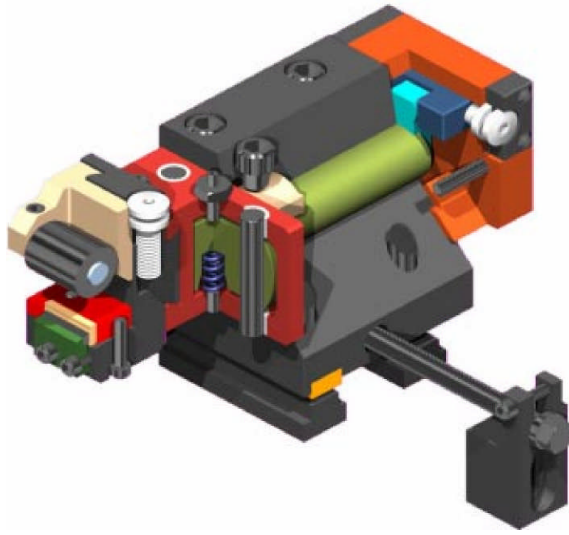


# PETERSON TOOL COMPANY



## ***Owner's Manual for ThriftShave®***

**A hands on manual for better understanding of the  
operation of your new ThriftShave®**

**U.S. Patent # 6,012,364**

**U.S. Patent # 6,105,476**

**U.S. Patent # 6,182,542**

*Owner's Manual For ThriftShave* ®

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2004

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of  
Peterson Tool Company, Inc**

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**U.S. Patent # 6,012,364  
U.S. Patent # 6,105,476  
U.S. Patent # 6,182,542**

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## ***Using the ThriftShave®***

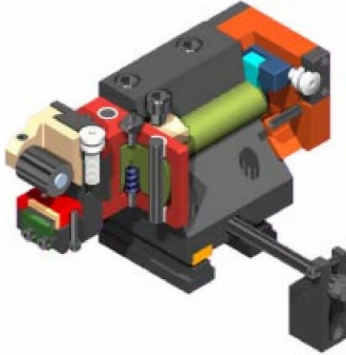
Thank you for purchasing the most advanced fixture for shaving a part on an automatic bar machine. ThriftShave® is carefully made by toolmakers accustomed to holding 0.0001 to 0.0002 inch on dimensions. Each component on your ThriftShave® has been ground to exacting tolerances to insure that you receive the most value for your money. We hope that this ThriftShave® will give you years of uninterrupted service.

The ThriftShave® is made to be easily adjustable. Following these instructions will make your fixture perform to your expectations. Please read the following instructions to make your experiences with ThriftShave® as easy as possible.

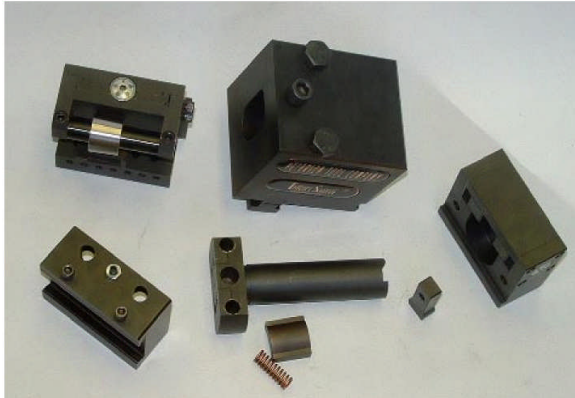
The adjustments on most models include roll adjustment, taper adjustment, an optional centerline adjustment, and lift adjustments. All of these adjustments are detailed in the manual. Other items detailed in the manual include disassembling the unit and converting the fixture for another position. This manual is made with generic pictures that may not be the exact model you have. These pictures are used to give visual aid in the instructions. Your fixture will also come with a parts list specific to your model.



