

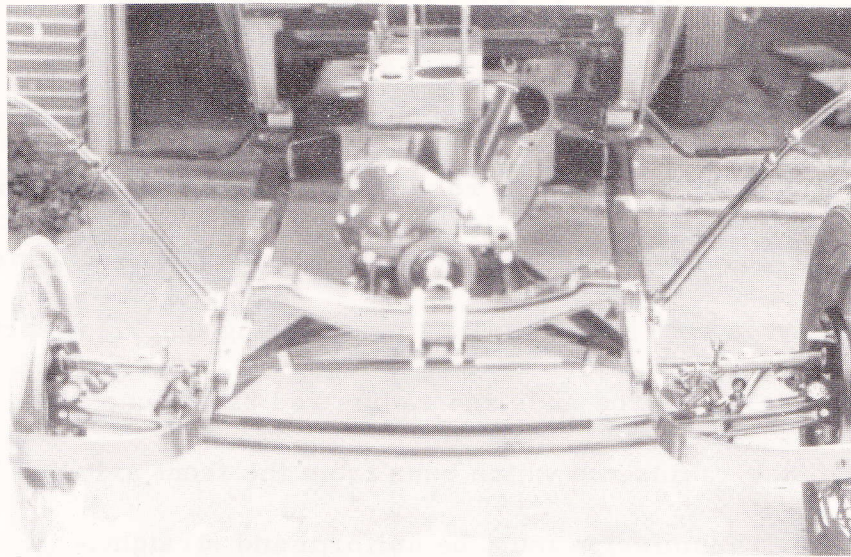
*Front End Booklet*

# Front End Booklet

The purpose of this booklet is to photographically familiarize you with the assembly of all the components related to the front axle. Before venturing out on its restoration it is best to make a thorough visual inspection and note the wear on such items as: king pins, spring shackles, spring perches, bearings, seals, tie rod ends and radius rod ball & cap kit. It should be noted that the radius rod which runs from the front axle and bolts in just beneath the transmission must be uniform and straight. If either one of these two arms are bent there is no way possible that you will be able to maintain stabilized steering and front axle control. Heating and bending this assembly is not recommended since this might cause an expansion of one of the arms thus still giving the same effect of being bent. Therefore, locating a good used one is the best route to go.

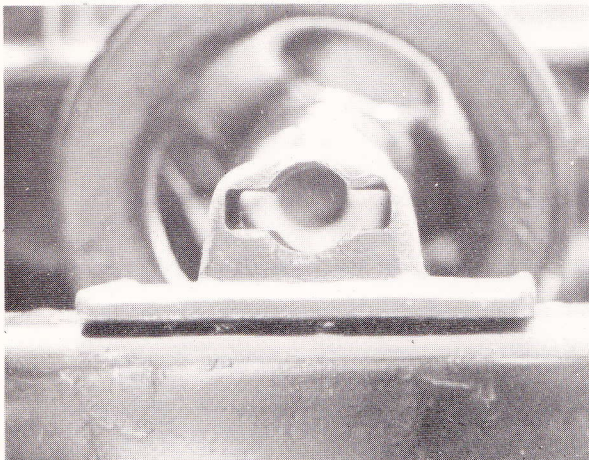
Very rarely will you ever find a bent front axle on a Model A. However, it has happened. It is best to take the axle once it is completely disassembled, lay it down flat and by using a good straight edge and an accurate ruller you can determine through uniform measurements from end to end if the axle is bent or twisted. Again, heating will not solve the problem of the bent axle. Replace it if necessary.

To remove the front axle from the car first disconnect the drag link which extends from the steering column arm to the front spindle arm. Disconnect all brake rods. It will be necessary to jack up the frame and place it on stable stands. (Please be careful and be sure that you are using good stands for this procedure.) Unbolt the radius rod ball and cap kit just beneath the transmission.

