

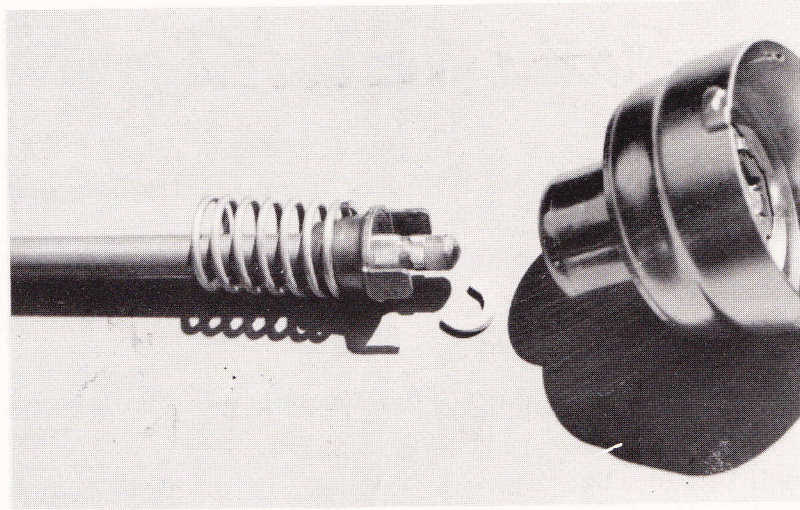
Steering Overhaul Booklet

Steering Overhaul Booklet

7-Tooth gear was used on Model A Fords primarily between 1928 and early 1929. The 2-tooth steering assembly ran from that date forward. The 2-tooth is more efficient and has a greater degree of adjustment. To remove either column from the car will require the following:

1. Removal of floorboards.
2. Removal of the brake and clutch pedals.
3. Disconnection of battery cable from the starter switch.
4. Removal of starter.
5. Disconnection of gas and spark linkage.
6. Unsnap the light switch bail.
7. Pull off the light switch wire assembly at the bottom of the steering column.
8. Removal of the pitman arm which activates the drag link which goes to the front end.
9. Removal of the clamp and anti-rattler rubber near the top of the column.

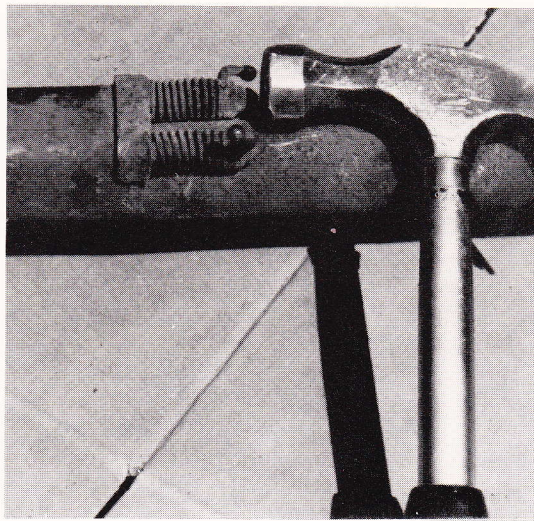
At this time the column can be completely removed from the car. Again on both assemblies give a particular amount of attention to the housing half way down the column where the spark and gas levers are linked. Many columns crack at this location. In commencing restoration of either column, it will be necessary to remove the light switch rod. This is the rod which activates the turning on of the headlamps and horn. It extends for approximately 45" down to the base of the column. To remove it, push up on the spider and remove the retaining clip. This will relieve the tension on the light switch rod and will allow you to remove the spider and spring. At that time you can pull the light switch rod out of the column.



Order of assembly of the light switch rod, spring, spider, clip & metal bulb which holds the wiring assembly.

For you to proceed any further, it will be necessary to remove the steering wheel. By removing the wheel nut and with the use of the rear wheel hub remover, remove the steering wheel. When using the rear wheel hub puller, screw it on lightly, tap gently and the steering should back off of the shaft. It should be noted at this point that a characteristic of the 7-tooth assembly is the steering wheel being held in place by a spline on the shaft as opposed to the 2-tooth keyed shaft.

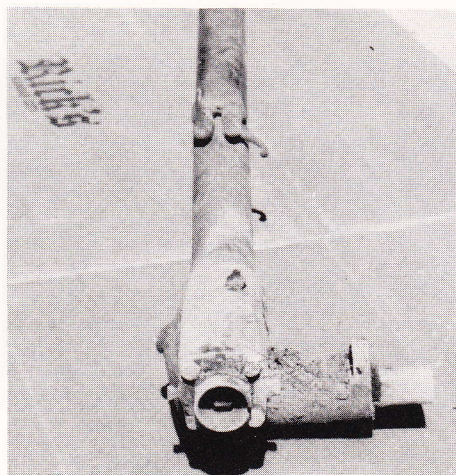
Next it will be necessary to remove the gas and spark rods. This procedure can be accomplished easily as shown in the illustration below. By tapping lightly on the shaft you can shear the soft pins off which hold the levers in place and then pull the rod on through from the top. By tapping and sheering as opposed to drilling, your accuracy with a drill in such a small and tight location and dealing with such a small pin you will probably enlarge the hole to the point of ruining possibly both the rod and the levers.



