PIERCE-ARROW SOCIETY

SERVICE BULLETIN

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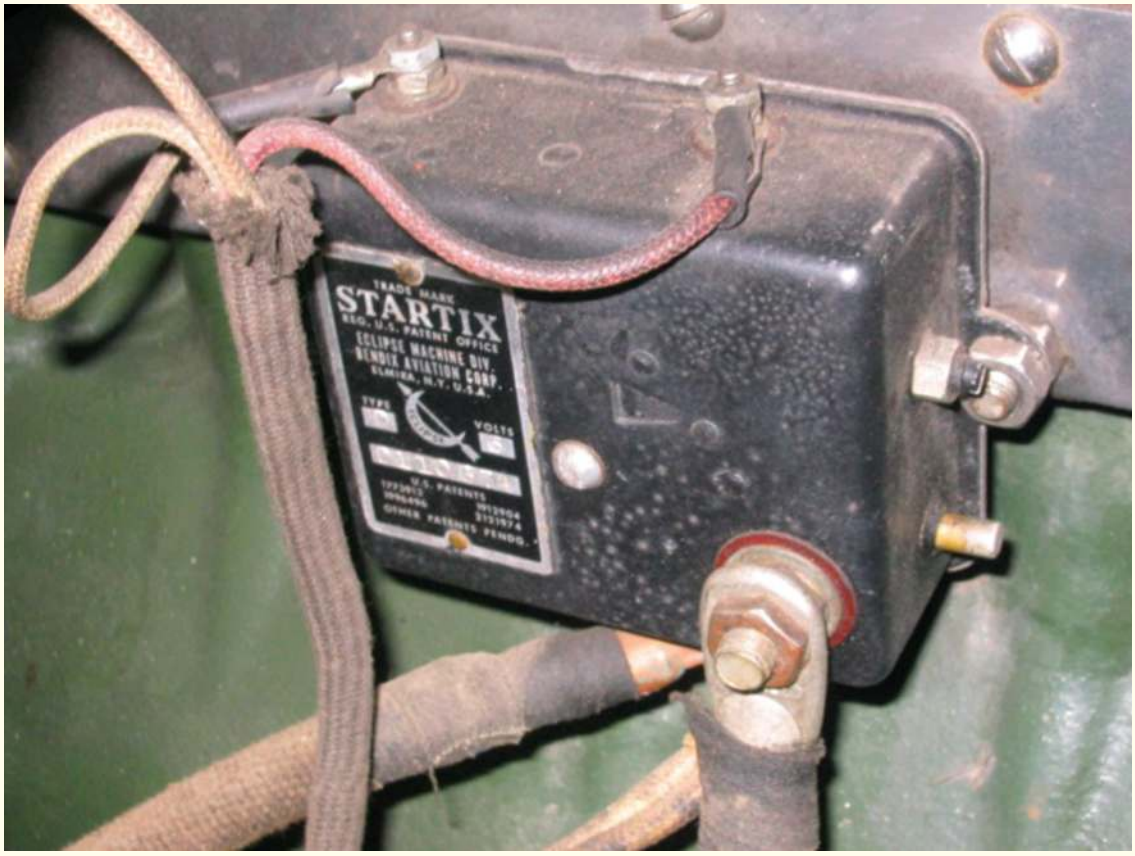
(Reprinted from PASB 72-5 plus additional information)

Editor's Note: The first portion of this Service Bulletin is from ***Bulletin S-23, Eclipse Machine Division, Bendix Aviation Corp., Elmira, N.Y.*** *and is reprinted from PASB 1972-5. Following that section is similar troubleshooting information from another Eclipse Machine Bulletin in a table format that some may find easier to use. Thank you to Bob Koch for the additional troubleshooting information.*



The Startix, used on Pierce-Arrows from 1932 until 1938, is an electrically operated starting switch, which requires but the turning of the ignition key to the "on" position to crank the engine. In addition, the Startix is an electrically operated anti-stall device, which automatically restarts the engine should the motor, for any reason, stop while the ignition switch is in the "on" position. Cars equipped with the Startix device do not require the use of the conventional foot starting switch, or an instrument board button.

