Running Board News

OFFICIAL PUBLICATION OF THE EAST VALLEY MODEL T FORD CLUB
JUNE 2005 **Volume 2 Issue 6**

Applications for membership in the EVMTFC may be obtained from any current member or from the Vice President/ Membership Chairman Joe Fellin at (480) 288-6463. Dues are $20.00 per year and include all family members.

The East Valley Model T Ford Club is affiliated with and is a chapter of The Model T ford Club of America (MFTCA), a national and international organization. Membership in The MFTCA includes six issues of **The Vintage Ford** and a vote for the Board of Directors. Dues are $26.00 annually. Membership is strongly encouraged. Direct correspondence to:

The Model T Ford Club of America
P.O. Box 126, Centerville, IN 47330
(756) 855-5248 FAX (765) 855-3428
e-mail:

NATIONAL EVENTS

July 17-22, 2005 Cochrane, Alberta, Canada. The Foothills Model T Ford Club will host Prairies and Peaks Centennial T Tour, an MFTCA National Tour. For more info contact Ross Benedict, (402) 286-4699. Email: rbmanagement@shaw.ca
This tour is sold out.

August 14-20, 2005 Estes Park, CO. The Mile High Chapter in Denver, CO will host Over The Top Tour, an MFTCA National Tour. For more info contact Paul Walter, (303) 277-1537.

PRESIDENT'S MESSAGE

By George Elms

Well, this temperature will sure reduce the Model T driving in Phoenix. 110 degrees In May!!

Some of us are planning at least a part of the summer away from this heat. I have wanted to drive around New England since I started the restoration 20 years ago, and it looks like it may finally happen!!

Following NBC's Today Show of Personal Dreams: What is your dream event? Are you acting on making it happen?

Summer activities are mostly breakfasts and our October meeting will be at Joe's Real Barbecue in Gilbert.

In my absence, call Joe Fellin at (480) 288-6463 or Ruthann can relay a message to me. I might be reached at (603) 448-4342 if you need me.

Have a good summer!!

Health and Welfare

It was good to see Bob and Idros Wildman at our 15 May brunch. We are all wishing you continued improvement, Bob.

Calendar of Events

June 2005
18 Breakfast at T-C Eggington's at 8:00 AM

July 2005
16 Breakfast at Crackers & Co. Café at 8:00 AM

August 2005
13 Breakfast at Little Mesa Café at 8:00 AM

September 2005
15 General meeting at the Linney's home at 7:30 PM

October 2005
20 Dinner meeting at Joes Real Barbecue at 6:00 PM

East Valley Model T Ford Club
2520 East Pueblo Avenue
Mesa, Arizona 85204

PHOENIX AZ 850 8
PM
02 JUN
2005

John & Jan Peterson
925 W. 11th Place
Mesa, AZ 85201-3117

85201+3117 17

15 May Mesa Southwest Museum Tour

At about 11AM we assembled at Bill Johnson's Big Apple restaurant at 950 E. Main St. in Mesa. We had a larger crowd than expected, 22 members and their families showed up. We had to be seated at three different groups of tables.

After a great time visiting and filling our bellies with good food most of us visited some of the local antique shops.

Going through all of the booths of the antique mall took quite a long time. Some of us remembered either our Moms or ourselves having some of the items that were now considered to be antiques! It was very enjoyable to browse around. Others in the group chose to tour the museum.

When The Museum opened at 1PM, several of us spent a few hours on self guided tours around this great facility. This museum is primarily focused on ancient finds around the Southwest. Displays include things such as minerals, fossils, Indian artifacts, and meteorites. Some more recent items are also on display. They include a stage coach, memorabiliar from movies made in Arizona, mining displays and jail cells from an early Phoenix court house.

Tentative Display of Cars at Antique Ville in Mesa, Nov 5

While visiting the Antique Ville shop in Mesa during our 15 May outing, the Petersons made contact with the owner who showed an interest in having us show our cars near her shop. She came to our meeting to discuss the idea. Our members were receptive. She will get back to us later.

RECIPE OF THE MONTH

Hash Brown Casserole

2 lb bag of frozen hash brown potatoes
2 cans cream of potato soup
8 oz carton sour cream
4 oz bag of grated sharp cheddar cheese
Salt & pepper to taste
Garlic powder to taste
Parmesan cheese
Butter or margarine

Allow potatoes to thaw enough to separate. Mix potatoes, soup and sour cream together. Add seasonings and cheddar cheese. Mix well. Pour into buttered casserole dish. Sprinkle top with Parmesan cheese and dot with butter. Bake uncovered in a 350 degree oven for 1 hour. Yield: 12 servings.

