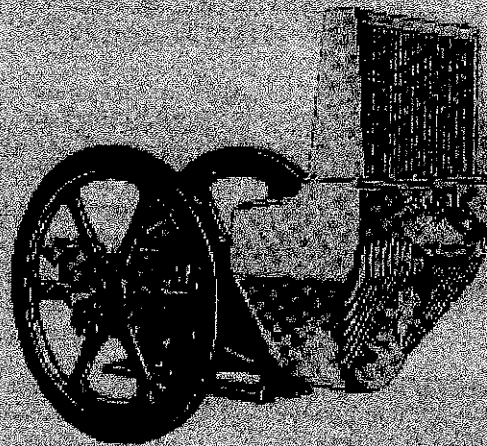


SERVICE INSTRUCTIONS AND PARTS LIST**Fairmont**

FOUR

RQ-D**8 TO 13 HP****Roller Bearing Engine**

This bulletin contains instructions for the operation and care of RQ-D roller bearing engines, and lists parts for them. Before starting engine read pages 2 through 12.

Before ordering repair parts read page 12.

FAIRMONT RAILWAY MOTORS

A DIVISION OF PULSON CORPORATION

FAIRMONT, MINNESOTA, U. S. A.**DISTRICT OFFICES**

Chicago

Philadelphia

St. Louis

St. Paul

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

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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 on page 5.

Remove filler cap from water jacket, open water level cock on right side, and pour in clean water up to this level. About thirteen quarts are required. A small can of rust preventative is included in the tool box with each new unit and it is recommended this be regularly used, except do not use with permanent type anti-freeze mixtures.

Remove gas tank filler cap at rear of ray 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 shut-off 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 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 1/4 pint of oil for each gallon of gasoline. 11 part oil and 11 parts gasoline by measure and stir the mixture thoroughly. Best results are obtained by using gasoline with a minimum lead content. 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

Non-detergent, straight mineral oils properly refined from either asphalt or paraffin base crudes furnish the best lubrication. They should not contain acids, alkalis, or impurities in injurious quantities. Detergent oils commonly sold for automotive use may cause excessive deposits of foreign matter on spark plugs and in combustion chamber and parts and should not be used.

In general the lower viscosity oils give cleaner results, easier starting, 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.

S. A. E. 30 oils of approximately the following viscosity characteristics are most satisfactory for year 'round use:

At 130° F. 185 to 255. At 210° F. 60 to 64.

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

At 130° F. 255 to 450. At 210° F. 62 to 75.

All refiners and oil companies can supply oils conforming to these specifications.

**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 jacket. Release idler lever, and set and lock the brake. Hook starting crank bearing to catch on right foot board. Then slide crank through bearing and over end of crankshaft.

**TO TEST
IGNITION**

Retard the spark by moving 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 6. 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 1-1/2 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 1 to 1-1/4 turns open for average conditions. 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 counter-clockwise or away from water jacket. Retard the spark by moving timer lever toward the front of car.

Follow the preceding instructions for testing ignition, setting throttle, priming, and starting, but crank the engine counter-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.

**TO STOP
ENGINE**

Open (push down) 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 (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.

LUBRICATION

The same grade of oil that is mixed in the gasoline is satisfactory for general lubrication of the car. 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 cooling system if available. Keep water up to level of water level cock. Capacity is approximately thirteen quarts. It is recommended that the rust preventative furnished be used regularly except do not use with a permanent anti-freeze. In service, steam 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 jacket, 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 "Terex" or "Prestone" make a satisfactory anti-freeze, providing the condenser is protected to prevent frost forming inside. Always use water to enish 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 and head after removing water jacket. The water jacket is held on the cylinder block by five studs with nuts and lockwashers, and a gasket prevents leakage. Water resistant packing is used around the cylinder head barrel, and tightening the packing washer nuts prevents leakage at this point.

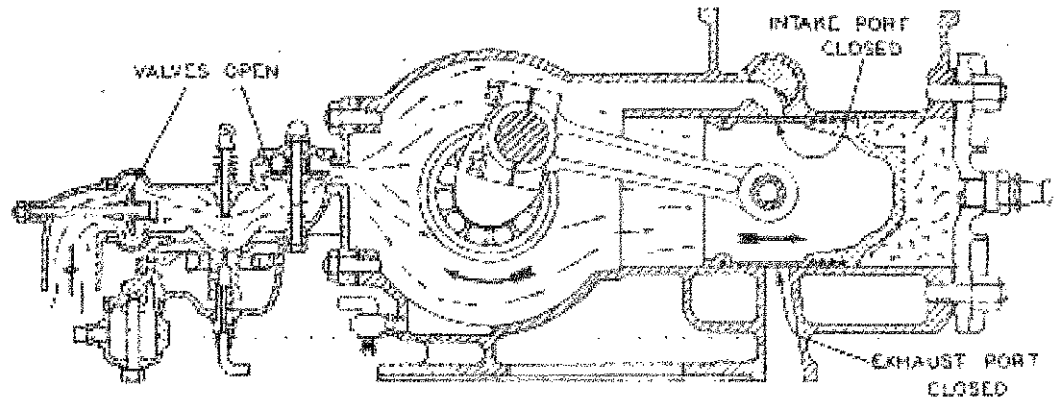
FUEL
SYSTEM

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 F3813 gas tank cap has an air vent to allow free flow of fuel to the carburetor. Never use F4116 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.