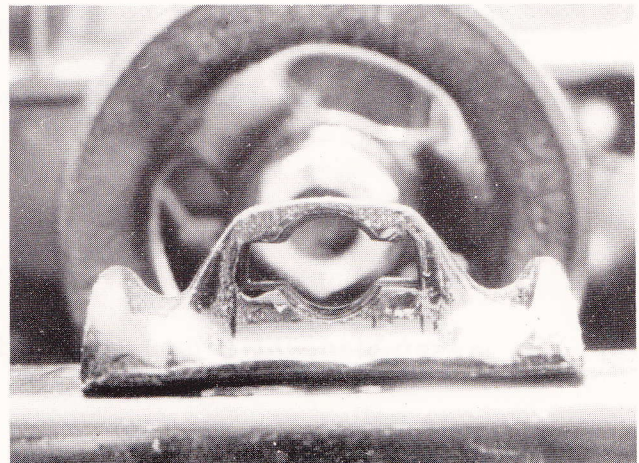


The front end assembly as it appears installed on the Model A. Note the two brightly plated u-bolts located at the center of the frame front cross-member which hold the front spring to the frame.

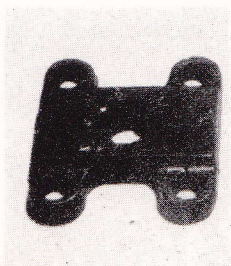
A



B

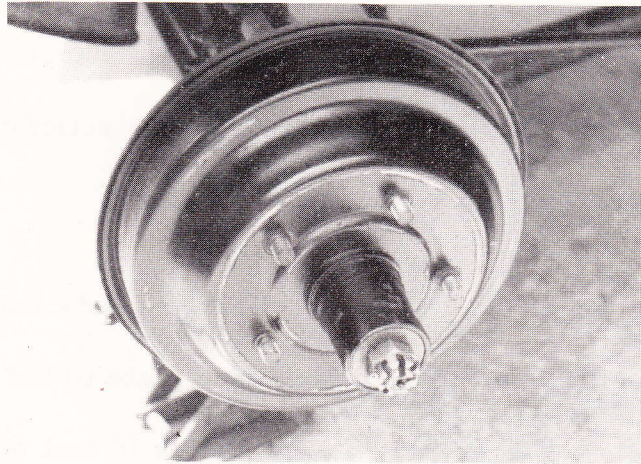


The front u-bolts clamp around a bracket which is shown in the above photos. The hole in the top of the bracket allows the starting crank to pass through to the ratchet nut on the front end of the engine crankshaft. The earlier type (picture A) was found only on 1928 Model A's. The later type (picture B) was found from late 1928 through 1931. The only difference being that the early model takes the squared u-bolt while the later models take the rounded u-bolt.



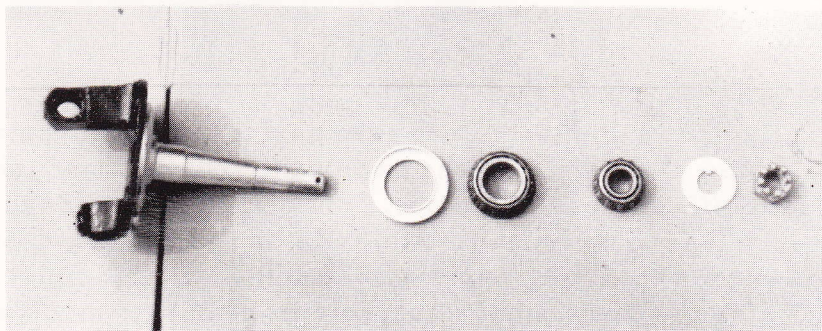
This bracket clamps underneath the front spring and is held in position by both u-bolts. The hole in the center of this bracket allows the center bolt to pass through.

Next, unbolt the U-bolts that extend around the front crossmember and hold the front spring in place. At this point the front end should drop down and you should be able to roll it out from beneath the frame.