COMING EVENTS

18 June – Meeting at T C Egginton's at 8:00 AM for breakfast. Restaurant is located at 1660 S. Alma school Rd., Mesa. Claudia Linney is the sponsor.

16 July – Meeting at Crackers & Co. Café at 8:00 AM for breakfast. The café is located at 535 W. Iron Ave., Mesa. Jan Peterson is the sponsor.

13 August – Meeting at Little Mesa Café at 8:00 AM for breakfast. The café is located at 3929 E. Main St., Mesa. Mary Griffin is the sponsor.

15 September – General meeting at Linneys at 7:30 PM. Address is 2520 E. Pueblo Ave., Mesa

20 October – General/Dinner meeting at Joe's Real Barbecue at 6:00 PM. The restaurant is located at 301 N. Gilbert Rd., Gilbert.

October Tour
Jerry Griffin will be providing information for a possible overnight tour and stay at Ft. Tuthill near Flagstaff.

Have We Come Full Circle? Is the "Model T" now the "Modern T"?
By John Peterson

Modern automobiles are evolving to look more and more like the Model T of 80+ years ago. Consider the following:

- Body style—Compare this sedan to a Scion xb or any small sport utility vehicle.
- Wheels—We are now back up to 22" spoked wheels with tires less than 4" high.
- Choice of colors/options—Some Models now come in only one color -few have more than six colors and several option packages. In the 1950s, GM advertised that they could make two million Chevrolets with no two the same.
- Engines—Where did the V16s, V12s, and even the V8s go? We Are now back to the rough running In-line 4s.
- Ignition systems—Now we have Individual coils per cylinder—so does the Model T.
- Fast/heavy steering and harsh ride-- It's back again. Where did the "land Yacht" of the 1950s go?
- Technical features that have come Back:
- Transverse springs (Corvette)
- Planetary transmission (modern automatics)
- Hand throttle (cruise control)
- Bucket seats (try to find a bench Seat now)
- In car diagnostics via the ignition Coils are almost as good as the Modern computer.
- Simplicity that has not come back o In contests, Model Ts can be assembled from major components and driven in less than 15 minutes.
- Two last thoughts—
- Model Ts require routine maintenance every 200 miles, present cars, every 5000 miles.
- The death rate in the 1920s was 50 per hundred million miles; it is now well under two per hundred million miles. Some important things have changed!

EAST VALLEY MODEL T FORD CLUB 2005 OFFICERS

George Elms, President
(480) 831-0835
Steve Linney, Immediate Past President
(480) 833-1907
Joe Fellin, Vice President/Membership
(480) 288-6463
Claudia Linney, Secretary
(480) 833-1907
John Peterson, Treasurer
(480) 969-0695
Jan Peterson, Historian
(480) 969-0695

RESTORING THE MODEL T FORD MAGNETO

By MURRAY FAHNESTOCK

The performance of the Model T Ford is largely dependent on the condition of its internal magneto. It is just not possible to get good high-speed operation with the standard Ford ignition operating from batteries. The magneto is a must!

The performance of the Model T magneto is dependent on the strength of its so-called "permanent" magnets which, like marriage vows, may become, with the passing of time, subject to that tired, run-down feeling.

Since magnetism is produced by rearranging the molecules in the steel to "point in the same direction," any heat or vibration which shakes up the steel molecules and allows them to resume their natural, helter-skelter positions, means a loss in magnetism. So handle those dear magnets gently and do not hit them with a hammer or drop them on the floor.

The magnets may also be weakened by electric currents from outside the magneto, such as from batteries or house lighting circuits.

Sometimes forgotten is the fact that the Model T Ford has a low-tension, alternating current, magneto, as compared with the direct current of dry cells and storage batteries, and that the voltage varies with the speed of the engine. Consequently, six dry cells, producing nine volts, are more effective for easy starting than the voltage of the Ford magneto at low speeds.

When the headlights are affected with pink-eye and the engine is hard to start, the first thing to check is the contact point at the top of the transmission cover, since this point is the "catch-all" for lint and dirt washed up by the oil from worn transmission band linings. Also, the contact spring may be weak.