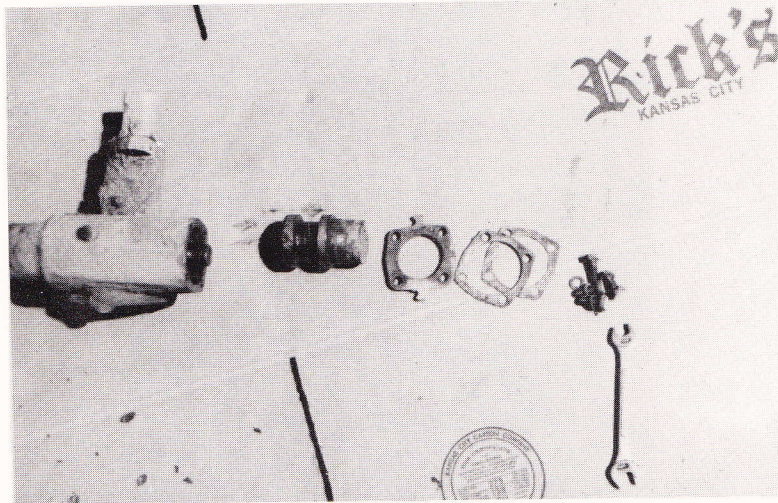
Through the use of a hammer the small soft pins can be sheered off of the ends of the spark and throttle rods.

Please recall that the gas rod lever points in an upward direction and the spark rod lever ball points in a downward direction. At this point you can now remove the upper steering bushing and the calibrator plate which cradles the spark and gas rods. Through the use of the series of photographs below you can disassembly the steering gear as shown. Some of the necessities that will be required to complete your restoration of the shaft will be the replacement of the sector bushings, gaskets, thrust bearings, shims, gas and spark rod springs, pins and both lever arms.

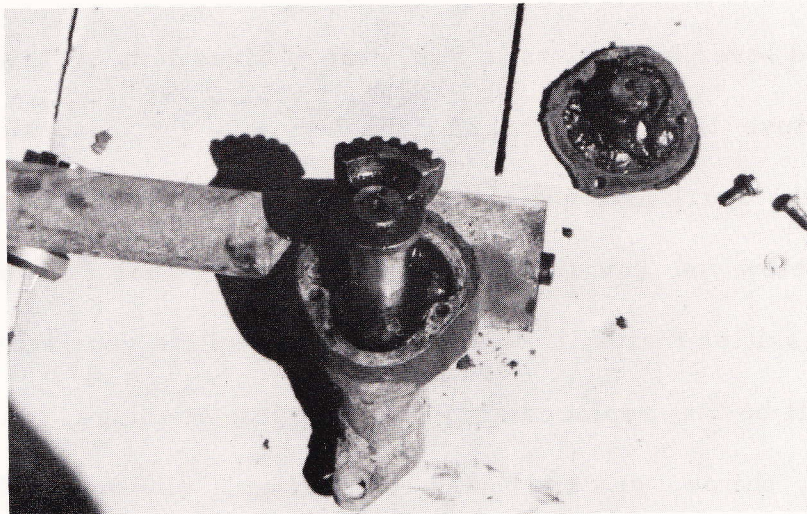
7-TOOTH RESTORATION



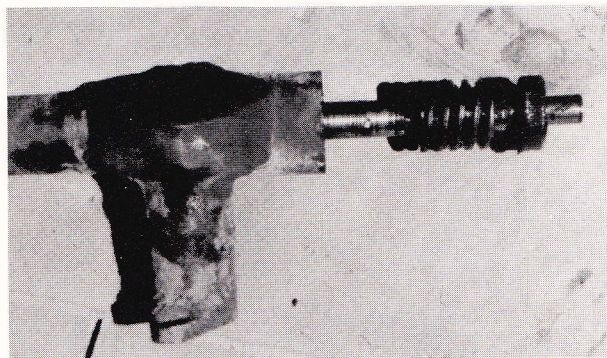
The 7-tooth steering column ready to be re-built.



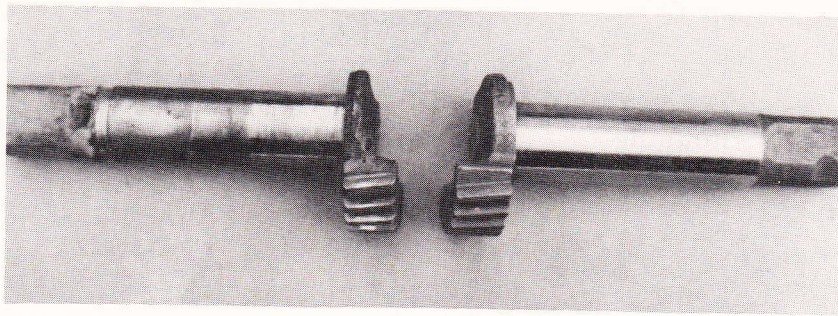
Removal of the end plate of the 7-tooth steering column enables removal of the lower bushing housing. Note the 2 shims which are used for adjustment of end play in the steering column.



