

INSTRUCTION BOOK FOR TYPE OC WICO MAGNETO

This book contains complete instructions for installing and caring for the Type OC WICO Magnetos and also explains how they operate, so that the man who uses them can thoroughly understand them. The Type OC WICO Magneto is a very simple device which every engine runner can keep in order as easily as he can any part of his engine. This book is written for the purpose of making this fact clear to every owner of WICO magnetos.

It sometimes happens that trouble occurs which the ignition is not to be attributed to the magneto. If the instructions are followed when trouble occurs, the responsibility can be definitely placed and time saved.

SPARK PLUGS

The distance between spark plug points should be .015 inches to .025 inches (the thickness of five or six sheets of paper.)

The insulator (Porcelain or Mica) inside base of spark plug must be kept clean (free from carbon), because the electricity from the magneto leaks through the carbon on the insulator instead of jumping across the points, and makes it hard or impossible to start the engine or makes it fire irregularly.

Carbon on the insulator is caused by

fuel mixture. Use a thin knife blade, a rag, and gasoline for cleaning.

A plug will sometimes show a spark when tested outside of the cylinder and yet fail to fire the engine when replaced in the cylinder. This shows that the plug is "leaky", because of carbon or because the porcelain insulator is weak. A "leaky" plug will spark outside the cylinder and not inside because the spark can jump through the air easier than it can jump through the compressed charge inside the cylinder, especially when the engine is cold. Trouble is sometimes caused (especially in two cycle engines) by spark plugs that do not extend far enough into the cylinder and thus a pocket is left at the end of the plug in which dead (burnt) gas collects. Such gas cannot be fired by any spark.

THE TYPE OC WICO MAGNETO

GENERAL DESCRIPTION

(See Figures I and II)

The Type OC WICO Magneto is a machine which generates high tension current for ignition purposes. This current is made by shifting the magnetism supplied by the magnets (141), in and out of the two cores (103) and (104).

This shifting is done by the armature (100) which is moved back and forth by the energy derived from the engine.

PRINCIPLE OF OPERATION

(See Figures II and III)

The armature (100) is held against the cores (107) by the return spring (97) and by the magnetic attraction of the cores un-

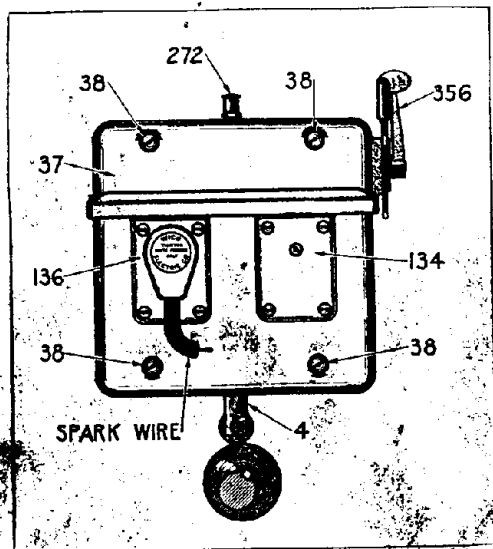


Fig. I—Type "OC" Magneto
Type No. I Drive

til the time for making the spark. This shifts the magnetism into the coils. The spark is produced by pushing the armature about $3/32$ inch away from the cores. This whips the magnetism out of the coils and discharges a high tension electric current through the spark wire to the spark plug.

The armature slides on the guide rod (157) and gets its movement from the rocker arm (406) and the driving bar (4) which is driven by an eccentric (A) on the crank shaft or valve shaft of the engine.

