

## Ford-Saginaw Non-Integral Steering Box Rebuilding Instructions

### READ INSTRUCTIONS COMPLETELY BEFORE REMOVAL & DISASSEMBLY

These instructions are specifically designed for the Ford-built, Saginaw-design, non-integral steering boxes most commonly found in 1965-1970 Ford Mustangs, but also used in many early model Falcons, Galaxies, Fairlanes, Torinos, Mavericks, Granadas and their Mercury counterparts.

Non-integral means that there are no hydraulic lines going to the steering box. These boxes are either used on cars with manual steering or power steering systems that have hydraulically assisted steering linkage.

#### REMOVAL:

##### 1965-1967 Mustang with Long-style input shaft:

- 1) Disconnect ground (negative) cable from battery.
- 2) On original style steering wheels, remove stock horn ring by depressing and turning counter-clockwise. Remove turn signal switch lever by unscrewing from the column.
- 3) Remove nut holding down steering wheel.
- 4) Remove steering wheel from end of shaft. It is preferable to use a proper steering wheel puller for this operation. Remove the coil spring that was under the wheel and the upper column centering bushing.
- 5) Disconnect the wiring for the horn and turn signals at the plug(s) at the base of the column.
- 6) Remove the large U-clamp that holds the column tube to the bottom of the dash panel.
- 7) Pull column up from the floor, off the steering box shaft and out of the car. The end of the tube may be stuck at the rubber tube seal just above the steering box. Pry on the end of the tube against the box to help push the column tube up into the car.
- 8) Although it is possible to remove the steering box without removing the drivers seat, since it is easy to damage the upholstery with the end of the steering shaft, it is recommended to remove the seat. It is retained by four ½" nuts that can be accessed from under the car and hidden under rubber plugs.
- 9) Remove pitman arm from the steering box sector shaft. Use a proper puller to do this. They can often be borrowed or rented from any auto parts stores. DO NOT USE A "PICKLE FORK"! Use of one can damage the pitman arm and put undue stress on the gear teeth inside the steering box.
- 10) Remove the three bolts holding the steering box to the frame rail.
- 11) **6-cylinder cars:** Tilting the steering shaft down inside the car, raise the box upward and remove from the top of the engine compartment.
- 12) **V8 cars:** Unbolt and lower the drivers side exhaust manifold from the engine. It may be necessary to remove the manifold completely to provide clearance. Remove drivers side engine valve cover. Tilting the steering shaft down inside the car, raise the box upward and remove from the top of the engine compartment.

##### 1967-1970 Mustang with Short-style input shaft:

- 1) Remove pitman arm from the steering box sector shaft. Use a proper puller to do this. They can often be borrowed or rented from many auto parts stores. DO NOT USE A "PICKLE FORK"! Use of one can damage the pitman arm and put undue stress on the gear teeth inside the steering box.

- 2) Disconnect steering box from steering shaft at the "rag joint" coupler.
- 3) Remove the three bolts holding the steering box to the frame rail.
- 4) Remove the steering box from the car by raising up from the top of the engine compartment.

**NOTE:** Removing the steering box on cars with air conditioning, power brakes or big-block engine will be more difficult and may require other parts to be removed for access to the box and its removal.

#### CHECKING GEAR MESH:

It is a good idea to check the condition of the steering box before disassembly. This check, along with later visual inspection, can give you a good indication of the condition of the gears inside and if the box is rebuildable.

- 1) Mount the steering box in a vise, being careful not to clamp onto either shaft. If not already off, remove the pitman arm from the steering box Sector Shaft, using a puller to remove.
- 2) Twist the shaft all the way through its travel, lock to lock, noting how many revolutions it makes.
- 3) **Long-shaft boxes:** Clamp a pair of Vise-Grips onto the shaft so you can turn the box lock to lock. Do not clamp onto the threads or splines of the shaft, but a several inches below. **Short-shaft boxes:** Connect a ratchet or short breaker bar to the input shaft. An 11/16" 12-point socket will usually slip over and engage the splines of the shaft.
- 4) Turn the shaft slowly through its travel, lock to lock, noticing if there are any positions where the shaft seems slightly tighter and harder to turn.

What you want to check is if the turning of the shaft feels slightly tighter in the center of its travel. There should be about half a turn where the shaft is tighter in the center. If you don't notice any difference, loosen and remove the Adjusting Screw Locknut from the Adjusting Screw. Tighten the screw about ¼ turn and check for center tightness again. Continue to tighten the screw in ¼ turn increments, each time testing for tightness at the center of travel, until you do get a center tightness.

The results of this testing can tell you something about the condition of the parts inside and the possibility of a successful rebuild. Though complete removal and inspection of the internal parts will be necessary for an accurate diagnosis, the testing can indicate this:

- a) If there is a slight but distinct tightness in the center of shaft travel, with no tightness anywhere else, the gear teeth on the Rack Block and Sector Shaft probably do not have much wear on them and should rebuild.
- b) If you start to get a tightness in the last half turn or so of shaft travel, or the Adjusting Screw is turned in all the way and the shaft starts to bind, the gear teeth are worn out and the Sector Shaft is bottoming out on the housing inside. The Rack Block and/or the Sector Shaft will have to be replaced.