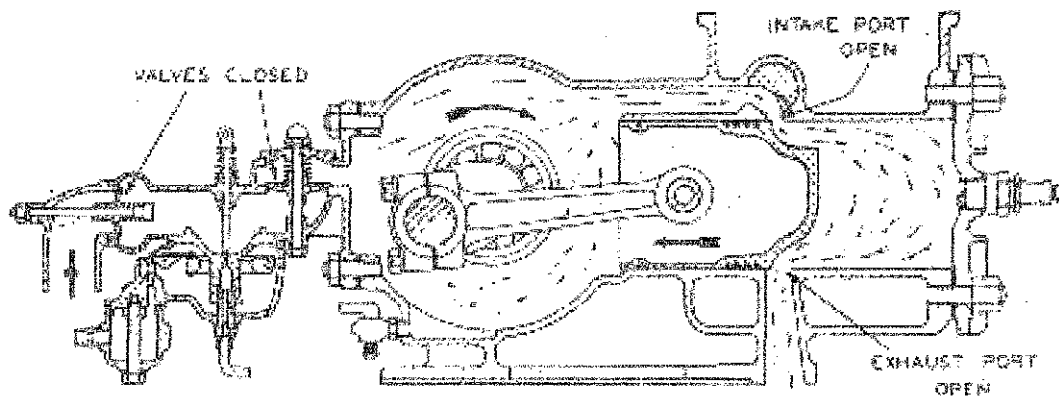
The carburetor strainer bowl should be taken off and cleaned at least once a month, oftener in winter. Be sure gaskets are in good condition when replacing bowl. This also applies to the strainer located below the fuel tank. Don't use heavy wrenches on fuel pipe couplings, float bowl, or strainer bowl.

HOW ENGINE OPERATES

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.

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
ADJUSTABLE
WEATHERSEALD**

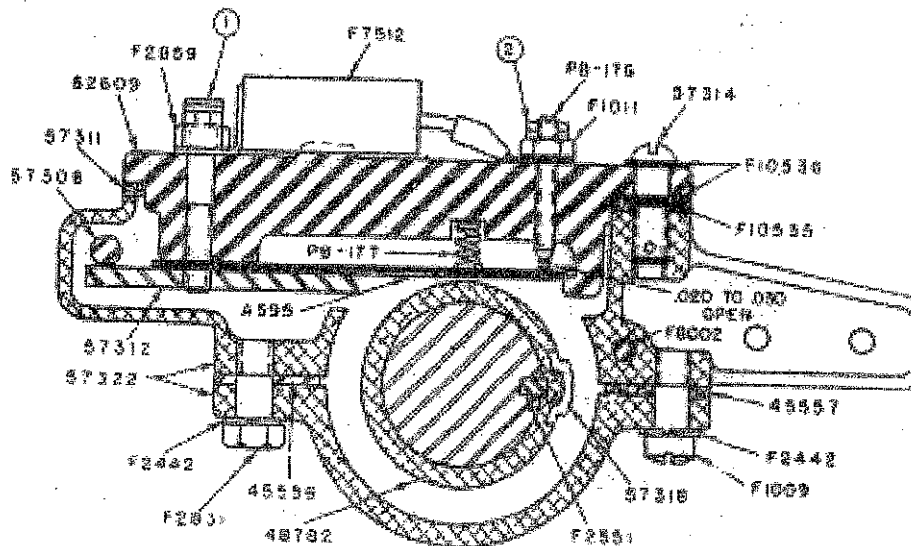
The Fairmont Adjustable Weatherseald Timer uses the standard A596 double leaf spring blade and has contact points enclosed in the mounting casting to prevent entrance of moisture, oil, and foreign matter. This timer is used on RQ-D battery ignition engines numbered 88480 and higher and is also applicable to earlier RQ-D units.

The interval during which the timer points close to produce the spark should be 30° to 35° , or about one tenth of a flywheel revolution. This measures $5-1/2$ " to 6" for RQ-D engines with 20" flywheels. To check this measurement, close switch and slowly turn flywheel until the contact points just close, causing coil to buzz. Mark flywheel rim in line with timer handle or some fixed object. Again turn flywheel in same direction until coil just stops buzzing and mark flywheel as before. If adjustment is necessary turn arc adjusting screw 57314 to right to increase the interval and to the left to decrease it. **CAUTION**--Do not attempt to adjust timer with engine running.

Best ignition is obtained with the contact points adjusted with $.020$ " to $.030$ " opening. Following is an easy way to set them. Remove timer body from mounting casting by releasing arc adjusting screw 57314. Loosen lock nut on point adjusting screw PB-176. Turn this screw down until the two points just touch, then back screw out a scant $1/2$ turn and tighten the lock nut. Check with a feeler gauge if one is available.

DO NOT ADJUST THE TIMER POINTS TO CHANGE THE LENGTH OF CONTACT--keep them set at $.020$ " to $.030$ " opening.

If the points burn or wear unevenly, dress them with a fine file, pocket stone, or fine emery cloth. Be sure they match and seat together evenly when adjusted. Keep timer connections clean and tight. The mounting casting should be adjusted



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 on 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 heat 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 leveled 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.

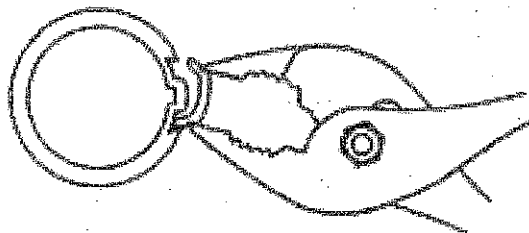
Clean gasket joints, remove timer support casing from side bearing casing, and oil bearings before reassembling. Replace crankshaft and bearings in crankcase, apply a new gasket, then start timer side casing with outer race on the rollers squarely and carefully tap to place. Be sure oil seal fits properly 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 bearings 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

closely on the support casting, yet be free to move when spark is "advanced" or "retarded".

