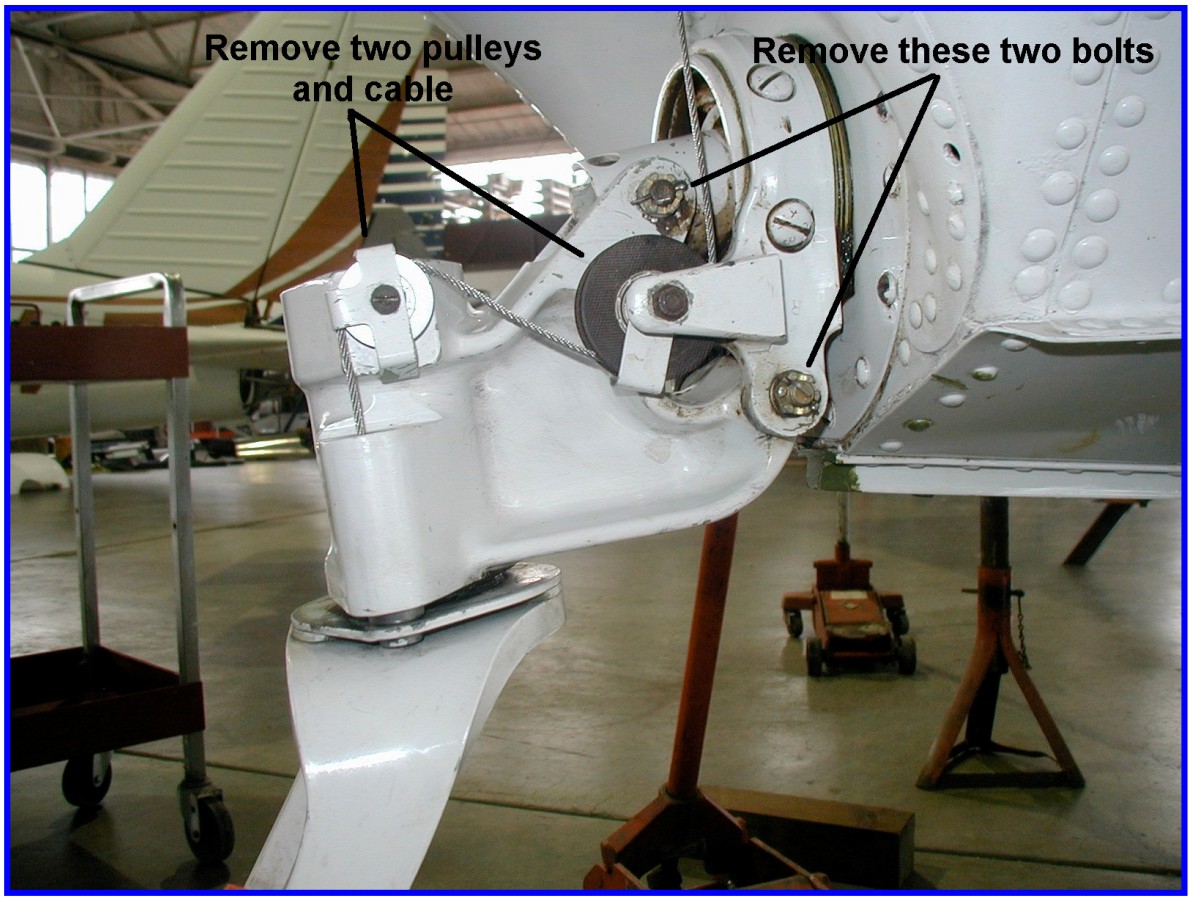
Changing the tail wheel seal (P/N: 1414)

This procedure is used if your tail wheel seal is leaking. This will probably be caused by a dried out seal or foreign object damage (sand) in the seal cavity. It will take you a little while to complete but take your time and get your mechanic to approve what you do. You can check this on the ramp by filling the aft compartment with water and see if leaks. The part number is Garlock (Klosure) 53x2657 or National #455194. (Part number 1414 in the drawing below). These are available from your favorite auto parts supplier. You may have to order it and wait.