For more information and detail on setting and measuring gear mesh. see the assembly instructions.

# StangersSite.com

## DISASSEMBLY:

- 10) Remove the Fill Plug. Loosen and remove the Adjusting Screw Locknut and the three bolts holding the Top Plate down, one of which should have an ID tag underneath it.
- 11) Screw the Adjusting Screw in until it goes through the Top Plate and remove Plate. Slide the Adjusting Screw out from the top of the Sector Shaft. There should be a small Sector Shim on the bottom of the Adjustment Screw. Don't lose this shim.
- 12) Turn The Input Shaft until the Rack Block and Sector Shaft are centered in the top opening of the housing (see Picture A). Pull up on Sector Shaft and remove. It may be necessary to hammer on the bottom of the shaft with a plastic mallet or a hammer and piece of wood. Be careful not to damage the threads on the bottom end of the Sector Shaft.
- 13) Loosen and remove the Adjusting Nut Lock Ring by turning counter-clockwise with a hammer and punch in the notches.
- 14) Unscrew the Bearing Adjusting Nut and remove from shaft. Remove the top Input Shaft Bearing cone from the shaft and discard. Remove Input Shaft with attached Rack Block assembly from housing.
- 15) Remove bottom Input Shaft Bearing which is probably still setting in the housing where the end of the shaft was setting. With a long punch, knock out the Bearing Plug out of the housing from the inside.
- 16) With the Bearing Plug out of the way, carefully knock out the bottom Input Shaft Bearing Race from the housing. From the outside of the housing, you should just be able to get the edge of a punch on the lip of the race and knock it into the housing (see Picture B). Be careful not to nick or damage the recess that the bearing race fits into.
- 17) Pry out and remove old Sector Shaft Seal.
- 18) Press or drive out both of the old Sector Shaft Bearings. **NOTE:** The original factory-style Top Bearing has a lip on the top edge. It must be removed from the housing by pressing up from the bottom. Using a suitable size socket or seal installation tool, drive the Bottom Bearing up into the housing and against the Top Bearing and continue until both bearings have been pressed out of the housing. Be careful not to gouge or score the surface of the housing where the bearings fit. This could cause new bearings to deform and bind on the Sector Shaft.
- 10) Remove the screws holding the Guide Retainer to the Rack Block.
- 11) Pull the Ball Guides out of the Rack Block, being careful not to lose any of the loose Ball Bearings. Turn the Rack Block upside down and turn the shaft in and out of the block, causing the ball bearings to fall out of the block, until the shaft can be removed from the Rack Block.
- 12) Remove the bearing race from the Bearing Adjusting Nut. Sometimes this is loose enough that it can be unscrewed from the nut. If not, slam the nut down on a hard flat surface, like the anvil portion of a bench vise, to try and knock the race down enough to get the edge of a punch behind it and drive it out of the Nut. If the box has the short-style Bearing Adjusting Nut (see Picture C), carefully remove the Rubber Shaft Seal from the Nut.

Thoroughly clean all parts in solvent or mineral spirits. Be sure to wash out all the old grease from the parts and inside the housing. Use a wire wheel brush or a ScotchBrite pad to remove any rust or varnish from parts. All external pieces can be sandblasted and painted.

## INSPECTION:

- 1) Inspect the Input Shaft/Worm Gear: Check the worm groove area at the gear end of the Input Shaft (see Picture D). There may be pitting from rust or galling in the grooves. A few small pits will probably not affect the working of the box. Excessive pitting, especially in the center grooves, may cause the box to feel notchy and will damage the Ball Bearings. A badly pitted shaft should be replaced.
- 2) Check the areas at both ends of the worm groove where the Input Shaft Bearings run on the shaft. These areas of the shaft act as the inner race of the bearings. If the bearing surface of the shaft is pitted, or the surface appears wavy, the box will feel rough and notchy and the bearing preload will be erratic. If this case, the bearing surfaces of the shaft must be machined smooth or the shaft replaced.
- 3) Inspect the Rack Block: Check the teeth of the rack where they mesh with the Sector Shaft (see Picture E). The teeth should not be pitted or excessively worn. The most critical area is the tooth sides of the center groove. If the sides of these teeth are badly worn, the box may not have the proper tightness or mesh when centered. Inspect the grooves inside the rack for pitting or galling. A few small pits will probably not affect the box. If unsure, set one of the loose Ball Bearings in the groove and rotate the block, letting the bearing roll along the grooves. If the Ball Bearing catches on the pitted area, the Rack Block should be replaced.
- 4) Inspect the Sector Shaft: Check the teeth for pitting or excessive wear. The most critical area is the center tooth. If this tooth is badly worn, the box may not have the proper tightness and mesh when centered. Notice the vertical lines etched into the sides of the teeth. These are tooling marks from when the shaft was machined. The farther those marks are visible towards the outer edge of the gear tooth, the better. Smooth shiny metal indicates the absence of tooling marks and a worn down surface. Check the shaft surface where the needle bearings ride for galling or pitting from rust. Polish with emery cloth if surface is only lightly rough. If bearing surfaces are rough or badly worn, the shaft should be replaced.
- 5) Inspect the Ball Bearings: Check for galling or pitting from rust and replace any damaged pieces. Bearings should be bright and shiny silver, like a mirror. If they are dull and black tinted, then the chrome finish has worn off of them and they are undersized. If still smooth, they can still be used this way, but will wear quicker and will make the Rack loose on the Worm Gear. Make sure all the Ball Bearings are accounted for. The typical small-bearing boxes (such as 1965-1970 Mustangs and 1960-1965 Falcons) have 62 Ball Bearings. The large-bearing boxes (such as Fairlane, Torino, Galaxie, Maverick and post-1965 Falcons) use 54 Ball Bearings.