To renew timer blade, remove body assembly from mounting casting, and loosen clamp screw P2859. Be careful not to lose PH-177 spring. Reassemble with new parts, making sure clamp block is clean to insure a good connection; also lined with blade and rounded end towards the points, and that the two contact points match and seat together evenly. Adjust points to .020" to .030" and reassemble on mounting casting; then adjust for proper contact interval as explained previously.

The nylon timer wiping block 57318 can be quickly and easily replaced as follows: Remove complete timer from support casting. Turn flywheel so timer wiping block is exposed through opening in support casting. With a pair of pliers opened wide grasp the wiping block as shown. Apply pressure on pliers, at the same time tilt pliers either up or down. This will release wiping block from one lip of cam sleeve and permit removal.

Use pliers to install new wiping block, placing one edge under sleeve lip, then apply just enough pressure to clear other lip of cam sleeve. The wiping block tends to straighten out, causing it to lock snugly in the cam sleeve. Center wiping block under timer blade and apply a thin coat of grease. Adjust points, reassemble timer on support casting, and reset contact interval.



The sponge rubber gasket 57311 seals the timer from water, snow and foreign matter. When applying a new gasket first clean timer body - then moisten adhesive side of gasket with gasoline and press into place.

Always check and readjust point opening, and length of contact interval, after making any repairs or removing timer parts from engine.

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 I and II 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.

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 3/8 to 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 - STEEL

The piston pin bushing is pressed into the connecting rod, and reamed for .001" to .002" clearance on the piston pin. The bronze backed babbitt bushing at the crankpin end wears slightly in service and needs occasional adjustment. A dull rattling sound in crankcase as engine slows down usually indicates a worn or loose connecting rod bearing.

To adjust a loose connecting rod, remove carburetor. Remove lock wire, both screws, cap and shims. Peel off 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 bronze cap. There should be but 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.

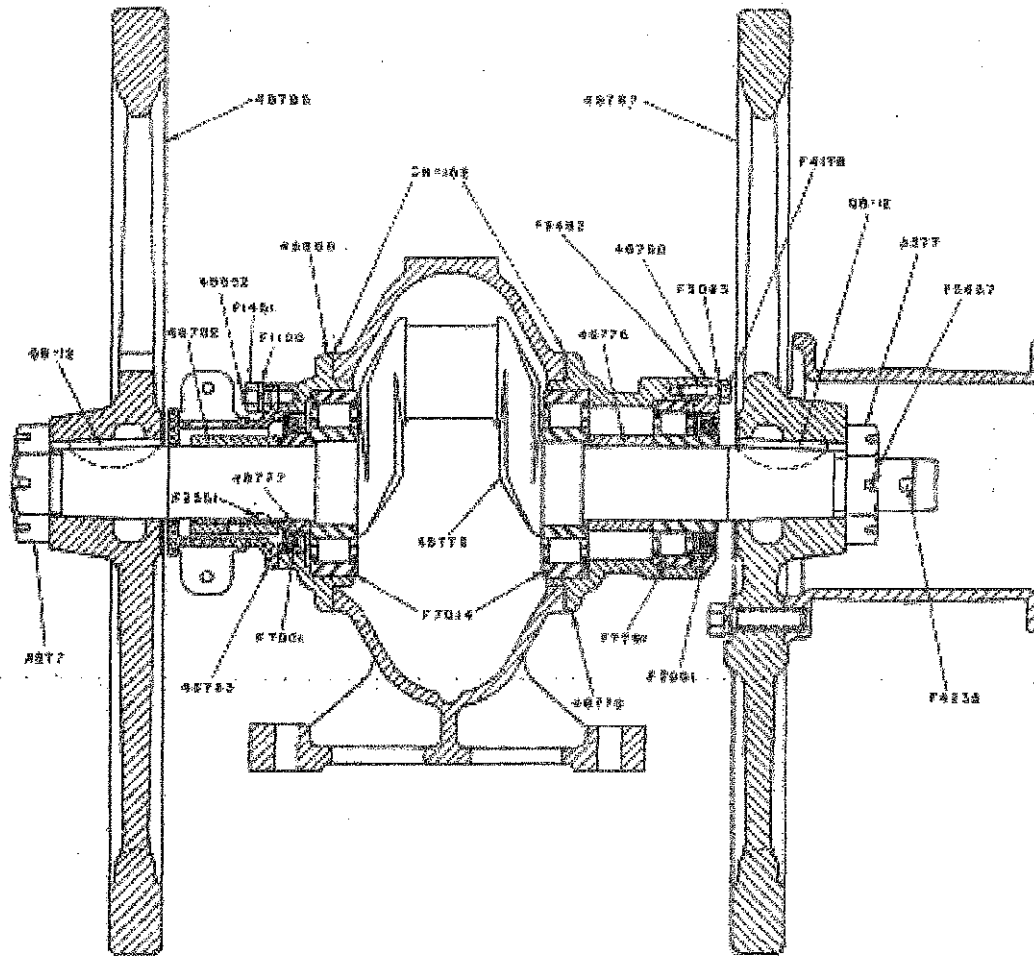
PISTON AND RINGS

The piston has a floating piston pin held in place by lock rings. Four piston rings prevent loss of compression. The three rings on the head end are doweled in place to prevent their turning, while the one on skirt end is free. When fitting new rings in cylinders, the end should have an opening of .016" to .026". Rings may be slipped on or off the piston by inserting thin strips of metal under them. When replacing piston in cylinder, have rings properly located on dowel pins.