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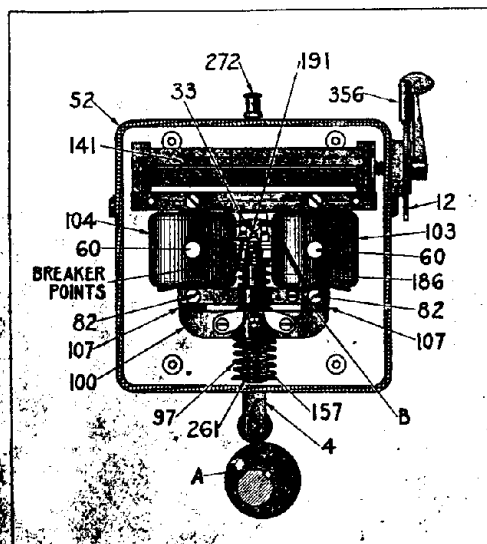


Fig. II—Type "OC" Magneto Cover
Removed

As the eccentric turns it carries the driving bar to the rocker arm and lifts it. This depresses the other end of the rocker arm and compresses the drive spring (186). At the proper time for making the spark the end of the rocker arm reaches the end of the armature tube (246) and instantly breaks the magnetic contact between the cores and the armature, which is snapped away from the cores by the compressed drive spring. When the armature is about $3/32$ inch away from the cores it opens the breaker points and the spark is made.

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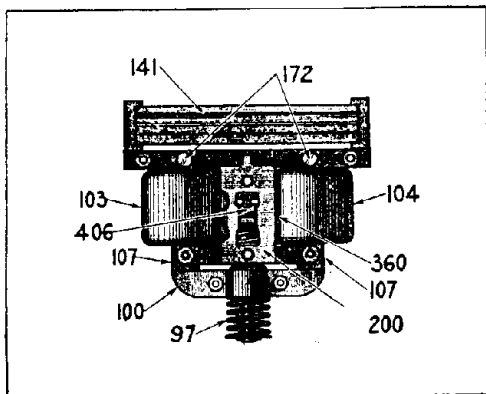


Fig. IIA—The Back of the Magneto
Removed from Case

As the eccentric continues to revolve the pressure on the drive spring is relieved and the return spring puts the armature back on the cores again.

Moving Parts:

(See Figure III).

All of the moving parts except the rocker arm (406) and the driving bar (4) can be removed as a unit by withdrawing the pin (261) (See Figure II) from the end of the guide rod, and raising the driving bar. Catch the parts in the hand as the drive spring expels them.

SPARK CONTROL

(See Figure IV)

Figure IV shows the parts used to shut off the spark and to advance or retard it to suit the speed of the engine. When the

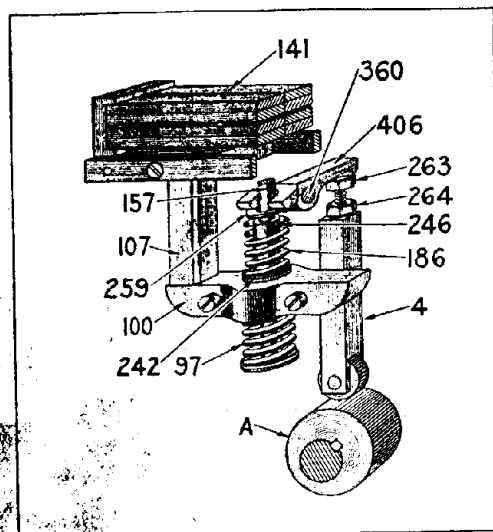


Fig. III—View Showing Action of
Moving Parts

NOTE—Some parts of the magneto that would obstruct the view of the moving parts have been left out of this view or are shown broken away, since their presence is not essential to an understanding of the action of the magneto.

timing lever (356) is pointing downward the magneto will not make a spark. The starting spark is made when the timing lever is set at the "start" mark. The spark is fully advanced when the timing lever is pointing directly upward. Few engines will require so much advance, and the timing lever stop (354) is provided so that the engine maker can limit the spark advance to suit his engine.

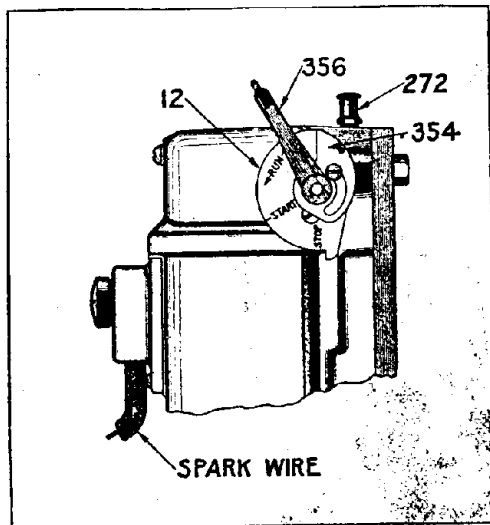


Fig. IV—Spark Control

INSTALLATION

Mounting:

(See Figure V)

Figure V gives the over-all mounting dimensions and the dimensions between fastenings.