**NOTE:** Some early built boxes, like the 1960-1963 Falcons, have bronze bushings for the Sector Shaft instead of needle bearings, like later built boxes. Replacement bushings are not available new and the boxes will not accept needle bearings. It is recommended to replace the housing with a 1965-1966 Mustang housing and install needle bearings. The Mustang housing looks very similar to the early Falcon housing and has the same bolt pattern. This is a recommended upgrade for the early Falcon bushing steering box.

# StangersSite.com

**For assembly and lubrication, use a good quality moly or lithium based chassis grease. These can often be purchased at any auto or hardware store. A single typical grease gun tube will do one steering box.**

## REASSEMBLY:

- 1) Set the Housing on a workbench upside-down, the bottom end facing up. Smear a little grease inside the Housing where the bottom shaft bearing will go. Press or drive one of the Sector Shaft Bearings into the bottom of the housing until slightly recessed into the opening for it (see Picture F). In the rebuild kit, both top and bottom bearings are the same. The end of each bearing has a flat surface, usually with the bearing number stamped into it. Press or drive the bearing into place with the tool against this flat surface.
  - 2) Install the Sector Shaft Seal into the bottom of the Housing. The inner lip of the seal sits toward the inside of the Housing, the taper to the lip faces outward. The seal should be driven in until seated against the raised area the bearing fit into.
  - 3) Turn the Housing rightside-up, lightly grease the area for the upper bearing and press or drive the other Sector Shaft Bearing into the Housing, making sure the top edge of the bearing is slightly below the surface of the Housing about 1/16" (see Picture G). If the bearing is not far enough down, the Sector Shaft may bottom on it during adjustment.
- NOTE:** After installing each Sector Shaft Bearing, check that the Sector Shaft will slide into and through the bearing. The shaft should slide into both bearings easily. If not, then one or more of the bearings has probably been damaged during installation and is no longer round. In this case, the bearing should be removed and replaced.
- 4) Apply a small amount of gasket sealer or RTV to the recess in the Housing where the Bearing Plug sits. Install the Bearing Plug into the Housing, hitting it in the center with a hammer to flatten it, which should expand it and lock it into the recess. It may be necessary to stake the plug into place to prevent it from coming out (see Picture H).
  - 5) Install one of the outer races of an Input Shaft Bearing into the Housing at the Bearing Plug. Press or drive the race into place until seated firmly in its recess (see Picture J). Apply grease to the outer race and fill the area behind it to the Bearing Plug.
  - 6) Install one of the Input Shaft Bearing cones into the outer race making sure it is seated evenly. Apply more grease to the bearing.
  - 7) Set the Input Shaft on the workbench, steering wheel end to your left (see Picture K). Slide the Rack Block over the worm gear portion of the Input Shaft, wide spaced end of the rack teeth to the top.
  - 8) Turn the Rack Block over, tooth side down. Look down the holes in the block and line up the grooves in the block with the grooves on the worm gear. Install one Ball Bearing into each of the four holes in the Rack Block and push them down into the block around the worm gear. It may be necessary to jiggle the shaft or block around a bit before the grooves line up and the bearings will drop down into place.
  - 9) Install four more Ball Bearings into the four holes and push them into place. Repeat this until you have installed all but 18 of the Ball Bearings (see Picture L).

