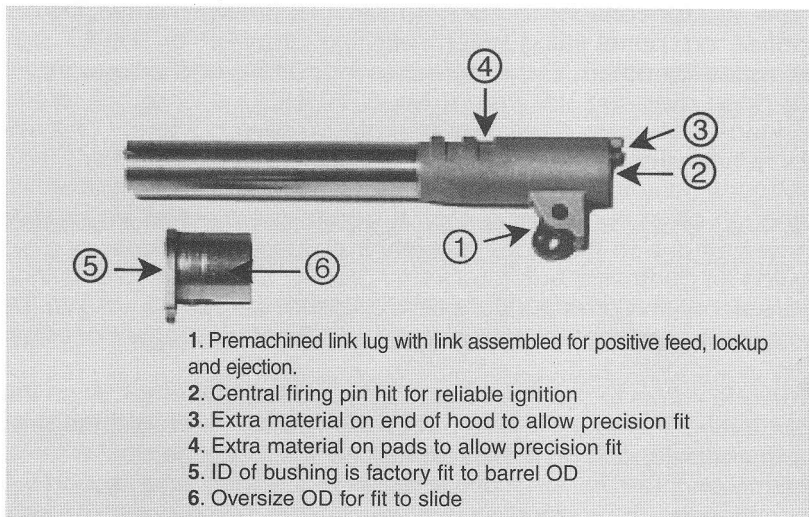


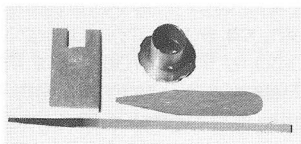
NEW MATH FOR SHOOTERS



A KART XACT FIT BARREL & BUSHING

+

A FEW
HAND
TOOLS

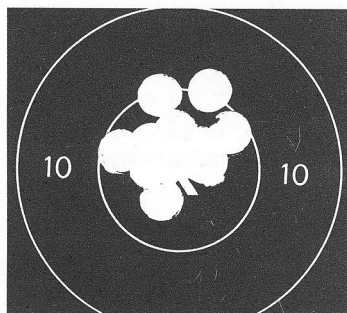


+

ABOUT
ONE
HOUR



=





KART PRECISION BARREL CORP
3975 GARNER STREET SW
SHALLOTTE, NC USA 28470

P: (910)754-5212

F: (910) 754-5210

Thank you for considering our KART XACT FIT BARREL SYSTEM. Do not confuse our barrel fitting system with the "Easy-Fit" or "Pre-Fit" barrels made by others. Our system is so innovative and unique that it has been awarded U.S. Patent No. 5,753,848. Ours does not merely enhance accuracy, it will give ultimate bullseye accuracy and reliability when installed according to our easy to follow directions.

Although all of our National Match barrels are created equal, we know that due to the many different installation techniques applied by various gunsmiths, end results vary greatly. Our goal is to convince professional and amateur gunsmiths alike that our system will give the best, most consistent results, certainly with the least amount of effort.

Everyone knows that a three legged stool will always sit solidly on the floor, even if the floor is uneven. Each leg you add will make the stool more unstable, and no matter how many you add, the stool will only sit firmly on three. As you move a four or five legged stool around the floor, though, the supporting legs will change. Some gunsmiths insist on fitting the sides of the hood tightly to the slide as well as fitting the radius of the rear locking groove to the slide segment. This is an almost impossible task, and in addition to being time consuming it is counterproductive, as each contact point after three will inevitably and absolutely add to the instability of the lockup. You have to agree that if a slide will slide on a frame there has to be a clearance between the two parts. If a barrel is fit using more than three contact points (the link lug legs and the two locking groove pads) the barrel can show that all did make contact during the lockup motion. This does not prove that all are in contact at full lockup. Any change of alignment between slide, frame and barrel can cause different contact points to come into play.