TECHNICAL SERVICE DATA ~ Bulletin S-23 (ca. 1934)

This bulletin has been compiled to assist all authorized Startix service stations to quickly and correctly diagnose apparent Startix failures. It is assumed that service men following the procedure outlined herein are familiar with and understand the fundamental principles of Startix design and operation. This is technically described in bulletin S-7.

Do not attempt to make any Startix adjustment except to obtain proper cranking and only then as outlined hereafter. The cranking adjustment is made by turning screw "J" in or out slightly. This decreases or increases the air gap between the end of the adjustment screw "J" in the core of hold-out coil "D" and the relay solenoid plunger. Although this adjustment is sensitive and may require only a very slight turning of the screw to obtain proper cranking adjustment, no difficulty should be experienced if directions are carefully followed.

Under no circumstances attempt any adjustment of the Startix time delay.

Before making any further investigation or attempting any Startix adjustment be sure that all connections are correctly made, tight, clean and that Startix is well grounded.

It is further recommended that service men follow the procedure under heading of "Bench Testing of Startix" as outlined in General Service Bulletin S-12.

Startix Troubleshooting and Repair Guide

Points to Observe -

The operation of Startix is based on fundamental principles. Being connected to the starting motor, generator, relay, and battery, it is important to have these various units in good condition and properly functioning. *Therefore, before criticizing or removing Startix because of unsatisfactory performance, a careful inspection of these units should be made checking all connections --- see that they are tight, clean, and correctly made as follows:*

Starting Motor ---

1. Is commutator surface clean?
2. Do brushes have proper contact? Should they be replaced?
3. Check ampere draw in free-running position. If in excess of 70 amperes, look for internal trouble.
4. Is the armature end play in excess of the manufacturer's specification?

Generator ---

1. Is commutator surface clean?
2. Do brushes have proper contact? Should they be replaced?
3. Check charging rate, especially its uniformity.
4. If belt drive, check for belt slippage or worn-out belt.

Generator Relay (Cut-Out) ---

1. Is Startix connected to generator side of relay? If not, change it. If correct, make certain that connection at this point is not grounded.
2. Do the relay points open and close at proper time?
3. If voltage regulator is used, Startix must be connected to the armature terminal.

Starter-Ground Connections ---

Is Startix properly grounded? . . . If Startix is mounted on a bracket assembled to engine, this serves as a ground and no wire is required. Be sure that

paint or other non-conductors are not insulating.

Battery ---

1. Are the binding posts and terminals clean? Are all connections tight, including ground strap?
2. Is the battery charge sufficient to crank the engine? Startix, or any other starting switch, will not operate with a "dead" battery.

Suggested Procedures For Tracing Down Apparent Startix Failure By Analyzing Startix Behavior

SYMPTOM:

I. Ignition key turned on and no action is heard.

CHECKS TO BE MADE (and procedure for tracing & correcting):

A. See that key is fully turned on and in correct direction. (Some cars are equipped with a two-position switch. One side for "Startix and Ignition", and the other for "Ignition" only. Turn to "Startix and Ignition". If car is equipped with an auxiliary switch, be sure that it is "on".).

B. Set up vibration either by slamming car door, stamping floor boards with feet, striking steering wheel with palm of hand, or lightly tapping Startix with screw driver handle. Retained in the unit, check "B" usually causes plunger to release. Should failure of this nature be frequent, replace Startix).

C. Turn ignition key off and on. Note if click is heard. (If no click is heard, it indicates that main switch plunger is not pulled in, therefore contacts "C" are not closed.

The cause may be:

1. No current to Startix "IGN" terminal. Remove lead and see if alive. If not, trace and correct.
2. Short circuit in main switch solenoid, indicated by excessive current flow. Normal is one amp. Replace Startix.
3. Open circuit in main switch coil, indicated by no current flow at "IGN" terminal if lead is alive Replace Startix).

D. Dead battery. (Turn headlights on and note if they go very low or out when ignition key is turned off and then on again.)

E. Remove lead from Startix "GEN" terminal. (If relay plunger then releases, current is flowing through winding "E". Should only flow when engine is running. This holds plunger in, causing contacts "H" to remain open. Trouble is due to improper connection at cut-out, or a leak from battery through cut-out.)