If a low reading (say thirty volt) alternating current voltmeter is available, a quick check of the voltage is an effective test, and should show at:

400 RPM (10MPH); 9.8 volts at 7.9 amps;
800 RPM (20MPH); 18.8 volts at 8.8 amps;
1200 RPM (30MPH); 26.2 volts at 9 amps.

A minimum of 7 volts at 400 RPM is usually necessary for reasonably satisfactory use.

Clean the contact spot on the magneto coil assembly where the contact point touches.

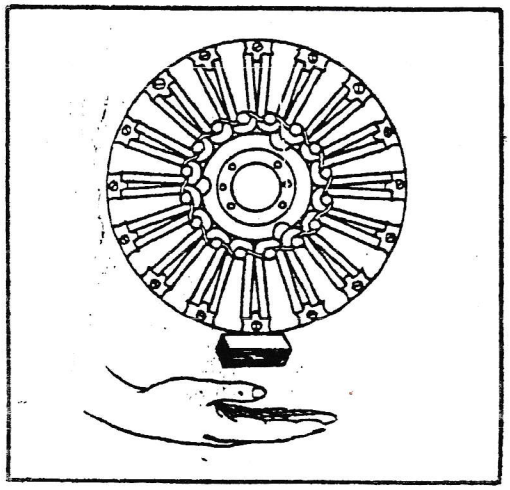
During the Model T production years the company furnished an "exchange" set of remagnetized magnets, properly positioned on a board, for $1.75! And it was only necessary to install these on the flywheel in the same position they had occupied on the board. Both the price and the board are gone these many years and it is now necessary to use other, even if less effective, methods. Since tests of the Ford Motor Company showed that trying to recharge the magnets in the car resulted in less than 60% of the magnetism as compared with recharging the magnets out of the car, this method is not recommended.

The magnets cannot be fully recharged in the car because the flywheel is of soft, cast iron and so much magnetism leaks off through it rather than passing through the hard steel magnets mounted on it.

A reliable test of the magnets (for the magnetism) may be made without removing them from the flywheel by checking to see if "like poles" of adjacent magnets will support a two-pound weight of soft iron. If the weight drops off, the magnets are weak. When making this test hold the flywheel vertically, in the position it has in the engine and hold the iron block to each pair of magnet poles in succession. The test should be made on each pair of like poles -- that is, a pole of one magnet and the pole of the adjacent magnet, not the two poles of the same magnet.

Before removing the magnets from the flywheel make sure that new brass screws (holding magnets to the rim of the flywheel) are available. Since the ends of these screws should be riveted over, and it is necessary to chip off the riveted ends to remove the old screws, new screws will be needed. Note: brass screws must be used at the outer ends of the magnets since steel screws would cause magnet leakage into the iron flywheel instead of through the poles in the coils.

Cut off the locking wire which runs through the steel capscrews near the center of the flywheel. (Ed. note: later production Fords did not use this wire as it was found to be unnecessary.)



A block of steel weighing about two pounds should hang from the magnets if they are of the correct strength. If they are too weak, the block will drop off.