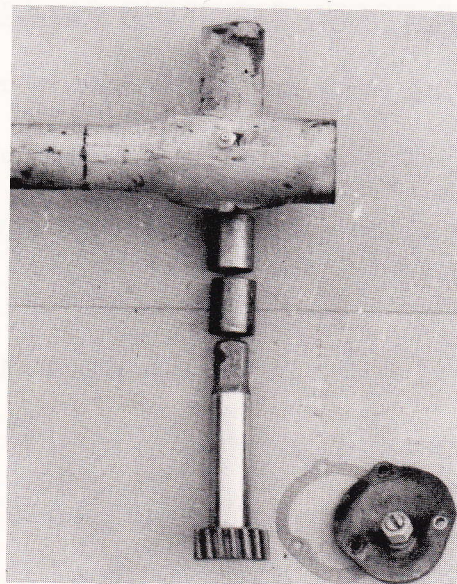
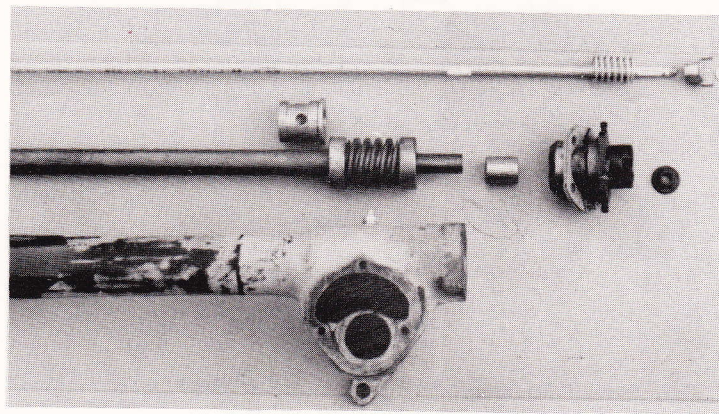
By removing the side plate the steering sector can be pushed through the top.



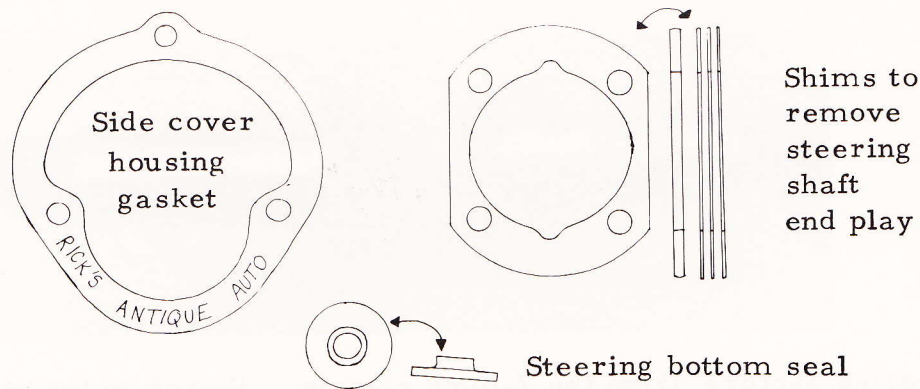
After removal of the steering sector the column on the 7-tooth can be removed by pulling it through the end of the housing.



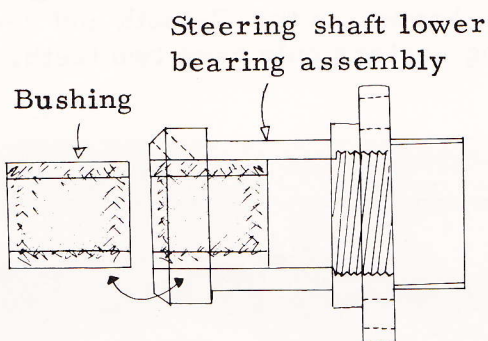
Steering sectors from the 7-tooth column. Sector on the right hand side is new. Note the sector on the left hand side is used. The shaft is pitted and worn. Close inspection will reveal marks on the gear teeth indicating wear. There are seven teeth on the steering sector. This is why the steering column is known as the 7-tooth and respectively in the 2-tooth column, the steering sectors only have two teeth.



Order of assembly of parts in the 7-tooth steering column.



Complete 7-tooth steering gasket set.



For undersize bushing:

Steering shaft must be turned on lathe to $5/8$ " to fit into new bushing. This will remove any worn or scored area and will provide a smoother steering action after reinstalling steering gear in car.

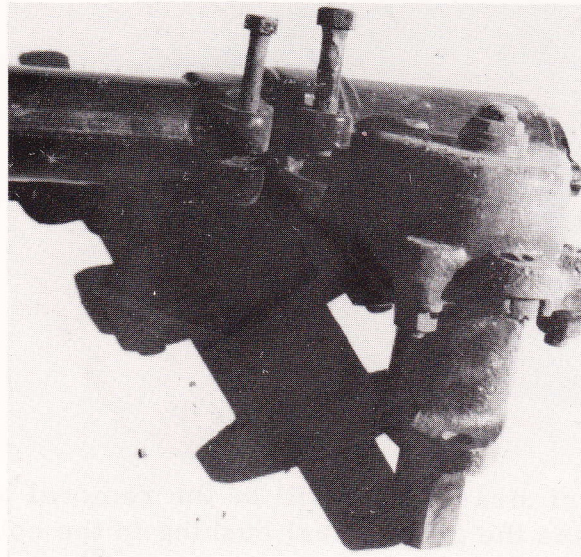
7-Tooth steering bushing.