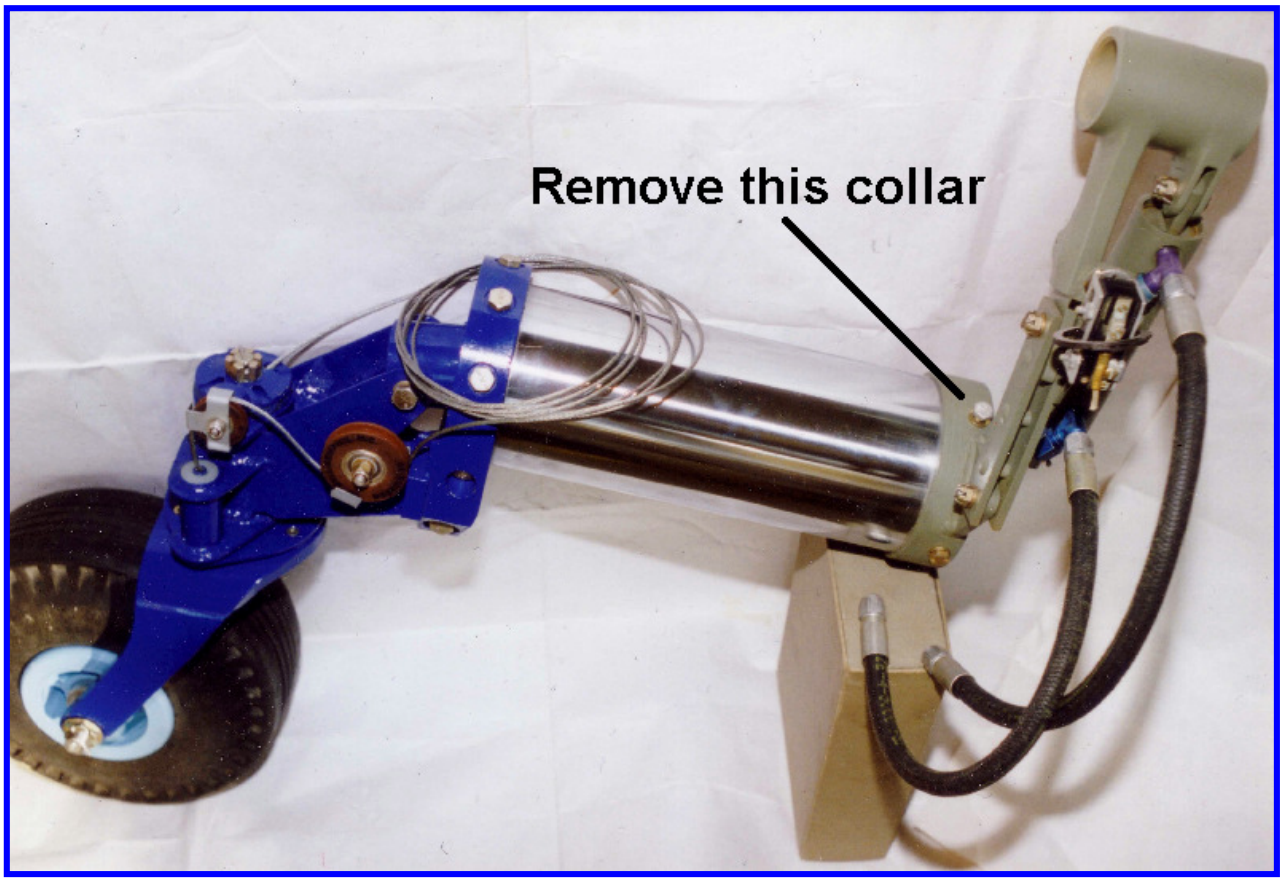
You will need to jack up the tail so that the tail wheel is off the floor and chock the main wheels. The hand holes on the left and right side just above the tail wheel compartment will need to be removed. If you have a hand hole on the top of the tail wheel compartment remove that as well. You will need a drop light inside the compartment.

The complete tail wheel assembly must be removed and stowed in a safe place until this procedure is complete. Start by removing the tail wheel and axle. Disconnect the locking tail wheel cable and remove it. Disconnect the steering cables if you have them. Remove the long bolt going through the tail wheel yoke (see photo). Remove the bolt going through the shock absorber piston. The whole yoke assembly should then be able to be removed.



