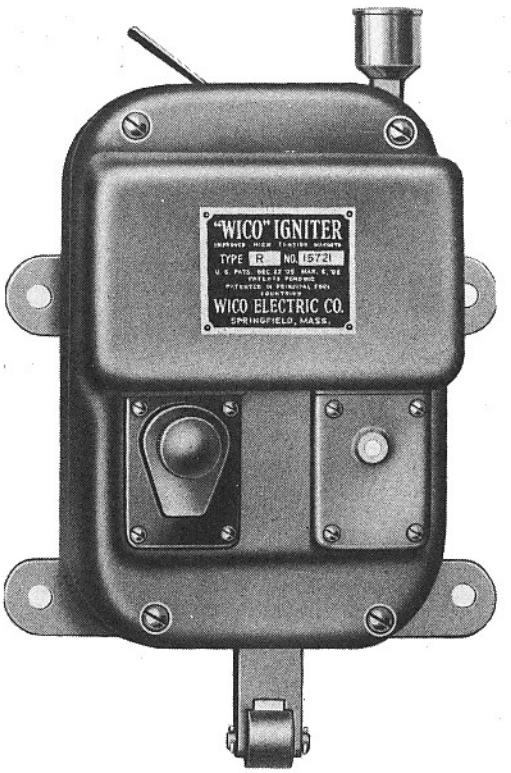
COMPLETE INSTRUCTIONS AND PARTS LIST
FOR CARE AND OPERATION OF

TYPE R
WICO MAGNETOS



WICO-BUILT
IGNITION

Wico Electric Company

WEST SPRINGFIELD, MASSACHUSETTS

SERVICE INSTRUCTIONS FOR THE TYPE R MAGNETO

SPARK CONTROL
(See Figure I)

Figure I shows the parts used to shut off the spark and advance or retard it to suit the speed of the engine. The timing quadrant (12) has on its lower edge notches numbered from 0 to 6, into which the timing wedge (9) fits. The igniter will not make a spark when the timing wedge is in notch No. 0. The starting spark is made when the timing wedge is in Notch No. 1, (as in Figure I) and the spark is ADVANCED as the quadrant is turned so that the timing wedge passes through notches Nos. 2, 3, 4, etc. A reverse movement of the quadrant RETARDS the spark and finally CUTS IT OUT at notch No. 0 and stops the engine.

A more complete description of the quadrant and timing wedge is given under "Action of Latch and Timing Wedge."

HOW TO START
(See Figure I)

Be sure the spark wire is connected to the spark plug. Set the timing quadrant so that the timing wedge is in notch No. 1. See that the carburetor (mixer) or the regulating cock on the fuel pipe is set according to the engine builder's instructions.

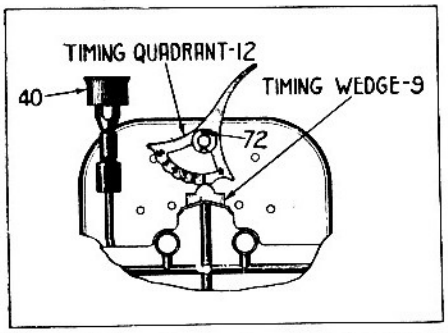


FIG. I—Timing Quadrant and Timing Wedge

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 quadrant with the timing wedge in notch No. 2 or No. 3 or even in higher notches, so that the igniter will make its spark earlier, and the fly wheels will not have to be rocked so far back against compression before the igniter fires. The fly wheels must always be rocked back until the igniter "snaps" as the spark is not made until this "snap" is heard.

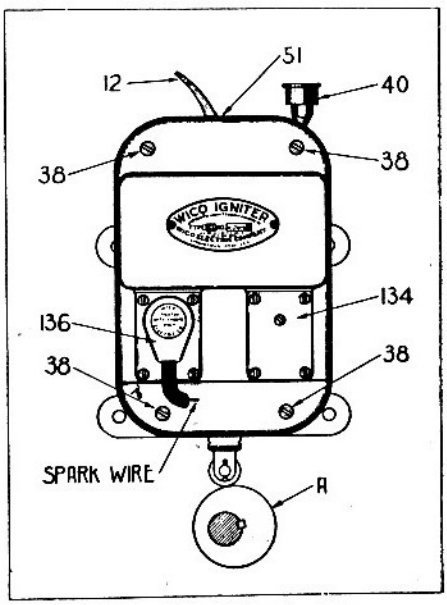


FIG. II—Type "R" Igniter—Type No. 1 Drive

After the engine is started, advance the spark (see Spark Control) until engine delivers full power. If engine begins to knock, retard the quadrant one notch.