Types of Drive:

(See Figures I and VI)

The magneto is driven from an eccentric either by a driving bar with a roller in its end (Type No. 1 Drive) (See Figure I) or by a driving bar connected to an eccentric strap (Type No. 2 Drive) (See Figure VI). The throw of eccentric is usually 9-16" to $\frac{5}{8}$ ". In the Type No. 1 Drive the length of

the driving bar is made adjustable for setting the timing when the magneto is installed, and for adjusting after wear has taken place. In the Type No. 2 Drive the same purpose is served by putting the adjustment in the end of the eccentric rod. (See "B" Figure VI).

TIMING

The timing of the running spark is controlled by the timing lever (356) (See Figure IV). The timing of the starting spark is set by properly locating the eccentric on its shaft, and by adjustment of driving bar length.

For reversible engines the eccentric is set so that when the piston is at end of its compression stroke the eccentric is at its point of maximum throw towards the magneto.

For non-reversible engines (both 2-cycle and 4-cycle) the eccentric should be so set on its shaft that when the piston is at the end of its compression stroke the eccentric will have to be revolved from 20 degrees to 25 degrees before it reaches its greatest throw towards the magneto. In other words, in 2-cycle engines the fly-wheel will have to be rotated 20 to 25 degrees beyond compression center before the eccentric reaches its greatest throw towards the magneto. In 4-cycle engines the fly-wheel will have to be rotated 40 to 50 degrees beyond compression center before the eccentric reaches its greatest throw towards the magneto, because in 4-cycle engines the fly-wheel rotates two degrees to the eccentric's one, while in 2-cycle engines the fly-wheel rotates one degree for every degree that the eccentric rotates.