#### PROCEDURE FOR DISASSEMBLY OF THE FRONT END

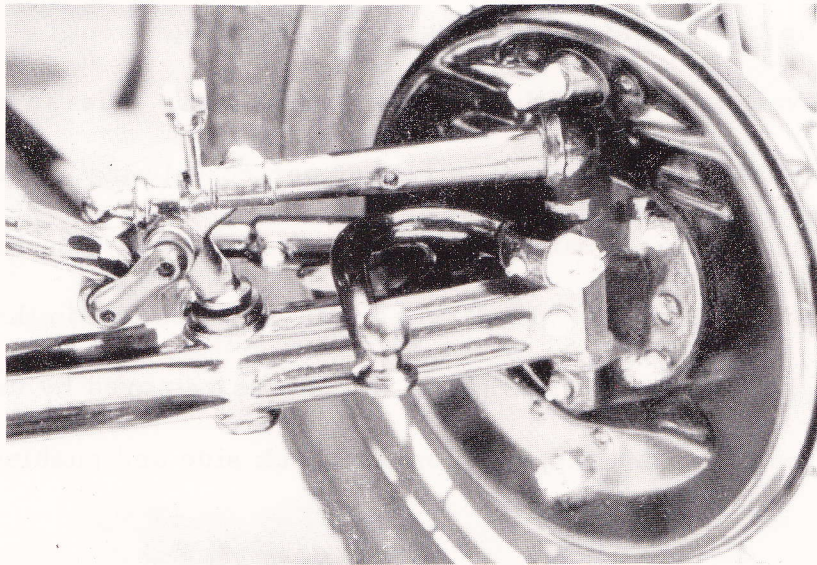
First remove both wheels, hub nuts, and pull off the front hub. This will allow removal of the front wheel bearings and seal. Please note that the front wheel seal is to neither have rubber nor cork lining. The seal itself is metal and acts as a baffle to keep grease from getting into the front wheel brakes. The front wheel races will still be inside the front hub. They have been pressed into place and can be removed by using a large punch and hammer and tapping from the back side and pushing them out.



A blow-up photo of wheel bearings & spindle. From left to right each item is as follows: front spindle, front grease seal, inner wheel bearing, outer wheel bearing, washer & hub nut. Please note that the races in which these tapered bearings ride are pressed into the brake hub.

All these pieces should be thoroughly cleaned and inspected, particularly the bearings and races for pits, cracks, marris and scoring. Do not hesitate to replace any component with these appearances. I have found too many restorers whotake a casual attitude toward these bearings, possibly not realizing that the entire rotation of the front wheels depends on them. Should a severe defect occur, this can stop the rotation of the wheel immediately and could lead to a serious accident.

Next remove the front wheel backing plates. This can be accomplished by removing the four bolts that attach each plate to the spindle. It would be good procedure to leave the backing plates in tact once they have been removed and as you proceed with your brake restoration you can then involve yourself with those components.



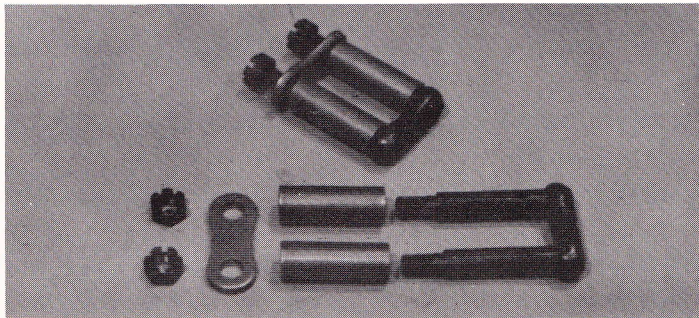
This basically shows the assembled area next to the backing plates. Toward the center of the plate you can see two of the four bolts which must be removed to take off the backing plate. The spindle arm is in the center of the picture. This arm is cast with balls on the end for connection of the steering. Notice the spring perch on the left side of the picture. You can see that it plays a very important role in braking, shock absorbers and spring and should be replaced if worn.

Upon removal of the backing plates you will probably note a small rod extending up through the king bolt. This is known as the brake operating pin. In some instances as you remove the backing plate this may fall out. That is fine do not fear you haven't broken anything. This rod activates both brake shoes. Take this small 7" rod and lay it to the side with the backing plates. Now you can unbolt the front brake arms from the front spring perches. Again, since this item deals specifically with the brakes it too should be laid aside with the backing plates.