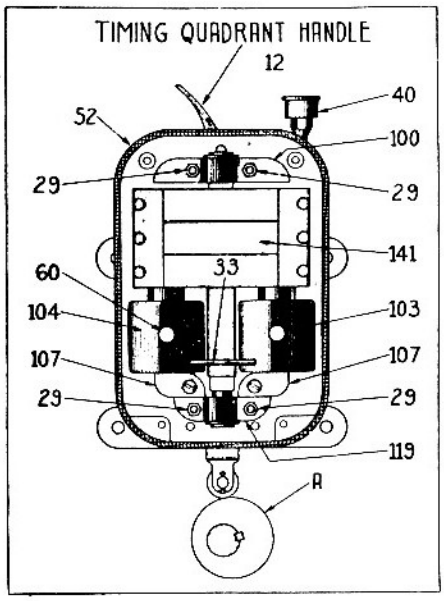


FIG. II-A—Type "R" Igniter—Cover Removed

METHOD OF DRIVING

Type No. 1 Drive:
Only two types of drive are used to secure the motion of the driving bar. In Type No. 1 Drive (See Figure II) the driving bar is equipped with a roller which runs directly on the eccentric. In this type a spring (46) (See Figure III) placed in the hollow portion of the driving bar, makes the driving bar follow the eccentric as it moves away from the igniter. In this type of drive the adjustment for timing or for wear is made by moving the igniter on the engine.

Type No. 2 Drive:
In the Type No. 2 Drive (See Figure V) the driving bar has no roller and usually no return spring, but is connected to the eccentric by a strap or yoke (C) that surrounds the eccentric, so that the eccentric draws the driving bar back as well as pushes it forward. The connection (B) between driving bar and eccentric strap is made adjustable so that the adjustment for timing or wear can be made without moving the igniter.

Some engine builders use the return spring (46) (See Figure III) in the Type No. 2 Drive to take up the lost motion caused by wear in the driving bar pin and eccentric strap.

ACTION OF LATCH AND TIMING WEDGE
(See Figures VI & VII)

Figures VI and VII show the action of the latch (7) latch block (5) and timing wedge (9) and explain how the driving bar (113) first engages the armature bar (latches on), then carries forward the armature bar (2) and finally lets go of (trips) the armature bar. Figure VI shows the driving bar latched on to the armature bar ready to carry it forward as the eccentric turns. The timing wedge (9) pushes the latch clear of the latch block (trips the igniter). Figure VII shows how this is

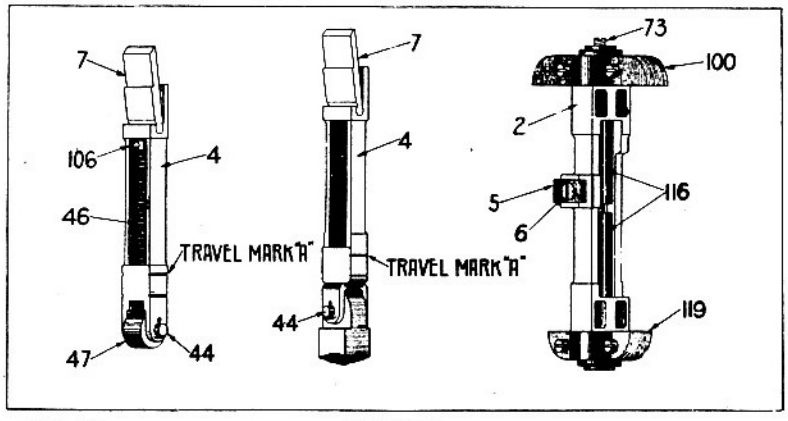


FIG. III
Driving Bar
Type No. 1 Drive

FIG. III-A
Driving Bar
Type No. 2 Drive

Bar
FIG. IV
Armature

done. As the driving bar moves forward carrying the armature bar, the beveled end of the latch reaches the timing wedge, and, riding up over it, is pushed clear of the latch block and trips the armature bar. The timing quadrant (12) holds the timing wedge in position and, when swung around on its stud, makes the timing wedge meet the latch earlier or later in the stroke of the driving bar, thus advancing or retarding the spark to suit the speed of the engine.

CARE OF TYPE "R" WICO IGNITERS

MAGNETS

Type "R" WICO Magnets are not weakened by the operation of the igniter, but their strength will be greatly reduced by removing them from the igniter, by removing both armatures at the same time, or by striking the magnets with any hard metal. All parts of the igniter 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 igniter thoroughly.

Keep well oiled the eccentric and roller of Type No. 1 Drive (Figure II) and the eccentric and the driving bar pin (44) of Type No. 2 Drive, Figure III-A.

ADJUSTMENTS

(See Figure V)

Driving Bar Travel:

The eccentric that operates the driving bar moves it about 5/8 of an inch. The necessary movement of the armature bar is only 1/2 inch, which is 1/8 inch less than the travel of the driving bar. The excess movement of the driving bar is used to offset the effect of wear, so that a reasonable amount of wear may take place before the latch will fail to "latch on" or fail to "trip."