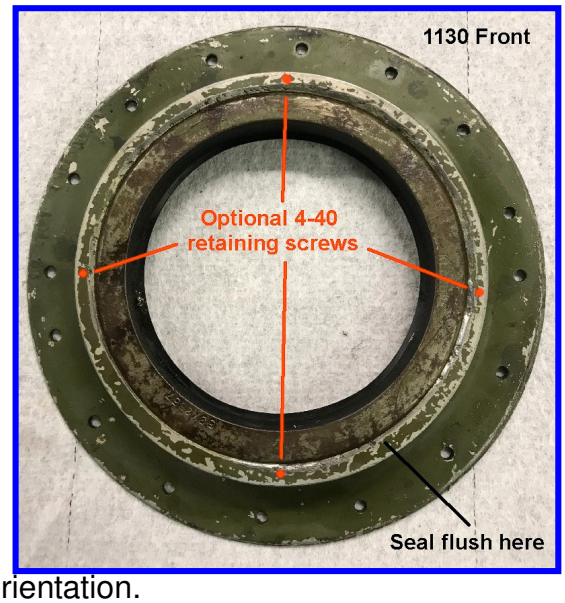
Tail wheel mechanism

Next, disconnect the tail wheel hydraulic cylinder from the large drum (P/N: 1125). There should be a cotter pin and washer on the forward end of the drum collar (P/N: 1145) holding the cylinder in place. No need to remove the cylinder unless you want to change the o-rings. Remove the retaining ring (P/N: 1145) on the forward side of the drum; four bolts. The drum should be able to be removed aft with the tail wheel collar (P/N: 1126) still attached. This is quite heavy as there are still shock absorber donuts and spacers installed.

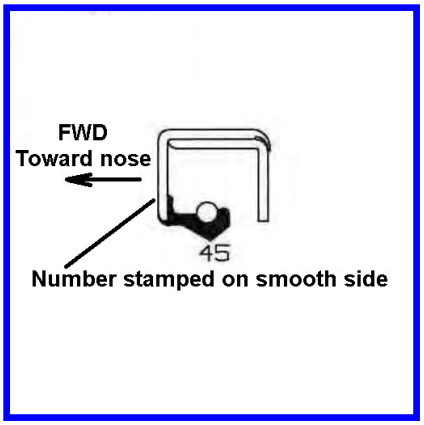


Complete tail wheel system

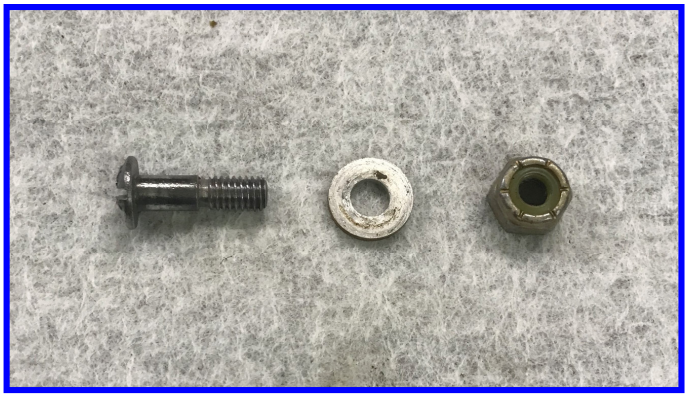
Next remove the tail wheel bearing (P/N: 1130) attached to the airframe by removing the 16 AN23-10A bolts. This part has the seal in it. There is no other way that I know of to change the seal. Part 1130 may have sealer holding it in place so a little heat (propane) or solvent may have to be used to remove it. Once removed, inspect the bronze bearing for condition. If there is any gaulling or deep grooves in it you might consider changing it. This part is a very precise fit and must be machined from bronze. The inner dimension of the bronze bearing MUST be precisley machined to match the outer diameter of the drum. It is also a press-fit into the bearing housiing. See photos below.



Note seal orientation.
Bronze bearing is under rubber seal.



Seal cross section



Hardware required to attach 1130 to airframe
16 each – AN23-10A clevis bolts
16 each – AN364-1032 lock nuts
16 each – AN960-10 washsers

If all is well so far, remove the old seal with a punch or seal removal tool. Clean the bearing housing completely. Be sure the seal surface in the housing is smooth and free from irregularities.

There should be a grease fitting on the left side of the housing. If not, install it now! (1/4-28 thread). This hole should be drilled at a slight angle through the seal case but not the rubber! I also installed an "outlet" hole on the right side so when the bearing is greased, the seal won't pop out if too much grease is applied! The outlet hole is capped off by a grease fitting that is cut off and plugged. It should be as close to flush with the bearing housing as possible. If it sticks out too far it will hinder the retraction of the tail wheel. Remove all sharp edges of the "outlet" hole. This cap is removed prior to greasing and reinstalled when finished.