To pull piston from cylinder, first remove carburetor, then disconnect connecting rod. Remove water jacket and take off 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 131). 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 tapered 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



The crankshaft and bearing assembly must have 1/64" to 1/16" 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, with opening for timer blade towards carburetor end of engine. 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 and belt side flywheel.

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 water jacket and 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 and water jacket 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:

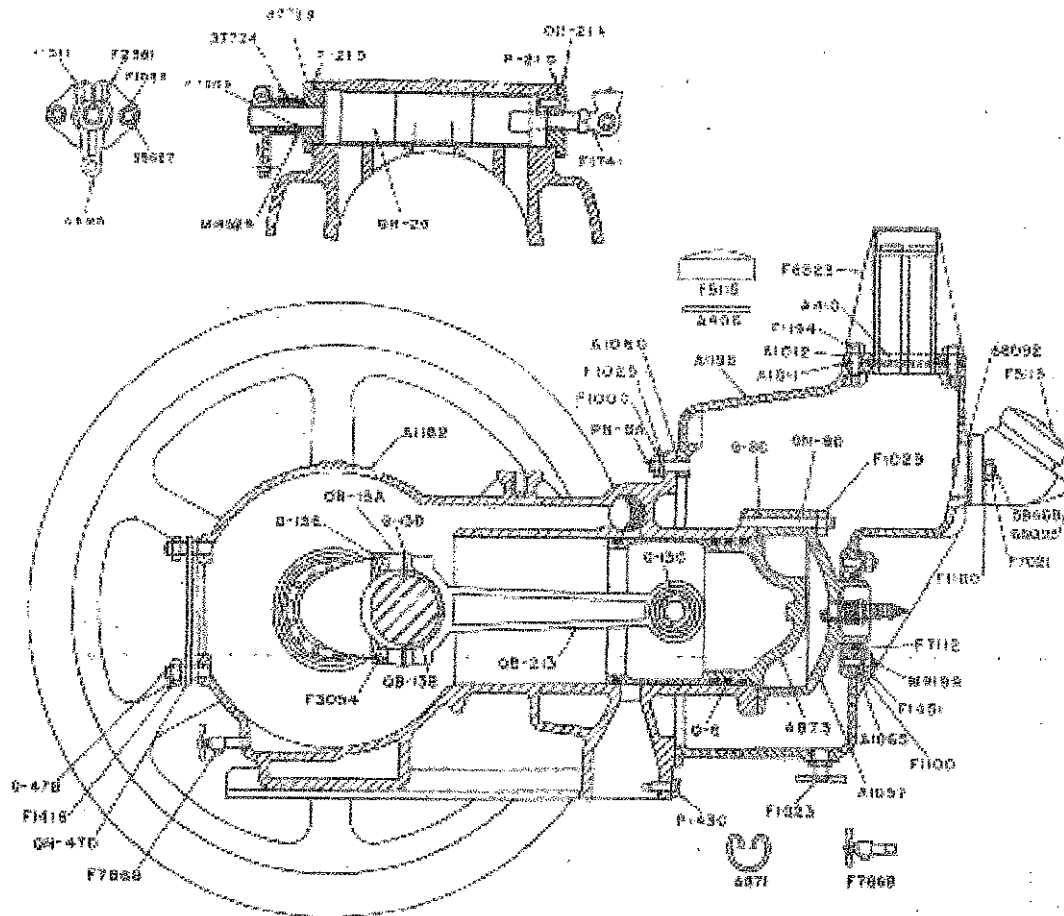
- (1) Quantity of each part wanted.
- (2) Symbol number of part as shown in this book.
- (3) Description of part as shown in this book.
- (4) Factory serial numbers recorded above.
- (5) Car gauge if other than 50th standard.
- (6) State whether shipment is to be by mail, express, or freight.

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 descriptions, 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 de-