- 8) Take one of the Bearing Guide halves and fill it with grease. Set nine of the Ball Bearings into the groove of the guide and into the grease and cover them with the other Bearing Guide half (see Picture M). Apply a dab of grease to each end of the assembled guide to prevent the bearings from falling out. Install the assembled Bearing Guide down into the diagonal holes in the Rack Block until flush. Assemble the other nine bearings into the other guides the same way and install into the block in the remaining holes (see Picture N).
- 9) Place the Bearing Guide Retainer over the Bearing Guides and secure with the screws.
- 10) Rotate the Input Shaft in and out through the Rack Block. After a couple of turns, the grease should be distributed a little bit and the shaft should turn smoothly in the block from one end to the other. If the shaft jams, or catches while turning, the tangs on one or more of the Ball Guides is bent or damaged. This will cause the bearings not to feed smoothly into the guides. If this happens, the damaged guides must be replaced.
- 11) Screw the Input Shaft all the way through the Rack Block, coat the grooves with grease, and run it back the other way. Repeat this procedure for the other end of the shaft. This helps grease the inside of the Rack. Make sure there is grease on the area of the shaft where the Input Shaft Bearings ride.
- 12) Set the Input Shaft/Rack Block assembly into the Housing, making sure that the end of the shaft sets into the bearing setting inside the housing. The tooth side of the Rack Block faces the open area of the Housing where the Sector Shaft will go (see Picture P).
- 13) Slide the remaining Input Shaft Bearing cone onto the Input Shaft and slide it down the shaft until it seats. Coat the bearing with grease.
- 14) If your steering box has the long-style Input Shaft (38" or longer), skip to Step 18.
- 15) If your steering box uses the short-style Input Shaft, it also had a Rubber Shaft Seal mounted in the Adjusting Nut. Reinstall the Rubber Shaft Seal at this time. One lip of the seal is slightly larger diameter than the other side. This lip mounts to the inside of the Adjusting Nut (see Picture C).
- 16) Install the remaining Input Shaft Bearing outer race into the Adjusting Nut. It may need to be pressed or driven into place. If it fits loosely in the nut, put a little grease inside the nut before installing the race to prevent the race from falling out during assembly.
- 17) Slide the assembled Adjusting Nut onto and down the Input Shaft and carefully thread the nut into the Housing until finger tight.
- 18) Turn the Input Shaft in and out from one end to the other. The shaft should run smoothly and the Rack Block should move evenly back and forth. If not, the end of the Input Shaft may not be centered in the bottom Input Bearing, or the bearing may have slipped out of place.
- 19) Tighten down the Adjusting Nut until it takes a little bit of effort by hand to turn the shaft. Turn the shaft lock to lock to set the bearings. It should turn evenly and smoothly. Then loosen the Adjusting Nut and tighten back down finger tight.

# StangersSite.com

## SETTING INPUT SHAFT BEARING PRELOAD:

To set the bearing preload and the center gear mesh, you will need a direct-reading **inch/pound** torque wrench capable of accurately measuring 0-10 in/lbs. This means a wrench you can read as you tighten, like a dial-type, not a “clicker” type.

- 1) Long-style Input Shaft: This style box usually has threads at the top for a nut to hold the steering wheel down. You can thread this nut onto the shaft and tighten it as it bottoms on the threads. You can put a socket on the torque wrench to fit the socket and use this method to turn the shaft and measure the bearing preload.
- 2) Short-style Input Shaft: This style box usually has splines on the end for a coupler. An 11/16”, 12-point socket will usually fit over the splines and can be attached to the torque wrench to turn the shaft and measure bearing preload. If the socket is a little loose on the splines and wants to slip, push a small piece of paper towel over the end of the shaft and then slip the socket over the splines. This should take up the slack and allow the socket to turn the shaft during adjustment.
- 3) Tighten down the Bearing Adjusting Nut while turning the Input Shaft with the torque wrench and measuring the bearing drag. Turn the Shaft from lock-to-lock while checking the reading. The desired reading is 5-6 in/lb. The Shaft should turn fairly smoothly and the reading should not jump around so much that it is hard to measure. Tighten the Adjusting Nut until you reach the correct reading. If you exceed it, loosen the Adjusting Nut and start again. You want to get an even and consistent reading of 5-6 in/lb across the travel of the Input Shaft. **NOTE:** If the measurement jumps around several increments (with new bearings), then the bearing surfaces on the Input Shaft are unevenly worn and the Shaft should be replaced or the bearing surfaces remachined.
- 4) Once the proper bearing load has been set, install the Adjusting Nut Lock Ring and tighten with a punch or chisel until the Lock Ring and Adjusting Nut are secure. Check the bearing drag with the torque wrench again. If it has tightened or loosened from your original settings, loosen the Lock Ring, move the Adjusting Nut appropriately, and then tighten down the Lock Ring again. Check bearing drag and repeat until bearing drag is still about 5 in/lb with Lock Ring tight and secure.
- 5) Install the Fill Plug into the Housing with a little sealer on the threads. Tighten down only until it stops or the top thread is still visible. Over-tightening can cause the Fill Plug to extend too far into the Housing and interfere with the travel of the Rack Block.
- 6) Turn the Input Shaft all the way to the right so that the Rack Block is up at the top end of the box.. Pack the area between the Rack and the bottom bearing with grease. It is easiest to do this by scooping the grease out of its tube or container with a putty knife and forcing it into the box. The idea is to force grease into the Housing and around the backside of the Rack Block.
- 7) Now turn the Input Shaft all the way to the left, moving the Rack Block to the bottom of the Housing. Fill the area above the Rack with grease as before. Push the grease into the box as best you can, trying to fill the area behind and around the Rack Block and bearings. Pack grease in the areas around where the Sector Shaft will set (see Picture Q).

