum - 7/8" pin) . . . . .	A1110	1
PISTON WITH PISTON PIN & LOCK RINGS (aluminum - 7/8" pin) . . . . .	A1111	1
Lock Ring (7/8" piston pin) . . . . .	A547	2
CONNECTING ROD COMPLETE (aluminum for 7/8" pin) . . . . .	A1894	1
Bushing (7/8" piston pin end - aluminum rod) . . . . .	51860	1
Bushing (7/8" piston pin end - steel rod only) . . . . .	44126	1
Cap Screw (cap - steel rod only) . . . . .	A1893	2

## CYLINDER AND CRANKCASE

CYLINDER AND CRANKCASE WITH STUDS, THROTTLE VALVE AND COVER.	47222	
Throttle Valve . . . . .	45542	
Guide (throttle valve) . . . . .	37723	
Cover (throttle valve - with stop) . . . . .	QH-21A	
Gasket (throttle guide and cover) . . . . .	P-21D	
Packing (throttle stem) . . . . .	F7608	
Washer (packing pressure) . . . . .	M18528	
Spring (packing pressure) . . . . .	37724	
THROTTLE ARM, SCREW AND NUT . . . . .	A695	
Screw (throttle valve arm) . . . . .	F2581	
Nut (throttle valve arm screw) . . . . .	F1011	
CYLINDER AND CRANKCASE WITH STUDS AND COVER . . . . .	47223	
Stud (side bearing and carburetor - 1-3/8") . . . . .	A1364	
Stud (side bearing - 1-11/16") . . . . .	M17647	
Stud (cylinder head) . . . . .	A554	
Stud 5/16 x 5-1/4" (water hopper) . . . . .	45573	
Stud 5/16 x 1-5/16" (water hopper) . . . . .	45575	
Stud 1/4 x 7/8" (throttle guide & cover) . . . . .	55627	
Cover (water jacket bottom) . . . . .	45571	
Gasket (cover) . . . . .	45574	
Stud 5/16 x 1-5/16" (cover) . . . . .	45575	
Hex Nut 5/16" (use F1100 L.W.) . . . . .	F7021	
Screw (throttle guide and cover) . . . . .	F1903	
Priming Cup . . . . .	F1741	
Drain Cock (crankcase) . . . . .	F7868	
Drain Cock (water jacket) . . . . .	F1023	
Cylinder Head (Ill. 45566) . . . . .	68201	
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

