

Model A Springs

The Model A Springs are designed to provide a smooth and stable ride for the car. The front spring aids steering and handling while the rear spring supports the weight of the car body and passenger comfort, particularly when loaded.

Overtime the springs lose their “springiness” due to loss of arch and friction between the leaves.

Front Spring

Check the spring as follows:

- Tires fully inflated to the proper pressure – 35 psi
- Park on flat level ground
- Measure the height of the car from the ground to the center of the front bumper
- It should be

1928 – 29	18 11/16” +/- 1/2”
1930 – 31	18 1/2” +/- 1/2”
- Remove the shock arms
- Press down on the bumper bracket and there should be 6” of travel without excessive force being necessary
- There should be a minimum of 1/4” between the bottom of the spring eye and the front axle
- The tie-rod should not be rubbing on the drag link
- The spring shackles should be firm and not excessively worn

All of these are indicators of a weak or worn front spring and it is time to do something about it.

The process of repairing / restoring a spring is straight forward however it is important to understand that cold re-arching of the spring is a limited fix. Springs are with “hot-arching” where the metal is placed in a furnace to reach about 1800 degrees the metal is then formed and then quenched. This is followed by tempering at 800-900 degrees and allowing it to air cool. This provides a solid spring that provides long service. The cold-work approach we are doing is the most economical and works for awhile.

For the best long term results either replace the spring or send it to a spring shop where it will be re-arched hot. The aftermarket springs sold by the various

suppliers work adequately, however the best on the market that we have found is



made by :

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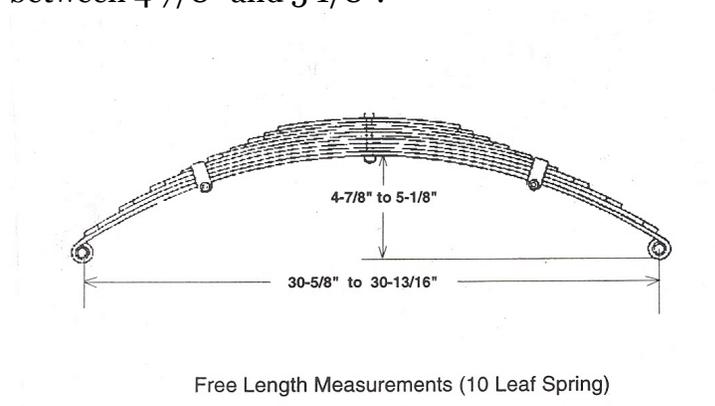
These springs are made to the original patterns and meet all the judging standards requirements.

Having said all the above lets start the cold arch process.

Warning: Model A leaf springs are under tremendous pressure and care must be observed during their removal and disassembly. They contain LETAL force that must be relived carefully to avoid injury.

Remove the front spring from the car. Les Andrew's great book, *Model A Ford Mechanics Handbook Vol. I*, provides step-by-step directions on removing the spring from the car safely.

With the spring removed measure its length the distance between the centers of the eyes should be $30 \frac{5}{8}$ " to $30 \frac{13}{16}$ " and the height of the spring should be between $4 \frac{7}{8}$ " and $5 \frac{1}{8}$ ".



Attached two 6" or larger "C" clamps to the spring on each side of the center bolt about two inches away from center.

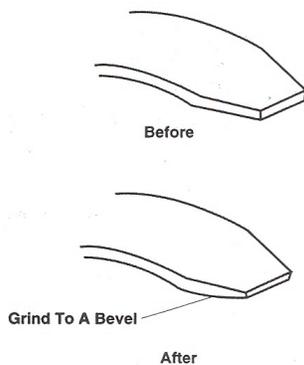
Now remove the nuts, long bolts and clips on the spring. You will note that the spring was mounted with the nuts facing forward. This is so the bolt can be removed and the clip replaced with the spring in the car if necessary. If the clip is

installed with the nut to the rear the front splash apron would need to be removed to replace the clip.

Slowly back off the nut on the center bolt and then remove the bolt. Replace the bolt with a section of 5/16" all thread about 12 inches long with two nuts and washers and then tighten it up leaving the long part of the all thread to the top. Now slowly back off the upper nut and release the C-clamps a little at a time until the tension from the spring is removed. The C-clamps and all thread can now be removed.

Clean each leave of the spring removing dirt, grease, paint, etc. This can be done by soaking in solvent, and then sanding, wire brushing, or sand blasting.

