



# Coupling Corporation of America

250 N. Main St. Jacobus, PA 17407 Phone: 717-428-0570 Fax: 717-428-2865 www.couplingcorp.com

<i>Process</i> <b>A0052</b> <b>1 of 5</b>	<i>Title</i> <b>Customer Installation and Use of the Anderson Clamp Hub</b> Collar Puller version	<i>Rev</i>	<i>PRCN</i>	<i>By</i>	<i>Appvd</i>	<i>Date</i>
		A	N/A	JTG	JHA2	01/06/99
		B	N/A	JTG	JHA2	05/29/00
		C	N/A	JTG	RRB	05/15/01
		D	N/A	JTG	JHA2	08/14/02
		E	N/A	TWF	JHA2	12/15/03
		F	N/A	TWF	JHA2	04/19/04

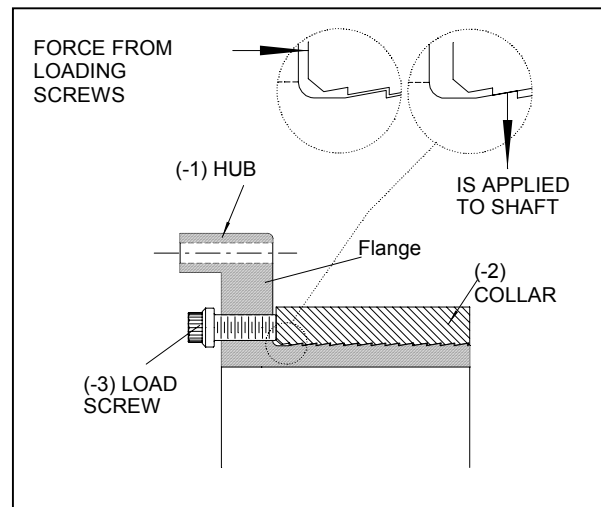
## The Concept

Welcome to the Anderson Clamp Hub, the revolutionary hub that mechanically attaches to shafts without the need for keys. It is easily installed, adjusted (axially or rotationally), or removed with simple hand tools when properly used. Please take a few minutes to read and understand these instructions. They will explain what you need to know to use the Clamp Hub safely and ensure a smoothly operating clamping system. This process is applicable for all varieties of clamp hubs. Concepts and procedures discussed pertain to your Clamp Hub even if its appearance varies from the illustrations used.

The (-2) COLLAR with a female tapered thread is moved axially by (-3) LOAD SCREWS. This movement transfers the axial force to the (-1) HUB's male tapered threads. The effect of the taper is to cause the hub to clamp inwardly onto the shaft.

Every Clamp Hub is operationally tested on a gage plug that simulates your shaft.

Clamp Hubs are shipped "ready to use." **Do NOT disassemble any part of the Clamp Hub at any time!!** Disassembly could remove the special lubricants or allow dirt onto bolts or clamping threads.




## Site Preparations

- 1) Inspect the Drawing that came with your Clamp Hub to verify that the shaft dimension information used to design and build the Hub is correct. The fit between the Hub bore and the shaft should be a sliding line to line fit. Ensure that you understand the Clamp Hub's desired final location/orientation for your application. Have the required measuring/locating devices.
- 2) Refer to the "Clamp Hub Parameters (Table 1)" section of the drawing for information on how far your clamping collar should move. We measure the collar's movement to verify the clamping action. You will need feeler gages or other appropriate devices for this.
- 3) Cleanliness is important. Have a supply of clean dry rags. **Both shaft and bore MUST be clean and dry.** It is recommended that alcohol or other solvents be used to ensure that ALL lubricants have been removed from the shaft and hub bore. However, do not allow any solvents to get onto clamping threads or loading screws!

## If Your Shaft Has a Keyway

If your shaft has a keyway, you should fill it with a "half key." This is necessary to preserve proper balance and to prevent the slight shaft deformation that would occur around an unfilled keyway. Be sure the key does not extend beyond the shaft diameter.

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## If Your Shaft Is Tapered

Your clamp hub may have a tapered bore or it may have a tapered bushing. In either case, check to make sure that the taper matches your shaft. Before clamping, the taper must be fully engaged with the shaft.

## Clamp Hub Preparations


Loosen loading screws so the ends don't protrude through their flange. (Note: If you have a reversed hub design, the loading screws will protrude from a "Pushing Collar" rather than a flange. If this is the case, when "flange" is used throughout this document, it will refer to the "Pushing Collar"; when "collar" is used, it refers to the "Clamping Collar".) Tighten collar by turning it so it lightly touches flange. Back off collar slightly (such as 0.010). Check clearances to ensure the collar's movement will be unencumbered. For some installations, the loading screws may need to be removed to provide adequate clearance for mounting the hub. If this is the case, mount the hub on the shaft before doing these clamp hub preparations. Keep loading screws clean.