Setting of Igniter:

The igniter preferably should be set so that the latch will not be carried back more than 1/32 inch after the latch has snapped under the latch block, (latched on). If the latch is carried back more than 1/32 inch, it latches on at an unnecessarily high speed which causes more rapid wear of latch and latch block. This setting is done as explained under "Travel Marks."

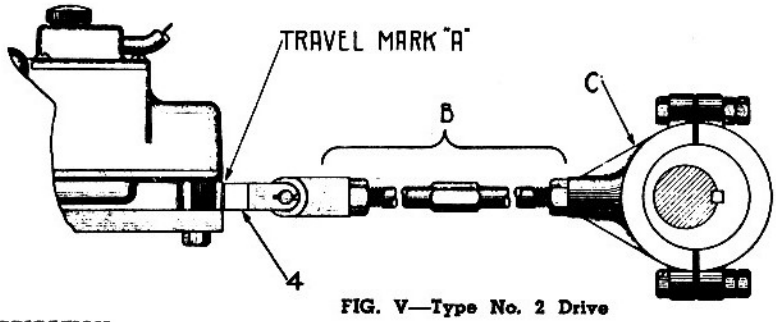


FIG. V—Type No. 2 Drive

LUBRICATION

(See Figure II)

The Type "R" WICO Igniter often runs for years when properly lubricated. Its life is greatly shortened when run dry.

A grease cup (40) and an oiler (51) have been mounted on the igniter. THE LIFE OF THE IGNITER AND THE REGULARITY OF ITS PERFORMANCE DEPENDS VERY LARGELY ON THE ATTENTION PAID TO THESE TWO PARTS.

Turn down the grease cup 1/2 turn for each 8 hours that the igniter runs. If the igniter is mounted in an upright position, drop a few drops of engine oil through the oiler every day the engine runs. If the igniter is mounted so that it lies flat, turning down the grease cup as explained above, will provide the needed lubrication.

Oil may be applied to the timing wedge at point (A) Figure VII and it will work down and lubricate the beveled ends of timing wedge and latch.

Travel Marks:

On the lower part of the driving bar are two "Travel Marks" 9/16 inch apart, (See Figures III, III-A & V). The mark (A) furthest from the roller or eccentric rod connection is used for setting the igniter. Turn the flywheels until the driving bar is pulled out of igniter as far as it will go. The travel mark (A) should then be flush with end of igniter as shown in Figure V. Get this setting for Type No. 1 Drive (See Figure. II) by moving the igniter, and for Type No. 2 Drive (See Figure V) by turning the nut or turnbuckle on the eccentric rod so as to shorten or lengthen the rod as needed.

When correctly set the igniter will make a spark if the timing wedge is in notch No. 1 of the timing quadrant, and should not make a spark when set in notch No. 0. If the igniter does fire in notch No. 0, file the notch about 1/32 inch deeper.