## *Getting to Know Your ThriftShave®*

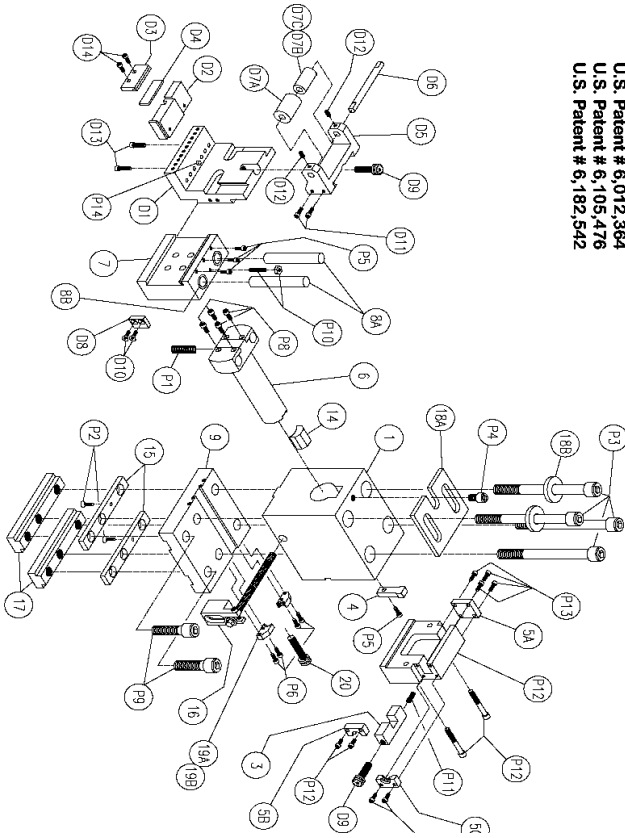


The following pages are included to help familiarize you with the different parts, assemblies and sub-assemblies of the ThriftShave®. It will help you in reordering worn or broken parts.



# Parts List

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## Detail List

<u>Detail</u>	<u>Qty</u>	<u>Description</u>	<u>Detail</u>	<u>Qty</u>	<u>Description</u>
1	1	Mounting Block Body	D5	1	Roller Support
2	1	Mounting Block End Cap	D6	1	Roller Pin
3	1	Taper Cam Follower	D7A	1	Roll
4	1	Taper Cam	D7B	1	Roll Spacer
5A	1	Stop Plate	D7C	1	Roll Spacer (Optional)
5B	1	Adj. Screw Retainer (Back)	D8	1	Shave Head Stop
5C	1	Adj. Screw Retainer (Front)	D9	1	Micro Adj. Screw (Roll)
6	1	Shaft	D10	2	Shave Head Stop Screws
7	1	Riser Block	D11	2	Roll Support Lock Screws
8A	2	Riser Block Pins	D12	2	Roll Pin Set Screws
8B	2	Riser Block Bushings	D13	2,3,4	Anvil Screws
9	1	Base Plate (Optional)	D14	2,3,4	Clamp Screws
10	1	Micro Adj. Screw (Taper)			
11	1	Shaft Lock Block	P1	1	Lift Spring
14	1	Mounting Block Key	P2	1,2	Mounting Block Key Screw(s)
15	1 or 2	Lateral Adj Assy (Optional)	P3	2,4	T-Bolts
16	1	T-Nut	P4	1	Taper Lock Bolt
17	1 or 2	Washer Plate (Optional)	P5	1	Taper Cam Screw
18A	1	Washers (Optional)	P6	4	Ctr Line Adj Plate Screws (Optional)
18B	2 or 4	Ctr Line Adj Plate L (Optional)	P7	2	Mounting Block End Cap Bolts
19A	1	Ctr Line Adj Plate R (Optional)	P8	4	Lift Pin Clamping Screws
19B	1	Micro Adj. Screw (Optional CL)	P9	1,2	Base Plate Hold down T-Bolt
20	1		P10	1	Lift Block Adj. Screw Assembly
D1	1	Shave Head	P11	1	Back Lash Spring
D2	1	Anvil	P12	4	Adj. Screw Retainer Screw
D3	1	Clamp	P13	4	Stop Plate Screws
D4	1	Insert	P14	1	Anvil Location Pin

## *Assemblies*



**Thriftshave Body**



**Roll Support**



**Head**



**Mounting Block**



**Roll and Spacer(s)**

The anvil, clamp, and insert are part specific, as is the roll and spacer.

