WILDERNESS TRAIL BIKES
TOGGLE CAM BRAKE
INSTALLATION INSTRUCTIONS

Getting Started

Refer to Drawings C and D for identification of parts of the Toggle Cam brake.

Installing the Adapter Caps

Clean the brake mounting posts. Use LocTite RC/609 or equivalent to bond the stainless adapter caps to the posts. Apply enough LocTite to the inside of the caps and to the posts to insure that there is complete fill of the clearance gap between the two. Slide the caps on the posts and wipe off any excess LocTite. While the LocTite is curing it is desirable to load the caps in the same direction they will be when the brakes are on. This avoids the possibility of minute play between adapter cap and mounting post which can cause brake squeal.

Screw the 6x1 bolts with washers and greased threads onto the posts without tightening them. Take a 14 gauge spoke or some other piece of springy, stiff wire and form it so when inserted between the caps it presses outward on them (See Drawing E). Then, tighten the 6x1 screws to 40 inch pounds (4.5 Nm). Allow the LocTite to cure over night at room temperature.

Mounting the Caliper Arms

After the LocTite has cured, remove the 6x1 screws from the adapter caps. Grease the stainless adapter caps and put the caliper arms on. The pad holders should be pressed into the caliper arms as far as possible before tightening. With the wheels in place, adjust the brake pads so they rest flat against the rim. Then grease the washer that goes between adapter cap and aluminum spring holder. Also, grease the underside of the spring holder. Insert the 6x1 bolts with greased threads and torque them to 55 inch pounds (6.2 Nm). The brake calipers should move freely on the posts. If they do not, determine what is causing them to bind and eliminate it. For example, if the 6x1 bolts are over tightened, the adapter caps will bulge and expand against the bronze bushings in the caliper arms causing friction. In this case either loosen the screws or increase the bore diameter of the bronze bushings.

Installing the Yoke Pivot and Pulley Screws

One of the two stainless 10-32 screws with the 8mm head is used on one caliper as a pivot for the yoke, the other screw holds the roller on the other caliper. The yoke pivot screw is locked to the caliper with the thin 10-32 nut (also 8 mm across flats) so that the yoke has .5 mm clearance between the bulge in the screw and the top of the nut (See Drawing C). It is best to use the outside 10-32 screw holes in the caliper arms for the roller and the yoke pivot screw unless your caliper arms are mounted so far apart that the yoke and cam are not long enough to span the distance between them when the screws are in the outer positions. Note that it is okay to put one screw in an inner hole and the other in an outer hole to obtain better cable alignment or to solve clearance problems.

Identifying Proper Cable Pull Line

With the wheel in place, turn the spring holders with a 5/8 inch or 16mm wrench so the springs are not touching the caliper arms. Since the Toggle Cam brake cable pulls from the side, you need to determine which side of the bike the roller should be on for best (smoothest, most direct) cable pull line. After deciding where your roller and yoke pivot screws will go, install the roller screw on one side and the yoke pivot screw on the other (See Drawing D). The axis of the yoke should be 90º to the axis of the yoke pivot screw to ensure optimum brake performance. If it is more than a few degrees off, add more 5mm ID x 7mm OD x 1mm thick washers under the roller to correct the alignment. (See Drawing A.)

Rear Mounting

For bikes with chainstay mounted brakes, the roller should be mounted on the non-drive side. This keeps the roller away from the chainrings as the brake pads wear.

Front Mounting

Use extra caution to ensure front fork Toggle Cam installations are safe. Do not install the Toggle Cam linkage in a way that allows it to hit downtube mounted cable stops or the downtube when the fork turns. This can cause damage to the roller or cable stop, either of which can be dangerous. This is usually not a problem on bikes that have the bars mounted low enough that the brake levers or grips hit the toptube, acting as rotation stops, when the fork is turned radically. On front Toggle Cam installations, it is often necessary to put the cable clamp bolt in one of the holes toward the inside of the cam so the cable does not hit control cables when the fork is turned. On such installations it is advisable to cut off (with a fine tooth hacksaw) the outer part of the cam with the unused outer holes, so it doesn't hit the downtube. In general, be extra careful to avoid set-ups where turning the fork actuates the brake or damages parts of the brake or bike.