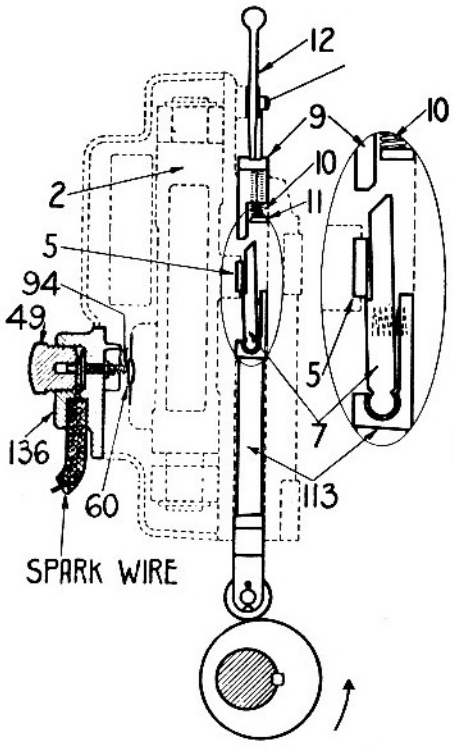


FIG. VI—Driving Bar Latched On

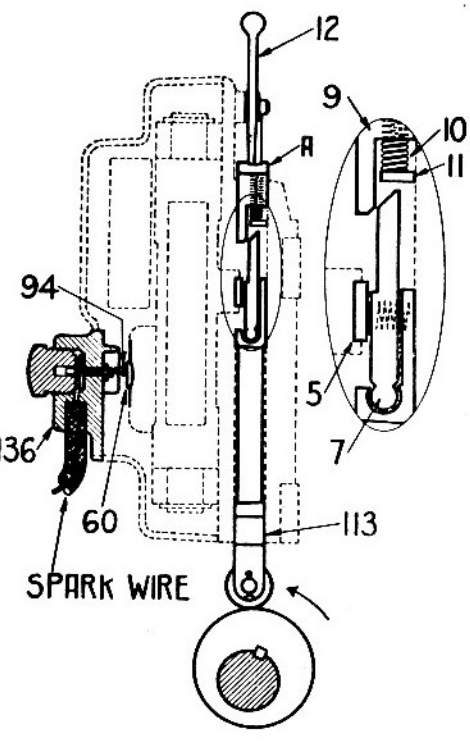


FIG. VII—Latch Tripped

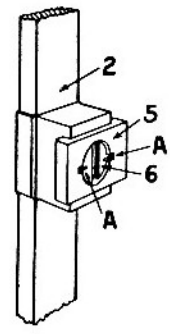


FIG. VIII—Latch Block

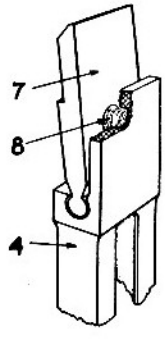


FIG. IX—Latch

REPLACEMENTS

(See Figures VIII, IX & X)

Latch:

If the latch becomes worn, it may be replaced as follows: (See Figure IX).

First remove the driving bar. In Type No. 1 Drive the igniter must be taken off the engine to remove the driving bar. In Type No. 2 Drive it will not be necessary to take igniter off the engine unless there is a return spring (46) (See Figure III) in the driving bar. If no spring is used in the driving bar it can be easily pulled out of igniter after removing pin (44) that connects eccentric rod to driving bar. If driving bar cannot be pulled out easily there is a return spring in it and the igniter must be taken off the engine.

Having removed the driving bar from the igniter, proceed as follows: With a screw driver or similar tool inserted between the latch and driving bar, work the latch spring (8) out of the hole in the driving bar so that it will not interfere, and push the latch sidewise out of the driving bar. The new latch may be inserted in the reverse manner. Take care during both operations that the latch spring is not jammed out of shape by being forced sidewise while its end is in the hole of the driving bar. Before replacing the latch in the driving bar, be sure that the slot in the driving bar in which the latch fits is perfectly clean, also that the holes in the latch and in the driving bar in which the latch spring fits are clean. After the latch has been replaced, be sure that it moves freely and can be pushed back against the flat surface of the driving bar.

Latch Block:

(See Figure VIII)

Should the latch block (5) become worn, it may be turned end for end, thus presenting a new edge to the shoulder of the latch. If both edges of the latch block are worn, a new one must be put in. The following instructions apply in either case: Remove the igniter from engine. Use a center punch or corner of a cold chisel, to knock out of the slots (AA) the edge of the screw head that has been spread into the slots to keep the screw from turning.

Do not strike the screw too hard when doing this. Too hard a blow may spring the armature bar or crack the latch block, which is very hard. Remove the screw (6) that holds the latch block in place. Be sure to use a screw driver with a square edge that fills the screw slot. Lift the latch block out of its slot. Clean the slot in which the block fits. Turn the latch block around or insert a new one as the case demands. Be sure that the latch block goes clear to the bottom of its slot. Before replacing the screw it is well to apply a little white lead to the threads of the screw. This will make it possible to set the screw tighter and will help to keep it from working loose. Set up the screw as tight as possible. Spread the edges of the screw head slightly into the small slots (AA) in the face of the latch block, using a center punch or corner of a cold chisel to do this. This will prevent the screw from turning. Be sure the screw head does not project above the surface of the latch block.

Timing Wedge and Timing Wedge Spring:

(See Figures I & VII)

To remove the timing wedge (9) and the timing wedge spring (10) which holds it against the timing quadrant (12), (See Figure VII): Press the timing wedge down into its slot until the timing quadrant will swing past the end of the wedge. Lift the timing wedge and timing wedge spring out of its slot. Insert the new timing wedge, being careful that the timing wedge spring fits into the hole of the timing wedge, and is not jammed out of shape while inserting it.

Timing Quadrant:

(See Figure I)

The timing quadrant is held in place by a cotter pin (72) which passes through the pin on which the timing quadrant turns. Remove the cotter pin and pull off the timing quadrant. Put on new quadrant and replace cotter pin.

When a new timing quadrant is put on the timing should be checked as follows: Set the timing quadrant so that the timing wedge is in notch No. 1, (See Figure I). Turn flywheels slowly in direction they should run until igniter fires. If at this instant the crank has pushed the connecting rod as far as possible into