F. Connect jumper across terminals of circuit controller. (If the circuit controller is defective, the circuit to Startix is open and the addition of the jumper will permit Startix to operate. Replace circuit controller.)

SYMPTOM:

II. Ignition key turned on. Single click is heard but starting motor does not crank engine.

CHECKS TO BE MADE (and procedure for tracing & correcting):

A. Connect heavy jumper between Startix "BAT" and "SM" terminals. Use starting cable. (If starting motor cranks engine, mis-aligned contacts at "C" is indicated. If starting motor does not crank engine, trace trouble from battery through starting motor and correct.)

SYMPTOM:

III. Ignition switch turned on, starting motor does not crank engine, and a series of clicks at about one second interval is heard until key is turned off.

CHECKS TO BE MADE (and procedure for tracing & correcting):

A. Bad or insulated connections to starting motor. (Startix continuously going through its cycle of operation as indicated by the clicking described indicates an open starting motor circuit.)

B. Manual switch on starting motor. (If Startix has been installed as an accessory, examine switch which was blocked out.)

SYMPTOM:

IV. Ignition key turned on, starting motor spins but Startix cuts out before Bendix Drive engages flywheel, repeating until key is turned off.

CHECKS TO BE MADE (and procedure for tracing & correcting):

A. Bendix Drive. (Examine Bendix Drive for broken spring, spring screw; or gummy and dirty screw shaft.)

SYMPTOM:

V. Ignition key turned on, Bendix Drive is heard to engage flywheel but engine is not cranked.

CHECKS TO BE MADE (and procedure for tracing & correcting):

A. Examine for Bendix pinion stuck in flywheel, seized engine, etc. (TURN IGNITION KEY OFF. Place car in high gear and rock back and forth to release pinion.)

SYMPTOM:

VI. Ignition key is turned on, starter attempts to crank and if engine does start, starting motor continues to over run, in some cases with a fluttering of main switch contacts.

CHECKS TO BE MADE (and procedure for tracing & correcting):

A. Check Startix ground. (Startix must have a good ground. If dash mounted, a lead from underside of mounting ear to engine or frame in recommended.)

B. Startix improperly connected to ignition coil. (If ground connection is O.K., Startix is connected to wrong side of ignition coil.)

SYMPTOM:

VII. Ignition key turned on, starting motor makes two or more attempts to crank engine before continuous cranking is accomplished. (Do not confuse with condition noted in paragraph VIII.)

CHECKS TO BE MADE (and procedure for tracing & correcting):

A. Check for low battery. (A low battery that will start the engine may in some cases cause this action. If the starting motor terminal voltage when free spinning is below 4.8 volts, replace battery.)

B. Dirty or gummy Bendix Drive. (Wash thoroughly in kerosene. Apply thin film of light oil.)

C. Check starting motor commutator. (In some cases, a gummy or dirty commutator will produce this condition. Clean the commutator. Weak starting motor brush spring tension also causes this action.)

SYMPTOM:

VIII. Ignition key turned on, starting motor does not crank engine continuously.

CHECK TO BE MADE (and procedure for tracing & correcting):

A. Adjust Startix. (Remove wire connected to Startix "GEN" terminal. Turn ignition on, loosen lock nut on adjusting screw "J" and decrease air gap by turning screw SLOWLY clockwise until a point is reached where starting motor just begins to spin continuously after the engine starts. Then turn adjusting screw 1/8th turn in counter-clockwise direction. Tighten lock nut and reconnect wire.

Note: Turning screw "J" too far clockwise will cause arm "G" to raise weight "B" and open points "H" rendering solenoid circuits "A inoperative.)

SYMPTOM:

IX. Ignition key turned on, starting motor continues to spin after engine starts.

CHECKS TO BE MADE (and procedure for tracing & correcting):

A. Adjust Startix. Remove wire connected to Startix "GEN" terminal, turn ignition on. Loosen lock nut on starting adjustment screw "J" and increase air gap by turning screw SLOWLY anti-clockwise until a click is heard indicating opening of contacts "C". From this point, turn adjusting screw a further 1/8th turn in counter-clockwise direc-

tion. Tighten lock nut and reconnect wire. If Startix has been working properly and adjustment not previously changed, over-run is probably caused by low battery, or a condition in the starting motor causing excessive current draw when free spinning. Normally this should not be in excess of 70 amps. Trace and correct. Note: If continued or steady cranking without over-run cannot be obtained, examine Startix ground connections. When engine is rubber- mounted, pay particular attention to connection between engine leg and car frame.)