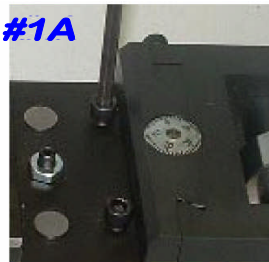
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## Installing the ThriftShave®

Before installing the ThriftShave® on the cross slide, assemble the anvil, clamp and insert on the ThriftShave® head assembly if it is not already done.

1. Loosen the head assembly lock screws. See Picture #1 and #1 A.  
*Warning: Never tighten the head assembly locking screws without the head being in place. This will severely damage the locking flange.*



2. Place the anvil on the head assembly by locating the slot on the bottom of the anvil to the pin on the lower portion of the head. See Picture #2

3. Tighten the anvil screws from underneath the head assembly as shown in picture #3.



## Installing the ThriftShave®



**4.** Align the clamp screw holes in the clamp to the holes in the head assembly, making sure the clamp is between the ears of the anvil. Picture #4

**5.** Place the insert into the pocket made by the anvil and the clamp and tighten clamp. Picture #5

**6.** Return the head assembly to the ThriftShave® body and retighten the head assembly lock screws.



**7.** ThriftShave® comes with T-bolts and T-nuts designed specifically for your machine type, size and model. On most ThriftShave® s an alignment key (#7A) is fixed as well. Through the course of many years of use and abuse, your machine may have damaged T-slots so it may be necessary to remove burrs or dimpling in the slots. We have found it easiest when mounting the ThriftShave® to do so with the T-bolts lightly tightened to the T-nuts and to slide into the T-slots (#7B)

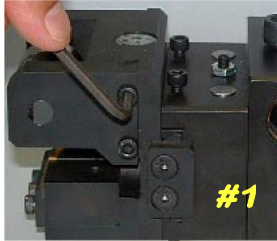


## Adjusting the ThriftShave®

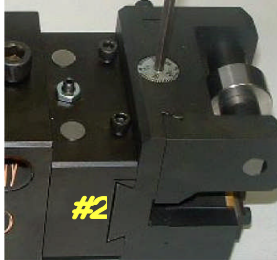
There are four adjustments for the ThriftShave®. Those being roll adjustment, taper adjustment, an optional fine feed adjustment, and lift adjustment.

### Adjusting the Roll

1. Begin by loosening the roll adjustment lock screws on the side of the head. (Picture 1).



2. Locate the micro adjustable screw (Picture 2) and using the provided allen wrench, turn clockwise or counterclockwise for the desired size. Each complete turn of the screw is approx 0.025". Each hash mark is approx 0.0005". **Never tighten the roll adjustment lock screws without being on the head assembly. Tightening these screws will cause severe damage to the locking flange.**



3. Adjust the roll diameter by using Vernier callipers as seen in picture #3. Slowly turn the micro adjustable screw until the desired diameter is read on the indicator. Setting the roll diameter can also be accomplished by using a gage made for the part or a combination of gages. As shown, in these pictures, the roll diameter can be set with the head removed or installed on the ThriftShave body. It is easiest to do this while out of the machine.



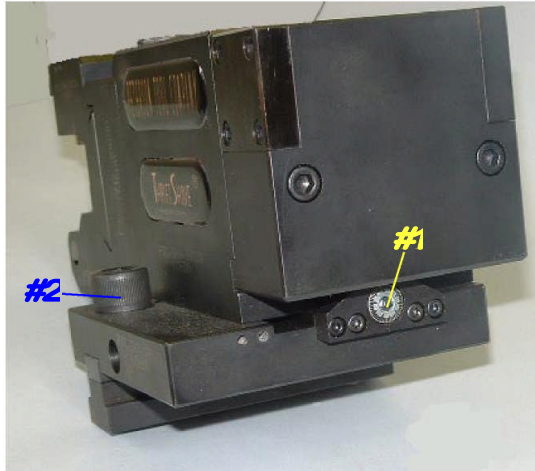
## *Adjusting the Taper*

Begin the taper adjustment by loosening the large set screw on the top of the fixture marked #1. Take the provided allen key and turn the micro adjustable screw (See #2) clockwise or counterclockwise to the desired position. Each complete turn of the micro adjustable screw is approximately 1.5 degrees or 90 minutes. Each hash mark on the screw is approximately 1.8 minutes. Once the desired setting is accomplished, retighten the large set screw marked #1. See Appendix A, on page 33, for determining how many turns corrects taper.



