

## FOX BODY MUSTANG 5-LUG CONVERSION

### Introduction

This article will detail the conversion of my 1990 Mustang GT from 4-lug to 5-lug for the purpose of mounting 17x8 wheels from a 1999 Cobra (this also applies to 1998 Cobra wheels and the 17" 'Split 5-Spoke' style wheel). This conversion was done with cost kept to a minimum. It would have been easy to simply order an M2300-K Cobra Brake Kit from FRPP but I wasn't ready to drop the \$1,600 for the kit. This article details the conversion that retains the front discs and rear drums for budget issues.

1987 to 1993 Fox body 5.0 liter Mustangs can be easily upgraded to 5-lugs by simply installing 5-lug axles and drums from a Ranger or Bronco II in the rear and 5-lug brake rotors from a late 80's Lincoln Mark VII in the front. This conversion will work for most types of wheels. But, if you are planning on installing a Ford OEM wheel such as the 1998 or 1999 Cobra wheel or the 17" 'Split 5-Spoke' wheel then this conversion will not work for you. This is due to the fact that the Mark VII rotor hat is too tall and the dust cap on the rotor extends too far out. This prohibits the center cap of the wheel from being installed.

There are two solutions to this problem. The first is to install 1/2" wheel spacers behind the front wheels to allow more clearance for the dust cap. This also requires that longer wheel studs be installed on the front rotors for safety. The other solution is to replace the front spindle, rotor and caliper assemblies from the Fox Mustang with complete spindle, hub, rotor and caliper assemblies from an SN95 Mustang. Wheel spacers are simply a Band-Aid for this fitment problem, though, and that is why I chose the latter option. The SN95 assemblies are also designed with improved geometry for better steering feel and the caliper assemblies provide improved braking as well. All in all, it is a better setup and is also the basis for any big brake upgrades in the future (i.e. - Baer or Cobra brakes). It is a project of low to moderate difficulty that can be performed in a garage or driveway with basic tools by anyone with the ability to perform a complete brake job.

### Parts List

#### Rear

To convert the rear end to 5-lugs you need to replace the 4-lug axles and drums with 5-lug units. The axles that are needed will be either off of a Ranger, Bronco II or Aerostar van.

From an '83 to '92 4 cylinder or 3.0L V6 Ranger/Bronco II with a 7.5" rear end you will need two driver's side axles. Only the driver's side will work as the pumpkin on these rear ends is offset and the axles are different lengths (you need the longer of the two axles). It should measure 29-5/32".

From an Aerostar you will need two of the passenger side axles from an 86 to 97 model.

The axles are all the same so they can be mix-matched (i.e. - one driver's side axle from a Ranger and one passenger side axle from an Aerostar).

You can use the brake drums from either side of the above listed vehicles but make sure that they are 9" drums. The 4.0L Rangers came with an 8.8" rear end with 10" drums - these will not work.

Prices will vary, of course, but I was able to get the axles and drums from a local "Pull It Yourself" type yard. The axles run about \$20 each and the drums will run about \$15 each.

Be sure to check the axles to make sure they are not bent or worn on the bearing surface and check the drums to ensure that they are smooth or can be turned to no more than the maximum diameter.

Miscellaneous items for the rear include new brake shoes, fresh gear oil, RTV gasket maker to seal the differential cover and one additional lug nut for each side.

### **Front**

For the front you will need one each left and right side spindles, hubs, rotors and calipers from either a '94 or '95 V6 or V8 Mustang. The assemblies are the same for the V6 and V8 so either will work but it must be from a '94 or '95. This is because the spindle was moved out about ¼" - ½" on the '96 and later Mustangs. This will cause the wheel to stick out too far and possibly cause interference problems with the wheel well lip on the fender.

If you are getting the parts from a wrecker in a complete assembly (as I did) then make sure that they include the Banjo Bolt that attaches the flexible brake line to the caliper. This will allow you to connect your existing brake lines to the SN95 caliper since the threads are different and the Fox Banjo Bolt will not thread into the SN95 caliper. Using the SN95 Banjo Bolt is the easiest way to do it rather than connecting the SN95 flexible lines to the Fox hard lines because they are different sizes and will require adapters (and the SN95 uses two different size connectors left and right side). Just use the SN95 Banjo Bolt on your flexible line for ease of installation (they even worked with my stainless steel braided lines). I was able to get the complete assemblies for \$125 per side from the wrecker.