ADJUSTMENTS FOR 7-TOOTH STEERING COLUMN

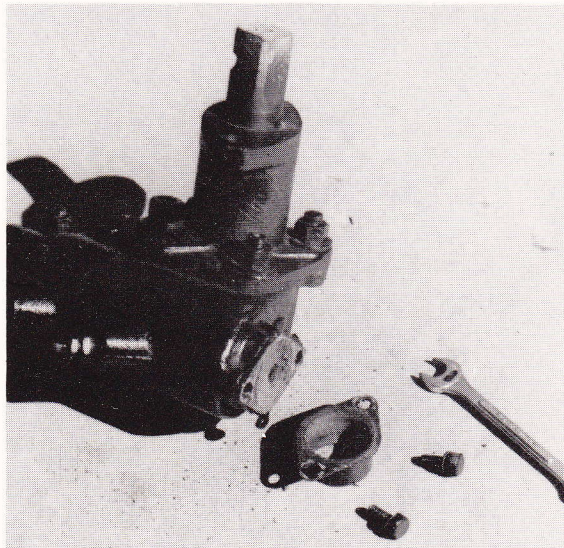
End play in the steering shaft can be changed by removing one or more of the brass shims as pictured previously in this book. When making adjustments to the steering column the front wheels of the car should be jacked up.

End play in the sector shaft can be adjusted by loosening the lock nut on the side plate and turning the steering worm thrust screw. After adjustment has been made be sure to tighten the locking nut, keeping the screw driver in the set lock to prevent the screw from turning. After taking up the end play in either the sector or the shaft, by turning the steering wheel the entire assembly can be checked for correct adjustments. There should be no binds or drag at any point.

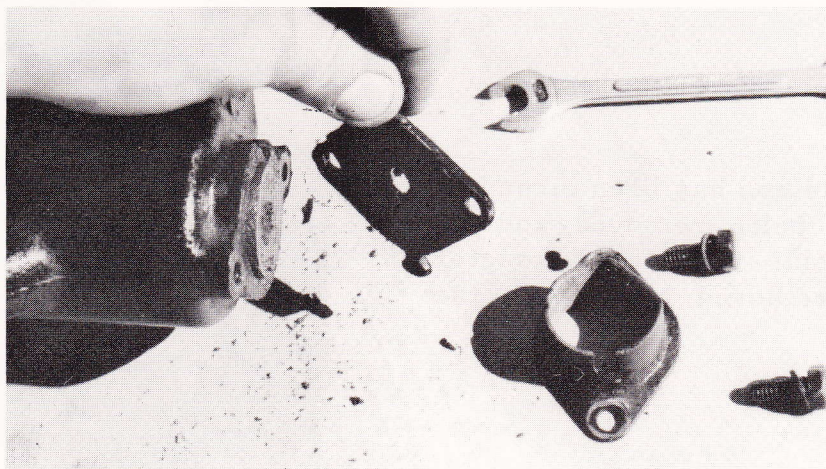
2-TOOTH RESTORATION



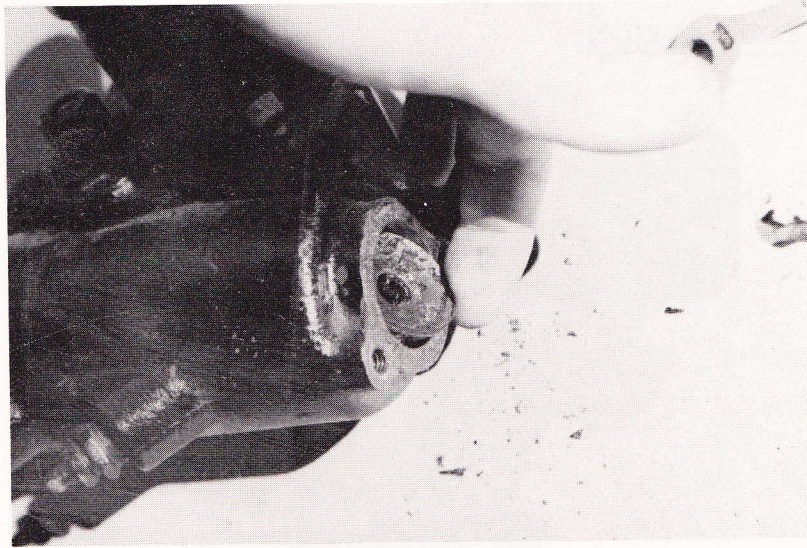
2-Tooth steering column ready for restoration.



Removal of the end plate which holds metal bulb which encloses wiring harness end.



Removal of the metal bulb wiring bail retainer.