## ***Adjusting the Centerline (Optional)***

On some models of ThriftShave® . an additional adjustment has been included for adjusting the centerline location of the roll and insert. This adjustment enables you to precision set the amount that the roll goes past the center of the part. This adjustment is located on the rear of the fixture, marked #1 on the picture below. In order to make this adjustment, the T-bolts must be loosened in order for the top portion of the fixture to slide along the base plate. **DO NOT** loosen the short hold down bolt on the base plate. (Marked # 2) After loosening the T-bolts, use the provided allen key to turn the micro adjustable screw counter clockwise to advance the tool and clock wise to retreat the tool.

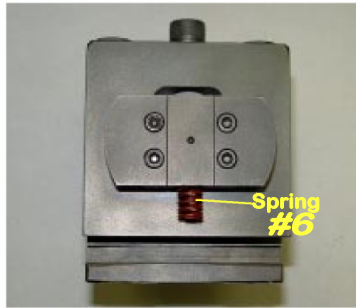
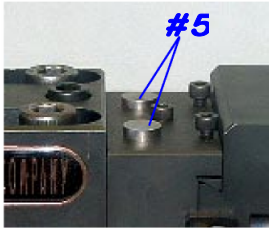


## Adjusting the Lift

There are two reasons for making adjustments to the lift block. One is to replace the spring with another spring of more or less tension. The second reason is to increase or decrease the amount of lift of the head.

## Replacing the Spring

1. Remove the fixture from the machine
2. Remove the head by releasing the set screws marked #2. Slide the head completely off.
3. Loosen the lift pin clamping screws marked #3
4. Back off the lift adjustment screw until the lift assembly no longer moves. This reduces the tension in the spring. This reduces the tension in the spring.
5. Remove the 2 lift pins from the fixture marked #5
6. Carefully remove the lift assembly from the fixture. *Be careful doing this as the spring is under tension.* The spring (#6) inside the lift block will be on the opposite side of the lift adjustment screw, see #4.



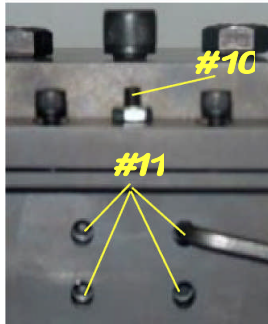
## Adjusting the Lift (cont)



7. There are usually 3 springs supplied with your ThriftShave®. These are colored: Blue, the lightest tension; Red, medium tension; and Gold, the heaviest tension. See picture marked # 7.



8. To reassemble the lift head, place the new spring in the spring chamber and position the bottom portion of the lift assembly over the spring and compress the spring. The assembly should snap into place on the shank. See picture # 8. Make sure the lift assembly has the lift adjustment screw 180 degrees around from the spring as shown in #4 and #6. This step is made easier if the lift adjustment screw has been completely backed out as described in step #4.



9. Replace the lift pins. When replacing the lift pins, make sure that they extend above the lift block as seen in the picture marked #5 on the preceding page. This will insure there is no pocket for oil and chips to collect. If chips with oil collect, there is a greater chance for contamination in the pins and pin bushings which will eventually decrease overall performance.