Cutting the Cam Thread

Now it is time to cut the 6x1 threaded shaft on the cam to the right length. The idea is to cut the threads as long as possible and still have the cam to roller relationship correct with new brake pads. This leaves enough 6x1 threads on the cam to be advanced out of the yoke to compensate as the pads wear. To determine where to cut the 6x1 threaded shaft, straddle the yoke over the stainless screw and hold the cam against the roller with the 6x1 cam thread next to the yoke to obtain the relationship shown in Drawing F. This will give you an indication of where the 6x1 cam thread needs to be cut. You want to cut the thread so that it fills the threaded hole in the yoke completely. Mark the thread with a felt pen and cut with a hacksaw. Deburr the cut end of the thread with a fine file or sandpaper so it screws freely into the yoke. Screw it in to the yoke all the way, put the linkage in place and actuate the cam with your fingers to see if the cam engages the roller as in Drawing F. If the threads were cut a little too short, you can just unscrew the yoke until like Drawing F. If the threads are still too long, shorten as necessary.

Making the Cam to Yoke Adjustment

Unscrew the 6x1 thread and put a drop of LocTite Small Screw Threadlocker 222 on the threads and screw into the yoke. The purpose of the Loctite 222 is to keep the yoke from turning freely on the 6x1 threaded shaft during quick release of the wheels or adjustment of the brake. Check the yoke after the LocTite 222 cures to see if you can turn it by hand. If not, turn the yoke with a wrench to free it up enough so you can make adjustments by hand. Adjust the thread so the cam engages the roller in Figure F.

Cable Attachment

Now you are ready to attach the cable. (By the way, WTB highly recommends DiaCompe BRS cables. The smooth surface of the die-drawn cable gives noticeably smoother, more precise braking than other cables.) Attach the cable to the side of the cam that gives the best cable alignment. Grease only the threads of the slotted 5x.8 clamping screw and use two 8 mm wrenches to clamp the cable. One wrench is used to prevent the head of the clamping screw from turning while the other is used to tighten the nut. When the nut is tightened to 50 inch lbs (5.7 Nm) the two wrenches can be turned in tandem to get the cable direction just right.

The cable should be coming straight out of the cam when the brake is *engaged*. This being the case, the cable will have a curve where it leaves the cam when the brake is relaxed.

Spring Adjustment

The return springs are independently adjustable. To adjust spring tension, hold the head of the 6x1 cap screw tight with an allen wrench while turning the aluminum hex spring holder with a 16mm (5/8") cone wrench. Adjust the springs so that the brake pads are equally spaced from the rim. We prefer to keep the return spring tension as low as possible while being enough to give smooth return of the brake lever.

Brake Bridge

WTB recommends using a WTB Brake Bridge on your Toggle Cam Brake for the ultimate in precision power and modulation.

WILDERNESS TRAIL BIKES
TOGGLE CAM BRAKE
ADJUSTMENT INSTRUCTIONS

ADJUSTING FOR BRAKE PAD WEAR

As the brake pads on your Toggle Cam brake wear, the brake hand lever will move closer to the handlebar when the brake is on. When the lever is too close to the handlebar for effective control it is time to adjust the brake. There are two methods for adjusting the brake. Regardless of the adjustment method used, the Toggle Cam brake is properly adjusted when the cam and roller contact is as shown in Drawing F. Refer to Drawings C and D for identification of parts of the Toggle Cam brake.

Manual Adjustment Method

The brake can be adjusted manually by rotating the yoke on the threaded shaft attached to the cam. To do this, pinch the brake pads against the rim with one hand and remove the cam with the other. Unscrew the yoke just enough to obtain the cam to roller relationship shown in Drawing F. No tools are needed and it can be done easily during or after rides.