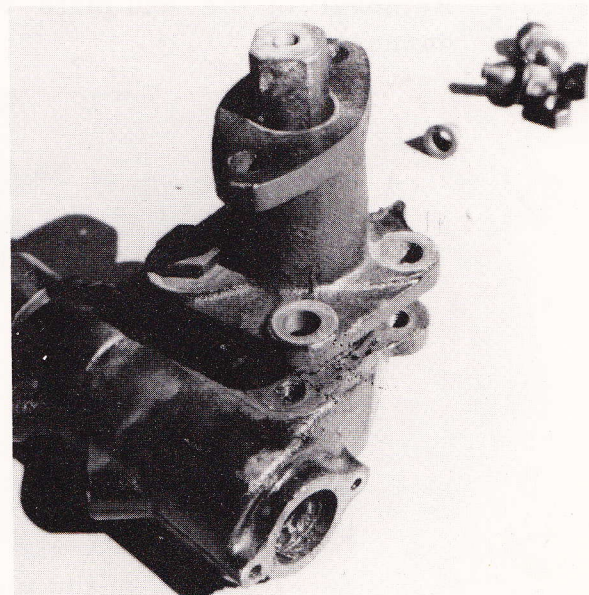


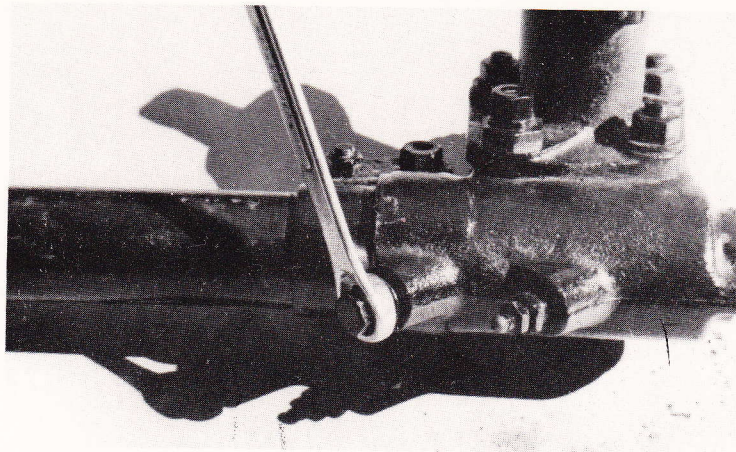
Next in the order of disassembly will be the removal of the spring loaded washer which retains the grease seal bushing in the column.



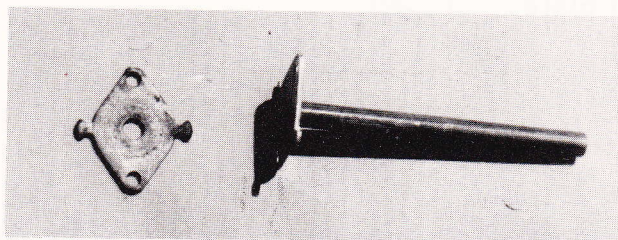
Removal of the grease seal.

At this time the column has been turned on its side, all four bolts removed and the assembly which holds the steering sector bushings can be removed along with the steering sector.

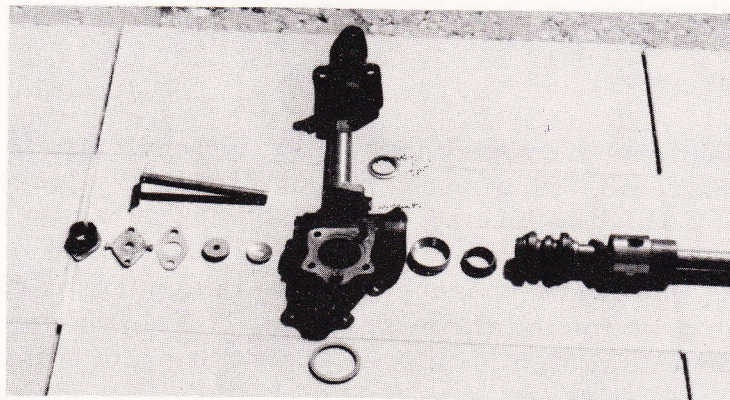




Adjustment of end play of 2-tooth steering sector is started by unscrewing the locking jam nut.

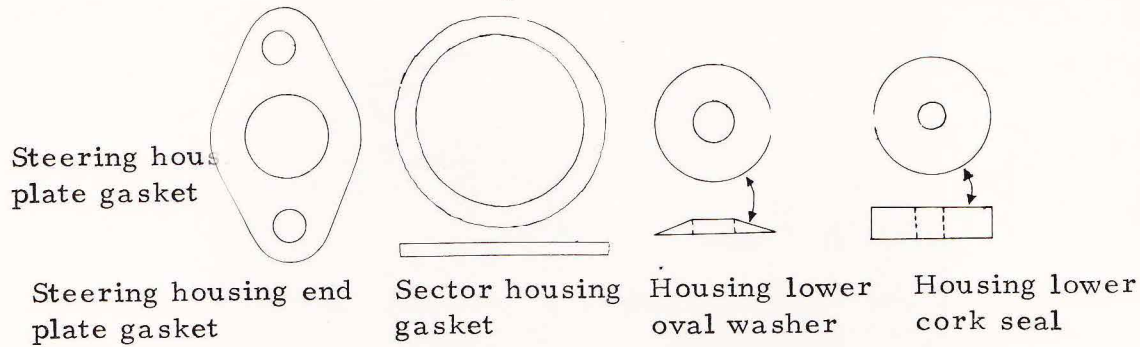


On the left is the original holder for the wire bail which supports the metal horn bulb. On the right is the assembly which is most popular with restorers which supports the long tube which passes through the oil reservoir in the steering column and prevents grease from accumulating on the wiring assembly. The assembly on the right replaces the original style.