10. Tighten the lift adjustment screw until the lift pin clamping screws are centered in the holes of the lift block.

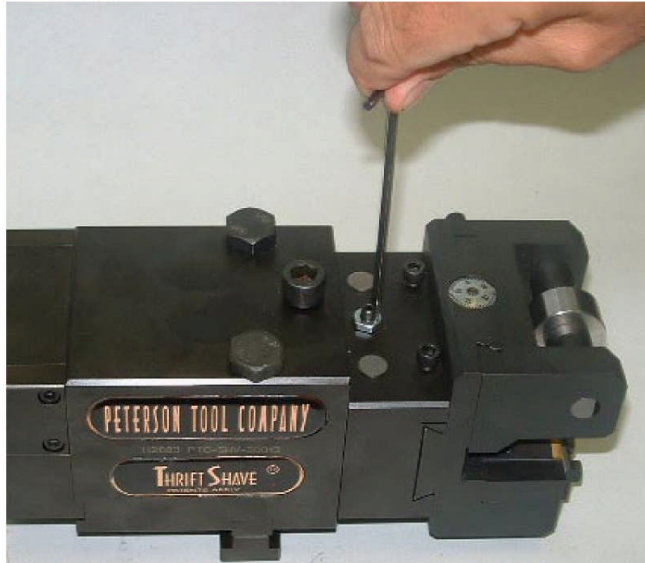
11. Retighten lift pin clamping screws, see picture #11.

## ***Adjusting the Lift (cont)***

### ***Adjusting the Amount of Lift***

The ThriftShave® comes from the factory preset near the midpoint of the total lift capacity. To increase or decrease the lift:

- 1.** Locate the lift control screw with lock nut. See picture below.
- 2.** Using the provided allen wrench turn this screw clockwise or counterclockwise to the desired lift amount.





## ***Maintaining the ThriftShave®***

The ThriftShave® will provide years of service and maintain its original integrity with the proper maintenance. Here are a few pointers in extending the life of your ThriftShave®.

**1.** Always make sure that all set screws, bolts and nuts remain tightened when in use. Over time, machine vibration can loosen these.

**2.** Keep chip build up off the ThriftShave®.

**3.** Make sure the lift pins extend out of the lift block on the top of the fixture so a small pocket is not created. These pockets can gather fines that can work into the lift assembly and cause damage.

**4.** Never tighten the head assembly locking screws without the head being in place. This will severely damage the locking flange.

**5.** Never tighten the roll adjustment lock screws without being on the head assembly. This will cause severe damage to the locking flange.

**6.** Every 6 months, the lift assembly should be removed from the fixture and thoroughly cleaned. This will extend the life of the lift pins, bushings and spring. Excessive wear will make close tolerance work difficult and could lead to chatter.

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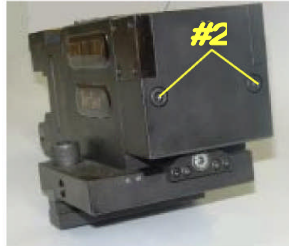
U.S. Patent # 6,182,542

## Disassembling the ThriftShave®

Complete disassembly of the ThriftShave® is rare. However, this section is devoted to that, in the event it is required.



**1.** Remove the head assembly from the ThriftShave® body assembly. *Never tighten the head assembly locking screws without the head being in place. This will severely damage the locking flange.*



**2.** Locate the bolts that retain the mounting block end cap shown in #2. Remove both bolts and then remove the mounting block end cap from the body.



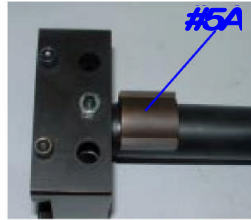
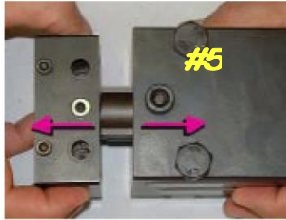
**3.** Remove the cam screw as seen in # 3 and lift the cam from the keyway in the end of the shank.



**4.** Loosen the shank lock nut #4 located on the top of the ThriftShave® body so the shank will slide.

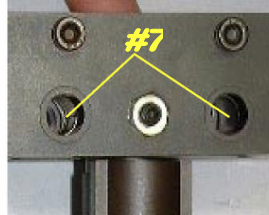
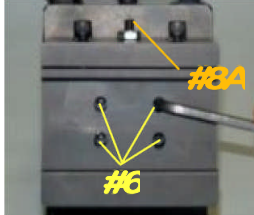
## Disassembling the Thriftshave

5. Remove the shank / lift assembly by sliding it out of the ThriftShave® body. See # 5 Be aware that the shank lock block (5A) is not secured to the shank.