Here is the kicker: Using a five inch barrel, a misalignment between the rear locking groove and the muzzle (a distance of approximately $3 \frac{1}{2}$ ") of only 0.001" equates to a one half inch misalignment at 50 yards. A drop-in or minimum fit barrel can only marginally improve the accuracy of any pistol. After all, your pistol came with a drop-in barrel. How can you expect another drop-in to improve accuracy to any extent?

We contend that using our barrel and our system will give the most consistent, longest lasting accuracy and reliability obtainable anywhere whether it be used for bullseye, action, carry or plinking.

Since 1975 Kart Sporting Arms Corp. and Kart Precision Barrel Corp. have supplied many thousands of the most accurate and highest quality national match type barrels to our service marksmanship units, the nations leading pistolsmiths, amateur pistolsmiths and individual purchasers.

The proper fitting of a conventional national match type barrel so that maximum accuracy and reliability will be attained is a very exacting and time consuming task. Although maximum accuracy is the prime objective, reliable feeding and ejection are extremely important also. The "worlds most accurate single shot semi-automatic pistol" will not hack it in competition. Many pistols are fit properly for accuracy, but in the process, the timing of the mechanism has been severely altered or completely lost. Unless the link lug and the link are of the correct form and size, neither feed, lockup nor ejection will reach their full potential nor will the accuracy last for an extended time. Unless the barrel is properly controlled by the link, severe battering of the link lug will occur, which will beat up both the locking and recoil absorbing surfaces.

In extreme cases, where the link lug is not properly formed or where the link is too long or has too large a hole, the barrel will not be disengaged from the slide before the bottom end of the link lug crashes into the recoil surface of the receiver. This may cause the link lug and/or the link to fail. In the feed and lockup cycle an uncontrolled barrel can be battered going into lockup. Be aware that the lockup surfaces that determine the accuracy of the pistol are the same surfaces that keep the entire slide and barrel assembly from flying off the end of the receiver. They must be treated as carefully as possible.

Kart Precision Barrel Corp. has long been aware of the problems involved in attaining the proper fit of conventional national match type barrels, and we have come up with a solution to those problems. We have fully developed and have been awarded a patent for a "SEMI-AUTOMATIC PISTOL BARREL WITH PRECISION ADJUSTMENT MEANS AND METHOD OF PRECISION ADJUSTING SEMI-AUTOMATIC PISTOLS."

Our new Xact fitting barrel system is of the same material, workmanship and inherent accuracy as always, except all the machining required and most of the expertise and time required for installation have been eliminated. The link lug is fully formed and is sized so the primer will receive a central hit from the firing pin for the most reliable ignition, and the proper length and size link is installed for full control of the barrel through the feeding, lockup and ejection cycles. The only fitting required is barrel hood length and the height of two raised pads located 45 degrees each side of top dead center in the rear locking groove of the barrel.

To install our Xact fitting barrel system, only the following tools are required:

- Kart barrel locating block
- Kart bench bushing
- Custom swiss file, .175" wide with safe sides
- .003" feeler gage

We recommend use of these Kart tools as they were specifically designed for our system. They are available from us in kit form or individually. The use of some tools made by others may not give satisfactory results, and their use would be at your own risk.

The Kart barrel locating block orients the link lug perpendicular to the bottom of the rails of the slide, not square to the inside of the rails. Being perpendicular assists proper mating of both legs of the link lug to the top of the slide stop pin.

The Kart bench bushing allows easy assembly and disassembly during fitting of the locking groove pads. The inside is made for a close but free fit to our barrel. The outside is made for a close sliding fit to the slide barrel hole, providing the slide hole is of the proper size. The two surfaces are made to the same concentricity as are our barrel bushings.

Our standard bench bushing is .700" O.D. to fit a standard slide barrel hole which is supposed to be .699" + .003". If you expect to fit a

quantity of barrels you may want a set of bushings to fit the range of slide hole sizes you will encounter. We have oversize bench bushings in stock which measure .701", .702", & .703". If your slide hole is larger than .703", call for advice.