- 20) Turn the Input Shaft until the center groove in the Rack Block lines up with the center hole in the top of the Housing (see Picture P). Tilt the upper edge of the Rack back into the Housing.
- 21) Drop the Sector Shaft down into the Housing, making sure the center tooth of the Sector Shaft goes into the center tooth gap of the Rack Block. Push the Sector Shaft down into the Housing until it bottoms. Turn the Input Shaft to the right until the slot in the top of the Sector Shaft is turned so that the slot is accessible from the side (see Picture R).
- 10) Fill the area around the Sector Shaft and the inside of the Housing with grease. Clean the gasket surface at the top of the Housing and set new Top Gasket into place.
- 11) The Sector Shaft Shim has a number etched onto one side, usually a 2 or a 3. Install the Shim onto the Adjusting Screw with the numbered side of the Shim against the large end of the Screw and thread the Adjusting Screw into the Top Plate from the bottom side (see Picture S). Slide the Adjusting Screw and Shim into the slot on the top of the Sector Shaft. Make sure the Shim is under the lip of the slot in the top of the Sector Shaft (see Picture T).
- 12) While holding the Top Plate, turn the Adjusting Screw counter-clockwise until the plate is flush against the Housing. Line the bolt holes in the Top Plate and Top Gasket and install the three bolts loosely.
- 13) Continue turning the Adjusting Screw counter-clockwise until it stops, pulling the Sector Shaft up as high in the Housing as it will go. Tighten down the three Top Plate Bolts to 12 – 20 ft/lbs. Install the ID tag under one of the bolts.

## ADJUSTING CENTER GEAR MESH:

With the torque wrench mounted on the end of the Input Shaft, slowly turn the Adjusting Screw in while turning the box from lock-to-lock. At some point you will feel the drag on the wrench increase slightly in the center of travel. Install the Adjusting Screw Lock Nut onto the Adjusting Screw and slightly lock into place so the Adjusting Screw will not turn. Going from lock-to-lock, check the drag reading on the torque wrench, paying attention to the reading obtained while going past the center of travel. The drag should run 5-6 in/lb (or just over) until the center of travel where it should increase to a total of 9-11 in/lb. After passing the center of travel, the reading should go back down to 5-6 in/lb.

**NOTE:** The steering box is designed to be slightly tighter in the center than to either side. This fit is engineered into the machining of the teeth on the Sector Shaft and the Rack Block. Without this “high spot”, the car will wander when going straight down the road, the biggest complaint about a worn or mis-adjusted steering box.

If the box has no “high spot” and has the same drag across the full travel of the Input Shaft, then the internal parts are too worn to provide proper adjustment. The Sector Shaft and/or Rack Block must be replaced with better parts to eliminate the excessive clearance.

# StangersSite.com

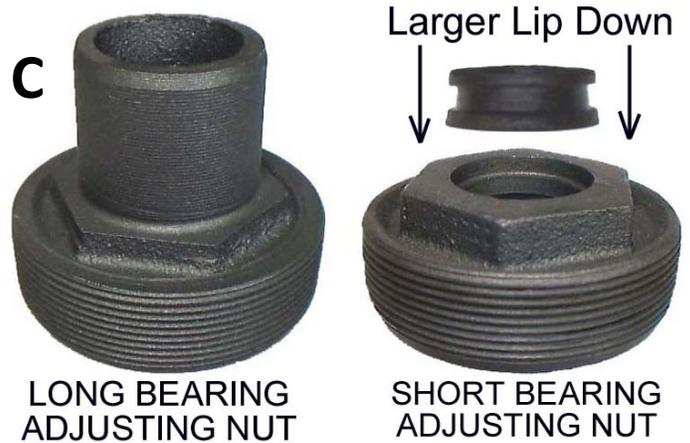
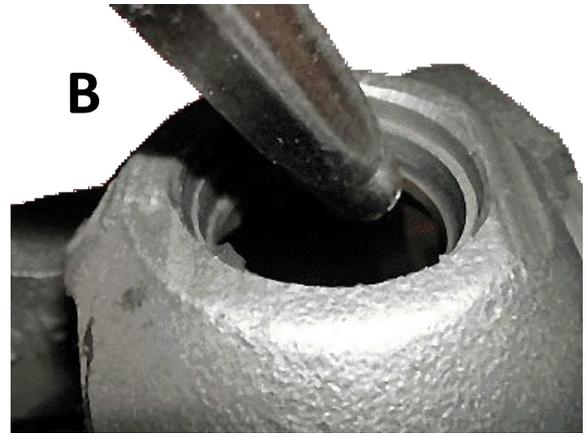
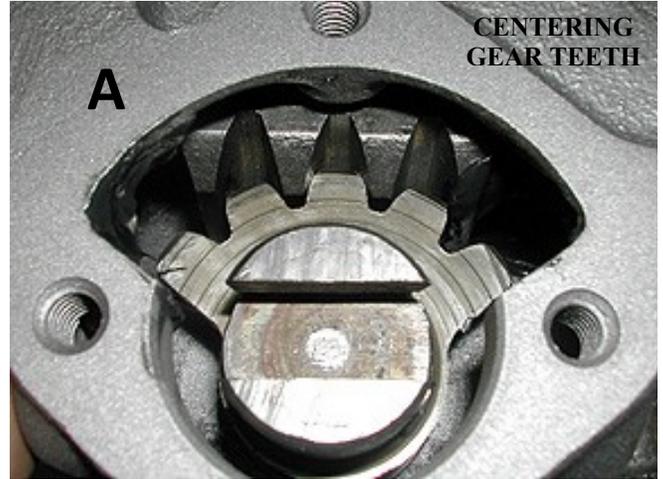
During adjustment, if the box has a tight spot at the end of travel either way, then the Sector Shaft has been adjusted so far into the box that its teeth are dragging on the inside of the Housing. Make sure the top Sector Shaft Bearing is recessed into the Housing and the Sector Shaft is not rubbing on it. If the bearing placement is not the problem, the teeth on the Sector Shaft and/or Rack Block are so worn that they allow the Sector Shaft to go too far down into the Housing and they must be replaced.