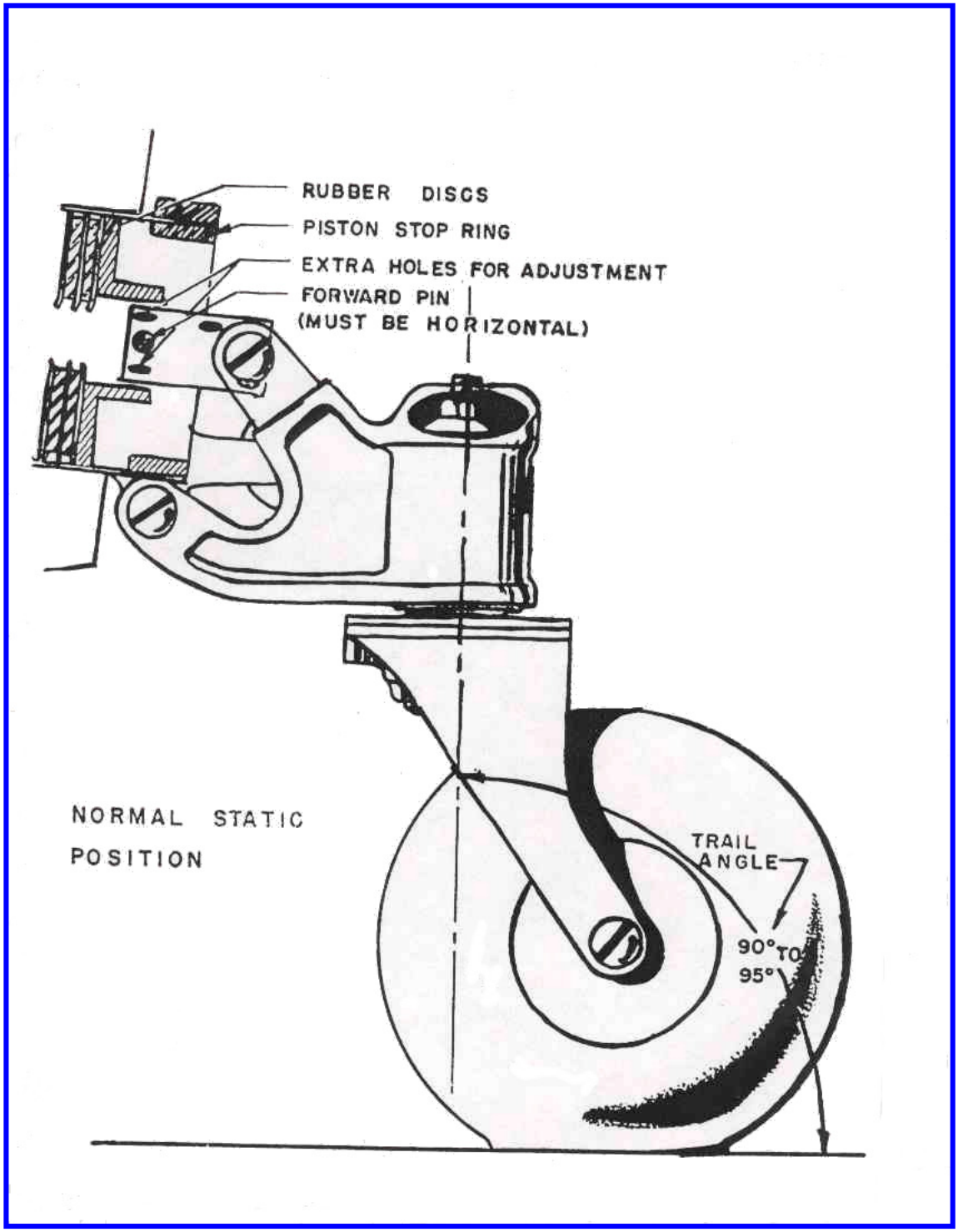
Install the new seal with the rubber facing aft. The forward edge of the seal should be flush with the bearing housing. See photo above. The seal is a press fit so use caution and make sure it goes on straight. Use a hydraulic press or a block of wood to install it.

> **Optional hint**: Four #43 holes can be drilled on the forward edge of the housing flange and tapped to a 4-40 thread. These are screwed in with washers to hold the seal in place. Use these in addition to the "outlet" hole on the right side. See photo above.