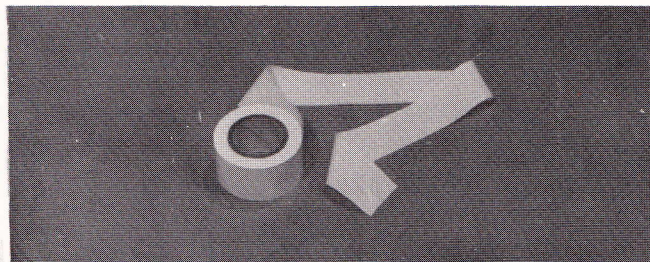
It is now easy to get to the tie rod ends and spindle arms for their removal. Please notice to keep track especially of the spindle arm nuts of which there are two and they are specially designed for the Model A only and are rather expensive to replace. Final steps require removal of the front spring. If you had an opportunity to notice before purchasing the car possibly you can note the condition of the front springs and if the car was sagging from one side to the other. It should be inspected for any bends or irregularities and if seen, the spring should be replaced. To remove the front spring it is best to rent a spring spreader from a nearby rental store. If this is not available, by use of a series of c-clamps clamp the spring down tight. Remove the center spring bolt and by reinstalling a longer center spring bolt, gently unscrew this bolt a little at a time and remove the c-clamps periodically and can relieve tension on all the spring leaves. All the upper leaves have been removed by placing small 2x4 wood squares under each shackle. By pressing on the top of the bottom leaf, the shackles can be pulled out but care should be taken still. The front spring shackle should be replaced with no questions asked. Whether they look

worn or not they are usually very old, rusted and pitted. They can easily crack under the strain of a new spring or a large bump. Don't take a chance, replace them.

It is advisable to sandblast each leaf of the leaf spring. Once disassembled, inspect it for cracks. Reinstall using teflon between each spring leaf to prevent the possibility of squeaks. If for some reason a leaf should be cracked, it is advisable to go the safe route and replace the entire spring since that one leaf (or leaves), if cracked, places undue strain on the other leaves causing their potential fatigue.



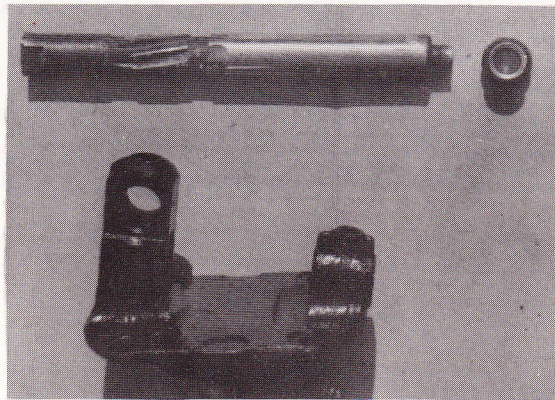
Front spring shackle assembly shown both assembled and disassembled. It will be necessary to install new steel bushings supplied with each kit and both leaf spring & spring perch.



Teflon is used by many restorers as an anti-squeak device between spring leaves. It is better than any type of grease lubricant and will not leave an oil residue.

The next procedure will be to remove the king bolts from the spindles. This can be accomplished by first removing the center locking nut and pin located next to the king bolt. With the use of a bushing driving tool, drive

out the king bolt. At this time the front spindle will come off the front axle. It should be noted before removal to grasp the spindle and to note how much play there is between the king pin and the bushings inside the spindle. Should there be any movement what so ever, it will be necessary to not only replace the bushings in the spindle but the king bolt itself. Removal of the king pin bushings can be accomplished by the use of a bushing remover. Combination king bolt bushing remover and reamer for the installation of new bushings are available. This is a wise investment to accomplish a job properly.