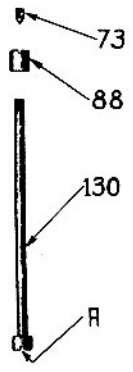


FIG. X—Retaining Rod

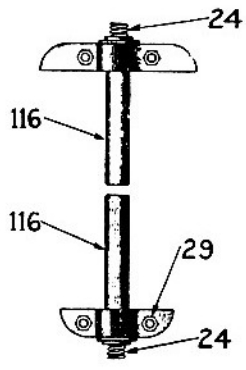


FIG. XI—Armatures

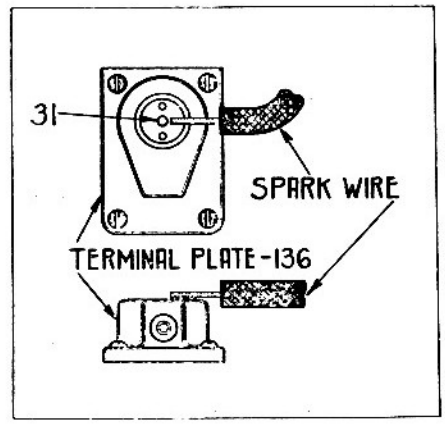


FIG. XII—Position of Spark Wire When Making Test No. 1

the cylinder so that the crank and connecting rod lie nearly in one straight line the igniter is firing at the proper time. If the timing is wrong it will be early and the igniter must be moved away from the eccentric in the Type No. 1 Drive (See Figure II), while in Type No. 2 Drive (See Figure V) the connection between driving bar and eccentric must be shortened until the timing is correct as shown by above test.

Driving Bar Spring:

(See Figure III)

The driving bar spring (46) is held in place in the driving bar by a guide rod (106). To renew the driving bar spring press down guide rod (106). Pull it to one side and release it the guide rod and spring will then jump out of the hollow portion of the driving bar. To replace, slip the spring over the guide rod. Place the end of the spring at the bottom of the hollow portion of the driving bar, push down on the guide rod until it snaps into place in the hollow portion of the driving bar as shown in Figure III.

Removal of Cover:

To inspect or replace the parts inside the igniter, take off the cover by unscrewing the four screws (38) (See Figure II). When removing the cover be careful not to disturb the gasket (52) (See Figure II-A) on which the cover rests.

Armature Retaining Rod:

(See Figures IV & X)

The armatures and armature springs are held in place by a retaining rod (130) passing through each armature and held by a nut and lock screw on the end located in the long armature (100) To remove the retaining rod insert a screw driver in the slot (A) in the head of the retaining rod in the short armature (119) to prevent the rod from turning. With another screw driver remove the lock screw (73) and nut (88) from the other end of the retaining rod located in the other armature. When this has been done, the retaining rod can be withdrawn for inspection or renewal. After replacing the retaining rod, tighten the nut (88) until it bottoms at end of the threads and set up tight the lock screw (73). Always insert the retaining rod so that the nut and lock screw are in the long armature (100).

Armature Springs:

(Figure XI)

To remove armature spring (24):—First remove retaining rod (130) as explained above. The springs can then be pulled out of the armature studs (116), without removing the armatures from the igniter. When replacing armature springs, apply a good coating of light grease to the springs.

Armatures:

(See Figures IV & XI)

DO NOT REMOVE BOTH ARMATURES AT THE SAME TIME. Remove one, examine it and replace it before the other is removed. If both armatures are off the igniter at the same time the magnets will be greatly weakened and the spark will no longer be satisfactory. In replacing the armatures be sure that the nuts (29) are on the front side of the armatures (See Figure II-A).

Further disassembling of the igniter should not be attempted unless apparatus for recharging magnets and completely overhauling the machine is at hand.

TROUBLE HUNTING

If the engine does not start, or does not run properly, proceed as follows:—

First make sure that the fuel mixture is correct and that no ENGINE parts are broken or failing to operate.

When trouble hunting, do not adjust, or operate the igniter with the spark wire connected to spark plug, because a spark may be produced which will start the engine unexpectedly.

Test No. 1:

(Spark Test):

Disconnect spark wire from spark plug and fasten wire in contact with bare metal of engine frame. Remove other end of spark wire from Terminal Plate (136) and twist end of wire so there will be no loose strands. Unscrew binding plug from terminal plate and hold end of wire in position shown in Figure XII. This gives a spark testing gap of about 5/16 inch between end of wire and the brass pin (31) inside terminal plate. Operate igniter and if the spark does not jump the test gap, proceed with Test No. 4. If a spark does jump the test gap, remove spark plug from engine, clean the plug, and make the gap between the spark points .015 to .025 inches as explained under "Spark Plugs." Then test as follows:—

Test No. 2:

(Spark Plug Test)

Replace spark wire in terminal plate. Attach other end of spark wire to spark plug. Place spark plug on bare metal of engine frame. See that spark plug terminal to which wire is attached does not touch frame. Operate igniter by turning flywheels. If plug does not spark it is defective (probably because insulator is cracked or broken) and must be replaced with a good plug.

If plug sparks, be sure it is clean and then replace it in engine and start as usual.

If engine does not start then, examine the spark wire and terminal plate for leakage as explained under Tests No. 5 and No. 6 and then start engine as usual.

If engine does not start then, put in a new spark plug.

If engine does not start then, the igniter may be firing at the wrong time. Proceed with Test No. 3.