The normal teardrop shape as on a regular bushing is left round at 1.25" in diameter with serrations on the perimeter of the bench bushing to facilitate installation by hand. Although there are bushings that could be used, such as G.I. or commercial bushings, the concentricity may not be correct, I.D. and O.D. may not be proper and the end result could be a disaster.

The custom swiss file will just fit the rear locking groove width so the whole surface of the pad is filed to make flat, even contact with the slide wall segment.

While fitting the hood, visually determining clearance on the sides of the hood is acceptable, but when slide, barrel and receiver are assembled for fitting, the feeler gage must be used each time to be certain that a side of the hood does not force the barrel to roll in the slide. This will cause the barrel to raise up on one leg of the link lug which will result in an improper fit and be detrimental to accuracy.

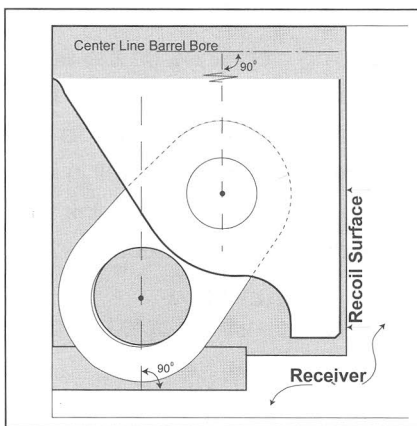
Of course, once you purchase these tools, you will be able to install any quantity of barrels with them.

DETAILS OF THE KART XACT FIT SYSTEM

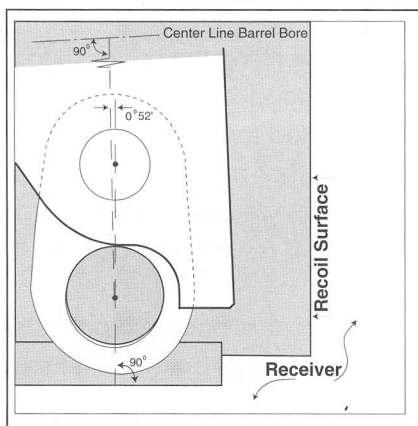
DETAIL 1

Shows the relationship of the barrel link lug, the link, the pin of the slide stop and the recoil surface of the receiver when the mechanism is in the beginning of the feed cycle. Note that the rear surface of the link lug is not in full contact with the receiver recoil surface as the slack in the link pin hole has been taken up by friction of the slide on the barrel and pressure from the round entering the chamber. The link is now in control of the barrel, holding it to the rear to accept the cartridge, and will continue in rotational control until just before the link becomes vertical. Note the two vertical dashed lines, one through the slide stop pin hole at 90° to the plane of the receiver rails, and the other through the link pin hole at 90° to the center line of the barrel bore. In this position they are approximately $.175''$ apart and parallel, as the barrel is laying parallel to the receiver.

DETAIL 1



DETAIL 2



DETAIL 2

Shows the link vertically positioned just after the link has smoothly transferred support of the barrel onto the slide stop pin. The support of the barrel by the link through the arc the barrel link lug has traveled has enabled the barrel locking grooves to engage smoothly, accurately and consistently into the locking segments in the barrel hole of the slide. The two lines have now come together to intersect at the slide stop pin hole and are no longer parallel, but diverge at an angle of $0^\circ 52'$. The barrel is now inclined downward toward the muzzle at the same angle, and, of course the rear surface of the barrel link lug is inclined also.

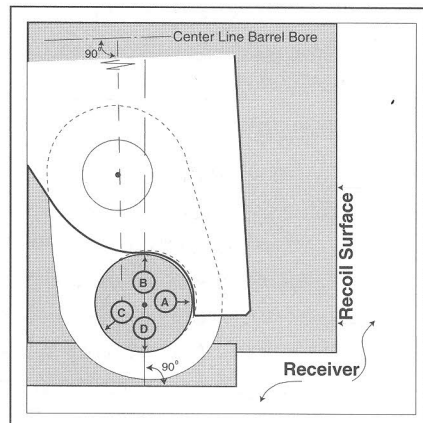
DETAIL 3

Shows the barrel in the full battery or lockup position. Point **A** will be under hard contact. This contact keeps the slide and barrel assembly from sliding off the receiver. Point **B** should be under hard contact also, providing the two contact pads in the rear locking groove of the barrel have been properly fit. This contact will cause consistent vertical location to the rear end of the barrel.