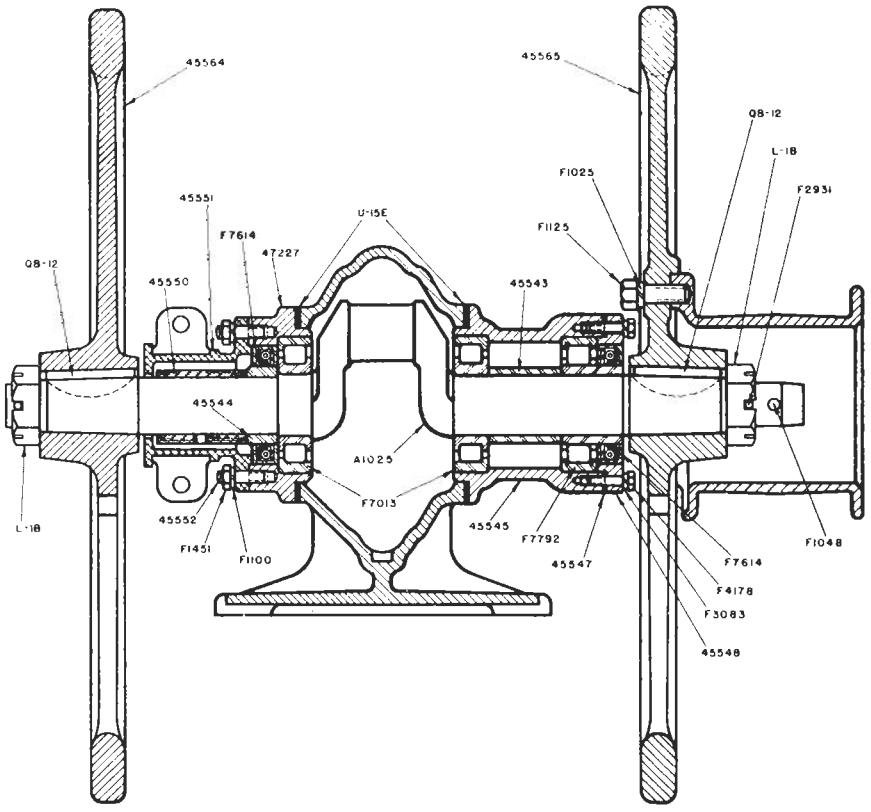
## WATER HOPPER - COOLING SYSTEM

Engines in group 3 cars have a stabilizer plate mounted between condenser and water hopper. Replacement WATER HOPPER WITH CONDENSER assembly will be furnished with plate for all groups.

WATER HOPPER WITH CONDENSER, STUDS, PLATE AND CAP . . . . .	59793	1
Stabilizer Plate (between condenser & water hopper) . . . . .	58467	1
Cooling Condenser . . . . .	F3849	1
WATER HOPPER WITH STUDS (cap included) . . . . .	59796	1
Stud 5/16 x 1-1/4" (water hopper) . . . . .	45575	6
Stud 5/16 x 5-1/4" (water hopper) . . . . .	45573	2
Stud 5/16 x 1-11/16" (condenser & filler neck) . . . . .	58468	16
Gasket (filler neck to hopper) . . . . .	68092	1
FILLER NECK (with cap) . . . . .	68093	1
FILLER CAP (with gasket) . . . . .	F5115	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
Hex Nut 5/16" (condenser to hopper studs) . . . . .	F7021	14
Gasket (hopper to cylinder) . . . . .	45572	1
Hex Nut 5/16" (hopper studs) (Ill. P145) . . . . .	F7021	8
Overflow Hose (not ill.) . . . . .	F3006	21"
Fiber Clip (overflow hose - not ill.) . . . . .	M12024	1
Rust Preventative . . . . .	41039	1

## 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.



## FLYWHEELS - CRANKSHAFT - SIDE BEARINGS

Flywheel (timer or magneto side)	45564	
Flywheel (belt side)	45565	
Key (flywheel)	QB-12	
Nut (flywheel)	L-1B	
Cover 5/32 x 1-1/2	F2931	
Pin (starting crank)	F1048	
<b>CRANKSHAFT WITH BEARINGS, SLEEVE AND OIL SEAL RACE</b>		
Crankshaft only	A1025	
Bearing with Races (inboard)	F7013	
Bearing with Races (outboard)	F7792	
Spacer (belt side)	45543	
Oil Seal Race (timer side)	45544	
Gasket (bearing casing)	U-15E	
Stud (bearing casing - 1-3/8")	A1364	
Stud (bearing casing - 1-11/16")	M17647	
Nut (bearing casing stud)	F7020	
<b>BEARING CASING WITH STUDS (timer side)</b>		
Stud 5/16" x 1-5/16"	45575	
Hex Nut 5/16" (use F1100 L.W.)	F7021	
Oil Seal (timer side)	F7614	
Support Casting (timer)	45551	
Bearing Casing (belt side)	45545	
<b>COVER WITH OIL SEAL (bearing casing, belt side)</b>		
Oil Seal only	F7614	A
Gasket (cover)	45547	1
Screw (cover - 1/4 x 7/8" - use F3083 L.W.)	F4178	4
Timer Cam	45550	1
Key (timer cam)	F2551	1
Set Screw (hollow head - engines below 88480)	F2447	1
<b>WEATHERSEALD TIMER Complete</b>		
TIMER CAM (with wiping block)	45550	1
Wiping Block	57318	1
Key (timer cam)	F2551	1
Wrench (set screw - engines below 88480)	F3032	1
Engine Pulley 4"	A555	1
Engine Pulley 3-1/2" (for M14 cars)	A692	1
Engine Pulley 5" (for MT14 cars)	A696	1
Cap Screw (pulley - use F1025 L.W.)	F1125	3
Wrench (spark plug)	M36400	1
Handle (spark plug wrench)	D-48A	1
Socket Wrench (connecting rod)	F4413	1

### 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. When ordering for engines with stabilizer plate, order one extra A408 condenser gasket.