B. Check circuit "F" --- Startix relay solenoid winding. (Disconnect lead at Startix "SM" terminal and turn ignition key on. Startix should go through entire operating cycle producing a series of clicks at about one second intervals until key is turned off. If but one click is heard, winding "F" is defective and Startix should be replaced.)

SYMPTOM:

X. Startix cuts in while engine is running at any speed.

CHECK TO BE MADE (and procedure for tracing & correcting):

A. Generator inoperative. (Disconnect lead at Startix "GEN" terminal. Connect jumper between Startix "BAT" and "GEN" terminals. If this corrects condition, the trouble lies in the generator or in circuit from generator to Startix. Trace and correct. If Startix still cuts in, replace Startix.)

SYMPTOM:

XI. Startix cuts in only at low engine speeds.

CHECK TO BE MADE (and procedure for tracing and correcting):

A. Check Startix ground connections. (If O.K., proceed with check "B").

B. Generator commutator or brushes in poor condition. (Check generator charging rate, condition of commutator, and brushes.If these are O.K. and this condition cannot be eliminated without excessive engine idling speed, replace Startix.)

The following information, from Bulletin S-12, Eclipse Machine Company, subsidiary of Bendix Aviation Corp., is also included for your information, though slightly abridged.

Bench Testing of Startix Electrical Circuits ---

If Startix has been removed from the car and it in desirable to make a quick test of the various Startix circuits for shorts, grounds, or open circuits without removing the cover, proceed as follows:

Connect a lead from a battery to one of the Startix mounting ears for a ground. Connect another lead from the battery to Startix BATT terminal.

Now connect a jumper between Startix BATT and IGN terminals. This energizes both solenoids and the complete cycle of Startix operation should occur. First, the main

switch closes, then the relay solenoid plunger in pulled in, which breaks the main switch circuit. This is followed by the releasing of the relay solenoid and the time delay occurs, after which the cycle is repeated. This cycle is readily identified by the reoccurring buzzing sound of the time delay mechanism.

To check generator circuit of the relay solenoid, leave the above jumper and connect another jumper between Startix BATT and GEN terminals. This should cause the cycle of operation to stop. Upon removing jumper lead at Startix GEN terminal, the cycle of operation should resume.

If Startix does not perform in this manner, it is reasonable to assume that internal difficulties exist. The Startix should be returned to the factory.

In making this test, use a battery reasonably well charged, be sure that a good ground is established and that all connections are tight.

Startix Adjustments ---

The time delay adjustment is properly set at the factory and under no circumstances is it ever to be changed. On Startix manufactured up to December 1933, the screw for this adjustment was on the top of the Startix and the lock nut sealed. Breaking of this seal voids Startix warranty. Startix manufactured since December 1933 incorporate an internal adjustment which cannot be changed without special tools and requires removing the cover. This also voids Startix warranty.

Cranking Adjustment ---

The operating principle that causes the starting motor to be disconnected when the engine starts is based on the difference in starting motor current drawn when it is cranking and when not cranking. The cranking adjustment screw provides a means of correcting any variation in the difference between these two current values by either increasing or decreasing the air gap between the end of the adjusting screw and the relay coil plunger.

The correct adjustment of this screw also is made at the factory and usually does not require changing. Indications that a slight change may be necessary will be evidenced by either of two distinctly different conditions, namely ---

1. Interrupted cranking.
2. Starting motor overrun after engine has started.

Before attempting to change the original setting, make certain there are no other factors responsible for the apparent unsatisfactory Startix performance.

Welding of Main Switch Contacts ---

This condition in evidenced by continued cranking after the key is turned off, the auxiliary button is used or immediately upon connecting a fresh battery. If the battery is in good condition, welding of the main switch contacts is caused by a poorly grounded Startix or through the improper operation of the auxiliary button. When the battery is very low or the Startix poorly grounded, the main switch plunger will be pulled in weakly, resulting in light contact pressure.