Note there is clearance between points **A & B** so these points will cause a v-block effect on the slide stop pin. The arc in the form of the link lug must be smaller than that of the diameter of the slide stop pin. If not, there will be only one point of contact and elevation of the rear of the barrel will vary, resulting in vertical shot dispersion. Point **C** should be a soft or casual contact, as the link should not restrain the pin from making hard contact at point **A**. It should be just barely free floating at this time, but standing ready to make contact at point **D** as soon as the barrel and slide assembly go into recoil and move together past the flat surface on the bottom of the link lug until the link attains a vertical position. The flat surface on the bottom of the link lug is machined at an angle inclined at $0^{\circ}52'$ relative to the center line of the barrel bore so that when the barrel is pivoted up into lockup, the flat surface is parallel to the rails. This flat surface allows the barrel and slide to remain fully locked together for a short while after ignition and into the recoil cycle.

The barrel and slide are still mated together and as they continue to the rear the link makes hard contact at point **D**, rotating the barrel down and away from its interface with the slide in ample time for the slide to continue to the rear to complete the ejection cycle without interference from the barrel.

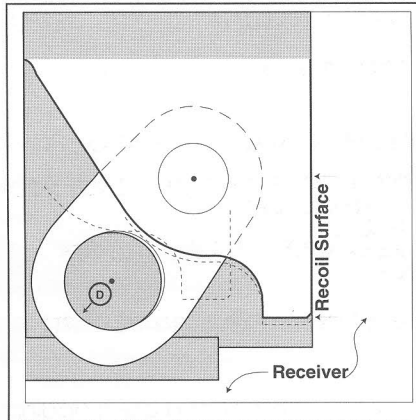
DETAIL 3



DETAIL 4

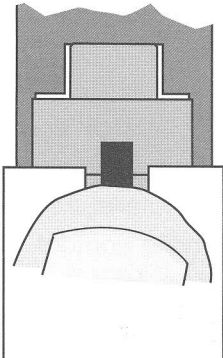
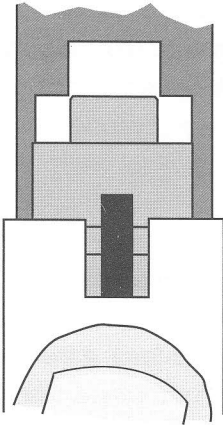
Shows the minimum position the barrel link lug must be pulled down to so the barrel locking grooves will be disengaged from the locking segments in the slide. Hard contact at point **D** has brought the lug down and into first contact with the recoil surface of the receiver. Note that at first contact the link lug has been pivoted down and its rear surface is now vertical, is parallel with and in full contact with the recoil surface of the receiver. The barrel, by virtue of the slack in the link pin hole, is now able to drop to its free location represented by the lower dotted line. The link will assume the position shown in **Detail 1**, ready for the feed cycle. As the barrel must only contact the receiver between these two positions, it is obvious that length of the link and/or the size of the slide stop pin hole is extremely critical. If the link has not pulled the barrel down to the position shown, the slide and barrel will still be engaged and their combined weight (and perhaps the weight of a compensator also) will strike the recoil surface of the receiver at the very tip of the link lug. Under those conditions the barrel will eventually fail. The two dotted lines in the form of the link lug represent the positions of maximum engagement and full free position. The Kart Barrel and Link Assembly, when properly installed in a slide and receiver assembly that is within standard manufacturing tolerances, should result in an engagement of the barrel locking groove into the locking segments in the slide for a minimum of .045". Total vertical travel of the link lug between the two dotted lines is .060", which leaves less than .015" as the "window of opportunity" for complete disengagement.