WEIGHT AND NUMERICAL PART INDEX

SYMBOL	WEIGHT	PAGE	SYMBOL	WEIGHT	PAGE	SYMBOL	WEIGHT	PAGE
Q-6	3 oz	14	A1321	1/4 oz	19	FT870	1/4 oz	19
G-8C	1 oz	15	A1322	1/4 oz	19	FT455	5 oz	17
PN-8A	7 oz	15	A1324	1/4 oz	19	FT512	1 oz	20
QN-8D	2 oz	15	A1325A	2 oz	19	FT608	1/4 oz	15
QB-12	2 oz	17	A1326	1/4 oz	19	FT791	1 1/2 lb	17
G-13C	6 oz	14	A1327	1/4 oz	19	FT358	1 oz	15
G-13D	1/2 oz	14	A1328	1/4 oz	19	FT901	1/4 oz	19
Q-13E	2 oz	14	A1331	1 oz	19	FT996	2 1/2 lb	17
QB-13A	11 oz	14	A1332	1/4 oz	19	FS002	1/4 oz	20
QB-13B	4 oz	14	A1334	1/4 oz	19	M9199	1/4 oz	15
QN-15E	1/4 oz	17	A1341	1/4 oz	19	PD482	1/4 oz	17
PS-17G	1/4 oz	20	A1342	1 1/2 oz	19	F10525	1/4 oz	20
PS-17T	1/4 oz	20	A1344	1/4 oz	19	F10536	1/4 oz	20
QH-20	6 oz	15	A1346	12 oz	19	M12024	5 oz	15
P-21D	1/4 oz	15	A1347	1/4 oz	19	M13523	1/4 oz	15
QH-21A	2 oz	15	A1349	1/4 oz	19	M24887	2 1/2 oz	17
P-43C	1 oz	15	A1350	1/4 oz	19	M35511	2 1/2 oz	17
Q-47B	1 oz	15	A1366	1/4 oz	19	M36519	7 oz	17
QN-47D	1 oz	15, 19	A1367	1/4 oz	19	M36670	4 1/2 lb	17
QB-84	6 1/2 lb	17	A1368	1 1/2 oz	19	37502	1 oz	19
QB-85	8 lb	17	A1369A	1 oz	19	37723	1/4 oz	15
QB-96	8 1/2 lb	17	A1371	9 oz	19	37724	1 oz	15
QB-113	2 1/2 lb	14	A1372	8 oz	19	38834	6 oz	15
QB-213	2 1/2 lb	14	A1384	1/4 oz	19	39530	1 oz	15, 17
A250	7 1/2 lb	17	A1386	1 oz	19	41039	9 oz	15
A251	13 1/2 lb	17	A1387	6 oz	19	45235	8 1/2 oz	17
A406	1 oz	15	A1390	1 1/2 lb	19	45236	1 1/2 oz	17
A410	3 oz	15	A1391	2 oz	19	45552	1/4 oz	17
EZ453	1/4 oz	19	F1416	1/4 oz	15	45555	1/4 oz	20
EZ454	1/4 oz	19	F1489	1/4 oz	15	45567	1/4 oz	20
EZ472	2 1/2 oz	19	F1692	1/4 oz	19	48775	1 1/2 lb	17
EZ590	1 oz	19	F1741	2 oz	16	48776	9 oz	17
RZ540	1/4 oz	19	F1903	1/4 oz	15	48778	5 1/2 lb	17
EZ541	1/4 oz	19	F1969	1/4 oz	19	48780	10 oz	17
A577	9 oz	17	F1971	1/4 oz	19	48782	8 oz	17, 20
A595	1/4 oz	20	F2442	1/4 oz	20	48783	8 oz	17
A545	1/4 oz	19	F2447	1/4 oz	17	48784	14 oz	20
A595	2 oz	15	F2551	1/4 oz	17, 20	48786	45 lb	17
A588	7 1/2 lb	14	F2551	1/4 oz	15	48787	42 lb	17
AR71	1/4 oz	14	F2557	1/4 oz	17	48789	1 lb	17
AR72	8 lb	14	F2591	1/4 oz	20	48790	1/4 oz	17
AR74	11 1/2 lb	14	F2599	1 oz	20	48791	1 1/2 lb	17
F1009	1/4 oz	20	F2870	1 oz	17	48877	1 1/2 oz	17
A1011	5 oz	15	FS006	1/4 oz	15	49557	8 1/2 oz	14, 15
F1011	1/4 oz	15, 20	F3032	1 oz	17	49558	3 1/2 lb	17
A1012	11 oz	15	F3054	1/4 oz	14	49559	4 1/2 lb	17
F1023	1/4 oz	15	F3083	1/4 oz	17	51140	1/4 oz	20
F1025	1/4 oz	15	F4169	1 oz	17	51142	10 1/2 oz	19
F1040	1/4 oz	15	F4178	1/4 oz	17	53342	1 oz	15, 17
A1057	2 1/2 lb	15	F4235	1/4 oz	17	55627	1/4 oz	15
A1060	1/4 oz	15	F4761	1/4 oz	20	57308	1/4 oz	20
A1065	5 oz	16	F5116	1/4 oz	15	57309	1/4 oz	20
A1073	2 1/2 lb	15	F6470	1/4 oz	19	57311	1/4 oz	20
A1082	1/4 oz	15	F6699	9 oz	17	57312	1 oz	20
F1099	1/4 oz	16	F6823	8 lb	15	57314	1/4 oz	17
F1100	1/4 oz	15	FT001	3 oz	17	57318	1/4 oz	20
A1182	59 1/2 lb	15	FT014	2 1/2 lb	17	57322	10 oz	20
A1185	61 lb	15	FT020	1/4 oz	15	58468	1/4 oz	15
A1198	25 1/2 lb	15	FT021	1/4 oz	15, 17	62509	1/4 oz	20
A1316	2 1/2 lb	19	FT057	1/4 oz	15, 17	68082	1/4 oz	15
			FT112	1/4 oz	15	68083	1 1/2 oz	15



PISTON AND CONNECTING ROD

To insure proper fitting assemblies always order replacement pistons with pins and lock rings. Symbol A873 covers the piston with piston rings, piston pin, and lock rings. A868 covers a similar group without piston rings.

PISTON, RINGS AND CONNECTING ROD (assembled).....	A874	1
PISTON WITH RINGS, PISTON PIN AND LOCK RINGS.....	A873	1
PISTON WITH PISTON PIN AND LOCK RINGS.....	A868	1
Lock Ring.....	A871	2
Piston Ring (notched).....	Q-5	4
CONNECTING ROD (complete).....	QR-215	1
ROD BODY WITH PISTON PIN BUSHING.....	QR-115	1
Bushing (piston pin).....	G-13C	1
Cap (connecting rod).....	QR-13A	1
Bushing (connecting rod - crank end).....	QR-13B	1
Shim (connecting rod cap).....	G-13D	3
Cap Screw (connecting rod - hex head).....	Q-13E	2
Lock Wire (connecting rod cap screw).....	F3054	12"

GASKET SET 49857

For a general engine overhaul, all gaskets, the throttle valve packing, and cylinder head barrel packing can be obtained under one symbol by specifying 49857 gasket set. This set includes items in this bulletin marked with an asterisk (*) and in the quantities shown.