To break the main switch contacts loose, it is only necessary to depress the auxiliary button fully and slide the finger off sideways to permit the button to snap out.

Auxiliary Starter Button ---

The auxiliary starter button located on the side of Startix is primarily intended to be used for cranking (ignition key "off") or starting the engine when setting tappets or making other engine adjustments. But, if Startix should fail to operate when ignition is turned "on", starting can be accomplished by leaving the ignition "on" and using the auxiliary starter button. The method of operation is very important. Press the button HARD and UNTIL SOLIDLY BOTTOMED and RELEASE QUICKLY --- let the finger slip off the side of the button. Should the starting motor continue to spin after releasing the button, press it HARD again and release QUICKLY. (Be sure the car is not in gear.)

Generator Failure and Unintentional Startix Operation ---

If the generator becomes inoperative while the car is being driven, Startix acts as a warning signal to the driver or generator trouble or faulty generator connection, and a periodical clicking sound results. This is the meshing contact of the drive pinion against the flywheel gear. This does no harm to the pinion or the flywheel because of the automatic principle of the Bendix Drive, but it can be prevented until an electrical service station is reached and generator repaired by disconnecting the small wire at terminal on top of Startix marked "IGN" and taping the loose end. If there is a short in the wire to this relay, the same condition will result. A similar sound may occasionally be heard when the engine is idling, which may result from too slow an engine idling speed, a gummed generator commutator, or a poor ground connection. Try advancing idling speed a little, clean the commutator with sandpaper, and check ground connections.

Thermostatic Safety Device ---

If, for any reason, the Bendix pinion should fail to release from the flywheel teeth and the ignition is unintentionally left "on", Startix automatically protects the starter system by a thermostatic control which opens the circuit momentarily after approximately ½ to 1 minute. From then until the ignition is turned "off", the circuit is repeatedly opened and closed and warns with a distinctive clicking sound that the ignition should be turned "off". No adjustment of Startix in necessary after the thermostat has been in action.

Low Battery ---

With a very low battery and certain starting motor conditions, the Startix relay plunger may not pull in at the time of engine firing and generator charging. This results in a prolonged spinning of the starting motor the same as when over- run occur.

By speeding up the engine, the resultant higher charging rate of the generator will pull in the relay plunger and stop starting motor spinning. Do not confuse this condition with starting motor overrun and attempt to move the starting adjusting screw to overcome it. This is a warning of a very low battery charge, and recharging of the battery is the proper remedy. If the battery ever reaches the point where it will not crank the engine and the car is started by towing or pushing, it is advisable to disconnect the small wire at the terminal on top of Startix marked "IGN". This permits the ignition to be turned “on” but makes the Startix inoperative.

General Service Suggestions ---

If Startix fails to operate upon turning the ignition key "on", it may indicate a loose battery connection, a dead battery, or a loose connection to the "IGN" terminal on top of Startix. It may also indicate that the generator cut-out points fail to open when the engine stops or is stalled and