## Locate the Hub

- 1) Carefully slide the Hub to its required location on your clean, smooth shaft. This should be a sliding line-to-line fit.
  - a) If the shaft is actually larger than dimensions shown on drawing, it may be possible to re-machine the hub. Contact CCA for assistance.
  - b) If fit is slightly tight, it might be due to the minor eccentricity that sometimes occurs when the slit allows the bore to relieve itself. Check the fit relative to the solid (flange) end to determine if this is the case. If the bore is actually undersized, hone hub bore using coarse stones. The finished bore should be smooth and burr free, but not highly polished. Wipe clean. If using solvents, ensure they don't contact clamping threads or screw threads.
  - c) If hub is a little loose, the shaft may have been "dressed" during a prior installation. Your Clamp Hub should accommodate most variations.
  - d) If fit is very loose, contact CCA regarding use of their FRICTION-EEZE joint preparation. Note: Using this product makes mounting, adjusting, and removing the Clamp Hub significantly more complicated. Only very unusual circumstances would lead to such a requirement.
  - e) If the shaft is actually smaller than dimensions shown on drawing, the problem may be correctable by fabricating a slit bushing. Contact CCA for assistance.
- 2) Verify that hub is located axially and phased angularly as required for your application.
- 3) Recheck the gap between collar and flange. The collar must not contact the flange.
- 4) Uniformly advance loading screws until they all contact the collar (do this sequentially, in very small increments). The section below describes the correct way to do this. It is critically

**Table 1**

1	Final Collar Clamping Movement (from drawing)	
2	Starting Collar-Flange Gap (your measurement)	
3	Final Collar-Flange Gap (Line 1 + Line 2)	
4	Maximum Safe Collar Movement (from drawing)	
5	Maximum Safe Gap (Line 2 + Line 4)	

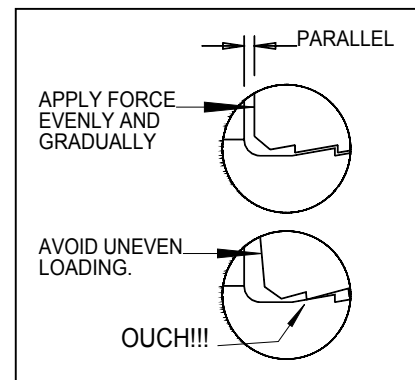
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important that the collar moves evenly (see drawing). Advance the collar until the hub begins to clamp on the shaft (you can't move it by hand). Measure your Start Gap (between Hub Flange and Collar) and record it on Table 1 for future reference.

## Loading the Screws

Depending on the design of your clamp hub, there may be a set of holes in the collar that match up to a set of holes in the hub flange. If this is the case, these holes are the clamp hub's puller feature, and it is important that the hole sets are aligned during loading. The appropriate bolts (included with the coupling) should be inserted through the hub flange and threaded into the collar during loading. These bolts are only for alignment; make sure that they are not threaded far enough to prevent the collar from moving the full required distance.

As shown on the sketch, the collar must move evenly. The action is similar to inserting a close tolerance hub onto a shaft. If the shaft becomes tilted to one side, it will become stuck. How much tilt is tolerable before it sticks is a function of the clearance between the male and female diameters. As a general guideline, you should advance each screw  $\approx .002$  at a time. (You can calculate the rotational angle using the thread pitch) Advance the screws sequentially (1, 2, 3,...) . Do not use a star pattern. As you can see, you will need numerous iterations to advance your collar the prescribed amount. Due to slight variations in the parts, the gap may be slightly uneven. Advance on the basis of feel.



Because .002 is an approximation and because it would be tedious to continually measure, you should gauge your progress by feel, using the following process. Advance the first screw slightly, stopping as soon as the collar's tilt causes the screw to feel tighter. As you move to the adjacent screw(s), your slight advance will first "take up the slack" (screw will meet slightly advanced collar) and then slightly advance the collar (stopping as soon as the collar's tilt causes the screw to feel tighter).

Because you are moving up a taper, the amount of torque required to "take up the slack" will increase as the collar advances. And, as the clearance diminishes (due to threads' taper), the amount that you can advance the screw before it starts getting tight, similarly diminishes.

The change from to "take up the slack" to "starting to get stuck" is fairly distinct. An attentive operator will be able to feel the collar's smooth clamping movement. It is important to measure the advance per iteration early in the process. This prevents advancing too fast and suggests the minimum iterations required for clamping (progress slows as the hub approaches the final clamping state). The Hub is properly clamped when the Collar has evenly moved its prescribed amount.

**IMPORTANT NOTE:** If the screws are advanced too quickly, the collar will continually be stuck—although at different places—throughout the process). The Hub will still clamp, but it will be difficult to unclamp. The clamping threads can be damaged by improper use.



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## Unloading the Screws

The process of unloading the screws is essentially the reverse of the loading process. An improperly loaded screw will clamp but **AN IMPROPERLY UNLOADED CLAMP HUB WILL NOT EASILY RELEASE**. Once your collar becomes stuck while unloading, there is no convenient way to apply a countervailing force.

