



Front Wheel Tapered Roller Bearing Kit

Installation Instructions

For: Sprite and Midget, Disk and Drum

PART # 125-822

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Tools required:

- Safety glasses
- Workshop manual
- Hammer
- Drift or punch
- Bearing race drivers
- Torque wrench capable of 46 – 65 ft. lbs.
- File or grinder or belt or sander
- Various combination of wrenches and sockets
- Sharp side cutters
- Jack and jack stands
- Wheel chocks

Before you begin:

These instructions only cover the installation of the tapered roller bearings. You will need a workshop manual to use as a guide for disassembly of the stock parts, brakes or any other components.

Read and understand these instructions before you begin work on the car. Actual parts may vary slightly from images shown.

Disassembly

- 1) On level ground, chock the rear wheels, set the parking brake and put the transmission in 1st gear. Lift and support the front end of the car with jack stands. Remove the front wheels.
- 2) Using a workshop manual for guidance, remove the hub assembly.
- 3) Remove the bearings from the hub. This will require a drift or punch and a hammer as the bearing are pressed into the hub.
- 4) Clean the hub and all related parts to get them ready for reassembly.

Assembly

- 5) Using a bearing driver and a hammer or press, install both inner and outer, outer bearing races into the hub. Make sure both races are seated all the way down. Refer to Figure 5.



Figure 5



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- 6) You may need to remove a little material from the small end, outside radius of the factory bearing spacer so that it doesn't interfere with the outer bearing cage. Only the outer corner of the small side of the spacer needs to be taken off. Not all spacers need this modification. To determine if your spacers need modification:

- a. Set the outer bearing on a flat surface, big diameter down, small diameter up. Only the inner race should be touching the flat surface. Refer to Figure 6a.



- b. Hold the race firm to the table and give the bearing a spin to get a feel for how it spins free.
- c. Fit the small end of the bearing spacer to the inner race of the bearing. Refer to Figure 6c.



- d. Hold the bearing spacer against the bearing, pinning the inner race to the table, and try to spin the bearing. If the bearing will not spin freely, it's because the cage of the bearing is in contact with the spacer. If the bearing still spins freely, your spacer doesn't need any material removed; skip to step 7. Refer to Figure 6d.



- e. Remove the outer corner of the spacer where it was touching the bearing cage using a file, grinder, belt sander, etc.
- f. Clean the spacer thoroughly before fitting it back up with the bearing. You do not want abrasive debris in the bearing. Refer to Figure 6f.



- g. Repeat this step until the bearing spins freely with the spacer pinning the inner race firmly to the table. Figure 6g shows a before and after of the modified corner.

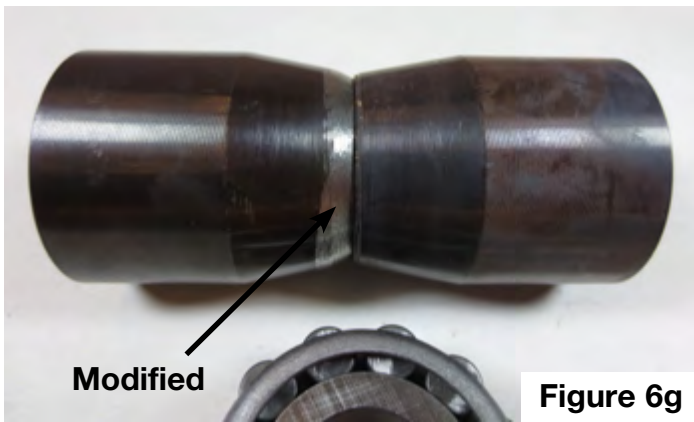


Figure 6g

Tip: The rollers and cage of the bearing will be pushed away from the bearing spacer when assembled on the car, so don't get carried away with material removal. You can remove enough material from the spacer for it to clear the bearing race in less than a minute on a belt sander or bench grinder.

7) Before any grease is applied to the bearings, you must install the entire hub and bearing assembly dry to set the bearing preload/end float. Do not include the seal at this point. Clean and lube the spindle to aid with bearing fitment. Install the parts onto the spindle in the following order:

- a. Inner bearing
- b. Inner bearing spacer ring
- c. Bearing spacer – factory part not provided in kit
- d. Hub
- e. Outer bearing
- f. Stock keyed washer
- g. Castle nut provided with roller bearing kit. The factory nut will not allow the cotter pin to fit. Do not tighten the nut at this time, just finger tight will do. Figure 7a shows how the parts stack up with bearing races pressed into the hub. Figure 7b shows the stack without the hub in the picture.

