

## SAFE HARBOUR STATEMENT:

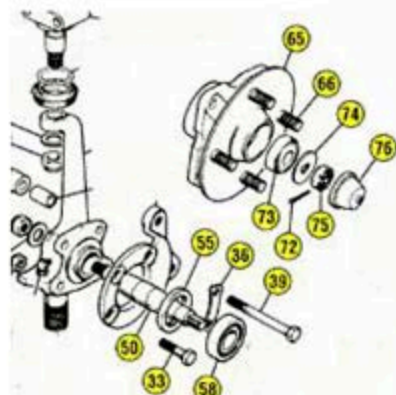
This "How I installed it" essay is presented as general information and has been prepared by a Triumph TR6 owner with very limited auto mechanic knowledge. The installation procedures shown in this document are not professional instructions and are not intended to be such. The front wheel bearings and wheel hubs of a 1969 Triumph TR6 were successfully refurbished with these amateur procedures and I was not injured during the process.

The following essay documents the removal, cleaning and refurbishing of both front wheel bearings. Therefore these procedures can also be used to remove old wheel bearings and install new sets. Specifically, the recommended every 20K mile routine maintenance task of cleaning, inspecting and repacking wheel bearing with new grease



## TOOLS I USED TO COMPLETE THE PROJECT:

In order to access and remove the wheel bearings, the project requires removing the two wheel hubs, both disc brake calipers and both brake rotors. The working space is mostly open with easy access to most of the fasteners. Most of the bolts are fairly high torque and require a long handle ratchet for leverage.



**Front wheel hub bearings  
and component parts**

Moss Motors sketch modified



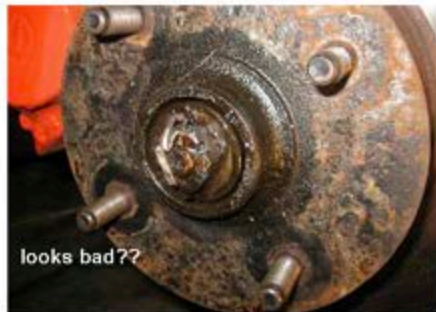
Normally, I work with two jack stands but this was not possible due to no access on the opposite side of the car. (car non-functional) I worked with two primary hydraulic jacks and a scissor jack for a third.

The work area in my car presented difficult working conditions due to the many years' accumulation of old grease and road dirt. Many of the fastener bolt heads and nuts could not be seen due to thick layers of grease / road dirt.

Four days before I began the disassembly, I sprayed the entire wheel hub and suspension system area with a heavy degreaser liquid. I applied the degreaser several times over a three day period.

After three days of soaking in degreaser, I hooked the garage hose up to the hot water tap and pressure washed the wheel hub and suspension components. I let the work area air dry. I then sprayed the bolt heads and nuts with Liquid Wrench and let it soak in for one day.

**Wheel hub before cleaning**



**Wheel hub after cleaning-below**



There was still a ton of grease and road dirt inside. Have plenty of paper towels and garage rags on hand. You will need them in order to keep your tools and hands clean and for safety reasons.

**Step One: Remove Brake Caliper-**



**Brake Caliper - seen from behind**

As an amateur trying to perform auto mechanics, my own safety is always foremost in my mind. Working beneath a car and putting my hands and tools in places I cannot see with my eyes scares me.

The Bentley Book is a great resource but it does not always give the depth or perspective of how the various pieces fit together. For this reason, I try to take photos of fasteners before I put tools onto them.

Two bolts secure the brake caliper to the caliper mounting plate, as seen above. The two bolts also secure two of three tabs that attach the circular dust shield and the brake hose clip.

A brake caliper centering shim should be found between the two bolts. The shim was missing from my car and is on order.

# WHEEL BEARINGS REFURBISH

Removing the two brake caliper bolts is a difficult task and requires great strength. Perhaps the heat generated during braking has caused the bolts to seize.

After soaking in Liquid Wrench for one day, it was still necessary for me to lie on my back and with a long handled ratchet and 9/16" sockets, put my entire body weight onto the bolts before they would rotate and could be removed. Use only six sided tools for this project or you will round off the bolt heads and have a real mess on your hands. Be sure to wear safety goggles as a lot of crud falls down in your face



**Brake Caliper Removed**

Once you have removed the brake caliper it is very important to secure the caliper to the upper A-Arm so it is out of the working area and more importantly, so you do not break the rubber brake hose or connections. Set the bolts aside and label them.

With the brake caliper safely secured out of the way, it is now time to removed the wheel hub and brake rotor disc. This is an easy, straight forward task.

The wheel hub and brake rotor are secured to the stub axle by a single castle nut, cotter pin and large steel washer. Remove the cotter pin and back off the large castle nut and set them aside and label them. Gently work the washer off the stub axle.