Miscellaneous parts needed for the front include new brake pads, one additional lug nut for each side, new cotter pins (4), new copper washers for the Banjo Bolts (4) and a 0.330" tall spacer (or washers totaling 0.330"). The last item is necessary to properly fasten the crown nut on the lower control arm ball joint/spindle connection. I will explain this in more detail in the reassembly section.

### **Disassembly**

Begin by loosening all lug nuts prior to raising the vehicle. Raise and safely support the vehicle with jack stands. The jack stands should be positioned so that the suspension components hang free. You will want the rear end to hang down to ease the removal and reinstallation of the differential cover (otherwise the rear sway bar can be a hindrance). You will want the front control arms to hang down free so you can manipulate it with a floor jack during the removal and installation of the spindle(s).

### **Rear**

Once the vehicle is safely supported on jack stands and all 4 of the wheels have been removed start by removing both brake drums (ensure that the parking brake is off). Drain the rear differential fluid by loosening (not fully removing) all of the cover bolts and pull the lower portion of the cover away to allow the fluid to drain out the bottom. Once empty remove the bolts and remove the cover. With the transmission in neutral rotate the rear differential until you see the small Pinion Rod Retaining Bolt. This bolt runs sideways into the differential. Remove this bolt and then slide out the Pinion Rod (placing the car in Park or in gear will allow you to remove this bolt without the differential rotating). Now you can push the axles inwards allowing you to remove the C-Clip retainers. With the C-Clips removed the axles will slide right out. Be careful not to damage the axles bearings or seals when removing the axles.

### **Front**

Start with the front by disconnecting the flexible brake line from the caliper by removing the Banjo Bolt completely from the brake line. Have a cup or rag ready to catch the brake fluid (brake fluid will destroy paint - Be Careful!). Remove the two bolts holding the caliper to the

spindle and remove the caliper. Remove the dust cap from the rotor to allow access to the bearing retaining nut. Remove the cotter pin on the crown cap and then remove the cap and nut. Pull the rotor off of the spindle with the bearings.

Place a floor jack under the lower control arm and raise the jack just under the control arm so it just starts to compress the spring. Loosen the two bolts that secure the strut to the spindle.

On the tie rod end, remove the cotter pin and crown nut and separate the tie rod end from the spindle.

On the lower control arm ball joint, remove the cotter pin and crown nut and separate the spindle from the lower control arm (be sure the floor jack has the lower control arm supported to keep the spring from unseating and causing damage or injury!).

Now you can remove the two screws holding the spindle onto the strut and remove the spindle completely.

Repeat for opposite side.

## Reassembly

### Rear

Slide the new axles into the housing tubes being careful not to damage the bearings or seals. Push the axles in as far as they will go and seat them with the spider gears in the differential. Replace the C-Clips on the axle ends and push the axles back outwards to lock them into place. Reinstall the Pinion Rod. Apply thread locker to the Pinion Rod Retaining Bolt, reinstall in the carrier and torque to specification (15-30 lbf.ft.). Clean the differential housing cover and remove any silicone sealer residue from both the cover and the housing itself. Apply a ¼" bead of RTV to the cover and reinstall the cover on the housing. Replace all bolts and torque in sequence to specification (25-35 lbf.ft.).

At this time the rear brake shoes can be replaced to allow time for the silicone to set up before adding new gear oil. Once complete, replace the brake drums and add the required amount of the specified gear oil.

### Front

Begin the installation of the SN95 spindles by placing the spindle/hub assembly on the ball joint on the lower control arm. Before screwing on the crown nut to secure the spindle you will need a spacer on the ball joint between the spindle and crown nut.

The reason for this is that the stud on the ball joint of the Fox cars is longer than the stud on the SN95 cars. So, when you go to tighten the crown nut to specification you will have gone past the cotter hole and the crowns on the crown nut will not line up with the cotter hole for the cotter pin. FRPP addresses this problem in their M2300-K Cobra Brake Kit with a spacer that they provide to keep the crown nut in line with the cotter hole.

Unfortunately FRPP does not sell this spacer separately (it is only available in the kit) and nobody else to my knowledge sells it either. But, I was able to obtain the height of this spacer from FRPP whom suggested I have my own manufactured. The height needed from the spacer is 0.330" and the center hole diameter should be 5/8" to fit on the stud. The thickness of the spacer should simply be sufficient to sustain the rigors of the suspension.