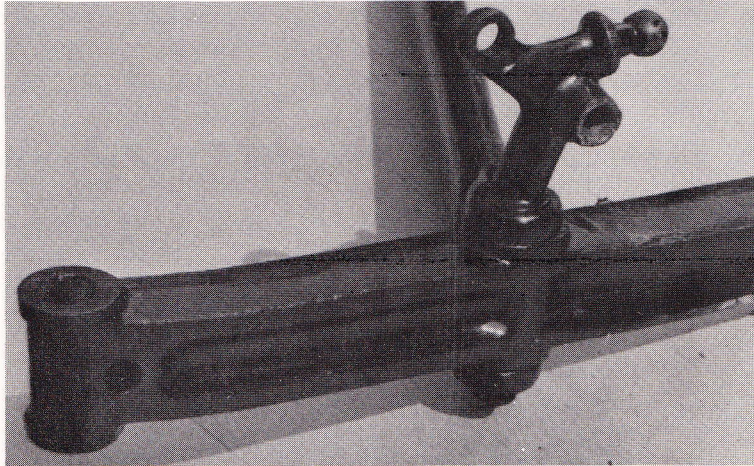


The king bolt reamer is shown at the top of this picture. This particular tool can also remove and re-install the king bolt bushings by use of the special attachment just to the right of the reamer. Removal of the bushings and their re-installation can be done by placing the small attachment on the end of the reamer and by hammering the other end drive out or install the bushing. For its use as a reamer once the new bushings have been installed, use a pair of pliers and screw the reamer through the bushings. It will be necessary to have both bushings installed before reaming since the basic idea of the long reamer is to align the one bushing to the next.

The removal of spring perches is next by simply unbolting the nuts and driving out the old spring perch. Note the wear on the opening for the spring shackle bushing. If this is worn extensively, the entire spring perch itself should be replaced. This spring perch is available from most parts companies. However, it should be noted that unless specified in



parts catalogs, this item is imported and will not fit. Be sure of what you are buying. The catalog should state that they are exact duplicates of the originals.

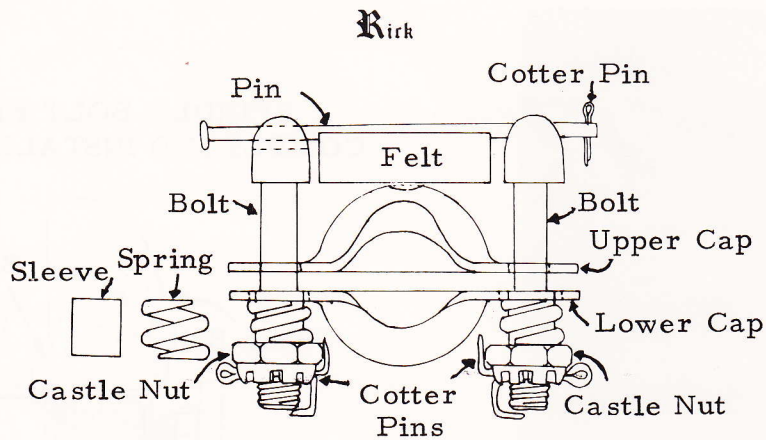


### REASSEMBLY

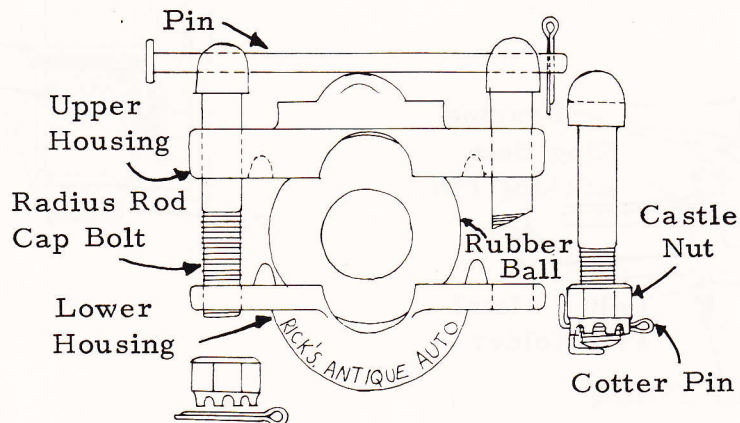
By just reversing the above procedures you can completely reassemble the entire front end. It is best to have all components except bearings and seals, completely sandblasted including spring leaves for a very detailed final inspection before painting and reassembly. Upon preparing for reassembly you will probably notice that most of the tie rod end pieces are badly worn or in need of repair. Therefore, it is best to purchase all new components in this area. The investment is small and the ability to create an excellent steering system throughout the "A" depends on these small pieces.

There were two types of radius rod balls and cap kits that were available during the Model A era: The original is the spring loaded type pictured below; and the replacement style utilizing a rubber ball. Both do the same job very efficiently, however, the rubber ball type is more popular, but not original.