CYLINDER AND CRANKCASE

Gasket Set (items on page 15 and page 17 marked *)	49857	1
CYLINDER AND CRANKCASE WITH STUDS AND THROTTLE VALVE	A1185	1
Throttle Valve	QN-30	1
THROTTLE GUIDE AND PACKING GROUP	38854	1
Guide (throttle valve)	37723	1
*Packing (throttle stem)	F7503	1
Washer (packing pressure)	M18528	1
Spring (packing pressure)	37724	1
*Gasket (throttle valve guide)	P-21D	1
Cover (throttle valve - includes stop pin)	QN-314	1
*Gasket (throttle guide and cover)	P-21D	2
THROTTLE ARM, SCREW AND NUT	A695	1
Screw (throttle valve arm)	F2531	1
Nut (throttle valve arm screw)	F1011	1
CYLINDER AND CRANKCASE WITH STUDS	A1182	1
Stud (side bearing - 1-7/16")	39530	4
Stud (side bearing - 1-7/8")	53342	4
Stud (cylinder head)	QN-80	6
Stud (throttle guide and cover - 1/4 x 7/8")	55627	4
Stud (carburetor)	Q-47E	2
Screw (throttle guide and cover)	F1303	4
Priming Cup	F1741	1
Drain Cock (crankcase)	F7862	1
Cylinder Head	A1057	1
*Gasket (cylinder head)	G-8C	1
Nut (cylinder head stud)	F7057	6
*Gasket (carburetor to crankcase)	QN-47D	1
Nut (carburetor stud)	F1416	2
Set Screw (exhaust outlet)	P-42C	1
WATER JACKET - COOLING SYSTEM		
WATER JACKET WITH CONDENSER, STUDS AND FILLER CAP	A1073	1
Cooling Condenser	F6823	1
WATER JACKET WITH STUDS (cap included)	A1198	1
Stud 1-1/2" (water jacket to cylinder)	A1088	1
Stud 1-5/8" (water jacket to cylinder)	PN-8A	4
Stud 1-1/8" (cylinder head barrel packing)	M9139	4
Stud 1-11/16" (filler neck)	58463	2
Gasket (filler neck)	68092	1
FILLER NECK WITH CAP	68093	1
FILLER CAP WITH GASKET	F6115	1
Gasket (filler cap)	A406	1
*Gasket (condenser to water jacket)	A1011	1
Clamp Bar (short - end of condenser)	A410	2
Clamp Bar (long - side of condenser)	A1012	2
Cap Screw 5/16 x 3/4" hex head (condenser to jacket)	F1439	12
Cap Screw 5/16 x 1" hex head (condenser to jacket)	F1099	4
*Gasket (water jacket to cylinder)	A1069	1
Hex Nut 3/8" (water jacket stud)	F7030	4
Hex Half Nut 3/8" (water jacket stud)	F1040	1
Lock Washer 3/8"	F1025	5
Water Level Cock	F7683	1
Drain Cock (water jacket)	F1023	1
Rust Preventative	41039	1
Overflow Hose (not illustrated)	F3006	21
Clip (overflow hose - not illustrated)	M12024	1
*Packing (cylinder head barrel)	F7112	1
Packing Pressure Washer	A1065	1
Hex Nut 5/16"	F7021	4
Lock Washer 5/16"	F1122	1

FLYWHEELS - CRANKSHAFT - SIDE BEARINGS

Flywheel (timer or magneto side).....	48786	1
Flywheel (belt side).....	48787	1
Key (flywheel).....	QB-12	2
Nut (flywheel).....	A877	2
Cotter 3/16 x 1-3/4".....	F2667	2
Pin (starting crank).....	F4295	1
CRANKSHAFT WITH BEARINGS, SLEEVE AND OIL SEAL RACE.....	49858	1
Crankshaft (only).....	48775	1
Bearing with Races (inboard).....	F7018	2
Bearing with Races (outboard).....	F7791	1
Sleeve (belt side).....	48776	1
Oil Seal Race (timer side).....	45777	1
*Gasket (side bearing).....	QN-15K	2
Stud (side bearing - 1-7/16").....	39530	4
Nut (side bearing).....	F7057	5
Stud (side bearing - 1-7/8").....	53342	4
BEARING CASING WITH STUDS (timer side).....	49859	1
Stud 5/16" x 1-1/16".....	45552	4
Hex Nut 5/16" (use P1100 L.W.).....	F7021	4
Oil Seal (timer side).....	F7001	1
Support Casting (timer).....	48783	1
Bearing Casing (belt side).....	48778	1
COVER WITH OIL SEAL (bearing casing - belt side).....	48780	1
Oil Seal.....	F7001	1
*Gasket (cover).....	F9489	1
Hex Head Cap Screw 4" x 7/8" (cover).....	F4178	4
Lock Washer (cover screw).....	F3083	4
Engine Pulley 5".....	QB-84	1
Engine Pulley 6".....	A250	1
Engine Pulley 7".....	QB-96	1
Engine Pulley 8 1/2".....	A251	1
Engine Pulley 10".....	QB-96	1
Cap Screw 7/16 x 1-3/4" hex head.....	F2879	8
Timer Cam.....	48782	1
Key (timer cam).....	F2551	1
Set Screw (hollow head).....	F2447	1
Wrench (set screw).....	F3082	1

