

Tech Tips

CHA116 Printronix Yoke Removal Tool

The CHA116 yoke removal tool has been designed to allow the field service technician to safely remove and replace the yoke assembly and cam follower bearing on the P300/150 shuttle assemblies. This procedure has been virtually impossible to perform in the field. Those who have tried have generally regretted it. The problem is that the shaft which carries the yoke is tapered. The constant driving action of the flywheel cam drives the yoke down into this shaft extremely tight. Because this shaft is attached to the shuttle bar with only an epoxy bond, it is extremely fragile and most attempts to remove the yoke result in the fracture of this bond between the shaft and the shuttle bar.

The CHA116 has been designed to apply a large amount of pressure between the cam follower bearing and the head of the loosened yoke hold-down bolt. This basically pulls the yoke straight off of the shaft, while causing no stress between the shaft and the shuttle bar. The tool also allows for the removal and replacement of the spiral pin which secures the cam follower bearing in the yoke. This feature allows the technician to replace the bearing in the field.

**** Caution ****

This procedure is not endorsed by the manufacturer and does impose some risk to the shuttle bar. This tool is not designed for production use. We have found it to be effective on approximately 85% of the units we have tested. We have run into some shuttles where the only alternative has been to replace the shaft. Carefully following these directions and having a good understanding of the objectives will help to insure success.

This kit contains:

- 1 CHA116 opposing wedge clamp tool
- 1 3/16 diameter dowel pin attachment
- 1 thin ground 5/16 box end wrench
- 1 101315-005 cam follower bearing
- 2 CHA100 bearing block bushing
- 1 CHA100 installation instructions

Yoke removal procedure:

1. Remove the shuttle assembly from the printer using the procedure outlined in the P-Series maintenance manual. Find yourself an area to work which is clean, flat, protected from scratching, and clear of metal objects which may be attracted to the magnetic shuttle.

2. Lay down several layers of printer paper on the work surface to protect the fragile hammer tips. Carefully lay the shuttle assembly down on the work surface. Using the ground box end wrench, loosen the bolt securing the yoke to the shuttle shaft. Once the bolt is loose, remove the wrench and continue to unscrew the bolt with your fingers until its head is approximately 1/8 from the surface of the cam follower bearing.
3. Examine the clamp tool. One side has a tapered wedge and the other side has a pair of wedges. The idea is to orient the wedges so that they oppose each other with the single wedge slipping inside of the dual wedge. When the clamp is tightened, these wedges are driven towards each other.
4. Cradling the yoke in one hand, carefully align the wedges so that they are opposing each other (as described above) between the cam follower bearing and the head of the yoke hold-down bolt. d above. This is a little tricky at first but once started, the tool should align itself. Slowly tighten the clamp until snug.
5. It is important to remember at this point that we are attempting to move the "immovable" object. We are driving a metal wedge between two pieces of metal, and there is nothing to give or flex. Once you tighten the clamp and it becomes snug, the yoke should simply pop loose. This is exactly what happens in most cases.

If, however, you should get a stubborn one, the first sign will be that it gets tight and stays tight for over one full turn. The element that is giving way (the weak link) is the threads on the yoke hold-down bolt. Your only hope at this point, is to *** gently *** tap on the yoke with the blade of a screwdriver or other light object while it is under the pressure of the tool. This will often jar it loose. However, continuing to tighten the tool will only shear off the bolt threads. Muscle is not the secret here...finesse is.

6. Once the yoke has popped loose, remove the tool and finish unscrewing the yoke hold-down bolt with your finger tips or with the wrench if needed. The yoke should now be completely free of the shuttle bar. The shuttle spring and bearing block will slide off easily. Clean and inspect all parts. Install CHA100 bushing using the directions included with this kit.

Replacing cam follower bearing:

1. This procedure can be done with the yoke on the shuttle bar or on a yoke which has been removed from the shaft.

***The cam follower bearing should always be replaced on a yoke which has been removed by the CHA116. The high pressure exerted by the tool on only one portion of the bearing surface can damage its internal rolling elements.

2. Insert the small end of the dowel pin into the hole on the reverse side of the twin wedge. Loosen the tool so that it can be aligned with the end of the dowel pin on one end of the spiral pin in the yoke. The small dimple on the end of the dowel pin helps to keep it centered. Hold the curved surface on the reverse side of the single wedge so that its hole aligns with the other end of the spiral pin embedded in the yoke. Again, it is difficult to hold all of these elements in alignment until some pressure is applied to the tool.

Once the spiral pin begins to be pressed out of the yoke and enters the hole in the curved surface, the tool will keep itself aligned. Continue to push the spiral pin until the bearing can be removed. It is recommended that you do not remove the spiral pin from the yoke completely as this will make it more difficult to re-install.

3. Clean the surface of the yoke and inspect for wear. To install the new bearing, remove the dowel pin from the tool. Next, align the tool so that the curved surface opposite the single wedge is on the side of the yoke opposite the protruding spiral pin. Align the back of the dual wedge so it is centered on the spiral pin and tighten the clamp. Continue to tighten until the spiral pin is driven completely through the new bearing and the opposite side of the yoke.

4. Re-install the bearing block with the new bushings, the shuttle spring, and the yoke assembly onto the shuttle bar. Fully install, but do not tighten the yoke hold-down bolt, yet. Just eyeball the yoke alignment and make sure the bolt is barely snug. Install the shuttle assembly into the printer per manufacturer's procedure.

To align the yoke assembly, restore the printer to a level of assembly which will enable it to operate. Leave the cam cover and the power off. Now rock the flywheel and make sure everything still moves as it should. Apply power and put the printer on-line. Examine the cam follower bearing as it rides on the cam surface. It should flutter from side to side within the yoke assembly. The total amount of this travel is about 1/16 of an inch on a new bearing but should be easily visible.

If the bearing seems to be jammed over to one side of the yoke, take the printer off-line and power down. Insert a large screwdriver in the yoke between the bearing and the yoke hold-down bolt. Rotate the yoke on the shuttle shaft in the direction the bearing is leaning.

If the bearing is riding toward the rear side of the yoke, rotate the yoke so that the top moves toward the rear of the printer. The objective is to set the yoke in a position so that it is "steering" the bearing straight down the cam surface and not off to one side or the other. This adjustment is critical to the long term operation of the printer; so take your time and get it just right. Once the alignment is set, snug up the yoke hold-down bolt using the wrench provided in the kit. Do not over tighten.

5. Now it's time to let the machine run awhile - we recommend at least an hour. During this time the yoke will be driven further down onto the shaft and things will generally "settle in". Adjust shims and bearing block set screws for quiet operation. Check the yoke hold-down bolt and make sure it is still snug. Once this fine tuning is accomplished complete printer assembly and you are finished.

Tool care and storage:

The CHA116 requires little care. Keep some bearing grease on the screw threads to minimize friction. Avoid sharp blows to the wedges. They are made out of hardened steel and are designed to give years of service but could be damaged by severe mis-handling. When not in use, install the dowel pin into its hole opposite the dual wedge. Arrange the jaws so that when tightened the pin will enter the hole opposite the single wedge and close the tool.. This will prevent pin loss.

Replacement bushings are available under number CHA100. Replacement cam follower bearings are available under part number 101315-005.