**Outer Wheel Bearings Exposed**

Once you have removed the cotter pin, castle nut and steel washer, the outer wheel bearing is exposed. As seen above. The bearing will slide out into your hands. For now, wrap it in a clean cloth, label it and set it aside with the other removed parts.

*Note: Now is probably a good time to remember a camera is a tool you need for this project. Take many photos of pieces before and after you have removed them. They make an excellent reference when you try to put things back together.*



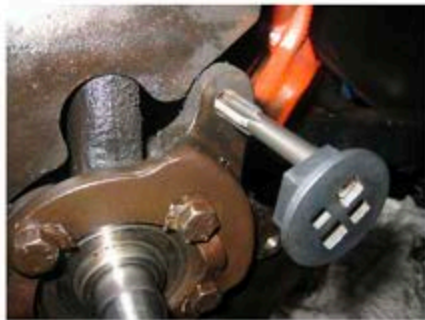
With the outer bearing safely set aside, it is time to remove the wheel hub and disc rotor. Firmly grip the rotor at 9:00 and 3:00 and pull it straight toward while being careful not to bang up the stub axle.

# WHEEL BEARINGS REFURBISH



Once the brake rotor and wheel hub are removed as a single unit; the stub axle, caliper mounting plate and dust cover are exposed as seen in the photo above. Pretty nasty looking to this non-mechanic guy.

Spray the area with degreaser liquid and start cleaning up the work area. This will take a bit of time and make a great pile of greasy paper towels. I preach to my construction workers "A clean work area is a safe work area." I don't see why auto mechanics projects should be any different.



Clean all threads with tap

After the stub axle, caliper mounting plate and dust shield were cleaned of grease and road dirt, I ran a tap thru the two bolt holes of the mounting plate to clean up the threads. This task can be viewed in the lower left photo.



The front wheels rotate on the stub axle and are supported by two sets of bearings. An inner set and an outer set. After I had removed the grease and road dirt I polished the bearing's areas of the stub axle with #1500 wet grit paper, as seen above.

I lightly coated the exposed metal surfaces with wheel bearing grease and then removed the dust shield to inspect the suspension system behind it.



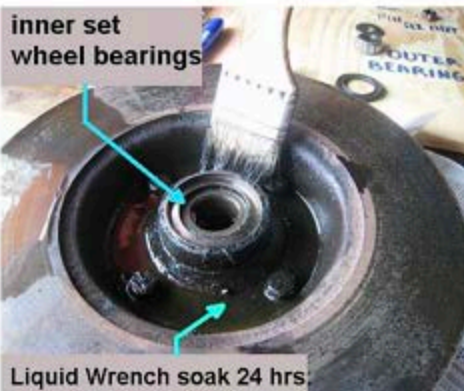
Remove 3rd dust shield bolt from caliper mount.

## WHEEL BEARINGS REFURBISH

So far, it has been about four hours time to get to this point. Now would be a good time to scrub the grease off your hands and arms and take a beverage break. Coffee, beer, iced tea. Coca Cola- any will do.

Wow, that icy cold Coke hit the spot. Now back to the Wheel Bearing refurbish.

### inner set wheel bearings



Liquid Wrench soak 24 hrs.

The wheel hub with inner and outer bearing sets is fastened to the brake rotor disc with four (4) bolts as seen in the photo above. It is easier to remove the bearing components with the wheel hub separated from the brake rotor.

The four bolts holding this hub and rotor together were "frozen" so tightly even an 18" ratchet extension could not break them loose. I filled the bolt area with Liquid Wrench and set it aside to soak overnight.



With the wheel hub and brake rotor set aside soaking overnight, now is an excellent opportunity to perform a little general suspension / steering cleaning and inspection. As seen in the photo below left, the brake caliper mounting plate looked pretty sad and the vertical link and trunion behind it were both covered with at least a 1/4" thickness of ancient grease and road crud.

### Brake caliper mount



Use flat punch tool to flatten the four (4) tab-lock washers. Then remove the four (4) thru-bolts.

The brake caliper mounting plate is held in place with four bolts and two sets of tab-lock washers. The yellow arrows show the tabs in their down or unlocked position. In the UP position, the tabs prevent the bolts from rotating. I used a flat screwdriver with a ground off, widened tip to flatten the tab-locks.

The four bolts are thru-bolts secured with conventional lock nuts on the opposite side. Two bolts are short and easily removed after sprayed with Liquid Wrench. A 9/16" socket is required on the bolt head and a 9/16" wrench is required to keep the lock nut from rotating.

The other two bolts are long thru-bolts passing thru the caliper mount plate, a steel spacer and the steering control arm. These two bolts might be difficult to remove due to rust build-up inside the steel spacer and steering control arm. Use Liquid Wrench and a ratchet extension to remove these two bolts.