SIDE EXHAUST

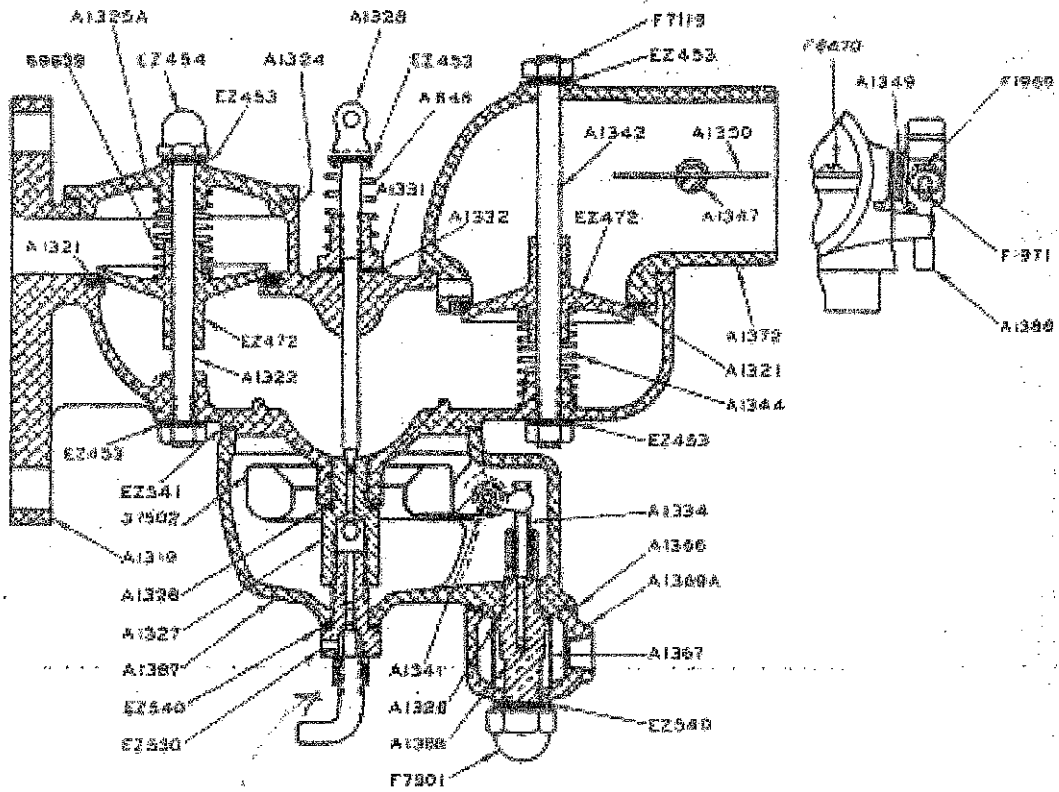
Exhaust Elbow.....	48789	1
Gasket.....	48790	1
Tail Pipe.....	48791	1
Exhaust Tubing.....	F6699	26

STARTING CRANK

Starting Crank (with bearing).....	M36670	1
Bearing Catch (on stop plate).....	M36639	1
Spacer (bearing catch - thick).....	45235	1
Spacer (bearing catch - thin).....	45236	6
Holder (starting crank - with loop).....	M35511	1
Holder (starting crank - plain).....	M24837	1