DETAIL 4



BARREL FITTING PROCEDURE

1. Place the bench bushing on the barrel, insert the barrel into the slide and lock the bushing. Slide the barrel in as far as it will go. The barrel should not start to drop into its lockup position in the slide. If it does, engage it into the slide segments and pull to the front. If the .003" feeler gage does not go, you will not have to fit the hood for length. If the gage goes freely, do not continue with the fitting procedure. This means that your slide is oversize between the rear locking segment and the breechface. Call us and we may be able to offer a solution. Do Not alter the Barrel Assembly in any way or you will not be able to return it for exchange.



2. If the barrel hood length is so that it won't allow the barrel to start to go into position; pull the barrel forward so the entire length of the hood is forward of the hood recess in the slide. With the link turned backward between the legs of the link lug, place the barrel locating block on the barrel as in the upper diagram to the left. With thumb pressure holding the barrel locating block firmly against the side rails, slowly slide the block and the barrel toward the breechface. As the hood starts into the recess, observe that there is clearance on both sides of the hood. If there isn't, remove material from that side of the hood until there is a minimum of .003" clearance. There is no maximum clearance, except that it probably shouldn't be more than about .010". The hood merely guides the barrel into position so the pads can do the final positioning just before full lockup. With thumb pressure on the link and block, as shown in the lower diagram, push the barrel hood back against the breechface,

while trying to push the barrel into lockup position in the slide. File the end of the hood to match the breechface (some aren't square) until the barrel can be moved in and out of lockup position without force. A clearance of .001" to .002" is ideal. The feeler gage should not go between the hood and the breechface, but it is important that the barrel can be moved in and out of lockup position without "sticking".

3. Assemble the barrel and bench bushing into the slide and mount the assembly onto the receiver with the slide stop pin through the link. Leave the recoil spring, guide and plug out. Slowly close the slide and observe the barrel as it enters its recess in the slide. It shouldn't contact on either side, but even so, note which side, close the slide as far as it will go, and check with the feeler gage. The .003" clearance specified is a minimum dimension, and if the barrel hood touches the slide but then moves away, increase the clearance on that side so no contact can be made. You must have clearance on both sides, as hard contact will roll the barrel up on one leg of the link lug and you won't get a good fit.

4. Remove the barrel and bushing (leave the slide on the receiver). Coat the two pads in the rear locking groove and the two legs of the link lug where they will contact the slide stop pin with a contact disclosing material such as Bearing Blue or Hi-Spot. If they are not available, dark lipstick will work.

5. Replace the barrel and bushing in the slide and insert the slide stop pin. With vigor, try to close the slide. It should stop short of going into full battery. Check sides of hood with the feeler gage to be sure that clearance is maintained. Move slide to the rear and remove the barrel from the slide.

6. In some applications, the link lugs will not contact the slide stop pin until some material has been removed from the pads, during which time the link is still supporting the barrel. Remove material from the pads until both legs of the link lug just begin to make contact with the slide stop pin. Recoat, reassemble, and with vigor, close the slide again. Disassemble and observe all contact points. If both legs show

contact and one pad shows heavier contact than the other, remove material from the heavier contacted pad only. If they show equal contact, remove material from both.

7. Recoat, reassemble and try to close the slide. Each time material is removed from the pads you must check hood clearance. Uneven removal of material from the pads will cause the barrel to move side-wards. If the hood clearance closes up, try removing material from the opposite side pad while making sure legs of the link lug are making contact with the slide stop pin. If the barrel picks up onto one leg, adjust it back by removing material from the opposite pad and from the hood if necessary. The most important thing to keep in mind is that both legs of the link lug must be in even contact with the slide stop pin and side clearance of the hood must be maintained. The removal of material from one or both pads and/or the hood must be done carefully and patiently. Each time material is removed from the pads, the slide will come closer to going into full battery. Just before you attain full battery lockup, it is recommended that you switch to the match bushing for the final fitting.