Test No. 3:

(Timing Test):

To test time of firing, set quadrant with the timing wedge in the position shown in Figure I (Notch No. 1) or in the notch usually used for starting. Turn flywheels slowly in direction they should run until igniter fires, ("snaps"). If at that instant the crank has pushed the connecting rod as far as possible into the cylinder so that the crank and connecting rod lie nearly in one straight line, the igniter is firing at the proper time. If the timing is right the fact that the igniter will not now run the engine indicates a condition that can be remedied only by those who are equipped to overhaul the igniter thoroughly.

The engine will no doubt start and run if the timing is not just right and especially if the timing should not appear to be late.

If, however, the timing appears to be late, and probably so late as to cause trouble, proceed as follows:

Examine the connections between the eccentric and driving bar and take up all lost motion there, because lost motion will make the spark late. If the timing is still too late, set the quadrant with timing wedge in notch No. 2 and see where the igniter fires then. If the timing is still too late, the igniter must be set nearer the eccentric in the Type No. 1 Drive, while in the Type No. 2 Drive the connection between driving bar and eccentric must be lengthened. Be careful not to set the igniter so near the eccentric or to lengthen the eccentric rod so much that the travel mark (A) cannot be seen at edge of the igniter casing (See Figure V), because if travel mark is out of sight inside the casing the driving bar is so far in that the end of the latch may strike on the timing wedge spring stop (11) (See Figure VII).

Of course a late spark may be caused by the slipping of the eccentric if it is not fastened to the shaft with a key. If the eccentric has slipped it must be returned to its original position.

After the timing has been made right, start engine as usual. If engine does not run properly, the igniter should be fixed by those equipped to overhaul it thoroughly.

Test No. 4:

(Armature Test)

If no spark is seen when making Test No. 1, proceed as follows:—

Set quadrant with the timing wedge in the position shown in Figure I (Notch No. 1) or in the notch usually used for starting. Turn the flywheels in the direction that they will run, to make sure that the armatures are operating properly. If they are operating properly, a "click" will be heard at one end of stroke and a sharp "snap" at the other. If these are heard, proceed with Test No. 5.

If these sounds are not heard, examine the connections between the eccentric and the driving bar and take up all lost motion there, because lost motion may reduce the travel of the driving bar so much that it will neither latch on nor trip off in notch No. 1. Turn the flywheels again until the driving bar has been pushed into the igniter as far as the eccentric will carry it. Then advance the quadrant towards notch No. 6.

Failure to Trip:

If the igniter trips while the quadrant is being advanced, (causing the sharp "snap" referred to above) the driving bar is not being carried far enough into the igniter to trip in notch No. 1 and the igniter must be set nearer the eccentric in Type No. 1 Drive, while in Type No. 2 Drive, the connection between driving bar and eccentric must be lengthened. Be careful not to set the igniter so near the eccentric or to lengthen the eccentric rod so much, that the travel mark (A) cannot be seen at edge of the igniter casing (See Figure V).

Failure to Latch On:

If the quadrant can be moved to notch No. 6 without tripping the igniter, the driving bar is probably not latching on. Turn the flywheels until the driving bar is pulled out of the igniter as far as it will go. Then move igniter or adjust eccentric rod so that the Travel Mark (A) is just flush with the lower end of igniter (See Figure V).

If the igniter will not trip in notch No. 1 after setting the Travel Mark as above, the timing quadrant and timing wedge have become worn and must be renewed.

Loose Latch Block:

If the quadrant sticks while advancing it and cannot be moved by reasonable pressure of the hand, the latch block is probably loose. Take the igniter off the engine and fix the latch block as explained under "Replacements."

Worn Latch and Latch Block:

If only the "click" is heard, or if the "snap" does not always occur at the same point in the stroke when the flywheels are turned, the latch and latch block are worn and must be renewed as the driving bar is either not latching on or else the latch is slipping off the block at the wrong time instead of being tripped off by the timing wedge at the right time.

After making the adjustments that Test No. 4 shows to be necessary, repeat Test No. 1 and if igniter fails to spark, proceed with Test No. 5. If igniter sparks, start engine as usual. If engine will not start, proceed with Test No. 2.

Test No. 5:

(Spark Wire Leakage Test):

Examine the spark wire for leakage through its rubber insulation. The wire should be kept free from oil because oil will rot the rubber and then the spark will leak away before it reaches the spark plug. The wire should not touch any metal because if the rubber has become worn, or rotted by oil, the spark may jump to the metal instead of going to the plug.

If the spark may have been leaking through the rubber insulation of the spark wire, put on a new spark wire or arrange the wire so it does not touch the engine frame, then proceed with Test No. 6.

Test No. 6:

(Terminal Plate Test):

Examine the Terminal Plate (136), (See Figure II) to make sure that the bare end of the spark wire makes good contact with the brass plate, under the binding plug (49) of the terminal, and that the rubber insulation of the spark wire extends into the terminal as shown in Figure VI. The binding plug should be tightened with the fingers, do not tighten with pliers or a wrench. Remove all dirt and oil from the terminal plate. If the terminal plate is cracked or broken it should be renewed as soon as possible but a crack, especially across the corners, may not cause spark leakage.