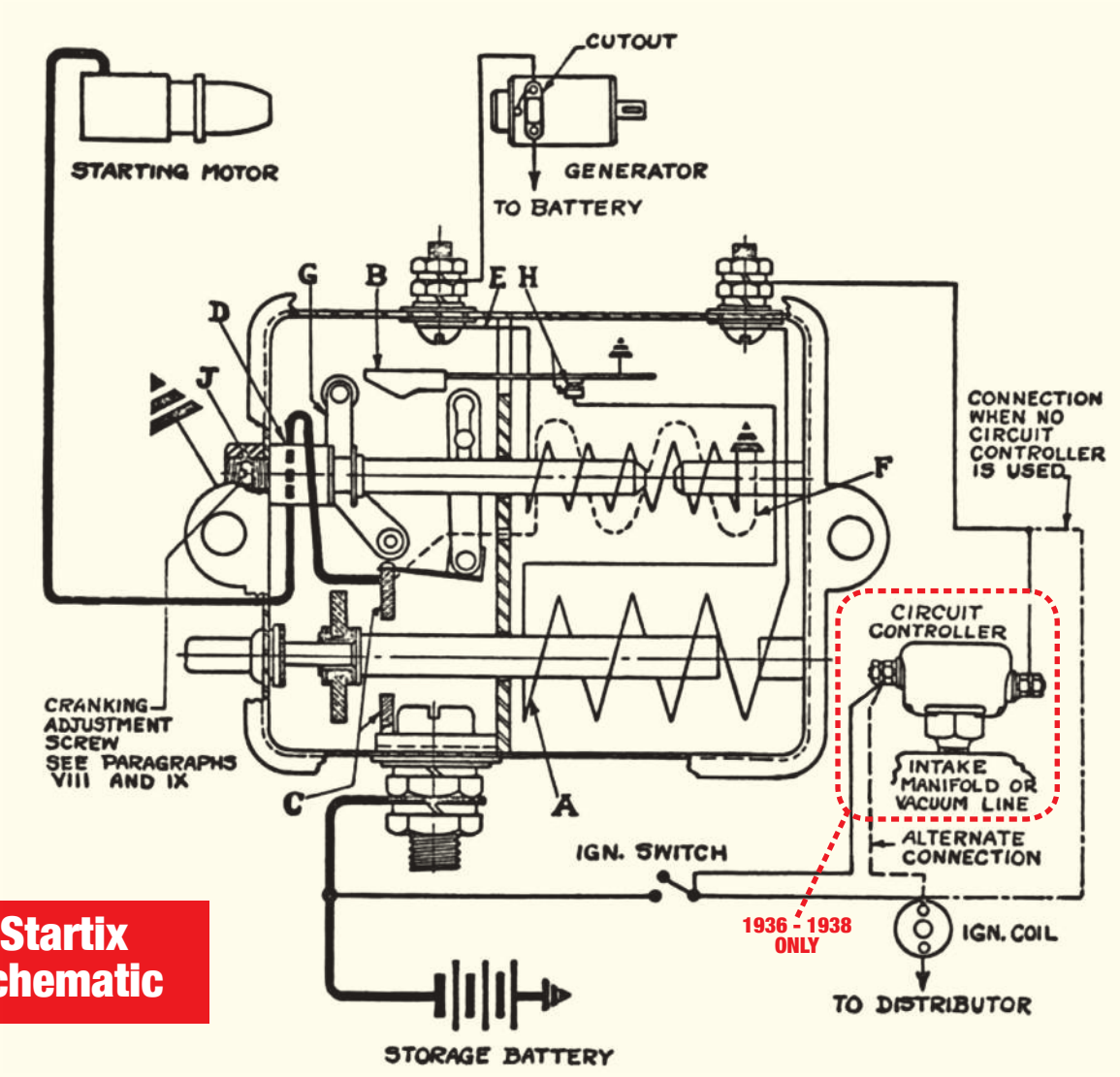
current would then be flowing back through the cut-out and into the Startix relay coil. Consequently, the Startix relay coil plunger is not released which means that the main switch circuit is held open. Check by turning ignition "off" and seeing if grounding or disconnecting the lead from the generator to Startix releases the relay plunger. Perhaps a slight tapping of the cut-out will be sufficient.

In the event that the STARTING MOTOR or BENDIX DRIVE ARE COMPLETELY INOPERATIVE, such as a burnt-out armature or broken drive spring, and hand-cranking is necessary for starting, disconnect the small wire at "IGN" terminal on top of Startix. This allows the ignition to be turned "on" without Startix operation.

If ENGINE TIMING IS INCORRECT thereby causing backfiring and considerable backfire rotation of the engine, the automatic time delay of Startix, which prevents meshing of Bendix pinion while engine is backrocking, may not prove strong enough to avoid overloads on starting motor and drive. Under such conditions, have timing corrected IMMEDIATELY!!!

In washing the engine or cleaning the engine compartment, avoid directing a stream of water at Startix or washing it with water.

Cars equipped with Startix ***SHOULD NEVER BE LEFT IN GEAR***. Be sure this and also the method of auxiliary starting is thoroughly understood by the car owner.