6. Loosen the lift pin clamping screws marked #6

7. Remove the 2 lift pins #7 from the lift assembly.



8. Carefully remove the lift assembly from the shank. The spring #8B, under tension inside the lift block, will be on the opposite side of the lift adjust screw #8A.



# ***Disassembling the Thriftshave***

## ***The Head Assembly***

To disassemble the head assembly follow the next steps:

- 1.** Loosen the Roll Support Lock Screws #1.
- 2.** Loosen the Roll Pin Lock screws #2A and push out roll pin. Back out the micro-adjustable screw (2B) and the roll support assembly can be removed.



- 3.** Remove insert, clamp and anvil #3A, #3B, and #3C.



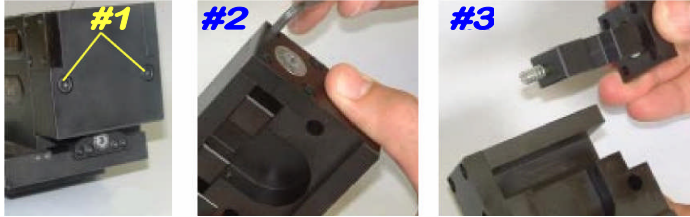
U.S. Patent # 6,012,364  
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U.S. Patent # 6,182,542

## ***Disassembling the ThriftShave®***

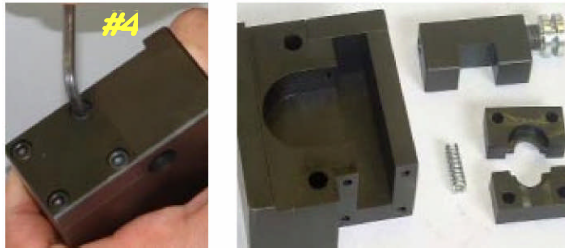
### ***The Mounting Block Taper Assembly***

To disassemble the mounting block assembly which houses the taper adjustment mechanism, follow the next steps.

- 1.** Locate the bolts that retain the mounting block end cap shown in #1. Remove both bolts and then remove the mounting block end cap.
- 2.** Hold the micro adjustable screw end up and remove the four screws in the micro adjustable screw retainer. See picture #2



- 3.** Slide the Micro adjustable screw which is attached to the cam follower out of the mounting block. #3. **The small backlash spring is not attached so be careful.** Most models will have the backlash spring.
- 4.** Remove the 4 screws from the stop plate #4 on the opposite side of the micro adjustable retainer.



## ***Converting the ThriftShave®***

The ThriftShave® is a very flexible shave fixture. It comes to you configured to run the specific job you ordered with it. When this job is completed or you require a shave tool in another position than the original configuration, it may be possible to use this one by converting it to run in a different position.

### ***Converting the Taper Adjustment***



***1. Contact Peterson Tool Company Engineering Department to see if your model can be converted to the desired position. (615) 242-7341***

***If it can be converted, continue these steps***



***2. Locate the bolts that retain the mounting block end cap shown in #2. Remove both bolts and then remove the mounting block end cap.***

***3. Hold the micro adjustable***

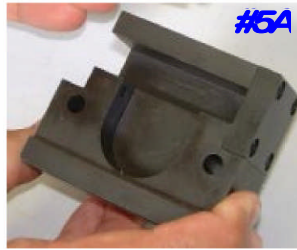
*screw end up and remove the four screws in the micro adjustable screw retainer. See picture #3*

*4. Slide the Micro adjustable screw which is attached to the cam follower out of the mounting block. #4. **The small backlash spring is not attached so be careful.***

*5. Remove the 4 screws from the stop plate #5 (next page) located on the opposite side of the micro adjustable retainer and replace it where the micro adjustable retainer was just removed #5A.*