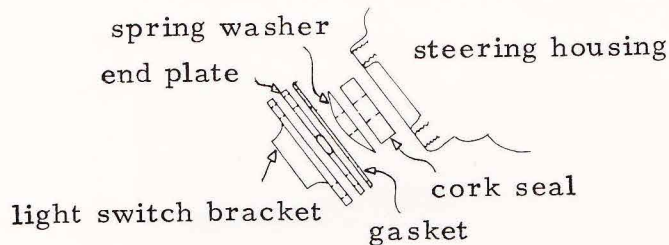


Blow-up of the order of assembly on the 2-tooth steering column.

Complete 2-tooth steering gasket set.



Steering oil filler and spring washer.



ADJUSTMENT FOR THE 2-TOOTH STEERING COLUMN

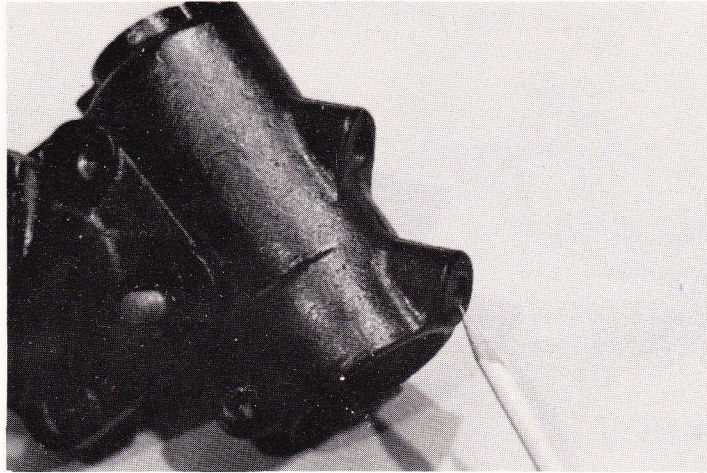
Basically there are 3 types of adjustments:

1. End play of steering shaft
2. Alignment of the sector teeth in worm
3. End play of the steering sector

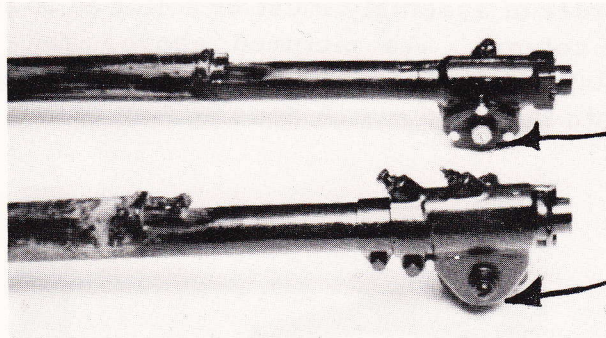
It is advisable when making these adjustments to follow the procedure in chronological order.

1. For adjustment of end play in the steering shaft turn the steering wheel to the extreme, then back $1/8$ of a turn. By loosening the housing clamp bolt which is located on the backside of the steering column and by releasing the jam nut as shown, the thrust screw can now be screwed downward thereby pushing the upper bearing assembly and bearings down toward the worm gear. Make sure you have turned this adjustment down tightly. For re-tightening jam nut, back off approximately $1/6$ of a turn on the thrust bolt. Please secure the housing bolt. Turn steering wheel from lock to lock and be sure that it is not binding.
2. To adjust the end play in the steering sector it will be necessary to turn the steering wheel to the extreme, then back $1/8$ of a turn. Be sure that all housing bolts are tight. Loosen the jam nut that secures the thrust screw located on the side of the steering column. Using a small screwdriver, turn in a clockwise direction until screw is snug. Re-secure the jam nut. Turn the steering wheel from lock to lock, being sure that there is no binding.

3. The last adjustment is for that of the alignment of sector teeth in the worm. This is without a doubt one of the most complicated adjustments to make. To be sure of proper adjustment it will be necessary to notice the back & forth play of the steering pitman arm which connects to the drag link. The drag link should have already been disconnected for proper steering adjustment. Check the back & forth play of the steering wheel when in its mid position. All fittings should be snug.



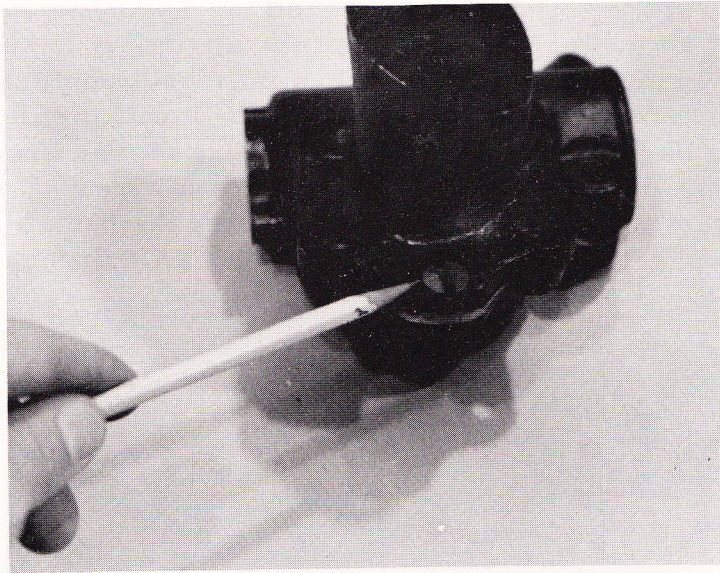
The location for the adjusting nut governing end play of steering shaft.