After making this examination, repeat Test No. 1 and if the spark does not jump, proceed with Test No. 7. If the spark jumps the test gap, start engine as usual. If engine does not start, proceed with Test No. 2.

Test No. 7:

(Broken Lead Test):

Remove the cover from the igniter as explained under "Replacements." See that the wire connection (33) (See Figure II-A) between the coils has not broken loose from either coil. If it has broken loose, use a soldering iron to fasten it back in place. DO NOT APPLY A TORCH TO THE COILS to resolder this connection as the coils will be injured by so doing. Proceed with Test No. 8.

Test No. 8

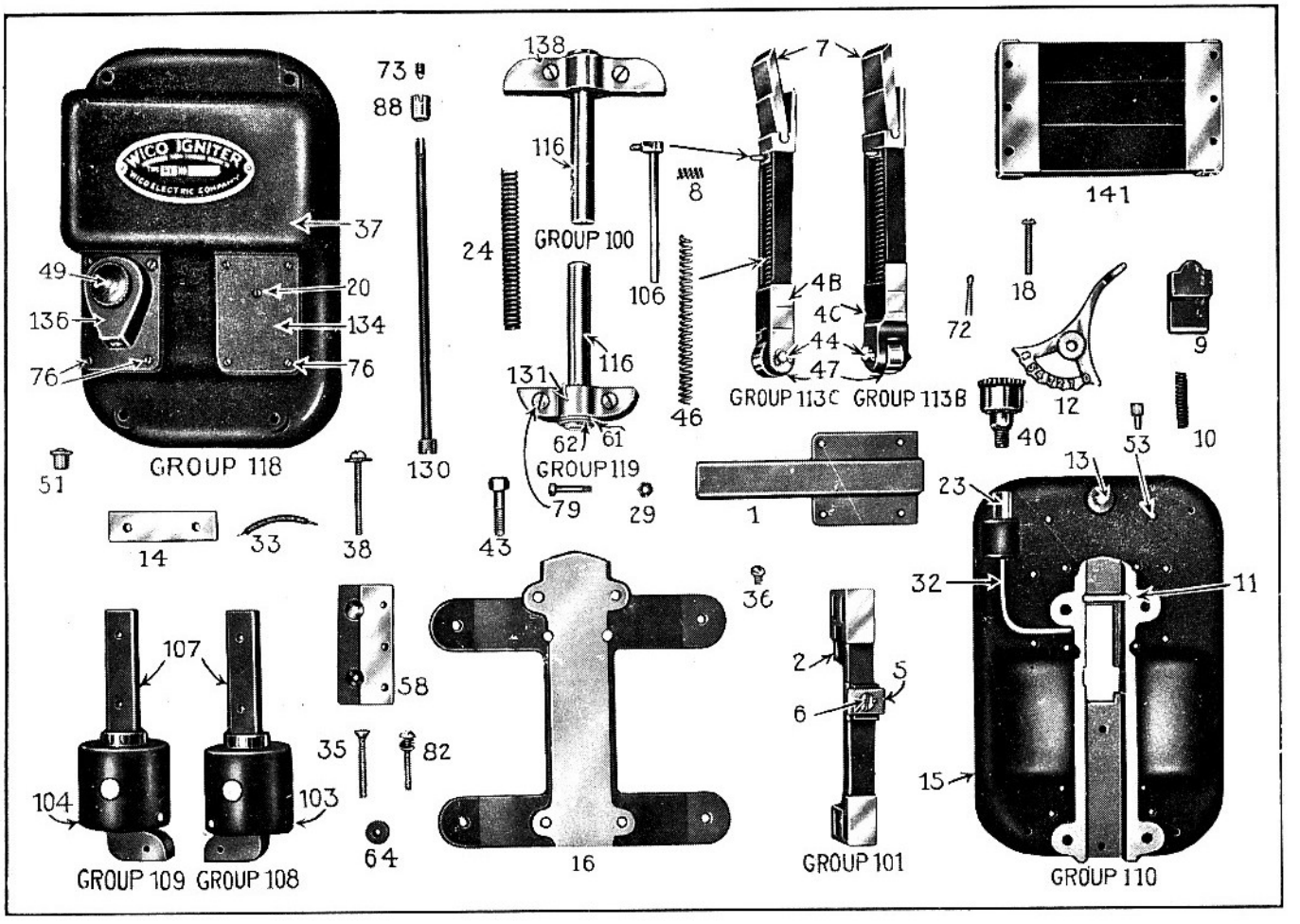
(Inside Test):

Hold one end of spark wire against one contact button (60), (Figure II-A). Hold other end of spark wire ¼ inch to ⅜ inch from other contact button. Operate igniter and if a spark does not jump from contact button to spark wire, the igniter should be repaired by those who are equipped to overhaul it thoroughly. Return it as explained on last page of this book. If a spark does jump from contact button to spark wire, replace the cover carefully so that the gasket will not be disturbed and so that the contact springs (94) will strike the contact buttons (60) on the coils. Repeat Test No. 1. If no spark is made when Test No. 1 is repeated, there is leakage in the spark wire or in the Terminal Plate (136). Proceed with Test No. 9.