This setting of the eccentric will give the

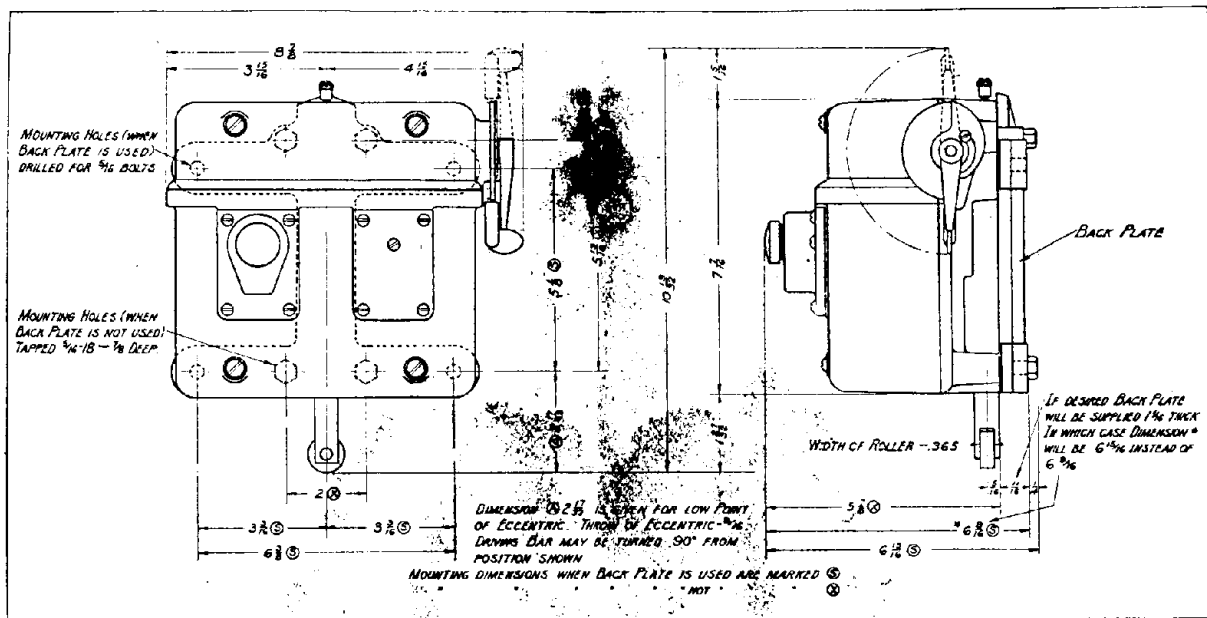


Fig. V—Information and Dimensions for Mounting the Type "OC" Magneto

proper over-travel of the eccentric, the proper timing range, and will insure cut-out and starting by backing up against compression. The magneto should trip at the end of the compression stroke, that is to say, at center or slightly after, with the timing lever at the "start" mark.

To time the magneto, put the timing lever at the "start" mark and adjust length of driving bar or eccentric rod until the

magneto fires when piston is at end of compression stroke.

CAUTION—If while doing this the magneto trips very much before the end of the compression stroke, **BE SURE TO BACK UP THE ENGINE AS SOON AS THE MAGNETO TRIPS**, because the driving bar or the eccentric rod may be adjusted so long that it would be pushed too far into the magneto, if the engine were turned over center, and wreck the magneto.

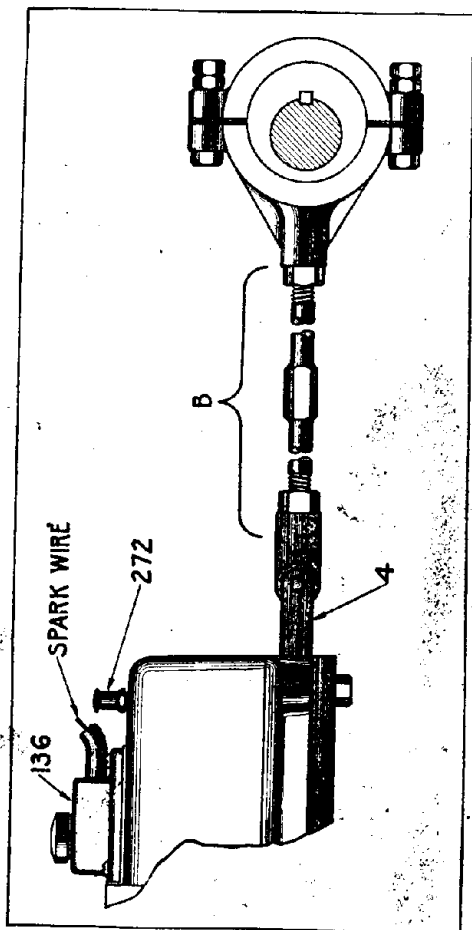


Fig. VI—Type No. 2 Drive

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HOW TO START

(See Figure IV)

Be sure the spark wire is connected to the spark plug. Set the timing lever at the "start" mark on timing quadrant (12). See that the carburetor (mixer) or the regulating cock on the fuel pipe is set according to the engine builder's instructions. Start the engine by turning the fly wheels in the direction they will run. If the engine is to be started by rocking the wheels back against the compression in the cylinder, it may be necessary to set the timing lever slightly advanced, in the case of two cycle engines, so that the magneto will make its spark earlier, and the fly wheels will not have to be rocked so far back against compression before magneto fires.

After the engine is started, advance the spark (See Spark Control) until engine delivers full power. If engine begins to knock, retard spark until knocking stops.

CARE OF TYPE OC WICO MAGNETOS

MAGNETS

The Magnets of the Type OC WICO Magneto are not weakened by the operation of the magneto, but their strength will be greatly reduced by removing them from the magneto. All parts of the magneto that should be inspected or replaced by the user are accessible without removing the magnets. Any changes or replacements that require the removal of the magnets should be made by those who have the special equipment for overhauling the magneto thoroughly.