The location of the thrust screw governing the end play of the sector shaft.



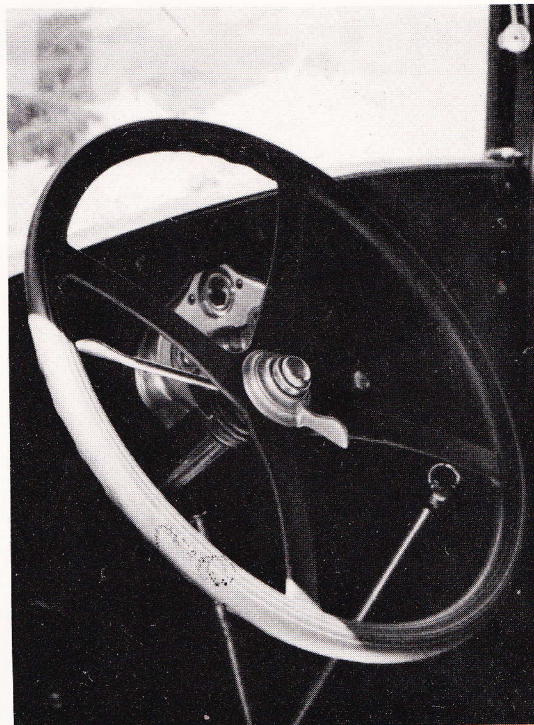
Location of the eccentric for adjustment of proper gear mesh between the sector and the worm.



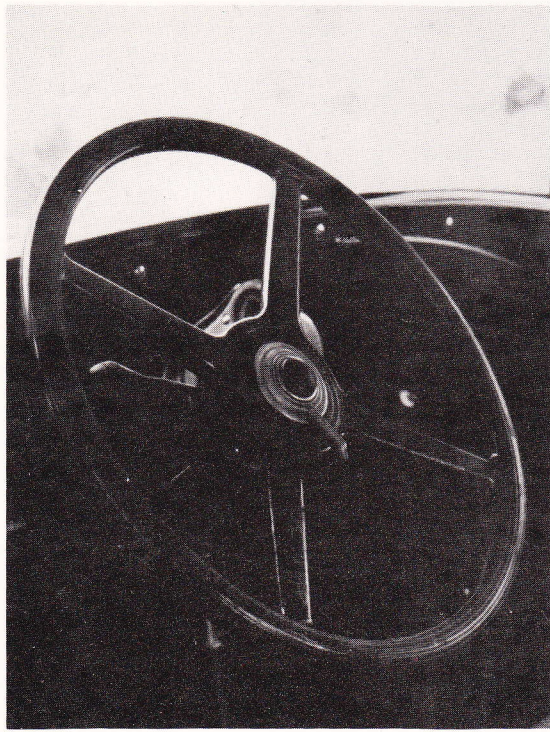
The adjusting eccentric rivet for adjusting centralization of the tooth contact giving minimum play when the steering wheel is at center location.

ORDER OF ASSEMBLY

These cork seals, gaskets and spring washers are in the steering gasket set. The end plate and light switch bracket are part of the old steering column. This order of assembly must be followed to prevent sealant leakage from end of column. As pictured above, you may wish to use the steering end plate at the long tube in place of the original to help prevent leakage of oil into the light switch housing.



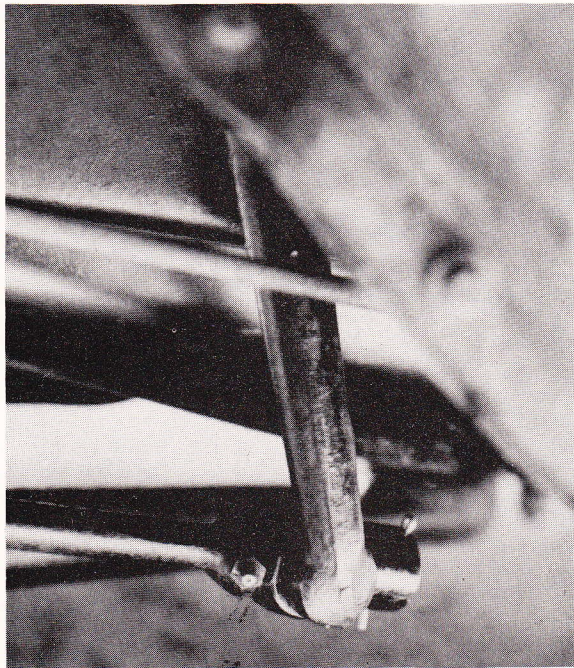
1928-29 Steering wheel and column. Note the design of the horn button and light switch.