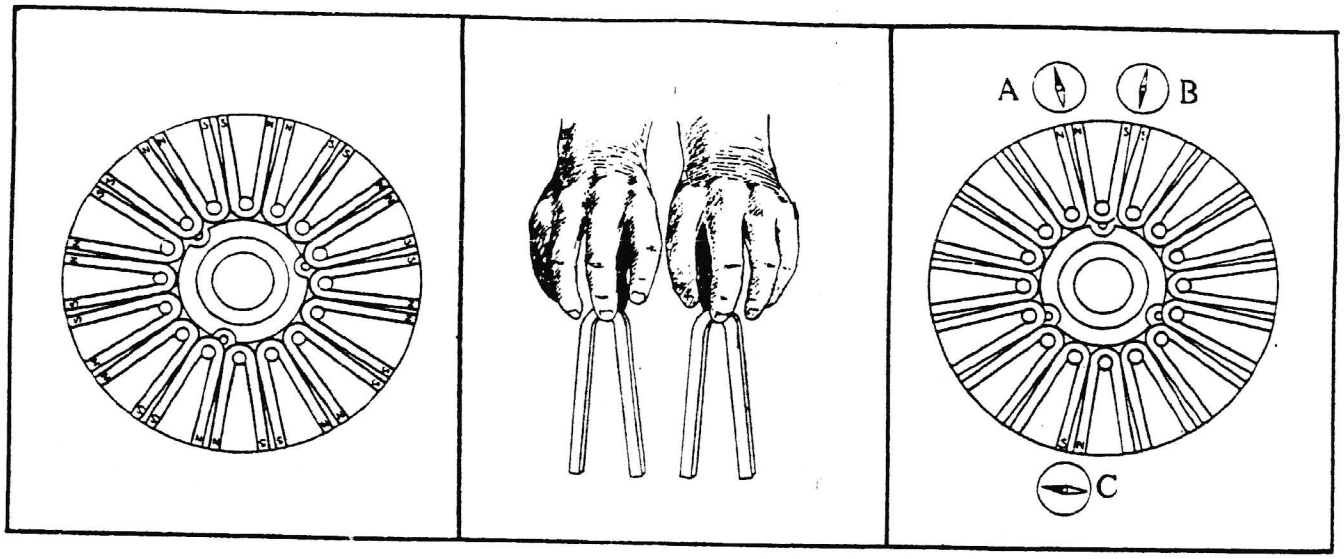


Diagram of the correct assembly of the magnets on the flywheel.

This is the method used to determine the polarity of the magnets. Like poles will repel each other; opposite poles will attract. The magnets are installed with the like poles together.

Using a compass to determine the correct assembly of the magnets.

After marking the magnets with chalk or crayon so that they can be reinstalled in the same position, remove them and place them in a position on a board so they can be recharged in the same polarity as before and can be easily kept in the proper order.

When recharged, arrange them the way they should go on the flywheel and install the capscrews in the center but do not tighten them yet. Slip the brass (or aluminum) spools under the outside ends of the magnets and put the steel pole pieces in place. Catch the new brass screws through the spools and pole pieces into the flywheel and snug them down. Before putting the final twist to the screws, pinch the ends of the magnets with pliers until the sides of the magnets rest against the lugs on the pole pieces. Tighten the steel capscrews near the hub.

Before the final assembly of the magnet assembly, it is wise to check to be sure the magnets have been installed properly. To check the polarity bring a small pocket compass near the poles. If the needle takes a "jump" and reverses its position each time it passes from one pair of poies to the next, it is OK, but if at any of the poles the needle just wiggles and does not seem to know which way to turn, this suggests that this pair of magnets is positioned incorrectly.

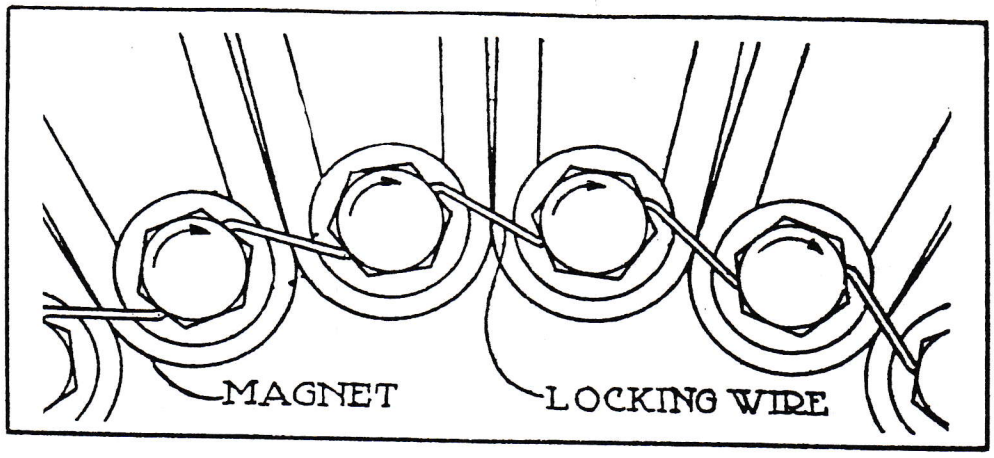
A single magnet, improperly placed, will make a considerable difference in the output of the entire magneto since there is not only the loss of its own power but it also tends to nullify that of the two adjacent magnets. Such a weakness will tend to cause jumpy ignition.

Put a new locking wire through the holes in the capscrews (if there was one before), getting the wire as tight as possible and then twisting the ends together. Use No. 14 brass wire, as iron wire will not stand the twisting. When installing this wire, put it through "zig–zag" so it will have a tendency to tighten the screws, rather than loosen them.