ORIGINAL  
RADIUS ROD BALL & CAP KIT  
ORDER OF ASSEMBLY DIAGRAM

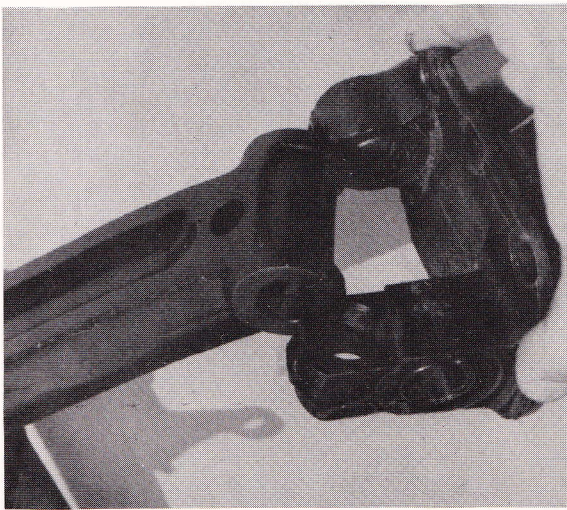


REPLACEMENT  
RADIUS ROD BALL & CAP KIT  
ORDER OF ASSEMBLY DIAGRAM



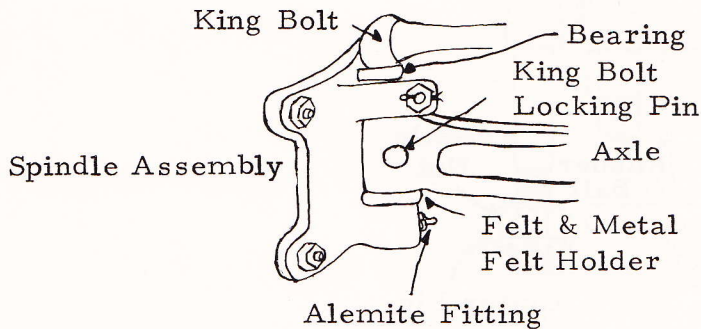
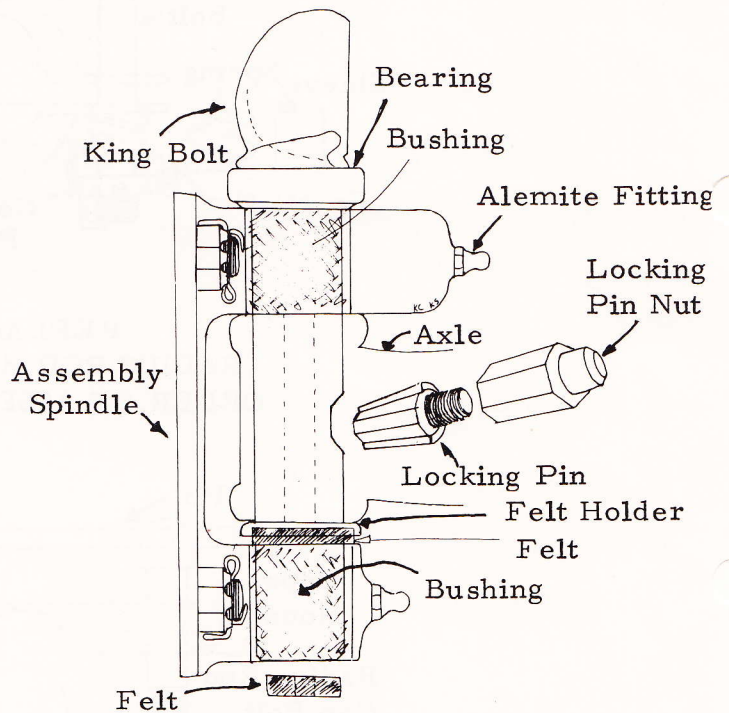
Note that the spindle arms which have the steering balls on each end have probably been worn to an egg shape. These are to be perfectly round. Since new ones are not available on the market it is best to try to have someone heli-arch on new balls. Replacement balls are available from most parts houses.