## Converting the ThriftShave®



6. Flip the Micro adjustable screw to the side where you removed the stop plate and slide it into the mounting block and replace the retainer screws, see #6 & 6A



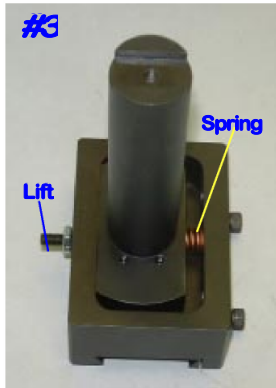


## Converting the Shank & Lift Block

The next assembly to change over to complete the conversion process is the lift block assembly and shank. During this process several components will be reversed so it is a good idea to mark them or place them in an orderly fashion as to how they are originally.



1. Follow the steps to disassembling the lift block on page 18 and 19, steps 3 thru 8. Make sure you note the orientation of the position of the spring relative to the extended end of the taper cam. Because the spring is inside the lift block at this point, remember that the lift adjustment screw is on the opposing side of the spring. The taper cam is fixed but the spring location will be reversed after the conversion.



2. Begin the conversion by removing the lift adjustment screw and placing it on the opposing side of the lift block. There will be a tapped hole on that side also. See picture #2. Do not run the lift adjustment screw into to the inside of the block, yet.

3. Place the spring into the spring chamber on the shank and reassemble the lift block onto the shank with the lift adjustment screw opposite the spring.

## Converting the Shank & Lift Block

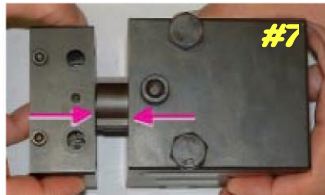
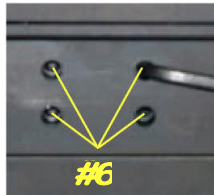
4. Replace the lift pins into the lift block assembly. #4 It will be easier to start the pins from the side where the lift adjustment screw is located, provided you did not run the screw into the interior of the block.

5. Now adjust the lift adjustment screw to the desired amount of lift leaving a small amount of the pin exposed above the side where the head lock screws are.



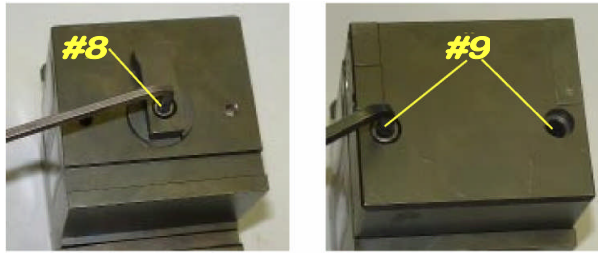
6. Tighten the Lift pin clamping screws, #6.

7. Slide the lift block and shank assembly into the ThriftShave® body. The head locking screws should be on the same side as the top of the T-bolts and the shank locking bolt, #7. *Continued on next page*



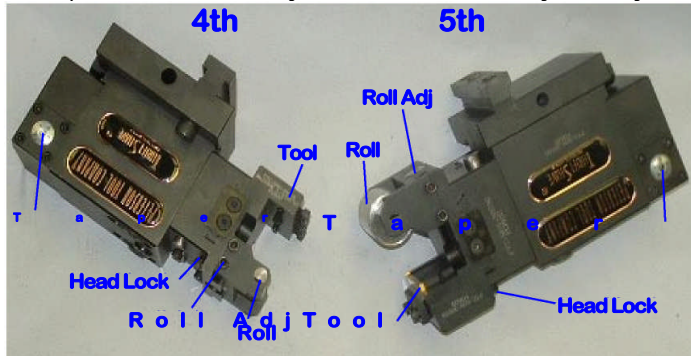
## Converting the Shank & Lift Block

8. Replace the taper adjustment cam on the end of the shank, #8.
9. Re-attach the mounting block end cap to the ThriftShave® body,



#9.

10. Replace the head assembly on the ThriftShave® body assembly



and tighten head lock screws.