Four (4) thru-bolts and two (2) tab-lock washers removed from caliper mount plate. Slide plate forward off axle.

Grip the caliper mount plate at 9:00 and 3:00 and pull straight forward over the stub axle. Make sure to keep the stub axle lightly coated with grease.



Now is a good opportunity to clean and inspect the suspension and steering components. Good odds the busings need replacement.



Good thing I inspected the bushings !

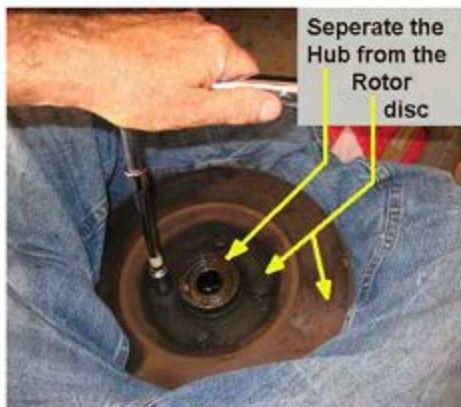
If you are going to all the trouble to rework or replace the wheel bearings, the few extra minutes it takes to inspect the front suspension bushings is well worth the effort.

As seen above and below, All the suspension bushings in my front end were either deteriorated with age or were not the proper bushing for the component. The inspection of this car indicates a complete replacement of all the bushings is required. Also, a broken tie rod end was observed.



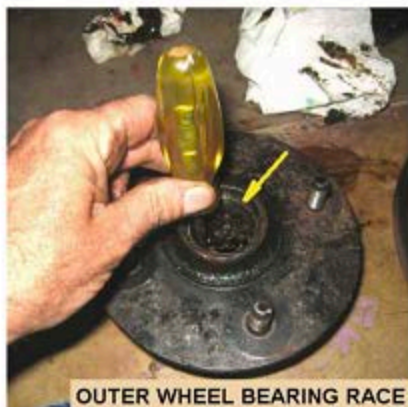
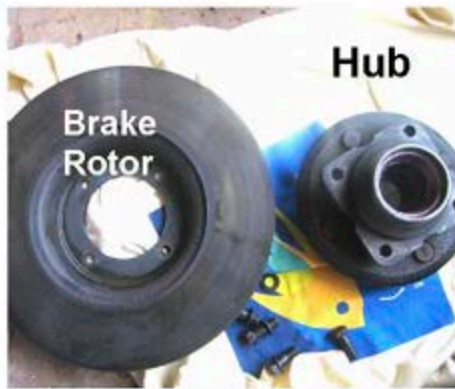
Bushings Deteriorated

Next day after the wheel hub / brake rotor have  
Soaked in Liquid Wrench:



#### SEPARATE WHEEL HUB FROM BRAKE ROTOR:

Four bolts secure the wheel hub to the brake rotor. They are a bear to back out even with Liquid Wrench. This odd position with the rotor locked against my legs was the easiest for me to hold everything tight and use an 18" extension on the ratchet.



Once you have the hub separated from the brake rotor it is easier to work with things. The inside of the hub might be filled with old grease. Yes or no, clean the hub interior thoroughly. Once clean, you will be able to see the bearings access slots, as below.



Wheel hub as seen from behind, looking thru inner bearings area (2) down to access slots for outer bearings (1).

(bearings and races removed to show access slots)

# WHEEL BEARINGS REFURBISH

The outer wheel bearings have already been removed and are safely wrapped in clean cloth and set aside. The outer wheel bearing race piece is still in place inside the hub. The inner wheel bearings and race are also still inside the hub and must be removed.

The access slots are narrow and rectangular in shape. I ground down an old screwdriver to make a punch tool to fit the shape of the access slots. A small hammer is used to lightly tap the bearings' edge or race edge where they are exposed in the access slots. Tap from side to side so the piece slides forward and does not jam. A great deal of force is not required.

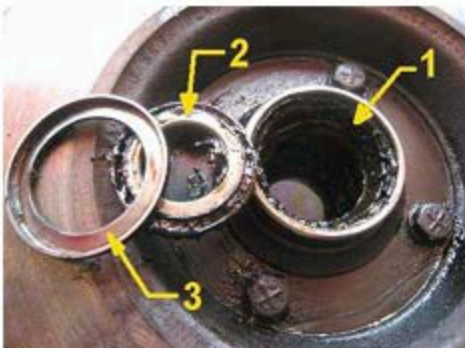
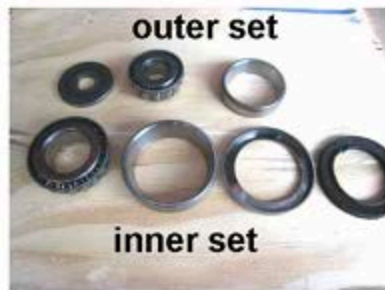


Photo above shows removing outer race.