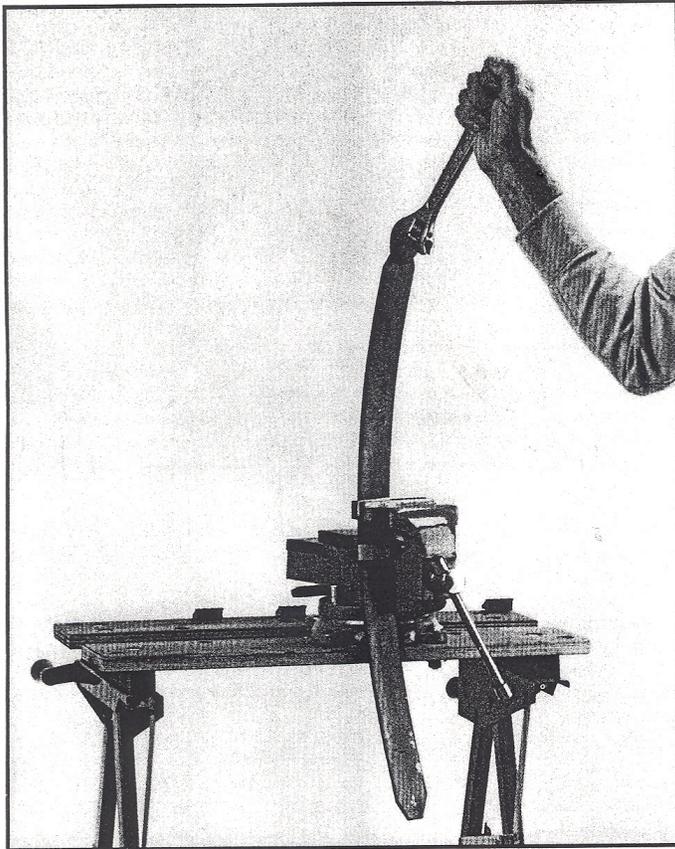
The clean leaves should be inspected for cracks or other signs of excessive wear. The ends of the leaves should be ground to a bevel where they contact the lower leave. The first leave with the eyes does not need to be beveled. The top of each leave should be inspected for gouges created by the upper leave and if present these should be ground smooth.



Please the leaves one at a time on a sheet of butcher paper or similar large piece and draw and outline of the arch. This will be your reference for re-arching the leave.

Mark the leave 3" from the center hole on both sides of the hole. Leave should never be bent in this area so these are reference points for placing the leave into a vice.

Beginning with the bottom leave, clamp it into a vice with your reference make (3" from center) securely in the vice. Take a large crescent wrench (12" or 14") and clamp it on the end and then make a strong pull in the direction of the arch. Repeat this process every 1/2" to about 8" from the end then flip it over and do the other side.



Spring leaf being re-arched by the cold-bending method. Photo is for illustration purposes only; the mechanic's vise should be attached to a sturdy workbench.

Compare the arch to your reference on the paper. The height should have increased $\frac{1}{4}$ " to $\frac{3}{8}$ ". Repeat the process until the desired arch is achieved. Several passes will provide better results rather than trying to make the entire change in one pass.

Proceed to the next leaf. Repeat the process and compare it to the previous leaf. The gap in the center between the leaves should be close to what was previously outlined on your paper.

One leaf has holes on the ends where the clips attach. DO NOT put your crescent wrench on this end as the pull can break off then end. The wrench can be placed below the hole for pull.

You will note the leaves vary in thickness. This provides the proper flexibility. Ford made all front springs with 10 leaves. A special 12 leaf front spring was available for special equipment or extreme use.

Once all leaves have been re-arched place them together and they should next uniformly. Paint each leaf with a rust oxidizer like Loctite Extend Rust Neutralizer available at hardware and automotive stores.

Paint the bottom of each leaf with a graphite paint lubricant like John Deere SLIP-PLATE or similar brand. Your automotive parts supplier will carry this product as do the Model A suppliers such as Snyder's or Bratton's. It is not necessary to coat the bottom of the first leaf. This graphite paint is a dry lubricant that allows the leaves to flex against each other easily providing a more comfortable ride as well as prolonging spring life.

Assemble the spring using the all thread and a large C-clamp to compresses the leaves. Replace the center bolt with a new bolt with a square head, lock washer and nut. A square head is required to fit correctly into the cross members. These bolts are available from the Model A suppliers. This bolt is under a great deal of pressure and replacement is always recommended due to stretching over time. The square head should be aligned with sides parallel to the spring leaves.

Attached the clips and firmly tighten the bolt.

Paint the entire spring black using Rustoleum or a similar paint.

Rear Spring

Rear springs contain various numbers of leaves - 7 (Roadsters), 8 (Coupes, Phaetons, Cabriolets, Victoria, A400), or 10 depending on the body style. There is a significant difference between them – for example the 10 leaf spring for the Tudor sedan is much more flexible than the 10 leaf spring for the AA Panel truck.

The rear spring cannot be easily checked like the front spring by measuring with a tape. However, by disconnecting the shocks the rear spring should allow approximately 6" of travel. The eyes of the spring and the rear perches should show no excessive wear and the leaves should be tight together without visible gaps between them.

Removal of the rear spring is nicely covered in Les Andrews *Mechanic's Handbook*. It requires the use of a full length spring spreader. The spreader is placed so the ends are behind the spring eyes and then the nuts on each side are turned to hold the spreader in place. The pressure is applied to the nuts equally until the shackles can be removed easily. The rear spring is much stronger than the front spring – therefore serious injury is more likely to result without proper care.