Another solution (the route I chose) is to simply obtain some 5/8" hardened washers and stack them up to achieve the necessary height. I ended up needing 3 fairly thick washers per side. Once you have your spacer (or washers) in place you can screw on the crown nut but do not tighten just yet.

Now fit the tie rod end onto the spindle and screw on the crown nut but do not tighten just yet.

At this point the strut can be attached to the spindle with the two mounting bolts and nuts.

Torque the nuts to specification (140-200 lbf.ft.). Some manipulation will most likely be

necessary with the floor jack at this point to attach the strut mounting bolts.  
Now you can torque down the tie rod end crown nut to specification (35-47 lbf.ft.) and install a new cotter pin.  
Finally torque down the lower ball joint crown nut to specification (110-150 lbf.ft.) and install a new cotter pin.  
With the spindle now installed, place the rotor on the hub and mount the loaded caliper on the spindle. Attach the caliper with the two mounting bolts and torque to specification (70-95 lbf.ft.). Place a new copper washer on the SN95 Banjo Bolt and insert the Banjo Bolt into the flexible brake line. Place another new copper washer on the other end of the bolt (so there is now a new washer on either side of the brake line) and screw the Banjo Bolt into the caliper. Be sure to route the flexible line so that it will not make contact with the front tire or wheel while driving and turning and then torque the Banjo Bolt to specification (30-40 lbf.ft.).  
Repeat procedure for opposite side.  
Once both sides are complete bleed the brake system (consult your repair manual for proper bleeding procedure).  
Once the brakes have been bled the new wheels can be mounted and the lug nuts snugged up. The car can then be safely lowered from the jack stands and, with the car on the ground, the lug nuts can be torqued to specification (85-105 lbf.ft.).

## **Finishing Up**

### **Alignment**

With the car on the ground and the steering wheel centered you will notice that both of the front wheels are pointing inward (toe-in). This is due to the different mounting points of the SN95 spindles. The car cannot be driven like this safely and will surely destroy your tires. The toe needs to be adjusted out so the car can at least be driven to have the front end re-aligned (or have the car towed). Consult your repair manual for the proper procedure for adjusting the toe (basically loosen the tie rod end lock nut and rotate the adjustment until the wheel(s) point straight forward and then tighten the lock nut).

### **Clearance**

With the toe adjusted check clearances before driving the car.  
Check the clearance of the tires to the fenders. If they are going to rub then the fenders will have to be rolled to allow the proper clearance.  
Check the clearance of the wheel to the lower control arm at full lock of the steering wheel. Larger wheels on an '87 to '90 Mustang will most likely rub at this point. This can be solved by installing steering rack limiters to decrease the turning radius of the vehicle (Ford part number N804842-S). '91 to '93 Mustangs have a decreased turn radius from the factory so this may not be a problem.  
Finally check the clearance of the brake lines to ensure that they will not rub the tires or wheels under any condition.

### **Impressions**

With the installation of the SN95 spindles and brakes on the front of the car I have noticed improved handling and braking. The steering feels more precise and responsive especially on turn-in.  
One huge bonus is that the SN95 spindles seem to have completely cured the excessive bump-steer that I was experiencing. The car no longer wanders around the road following grooves or bumps. It just feels solid. This may not be the cure for everyone's bump-steer but it helped in my

case.

The improved design of the SN95 calipers provide more clamping force and less brake fade. A huge improvement over the stock Fox brakes.

Another positive aside from this conversion is that you now have the basis for the addition of larger Cobra brakes or an aftermarket big brake kit such as Baer later on down the road. These kits require SN95 style spindle and hub assemblies to work on Fox body cars.

Total outlay for parts (including brake pads and miscellaneous parts) and labor (for turning the rotors/drums and alignment) was just about \$475 (not including new wheels). All in all it was a worthwhile conversion that I would certainly recommend to anyone considering converting to 5-lug on a budget. It will be more costly than simply using Mark VII rotors but not near as much as the FRPP M2300-K kit and will still give you improved braking and handling.

*\* Disclaimer: I am not a certified mechanic and in no way imply that I am. This article is only published to give the reader an idea of the scope of the task listed therein and should in no way be construed as instructions for completing this task. Consult a qualified mechanic before attempting this task. Torque values and technical references listed in this article are for reference only and are believed to be correct at the time of this writing. Always verify current torque specifications prior to final tightening. Use this article and the information contained herein at your own risk.*

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