COIL - SPARK PLUG

SPARK COIL.....	F7996	1
Vibrator (includes both points).....	F4166	1



1/2" x 30 threads

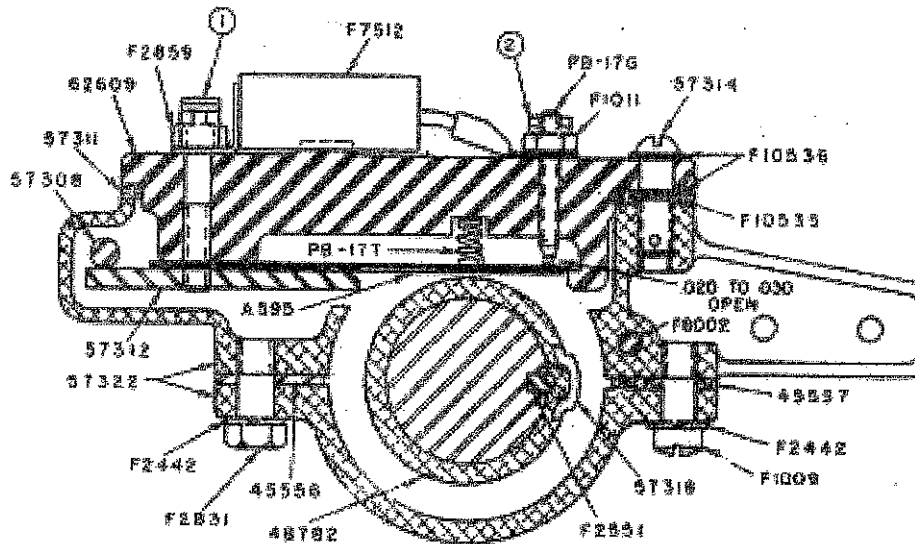
C8 CARBURETOR

Gasket (carburetor to crankcase--inc. in gasket set).....	QN-47D	1
*Gasket Set (complete for C8 carburetor).....	A1391	1
FAIRMONT C8 CARBURETOR Complete (yoke head needle valve)....	A1316	1
CARBURETOR BODY Complete (with needle valve guide, needle valve seat, and check valve seat).....	A1390	1
CARBURETOR BODY (with check valve seat only).....	A1319	1
*Valve seat (for either check or air valve).....	A1321	1
Guide (needle valve).....	A1331	1
Gasket (needle valve guide).....	A1332	1
Cap Screw 1 x 1/2" (needle valve guide).....	FT370	2
*Seat (needle valve).....	A1327	1
Gasket (needle valve seat).....	A1326	1
*Needle Valve (yoke head - length 3-5/8").....	A1328	1
Washer for gasket - needle valve friction).....	EZ458	2
Lock Spring (under needle valve).....	A646	1
*Check Valve (same as air valve).....	EZ472	1
Check Valve Stem (with lower nut - length 3 1/2").....	A1322	1
*Spring (check valve-1-5/16" free length-111. EZ456).....	69639	1
Cover (check valve).....	A1325A	1
Gasket (check valve cover).....	A1324	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).....	A1358	1
Gasket (float valve seat).....	A1356	1
Float with Lever (metal - replaces A1356).....	37502	1
*Hinge Pin (float lever).....	A1341	1
Bearing Screw (hinge pin).....	A1384	2
*Float Valve.....	A1384	1
Strainer Bowl only.....	A1369A	1
Screen (strainer).....	A1367	1
Gasket (strainer bowl upper).....	A1366	1
Cap Nut (strainer bowl).....	FT901	1
Gasket (cap nut - strainer bowl lower).....	EZ540	1
Gasket (float bowl to carburetor body).....	EZ541	1
Drain Cock Complete (float bowl).....	EZ539	1
Gasket (drain cock).....	EZ540	1
AIR VALVE CAGE (with choke bar less air valve).....	A1345	1
AIR VALVE CAGE (with valve seat only).....	A1372	1
*Valve Seat (for either air or check valve).....	A1321	1
Choke Shaft.....	A1347	1
Choke Disc.....	A1350	1
Screw (choke disc - self tapping).....	FG470	2
CHOKER ARM (with clamp screw).....	A1386	1
Machine Screw (choke arm clamp).....	FI971	1
Hex Nut (clamp screw).....	FI969	1
Lock Washer 3/16".....	FI692	1
Spring (choke arm).....	A1349	1
Air Valve Stem (with lower nut - length 4-1/8").....	A1342	1
*Air Valve (same as check valve).....	EZ472	1
*Spring (air valve - 1-5/8" free length).....	A1344	1
Hex Nut (air valve stem upper).....	FT119	1
Gasket (or washer - valve stem - lower end).....	EZ453	1

CARBURETOR SERVICE KIT 51142

For major carburetor repair, all gaskets, valves, seats, and springs and hinge pin can be obtained under one symbol by specifying 51142 C8 carburetor service kit. This kit includes items listed above marked with an

ADJUSTABLE WEATHERSEALD TIMER



WEATHERSEALD TIMER COMPLETE (adjustable).....	45784	1
MOUNTING CASTING (complete-halves not sold separately)..	57308	1
Spacer (steel - lower - casting halves).....	45556	1
Spacer (cork - upper - casting halves).....	45557	1
Cap Screw 5/16 x 7/8" hex hd.	F2851	1
Clamp Screw 5/16 x 3/4" fillister hd.	F1009	1
Lock Washer 5/16" (light).....	F2442	2
Stop Pin 7/32 x 1/2".....	F8002	1
Pivot Pin 1/4 x 1-1/8" (grounds timer to body).....	57308	1
TIMER BODY COMPLETE (with blade, points and condenser)..	57309	1
Body (with gasket).....	57309	1
BLADE AND SCREW (service set).....	51140	1
Timer Blade (with point).....	4595	1
Adjusting Screw (with point).....	PB-176	1
Spring (timer blade - spiral).....	PB-17T	1
Cap Screw 1/4 x 1-3/8" hex hd.	F2859	1
Clamp Block (timer blade).....	57312	1
Connector.....	F4751	2
Hex Nut #12-24.....	F1011	1
Ignition Condenser.....	F7512	1
Arc Adjusting Screw.....	57314	1
Retaining Ring (adjusting screw).....	F10535	1
Washer 3/16.....	F1050	2
Gasket (timer body to mounting casting).....	57311	1
NOTE - When applying a new gasket to timer body moisten adhesive side of gasket with gasoline, then press into place.		
TIMER CAM (with wiping block).....	45782	1
Wiping Block.....	57318	1
Key (timer cam).....	F2551	1

PARTS USED ON SPECIAL ENGINES ONLY

Listed on this and the 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 engine 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.

RQ-D-1

P6823	Condenser.....	omit	
A1012	Clamp Bar (long).....	omit	
A410	Clamp Bar (short).....	omit	
Add:	1 Cover Plate (water jacket).....		48420
	1 Overflow Tube.....		QUB-237-1

RQ-D-2

See bulletin 559 for magneto parts, magneto drive parts and magneto instructions. Omit all sections of this bulletin 581 referring to battery ignition, timer parts and timer controls, and in addition:

49858	CRANKSHAFT WITH BEARINGS, SLEEVE & OIL SEAL RACE.....	omit	
48775	Crankshaft (only).....	should read.	51263
49859	BEARING CASING WITH STUDS (timer side).....	omit	
FT001	Oil Seal.....	omit	
48777	Race (oil seal).....	omit	
48783	Support Casting (timer).....	omit	