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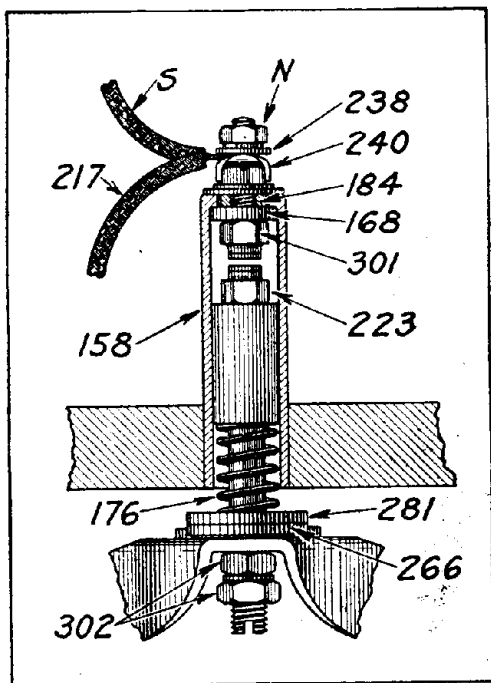


Fig. VII—Breaker Point Details

LUBRICATION

(See Figure II)

The Type OC WICO Magneto will run for years if properly lubricated. Its life will be greatly shortened if run dry.

An oiler (272) has been provided at the top of the magneto. This should be filled with engine oil each day the magneto runs.

Magnetos that are mounted horizontally are provided with an oiler in the top of the cover, and also an elbow oiler at the top of the magneto. Both of these should be filled each day.

The magneto will not require oil at any other points.

ADJUSTMENTS

Breaker Points:

(See Figure VII)

The breaker point contacts are perfectly adjusted at the works of the Wico Electric Company, and no readjustment will be required except when installing new contacts, at which time proceed as follows:—

The breaker point contacts (301) and (223) should just open when the armature (100) is $3/32''$ from the cores (107). To adjust, trip the armature from its contact with the cores, and insert a strip of metal $3-32''$ thick between the armature and the face of the cores. Loosen the nuts (302) on the breaker point stem, and turn the upper nut until the contact (223) just clears the contact (301). Then set up the lower nut tight against the upper nut. As soon as adjustment has been made, be sure to remove the strip that you placed between armature and cores.

Driving Bar:

(See Figure III)

The adjustment of the driving bar will be made originally by the engine builder and will not require attention thereafter for the Type No. 2 drive. For the Type No. 1 drive the driving bar will have to be adjusted only if enough wear has taken place to cause a change in spark timing that cannot

be overcome by advancing the timing lever (356).

If spark timing has become retarded by wear, the first evidence of it will be failure to trip with the timing lever at the "start" mark (See Figure IV). To secure original setting remove the driving bar, loosen lock nut (264) and unscrew the adjusting screw (263) one half a turn. Tighten lock nut and replace driving bar. If magneto does not then trip at end of compression stroke with timing lever set at "start" mark the exact timing can be secured by screwing the adjusting screw OUT some more if the spark is too late, or by screwing it back IN if the spark is too early.

Eccentric Rod: (See Figure VI)

The adjustment of the eccentric rod (used only on Type No. 2 drive) will be made originally by the engine builder and will not require attention thereafter unless enough wear has taken place to cause a change in spark timing that cannot be overcome by advancing the timing lever (356). If the spark timing has become retarded by wear, the first evidence of it will be failure to trip with the timing lever at the "start" mark (See Figure VI). To secure the original setting, unloosen the lock nut or nuts on the eccentric rod as shown in Figure VI and turn the rod one half turn in the direction which will increase the length of the rod. Tighten the lock nut and turn the flywheels very slowly until the magneto trips.

If it does not trip at the end of compression stroke with the timing lever set at the "start" mark, the exact timing can be secured by lengthening the eccentric rod some more if the spark is too late, or by shortening it again if the spark is too early.

Armature:

(See Figure II)

If the armature (100) does not trip from both cores (107) at the same time, when the engine is turned over slowly, the armature should be lined up parallel with the cores by tapping it gently on the end which separates first. An even break produces the best spark.

REPLACEMENTS

Breaker Points:

(See Figure VII)

The best results will be obtained if both contacts are renewed whenever one of them fails. If either contact fails it may leave the other in such shape that it may soon spoil a new contact.