Startix schematic

Suggested Procedure for Tracing Down Apparent Startix Failure by Analyzing Startix Behavior

SYMPTOMS	CHECK TO BE MADE	PROCEDURE FOR TRACING & CORRECTING
I. Ignition key turned on and no action is heard.	A. See that key is fully turned on and in correct direction.	Some ears are equipped with a two position switch. One side for "Startix and Ignition," the other for "Ignition" only. Turn to "Startix and Ignition." If car is equipped with an auxiliary switch be sure that it is "on."
	B. Set up vibration either by slamming car door, stamping floor boards with feet, striking steering wheel with palm of hand or lightly tapping Startix with screw driver handle.	Under certain conditions relay plunger may not release when engine comes to rest. If this happens due to an excess of magnetism retained in the unit, check "B" usually causes plunger to release. Should failure of this nature be frequent, replace Startix.
	C. Turn ignition key off and on - note if click is heard.	If no click Is heard, it indicates that main switch plunger is not pulled in, therefore contacts "C" are not closed. The cause may be: 1. No current to Startix "Ign" terminal. Remove lead and see if alive. If not, trace and correct. 2. Short circuit in main switch solenoid, indicated by excessive current flow. Normal is 1 amp. Replace Startix. 3. Open circuit in main switch coil - indicated by no current flow at "IGN" terminal if lead is alive. Replace Startix.
	D. Dead Battery	Turn headlights on and note if they go very low or out when ignition key is turned off and then on again.
	E. Remove lead from Startix "Gen" terminal.	If relay plunger then releases, current is flowing through winding "E" (should only flow when engine is running). This holds plunger in, causing contacts "H" to remain open. Trouble is due to improper connection at cutout or a leak from battery through cut-out.
	F. Connect jumper across terminals of circuit controller.	If the circuit controller is defective the circuit to Startix is open and the addition of the jumper will permit Startix to operate. Replace circuit controller.
II. Ignition key turned on— single click is heard but starting motor does not crank engine.	Connect heavy jumper between Startix "Bat" and "SM"terminals. (Use starting cable).	If starting motor cranks engine, misaligned contacts at "C" is indicated. If starting motor does not crank engine, trace trouble from battery through starting motor and correct.
III. Ignition key turned on, starting motor does not crank engine and a series of clicks at about one second interval is heard until key is turned off.	A. Bad or insulated connections to starting motor. B. Manual switch on starting motor.	Startix continuously going through its cycle of operation as indicated by the clicking described indicates an open starting motor circuit. If Startix has been installed as an accessory, examine switch, which was blocked out.
IV. Ignition key turned on, starting motor spins but Startix cuts out before Bendix Drive engages flywheel, repeating until key is turned off.	Bendix Drive.	Examine Bendix Drive for broken spring, spring screw; or gummy and dirty screw shaft.

SYMPTOMS	CHECK TO BE MADE	PROCEDURE FOR TRACING & CORRECTING
V. Ignition key turned on, Bendix Drive is heard to engage flywheel but engine is not cranked.	Examine for Bendix pinion stuck in flywheel, seized engine, etc.	TURN IGNITION KEY "OFF". Place car in high gear and rock back and forth to release pinion.
VI. Ignition key is turned on, starter attempts to crank and if engine does start, starting motor continues to over run, in some cases with a fluttering of main switch contacts.	A. Check Startix ground. B. Startix improperly connected to ignition coil.	Startix must have a good ground. If dash mounted, a lead from under side of mounting ear to engine or frame is recommended. If ground connection is OK, Startix is connected to wrong aide of ignition coil.
VII. Ignition key turned on, starting motor makes two or more attempts to crank engine before continuous cranking is accomplished. (Do not confuse with condition noted in paragraph VIII).	A. Check for low battery. B. Dirty or gummy Bendix drive. C. Check starting motor commutator.	A low battery that will start the engine may in some cases cause this action. If the starting motor terminal voltage, when free spinning is below 4.8 volts, replace battery. Wash thoroughly in kerosene - apply thin film of light oil. In some cases a gummy or dirty commutator will produce this condition. Clean the commutator. Weak starting motor brush spring tension also causes this action.
VIII. Ignition key turned on, starting motor does not crank engine continuously.	Adjust Startix.	Remove wire connected to Startix "Gen" terminal. Turn ignition on, loosen lock nut on adjusting screw "J" and decrease air gap by turning screw SLOWLY clockwise until a point is reached where starting motor just begins to spin continuously after the engine starts. Then turn adjusting screw l/8th turn in counter clock direction. Tighten lock nut and reconnect wire. *Note: Turning screw "J" too far clockwise will cause arm "G" to raise weight "B" and open points "H" rendering solenoid circuit "A" inoperative.*
IX. Ignition key turned on, starting motor continues to spin after engine starts.	A. Adjust Startix. B. Check circuit "F - Startix relay solenoid winding.	Remove wire connected to Startix "Gen" terminal, turn ignition on. Loosen lock nut on starting adjustment screw "J" and increase air gap by turning screw SLOWLY anti-clockwise; until a click is heard indicating opening of contacts "C". From this point, turn adjusting screw a further 1/8th turn in counter-clock direction. Tighten lock nut and reconnect wire. If Startix has been working properly and adjustment not previously changed, over-run is probably caused by low battery, or a condition in the starting motor causing excessive current draw when free; spinning. Normally this should not be in excess of 70 amps. Trace and correct. Note: If continued or steady cranking without over-run cannot be obtained, examine Startix ground connections. When; engine is rubber mounted, pay particular | attention to connection between engine leg and car frame. Disconnect lead at Startix "SM" terminal and: turn ignition key "on." Startix should go through entire operating cycle producing a series of clicks at about one second intervals until key is turned off. If but one click is heard, winding "F" Is defective and Startix should be replaced.