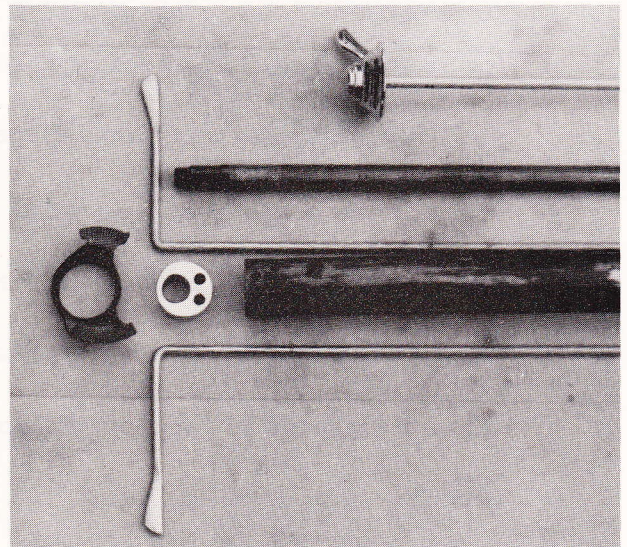
1930-31 Steering wheel. Note the design of the horn button and light switch.



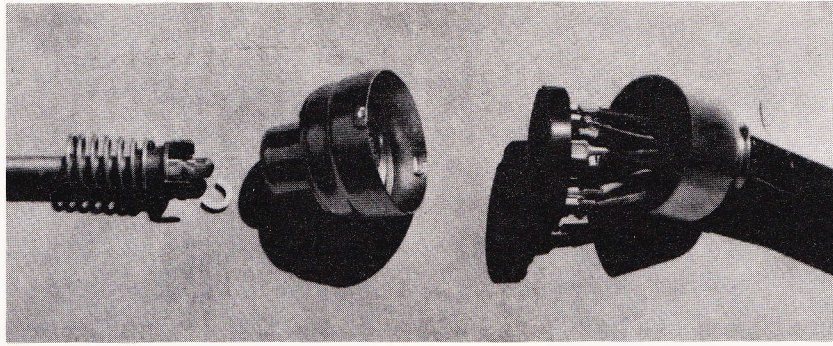
Attachment to the steering column inside the car was usually made from underneath the gas tank as pictured. On a few late models this attachment was made through a bracket which extended from in front of the gas tank.



The pitman arm as it extends downward from the steering arm which attaches to the drag link.



Order of assembly at the top of the steering column.



Order of assembly of the horn rod, spring, spider, light switch retainer, and metal horn bulb with wiring.

It is best to paint the steering column black laquer as originally used. The steering wheels were red from the "A" beginning until May-June 1928. From that time until 1930 the steering wheels were black, however, retained the similar design. 1930-31 steering wheels were black and had a more rugged appearance. The spark and gas levers were originally nickel plated with the horn rod which activates horn and lights also being nickel plated. 1930-31 it was made of black bake-o-lite. All steering columns in 1928-31 used the same lubricant that was found in the transmission and differential, that being 600 weight oil. They should be checked frequently for lubrication. It should be pointed out that in both 2-tooth and 7-tooth steering columns that many times a grease fitting replaced the filler plug since many Ford agencies were able to fill the reservoir using a pressure gun. This grease fitting can be removed and replaced with a brass drain plug. The purpose of the grease fitting was to allow a heavy 600 weight oil to be placed in the column under pressure rather than trying to pour it through such a small hole.

PARTS NEEDED TO COMPLETE YOUR RESTORATION:

1. STEERING GASKET SETS - 7-TOOTH & 2-TOOTH. Complete set of gaskets to service gear boxes.
2. STEERING COLUMN ANTI-RATTLER - 7-TOOTH & 2-TOOTH. Rubber located around the column at the gas tank.
3. NUT FOR WHEEL - 7-TOOTH & 2-TOOTH. Special thin nut for holding steering wheel.
4. WOODRUFF KEY - 2-TOOTH. Holds keyed wheels in place.
5. CONTROL ROD SPRING SET - 7-TOOTH & 2-TOOTH. Includes two springs and lever pins.
6. 600 WEIGHT OIL - 7-TOOTH & 2-TOOTH. For lubrication of steering columns.
7. 7-TOOTH SHIMS. These are the special brass shims located at the bottom of the steering column to give end play adjustment.
8. LOWER BUSHING - 7-TOOTH. Bronze bushing located inside the lower bearing assembly (the part that comes off the bottom of the column.)
9. STEERING WORM BEARING LOWER CUP - 2-TOOTH. Maintains gear alignment at bottom of housing.
10. A DIVISIBLE STEERING HOUSING END PLATE - 2-TOOTH. A modern design to prevent grease from entering the light wires at the bottom of the 2-tooth columns.
11. WORM BEARINGS - 7-TOOTH & 2-TOOTH. A must replacement for smooth steering.
12. SECTOR BUSHING - 7-TOOTH & 2-TOOTH. Steel backed bronze bushing with oil groove.
13. LIGHT SWITCH & HORN ROD. The measurement is taken from the keeper groove to just beneath the head assembly. (Different lengths due to differing manufacturers of columns.) If you do not have an old rod to go by, just measure your steering shaft from the top where the nut screws on to the bottom, then add 1" to give approximate measurement. In 1928-29 the most common rod length was 45-3/4" and in 1930-31 it was 45-31/32".
14. LIGHT SWITCH SPIDER - 7-TOOTH & 2-TOOTH. Fits on the lower end of the light rod and activates the light switch.
15. LIGHT SWITCH BAIL - 7-TOOTH & 2-TOOTH. Holds the light switch in position. Cadmium plated.
16. LIGHT SWITCH BODY. Fits on the lower end of the steering column and holds wires.