Once you have reached the correct center gear mesh reading, tighten down the Adjusting Screw Lock Nut, making sure the Adjusting Screw doesn't turn with it. Check the gear mesh reading again to make sure it hasn't changed after tightening the Lock Nut.

This initial adjustment should hold for most rebuilt steering boxes if the internal pieces are in serviceable condition. Sometimes a rebuilt box will loosen up after a few thousand miles due to bearings wearing in and other factors. Manual steering boxes have more stress on them than power assisted boxes and therefore are more susceptible. When new from the factory, the first scheduled service maintenance at 4000 miles included a re-adjustment of the steering box.

The adjustment settings in these instructions are a little tighter than the original factory specifications. This is to allow for some anticipated loosening of the settings after break-in. They are more in line with the settings used by Ford on the "GT" style steering boxes.

It is difficult to properly adjust the steering box once it is mounted in the car. The original measurements are taken with no load on the box, where as in the car, there is more drag. The small difference in drag measured at the center of travel cannot be felt through the leverage of a steering wheel. If you feel the need to tighten the steering box, turn the Adjusting Screw in only 1/8 turn and test drive the car. Over tightening the Sector Shaft adjustment will cause rapid parts wear and possible internal component failure.

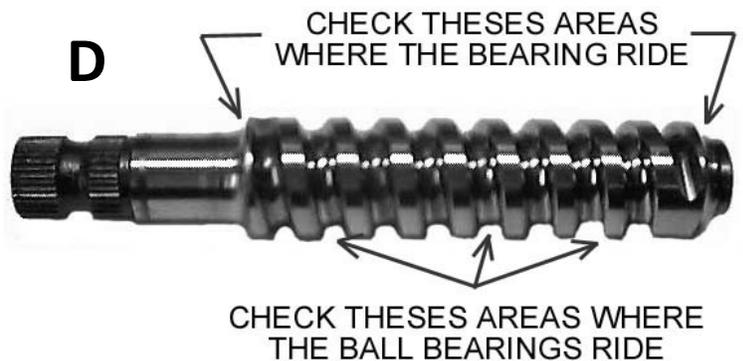


### TORQUE SETTINGS

Top Plate Bolts to Housing	
7/16" and 1/2" head bolts	12-20 ft/lbs
9/16" head bolts	
Pitman Arm to sector Shaft	85-110 ft/lbs
Steering Box to Frame Rail	45-65 ft/lbs

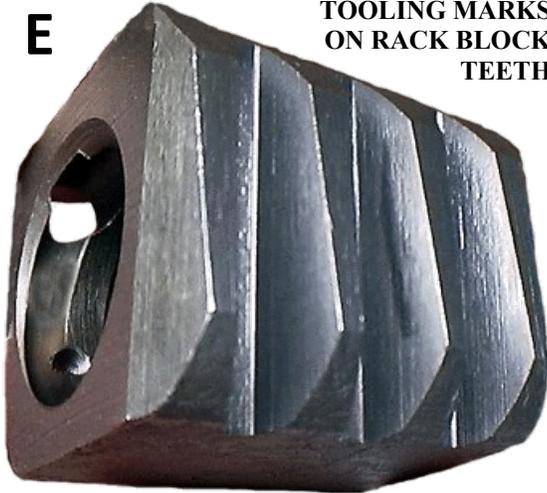


NEVER USE A "WEDGE" OR "PICKLE FORK" TO SEPARATE SUSPENSION OR STEERING PARTS YOU INTEND TO RE-USE. ALWAYS USE THE PROPER PULLER FOR THE JOB TO AVOID DAMAGE.