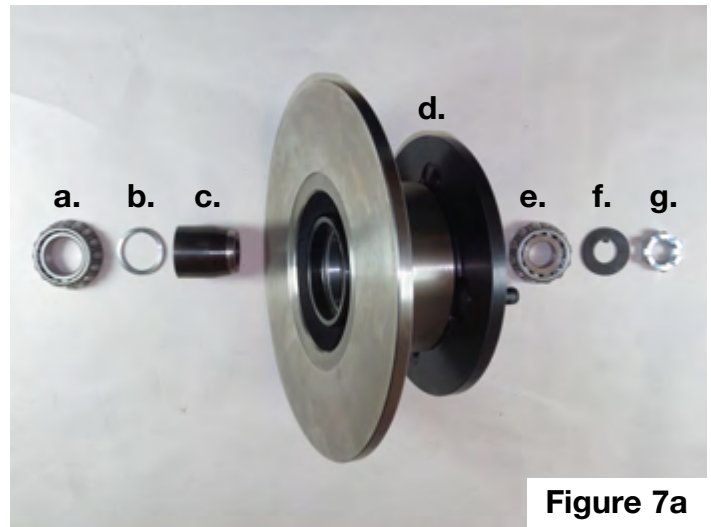


Figure 7a

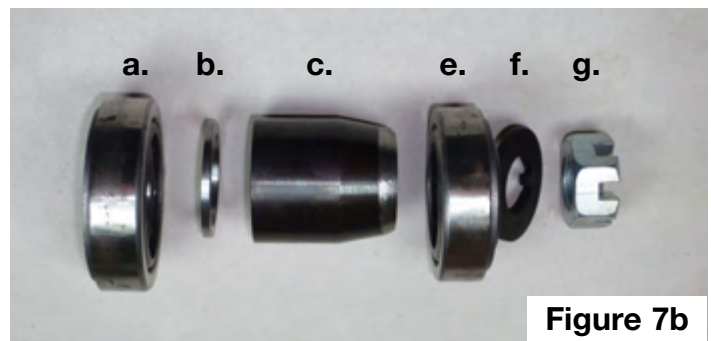


Figure 7b

8) Spin the hub as you slowly begin to torque the nut to 46ft. lbs. If the hub starts to build resistance as you torque the nut; stop torqueing the nut. Shims are required. Move on to the section of instructions labeled 'SHIMMING THE BEARINGS.' The resistance of the bearing as the nut is tightened is called bearing preload. Having to add shims is the most typical scenario.

If you are able to achieve 46ft. lbs. of torque on the nut and the hub spins freely, check the hub endplay. It should fall between zero clearance and .004". If the end play is looser than .004", the bearing spacer stack will need to be shortened. Move on to the section of instructions labeled 'SHORTENING THE BEARING SPACER STACK.' Most vehicles do not need this procedure.

If you are able to achieve 46-65 ft. lbs. on the nut and the hub end play is .000"- .004", you are lucky and no further fitment is required. Move on to the section of the instructions labeled 'FINAL ASSEMBLY.'

Installation Instructions

9) SHIMMING THE BEARINGS

- Remove the castle nut, keyed washer and outer bearing.
- Install .020" worth of shims from shim kit package between the bearing spacer and the outer bearing.
- Reinstall the outer bearing, keyed washer and castle nut.
- Begin to tighten the nut and check for preload. If preload still is felt before the torque spec on the nut is reached, repeat this step, adding shims until the nut can be fully torqued and there is zero preload on the bearing.
- Adding shim thickness will result in more end play. Subtracting shim thickness will result in less end play.

The goal is to set the bearing preload to zero and have the endplay between .000" and .004" with the castle nut torqued down to 46-65 ft. lbs. You will need to try a few combinations of varying thickness shims to meet this goal.

Caution: Excessive bearing preload or end play (tight or loose bearings), will cause excessive wear and premature bearing failure. Figure 9 shows where the shims go.



Figure 9

10) SHORTENING THE BEARING SPACER STACK

The easiest way to shorten the stack is to remove the inner bearing spacer ring so that the bearing spacer sits directly against the inner race of inner bearing. However this will cause the spacer to contact the inner bearing cage. Follow step 6 of these instructions except: use the inner bearing and remove material from the large side outer radius of the bearing spacer to gain the necessary clearance. Once you have removed the ring and filed the spacer for clearance, you will need to shim the bearings.

See the section of these instructions called 'SHIMMING THE BEARINGS.' You may find you need another pack of shims to attain proper bearing set up.

11) FINAL ASSEMBLY

Remove all the parts from the spindle. Clean everything once again for final assembly.