8. Repeat as above until the slide will go into full battery, which will be evidenced by hard contact being made at point **A** shown in **Detail 3** previously. Leave lockup a little tight and if possible fire some rounds to help contact surfaces seat to each other. If the lockup remains too tight, carefully file the places on the pads that show hardest contact. Experience will dictate how tight to make the initial lockup.

Comments:

Contact on both pads, both link lug legs at points **A** and **B** in **Detail 3** and clearance on both sides of the hood means you now have maximum repeatability to the slide. If your sights are mounted on the slide, you do not necessarily have to have the slide perfectly fit to the receiver. If you are using a grip mount or want to test for accuracy with a machine rest, you will need a good slide fit to the receiver. If so, do the slide to receiver fitting before attempting to fit the barrel.

Sometimes, even when much care has been taken to fit a barrel, results are not what was expected. You may not get as tight a group as was hoped for, different ammo produced different results, different ammo shot good groups but point of impact changed, wadcutter ammo shot well, but hardball would not group - all of these are exactly the same problem, just varying degrees of severity.

The problem, plain and simple, is that the barrel was not fit correctly. The barrel must sit squarely on the slide stop pin with both legs of the link lug and there must be equal pressure on both pads in the rear locking groove. Any deviation from that, and accuracy will suffer. If the barrel is not held absolutely securely at ignition, it will torque when the bullet crashes into the rifling and begins its spin to stabilize. The harder the bullet and the heavier the load, the more the disruption will be. Lead bullets will usually stabilize easier than jacketed, lighter bullets easier than heavier, and of course, any wadcutter will cause less disruption to the lay of the barrel than will hardball. Do not accept less than a threepoint lockup, and excuses won't be necessary for why a pistol won't shoot hardball.

The variables involved are the quality of the barrel fit and the quality of the ammunition. The inherent accuracy of the barrel is not a variable. There is no black magic involved. The barrel has no idea what ammo is being fired through it. The new math for shooter is: a Kart barrel plus the best possible fit plus the best quality ammo equals the best possible groups.

KART NATIONAL MATCH BUSHINGS and KART XACT FIT BUSHINGS are manufactured in our own plant from prehardened 4140 steel. Although working with already hardened steel is more difficult and therefore more expensive, the benefits far outweigh the disadvantages. We are able to machine exterior and interior surfaces to finished dimensions at the same time, insuring that they will be perfectly symmetrical and there will be no deformation from heat treating after machining.

There is a variety of bushings on the market that use a variety of methods to try to hold the muzzle of the barrel securely during lockup, none of which do a proper job. The most common use a cylindrical barrel bearing surface. These are very difficult to fit, as the length of the bearing surface will not allow the barrel to cam up properly during lockup if too tight, and will try to spring the rear of the barrel back out of lockup. This condition can also cause the whole slide assembly to stop short of full lockup and cause vertical stringing of the shot group. In extreme cases, the muzzle of the barrel can be deformed, destroying any possibility of accuracy. In any event, the actual contact area between the barrel and bushing will be two very narrow points, at the lower front and the upper back of the barrel contact area.

KART NATIONAL MATCH BUSHINGS are of the standard National Match design, oversize outside dimension and undersize inside dimension which provides an interference fit to the outside of the barrel, necessitating a careful fitting by a knowledgeable gunsmith.

KART XACT FIT BUSHINGS (Patent Pending) use three planes on the barrel bearing surface to eliminate any possibility of an improper fit. These planes are designed so that the bushing will slide freely over the narrow middle plane, the two angled planes will make full contact with the barrel for their full length at lockup, and no pinching or springing of the barrel will occur. The slide assembly will go to full lockup each time and all wear will be borne by the middle plane which does not contact the barrel during lockup.

XACT FIT BUSHINGS are available only as a factory fit set with either the NATIONAL MATCH or XACT FIT BARRELS. There is a small fitting charge for fitting the XACT FIT BUSHING to the NATIONAL MATCH BARREL. There is no fitting charge for the XACT FIT SET.