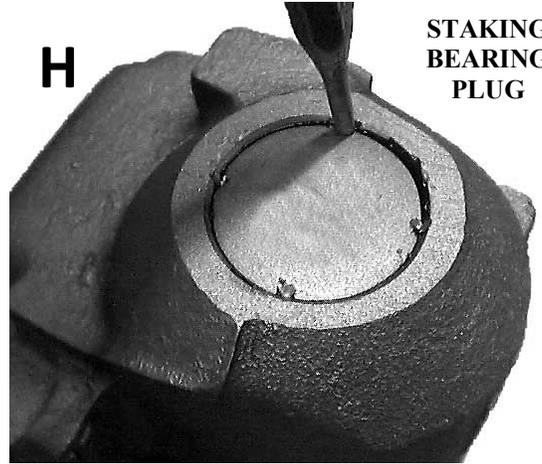


# StangersSite.com

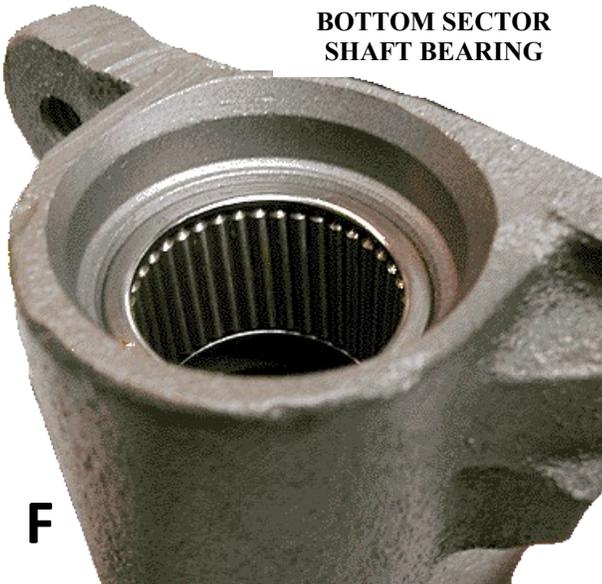
**E** TOOLING MARKS  
ON RACK BLOCK  
TEETH