SYMPTOMS	CHECK TO BE MADE	PROCEDURE FOR TRACING & CORRECTING
X. Startix cuts in while engine is running at any speed.	Generator inoperative.	Disconnect lead at Startix "Gen" terminal. Connect jumper between Startix "Bat" and "Gen" terminate. If this corrects condition the trouble lies in the generator or in circuit from generator to Startix. Trace and correct. If Startix still cuts in, replace Startix.
XI. Startix cuts in only at low engine speeds.	A. Check Startix ground connections. B. Generator commutator or brushes in poor condition.	If okeh, proceed with check "B." Check generator charging rate, condition of commutator and bruehes. If these are okeh and this condition cannot be eliminated without excessive engine idling speed, replace Startix.

Servicing the Automatic Circuit Controller

Several makes of cars are standardly equipped with an automatic circuit controller, the function of which is to break the circuit from the ignition switch to Startix in case of backward rotation of the engine whether due to backfire or backward movement of the car when in forward gear. The operating principle is based on the presence of pressure in the intake manifold at the time of backward engine rotation. The controller consists of a cylinder and piston, a thermostatic device and two sets of contact points, one of which is closed during normal operation permitting current to flow from the ignition switch to Startix.

When a backfire or reversed engine rotation **occurs,** the resulting pressure in the intake manifold forces the piston upwards thereby raising a bimetallic strip and grounding it through a second set of points. The grounded current through the bimetallic strip causes it to heat and deflect upward thereby breaking the circuit from ignition to Startix. Continued backward rotation prevents cooling of the strip until such time as the reversed rotation ceases, after which the piston returns to its original position, the bimetallic strip cools and Startix automatically restarts the engine.

Certain precautions should be observed in installing this device:

1. The controller should be screwed into the manifold by hand only to a light finger tight fit Final tightening should be lightly done with a wrench on the hex. Do not apply a wrench to the outside of the controller for screwing into the manifold.
2. The terminals must be connected in accordance with the stamping on the cover. The terminal stamped "Startix" is for the lead to Startix and the other one stamped "Ignition" is for the lead to the ignition switch. If these are reversed, the bimetallic strip will be burned out between the silver and tungstein points attached to it, permanently opening the Startix circuit.
3. When attaching leads, terminal nuts should be turned down only to a reasonable tightness. If a socket wrench is used care should be exercised not to push in on the nut hard enough to bend the terminal ear. Excessive pressure inward against the terminals may cause distortion which will change the adjustment.

The service policy now in force for Startix also applies to the circuit controller, ie., warranty under standard N.A.C.C. agreement and all defective ones to be replaced and returned as complete units to the factory. No field repairs or adjustments are to be attempted.

In diagnosing difficulty which is suspected to be within the controller resulting in failure of Startix to operate or to definitely determine where the trouble is, it is only necessary to wire around the device. If Startix then operates it is reasonable to assume the trouble is in the circuit controller and the defective unit should be replaced.