Pound down the four corners of the pole pieces over the magnets so they will not catch on the poles of the coils when reassembled. Rivet over the ends of the brass screws. *(Ed. note: all magnets should be the same height above the flywheel so that the gap between them and the field coil pole pieces will be uniform. A blow with a brass (not iron) hammer on the magnet pole pieces which are high will compress the supporting spools. When all magnets are the same height, then tighten and rivet the brass screws.)*

End play of the crankshaft controls the vital clearance between the magnets and the poles of the coils (which should be just 1/32-inch). This clearance is very important because the loss of magnetism increases even more rapidly than the square of the gap!

The end play of the crankshaft should be checked by placing the engine in a vertical position and forcing the flywheel-transmission assembly as closely as possible towards the engine block by pushing and turning it a quarter of a turn one way and then the other. After measuring the gap between the cores of the coils and the face of the magnet clamps, pull the flywheel away from the block and measure again. The difference is the



This is the way the wire should run through the heads of the bolts. If run through the other way, there is a tendency to loosen the bolts when the wire is pulled tight.

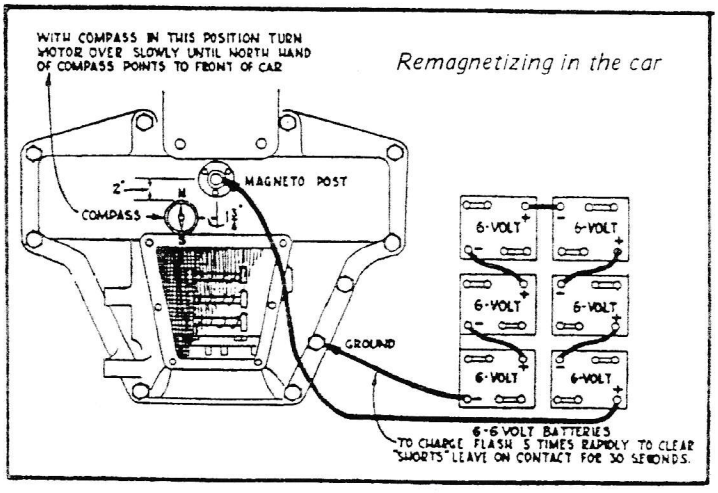
amount of end-play. On new motors the end-play was .004-inch, while repaired motors may have as high as .008-inch. End-play up to .015-inch, while detrimental to smooth running, should not cause a weak magneto but if more than .008-inch is found, a new rear main bearing cap should be fitted.

The Model T magneto has sixteen coils of insulated copper ribbon wound around soft iron cores, with adjacent coils connected in opposite directions. Any break in this circuit will cause loss of current, while a ground in any of the coils will cause a low output, depending on where the ground occurs.

To test for grounds, pry off the ground connection from the iron frame. Using an ohmmeter, check for continuity from the magneto contact point to the metal frame. There should be none. If there is, then it will be necessary to break the circuit between a few of the coils until you can determine at which the ground occurs.

The repair and rebuilding of the magneto field coils was covered in Volume 10, Number 2 of *The Vintage Ford*.

To re-magnetize the Model T magneto (in the car), six six-volt storage batteries were used in series; being preferred to three twelve-volt batteries because of their greater amperage output — although the twelve-volt batteries would probably stand the brief jolts of juice.



Remagnetizing in the car

Remove the floor boards and the transmission cover plate and place a magnetic compass 1¾-inches to the left and two inches to the rear of the center line of the magneto post. Now turn the flywheel until the north pole of the compass points toward the front of the car, as shown in the drawing.

When this position has been reached the brass magnet holding screws will approximately straddle the center-line of the car, or center-line of the magneto post. However, abide by the compass reading and stop turning when the compass points directly ahead.

Using heavy, insulated starter cable, connect the positive (+) lead from the batteries to the magneto post. Holding the negative lead from the battery, flash it five or six times on the transmission cover.

After flashing, disconnect the battery and install the transmission cover plate and start the engine. When it is running at a speed corresponding to fifteen miles per hour, use an ampmeter to see if the magneto will produce about two and a half amperes. If it is below two amperes there may be internal trouble which can sometimes be corrected by holding the negative wire in contact for thirty seconds instead of flashing it on and off as before, to burn out a ground between a coil and the frame. Be sure to use the compass and set the flywheel as described above before reconnecting the battery. Failure to do this might discharge the magnets you have just charged.

As the voltage from the storage batteries is quite low, it may be necessary to use the higher voltage from a modern "fast charger" to burn out the ground. After forcing a heavy current through the magneto contact, better check to see if it still makes good contact.

To successfully recharge the magnets in the Model T, the following conditions should be observed:

The windings of the magneto coil assembly must be

in good condition; free of grounds and short circuits.