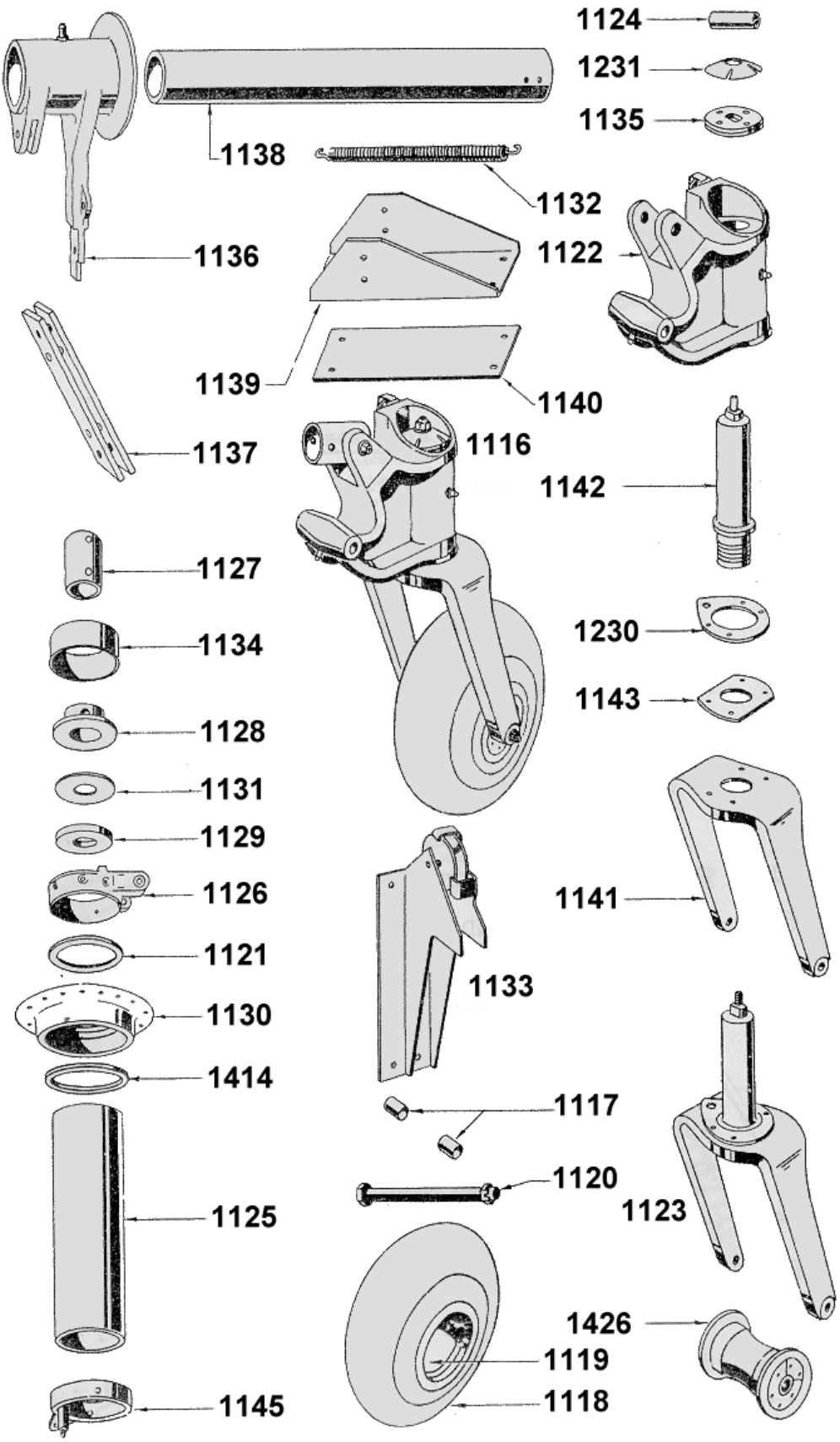
If a new bronze bearing has been installed, make sure the drum fits into it. Fine wet or dry sandpaper can be used if the fit is too tight. Reinstall the bearing housing using a good waterproof sealer (3M P/N: 5200) and the existing hardware but use new AN364-1032 lock nuts. Reinstall the drum (P/N: 1125) and the forward collar (P/N: 1145) using the existing hardware and new lock nuts. Reinstall the tail wheel actuator with the washer and NEW cotter pin. Install the tail wheel assembly and check the trailing angle. It should be 90°-95° from vertical when the full weight is on the tail wheel. This can be adjusted using the offset holes in the piston (P/N: 1128) or adding/removing rubber donuts. See photo below.

While you have everything apart, check the tail wheel collar (P/N: 1126) closley for cracks. This is a common problem that can't be seen with everything together. Usually the cracks are seen between the bolt holes and the outer edges. Clean all parts and paint them as desired. If any hardware is worn, change it!

This seal, if installed correctly, should last a long time. Grease it at least every annual inspection. Just a couple of pumps from the grease gun should be enough. Don't forget to reinstall the "outlet" hole plug. Good luck and I hope this has helped you.



Trailing angle



Tail Wheel Parts