The rear spring is heavy so once the shackles are removed it will require support and strength to handle.

The spring is disassembled like the front spring except that a 3/8" piece of all thread or a safety chain wrapped around the spring is needed. The C-clamps need to be of adequate size for the job and in good condition. Re-arching the rear

leaves takes a little more force as the leaves are thicker than those of the front; the same caution applies to the leave with holes on the ends.

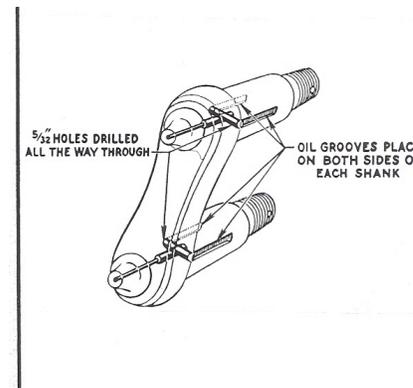
Re-conditioning and re-assembly of the spring is like that of the front spring. The spring clips go on with the nuts facing forward.

Installing Springs

There are several important factors when installing springs that must be observed for long service.

The spring and perch bushings must be in good condition and properly sized. Typically the required reaming to provide a good fit, they should be an easy slip in but not sloppy loose. They need to allow enough room for grease and movement of the spring.

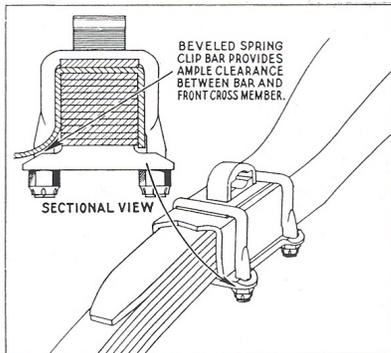
The spring shackles should be free of wear and provide full lubrication. The first Ford shackles had a groove on only one side. This was later modified so that grease is available on both sides of the shackle. See below:



After market shackles often only have the one oil groove. They can be easily modified by drilling the hole all the way through and using a die grinder to make a matching groove on the other side. We have found many of the aftermarket shackles have press in grease fittings that come out easily under pressure. We recommend replacing them with threaded fittings by drilling out and tapping the hole.

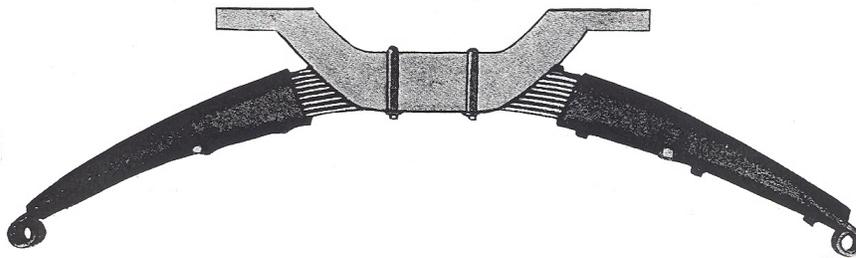
The springs must fit into the cross members security with the square headed bolt centered in the square hole [some after market springs have a round head that fits in the hole as well]. Take a piece of body welting 8" long and punch a hole in the center to fit over the spring. Coat this welting with grease on both sides and then push the spring up into position. The welting and grease avoids metal to metal contact and allows the spring to flex against the body.

The spring must be TIGHTLY attached to the cross member with no room to move. Until February 1930 the front crank bearing plate and attaching bolts were square and sometimes the plate rested against the cross member allowing the spring to move side to side. The modification made in February 1930 beveled the edges of the bearing plate and changed the design of the bearing to use rounded bolts. If you have an early car make sure the bearing plate is not touching the cross member, but resting on the spring.



The number one cause of a broken leaf spring is they are not tight on the clips. The center hole in each leaf makes it weak at this spot. Torque the clips to prevent any flexure of the leaves between them. The spring bolt clips and nuts are grade 8 and should be torqued to 100 ft. lbs. to ensure proper tightness.

Spring Covers



Ford recommended spring covers for both the front and rear springs. The purpose of the covers is to keep out dirt and grease that can get in-between the leaves and cause wear and reduce flexibility. The covers also provide some lubrication.

The original spring covers came with a felt pad containing a special lubricant put in under the tremendous pressure of 800 lbs per square inch. The lubricant would not flow until the temperature reached 320 degrees. It contained graphite but no moisture and provided lubrication to the ends of the leaves. These covers lasted for a number of years and did in fact work well.

Today the parts suppliers furnish a spring cover that in appearance is identical to the one Ford offered. The difference is the felt pad is just a pad and requires soaking in oil to provide the lubrication. They work well and keep the springs lubricated but are not advised for a dusty environment as the dust and oil attract each other and make a “grinding compound” that rapidly wears. If you drive on paved roads the spring covers are a reasonable option.

Spring covers must be removed for judging of blue ribbon cars.