The magnets must not be cracked and they must not rub on the magneto coil assembly.

If there is too much end play of the crankshaft, the magneto will still be weak, even though the magnets are recharged to full strength.

The hand brake lever should be left forward when the current is being applied so that the spring of the high-speed clutch will not be pulling the magnets away from the poles of the coil assembly.

A powerful direct current of at least 24 volts and 30 to 50 amperes must be used.

The magnets must be properly positioned in regard to the magneto coil assembly, and the current sent through the coils in the proper direction.

Better results will be obtained if the magnets are recharged to retain their original polarity.

The magnets should be recharged at each quarter turn of the flywheel, after being properly positioned each time.

Several brief shots of current, of from one to three seconds duration, should be given at each quarter turn of the flywheel.

TINKERIN TIPS

RECHARGING MAGNETO MAGNETS

Several of the Ts in our chapter have 'mags' that have that "tired, run-down feeling." If the mag in your T is too pooped to pop, give this inexpensive remedy a try.

You will need:

A set of listless magnets;
A 'bum' field coil;
A five to six-amp battery charger;
An old-style iron piston or similar weight;
A small hammer.

I suggest using a "bum" coil because a good one might be damaged.

First, connect the battery charger to the iron frame and to the magneto coil contact button. With the power supply "on" the coils should be magnetized (the coil must, of course, be a good one electrically). Take each magnet, in turn, and place it on any two poles of the field coil. Now take the magnet off and turn it around and put it back on the same two poles, noting which way the pull is strongest. You want to leave it on when the pull is strongest.

Now take the small hammer and briskly tap the ends of the magnets. Use the iron piston as a gage; when the magnet will lift the piston it can be passed and another magnet charged. The magnets can be charged until they will lift much greater weights than the piston, but let's not be greedy!

After the magnets have been charged in this manner they can certainly be passed as excellent. After doing the magnets in my T, before which it wouldn't even run on "Mag," and setting the distance from my good field coil, I can start it when cold on magneto.

Dan Haynes
Lodi, California

Ed. Note: The field coil does not have to be good on all poles if the magnets are to be charged individually, as is outlined above. However, if you have a good coil in which all the poles are operative, the entire flywheel-magnet assembly may be charged without removing the individual magnets. The procedure is similar: note the position at which the magnet assembly has the strongest attraction to the coil. Instead of rotating the flywheel assembly one position (which does the same thing as reversing the magnet) you can just reverse the connections of the two wires from the battery charger, which reverses the polarity of the coil pole piece. Using the strongest position, tap each magnet with the hammer (and the hammer should be brass, or other non-magnetic material) as is described. The more current flowing through the field coil, the stronger the resulting magnets will be. The current from the charger is limited (in the typical home units) to just a few amperes; using a twelve-volt car battery (or even two in series) really does the job. Don't leave the battery connected for long, though, as the coils can become quite hot and even burn.

If the magnets are charged individually, be sure you install them on the flywheel with like poles together (this is when the two magnets DO NOT attract each other). To preserve the balance of the flywheel, it is wise to make sure each magnet goes back in the same position from which it came.

Use a straight-edge to make sure all magnets are the same height. This is very important since uniformity here determines the ultimate clearance between the magnets and the field coil. If one of the magnets should happen to be 'high,' this one would have to be the one used to set the minimum clearance, resulting in the others having more than necessary clearance. Since the electrical output of the magneto is inversely proportional to the clearance, a weaker magneto results.

One might suppose that all magnets would come out even in height but variances occur because of changes in the size of the aluminum spools which support the outer ends of the magnets, and minor variations in the magnets themselves. The accepted method of adjusting the height of the magnets is to rap the high ones with a brass hammer. This squashes the aluminum spools a bit. Be sure to tighten the brass screws after the 'rap' and to peen them over so they won't come loose.

The correct magnet pole piece to coil clearance should be not less than .025" nor more than .040." This is set by adding or subtracting shims between the field coil

and the engine block. The clearance should be checked with the crankshaft pushed forward and the rear of the transmission supported. This is best accomplished by setting the engine on end (on its 'nose') which allows the weight of the flywheel and transmission to automatically settle forward. The crankshaft itself must not have more than about .004" end play. Measure the magnet to core gap at several points and recheck after rotating the crank a bit.