## PARTS USED ON SPECIAL ENGINES ONLY

Listed on this and following pages are spare parts used only on engines with figures in the space on the name plate marked "Special". The symbols at left side of page are for standard engine parts and symbols for corresponding parts as used on the special engines are shown at the right-hand side of page. Items for which there are no corresponding parts in the standard parts section are shown as additional items.

## RO-C-2

51937	PISTON, RINGS, PIN AND CONN. ROD . . .	Should read . . .	42268
55495	PISTON, RINGS, PIN AND LOCK . . . . .	" " . . . . .	A1276
55494	PISTON PIN AND LOCK . . . . .	" " . . . . .	A1277
51945	Lock Ring - Omit		
45566	Cylinder Head . . . . .	" " . . . . .	54003
Add:	1 Set Screw . . . . .		A1279

## RO-C-3 (Magneto Ignition)

See bulletin 559 for magneto installation parts, magneto and magneto drive parts, also:

47226	CRANKSHAFT WITH BEARINGS - Omit
F7013	Bearing with Races (inboard) - Omit one
45544	Oil Seal Race - Omit
F7614	Oil Seal - Omit
47227	BEARING CASING - Omit
45551	Support Casting (timer) - Omit
45553	WEATHERSEALD TIMER - Omit
45550	Timer Cam - Omit
M17647	Stud (side bearing) - Omit

## RO-C-5

51937	PISTON, RINGS AND CONN. ROD . . . . .	Should read . . . . .	42268
55495	PISTON, RINGS, PIN AND LOCK . . . . .	" " . . . . .	A1276
55494	PISTON PIN AND LOCK . . . . .	" " . . . . .	A1277
51945	Lock Ring - Omit		
45571	Water Jacket Plate . . . . .	" " . . . . .	51130
Add:	1 Set Screw . . . . .		A1279

## RO-C-6

With generator mounting.

## RO-C-7

51937	PISTON, RINGS AND CONN. ROD - Omit		
55495	PISTON, RINGS, PIN AND LOCK RINGS . . . . .	Should read . . . . .	A1110
55494	PISTON WITH PIN AND LOCK RING . . . . .	" " . . . . .	A1111
51945	Lock Ring . . . . .	" " . . . . .	A547
51943	CONNECTING ROD . . . . .	" " . . . . .	A1394
51944	Bushing (piston pin end) . . . . .	" " . . . . .	51860
45571	Cover (water jacket bottom) . . . . .	" " . . . . .	51130

## RO-C-8

With generator mounting and generator.

## RO-C-9

58647	Stabilizer Plate (between cond. & hopper) - Omit
A408	Gasket - Omit one

## RO-C-10

58647	Stabilizer Plate assembled so anchor holes are offset to the front.
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## RO-C-II (Magneto Ignition)

See Bulletin 559 for magneto installation parts, magneto and magneto drive parts, also:

47226	CRANKSHAFT WITH BEARINGS - Omit
F7013	Bearing with Race (inboard) - Omit one
45544	Oil Seal Race - Omit
A1364	Stud (side bearing) - Omit one
M17647	Stud (side bearing) - Omit one
47227	BEARING CASING WITH STUDS - Omit
F7614	Oil Seal - Omit
45551	Support Casting (timer) - Omit
45553	WEATHERSEALD TIMER - Omit
45550	Timer Cam - Omit
58647	Stabilizer Plate - Omit
A408	Condenser Gasket - Omit one