Alternative Adjustment Method

The alternative method should be used when the cam threads are screwed so far out of the yoke that only 5mm of contact is left. *Never let the thread contact become less than 5mm.* Remove the cam from the roller and screw the yoke all the way back on to the cam thread. Put the cam back in place on the brake. Loosen the pad fixing bolts with a 10mm box wrench and advance each of the pads equally toward the rim until the cam to roller relationship shown in Drawing F is obtained. Tighten the pad fixing screws to 100 inch lbs (11.2 Nm).

Note: With the Toggle Cam brake, one should *not* adjust for pad wear by using the cable adjustment screw on the brake lever. While this will not cause the brake to lose power, the pads will not retract as far as if either of the above methods is used.

MAINTAINING THE CAM AND YOKE ADJUSTMENT

To keep the cam to yoke adjustment from inadvertently changing when you quick release your wheels, a little friction between the yoke and cam thread is needed. WTB recommends a drop of LocTite Small Screw Threadlocker 222 on the cam threads. After the LocTite cures, you may need to use an adjustable wrench one time to turn the yoke. After that it should have low friction turnable by hand.

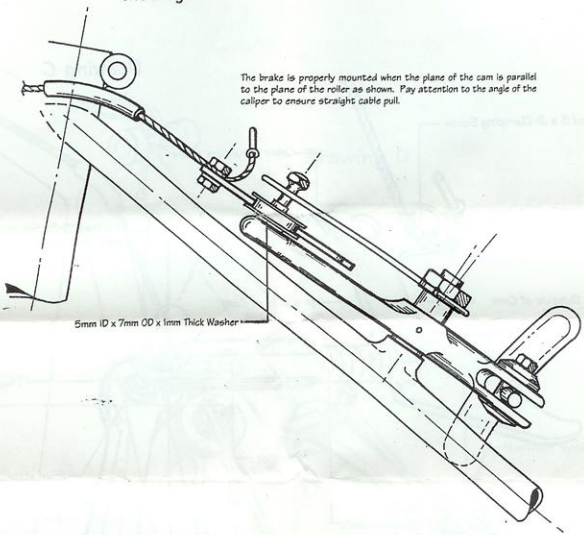
LUBRICATION AND MAINTENANCE OF THE TOGGLE CAM BRAKE

Each caliper arm has a hole in the side for grease (See Drawing D). The caliper arms should be greased about once a month in dry weather and more often in wet weather. (If greased often enough, the bearings last indefinitely and the brake will not need to be taken apart for cleaning.) Before greasing, dirt should be cleaned out of the holes with a pin. Then, using either the Wilderness Trail Bikes or Finish Line Grease Gun, inject Certified GREASE GUARD® Grease into the hole on each caliper arm. The grease flows better if the brake is applied and released during greasing. Wipe off excess grease after greasing. A drop of oil should occasionally be put on the end of the yoke where it straddles the stainless screw also.

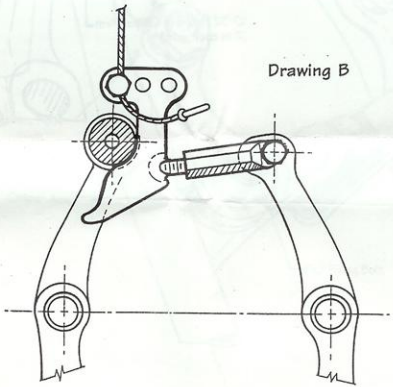
TOGGLE CAM BRAKE INFORMATION

Further technical information on the Toggle Cam Brake is available from Wilderness Trail Bikes. Please call (415) 924-9632 for a free copy.