MAGNETO MAGNET RECHARGING

Richard Lowell, from Thomaston, Maine, comes up with an amusing anecdote brought to mind by a piece in *The Vintage Ford* a year of so ago relating one man's experience in recharging (re-magnetizing) the flywheel magnets. Richard's story appears here, both for its humorous aspect and also to point out a possible hazardous condition that is present should you recharge your own T's magnets.

In his own words, here is is Richard's tale:

". . . . . back in the late twenties I had a Model T speedster which had a weak mag. I drove this old Ford to a garage which would charge the mag in the car. The man that was going to do the recharging was a little mite mad as it was about four in the afternoon when I got there. I asked him if he wanted me to drain the oil out of the base but he said that it was OK as it was. Well, that old Ford had gasoline in the base — I suppose from so much choking to get the old girl started. When the old fellow got the wires hooked up he gave her a shot of juice, she blew up in the base, blowing out all the gaskets and the breather cap we never did find . . . . ."

While Richard's experience ended with him losing the oil filler cap, he was lucky that he didn't have a fire. Recharging the magnets properly is best done using 24 to 30 volts at about 300 amps. While only a momentary contact is made, because of the heavy current surge, there is usually a fairly good spark when contact is made.

The procedure followed by many, and the one that I heartily recommend, is to tightly secure the positive lead to the magneto post. The negative lead is then brought into contact with the chassis at a convenient point away from any gasoline or volatile fumes.

Ed. Note: It is possible that the current surge can create an arc inside the engine if one of the internal connections between the coils should fail, and this is likely what happened in the above situation. Draining the oil might help but it also might make the situation worse — it's the fumes that explode, not the liquid. It might be a better idea to run the engine until it is quite warm, which will boil off the gasoline. Better yet, let someone else make the connection — your mother-in-law, for instance.

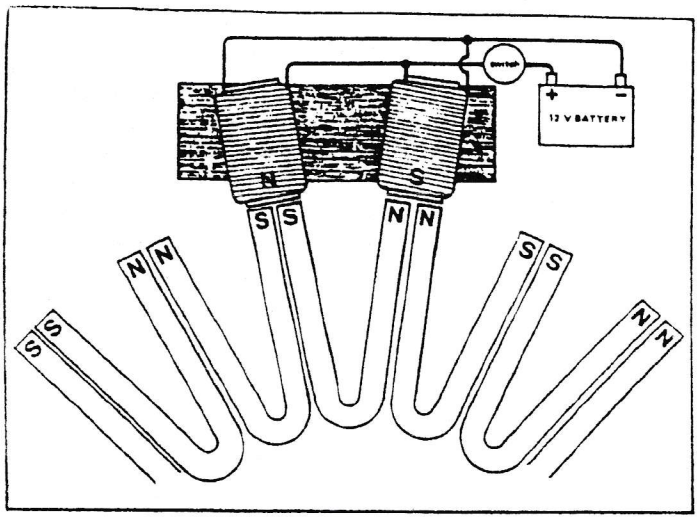
RECHARGING THE MODEL T MAGNETO
***** SAFELY *****

Articles have been written on recharging the Model T's magneto magnets by proper positioning of the magnets in relationship to the magneto coils and flashing a high amperage current by applying 24 to 36 volts to the coil. This does the job but it can destroy the coil assembly if not done properly. Another method suggests removing the transmission from the car and laying a spare coil assembly on top of the magnets and then following a similar flashing procedure. This system works better as the coils are in closer contact with the magnets but it involves more work to remove the transmission from the car. Undoubtedly the best method is removing the individual magnets from the flywheel and recharging them separately. Again, this involves a lot of time and work, plus the necessity of replacing the magnets on the flywheel at the proper height relationship.

A device to restore the magnetism in the magnets can be constructed using a couple of discarded 12-volt Delco (General Motors) starter solenoids. Wire obtained from the solenoids is wound on a soft iron core to make an electromagnet. This electromagnet will recharge the weak magnets in the car by only removing the transmission cover to expose the ends of the magnets on the flywheel. It can also be used to recharge individual magnets removed from the flywheel if so desired.

Two pieces of one-inch round soft iron rod about 2-½ inches long are required. This is the core of the electromagnet. Obtain two discarded defective Delco 12-volt starter solenoids from your local auto repair shop. Usually the coil in the solenoid is not damaged as most times the switch section is defective from wear. There are two windings inside (one wound over the other). Unwind the wire and save the wire from the primary winding, which is heavier and carries more current. The wire has a varnish coating which acts as the insulation so be careful to not damage it.