In conclusion, the front end is the life line of your "A". It effects steering, suspension and braking. No other single unit involves so many other systems. A thorough restoration of the front end is a must.

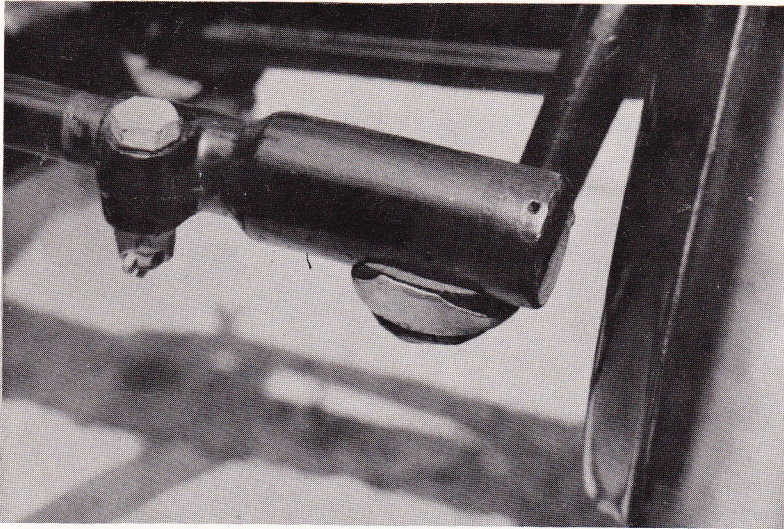


The re-installation of the front spindle. These are interchangeable from right to left. Please note that the extra hole for the spindle arms to pass through must be on the top.

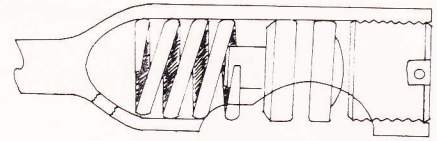
SPINDLE BOLT KIT  
COMPLETED INSTALLATION



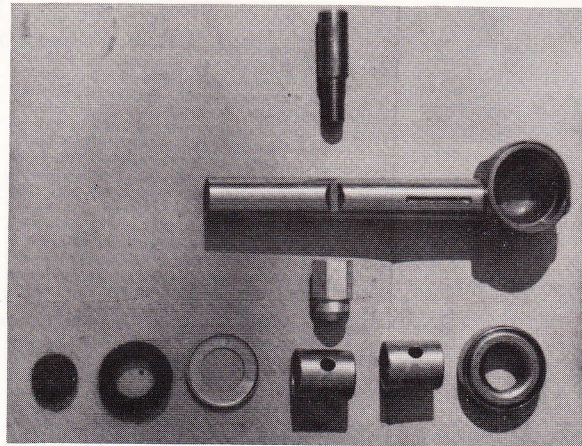
Remove alemite fittings and take out old bushings. Bushing reamer with built-in bushing driver available to ease installation. Install new bushings and ream to fit. There should be a snug fit between king bolt & spindle. Slip bearing onto king bolt. Put assembly into new bushings while holding axle in place. Have felt & felt retainer washer correctly positioned.



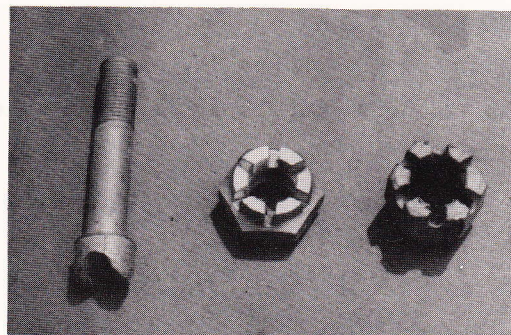
DRAG LINK & TIE ROD KIT  
Order of Assembly