Test No. 9:

(Final Test):

Put in new spark wire, and renew terminal plate (if cracked), and repeat Test No. 1. If no spark is seen, the igniter should be returned for repair as instructed below. If spark is seen when Test No. 1 is made, connect spark wire to spark plug. Make sure that fuel mixture is correct and that no engine parts are broken or failing to operate. Start engine as usual. If engine does not start, proceed with Tests No. 2 and No. 3.



WICO MODEL R PARTS LIST

Part No.	Name	Price
IRA-1	Armature Bar Guide	$ .60
IRB-2	Armature Bar	3.50
IRB-3	Cover Screw Washer	.05
IRB-4	Driving Bar (Only)	2.90
IRA-5	Latch Block	.35
IRA-6	Latch Block Screw	.05
IRA-7	Latch	1.25
IRA-8	Latch Spring	.05
IRA-9	Timing Wedge	1.35
IRA-10	Timing Wedge Spring	.05
IRA-11	Timing Wedge Spring Stop	.05
IRA-12	Timing Quadrant $\frac{1}{16}$" lift	.90
IRA-13	Pin for Timing Quadrant	.15
IRA-14	Pole Piece Base	.40
IRB-16	Back Plate	2.30
IRA-17	Magnet	.75
IRA-18	Magnet Screw	.05
IRA-19	Keeper	.55
IRB-19	Keeper Group	.95
IRA-23	Extension for Grease Cup	.35
IRD-24	Armature Spring	.55
IRB-29	Armature Bolt Nut	.05
IRA-32	Grease Tube	.30
IRD-33	Secondary Interlead	.15
IRA-35	Pole Piece Screw	.10
IRA-36	Armature Bar Guide Screw	.05
IRC-37	Cover	3.75
IRA-38	Cover Screw	.10
IRAX-38	Cover Screw Group	.10
IRB-40	Grease Cup	.35
IRA-43	Back Plate Screw	.05
IRA-44	Driving Bar Roller Pin	.30
IRB-46	Driving Bar Spring	.20
IRA-47	Driving Bar Roller	.35
IRC-49	Lead Wire Connection Plug	.20
IRA-52	Gasket (Cover)	.15
IRA-53	Armature Guide Button	.15
IRB-58	Pole Piece	.90
IRB-61	Armature Stud Fibre Washer	.05
M-61X	Lockwasher	.05
IRB-62	Armature Stud Steel Washer	.10
IRA-63	Driving Bar Spring Rod	.30

Part No.	Name	Price
IRA-64	Core Washer	$ .05
IRA-65	Lead Wire Terminal	.10
IRA-68	Driving Bar Spring Guide Head	.55
IRA-72	Roller Cotter Pin	.05
IRA-73	Locking Screw for Armature Retaining Rod	.05
IRD-74	Name Plate	.30
IRC-76	Screw for Terminal and Ground Plates	.05
IRA-79	Armature Bolt	.05
IRA-81	Replaced with M-61X	
IRA-82	Core Screw	.05
IRB-88	Nut for Armature Retaining Rod	.15
IRC-94	Terminal Spring	.05
IRCX-100	Long Armature and Stud Group	3.50
IRBX-101	Armature Bar Group	3.85
IREX-103	Coil Group R. H.	2.90
IREX-104	Coil Group, L. H.	2.90
IRAX-106	Driving Bar Spring Guide Rod Group	1.20
IRAX-107	Core Plate Group	1.95
IREX-108	Coil and Core Group—R. H.	4.75
IREX-109	Coil and Core Group—L. H.	4.75
IRCX-110	Case Group	7.80
IRBX-113	Driving Bar Group (No. 2 Drive "Side")	6.40
IRCX-113	Driving Bar Group (No. 1 Drive "Front" Roller)	6.40
IRDX-113B	Driving Bar Group (Pin—No Roller)	6.00
IREX-113C	Driving Bar Group (Pin—No Roller)	6.00
IRCX-116	Armature Stud Group	2.20
IRCX-118	Cover Group	5.40
IRCX-119	Armature Group and Stud (Short)	2.90
IRAX-121	Lead Wire Group 24"	.85
IRBX-121	Lead Wire Group (Double Term.) 24"	.95
IRAX-130	Armature Retaining Rod Group	.40
IRAX-131	Armature Group (Short)	1.15
IRBX-134	Ground Plate Group	.60
IRDX-136	Terminal Plate Group (Revers. Joseph Reid)	.90
IREX-136	Terminal Plate Group	.90
IRFX-136	Terminal Plate Group (Superior Eng.)	1.15
IRAX-138	Long Armature Group	1.25
IRAX-141	Magnet Group	6.95

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