- Pack both bearings with grease.
- Install the inner bearing into the hub.
- Install the dust seal into the hub.
- Install the hub, inner bearing, seal assembly onto the stub shaft.
- Install the inner bearing spacer ring.
- Install the bearing spacer.
- Install the shims if required.
- Install the outer bearing.
- Install keyed washer.
- Install nut and torque to 46ft. lbs.
- Install the cotter pin through the castle nut and stub shaft. If the nut doesn't line up with the either of the holes in the stub shaft; tighten the nut until it does. Do not exceed 65 ft. lbs. If the cotter pin will not fit, make sure you are using the castle nut provided in this kit and not the vehicles stock castle nut.
- Double check the hub still spins freely. The grease will provide more resistance to spinning than the dry fit up, but the hub should still easily turn by hand. If the hub is difficult to turn, a shim may have been left out. The cause of this must be addressed before moving on. If necessary, disassemble and clean all parts and start over at step 1.
- If the hub still spins easily, check the hub endplay. Again, you may have less endplay than with the dry fit up but that is OK. The hub just needs to spin freely and have less than .004" endplay.
- Finally, install the grease cap. Do not pack the cap full of grease. The grease packed into the bearings is adequate and will expand. The cap provides an area for it to go.

The installation of the tapered roller bearing is complete. Hold onto any extra wheel bearing shims. They could provide adjustment down the road if the hub endplay ever exceeds .004" limit.

bearings is a breeze. The rear grease seal must be removed from the hub but if done carefully, it can be reused. Set up correctly and serviced occasionally, they will last a very long time.

Now that you have setup the bearings, service is very easy just as long as you keep track of all the parts (especially the shims). Repacking the

CONTENTS OF THE KIT



- | | |
|---------------------|---------------------------------|
| a. Grease packet x2 | e. Inner bearing spacer ring x2 |
| b. Inner bearing x2 | f. Castle nut x2 |
| c. Outer bearing x2 | g. Dust seal x2 |
| d. Cotter pin x2 | h. Shim kit |

Installation Instructions

EXTRA INFORMATION ON SPRITE MIDGET WHEEL BEARING, HUB, AND STUBAXLES

There are many vehicles on the road which use tapered roller front wheel bearings. Why is the Sprite-Midget setup so different?

The main reason is that these cars do not use tapered roller bearings from the factory. Instead they used ball bearings that are designed for thrust in one direction. The stub shaft by itself did not provide adequate support for the inner bearing races. Enter the bearing spacer. The bearing spacer fixes the two inner bearing races to the stub shaft once torque is applied to the nut. Arguably, this bearing spacer set up is also to increase strength of the stub axle. If you think about it, once the nut is tightened, there is basically a tube around the stub shaft consisting of the two bearings inner races, and the bearing spacer. They are all squeezed together by the nut on one side and the face of the stub shaft on the other. For the sake of keeping this short, we'll just assume that it does add strength.

The problem with using the bearing spacer is that all parts in the stack up must have very tight machined tolerances. The hubs, the spacer and the bearings themselves all must be manufactured virtually identically to one another, regardless of the manufacture of each component to end up with the correct endplay of the hub. If even one of these components was off by as little as .002", it could result in the bearing being excessively preloaded, having excessive end play, or the bearing actually being damaged by simply tightening the nut. If more than one part was out of this tight tolerance range, the problems only grow.

If you were keen enough to notice, when installing a front hub assembly onto the stub axle, that there was a problem, there are two things you could do to correct it. If the bearing was tight (too much preload) when assembled, you could shim in-between the outer bearing and the bearing spacer. If the bearing had excessive end play ($>.004"$), you could remove material from one end of the spacer. Either way it requires pushing one of the bearings out of the hub, which also ruins the bearing. None of this information is in the factory manual. You can start to see how stack up of these parts is problematic if all parts aren't machined nearly perfect.

The main benefit to switching to a tapered roller bearing (aside from the ease of maintenance) is the ability to correctly set hub endplay without destroying perfectly good bearings in the process. Only the outer races are pressed into the hub in a tapered bearing set up. The rollers, cage and inner race are not a part of it and therefore can be removed separately. This is important because it gives access to the bearing spacer (for shimming or trimming) without having to knock a bearing out of the hub. What this means is that the tolerance between the hub, bearings, and spacer is much less of an issue because there is a relatively easy means of correcting it. In most cases, the assembly will require shims between the outer bearing and the bearing spacer.

Some of you may ask "Why use the bearing spacer at all with the tapered bearings?" "My '69 Camaro didn't use a bearing spacer and it had and nearly identical set up". It could be argued that the spacer could indeed go in the round file with no ill affects, but we do not recommend leaving it out of the assembly. No one can argue that keeping it in place would weaken the structure.

Although every effort has been made to ensure the accuracy and clarity of this information, any suggestions that you may have that will improve the information (especially detailed installation notes and photos) are welcome. These instructions were developed and written by Moss Technical Support. If you have any questions or difficulties with your installation of this product, telephone 800-667-7872 between 7:00 a.m. and 4:00 p.m., Pacific Time for assistance.

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