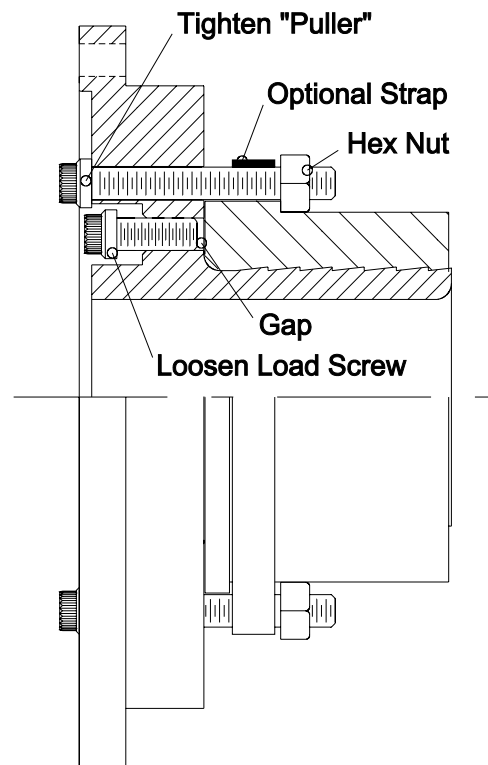
As noted above, the loading screws are advanced in very small increments as the collar nears its final location. Therefore when you begin to unload the screws, you should start by very slightly reducing the load on each screw (sequentially). Your goal is to lessen (but not to point of being loose) the load on each screw. Gage your progress by the feel of the screws rather than by the dimension of the gap. Due to slight variations, the gap may not be uniform. **LOOSENING TOO MUCH WILL CAUSE THE COLLAR TO STICK!** Because you will likewise lessen the load on all the other screws before returning, the load will now be greater than it was when you left that screw (since it now bears more of the burden of the collar); but less than before the last time you loosened it (since the hub is gradually unclamping). If, when you return to a screw, it is the same level looseness as when you last left it, the collar's loosening progress has stopped. The collar might have become cocked. Try tapping the collar with blocks or a soft mallet and try using smaller loosening increments.


If this does not free the collar, you may be able to straighten the collar by gently re-tightening the loading screws (DO NOT EXCEED MAX SAFE MOVEMENT). While this technique works, it requires greater sensitivity to correct a cocked collar than it does to operate a clamp hub normally. You should try this technique several times to free the collar before using your clamp hubs "Puller" feature.

## The "Puller" Feature

Your Clamp Hub has a puller feature that enables you to positively pull the clamping collar back toward the hub flange. You should however use the technique of re-tightening the loading screws to free a stuck collar as long as the collar still moves. A typical Puller set-up is shown in the illustration. The pulling bolt (or threaded rod), hex nut, and optional strap are not provided with the hub. Loosen loading screws. Then tighten puller screws to straighten (and thereby loosen) the collar.

If your hub uses holes in the collar for the puller feature, you may have already used the puller bolts while loading the clamp hub. To pull the collar, simply insert the puller bolts through the flange and thread them into the collar until all the bolts are tight. (If you have to remove loading screws



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to use the puller feature, make sure they stay clean.) Then gradually tighten each bolt so that you evenly pull the collar toward the flange.

### **Oops! Somebody took my Clamp Hub Apart**

The Anderson Clamp Hub should not be disassembled since doing so could disturb frictional coefficients or inadvertently permit ordinary screws to become substituted for the specially prepared loading screws. In other words, **DO NOT REMOVE THE COLLAR OR ANY OF THE LOADING SCREWS AT ANY TIME.** In the unlikely event that your Clamp Hub has been

disassembled, do the following:

- 1) Read and understand this entire set of instructions.
- 2) Make sure you have the correct loading screws. If similar screws have been intermingled, check the ends of the screws. Loading screws have been filed or ground flat. Use the same grade or better to replace lost or damaged bolts (See your Assembly Drawing Parts List). Flatten ends of new bolts. Use bolts in weight-balanced sets if required. Cleanliness is vitally important. Make sure that each bolt is clean from oil, dirt, etc. and that they are free from all burrs prior to lubricating the bolts as described in step 3.
- 3) Dress threads only if required but in such a way as not to change factory tolerances. All threads should be well lubricated to minimize friction. **FEL-PRO Moly paste is required for clamping threads (both male and female) and load screws (threads and ends—where the bolts contact the collar).** Bolts should turn in easily.
- 4) You must be able to thread collar all the way up to flange.
- 5) Clamping a reassembled Clamp Hub should be done the same as previously stated in these instructions. Because different lubricants might be used, the force required to achieve the correct collar movement could be different than previously.

### **Safety**

Follow good safety practices. Maintain a clean, orderly area. Install coupling guards and safety devices before operating equipment.

### **Thank You**

Thank you for your business. We trust this Anderson Clamp Hub will provide many years of excellent service. We welcome your feedback.