To replace the moving contact (223):—Withdraw the armature group (See Moving Parts) and remove the old contact and its spring (176) from the breaker point plate by unscrewing the two nuts (302). Substitute the new moving contact and replace the nuts. After replacing the armature group, adjust the breaker point contact as explained under "Adjustments".

To replace fixed contact (301):—Withdraw the armature group (See Moving Parts) and disconnect condenser lead (S) and primary lead (217) from breaker point tube (222). Remove all nuts and washers from shank of the contact (301) and push contact down and out of tube. There are two insulating washers (168 and 184) inside of tube and these should be removed also. (A new insulating washer (168) and new nuts will be supplied with each new fixed contact and these should always be used in replacements). Place insulating washers on new contact and insert in tube, replace outside insulat-

ing washer, cover it with lock washer and screw the nut up tight. After replacing the armature group, see that the contact is in proper adjustment. (See "Adjustments").

Drive Spring:

(See Figure III)

Remove armature group (See Moving Parts) and substitute the new spring in place of the old one. The spring should extend $5/32$ " beyond end of armature tube, and washers (242) should be added or subtracted until the extension is correct.

Be sure to replace the trip washer (259) when reassembling the armature group.

Return Spring:

(See Figure II)

Remove pin (261) and substitute new spring for old one.

Guide Rod:

(See Figure II)

To replace guide rod (157):—Withdraw the armature group (See Moving Parts). Remove screw (191) and its lock washer and pull out old rod. Put in new rod with counter-bored side of screw hole towards the front of the magneto. Line up the screw hole in the rod with the hole in the casting and replace the screw and lock washer.

Rocker Arm and Rocker Arm Pin:

(See Figures II, IIA and III)

Remove magneto from engine and take off the cover (37). If a backplate (See Figure V) is used, remove it. Dismount magneto by removing the two screws in the slot in which driving bar slides. Withdraw the armature group (See Moving Parts).

Take off assembly plate (200) by removing screws (172) and (82). The rocker arm pin

can then be withdrawn and replaced. If the rocker arm is to be replaced, the guide rod as well as the rocker arm pin must be removed (See Guide Rod) and then the rocker arm can be pulled straight out from the assembly plate.

TROUBLE HUNTING

(See Figures II, III and VII)

If ignition trouble is suspected, disconnect spark wire from plug and observe spark between wire and engine frame, holding end of wire about $1/4$ inch from frame. If no spark is produced when magneto is operated, the trouble can be located by removing the cover and proceeding as follows:— See that the armature (100) returns and makes a firm contact with the cores (107) after being tripped off.

Failure to make firm contact indicates a weakened or broken return spring (97) or friction of moving parts caused by lack of oil.

Remove any dirt from between armature and face of cores.

Turn the engine over slowly and see that when the armature (100) is tripped it snaps quickly away from the cores (107). Failure to do this indicates binding, or friction or a broken drive spring (186) (See Figures II and III).

See also that the armature leaves both cores at the same time and, if it does not adjust, is explained under "Adjustments" (Armature).

With a small wire or piece of wood, remove any dirt from the surfaces of the contacts (301 and 223) and from the insulating washer (168) (See Figure VII).

See that electrical connections are tight at point (B) (See Figure II) and point (N) (See Figure VII).

See that breaker point contacts (223) and (301) are closed when armature is on the cores and are just opened when the armature is tripped.

RETURN OF MAGNETOS

If after carrying out the instructions in this book the engine does not start or run properly, the magneto should be sent to the service department of the Wico Electric Company at Tulsa, Oklahoma, or to the works of the Wico Electric Company at Springfield, Mass.

EMERGENCY SHIPMENTS

Upon request by telegraph or telephone list the number on the defective magneto of the Wico Electric Company. The magneto will be shipped by express to any point in the United States or Canada and after examination of the returned magneto will refund the purchase price less the cost of repair and freight. Note on the returned magneto that it was found defective in material or workmanship. This will be included in the list of repairs.

PACKING OF RETURNED MAGNETOS

Pack the magneto carefully for shipment. Damage in transit will be included in cost of repairs.

PREPAYMENT OF CHARGES

Transportation charges on returned magnetos must be prepaid. Magneto will not be accepted.

WARRANTY

Wico's magnetos are guaranteed against defects in material or workmanship.