

# PRECISION BRAND®



## SOF' SHOE® DIRECTIONS

FOR RELIABLE ANGULAR SOFT FOOT CORRECTION,  
FOLLOW THESE ALIGNMENT STEPS:

NOTE: Good alignment means correcting the driven machine as well as the driver, when applicable.

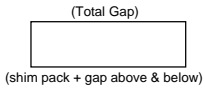
1. Number the "driver" feet on your sketch or form to keep track of soft foot measurements.
2. Loosen all the hold down bolts on the motor. If any bolts are loose, the foot may have been soft. Check the foot for cracks or welds, as this may have been a long time problem.
- 2a. If it is a replacement motor, rock the motor on the base; shim until it is stable. (Best if the driver and driven bases are level as well as being planar, that is all four feet are in the same plane. However, in the "real world" level is not often attainable but, planar is a must for good alignment.)
3. Tighten all feet **evenly** with a torque wrench and if necessary crowsfeet also, or with your own "calibrated elbow" as a last resort.
4. Zero a dial indicator on a magnetic base at foot number 1, back off the hold down bolt and record the amount of rise.
5. Check under all four corners of the foot with PRECISION BRAND® Feeler Gages. Each corner's measurement should combine any gap on top of and beneath the shim pack. If the measurements from each corner of the motor foot differ, this indicates angular soft foot.
6. To determine how severe a foot's angularity is: subtract the smallest corner feeler gage reading from the largest corner; then divide the remainder by the width of motor foot (in inches) to find the foot's angularity per inch. Record the angularity per inch for the foot.
7. Retighten that foot. Check the opposite diagonal foot the same way. Now do the other diagonal pair before correcting any foot. Replace badly corroded or dirty shim packs with new PRECISION BRAND® Stainless Slotted Shim. Before inserting new, clean shim under a foot, try to remove any residue, oil and corrosion by sliding a cloth or abrasive screen strip between the foot and the base. If one diagonal pair of feet has a "zero" rise and the other diagonal pair has a rise, carefully read 8c.
- 8a. To correct angularity of a foot -  
If the angularity per inch of a motor foot is less than .003, replace .035" of the existing shim pack with two (blue) SOF' SHOE® shims, one next to the foot, one next to the base. [Two blue SOF' SHOE® shims will compress to .035" (.0175" x 2) under standard bolt torque.] Subtract .035" from the original shim pack thickness\* and replace only the difference with PRECISION BRAND® Stainless Slotted Shim between the SOF' SHOE® shims, then add what is needed to relieve the ordinary soft foot flat rise stress as described in 8b.
- 8a cont.'d.  
If the angularity per inch is more than .003, replace .080" of the existing shim pack with two .045" (yellow) SOF' SHOE® shims, one next to the foot, one next to the base. [Two yellow SOF' SHOE® shims will compress to .080" (.040" x 2) under standard bolt torque.] Subtract .080" from the original shim pack thickness\* and replace only the difference with PRECISION BRAND® Stainless Slotted Shim between the SOF' SHOE® shims, then add what is needed to relieve the ordinary soft foot flat rise stress as described in 8b.
- 8b. To correct ordinary soft foot flat rise -  
While correcting for angularity of a foot, add together the rise measurements from both feet in the diagonal and divide by two. The result represents the average ordinary soft foot flat rise which tells you what thickness needs to be added to each foot's existing shim pack in that diagonal.
- 8c. If one diagonal pair of feet has a "zero" rise and the other diagonal pair has a rise of < .020" reduce the average soft foot flat rise per foot of the bad diagonal by 10% before correcting. If one diagonal pair of feet has a "zero" rise and the other diagonal pair has a rise of > .020" reduce the average soft foot flat rise per foot of the bad diagonal by 20% before correcting.
9. If either diagonal does not have angular soft foot, calculate the average ordinary soft foot flat rise of the diagonal pair and correct with PRECISION BRAND® Stainless Slotted Shim.
10. Once you calculate the correct SOF' SHOE® and PRECISION BRAND® Stainless Slotted Shim to place under each motor foot, slide the shims under all feet, keeping the shim's slot edges away from the bolt to avoid creating burrs and lips on the shims. Then tighten the bolts to standard bolt torque. Burrs or lips on the shims can also degrade the alignment. SOF' SHOE® shims may curl slightly under standard bolt torque, this just shows that they are absorbing all the irregularities of the foot and/or base.
11. Recheck the motor's rise by placing the dial indicator back on each foot and backing off (loosen) the bolt. If the dial indicator measures a rise of .010" per foot or less with two yellow SOF' SHOE® and .005" or less with two blue SOF' SHOE® you have corrected the angularity. Many 'cured' feet will show some dial rise but will not allow insertion of PRECISION BRAND® Feeler Gage. This rise represents only temporary compression. Go ahead and align with confidence.