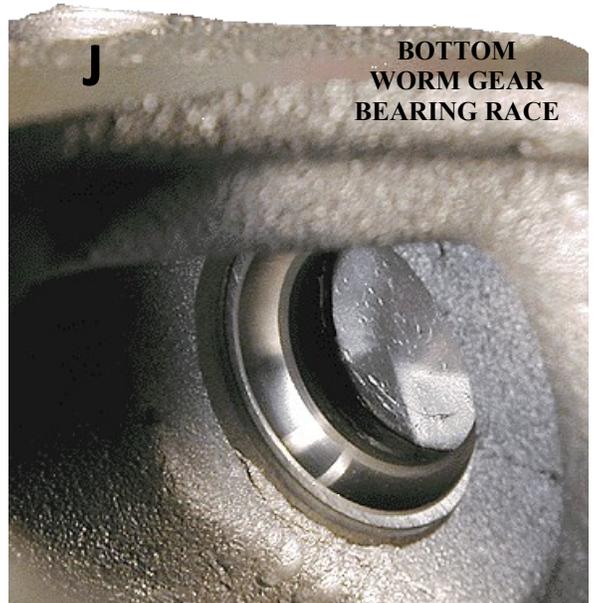
**H** STAKING  
BEARING  
PLUG



**F** BOTTOM SECTOR  
SHAFT BEARING



**J** BOTTOM  
WORM GEAR  
BEARING RACE



**F**

**G**

**G** TOP  
SECTOR SHAFT  
BEARING

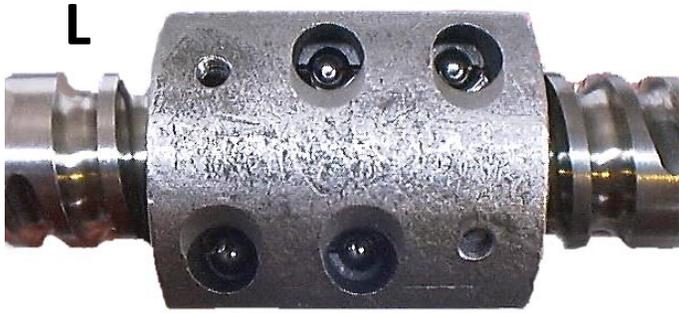


WIDE END OF  
GROOVE UP

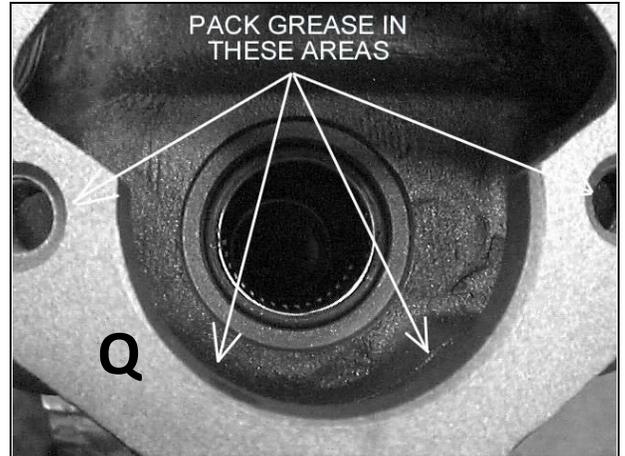
**K**



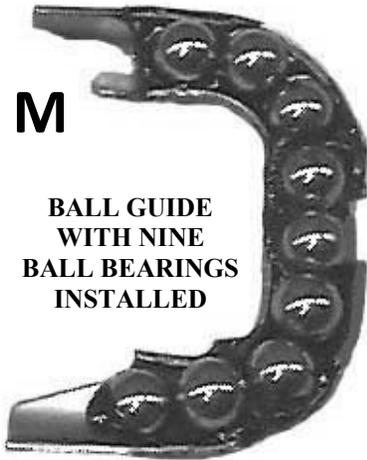
# StangersSite.com



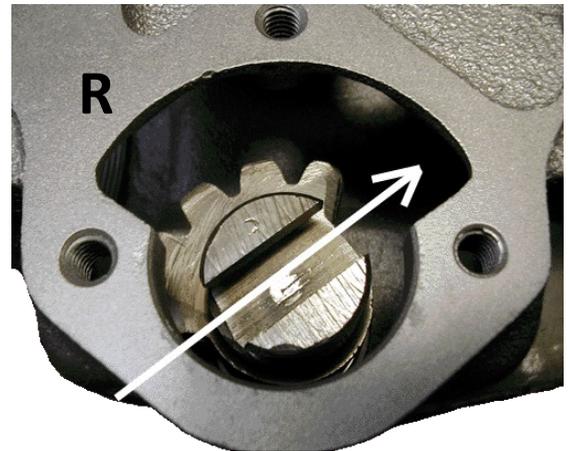
**L**  
RACK BLOCK WITH BALL BEARINGS INSTALLED



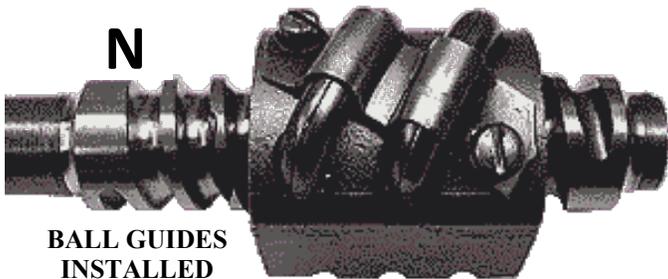
**Q**



**M**  
BALL GUIDE  
WITH NINE  
BALL BEARINGS  
INSTALLED



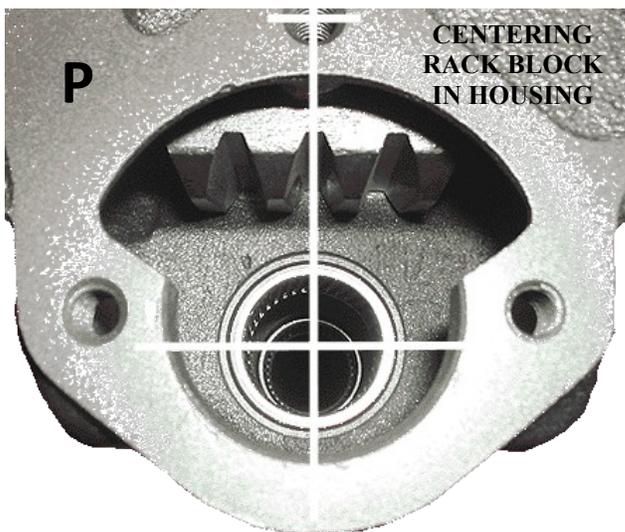
**R**



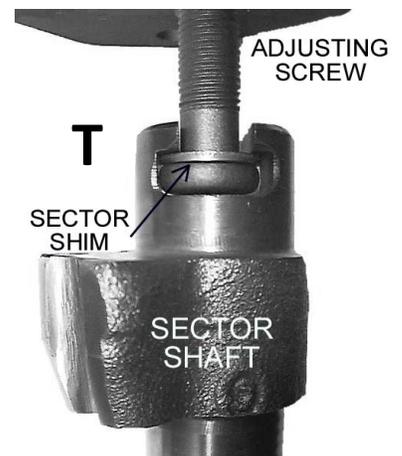
**N**  
BALL GUIDES  
INSTALLED



**S**



**P**  
CENTERING  
RACK BLOCK  
IN HOUSING



**T**  
ADJUSTING  
SCREW  
SECTOR  
SHIM  
SECTOR  
SHAFT

# Stangor

Quality Steering Components

If the steering box has been completely filled with grease, it is not unusual for some grease to be pushed out of the box once it has been installed and used.

On long input shaft boxes, grease will often get pushed through the top input shaft bearing and into the Adjusting Nut and around the input shaft. This is actually a good thing, since there is no seal in this area, the grease helps to seal out water and dust from the box.

On short input shaft boxes, sometimes grease will leak past the Rubber Shaft Seal for the same reason. This seal is really more of a dust seal and is not made to seal the box, so some grease will leak past it. Also, the short input shaft boxes use a vented Fill Plug and grease will come out of this vent at first.

After the box has been operated for a while, and the grease has softened and leveled from engine compartment heat, the grease level in the box will adjust itself and the box should stop venting grease.