The picture above shows, as an example, the proper arrangement for a 4th position shave and a 5th position shave on an Acme Gridley machine. The only adjustment not readily available to the operator will be the roll adjustment on the 5th position, but is easy to make with the

head removed from ThriftShave® body.

## ***Troubleshooting***

***When needing additional information about your ThriftShave®, please refer to the inside cover of this manual and have this information available to give the person you speak with.***



The Serial # and Model # can be found on the side of the ThriftShave® as shown. In this example, 112883 is the serial # and PTC -SHV-30013 is the model #. Always refer to this set of numbers when communicating with Peterson Tool about your ThriftShave®.

Please review the following pages for suggestions in the event that you experience problems. If you still are having problems, please call Peterson Tool Company at 615-242-7341.

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U.S. Patent # 6,105,476  
U.S. Patent # 6,182,542

## ***Troubleshooting***

### **1. Excess Chatter**

**a. Too much material being removed** Check diameter and lateral dimensions on part before and after shave and reduce to 0.004" ( 0.1 mm ) on laterals and 0.008" (0.2 mm) on diameter.

**b. Machine spindles worn**

Check for loose spindles and correct problem

**c. Speed and feeds to high**

Reduce spindle speeds and / or feed rate

**d. Lift pressure not correct for material or form being shaved**

Replace lift spring with higher or lower tension spring. See page 15.6 for description of springs

**e. Provide additional roll or end supports.**

**f. After extended use, check integrity of actuating parts. Check with PTC for rebuild or replacement parts**

### **2. Work piece breakage**

**a. Feed rate to high**

Decrease feed rate

**b. Improper roll setting**

Readjust roll support assembly

**c. Spring tension too high**

Replace with lower tension spring

**d. Tool removing too much material**

Check pre-shave tool settings

**e. Part set too far from collet**

Check process sheet for setup info

**f. Breakdown for cut off may be too much**

Readjust breakdown tool.

## ***Troubleshooting***

### **3. Rough Surface Finish**

**a. Tool is dull**

Replace insert

**b. Pre-shave diameter too large**

Check diameter of part in the previous position

**c. Pre-shave surface is rough**

Check condition of the pre-shave tool

**d. Built-up-edge on insert**

Reduce feed rate

Increase spindle speed

Insure proper coolant flow

**e. Coolant flow inadequate**

Position the coolant line on tool, not part

Check for clogged coolant line, pump

**f. Recheck center**

**g. Make sure roll is clean**

### **4. Unexpected cutting edge wear**

**a. Chipping on cutting edge**

Spring tension may be too weak, replace spring, see page 14.

Review whole setup.

**b. Tools dull to quickly**

Spindle speed too high or low

Feed rate too high or low

Roll may not be going to center or past center

### **5. Taper on diameters**

**a. Readjust taper control.**

**b. Retighten taper lock bolt. See page 12.**

U.S. Patent # 6,012,364

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## Appendix A

### How Much to Turn Micro Adjustable Screw for Taper.

Each complete turn of the micro adjustable screw is approximately 1.5 degrees or 90 minutes. Each hash mark is 1.8 minutes. Below are two formulas to help determine how many turns plus hash marks must be taken to remove taper.

L = Length between measurements

T = Total amount of taper

A = Angle of taper

IT = Inverse Tangent (Must have Calculator with  
Inverse Tangent function)

$$A = (T/L) IT$$

$$\text{Example: } A = (0.020" / 3.5") IT$$

$$A = (0.05714) IT$$

$$A = 3.27 \text{ degrees}$$

Once the angle is determined,

$$T_{\text{urns of S}_{\text{crew}}} = A / 1.5$$

$$\text{Example: } TS = 3.27 / 1.5$$

$$TS = 2.18$$

The whole number is the number of complete turns.

Multiply the decimal number by 50 for the number of hash marks.

$$\text{Example: } (0.18 \times 50) = 9$$

$$TS = 2 \text{ Turns} + 9 \text{ Hash marks}$$

This is not 100% but will get you very close the first time to adjust for taper.