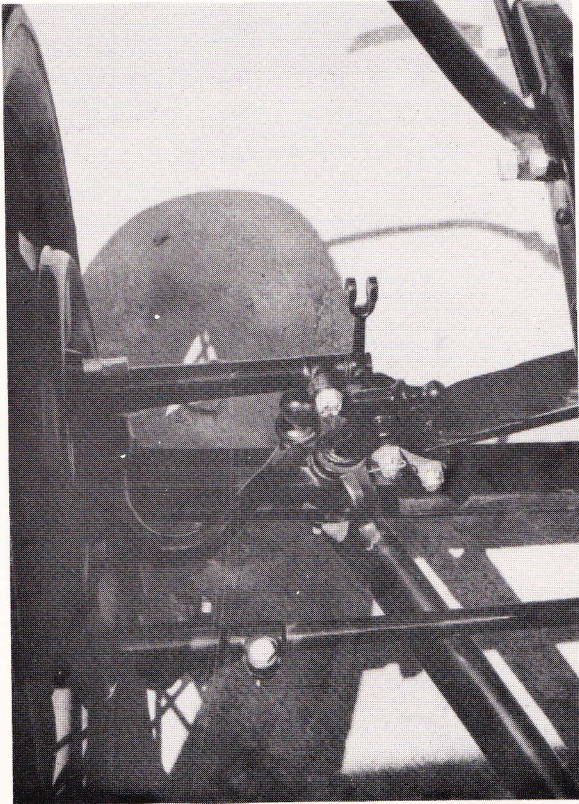
The tie rod end installed on the spindle arm.



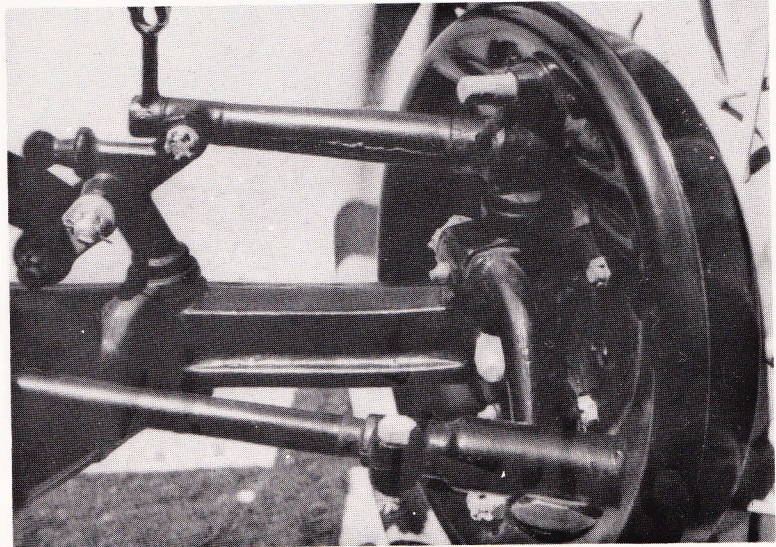
Photographic blow-up of the king bolt assembly with its felt washers, retainers, bushings, bearing and locking nut.



There are 3 special bolts or nuts on the Model A front axle which you should try to retain. These are available new but are rather expensive. Pictured from left to right they are: radius rod ball & cap bolt; front spindle arm nut; and the spring perch mounting nut.



Viewing the rear driver side of the front axle assembly.



Viewing the rear passenger side of the front axle assembly.

The finalizing of the front axle assembly will be as follows:

It is advisable to have all pieces sandblasted, primed and painted gloss black enamel. All nuts, bolts & cotter pins were originally cadmium plated.

#### PARTS NEEDED TO COMPLETE YOUR RESTORATION

1. KING BOLT KIT. 18 piece set contains forged chrome alloy steel king bolt, bushings, lock pins, bearing, felts & cups.
2. KING BOLT REAMER & DRIVER. Combination tool is a must to install and align king bolts.
3. TIE ROD OR DRAG LINK REBUILDING SET. Set contains springs, plugs, bushings, & cotters to service both ends of either tie rod or drag link.
4. DRAG LINK & TIE ROD SEALS. Rubber seals that fit under the steering balls & retain grease.
5. METAL CAP. Fits around seal & helps hold it in place.
6. RADIUS ROD BALL FELT. Felt can retain grease & lubricate the radius rod ball.
7. RADIUS ROD BALL & CAP KIT. The purpose of this assembly is to stabilize the front end movement.
8. RADIUS ROD BALL CAP PIN. Pin passes through the bell housing & holds the ball & cap kit in place.