Cover the iron cores with a layer of tape. Masking tape is sufficient insulation in case there is a break in the wire's insulation. Plastic tape is all right but use only one layer, to keep the thickness down. Leave about a six inch lead and start winding the wire on the iron core. Wind the wire as tightly and closely together as possible. When you have wound a layer of wire across the length of the iron core (leaving about an eighth-inch of core exposed at each end so the wire will not slip off) tape the coil tightly to hold it in place. Continue winding the wire back towards where you started, making a second layer. When the second layer is completed, tape it and put on a third layer going in the original direction. Always keep winding around the core in the same direction. You should end up with about four complete layers. Don't be concerned if you end up with 3½ or 4¼ layers as it is the total length of the wire that is more important. Use the total length of the heavy wire that was removed from the solenoid. Allow a six-inch lead at



the end of the winding and finish by taping the winding down securely. Now make another electromagnet in the same manner, using the wire from the second solenoid. Wind this coil in the same direction around the core as the first.

Mount the two assemblies on a wooden base. A piece of ½-inch board, 2 inches wide and 6 inches long is fine. The coils are positioned on the base so a line drawn through the centers of the coils will line up with the magnet ends on the flywheel. It is important that the core ends make flush contact with the magnet end clamps for maximum magnetism transfer. The coils can be held in position by drilling small holes in the board and tying the coils down with heavy string. Do not use wire or any metal that would effect the magnetic field of the coil.[1]

Remove about one inch of insulation from the four wire leads by scraping it off with a knife blade. Twist the beginning lead of one coil and the end lead of the other coil together and then connect the two remaining ends together. It is very important to connect the leads as explained so that the current will flow through the coils in opposite directions to create an electromagnet with a north pole on one leg and a south pole on the other. Heavy wire is used to connect the electromagnets to your modern car's 12-volt battery. The connections to the electromagnet's leads should be soldered for a good contact. Number 12 or larger wire (a set of jumper cables is ideal) is necessary to carry the heavy current. The current is only allowed to flow briefly (about one second) so a switch to carry this high current is necessary. The switch portion of one of the solenoids is connected in one of the wires leading to the battery. If the contacts are worn and pitted they can be turned 180 degrees and the unused portion of the contact is placed in use. The leads should be marked Positive (+) and Negative (−) and are attached to the battery with the same polarity so the magnetic field in the electromagnet is always the same polarity.

Determine the magnetic polarity (north and south poles) of the electromagnets by placing a compass about two inches from the coils and momentarily connecting a flashlight battery to the leads. Remember the top (or button) on the battery is the Positive (+) end. This test places almost a dead short on the battery so make it quickly or you will wear out the battery. One coil should have a north pole and the other a south pole. Mark the coils for future reference. (Ed. Note: If you have two norths or two souths, reverse the connections to *one of the coils.*)

Determine the polarity of any two pairs of magnet ends on the magneto with the compass. It is very important that the magnets be recharged in the same direction (or polarity) as they were originally because recharging will not be effective for long if done in the opposite direction. The magnets have a tendency to return to their original polarity and would soon weaken. Mark the pair of magnet ends with a piece of chalk for reference. The next set of magnet ends on either side will be of the opposite polarity as there are eight north poles and eight south poles on the magneto.

The electromagnet is positioned with its north pole in contact with a south pole on the magneto. Now energize the electromagnet with the 12-volt battery for four or five times of about one-second duration. The recharging effect is accomplished when the connection is made and when it's turned off so keeping the high current flowing is unnecessary and will cause the coil to overheat. It's recommended when recharging the magnets that the 12-volt battery charging system be operated by running the modern car's engine at a fast idle. This will reduce the voltage drop on the battery during heavy current drain.

Next keep one of the electromagnet's coils in position with the magneto's magnets while flipping the other coil over to the next set of magnets. Activate the electromagnet as before and then keep the second coil in contact with the magnets while flipping the first coil to the next set of magnets. Using this technique you will "walk" the electromagnets around the magneto. The direction you proceed around the magneto is not important. Keep moving the electromagnets around the magneto, activating them four or five times at each stop, until you have made three complete revolutions of the flywheel.

Now your magneto should be again charged for MAG operation.

Mike Ludkiewicz
Ludlow, MA

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1. Ed. note: The two electromagnet cores could be drilled and tapped and then bolted to a piece of strap iron, making a sort of horseshoe magnet affair. This will not only make a stronger magnet but the strap iron can be bent so that the pole pieces of the electromagnet will match the pole pieces of the magneto magnets.