NOTE: We highly recommend the use of two SOF' SHOE® shims for each "driver" foot showing angular soft foot as outlined in these instructions to insure motor alignment because the source of angular soft foot is often not detectable. However, if you can determine without any doubt which, the foot or the base, is the cause of the angularity, then only one SOF' SHOE® Shim placed next to the problem surface would be necessary. In most "driven" machine applications the use of two SOF' SHOE® shims is not necessary since many driven feet have no shim packs and SOF' SHOE® shims contact both the foot and the base.

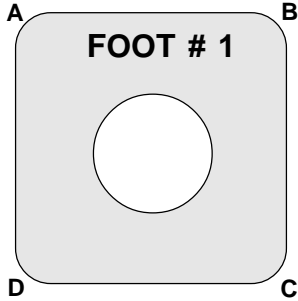
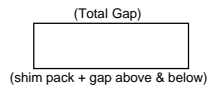
\*For the driver, it is good standard alignment practice to always have a min. of 1/8" (.125) thick shim pack (using no more than 5 shims) under each motor foot for motors up to 250 HP. For larger motors a min. of 1/4" (.250) shim pack thickness is recommended.

# ANGULAR SOFT FOOT CALCULATION CHART

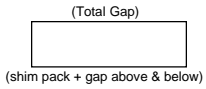
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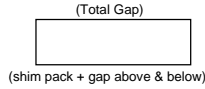
**CORNER #B**



**CORNER #D**

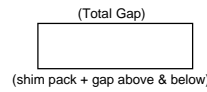


**CORNER #C**

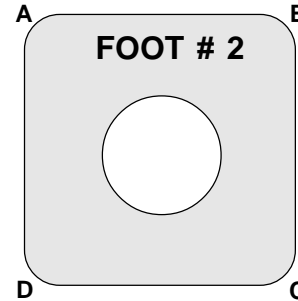
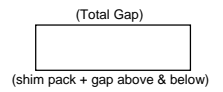


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 \text{(inch width of motor foot)}
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 \text{(foot \#1's angularity per inch)}
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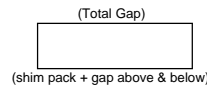
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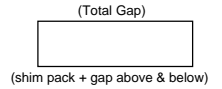
**CORNER #B**



**CORNER #D**

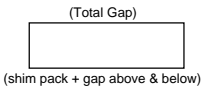


**CORNER #C**

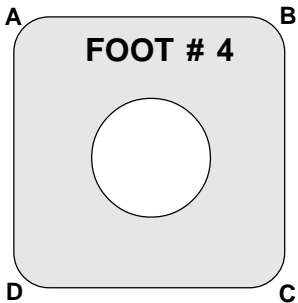
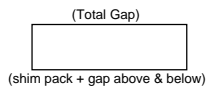


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 \text{(foot \#2's angularity per inch)}
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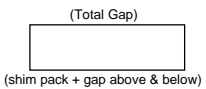
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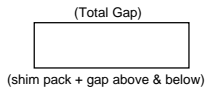
**CORNER #B**



**CORNER #D**

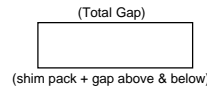


**CORNER #C**

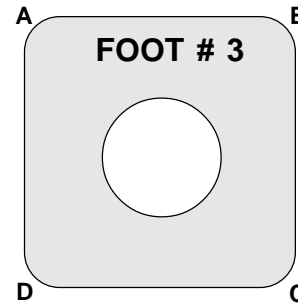
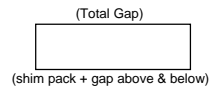


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 \text{(foot \#4's angularity per inch)}
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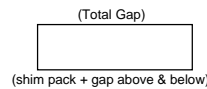
**CORNER #A**



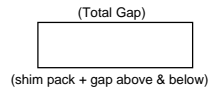
**CORNER #B**



**CORNER #D**



**CORNER #C**



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 \text{(smallest total corner gap)}
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 \text{(difference)}
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 \div
 \begin{array}{c}
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 \text{(inch width of motor foot)}
 \end{array}
 =
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 \boxed{\phantom{000}} \\
 \text{(foot \#3's angularity per inch)}
 \end{array}$$