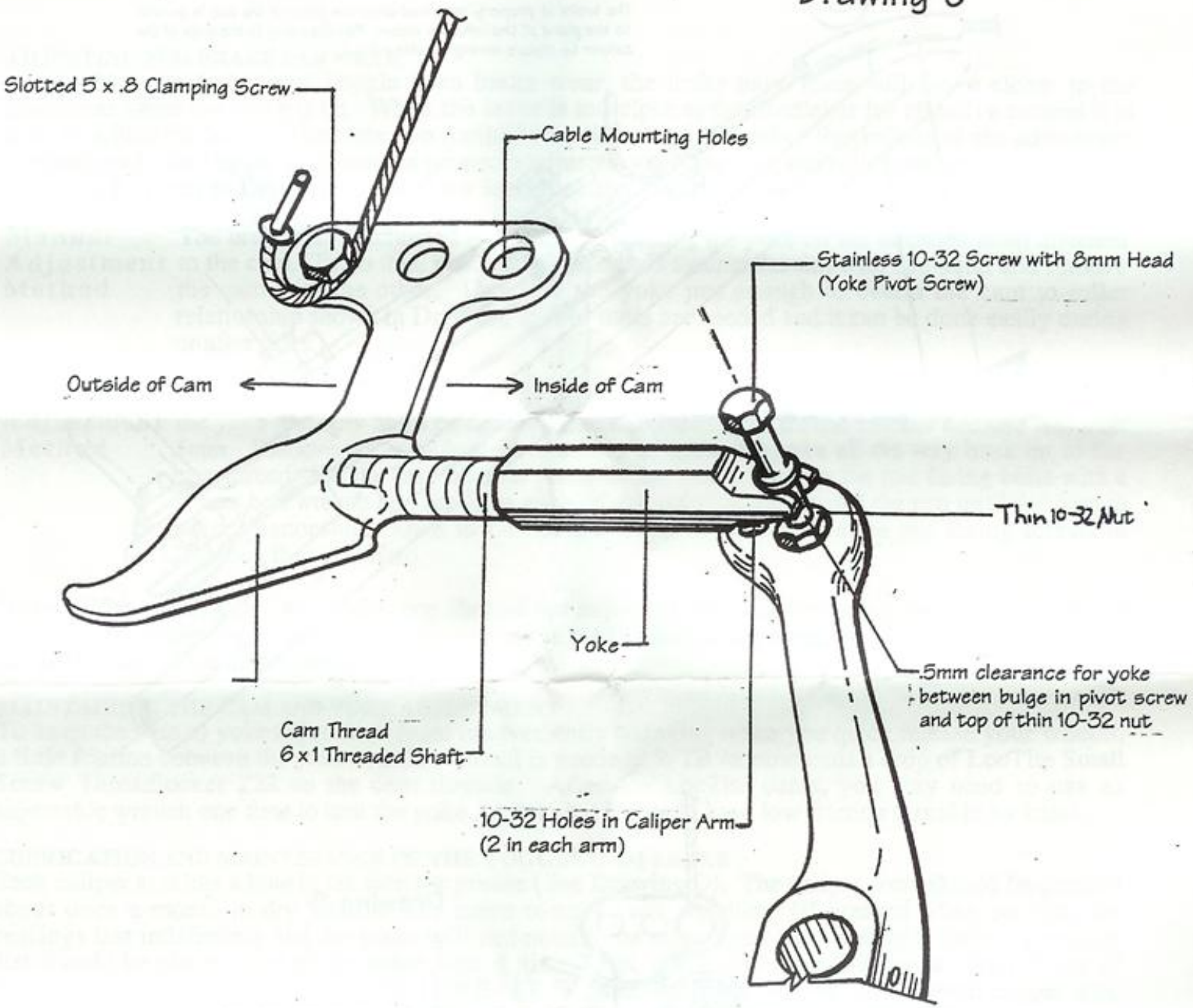
Drawing A



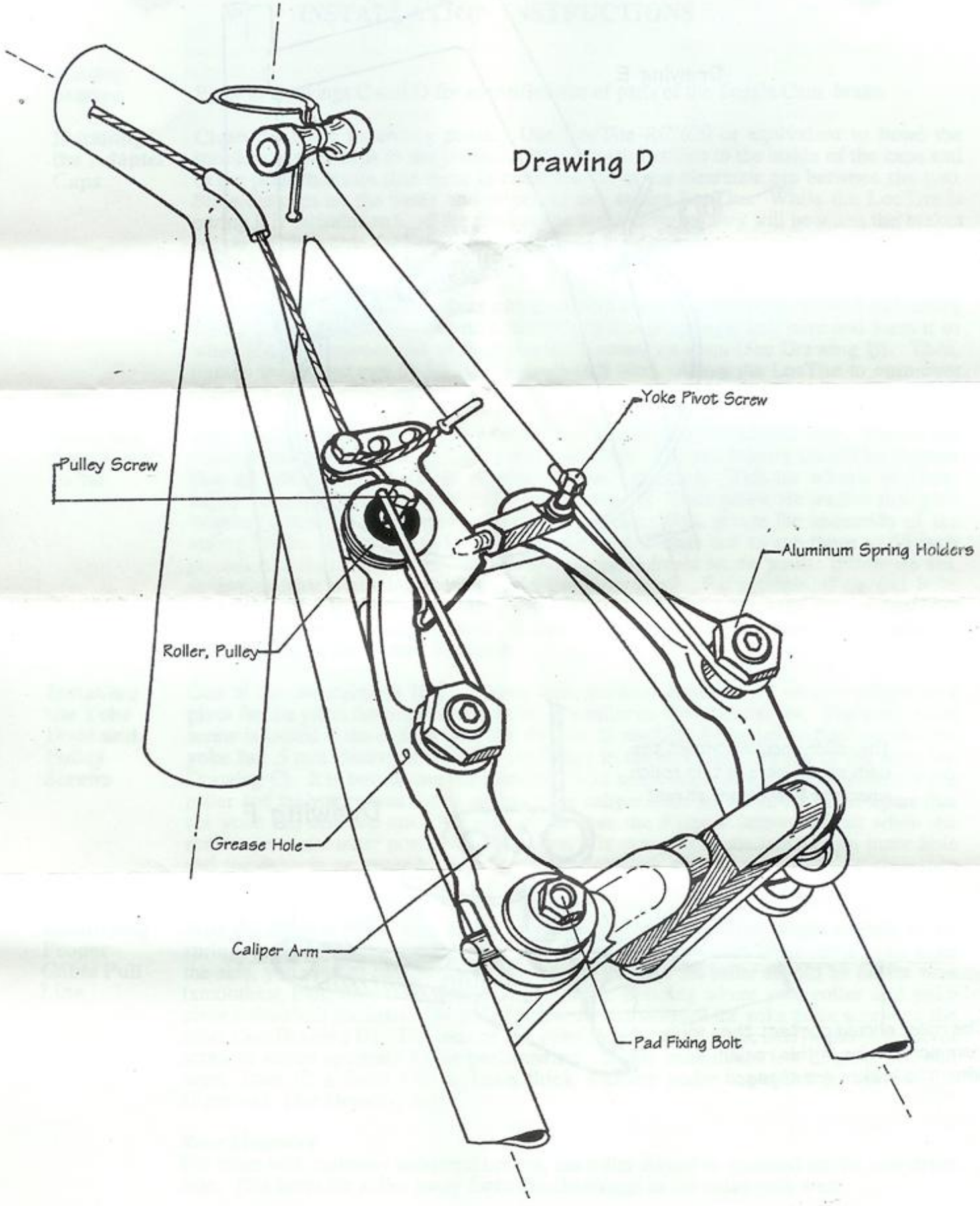
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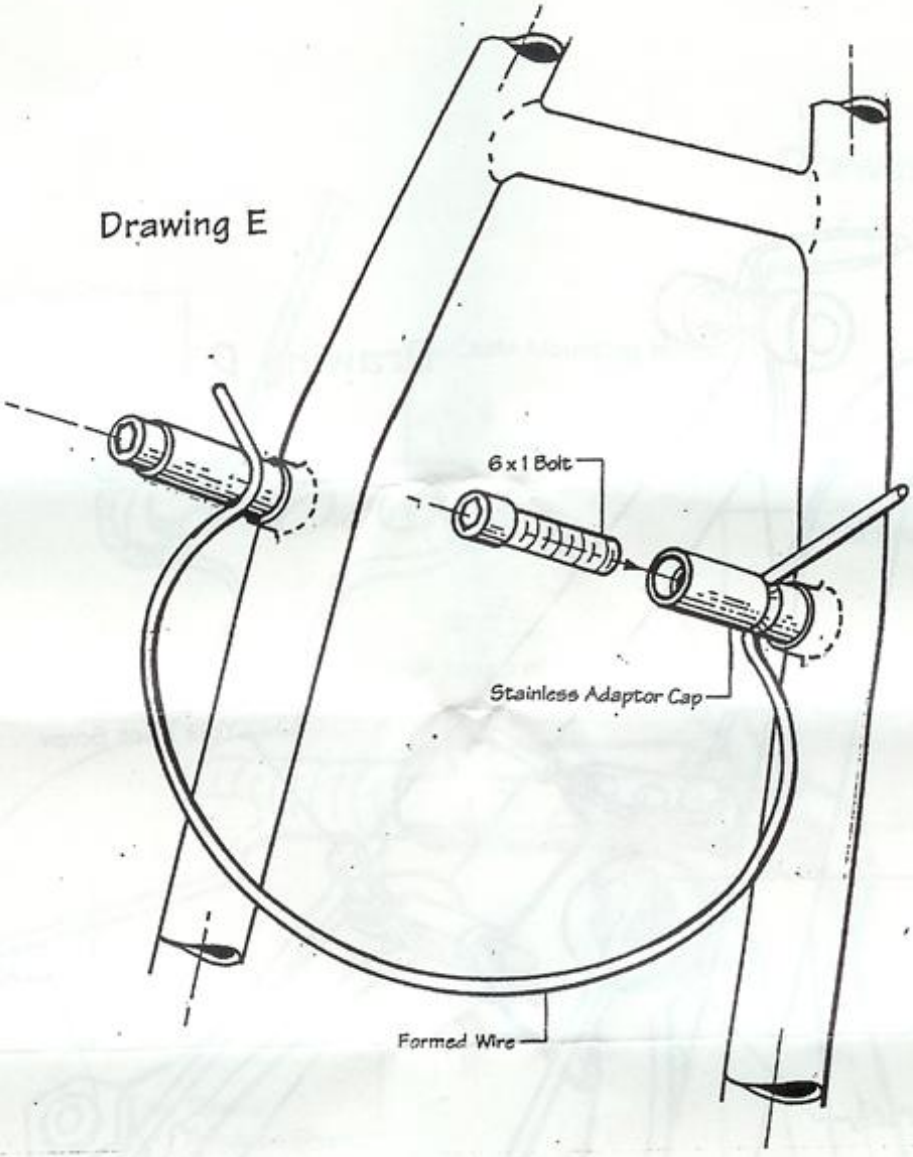
Drawing C


Slotted 5 x .8 Clamping Screw
Cable Mounting Holes
Stainless 10-32 Screw with 8mm Head
(Yoke Pivot Screw)
Outside of Cam
Inside of Cam
Thin 10-32 Nut
Yoke
.5mm clearance for yoke
between bulge in pivot screw
and top of thin 10-32 nut
Cam Thread
6 x 1 Threaded Shaft
10-32 Holes in Caliper Arm
(2 in each arm)

Drawing D


Yoke Pivot Screw
Pulley Screw
Aluminum Spring Holders
Roller, Pulley
Grease Hole
Caliper Arm
Pad Fixing Bolt

Drawing E



Drawing F