Tap out both bearing races and wrap them in clean cloth with the two bearing sets. Once again clean the inside of the wheel hub and give the machined metal surfaces a light coating of wheel bearing grease.

Prepare a work area that is very clean and sheltered from the wind. Locate a very clean work surface to begin the bearings sets refurbishing. Now go take a coffee break and scrub your hands as clean as you can get them.

It is very important that the work area be 100% free of any grit or sand that might get into the bearings destroy them.



Wheel hub looking into inner bearings.

1. Bearings race piece still in hub
2. Bearings tapped out with flat punch
3. Bearings retainer band
4. Felt grease seal removed from (3) for photo

The photo above shows the inner bearings tapped out thru the two access slots. The bearing race is still in place and requires removal as well. The bearings retaining band is also shown with the felt grease seal removed for photo clarity.

Wrap the inner bearings in a clean cloth and set aside.



**TR6**

# WHEEL BEARINGS REFURBISH



I cleaned the bearings and races with a commercial grade grease remover. I then inspected the bearings and races for indications of wear or scratches. Everything looked acceptable.

inner bearings and race



Scoop up a palmful of grease and work it into each bearing making sure to roll the bearing to expose all surfaces.



The bearing are now clean and prepared to be repacked with wheel bearing grease. Make sure you purchase wheel bearing grease formulated specifically for disc brakes.



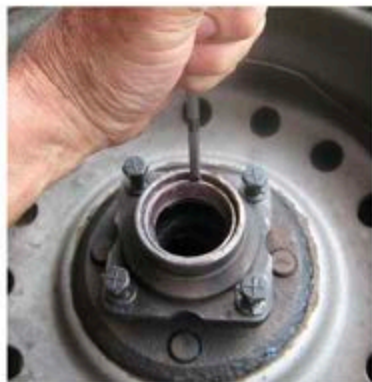
**TR6**

## WHEEL BEARINGS REFURBISH



The photo above shows the outer and inner bearings resting within their race rings. I also coated the inner surface of the two (2) race rings with grease prior to inserting the bearings sets.

I began the bearings reassemble with the inner bearings first. As seen in the photo below left, I used a flat steel bar and medium weight hammer to start moving the bearings' race down into the hub. I rotated the steel bar at 90° intervals to keep the race moving straight downward. Very light taps with the hammer are all that is required. Too much effort with the hammer and you might drive your wheel studs out.



Once the race is flush with the hub, you need to drive the race home with a flat punch tool, again at 90° intervals. To completely seat the race, I set the hub and lugs into the wheel. This protected the lugs from being driven out by the final strong force needed to seat the race.



Inner & outer bearings  
pressed into hub

After you have seated the inner bearings' race is an excellent time to clean out the mounting bolt threads. It takes just a few extra minutes and makes for a better reassemble.

Install the outer bearings' race exactly the same way as the inner race. Now it is time to insert the bearings. Begin with the inner bearing first because it has more pieces.



reassemble hub and brake rotor.  
Tighten bolts to 30#



inner bearings installed

Lightly grease the inner bearing's race and then set the bearings into the race. Make sure they rotate smoothly. Next tap in the retainer band with the punch tool until it comes into contact with the bearings. Add a dab of grease and push in the felt grease shield. The finished assembly is seen above.



Reinstall  
brake caliper  
mount plate



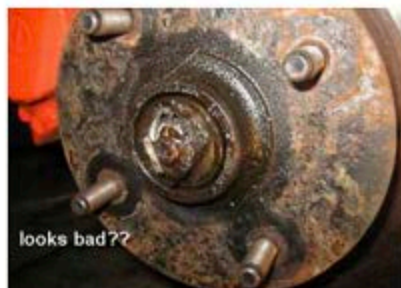
# WHEEL BEARINGS REFURBISH



Clean stud threads prior to powder coat.



Wheel hub prepared for powder coating.



looks bad??

**DPO Pedro's front wheel hub**

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**wheel hub powder coated  
After total refurbishing**

This page is totally optional and has nothing to do with wheel bearings: But while I had things apart.....might as well-----

My wheel hub was really nasty looking and had a lot of surface rust. Plus the lug studs were so filled with crud it was difficult to remove or install the lug nuts. I used a paint brush to apply rust remover to the surface of the wheel hub. Then I applied clean water to wash it off. I used several cycles of this.

Then I used a thread die and cleaned up the four (4) studs. Next I wire brushed the hub surface with a rotary drill wheel to get down to clean metal. Then I washed it with xylol

I masked the threads and hub opening with high temperature tape. Then I powder coated the outer surface of the wheel hub with gun barrel black. It came out looking much better than before.

I hope this "HOW TO " essay might be helpful to other non-mechanic oriented TR6 owners.

Dale Aug 2007